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Modular Plus List of Features

Modular Plus List of Features
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Accidental Disconnect Protection

1.1 Overview

1.1.1 Description

This feature protects the user from dropping a call accidentally by fumbling the handset while picking it up.

1.1.2 Rationale for Feature

N/A

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details


1.2.1 Controls

Hookswitch

1.2.2 Message Displays

Call Identification for the active call

1.2.3 End User View

If the user lifts the handset to answer a ringing call or to switch to handset mode on an active call, and if the handset goes onhook less than one second after going offhook, the call is switched from the handset to the speaker voice path instead of being disconnected. At this point, if the user lifts the handset, the handset voice path is active. Alternatively, if the handset remains onhook, the set stays in speaker-only mode until the user lifts the handset, presses , holds the call, or releases the call.

Accidental Disconnect Protection applies to ringing calls eligible for Automatic Incoming Line Selection, and to active calls (that is, calls that are being initiated or are connected) which are in speaker-only mode or handsfree mode.

This feature applies to both internal and external calls.

The feature works in the same way for multiple offhook or onhook transitions lasting less than one second each.

1.2.4 OAM Programming View

N/A

1.2.5 **EXTN/ **LINE

N/A

1.3 Technical Specification (Limits/Constraints)

N/A

1.4 Interactions

Feature name	Interaction
Line Selection - Automatic Incoming	Applies to ringing calls eligible for this feature.

Alarm Extn

1.1 Overview

1.1.1 Description

This feature allows the user to assign an Extension on which Alarm messages appear when a problem is detected in the system.

1.1.2 Rationale for Feature

See "1.1.1 Description".

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 End-User View

N/A

1.2.2 OAM Programming View

1.2.2.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item		I	SC+	SC
System prgrming	Featr settings	Alarm Extn:221	X	X	

1.2.2.2 Programming Receiver Volume

See ["System Programming - Feature Settings"](#).

Alarm Extn is set in System prgrming ▶ Featr settings. The default value is 221. Other possible values are any valid DN, or None.

1.2.3 **EXTN/ **LINE

N/A

1.3 Technical Specification (Limits/Constraints)

N/A

1.4 Interactions

Feature	Interaction
Change Extn Extn Length	Changing individual Extns, or Extn length, preserves the relationship between an alarm extn and its Extn.
Do Not Disturb	Do Not Disturb activation at the alarm extn does not suppress the Error tone associated with an alarm.

Analog Terminal Adaptor

1.1 Overview

1.1.1 Description

For each Analog Terminal Adaptor (ATA), an administration setting will be available in order to set the gain that is required for proper volume levels for off site (OPX) or on site connections. There are also settings for the mode that the attached device uses (that is, Tone or Pulse) and for whether confirmation and error tones should be delivered to the device.

1.1.2 Rationale for Feature

The ATA can be used for two types of TCM/analog conversion: first, the standard on site applications for connecting tip and ring devices (for example, 2500 sets, modems, answering machines) to a TCM loop, and second, off site applications for connecting an off premise extension (OPX or external CO line) to a TCM loop.

The off site or OPX application requires a different loss (gain) plan to optimize volume levels when the ATA is directly connected to certain types of external CO lines.

On Pulse sets attached to the ATA, the user cannot invoke Norstar features by using the Recall signal, as the ATA cannot differentiate between the Timed Break Recall signal and the signal for the digit 1(one pulse).

If the user could activate Tones as in North America, Pulse sets would not be able to enable tones, and consequently, any tones associated with supported features would not be presented to the Pulse set ATA user. In this case, the ATA user on a Pulse set would not receive:

- Error Tones (for instance, if an invalid Call Park Retrieve attempt is made)
- Attention Tones (for instance, to inform the user that a Priority Call is about to be connected)
- Confirmation Tones to inform the user that a feature invocation has succeeded (for instance, invocation of Call Forward All Calls).
- Call Waiting Tones (indication that a call is alerting on the alternate intercom).

To overcome this short-coming, the Tones feature becomes part of System Administration. It appears in conjunction with another ATA-related System Administration parameter that designates the mode (DTMF Tone or Pulse) of the device attached to the ATA.

Following the rationale in North America, the default value of the ATA tones parameter is N, to prevent devices such as fax machines from receiving unwanted system-generated tones. This parameter and its associated values replace the Modular DR3 ATA User-administration features Tones ON (Link*809) and Tones OFF (Link#809), so that there is no need for User Administration.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

Press , ATA use:On Site appears.

1. Press CHANGE to alternate between On site for internal ATA applications (i.e., a 2500 set or fax machine) and Off Site for off premise extensions or connections to a CO line.
2. Press to move to ATA mode: Tone.
3. Press CHANGE to alternate between Tone and Pulse.
4. Press to move to ATA tones:N.
5. Press CHANGE to alternate between N and Y.

1.2 Feature Details

1.2.1 Controls

N/A

1.2.2 Message Displays

N/A

1.2.3 End User View

If the ATA use: parameter is set to the On Site value, the transmit and receive volume levels the user hears will be optimized for on site applications, such as: TCM loop - ATA - local 2500 set. If the ATA use: parameter is set to the Off Site value, volume levels the user hears will be optimized for off site or OPX applications, such as TCM loop - ATA - remote 2500 set. If the wrong value is selected for this parameter, the user may experience volume levels that are either too high or too low.

Both data and voice applications are set the same, that is, the fact that it may be voice or data that is being transmitted has no effect on what value needs to be selected.

1.2.4 OAM Programming View

The ATA Settings feature is the last parameter under Terminals&Extns► Capabilities►ATA settings►. The settings are required for a DN that has been identified as having an ATA attached.

[See "Terminals&Extns - Capabilities - ATA setting".](#)

ATA Settings contain three parameters that apply to the ATA. At the first parameter, ATA use: the installer will be able to select between Off Site for off site connections (requiring high gain), or On Site for on site connections (normal gain).

The other two parameters, ATA mode: to designate whether the device attached to the ATA is tone or pulse and ATA tones: to specify tone activation/deactivation.

Because DTMF (that is, Tone) and Pulse devices are supported differently, it is necessary to designate which type of peripheral device is attached to the ATA. In the absence of a physical switch on the ATA, and of support of a Timed Break Recall signal from pulse devices, an administration setting is required to distinguish whether the attached set is Pulse or Tone (the default).

If the `ATA mode:` parameter is set to `Pulse`, all signals will be interpreted as call dialling signals:

1. A valid DN (or 0 for the Dial-0 set) dialled into internal dial tone will be interpreted as internal dialling.
2. A valid external code, or a valid external Line pool code dialled into internal dial tone will attempt to access an external line for dialling.
3. A valid Call Park Retrieve code (102 or 101) into internal dialtone will result in an attempt to retrieve a call parked against the Call Park ID.
4. Any invalid digits that do not result in one of the three scenarios above will result in an error condition.
5. Any attempts to invoke a feature using the 'Recall' signal will not be interpreted as such. The signal will be interpreted as the digit 1.

For Tone mode:

1. A valid DN (or 0 for the Dial-0 set) dialled into internal dial tone will be interpreted as internal dialling.
2. A valid external code, or a valid external Line pool code dialled into internal dial tone will attempt to access an external line for dialling.
3. A valid Call Park Retrieve code (102 or 101) into internal dialtone will result in an attempt to retrieve a call parked against the Call Park ID.
4. A valid feature invocation using the 'Recall' signal will result in an attempt to activate the feature.
5. Any invalid digits that do not result in one of the four scenarios above will result in an error condition.

Note that the first three actions are identical for Pulse and Tone designated ATA sets, and that with the Tone setting there is the additional valid action of invoking a feature, using the 'Recall' signal.

The `ATA tones:` parameter allows the activation/deactivation of ATA feedback tones over the voicepath. It should be set to N (the default) when a data device is attached to the ATA and Y when a voice terminal is attached to the ATA.

1.2.4.1 System Administration Forced Settings

The ATA-based set has some forced settings. They are the same as on the North American ATA (that is, the same as for a Basic Set). For both DTMF (Tone) and Pulse devices, the settings for Full handsfree, Handsfree Answerback, Auto handsfree, Page zone and the number of intercom keys are ignored.

1.2.4.2 Second Intercom Key and Pulse Devices attached to the ATA

Although the software makes two intercom keys available to an ATA, if a device attached to the ATA is designated as Pulse, it will not have access to features that require the use of the Recall signal. Accessing the alternate intercom line requires the use of the Recall signal. Therefore, Pulse set users will not have simultaneous access to the second intercom line. If a second call is coming in on the second intercom line, and the user hears the Call Waiting Tones, the current call will have to be released in order for the user to pick up the second call.

1.2.5 **EXTN/ **LINE

N/A

1.3 Technical Specification (Limits/Constraints)

N/A

1.4 Interactions

The `ATA use:` parameter of this feature does not impact any of the call processing features on the system. The only impact is to ensure audio quality when the ATA is connected to an off site line or an on site device.

Note that the two special tones, Tone on Conference (when enabled) and the regulatory Intrusion Tone will be presented to the ATA in all cases, regardless of the setting for the ATA tones parameter.

As with the North American Tones feature, the `ATA tones:` setting has no effect on the ability of the ATA user to activate or cancel features. For example, the user on a DTMF set can activate Norstar Call Forward even when tones are off. The activation succeeds, even though no confirmation tone is given to the user.

Answer Extensions

1.1 Overview

1.1.1 Description

This feature allows incoming external calls to a given set to appear and be answered at other sets. The Extn of a telephone that is monitored by an Answer key is called the Answer Extn. A set can be programmed to have one to eight Answer Extns.

When an Answer Extn is programmed for a set, an Answer key is created automatically at that set.

1.1.2 Rationale for Feature

An Answer key allows a user acting as an attendant to receive visual indication, and ringing (if set in OAM Programming), when a call is directed to the set of another user who receives attendant service (service receiver). An alerting call can then be answered either at the attendant's or at the service receiver's set. An attendant can provide service for up to eight extensions.

Any number of sets on the system can have an Answer key for the same Extn. In this way, more than one set can provide call alerting and call answering for calls directed to that Extn.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

In order to distinguish the Answer key (used for answering calls directed to the service receiver's set) from the Internal Autodial key (used for initiating calls to the service receiver's set, and for monitoring its busy status), the Answer key should be labelled "Answer Smith's", where Smith is the service receiver; while the Internal Autodial key is labelled "Smith".

1.2 Feature Details

1.2.1 Controls

Answer keys

1.2.2 End User View

An Answer Extn allows more than one set to answer an incoming call. At the attendant's set, a call alerting at the Answer key displays <originator's name>><the service receiver's name>, where <originator's name> is the name associated with the originating set or line, and <the service receiver's name> is the name associated with the service receiver's set in

OAM Programming. This display allows the attendant to respond appropriately when answering the call (for example, stating the service receiver's name).

Message Displays

Message	Description
<originator's name> > <the service receiver's name>	Displays at the attendant's desk, when a call is alerting at the Answer key.
No call answered	Displays, accompanied by Error tone, when the user presses an Answer key when no call is attempting to ring the service receiver's set.

All calls directed to the service receiver's set also alert the attendant's set at the Answer key, provided that an Answer key is not already in use.

If the service receiver answers their own call, and the attendant has an Internal Autodial key with an indicator for the service receiver's set, busy status indication is displayed at the Internal Autodial indicator, not the Answer key.

When a call is showing alerting, active, or I-Hold status on an Answer key on the attendant's set, that key is not available to display alerting for another call to the service receiver's set.


When more than one call is alerting at the attendant's set, normal incoming call priorities (as described in the Call Capture feature) apply in determining which call controls the display and the ringing. The priorities are not affected by the fact that a call appears on an Answer key.

Pressing an Answer key at a set where another call is active applies Automatic Hold to that call, whether or not the answer attempt is successful.

Private lines do not generate alerting at Answer keys. For the rules on which types of calls can alert at the Answer key, see the table in "1.2.2.2 Rules for Alerting at an Answer key".

An Answer key cannot be used to initiate an outgoing call. There is no method provided for a set to originate a call from an Extn other than its own.

1.2.2.1 Answering a call

When a call is alerting at the Answer key, normal call answering rules apply. If the call is controlling ringing at the set, the attendant can answer the call by lifting the handset or by pressing . If the call is only presenting visual alerting (because the Answer key is programmed not to ring (see "1.2.2.2 Rules for Alerting at an Answer key"), or because Do Not Disturb is activated at attendant's set), the attendant can answer the call either by lifting the handset and then pressing the Answer key, or by pressing the Answer key to perform Preselection, and then activating the handset or Handsfree voice path.

When the attendant answers a call at the Answer key, the indicator turns on at that set, and turns off at the service receiver's set. The call is treated as an ordinary two-party call between the caller and attendant's set, with normal call

identification messages and feature interactions. At the originating set, the name associated with the set that actually answered the call is displayed. Holding a call appearing at the Answer key causes the indicator to show I-Hold state. The I-Active or I-Hold indication at the Answer key is removed when the call is disconnected, parked, or transferred.

If the service receiver answers an alerting call, the alerting indication at the attendant's set is removed, and the Answer key becomes available to show alerting for a call that subsequently attempts to ring at the service receiver's set.

1.2.2.2 Rules for Alerting at an Answer key

As a general rule, a call is presented on only one key on a set. Where an external call is directed to the service receiver's set and the attendant's set has an appearance of the external line as well as an Answer key, the call is presented only on the external line key. The call displays the normal message indicating that the call is directed to the service receiver. In this situation, the Answer key cannot be used to answer the call.

Rules for Alerting at an Answer key

Type of Call to the Service Receiver's Set	Alert at Answer key on Attendant's Set?
Internal or external call attempting to ring the service receiver's set directly, or as a result of Transfer, Direct-dial, accepting a Ring Again offer, or Reply Message. (Status of the service receiver's set —Call Forward, Do Not Disturb, Out of service, and so on — is unimportant.)	Yes (with some exceptions, as noted in "1.4 Interactions".)
Call redirected from the service receiver's set using Call Forward	Yes
Park Callback, Transfer Callback or Camp Callback	No (Callback is directed to the specific set that initiated the Park, Transfer or Camp.)
Call ringing at Answer key at the service receiver's set	No (Chaining of Answer keys is not supported.)
Call originated from attendant's set	No
Call transferred to the service receiver's set from attendant's set	No
Call to Private line on the service receiver's set	No
Call to the service receiver's set using Priority Call	No
External call alerting at service receiver's set but not attempting to ring there	No
Internal or external call directed to service receiver's set by Prime Set Call Capture, or a Scheduled Service	No
Held Line Reminder for call on I-Hold at service receiver's set	No
Second or subsequent call attempting to ring at service receiver's set when Answer key is already in use for an alerting, connected, or held call	No

1.2.2.3 Moving Answered Calls

An internal or external call can be moved from one set to another by means of Blind Transfer, Transfer using Conference, Transfer With Announcement, or Call Park/Retrieve Park. A call cannot be transferred from the attendant's Answer key to the service receiver's intercom key, or vice versa, using Hold. Transfer using Hold can be used to move an external call from an Answer key or intercom key to a set that has an appearance of that external line.

1.2.2.4 Feedback at Calling Set

When an internal call is initiated to a set for which Answer Extns exist, the tone and display feedback at the calling set depend on the combined status of the service receiver's set and the attendant's set (or the sets to which either or both of these sets are forwarded).

Status of Sets in Answer Extns	Tone at Calling Set	Display at Calling Set
At least one set is alerting (visually or audibly).	Ringback	Calling <the service receiver's name>
Only the service receiver's set is alerting (visually or audibly).	Ringback	Calling <the service receiver's name> for three seconds, followed by: On another call, Do Not Disturb, or Calling <the service receiver's name> depending on the status of the service receiver's set.
Neither set is alerting, because there is no key on the service receiver's set at which to present the call, and another call is already alerting, held, or connected at the Answer key on the attendant's set.	no tone for three seconds, followed by: Busy tone	Calling <the service receiver's name> for three seconds, followed by: <the service receiver's name> busy
Neither set is alerting, because both sets are out of service.	no tone for three seconds, followed by: Overflow tone	Calling <the service receiver's name> for three seconds, followed by: Not in service

1.2.2.5 Calls within the Answer Group

If the attendant initiates a call to the service receiver, this call alerts at the service receiver's set only. The call does not alert audibly or visually at the Answer key on the attendant's set (but see "1.2.2.7 Multiple Attendants").

If the service receiver initiates a call to the attendant, this call alerts at an intercom key, not at the Answer key, on the attendant's set.

1.2.2.6 Private Extns

An Answer key operates normally whether or not the service receiver's set is in service. This capability allows a set to be given a private Extn, by giving it an Answer key for a set that does not exist. This private Extn is used to receive calls from selected co-workers who know this Extn, while other internal calls arrive at the set's ordinary Extn.

1.2.2.7 Multiple Attendants

No limit is placed on the number of sets that can be programmed to have an Answer key for the same Extn. This capability permits two or more attendants to cover calls for one service receiver.

In the case of multiple attendants, calls directed to the service receiver's set by a given attendant do not ring at that attendant's Answer key, but do attempt to ring at the Answer keys on any other attendant's set.

1.2.2.8 Group Answer

A group of co-workers can be assigned Answer keys to allow them to answer one another's phones. For example, Set 225 has Answer keys for Sets 226 and 227, Set 226 has Answer keys for Sets 225 and 227, and Set 227 has Answer keys for Sets 225 and 226.

1.2.2.9 Features with Similarities to Answer Extns

Other features that allow a set to answer calls directed to another set are:

- Call Forward (All Calls or No Answer)
- Call Pickup (Group or Directed)
- shared external line appearances
- Prime Set Call Capture features (Delayed Ring Transfer, Overflow Call Routing, and so on)

Call Forward and Answer Extns provide call answering capabilities that are very similar. Both features redirect internal and external calls intended for the service receiver's set to attendant's set. The exact requirements of the service receiver and the attendant determine which feature is preferable.

The main differences between Answer Extns and Call Forward No Answer are as follows.

Call Forward	Answer Extns
Call Forward (All Calls) is activated or deactivated by the service receiver. Call Forward (No Answer) is set in OAM Programming. Call Forward (Busy) is set in OAM Programming.	Set in OAM Programming.

Call Forward	Answer Extns
Call Forward (All Calls) attempts immediate alerting at the attendant's set. Call Forward (No Answer) causes alerting at the attendant's set after a delay set in OAM programming. Call Forward (Busy) attempts immediate alerting at the attendant's set.	Tries to alert at the Answer key at attendant's set immediately.
Presents call at the service receiver's set and on intercom key or external line key at the attendant's set.	Presents call at the service receiver's set and on Answer key at the attendant's set. This makes it easier to - distinguish calls for the service receiver from direct calls to the attendant - distinguish, in the case of multiple persons receiving attendant service) the service receiver's calls from calls for a different user receiving attendant service
Allows multiple concurrent calls to the service receiver's set to appear on intercom keys on the attendant's set.	Each Answer key supports one call at a time.
Always attempts to ring at the attendant's set. Call Forward (All Calls) can be turned ON and OFF by the user. Call Forward (No Answer) is set in OAM programming. Call Forward (Busy) is set in OAM programming.	Ringing for Answer key at the attendant's set can be turned ON or OFF in OAM Programming.
Suppresses ringing at the service receiver's set.	Does not suppress ringing at the service receiver's set.
Forwards Private Lines.	Does not extend Private Lines to the Answer key.

Answer Extns and Call Pickup do not allow private lines to be picked up. The main differences between Answer Extns and Call Pickup (Group or Directed) are as follows.

Call Pickup	Answer Extns
Can be assigned to a key with or without indicator (indicator is not used).	Must be assigned to a key with an indicator.
Can be activated by a feature code.	No associated feature code.
No visual indication at the attendant's set for a call ringing at the service receiver's set.	When a call is directed to the service receiver's set, it shows at the attendant's Answer key, and can show incoming call identification on the attendant's display.
No ringing at the attendant's set for a call ringing at the service receiver's set.	Ringing for Answer key at the attendant's set is optional.

Call Pickup	Answer Extns
Can only be used to answer calls actually ringing at another set.	Supports ringing and call answering for calls attempting to ring the service receiver's set, but not actually ringing there because the service receiver's set is in Do Not Disturb or Call Forward mode, or is not in service.

1.2.3 OAM Programming View

1.2.3.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item		I	SC+	SC
Terminals&Extns	Line access	Answer Extns	X	X	

1.2.3.2 Programming Answer Extns

See ["Terminals&Extns - Line Access - Answer Extension"](#).

When Answer Extn is programmed for an attendant's set in `Terminals&Extns►Line access►Answer Extns►`, an Answer key with indicator is assigned automatically.

The Ringing Preference for line at the attendant's Answer key can be programmed as `Appear only`, or `Appear&Ring`, or the key can be `Unassigned` (the default). (See Line Assignment.)

The name associated with an Answer key is the name assigned to the service receiver's set in OAM Programming, `Terminals&Extns►Name`. The default is `Extn<Extn>`, where `<Extn>` is the Extn of the service receiver's set. For more information, see Call Identification.

1.2.4 **EXTN/ **LINE

N/A

1.3 Technical Specification (Limits/Constraints)

When Answer keys are assigned to a set, they are given a key with an indicator.

A set cannot be programmed to have an Answer key for itself.

A set cannot be assigned an Answer key for itself.

There is no specific limit to the number of sets that can be programmed to have an Answer key for the same Extn.

An individual set can have a maximum of eight Answer keys, each for a different Extn. (If the user attempts to program more than eight Answer keys, the error message `Maximum reached` is displayed.)

1.4 Interactions

Feature name	Interaction
Blind Transfer	If the service receiver's set is specified as the destination for the Blind Transfer command, the call also alerts at the Answer key on the attendant's set. Alerting does not occur at the attendant's set if the attendant is initiating the transfer.
Blind Transfer / Callback	If the attendant answers an external call on the Answer key and then uses Blind Transfer to transfer the call to the service receiver's set, and if that call is not answered there, a Callback occurs to the attendant's set. As in the normal situation, the Callback is presented on an appropriate external or internal line key, not on the Answer key. Callback does not occur for internal calls. For more information, see the Callback feature.
Callback	Callback from Park, Camp and Blind Transfer is directed to a specific set. If the Callback is directed to the service receiver's set, it does not alert at the attendant's set.
Call Forward	<p>When the attendant's set is forwarded, Call Forward applies to all calls attempting to ring that set, including calls to the Answer key. If the Answer key is not programmed to ring, no forwarding occurs from that key.</p> <p>When the service receiver's set is forwarded to another set, the Answer key continues to operate normally, presenting calls in the same way as if the service receiver's set were not forwarded.</p> <p>In the case of multiple attendants, calls forwarded to the service receiver's set by an attendant do not ring at that attendant's Answer key, but do attempt to ring at the Answer keys on any other attendant's set.</p>
Call Pickup	<p>As in the case of an ordinary call, a call that is ringing at an Answer key can be answered by means of Group Call Pickup from any set in the same Pickup group.</p> <p>A call ringing at an Answer key can be answered by means of Directed Call Pickup. The call can be picked up by supplying the attendant's Extn, or the Extn of any other set where the call is ringing.</p>
Conference	Conference calls can be created in the normal manner when one or both calls appear at Answer keys.
Do Not Disturb	<p>When the service receiver's set is in Do Not Disturb mode, calls alerting visually at the service receiver's set continue to appear at the attendant's Answer key. If the attendant answers a call and wants to transfer it to the service receiver, a normal call or Blind Transfer does not succeed. The attendant can tell the service receiver in person, or using Priority Call to cancel Do Not Disturb, so that the call can be transferred with Blind Transfer. If this is an external call for which the service receiver's set has a line appearance, the attendant can hold the call and tell the service receiver in person, or using Priority Call, to press the held line key to retrieve the call. If the service receiver does not have the call appearance, the attendant can park the call and tell the service receiver in person or using Priority Call, to dial the appropriate code to retrieve the call.</p> <p>If Do Not Disturb is active at the attendant's set, it does not prevent a call from alerting visually at an Answer key.</p>
Exclusive Hold	Exclusive Hold can be applied to a call appearing at an Answer key.

Feature name	Interaction
Priority Call	If a caller activates the Priority Call feature while receiving Ringback or Busy tone on a call to an Answer group, the feature is applied to the service receiver's set only. The attempt is denied if the service receiver's set is not in service. For details, refer to the Priority Call feature.
Private Lines	Private lines at the service receiver's set do not activate the attendant's Answer key.
Reply Message	A call directed to the service receiver's set by means of Reply Message alerts at the Answer key as well.
Ring Again	<p>When the service receiver activates Ring Again on another set, the subsequent Ring Again offer is made to the service receiver's set only, not to the attendant's set.</p> <p>An internal caller can activate Ring Again on Busy or Ring Again on No Answer while receiving ringback or busy tone in response to a call to sets with an Answer Extn programmed where the service receiver's set is in service. Activating Ring Again on an Answer Extn is the same as activating the feature on the service receiver's set directly. The Ring Again offer is made when the service receiver's set is in the appropriate state.</p> <p>When the caller who has activated Ring Again on the service receiver's set accepts a Ring Again offer to try the call again, the call to the service receiver's set alerts at the Answer key on the attendant's set as well. If the service receiver's set is not in service, any attempt to activate Ring Again results in a three-second delay followed by the error message <code>Can't ring again</code> accompanied by Error tone.</p>
Ringing Call	<p>If a call already exists between the service receiver's set and the attendant's set, a second call from the service receiver to the attendant rings the Answer Extn. (If the second call is made as a Priority Call, the Error message <code>Already Joined</code> and Overflow tone are presented.)</p> <p>In a situation where several sets are involved, and one set has Answer keys for the others, if the end result, through the use of Answer keys, is that two connections would exist between the same two sets, the second call does not ring at the Answer key.</p>
Selective Call Forward	For an ordinary external call ringing at a set, the Selective Call Forward feature rings the prime set if the user activates Do Not Disturb while the call is ringing. For consistency, this feature also applies when Do Not Disturb is activated for a call ringing at an Answer key.
Send Message	<p>When the service receiver's set is specified as the destination for the Send Message feature, the attendant's set is not involved.</p> <p>If the service receiver's set is not in service, an attempt to send a message to it fails.</p>
Set Copy	Line access attributes (such as Answer Extns) can be copied from one set to another.
Voice Call	In Norstar, if a user initiates a Voice Call to a set in the correct state to receive a Voice Call, the call is connected at once. When the service receiver's set receives a Voice Call, no alerting occurs at the attendant's set. If conditions for a Voice Call are not correct and the call is converted to a Ringing Call, this call is directed to the service receiver's set only, and does not alert at the Answer key on the attendant's set. This rule is made on the assumption that the caller is interested in calling a specific set only.

Autodial – External

1.1 Overview

1.1.1 Description

This feature allows the user to press a key to dial a programmed sequence automatically on an external line.

1.1.2 Rationale for Feature

External Autodialers permit one-touch dialing to destinations external to Norstar. They differ from Internal Autodialers in that the digit strings for External Autodialers are not a fixed length, and External Autodialers require the selection of a valid facility on which to dial the external numbers.

1.1.3 General Definitions

The following table defines terms useful for understanding this document.

Term	Definition
Autodial key	Key programmed to dial an Internal or External Autodial number.
Autodial number	Dialing sequence programmed by the end user on a programmable key, activated simply by pressing that key. Autodial keys can be programmed for internal or external numbers.
Dialer	Memory allocated to the storage of frequently used numbers that can be accessed by a feature code, or programmed key press. Features that use dialers include: System Speed Dial, User Speed Dial, Internal Autodial, External Autodial, Last Number Redial (LNR), and Saved Number Redial (SNR) keys. Speed dialers cannot be programmed on a key, while Autodialers, LNR and SNR can.
Facility	Method used to route an External Autodial, Speed Dial, Direct-dial or Hotline call; one of: Prime Line, line number, line pool, or intercom.
External Autodial key	Key programmed to dial an External Autodial number.
Internal Autodial key	Key programmed to dial an internal Autodial number. Also called a Direct Station Selection (DSS) key.
Speed Dial code	Two-digit number associated with the Speed Dial number in OAM Programming, dialed by the caller after activating the Speed Dial feature (<input type="text" value="Feature"/> <input type="text" value="0"/>).
Speed Dial number	Speed Dial sequence, which can be up to 24-digits long, and can include the facility used to dial the number. A Speed Dial number is associated with a bin (rather than a programmable key) and is accessed by activating the Speed Dial feature and dialing a code.
Speed Dialer	A bin in which an external number can be stored and is accessed with the Speed Dial feature code and a Speed Dial code.
Stored number	Number stored by any of the methods described in the definition for Dialer.

1.1.4 General Procedures

External Autodial is one of a set of User Preferences features that can be programmed by one of the following methods:

- an individual user at their set, using Feature keys (see End User View)

- for another user by the installer, system coordinator plus, or system coordinator, through OAM Programming (see OAM Programming View)
- for another user by a user with the Installer, System Coordinator Plus, System Coordinator, or Basic password, using the User Preferences feature, **USER (see OAM Programming View, and the User Preferences feature)

1.2 Feature Details

1.2.1 Controls

To program an External Autodialer:

or Dialpad keys

To run an External Autodialer:

Programmed keys, with or without indicators

1.2.2 Caller View

When an External Autodial key is pressed, the facility selected depends on telephony state of the caller's set. For more information, refer to the Facility specification.

Digit translations that occur as a result of the Routing table are not displayed to the user. The display shows only the digits the user originally dialed.

1.2.3 Message Displays

Message	Description
Select a line	Displays at run time when no facility has been stored with the Autodialer and no Prime Line has been programmed for the set.
Invalid number	The number dialed is not known to Norstar. Norstar cannot determine how to handle it. Typically, this can occur at run time if the user made an error in entering a route. Alternatively it can occur if the user entered a white pages number into I/C (that is, forgot to specify an outgoing facility).

1.2.4 End User View

The model for programming External Autodial keys is consistent with that for User Speed Dial, System Speed Dial, Hotline, and (Network) Direct-dial.

The user can assign Autodialers up to the number of programmable keys on their set (minus any line keys, intercom keys, Answer keys, and Handsfree key, which are set in OAM programming only.)

The following table shows the steps taken by an end user to program External Autodial key(s) for their set. The table illustrates how the displays appear on two-line display sets (M7310 and M7324). One-line display sets (M7208, M7100) do not use display keys, and use the key instead of the OK display key. The

[Rls] key is used instead of the **QUIT** display key, and Volume Down is used for backspacing.

User Action	Resulting Display	Explanation
1. Press Feature * 1	Externl Autodial	Displays transiently to provide feedback to the user. The user can press a desired key without waiting for the display to disappear.
	Press a key QUIT	Prompts the user to indicate which key is to be programmed.
2. Press a programmable key (on the M7310, user may need to press Shift) (not on M7100)	Program and OK QUIT OK	On the M7100 and M7208 sets, the user is prompted to press the Hold key instead of the OK display key.
3. Go to step 4 unless you press a line, line pool, or intercom key	Enter digits QUIT OK	Prompts for the entry of dialing information.
4. Enter dialing information to be stored (can include feature codes, routing codes or line pool codes)	<dialing information> QUIT BKSP OK	Echoes dialing information (up to 24 characters) as it is entered. On M7310 and M7324 sets, a BKSP display key and (on any sets) a cursor appear after the first digit is entered by the user.
5. Press OK display key	Programmed	Transient display to advise user that the key is programmed. Programming ends.
	Autodial full	Transient display accompanied by an Error tone. Autodial number is not stored. Programming ends.
	Button erased	Transient display. No dialing information was entered in step 4. The programming on the key is erased. Programming ends.

Message Displays

Message	Description
Access denied	Displays transiently when the user tries to program an External Autodial key, and an OAM Programming session is in progress elsewhere.
Hold or release	Displays transiently if the user tries to program an Autodial key when a call is connected or being initiated.
Incoming only	Displays transiently when the user has selected an incoming (DIA line) as the facility.
<external line name>	Displays transiently when the user presses a line key to store a line with an External Autodialer.
Line pool <letter>	Displays transiently when the user selects a line pool programmed key.
Intercom	Displays when the user selects an intercom key when specifying a line to be stored with an Autodialer.

Message	Description
Intercom, Linennn, or Line pool X	Key inquiry of an External Autodialer displays the name of a facility that has been programmed on the key (nnn is the line number and X is the alphabetic line pool code). Intercom displays transiently if it is selected during programming.
No number stored	Transient message that displays, accompanied by Error tone, if the user presses the LNR or SNR key while programming an Autodialer that does not have a stored number. The user is returned to where they were in the programming sequence prior to entering LNR or SNR.

When programming External Autodial, if the user presses an Autodial key that already has a stored number, and programs a new number, the existing stored number is cleared and replaced by the new number.

1.2.4.1 Valid Dialing Sequences

An External Autodial number can contain up to 24 characters including:

- PBX reachthrough codes: Recall, Run/Stop, and Pause
- asterisk (*) and octothorpe (#)
- any transmitted routing digits, if a facility is programmed for the number
- LNR or SNR numbers

Asterisk and octothorpe have special meanings in DTMF signaling mode. For more information, see the PBX Reach Through and Pulse to Tone features.

Entry of more than 24 characters when programming an Autodial key stops echoing digits, but does not exit from the activity.

Programming a Facility

The user can program a facility to be stored with the Autodialer. This facility can be one of Prime Line, a specific line, a line pool, or the Routing table. For details on programming a facility and the differences between facility programming by the end user and through OAM Programming, refer to the Facility Programming specification.

If I/C is selected, followed by an incomplete line pool code, incomplete routing code, or unrelated set of digits, the Autodialer fails at run time. It fails at run time rather than at programming time in order to provide for dynamic Routing tables.

Feature codes

Pressing causes the character F to appear on the display. Most feature codes are blocked, except for LNR, SNR, DND, Cancel DND (#), and the PBX Reach Through codes.

Last Number Redial and Saved Number Redial

The user can transfer the stored number associated with the Last Number Redial (LNR) or Saved Number Redial (SNR) key, or the applicable feature codes for these features into an Autodialer, instead of having to re-enter the entire number explicitly. The user can choose to specify a line to be stored with the Autodialer, because line information associated with the LNR or SNR key is not copied.

The numbers stored in the SNR or LNR buffers are shown on the display when the user presses the key (or enters the applicable code).

Because the numbers contained in the LNR and SNR keys were copied and not erased, the LNR and SNR keys still contain the original number. The user can use these stored numbers again.

The user is also not prevented from pressing the LNR or SNR key more than once when programming a dialer.

Do Not Disturb

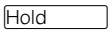
If the user enters the feature code (or presses the programmed feature key) for Do Not Disturb while programming an External Autodial number, Do Not Disturb is activated, and programming continues.

This scenario can occur if, in the middle of the user's entering a number, another call subsequently alerts at the set. If the user does not want to answer the call, they activate Do Not Disturb.


When the Do Not Disturb programmed key is pressed, the messages associated with Do Not Disturb appear transiently on the display. (If the user activates Do Not Disturb by entering the feature code number, the feature code, F85, is first shown transiently on the display, as part of the number being programmed.) If the user enters more digits before the Do Not Disturb messages are finished, or if the Do Not Disturb messages finish before any user input is given, the user is returned to the Autodial number being programmed. The user can then continue with programming.

Do Not Disturb feature can be cancelled without ending the Autodial programming.

1.2.4.2 Ending Programming

Pressing OK (or ) stores the changes and quits the feature.

If the user exits the feature by any means other than OK, the original contents of the Autodial key are left unchanged. If the user enters OK before entering any digits to outpulse, the programming for the key is erased.

Pressing  or pressing the QUIT display key during the programming sequence ends the programming.

Pressing a programmed key other than one associated with LNR, SNR, DND or Reach Through codes terminates current programming without storing the number.

Digit Entry and Navigation

For information on digit entry, navigation, and the behaviour of the display, refer to the Alpha entry feature.

1.2.4.3 User Programming View

The user can store an Autodial sequence in any programmable key.

External Autodialers can be programmed onto keys that are not associated with an indicator. If an External Autodial key is programmed onto a key that has an indicator, that indicator is not lit when the key is pressed.

Command Mapping During End-User Programming

During end-user programming, the dialpad is used for selecting options and entering sequences to be stored. The **Hold** and **Rls** keys and the Volume bar are used for control commands. Two-line display sets use display keys where possible, to make the commands more apparent and to provide the user with more control. No key overlay card is used, as it is in OAM Programming. Users should consult end user documentation in order to learn how to perform each programming activity.

The commands provided by display keys on the two-line display sets are mapped onto keys (hard keys) on all sets. The one-line display sets do not have display keys, so the user must use the key equivalents.

The following table describes the most frequently used display keys and their key equivalents, when programming a feature to a key. See the equivalent tables in Internal Autodial and Key Programming.

Display keys and key equivalents in end-user Feature programming

Meaning	Display key (Two-line Display sets)	Key (Hard Key) Equivalents
Quit this programming activity	QUIT	Rls Hold Feature (only when Feature is pressed immediately after the Press a key prompt)
Backspace	BKSP (after at least one digit has been entered)	Volume bar (down) (after at least one digit has been entered)

1.2.5 OAM Programming View

External Autodial buttons can be programmed for another user in one of two ways

- under the heading **Terminals&Extns**►**User preferences**►**Key prgrming** in OAM Programming, as shown in “1.2.5.1 Levels of Access”
- if the user is programming from a set with a two-line display, using the **User Preferences (**USER)** feature

See ["Terminals&Extns - User preferences - Key programming - External Autodialer programming"](#).

The user interface for customizing a set looks the same from within OAM Programming as from ****USER**. However, the steps to reach User Preferences are different. For more details on ****USER**, refer to the User Preferences feature.

1.2.5.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes for User Preferences, using OAM Programming.

Heading	Item			I	SC+	SC
Terminals&Extns	Individual Extn	User Preferences	Key prgrmg	X	X	X

1.2.5.2 Programming External Autodial Buttons

Programming an External Autodialer is achieved in three steps:

1. At the Bnn: prompt, press the TEL# display button. At the prompt Tel # destŌn?, press the EXTRNL display button.
2. Enter the dialed digits. For valid dialing sequences, refer to “1.2.4.1 Valid Dialing Sequences”.
3. Specify the facility to be used when using the Autodialer.
The External Autodial facility can be one of
 - Prime line (Use prime line)
 - A line (Use line: __) assigned to either Appear or Appear&Ring at this set. (No other values can be assigned.)
 - A line pool code (Pool code: _)
 - Routing table (Use routing tabl)

CANCL restores the previous value.

[See "Terminals&Extns - User preferences - Key programming - External Autodialer - Facility selection".](#)

Message Displays

Message	Description
<DN> busy	Displays transiently for three seconds, accompanied by Error tone, if the user tries to program an Autodial button for a DN, while that DN has active calls.
Release calls	Displays transiently if the user attempts to activate OAM programming while calls are active or held at the set being programmed.

The following table shows the differences in programming External Autodial with User Preferences (**USER) and with Feature * 1 ..

Differences in Programming External Autodial

User Preferences (**USER/OAM Programming)	End User <input type="text"/> Feature <input type="text"/> * <input type="text"/> 1
Destination digits first, facility second	Facility first, destination digits second
Prime line (Use prime line)	Prime Line is the facility if none is specified. That is, Prime Line is the default.
A particular line appearance is a facility	A particular line appearance is pressed to identify the facility

Differences in Programming External Autodial

User Preferences (**USER/OAM Programming)	End User Feature <input type="text"/> * <input type="text"/> 1
A particular line pool can be a facility	A particular line pool can be a facility when identified by one of - pressing a programmed line pool key - pressing intercom and entering leading digits that map to a line pool code
A particular line pool can be specified as the facility Leading digits in destination do not need to map to a pool code, because of the explicit line pool facility choice using a pool code.	A particular line pool can be a facility when identified by one of - pressing a programmed line pool key - pressing intercom and entering leading digits that map to a line pool code To use line pool as a facility, leading digits in destination must map to a line pool code, after intercom is pressed
Routing table can be a facility.	The Routing table is assumed when intercom is pressed and the leading digits in a destination map to a route.

1.2.6 **EXTN/ **LINE

N/A

1.3 Technical Specification (Limits/Constraints)

External Autodial keys can be reprogrammed, but programming the same sequence on another key does not remove it from the first key. The user can store the same sequence for more than one External Autodial key.

Calls initiated by an Autodial key do not provide dialing feedback tones to the user.

Only M7000 series terminals can be programmed through User Preferences. Other terminal types are not supported.

Autodial numbers are stored in non-volatile memory (NVRAM). They are preserved over warm starts, but not over cold starts.

One Autodial key cannot activate another.

Memory Full Errors

An individual set can have up to 24 Speed Dial entries plus any desired number of Autodial keys (limited by the number of keys on the set), so long as space remains in the system's memory pool. A user's attempt to program an Autodial key can be denied because all memory in the pool has been used.

If the pool is full, the number the user tried to program is not stored. The user can store a new number by re-executing the sequence and altering the contents of an existing Autodial key. Otherwise, this programming cannot be done until this user or another user in the system does one of the following

- erases an existing User Speed Dial entry
- erases an Autodial key
- erases a Hotline number

thereby freeing memory.

Similarly, because dialer memory is not reserved for any individual set, there is no guarantee that a new set added to the system can program any User Speed Dial entries or Autodial keys.

Memory full errors are unlikely, because systems are rarely equipped with the maximum number of sets, and users do not often program the maximum number of Autodial keys.

1.4 Interactions

Feature name	Interaction
Active calls	The user cannot program an Autodial key while initiating or connected on a call. (The user can hold the call and then program the Autodial key.) If the user is programming a number, and answers an alerting call, programming ends and the programming is not stored.
Call Restrictions and Overrides	All autodial numbers are subject to Call Restrictions and Overrides when they are used. No restrictions are in effect when they are programmed. Programmed numbers are checked against restriction at run time.
* , # PBX Reach Through Pause Recall Run/Stop	Special keys * , # , and PBX reachthrough codes can be stored in the Last Number Redial buffer. Reachthrough code digits are immediately replaced with the appropriate symbol. For more information, see the Pulse to Tone Conversion and PBX Reach-Through features.
Do Not Disturb	Do Not Disturb can be activated or cancelled when a dialer is being programmed. (For more information, refer to "Do Not Disturb" on page 5).
Last Number Redial (LNR) Saved Number Redial (SNR)	Autodialers can be programmed using dialing sequences from LNR and SNR. However, if the number in the LNR buffer came from a named System Speed Dialer, it cannot be programmed onto an Autodial key. If the user selects LNR at the Program and OK prompt, they are presented with Error tone and the transient message Hidden number, and the Autodial feature is terminated.
Line Pools	External Autodialers with a line pool stored as the facility use the line pool when the dialer is activated if - a line in the pool is idle - the set has access to that line pool defined in OAM Programming
Extn Copy	Extn Copy can be used to copy Autodial keys from one set to another, only if both sets are the same model.

Feature name	Interaction
Volume Control	If the user is programming a dialer and uses the volume down portion of the volume bar to backspace over entered digits while a call is ringing at the set, using the volume bar both lowers the volume of the ringing call and backspaces over digits. At the end of each ring cycle, the volume is restored to the original volume level. (Except for Global sets, which can be programmed differently. See the Volume Control feature.)

Autodial – Internal

1.1 Overview

1.1.1 Description

Internal Autodial allows a user to make an internal call with a single key press, using a key programmed to ring an internal party.

1.1.2 Rationale for Feature

See “1.1.1 Description”.

1.1.3 General Definitions

Internal Autodial keys are also known as Direct Station Selection (DSS) keys. The following table defines terms useful for understanding this document.

Terms used in this document

Term	Definition
Autodial key	Key programmed to dial an Internal or External Autodial number.
Autodial number	Dialing sequence programmed by the end user on a programmable key, activated simply by pressing that key. Autodial keys can be programmed for internal or external numbers.
Dialer	Memory allocated to the storage of frequently used numbers that can be accessed by a feature code, or programmed key press. Features that use dialers include: System Speed Dial, User Speed Dial, Internal Autodial, External Autodial, Last Number Redial (LNR), and Saved Number Redial (SNR) keys. Speed dialers cannot be programmed on a key, while Autodialers, LNR and SNR can.
External Autodial key	Key programmed to dial an External Autodial number.
Internal Autodial key	Key programmed to dial an Internal Autodial number. Also called Direct Station Selection (DSS) key.
Stored number	Number stored by any of the methods described in the definition for “Dialer”.

1.1.4 General Procedures

Internal Autodial is one of a set of User Preferences features that can be programmed by one of the following methods:

- an individual user at their set, using Feature keys (see “1.2.3 End User View”)
- for another user by the installer, system coordinator plus, or system coordinator, through OAM Programming (see “1.2.4 OAM Programming View”)
- for another user by a user with the Installer, System Coordinator Plus, System Coordinator, or Basic password, using the User Preferences feature, **USER (see “1.2.4 OAM Programming View”, and the User Preferences feature)

Only valid internal Norstar DNs can be programmed as internal autodialers. A set cannot be programmed to autodial itself. Invalid digits are blocked.

1.2 Feature Details

1.2.1 Controls

Programmed key, with or without indicators or *

1.2.2 Caller View

An Internal Autodial key allows the user to initiate a call to a selected internal number by pressing a programmed Internal Autodial key, instead of selecting an idle intercom key manually and dialing that intercom number. Otherwise, all the rules and messages for intercom calls apply.

When the user presses the Internal Autodial key, the system selects an idle intercom key, turns on the intercom key indicator, and places the call. If the user presses the Internal Autodial key while connected to another call, that call is held automatically and the new call is initiated.

If an internal line is preselected manually at the set and dial tone is presented, the preselected line is used to place the internal call. Otherwise, Automatic Hold applies to active calls at the originating set.

An Internal Autodial key cannot be used as a line key, and cannot be used to answer an incoming call. The Internal Autodial key cannot be used to reconnect to a held call.

1.2.3 End User View

The maximum number of digits for an Internal Autodial number is equal to the DN Length for the system.

The following table shows the steps taken by an end user to program Internal Autodial key(s) for their set. The table illustrates how the displays appear on two-line display sets (M7310 and M7324). One-line display sets (M7208, M7100) do not use display keys.

User Action	Resulting Display	Explanation
1. Press <input type="text" value="Feature"/> * <input type="text" value="2"/>	Internl Autodial Press a key QUIT	Three-second transient display. Prompts user to select a key to program (except on Basic sets.)
2. Press a programmable key (on the M7310, user may need to press Shift)	Intercom #: _ QUIT	Prompts user for the DN to be programmed.
3. Enter digits to be stored	Intercom #: < digits > QUIT	Echoes entered digits.
4. Last digit entered	Programmed	Transient message informs user the key is programmed. Programming ends.

Additional Message Displays

Message	Description
Access denied	Displays transiently, accompanied with Error tone, if the user tries to program an Internal Autodial key, and an OAM Programming session is in progress elsewhere.
Hold or release	Displays transiently, accompanied by Error tone if the user tries to program an Internal Autodial key while initiating or connected on a call.
No button free	Transient message displayed, accompanied by Error tone, if no intercom key is available at the originating set. The new call is not made, and automatic hold is applied to any active call.

When programming an Autodial key, if the user presses an Autodial key that already has a stored number, and programs a new number, the existing stored number is cleared and replaced by the new number.

1.2.3.1 Ending Programming

Once a valid DN is entered, it is stored, and the feature is exited.

If the user exits the feature before a valid DN has been entered, the original contents of the Autodial key are left unchanged.

Pressing **[Rls]** or pressing the **QUIT** display key during the programming sequence ends the programming.

Pressing the **[Feature]** key or another programmed key terminates current programming without storing the number.

1.2.3.2 User Programming View

If there is space for them, by default, the M7310 set has Internal Autodial keys for all sets except itself, located in the field of programmable keys on the upper part of the set. (See the Key Programming feature).

Pressing **[Feature] [*] 2** allows the user to create or move existing Internal Autodial keys, depending on whether they already exist at that set.

Indicators are optional for Internal Autodial keys. If indicators are present, they are used.

Command Mapping During End-User Programming

During end-user programming, the dialpad is used for selecting options and entering sequences to be stored. The **[Hold]**, **[Rls]** and **[*]** keys and the Volume bar are used for control commands. Two-line display sets use display keys where possible, to make the commands more apparent and to provide the user with more control. No key overlay card is used, as it is in OAM Programming. Users should consult end user documentation in order to learn how to perform each programming activity.

The commands provided by display keys on the two-line display sets are mapped onto keys (hard keys) on all sets. The one-line display sets do not have display keys, so the user must use the key equivalents.

The following table describes the most frequently used display keys and their key equivalents, when programming a feature to a key. See the equivalent tables in key Programming and External Autodial.

Display keys and key equivalents in end-user Feature programming

Meaning	Display key (Two-line Display sets)	Key (Hard Key) Equivalents
Quit this programming activity	QUIT	<div>Rls</div> <div>Hold</div> <div>Feature</div>

1.2.4 OAM Programming View

Internal Autodial keys can be programmed for another user in one of two ways

- under the heading `Terminals&Extns`►`User preferences`►`Key prgrming` in OAM Programming, as shown in “1.2.4.1 Levels of Access”
- if the user is programming from a set with a two-line display, using the User Preferences (**USER) feature

See "[Terminals&Extns - User preferences - Key programming - Internal Autodialer programming](#)".

The user interface for customizing a set looks the same from within OAM Programming as from **USER. However, the steps to reach User Preferences are different. For more details on **USER, refer to the User Preferences feature.

1.2.4.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes for User Preferences, using OAM Programming.

Heading	Item			I	SC+	SC
Terminals&Extns	Individual extn	User Preferences	Key prgrming	X	X	X

1.2.4.2 Programming Internal Autodial Keys

After entering User Preferences, at the `Bnn:` prompt, the user presses the `TEL#` display key. At the prompt `Tel # dest'n?`, the user presses the `INTRNL` display key.

The user specifies the DN for the Internal Autodial key in one of two ways

- provide the DN at the `Intrnl:___` prompt (BKSP appears after the first digit entered)
 - press the `LIST` display key to display the list of all sets, then select the DN by <DN, set name> pair from the list of sets, by pressing the `OK` display key
- Only a valid DN is accepted. The hangman game style for data input is used here, because DNs have a fixed length.

To return to the `Intrnl:___` prompt, press the `FIND` display key.

Message Displays

Message	Description
<DN> busy	Displays transiently for three seconds, accompanied by Error tone, if the user tries to program an Autodial key for a DN in OAM Programming, while that DN has active calls.

1.2.5 **EXTN/ **LINE

N/A

1.3 Technical Specification (Limits/Constraints)

Internal Autodial keys can be reprogrammed. However, if the user programs a key with an Internal Autodial number that already appears on another key at the set, the Internal Autodial number is automatically removed from its original location.

When this occurs, the original location becomes a blank key. This prevents complications that arise in cases where the feature makes use of an indicator.

Only M7000 series terminals can be programmed through User Preferences. Other terminal types are not supported.

Calls initiated by an Autodial key do not provide dialing feedback tones to the user.

The user is not allowed to create an Internal Autodial key containing their own intercom number or an Internal Autodial key for the digit 0. Such keys are not assigned by default. The user can only dial set (B1) or B2 DN's. No other digits are accepted.

One Autodial key cannot activate another.

Autodial numbers are stored in non-volatile memory (NVRAM). They are preserved over warm starts, but not over cold starts.

1.4 Interactions

Feature or condition name	Interaction
Active calls	The user cannot program an Autodial key while initiating or connected on a call. (The user can hold the call and then program the Autodial key.) If the user is programming a number, and answers an alerting call, programming ends and the programming is not stored.
Call Forward / Send Message	Line selection does not occur (that is, a call attempt is not made) when the user presses an Internal Autodial key in response to a prompt for a destination in features such as Call Forward and Send Message. Call Forward applies to Internal Autodial calls.

Feature or condition name	Interaction
Handsfree	Pressing an Internal Autodial key to make an outgoing call does not activate the Handsfree microphone, but leaves it active if the user is already in Handsfree mode.
Onhook Dialing	An Internal Autodial key can be used to perform onhook dialing.
Extn Copy	Extn Copy can be used to copy Autodial keys from one extension to another, only if both extensions are the same model.
Voice Call	Internal Autodial calls are made as Ringing Calls, unless the user presses the Voice Call key (or dial pad code) before pressing the Internal Autodial key. In that case, the Internal Autodial call is made as a Voice Call, if the conditions for a Voice Call are met at the destination set. For details, see the Voice Call feature.

Auxiliary Ringing

1.1 Overview

1.1.1 Description

External lines can ring a customer-supplied Auxiliary Ringer. In addition, specific sets and lines in one of the scheduled services can be programmed to ring an Auxiliary Ringer.

1.1.2 Rationale for Feature

See “1.1.1 Description”.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 End User View

When a set is designated to ring the Auxiliary Ringer, all incoming internal or external calls ringing on that set ring the ringer as well.

When a line is designated to ring the Auxiliary Ringer, all incoming calls on that external line ring the ringer, as well as all sets with that line appearance, if they meet the conditions for ringing.

When a line is designated to ring the Auxiliary Ringer during one of the Scheduled Services, all incoming external calls on that line ring the ringer when the system is placed in that service. When more than one line is trying to ring the Auxiliary Ringer, and the controlling line stops ringing, the next highest priority call assumes control of the ringer and the cadence can be changed accordingly.

Ringing at an Auxiliary Ringer is immediate, rather than being based on ringing at the Prime Set.

When auxiliary ringing occurs for an internal call, the ringing at the set and at the ringer are not necessarily synchronized. When auxiliary ringing occurs for an internal call, the ringing is discontinued after ten minutes. This covers the case where a set initiates auxiliary ringing and then goes out of service, and therefore cannot turn the ringing OFF.

For external incoming calls, there is no time limit to how long the ringer is allowed to ring.

1.2.2 OAM Programming View

1.2.2.1 Levels of Access

The following tables show the levels of access required for users to program OAM changes.

Heading	Item			I	SC+	SC
Terminals&Extns	Individual set	Capabilities	Aux. ringer:N	X	X	X

Heading	Item			I	SC+	SC
Lines	Individual lines	Trunk/Line data	Aux. ringer:N	X		

Heading	Item					I	SC+	SC
Services	Ringing service	<i>Night sched</i>	Line settings	Line <i>nnn</i>	Aux. ringer:N	X	X	

1.2.2.2 Programming Auxiliary Ringing

One or more sets, or one or more lines, can be assigned in OAM Programming to have all calls that ring at the set also ring at the Auxiliary Ringer.

To program a set with an Auxiliary Ringer, go to **Terminals&Extns**►**Capabilities**►**Aux. ringer:N**. Press **CHANGE** to set the value for **Aux. ringer** to **Y** or **N**. The default is underlined.

See "[Terminals&Extns - Capabilities](#)".

To program a line with an Auxiliary Ringer, go to **Lines**►**Line data**►**Aux. ringer:N**. Press **CHANGE** to set the value for **Aux. ringer** to **Y** or **N**. The default is underlined.

See "[Lines](#)".

The Auxiliary Ringer can be programmed to ring only during one of the Scheduled Services for any line, or all lines.

This parameter is set under the heading **Services**►**Ringing service**►**Night sched**►**Line settings**►**Aux. ringer:N**, press **CHANGE** to set the value for **Aux. ringer** to **Y** or **N**. The default is underlined (See also **Trunk Answer From Any Station**.)

See "[Services - Ringing Service - Line Setting](#)".

If the Auxiliary Ringer is programmed to ring for sets, lines, or both during normal service, this ringing continues to operate in the same manner when one of the other scheduled services is in effect.

1.2.3 **EXTN/ **LINE

N/A

1.3 Technical Specification (Limits/Constraints)

A single Auxiliary Ringer is available. Ringing at the Auxiliary Ringer is immediate, rather than being based on ringing at the Prime Sets.

1.4 Interactions

1.4.1 Auxiliary Ringing Associated with a set

The following rules apply to the case where the Auxiliary Ringer is associated with a set.

Feature or condition name	Interaction
Callback	Callback can ring an Auxiliary Ringer if one is associated with the set being called back.
Call Forward	Auxiliary Ringing does not occur if the set has Call Forward active.
Do Not Disturb	Auxiliary ringing does not occur if the set is in Do Not Disturb mode. Activating Do Not Disturb while auxiliary ringing is occurring for a set suppresses ringing at the Auxiliary Ringer as well as at the set.
Out of service	Auxiliary Ringing for a set does not occur if the set is out of service when the call attempt is made.
Ring Cadence	If a set is driving Auxiliary Ringing, dynamic ring changes can occur at the Auxiliary Ringer when a higher priority call begins ringing at the set.
Voice Call	A Voice Call does not cause the Auxiliary Ringer to ring.

1.4.2 Auxiliary Ringing Associated with a Line

The following rules apply to the case where the Auxiliary Ringer is associated with a line

Feature or condition name	Interaction
AC15A lines	The second call on a split line rings the Auxiliary Ringer if the line is configured to ring the Auxiliary Ringer.
Delayed Ring Transfer	When Auxiliary Ringing occurs for a line, Delayed Ring Transfer does not stop the auxiliary ringing.
Do Not Disturb OAM Programming Out of Service	As a result of OAM Programming, Do Not Disturb activation, or sets being out of service, an incoming external call may be unable to ring at any set. However, the line can still ring the Auxiliary Ringer in this case, if it is programmed to do so.
Hunt Groups (HG)	Since Auxiliary Ringing (lines) is configured for the line itself, it is possible for some lines in a HG to ring an Auxiliary Ringer and others not.
Selective Line Redirection	If the line is redirected the Auxiliary Ringer does not ring (does not receive Redirect ring).
Control Node	The second call on a split line rings the Auxiliary Ringer if the line is programmed to ring the Auxiliary Ringer.

Background Music

1.1 Overview

1.1.1 Description

This feature allows a user to listen to music, radio, or a similar audio signal through the set speaker, if an external audio source is attached to the CCU. The music source is customer-supplied.

1.1.2 Rationale for Feature

N/A

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls

Feature 8 6 , programmed key

Feature # 8 6 to cancel

1.2.2 Message Displays

Message	Description
Music ON	Transient display that appears when the feature is turned on.
Music OFF	Transient display that appears when the feature is turned off.
Not available	Transient display that appears when a user attempts to activate Background Music when the feature has not been enabled in OAM.

1.2.3 End User View

To activate this feature, the user presses the Music programmed key or Feature 8 6 . The transient display `Music ON` appears. If the programmed key has an indicator, it is turned ON. When this feature is enabled, music is played through the speaker whenever the user does not have any alerting, active, or held calls on the set and when Paging is not in progress.

The music volume can be adjusted using the Volume bar. (For details, refer to the Volume Control feature.)

To deactivate the Background Music feature, the user presses the Music programmed key again or Feature # 8 6 . The transient display `Music OFF` appears. The programmed key indicator, if present, is turned OFF.

The existence of U-Hold or U-Active external lines on the set does not suppress Background Music.

On an idle set with this feature activated, any call ringing the set disconnects the music. If Background Music is being presented and the user initiates or receives a call and subsequently places that call on hold, music is not presented while that call remains in I-Hold state. Background Music is presented again once the set returns to an idle state.

1.2.4 User Programming View

For each set, the user can program one Music key, with or without an indicator. If present, the indicator is used.

1.2.5 OAM Programming View

1.2.5.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item		I	SC+	SC
System prgrming	Featr settings	Backgrnd music:N	X	X	

1.2.5.2 Programming Background Music

This feature can be enabled or disabled on a system-wide basis. If enabled, it can be individually controlled by each user.

From System prgrming►Featr settings►Backgrnd music:N, press CHANGE to reset the value of Backgrnd music, from N (the default) to Y.

[See "System Programming - Feature Settings".](#)

1.2.6 **EXTN/**LINE

N/A

1.3 Technical Specification (Limits/Constraints)

The user's setting (On or Off) for Background Music is stored in NVRAM. It is preserved over warm, but not cold restarts.

1.4 Interactions

Feature or Condition name	Interaction
Call Forward/Do Not Disturb	The user can activate Background Music and receive music when Call Forward or Do Not Disturb are in effect. Alternatively, the user can activate Call Forward or Do Not Disturb when Background Music is active and continue to receive music at the set.
Digit entry	Background Music, if active at the set, is disabled when the user is entering digits. Background Music volume is not affected if the Volume Down key is used to backspace while programming a dialing sequence.

Feature or Condition name	Interaction
Feature activation	Background Music, if active at the set, is not disabled when the user activates a feature (by programmed key, or entering the feature code). If the feature accesses a line (for example, LNR and SNR), Background Music is interrupted at that time.
Headset	Background Music is presented through the speaker, even if a headset is attached.
Hold Conference Transfer	Background Music cannot be held, conferenced, or transferred.
Page	Incoming Pages override Background Music reception for the duration of the Page. After the Page has ended, Background Music is restored.
Extension Administration Lock	When Extension Administration Lock is Full , Background Music is not accessible. When Extension Administration Lock is Partial , Background Music remains accessible.
Extension Relocation	Background Music settings are retained but not the volume, when a set is moved and Extension Relocation is active.
Volume Control	Background Music uses the same register as the Page feature. Background Music volume is controlled independently of Handsfree and Headset volume. (For details on the effect of power interruptions on background music volume, refer to the Volume Control feature description.)

BERT-Extn tests

1.1 Overview

1.1.1 Description

The diagnostics capability in Norstar Plus includes BERT (Bit Error Rate Test), a test of the link from the CCU to a set. BERT is used to test the voice and data quality on a CCU/set link. It can be used to verify the integrity of wiring at installation time or later, or it can be used as a diagnostic tool.

This is not an end user feature.

1.1.2 Rationale for feature

BERT-Extn tests are required to determine the transmission quality of the loop between the CCU and a set.

A BERT result of `FAIL` is an indication of wiring issues such as

- opens
- shorts
- bridge taps
- split twist
- crosstalk
- ohmic connections
- imbalance
- length of CCU/set link

BERT is one of two tools (the other being Station Set Test) used to identify the causes of a user's report that the set is not working.

Past experience shows a significant number of sets are returned with the reason No Fault Found. Use of BERT and Station Set Test is expected to reduce the number of sets that are replaced for the reason No Fault Found, and therefore reduce distributor and manufacturing costs.

1.1.3 Usage scenario

1.1.3.1 User complains that set is not working

A user has complained that the set is not working. There can be several causes for the complaint

- incorrect user programming of keys (the key label does not match what is programmed for the key)
- incorrect programming of system data for the set (line assignment may be incorrect, or capabilities, such as Call Forward No Answer or Call Forward on Busy, are inappropriate)
- physical properties of the set are not working (sticky keys, stuck keys, failed displays, failed indicators)
- the connection from the CCU to the set is more than 300 metres (1000 feet) (Ringing at maximum volume results in a voltage drop below a minimum value, and the set resets.)

- the connection between the CCU and the set has transmission faults

Station Set Test handles the first four items, and BERT handles the last.

1.1.3.2 Adding Voice Mail to a Norstar system

As one of the steps in installing a voice mail application on Norstar, the link to the terminating port for the application needs to be tested for acceptable data transmission quality. BERT is used in this situation.

1.1.4 General Definitions

Term	Meaning
BERT	BERT-Extn tests the physical link (the wire) between a CCU and a set. This link is identified by the Extension number of the terminating set. BERT does not test the set, nor does it test the logical B-channels imposed on the physical link.
out of sync	<p>A BERT-Extn tests result can be <code>Out of sync</code> if</p> <ul style="list-style-type: none"> - the received BERT-Extn tests bit pattern is significantly different from what is transmitted. This result appears immediately for the user. - there is no set at the port terminating the link. This can occur when: <ul style="list-style-type: none"> -- a set is disabled, then removed -- the Extension number for an unequipped set is disabled <p>To Norstar, the port reports <code>Disabled</code> (even though it is <code>Unequipped</code>), with the result that the first checks succeed for running BERT.</p>
Voice quality test	<p>A bit-error rate extension test using 10^5 bits on the physical link from the CCU to a set. The transmission time is 1.56 seconds. To get a more accurate test, the time is doubled: the user perceives a test of four seconds.</p> <p>The result is <code>PASS</code> when there is no more than one error in 10^5 transmitted bits. Otherwise, the result is <code>FAIL</code> and the test stops automatically, unless the bit transmission is <code>Out of sync</code>. Because sufficient errors can be encountered early in the test, resulting in the test being stopped automatically, it is meaningless to calculate and display a bit-error rate for the entire test.</p>
Data quality test	<p>A bit-error rate extension test using 10^7 bits on the physical link from the CCU to a set. The transmission time is 156 seconds or 2.6 minutes. To get a more accurate test, the time is doubled: the user perceives a test of 5.25 minutes.</p> <p>The result is <code>PASS</code> when there is no more than one error in 10^7 transmitted bits. Otherwise, the result is <code>FAIL</code> and the test stops automatically, unless the bit transmission is <code>Out of sync</code>. Because sufficient errors can be encountered early in the test, resulting in the test being stopped automatically, it is meaningless to calculate and display a bit-error rate for the entire test.</p>
Continuous test	<p>A bit-error rate extension test on the physical link from the CCU to a set. The test runs continuously until a user stops it or it fails. The test can be stopped during the session in which the test was started, or during another Maintenance session.</p> <p>While the test is running, the display shows the average bit-error rate over the most recent 5.5 minute window, or if the test has been running less than 5.5. minutes, the elapsed time.</p> <p>If the bit-error rate is more than $10E-3$ for a two-second interval during a continuous test, the test is automatically canceled. The test result reported to the user is <code>FAIL</code>.</p>

Term	Meaning
Mini-OAM session	<p>Components of UK Norstar Plus' OAM structure are available as end-user features. These mini-OAM sessions include:</p> <ul style="list-style-type: none"> - User Preferences - Time and date changes - System speed dial changes - Set and line name changes <p>Only one user can have one of OAM or mini-OAM session in progress at any time. If a user attempts to run an OAM or mini-OAM session while another one is in progress, this user is given the three second transient message: <code>In use: EXTNNNAME</code> followed by an Error tone. The user should try again later.</p>

1.1.5 General procedures

The user specifies the CCU/set link by the Extension number of the terminating set. The BERT feature tests the link, not the set.

The general steps to run BERT are as follows.

1. Select the set from which to run BERT. (BERT must be run from a set other than the one terminating the link that is to be tested.)
2. Select the link-terminating set.
3. If the link-terminating set is enabled, disable the set. Otherwise, skip this step.
4. Run the test.
5. Check the results.

Only one BERT-Extn tests can be run at a time.

Test results, when captured as Stop Test log events, can also be viewed in the System Test Log. When a running voice or data BERT that is not being run through a remote session is canceled, no Stop Test log event is written to the System Test log. This occurs because an insufficient number of bits were transmitted to calculate the bit-error rate.

1.2 Feature details

1.2.1 User View

To run BERT, the user must use a set with a two-line display. A programming template is recommended to make sense of the navigation keys, which are the key/indicator pairs.

The BERT loopback is run on the link between the CCU and a specific set. The link is identified by the terminating set. BERT is activated by entering `Maintenance►Tests►Bert-Extn tests` and at the `Show set: __` prompt, entering the Extension number of the link-terminating set, then following the prompts.

[See "Maintenance - Tests".](#)

[See "Maintenance - Tests - Steps for BERT".](#)

BERT must be run from a set other than the one terminating the link to be tested. The installer is likely to know what the link-terminating set is, and so does not need the list of all sets from which to select the link-terminating set.

To run BERT successfully, the link-terminating set must

- be installed
- support loopbacks (for example, any M7000 series terminal)

Once the link terminating set is selected, the sequence of steps is as follows:

1. If the link-terminating set is enabled, disable the set. (If the set is already disabled, skip this step.)

All active, alerting, and held calls on the link-terminating set are dropped. If the set is busy, the system provides warning messages to hang up. These messages are the same as when Port/Extn Status is used to disable the set. Similarly, the messages are the same to an idle set as they are for Port/Extn Status.

2. Select and run the BERT-Extn tests.

While BERT is running, the display is updated every two seconds with the average two-second bit-error rate calculated over the most recent 5.5 minutes. The bit-error rate value is captured every minute in NVRAM.

3. Check the test results.

If the test runs without interruption (no Stop Test log event occurs), the user is given the test results on the display only. The test results are reported as `PASS`, `FAIL`, or `Out of sync`. The final continuous test bit-error rate is reported as `BER:n.nE-n`.

The link-terminating set (disabled before running BERT) is re-enabled automatically whenever the user

- completes BERT testing on the link
- cancels BERT
- releases from voice or data BERT once the set is disabled
- lets the feature timeout

This auto re-enable occurs so that there is no opportunity for a previously enabled set to remain disabled, and a subsequent need for a service call or visit by a technician to re-enable the set.

Retrying BERT-Extn tests

It is possible to retry any of the voice, data, or continuous tests. In particular, a CCU/set link may `PASS` the voice test, but `FAIL` the data test. If a running voice or data test is cancelled, not enough information is available to determine the quality of the link. Consequently, there is no purpose in generating a Stop Test log event. However, the user is then prompted to enable the disabled set.

Error Conditions

If system resets during the test (which can happen if the test has been running for several hours), upon restart, the BERT result in NVRAM is packaged into a Stop Test log event. This can be viewed in the System Test log.

If the bit-error rate exceeds 10E-3 within the two-second time interval, the test stops automatically.

Only one BERT-Extn tests can be run at a time.

If a BERT-Extn tests is already running (most likely a continuous test that has been running for a considerable length of time) when a user selects BERT as the type of test in Loopback test, the following message displays along with the STOP display key: BERT-Extn:Extn#.

To stop the test, the user presses the STOP display key and a Test Stop log event is generated. This allows the start and stop times, recorded in all log events, to be compared against the test results of a lengthy continuous test.

1.2.1.1 Canceling a continuous BERT-Extn tests

There is no specified length of time that a continuous BERT should run. Once started, it runs until the user stops it manually, usually by pressing the STOP display key in the sequence of test steps. If a user exits OAM Programming by pressing **[Rls]**, the continuous test can be stopped by re-entering OAM Programming, and selecting Maintenance►Tests►Bert-Extn tests.

[See "Maintenance - Tests".](#)

1.2.1.2 Ending the Maintenance session

The following features terminate a Maintenance session, including BERT.

- pressing **[Rls]**
- 30-minute OAM timeout

If the user presses **[Rls]** before a running voice or data test is completed, the BERT-Extn tests is stopped automatically. This is equivalent to canceling the test. No Stop Test log event is generated.

When the user performs any of the following actions

- presses CANCL (when available as a display key)
- presses Release, or
- lets the feature time out

at any point while the link terminating set is disabled (except when a continuous test is running) the link-terminating set is re-enabled automatically.

If the user presses **[Rls]** while a continuous test is running or the test times out, the test continues and the link-terminating set remains disabled. A continuous test may need to run for several hours, in order to determine any pattern to transmission quality errors. The only way to STOP a continuous test is to reenter OAM Programming and select BERT-Extn tests at the Maintenance►Tests►BERT-extn tests. A Stop Test log event is generated and is available in the System Test Log.

1.2.1.3 System Test log

The BERT entries in the System Test log refer to the BERT-Extn tests by numbers. For more information, see the following table.

System test names and numbers for BERT-Extn tests

Test Name	Test Number
BERT voice loopback	001
BERT data loopback	002
BERT continuous loopback	003

1.2.2 OAM Programming View**1.2.2.1 Levels of Access**

The following table shows the levels of access required for users to program OAM changes.

Heading	Item		I	SC+	SC
Maintenance	Tests	BERT-Extn tests	X		

1.2.2.2 Running BERT

Although BERT is activated in OAM Programming, it is a maintenance activity performed by the user. It is therefore discussed in “1.2.1 User View”.

1.2.2.3 Event Codes

The BERT log entry shows log events associated with starting and stopping the BERT-Extn tests.

BERT-Extn tests Started log entry

The following is a sample of a BERT-Extn tests Started log entry

- EVT362 is Test Started
- Extension number of the link terminating set
- test number
- time stamp when the test started
- Severity of 4

BERT-Extn tests Stopped log entry

The following is a sample of a BERT-Extn tests Stopped log entry:

- EVT363 is Test Stopped
- 00x is the BERT-Extn tests number
- Extension number of the link terminating set
- PASS, FAIL, or Out of sync
- BERT value for a continuous test
- time stamp when the test stopped
- Severity of 4

See Please refer to “figure 1-1 Getting more information on BERT-Extn tests from the System Test log” on page 7..

1.2.3 **EXTN/LINE**

N/A

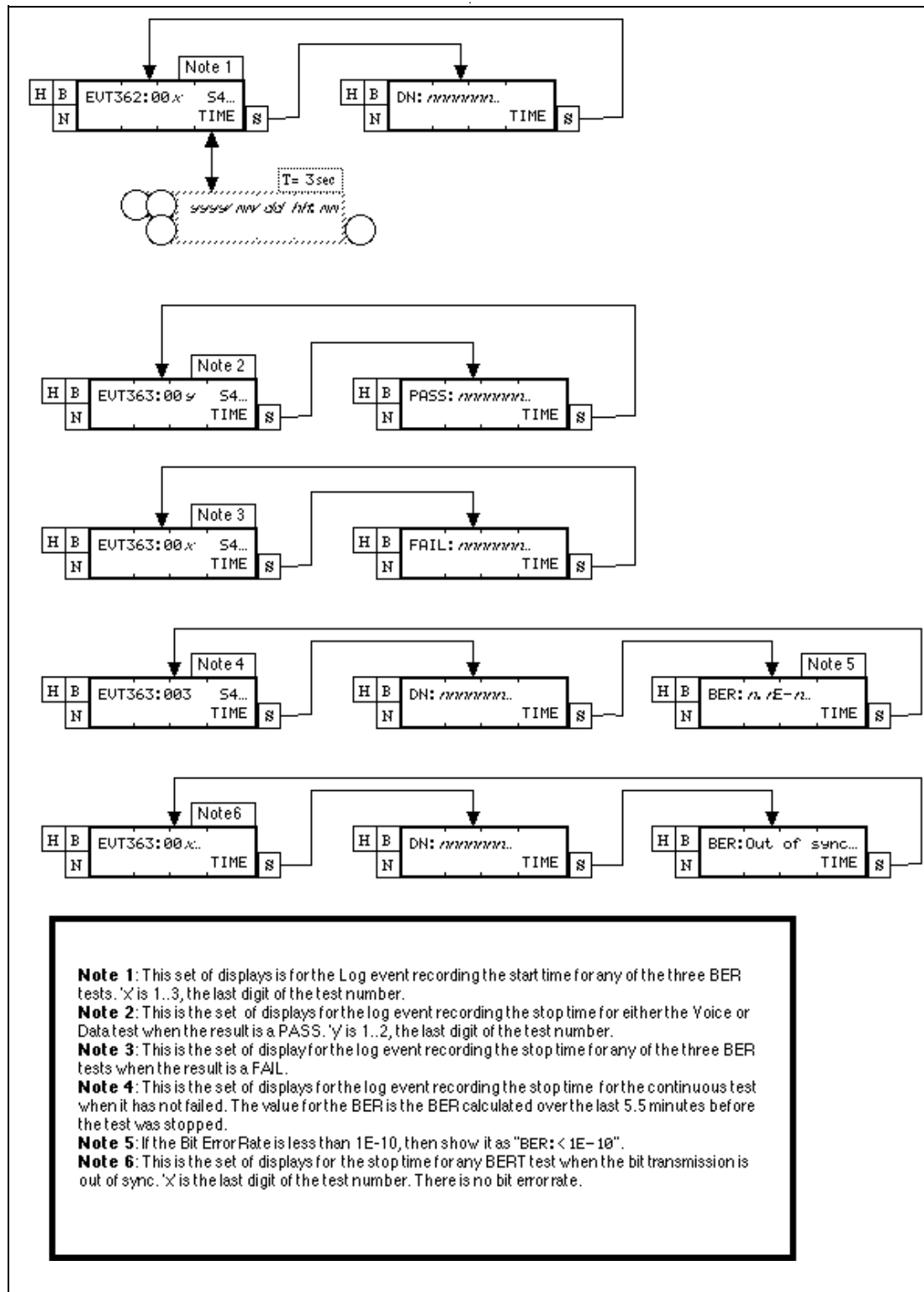


Figure 1-1: Getting more information on BERT-Extn tests from the System Test log

1.3 Technical specification (Limitations/Constraints)

1.3.1 DSP contention

The Digital Signal Processor (DSP) contains the hardware component that runs BERT on the physical link to a set. DSP resources may not be available when a user wants to run BERT.

The following features contend for DSP resources:

- BERT
- Conference
- Auto Attendant
- modem
- DTMF receivers

If contention exists for DSP resources and the user has tried to start BERT, the user is given the three-second transient message `BERT: Try later` and Error tone. The user is returned to the idle display.

If the user tried to start BERT using `[Feature] **BERT`, the user is returned to the idle display or if the user pressed the `START` display key when attempting to start a test, they are to the point where they pressed the `START` display key.

1.3.2 CCU resets during a continuous BERT

If the CCU resets during a continuous BERT, in particular, one that has been running for several hours, a Stop Test log event is generated and available in the System Test log after the CCU restarts.

If a continuous test has been running less than one minute and the CCU resets, no record is stored in the Event log that the continuous test has been run. This occurs because this event is stored in NVRAM and is updated only once a minute.

1.4 Interactions

Tests interaction table

Action	Event
Request to end OAM programming session	The BERT-Extn tests continues running.
Select a BERT from <code>Tests</code> while a BERT-Extn tests is running	The system permits one test at a time to run. The system displays a message indicating that a test is running.
Request configuration of link-terminating set.	Allow change in configuration, changes do not take place until test has stopped.
Querying the port status of a set in a BERT-Extn tests.	Show set as disabled. Disabling the station module stops the test. Enabling the set stops the test and generates the Stop Test log event.
Disabling a set and then removing it	BERT returns an <code>Out of sync</code> result when a disabled then unequipped set Extension number is used as the link-terminating Extension number
Disabling an unequipped set Extension number	BERT returns an <code>Out of sync</code> result when an unequipped and then disabled set Extension number is used as the link-terminating Extension number.

Feature interaction table

Feature	Interaction
Central Answering Position	BERT cannot be run on a Extension number with a CAP attached.
Global ATA	A Global ATA cannot support BERT. An error message (BERT denied) is displayed if a user attempts to run a BERT on a Extension number with a global ATA.
IATA	BERT cannot be run on the IATA Extension number.
IRSD	BERT cannot be run on the IRSD Extension number.
M7000 terminal	Must be installed at the set port for BERT.
PCI-B	Does not support BERT.
System Test log	Test start and test stop logs are captured in the System Test log.
User programming features: Feature * 1 Feature * 2 Feature * 3 Feature * 4 Feature * 6 Feature * 7 Feature * 8 0 Feature * 8 2 Feature * 8 4	<p>When a user tries to activate one of the user programming features and an OAM session or mini-OAM session is in progress elsewhere, the three-second transient message <code>Access denied</code> is displayed with an Error tone.</p> <p>If a user is in the middle of a User Programming session and an OAM or mini-OAM session is activated elsewhere, the three-second transient message <code>Access denied</code> is displayed with Error tone.</p>

BRI Loop Numbering

1.1 Overview

1.1.1 Description

Each ISDN BRI loop corresponds to a Norstar port number. The three digit loop number is preceded by the following identifier: L_p

1.1.2 Rationale for Feature

The purpose of BRI Loop Numbering is to provide a distinctive identifier for loop numbers within the system. Trunks, lines, Norstar sets, and now loops are all attached to ports. Line numbers are preceded by the L identifier, and different line types use different number ranges. Port numbers are preceded by the P identifier, while Norstar Extension numbers do not use a letter identifier. The different identifiers ensure that the different entities are not addressed/ configured inadvertently.

Different facilities associated with the different loop types should not be confused with the loop. For instance, a T-loop may have up to two lines provisioned, and each S-loop may have one or more Extension numbers assigned to it.

BRI Loop numbering - (for both Compact Plus and Modular Plus (Mini) systems)

Components	DS-30 port (Modules)	Slot#	Port #	Loop #
CCU	2	1	201-204	201-204
		2	231-234	231-234

BRI Loop numbering - Midi system (for Modular Plus system only)

Components	DS-30 port (Modules)	Slot#	Port #	Loop #
CCU	2	1	201-204	201-204
		2	231-234	231-234
External Modules (Line/Trunk)	4	1	401-404	401-404
		2	405-408	405-408
		3	409-412	409-412
	3	1	301-304	301-304
		2	305-308	305-308
		3	309-312	309-312

BRI Loop numbering - Maxi System (for Modular Plus system only)

Components	DS-30 port (Modules)	Slot#	Port #	Loop #
CCU	2	1	201-204	201-204
		2	231-234	231-234
External Modules (Line/Trunk)	8	1	801-804	801-804
		2	805-808	805-808
		3	809-812	809-812
	7	1	701-704	701-704
		2	705-708	705-708
		3	709-712	709-712
	6	1	601-604	601-604
		2	605-608	605-608
		3	609-612	609-612
	5	1	501-504	501-504
		2	505-508	505-508
		3	509-512	509-512
	4	1	401-404	401-404
		2	405-408	405-408
		3	409-412	409-412
	3	1	301-304	301-304
		2	305-308	305-308
		3	309-312	309-312

1.1.3 General Definitions

N/A

1.2 Feature Details**1.2.1 Controls**

N/A

1.2.2 Message Displays

Message	Description
LpXXX	Lp is the new loop identifier.

1.2.3 OAM Programming View

N/A

1.2.4 **EXTN/LINE**

N/A

1.3 Technical Specification (Limits/Constraints)

N/A

1.4 Interactions

N/A

Busy Status Indication

1.1 Overview

1.1.1 Description

The busy status indicator displays whether or not other sets are busy.

1.1.2 Rationale for Feature

From looking at the busy status indicator, the user can determine whether or not a call to a person would be an interruption.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

On M7208, and M7310, M7324 sets, the indicator beside each Internal Autodial key shows the busy status of the set corresponding to that key. A CAP attached to an M7324 also gives busy status indication for internal autodial keys.

An optional Busy Lamp Field (BLF) module can be attached to the M7310 set to allow the user to see the busy status of other sets on an ongoing basis. Busy Status Indication does not apply to M7100 sets as they do not have an indicator associated with the programmable key.

1.2 Feature Details

1.2.1 End User View

The busy status indicator is ON when the associated set is:

- active on an internal or external call
- in Do Not Disturb mode
- making a Page announcement
- in Administration Programming

The busy status indicator does not tell the user whether or not the associated set has an available intercom key on which to receive a call. An attempt to place an intercom call to a set whose busy status indicator is ON, results in a Ringback, if that set has an available intercom key. Similarly, an attempt to call a set whose busy status indicator is OFF, results in a Busy tone if no intercom key is available at that set (that is, the set has no intercom keys assigned, or all intercom keys are in alerting or held state).

1.2.2 OAM Programming View

N/A

1.2.3 **EXTN/**LINE

N/A

1.3 Technical Specification (Limits/Constraints)

Busy Status Indication does not apply to M7100 sets as they do not have an indicator associated with the programmable key.

1.4 Interactions

Feature name	Interaction
Answer DNs	An Answer key allows an attendant to receive visual indication, and optional ringing, when a call is directed to the set of a receiver or attendant services. The alerting call may be answered at either set. If the attendant has an Internal Autodial key with indicator for the service receiver's set, Busy Status Indication is displayed on that indicator only after the service receiver answers the call. Therefore, Answer keys are only activated when a set is ringing, while Internal Autodial keys are activated only when the set is active.
DND on Busy	The Busy Status Indicator is on for a set with an active call with DND on Busy activated. An attempt to place an internal call to a busy set with DND on Busy and its Busy Status Indicator is on results in a Busy status message and Busy tone, even if the set has an available intercom key.
Do Not Disturb (DND)	If a set is unplugged with DND on, the busy status indicator for that set remains ON. If the set is unplugged with DND off, the busy status indicator for that set remains off.
Hold	The existence of held calls on a set does not activate the busy status indicator for that set.
Line Pools	Line pool busy status is also displayed by Busy Status Indication if a user has a key with an indicator programmed for that line pool. The indicator is activated only if all lines in the line pool are in use. As long as there is an available line, the indicator does not activate.
Page	Paging activates the Busy Status Indicator for the set doing the paging.

Callback

1.1 Overview

1.1.1 Description

This feature allows Callback to occur at a set when Call Park, Transfer or Camp-On is applied to external calls and the call is not retrieved or answered before a timeout occurs.

Callback applies only to unretrieved parked external calls, to unanswered transferred external calls, and to camped calls. Callback is never activated for internal calls.

1.1.2 Rationale for Feature

Callback minimizes the chance of an external line ringing indefinitely if it is not answered or retrieved, and allows the person who parked or transferred the call to take further action to help the calling party.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls

N/A

1.2.2 Message Displays

Message	Description
Parked call	Displays at the set that parked the call.
<name> busy	Displays at the set that transferred the call if the destination set is busy.
<name> DND	Displays at the set that transferred the call if the destination set is in Do Not Disturb mode.
Not in service	Displays at the set that transferred the call if the destination set is out of service.
<name> no reply	Displays at the set that transferred the call if the destination set does not reply.
<linename> > <setname>	Displays at the forward destination to which the originating set is forwarded.
<linename> callback	Displays at the Prime Extn for the line (when originating set is unavailable).

If the call is not answered, or is unable to ring at the originator's set, the Callback call is routed to the Prime Extn for the external line, if that set exists. If no Prime

Extn exists, the call continues to alert the set to which it was transferred until it is answered at the transferred-to set or the originating set (now able to answer the Callback), or until the external party disconnects.

1.2.2.1 Transfer not completed

If the transfer destination cannot alert for the call due to any of the following conditions

- no suitable line key available
- in Do Not Disturb mode
- not in service

Callback for external calls does not wait for the timeout, but occurs as soon as the system detects them. In some cases, this can involve a delay of a few seconds.

The appropriate message is displayed at the set that attempted the transfer. In the case where the transfer destination is forwarded, the <name> in these messages is the name of the original transfer destination.

If a call is forwarded to a set that cannot ring, the forwarded set (with ringer off) still receives alerting and goes through the timeout before calling back the original set.

1.2.2.2 Internal Calls

Callback does not occur when an attempt to connect two internal calls fails. If the transfer destination does not answer, the internal caller

- may not wish to be switched back to the original destination
- can call back easily if necessary

If the caller disconnects, the call is dropped.

1.2.2.3 Call Priority

Callback controls ringing at the set only if that call is the highest priority call alerting the set. The Call Capture feature defines the call priority scheme. New external calls, for example, have higher priority than Callback calls.

1.2.2.4 Ringing and Ringback during Callback

The ringing cadence used for Callback is the same as for internally signaled calls in Norstar.

The external party hears Ringback while Callback is in progress, with the normal Norstar ringback cadence (two seconds on, four seconds off). For external calls, this ringback is generated even if the call is not actually ringing anywhere. For more information see the External Ring Cadence feature.

The Norstar system does not know the state of an unsupervised external line after a call is initially connected. When a call is performing Callback, the ringing is generated by Norstar, not by the external line. The call rings at the destination set even if the external party has disconnected. If a user selects the line, the ringing stops.

1.2.2.5 Unanswered Callback for External Calls

If there is no Disconnect Supervision on external lines, the system stops ringing and disconnects the call if, after the first Callback attempt, Callback exceeds 170 seconds. This prevents a line being tied up indefinitely when a Callback is not answered and the disconnection of the external line is not detected.

If the system is equipped with Disconnect Supervision, this rule is not required.

1.2.2.6 Callback for External Call Unable to Ring

Callbacks, like incoming calls, ring at the set being called back, unless that set is in one of the following conditions:

- busy (for example, in a call, no keys available, in Do Not Disturb mode)
- involved in an Administration Programming session
- not in service

If the set being called back is programmed to forward unanswered calls to another number (for example, voice mail, another set), the call is forwarded to that number.

For a set that is unable to ring, if the set is not programmed to forward unanswered calls to another number, the call attempts to callback at the Prime Extn for that line, if one exists, and at any set having an appearance of that line. This action is repeated every ten seconds for four minutes or until the call finds somewhere to alert audibly. If Callback cannot be performed within 170 seconds, the external line is dropped.

1.2.2.7 Display Keys

In the event of a Callback, the CALLBACK display key appears on the display on all M7310 and M7324 sets when the set is idle or receiving other incoming calls. During other states (for example, ringback, established, and the like), the CALLBACK display key is not displayed because it has a lower priority. For instance, in the established state, the TRANSFER display key is displayed, and during the ringback state, the LATER and CANCEL Transfer) display keys are displayed.

Pressing the CALLBACK display key connects the user to the highest priority Callback call (that is, the call that has been waiting the longest to be answered). The CALLBACK display key provides a simple method for answering Callback calls that is especially useful for users, such as attendants, who do a lot of transferring. Calls are ordered by priority automatically. Searching for specific lines is not necessary.

1.2.3 End User View

If a transferred, parked, or camped external call is not answered within the number of rings or the timeout period specified through Configuration Programming, a Callback attempt occurs. The call attempts to ring at the set from which it was transferred or parked. The call shows alerting indication at the external line appearance, if it is available. Otherwise, it appears on an intercom key.

A transferred call continues to ring at the destination set and at the Callback set. The destination set can still accept the transfer after Callback occurs as long so the Callback set has not yet reconnected with the external party.

After transferring an external call, the set that originated the call park, camp-on, or transfer receives Callback if the destination party does not answer the call. At the originating set, ringing is activated and the indicator for the external line (if any) flashes. Otherwise, the Callback appears on an intercom key.

During alerting on the M7310 or M7324 set that transferred the call, the display shows the reason for the Callback on the top line (see the Message Displays table) and the CALLBACK display key is displayed. If other higher priority calls are alerting the set at the same time, they overwrite the message on the top line of the display. On M7208 sets, the display shows the reason for the Callback, and the alerting line must be selected to reconnect to the transferred-to party (external line).

1.2.4 OAM Programming View

1.2.4.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item		I	SC+	SC
System prgming	Featr settings	Trnsfr callbk:4	X	X	
		Park timeout:60	X	X	

See "System Programming - Feature Settings".

By default, a transferred call rings four times at the destination set before callback occurs. The number of rings can be programmed to 3, 4, 5, 6, or 12 rings, as desired. This timeout is in effect on a system-wide basis.

The default value of the call park callback timer is 60 seconds. Its minimum value is 30 seconds; other values are: 15, 45, 60, and 90 seconds.

1.2.5 **EXTN/**LINE

N/A

1.3 Technical Specification (Limits/Constraints)

N/A

1.4 Interactions

Feature or condition name	Interaction
Answer DNs	A Callback from a park or transfer is directed to a specific set. For example, if the Callback is directed to the set of the person receiving attendant services, it does not alert at the attendant's set.
Automatic Incoming Line Selection	Callback calls are third in the priority rules for Automatic Incoming Line Selection, after a ringing external line, and before a ringing internal line.
Auxiliary Ringer	Callback can ring an auxiliary ringer if one is associated with the set being called back.

Feature or condition name	Interaction
Call Capture	Call Capture defines the priority of the call. For example, new external calls have a higher priority than transferred calls.
Call Forward	<p>If Call Forward is active at the set that attempted the call park or transfer, the Callback is forwarded to the forward destination with the normal forward message, <code><line name> > <setname></code> (where <code><line name></code> is the name of the line performing the Callback, and <code><setname></code> is the name of the set that originated the call park or transfer). In this case, the Callback call does not alert at the set that attempted the transfer, and cannot be picked up at that set.</p> <p>If Call Forward is active at the set that attempted the transfer, the Callback is forwarded to the forward destination, with the normal forward message, <code><party being transferred> > <transfer originator></code>. In this case, Callback call does not alert the set that attempted the transfer, and cannot be picked up at that set.</p>
Call Forward No Answer	<p>If Call Forward No Answer (CFNA) is active at the destination set, the CFNA timeout activates the Callback, if that timeout is shorter than the Callback timeout.</p> <p>Callback does not apply to internal calls.</p> <p>A call performing Callback is subject to Call Forward No Answer at any set it is trying to ring.</p>
Call Forward on Busy	A call performing Callback is subject to Call Forward on Busy at any set it is trying to ring. The Callback is forwarded to the destination set.
Call Park	<p>Callback occurs if an external call is parked for an excessive time, generating ringback to the parked party.</p> <p>This feature, along with several others, ensures that calls are not forgotten, dropped or abandoned.</p>
Call Pickup	Call Pickup can be used to answer a call for a set ringing for Callback.
Camp Max	Call back immediately if destination has a call already camped.
Delayed Ring Transfer	Delayed Ring transfer can occur after the number of rings set in OAM Programming for an unanswered Callback, provided that a Prime Extn is associated with the external line and that Delayed Ring Transfer is enabled in OAM Programming.
DIA lines	In Callback cases, after overflow call routing has occurred, the Callback call alerts on the autoanswer appearance as well. For example, overflow call routing routes a call to Set A, which answers the call on an autoanswer line and transfers it (parks, or camps it, and so on) to Set B. If Set B doesn't answer and a Callback occurs, then the call appears on the autoanswer line at Set A.
Do Not Disturb	<p>Do Not Disturb suppresses ringing for Callback. Visual alerting persists at the line appearance for that call, or at the intercom key if no line key exists for that line.</p> <p>If Callback has no suitable line available, the original set does not ring.</p>
Incoming Call Information (ICI)	The Callback message does not appear if Callback arrives while Call Information is active.
OAM Programming	Callback does not occur to a set involved in an OAM programming session. In this case, a Callback is made to the Prime Extn, if one has been assigned.

Feature or condition name	Interaction
Set not in service	If Callback has no suitable line available, the original set does not ring. If a set attempts to transfer a call to a set that is not in service, Callback is made immediately.
Transfer	Callback rings only at the set that attempted the transfer, or at the Prime Extn for the external line, and not at any other set that has the appearance of an external line. If a valid DN has been specified, transfer completion actions taken before the appearance of the status/error message will result in an attempt to complete the transfer, along with associated Callback, if applicable. If a valid DN has been specified, transfer completion actions taken before the appearance of the status/error message will result in an attempt to complete the transfer, along with associated Callback, if applicable.
User Programming	User programming does not suppress Callback.

Call Capture

1.1 Overview

1.1.1 Description

Call Capture is inherent to Norstar and provides a mechanism to ensure that all incoming external calls can be answered. It is not a single feature, but the result of the combined interaction of several system and telephone features.

1.1.2 Rationale for Feature

See “1.1.1 Description”.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A


1.2 Feature Details

1.2.1 End User View

The basic requirements for effective Call Capture are:

- every external line should appear on at least one telephone in the system, or be part of an Hunt Groups that appears on at least 1 extension
- a Prime Extension can be specified for every external line, to perform backup call answering functions
- the Prime Extension(s) for external lines should not have DND enabled if all extensions with an appearance for the line also have DND enabled

1.2.1.1 Call Priority Rules

When more than one call is ringing at an extension and the user lifts the handset or presses the  key, Automatic Incoming Line Selection selects an incoming line according to the following priority scheme:

1. Ringing Prime Line (if defined in OAM Programming, and if the Prime Line is not in a line pool)
2. Ringing external lines
3. Ringing Callback calls and transferred calls on external lines
4. Ringing internal lines

When more than one call is ringing at an extension and a user activates the Call Pickup feature from another set, an incoming line is selected according to the following priority scheme:

1. Ringing external lines
2. Ringing internal lines

In the case of both Automatic Incoming Line Selection and Call Pickup, when there are multiple ringing calls within the same priority level, the longest ringing call is answered first.

Ringling of a Prime Extn's Prime Line takes priority over Delayed Ring Transfer to the Prime Extn.

1.2.1.2 Ring Cadence

Ringling Cadence can change dynamically when a higher priority call begins alerting. Also, if more than one call is alerting the set, Ringling Cadence can change dynamically when the highest priority call is abandoned and another call starts ringling.

An external line is considered to be ringling for a period of five seconds after the most recent removal of ring voltage by the external switch. During that period the line indicator continues to flash with Ringling Cadence, and no transition to another ring cadence occurs.

1.2.1.3 No Ringling Conditions

If no Delayed Ring Transfer or Prime Extn exists, an incoming external call may be unable to ring at any set as a result of any of the following conditions

- Administration programming settings
- Do Not Disturb activation
- sets are out of service
- user is calling in on a line that does not appear on any set
- call was transferred to an extension with no available intercom keys (Callback occurs to originating extension)
- system timeout

An external line can be programmed to allow it to be used for outgoing calls only by placing it in a Line Pool and removing any appearance of that line at all extensions. Likewise, an external line can be programmed to allow it to be used for incoming calls only by placing it in a Hunt Group, and removing any appearance of that line at all extensions. Lines can be placed in both a Line Pool and a Hunt Group at the same time.

1.2.2 OAM Programming View

N/A

1.2.3 **EXTNLINE**

N/A

1.3 Technical Specification (Limits/Constraints)

N/A

1.4 Interactions

The following features affect various aspects of Call Capture. For details, refer to the individual feature descriptions.

Auxiliary Ringling	Pre-Selection
Call Forward	Prime Extension

Call Forward Transfer to Prime Extension	Ring Again on Busy
Call Identification	Ring Again on No Answer
Call Park	Ring Cadences
Call Pickup (Directed and Group)	Ring Type
Delayed Ring Transfer	Ringing Line Preference
Do Not Disturb Selective Call Forward	Send Message
Do Not Disturb Transfer to Prime Extension	Scheduled Services
Line Selection - Automatic Incoming	System Answer (Auto Attendant)
Line Selection - Manual	Transfer Callback
Message Waiting/Reply	

Call Charge

1.1 Overview

1.1.1 Description

The user uses the Call Charge feature to see call charge information for the last outgoing disconnected DASS2 call at the set and the DASS2 Supplementary Service, Call Charge Indication, has delivered call charge information for that call. The call charge is in pounds sterling.

1.1.2 Rationale for Feature

A user may want to track personal call charges on paper.

A likely user of this feature may be someone needing call charge information for client billing purposes, for example, a lawyer or financial advisor.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls

Call Charge programmed feature key or

1.2.2 Message Displays

Message	Description
No call charges	Displays transiently if the feature is invoked and no DASS2 calls were disconnected from the set since the last system reset.
Chrg N/A	Displays if charge information is not available.

1.2.3 End-User View

The user must be disconnected from an outgoing DASS2 call to view the call charge information for that call.

The call charge feature applies only to calls for which the network has delivered call charge information.

The DASS2 call charge value on a disconnected DASS2 call is only presented to the set which is disconnected from the call.

The DASS2 call charge value is available only when there is subscription to the DASS2 Call Charge Indication service.

Call Charge is a set-based feature. Call charge information for a call on a particular line is private to that set; the charge information for this call is NOT available at a set that has an appearance of the same line.

This feature can be invoked by pressing:

- or a feature key programmed with Call Charge

The call charge feature presents one screen of information: charge information and the time at which the call is disconnected at the set for the last DASS2 call. The call charge information is shown including the currency mark £. The time at which the call is disconnected at the set is shown right justified and includes the am or pm mark. See the following figure.

The Call Duration Timer feature () is available should a user want to know the elapsed time for the call.

The feature will time out after 15 seconds.

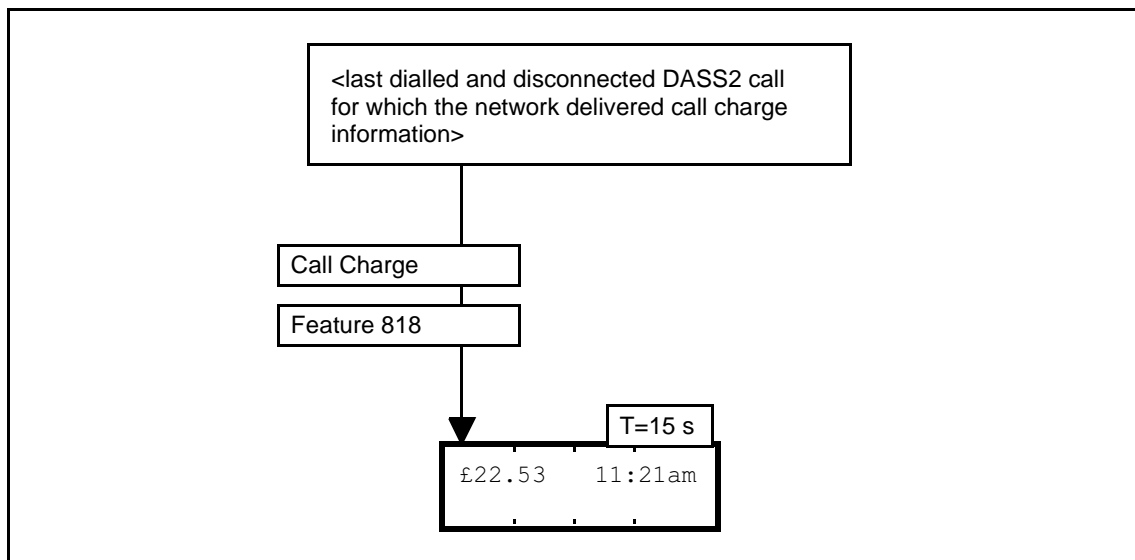


Figure 1-1: Call charge for last dialed DASS2 call – after disconnection

1.2.3.1 What the user does to clear Call Charge information

This is different from clearing the information from the screen.

The user disconnects from a DASS2 call and the network delivers call charge information for the call. The existing call charge info for the previous disconnected DASS2 call that had call charge information is replaced by that for this most recently disconnected call.

In the multiple simultaneous outgoing call situation, as call charge information is delivered from the network, these charges overwrite the existing call charge information. The scenario is: A user has dialed one outgoing call (#1) and while on that call needs to consult another party, so the user dials another outgoing call (#2). The consultation call completes and charge info for call #2 is delivered from the network, all the while call #1 is active or held. Once call #1 completes, call charge info for call #1 is delivered from the network.

1.2.3.2 Preservation of Call Charge information

Call Charge is preserved until the user is disconnected from another DASS2 call for which there is call charge information, at which point the existing information is cleared. This means that call charge information continues to be available:

- after the user accepts analog PSTN or DASS2 PSTN, AC15, or internal calls
- after the user accepts a rerouted call which was dialed from another set
- after the user dials an internal, AC15, analog PSTN, or DASS2 PSTN call; the DASS2 PSTN call is not yet disconnected.
- when any incoming call, outgoing internal, AC15, analog PSTN, or DASS2 PSTN call is active or held
- when any incoming call, outgoing internal, AC15, or analog PSTN call is disconnected
- when any outgoing DASS2 PSTN call is disconnected and the network does NOT deliver any call charge information
- after the user invokes any feature.

1.2.3.3 Last dialed DASS2 call – No information situations

There is no change to the call charge information for an earlier call when the user had dialed a DASS2 PSTN call and the call is disconnected AND one of the following:

- the network has no charging information available at time of disconnection; the call charge information may arrive some time after the call is cleared.
- the network has not delivered charging information because the service is not operating.
- there is no subscription to the Call Charge Indication service.



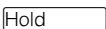
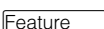
1.2.3.4 Other messages

The feature will provide a 3 second transient message `No call charges` when there have been no DASS2 calls disconnected from this set since the last system reset.

1.2.3.5 How the user stops seeing it

Once the user has noted the information, the user is likely to go onto to some other Call Processing action, or do nothing.

All the following cancel the display of information:

- going on-hook or pressing 
- going off-hook or pressing 
- holding an active call; pressing the  key will both cancel Call Information and hold the active call
- pressing a key with an alerting call or call on public hold, or on exclusive hold at that set. The alerting or held call will be answered and the active call, if any, is autoheld.
- pressing the  key
- pressing a line pool key
- pressing a programmed feature key
- pressing an autodialer
- a Priority Call arriving at the set
- a Voice Call arriving at the set
- When the feature times out, the display returns to:
- the call information for the active call, or

- if there is no active call, the call information (reroute message) for the highest priority ringing call, or
- if there are no ringing calls, the idle display message.

1.2.4 OAM Programming View

N/A

1.2.5 **EXTN/ **LINE

N/A

1.3 Technical Specification (Limits/Constraints)

There is no charge information for a dialed DASS2 call. This may arise when:

- there is no subscription to the Call Charge Indication Supplementary Service
 - The call charge information for an earlier call is not cleared.
- the network sends a message that it cannot make the charge info available
 - The call charge information for an earlier call is cleared. The user sees Chrg N/A in place of a value.
- the network does not send a message because the service is not operating.
 - The call charge information for an earlier call is not cleared.

When the charge for a call exceeds the maximum value that can be delivered by the Call Charge Indication Supplementary Service, the user sees £9999.99 as the charge.

The DASS2 network may deliver Call Charge Indication some significant time after the call is disconnected. This may be a rare situation. In this situation, the call charge information for an earlier call is not replaced.

1.3.1 Off-core applications

Information from the Call Charge Indication and Call Charge Rate Data Supplementary Services are available to off-core applications, such as through the SMDR box or through a PC application with ACCESS, for detailed call charge logging capabilities.

1.4 Interactions

Feature name	Interaction
AC15 line	When a user is disconnected from a dialed call on an AC15 line, the existing call charge info for a DASS2 call is NOT cleared.
Active call	The existing Call Charge information is preserved when the active call is held, or when a held call becomes active.
Analog PSTN line	When a user is disconnected from a dialed call on an analog PSTN line, the existing call charge info for a DASS2 call is NOT cleared.
Call Duration Timer	Call Duration Timer can be invoked should the user want to know the elapsed time for the call.

Feature name	Interaction
Call Park agent	The call charge information on a dialed DASS2 call is presented only to the set which disconnects from the call. The park agent sees the existing call charge information for the last disconnected call from the park agents set, not the call that was parked. Parking an outgoing DASS2 call is expected to happen rarely.
Call Park - Park receiver	Call charge information for a parked outgoing DASS2 call is available at the park receivers set. Parking an outgoing DASS2 call is expected to happen rarely.
Call Pickup	Call charge information for a picked up outgoing DASS2 call is available at the pick up set. Picking up an outgoing DASS2 call is expected to happen rarely.
Conference	To determine the overall charge for a conference, the conference master must release one call, query for its call charge information and then release the other call to query for its call charge information. Scenario: A conference is established with another Norstar user and a party reached on a DASS2 line. If the conference master releases first from the conference (Transfer from Conference), then the other Norstar user will have the Call Charge information for the call to the external party. If the other Norstar user releases first, the conference master will have the Call Charge information for the call to the external party.
Far-end release	Scenario: The user has an active outgoing DASS2 call and is also viewing the Call Charge information for the last disconnected DASS2 call; the far-end releases. The user will have to invoke Call Charge again to see the Call Charge information for the call that was just released by the far end. In other words, the display of Call Charge information is not updated when an active outgoing call has a far-end release.
Held call	Call Charge information is preserved when the active call is held, or when a held call becomes active.
Internal call	When a user is disconnected from an internal dialed call, the existing call charge info is NOT cleared.
Key inquiry	During Key Inquiry, the user will see Call Charge after selecting a programmed key.
CCU reset	Call charge information is lost when there is a CCU reset.
Network DN	A network DN is dialed the same way as for an internal DN. If a user dials a DN and it is a network DN reached via a DASS2 facility, the user may be surprised to see that there is a charge for the call, if the network delivers call charge information when the call is cleared.
Shared lines	The call charge information on an outgoing DASS2 call is presented only to the set which disconnects from the call.
System time	Changing system time has no effect on the network-supplied charge on disconnected outgoing DASS2 calls.

Feature name	Interaction
Transfer with Announcement, Transfer Direct – Transfer agent	The call charge information on a dialed DASS2 call is presented only to the set which disconnects from the call. The transfer agent sees the existing call charge information for the last disconnected call from the transfer agents set, not the call that was transferred. Transferring an outgoing DASS2 call is expected to happen rarely.
Transfer with Announcement, Transfer Direct – Transfer destination	Call charge information for a transferred outgoing DASS2 call is available at the Transfer destination set. Transferring an outgoing DASS2 call is expected to happen rarely.
Transfer via Hold – Transfer agent	The call charge information on a dialed DASS2 call is presented only to the set which disconnects from the call. The transfer agent sees the existing call charge information for the last disconnected call from the transfer agent's set, not the call that was transferred. Transferring an outgoing DASS2 call is expected to happen rarely.
Transfer via Hold – Transfer destination also Transfer from Conference – Transfer destination	Call charge information for a transferred outgoing DASS2 call is available at the Transfer destination set. Transferring an outgoing DASS2 call is expected to happen rarely.

Call Display When Busy

1.1 Overview

1.1.1 Description

When an incoming internal or external call rings the set while the user is active on an external call (for which the Call Duration timer has commenced), or connected on an internal call, this feature allows the display to show transient information for the new call.

1.1.2 Rationale for Feature

N/A

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls

N/A

1.2.2 Message Displays

Message	Description
<setname or linenname> calling	Displays for direct calls from a line or set.
<setname or linenname> > <original destination name>	Displays for calls forwarded from another set.
DRT <linename>	Displays for Prime Extn incoming call messages.
DND from <name>	Displays for Prime Extn incoming call messages.
DND transfer	Displays for Prime Extn incoming call messages.
<linename> to prime	Displays for Prime Extn incoming call messages.
<linename> Callback CALLBACK	Displays when a call is Camped or Transferred and the system generates a Callback.
<setname> DND CALLBACK	Displays when a called is made to a set in DND and the system generates a Callback.

1.2.3 End User View

In order to receive Call Display When Busy, the user must be

- connected on an internal call or
- on an external line for which call timing has commenced

If the user has been active on an outgoing external line for less than ten seconds, Call Display When Busy is not presented, to minimize the possibility that this identification would overwrite the digits being dialed by the user.

Call Display When Busy does not overwrite feature prompts. This is true for both CCU-supported features and for features supported by intelligent terminals.

1.2.4 OAM Programming View

N/A

1.2.5 **EXTN/LINE**

N/A

1.3 Technical Specification (Limits/Constraints)

N/A

1.4 Interactions

Feature name	Interaction
Call Forward Do Not Disturb Delayed Ring Transfer Prime Extn	Call identification is displayed for incoming external calls that begin ringing the set as the result of any rerouting feature. For more information, refer to each feature.
Extension Copy	Call information settings, including the Call Display When Busy setting, are copied.
Feature activation	Call Display When Busy display is blocked <ul style="list-style-type: none">- whenever any feature is active- in the first ten seconds of a call being answered by a Norstar user- at the end of the Call Timer delay timer on an outgoing external call (or, in the case of answer-supervised trunks, ten seconds after the call is answered)
Incoming Call Information (ICI)	When the user is on an active call, and another call alerts at the set, Call Display When Busy rules apply. That is, the new alerting call displays Call Display When Busy messages, not passive-ICI. But while Call Information is active, the display and associated call are changed by new incoming calls associated with Call Display When Busy or priority bumping.

Call Duration Timer

1.1 Overview

1.1.1 Description

This feature allows the user to query the elapsed connect time on the current call (if active), or the most recently completed call (if not active on another call) and display it at the set.

1.1.2 Rationale for Feature

The intent of the timer is to show the elapsed time that a particular line has been active, from the time that the call was first established to the time it is released.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls

, or programmed key

1.2.2 Message Displays

Message	Description
<name> h:mm:ss	The <name> describes the other party in an internal call, or the last party who joined in a conference call. The time consists of: h (0 to 9 hours), mm (00 to 59 minutes), and ss (00 to 59 seconds). If the time is less than one hour, the h : is not displayed.
Make call first	If the user activates Call Duration Timer when no call has been initiated or answered since the last system reset, this transient display appears. No Error tone is given.

1.2.3 End User View

To see the duration of the current call (if active on a call) or the most recently completed call (if not active on a call), the user presses the Call Timer programmed key or . The call duration is shown in hours (if call was one hour or longer), minutes, and seconds. The timer display is a transient display, and is not updated dynamically.

Timing is done automatically for both internal and external calls. The timer is not stopped when a call is held, conferenced, or transferred. Instead, the timer runs continuously until the call is completely cleared.

If a call is transferred to another set and is activated, it shows how long the call has been active at the transferred-to set.

For internal calls, timing begins when the destination set answers the call. Both sets can query the elapsed time on the call. For incoming external calls, timing

begins when the call is answered. Only the set active on the external line can query the time.

For outgoing external calls, connect time cannot be determined precisely, since it cannot always be determined whether or when the far end has answered the call. In this case, timing begins ten seconds after the line is accessed if no digits have been dialed, or once an interdigit time greater than ten seconds is detected. In most cases, the entire number has been dialed when this occurs, but any digits dialed after the call timer starts do not reset the timer.

If the set is active on a call, the connect time for the active call is shown. A time of zero (0) is shown for

- an outgoing alerting internal call
- an outgoing external call for which no digits have been dialed
- an outgoing external call for which the interdigit timer has not yet expired

If a set has no active calls, the timer value for the most recent active call (that is, the last call that was disconnected or placed on hold) is displayed. Querying the timer while one or more calls are alerting the set also redisplay the most recent timer value.

Call timer values are maintained for all calls held on the set, as well as for the active call (if one exists). The user can reaccess any held call and obtain the elapsed time since the call began. (Priority is given to the last call disconnected or put on hold.)

In all cases, the time is displayed transiently, along with some identification of the call being timed. Times of up to 9 hours, 59 minutes and 59 seconds can be displayed. For calls longer than ten hours, the timer wraps.

1.2.4 User Programming View

The user can program one Call Timer key for each set. An indicator is not used.

1.2.5 OAM Programming View

N/A

1.2.6 **EXTN/LINE**

N/A

1.3 Technical Specification (Limits/Constraints)

Call Timer values are not retained over power interruptions.

1.4 Interactions

Feature name	Interaction
AC15 Lines	There is a Call Duration Timer for each call on a split line.
Call Charge	Call Duration Timer can be activated if the user wants to know the elapsed time for the call.

Feature name	Interaction
Custom Call Routing (CCR) (for Compact Plus only)	The Call Duration Timer for an incoming call is started as soon as the call is answered by CCR.
Hold / Transfer	If an external call is held at one set, and then unheld at another (Transfer Using Hold), the total elapsed connect time, including time accessed at the first set, and held time, can be displayed at the second set only. This also applies to internal and external calls transferred using Transfer Using Conference.
Loopstart trunks	For manual and autoanswer trunks, the timer begins when the call is answered by the user.
Page	Querying the timer while originating a Page Call returns the set to idle and cancels the Page. Outgoing and incoming paging do not affect the stored timer value for the most recent call.
System Time	Changing the system time in OAM Programming while calls are active makes the call timers associated with those calls inaccurate.
Voice Call	Because a Voice Call can be turned into a two-way call, timing is maintained for Voice Calls.Voice Call reception resets the stored timer value for the most recent call.

Called Line ID

1.1 Overview

1.1.1 Description

When the call arrives on a DASS2 target line on a DASS2 equipped Norstar, the Norstar echoes the DDI routing digits for the call as the Called Line ID sent to the DASS2 network. In this case, the calling party at a DASS2 equipped PBX sees that the extension digits of the dialled number are the same as the extension digits of the Terminating Line ID (TLI). TLI is the number a calling party sees on the display and may be used to verify a dialling sequence.

There is no Called Line ID sent to the DASS2 network when the call arrives on a non-DDI DASS2 facility. The TLI displayed at the calling party's set is a DASS2 network supplied number for the DASS2 Norstar.

TLI is not supported on outgoing calls on BRI lines. However, on outgoing calls from an ISDN terminal, the TLI is delivered to the terminal through the Stimulus Signalling.

1.1.2 Rationale for Feature

N/A

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 End User View

Called Line ID does not reflect any rerouting (such as OCR, CFAC, Prime set Call Capture) or answering information about any incoming call.

1.2.1.1 How Called Line ID relates to TLI

In the case of an incoming call on a target line, the Called Line ID will be the received digits for the target line. This means there is no redirection information (such as Call Forward destination) contained in the Called Line ID.

Where incoming call is destined	Facility for call	Called Line ID	TLI
a set	DDI path	Received digits for the DDI path	Complete CLID – consists of Norstar DASS2 number and received digits for the target line. Typically, in the case of a call destined for a set, a call could be directly returned to the called party.
	non DDI path	do not supply Called Line ID	DASS2 network supplied number

Where incoming call is destined	Facility for call	Called Line ID	TLI
a tandem call	non DDI path (tandem is only via SLR)	do not supply Called Line ID	DASS2 network supplied number

1.2.2 OAM Programming View

N/A

1.2.3 **EXTN/ **LINE

N/A

1.3 Technical Specification (Limits/Constraints)

1.3.1 CO verifying Called Line ID digits

A CO performs one of two kinds of Called Line ID verification: full or limited.

1.3.1.1 CO that performs Full Called Line ID verification

If a Norstar sends an Called Line ID that is longer than 6 digits, the DASS2 CO will analyze only the first 6 digits as the Called Line ID.

The CO will verify the length of the Called Line ID from the calling Norstar will be that registered within the DASS2 network for that Norstar.

The CO will also verify that the Called Line ID provided by the calling Norstar falls within the numbering range(s) registered for that Norstar.

1.3.1.2 CO that performs Limited Called Line ID verification

The CO only checks that the Called Line ID is 6 or less digits long.

1.3.1.3 Result of verification

If the Called Line ID passes the above screening tests, then the DASS2 network will supply a complete TLI towards the called PBX.

If the Called Line ID does not pass the above screening tests, the CO discards it. The CO either

- supplies a Listed Directory Number, for the calling Norstar, towards the called PBX, or
- supplies a partial TLI, pertaining to the calling Norstar, toward the called PBX.

1.4 Interactions

Feature	Interaction
ATA	Called Line ID is sent to the network even when the call arrives on a target line that is assigned only to an ATA. This is the same as for any other type of set.
Answer key	The Called Line ID will not reflect the number of the set with an answer key where the call is rerouted/answered.

Feature	Interaction
Call capture	The Called Line ID will not reflect the number of the set where the call is answered.
Call Forward (all varieties)	The Called Line ID will not reflect the rerouting/answering of the call at a call forward destination.
Call Pickup	The Called Line ID will not reflect the rerouting/answering of the call at the set used for Call Pickup.
DRT to Prime	The Called Line ID will not reflect the rerouting/answering of the call at the prime set.
Do Not Disturb	The Called Line ID will not reflect the rerouting/answering of the call at the prime set.
DND on Busy	The Called Line ID will not reflect the rerouting/answering of the call at the prime set.
Line pool codes	Line pool codes received on a DDI line are used as the Called Line ID. The call is routed to the prime set for the line.
Prime set call capture <ul style="list-style-type: none"> • Call forward transfer to prime • Callback extension to prime • Delayed Ring Transfer • DND selective call forward • DND transfer to prime • OCR • default ringing when no sets ring • HLR extension to prime 	The Called Line ID will not reflect the rerouting/answering of the call at the prime set.
Public network target lines	Called Line ID is sent to the network only for calls on DDI DASS2 public network target lines. (Called Line ID is not available on analog PSTN or private network AC15 lines.)
Routing codes	Routing codes received on a DDI line are used as the Called Line ID. The call is routed to the prime set for the line.
SLR	SLR is not supported for DDI lines, as these lines are Auto-Answer, and so cannot be used for tandeming calls on DDI-lines. SLR can be the means for tandeming calls on non-DDI lines, which are Manual-Answer. In this case, there is no Called Line ID.
Services	Typically, the Called Line ID will not reflect the rerouting/answering of the call at a ringing set defined for Services.
Tandem call	Tandeming is supported only via SLR on non-DDI lines. In this case, there is no Called Line ID. Tandeming is not supported, via routing codes, line pool codes, SLR, on DDI lines.
Trunk Answer from Any Set	Typically, the Called Line ID will not reflect the rerouting/answering of the call by TAFAS.

Call Forward

1.1 Overview

1.1.1 Description

Call Forward allows internal and external calls to be transferred to another set. This feature has an end user and an OAM programming aspect.

- Call Forward (All Calls) and Call Forward Override are options programmed by the end user.
- Call Forward Override allows an end user at the forward destination to call the user of the forwarding set.

Call Forward No Answer and Call Forward On Busy are options programmed on a set-by-set basis in OAM programming.

- Call Forward No Answer transfers ringing for an internal or external call from one set to another after a programmable number of rings.
- Call Forward On Busy transfers ringing to another set if the user's set is busy (the user is active on one call, already has an alerting call, or has held calls).

1.1.2 Rationale for Feature

The retry capability of Call Forward On Busy is required to support the voice mail interface, which expects that a call is presented eventually at a free destination.

The forwarded to party may need to call the forwarded from party. Call Forward Override makes such a call possible by overriding the Call Forward feature (not cancelling it).

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls

1.2.1.1 Non-ISDN terminals

To activate Call forward (All Calls):

- , or programmed key
- Internal Autodial programmed keys, or digits entered from the dialpad

To cancel:

- , or
- (or otherwise exiting without specifying a valid destination)

No control is required for Call Forward Override.

1.2.1.2 ISDN terminals

To activate Call forward (All Calls):

1. Press * 4 *, or programmed key.
2. Press Internal Autodial programmed keys, or enter digits from the dialpad, followed by
3. Enter the appropriate key to SEND.

To cancel:

1. Press # 4 #
2. Enter the appropriate key to SEND.

No control is required for Call Forward Override.

1.2.2 End User View

1.2.2.1 Activating Call Forward

Non-ISDN terminals

To activate Call Forward, the user presses the Call Forward key or 4 . The prompt, `Forward to:` appears on the display. The user then dials the number of the destination set, or presses a programmed Internal Autodial key to indicate the destination set to which calls are to be forwarded.

If a Direct-dial set exists, the Direct-dial digit is also a valid internal number.

Message Displays during the Programming of a non-ISDN terminal

Message	Description
<code>Forward to:</code>	Displays when the user activates Call Forward.
<code>Forward> <name></code>	Displays the programmed name associated with the forward destination set.
<code>Forward denied</code>	Displays if any of the following conditions exist: <ul style="list-style-type: none"> - an invalid internal number is specified - an invalid programmed key is pressed - the destination set is not in service - the destination set has Call Forwarded activated in such a way that a forward loop is created - the destination set is in Do Not Disturb mode
<code>Forward <name></code> <code>CANCEL</code>	Appears after three seconds when forwarding is enabled on M7210 and M7324 sets, subject to message display priorities.
<code>Cancel forward</code>	Displays for three seconds when the feature is cancelled.

To allow activation of Call Forward, the following conditions must exist:

- the destination set must be in service
- the destination set must not have Call Forward activated in a way that creates a forward loop
- the destination set must not be in Do Not Disturb or Administration mode

A forwarded set receives visual indication of incoming calls on line keys, but does not ring for those calls. Call Identification appears briefly at the forwarded set. To

answer the call at the forwarded set, the user presses the line key. No indication is given if the forward destination is also forwarded, but the creation of a forward loop is not allowed. No limit is placed on the number of sets that can be programmed in a Call Forward chain, provided that a loop is not created.

For example, forwarding can be chained A to B, and B to C; calls to A then appear at C. Since forwarding cannot be looped, an attempt by C to forward to A is denied. The forward destination can call the forwarded set (but not any set higher up in the forwarding chain) and override forwarding. For example, C can call B, and B can call A, and forwarding does not apply. If C calls A, or any set higher in a forwarding chain, the call rings the set immediately before C in the chain (in this case, B).

If the Call Forward key has an associated indicator, the indicator is turned ON when forwarding is activated.

The user can activate Call Forward while a call is ringing, but forwarding does not apply to that call. Only calls arriving after Call Forward has been activated are forwarded.

Forwarding to an external number is not supported.

Message Displays at programming set when Call Forward is active (non-ISDN terminals)

Message	Description
Calling <originating setname>	Displays - transiently on a set placing an internal call to a forwarded set (three seconds). - on the calling set if more than one set is ringing for an internal call (for example, a set with an Answer key is also ringing for the call).
<original destination name>> <final destination name>	Displays transiently, after the message Calling<original destination name> , on a set placing an internal call to a forwarded set (three seconds). It is followed by call status display for the forward destination.
Calling <name>	Displays if any set in the Call Forward chain is performing OAM Programming (accompanied by Ringback tone). <name> is the name of the set trying to forward the call to the set performing OAM programming
Do Not Disturb	Status message that indicates the forward destination set is in Do Not Disturb mode.
Not in service	Status message that displays if any set in the Call Forward chain is out of service (accompanied by Reorder tone)
<final destination name> busy	Displays on the calling set, accompanied by Overflow tone, if an internal call goes through the forwarded chain and no sets are free.

The Basic set is an exception, because it does not have physical line appearances upon which to present incoming calls.

Message Displays at destination set when Call Forward is active (non-ISDN terminals)

Message	Description
<originating setname>> <forwarded setname>	Displays on a destination set when it is ringing for a forwarded internal call.
<external linename> <forwarded setname>	Displays on a set ringing for a forwarded external call. <external line name> refers to the line on which the call is coming into the forwarded set.
<calling setname> <forwarded setname>	Displays, with attenuated ring tone, if - the forwarded destination set is active on a call - the incoming call is the highest priority call ringing the set.
<calling setname or linename> <original destination name>	Displays at the destination set for an internal or external call unless the call is forwarded to a new destination by Call Forward No Answer

ISDN terminals

The Call Forward All Calls feature can be used from an ISDN terminal connected to Norstar. On most ISDN terminals, the user needs to press one or more keys to access feature services before entering the Norstar feature code for these features. To determine what keys to press, the user should consult the instructions that come with their ISDN terminal.

Although ISDN terminals may have Call Forward keys or display prompts, these keys do not activate the Norstar feature. The user must use the appropriate procedure to access feature services, then enter the Norstar feature code.

To activate Call Forward, after accessing feature services, the user presses **[*] 8 [*]**. The user then dials the number of the destination set, presses **[*]**, and enters the appropriate key to SEND.

1.2.2.2 Cancelling Call Forward

Non-ISDN terminals

When forwarding is enabled, pressing the Call Forward key cancels forwarding. Forwarding can also be cancelled by pressing **Feature [] # 4** or the CANCEL display key on two-line display sets.

ISDN terminals

To cancel Call Forward on an ISDN terminal, after accessing feature services, the user presses **Feature [] # 4 #** and enters the appropriate key to SEND. (For instructions on accessing feature services, the user should consult the instructions that come with their ISDN terminal.)

1.2.3 Call Forward Behaviour

At the Forward to: prompt, the user presses **[Rls]**, or otherwise exits without specifying a valid destination, call forwarding is cancelled. The display is restored to the state it was prior to the call forwarding being cancelled.

Call Forward (All Calls) takes precedence over Call Forward On Busy, which in turn takes precedence over Call Forward No Answer. If the user activates Call Forward all Calls on their set, the other types of Call Forward do not occur.

The following table illustrates some of the characteristics of Call Forward (All Calls), Call Forward No Answer, and Call Forward On Busy, when these features are active.

Characteristics at Forwarded From User's Set

Characteristic	Call Forward	Call Forward No Answer	Call Forward On Busy
Call is immediately forwarded	4	No	4
Transfers ringing to another Norstar set specified by the user	4	4	4
Suppresses ringing of all incoming calls.	4	No	4
Displays visual alerting for all incoming calls (if a key is available for the call to be presented)	4	4	4
Call forwarded-user can pick up the call if it has not been answered elsewhere ¹	4	4	4
User can answer other incoming calls, if desired.	4	4	4
User can make outgoing calls	4	4	4

The Basic set is an exception, because it does not have physical line appearances upon which to present incoming calls.

Calls that are forwarded to a destination set appear on the appropriate key (line key, or intercom key). A forwarded call, or any other type of rerouted call, does not ring at an Answer key for the destination set. For example, if Set A is forwarded to Set B, and Set C has an Answer key for Set A, the Answer key at Set C will not ring or flash for Set A's call.

If a set (that has an Answer key for another set) is forwarded, then the Answer key flashes and rings (if programmed to do so). For example, if Set C has an Answer key for Set A and Set A is ringing for a call, then alerting occurs at the Answer key at Set C. If Set C is also on another call, then Call forward on Busy forwards the call at the Answer key to its appropriate destination.

If a set with Call Forward On Busy has calls directed to a set that also has Call Forward On Busy (or Call Forward All Calls) activated, then the call is again forwarded, creating a chain. The call is directed to (1) the first available set in the forwarded chain, (2) a set on which only Call Forward No Answer applies, or (3) the final set in the forwarded chain. After the message `Calling <original destination name>` appears, the display of a set making an internal call shows `<original destination name>><<final destination name>`, regardless of the number of intermediate sets in the forwarded chain.

For Call Forward No Answer, an incoming call rings at a set before the call is forwarded. When Call Forward all Calls or Call Forward On Busy apply at a set,

an incoming call is immediately forwarded. For Call Forward On Busy, messaging must therefore occur before the call can be directed to an available set in the forwarded chain.

For each call, the first ten sets in the chain that have any type of Call Forward active, are evaluated for the call. The total number of sets in a system that can have Call Forward programmed is not limited to ten.

The chain includes sets that have any type of Call Forward activated at their set. Looping can occur in this chain. For example, set A is forwarded to B, and set B in turn is forwarded to set C. Set C could be forwarded to A, thus creating a loop. Such loops are not prevented from occurring, and are considered harmless.

If a forwarded call rings at a set where Call Forward No Answer applies, Call Forward No Answer rules and display messages associated with Call Forward No Answer apply. If the call is forwarded from a set again, the call searches for the next available set. The caller continues to hear Ringback tone.

If a call is forwarded and the set from where it was forwarded subsequently becomes free, the call does not ring at the now-available set.

Call Forward does not present calls to intermediate sets in a Call Forward chain.

An internal call to a forwarded set can have two alerting appearances, one at the forwarded set and one at the forward destination. When the call is answered at either set, the visual indication at the other set is removed.

If no intercom key is available at the forwarded set when an internal call is forwarded, the call appears at the forward destination only.

If no intercom key is available at the forward destination when an internal call is forwarded, the calling set receives busy tone, and the call does not appear at the forward destination. The call indication appears very briefly at the forwarded set and is then removed. In this situation, the message `<name> busy` is displayed on the caller's set, where `<name>` is the name associated with the forwarded destination (that is, the set that the call has been forwarded to).

For internal calls, if the forward destination has Do Not Disturb enabled, the calling set receives a Ringback tone, and sees the status message, `Do not disturb following the <original destination name>><<final destination name>` message. The call gives visual ringing indication at both the forward destination and the forwarded set, and can be answered at either set.

All forwarded internal calls are made as Ringing Calls, even if other conditions are suitable for a Voice Call to be made.

The ring cadence for internal and external originating calls is different. When an external call is presented on an intercom key, the external ring cadence is maintained.

Call Forward Transfer to Prime Extension

For external calls, if the forward destination does not have an appearance of the external line, the call is presented on an intercom key if one is available. Similarly,

if the forward destination has Do Not Disturb enabled, an attempt is made to present the call to the Prime Extension.

For incoming external calls, if either the following conditions exist:

- the forward destination has Do Not Disturb enabled
- the destination does not have an appearance of the external line and does not have an available intercom key

The alerting call is transferred to the Prime Extension for that line, if one exists.

If the Prime Extension, or the set it is forwarded to, has Do Not Disturb enabled, or does not have an appearance of the line and does not have an available intercom key, the caller receives a Ringback tone, although the line may not be ringing on any sets in the system.

1.2.3.1 Call Forward No Answer

When Call Forward No Answer occurs, visual alerting remains at the forwarding set, and the call can be answered there if desired (as in normal Call Forward).

As with ordinary Call Forward, the forwarded call appears on an appropriate key (external line appearance, or intercom key) at the destination set. If the forwarded call is already alerting an Answer Group key on the destination set, it continues to do so at that Answer Group key, and a line key is not selected.

If Set A is forwarded to Set B, and Set B has an Answer key for Set A, the Answer key continues to ring or flash after calls at Set A are forwarded (until the call is answered).

A set placing an internal call affected by Call Forward No Answer receives the If the destination set is not in service, or has no key on which to present the call, Call Forward No Answer does not extend the call beyond that set.

As with Call Forward (All Calls), Call Forward No Answer does not redirect calls directed to a set that is performing OAM Programming. Also, if any set in the Call Forward chain is performing OAM Programming, forwarding does not operate through that set. In these cases, the caller continues to hear a Ringback tone and sees the display `Calling <setname>` where `<setname>` is the name of the set trying to forward the call to the set performing OAM Programming.

The action of this feature is similar to Delayed Ring Transfer and Answer Groups, but has differences from both.

Unlike Answer Groups, Call Forward No Answer does not require a special key at the destination set. It rings that set after a programmable delay, rather than immediately.

Delayed Ring Transfer, if enabled system-wide in OAM Programming, applies to each external line for which a Prime Extension exists, and does not suppress ringing at any set. In contrast, Call Forward No Answer applies to all ringing internal or external calls to a set, and suppresses ringing at the original set, as does Call Forward (All Calls). The Delayed Ring Transfer delay is a system-wide

setting, whereas the Call Forward No Answer delay is programmed on a set-specific basis.

1.2.3.2 Call Forward On Busy - Retries

For an incoming call on an external line, Call Forward On Busy keeps trying to find a free set in a chain of Call Forward destinations. If no free set is found in a chain of Call Forward destinations, a timer is starts, reactivating the new call every twelve seconds for a maximum of two minutes after which the call is forced to ring at an extension that has an available key.

This mechanism allows time for an extension to become idle and hence receptive to the new call. There is no limit on the number of extensions included in the call-forward loop.

A set with Call Forward On Busy programmed receives only visual alerting when a call arrives at the set (provided that a key is available at which the call can be presented). Call Forward On Busy then redirects the call. As long as the call has not yet been answered elsewhere, the user can select the visually alerting key to answer the call.

Calls that are forwarded to a destination set appear on the appropriate key (line key or intercom key). A forwarded call, or any other type of rerouted call, does not ring at an Answer key for the destination set. For example, if Set A is forwarded to Set B, and Set C has an Answer key for Set B, the Answer key at Set C does not ring or flash for Set A's forwarded call.

If a set (that has an Answer key for another set) is forwarded, the Answer key flashes and rings, if programmed to do so. For example, if Set C has an Answer key for Set A and Set A is ringing for a call, alerting occurs at the Answer key at Set C. If Set C is also on another call, Call Forward On Busy forwards the call at the Answer key to its appropriate destination.

If there is an Answer key in the system for the original destination set, the caller's display remains `Calling <original destination name>`. This occurs even if one of the sets that has an appearance of the original destination's DN is subject to Call Forward On Busy.

The display messages that an internal caller sees when their call is forwarded to a set that has Call forward on Busy activated are the same as for Call Forward all Calls. Existing display messages also apply for the destination set to which calls are forwarded.

If a set with Call Forward On Busy has calls directed to a set that in turn has Call Forward On Busy (or Call Forward all Calls) activated, the call is again forwarded, creating a chain. The call is directed to

- the first available set in the forwarded chain
- a set on which only Call Forward No Answer applies
- the final set in the forwarded chain

After the message `Calling <original destination name>` appears, the display of a set making an internal call shows `<original destination`

name> <final destination name> regardless of the number of intermediate sets in the forwarded chain.

For Call Forward On Busy, messaging must occur before the call can be directed to an available set in the forwarded chain. For each call, the first 30 sets in a chain that have Call Forward On Busy (or a combination of the other types of Call Forward and Call Forward On Busy) activated, are evaluated for that call. (The total number of sets that can have Call Forward On Busy programmed on a system-wide basis is not limited to 30.)

The chain includes sets that have any type of Call Forward activated. Looping can occur in this chain. For example, Set A is forwarded to B, and Set B in turn is forwarded to Set C. Set C could be forwarded to A, thus creating a loop. Such loops are not prevented from occurring, as they are considered harmless.

If a call goes through the forwarded chain and no sets have an available line on which to receive the call, an internal caller's display shows <final destination name> busy. Overflow tone is given. Existing call capture rules for external calls apply.

If a call is forwarded and the set from which it was forwarded subsequently becomes free, the call does not ring at the now-available set.

Forwarding does not operate if any set in the forwarded chain

- is out of service
- is in OAM Programming
- is in Maintenance
- has no key on which the call can be presented

An internal set shows the appropriate display messages, such as Not in service or Busy. An external call is directed to the Prime Extension using Delayed Ring Transfer.

Basic sets do not have physical line appearances or intercom keys upon which to present incoming calls. Thus, a basic set that has calls forwarded to it receives only ringing indication (and the appropriate display message) for the incoming call.

1.2.3.3 Call Forward Override

If the forwarded to party needs to contact the forwarded from party, to ask that forwarding be cancelled, or to transfer back a call forwarded from the forwarded from party's set, Call Forward Override makes such a call possible by overriding the Call Forward feature.

This feature is sometimes called Secretarial Filtering. When a user forwards to an attendant's phone, the attendant can answer all calls directed to the forwarding user's set, and can then transfer selected calls to the user using Hold or Conference.

1.2.3.4 User Programming View

The user can program one Call Forward key for each set, with or without an indicator. If present, the indicator is used.

1.2.4 OAM Programming View

1.2.4.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item			I	SC+	SC
Terminals& Extns	Individual extn	Capabilities	Fwd no answer	X	X	X
			Fwd on busy	X	X	X

1.2.4.2 Programming Call Forward

See ["Terminals&Extns - Capabilities - Fwd programming"](#).

Call Forward On Busy (Fwd on busy) and Call Forward No Answer (Fwd no answer) are programmed on a set-by-set basis under Terminals&Extns► Capabilities.

At the Forward to prompt, the user can specify an internal DN, or a value of None.

For Call Forward No Answer, the user is then prompted for the Forward delay, which can be set as 2, 3, 4, 6, or 10 rings. The default is 3.

1.2.5 **EXTN/**LINE

N/A

1.3 Technical Specification (Limits/Constraints)

If any set in the forwarded chain is in the process of OAM Programming, Call Forward does not operate. End-user programming activities do not prevent a set from participating in Call Forward.

A set can receive messages when it is forwarded. Messages are not forwarded to the forward destination.

A set cannot be programmed to forward calls to itself.

Forwarding to an external number is not supported.

1.4 Interactions

Feature or condition name	Interaction
Callback	<p>A call performing Callback is subject to Call Forward No Answer at any set it is trying to ring.</p> <p>A call performing callback is subject to Call Forward On Busy at any set it is trying to ring. The Callback is forwarded to the destination set. (For more information, refer to the Callback feature.)</p>

Feature or condition name	Interaction
Camp-on	A camped call that arrives at a busy set that has Call Forward On Busy activated is not forwarded. For more details about forwarding camped calls, see the Camp-on feature.
Delayed Ring Transfer	If the Prime Extension has Call Forward enabled, Delayed Ring Transfer occurs at the forward destination, whether or not the forward destination has an appearance of the external line. The ring transfer message is displayed at the forward destination. Because Delayed Ring Transfer is line-based, and Call Forward No Answer is set-based, both can occur for the same call.
Intercom keys	Call Forward presents an external call on an intercom key if the set does not have an appearance of the external line.
Internal Autodial	Line selection does not occur (that is, a call attempt is not made) when the user presses an Internal Autodial key in response to a prompt for a destination when using Call Forward.
Do Not Disturb	Both Call Forward and Do Not Disturb can be active at the same time, and can be activated in either order. When both features are active, the only effect of Do Not Disturb is to suppress incoming paging. Otherwise, Call Forward proceeds normally.
External Line access	Call Forward forwards the ringing of external lines and can be performed on external calls.
Held Line Reminder	Held Line Reminder Extension to Prime Extension is also forwarded, but the Held Line Reminder takes place at the Prime Extension.
Maintenance	If any set in the forwarded chain is in Maintenance, forwarding does not operate.
OAM Programming	Forwarding does not occur for calls directed to a set that is performing OAM Programming. Also, if any set in the Call Forward chain is performing OAM Programming, forwarding does not operate through that set. The caller hears busy tone and sees the message <code>Not in service.</code>
Page	Forwarding does not apply to Page calls.
Prime Extension	If a Prime Extension has Call Forward active, all alerting messages, line indications, and ringing associated with Prime Extension Call Capture features are forwarded from the Prime Extension to the destination set. Held Line Reminder Extension to Prime Extension is also forwarded, but the Held Line Reminder takes place at the Prime Extension. This forwarding occurs even if the Prime Extension has Do Not Disturb active and/or has no line key on which to present the call. If Call Forward is in effect at the Prime Extension, the Call Capture features are forwarded to the destination set regardless of Do Not Disturb status at the Prime Extension.

Feature or condition name	Interaction
Priority Call	<p>A set with Call Forward On Busy programmed can receive a Priority Call. If the user calling the original (Call Forward On Busy) destination set activates a Priority Call, the Priority Call is directed to the original destination set only, and not any other set in the forwarded chain. If the Call Forward On Busy set is part of a forwarded chain, a call may have already been forwarded to a second (or third, and so on) Call Forward On Busy set. If the caller makes a Priority Call, the Priority Call applies to the original Call Forward On Busy destination set only. The call then takes on the attributes of a Priority Call. Priority Calls, whether or not they are answered, are not reforwarded.</p>
Private Lines	Private lines can be directed to another set by Call Forward.
Ring Again	If a user's call is being forwarded by Call Forward Busy, activating Ring Again On No Answer) applies to the original set being called, and not the destination set to which the call is forwarded. For example, Set A is forwarded to Set B. Set C calls Set A and activates Ring Again. The Ring Again applies to Set A and not Set B.
Line Assignment	If an Answer key is programmed not to ring, no forwarding occurs from the key.
Set not in service	If Call Forward No Answer directs a call to a set that is not in service, the caller continues to hear a Ringback tone, even though the call cannot ring or appear on that set.
Transfer Callback	<p>If Call Forward is active at the set that attempted the Transfer, the Callback is forwarded to the forward destination, with the normal forward message, <party being transferred> > <transfer originator>. In this case, the Call Back Call does not alert at the set that attempted the transfer, and cannot be picked up at that set.</p> <p>If Call Forward is active at the set that attempted the Transfer, the Callback is forwarded to the forward destination, with the normal forward message, <party being transferred> > <transfer originator>. In this case, the Call Back Call does not alert at the set that attempted the transfer, and cannot be picked up at that set.</p>
Voice Call	Call Forward prevents the called set from receiving a Voice Call

Call Identification/Call Status Display

1.1 Overview

1.1.1 Description

For internal calls, Call Identification automatically displays

- the name of the calling (originating) party for an incoming call at the called (destination) set
- the name of the called (destination) party of an outgoing call at the calling (originating) set

Other Call Identification information is displayed for

- external calls
- calls affected by rerouting

If the user is active on an external call, or connected on an internal call, transient information is shown for a new incoming call (Refer to Call Display When Busy).

1.1.2 Rationale for Feature

See “1.1.1 Description”.

1.1.3 General Definitions

Call Identification is available on all Norstar systems. It should not be confused with Incoming Call Information, which is available only with DASS2 or ISDN.

1.1.4 General Procedures

1.1.4.1 Internal calls

For outgoing and incoming internal calls, the name associated with the other party's set in OAM Programming is displayed. The default is <setname>, where <setname> is the set's DN or intercom number. The set name is programmed in OAM Programming.

Where applicable, Call Forward information is displayed for incoming and outgoing calls.

1.1.4.2 External calls

For incoming external calls, the linename is displayed when the call is answered. For outgoing external calls, the display echoes the dialed digits, but does not show any other Call Identification information.

1.2 Feature Details

1.2.1 Caller View

When a caller dials digits on a call, the dialed digits are shown on the display. If a transient display occurs (because the user activates a feature such as Do Not Disturb or because an asynchronous event such as Held Line Reminder or Ring Again Offer occurs), when the transient display is removed, the identifier <line

name> is displayed for external lines, and the idle state display is shown for internal calls.

Call identification messages displayed to caller (on an analog line)

Condition or Action	Call Identification or Display Behaviour
Select idle external line	<linename>
Select idle internal line	Display is cleared.
Dial on outgoing external line	Echo digits
Dial on outgoing internal line	Echo digits then Calling <name> then called party's status, for example: Do not disturb <setname or linename> busy On another call or <setname> if successful
Initiate a successful Voice Call	Voice call(transient)
Select held external line	<linename>
Select held internal line	<setname>
Displays on the calling set when a call to a Call Forwarded set is answered.	<original destination name> > <final destination name>
Connected conference call (internal)	<setname 1> <setname 2>
Connected conference call (external)	<setname> <linename 2>

Error Message Displays at caller's set (on an analog line)

Error Message	Description
<setname> busy	Displays if the destination set has all its intercom keys in use.
Already joined	Displays when a call in any state (alerting, held, connected, conferenced) exists between two sets and a second call is attempted between those two sets. Attenuated ringing occurs at the called set.
Do not disturb	Displays, accompanied by Ringback tone, if an internal call is made to a set which activates Do Not Disturb during alerting or has Do Not Disturb enabled.
No voice call	A transient message that displays on the calling set if one or more conditions at the destination set prevent the latter from receiving a voice call. For a list of conditions, see the Voice Call feature.

Error Message Displays at caller's set (on an analog line)

Error Message	Description
Not in service	Displays after echoing the digit transiently if the destination set is not installed or does not respond to status polling or is in OAM Programming.
On another call	Displays if an internal call is made to a set that has an available intercom key but is active on another call.
Invalid number	Displays if the user dials an invalid intercom number.
Your number	Displays if a user attempts to call their own intercom number.

1.2.2 End User View

In order to receive this incoming Call Identification, the user must be

- connected on an internal call
- on an external line for which call timing has commenced

Call timing does not commence until the user has been active on an outgoing external line for ten seconds. This means Call Identification is not presented until after ten seconds have elapsed, to minimize the possibility that this identification would overwrite the digits being dialed by the user.

Incoming Call Identification is not displayed for a call that does not generate ringing at the set.

If the user places an internal or external call on hold, the display of Call Identification is replaced by the display appropriate to the user's new state.

When the user reconnects to the held call, the appropriate Call Identification is again displayed.

Call identification messages displayed at called party's set (on an analog line)

Condition or Action	Call Identification or Display Behaviour
Incoming ringing external call	None, until the call is answered.
Incoming ringing internal call	<setname> calling The display persists until the call is abandoned or answered. If the called party is on another call, this information is display transiently, accompanied by attenuated ringing.
Incoming ringing call rerouted by Call Forward. (For details, refer to Call Forward.)	<calling setname or linename> <original destination name>
Incoming ringing call rerouted to Prime Etn. For details, refer to Delayed Ring Transfer, Do Not Disturb, and Selective Line Redirection, and Prime Line.	At the Prime Etn, any of: DRT <line name> DND transfer DND from <name> <line name> to prime

Call identification messages displayed at called party's set (on an analog line)

Condition or Action	Call Identification or Display Behaviour
Preselect incoming external call or internal call	<linename> calling <name> Occurs with attenuated volume.
Answer incoming external call	<linename>
Answer incoming internal call	<setname>
Answer external call using Call Pickup	<linename> pickup
Answer internal call using Call Pickup	<setname> pickup
Connected conference call (internal)	<setname 1> <setname 2>
Connected conference call (external)	<linename 1> <linename 2>

For error messages associated with calls rerouted to the Prime Etn, see the Prime Extension feature.

1.2.3 OAM Programming View

See ["Terminals & Extensions"](#).

See ["Lines"](#).

1.2.4 **EXTN/LINE**

N/A

1.3 Technical Specification (Limits/Constraints)

N/A

1.4 Interactions

Feature name	Interaction
Blind Transfer Camped Calls	Blind Transferred and Camped calls always deliver passive-ICI to idle (that is, no active call) sets, no matter how the line is programmed at the set or the type of key on which the call appears. For sets on active calls, Call Display When Busy rules apply.
Call Forward Do Not Disturb Delayed Ring Transfer Prime Extension	Call identification is displayed for incoming external calls that begin ringing the set as the result of any rerouting feature. For more information, refer to each feature.
Extension Copy	Call information settings, including the Call Display When Busy setting, are copied.
Feature activation	Call Display When Busy display is blocked <ul style="list-style-type: none"> - whenever any feature is active - in the first ten seconds of a call being answered by a Norstar user - at the end of the Call Timer delay timer on an outgoing external call (or, in the case of answer-supervised trunks, ten seconds after the call is answered)

Feature name	Interaction
Hold	If the user is active on a call and an incoming internal call occurs, the new call displays Call Identification. If the user holds or releases the original call, Call Identification can be displayed for the highest priority call now ringing the set.
Incoming Call Information (ICI)	When the user is on an active call, and another call alerts at the set, Call Display When Busy rules apply. That is, the new alerting call displays Call Display When Busy messages, not passive-ICI. But while Call Information is active, the display and associated call are be changed by new incoming calls associated with Call Display When Busy or priority bumping.
Selective Line Redirection	When programming SLR, the feature makes use of the indicators. Therefore, no call handling status of lines will be visible. There is no visual alerting of incoming calls. Alerting external calls will only ring (if administered to do so). Incoming calls do not overwrite the display. The caller must exit the programming session to receive the display.

Call Information

1.5 Overview

1.5.1 Description

The Call Information feature displays call information on keys where calls can appear. Call information for Calling Line ID (CLID) or Terminating Line ID (TLI) calls is composed of the CLID or TLI number from the CO switch, plus the Norstar line name associated with the call. The combination of CLID or TLI data and Norstar line number is termed Identifying Call Information (ICI). Non-CLID/TLI calls only display local Norstar call information such as the name of the line a call is on, or the set name of an internal caller, as in ENET.

There must be a subscription to the DASS2 or ISDN service for delivery of CLID and TLI.

Call Information is not supported for ISDN Terminals. Call Information is supported for Norstar sets for calls involving BRI lines.

1.5.2 Rationale for Feature

Call Information is required for the following reasons:

- To provide a means for users to view all the ICI data. All the components of ICI data will not fit in a single 16 character display. This feature enables the user to view or scroll the display to the other data associated with the call.
- To provide a means of displaying ICI for alerting lines not administered to automatically display passive-CLID.
- To permit users to check the call information on other calls at their set.

For example: a user at a busy set (numerous lines alerting and on U-hold or I-hold) uses Call Queue to answer a call and notes the caller's number from the display. Then the user holds the call to handle an interruption. Now the user wants to return to the held call, but because the call was not answered using the line key, the user has no idea which line the call is on. And since the set is busy, the user is unable to identify the held call by its indicator's flash rate because they cannot discriminate between all the other indicator flash rates. The Call Information feature permits the user to check ICI for each call on the set without actually answering the call. All the user has to do is find the call that displays the caller's number, then answer the call in the usual way.

- To provide a means of displaying TLI for an outgoing call, especially when the set is not administered to passively display TLI.

1.5.3 General Definitions

In this document, call information (not capitalized) is used as a general phrase to mean both ICI (which is specific to CLID and TLI calls) and local Norstar call information (for non-CLID/TLI and internal calls). It should not be confused with the feature name Call Information (capitalized).

1.5.4 General Procedures

N/A

1.6 Feature Details

1.6.1 Controls

Feature 8 1 1, or programmed memory key, or INFO display key

1.6.2 Message Displays

Message	Description
►Select a call	Prompts if feature is invoked and there are calls at the extension but no active or audibly alerting calls, or if the user is the conference master on a conference call.
►No calls	Displays if the feature is invoked and there are no calls at the set.

1.6.3 End User View

Call Information is an interactive feature that users can invoke by

- Entering the feature code Feature 8 1 1
- Pressing a programmed memory key
- On a two line display set, pressing the INFO display key after it is presented.

Information on a call may already be on the display when the user invokes the feature. This may be ICI data for a CLID or TLI call, or local Norstar data for an internal call, or non-CLID/TLI call. Either way, Call Information ignores whatever call information was previously on the display.

When Call Information is invoked, the information which is displayed is determined by the following rules:

- If there is an active call, then the call information for the active call is displayed first.
- If there is no active call, then the call information for the highest priority ringing call is displayed first.
- **Note:** Ringing CLID calls do not have any special priority over ringing non-CLID calls. They will be treated as regular ringing external calls by the existing ENET rules used to determining the highest priority ringing call.
- If there are no active or audibly alerting calls, then the user is prompted to ►Select a call
- If the user is on a Conference call and is the Conference master, then the user is prompted to ►Select a call
- If there is no indication of any kind of call at the set, then the user will be prompted with ►No calls accompanied by error tone.

1.6.3.1 Active & ringing CLID calls with ICI data on the display

For CLID calls, the first ICI data the user sees is the preferred-ICI. The preferred-ICI is simply the piece of ICI data, number or line name, that is to appear first for that set.

When the user invokes Call Information, the feature displays the preferred-ICI but prefixed with a special symbol, ► to indicate that they are now in the Call

Information feature. Two line sets show the display keys EXIT, to cancel the feature, and MORE to display the next screen of data.

To view the next piece of ICI data the user can press the # dial pad key or the MORE display key.

The following table illustrates the general sequence.

Inquiring on a call with CLID on the display (preferred-ICI is number

Sequence of events & actions	Display
A ringing CLID call with passive-ICI arrives at the set or The user answers a CLID call	0813968452 or 0813968452 INFO TRANSFER
The user presses, Feature 8 1 1 , or the INFO display key on two-line sets, then the set displays the preferred-ICI with the Call Info symbol. (first piece of ICI data)	▶0813968452 EXIT MORE
The user presses # or the MORE display key on two-line sets, then the set displays the second piece of ICI data	▶LINE002 EXIT MORE
The user presses # or the MORE display key on two-line sets again, then the set displays the first piece of ICI data again	▶0813968452 EXIT MORE

Note that the user must take two actions in order to see the second piece of ICI data.

This is not the ideal design from the users point of view. Users' comments from simulations were that they wanted to see the next piece of data with one key press rather than two. The simulation tests also suggest that users do not make a clear distinction between the state the set is in when displaying call information like ICI for an active CLID call, and the state the set is in when Call Information is active. Users' first impression of Call Information was that it merely scrolled the screen and nothing else.

However, there are two reasons for this two-step design:

- To reinforce the fact that the user's set is now in a new state — a feature — as indicated by the Call Information symbol, ▶.
- To minimize the problem in which an audibly alerting call on a line administered with passive-ICI is "bumped" by another higher priority passive-ICI call on another line. For example, if a set is administered with number as preferred-ICI and a call rings at a line with passive-ICI administered, then the user will see the caller's number. If the user invokes the feature, to see the second piece of ICI data, namely line name, just as a higher priority call starts to ring, the user would see the line name for the second call, instead of the first call.

1.6.3.2 TLI calls

For TLI calls, the first ICI data the user sees is the preferred-ICI. The preferred-ICI is simply the piece of ICI data, number or line name, that is to appear first for that set.

When the user invokes Call Information, the feature displays the preferred-ICI but prefixed with a special symbol, ► to indicate that the Call Information feature is active. Two line sets show the display keys EXIT, to cancel the feature, and MORE to display the next screen of data.

To view the next piece of ICI data the user can press the # dial pad key or the MORE display key.

The following table illustrates the general sequence.

Inquiring on a call with TLI (preferred-ICI is number)

Sequence of events & actions	Display
TLI is being displayed passively and transiently at the set or Either the transient display of passive-TLI is complete or the set has not been administered for passive delivery of TLI. The number shown is the number dialed for this outgoing call. or The outgoing call has been redirected and answered at another set – TLI for the call is displayed on the set.	+0813968452 INFO TRANSFER or 90813968452 INFO TRANSFER or +0813968452 INFO TRANSFER
The user presses, Feature 8 1 1 , or the INFO display key on two-line sets, then the set displays the preferred-ICI with the Call Info symbol. (first piece of ICI data)	►+0813968452 EXIT MORE
The user presses # , or the MORE display key on two-line sets, then the set displays the second piece of ICI data	►LINE002 EXIT MORE
The user presses # , or the MORE display key on two-line sets again, then the set displays the first piece of ICI data again	►+0813968452 EXIT MORE

1.6.3.3 Non-CLID/TLI and internal calls

Users can also inquire on non-CLID/TLI calls and internal calls. Since local Norstar call information can be displayed in one display, the mechanism for navigating to the next display is no longer needed. Therefore the MORE display key is not presented on two line sets and on all sets the # dialpad key will be ignored.

Inquiring on a non-CLID/TLI call

Sequence of events & actions	Display
The user is on a non-CLID/TLI call. The INFO display key will not appear for non-CLID/TLI or internal calls. or An incoming non-CLID/TLI call. This is a sample display of a background display.	LINE002 TRANSFER or 25 Dec 12:23 pm
The user presses <input type="text" value="Feature"/> 8 1 1, then the set displays the local Norstar call information.	▶LINE002 EXIT

Inquiring on an Internal call

Sequence of events & actions	Display
The user is on an internal call. The INFO display key will not appear for non-CLID/TLI or internal calls. or An incoming internal call.	JOHNNY TRANSFER or JOHNNY calling
The user presses or <input type="text" value="Feature"/> 8 1 1, then the set displays the set name and Extn number.	▶JOHNNY calling EXIT

1.6.3.4 Answering calls when Call Information is active

When Call Information is active, then the key associated with the call information on the display is preselected. Call Information will be canceled and the preselected call will be answered when one of the following actions is taken:

- Lifting the handset (no active call).
- Pressing (if administered) when there are only alerting calls (no active call).
- A (second sequential) press of the key that represents the preselected call. Note that this action will answer the call if: there is no active call, Auto Handsfree is administered and a call is preselected by default (highest priority ringing call) or by explicit press of the line key; or there is an active call (which would be autoheld). In this case, the present voice path is used.

Otherwise, the call will remain preselected until Call Information is cancelled at which time the display will reflect the state of the set.



Note that if there is an active call at this point, Handsfree will act normally, i.e., it will affect the voice path on the active call. If Handsfree is active, pressing Handsfree mutes the voice path. If Handsfree is not active, pressing Handsfree will activate Handsfree on the active call.

If Trunk Answer From Any Set (TAFAS) or Call Queue is invoked, it will cancel Call Information and answer a call based on the operation of that feature, not Call Information. For example, Call Queue would answer the highest priority ringing call.

1.6.3.5 Querying other calls

The general rule for viewing call information on alternate calls (calls other than the active or audible alerting call) is that the Call Information feature must be invoked before selecting the call.

On initial invocation, the feature will attempt to display default call information on the active or audibly alerting call, or prompt the user appropriately (see “1.6.3 End User View” for details). At this point, the user can scroll through the call information on the default call or select another key to view call information. Alternate alerting or held calls queried in this way are not answered but are preselected. See “1.6.3.4 Answering calls when Call Information is active”, for details on preselection.

Once the user presses the  dialpad key or MORE display key to show the next screen of information, then any other key press (except for the  dialpad key, MORE display key, or Call Information programmed key) will cancel the feature and take the appropriate call processing action for that key.

If the user presses the Call Information programmed key while Call Information is active, then the user will be prompted with **►Select a call**. The user can then select another key to view the associated call information.

Call Information feature can display call information on keys representing calls. These keys are

- Line keys
- Target line keys
- Intercom keys
- Answer keys
- Hunt Group keys

These keys can be in any state including:

- Active
- Alerting (both ringing or non-ringing)
- On hold
- Idle

The feature will not provide call information for incoming calls on:

- Call Queue programmed keys
- Trunk Answer From Any Set (TAFAS) programmed keys/Call Pick-up

Making Call Queue and TAFAS work with Call Information would result in an awkward UI. The reason is that these features and their associated keys do not represent a call, rather they only provide an alternative mechanism for answering calls. In fact, invoking Call Queue or TAFAS feature cancel Call Information.

1.6.3.6 Feature Details

This section provides more specific details of how the feature operates and what is displayed under various specific conditions.

General rules

Call Information is invoked by:

- The feature code 8 1 1
- A key programmed with 8 1 1
- The INFO display key from an active CLID call with ICI on the display
- The INFO display key from an active TLI call

While Call Information is active, and it is programmed on a feature key with an indicator, then the indicator will be on.

The symbol ► will prefix all data and prompts displayed by Call Information. Pressing the # dial pad key or MORE display key will display the next piece of ICI data. Pressing the * dial pad key or VIEW→ display key will show the other part of a long CLID or TLI number. The display and associated call will not be changed by new incoming calls associated with Call Display When Busy or priority bumping. Pressing a key with a call appearance (i.e., active, alerting or on hold) will display call information for that line. Dial pad entries are ignored, except for the # key and the * key (the dial pad is inactive, therefore, Predial and automatic dial cannot be used and all DTMF tones are suppressed).

Exiting Call Information

In general, once a user has invoked the feature and noted the information of interest, they will likely proceed either with some other Call Processing action or do nothing (for example, the user checks a non-ringing call while in DND, and decides they do not want to answer it).

Thus all of the following actions will cancel the feature:

- Going on-hook or pressing
- Going off-hook or pressing Handsfree
- While active on a call, a far end release on trunks equipped with Disconnect Supervision (DS)
- Holding an active call, pressing the key will both cancel Call Information and hold the active call
- Pressing a key with an alerting call or call on public hold, or on exclusive hold at that set, after the user has scrolled once (pressed # or MORE) or is viewing information on a second call. The alerting or held call will be answered and the active call, if any, is autoheld
- Pressing the key
- Pressing a line pool key
- Pressing a programmed feature key (except Call Information)
- Pressing an autodialer
- Pressing the EXIT display key on M7310/M7324 sets
- A Priority Call arriving at the set
- A Voice Call arriving at the set

Time outs

The feature will time out after 15 seconds. The timer is reset each time the user selects a different call or, while on the same call, navigates to the next piece of data.

If a line is preselected while Call Information is active, then the Call Information feature time-out takes priority over the preselection time-out (5 seconds). Once the feature times out, the normal rules are back in effect. Therefore, the last call that was displayed when Call Information times out is no longer preselected.

If the feature times out just as the user is attempting to press a display key, they may press the `INFO` display key instead of `EXIT`. This is not viewed as a problem as it should occur infrequently and does not have a major impacts—possibly a re-entry into the Call Information feature.

When Call Information times out, the display returns to:

Condition	Display
If there is an active call	The preferred-ICI for a CLID call or a rerouted TLI call, or call information for any other type of call.
If there is no active call	The preferred-ICI (if passively delivered) or call information (reroute message) for the highest priority ringing call.
If there are no ringing calls	The idle display message.

M7100 Basic set specific operations

Call Information will only display ICI for one call on an M7100 set.

When Call Information is invoked on a basic set with:

- An active call, then the preferred-ICI for the active CLID or TLI call is displayed
- No active call, then the preferred-ICI for the highest priority ringing call is displayed
- No active or alerting call, then the preferred-ICI for the held call is displayed
- No calls of any kind, then the user will be prompted with `►No calls` accompanied by error tone

The user will not be able to view ICI for an alternate line or call because there is no clear method for checking the alternate lines' call information in a way that is consistent with the basic set's overall UI. For example, accessing the alternate line ICI by pressing, as the user does now to handle two calls, is inconsistent with the current use of to exit features like Key Inquiry.

If a basic set user attempts to invoke Call Information while on a Conference, the message `INFO denied` will be displayed accompanied by error tone. The feature will not be activated because there are two active calls at the set and the basic set, while in Call Information, cannot alternate between calls. If the user splits the conference, then ICI will be displayed for the active call and Call Information can be invoked.

Message that CLID/TLI Number is Truncated

CLID or TLI numbers greater than 14 digits are truncated to the last 14 digits and prefixed with the truncation symbol, /, and the Call Information symbol, ►. The following table displays an example of truncated numbers:

Type of number	Truncated Number
Truncated CLID number	►/00487139283143 EXIT MORE
Truncated TLI number	►+/03456713928 EXIT MORE

Message that TLI Number is Hidden

User Action	Display
A user uses a Named System Speed Dialer to originate a call, and invokes Call Information to query about this call.	►+Hidden number EXIT MORE
A user uses a Named System Speed Dialer to originate a call to a called party whose number is Private.	►+Hidden number EXIT MORE
A call that shows Hidden number at the call originator's set will be treated as if it has no TLI information after the call is explicitly rerouted to another set. This treatment holds only when the call arrives at the set.	LINENAM
The user invokes Call Information for this call (see previous item in table). Note: Showing the TLI number would thwart the intent of Named System Speed Dialers, because the call originator could transfer the call and then investigate the TLI at the destination set.) When the user exits the Call Information feature, the Line name is shown, same as when the call arrived at the set.	►+Hidden number EXIT MORE
The call is rerouted to the set where the call was initially originated (see previous items in table).	►+Hidden number EXIT MORE

Message that CLID/TLI Number is Private

A user can subscribe to a public network service that blocks the delivery of her/his number at the other end of a call. The user's number is considered to be private.

Type of Number	Display
Private CLID number	►Private number EXIT MORE
Private TLI number	►Private number EXIT MORE

Message that CLID/TLI Number is Partial

The PBX of the calling party did not send information about the calling party's extension. The digits for display are the DASS2 routing digits for this PBX. The x means that there is one or more missing digits.

Type of Number	Display
Partial CLID number	►0716582x EXIT MORE
Partial TLI number	►+0669548x EXIT MORE

Message that CLID/TLI Number is Partial and Truncated

Partial CLID or TLI numbers greater than 14 digits are truncated to the last 14 digits and prefixed with the truncation symbol, /, and the Call Information symbol, ►, and suffixed with x to mean that there is one or more missing digits. The x is not included in the count of 14 digits.

Type of Number/Action	Display
Example of a partial and truncated CLID number	►/0076582846783... EXIT VIEW→ MORE
Pressing the VIEW→ display key shows the right most digits of the CLID number	►/...765828467832x EXIT ←VIEW MORE
Example of a partial and truncated TLI number	►+/006493239381... EXIT VIEW→ MORE
Pressing the VIEW→ display key shows the right most digits of the TLI number	►+/...49323938149x EXIT ←VIEW MORE

There is a subtle difference in the interaction between ICI and Call Information of partial and truncated CLID numbers and that for partial and truncated TLI numbers. A partial and truncated CLID number fits on one display line for ICI and its 13 leftmost digits are shown as the first screen in Call Information. That is, the last digit and the symbol x are not shown on the first screen.

A partial and truncated TLI number does NOT fit on one display line for ICI, so the 12 right most digits are shown (see “Message that CLID/TLI Number is Partial” on page 10). The first screen in Call Information shows the 12 left most digits. What the user sees is effectively an automatic swapping of the right most and left most digits of the TLI number.

1.6.3.7 Checking Other Lines

To check on other lines while in Call Information, the user can press any other key where a call can appear.

CLID calls can be a DIA line, Hunt Group, intercom or Answer keys. The sequences in the following table assume the user is not on a call and the set is on hook

Inquiring on CLID calls

User presses a key with a call that is:	Set displays	User lifts receiver or presses Handsfree or 2nd key press when Auto Handsfree is administered	Set displays
Alerting	►Preferred-ICI EXIT MORE	Cancel feature and answer call	Preferred-ICI INFO TRANSFER
On I-Hold or U-Hold	►Preferred-ICI EXIT MORE	Cancel feature, answer the held call	Preferred-ICI INFO TRANSFER
Exclusive Hold or an Active line at another set	►In use:SETNAME EXIT	Cancel feature, select prime line if available, or prompt user that they have no line selected	LINENAM TRANSFER or No line selected or (blank display)

TLI calls can be on line or intercom keys. The sequences in the following table assume the user is not on a call and the set is on hook.

Inquiring on TLI calls

User presses a key with a call that is:	Set displays	User lifts receiver or presses Handsfree or 2nd key press when Auto Handsfree is administered	Set displays
On I-Hold or U-Hold	►Preferred-ICI EXIT MORE	Cancel feature, answer the held call	+Preferred-ICI INFO TRANSFER
Exclusive Hold or an Active line at another set	►In use:SETNAME EXIT	Cancel feature, select prime line if available, or prompt user that they have no line selected	LINENAM TRANSFER or No line selected or (blank display)

Non-CLID/TLI calls can be on a (as appropriate) line, a DIA line, Hunt Group, intercom or Answer keys. The sequences in the following table assume the user is not on a call and the set is on hook.

Inquiring on non CLID/TLI calls

User presses a key with a call that is:	Set displays	User lifts receiver or presses Handsfree or 2nd key press when Auto Handsfree is administered	Set displays
Alerting	►LINENAM EXIT	Cancel feature and answer call	LINENAM TRANSFER or LINENAM calling

User presses a key with a call that is:	Set displays	User lifts receiver or presses Handsfree or 2nd key press when Auto Handsfree is administered	Set displays
On I-Hold or U-Hold	►LINENAM EXIT	Cancel feature, answer the held call	LINENAM TRANSFER
Exclusive Hold or an Active line at another set	►In use : SETNAME EXIT	Cancel feature, select prime line if available, or prompt user that they have not selected a line	LINENAM TRANSFER or No line selected

Norstar Internal calls can be on internal keys. The sequences in the following table assume the user is not on a call and the set is on hook.

Inquiring on Norstar Internal calls

User presses a key with a call that is:	Set displays	User lifts receiver or presses Handsfree or 2nd key press when Auto Handsfree is administered	Set displays
Alerting	►SETNAME : DN EXIT	Cancel feature, answer the call	SETNAME TRANSFER
On Hold	►SETNAME : DN EXIT	Cancel feature, answer the held call	SETNAME TRANSFER

Idle keys can be a (as appropriate) line, a DIA line, Hunt Group, intercom or Answer keys. The sequences in the following table assume the user is not on a call and the set is on hook.

Inquiring on Idle keys

User presses an idle:	Set displays	User lifts receiver or presses Handsfree or 2nd key press when Auto Handsfree is administered	Set displays
Line key	►No call EXIT	Cancel feature, user hears external dial tone.	LINENAM TRANSFER
Hunt Group key or Target line or Answer key	►Incoming only EXIT	Cancel feature, select prime line, if available, or prompt user for line.	Incoming only or No line selected or (blank display)
Intercom key	►No call EXIT	Cancel feature, user hears internal dial tone.	(blank display)

Active calls on a (as appropriate) line, a DIA line, Hunt Group, intercom or answer key are outlined in the following table.

Information on Active calls

User presses a key with the active:	Set displays	User replaces receiver, or presses or presses	Set displays (examples only)
CLID call	►Preferred-ICI EXIT MORE	Cancel feature, call is dropped or held. Set shows background display.	16 Dec 12:43 pm
TLI call	►Preferred-ICI EXIT MORE	Cancel feature, call is dropped or held. Set shows background display.	16 Dec 12:43 pm
Non-CLID call	►LINENAM EXIT	Cancel feature, call is dropped or held. Set shows background display.	16 Dec 12:43 pm
Norstar Intercom or Extension call	►SETNAME: DN EXIT	Cancel feature, call is dropped or held. Set shows background display.	16 Dec 12:43 pm

Conference calls will show information in all conference states; held, split or held independently. The second sequential key press will cancel Call Information and conference will then respond in the appropriate way for that key press. The following examples are for an active Conference call (two active calls). When the feature is first invoked the user is prompted to ►Select a call.

Information on Conference calls

User presses a key with an active call in the Conference:	Set displays	User presses same key	Set displays
CLID call	►Preferred-ICI EXIT MORE	Conference is split. The other call is held and the user is on a single active call with the selected call.	+Preferred-ICI INFO TRANSFER
TLI call	►Preferred-ICI EXIT MORE	Conference is split. The other call is held and the user is on a single active call with the selected call.	+Preferred-ICI INFO TRANSFER
Non-CLID call	►LINENAM EXIT	Conference is split. The other call is held and the user is on a single active call with the selected call.	LINENAM TRANSFER
Internal	►SETNAME: DN EXIT	Conference is split. The other call is held and the user is on a single active call with the selected call.	SETNAME TRANSFER

1.6.3.8 Call Information And Dial Tone

If the user invokes the Call Information feature while listening to dial tone:

Condition	Display
If the dial tone is provided by a line	LINENAM EXIT
If the dial tone is provided by intercom	SETNAME EXIT

1.6.4 OAM Programming View

N/A

1.6.5 **EXTN/ **LINE

N/A



1.7 Technical Specification (Limits/Constraints)

The feature will time out after 15 seconds.

1.8 Interactions

1.8.1 Telephony Action Table

The following table describes the actions of telephony actions on the interactive feature Call Information.

Feature name	Interaction
Programmed feature keys	Cancels feature and activates programmed feature
External autodialers	Cancels feature and originates call
Internal autodialers	Cancels feature and originates call
Feature key	Cancels feature
 key	Cancels feature
key	Cancels feature and holds call if active
Line key	Displays the available call information
Intercom key	Displays the available call information
On-hook	Cancels feature and releases call if active
Dialpad	All dialpad digits are ignored except for the  key which is used to navigate to the next screen of data
Shift key	No effect
Incoming Priority Call	Cancels feature
Incoming Voice Call	Voice call is presented and feature is canceled
Volume bar	No effect
Unlabelled display keys	No effect

Feature name	Interaction
Incoming internal or external calls	No effect
Handsfree key	If the user is on a call the Handsfree key operates normally and mutes the microphone. Otherwise, it attempts to select the call or line that the feature has preselected. For example, pressing Handsfree will answer alerting lines.
Answer keys	Displays the available call information.

1.8.2 Interaction Table For ICI And Call Information







The interaction table for both Identifying Call Information and the Call Information feature have been combined since the features are so closely related.

Feature name	Interaction
AC15 lines	CLID and TLI are not available on AC15 lines.
Accidental Disconnect Protection	Current ICI or Call Information display maintained
Analog PSTN lines	CLID and TLI are not available on analog PSTN lines.
Alerting Extn, External	Passive according to administration of each line appearance
Answer Extn numbers	Lines not shared with the master set display the reroute message. ICI is available through Call Information.
Auto Answer DASS2 lines	CLID is delivered on Auto Answer DASS2 lines when there is a subscription to the service.
Autodial Keys	Pressing an autodial key will terminate the Call Information feature.
Automatic Handsfree	ICI is delivered when the alerting line key is pressed to answer a call.
Automatic Line Selection - Incoming Line	The set receives ICI when the user answers the call. ICI data will appear on the display when the user lifts the receiver or presses the Handsfree key when Automatic Line Selection is administered.
Automatic Line Selection - Outgoing Internal Line by a Feature	ICI on the display will be cleared.
Automatic Line Selection - Outgoing Prime Line	ICI on the display will be cleared
Automatic Line Selection - Outgoing Prime Line by a Feature	ICI on the display will be cleared
Automatic Line Selection - Outgoing Prime Line by Handsfree/Off-hook	ICI on the display will be cleared
Automatic Set Relocation	Re-deliver ICI information if set is replaced during an alerting call within 1 minute. If set is relocated, all active calls are dropped.
Call Capture	The Prime Extn will receive ICI according to the sets preferred-ICI.

Feature name	Interaction
Call Display When Busy (CDWB)	Also see text for interaction of Passive -ICI and Call Display When Busy.
Call Forward	<p>The reroute message is shown while destination alerts. ICI is available for both the rerouting and destination sets by invoking Call Information. Information is displayed according to the set's preferred-ICI. The rerouting set's Forward message will not be overwritten by passive-ICI (all calls are non-ringing while the feature is active, therefore, the user will have to use the Call Information feature).</p> <p>The reroute message is only available during alerting, it is lost once the call is answered or Call Information is invoked (the reroute message is not included as a piece of ICI data).</p>
Call Forward All Calls	See Call Forward
Call Forward Busy	See Call Forward
Call Forward No Answer	See Call Forward
Call Identification/Call Status Display	Inactive during Call Information
Call Park (with Callback)	<p>Set that answers the parked call receives ICI when the call is active.</p> <p>A call that shows ►+Hidden number at the call originators set will be treated as if it has no TLI information after the call is picked up at another set. This does NOT apply when the user invokes Call Information for this call. The user sees ►+Hidden number.</p>
Call Pickup (Group)	Set that answers the call with Call Pickup (Directed) receives ICI when the call is active
Call Queuing	Cancels Call Information and selects highest priority ringing call. The set that invokes Call Queue receives ICI when the call is answered
Callback (Park, Transfer and Camp)	<p>Reroute message on alerting. ICI is displayed according to the set's preferred-ICI when the call is answered or Call Information is invoked. Callback message will not appear if callback arrives while Call Information is active.</p> <p>A call that shows ►+Hidden number at the call originator's set will be treated as if it has no TLI information after the call is rerouted to another set. On the Callback to the park/transfer/camp agent's set, the Call Information feature will show ►+Hidden number. If the Callback arrives at another set, the call will be treated as if it has no TLI information. This does NOT apply when the user invokes Call Information for this call. The user sees ►+Hidden number.</p>

Feature name	Interaction
Camp on	<p>Camped calls will always (except for TLI calls dialed with a Named System Speed Dialer – See “Message that TLI Number is Hidden” on page 9) deliver passive-ICI (CLID and TLI) to idle sets, no matter how the line is administered at the set or the type of key the call appears on. For sets on active calls, Call Display When Busy rules apply.</p> <p>For calls that are camped to an idle set, the Call Waiting transient message will periodically overwrite the passive CLID or TLI.</p> <p>Call Display When Busy rules apply to calls camped to a set.</p> <p>Camped calls will ring the destination set and display passive-ICI according to the set's preferred-ICI.</p> <p>Users will receive ICI, if available, when a CLID or TLI call is Camped on their idle set.</p> <p>A call that shows ►+Hidden number at the call originator's set will be treated as if it has no TLI information after the call is camped at another set. This holds for when the call arrives at the set. This does NOT apply when the user invokes Call Information for this call. The user sees ►+Hidden number.</p>
Conference	<p>ICI data is shown at the conference master's set only when the user is connected to one of the callers, and the other is on hold. Otherwise the normal Conference message is displayed. If the user invokes Call Information, then ICI data can be viewed on each line separately while on the conference.</p>
Conference - Hold Conference	<p>Normal Conference message is displayed. If user invokes Call Information, then ICI data can be viewed on each line separately while on the conference.</p>
Conference - Split Conference	<p>If user invokes Call Information, then ICI data can be viewed on each line separately.</p>
Conference - Transfer from Conference (internal and external)	<p>Internal destinations receive ICI according to the set's preferred-ICI once the transfer is complete. For transfers to external destinations, no ICI is sent because Norstar cannot re-transmit a CLID or TLI message. In the UK, PSTN-PSTN Barring also applies.</p> <p>A call that shows ►+Hidden number at the call originator's set will be treated as if it has no TLI information after the call is transferred to another set. This holds for when the call arrives at the set. This does NOT apply when the user invokes Call Information for this call. The user sees ►+Hidden number.</p>
Copy, General Extension	<p>Call information settings will be copied.</p>

Feature name	Interaction
Dial pad key press	The INFO display key remains available if the following applies: 1. When the user does not have Call Info active AND any of the next three: <ul style="list-style-type: none"> - The user is active on a TLI call that was transferred to the user - The user has unheld a held TLI call - The user has an active CLID call AND 2. The user has dialled digits.
Internal Autodial Keys	Pressing an internal Autodial key terminates the Call Information feature and clears any ICI from the display and makes the internal call
Disconnect and Answer Supervision (Far End)	On trunks equipped with Disconnect Supervision (DS), a far end release will take down the call and clear the display of any ICI. If the user is active on a call and in Call Information, a far end release will take down the call and cancel the feature.
Do Not Disturb (DND)	A set in DND will not display passive-ICI for alerting calls (all calls are non-ringing while the feature is active). To view the call's ICI, the user must invoke Call Information and select the alerting line.
DND on Busy	A busy set with DND on Busy enabled will not display passive-ICI for alerting calls (all calls are non-ringing while the set is busy). To view the call's ICI, the user must invoke Call Information and select the alerting line.
Exclusive Hold	Call Information cannot view ICI for a line on exclusive hold at another set, ►In use: SETNAME is displayed. Only the set that placed the call on Exclusive hold can use Call Information to view the ICI.
Extension Profile	Will show Call Info parameters: 1stDisplay: and Auto Called ID:.
Extra-Dial Set	If a call is transferred to a Direct Dial Set, and Services has been invoked that extends the call to an Extra-Dial Set, the re-route message, not passive-ICI, will be extended to the Extra-Dial Set.
Feature Access Keys	Pressing a feature access key (except for the Call Information key) clears any ICI from the display and terminates the Call Information feature. The feature is invoked.
Handsfree (Full) with Mute Capability	When used to answer a call, pressing Handsfree will display the preferred-ICI and cancel Call Information.
Hold/Mutual Hold	Holding a call will clear the ICI from the display and terminate the Call Information feature. Call Information can be used to view ICI on a line on I-hold.

Feature name	Interaction
Hot Line	<p>While Call Information is active, going off-hook will select the preselected line (preselection overrides Hotline when going off-hook). If the user is in Call Information, the user's intention, when going off-hook, is to access the line or call for which there is call information, and not dial up the Hotline number.</p> <p>If the user exits Call Information and there is a ringing call, that call is selected when the user goes off-hook. If there are only visually alerting calls, a Hotline call is attempted.</p>
Idle Line	Call Information feature will display ►No call.
Key Inquiry	A programmed Call Information key shows Call Information.
Line Pools, Multiple	Invoking the line pool access code or programmed key terminates the Call Information feature.
Listen on Hold	The set first loses ICI when the call is placed on hold. The set will receive ICI again when the held line with a CLID call or a rerouted TLI call is re-selected.
Manual Answer DASS2 lines	CLID is delivered on Manual Answer DASS2 lines when there is a subscription to the service.
Manual Line Selection	<p>A set will receive ICI when manual line selection is used to answer a call. ICI information will be cleared from the display when manual line selection is used to make an outgoing call.</p> <p>While call information for a line is being viewed in Call Information, manually selecting the line with ICI information on the display will cancel Call Information.</p>
Off-hook Set	Call Information can be invoked while the set is off-hook and not on a call (see "1.6.3 End User View").
Onhook Dialing - Automatic Dial	The user must exit Call Information before attempting to dial. While the feature is active, dial pad entries are ignored, except for the  key which is used to display the next screen of ICI data and the  key which is used to display the other part of a long CLID or TLI number.
Onhook Dialing - Dial Pad Modes	The user must exit Call Information before attempting to change the dialing mode. While the feature is active, dial pad entries are ignored, except for the  key which is used to display the next screen of ICI data and the  key which is used to display the other part of a long CLID or TLI number.
Onhook Dialing - Predial	The user must exit Call Information before attempting to dial. While the feature is active, dial pad entries are ignored, except for the  key which is used to display the next screen of ICI data and the  key which is used to display the other part of a long CLID or TLI number.

Feature name	Interaction
Onhook Dialing - Standard Dial	The user must exit Call Information before attempting to dial. While the feature is active, dial pad entries are ignored, except for the # key which is used to display the next screen of ICI data and the * key which is used to display the other part of a long CLID or TLI number.
Power Interruptions	ICI for any active and alerting calls will be lost.
Pre-Selection/Call Screening	Pre-selection of a line with a CLID or TLI call will deliver the ICI to the set. Call Information preselects calls or lines selected by the user.
Prime Extn(s)	All calls rerouted to the Prime Etxns will display the reroute message unless the call has been explicitly transferred by blind Transfer or Camp-on. ICI is available if the user invokes Call Information.
Prime Extn(s) - Call Fwd. Transfer to Prime Extn	Implicit transfers or reroutes to prime, such as DRT and Call Fwd Transfer to Prime, are calls that were not originally intended for the Prime Extn so, these rerouted calls display the appropriate reroute message. ICI is available if the user invokes Call Information.
Prime Extn(s) - Callback Ext. to Prime Extn	See Prime Extn(s) above
Prime Extn(s) - Default Ringing	See Prime Extn(s) above
Prime Extn(s) - Delayed Ring Transfer (DRT)	See Prime Extn(s) above
Prime Extn(s) - DND Selective Call Forward	See Prime Extn(s) above
Prime Extn(s) - DND Transfer to Prime Extn	See Prime Extn(s) above
Prime Extn(s) - HLR Ext. to Prime Extn	User can invoke Call Information and select the held line to view ICI.
Priority Call	Priority calls will cancel Call Information and overwrite the display.
Pulse-->Tone Conversion	While Call Information is active, all dial pad input is ignored (except for # key which is used for navigation and the * key which is used to display the other part of a long CLID or TLI number), therefore, Tone mode cannot be invoked.
Release	Pressing the RLS key cancels the Call Information feature and releases the active call
Ring Again	Offer will not be presented if Call Information is active.
Saved Number Redial	ICI number data cannot be used with SNR
Selective Line Redirection	Norstar has no ability to re-transmit CLID or TLI information out of the system.
Services Control Set	While the control set is in Services, the status message will be overwritten by passive-ICI if the set has a ringing appearance of a call.

Feature name	Interaction
Services Dial-0 Set	Transferred and Camped calls display passive-ICI, all other rerouted calls display the reroute message. ICI for the latter is available through Call Information.
Services Ringing Set	<p>If a set is administered to ring for a line in Services and:</p> <ul style="list-style-type: none"> —has an appearance of the same line administered with passive-ICI, then the set will ring and visually alert at the line key, and display ICI according to the set's preferred-ICI setting. —has an appearance of the same line but not administered with passive-ICI (i.e., ringing or non-ringing), then the set will ring and visually alert at the line key, and display the reroute message. ICI is available by invoking Call Information. —has no appearance of the line, then the set will ring and visually alert at an intercom key, and display the reroute message. ICI is available by invoking Call Information.
Startup Template	The preferred-ICI at start-up will be number.
Tandem calls	Norstar has no ability to re-transmit CLID or TLI information out of the system.
Terminal Type - Analog Terminal Adapter (ATA)	<p>No ICI support.</p> <p>If ATA redirects a CLID or TLI call, then ICI will be available if the destination is a local Norstar or ISDN set with a display.</p>
Terminal Type - Personal Computer Interface	ICI data can be accessed and used by PC applications
Transfer	<p>Passive-ICI to destination. The transfer destination set's preferred-ICI settings are used.</p> <p>For transfers to external destinations, no ICI is sent because Norstar cannot re-transmit a CLID or TLI message.</p> <p>A call that shows ►+Hidden number at the call originator's set will be treated as if it has no TLI information after the call is transferred to another set. This holds for when the call arrives at the set. This does NOT apply when the user invokes Call Information for this call. The user sees ►+Hidden number.</p> <p>If the transfer agent transfers a call before Norstar receives the TLI for it, the call is treated as if there is no TLI for it.</p>
Transfer Callback	<p>The set receiving the Callback displays the Callback message. ICI on the call is available through the Call Information feature. Callback message will not appear if callback arrives while Call Information is active.</p> <p>A call that shows ►+Hidden number at the call originator's set will be treated as if it has no TLI information after the call is transferred to another set. On the Callback to the transfer agent's set, the Call Information feature will show ►+Hidden number. This holds for when the call arrives at the set and when the user invokes Call Information for this call. If the Callback arrives at another set, the call will be treated as if it has no TLI information. This does NOT apply when the user invokes Call Information for this call. The user sees ►+Hidden number.</p>

Feature name	Interaction
Transfer Immediate	<p>Passive-ICI to destination. The transfer destination sets preferred-ICI settings are used.</p> <p>For transfers to external destinations, no ICI is sent because Norstar cannot re-transmit a CLID or TLI message.</p> <p>A call that shows ►+Hidden number at the call originator's set will be treated as if it has no TLI information after the call is transferred to another set. This holds for when the call arrives at the set. This does NOT apply when the user invokes Call Information for this call. The user sees ►+Hidden number.</p>
Transfer Using Conference	<p>ICI appears at destination once transfer is complete.</p> <p>For transfers to external destinations, no ICI is sent because Norstar cannot re-transmit a CLID or TLI message.</p> <p>A call that shows ►+Hidden number at the call originator's set will be treated as if it has no TLI information after the call is transferred to another set. This holds for when the call arrives at the set. This does NOT apply when the user invokes Call Information for this call. The user sees ►+Hidden number.</p>
Transfer Using Hold	<p>ICI is displayed when the user answers the held CLID call or uses Call Information to query the call information.</p> <p>A call that shows ►+Hidden number at the call originator's set will be treated as if it has no TLI information after the call is transferred to another set. This holds for when the call arrives at the set and when the user invokes Call Information for this call.</p>
Transfer With Announcement	<p>Deliver ICI Info to destination set when transfer completed.</p> <p>For transfers to external destinations, no ICI is sent because Norstar cannot re-transmit a CLID or TLI message.</p> <p>A call that shows ►+Hidden number at the call originator's set will be treated as if it has no TLI information after the call is transferred to another set. This holds for when the call arrives at the set and when the user invokes Call Information for this call.</p>
Trunk Answer From Any Station (Extended Ringing Service)	No ICI delivered, call must appear at the set first. ICI is delivered when call is answered.
Voice Call	The Voice Call is presented and Call Information, if active, is canceled.
Volume Control	Volume control functions normally while in Call Information

Call Offer

1.1 Overview

1.1.1 Description

Call Offer allows a calling party to indicate that an incoming call is available even though no key is available to present the call on the extension. The intended recipient can ignore, accept, or decline the offered call.

The party receiving a Call Offer has three choices:

- Ignore the call. After a programmed time interval, the Offer request is removed.
- Reject the call. To do this, use a control code.
- Accept the call. To do this, release the appropriate active call.

Call Offer is one of the features supported on DPNSS 1 lines in Norstar systems. For a listing of these features, see the DPNSS 1 feature.

1.1.2 Rationale for Feature

Call Offer increases the call-coverage capability of a Norstar system and helps ease the network processing load.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls

to reject a Call Offer.

Do Not Disturb (DND) also rejects an offered call. The user must remember to use to release DND following the call; otherwise, future incoming calls will stop ringing at the extension.

1.2.2 End User View

When a Call Offer is made by the originating exchange, the target extension displays a message, and a tone is heard. When an offered call arrives on extensions with line display, the user sees `XX. . .X wtng` if the calling party ID is available and CLID is enabled; otherwise, `Line XXX waiting` is shown (the line name associated with the call). If there are more than 11 digits in the incoming number, only the last 10 display.

If Call Queuing is programmed for the system, the display shows `Release Line XXX`, where XXX is the line name of the highest priority queued call if it is an offered call.

1.2.3 OAM Programming View

1.2.3.1 Levels of Access

The following table shows the levels of access required to program OAM changes.

Heading	Item			I	SC+	SC
Terminals&Extns	Capabilities	DND on busy		X	X	X
		Fwd on busy		X	X	X
Lines	Line data	Direct Inward Access Lines	If busy	X	X	X
		DPNSS lines	Ans mode	X	X	X

1.2.3.2 Programming Call Offer

There are four requirements:

- Set DND on Busy to No. This is set in **Terminals&Extns**►**Capabilities**.
- Set Fwd on Busy to None. This is set in **Terminals&Extns**►**Capabilities**.
- Set If busy to BusyTone. This is set in **Lines**►**Line data**►**Direct Inward Access lines**.
- Set Ans mode to Auto. This is set in **Lines**►**Line data**►**DPNSS lines**►**Ans mode**).

See "Terminals&Extns - Capabilities", "Lines - Line Data - DIA lines", and "Lines - Line Data - DPNSS 1".

1.2.4 **EXTN/ **LINE

N/A

1.3 Technical Specification (Limits/Constraints)

Call Offer is a receive-only capability on Norstar: incoming calls are initiated at another Private Branch Exchange (PBX) on the DPNSS 1 network.

Call Offer is indicated differently on different types of extensions:

- M7000—The associated LED or LCD flashes, and a tone is heard.
- ATA—Call Offer is supported as a Camp-On feature; a tone is heard.
- ISDN—Call Offer is not supported.
- Cordless Handsets—Call Offer is not supported.
- DNA—Call Offer is not supported.

1.4 Interactions

Feature or condition name	Interaction
Answer mode	If Answer mode is Manual, Call Offer will not work.
Call Forward on Busy	If Call Forward on Busy is programmed for the extension, Call Offer will override it.
Do Not Disturb on Busy	If DND on busy is set to Yes, Call Offer will not work.

Feature or condition name	Interaction
Hold	Accepting the offered call by holding the existing call is not supported.
If busy	If busy is not set to BusyTone, Call Offer will not work.

Call Logs

1.1 Overview

1.1.1 Description

The Norstar Call Log feature uses incoming calling line identification (ICLID) information accompanying an external call to make a record of the call details for follow-up by the Norstar users.

Many enhancements have been made over the residential single-line user model, to address the needs of business customers in multi- and shared line environments.

Call Log can be customized in OAM Programming for a wide range of business needs and telephone configurations, including:

- Call log space and accessibility can be allocated with total flexibility, from allocating all log space to one central log, to allocating some space to all Norstar set users.
- Programmed settings allow flexibility for automatic logging of calls when lines are shared by many people, as is typical in systems configured to the Square or Hybrid template. Appropriate programming provides that where sets share the same line, all sets, some sets, or no sets, log calls automatically on the shared line.
- For a telephony environment where several lines appear at an individual set, at initial alerting, a set can log calls on all lines, some lines, or no lines, that alert that set.

For more information, refer to “1.2.5 OAM Programming View”.

The end user can program their set to:

- log unanswered calls automatically
- log answered calls automatically or manually
- have the system delete old call items automatically, or always delete items manually
- program a password, if desired

each set user can:

- decide when a call's information is to be logged (see “User Options for Autologging” on page 7)
- enter a call log from their own set
- control the contents of their own call log independently

For more information, refer to “1.2.4 End User Programming View”.

1.1.2 Rationale for Feature

This section discusses the rationale for the Call Log feature. Throughout the chapter, rationales are provided for detailed design decisions.

The Norstar Call Log addresses the following business needs.

- Increase the call coverage capability of the system. In a business environment, when abandoned and unanswered calls are logged:
 - There is the possibility of increased revenue, by being able to call back a customer who was unable to reach anyone at the business, both in an after-hours scenario and in the scenario where the volume of incoming calls exceeds the ability of employees to handle all calls.
 - Patterns of missed opportunity can be examined. Logging of missed calls after-hours assists in rescheduling working hours to cover formerly unknown peak times.
 - The log can serve as an alternate or adjunct to the answering machine or voice mail as a record of information about missed calls. This can be particularly valuable when an answering machine cannot be used to cover all lines in a multi-line environment, and when callers do not leave a message on the voice answering device.
- Record keeping of incoming calls. The capability to log answered as well as unanswered calls in the system provides the customer with information to determine things such as:
 - The geographical location of the majority of calls. This information can feed into such things as advertising strategies to reach those areas unrepresented, or canvassing strategies in areas where there is high interest.
 - The volume of calls in a given time period. This could affect scheduling, or, indirectly, provide clues to the demographic nature of callers.
- Capture important information through the use of Logit.
 - Logit records the callers information quickly and accurately, without the use of paper and pencil.
 - Logit allows the quick notation of a call's information, in a situation where an immediate record is required, in case the caller hangs up. Customers such as collection agencies run into this situation, in which the caller hangs up when the employee announces the company name.
 - In cases where a user is not generally interested in making notes about answered calls, the Logit feature allows a shortcut way to make a note of a caller's information for future use.
 - If the user wishes to use their own call log as a kind of directory, they can choose the `Log no calls` option, and maintain only personally chosen, manually logged calls in their log.

1.1.3 General Definitions

Term	Definition
Call log	The call log is composed of a list of items.
ICI	Incoming call information
ICLID	Incoming calling line identification
Log item	A log item is all the information about one call in the log.
Log screen	A log screen is a screen of information about one call log item. For instance, it can be a Name screen, Number screen, Time and Date screen, and the like.

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls

Programmed call log key or 8 1 2

Programmed Logit key or 8 1 3

Programmed autobumping key or 8 1 5

1.2.2 Message Displays

Message	Description
Call logged	Displays when a manual logging attempt is successful.
No space in log	Displays during manual logging if the log is full and autobumping is set to off.
No log assigned	Displays during manual logging if no log space has been assigned.
No info to log	Displays during manual logging if a call has no ICLID information or when no call is active.
Log is empty	Displays if the log has no items.
Log is full	Displays if the log is full and the autobump option is off.
No new items	Displays if the user presses <input type="text" value="#"/> and no new items are in the log.
No old items	Displays if the user presses <input type="text" value="*"/> and no old items are in the log.
No resume item	Displays if the user presses <input type="text" value="0"/> and the resume item is not available.
Call for you CALLS	Displays if there is one new (unread) item in the log and no items are in the message waiting list.
Calls for you CALLS	Displays if more than one new item is in the log and no items in are the message waiting list.
Messages & Calls MSG CALLS	Displays if there are one or more items in the message waiting list, and one or more new calls in the log.
Hold or release	Displays if the user is active on a call when the feature is activated. (Not for M7100)
Release calls	Displays if the user is active on a call or has a held call when the feature is activated. (M7100 only)
Private name or Private number	Displays in the log if the name or number is private.
Unknown name or Unknown number	Displays in the log if the name or number is unknown.

1.2.3 End User View

1.2.3.1 Call Log Concepts

This section describes:

- the conditions required to log calls automatically or manually
- Norstar call types eligible for call logging
- answered and unanswered calls
- logging sets and how they handle unanswered calls

Conditions for Logging

For items to be logged in a set's call log, the following conditions must be true:

- the call must have ICLID information associated with it
- the set must be defined as a set that can receive incoming call information (ICI) in OAM Programming (Caller ID set) (See "1.2.5 OAM Programming View".)
- the set is assigned log space (See "1.2.5 OAM Programming View".)
- space exists in the call log (Log space), or, if no space is available, the autobumping option must be set to ON (See "Autobumping" on page 29.)
- the call is an ICLID call (See "Norstar Call Types Eligible for Call Logging" on page 4.)
- the set answers the call, or the set is defined in OAM Programming as a logging set (Call log set) for the call (See "Logging Sets" on page 5.)

Calls can be logged automatically (autologging) or manually by means of the Logit feature. (See "Logit Feature - Manual Logging of Answered Calls" on page 8.)

For a call to be logged automatically, the following condition must also be true:

- the user option (Log all calls) defines that autologging is in effect (See "User Options for Autologging" on page 7.)

Norstar Call Types Eligible for Call Logging

The ability to record ICLID calls in the call log depends on the type of call alerting at the set. For Norstar, a call can be classified as one of three call types, depending on how it is routed to the set:

- initially alerting
- explicitly rerouted
- implicitly rerouted

Initially alerting calls terminate at the set without having been redirected or transferred (by any means). This type of call terminates at the set that is the intended recipient of the call. DIA line calls (on autoanswer loopstart trunks) fall into this category. (Note that calls on DID or E&M autoanswer trunks also fit into this general category, but do not offer CLASS/CMS features such as ICLID.)

Explicit rerouting reroutes a call explicitly to one set, and is usually performed by another user. In this case, the destination set is more concerned with the ICLID

associated with the call, rather than with why the reroute occurred. Features in this category include Blind Transfer, and Camp-on.

Implicit rerouting is the rerouting of a call by the system, primarily for call capture purposes. In this case, the destination set(s) are more concerned with why the reroute happened, than with whom is calling. Features in this category include OCR, DND transfer, all Call Forward features, all reroutes to Prime and Callbacks.

Answered Calls

If a set answers an ICLID call belonging to any of the three call types (initially alerting, explicitly rerouted, implicitly rerouted) the call is eligible for either automatic or manual logging.

- automatic logging can occur when the user option is set to the option `Log all calls` (see “User Options for Autologging” on page 7)
- manual logging occurs when the user uses the Logit feature (see “Logit Feature - Manual Logging of Answered Calls” on page 8)

Unanswered Calls

Unanswered calls include calls directed to sets that cannot alert for the call because the set is busy. This includes:

- a third (or subsequent) call to a Basic set
- a transferred call rejected because the transfer destination is busy
- camped call rejected because a call is already camped at the set
- a call rerouted from a busy set by Call Forward Busy

Logging Sets

A logging set is a set that is defined in OAM Programming to automatically log the information about unanswered calls on lines for which it is defined as the logging set.

A set can be a logging set for initially alerting calls, or for explicitly rerouted calls, but not for calls that are implicitly rerouted.

Please refer to “figure 1-1 Logging Set for Incoming ICLID Calls” on page 6..

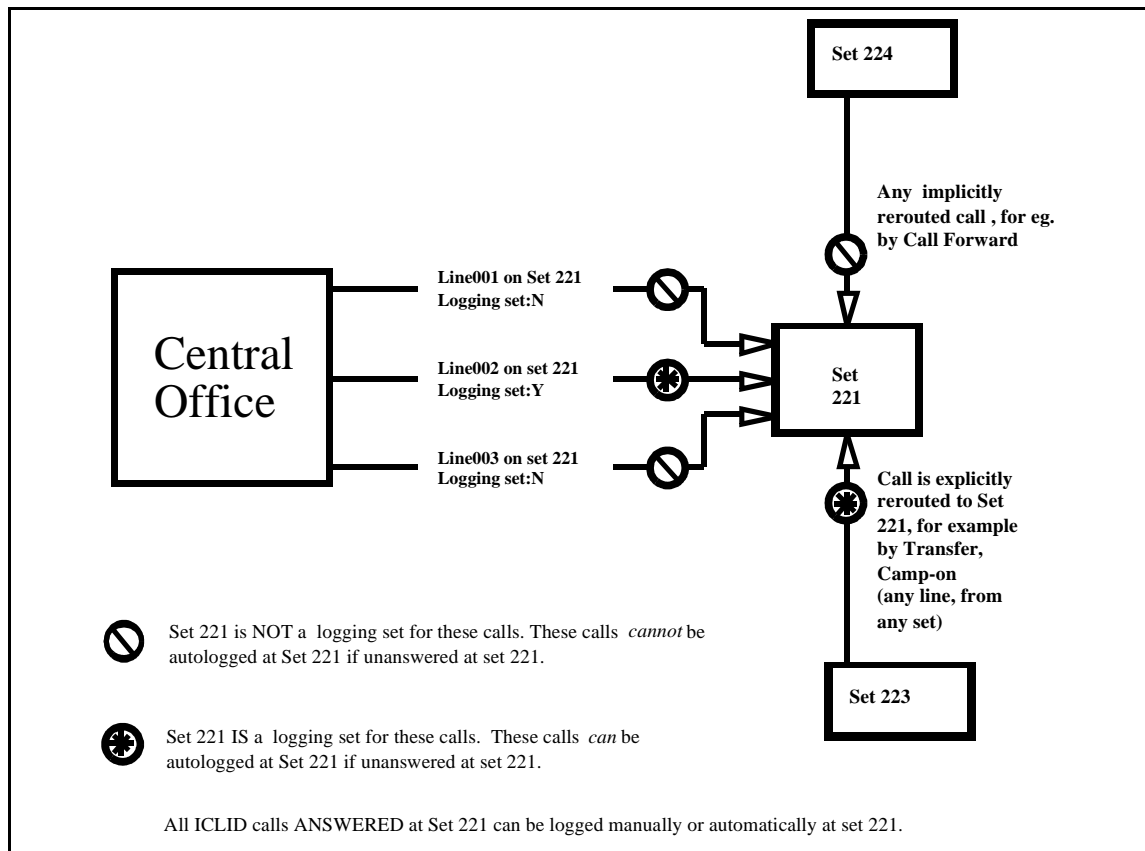


Figure 1-1: Logging Set for Incoming ICLID Calls

1.2.3.2 Autologging and Manual Logging

This section describes:

- how customers wish to handle unanswered calls
- autologging options
- manual call logging

Handling Unanswered Calls

Unanswered Initial Alerting Calls

In general, a user is interested in calls that alert audibly at their set. However, in the multi-line, multi-appearance business environment, interest in a call for logging purposes may not be the same as interest in a call for real time processing.

Different customers have different requirements for logging.

- Some sites may want all unanswered calls to be logged at all sets ringing for that call.
- When a set has multiple ringing lines, the set user may be interested in the calls on only a subset of those lines. For example, the user may normally handle calls on the Sales line, and only answers calls on the Service line when no one is available to answer calls on that line. In this case, the user wants information only about unanswered calls on the Sales line, and not on the Service line.
- When multiple sets ring for a single line, all sets are interested in answering alerting calls during. However, users want the information for unanswered

calls to be logged at one designated set only.

- Some businesses may wish to have a central logging set. In this case, all lines may be assigned to the set, so that calls can be logged there. However, they may be all assigned not to ring, because no one is answering calls from that set.

In order to meet the above requirements for initially ringing calls, a set user must be identified on a line-by-line basis, as being interested in automatically logging unanswered calls on that line. It is assumed that before installation, customer services analyze the business practices and desires of the customer, and define which set(s) are interested in calls on given lines that appear at the sets. Given this information, each set is programmed, for each line that appears at their set, to be a logging set (or not) for calls on that line. For details, see “1.2.5 OAM Programming View”.

Unanswered Explicitly Rerouted Calls

Calls that are explicitly rerouted (for example, by Camp-on) to a given set are destined exclusively for that set. In this case:

- The set is a logging set for all those calls.
- All calls that arrive at a set by means of explicit rerouting are eligible for automatic logging.

On the other hand, calls that arrive at a set by means of implicit reroute (by Call Capture features) are not explicitly meant for the destination set, and therefore, if they are not answered, are not eligible for automatic logging.

User Options for Autologging

At each set, the end user can program one of the following options for determining which of the eligible calls are logged in their call log. (For details about setting the option, see “1.2.4 End User Programming View”.)

No autologging: Call information is not logged automatically.

This option can be used by a person who wishes to reserve their log space for specifically chosen items, using the Logit feature to log answered calls.

No one answered: Logs information at the logging set for ICLID calls that were unanswered at the set, and were not subsequently answered elsewhere. That is, the caller hung up (abandoned the call) before the logging set, or anyone else answered the call, subsequent to its arrival at the logging set.

This is the default option at all sets.

This option applies to calls initially alerting in Norstar, and to calls that have been explicitly rerouted (for example, by Transfer and Camp-on).

This option is used by persons who wish to know about calls directed to them, and missed by them, that were not handled by someone else. The assumption is that if someone in the company handled a call, then there is no need for further follow-up.

This option is appropriate where business practice provides other means of communication, such as telephone message memos, to relay information to the appropriate person.

Unanswered by me: Logs information at the logging set for ICLID calls unanswered at the set, regardless of whether or not they were answered elsewhere.

This option includes calls abandoned by the caller, and calls answered by another set.

This option can be used in businesses where a user wants to know about all calls they missed, whether they were answered by someone else or not. In this case, if the call was handled by someone else, the log indicates which set handled the call. In this way, the user who has logged the call can check with the answering party to see if there is a need to follow-up with it.

This option can be used when the answering party is an answering machine or a voice mail system. The log has captured information-~~if~~ whether or not the caller left a message on the machine.

Log all calls: Logs information for ICLID calls that have been answered, and that were not answered at the logging set.

This option includes set unanswered calls (option 3), and all calls answered by the set. For set answered calls, it makes no difference how the calls were routed to the set.

This option can be used to capture a record of all ICLID calls coming into the system.

Logit Feature - Manual Logging of Answered Calls

When the user is connected to a call that has ICLID information associated with it, the Logit feature can be activated to log the call's information into the user's call log.

The feature is activated by:

- 8 1 3, or
- pressing a key programmed for the Logit feature

For example, when the user is on a call and activates Logit:

John Jones
INFO TRANSFER

one of the following three-second transient messages is displayed:

Display	Condition
Call logged	When the logging attempt is successful
No space in log	If the log is full and autobumping is set to off (error tone accompanies the message)
No log assigned	If no log space has been assigned (error tone accompanies the message).

Display	Condition
No info to log	If the call has no ICLID information, or if Logit is activated when no call is active (error tone accompanies the message)

1.2.3.3 Notification and Status Display

Notification

Notification of new items in the set's call log is incorporated into the CLASS Message Waiting status display¹.

This display varies, depending on whether there are also items in the message waiting list (see the Message Waiting feature).

Display	Condition
Call for you CALLS	If one new (unread) item is in the call log and there are no items in the message waiting list
Calls for you CALLS	If more than one new item is in the call log and there are no items in the message waiting list
Messages & Calls MSG CALLS	If one or more items are in the message waiting list, and one or more new calls in the call log

To cut down on the number of displays to be shown, the plural version is always used on the combined display, even if there is only one item in the message waiting list, or one new call in the call log.

Status Display Priority

The message waiting/ call log status display is in the fifth position of priority. The following displays illustrate the presence of display keys associated with Message Waiting Indication and Call Log, when a higher priority status display is in effect.

Note that for all status displays, except for the alarm display, a display key is associated with Message Waiting Indication and Call Log, to keep the user informed about the status of these two features.

-
1. In Norstar, call log and message waiting indication are given equal status, because both may represent information about external calls.
 - CO voice message waiting indication takes top priority when it is available to a customer. The status indication of CO message waiting indication is controlled by the messages from the CO, not Norstar. Also, message waiting indication is active if there are internal messages but no external messages. A user may rarely have direct access to the information about new calls in the call log. It is assumed that because the information about calls in the call log also pertains to external calls, there will be complaints from the field that there is no immediate indication about missed external calls.
 - Some customers may not subscribe to CO Voice Messaging. In this case, if message waiting indication status screen is given top priority, internal messages have priority over information about external calls in the call log. The prediction is that there would be complaints from the field.

For one-line displays, no indication appears on the message display.

Display	Status
Alarm: xx-x-x TIME CLEAR	Alarm display
Night Service MSG CALLS	Scheduled services status display
Do not disturb MSG CALLS	Do Not Disturb
Forward>SETNAME MSG CALLS CANCEL	Call Forward All Calls

1.2.3.4 Using the Call Log

This section describes:

- entering the call log with or without a password
- navigating in the call log
- information in the call log
- calling out from the call log
- user and system deletion of items from the call log
- exiting the call log

Entering Call Log

Entry into the call log for both one-line display sets and two-line display sets is by means of:

- , or a programmed key for call log

In addition, the two-line display set has:

- the `CALLS` display key

A user cannot enter the call log when active on a call. This avoids ambiguity in meaning for function keys hard mapped to Call Log, that may also have meaning for an active call.

For all sets other than the M7100, if the user activates Call Log while on an active call, a prompt appears, advising the user to hold or release the present call. Error tone occurs with the following error message: `Hold or release`.

For the M7100, the user cannot hold a call, but must release it in order to enter the call log. This avoids the difficulty of reaccessing a held call by using the Hold key while in Call Log (Hold is interpreted as `ERASE`). Therefore, if the M7100 set user activates Call Log while a call is active or held at the set, the message `Release calls` is presented, with error tone.

Entry to Log with Password (Optional)

A password can be essential to some members of some businesses. Other businesses have no need at all for password entry to the call log, and find that it

would be a hindrance. To address both needs, an optional password capability is provided.

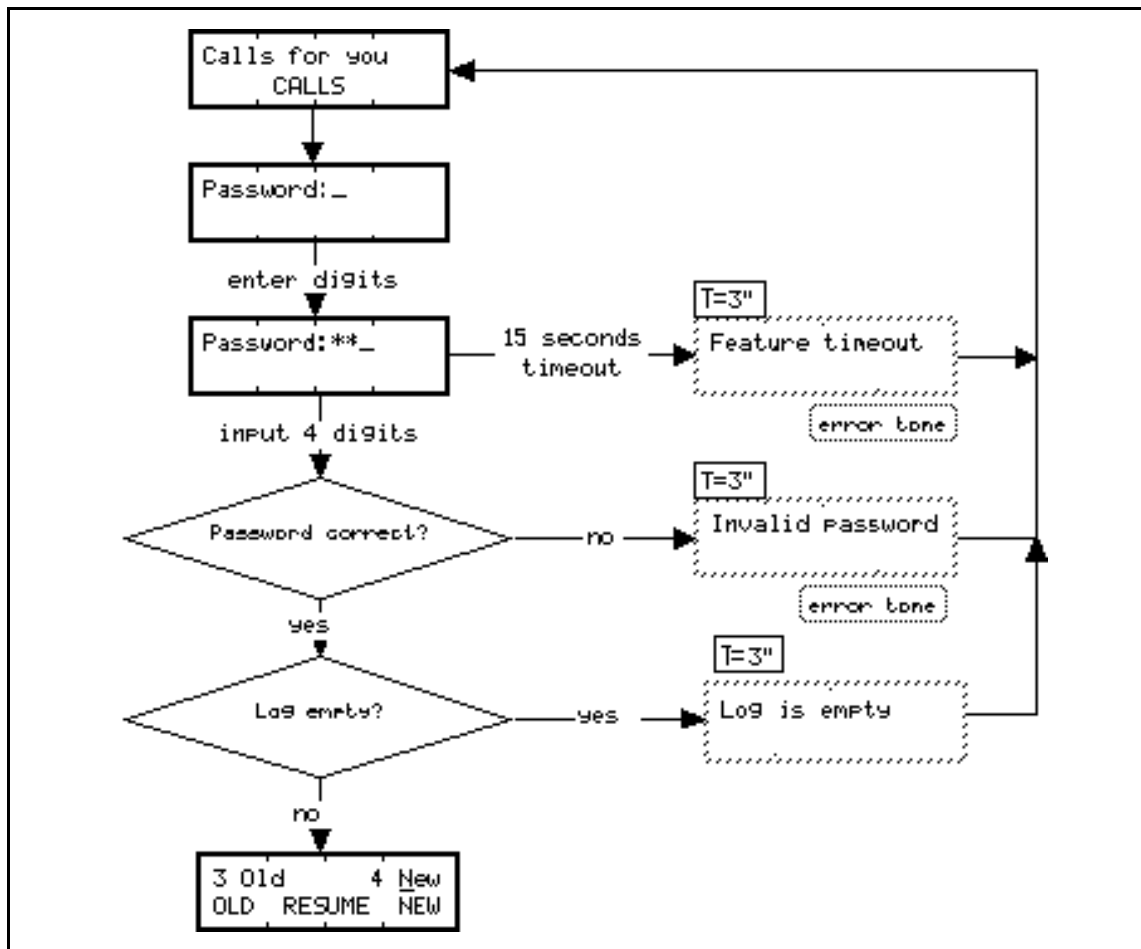


Figure 1-2: Entering the Call Log when a Password has been programmed

Note: Status messages are given only after successful Password input

The end user can choose to program a four-digit password at their set, so that entry to the call log is protected. See “1.2.4 End User Programming View” for details about programming the password, and “1.2.5 OAM Programming View” for password resetting.

For an example of the call log entry sequence if the user has programmed a password, see Please refer to “figure 1-2 Entering the Call Log when a Password has been programmed” on page 11..

The user is prompted to put in the password when call log entry is activated.

As the user enters password digits, feedback is provided by returning an asterisk (“*”) from the display. If the user enters invalid characters from the dialpad (“*” and “#”), the feedback “*” is still provided to increase level of security.

If a password has been assigned, the log status messages (for example, Log is full) does not appear until a successful password has been entered. This maintains the privacy of the log and its status.

Special Status Messages

No items. If the log has no items in it, the following three-second transient message `Log is empty` is shown, and then the user is returned to the idle display.

No Log space assigned. The user is returned to the idle display after the following three-second transient message `No log assigned`.

Log is full, and Autobump option is set to off. The user is presented with the call log header display after the following one-second transient message `Log is full`.

This message alerts the user so that they can:

- check that all calls have been read and noted
- delete selected items manually to make space in the log for new calls that come in

Navigating in the Call Log

This section describes:

- the order of items in the call log
- navigation in and from the header screen
- navigation from item to item

It does not describe scrolling through information screens for one item (see “1.2.3.6 Scrolling through Information Screens for One Item”).

Order of Items in the Call Log

Items in the call log are listed in forward chronological order (oldest to newest)². This chronology is based on the time that the call was logged in the call log, not the time that the call entered the Norstar system (Norstar time stamp).

This approach to dating the items makes sense, as means that the time of the logging of recording the call in the log is the time that the call was directed to the logging set. In some cases, the call could be in the Norstar system for some time before being transferred to the logging set, so the Norstar time stamp is not the most appropriate one to enter into the call log³. With this approach, All new call items are placed at the bottom of the list.

In the case of repeat calls, the date and time are updated, and the call item is also moved to the bottom of the list.

Header Screen in the Call Log

On entry to the call log, on sets with display keys, the user sees a header screen, that displays the number of old and number of new calls in the call log. From this header screen, the user can choose to go immediately to

-
2. Usability testing on residential products indicate that users expect the list to have the oldest call numbered 1, and the newest call numbered with the highest number.
 3. Also, if the Norstar time were the time used, and a new call coming in to the call log was in the system for some time, then to keep the chronological sequence, in some circumstances it would be necessary to insert the new' item somewhere in the middle' of the list.

- old items (items that have been seen before)
- new items (items that have not been seen before)
- the Resume item (the item the user was at the last time the log was exited).

Note: New calls are indicated by underlining the first digit of the sequence number.

For one-line display sets, the options are mapped on to the following keys

- OLD to
- RESUME to
- NEW to

Context Sensitivity

The display keys in the header screen are context-sensitive. Each display key appears only if an appropriate item is in the call log.

The user may activate an unavailable item (header option) under two circumstances:

- although there is no display key, the user uses the hard-mapped key (especially on one-line display sets)
- while the user is viewing the header, the status of the call log (and therefore an item type) has changed. For example, if autobumping has taken place, all old items, or the Resume item may have been deleted.

When an unavailable item is requested, The following messages are presented to the user. Navigation requests during these transient messages are ignored.

If there are no new items and the user presses the hard-mapped key, , the following one-second transient message `No new items` is presented.

After this message, the first item in the log is displayed, which is the oldest old item. From here the user can choose to go forward through the log, or use the back navigation to return to the header screen.

If there are no old items and the user presses the hard-mapped key, , or an outdated display key, the following one-second transient message `No old items` is presented.

After this message, the first item in the log is displayed, which is the oldest item marked `NEW`. From here the user can choose to go forward through the log, or use the back navigation to return to the header screen.

If the Resume item is no longer in the list (because it has been autobumped, or an update for a repeated call has occurred, or because the user reduced the size of the user's log) and the user presses the hard-mapped key, , or an outdated display key, the one-second transient message `No resume item` is presented.

After the message, the user is returned to the header screen which is updated: that is, the number of old and new items is updated, and appropriate display keys are presented.

Forward List Wraparound

When the user activates the `NEXT` navigation function from the item in the last position in the log, the updated header screen appears.

When the user activates the `BACK` navigation function from the item in the first position in the log, the updated header screen appears. (This prevents the user from navigating directly to the item in the last position of the log, and creating orphan new items.)

Note the hard-key mapping for `NEW` also maps onto the `NEXT` display key. For one-line display sets, if the user presses `NEXT` key, they see the new items, if available. Otherwise, they see the first old item. If the `NEXT` navigation function is the only one that one-line display set users remember, from the header screen, the voice message model is maintained; that is, the user goes to the oldest new call first.

Navigation From Item to Item

Navigation controls include:

- pressing the `NEXT` display key displays the next item (maps to `#`)
- backwards navigation through the call log is provided by a physical key mapping to the `*` key

The `NEXT` and `BACK` key mappings were chosen for two reasons:

- to have consistency with message waiting list
- to follow the recommendations of the document, Voice Messaging User Interface Forum Specification

When the user is navigating from the old items to the new items of the log, in the forward chronological order, the message screen:

New calls begin
OK

appears before the first new item.

Note that this screen occurs only once for each time the user passes the old-new boundary. That is, if the user continues to navigate forward through the new items, the prompt does not reoccur. If, however, the user

- navigates backwards through the list
- wraps around to the header and new calls are added to the list

A new boundary is created, for the next time the user navigates forward. The prompt then reappears at the new boundary.

The `OK` display key maps to the `#` key for one-line display sets.

When the user is viewing the item in the last position of the log, pressing the `NEXT` display key displays an updated header screen. See also “Entering Call Log” on page 10.

First Screen Presented during Navigation

The first screen of information displayed about an item depends on the services to which the line is subscribed, and the data provided.

Information Delivered

Subscription	Data	O or P	Mixed: Data and O or P
Name only	Name field	Unknown call	Not applicable
Number only	Number	Unknown call	Not applicable
Name and Number	Name	Unknown call	Name or Unknown name or Private name

As the user goes from one item to the next, the first screen displayed for an item is the Name information screen, if it is subscribed. In our site sample, all users chose the Name information as the preferred information to be presented first.

Please refer to “figure 1-3 First and Second Information Screens, based on Subscription and Availability of Information” on page 16. shows the details of the first and second screens of information shown for an item, given different combinations of subscription type and availability of information.

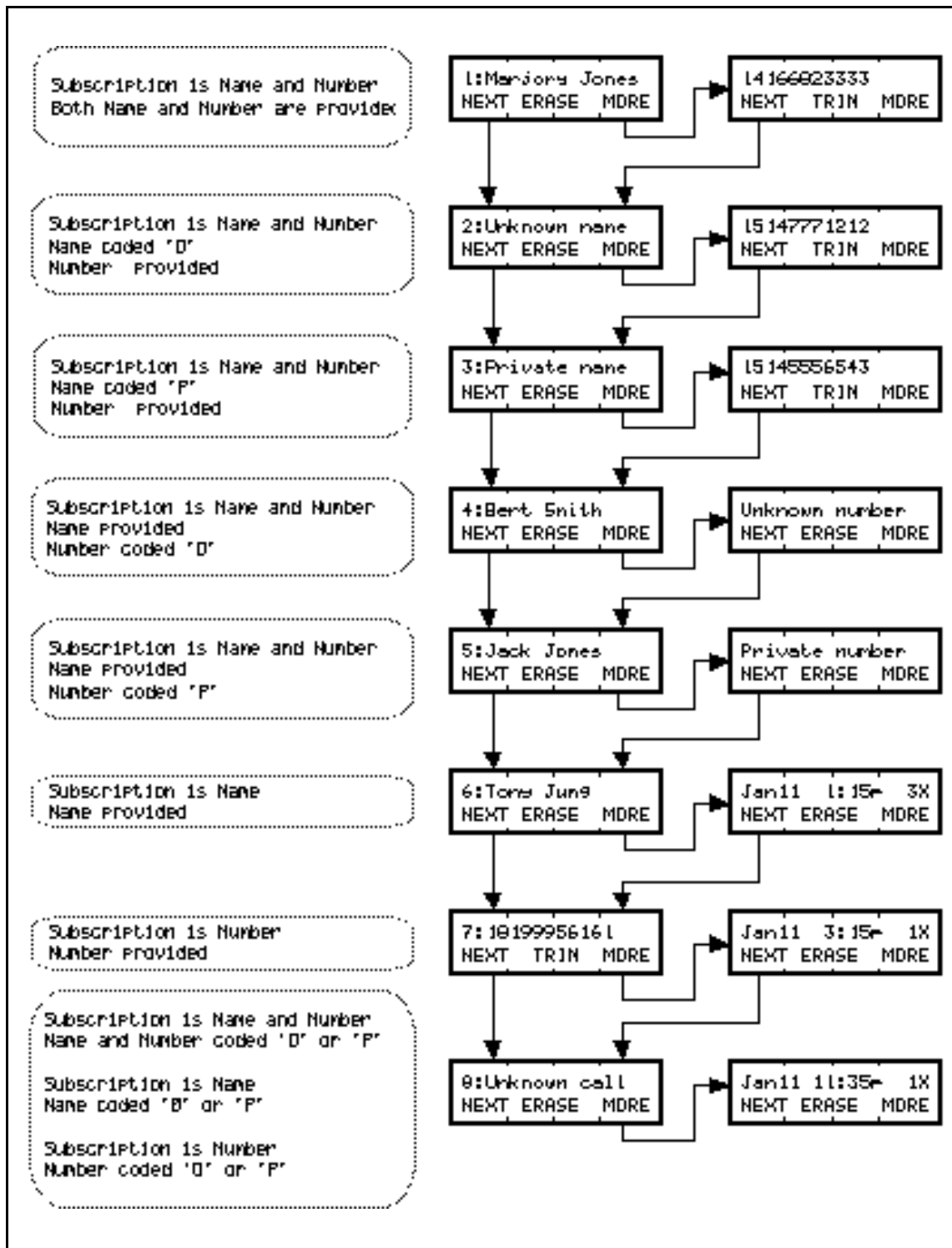


Figure 1-3: First and Second Information Screens, based on Subscription and Availability of Information

1.2.3.5 Information Provided in the Call Log

The table below illustrates the Call Information associated with a given call log item for autologged calls (refer to text in this section) and calls logged manually with the Logit feature (see "Information Associated with Call Items Entered With

Logit” on page 24). The information included in any call log item depends on the Call Information delivered by the CO switch.

Call Information Provided through Autologging or by Logit

Call Information	Entered through Autologging	Entered through Logit
Calling name (from CO, if provided)	X	X
Calling number (from CO, if provided. Can be a 10-digit ICLID or an 11-digit dialable Extension number)	X	X
Sequence number (Norstar provided)	X	X
New call indication (Norstar provided)	X	X
Norstar date and time that the call was logged at the set	X	X
Norstar line name on which the call came in	X	X
Answered call indication and identification of answering set (Norstar provided)	X	X ^a
Logit indicator (Norstar provided)	X	X
Long distance indicator (if provided by the CO in the call qualifier field of the CLASS/CMS data)	X	--
Repeat call (number of times a call came in from the same number: (Norstar provided))	X	--
Special entry for ICLID calls that have no data (Coded Private or Out of Area) (Norstar provided)	X	--

a.Handled differently by the Logit feature. Refer to “ Information Associated with Call Items Entered With Logit”.

The user sees an information screen only for the ICLID to which they are subscribed. If the user does not subscribe to both Name and Number, no information or message appears with the non-subscribed information.

Potentially there are a mixture of subscriptions in one Norstar system, some lines subscribing to Name only, some to Number only, and some to both. Therefore, a call log that is logging calls from different lines can potentially have different information provided for different lines. This situation makes inclusion of navigation feedback crucial. (See “Sequence Number” on page 18.)

There are some differences of information between calls that are automatically logged and those that are logged by the Logit feature. These differences are described under the description for the individual information fields, below.

Calling Name

See also the section “Sequence Numbers, Status Indicators, and Effect on Scrolling” on page 25.

When the user subscribes to Calling Name, one of the following is provided:

The switch delivered name. This name can be up to 15 characters. For the scrolling procedure when the full 15 characters are delivered, see section “Sequence Numbers, Status Indicators, and Effect on Scrolling” on page 25.

1:Joseph Capell

Message that Name is Private (P coded in the protocol)

15:Private name

Message that Name is Unknown (O coded in the protocol)

150:Unknown name

Note that the last two screens occur in call log only if accompanied by a Number field with data other than O or P. See “Item for Private and Unknown Calls” on page 23.

Calling Number

When provided, this number can be in the format of a ten-digit number, or dialable Extension number, depending on which the switch delivers.

If Name as well as Number is subscribed, the sequence number does not appear with the number. If Name is not subscribed, then the sequence number appears.

ICLID 10 digits (Note that the area code is placed after the main number.)

15: 7632142 (613)

Dialable Extension number.

150: 16137632142

If the number is truncated, the number is preceded by the truncation character that is also used in ICLID. If it is the only status indicator, it take the place of the sequence number separator.

150/16137632142

Message that Number is Private (P coded in the protocol)

1:Private number

Message that Name is Unknown (O coded in the protocol)

1:Unknown number

Note that the last two screens occur in call log only if accompanied by a Name field with data other than O or P. See “Item for Private and Unknown Calls” on page 23.

Sequence Number

See also the section “Sequence Numbers, Status Indicators, and Effect on Scrolling” on page 25.

Because of display space constraints, the sequence number is present only on first viewing of the first information screen when navigating from another item.

Inclusion of the sequence number on first viewing of the first screen addresses the following usability requirements:

- The user requires feedback that a new item is being viewed in response to a navigation action. This is especially important when there are items in the call log with mixed subscriptions. Providing a sequence number at the point of changing items gives this feedback.
- A corollary to the previous point: Users on one-line displays who are using hard-mapped keys to navigate need feedback especially when they want to know whether they are using the correct keys to navigate.
- User testing has shown that users want to know approximately where they are in a list of a given size.

New Call Indication

A new item is one that has not been seen before by the user⁴.

Users may find it helpful to know that they are looking at a new or old item, to make decisions about such things as deleting items from the log.

The sequence number format on the first screen is differentiated for New items. For New items, the initial digit of the sequence number is underlined. (Ideally the whole sequence number would be underlined, but the Norstar display constraints underlining to only one character).

For example,

Old item	New item
12:Kate Smith NEXT ERASE MORE	12:Kate Smith NEXT ERASE MORE
120:16137632142 NEXT TRIM MORE	120:16137632142 NEXT TRIM MORE
120:7632142 (613 NEXT TRIM MORE	120:7632142 (613 NEXT TRIM MORE

The header screen gives a clue to the meaning of this convention, by underlining the N in the word New.

5 Old	7 New
OLD RESUME	NEW

4. The term New for log items that have not been seen before, and Old for those that have been seen before follows the convention of residential NT products. However, the connotation is confusing for some users. The terms Read and Unread, or Seen and Unseen would be more appropriate, but the products to date suffer from the lack of display space to use more appropriate terms. It is recommended that for products that provide more display space, more appropriate terms be used.

Time and Date

The Norstar date and time at which the call item was entered into the call log is used to:

- avoid any problems of the CO delivering time information from a different time zone
- ensure that the time and date in the call log items can be related to the time and date on the idle display

Date. A three-letter abbreviation of the month is followed by the number indicating the day of the month. When the day is represented by two digits, no space is provided between the month and day. The date is left justified on the display.

One-digit day	Two-digit day
Jan 1	Jan11
Feb 1	Feb11
Mar 1	Mar11
Apr 1	Apr11
May 1	May11
Jun 1	Jun11
Jul 1	Jul11
Aug 1	Aug11
Sep 1	Sep11
Oct 1	Oct11
Nov 1	Nov11
Dec 1	Dec11

Time. The time uses the 12- or 24-hour clock set for time and date (related to language choice).

The format allows:

- two digits for the hour (there is a leading space for hours consisting of one digit)
- colon (for English) or h (for French) to separate hours from minutes
- two digits for the minutes
- for the English version, one space for a p (indicating pm) or an a (indicating am) The abbreviations are used to allow a two-digit repeat counter that appears on the same screen.

The time digits are right justified on the display.

12-hour clock	24-hour clock
1:05a	1h05
1:05p	13h05
11:25a	11h25
11:25p	23h25

The Norstar Line Name

The Norstar line name (or DIA line name) that the call arrived on is indicated.

The line name supplies important information in some Norstar businesses. For instance, there can be a differentiation of call type, based on the line on which the call arrived. Examples are:

- Calls on the Sales line are for different people than the calls on the Service line.
- Calls on the APEX line are calling a company that sells watches, and calls on the VERTEX line are calling a company that sells hats. Both lines really are handled by the same organization. Persons who call back the customers can identify themselves according to the incoming call request.

The Line name is left-justified on the screen.

Answered Call Indication, Answering Set Identification

For the user who has set up the call log to `Log all calls`, which includes calls answered at the set, or who has used `Logit` to log a call, this function helps to differentiate between call items that represent answered and unanswered calls. It is important to include this information on the first screen, as the user scanning the log may want to concentrate on calls that were not previously handled as top priority.

An icon (handset) on the first information screen (Name or Number or Unknown call) indicates that the call item was an answered call. On the first viewing of the first screen, this icon always replaces the sequence number separator.

For example, first viewing of Name screen, when navigating:

```
105 handset Sam Snead
NEXT ERASE MORE
```

Subsequent viewing of Name screen, when scrolling:

```
handset Sam Snead
NEXT ERASE MORE
```

Automatically logged calls

On the same screen as the Norstar Line name, the answering set is identified by Setname, preceded by the answered call indicator. The field is right justified. The answered icon is in the space directly preceding the first letter of the set name.

LINENAM	ANS	SETNAME
NEXT	ERASE	MORE

When another set has answered the call, this information provides users with a vehicle to

- adopt logical business practices and conventions, to avoid circumstances such as several employees calling back the same customer
- know when a call has been answered by an attached answering machine or voice mail
- make a call to the answering Extension number from this screen to check if there was a message associated with the call

Calls logged by Logit feature

An answered indicator appears, but instead of a set name in the answerer identifier field, the word `Logit` follows the answered icon. This clarifies that the entry was specially marked by the user.

LINENAM	ANS	Logit
NEXT	ERASE	MORE

Long Distance Indicator

If included in the Call Qualifier CLASS/CMS data field, the icon `SL` is included on the Number screen, if it exists, or on the Name screen for Name-only subscriptions, or on the `Unknown call` screen.

If it appears with the sequence number on the Name screen, or with a dialable Extension number, and is the only special status indicator, it replaces the sequence number indicator “:”. The long distance indicator follows the answered call indicator if it is also used.

1	SL	Joseph Capell
NEXT	ERASE	MORE

150	SL	16137632142
NEXT	TRIM	MORE

If it appears with the ten-digit ICLID, it replaces the opening bracket before the area code. The closing bracket is removed.

150	:	7632142	SL	613
NEXT	TRIM	MORE		

Repeat Call Counter

A counter is provided indicating that there have been repeat calls from the same source. This approach:

- obviates the need to use up a new log item slot for every call from the same source
- organizes the items for the user. This organization avoids the situation where

the user returns an earlier arriving call from the list and later, not recognizing a second item as a repeat call, needlessly makes a second call to the same source.

- indicates the urgency of the call, if the repeat indication is readily accessible

The counter appears on the screen with the time and date. The two-digit number is followed by an X.

The first occurrence of a specific call is indicated with the number 1.

```
Nov11 11:45p 1X
NEXT ERASE MORE
```

The counter is limited to 99 repeats. After 99 has been reached, the repeat counter remains at 99 until a deletion of the item occurs.

The field is right justified. For example:

```
Nov11 11:45p 99X
NEXT ERASE MORE
```

If the same logical call returns to a set, after being rerouted through the system, if it is logged again, it increases the counter.

Calls logged by Logit feature

The repeat counter is meant to give an indication about how many times a particular party called, and therefore applies only to autologged calls.

Therefore, there is no repeat counter for a call entered into the log by the Logit feature. If a match for that call's information was already in the call log, the repeat counter is not increased, but remains at its former value.

The call item, however, is moved to the bottom of the list.

Item for Private and Unknown Calls

One item (with repeats) is provided to indicate if calls of Unknown or Private status have arrived. Included in this item are calls for which no information is provided about both name and number. If one piece of data is provided, it is recorded as a normal item.

This approach:

- helps to keep a record of how many ICLID calls (and how many unidentified ICLID calls) have arrived in the system
- saves log resources (which are minimal)

The repeat counter indicates the total number of ICLID calls received without any calling information. The other information fields are based on the last call that was included in the item. This includes the date and time, answered call indication (and answering set), long distance indication, line name.

The first screen has the following indication:

```
10:Unknown call
NEXT ERASE MORE
```

Information Associated with Call Items Entered With Logit

The information for an item entered using of Logit has a few differences from autologged call items. (See the table, “Call Information Provided through Autologging or by Logit” on page 17).

Just as with calls that are autologged, the call is entered at the bottom of the call log. The following information fields are treated somewhat differently.

Answering Set Identification

An answered indicator appears, and instead of a set name, the word Logit follows the answered icon in the answerer identifier field. This clarifies that the entry was specially marked by the user.

LINENAM	Logit
NEXT ERASE MORE	

Repeat Counter

The repeat counter is meant to give an indication about how many times a particular party called, and therefore applies only to autologged calls.

The repeat counter is not used for a call entered into the log using the Logit feature. If a match for that call’s information was already in the call log, the repeat counter is not increased, but remains at its former value.

The information for an item entered using of Logit has a few differences from autologged call items. (See the table, “Call Information Provided through Autologging or by Logit” on page 17).

Just as with calls that are autologged, the call is entered at the bottom of the call log. The following information fields are treated somewhat differently.

Answering Set Identification

An answered indicator appears, and instead of a set name, the word Logit follows the answered icon in the answerer identifier field. This clarifies that the entry was specially marked by the user.

LINENAM	Logit
NEXT ERASE MORE	

Repeat Counter

The repeat counter is meant to give an indication about how many times a particular party called, and therefore applies only to autologged calls.

The repeat counter is not used for a call entered into the log using the Logit feature. If a match for that call’s information was already in the call log, the repeat counter is not increased, but remains at its former value.

1.2.3.6 Scrolling through Information Screens for One Item

Scrolling allows the user to move through the pieces of information associated with each log item.

The user can cycle through one item's information screens by using the MORE display key on a two-line display, or by using the mapped key (Volume bar up) on one-line display sets.

Scrolling is unidirectional and circular.

Sequence Numbers, Status Indicators, and Effect on Scrolling

The minimum sequence number for a log is one digit and a separator character (two characters), and the maximum sequence number, for a large log, is three digits and a separator, (four characters). In addition, one or all of the following indicators (in this priority order) can be present on the first screen, along with the sequence number:

1. Answered call indicator

```
150George Smith
NEXT ERASE MORE
```

2. Long distance indicator

Except on the ten-digit ICLID Number screen, this icon appears before the Name or Number information:

For a Name-only subscription:

```
130Mary Smith
NEXT ERASE MORE
```

For a Number-only subscription (dialable number or DDN)

```
105S16137632142
NEXT TRIM MORE
```

For a Number-only subscription (10 digit ICLID)

```
1057632142 S613
NEXT TRIM MORE
```

3. Truncated DDN (represented by the backslash “/”, as in ICLID)

```
49S/12345678901
NEXT TRIM MORE
```

The highest priority call indicator replaces the sequential number separator (“:”). Therefore, in the worst case, there are potentially six leading characters before the Name and Number information begins: a three-digit sequence number and three icons.

When the total character count of the Name or Number screens exceeds ten characters, not all the information is shown on one screen.

The worse case scenarios are all described here, but it is unlikely that they will occur with any great frequency.

Full Data or Message Cannot be Displayed

If the leading sequence number and special indicators prevent the full Name or Number from being completely displayed:

Rule 1. If the missing information is informative, that is, it is an identifying digit or alphabetic character, show as much of the information as fits on the first screen, using the 16th character for the one-space ellipsis. When the user presses MORE, show the full screen of information, and any icons for which there is room. This applies to name data, and truncated DDN when they are the first screen of a call log item.

Name data (other than Unknown name and Private name)

100 Gregory Smith
NEXT ERASE MORE

press MORE

Gregory Smithon
NEXT ERASE MORE

Note that the long distance indicator appears on the Name screen only if there is no subscription to number.

The Answered call indicator is dropped in this case only (15-character name and long distance indicator), where the full 15-character name is provided. This information is available on a later screen with the identification of the answering set.

If the Name is 14 characters or less, the icon remains. For example:

100 Gregory Jo...
NEXT ERASE MORE

Press MORE :

Gregory Jones
NEXT ERASE MORE

Truncated DDN with three-digit sequence number and the two other icons

498 /123456789...
NEXT TRIM MORE

Press MORE

/12345678901
NEXT TRIM MORE

Note that all the icons remain on the screen.

See also the section “Editing Call Log Numbers” on page 35 for the effects of using the TRIM function on this screen.

Rule 2. If the missing information is not informative, that is, it does not help to identify name or number data, then let the right most characters fall off the display. When the user presses MORE, no attempt is made to show the full information. Instead, the next information screen is displayed. This applies to the first screen of the repeat call item, and the ten-digit ICLID with a three-digit sequence number.

Repeat Call first screen. The situation can occur when there is a three-digit sequence number, or some combination of more than one digit sequence number and two status indicators.

For example:

```
1235Unknown cal
NEXT ERASE MORE
```

or

```
1235Unknown call
NEXT ERASE MORE
```

Because the loss is only the end of the word call, pressing MORE displays:

```
Nov11 1:45p 99X
NEXT ERASE MORE
```

Ten-Digit ICLID with a three-digit sequence number.

```
120:7632142 (613
NEXT TRIM MORE
```

Because the loss is only a closing bracket, pressing MORE displays:

```
Nov11 1:45p 99X
NEXT ERASE MORE
```

Unknown and Private Name and Number Messages

Even in the worst case scenarios, these messages never exceed 16 characters.

Unknown name/Private name messages. Note that even in the worst case scenario, these messages always have room, because if this message is in the call log, it is accompanied by a known number, and the long distance indicator is on the Number screen. Therefore, the worst case scenario is always 16 characters or less (three-digit sequence number plus the Answered Call icon plus the 12-character message). For example:

```
1005Unknown name
NEXT ERASE MORE
```

```
1005Private name
NEXT ERASE MORE
```

Pressing the MORE key displays:

```
7632142 5613
NEXT TRIM MORE
```

or

```
5/16137632142
NEXT TRIM MORE
```

Unknown number/Private number messages. These messages are never accompanied by a sequence number or an answered call icon, because if they appear in the call log, they are preceded by a valid Name screen which has the

sequence number. Therefore, in the worst case scenario, there are 15 or fewer characters (long distance indicator plus a 14-character message). For example:

Private name
NEXT ERASE MORE

or

Unknown name
NEXT ERASE MORE

1.2.3.7 Deletion of Items from the Call Log

In order to have new items entered into a call log, there must be sufficient space in the individual log. If a log is full, item(s) must be removed before new items can be entered into the log.

This can be accomplished in two ways:

- manually

The user can choose to do their own log clean-up. That is, when a call has been answered, or the information recorded elsewhere, they will delete those items from their log manually, to make room for new items. Such users may choose to keep their call log accessible to new calls, or may prefer to maintain information about older calls.

- Autobumping

Some users find this method convenient, because they do not wish to delete log items manually, and they prefer to keep information about new calls.

If the user chooses the Autobumping mode, the system automatically deletes the oldest call log item in order to insert a new item.

When Autobumping is enabled, if the user's call log is full, and a new call needs to be added to the log, the system automatically deletes the oldest call item to make room for the new one. If Autobumping is not enabled, new calls are not logged when the log is full. (For details, see "Autobumping" on page 29.)

Erasing an Item From the Call Log Manually

All deletions are local to a specific call log. That is, if an item is entered into more than one call log, deletion in one call log does not affect that item in other logs.

On the Name screen and the other information screens, there is an ERASE display key.

The ERASE display key maps to the Hold physical key, as in Message Waiting.

Pressing the ERASE display key or Hold erases the item from the call log.

3:Sam Snead
NEXT ERASE MORE

In the case of a valid number screen, there is no ERASE display key, but the user can use the Hold key, to remove the item.

7632142 (613)
NEXT TRIM MORE

Feedback is necessary for this user action. If the user is navigating the call log on a one-line display set, and is confused about the mapping of the keys to call log function, it is crucial to advise the user of the consequences of their actions.

A static feedback message appears to the user when an item has been removed:

Item erased
OK UNDO

The user can cancel the erasure from this screen by pressing the UNDO display key. On both a one-line display and a two-line display set, if the user presses a digit, or the Hold key at this screen, the erasure is cancelled. When the erasure is cancelled, the user is returned to the item from which the ERASE command was activated, provided that item was not also autobumped.

Pressing a navigation key results in erasure of the item.

Pressing a key that terminates call log results in erasure of the item as well as termination of the feature.

The user can use the NEXT or BACK navigation keys, and the OK display key to see a different item, which will have an updated sequence number. The OK display key is an implicit NEXT navigation command.

When the next or previous navigation function is requested from this screen, a message can appear about any autobumping that has also occurred during the time period that the user was viewing and erasing the item. (See “Autobumping” on page 29).

If autobumping or manual deletion occurs, the sequence numbers are reorganized with items.

If the erased item is the last remaining list item, then when a navigation action is taken, the following transient message *Log is empty* is displayed, and then the user is returned to the idle display.

Autobumping

It may be the case that many users are strongly opposed to having the system decide which items to delete, and prefer to miss new call items than old call items. On the other hand, some users indicated the preference for automatic deletion, as they would not have the log cleaning habit to maintain log space for new calls, even though they have attended to the items.

Because the use of automatic deletion appears to be an individual preference, and not a system preference, the activation or deactivation of autobumping is a user-level feature. The default is Autobumping ON.

Automatic deletion deletes the oldest call in the list, when a new item arrives. Note that for repeat calls, the updated time stamp is examined for this decision.

Autobumping is enabled and disabled by a programmed key. (See “1.2.4 End User Programming View”.)

When the user enables or disables the feature, a three-second transient status message appears:

Enable message:

Autobumping ON

Disable message

Autobumping OFF

System Updating of the Call Log

The system can add new items, and autobump existing items while the user is in the call log. The log is updated when these activities take place, rearranging sequence number and item pairings, and updating the count of old and new items.

System Deletions

The system deletes items from a set’s call log in the following situations:

- A new item has arrived, the log is full and autobumping is set to on. Therefore, the first item in the list is autobumped by the system.
- A new item has arrived, the log is full and autobumping is set to off. In this case, the new item fails to be logged (and therefore is virtually deleted by the system).
- A new call has arrived, but it is identified as a repeat call. In this case the item already logged is deleted from its previous position (unless it was the last position in the list) and is re-entered as the last item in the call log.
- The user has reallocated log space, such that data has been removed from the log.

Informing the User of Updates

When system deletions occur while a user is in the call log, it is necessary to advise the user for two reasons:

- to prepare the user for unexpected sequencing patterns when a navigation action is taken
- to let the user know that old items are being deleted by the system, or new items cannot be added

When items are deleted by the system when the user is viewing an item, when the user activates a navigation function (NEXT or BACK), the appropriate item of the updated log is displayed.

Effect of System Deletions when Autobumping is Enabled

When system deletions take place, the list is reorganized and the sequence numbers associated with items in the list change. Because sequence numbers are being used, when items previous to the item being viewed, or the item being

viewed, are deleted by the system, when the user navigates to the next or previous item, the sequence number seen may not be the one expected. The autobumping updating message prepares the user for this possible change in structure.

The autobumping updating message is a static message.

The message does not indicate how many items have been bumped.

The message has the following format:

Call(s) bumped OK

The display key OK maps to the **[#]** key.

When the user presses OK (**[#]**), the navigation requested from the last viewed item, or the *Item erased* feedback message, is executed.

When the user is viewing an item, and the item being viewed is autobumped, the list appears to the user as updated only when:

- the user activates the NEXT or BACK navigation function (above message is given)
- the user returns to the call log after exiting (no message is given when user exits or enters)

If only one item is autobumped, and it is the same item that the user has just erased manually, only the *Item erased* message is given.

Log becomes full while viewing

If the call log becomes full while the user is in the log, when the user activates a navigation function the following message appears:

Log is full OK

When the user presses OK (**[#]**), the navigation requested from the last viewed item is executed.

This message does not appear if the message *Call(s) bumped* has appeared. If calls have been bumped, then the bumping message conveys the fact that the log is full.

Note: Autobumping has taken place when two new items have been entered into the Log.

Additions to the List When there was only One Item

If the user is viewing the list when it contains only one item, the NEXT display key is presented. This approach allows for the user to view any new items added while they are looking at the first item in the log.

Effect of Reallocating Call Log Space

For a description of how call log space is reallocated, see the section “1.2.5 OAM Programming View”.

For both set-based and system-based log reallocation, the reallocation deletion algorithm removes blank spaces first, and then the oldest items.

This minimizes the loss of important information to the end user.

1.2.3.8 Calling Back From the Call Log

Calling the Answering Set

If identification of an answering set is provided in the call log, the user can call the answering set from that screen (the field acts like a predialed DSS key). When on this screen, the user can call the answering set by

- going offhook
- pressing an available intercom (extension) key
- pressing the handsfree key

The digits associated with the answering set are outpulsed on the line. Note that if the user selects an external line, that call log is terminated and the line selected.

If the identified set is that set's name, or the `Logit` message, then the message `Yournumber` is presented with overflow tone.

If the identified set is an ATA with an answering machine, or a Startalk (voice mail) Extension number, that Extension number is called.

If no answering set is identified, that is, the call is not an answered call, and the user selects an intercom key or goes offhook, the action is interpreted as it is from other screens (see table "Effect of Telephony Actions on Interactive Feature (Call Log)" on page 51 in the "1.3 Technical Specification (Limits/Constraints)" section).

Calling from the Number Screen in Call Log

When a number is provided by ICLID, the user can make a call from the call log while viewing the number.

This section assumes that there is a dialable number on the number screen, because the switch delivered DDN, or because any editing required has already been done by the user. For details about how number editing is accomplished, refer to "1.2.3.9 Editing Call Log Numbers".

When Calling Number is Not Available

Throughout the document reference is made to a valid Number screen. A valid Number screen is:

- one that contains a DDN or 10-digit ICLID, edited or unedited
- one that originally showed `Unknown number` or `Private number` and was subsequently edited to contain digits

Note that dialing directly from the call log is possible only if ICLID or DDN is part of the CMS/CLASS information delivered. In situations where:

- calling number is not subscribed to
- the data is corrupt

- no number field appears in the call log. In this case, capabilities for editing and calling from the log are not provided.

On number screens that read `Private number` or `Unknown number`, editing is supported. In these cases:

- The `TRIM` display key is not available. The `ERASE` display key appears instead.
- Editing must begin with adding leading digits. See “Adding Digits” on page 38.

If the user attempts to make a call from the number screen when the number is an unedited `Private number` or `Unknown number`, and then selects an idle line or intercom key, the feature is exited.

Method of Making a Call

For making a call from the call log, a method like predial is used.

The method for making a call from the call log has the following characteristics:

- does not use a display key
- requires all editing to be completed before choosing a line
- requires explicit choice of an outgoing facility
- is easily transportable to one-line display sets

There was no negative feedback from the users at the site visits about this approach to dialing from the log. (Many of these users were accustomed to explicitly selecting a line to make a call.)

When the user is viewing a valid number screen for an item in the call log, explicitly choosing an outgoing facility results in the digits being sent out on the chosen facility. The explicit facility can be chosen in one of the ways illustrated in the following table.

As with other Norstar autodialers, the actual telephone number associated with the system autodialer appears on the user's display when the call is placed.

Facility chosen	Outgoing digits format
Intercom key	leading digits are: <ul style="list-style-type: none"> • line pool access code or • external line access code followed by external number If not, deliver error message: <code>No line selected</code>
External line key	external number <ul style="list-style-type: none"> • can include beyond-PBX access code (access code that the switch recognizes)
Programmed line pool key	external number <ul style="list-style-type: none"> • may include beyond-PBX access code (access code that the switch recognizes)

Facility chosen	Outgoing digits format
Offhook/handsfree key Prime line is: Line pool or External line	external number <ul style="list-style-type: none"> • may include beyond-PBX access code (access code that the switch recognizes) • Basic set must dial external line access code to obtain prime line
Offhook/handsfree key Prime line is: intercom	leading digits are: <ul style="list-style-type: none"> • line pool access code or • external line access code followed by external number If not, deliver error message: <code>No line selected</code>

Facility Choice for Dialing Digits from the Call Log⁵

When the user is on the Number screen, and there are calls alerting at the set, there is an interaction between the facility choice actions for making the call, and answering an incoming call. The following table summarizes.

Case	Call is	Action to choose facility is	Result is
1.	Audible alerting	Offhook/handsfree	Exit call log Answer incoming call (automatic incoming line selection)
2.	Audible alerting	Choose idle line	Send digits
3.	Non-audible alerting on prime line	Offhook/handsfree	Error message <code>No line selected</code>
4.	Non-audible alerting NOT on prime line	Offhook/handsfree (prime line assigned)	Send digits
5.	Non-audible alerting	Offhook/Handsfree (no prime line assigned)	Error message <code>No line selected</code> or <code>Select a line</code>
6.	Audible (external line, Answer key, DIA line or Intercom) or Non-audible alerting call	User chooses alerting line key	Exit call log Answer (or preselect) call on the key

Interaction between Facility Choice Actions when the User is on the Number Screen (with a delivered number), and an Incoming Alerting Call

For hotline sets, if the user is on a valid Number screen, selecting the prime line sends the call log digits on the prime line.

On any screen other than a valid Number screen or the screen identifying an answering set, all user actions listed in the table, "Interaction between Facility

5. This table looks at products other than Norstar/Centrex. Norstar/Centrex product must be examined in terms of extension keys when prime line is chosen or prime line not chosen (with and without voice mail) and extra line keys with and without voice mail. The same reasoning as used in the other product platforms should be used.

Choice Actions when the User is on the Number Screen (with a delivered number), and an Incoming Alerting Call” on page 34, exit call log. In addition, for hotline sets, the hotline call is made if the user goes offhook or presses handsfree.

No Prime Line is Assigned

If the prime line is busy, or no prime line has been assigned and the user attempts to select a line by going offhook or pressing handsfree, the following three-second transient message is displayed with error tone.

No line selected

The call log context is maintained. Therefore,

- If user selects a line (intercom key) at this point, the digits are outpulsed on the line (intercom).
- If the user waits for the three-second timeout period, the Number screen (with any edits preserved) is presented.

User Selects Someone Else's Private Line

If the user selects a private line that is assigned as Private to someone else, the normal error message appears with error tone and call log context is maintained.

Line denied

Line (Pool) is Busy

If the facility is busy, an error tone and the appropriate error message is presented, depending on whether the facility selection was a specific line access, or through a line pool.

For a specific line, the transient message:

In use: SETNAME

For a line pool, the static message:

No free lines

Due to software constraints, the user cannot be returned to the Number screen of the call log. The user is returned to the idle display. The user can use the RESUME function to return to the same place in the log quickly.

1.2.3.9 Editing Call Log Numbers

In order to call back a previous caller, sometimes the user need to erase leading digits from, and to add leading digits to, the number in the call log in order to

- create a dialable number
- specify facilities such as Norstar line pool codes and Norstar external line access code
- specify facilities such as PBX and private network access codes

Because of memory constraints, Norstar cannot maintain both an edited version, and an unedited version of a number in the call log.

In order to provide the repeat call capability, Norstar preserves the unedited version of a number in the call log. This is required, so Norstar can match information about incoming items against existing items. Because repeat calls is an important capability, any editing performed by a user is not saved. This means that every time a user returns to an item to make a call, any required editing must be repeated. Users may expect that once an edit has been made to an item's number, those changes are permanent. Therefore the need to edit a number in the log before making a call must be minimized.

If the user leaves the Number screen after editing the number using the NEXT, MORE or BACK facilities, the number returns to its original format.

Dialable Numbers

Some switches provide DDNs to customer premises equipment (CPE), instead of the ten-digit telephone number associated with a call. In this case, Norstar displays the DDN to the user.

For example, a local number can appear like this (without area code):

100:7632142
NEXT TRIM MORE

and a long distance number can appear like this (with long distance digit and area code):

100:14167632142
NEXT TRIM MORE

or this (with long distance digit without area code):

100:17632142
NEXT TRIM MORE

As in ICLID and Call Information, if a DDN is truncated (that is, the switch delivered more than 11 digits) the number is directly preceded by the symbol “/”. If the Number screen has a sequence number, and there are no other status indicators (Answered call, or long distance indicator), this symbol replaces the sequence number separator.

100/12345678901
NEXT TRIM MORE

100 5 /12345678901
NEXT TRIM MORE

The ability to edit (see “Editing Functions” on page 37) is also provided to cover exceptions, and to allow:

- the input of leading digits which may be required to access an outgoing facility
- TRIM in the case of a Centrex number when a full 10-digit number has been delivered
- TRIM and input in the case where the user wishes to replace normal long distance dialing digits with private network dialing digits

Display and Use of Ten-Digit ICLID on the Number Screen

The majority of switches in the United States do not provide DDN to CPE. Because users are opposed to editing, Norstar must provide a means to minimize the need to edit. Because of implementation constraints, Norstar CMS/CLASS cannot provide totally dialable numbers. However, Norstar's approach to providing the area code reduces the cognitive task of editing. In most cases, any editing consists of only one activity, adding digits, instead of two different activities, trimming and adding.

Norstar strips the area code from the ten-digit ICLID, and appends it at the end of the remaining seven-digit ICLID. The area code digits are for reference only, and is not sent out on the chosen facility.

If there is no long distance indicator, the area code is presented in brackets.

7632142 (613)
NEXT TRIM MORE

If there is a long distance indicator, the brackets are dropped, and the long distance indicator precedes the area code.

7632142 5613
NEXT TRIM MORE

In this way:

- For local calls, the user never has to delete (trim) the area code. This means that for local calls, the user only needs to insert the leading access digits.
- For long distance calls within the same area code, where the area code must not be part of the dialed number, the user does not have to delete the area code
- The user seldom has to use the trim operation (only in the case of Centrex, or behind PBX where truncated dialing plans are used)
- The user always knows the area code. This is in contrast to the situation where only a limited number of local area codes are stripped. Local area code stripping leads to confusing situations
 - In areas where sometimes the local area code is required for dialing and sometimes it is not.
 - Where extended area dialing precludes the insertion of an area code different than the local area code.

Norstar allows the user to make the decision, and the Norstar user has the area code for reference.

Editing Functions

Trimming Leading Digits

A user may need to trim leading digits to make a dialable Extension number. This is appropriate behind Centrex, or behind a PBX where a truncated dialing plan is used, and a 10-digit ICLID is delivered.

The Number screen has **TRIM** as its center display key. If the user adds leading digits, the display key changes to a **BKSP** display key.

Both the TRIM and BKSP display keys map to the Volume down bar, which acts in a context sensitive manner.

7632142 (613)
NEXT TRIM MORE

The user presses the TRIM key once for each digit removal. Therefore, to make this number a five-digit Centrex number the user presses the TRIM display key twice.

32142 (613)
NEXT TRIM MORE

If the number is preceded by a sequence number and status indicators, as soon as the TRIM function is used, the sequence number is removed, along with any status indicators and the first digit of the telephone number.

For example:

107632142 (613)
NEXT TRIM MORE

Press TRIM once:

632142 (613)
NEXT TRIM MORE

If the number is a ten-digit ICLID number, and the only thing remaining on the display is the area code (with brackets or the long distance indicator), the TRIM display key is replaced with the ERASE display key.

For example:

(613)
NEXT ERASE MORE

If the user input numbers at this point, the BKSP display key appears:

2142- (613)
NEXT BKSP MORE

Adding Digits

Digits are added to the beginning of the digit string, in the order that they are pressed during ordinary dialing, by pressing the appropriate dialpad digit.

When the user adds a digit, a dash appears between the first digit of the delivered number and the inserted digits.

7632142 (613)
NEXT TRIM MORE

The user inserts the digit 3, 2, 1 for line pool access.

321-7632142 (613)
NEXT BKSP MORE

Note that the TRIM display key has changed to a BKSP display key.

The user inserts the digit **1** for long distance access.

1321-7632142 (61
NEXT BKSP MORE

Digits can be added until the autodialer string reaches 24 digits, excluding the appended area code.

As the user adds digits, the digits to the right of the insertion dash (including the area code) scroll off the right hand side of the display. When the insertion dash becomes the 16th character, entry of further digits results in an ellipsis in the first position, as the digits to the far left scroll off the left hand side of the display⁶. In this way, the user always has

- maximum view of the digits that have been input
- access to the latest input digits so the **BKSP** function can be used

For example:

7632142 (613)
NEXT TRIM MORE

Input 11 digits (right hand scrolling off display):

12345678901-7632
NEXT BKSP MORE

Input 15 digits (insertion dash becomes the 16th character):

123456789012345-
NEXT BKSP MORE

Input 16 digits (at the 16th input digit, left hand scrolling off the display, and addition of the ellipsis):

...34567890123456-
NEXT BKSP MORE

If the number is preceded by a sequence number and status indicators, as soon as the input function is used, the sequence number is removed, along with any status indicators and the input digit is shown.

For example:

10:7632142 (613)
NEXT TRIM MORE

Input the digit **1**:

1-7632142 (613)
NEXT TRIM MORE

6. This is similar to the way Predial works. The digits are input and advance to the right until the 16th position is reached, and then the digits to the left scroll off the display.

Note that the **[*]** and **#** keys are still active navigation keys, and therefore cannot be used as part of the input string.

[Hold] is still a method of erasing the item.

Reach-through codes are not allowed as input on the Number screen⁷.

On number screens for private and unknown number, digit input is allowed. If a digit is input, the **ERASE** display key toggles to the **BKSP** display key, and the dash appears.

Private number
NEXT ERASE MORE

User inputs digits.

1613283555-
NEXT TRIM MORE

Backspacing to Delete Added Leading Digits

When leading digits are added, the **TRIM** display key changes to a **BKSP** display key. Volume down, which is mapped to a physical key, is context sensitive to the **TRIM** and **BKSP** function.

1321-7632142 (61
NEXT BKSP MORE

Each time the **BKSP** key is pressed, one digit is removed, in reverse order to that in which they were entered (as **BKSP** works in other features such as **Predial**).

The user presses **BKSP** once. At this point the area code reenters as space permits:

132-7632142 (613
NEXT BKSP MORE

The user presses **BKSP** three more times. The **BKSP** display key changes to **TRIM** when all inserted digits have been removed, and the insertion dash is removed.

7632142 (613)
NEXT TRIM MORE

1.2.3.10 Exiting the Call Log

The user can exit the call log by:

- pressing the **[Rls]** key
- pressing the **[Feature]** key
- taking no action for the feature timeout period (30 seconds)

In this case, the timeout is accompanied by the message **Feature timeout** and an error tone.

- attempting to make a call from the call log

⁷ Reach-through codes are not allowed because the use of the “Feature” key ends the Call Log feature. Theoretically, the reach-through codes that can be programmed onto a key could be entered, by using a programmed key. However, there appears to be no strong requirement for this function.

This includes selection of an unavailable facility.

- answering or preselecting an incoming call
- selecting an idle line or intercom key, when not on a valid Number screen
- selecting a held line

Except on an editable Number screen, pressing any dialpad keys, other than those mapped to navigation, scrolling, and erasing, is ignored. Navigation keys for both one- and two-line displays are:

, , , and .

1.2.4 End User Programming View

The end user can perform the following functions

- program keys (See “1.2.4.1 User-Programmable Keys”.)
- assign the autologging option under **Terminals&Extns**►
User Preferences►**Call log options**.
(See “User Options for Autologging” on page 7 and “1.2.4.2 Programming the Autologging Option”.)
- assign or change an optional password under **Passwords**►
Call log pswds►**Extn #:****ExtnName**►**Log pswd:******.
(See “1.2.4.3 Assigning and Changing the Password”.)

1.2.4.1 User-Programmable Keys

Enter Call Log

The user can program one key for call log entry, .

If a key with an indicator is programmed, the indicator is lit when there are new items in the call log.

Key inquiry displays:

Call Log

Logit

The user can program one key for the Logit feature, . An indicator is not used.

Key inquiry displays:

Logit

Autobumping option

The user can program one key for the autobumping option, .

A cancellation code is available, to disable the feature.

can be programmed on a key. Pressing the key toggles autobump on and off.

If it is assigned to a key with an indicator, the lamp is on when the Autobump feature is enabled.

Key inquiry displays:

Log Autobumping

1.2.4.2 Programming the Autologging Option

The end user can program one of five autologging options at their set, once it has been set up for the Call Logs feature in OAM programming. The options are:

- No autologging
- No one answered
- Unanswered by me
- Log all calls

The default setting is `No one answered`.

For a complete description of these options, refer to “User Options for Autologging” on page 7.

For the interaction of selecting the autologging options with other user actions, refer to the table, “Effect of Telephony Actions on Interactive Features” on page 43.

1.2.4.3 Assigning and Changing the Password

See also “Effect of Telephony Actions on Interactive Features” on page 43 table for interaction with other user actions.

If the user has not previously assigned a password, then they are prompted for the new password immediately. Otherwise, programming begins with entry of the old password.

If the old password does not match the assigned password, then programming ends with the transient error message and error tone.

If the user enters four digits before pressing the `OK` display key, they are prompted to re-enter the password for confirmation. If the re-entered password does not map the first entry, then the password is not assigned (changed). An error tone and transient error message is displayed before returning to the idle display.

If the user enters a new password that is identical to the old password, the message is given.

`Pswd not changed`


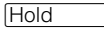



If the user enters no digits at the first prompt before pressing `OK`, any previously assigned password is deleted, and the user is given a confirmation transient before returning to the idle display.

If the user enters any number of digits other than none or four at the first `Newpasswd_` prompt, an error message and error tone are given, before the user is returned to the idle display.

1.2.4.4 Effect of Telephony Actions on Interactive Features

The following table shows the effect of interactive features on programming the autologging option or a password.

Effect of Telephony Actions on Interactive Features

Feature	Effect on Autologging Option Programming	Effect on Password Programming
Programmed feature keys	Terminates programming.	Terminates programming.
External autodialer	Terminates programming.	Terminates programming.
DSS key	Terminates programming.	Terminates programming.
Feature key	Terminates programming.	Terminates programming.
 key	Terminates programming.	Terminates programming.
 key	Mapped to OK display key.	Maps to the OK display key.
Line key	Terminates programming.	Terminates programming.
Intercom key	Terminates programming.	Terminates programming.
Onhook	Terminates programming.	Terminates programming.
Offhook	Terminates programming.	Terminates programming.
Dialpad	 mapped to NEXT. All others ignored-no effect.	Digits are valid input.  and  are ignored (no effect).
Shift key	No effect.	No effect.
Incoming Priority Call	Terminates programming.	Terminates programming.
Incoming Voice Call	Terminates programming.	Terminates programming.
Handsfree key	Terminates programming and attempts to select line.	Terminates programming and attempts to select line.
Blank key	Terminates programming.	Terminates programming.
Blank display key	No effect.	No effect.
Display key	Performs appropriate function.	Performs appropriate function.
Volume bar up	No effect on programming.	No effect on programming.
Volume bar down	No effect on programming.	No effect on programming.

1.2.5 OAM Programming View

1.2.5.1 Levels of Access

The following tables shows the levels of access required for users to program OAM changes.

Heading	Item			I	SC+	SC
Terminals&Extns	Individual extn	Call Services	COPY (softkey)	X	X	
			Auto call info	Line <i>nnn</i>	Calller ID set:N (Compact Plus only)	X
					Call log set:N	X
			1stDisplay:NAME	X	X	
			Auto Called ID:N	X	X	
			Log space	X	X	

Heading	Item			I	SC+	SC
System prgrming	Featr setting	Call log space	Space/log: <i>nn</i> 250 for Compact Plus 600 for Modular Plus	X	X	

Heading	Item			I	SC+	SC
Passwords	Call log passwords	<i>Extn#</i> :EXTNAME	Log pswd:****	X	X	

See "Terminals&Extns - Call Services".

See "System Programming - Feature Settings - Call Log Space".

The user in OAM Programming can also reset a password for an end user, if an individual password has previously been set:

See "Passwords - Call Log Passwords".

1.2.5.2 Programming a Set as a Logging Set for Log Items (for Initially Alerting Calls) on Assigned Trunks and DIA lines

To be assigned as a logging set (for initially alerting calls) for the automatic logging of unanswered calls on a trunk or DIA line, the set must have already been assigned the trunk or DIA line. (See the "Norstar Call Types Eligible for Call Logging" on page 4 under "1.2.3 End User View" for a detailed definition of logging set.)

Assignment is done in **Terminals&Extns**, under **Call Services**►**Auto call info**.

When the user presses **SHOW** from the heading **Linennn:LINENAM**, the lowest numbered trunk or DIA line assigned to the set is shown. Pressing **SHOW** again shows the parameter **Call log set:** with the value **N** or **Y**.

N (the default) indicates that the set is not a logging set for the trunk or DIA line, and therefore calls on that trunk or DIA line unanswered at that set cannot be autologged in that set's call log.

Y indicates that the set is a logging set for the trunk or DIA line, and therefore calls on that trunk or DIA line defined as Unanswered at that set can be autologged in that set's call log.

Assignment as a logging set can be made to sets that have ringing or non-ringing appearances of trunks and DIA lines.

Template-Specific Defaults for Receiving Call Logs

Newly assigned lines in all templates are by default assigned to ring, but the default setting for `Call log set:` on newly assigned lines is N.

1.2.5.3 Allocating and Reallocating Call Log space

Call log space can be allocated and reallocated on a system-wide (global) basis, or on a set-by-set basis.

At Startup, the user can allocate call log space at a global level, by assigning a default or equal number of log spaces to all sets, within the system's maximum constraints, (under the heading `System prgrming►Featr settings►Call log space►Space/log:nn`).

This global approach can also be used for reallocation of log space.

Allocation and reallocation can also be done on a set-by-set basis. If only a few sets need to have their space allocations changed, then set-based reallocation should be used.

If major changes to the allocation of space are to be made, for example, to change the general allocation to all sets from 10 to 5, then the system-based allocation is more efficient. After the major changes have been made with system-based allocation, the set-based allocation can be used for fine-tuning.

1.2.5.4 Allocation and Reallocation on a System-Wide Basis

Allocation and reallocation on a system-wide basis is provided as a means to easily assign an equal number of log spaces to all sets (within the constraint of the system maximum). This function is provided under `System prgrming►Featr settings►Call log space`.

[See "Terminals&Extns - Call Services - Log Space".](#)

It is expected that the system-wide function is used very rarely, for example:

- at Startup
- after using Call Log for a while, the business wishes to make major changes to the configuration of Call Log structure, because they wish to change the way Call Log is used

At Startup, by default, no log space is assigned. The user can assign an equal number of log spaces to all sets, within the maximum constraints.

The following table indicates the available log space and allocation in each platform at Startup. The system maximums do not change.

Number of Sets and Log Spaces by Platform Type

Platform	Maximum No. of Sets	Spaces Assigned at Startup	In the Free Pool at Startup	System Maximum
Compact 3X8	8	0	80	80
Compact 6X16	16	0	160	160
Compact Plus	99 (number given in **Startup)	0	250	250
Modular Mini	24	0	600	600
Modular Midi	56	0	600	600
Modular Maxi	120	0	600	600

The total log space can be reallocated: that is, some removed from some sets and added to others.

A business may want to assign log space to only a few sets, or to one central logging set. In this case, it would be tedious to remove space from all sets before allocation. All space can be reclaimed into the free pool by assigning the value 0 to the parameter `Space/log`:

A business with a Maxi system may want more than 60 sets to have log space, and therefore wishes to change a previously set default to some number smaller than 10.

Because the consequences of system-based reallocation can be quite destructive, when the user requests that this action be taken, a confirmation action is requested. This confirmation informs the user about:

- The number of sets that received logs of this size
- The number of log items assigned to each log that is assigned

For example:

```
6 sets:100 each?
YES                NO
```

If this message represents what the user meant to do, accepting the reallocation (by the `YES` display key) ends the programming session and begins the reallocation procedure.

If the user re-enters OAM Programming immediately, the reallocation process may not be complete. In this case, if the user tries to enter `Call log space` or `Reset all logs`, entry is denied, error tone given, and the transient message

```
Reallocating...
```

If the confirmation message does not represent what the user meant to do, rejecting the confirmation (by NO) returns the user to the `Space/log:_` input screen.

For programming from one-line display sets:

- the YES confirmation display key is already mapped to the COPY key
- NO is already mapped onto the BACKSPACE key
- the OK display key is mapped to NEXT key

How System-Wide Reallocation is Performed

Reallocation is a background activity, and therefore affects any individual set only when that set's reallocation is taking place. The effect is instantaneous for each set.

In order to preserve as much log data as possible, the system uses following reallocation strategy.

- The sets to be allocated log space are determined (new log sets)
 - Allocation begins at set 221, and continues sequentially until all space is allocated. Therefore, as at Startup, some sets may not be assigned log space.
 - If the division of: maximum log space/items for each log leaves a remainder, that remainder space is allocated to the free pool.
- Log space at sets not to be allocated space is reclaimed to the free pool (data lost at these sets).
- At new log sets where log space exceeds the new allocation space, extra space is reclaimed. Blank space is taken first, then oldest items to maintain as much data as possible.
- Reclaimed space is allocated to those new log sets with less than new allocation space.
- Any space not allocated to any set remains in the free pool.

Effect of System-Wide Reallocation on the End User in Call Log

It is expected that system-wide reallocation will take place only as a part of call log setup; such as at the time of initial programming, or after hours. It is also expected that it to be used when few, or no, users are checking their logs.

The following rules describes what happens to users who are in their call log at the time of global reallocation.

1. If no change occurs to a set's log as a result of reallocation, the end user proceeds as normal.
2. If space is being added to the set's log, the end user continues as normal.
3. If log space without data is removed, the end user continues as normal.
4. If space with data is removed, upon navigation from the present item (next or back) the end user sees the transient message

Log reallocation

accompanied by attention tone, and is returned to the updated header screen.

This message takes priority over all other call log status messages.

5. If a set's call log is completely removed because of reallocation, upon navigation from the present item (next or back), the end user sees the transient message `Log reallocation` accompanied by attention tone, and is returned to the idle display.
6. If the end user attempts to enter the call log when reallocation is taking place, admission is allowed in all cases, as reallocation for each set is handled independently of all other sets.

Allocation begins at the lowest numbered set, based on the default set numbers beginning with 221, even if the Extension numbers have been changed.

Allocation on a Set-by-Set Basis

Programming of call log space on a set-by-set basis is performed under `Terminals&Extns`►`Call Services`►`Log space`.

[See "Terminals&Extns - Call Services - Log Space".](#)

If there is space in the free pool, adding space to a set's call log can be done in one step. If there is no space in the free pool, adding call log space to a set is a two-step process.

1. Remove space from one or more set(s). This also puts that removed space into the free pool.
2. Add space to set(s). This removes space from the free pool.

When the user is adding or removing space from the log of a given set, information about the amount of space in the free pool is also available.

The user cannot:

- remove more space from a set's log than is assigned
- add more space to a set's log than what is available in the free pool

If the user attempts either of these two actions, an error message is given, and they are returned to the space status screen.

If changes have been requested in the `Reset all logs` section, and the reallocation is not yet complete, if the user tries to enter the `set Call log space` section, the message `Reallocating...` is presented with error tone. When the reallocation has been completed, entry is permitted, to the updated space status screen.

Space can be removed or added to a set's call log while it is in use. (See "Effect of Set Reallocation on the End User Who is in Call Log" on page 49.)

When an end user's call log is updated:

- blank spaces are removed first
- then items are removed in forward chronological order

The end user can enter their call log while the user who is performing OAM programming is in the `Call log space` session.

Effect of Set Reallocation on the End User Who is in Call Log

If the end user is in the call log when space is being removed, the same rules apply as for global reallocation. That is:

1. If there is no change to a set's log as a result of reallocation, the user proceeds as normal.
2. If space is being added to the set's log, the end user continues as normal.
3. If log space without data is removed, the end user continues as normal.
4. If space with data is removed, upon navigation from the present item (next or back) the user sees the transient message

Log reallocation

accompanied by attention tone, and is returned to the updated header screen.

This message takes priority over all other call log status messages.

5. If a set's call log is completely removed because of reallocation, upon navigation from the present item (NEXT or BACK), the end user sees the transient message `Log reallocation` accompanied by attention tone, and is returned to the idle display.

1.2.5.5 Resetting the Password through OAM Programming

See "Passwords - Call Log Passwords".

It is expected that the only time a user will change the password setting in OAM Programming is if a request comes from a particular end user who has forgotten the password that they have assigned at their set.

If the end user has not assigned a password to their set in OAM programming, the setting is at the startup default, and no means exists for changing the password.

Log pswd:None

If the end user has assigned a password, the user sees the setting "****" (the same as the feedback provided to an end user when a password is entered). The `CHANGE` function here cycles through the options `None` and "****".

Log pswd:****
CHANGE

When a change is made in OAM programming, the password is not changed until the user leaves the `Log pswd:` parameter.

If the user uses the `CHANGE` function, a check is made as to whether the password was reset to `None`, or left intact. If the password was reset to `None`, then the following transient message is given, before going to the specified destination from the `Log pswd:` screen.

Pswd erased

In most cases, the only reason the user is in OAM Programming is to reset the password. Therefore, no navigation is offered at this transient message.

1.2.5.6 Extension Copy

Extn copy does copy the data relating to Call log set, but does not copy password data (Log pswd), or Log space data. For more details see the Extension Copy feature.

1.2.6 **SET/ **LINE

N/A

1.3 Technical Specification (Limits/Constraints)

1.3.1 Logs only Calls that have some ICLID Data

It must be noted that only calls that have some ICLID data associated with them are eligible for logging into a call log. If a customer is using the call log to capture information about how many calls enter the system, they must be made aware of this fact. Calls are not logged in the following situations:

- no ICLID subscription exists for a line (or trunk associated with a DIA line).
- for some reason, no ICLID data was received for a call that came in on a line subscribing to the ICLID feature
 - data is corrupt
 - call was answered before the data was received
 - caller hung up before data was sent or received

1.3.2 Limits of Call Log Input

The following cannot be used as input to the Number screen for callback:

- ☐ used for navigation
- ☐ used for navigation
- reach-through codes

1.3.3 Loss of power

In the Modular Plus product, call logs are stored in NVRAM. This is similar to what was done in previous releases.

In the Compact Plus product, call logs are stored in RAM. This is similar to what was done in previous releases.

The impact of this difference is that in the Compact Plus product, if a loss of power occurs, all logs will be removed; but in the Modular product, all logs will be preserved.

1.3.4 Effects of Shared Lines

If a line and call log receivership for that line is also shared, some social/business convention is required to coordinate handling of the identical log items.

1.3.5 Calls Redirected by scheduled services

Some sites configure their system in the following manner.

A set has not been assigned a trunk. However, all calls coming in on that trunk are meant for that set user. The calls are normally answered by a receptionist and transferred to the set. In off-hours, calls are directed to the set by means of a scheduled services ringing set assignment.

In this set up, that set user is cannot be assigned line autologging for that line. When the set receives calls by means of the scheduled services rerouting, unanswered calls cannot be autologged at the set.






The workaround is to assign a non-ringing trunk appearance.

1.3.6 Calls on Overflow Lines are Not Logged

If more lines are assigned to a set than can appear on keys at that set (with the exception of the M7100 which has no line appearance keys), these non-appearing lines are overflow lines. Even if a set is programmed to be a logging set for overflow lines, automatic logging at initial alerting does not apply.

Note that for a 7100 set, there is no maximum for the number of lines that can be assigned, so in this case, the M7100 can be a logging set for any number of assigned lines.




Effect of Telephony Actions on Interactive Feature (Call Log)

Feature	Effect
Programmed feature keys	Terminates Call Log, attempts to activate feature (exception: programmed key press is ignored).
External autodialer	Terminates Call Log, attempts to dial autodialer.
DSS key	Terminates Call Log, attempts to dial DSS number.
Feature key	Terminates Call Log.
 key	Terminates Call Log.
 key	Used as key map for ERASE display keys.
Line key	On screen other than valid Number screen, terminates feature. On valid Number screen terminates feature, and if line is free, dials out call log Number screen digits.
Intercom key	On screen other than valid Number screen, or screen identifying an answering set (data in this field) terminates feature. On valid Number screen terminates feature, and if line is free, dials out call log Number screen digits. On screen with identified answering set, terminates Call Log and attempts to dial the answering Extension number.
Onhook	Terminates programming.
Offhook	On screen other than valid Number screen, or screen identifying an answering set (data in this field) terminates feature. On valid Number screen terminates feature, and if line is obtained, dials out call log Number screen digits. On screen with identified answering set, terminates Call Log and attempts to dial the answering Extension number on an intercom (extension) key.
Dialpad	On header screen,  is mapped to RESUME.  and  are context sensitive navigation keys on all call log screens. See text for details. On valid Number screen, digits are input on front of number. On other screens, digits are ignored - no effect.

Effect of Telephony Actions on Interactive Feature (Call Log)

Feature	Effect
Shift key	No effect.
Incoming Priority Call	Terminates Call Log.
Incoming Voice Call	Terminates Call Log.
Handsfree key	On screen other than valid Number screen, terminates feature. On valid Number screen terminates feature, and if line is obtained, dials out call log Number screen digits.
Blank key	Terminates Call Log.
Blank display key	No effect.
Display key	Performs appropriate function.
Volume bar up	Used for scrolling within an item.
Volume bar down	Used for TRIM and BKSP function on valid Number screen. On other screens, no effect.

1.4 Interactions

Feature name	Interaction
Answer Groups	No receivership is assigned based on Answer Extension numbers.
Autodial keys (user programmable)	Ends feature if pressed.
Automatic Dial	While in Call Log, Automatic Dial, if assigned at the set is disabled. Any dialpad key presses, except for  ,  ,  are ignored.
Automatic Line Selection	See table, "Facility Choice for Dialing Digits from the Call Log" on page 34.
Automatic Line Selection: Incoming Line	See table, "Interaction between Facility Choice Actions when the User is on the Number Screen (with a delivered number), and an Incoming Alerting Call" on page 34.
Automatic Line Selection: Outgoing Internal Line by a Feature	See tables, "Facility Choice for Dialing Digits from the Call Log" on page 34, and "Interaction between Facility Choice Actions when the User is on the Number Screen (with a delivered number), and an Incoming Alerting Call" on page 34. Call Log Number is an autodialer that requires explicit line selection by the user. An intercom key can be used in conjunction with line pool codes and external Line access code.
Automatic Line Selection: Outgoing Prime Line by Handsfree/Offhook	See table, "Interaction between Facility Choice Actions when the User is on the Number Screen (with a delivered number), and an Incoming Alerting Call" on page 34.

Feature name	Interaction
Automatic Line Selection: Outgoing External Line by a Feature	See tables, "Facility Choice for Dialing Digits from the Call Log" on page 34, and "Interaction between Facility Choice Actions when the User is on the Number Screen (with a delivered number), and an Incoming Alerting Call" on page 34. Call Log Number is an autodialer that requires explicit line selection by the user.
Key Inquiry	As with other feature activation, terminates Call Log.
Automatic Set Relocation	Call log data maintained and if update has been received during set disconnection, that update is reflected on set when reconnected, if within a one-minute period.
Call Forward	Forward destinations are not logging sets for a call by virtue of their being a forward destination (implicit reroute destination). A logging set that is forwarded can automatically log calls that are forwarded.
Call Forward All Calls	See text for information about status display priority, and MSG/CALLS display key. As with other feature activation, terminates Call Log. If set is busied out, call can still be logged.
Call Forward Busy	If set is busied out, call can still be logged.
Call Forward No Answer	Call can be logged at the forwarded set.
Call Identification/Call Status Display	No Call Identification information presented when Call Log is active.
Call Park	No logging of an unanswered Parked call.
Call Pickup	As with other feature activation, terminates Call Log.
Call Pickup - Group	Answered call can be logged as answered call automatically, or with Logit feature. As with other feature activation, terminates Call Log.
Call Pickup - Directed	Answered call can be logged as answered call automatically, or with Logit feature. As with other feature activation, terminates Call Log.
Call Restrictions and Overrides	See Dialing filters in this table.
Call Queueing	As with other feature activation, terminates Call Log. If programmed key is used, immediately activates feature. If feature key used, same as Message Waiting in DR4. Feature key is pressed a second time. The first press simply ends the feature.
Camp on	An explicit reroute. Therefore, the set to which a call is camped is a logging set for that call.
PBX Access (Reach Through)	Cannot be input into a valid call log number. Theoretically, codes stored on a programmed key could be used, but is not allowed.
CLASS/CMS Incoming Call Identification	Passive ICLID not shown when Call Log active.

Feature name	Interaction
CLASS/CMS Call Information	As with other feature activation, terminates Call Log. If Programmed key is used, immediately activates feature. If Feature key used, same as Message Waiting in DR4. Feature key is pressed a second time. The first press simply ends the feature.
CLASS message waiting indication	As with other feature activation, terminates Call Log. If Programmed key is used, immediately activates feature. If Feature key used, same as Message Waiting in DR4. Feature key is pressed a second time. The first press simply ends the feature.
Conference	As with other feature activation, terminates Call Log. If Programmed key is used, immediately activates feature. If Feature key used, same as Message Waiting in DR4. Feature key is pressed a second time. The first press simply ends the feature.
Delayed Ring Transfer	Calls rerouted can be logged automatically at original destination. Calls are not logged automatically at DRT destination (implicit reroute).
Dial Mode - Pulse/Tone	Subscription to ICLID for the trunk requires that the trunk be a TONE trunk.
Dialing Filter	A restriction prevents dialing the number from Call Log.
Direct Station Select (DSS)	Terminates Call Log and makes call.
Do Not Disturb	See text for information about status display priority, and MSG/CALLS display keys. If activated while in Call Log by a programmed key, does not quit Call Log. User may use this to prevent incoming voice calls from terminating feature.
Exclusive Hold	Exclusively held calls can exist at all sets except M7100 when activating Call Log.
Extension Copy	Extension Copy copies receivership value only if line is assigned to Copy To destination. Does NOT copy Password or Log space data.
External Line Access	Required to call from the call log number screen.
Feature Access key (programmable)	Call Log key can be programmed.
Handsfree	See tables, "Facility Choice for Dialing Digits from the Call Log" on page 34, and "Interaction between Facility Choice Actions when the User is on the Number Screen (with a delivered number), and an Incoming Alerting Call" on page 34.
Handsfree - Automatic	Disabled while in Call Log. If line selected, is activated.
Hold	Physical key mapping for Erase/Clear through the list.
Hotline	See "Method of Making a Call" on page 33.
I-Hold/U-Hold/Mutual Hold	I-hold calls can exist at all sets except M7100 when activating Call Log.
Intercom key assignment	Must have an intercom (free) to return internal item and Startalk item call. If not available, error message and tone.

Feature name	Interaction
Language Choice	Translations required for CMWI and internal items prompts. If activated while in Call Log, terminates feature.
Last Number Redial	Terminates Call Log. Calls dialed from the Call Log captures in LNR.
Line access	Required to return call from Number screen.
Line and extn filters	Apply to CMWI callback calls.
Line and Extn Restrictions/Overrides	Apply to calls made from the call log.
Line Type	See table, "Facility Choice for Dialing Digits from the Call Log" on page 34.
Line Type: Pool	If a trunk is assigned only to line pool and not to any set, receivership to CMWI cannot be assigned to any set.
Line Type: Private	Callback to Call Log number can be made on Private line only by owner of that line.
Line Type: Public	For description of shared lines problems, see text.
Manual Line Selection	See tables, "Facility Choice for Dialing Digits from the Call Log" on page 34, and "Interaction between Facility Choice Actions when the User is on the Number Screen (with a delivered number), and an Incoming Alerting Call" on page 34. Can be used in valid Number screen to make call from Call Log. From other screens, terminates Call Log.
Message Waiting/Reply	Activation of feature terminates Call Log.
Paging	Activation of feature terminates Call Log.
Paging- Internal Multiple Zones	Can be received while in Call Log. Does not deactivate Call Log.
Pre-selection	Pre-selection exits from Call Log.
Pre-dial	Number on a valid number screen is a type of predialed number.
Pre-Selection/Call Screening	Terminates Call Log.
Prime Extension (s)	Calls implicitly rerouted to Prime Extension not automatically logged. Applies to all features listed here.
Priority Call	A successful priority call cancels Call Log at priority call destination.
Ring Again	RAG offer does not interrupt any of the CLASS features that are active.
Release	Terminates Call Log.
Saved Number Redial	Can be used to save a number dialed from the Call Log.
Scheduled Services	See text for status priority and display key for CALLS. No special relationship to logging; calls diverted by Scheduled Services considered implicit rerouting.

Feature name	Interaction
Startup	See text.
DIA line Extension numbers	For Call Log receivership, treated as an initially alerting line. See text.
Terminal Type	Can be accessed from M7100, M7208, M7310, and M7324 sets.
Terminal Type: ATA	No access to Call Log. No access to Password programming. No access to Autobumping feature. No access to Autologging options feature. In all cases, deliver error tone.
Trunk Answer From Any Station	As with other feature activation, terminates Call Log.
Transfer	Explicit reroute, therefore, Transfer destination is a logging set.
User-Programmable Feature Keys	See text: "1.2.4 End User Programming View".
Voice Call	See the three tables on "Effect of Telephony Actions on Interactive Features" on page 43, and "Effect of Telephony Actions on Interactive Feature (Call Log)" on page 51. Voice Call Deny can be used to prevent an incoming Voice Call from terminating Call Log.
Volume Control	Inactive as a Volume control during Call Log. Volume up and Volume down used as function keys.

Call Park

1.1 Overview

1.1.1 Description

Call Park places a connected call on hold, allowing it to be retrieved from any Norstar set by means of an automatically assigned Call Park retrieval code. The Call Park prefix can be set in OAM programming to be `None`, or 0 through 9.

Call Park is often used in conjunction with Paging.

1.1.2 Rationale for Feature

A programmable prefix code is used to avoid conflicts with other features accessed using the numbering plan, such as line pool access codes and DN's.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls

, or programmed key

1.2.2 End User View

Call Park provides a method of moving an internal or external call from one set to another, without requiring the user to direct the call to a specific set, and without requiring the destination set to have an appearance of the line. The feature allows a call to be held at one set and then re-accessed by the same user or a different user from any other set, using the system-assigned retrieval code.

Any connected two-party internal or external call can be parked.

To activate the feature, the user presses the Park programmed key or while connected on a call. The display shows `Parked on:<n0x>`, where `<n0x>` is the Retrieve Park ID).

Up to nine calls can be parked in the system at the same time, using Retrieve Park IDs `n01` to `n09`, where `n` is the programmed Call Park prefix. The system assigns Retrieve Park IDs dynamically, from lowest to highest, depending on which IDs are in use by other parked calls at that time. If no other calls are parked, the Retrieve Park ID is `n01`.

On M7310 and M7324 sets, a `PAGE` display key appears automatically after the user parks a call. An `EXIT` display key is also displayed, for cases where paging is not required. These display keys accompany the `Parked on:<n0x>` message. Pressing the `PAGE` display key activates the General Page feature. (For details, see the Page feature.) This allows the user to page any internal zone and/or the external speaker, to request that a particular party retrieve the parked call.

The `Parked on: <n0x>` message and the `PAGE` and `EXIT` display keys remain on the display until one of the following occurs:

- the user presses one of the display keys
- the parked call is retrieved
- the user takes an action (for example, activating a feature or selecting a line) that causes a new message to be displayed

1.2.2.1 Parking a Call

Any connected two-party internal or external call can be parked. Parking of conference calls is not supported. An attempt to park a conference results in a `Park denied` message, along with Error tone.

The user cannot park a call which is in I-Hold state. To Park the call, the user must reselect it and then activate Call Park.

If the call has been placed on hold by the other party, the operations a user can perform on a call are not affected. The user can Park a call placed on hold by the other party, and can retrieve a call in cases where the other party Holds it, either before or after being parked.

When an internal or external call appearing on an intercom key is parked, the indicator beside that key changes to idle state. This allows the intercom key to be used for another call.

When an external call appearing on an external line key is parked, the indicator shows U-Hold status at the set that parked it. The call also shows U-Hold status at any other set having an appearance of the line.

No intercom key or actual set DN is busied when a call is parked. After parking a call, the user is free to place or receive other calls.

No mechanism is provided for querying the park ID of a Parked call.

1.2.2.2 Message Displays

Message	Description
<code>Get call first</code>	Displays if the user activates Call Park when not connected on a call but has one or more I-Hold calls.
<code>Denied in admin</code>	Displays, accompanied by Error tone, if the Call Park prefix value is changed to <code>None</code> , and a user tries to Park a call.
<code>Invalid number</code>	Displays, accompanied by Overflow tone, if the user dials an invalid Retrieve Park ID.
<code>No call on <park ID></code>	Displays, accompanied by Overflow tone, if the user dials a Retrieve Park ID that has no parked calls.
<code>No call to park</code>	Displays, accompanied by Error tone, if the user activates Call Park when not connected on a call and have no calls in I-Hold state.

Message	Description
Park denied	Displays, accompanied by Error tone, if the user tries to Park a Conference call.
Parked on: <n0x> PAGE EXIT	When the feature is activated, displays where <n0x> is the Retrieve Park ID, a three-digit number assigned by the system, n is the programmed prefix with a value between 0 and 9 (default is 1), and x is a digit between 1 and 9.
Parking full	Displays, accompanied by Error tone, if the user activates Park when no System Park ID is available.

To the parked party, being parked is the same as being on Hold. One difference is that if an external call is parked for an excessive time, Callback occurs, generating a Ringback tone to the parked party. (For more information, refer to the Callback feature.)

A parked external call receives the same treatment as a call on Hold, that is, Music/Tone/Silence on Hold.

1.2.2.3 Retrieve Park

A parked call can be retrieved from any set in the system, including the set that parked it, by dialing the park ID into internal dial tone. The ID consists of

- a programmable prefix
- the digit 0
- a digit between 1 and 9, assigned by the system

When a parked call is retrieved, the display shows the normal Call Identification message associated with that call (that is the incoming call information, <linename> or <setname>).

When a parked call is retrieved, the Retrieve Park ID becomes available to be used to park another call.

When retrieved, an external call appears on an external line key at the retrieving set if an appearance exists, and on an intercom key otherwise. An internal call appears on an intercom key.

A parked external call can be reaccessed by pressing the line key on any set which has an appearance of that line, including the set that parked it.

In a system fully configured to the Square template (that is, one in which all external lines appear on all sets), Call Park is unnecessary for external calls, as they can be moved from one set to another using the Hold feature. In this situation, the only application of Call Park is as an alternative to using the Transfer feature. Although Call Park is not needed for external calls in a system configured with the Square template, the feature operates normally, if activated.

1.2.2.4 Park Timeout

If a parked call is not answered, Park Callback Timeout applies, and any parked call is routed back to the set that parked it after the timer has expired. This applies

to any unanswered parked call, including calls that are already parked when the Call Park prefix is changed to `None`.

1.2.2.5 Changing the Call Park Prefix

If the Call Park prefix value is changed to `None` and the user tries to park a call, Error tone and the transient message `Denied in admin` is provided. If an internal call is already parked on the system, when the Call Park prefix value is changed to `None`, the parked call is not dropped, but it cannot be retrieved using the Retrieve Park code. Call processing rules are followed: the system tries to place an internal call, or match the entered digits with some other system-programmable code. The unretrieved parked call is routed back to the set that parked it after the timeout.

If the prefix is changed to a value other than `None`, the same rules apply as for setting the call to `None`, unless the user knows the new prefix. In this case, the call could be retrieved using the new code. For example, if a call is `Parked on:102` and the prefix is then changed to 4, then the call is automatically changed to be on 402, and the user can retrieve the parked call using code 402. The original display of the retrieval code (showing `Parked on:102`) is not updated.

If an external call is parked on the system when the Call Park prefix value is changed, a set with an appearance of an external line on which the call was parked can retrieve the call using the external line.

1.2.3 User Programming View

The user can program a Call Park key but not a Retrieve Park key. Calls are retrieved by dialing the number where the call is parked (for example, 101).

1.2.4 OAM Programming View

1.2.4.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item		I	SC+	SC
System prgrming	Access codes	Park prefix:1	X		
	Featr settings	Park timeout:60	X	X	
		Park mode:Lowest	X	X	

1.2.4.2 Programming Call Park Prefix

See ["System Programming - Access Codes"](#).

The Call Park prefix is set in `System prgming`►`Access codes`►`Park prefix:1`. The default value is 1. The values can be `None`, or 0 through 9, with the constraint that the Call Park prefix cannot conflict with other access codes. Press `CHANGE` to cycle through available choices. (See “1.4 Interactions”.)

1.2.4.3 Programming Call Park Timeout

See ["System Programming - Feature Settings"](#).

Call Park Timeout is programmed in `System prgming`►`Featr settings`►`Park timeout:60`. The values are 30, 45 60, 90, 120, 150, 180, 300 and 600

seconds. Press `CHANGE` to cycle through available options. Park Callback cannot be disabled.

What the caller hears while parked is programmed in `System prgming►Featr settings►On hold:Tones`. The values are: Tones, Music, Silence. The default is underlined. Press `CHANGE` to cycle through available options.

If the park prefix is `None`, the `Park timeout` parameter is still presented. The timeout value for `Park timeout` is ignored when the value is `None`, except in the case described above when parked calls exist, and the prefix is changed to `None`.

1.2.4.4 Programming Park Mode

See "[System Programming - Feature Settings](#)".

Park Mode is programmed in `System prgming►Featr settings►Park Mode:45`. The values are Lowest, and `Cycle`.

The Call Park feature assigns call park codes sequentially until the maximum number of call park codes is reached (25) before starting again at the first call park code. This helps to prevent users from picking up parked calls on a code which was intended for them, but has since been answered and reused for a new and different call.

1.2.5 **EXTN/**LINE

N/A

1.3 Technical Specification (Limits/Constraints)

N/A

1.4 Interactions

Feature or condition name	Interaction
AC15 lines	A user can invoke Call Park for a call on a split line.
ATA	Call is always parked on X09 if available.
Callback	For parked calls, the Held Line Reminder function is performed by Park Callback. If an external call is parked for an excessive time (the default is 45 seconds), callback occurs generating a ringback tone to the parked party.
Conference	Parking of Conference calls is not supported. An attempt to park a Conference results in a <code>Park denied</code> message.
Flexible Numbering Plan: Direct-dial digit Line Pools Routing Service External Line Access Change DN, DN Length	The Call Park prefix cannot conflict with the - Direct-dial digit It also cannot conflict with the first digit of: - a line pool access code - a Destination code - an External Line access code - a DN For more information on programming interactions, refer to the Flexible Numbering Plan specification.

Feature or condition name	Interaction
Held Line Reminder	Held Line Reminder does not apply to parked calls.
Hold	The user can Park a call placed on Hold by the other party, and can retrieve a call in cases where the other party holds it, either before or after being parked.
Music/Tone/Silence on Hold	A parked external call receives the same treatment (Music/Tone/Silence on Hold) specified for held calls in OAM Programming.
OAM Programming session	A parked call does not prevent the set that parked the call from originating an OAM Programming or Maintenance session.
Recall on AC15 (manual)	A user may park the current call on a line that has been split. The user who retrieves the parked line will be connected with the current call on the line and will not see any indication that the line is split.

Call Pickup - Directed

1.1 Overview

1.1.1 Description

Directed Call Pickup allows the user to answer a call ringing at a specific set by specifying the DN of that set from any other set in the system.

1.1.2 Rationale for Feature

See “1.1.1 Description”.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls

, or programmed key and the DN, or Internal Autodial programmed key

1.2.2 Message Displays

Message	Description
<name> pickup	Displays the name of the set or line being answered on the Call Pickup set.
Already joined	Displays transiently, accompanied by Error tone, if the user attempts to pick up a call originating from an internal party with whom the user already has a call.
Denied in admin	Displays transiently, accompanied by Error tone, if the user attempts to activate Call Pickup and it is disabled in Administration Programming.
Invalid number	Displays transiently, accompanied by Error tone, if the user enters an invalid DN.
No key free	Displays transiently, accompanied by Error tone, if no appropriate key is available.
Not in service	Displays transiently if the user specifies the DN of a set that is not in service.
Pickup denied	Displays transiently if - no call is eligible for Call Pickup on the set - the user attempts to pick up a call on a private line
Pickup:	Prompts the user for the DN of the set to be answered.
Your number	Displays transiently, accompanied by Error tone, if the user enters the DN of the set where a Call Pickup is being attempted.

Message	Description
Feature timeout	Displays transiently, accompanied by Error tone, if the feature is activated and, after the user is prompted for a DN, input is not entered for 15 seconds.

1.2.3 End User View

To answer a call ringing at another set, the user presses the Directed Call Pickup programmed key or Feature 7 6. The display prompts `Pick up:`. The user dials the desired DN (or presses the appropriate Internal Autodial key), and the highest priority Ringing Call at their set is connected.

This feature lets the user answer their own phone from another phone, without being in the same Pickup Group as the target set or without having an Answer Key assigned. As well, the feature allows the user who is covering calls for someone else to specify the exact set for which a call is to be answered, rather than answering any call in a group of sets.

The operation of this feature, aside from the ability to specify the target set, is the same as the Group Pickup feature. Specifically, the picked up call appears on an appropriate external line key or intercom key on the user's set, with the display `<name> pickup`, where `<name>` is the name associated with the set or line being answered.

If the user activates the Pickup feature, they are prompted to enter the Pickup DN. Subsequent presses of the Directed Call Pickup programmed key are ignored.

The user cannot program a Directed Call Pickup key for a specific set. In a situation where a user regularly wants to pick up calls directed to a specific other set, the possible solutions are:

- create a Pickup Group containing only those two sets, and then use Group Call Pickup to pick up the calls (See the Call Pickup - Group feature.)
- assign one set an Answer key for the other (See the Answer DNs feature.)
- Call Forward

There may be a privacy issue associated with the Directed Call Pickup feature, especially in larger systems where a call ringing at another set could be picked up by mistake or maliciously by a user anywhere on the premises.

A call cannot be picked up by Directed Call Pickup (or Group Call Pickup) if the call is ringing the Auxiliary Ringer but not alerting at any set. Such a call could be answered by Trunk Answer From Any Station, assuming that the line is in one of the Scheduled Services, and the Trunk Answer From Any Station feature is enabled in OAM Programming.

If a call is ringing at an attendant's set in an Answer Group, a user can pick up that call with Directed Call Pickup by dialing either the DN of the attendant's set or the DN of the set for which attendant services are being performed.

Directed Call Pickup does not apply to Private Lines.

1.2.4 User Programming View

The user can program one Directed Call Pickup key on a set. The key does not use an indicator.

1.2.5 OAM Programming View

1.2.5.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item		I	SC+	SC
System prgrming	Featr settings	Directd pickup:Y	X	X	

1.2.5.2 Programming Directed Call Pickup

Directed Call Pickup capability is enabled or disabled on a system-wide basis.

[See "System Programming - Feature Settings".](#)

In System prgming►Featr settings►Directd pickup:Y, press CHANGE to reset the value for Directd pickup from Y (the default) to N.

1.2.6 **EXTN/**LINE

N/A

1.3 Technical Specification (Limits/Constraints)

N/A

1.4 Interactions

Feature name	Interaction
Answer DNs	If a call is ringing at an attendant's set in an Answer Group, the call can be answered with Directed Call Pickup by dialing either the DN of the attendant's set or the DN of the set for which attendant services are being performed.
Auxiliary Ringer	A call which is ringing at the Auxiliary Ringer but not at any set cannot be answered by Call Pickup.
Hold	If the user activates Call Pickup while active on a call, Automatic Hold is applied to that call, whether or not the Pickup attempt is successful.
Priority Call Private Line Voice Call	Priority Calls, Voice Calls, and calls on a Private Line cannot be picked up with Call Pickup - Directed.

Call Pickup - Group

1.1 Overview

1.1.1 Description

A member of a Pickup group can answer an internal or external call ringing at another set in the group.

1.1.2 Rationale for Feature

See “1.1.1 Description”.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls

7 5, or Call Pickup programmed key

1.2.2 Message Displays

Message	Description
<name> pickup	Displays on the Call Pickup set for internal and external calls.
Denied in admin	Displays transiently, accompanied by Error tone, if the feature is activated on a set that is not in a Pickup Group.
Pickup denied	Displays transiently, accompanied by Error tone, if no call is eligible for Call Pickup on the set, or if Call Pickup is used to answer a call that originated at the set attempting to pick it up.
No button free	Displays transiently if <ul style="list-style-type: none"> - no line key or intercom key is available to present the picked-up call - the user tries to pick up a call at the set that originated the call
Already joined	Displays transiently, accompanied by Error tone, if a set attempts to pick up a call from a set which, if connected, would mean having two connections with the same set.

1.2.3 End User View

When the user presses the Call Pickup key or 7 5, the highest priority ringing call in the group is answered at the set. (For information on call priority, see the Call Capture feature.)

The user's set must be a member of a Pickup group defined through OAM Programming. Any member of the group can answer a call ringing on another member's set by pressing the Call Pickup key or dial pad code. If the attempt is successful, the call appears on a line key.

If the picked-up call is on an external line that already appears on the set, that line key is used. Otherwise, the call is presented on an intercom key, which is selected automatically if the user has not already obtained internal dial tone.

The user can activate Call Pickup at any time. If the user is active on a call, Automatic Hold is applied to that call, whether or not the Pickup attempt is successful. There is no limit to the number of concurrent Call Pickup attempts taking place in the system. After picking up a call, the user can press the Call Pickup key or dialpad code to pick up another call while the first call is still active.

If the set is onhook with Handsfree OFF when Call Pickup is performed, the set is placed in speaker-only state (similar to the Onhook Dialing state). The call is connected and the speaker is active, but the user must lift the handset or activate Handsfree in order to talk to the calling party.

Call Pickup applies only to calls which are ringing at sets in the Call Pickup Group.

Call Pickup cannot be used to answer a call that is ringing only at the set from which the Pickup attempt is made, or a call that originated at the set attempting to pick it up.

A set can belong to only one Pickup Group.

1.2.4 User Programming View

The user can program one Call Pickup key on their set. An indicator is not used.

1.2.5 OAM Programming View

1.2.5.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item			I	SC+	SC
Terminals&Extns	Individual set	Capabilities	Pickup grp:None	X	X	X

1.2.5.2 Programming Call Pickup - Group

See "[Terminals&Extns - Capabilities](#)".

A set can be assigned to one of four pickup groups. From `Terminals&Extns`►`Capabilities`►`Pickup grp:None`, press `CHANGE` to select the appropriate value for `Pickup grp` from 1 to 4, or None. The default is underlined.

1.2.6 **EXTN/**LINE

N/A

1.3 Technical Specification (Limits/Constraints)

A set can be assigned to one of nine pickup groups in Administration programming. A set can belong to only one Pickup group.

1.4 Interactions

Feature or condition	Interaction
Answer DNs	If a call is ringing at an attendant's set in an answer group, the call can be answered with Directed Call Pickup by dialing either the DN of the attendant's set or the DN of the set for which attendant services are being performed.
Auxiliary Ringer	A call which is ringing at the Auxiliary Ringer but not at any set cannot be answered by Call Pickup.
Hold	If the user activates Call Pickup while active on a call, Automatic Hold is applied to that call, whether or not the pickup attempt is successful.
Priority Call Private Line Voice Call	Priority Calls, Voice Calls, and calls on a Private Line cannot be picked up with Call Pickup - Directed.

Call Restrictions and Overrides

1.1 Overview

1.1.1 Description

Call Restrictions and Overrides allows extensions and lines to be restricted in OAM Programming, such that certain digit strings cannot be dialed on external calls. Where restrictions have been applied, a second group of digit strings can be specified that are overrides to the restrictions, which override the restricted digit strings. The restrictions and overrides are flexible in that they are customer-definable and can be applied selectively to individual extensions and lines.

The feature permits the user to provide, or to limit, certain capabilities available to

- extensions
- lines
- line/extension combinations
- remote-access calls using auto answer trunks
- users with Class of Service (COS) passwords

A concept introduced in this feature is restriction filters. A restriction filter is an user-defined collection of dialing restrictions and overrides. A restriction filter can be applied as a unit to

- one or more extensions (extension restriction)
- one or more lines (line restriction)
- line(s) on a particular extension or extensions (line/extension restriction)

The restrictions limit what calls can be dialed out using these facilities.

In additions to the regular restriction filters, which manage outgoing dialed digits, lines can have remote restrictions applied to them. Remote restrictions manage the digits that can be dialed in on those lines when they are used on the incoming side of a tandem call. As such, these remote restrictions serve the same purpose as do extension restrictions for locally dialed calls. In a tandem situation, the outgoing line's restrictions apply as usual.

Remote access packages permit the system administrator to manage access to line pools and to the remote page feature for remote-access users.

The administrator is also permitted to define Class of Service passwords (as described in the Class of Service feature) and assign restriction filters and remote-access packages to each of them.

The remote user can change their Class of Service by dialing the DISA DN (see the Class of Service feature) and entering a valid COS password. The capabilities associated with that password (user restriction, line restriction, remote package) then replace any existing restriction filters and access package for the duration of the call.

Internal users do not have access to the DISA DN, but can change their dialing capabilities using Feature 6 8 (Restriction Override feature) and entering a COS password. The restriction filters associated with that password replace any existing extension, line, or line/extension restrictions. For details, see the Class of Service feature.

1.1.1.1 Extensions, systems, and hardware supported

Restriction filters can be used to manage dialing on extensions as well as on outgoing trunks.

Remote restriction filters can be used to manage dialing on incoming auto answer trunks being used for tandeming.

Remote access packages can be used to manage:

- line pool access on incoming auto answer trunks being used for tandeming
- access to the Page feature from auto answer trunks.

1.1.2 Rationale for Feature

Call Restrictions and Overrides supports the following usage scenarios:

- prevents long distance calls from a waiting-room extension (extension-based restriction filters)
- limits the capabilities of a particular line to calls to area codes 613 and 416, as well as to the west-coast office, the number for which is (604) 763-2734 (outgoing line-based restriction Filters)
- permits the waiting-room extension to call the west-coast office on line 003, but no other long distance numbers, and on no other line (line/extension-based restriction filters)
- permits salesmen phoning in on auto answer lines to tandem through to predefined area codes (remote-access restriction filters)
- permits, or denies to remote-access users use of the Paging feature (remote access packages)
- permits the managers to gain extra dialing capabilities on a Norstar extension by entering a system-defined COS password

As a result of a Product Change Request, Restrictions and overrides are enhanced to allow for the inclusion of star (*) and number sign (#) as valid digits, so that telco feature codes can be included as restrictions and overrides.

A display key (ANY) is introduced so that a wildcard character can be entered. A wildcard character represents any single dial pad digit, 0...9, *, #. A middle dot (×) is used as the wildcard character.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

The following is an overview of the procedure.

1. Start a OAM Programming session. Go to **Terminals&Extns**►
Restrictions.

2. Specify restriction filters. There might be, for example, an attendant restriction, a manager restriction, clerk restriction and so on. (The names are for illustration only, no naming capability is provided.) Proceed as follows:
 - enter a restriction number to create or modify
 - specify a dial string to restrict (maximum 15 digits)
 - specify as many overrides (maximum 16 digits each) to the restriction as needed
 - repeat the second and third steps above, until no more restrictions and overrides are needed for the particular restriction, or until the available entries are used up. (For more information, see the Technical Specifications section of this feature.)
3. Specify remote-access packages, giving remote users access to line pools and to the Remote Page feature, as follows:
 - enter a package number to be created or modified
 - specify the line pools accessible in the package
 - specify the access to Remote Page
4. For each extension, specify the following:
 - the restriction filter (if any) that applies
 - line/extension restrictions as required, or until the system limit is reached
 - the extension lock, handsfree, and priority call parameters applicable
5. For each line, where applicable, specify the following:
 - the restriction filter (`Line filter`) that applies to outgoing call
 - the remote restriction filter (`Remote filter`) that applies to remote (tandem) users of that line, if the line is auto answer. These are added to the restriction filters in effect for the outgoing line, in the same way that extension restrictions apply.
 - the remote-access package (`Remote pkg`) available to external (remote) incoming users (thereby specifying access to line pools and Remote Page feature in the event that the line was auto answer).
6. Specify the Class of Service passwords, and, for each password, specify the following:
 - a replacement extension restriction (applicable for internal users) or remote restriction filter (applicable for remote users), called the `User fltr`, or leave it (default), which causes the original extension restriction or remote restriction to be used
 - a replacement line restriction filter (`Line restriction`) that replaces any line restriction in effect, or leaves it as `Deflt` that causes the line's original restriction to be used
 - the applicable remote-access package (thereby providing access to line pools and to remote page for external users)

1.2 Feature Details

1.2.1 User View

The discussion below is for background only. The details of the feature are in the OAM Programming section of this feature.

Once the programming of call restrictions and overrides is complete, operation is automatic for all outgoing external calls. Any restrictions or overrides applied to an extension or a line apply for digits dialed both automatically and manually.

If a call does not pass extension and line restrictions, an Error tone is presented, the transient display `Restricted call` appears, and the call is dropped.

Digit strings assigned as restrictions or overrides to an extension apply to all lines used by the extension. Strings assigned as restrictions or overrides to a line apply to all extensions using the line. When both line and extension restrictions are in effect, both restrictions must be passed in order for the call to be made. An override assigned to a line does not remove an extension restriction, and an override assigned to an extension does not remove a line restriction.

When used in a restriction or override string, the wildcard character ("*") matches any digit. When the user dials digits that match a call restriction, and for which no override exists, the call is maintained until the user dials a digit matching the last item in the restriction string. Thus, if a restriction with a value of 11 is in effect, the user can dial 12, 13, etc. without the call being dropped. Similarly, if a restriction of eight wildcard characters is in effect, the user can dial any seven digits without the call being dropped.

Using eight wildcard characters as a restriction provides a type of digit counting, which prevents the user from dialing more than seven digits. To be effective, this restriction should be combined with a restriction against dialing 0 for operator-assisted long-distance dialing. Norstar feature codes are ignored.

In order to eliminate a method of defeating call restrictions, execution of Link, after dialing has commenced, resets call restriction checking. In some cases, this reset can cause the line to drop when the user attempts to perform end-to-end signaling or dial PBX reach-through codes.

This feature is independent of the dialing mode (pulse or tone) on the line.

1.2.1.1 Examples

An extension can be restricted from direct dialing all toll calls outside the home area code by assigning the flexible call restrictions (FCR) strings 1*0 and 1*1 to it (since all area codes have 0 or 1 as the second digit). Toll calls within the area code are still permitted. It may be desirable to allow the user with this restriction to dial a particular area code outside the home area code. This can be done by assigning an override string of 1416, for example, to permit calls to area code 416. Another desirable override might be 1***5551212, to allow directory assistance inquiries in any area code.

1.2.1.2 Internal users

Restriction filters, that are extension-based, line-based, or line/extension-based, restrict the numbers a user can dial on external lines. If a line/extension restriction filter has been defined for the line selected at the user's extension it completely replaces any line restrictions or extension restrictions that otherwise apply. If no line/extension restriction filters are defined then dialed digits are restricted through (and can be rejected by either one of) the extension or the line restriction (if defined).

Access to line pools by an extension is controlled in System programming►
Access codes of OAM Programming.

If the Class of Service is changed by an internal user using (see the section on “*Changing a Class of Service*” in the Class of Service feature), the restriction filters associated with the password entered by the user replace any other restriction filters that otherwise apply, for the duration of the user's immediately subsequent external call.

1.2.1.3 External Users

No restrictions exist on the DIA lines that a remote user, dialing into the Norstar on an auto answer line (or dialing digits into system dial tone on a DID line), can dial. (This assumes the user passed through and DISA security was imposed).

The remote access package to be associated in Administration with the incoming line used by the remote user (or the COS password entered by the remote user), controls access to line pools and the Paging feature (-).

For remote-access users trying to tandem through the Norstar system, the remote restriction filters and the outgoing line restriction filters apply.

If the user enters the system through DISA, the remote restriction, the outgoing line restriction, and access to Remote Page are replaced by those restrictions associated with the COS password, unless the relevant entries associated with that password are Default.

1.2.1.4 Feature Details

For details on Class of Service and a detailed description of remote user capabilities, see the Remote System Access and Remote Capabilities features.

1.2.2 User Programming View

This feature cannot be programmed by the end user. Internal users can change the restriction filter in effect at their extension to those associated with a Class of Service password by using . For details, see the Class of Service feature.

Remote users can change their class of service by dialing the DISA DN, if defined for their system. (See the Remote Access feature.)

1.2.3 OAM Programming View

See ["Terminals&Extns - Restrictions"](#).

The ← and → characters represent the arrow characters on the display. Use of the VIEW→ (or ←VIEW) display key follows existing rules: the display key only appears when all the digits cannot be presented on the screen, in that case the sixteenth character position shows ... (one character). The display key appears in the center display key position.

For this feature, in every case where the user enters a filter or an override, the BKSP display key is provided. Whenever there is at least one digit entered, the BKSP display key appears in the second display key position. When OK is pressed,

the BKSP and OK display keys disappear and the entered filter or override is shown. For example,

H	E	Restr'n nn: 1234_			
N		ANY	BKSP	OK	S

When OK is pressed, if the filter (or override) exceeds the length of the display, the display shows:

H	E	Restr'n nn: 1234...			
N		ADD	VIEW→REMOVE		S

Transient displays last for three seconds, unless otherwise specified. Transient displays never prevent the administrator from proceeding, and disappear as soon as the administrator touches any valid key.

1.2.3.1 Restrictions filters

Restriction numbers range from 00 to 99.


Restriction 00 is a Null restriction, permitting unrestricted dialing.

Restriction 00 cannot be changed. Restriction 00 is allowed to be seen, to allow the administrator to see the contents of the restriction (No restrictions), just as any other restriction can be seen.

Since Restriction 00 cannot be changed, there is no ADD display key presented when viewing the contents of the restriction.

Another restriction cannot be copied to Restriction 00. Therefore, when copying between restrictions, at the Copy to filter: _ prompt, the entry 00 is blocked by the software.

Any number dialed on an outgoing line is checked against the restrictions and overrides (as defined in a restriction or restrictions) associated with the extension (or the user restriction in the case of remote access) and against the outgoing line selected. If the dialed string does not match any restriction, it is permitted to be dialed. If it matches one or more restrictions, but is excepted anywhere within those restriction, it is permitted to be dialed.

The “*” is used to signify wildcard characters, input by means of the  dialpad key.

The restriction filters are always referred to by their two-digit numbers.

It is not possible to delete a restriction. Removing the restrictions from a restriction makes it an unrestricted restriction, but it is not removed. Thus Restriction 08 always retains that number, regardless of anything that happens to the other restrictions.

Conversely, the number displayed with particular restrictions and overrides is an ordinal identifier used for convenience. For example, Restr'n 01: can be 41,

and two exceptions, Override 001:411 and Override 002:416 can apply for that particular restriction. Any override that corresponds to a particular restriction must start with the same digits as that restriction, and be at least as long as its corresponding restriction (as in the example above). Invalid digit input is blocked by the software. When the override is a valid length, an OK display key appears.

If restriction 01 is removed, restrictions 02 through 48 are displayed with the numbers 01 through 47 (restrictions 02-48 move up). This is to prevent the administrator from potentially having to scroll through a long list of ordinal numbers that do not have restrictions associated with them.) If a restriction is removed, its associated overrides are lost. The space that is freed up from removing the entries is thereby made available for use in defining other restrictions and overrides.

While the user is viewing restrictions or overrides, NEXT and BACK show the next or previous restriction or override in order. Pressing NEXT at the last entry in the restrictions list, or pressing BACK at the first entry of the restrictions list shows the parameter Show filter:. Pressing NEXT at the last entry in the overrides list, or pressing BACK at the first entry of the overrides list shows the parameter Restr'n nn:, where nn is the restriction to which that override applies. For example, if override 005 is the last entry associated with restriction 01, pressing NEXT at override 005 shows the parameter Restr'n 01: <digits>.

If no overrides apply to a restriction, pressing SHOW when viewing that restriction gives the display:

H	E	No exceptions	
N		ADD	S

If no restrictions apply to a given restriction, pressing SHOW when viewing that restriction gives the display:

H	E	No restrictions	
N		ADD	S

No relationship exists between the overrides associated with one restriction and the overrides associated with any other restriction. Each override is tightly coupled with its particular restriction. Additions and deletions of overrides do not have any impact beyond the particular restriction and override group concerned, even in those cases in which the restriction was originally created by a restriction COPY operation. Similarly, removing a restriction necessarily implies removing all associated overrides. Nevertheless, if a given number is excepted against one restriction, no other restriction can prevent it from being dialed.

If the user presses the ADD display key at any stage, and adds an entry (if space is available for new entries), a new restriction (or override) is inserted after the one visible at the time the display key was pressed. When the administrator presses OK

to terminate entry of that new restriction (or override) then the new entry is displayed.

If the **ADD** display key is pressed, only the **BACK** key is provided. **HEADING** and **NEXT** are not available. If **BACK** is pressed (before **OK** is pressed), any entered input is not saved, and the administrator is returned to the previous display.

A maximum of 48 restrictions is permitted for each restriction. Any number of overrides can be defined, to a maximum total of 400 restriction entries and override entries for each system.

If no space remains for new entries, and the administrator presses the **ADD** display key, or attempts a **COPY** operation that exceeds the available space, the transient message `Filter(s) full` is presented transiently with error tone. Note that the same message, `Filter(s) full` is presented whether one or more restrictions are full. The display that appeared prior to the transient display is then restored.

The restriction and override string-entry displays scroll left as characters are entered past the right margin. When the maximum number of digits has been entered, the cursor disappears and no more characters are accepted. This follows existing rules for input entry (as with programming Speed Dialers, for example).

Copying information, using the **COPY** operation causes the destination restriction entries (restrictions and overrides) to be removed and the new restriction entries associated with the source restriction to be added.

Rationale for Feature

Without restrictions on telco feature codes, toll fraud can occur, as in the following example. A user selects an external line to a CO. The user dials the telco feature touch-tone code for Call Block (***67**) and then a number in Arizona. (The user's dialing sequence is ***6716027348917**.) If there is no restriction that consists of just the Call Block touch-tone code, this dialing sequence passes restriction checking, the Arizona number is dialed and the operators of the Norstar system are liable for the call charge.

As a second example, a user uses the telco feature tone-tone for a data call (**#54**) as another means to bypass restrictions.

Definitions

Telcos offer their customers a variety of telco features. These features include:

- Call Forward
- Call Return
- Call Block
- Selective Call Rejection
- Selective Call Acceptance
- Call Trace

as well as others. The extension of features offered by one telco can be different from that offered by another telco. A particular feature common to two telcos can have different feature codes.

A telco feature has a pair of codes: one for touch-tone users, and one for rotary dial users. A touch-tone feature code has the format:

`*nn`

The rotary dial equivalent is:

`11nn`

where the pair of digits *nn* is the same.

The dial pad digit star ("*") and number sign("#") are valid digits for inclusion in restriction and override strings.

The user can press the `BKSP` display key to remove a wildcard character. The user can press `OK` when the last character is a wildcard character.

Programming on an M7208 Extension

The `ANY` display key equivalent on an M7208 extension is the fourth key from the top. This key is also used as the equivalent for the `ADD` and `DEFAULT` display keys.

1.2.3.2 Remote Access Package

See ["System Programming - Remote Access"](#).

Remote access packages range from 00 to 15.

Remote access package 00 is a Null package, permitting no access to line pools or remote page.

Remote access package 00 cannot be changed. Remote access package 00 is allowed to be seen, to allow the administrator to see the contents of the package (no access to line pools A-O, and no access to remote page), just as any other package can be seen.

Since remote-access package 00 cannot be changed, no `CHANGE` display key is presented when viewing the contents of the package.

Another package cannot be copied to package 00. Therefore, when copying between packages, at the `Copy to pkg:-` prompt, the entry 00 is blocked by the software.

- At the `package:` prompt the administrator can enter a two-digit package number.
- North America only: On the display for a particular line pool, the numeric line pool access code is provided along with the alphabetic line pool identifier. If no access code has been identified, the brackets appear empty, for example, `Pool A ()`.
- Remote access to line pools and remote page defaults to `N` (meaning no access to either).
- From a line pool display, `NEXT` cycles through each line pool in alphabetical order. After the last line pool is shown, processing continues at the `Remote page:` display.

- Using `COPY` replaces the contents of the destination package (even if already defined) with the contents of the source package.

1.2.3.3 Extension restrictions

[See "Terminals&Extns - Restrictions - Extension Restrictions".](#)

The intent in this section (and the subsequent sections) is to permit the administrator to deal with each extension, line, and so on, only once, applying the required restrictions, and granting the required permissions (handsfree parameters, and so on).

The `Extension restrictions` section incorporates DR3 Permissions, and adds two additional parameters, providing provides permissions for the direct-dial extension, and for redirect ring.

The administrator can assign a normal extension restriction for the extension and alternate extension restrictions for each service mode. (For details, see the Scheduled Services feature). Extension restrictions correspond to the restriction filters previously defined by the administrator.

By applying an extension restriction, the user applies dialing restrictions (and overrides) to an extension. The default extension restrictions have no dialing restrictions defined, but can be changed.

If `CHANGE` is pressed to change an extension restriction, the `NEXT` key is provided. `HEADING` and `BACK` are not provided. If `CHANGE`, followed by `NEXT` is pressed (and no digits, or an insufficient number of digits are entered), the restriction resets to `00` that is, by definition, unrestricted. The user remains at the prompt, `Extn restrns:00`. If `CHANGE` is pressed, followed by valid digits, the entry is accepted, the cursor is removed, and the `CHANGE` display key reappears.

1.2.3.4 Line/extension restrictions

Pressing `NEXT` after the last mode restriction display takes the administrator on to the `Line/extn rstrn` display. This section allows the administrator to specify one or more line/extension restrictions for that extension.

[See "Terminals&Extns - Restrictions - Line/Extension Restrictions".](#)

Like extension restrictions, different line/extension restrictions can be assigned for different Scheduled Services. (For details, see the Scheduled Services feature.) The default line/extension restrictions have no dialing restrictions defined, but can be changed.

- Line/extension restrictions, if specified to be other than `None`, replace the extension restrictions and line restrictions that otherwise apply to calls on that extension and line.
- A total of 255 such restrictions can be assigned system-wide. If the user attempts to assign more than that, an error tone and the transient message, `Line/extn full` is provided.
- If the administrator presses the `CHANGE` display key, and then presses `NEXT` (without entering any digits, or an insufficient number of digits), the restriction is extension to `None`, which means no line/extension restriction. The user remains at the same restriction prompt. Note that when `CHANGE` is pressed,

HEADING and BACK are not available. If CHANGE is pressed, followed by valid digits, the entry is accepted, the cursor is removed, and the CHANGE display key reappears. The administrator presses NEXT to view the next mode's restriction, or from the last mode restriction display return to the Show line: prompt.

If the administrator enters a line number for a line that is not assigned to the extension, error tone and the transient display, Line not assigned, is provided.

When a line appearance(s) is removed from an extension, any associated line/extension restrictions for that line (for that extension) are removed.

NEXT after the Line/extn Rstrn display takes the administrator on to the Extn lock: display.

1.2.3.5 Line restrictions

Line restrictions are also assigned on a mode-by-mode basis. (For details, see the Scheduled Services feature). The default restriction filters for lines have no restrictions or overrides defined, but can be changed.

See ["Lines - Restrictions - Line Restrictions"](#).

Pressing CHANGE to change a line restriction, followed by NEXT (without entering any digits, or an insufficient number of digits), resets the restriction to Restriction 00, that is, by definition, unrestricted. Note that when CHANGE is pressed, HEADING and BACK are not available. If CHANGE is pressed, followed by valid digits, the entry is accepted, the cursor is removed, and the CHANGE display key reappears.

The default remote restrictions for a line (again, assigned on a mode-by-mode basis) have no restrictions or overrides defined, but can be changed.

See ["Lines - Restrictions - Remote Restrictions"](#).

Pressing CHANGE to change a remote restriction, followed by NEXT (without entering any digits, or an insufficient number of digits), reset the restriction to Restriction 00, that is, by definition, unrestricted. Note that when CHANGE is pressed, HEADING and BACK are not available. If CHANGE, followed by a valid entry is inputted, the value is accepted, the cursor is removed, and the CHANGE display key reappears.

The default remote package for a line is package 00, that, by definition, gives no access to line pools or Remote Page. This particular package cannot be changed. The remote package for a line is not assigned on a mode-by-mode basis; it applies regardless of which service mode is in effect.

Pressing CHANGE to change the package for a line, followed by NEXT (without entering any digits, or an insufficient number of digits), resets the package to Package 00. The user remains at the prompt, Remote pkg: 00. Note that when CHANGE is pressed, HEADING and BACK are not available. If CHANGE is pressed, followed by valid digits, the entry is accepted, the cursor is removed, and the CHANGE display key reappears. The administrator presses NEXT to go to the Show line: prompt.

1.2.3.6 Class of Service Passwords

For details on specifying password numbers, see the Class of Service feature. Only the assignment of capabilities (user and line restriction, and remote package) to passwords is covered here.

[See "Passwords - COS Passwords".](#)

In this section, the administrator can specify passwords for the system, and assign restriction filters and remote-access packages to each password. In the event that a restriction filter is not defined for a given Class of Service password (it is left at `Deflt`) then the restriction filter that applies to calls made under that Class of Service is determined by the restriction that normally applies for the respective line, extension, or to the user's COS password. For example, assume a given line is restricted to local calls and an internal user changes the class of service in effect (by using `Feature` `6` `8` and entering a COS password). If the new class of service (determined by the COS password) has a restriction `FILTER` defined that permits long distance calls, the user is able to dial long distance on any accessible line. If, on the other hand, the restriction filter for the COS password is left at `Deflt`, the original restrictions remain in effect.

1. A `User fltr`: can be specified. Unless it is extension to `Deflt`, it replaces the extension restriction (and line/extension) or remote restriction in effect. The default value is `Deflt`.
2. A `line restrn`: can be specified. Unless it is extension to `Deflt`, replaces the line restriction in effect. The default value is `Deflt`.
3. A `Remote pkg`: can be specified. Unless it is extension to `Deflt`, it replaces the remote-access package in effect. The default value is `Deflt`.
4. The default option means that the restriction in effect before the user changes the class of service remains in effect.
5. In the case of `User fltr`:, `Line restrn`:, and `Remote pkg`:, if the administrator presses `CHANGE` and then `NEXT` without entering a valid restriction number (or without entering any restriction number, or insufficient digits), the restriction is extension to `Deflt`, the default. The user remains at the prompt, either `User fltr:Deflt`, `Line restrn:Deflt`, or `Remote pkg:Deflt`. Note that when `CHANGE` is pressed, `HEADING` and `BACK` are not available. If `CHANGE` is pressed, followed by valid digits, the entry is accepted, the cursor is removed, and the `CHANGE` display key reappears. The administrator presses `NEXT` to go to the next prompt.

Note that for `User fltr`:, `Line restrn`:, and `Remote pkg`:, when changing the restriction value or remote package, a `DEFAULT` display key is also available. If pressed, the `DEFAULT` display key inserts the value of `Deflt` for the user restriction, line restriction, or remote package.

6. If the user changes an existing Class of Service, the restriction that is in effect is replaced. For example, if the remote user enters the `DISA DN` to change an existing Class of Service, the user restriction associated with the entered COS password replaces the remote restriction. If the internal user activates `Feature` `6` `8`, the user restriction associated with the entered COS password replaces the extension restriction.
7. The remote-access package (applicable for remote users entering a COS password) replaces the access package already in effect.

1.2.4 **EXTN/ **LINE

N/A

1.3 Technical Specification (Limits/Constraints)

- The only non-dialing feature available for remote-access is the Page feature.
- There is a limit of 100 restriction filters. Restriction 00 is a Null restriction, permitting unrestricted dialing. Restriction 00 can be applied by the administrator, but the contents of Restriction 00 cannot be changed. The remaining restrictions (01 through 99) can be specified by the administrator.
- Each restriction filter can have up to 48 restrictions, provided that a combined total of no more than 400 restrictions plus overrides are defined system-wide (that is, the total number of separate restriction entries and override entries cannot exceed 400).
- Each restriction can have any number of overrides, provided that the combined system-wide total of 400 restrictions plus overrides is not exceeded.
- Each restriction can be defined in one or more restrictions. Each restriction counts as one entry in each and every restriction to which it is assigned. For example, if Restriction 07 appears in Restrictions 01, 02, and 03, the same Restriction 07 has used up three entries.
- There is a limit of 16 remote-access packages. Package 00 is a Null package, permitting no access to line pools or remote page. Package 00 can be applied by the administrator, but the contents of Package 00 cannot be changed. The remaining packages (01 through 15) can be specified by the administrator.
- A maximum of 255 line/extension restriction filters can be applied in the system.
- The maximum length of a restriction entry is 15 digits and the maximum length of an override entry is 16 digits.

1.4 Interactions

Feature	Interaction
Changing the Class of Service	If the COS is changed and if the new COS has <code>User fltr:</code> and <code>outgoing line restrn:</code> defined, they replace those defined for the Extension (and line/extension restriction) or the outgoing line, or both.
Copy, General Extension	When copying between extensions, if the line/extension restrictions maximum for a system is exceeded, error tone and the transient message, <code>Line/extn full</code> is given. The other parameters are not copied. When copying between extensions, the line/extension restriction(s) for the source extension is copied to the destination extension.
Speed Dial (System)	Can bypass restrictions.
Link	If the user executes Link after dialing has begins, it resets call restriction checking.
End-to-End Signaling / PBX Reach Through	If call restriction checking is reset, the line can be dropped if the user tries to perform End-to-End signaling or dials PBX Reach Through codes.

Call Retention

1.1 Overview

1.1.1 Description

This feature preserves a voice connection for one minute when an M7208 set, M7310 set or M7324 set is unplugged or performs an internal reset.

1.1.2 Rationale for Feature

N/A

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 End User View

If a set is unplugged while active on an external call, then reattached before the set is polled and receives out of service status, the call is retained. The previous status of the voice path and visual indications at the set are restored.

1.2.2 OAM Programming View

N/A

1.2.3 **EXTN/**LINE

N/A

1.3 Technical Specification (Limits/Constraints)

This feature does not apply if the set is detached for longer than it takes for it to go out of service, if the set is moved to a new port, or if a new type of set is connected to the port.

1.4 Interactions

N/A

Camp-On/Call Waiting

1.1 Overview

1.1.1 Description

The Camp-On feature is used to send an external call to another set.

1.1.2 Rationale for Feature

1.1.2.1 Usage Scenarios

Camping calls onto a set is possible from any type of set, however, it is most practical from a set with a two-line display, or a set that is processing a large number of calls, such as a Central Answering Position (CAP). The CAP attendant can either try to transfer the call to the destination set, or can immediately try to camp a call. An immediate camping of a call is particularly useful if the attendant has Busy Lamp Field indication of other sets.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls

, or programmed key

1.2.2 Caller View

External calls are camped in a manner similar to transferring an internal call to a set.

While a call is camped at a set, the Camp-on timer tracks the amount of time the call has been camped. The timer ends when a camped call is:

- answered
- forwarded
- routed back to the set that camped it

1.2.3 Message Displays

Message	Description
Camp denied	Displays, accompanied by Error tone, if an attempt to camp an internal call is made.
Camp to	Displays after the user activates <input type="text" value="Feature"/> <input type="text" value="8"/> <input type="text" value="2"/> or presses the programmed key.
Line <xx> camped or <linename> camped	Appears transiently on the display of a set that camps a call onto another set.

Message	Description
Camped: <setname> CALLBACK	Displays, accompanied by Ringback tone, at a set to which a camped call has been returned after a system-programmable timeout period. Pressing CALLBACK reconnects the original call.
<setname> Camp max CALLBACK	Displays if a user has camped a call onto a set that already has a camped call. Pressing CALLBACK reconnects the original call.

If the destination set is idle, or connected on one or more calls, activating the Camp feature and then pressing an Internal Autodial key, or entering the DN of the set, camps a call onto the destination set. Since transfer rules are followed, if there is an appearance of the call, the line indicator appears at the line appearance, otherwise it appears at the intercom.

1.2.4 End User View

The user who receives a camped call receives a periodic display and hears periodic tones (Held Line) over their speaker indicating that a call is waiting. Camped calls do not alert visually.

The user can answer the camped call by

- pressing the flashing intercom or line key to preselect the line or intercom, then going offhook or pressing the Handsfree key
- pressing the Answer key or its feature code (see the Offhook Call Queuing feature) to answer the camped call (Calls with higher Call-Capture priority are answered first.)

Message Displays

Message	Description
Line <xxx> waiting or <linename> waiting	Appears transiently, accompanied by Camp-On/Call Waiting tones, on the display of a set receiving a camped call. This message is redisplayed each time the tones occur (every ten seconds).
Release a call	Appears on the display of a set with no available lines on which to present the camped call when the user tries to retrieve a camped call using the Answer Call programmed key or feature code (see Offhook Call Queuing feature).

1.2.5 OAM Programming View

1.2.5.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item	I	SC+	SC
System Prgrming	Featr settings	Camp timeout:45	X	X

1.2.5.2 Programming Camp-On

In OAM, the Camp timeout is programmed in System Prgrming► Featr settings►Camp timeout:45. The Camp timeout values are 30, 45, 60, 90, 120, 150, and 180 seconds. The default is underlined.

See "System Programming - Feature Settings".

1.2.6 **EXTN/ **LINE

N/A

1.3 Technical Specification (Limits/Constraints)

A maximum of one call can be camped at a set.

Only external calls can be camped onto Norstar sets. As well, camping a call onto an external destination is not supported.

1.4 Interactions

Feature name	Interaction
Alerting calls	Alerting calls and camped calls can both occur at a set simultaneously. For example, if an alerting call arrives first, the display message for that call is given. If a call is then camped at the set, the Line 2 waiting (for example) message is then given.
Answer DN	Camped calls sometimes appear at Answer keys. If Extn A has an Answer key for Extn B, and camps a call onto Extn B, then Extn A's Answer key does not flash or ring. If another set camps a call onto Extn B, Extn A's Answer key flashes. Ringing at the Answer key also occurs if it has been programmed. Existing display messages appropriate for Answer keys are provided.
Call Forward - All Calls - No Answer - on Busy	A call camped at a set that has Call Forward All Calls activated will be forwarded. Once a camped call is forwarded, the user whose call had been camped hears Ringback. Existing rules for Call Forward All Calls apply. An unanswered call alerts visually at the original set so the user can answer it there, if desired. A call that is camped at a set that has Call Forward No Answer may or may not be forwarded. If the set is active on another call, the camped call is not forwarded. If the set is idle, the camped call provides call waiting tones through the user's speaker until it is forwarded. Existing rules for Call Forward No Answer then apply. If the Camp-on timer expires before the call is forwarded, then the call is rerouted back to the set that camped it. A call that is camped at a busy set that has Call Forward on Busy activated is not forwarded.
Call Pickup	Camped calls cannot be retrieved using Directed Call Pickup or Group Call Pickup. Existing display messages apply.
Do Not Disturb (DND)	Callback rules also apply if a call is camped at a set that has Do Not Disturb activated, or if the user subsequently activates Do Not Disturb after a call is camped.

Feature name	Interaction
Offhook Call Queuing	The Offhook Call Queuing feature can work simultaneously with the Camp-On feature. Since the Call Queuing feature can be activated when the user presses a programmed key, camped calls and alerting calls can be accessed using the same Answer Call programmed key (or <input type="text" value="Feature"/> 8 0 1). Since alerting calls have a higher Call Capture priority, they are answered before camped calls.
OAM Programming	Callback rules apply for Camp Callback generally, and to a set attempting to Camp a call at a destination set that is performing OAM Programming, or is out of service.

Central Answering Position (CAP)

1.1 Overview

1.1.1 Description

The Central Answering Position (CAP) module attaches to a Norstar M7324 telephone to add 48 key/indicator pairs. The function of a CAP module is similar to that of a Busy Lamp Field, enabling an attendant to monitor the status of co-workers' telephones and to direct incoming calls to the appropriate people.

Two CAP modules can be attached to each M7324 set. A Modular CCU can support up to five designated CAPs. A Compact CCU supports only one. A designated CAP has the capability to answer up to 120 lines. For Compact ICS, the CCU supports 8 lines. The designated CAP supports: line keys, feature keys, Internal Autodial keys, or a combination.

1.1.2 Rationale for Feature

See "1.1.1 Description".

1.1.3 General Definitions

The term "CAP" refers to the base set and its add-on module or modules. The term "module" does not refer to the entire CAP terminal. A designated or enhanced CAP (E CAP) is administered to have line keys.

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 End User View

Lines can only be added or deleted in configuration programming. Deleted lines appear at the CAP as blank keys. A user can reprogram a blank key.

Because users can move line keys, lines may not appear at the set in an increasing line order number. For more information, see "1.2.2.1 Relocation" and the Moving Lines feature.

1.2.2 OAM Programming View

See ["System Programming - CAP Assignment"](#).

[Compact Plus allows one CAP to be programmed. Modular Plus allows for up to five CAPs to be programmed.](#)

The default configuration of the CAP has the number of lines that are allocated to the CAP assigned to it immediately upon initialization of the set.

The user must specify which DNs are to be programmed as CAPs. The default value is `None`.

When a CAP is programmed, lines are assigned in sequence starting from the top left-hand key on the base set, beginning with the lowest line number for that set. The right-hand column of keys on the base set contains feature and intercom keys, although all 24 keys could be used for lines.

Once all keys are assigned, the remaining lines are assigned beginning at the first add-on module starting at the top left-hand corner, and moving down. Similarly, the second add-on module is assigned the remaining lines, to a maximum of 120 lines. If any keys remain after lines are assigned, they are brought up as Internal Autodial keys, starting with the lowest default DN on the system. The user can re-program Internal Autodial keys.

If a line or lines are added during configuration programming, the lines overwrite the first available key. A key that has a line appearance is not overwritten. A blank key, a Internal Autodial key, or a feature key is overwritten, starting at the top left corner of the base set. Because blank keys have no stored information, these keys are overwritten first. Thus, after the addition of one or more lines, lines cannot appear in an increasing line order number. (That is, lines do not renumber themselves sequentially, so they appear on the set in the order they were assigned.)

If a designated CAP has been assigned more lines than can appear on its base set and module(s), the number of lines that can appear are applied, in the default configuration previously described. Extra lines can appear on the right-hand column of the base set. Lines can also appear on the base set if the CAP modules are removed. This assigns as many lines as possible to the base set.

Feature keys, line keys, and Internal Autodial keys have status indication when programmed on a CAP module or base set.

1.2.2.1 Relocation

In OAM programming, the user specifies on a system-wide basis whether Set Relocation is allowed. CAPs follow this specification, so that if sets are not permitted to be relocated, neither are CAPs.

When the entire CAP (base set and add-on modules) is moved as a unit, all of its settings are retained. If a module or modules are moved, and the moved-to set already has the same keys assigned, the keys on the moved-to set are retained, and the same keys on the module being moved become blank.

Modules reassigned to another designated CAP pick up programming from the new position. For example, if CAP1 has two modules (A and B) and is moved to CAP2, the software checks to see if modules A and B have lines assigned to them that also assigned to CAP2. If CAP1 and CAP2 have lines 1 to 5 assigned, CAP2 retains lines 1 to 5 where they were, and lines 1 to 5 on CAP1's modules become blank. The software also checks to see if CAP2 previously had lines assigned to it but didn't have any keys on which they could be presented. These lines now appear on the CAP, if keys are available on which the lines can be presented. The software also checks if modules A or B have lines assigned that CAP2 doesn't have assigned. These are removed. Because of existing lines, the lines may not appear in the default order on the set (that is, ordered in ascending sequence, starting with the base set).

If a CAP module is moved to another CAP that has additional lines and therefore requires additional line appearances on the module(s), the existing lines are re-allocated on the modules, using the default method previously discussed.

Similarly, if new lines are assigned to the CAP in OAM programming, lines are re-assigned to the add-on modules.

Duplication of Internal Autodial, feature keys, and line appearances is not allowed.

If a set has a CAP module removed from it, there may not be line appearances to represent all of the set's lines. In this case, an incoming external call follows existing call processing rules. If no other set was programmed to ring for the line, and a Prime Set for that line exists, an incoming external call is transferred to the Prime Set.

1.2.2.2 Performing Extension Copy

In OAM programming, the user can perform a Extension Copy from one CAP to another CAP. If the two CAPs are identical (both have the base set and the same number of modules), either system data only, or system and user data can be copied from one CAP to the other. CAP assignment cannot be copied.

User data can only be copied between the base sets. CAP memory key assignments cannot not be copied between sets.

Key assignment cannot be copied between two sets of different types.

If the destination CAP has more modules than the source CAP, the system data for the source CAP that can be copied appears on the modules for the destination CAP. Remaining keys on the modules appear as blank keys. The same rule described at the beginning of the previous Relocation section also applies in this case.

If the destination CAP has fewer add-on modules than the source CAP, and Extension Copy is performed, only the settings that the destination CAP can support are added. If modules are added later, the remaining line appearances appear.

When performing Extension Copy, the user can copy administration data between CAPs and sets not defined as CAPs. The user cannot copy user data between CAPs and sets not defined as CAPs. Because CAPs and expanded sets are essentially the same set (M7324), data on the base set can be copied between a CAP and an expanded set.

1.2.3 **EXTN/ **LINE

N/A

1.3 Technical Specification (Limits/Constraints)

A maximum of five sets can be programmed as designated CAPs on a Modular system, and one on a Compact system. Each CAP is capable of supporting up to 120 lines.

If a module of a CAP undergoes a cold start, the entire CAP terminal should also undergo a cold start. (To cold start the CAP, press the two keys on the outside bottom of the module.) The default settings are applied.

1.4 Interactions

Feature or condition name	Interaction
Extension Copy	Data cannot be copied between CAPs.
Extension not programmed as CAP	If add-on modules are attached to a base set that has not been designated as a CAP, CAP still boots, but cannot have line appearances. Only Internal Autodial keys are initialized, and only Internal Autodial or feature keys can be supported on the module.
Line Assignment	Lines can only be added in OAM Programming. Lines that are deleted appear at the user's set as blank keys. End users can program features or Autodial keys on blank keys.
Moving Lines	An end user cannot assign lines, but can move line keys. Lines can therefore appear in non-sequential order on the user's set.
OAM Programming	If a set that has not been defined as a CAP is changed to a CAP in OAM Programming, and the user has previously moved lines on the set, the line positions that the user has specified are maintained.
Send Message	Each CAP can send and receive up to 30 messages.

Centralised Operator

1.1 Overview

1.1.1 Description

Centralised Operator is the ability to centralise operators on a few Private Branch Exchanges (PBXs) on the network. There is no need to provide operator positions on every network PBX.

Centralised Operator is one of the features supported on DPNSS 1 lines in Norstar systems. For a listing of these features, see the DPNSS 1 feature.

1.1.2 Rationale for Feature

The ability to centralise operators enhances network efficiency.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

Normal signalling procedures for the Simple Call and Supplementary Services apply, except that Calling/Called Line Category Operator (CLC-OP) is used to denote an operator instead of CLC-ORD.

Most operator consoles are capable of displaying various information about calling and called extensions. The information displayed varies considerably across manufacturers. DPNSS 1 does not currently provide a standard means of passing this information across a network.

Certain services are required to support Centralised Operator:

- Call Offer
- Executive Intrusion
- Redirection
- Three Party Service

For information on these services, see the sections in this manual on the individual service.

The following services may be required:

- Controlled Diversion
- Extension Status
- Hold
- Night Service
- Route Optimisation
- Series Call
- Three-Party Takeover

For information on these services, see the sections in this manual on the individual service.

1.3 Technical Specification (Limits/Constraints)

Operator groups cannot be spread across two or more PBXs. All positions in an operator group must be within the same PBX.

Change Extns

1.1 Overview

1.1.1 Description

Change Extns allows the Extension Number of an individual set to be changed in OAM programming. An Extn is the same as an internal set number.

Any B1 or B2 Extn can be reassigned in OAM Programming. This capability exists whether or not the original Extn has been assigned to a port or a device.

1.1.2 Rationale for Feature

This capability allows the installer to coordinate the Extn table with the Extns of a host system (PBX). For system-wide changes to the numbering plan, at system startup, the System Startup feature should be used.

1.1.3 General Definitions

The terms B1 and B2 correspond to the channels on the Norstar system used for transmitting voice and data, respectively. Each Extn port number has one B1 Extn and one B2 Extn associated with it. Some devices, such as the M7100, M7208, M7310 and M7324 telephones, use only the B1 channel and the B1 Extn. The M7900 telephone uses both B1 and B2 channels, and therefore has both a B1 and a B2 Extn associated with it.

1.2 Feature Details

1.2.1 End User View

N/A

1.2.2 OAM Programming View

1.2.2.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item	I	SC+	SC
System prgrming	Change Extns	X		

1.2.2.2 Programming Change Extns

Change Extns is set in System prgrming►Change Extns►.

[See "System Programming - Change Extensions".](#)

Individual Extns are normally changed, as required, at initial installation. Extns can also be changed while the system is in use, but they do not take effect until OAM Programming terminates.

If the user attempts to assign an Extn that is identical to one already assigned to another B1 or B2 port or device, the Extns are swapped.

Changing a device's Extn does not change any other programmed data for that device.

1.2.3 Message Displays

Message	Description
Invalid Extn	Displays transiently, accompanied by Error tone, if invalid data is entered.

1.2.4 **EXTN/ **LINE

N/A

1.3 Technical Specification (Limits/Constraints)

The first digit of the Extn cannot be the same as

- the Call Park prefix
- the Direct-dial digit
- a Line Pool access code
- a Destination code
- an External Line access code

The user cannot delete the Extn for a device. (A set can be removed from the system. Then the Extn can be made “unequipped”.)

1.4 Interactions

Feature	Interaction
asterisk (*) and octothorpe (#)	Symbols such as asterisk (*) and octothorpe (#) cannot be used in Extns.
Alarm Set	Changing individual Extns, or Extn length, preserves the relationship between an Alarm set and its Extn.
Call Forward	If an Extn changes, Call Forward is cancelled. This prevents the possibility of a Call Forward loop.
Direct-dial	Changing individual Extns, or Extn length, preserves the relationship between a Direct-dial set and the Extn(s) assigned to call it.
Extn Length	The maximum allowable Extn length is 7. For both Compact Plus and Modular Plus, the default is 3.
DSS keys	DSS keys are not updated to maintain a reference to the same destination. As a result of an Extn change, a set may have a DSS key for itself, or may dial a different or non-existent set.
Flexible Numbering Plan: Line Pools Routing Service External Line Access Call Park Direct-dial	<p>The first number of an Extn must not conflict with the first digit of:</p> <ul style="list-style-type: none"> - a line pool access code - a destination code - an external line access code <p>It must also not conflict with the</p> <ul style="list-style-type: none"> - Call Park prefix - Direct-dial digit <p>For more programming interactions, refer to the Flexible Numbering Plan specification.</p>

Feature	Interaction
Message lists	Message lists are not updated to reflect Extn changes.
Prime Extn	Changing individual Extns, or Extn length, preserves the relationship between a Prime Extn and the Extns assigned to call it.
Private Lines	Changing individual Extns, or Extn length, preserves the relationship between a Private Line and the set to which it is assigned.
Ring Again	If an Extn changes, Ring Again is cancelled. This prevents the possibility of a Ring Again that cannot be offered or cancelled.
**Startup	As part of the re-initialization during Startup, all calls in the system are dropped. B1 and B2 Extns are restored to their default values. This negates the effect of any changes to Extns that have occurred. (For more information, refer to **Startup)

Change Extension Type

1.1 Overview

1.1.1 Description

This chapter details the new functionality required to specify the Extension terminal type of the pool of extensions shared by Portables and ISDN terminals.

Norstar extensions cannot be changed to any other type of extension.

Portables must be deregistered in `System prgrming►Companion` before the extension type can be changed to ISDN.

1.1.2 Rationale for Feature

By default, on startup, Norstar terminals, Portables and ISDN devices (sets) occupy specific, discrete extension ranges.

Number Ranges for Norstar, Portables and ISDN Extensions

Norstar Extensions	Portable Extensions	ISDN Extensions
221 - 476	477 - 508	477 - 540

The Extensions also represent specific default information about the features and capabilities that apply to the type of terminal associated with the extension. Many Norstar capabilities do not apply to either Portables or ISDN devices.

In OAM Programming, under `System prgrming►Change Extn type`, extensions can be swapped between the 3 different number ranges. It is important to note that only the extensions are swapped; all of the features and capabilities controlled in OAM Programming, and by the user at the set, remain with the terminal.

Examples:

- If you had Handsfree before the swap, and the other set did not, you will still have Handsfree after the swap and the other set will not.
- If you want your Portable (currently Extn# 477) to be 222, in `System prgrming►Change Extn type`, you can swap the extensions, so that your portable now has Extn 222, and the Norstar set that was 222 now has the Extn 477.

The number of Norstar extensions remains constant. Portable extensions and ISDN extensions on the other hand, share the same range, or pool of 64 extensions.

Within that range ISDN extensions can occupy all or part of the full range of extensions (477-540).

Therefore, if a system has 32 Portables extensions, there can be a maximum of 32 ISDN extensions. Before adding another ISDN extension, a Portable extension must be deregistered (if required), and reassigned as an ISDN extension. If a portable is registered to the extension, the portable must be deregistered in

System programming Companion. Registration before it can be reassigned. If only 10 Portable extensions are required, there are 54 extensions available for ISDN terminals.

A current proposal for default extension numbering within this range is to increment the Portable extensions from 477, and decrement the ISDN extensions from 540.

Shared extension Range for Portables & ISDN Terminals

[illegible]

1.1.3 General Definitions

- Norstar extensions can only be assigned to Norstar sets.
- Portable extensions can only be assigned to Wireless handsets.
- ISDN extensions can only be assigned to S-loops.
- ISDN extensions can not be assigned to T-loops.
- An ISDN extension must be assigned to an S-loop before calls can be made or received on that loop. This may be done automatically by Norstar through the Loop extension.
- An S-loop may have more than one ISDN extension associated with it.

1.1.4 General Procedures

This feature will be used by installers, either during the installation of a new system, or when new functionality is added to an existing Norstar system. This feature may be used when ISDN BRI functionality is added, increased, or decreased. It may also be used when Wireless functionality is added, increased, or decreased.

1.2 Feature Details

1.2.1 Message Displays

Message	Description
Change extn type	System prgrming▶Change Extn type
Show extn: _	Specify a Portable or ISDN Extn. Pressing NEXT goes to the first Portable/ISDN extension.
Norstar extn	Appears transiently if the extension entered is neither a Portable nor ISDN.
nnnnnnnn:<type> STATE CHANGE	Extension type display, where nnnnnnnn is the extension. <type> can be either ISDN or Portable. STATE shows the state value for the extension. CHANGE changes the Extension type.
Assigned	State display indicating that the corresponding ISDN extension is assigned to an S-loop.

Message	Description
In use by system	State display indicating that the corresponding ISDN extension is in use by the system. Changing an extension in this state will affect another ISDN device on the system (See "1.2.2.3 Changing from ISDN to Portable")
Registered	State display indicating that the corresponding Portable extension is registered.
Available	State display indicating that: <ul style="list-style-type: none"> the corresponding ISDN extension is available to be changed to Portable, or the corresponding Portable extension is not registered and is available to be changed to ISDN.
Pending	State display indicating that the corresponding Portable extension will be available for registration upon exiting the OAM Programming session.
Deregister first	Transient display indicating that the user has attempted to change the Extension type for a registered portable. The attempted change is not made.
Max 32 portables	Transient display indicating that the user has attempted to exceed the system maximum of 32 Portable extensions. The attempted change is not made.
Unassign first	Transient display indicating that the user has attempted to change the Extension type for an ISDN extension which is assigned to an S-loop. The attempted change is not made.
Disrupt service? CANCEL OK	Transient display indicating that the user has attempted to change the Extension type for an ISDN extension which is in use by the system (See "1.2.2.3 Changing from ISDN to Portable"). CANCEL cancels the attempted change. OK removes the ISDN extension from use by the system and changes the Extension type to Portable (provided that this doesn't exceed the system maximum of 32).

1.2.2 OAM Programming View

This feature is provided to enable the installer to change one extension at a time. Only Portable and ISDN extensions can be changed. Norstar extensions can not be changed to any other Extension type.

The following 3 second transient is presented if the user enters a Norstar extension: `Norstar Extn.`

When the user enters a valid extension, the display shows the extension and its Extension type (invalid numbers are blocked as per current functionality).

Pressing the `CHANGE` display key toggles between `Portable` and `ISDN`, but the Extension type is not actually changed until the user navigates away from the display.

The user must deregister a portable before reassigning a Portable extension to an ISDN extension. This can either be done:

- directly from the portable handset, or
- through System prgrming►Companion►Registration►Registrd extn, select the extension, and press the DEREG display key.

The extension then appears as Available in both System prgrming►Companion►Registration, and System prgrming►Change extn type.

[See "System Programming - Companion - Registration".](#)

[See "System Programming - Change Extension Type \(Modular Plus only\)".](#)

1.2.2.1 STATE display key

The user can determine whether a Portable extension is Registered, Available, or Pending, or if an ISDN extension is assigned to an S-loop (the state display reads Assigned), Available, or In use by system by pressing the STATE display key.

The state value In use by system indicates that although the ISDN extension is not assigned to an S-loop, the extension is in use by the system and changing an extension of this type to Portable will affect other devices. See “1.2.2.3 Changing from ISDN to Portable” and “1.3 Technical Limitations” for details.

If an ISDN extension is both Assigned and In use by system, the state of that extension is shown as Assigned. If the user then unassigns it, the state will be In use by system.

1.2.2.2 Changing from Portable to ISDN

If the user attempts to change a registered Portable extension to an ISDN extension, the 3 second transient Deregister first is displayed. The user must enter System prgrming►Companion►Registration►Registrd extn, select the extension, and press the DEREG display key. The extension then appears as Available in both System prgrming►Companion, and System prgrming►Change extn type.

1.2.2.3 Changing from ISDN to Portable

If the user attempts to change an ISDN extension which is already assigned to an S-loop to a Portable extension, the 3 second transient Unassign first is displayed. The user must enter Hardware►Extns on Loop►Assign extns, select the S-loop, navigate to the extension, and press the CHANGE display key. The extension then appears as Available in both Hardware►Extns on Loop, and System prgrming►Change extn type.

There is a possibility that changing an unassigned ISDN extension to a Portable extension will cause another ISDN device to go down. Such ISDN extensions have a state value of In use by system. In some cases, the ISDN device will come back online itself; in others, it may have to be unplugged and then plugged in again. This depends on the particular ISDN device. For this reason, it is strongly recommended that this feature only be used if system traffic is low. See “1.3 Technical Limitations” for a more detailed explanation.

If the user attempts to change an ISDN extension that is in use by the system to a Portable extension, the following confirmation display appears when the user navigates away:

A rectangular display box with a black border. On the left side, there are three small circles arranged vertically. The text inside the box reads "Disrupt service?" on the top line, "CANCEL" on the bottom left, and "OK" on the bottom right. On the far right side, there is a single small circle.

Pressing CANCEL returns to the Extension type display for that extension, leaving the value as ISDN. Pressing OK removes the ISDN extension from use by the system, changes the Extension type for that extension to Portable, and presents the appropriate display dependent on the means used to navigate away.

As an example, consider ISDN extensions 520, 521, and 522, where 521 is In use by system. The user attempts to change 521 from ISDN to Portable as follows:

A rectangular display box with a black border. On the left side, there are two small circles arranged vertically. The text inside the box is organized into two rows. The top row contains "H B" in the first column, "521: ISDN" in the second column, and a small circle in the third column. The bottom row contains "N" in the first column, "STATE" in the second column, and "CHANGE" in the third column.

user presses CHANGE:

A rectangular display box with a black border. On the left side, there are two small circles arranged vertically. The text inside the box is organized into two rows. The top row contains "H B" in the first column, "521: Portable" in the second column, and a small circle in the third column. The bottom row contains "N" in the first column, "STATE" in the second column, and "CHANGE" in the third column.

Regardless of the means used to navigate away, the following appears:

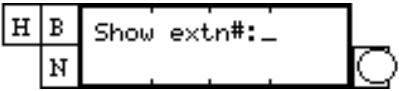

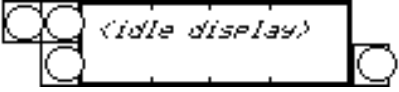
A rectangular display box with a black border. On the left side, there are three small circles arranged vertically. The text inside the box reads "Disrupt service?" on the top line, "CANCEL" on the bottom left, and "OK" on the bottom right. On the far right side, there is a single small circle.

CANCEL always returns to the original display and value:

A rectangular display box with a black border. On the left side, there are two small circles arranged vertically. The text inside the box is organized into two rows. The top row contains "H B" in the first column, "521: ISDN" in the second column, and a small circle in the third column. The bottom row contains "N" in the first column, "STATE" in the second column, and "CHANGE" in the third column.

The result of OK depends upon the means used to navigate away as follows:

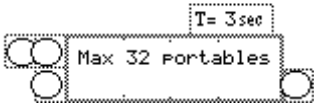
Navigation keypress	Resulting display
NEXT	<p>A rectangular display box with a black border. On the left side, there are two small circles arranged vertically. The text inside the box is organized into two rows. The top row contains "H B" in the first column, "522: ISDN" in the second column, and a small circle in the third column. The bottom row contains "N" in the first column, "STATE" in the second column, and "CHANGE" in the third column.</p>
BACK	<p>A rectangular display box with a black border. On the left side, there are two small circles arranged vertically. The text inside the box is organized into two rows. The top row contains "H B" in the first column, "520: ISDN" in the second column, and a small circle in the third column. The bottom row contains "N" in the first column, "STATE" in the second column, and "CHANGE" in the third column.</p>

Navigation keypress	Resulting display
HEADING	
	

Note that although this change is globally reflected in the UI immediately, it does not actually occur within the system software until the OAM Programming session is terminated (see “1.3 Technical Limitations” for details).

The state of a Portable extension created in this manner is Pending, in both System prgrming►Change extn type and System prgrming►Companion. This state indicates that once the OAM Programming session is terminated, the Portable extension will be Available for registration. The state is updated when the session is terminated. The Pending state exists because of the constraints imposed by ISDN extensions which are In use by system (see “1.3 Technical Limitations” for details).

If changing an ISDN extension to be Portable would cause the system maximum of 32 Portable extensions to be exceeded, the following transient appears:



The change is not allowed, and the display returns to the original extension.

1.2.2.4 Restoring the original value

If the user changes an Extension type from ISDN to Portable, or vice versa, then subsequently restores the original Extension type value, the original state value (displayed via the STATE display key) is restored.

1.2.3 **EXTN/ **LINE
N/A

1.3 Technical Limitations

Norstar supports a maximum of 32 Portable extensions in the (default) range of 477-508. Norstar supports a maximum of 64 ISDN extensions in the (default) range of 477-540.

The possibility that changing an unassigned ISDN extension to a Portable extension could affect another ISDN device on the system is a result of the system architecture. Each TEI on the system requires that an emulator be running in the software. There is also a relationship between emulators and extensions. However, not every TEI, or even ISDN device, needs its own extension from a users point of view. Thus situations may arise where extensions can be considered to be “in use by the system”, in that the emulator associated with the extension is in use by the system. Changing the Extension type from ISDN to Portable in such cases tears

down the emulator, which means that the device (or part of the device) using that emulator will also go down.

The emulator is not actually torn down until the user exits the OAM Programming session. Thus a new state, `Pending`, has been defined for Portable extensions created from ISDN extensions which are `In use by system`. This state indicates that the corresponding extension will become an `Available Portable` extension upon releasing the session, but cannot be registered prior to releasing the session.

1.1.1 Description

1.1.2 Rationale for Feature

This feature is placed in Maintenance because it will best serve the customer if it is used in a controlled fashion by the system coordinator. This will facilitate the system coordinator's ability to monitor the frequency and patterns of occurrence of hung lines so that they may be prevented or minimized. In addition, the feature can release any line in use, therefore, for security reasons it should not be made generally available.

1.1.3 General Definitions

1.1.4 General Procedures

1. Go to Maintenance►Clear lines. Press to view the first busy line starting with AC15 PCcts. The following display appears:

This means that line xxx has been busy for “hh” hours and “mm” minutes.

2. If it is not necessary to clear this line, press to go to the next highest busy line, or press to go to next lowest busy line, or press to

return to Clear lines.

3. Press CLEAR to release the line. Line xxx cleared is displayed. The cleared line and any lines tandemed with it now return to an idle state.
4. Press to go to the next highest busy line, or press to go to next lowest busy line, or press to return to Clear lines.

1.2 Feature Details

1.2.1 Controls

N/A

1.2.2 Message Displays

Message	Description
Line in use	Displays transiently when a user tries to get a line from a line pool if all the lines are in use and/or hung.
No free lines	Displays after the Line in use message.
No busy lines	Displays transiently when you press <input type="button" value="Show"/> , <input type="button" value="Next"/> or <input type="button" value="Back"/> , and no lines are busy.
Start of check	Displays this static message when all busy lines have been displayed.
Line xxx cleared	Displays when a line is cleared.

1.2.3 End-User View

It is important to emphasize that the end user's role in this feature is to inform the system coordinator if they detect and/or determine that a line is hung.

A hung tandem call will always appear as a pair of busy lines:

- CO-AC15; where Norstar is an endpoint and the CO call is entering or exiting the private network to/from the AC15.
- AC15-AC15; where Norstar is serving a tandem node with the call coming in on one AC15 and is going out on another. The destination or origin of the call is not known, and the unsupervised lines causing the problem may be several nodes away.
- DIA line (via AC15)-CO; where an incoming call from an unsupervised CO line is redirected by a remote system to an AC15 PCct connected to a Norstar system, which in turn redirects the call to a DIA line that has invoked Selective Line Redirection, External Transfer from Conference or Enhanced Transfer which redirects the call to an unsupervised CO line or another AC15 with an unsupervised CO line at the far end.

1.2.3.1 Visible Hung Lines

For hung lines to be visible to the end user, they must have explicit appearances on a set. For the end user, a hung tandem call will be seen as two line appearance indicator that have both been solid (on) for the same, exceptionally long period of time.

The attendant's position, normally the set with the most line appearances, is where a pair of hung lines is most likely to be noticed. Users with their own external line(s) or DIA lines may also notice a hung line. An attempt to select a hung line results in the message:

- `Line in use` if a user attempts to obtain a line from a line pool, but all of the lines are hung and/or are in use. Then the message
- `No free lines` is presented.

1.2.3.2 Invisible Hung Lines

Hung lines with no explicit appearances, such as lines assigned to line pools, may not be easily detected. Any system serving as a tandem point between two AC15 lines (each assigned to line pools with no explicit appearances of the line or the line pool), may have little or no visible indication of hung AC15 lines. In the case where the AC15 is the only line in the line pool, the problem would be evident in that every attempt to dial a network DN that is routed through that AC15 would result in the message `No free lines`. For line pools with multiple AC15 lines to the same destination, the problem would be less evident. Users would be denied a line for network calls through that line pool more frequently since there would be one less line available.

1.2.4 OAM Programming View

See "[Maintenance - Clear Lines](#)".

If the user presses `Show` (from `Clear Lines`), `Next` or `Back` and there are no busy lines in the system, then `No busy lines` appears transiently for three seconds followed by `Clear lines`. If the user presses `Heading` while the transient message is on the display, the display will be cleared and `Clear lines` will be displayed. The static message `Start of check` appears when all busy lines have been displayed and the user is starting over at line 081 (there must be at least one remaining busy line for this message to appear). The user can press `Next` or `Back` to continue checking lines, or `Heading` to return to `Clear lines`.

The feature will be able to release any line if it is in use.

When any one line in a tandemed call has been disconnected (cleared), the resulting disconnect signal shall release any associated line(s). For example, if the following set of lines were connected in tandem, AC15—DIA line —CO line, clearing the DIA line will result in both the CO and AC15 lines being released. As well, clearing the either the CO or the AC15 line will result in the DIA line and the AC15 or CO line, as the case may be, being released. Confirmation that the associated line has been disconnected is not displayed. The user may check the line appearance of that line if they want confirmation.

The search for busy lines starts with the first AC15 PCct. The reason for this is that AC15 lines are almost always one of the pair of lines that is hung and therefore the user will be able to find and clear the problem line(s) faster than starting at line 001 and having to view all the CO lines in use on normal calls.

1.2.4.1 AC15 lines and DIA lines

DIA lines will become hung when:

- the far end of the incoming call is an unsupervised CO line (redirected from a remote system to an AC15 PCct) and,
- the DIA line is used with External Transfer from Conference, Enhanced Transfer or Selective Line Redirection to redirect (forward) the call to an unsupervised CO line or AC15 line with an unsupervised CO at the destination.

Both busy DIA line numbers and busy AC15 line numbers will be displayed by the Clear Lines feature.

1.2.4.2 Display specifications

xxx busy is left justified on the screen, hhh:mm is right justified. There are no extra leading zeros for the hours shown unless the duration is less than one hour. The following are examples of correct and incorrect displays:

Correct	Incorrect
002 busy 23:04	002 busy 023:04
023 busy 123:05	023 busy 123: 5
101 busy 0:12	101 busy :42

If the duration exceeds 999:59 then the display shall stop at 999:59. It shall not loop around to 0:01. If the elapsed time is less than one minute, the duration 0:01 will be displayed and not 0:00.

1.2.5 Maintenance View

Disabling a hung line during a Maintenance session will also clear the line and any lines tandemed to it will be released. The line must be enabled to return it to an idle state.

1.2.6 **EXTN/ **LINE

N/A

1.3 Technical Specification (Limits/Constraints)

This feature is designed for both Modular Plus and Compact Plus.

The feature shall be able to work from the M7208 for Compact only, and the M7310 and M7324 sets for both systems.

1.4 Interactions

In general, internal Norstar features involved, for whatever reason, with a line that is released by the Clear line feature shall treat it the same as if the (hung) line was supervised and provided its own release from the far end.

For example, if a user has invoked Ring Again on a busy line pool and the Clear Lines feature releases a line in the pool which becomes the first free line, the RAG

feature shall treat the release given by the Clear Lines feature as if were a release from the far end and alert the user that a line in the pool is now available.

Feature name	Interaction
Active calls	Same as for any Administration session.
Incoming calls	Same as for any Administration session.
Other connected lines	It is assumed that when, say an AC15 or DIA line is cleared, all other connected CO or PCct lines should become clear as well since a "link" in the hung chain has been cleared.
Maintenance - Alarms	No alarm or event is required as it will be after-the-fact, since the user will have solved the problem. Also, if clearing hung lines occurs frequently, it could fill up the test log with messages of limited use.

Conference

1.1 Overview

1.1.1 Description

The Conference feature allows a user to establish a three-party Conference between two calls at the set. When a Conference call is established, several operations can be performed within that Conference.

- Conference - Hold allows any participant in a Conference to hold and unhold a Conference call.
- Conference - Split allows the initiator of the Conference to talk privately to one of the two parties involved, while holding the second party. This option also allows the user to Hold both parties of a Conference independently, preventing them from talking to each other.
- Conference - Force Release a Party, an extension of Split, allows the initiator to disconnect one of the external parties from a Conference without disconnecting the other.
- Conference - Transfer From allows the initiator, having established a Conference call with at least one internal party, to disconnect from the Conference, thus transferring the original call to the other party.

1.1.2 Rationale for Feature

1.1.2.1 Conference

The user creates a three-party Conference by adding a held call to a connected call. After connecting the first call, the user holds it (either explicitly or automatically) and then makes the second call. When the second call is connected, the user presses the Conference key or dial pad code, and then presses the first call's held line key to create the Conference.

An advantage of this method of conferencing is that the user establishes each call individually before activating Conference. If the second call results in busy or no answer, the user can disconnect it by pressing **[Rls]**, without dropping the original call.

1.1.2.2 Conference – External Transfer From Scenarios of Usage

- A customer has called a Norstar user and, after conferencing with someone on another line (for example, a technical person at the head office), the Norstar user decides to drop out of the conversation, leaving the other two talking.
- An offsite employee has called the attendant and asked to be connected to a long distance number (thereby using the company's facilities for the call).

1.1.3 General Definitions

This specification refers to AC15 lines and any other line type that supports Disconnect Supervision.

1.1.4 General Procedures

When the user is connected on a call and has a held call on the set, creating a Conference is a two-step sequence, as follows:

1. Initiate the Conference by pressing the Conference key (or feature code).
2. Press the held line key to join the held call to the connected call.

1.2 Feature Details

1.2.1 Controls

or programmed key, Internal and external line keys, ,
 or programmed key and

1.2.2 Message Displays

Message	Description
Press held line	Prompts the user to press the held line to include a user on hold in a Conference call.
Conference call	Displays transiently at the controlling set when a Conference call is created.
<party 1> <party 2>	Displays for the duration of a Conference call on the controlling set.
<initiator's name> <3rd party name>	Displays on the non-controlling sets when a Conference call is created.
3 parties only	Displays if the user tries to add a fourth party to a Conference call.
Conference busy	Displays transiently, accompanied by Error tone, if hardware resources are insufficient to create a Conference call.
Make calls first	Displays if the user tries to activate the feature without having one active call.
Make second call	Prompts the user to add a third party to an attempted Conference call.
Already joined	Displays, accompanied by Overflow tone, when a call in any state (alerting, held, connected, conferenced) exists between two sets and a second call is attempted between those two sets.

1.2.3 End User View

Each three-party Conference, has one controlling party (the initiator), and two other parties. The controlling party is always an internal party, and the other two parties can be internal or external.

1.2.3.1 Activating the Conference Feature

When the user presses either the Conference key or , and the set is in the correct state to activate the Conference feature (that is, the set is active on a two-party call and has at least one other call on hold) the message `Press held line` displays.

To complete the Conference, the user selects the held call that is to be joined to the connected call. The user presses the line key for the held call, and the Conference is connected. The user at the controlling set sees the transient message `Conference call`, but the other internal parties receive no visual indication that the call is a Conference.

Once the Conference is created, the name associated with the Conference initiator's set appears on the display as well as the name of the other party in the

Conference, <initiator's name> <3rd party name>. This message persists as long as the Conference is connected.

The user can terminate the Conference before pressing the held line key by pressing `Feature`, or by pressing any key that holds or Autoholds the active call. For example if the user presses an idle or alerting line key in response to the `Press held line` prompt, the Conference sequence is terminated, the active call is held automatically, and the line that was pressed is selected.

To switch a party from one Conference to another on the set, the user at the controlling set must split the original Conference. See “1.2.4.2 Conference - Split”.

If the other internal party replaces the handset or presses `Rls`, the call becomes a normal two-party call. The <party 1> <party 2> display at the controlling set changes to show the name of the remaining party (or line) only.

Failure to Complete the Conference

If no call is active at the beginning of the Conference sequence, the transient display `Make calls first` is presented. This provides guidance to novice users who attempt to create a Conference by pressing the Conference key before making any calls.

If the Conference initiator is already connected on a Conference and tries to Conference in a fourth party by pressing the Conference key or feature code, the transient display `3 parties only` appears. The Conference sequence is terminated, and the active Conference is not affected.

If one of the other parties to the Conference is already connected on a Conference (controlled at another set) and tries to Conference in a fourth party by pressing the Conference key or feature code, the transient message `Make calls first` appears. The Conference sequence is terminated, and the active Conference is not affected.

If the Conference sequence is started by pressing the Conference key or feature code with an established call at the set, but no held call, the transient message `Make second call` is displayed, and the Conference sequence is terminated, and the active call is not affected.

Pressing the Conference key does not affect the active call.

1.2.4 Options within the Conference feature

1.2.4.1 Conference - Hold

If any of the Norstar Conference participants presses `Hold` or selects another line while connected to the Conference, the call is placed on hold from that user's point of view.

When a Conference participant holds the Conference, the other two parties remain connected to each other and can continue talking.

After holding a Conference, the user can initiate or participate in another Conference. This can be repeated up to the limit of the Conference hardware resources, as the user places successive three-party Conference calls on hold.

Only one Conference call can be in connected state on the set at any given time. The same two sets cannot be involved together in more than one Conference call.

After holding a Conference call, the initiator reconnects to it by pressing the line key of either of the held calls. When the Conference is reconnected, the call identification information <party 1> <party 2> is redisplayed.

If the internal party involved in a Conference with two external parties places the Conference on hold and leaves it on hold for two hours, the external lines are disconnected. The same timeout applies if both internal parties involved in a Conference with one external party place a Conference on hold for two hours. This timeout is to guard against tying up an external line indefinitely as a result of a user error.

A Conference initiator who wants to prevent held Conference parties from conversing, must split the Conference into two separate calls (see “1.2.4.2 Conference - Split”). To recreate a Conference after splitting it, the user must reactivate the Conference to join the calls together.

The line indicators on an initiator's set show no visual distinction between a held Conference and two separately held calls.

Mutual Hold is supported for Conference calls. That is, two or three internal parties can place a Conference on hold, and the Conference is reconnected when all parties reaccess the call.

1.2.4.2 Conference - Split

To split a connected Conference, the initiator presses one of the active line keys. The other line is automatically held, leaving the user connected to the selected line. The result is exactly as if the user had made two separate two-party calls and is connected to one of them with the other on hold. The user has one of the following options:

- alternate between the two calls by pressing one line key or the other
- force release the selected party and reconnect to the held party by pressing the held line key
- place the remaining call on hold as well

In the first and last cases, when connected to one of the parties, the user can re-establish the Conference with one party by pressing Conference, and with the other party by pressing the held line key.

1.2.4.3 Conference - Force Release a Party

To drop one of the parties from a Conference while remaining connected to the other (that is, to force release an external party), the initiator presses that party's line key (splitting the Conference) and then presses **[Ris]**. To reconnect to the remaining party, the initiator presses the held line key. Only the initiator can force release an external line in the Conference.

1.2.4.4 Conference - Transfer

Users can initiate a Conference with two external parties and drop it, leaving the other two parties connected, provided that one of the external parties joined as the result of an outgoing call.

The rules are set out in the two following tables.

	Call B: Incoming call	
Call A: Incoming call	Supervised	Unsupervised
Supervised	Valid	Valid
Unsupervised	Valid	Not Valid

	Call B: Outgoing call	
Call A: Incoming call	Supervised	Unsupervised
Supervised	Valid	Valid
Unsupervised	Not Valid	Not Valid

1. In Conference, the **TRANSFER** display key is presented in the right-hand display key position when Norstar can leave the two external parties connected after the Conference originator disconnects.
2. If external transfer from Conference is valid, the Conference master can drop out, leaving the other two parties connected by any one of the following means:
 - pressing **TRANSFER**
 - pressing a key programmed to Transfer
 - pressing **Feature** **7** **0** (Conference - Transfer From feature option)
3. Upon valid activation of Conference - External Transfer From, the user is presented with the following three- second transient display (the same as Conference - Transfer From): **Call transferred**, followed by the idle display.
4. When Conference - External Transfer From is valid, and the user presses the **Rls** key or goes onhook (with Handsfree OFF), the Conference is dropped. The user is returned to the idle display.
 - If Conference - External Transfer From is not valid, the **TRANSFER** display key is not presented. In these circumstances, the correct procedure is to **Hold** the Conference.

Pressing **Rls** or going onhook drops the Conference.

Other key presses provide the same results as using the **Conf/Trans** key.

Message Displays

Message	Description
Line in use or In use: <setname>	Displays one of these transient messages if the user tries to reaccess a terminated external transfer from Conference call.

Message Displays

Message	Description
Call transferred	Displays transiently if the controlling set transfers one of the internal parties in a Conference call.
Transfer denied	Displays transiently when the feature option is not valid and a transfer is attempted.

Transfer Display Key

On a set with display keys, once the Conference is established, the `TRANSFER` display key is shown at the Conference initiator's set. This display key has the same effect on the Conference as pressing `[Ris]`. The `TRANSFER` display key is not offered if both other parties are external and outgoing, or if an internal party has held the Conference, because a transfer is not allowed in these cases.

1.2.5 User Programming View

One Conference key can be programmed for each set. An indicator is not used.

1.2.6 OAM Programming View

N/A

1.2.7 **EXTN/ **LINE

N/A

1.3 Technical Specification (Limits/Constraints)**1.3.0.1 Conference - Hold**

After holding a Conference, the user can initiate or participate in other Conferences, up to the limit of the Conference hardware resources, as the user places successive three-party Conference calls on hold.

Only one Conference call can be in connected state on the set at any given time. The same two sets cannot be involved in more than one Conference call.

If the internal party involved in a Conference with two external parties places the Conference on hold and leaves it on hold for two hours, the external lines are disconnected.

If both internal parties involved in a Conference with one external party place the Conference on hold for two hours, the external line is disconnected.

In Hold, a set outside a Conference cannot access a held Conference line.

1.3.0.2 Conference - Transfer

Norstar currently does not provide for transfer of an incoming call to an external destination.

Once a transfer from a Conference is complete, the user cannot reaccess the Conference. If the user tries to reaccess the call, an Error tone and the transient messages, `Line in use` or `In use: <setname>` are provided.

At the controlling set, any intercom keys involved in the Conference show idle state when the transfer occurs. This rule holds true in cases in which an external call appeared on an intercom key at the initiator's set. In cases where an external call appeared on an external line key, the indicator continues to show the status of the line following the transfer.

When a set has an external call transferred to it, the call remains on the external line key at the destination set, if it has an appearance of the line. Otherwise, the call remains on the intercom key previously used by the Conference.

1.4 Interactions

Feature or condition name	Interaction
Background Music	Background music cannot be held, conferenced, or transferred.
Call Duration Timer	The Call Duration Timer does not stop when a call is held, three-party conferenced, or transferred.
Call Park	Parking of Conference calls is not supported. An attempt to park a Conference results in a <code>Park denied</code> message, along with Error tone.
CO-CO Barring	For details, see the PSTN-PSTN Barring feature.
Disconnect and Answer Supervision (Far End)	Since there is no guarantee of receiving a disconnect signal on an outgoing call (that is, it might never be answered), the Conference - External Transfer From option requires that one of the calls be incoming (effectively providing an answer) on a line that can detect when the caller disconnects.
End-to-End Signaling	End-to-End Signaling is not transmitted to lines or devices involved in a Conference call.
External lines	External lines in a held Conference continue to show active line indication at any set that is outside the Conference and has an appearance of the line.
Group Listen	The three-party call has properties of the call that was active (that is, not held) when the Conference was created.
Held Line Reminder	Held Line Reminder is not generated for held Conference calls.
Hold	When Automatic Hold is applied to a Conference call, both lines involved in the Conference are placed on hold. The user can reconnect the Conference by pressing either of the held line keys.
Page	A Page cannot be Conferenced.

Feature or condition name	Interaction
Privacy	<p>Privacy for external lines is maintained for held Conferences, even if all internal calls have placed the external line on hold. If a user presses an active external line appearance when Privacy is OFF on that line, a three-party Conference is automatically created, and Privacy is turned ON for the duration of the Conference call. Attention tone is generated at the Conference controller's telephone to indicate that the user has joined the call.</p> <p>The <code>Conference call</code> transient message does not appear for Privacy-created Conferences.</p> <p>The original programmed privacy setting is restored after the Conference ends. Privacy setting is maintained if a Conference is unsuccessfully activated.</p> <p>Privacy-created Conferences cannot be split.</p>
Private Lines	<p>Private lines can be forwarded or transferred to another set by Conference-Transfer From.</p>
Ring Again	<p>Ring Again can be used when trying to create a Conference, and a busy signal or no answer is received from an internal party. The person attempting to set up the Conference can reconnect to the original call and talk to that person while waiting for the Ring Again offer to occur.</p>
Transfer	<p>In general, attempts by the party who initiated the transfer to activate another feature (for example, Conference) during a Transfer causes that feature to be activated and the Transfer feature to be cancelled.</p> <p>Because Conferences of more than three parties are not supported, attempts by one Conference member to transfer a call to another Conference member causes the transfer originator to be replaced in the Conference by the call it is transferring. This is only permitted if the party performing the transfer is not the initiator of the Conference. If the Conference initiator attempts to transfer another member into the Conference in place of himself, the other party is placed on hold, and the initiator returns to the Conference.</p>

Consultation

1.1 Overview

1.1.1 Description

The Consultation feature allows the user to hold a two-party or three-party call temporarily in order to deal with another call.

1.1.2 Rationale for Feature

See “1.1.1 Description”.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls

N/A

1.2.2 Message Displays

N/A

1.2.3 End User View

The existence of multiple line keys and the Automatic Hold feature make it easy for the user to hold a connected two-party or three-party call in order to consult with a party on another line.

The user can press a line key at any time to initiate or answer a call while connected on another call. The user can also activate any feature that selects an incoming or outgoing line automatically. In all cases, the current call is held automatically. To reconnect to the original call, the user presses its line key.

When Automatic Hold is applied to a conference call, both lines involved in the conference are placed on hold. The user can reconnect the conference by pressing either of the held line keys.

For more details on consultation during conference calls, see the Conference feature.

1.2.4 OAM Programming View

N/A

1.2.5 **EXTN/ **LINE

N/A

1.3 Technical Specification (Limits/Constraints)

N/A

1.4 Interactions

N/A

Contrast Adjustment

1.1 Overview

1.1.1 Description

This feature allows the user to adjust the contrast of the display on their set. North American Norstar sets have a liquid crystal display (LCD) on each set with four user-programmable contrast levels from 1 to 4, with the default contrast level set at 1. This level of contrast is acceptable when viewed from a seated position, but is difficult to see from above — the angle at which an installer might typically first see the display. For Global sets, which have contrast levels from 1 to 9, a default value of 4 used, which is acceptably visible from both a seated and a standing angle of view.

1.1.2 Rationale for Feature

LCD displays are dependent on reflected light. A user's position with regard to their phone can vary, requiring the capability to adjust the contrast of the display on the set.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

Contrast Adjustment is one of a set of User Preferences features that can either be programmed by

- an individual user at their set, using Feature keys (see End User View)
- for another user by the installer, system coordinator plus, or system coordinator, through OAM Programming (see OAM Programming View)
- for another user by a user with the Installer, System Coordinator Plus, System Coordinator, or Basic password, using the User Preferences feature, **USER (see OAM Programming View, and the User Preferences feature)

1.2 Feature Details

1.2.1 Controls

Feature * 7, or programmed key

1.2.2 Message Displays

Message	Description
Contrast level <x> DOWN UP OK	<x> is a value between 1 and 9. Displays when the feature is activated, and when the contrast level is changed on two-line display sets (M7310 and M7324). There are no display keys on one-line display sets (M7100 and M7208).

1.2.3 End User View

As shown in the User Action table, the display contrast can be set to

- one of nine levels

The higher the number, the darker the contrast is between the display and the background.

The default value of 4 appears slightly darker than a contrast value of 1 from all angles of view, but nevertheless should be acceptable by all but the shortest of users (those with a very low viewing angle).

The contrast can be adjusted at any time, regardless of the telephony state of the user's set.

The following table show the steps taken by an end user to program Contrast Adjustment for their set. The table illustrates how the displays appear on two-line display sets (M7310 and M7324). One-line display sets (M7100 and M7208) do not use display keys.

User Action	Resulting Display	Set Response
1. Press Feature * 7 or the Contrast Adjust programmed key.	Contrast level 1 DOWN UP OK	The UP display key is not displayed when the contrast level is 4 (NA) or 9 (Global), and the DOWN display key is not displayed when the contrast level is 1.
2. Press dialpad digit between 1 and 4 for NA sets and up to 9 for Global sets. The Volume bar can also be used to adjust the contrast up and down.	Contrast level<x> DOWN UP OK	<x> is the new contrast level. Each new contrast level is shown. Invalid digits are ignored. Repeat this step until satisfied with the contrast.
3. Press Feature , Remove or replace the handset, or Press any key other than a dial pad key or the Volume bar, or Wait for 15-second time out	<Idle> <Idle> <Display consistent with activation of key> Feature timeout	Pressing a key exits from the Contrast Adjust feature, and returns to the idle display. All exit methods save any changes made in the contrast. Transient display accompanied by Error tone. The last setting is stored after a feature timeout (assuming the user did something in step 2).

1.2.4 User Programming View

Contrast Adjustment can be programmed on a key. It does not use an indicator.

1.2.5 OAM Programming View

Contrast Adjustment can be programmed two different ways:

- from within OAM, when an installer or system coordinator is programming system data for a set, under the heading of `Terminals&Extns`►

User preferences►Display cntrst:<x>

- by using a feature code (**USER) and any one of the four OAM programming passwords: Installer, System Coordinator Plus, System Coordinator, or Basic

See "Terminals&Extns - User preferences".

1.2.5.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes in OAM Programming.

Heading	Item			I	SC+	SC
Terminals&Extns	Individual Extn	User Preferences	COPY	X	X	
			Display cntrst:1	X	X	X

1.2.5.2 Programming Contrast Display through **USER

If the user is using a set with a two-line display, Contrast Adjustment can be programmed using **USER. The user, installer, or system coordinator changes the display contrast for the set by pressing the CHANGE display key to cycle through the options. For more details, refer to the User Preferences feature.

1.2.6 **EXTN/ **LINE

N/A

1.3 Technical Specification (Limits/Constraints)

Only M7000 series terminals can be programmed through User Preferences. Other terminal types are not supported.

The contrast setting is stored in non-volatile memory (NVRAM) and survives power interruptions. It survives warm but not cold restarts.

1.4 Interactions

See also the interactions in the User Preferences feature.

Feature or condition name	Interaction
Incoming Call	Feature drops when an incoming call is answered.
Priority Call	A Priority Call forces the feature to drop.
Extn Copy	If display contrast is copied from a Global set (which has nine levels of contrast) to a North American set (which has four levels of contrast), and the display contrast value is in the range of five to nine, the new display contrast value on the North American set is four.
Extn Relocation	If a phone is moved with Extn Relocation Set to Y in OAM Programming, the Contrast level is copied to the new set location.
Voice Call	The feature drops when an a Voice Call arrives at the set.

Class of Service

1.1 Overview

1.1.1 Description

Class of Service defines the access that internal and remote users have to the system's resources.

Class of Service is defined through dialing restrictions (dialing filters) and Class of Service (COS) passwords. Dialing filters and COS passwords are defined in OAM Programming. Programming COS Passwords is described in this specification. For information on programming dialing restrictions, see Call Restrictions and Overrides, and Restrictions Service. For further information on remote access, see Remote Access and Remote Capabilities.

1.1.2 Rationale for Feature

Class of Service permits controlled access to a system's resources, and flexibility in the packaging of these system resources.

1.1.2.1 Usage Scenarios

The Class of Service for remote users can be set in OAM Programming such that it allows or restricts system resources. Some examples follow.

- A user is using someone else's set in the system and that set has certain dialing restrictions. The user can use their COS password to be able to dial numbers that might normally be restricted at that set.
- Tandem calls using expensive routes can be barred by restricting the user's access to line pools when certain trunks or passwords are used.
- Groups of remote users can be restricted or permitted to access system features (remote paging), depending on the Class of Service applied to their password.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls

Feature 6 8

1.2.2 End User View

Class of Service determines the dialing restrictions that apply to

- a user's set, and any lines used for external calls (internal users)
- incoming and outgoing lines from line pools (remote users)
- access to remote features such as remote paging, remote administration, and remote monitoring (remote users)

These restrictions are defined in OAM Programming.

COS passwords permit controlled access to the system's resources for internal and remote users.

1.2.2.1 Internal Users

To make a call that is normally restricted on a line or a set, an internal user activates Feature 6 8 and then enters a six-digit COS password. This changes the Class of Service and bypasses the restrictions on the line or set. The dialing capabilities associated with that password (the user filter and the line filter) then apply for the duration of the user's subsequent external call. For more details, see the Call Restrictions and Override feature.

1.2.2.2 Remote Users

When remote access to the system is restricted, a remote user must enter a COS password to obtain access to the system. The dialing filters (user and/or line filters) and the remote package associated with the COS password then apply, rather than the normal dialing filters and remote package.

A remote user's capabilities are determined by the COS associated with either:

- COS password, if entered
- the autoanswer trunk on which the user is calling

Depending on the COS in effect, remote users are able to access some or all of the system's resources available to remote users. For details on supported resources, see the Remote Capabilities feature.

1.2.2.3 Obtaining Remote Access using a COS password

On a trunk is programmed to autoanswer with DISA, the user must enter a COS password to gain access to the system.

The remote user first dials the DISA DN, and when they hear stuttered dial tone, they enter a six-digit COS password. Once the first digit is entered, the stuttered dial tone is replaced with silence. If the six-digit password is valid, Norstar returns system dial tone to the caller.

The COS associated with the password applies for the duration of the user's call (unless the user changes the Class of Service and enters another password during that same call).

Passwords are assigned by the System Coordinator, and are defined in OAM Programming.

Using an octothorpe (“#”) as a terminator

Because many other Nortel products provide an octothorpe (“#”) as a terminator value when entering codes (such as the SL-100), a # is ignored if it is entered after the six-digit password. Although this terminator is not necessary on Norstar (since the passwords are a fixed length), SL-100 users accustomed to this method are not penalized for using it on Norstar.

1.2.2.4 Obtaining Remote Access without a COS password

As described in the Remote System Access feature, customers can choose to give direct access to their Norstar system, without requiring the user to enter a COS

password. In this case, the Class of Service associated (in OAM Programming) with the trunk on which the user is calling applies for the duration of the user's call, unless the user changes the Class of Service and enters another password during that same call.

1.2.2.5 Error Conditions

Message Displays

Message	Description
Invalid Password	Displays transiently, with Overflow tone, if characters, other than digits, are entered for the COS password.

If any of the following error conditions occur during password entry or password change

- user does not enter digits within 15 seconds of receiving stuttered dial tone, or waits more than 15 seconds between digits
- an invalid six-digit COS password is entered, that is, a password not defined for the Norstar system the user is trying to access (the entry is treated as invalid after the sixth digit is entered)
- the user enters an asterisk (“*”) as one of the six digits of the password (the entry is treated as invalid after the sixth digit is entered)
- the user enters an octothorpe (“#”) as part of the password (the password entry is immediately validated by the system)

For security reasons, Norstar allows the user only one attempt to enter a COS password. If the attempt fails for any reason, the user must redial the DISA DN and try again.

If the user enters the Auto DN instead of the DISA DN when they hear system dial tone, the operation has no effect. The system presents dial tone again. The Class of Service in effect for the password or the trunk before the Auto DN was entered is not changed.

Auto DN and DISA DN (see the Remote System Access feature) do not apply for internal users. If an internal user tries to enter either of these DNs, the system attempts to process the digits as in normal call processing. If an external line is used, the digits are sent on the line. If an intercom line is used, the system attempts to make an intercom call.

1.2.3 OAM Programming View

1.2.3.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item		I	SC+	SC
Passwords	COS pswds	COPY (display key)	X	X	
		COS pswd #nn			
		COPY (display key)	X	X	
		Pswd: nnnn	X	X	
		User fltr:nn	X	X	
		Line fltr:nn	X	X	
		Remote pkg:nn	X	X	X

1.2.3.2 Programming COS Passwords

COS passwords are programmed in Passwords►COS pswds.

See "Passwords - COS Passwords".

To see the passwords, the user presses the `SHOW` key. Passwords are referenced using the digits 00 through 99, for example, `Pswd 01:123456` or `Pswd 01:None`.

COS pswds allows the user to assign:

- a user filter (`User fltr`)
- line filter (`Line fltr`)
- specific remote access packages (`Remote pkg:nn`)

to a given COS password.

The user filter associated with the COS password replaces any normally applicable set filter, line/set filter, and remote filter.

The line filter associated with the COS password replaces any normally applicable line filter.

The remote access package associated with the COS password replaces any normally applicable remote access package.

The default value is `None` for each filter. For more details, see the Default Templates, and the Call Restrictions and Override feature.

Error Conditions

Message Displays

Message	Description
Invalid Password	Displays transiently if characters, other than digits, are entered for the COS password.

Message Displays

Message	Description
Already in use	Displays transiently, together with Error tone, if installer or coordinator tries to change a COS password to one that already exists. The original value is restored.

Characters other than digits (for example, “#” and “*”) are not accepted as valid input when the installer or coordinator enters a password. Invalid input is blocked by the software. If the installer or coordinator tries to change a COS password to one that already exists, Error tone and the transient message, `Already in use` is provided. The installer or coordinator is then returned to the previous display. The digits for the password attempting to be changed (or the value `None` for the password if it was not defined) are left unchanged. For example, if the installer or coordinator tries to change `Pswd 01:123456` to `223344`, but the latter is already used for Password 02, the transient error message is provided, and the installer or coordinator is returned to `Pswd 01:123456`.

1.2.3.3 Copying COS passwords**Message Displays**

Message	Description
Copied xx > yy	Displays transiently after a password is successfully copied from a source password to a destination password. <code>xx</code> and <code>yy</code> are password numbers.

Copying between passwords allows the values (dialing filters, access package) associated with one password entry to be copied to another password entry.

At the prompt, `Show password:`, a `COPY` display key is provided in the first display key position. The user can copy the values associated with a COS password to another COS password or passwords.

When `COPY` is pressed, the user is prompted with `Source:`. A password number (for example, 02, identifying password 223344), is entered, and the prompt, `Copy to pswd:` is given. When the user enters a destination, (for example, 05, identifying password 556677), information from the source password (user filters, line filters, and the remote access package) is copied to the destination password. A transient message is provided, for example, `Copied 02 > 05`. The prompt `Copy to pswd:` reappears so more copying can be done.

If the password is set to `None` (for example, `Pswd 01:None`) then its corresponding values can still be copied. When the password is copied, the existing values for the parameters (dialing filters, access package) are applied. The password number itself (for example, 223344 in the previous example), is never copied during a copy operation.

If values associated with a COS password are copied to another password, existing values (for the password receiving the new information) are overwritten.

1.2.4 **EXTN/ **LINE

N/A

1.3 Technical Specification (Limits/Constraints)

The COS password list can contain a maximum of 100 six-digit entries.

1.4 Interactions**1.4.1 Software Upgrades**

In DR3, corresponds to a list of 100, four-digit restriction override passwords that are used to override set and line dialing restrictions for the duration of one external call. In DR4, this feature is combined with the new COS password list to be one and the same.

When upgrading a system that has existing restriction override passwords, existing passwords are automatically extended. The passwords are changed from four to six digits by adding two zeros onto the end of the old password. For example, `Pswd 01:1576` would be changed to `Pswd 01: 157600`. The default values for access packages, and all dialing filters `Deflt` apply (see the **Call Restrictions and Override** feature.)

Because each COS password must have a unique Class of Service, passwords must also be unique. Therefore, when upgrading, if there are two or more passwords the same, the first one is kept (with the addition of two zeros as described above), and any others are changed to `None`.

Feature	Interaction
PBX Reach through	Reachthrough codes entered as part of a COS password are not usually transmitted to the far end system, except in the case of Link. If a Norstar system receives a Link code during COS password entry, the entry is treated as invalid input.

Daylight Savings Time

1.1 Overview

1.1.1 Description

This feature allows the user to set the time forward and backward by one hour.

- You can move one hour forward with * * 3 9 3 (FWD).
- You can move one hour backward with * * 2 2 2 5 (BACK).

1.1.2 Rationale for Feature

In the UK, the algorithm for Daylight Savings Time changes every three years. Rather than have the CCU perform a time change automatically, this feature allows the user to set the time from the dialpad of an M7324 or M7310 set.

1.1.3 Rationale for feature

N/A

1.1.4 General Definitions

N/A

1.2 Feature Details

1.2.1 End User View

**FWD and **BACK can be activated only from the dialpad of an M7324 or M7310 set. No password is required.

Message	Description
Access Denied	The user tried to activate **FWD or **BACK from a one-line display set. Activation is only permitted from M7324 and M7310 sets.
In use:221	A user tries to enter OAM programming, or **FWD/**BACK from another set while set 221 is using **FWD/**BACK.
Release calls	A call is active on the set and the user tries to activate **FWD/**BACK on that set.

[See "Time Forward or Back".](#)

Pressing ends programming and exits the feature without making changes.

1.2.1.1 Event Codes

After the user confirms the time change, a time change event is logged:

- Event 419

1.2.2 OAM Programming View

N/A

1.2.3 **EXTN/**LINE

N/A

1.3 Technical Specification (Limits/Constraints)

Only one activation of either **FWD or **BACK can take place at one time.

Changes to the clock made through **FWD or **BACK are retained in non-volatile memory (NVRAM). When the power is restored, the clock resumes running based on the stored time and date.

1.4 Interactions

Feature or condition name	Interaction
OAM Programming	OAM Programming cannot be activated from a set when a **FWD or **BACK session is in progress elsewhere.
Other features that make use of the clock setting, for example, Call Restrictions and Overrides, Services, Call Duration Timer, Call Log, Maintenance logs, Show Time, Time and Date	**FWD and **BACK change the Time and Date set in OAM Programming or by **TIME.
User-programmable features	The user cannot activate the user-programmable features when a **FWD or **BACK session is in progress elsewhere.

Delayed Ring Transfer (DRT)

1.1 Overview

1.1.1 Description

This feature allows an unanswered external call, after a number of ring cycles (specified system-wide through OAM programming), to extend ringing to the Prime Extn for that line.

1.1.2 Rationale for Feature

See “1.1.1 Description”.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls

N/A

1.2.2 Message Displays

Message	Description
DRT <linename>	Displays the name associated with the ringing line in OAM programming on the Prime Extn.
<linename> callback CALLBACK	Displays if Delayed Ring Transfer occurs for a Callback call.

1.2.3 End User View

With Delayed Ring Transfer (DRT) enabled, an incoming line call that goes unanswered for a programmable number of ring cycles, begins ringing at the Prime Extn for that line. The audible alerting and visual indications remain at the original set(s), but this line can now be answered using Automatic Incoming Line Selection at either the original set(s) or the Prime Extn.

Delayed Ring Transfer is not considered to be set-specific since the line typically rings at several sets.

The global Prime Extn displays the message DRT <linename>. The ring-transferred line is available for automatic incoming line selection, as the highest priority alerting call at the Prime Extn.

1.2.4 User Programming View

N/A

1.2.5 OAM Programming View

1.2.5.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item		I	SC+	SC
System prgrming	Featr settings	DRT to prime:Y	X		
		DRT delay:3	X		

1.2.5.2 Programming Delayed Ring Transfer

See "[System Programming - Feature Settings](#)".

Delayed Ring Transfer is programmed in System prgrming► Featr settings►DRT to prime:Y. The values are Y or N. The default is underlined.

The delay before the Delayed Ring Transfer occurs is programmed in System prgrming►Featr settings►DRT delay:3.

The delay before forwarding (DRT delay) is specified as

- after 1, 2, 3, 4 or 6 rings

The default is underlined. Internally, in software, the delay used is approximately the number of rings times

- 3 seconds

The same delay is used for all lines for which Delayed Ring Transfer is enabled.

1.2.6 **SET/ **LINE

N/A

1.3 Technical Specification (Limits/Constraints)

N/A

1.4 Interactions

Feature name	Interaction
Automatic Incoming Line Selection	If more than one line tries to present Delayed Ring Transfer concurrently, the line carrying the oldest incoming call drives the ringing and the message display at the set, and is selected if Automatic Incoming Line Selection is performed.
Call Forward	If the Prime Extn has Call Forward enabled, Delayed Ring Transfer occurs at the forward destination, whether or not the forward destination has an appearance of the external line. The ring transfer message DRT <linename> is displayed at the forward destination.

Feature name	Interaction
Do Not Disturb	Delayed Ring Transfer does not occur if Do Not Disturb is enabled at the Prime Extn, the call appears (flashes at the indicator) but does not ring.
Prime Extn	If the call is already ringing at the Prime Extn when Delayed Ring Transfer of the same call from another set is attempted, the DRT <linename> message is not displayed at the Prime Extn. If the Prime Extn is established on another call, the Prime Extn receives attenuated ringing for the Delayed Ring Transfer call. Delayed Ring Transfer does not occur if a Prime Extn has not been assigned, or is out of service.
Private line	A Private Line can perform Delayed Ring Transfer to a Prime Extn.

Dial Mode

1.1 Overview

1.1.1 Description

This feature allows the user to assign the signaling mode (either tone or pulse) that the line is to use.

Pulse and tone dialing distinctions, and the generation of pauses, apply to external calls only.

1.1.2 Rationale for Feature

See “1.1.1 Description”.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls

Dial pad keys:

* and #

1.2.2 Message Displays

N/A

1.2.3 End User View

OAM Programming allows any analogue line to be set up for tone dialing or pulse dialing. On lines programmed for pulse dialing, the dial pad key * is interpreted as a pause until the # key has been dialed on a call. The user can activate DTMF signaling (that is, generate DTMF tones for all dial pad keys, including * and #) by pressing the # key.

The conversion of Pulse to Tone by pressing #, lasts only for the duration of the call. When the call is disconnected, the dialing mode reverts back to Pulse.

In Pulse dial mode, digits are initially sent out as pulses, and the * key causes a 1.5 second pause to be inserted in the dialing stream.

The first “#” dialed on a pulse-dial line is not sent out. It converts the signaling mode to dual-tone multi-frequency (DTMF) mode, and enables tone generation for all subsequent digits, including the * and # keys.

In Tone dial mode, all dial pad key presses (digits, “*”, and “#”) are sent out as DTMF tones.

1.2.4 User Programming View

N/A

1.2.5 OAM Programming View

1.2.5.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item			I	SC+	SC
Lines	Individual lines	Trunk/Line Data	Dial mode:Tone	X		

1.2.5.2 Programming Dial Mode

See ["Lines - Line Data - Loop"](#) or ["Lines - Line Data - AC15"](#).

In **Lines**►**Trunk/Line data**►**Dial mode:Tone** set the **Dial Mode** to **Tone** or **Pulse**. Press **CHANGE** to change the value. The default is **Tone**.

If the trunks use dual-tone multi-frequency (DTMF) dialing, this setting should be left as **Tone**. Otherwise, assign this setting to **Pulse**.

1.2.6 **EXTN/ **LINE

N/A

1.3 Technical Specification (Limits/Constraints)

N/A

1.4 Interactions

Feature name	Interaction
ATA	User programmable features that require the use of the Recall feature on Pulse sets attached to the ATA are not supported (CUK1)
Autoanswer loopstart trunks	Norstar autoanswer loopstart trunks cannot detect pulse signaling. Therefore, unless the incoming digits are DTMF, the call is dropped after 15 seconds (the standard inter-digit time out).
Autodial Speed Dial LNR SNR	When Speed Dial or Autodialer is used to dial a number, the digits are transmitted in the Dial Mode programmed for that line. The meaning of [*] and [#] on Pulse dial lines remains intact even when used in Autodial or Speed Dial numbers.
DASS2 Lines	if Dial mode for a loopstart line is set to Pulse , and the line is re-equipped by a DASS2 line card, the system changes the Dial mode to Tone .
DIA line	The Dial Mode parameter is suppressed for DIA lines.
Incoming Call Information (ICI)	While ICI is active, all dial pad input is ignored (except for [#] key, which is used for navigation, and the [*] key, which is used to display the other part of a long CLID or TLI number). Therefore, Tone mode cannot be activated.
Network Voice Message Service (NVMS)	If a user uses a Pulse dial trunk to call the NVMS, they can use pulse-to-tone conversion if necessary to communicate to the NVMS (to give password, etc.)

Feature name	Interaction
PBX	Can be used in conjunction with this feature.
Services Card	Is not required when both the following conditions are true: <ul style="list-style-type: none">- part of an all-Norstar network is linked by DASS2 digital lines- dial mode is <i>Pulse</i>.

Dial Pad Feedback

1.1 Overview

1.1.1 Description

When a voice path or a set speaker is active, the set produces a feedback tone each time the user presses a dial pad key. As well, every dial pad key pressed is echoed on the display.

1.1.2 Rationale for Feature

See “1.1.1 Description”.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 End User View

1.2.1.1 Dial Pad Feedback

Dial pad feedback tone, presented through the active voice path, acknowledges to the user that a key press has been received. The tone is composed of a single tone presented once for each key press. Dial pad feedback tone is not transmitted to the other party in a connected call, except by re-entering the handset from the handset earpiece or the Handsfree microphone from the Handsfree speaker.

Tone description

Tone Name	Duration	Frequency
Dial Pad Feedback	16 ms	333 Hz

Some exceptions exist to this rule. For example, when an External Autodial key is activated, no feedback tones are heard.

Many features also block the entry of invalid digits. For more information, refer to the individual feature descriptions.

1.2.2 OAM Programming View

N/A

1.2.3 **EXTN/**LINE

N/A

1.3 Technical Specification (Limits/Constraints)

N/A

1.4 Interactions

Feature or condition name	Interaction
Dialing Options	When either Automatic or Standard Dial is active, Dial Pad Feedback is presented for each dial pad key press. When Pre-Dial is active, Dial Pad Feedback is presented for each dial pad key press once the line is picked up.
End-to-End Signaling	While the set is in End-to End Signaling mode, the user continues to hear only the fixed length, set generated dialpad feedback tones.
Last Number Redial Saved Number Redial System Speed Dial User Speed Dial Internal Autodial External Autodial	Dial Pad Feedback is not generated when a call is made using LNR or SNR. Dial Pad Feedback is not generated when a call is made or is being programmed with any of the following: System Speed Dial User Speed Dial Internal Autodial External Autodial
Restriction Override	When the user activates the Restriction Override feature, the display is cleared, that is, the digits are not echoed onto the display screen. However, dialpad feedback tones are still presented.

Dial Tone Detection

1.1 Overview

1.1.1 Description

Dial Tone Detection applies to external (PSTN or Norstar behind PBX) lines. If the feature is enabled, when an external line is seized in any manner, the user cannot dial any digits until dial tone has been received. If no dial tone is detected after 60 seconds, the line is released.

1.1.2 Rationale for Feature

The Dial Tone Detection feature allows some lines to operate in a non-SCRM (simple call routing mode). In SCRM, every external line attached to the Norstar System must be assigned to at least one set that has a LCD line appearance of that line, and be assigned to ring at that set. For Modular Plus and Compact Plus systems in the UK, if loop-calling guarded and earth-calling lines are to operate in a non-SCRM mode, they must be administered with Dial Tone Detection

1.1.3 General Definitions

This specification refers to AC15 lines or any other line that supports Disconnect Supervision.

1.1.4 General Procedures

Dial Tone Detection, when programmed, is performed on the following lines:

- loop-calling guarded
- loop-calling unguarded
- earth-calling

1.2 Feature Details

1.2.1 Controls

Dial Tone Detection programmed key, or Feature 8 0 4.

1.2.2 End User View

If the user selects a line and waits to hear dial tone before dialing (manually or automatically), they hear the dial tone as soon as it is detected. As soon as the user starts dialing, the dial tone stops.

If manual dialing, or a combination of automatic and manual dialing (concatenation) is done prior to dial tone detection, the user does not hear dial tone when it is detected. If only automatic dialing is done prior to dial tone selection, the user hears a short burst of dial tone when it is detected (to let the user know that the autodialed call is progressing).

The user can also insert a request to Dial Tone Detection Feature 8 0 4 within a dial string (for example, when programming an external autodialer). This feature causes the system to wait until it detects dial tone before proceeding any further with the dialing of remaining digits. Receipt of dial tone must occur within 60 seconds of the Dial Tone Detection feature request. When the second dial tone is detected, a short burst of dial tone is given.

The Dial Tone Detection timer starts when an external line is seized. An external line can be a PSTN line or a Norstar behind PBX line. The behavior of this feature depends on how the line is seized. The user can select the line manually by any of the following methods

- pressing a line key
- dialing a line pool code
- lifting the handset
- selecting Handsfree

The line can also be selected automatically when features such as Last Number Redial, Saved Number Redial, external autodialers, System Speed Dial, User Speed Dial, and Hotline are activated. The behavior of the feature also depends on whether the user waits to hear an audible dial tone before starting to dial.

When dial tone is detected, the user hears continuous dial tone if they are waiting to hear dial tone; or a short burst of dial tone if they need feedback to know that an autodialed call is proceeding. If dial tone is detected when the user is in the middle of dialing, the user is not interrupted by audible dial tone. According to these general rules, if dial tone is detected within 60 seconds, the call proceeds as follows:

1. If the user selects the external line manually and waits to hear dial tone before starting to dial (manually or automatically), they hear dial tone as soon as it is detected, and the dial tone stops as soon as they start dialing. The digits are sent out and displayed as they are dialed.
2. If the user does manual dialing or a combination of manual and automatic dialing before hearing dial tone, the digits are displayed as they are dialed. However, rather than being sent out immediately, the digits are stored until dial tone is detected. When dial tone is detected, it is blocked so that the user does not hear it. (The user does not expect to hear a burst of dial tone in the middle of dialing or after dialing). The digits are sent out when dial tone is detected.
3. If the user activates an automatic dialing feature and does no manual dialing before dial tone is detected, the number is displayed immediately. Once dial tone is detected, the user receives 700 milliseconds of unmuted dial tone after which time the autodialed digits are sent out. (The dial tone gives users feedback that the autodialed call is progressing).

In the descriptions 1, 2, and 3 above, manual dialing refers only to offhook dialing. The effect of onhook manual dialing depends on the dialing option that has been enabled, as described below:

- If the set has Automatic Dialing mode (Onhook Dialing with automatic prime line selection) enabled, touching the dialpad to dial the first digit selects the Prime Line automatically.
- If Predial dialing mode is enabled, the user dials the number first, then selects a line manually. As soon as dial tone is detected, the user receives 700 milliseconds of unmuted dial tone, after which time the predialed digits are sent out.

Feature 8 0 4 corresponds to the Dial Tone Detection feature in dial strings. It is used by inserting the feature code into a sequence dialed manually, or entered as part of an autodialer. This feature uses two characters in an autodialer each time it

is inserted as part of the digit string. This code is represented by a two character symbol on the display as: **■**.

The feature stops the system from outputting subsequent digits until a far end system responds with dial tone.

If Dial Tone Detection is requested as part of a dial string, the timer starts upon receipt of the request by the system. Further processing of remaining digits in the dial string is halted until dial tone is detected. When dial tone is detected, the timer is cleared, the user hears a 700 msec burst of dial tone, and then the system proceeds dialing the remaining digits. If the user begins to dial manually before dial tone is detected, the 700 msec burst of dial tone is not heard.

Message Displays

Message	Description
No dial tone	Displays transiently, accompanied by Attention tone, if no tone is detected after 60 seconds on a seized line.

In all the cases described above, if dial tone is not detected within 60 seconds, the No dial tone message is displayed transiently for three seconds, accompanied by Attention tone. The line is released, the associated indicator lamp is turned off and the display returns to idle (time and date). An event message is not generated, since it is the remote system that did not return dial tone and, therefore, it is not a problem with the Norstar system.

If the user has already dialed all or part of the number, the digits are cleared from the display. The user can, however use the Last Number Redial feature to automatically redial the digits.

1.2.3 User Programming View

Dial Tone Detection can be programmed on a key. The user dials some digits, enters the feature code or presses the programmed key, then continues dialing without waiting for dial tone. In this case, the user does not hear anything when dial tone is detected.

1.2.4 OAM Programming View

Dial Tone Detection is programmed under **Lines▶Line data▶Loop▶Dial Tone**. The values are **Detect** or **Delay**.

See ["Lines - Line Data - Loop"](#).

The **Dial Tone** setting only appears if the line number corresponds to a CO line (lines 001 to 004, 031 to 034 and 061 to 230 for Modular Plus and lines 001 to 004 and 031 to 034 for Compact Plus). Each line can be administered to either detect dial tone, or delay dialing for a period determined by the Host Delay feature.

Dial Tone Detection does not appear for line numbers corresponding to AC15 or target lines. Dial tone detection is not required for AC15 lines because they have their own protocol to determine when the far end is ready to receive digits. Target lines also do not require Dial Tone Detection as they are incoming lines only.

1.2.5 **EXTN/LINE**

N/A

1.2.6 Event Codes

The following event message appears in the System Test Log.

- EVT262-xxx S7

where xxx is the port number and the severity level is 7.

1.3 Technical Specification (Limits/Constraints)

N/A

1.4 Interactions

If no dial tone is detected on features that are expecting the line to be seized, the feature treats the failed seize as a far end release.

Feature name	Interaction
Line Presence test	Dial Tone Detection is not performed if the line presence test fails.
Automatic Dial	If no dial tone is detected when a line is active, the transient message <code>No dial tone</code> appears accompanied by an attention tone. For example, when a user starts dialing with Automatic Dial (live dial pad) administered, and no dial tone is detected, the message <code>No dial tone</code> appears on the display accompanied by an attention tone.
Hold	For non-active calls, if no dial tone is detected when a line is in a U-hold or I-hold state, the message <code>No dial tone</code> does not appear and there is no attention tone given. For example, if a user has selected a line from a line pool and then puts it on hold to reserve it (which can be done in less than three seconds), and then dial tone is not detected, the message <code>No dial tone</code> does not appear on the display and no attention tone is given.

Direct-Dial

1.1 Overview

1.1.1 Description

Direct-Dial defines a single digit on a system-wide basis that allows a user to call a specific extension, called a Direct-Dial extension. The Direct-Dial extension may be internal or external.

For Compact Plus systems, only one Direct-Dial extension can be defined. For Modular Plus systems, five Direct-Dial extensions can be defined in OAM Programming, so that different extensions on one system can be called.

Each Direct-Dial extension can send and receive up to 30 messages, and each can enable or disable ringing of Direct-Dial calls to the Extra-dial extension for a Scheduled Service.

1.1.2 Rationale for Feature

This feature permits different groups of users to route their Direct-Dial calls to different Direct-Dial extensions. This allows calls to be selectively routed to an individual that can handle these types of calls most appropriately. It also can be used to spread the load of Direct-Dial calls across several extensions.

No correspondence necessarily exists between the five Direct-Dial extensions and the five Enhanced Central Answering Positions (ECAPs), if defined. However, one or more extensions can be designated as both Direct-Dial and CAP, if desired.

Allowing a programmable Direct-Dial digit permits greater flexibility for a system's dialing plan. The digit dialed to reach a Direct-Dial extension is not required to be 0.

A requirement exists in several markets to have centralized attendants who serve users on several different CCUs. Extending the Direct-Dial feature to permit off-node (network) Direct-Dial destinations gives the user the flexibility to set up off-node (remote) attendant services.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Caller View

Message Displays

Message	Description
Calling <setname> LATER	Displays when an internal caller dials a Direct-Dial extension. Pressing the LATER display key allows the caller to use Ring Again, or if Ring Again is not desired, to Send a Message.
Invalid number	Displays, accompanied by Overflow tone, if an internal Direct-Dial call is attempted (directly or through use of a feature such as Call Forward, Transfer, Camp, Send Message, Directed Call Pickup) to an extension that is not defined as a Direct-Dial extension, or the Direct-Dial digit for the system is None.
Your number	Displays, accompanied by Overflow tone, if a caller dials their own extension into internal dial tone, or calls the Direct-Dial extension (through use of a feature such as a Call Forward, Transfer, Camp-on, Send Message, Directed Call Pickup) when it is programmed in OAM Programming to be their own extension.
D-dial:None	Displays if no Direct-Dial extension is defined for the calling extension.

To call a Direct-Dial extension, the caller dials a single digit into internal dial tone. (The Direct-Dial digit, Direct-Dial extensions, and the extensions allowed to call a Direct-Dial extension, are assigned in OAM Programming.)

Calling the Direct-Dial extension using other methods is also supported, for example, by activating an internal Autodialer, or dialing the extension number of the Direct-Dial extension.

Network Direct-dial programming is transparent to the end user. When a caller dials the Direct-dial digit into an intercom, their set behaves as if they had pressed an internal Autodialer, or an external Autodialer which uses the routing table to translate the Direct-dial digit into its full expansion. For example, if the network Direct-dial destination is internal, the display shows Calling <setname>. If, the network Direct-dial is external, the display shows the Direct-dial digit only.

1.2.2 End User View

Message Displays

Message	Description
<setname> calling	Displays at the Direct-Dial extension when an internal call is received.

The user at a Direct-Dial extension receiving an internal call sees <setname> calling.

Existing call processing rules apply for Direct-Dial calls, so that calls can be forwarded, transferred, and so on, provided that a Direct-Dial extension is associated with the calling extension, and a Direct-Dial digit has been defined for the system.

Handling of failure conditions, such as busy destination, busy facility, or no access to the line pool, and so on, is exactly the same as for Autodialers.

1.2.3 OAM Programming View

Implementing the Direct-dial capability includes programming the following

- Direct-dial digit
- Direct-Dial extension
- extensions that call the Direct-Dial extension

1.2.3.1 Levels of Access

The following tables show the levels of access required for users to program Direct-dial in OAM programming.

Direct-dial Digit

Heading	Item		I	SC+	SC
System prgrming	Access codes	Direct-dial:0	X		

Direct-Dial extension

Heading	Item		I	SC+	SC
Terminals&Extns	Capabilities	D-dial:Extn1	X	X	X

Extns that Call the Direct-Dial extension

Heading	Item		I	SC+	SC
System prgrming	Direct-dial	D-Dial1:None	X	X	

1.2.3.2 Programming the Direct-dial Digit

See ["System Programming - Access Codes"](#).

The Direct-dial digit is selected in `System prgrming`►`Access codes`►`Direct-dial`. The default value is 0. The Direct-dial digit is a single digit used to call the system's Direct-Dial extensions.

Press the `CHANGE` display key at the `Direct-dial:0` prompt to cycle through the values and change the Direct-dial digit. The values can be `N` (None), and 0 to 9, with the following constraints. The Direct-dial digit cannot be the same as the Call Park prefix, or the first digit of

- an extension number
- a line pool access code
- a Destination code
- an External Line access code

A Direct-Dial extension can be programmed whether or not a Direct-dial digit has been defined for the system.

If the user selects the value `None`, no Direct-dial calls can be made to any Direct-Dial extension. (See “1.2.1 Caller View”.)

Message Displays

Message	Description
Not available	Displays transiently if the user tries to change the value of the Direct-dial digit from <code>None</code> and no other values are available.

1.2.3.3 Defining Direct-Dial extensions

See ["System Programming - Direct Dial"](#).

Direct-Dial extensions are defined in `System prgming▶Direct-dial▶D-dial1:None`.

Any type of extension can be a Direct-Dial extension. For Compact Plus systems, only one Direct-Dial extension can be defined. For Modular Plus systems, up to five Direct-Dial extensions can be defined.

Extra-dial Extns (that is, extra Direct-Dial extensions) are defined in `Services▶Ringing Service▶Extra-dial:Extn#`. For more information, refer to the Scheduled Services (Ringing Service) feature.

Changing the extension number of a Direct-Dial extension

By default, for Modular Plus systems, the remaining Direct-Dial extension, `Extn2`: through `Extn5` have a value of `None`. No assumptions about desirable default values are made about the extension numbers for the remaining extensions.

The user can change the extension number of a Direct-Dial extension. If the extension number of a Direct-Dial extension is changed to a new extension number, any extension numbers programmed to call the old Direct-Dial extension call the newly defined Direct-Dial extension.

If no digits, or a digits string shorter than the `Extn # Length` is entered, a value of `None` is inserted. The transient message appears: `D-Dial<n>:unchangd`. The user remains at that prompt, for example, `D-Dial1: None`.

If the user assigns the value `None` for a Direct-Dial extension, no Direct-dial calls can be made to that Direct-Dial extension. Any extensions previously programmed to call it get an error message (See “1.2.1 Caller View”.) In order for the extensions to call another Direct-Dial extension, they must be specifically programmed to do so.

The five Direct-Dial extensions can be programmed to be the same or different. For example, `Direct-dial Extn1` can be 224, and `Direct-dial Extn5` can also be 224. This allows, for example, a user going on vacation, who is normally responsible for one department's Direct-dial calls, to send only their Direct-dial calls to another Direct-Dial extension (even if that other Direct-Dial extension is a Direct-Dial extension for another department) while they are away.

Facility Selection for Direct-dial

See ["System Programming - Direct Dial - Facility Selection"](#).

External Direct-Dial extensions can use one of four facilities: Use prime line, Use line, pool code, Use routing table. The default is underlined.

The option `Use routing tabl` provides for use of the translation table. If this option is programmed, and the digits provided are not recognized by the routing table at the time that the feature is used, an external line is obtained from the lowest numbered accessible line pool. This occurs even if the digits to dial include digits that are identical to a line pool code.

The extension that is the Direct-dial destination can be internal or external to the system. If the user specifies it as internal, it is not routed externally, even if the digits entered include a line pool code, or destination digits recognized by the routing table. Similarly, if the destination is defined as external, the system routes it externally, even if the entered numbers equal an internal extension number, for example.

The default for the first D-Dial Extn is `Intrnl` (Extn 221). The defaults for the other D-Dial Extns is `None`.

A `CHANGE` display key is provided with the parameter, `D-dial:Extn<x>`. When `CHANGE` is pressed, the user can cycle through the values `None/Intrnl/Extrnl` and the Direct-Dial extensions 1 to 5.

At the `D-Dial<n>: None/Intrnl/Extrnl` prompt, if changes were made to the extension number, `NEXT` goes to the `End of List` prompt. If changes were made to the facility but not to the extension number, the transient message appears: `D-dial 1:unchangd`.

The user can cycle through the options using the `CHANGE` display key without erasing any information.

As with Hotline, if the `D-Dial<n>: None/Intrnl/Extrnl` prompt is set to `Extrnl`, and if `Extrnl#` is set to `None`, the `D-Dial<n>:None/Intrnl/Extrnl` prompt reverts automatically to the previous setting.

If no Direct-Dial extension is defined for an extension, the prompt, `D-dial:None`, is provided. If the Direct-Dial extension number that an extension calls is programmed with the value `None`, no Direct-dial calls can be made to that Direct-Dial extension. (See “1.2.1 Caller View”.)

If the user presses `[Rls]` before completing the entry of an internal or external number, the Direct-dial destination reverts to the previous setting. If the user presses release during the entry of the facility, the OAM Programming session terminates and the facility reverts to `Use prime line`.

1.2.3.4 Defining extensions that Call the Direct-Dial extension

In `Terminals&Extns`►`Capabilities`►`D-Dial:Extn1`.

[See "Terminals&Extns - Capabilities".](#)

Each end user's extension can be assigned to call one Direct-Dial extension when the end user dials the system-wide Direct-dial digit.

Any extension, including a Direct-Dial extension, can be programmed to call another Direct-Dial extension.

There is no limit to the number of extension numbers that can call a Direct-Dial extension. However, each extension can only call one Direct-Dial extension.

1.2.4 ****EXTN/ **LINE**

N/A for Compact ICS.

For Modular, extension abilities in ****EXTN**.

1.3 Technical Specification (Limits/Constraints)

For Modular systems, a maximum of five Direct-Dial extensions is supported.

ISDN terminals cannot use the Direct-Dial digit to reach a Direct-Dial extension.

A cordless handset should not be designated to be a Direct-Dial extension because a cordless handset can handle only two calls at a time and may not always be reachable. Also a cordless handset cannot invoke a Scheduled Service to extend ringing to an Extra-Dial telephone.

1.4 Interactions

Feature name	Interaction
Autodial keys	The Direct-Dial digits can be programmed onto an internal Autodialer, irrespective of whether the destination is internal or external.
Automatic line selection	If an external dialer is dialed into an intercom, and does not match a routing table entry, the system selects an outgoing line using the existing external line-access algorithm.
Flexible Numbering Plan: Call Park Line Pools Routing Service External Line Access Change Extn, Extn Length	<p>The Direct-Dial digit must not conflict with the</p> <ul style="list-style-type: none"> - Call Park prefix <p>It also must not conflict with the first digit of</p> <ul style="list-style-type: none"> - a line pool access code - a Destination code - an external line access code (allowed if dialed remotely) - an Extn # <p>Changing individual extension numbers, or Extn length, preserves the relationship between a Direct-Dial extension and the extension number(s) assigned to call it. For more details of the programming interactions, refer to the Flexible Number Plan specification.</p>
Call Forward	Call Forward to an external Direct-Dial extension is denied. Call Forward to an internal Direct-Dial extension is permitted.
Central Answering Position	The extension number of a Direct-Dial extension can be defined as a CAP, although it does not have to be.
PBX Reachthrough	Reachthrough codes are not supported.

Feature name	Interaction
Extended Ringing Service (Services)	<p>The Direct-Dial extension can enable and disable extension of its ringing to a Ringing Service Extra-dial extension (if an Extra-dial extension is defined for that Scheduled Service). A user at the Direct-Dial extension extends ringing by activating the Ringing Service feature manually and choosing a Scheduled Service. Activation and deactivation of the Ringing Service feature at the Direct-Dial extension does not affect the other capabilities associated with Ringing Service.</p> <p>If the Direct-Dial extension is also a control extension for one or more lines, activating the Ringing Service feature enables ringing for those lines as well. When the Extra-dial extension is defined for a service, Direct-Dial calls attempt to ring at this Extra-dial extension as well as the Direct-Dial extension. This includes calls transferred or forwarded to the Direct-Dial extension. (For more information, see the Extended Ringing Service feature.)</p>
Extra-dial extension	Only supported for internal destinations.
Hotline	<p>The Direct-Dial digit, if defined for the system, is accepted as a valid internal Hotline entry.</p> <p>If a Hotline Extn is programmed to call an internal extension using the Direct-Dial number, and the Hotline Extn is also programmed to call no Direct-Dial extension (that is, <code>D-dial:None</code>, in <code>Terminals&Extns:Capabilities</code> of OAM Programming), then, when the user goes offhook, a Hotline call is not made. Normal rules apply: The system attempts to select the prime line (if defined).</p> <p>If the Direct-Dial digit for the system is changed in <code>System prgming</code> Access codes to <code>None</code>, any Hotline Extn programmed to call an internal extension using the Direct-Dial digit is changed to <code>None</code>, for example, <code>Intrnl #:None</code>. Because this occurs, the Hotline designation is changed to <code>Hotline: None</code>.</p> <p>An automatic connecting extension cannot be administered to connect to its own extension number. The Direct-Dial extension, however, can be set to connect to the Direct-Dial number.</p>
Last Number Redial (LNR)	LNR stores the Direct-Dial digit if it is for an external destination.
Line Selection	If the user preselects an outside line, autodialers that are programmed to use the routing table fail. (See also the Keys - External Autodial feature.)
Line Pools	<p>System Speed Dialers programmed with a line pool as the facility use the line pool when the dialer is activated if</p> <ul style="list-style-type: none"> - a line in the pool is idle - the extension has access to that line pool defined in OAM Programming.
Prime Line	If Prime Line is external, to autodial a network destination, the user must program the autodialer to user the intercom. See also the Keys - External Autodial feature.)
Prime Extn	The assignment of Direct-Dial extensions (and Scheduled Services Extra-dial Extns) is independent of any Prime Extn designations. The customer can choose to program the Prime Extn for a particular line to also be a Direct-Dial extension.
Saved Number Redial	SNR stores the Direct-Dial digit if it is for an external destination.

Feature name	Interaction
Ringing Service (Services)	<p>The Direct-dial extension can enable and disable extension of its ringing to a Ringing Service Extra-dial extension (if an Extra-dial extension is defined for that Scheduled Service). A user at the Direct-dial extension extends ringing by activating the Ringing Service feature manually and choosing a Scheduled Service. Activation and deactivation of the Ringing Service feature at the Direct-dial extension does not affect the other capabilities associated with Ringing Service.</p> <p>If the Direct-dial extension is also a control extension for one or more lines, activating the Ringing Service feature enables ringing for those lines as well. When the Extra-dial extension is defined for a service, Direct-dial calls attempt to ring at this Extra-dial extension as well as the Direct-dial extension. This includes calls transferred or forwarded to the Direct-dial extension. (For more information, see the Ringing Service feature.)</p>
Selective Line Redirection	The Direct-Dial digit is valid as an SLR destination if the Direct-Dial destination is external, and if an explicit facility is programmed for Network Direct-Dial. If Network Direct-Dial is programmed with <code>Prime Line</code> , the user programming SLR sees the message <code>Invalid Number</code> .
Send Message	Each Direct-Dial extension can send up to 30 messages. If the Direct-Dial extension is changed such that it is no longer a Direct-Dial extension, its list of sent messages is lost.
Scheduled Services	If an extension other than the Direct-Dial extension (or a control extension) tries to use a Scheduled Services feature, the three-second transient message <code>Denied in admin</code> is given, accompanied by Error tone.
Set Copy	During Set Copy, the <code>Direct-Dial<x></code> (where <code>x</code> is the extension number) OAM programming parameter is copied.
Transfer	Transfer to a Direct-Dial extension is permitted, irrespective of whether the destination is internal or external.

Direct Dial Inward

1.1 Overview

1.1.1 Description

See also the DND Busy/DDI Busy feature.

Direct Dial Inward (DDI) which allows incoming calls from the public exchange to reach a Norstar extension without operator intervention.

Direct Dial Inward (DDI) also operates by means of AC15A private networking, so a DIA line can have a public network received number and a private network received number.

DDI digits (network extension numbers) provided by the DASS2 or ISDN network will parse to a DIA line's Public network received number, and alert sets with an appearance of that DIA line.

If no or unknown DDI digits are received, then Overflow Call Routing (OCR) will route the call to the line's prime set.

DDI digits provided by the AC15A network will parse to a DIA line's Private network received number and alert sets with an appearance of that DIA line.

1.1.2 Rationale for Feature

1.1.2.1 Outgoing Calls On ISDN/DASS2 DDI Lines

Since the ISDN and DASS2 protocols support outgoing calls, there is no reason to restrict these lines from making outgoing calls. DIA lines remain incoming only. No administration is required to set a DDI line to make outgoing calls; this is the normal mode of operation.

The customer can now configure their system as they see fit — to restrict DDI lines to incoming only (by not assigning the DDI lines to pools or sets) or to support both incoming (DDI) calls and outgoing calls.

1.1.2.2 Non-DDI Lines (ISDN/DASS2 Private Lines)

ISDN/DASS2 private lines do not send DDI digits as the protocol assumes these lines route directly to a specific set, i.e., Hybrid vs. PBX template. Essentially, Norstar will treat these lines like an ordinary POTS line which can be made to appear at any number of sets or set to a `Private to:` line type for a specific set (Norstar's definition of private).

1.1.2.3 Private And Public Received Numbers

DDI must be supported from both PSTN lines and AC15A private circuits. However, it is quite possible for Private and Public dialing plans to have different Extension number lengths. Therefore, two received number lengths are supported. Having two received numbers per DIA line permits easier administration and maximum flexibility.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls

N/A

1.2.2 Message Displays

N/A

1.2.3 End-User View

DDI is supported by ISDN/DASS2 PSTN lines as well as AC15A lines.

1.2.4 OAM Programming View

See "[Lines - Line Data - DIA lines](#)".

See "[Lines - Line Data - AC15](#)".

See "[Lines - Line Data - BRI](#)".

See "[Lines - Line Data - DASS2](#)".

1.2.4.1 Feature Details

The installer must know that changing the `Ans mode:` value changes the operation of the line between DDI and non-DDI.

Startup defaults are:

- Answer mode: Manual
- Full AutoHold: No (N)
- Received number length: 3
- Private Received number: None (for Square, Hybrid templates)
- Public Received number: None (for Square, Hybrid templates)
- Private Received number: Extension number where the DIA line is assigned by default (for PBX template)
- Public Received number: Extension number where the DIA line is assigned by default (for PBX template)

Received Number Length And Public/Private Network Dialing Plans

There are Private and Public received numbers. PSTN lines configured as DDI (auto answer) are parsed for the Public received number. AC15A lines (61-62 for Compact Plus and 241-254 for Modular Plus) configured as auto answer are parsed for the Private received number. Each DIA line can be configured for either a Private or Public received number, or both.

Private and Public received numbers have different administrable lengths as well as different administrable received numbers. The OAM Programming of the DIA line received number length under `System prgrming` Rec'd # length is extended to support the configuration of Private and Public received number lengths. Public received numbers can have a length of 1 to 7 digits. Private received numbers can have a length of 1 to 7 digits.

[See "System Programming - Received Number Lengths".](#)

In a similar way, the OAM Programming of the DIA line received number under `Lines►Line Data►DIA lines►Received numbrs` is extended to support the configuration of Private and Public received numbers.

[See "Lines - Line Data - DIA lines - Received numbers".](#)

There are no interactions or conflicts if Private and Public received numbers have the same length, or if any single DIA line has the identical Private and Public received number.

It should be noted that if the customer has not subscribed to the supplementary service providing Caller ID, and if a single DIA line appearance has both a Private and Public received number, then there will be no way for the user to distinguish between Private and Public incoming calls on their DIA line. This is because when either Private or Public calls alert, the extension will display the same message: `<DIA line name> calling`.

Simultaneous DDI calls

Norstar Plus allows for simultaneous DDI calls to the same DIA line on the same extension. Appearances can be Ring&Appear, Appear Only, or Ring Only.

In the case of Ring&Appear or Appear Only, as many simultaneous DDI calls are allowed as there are DIA key appearances. For example, if Extension 221 has two appearances of DIA line 101, the extension can handle a maximum of two simultaneous DDI calls against DIA line 101. If a third calls comes in, the caller either get Busy Tone or the call is routed to the Prime extension of the DIA line, depending on the parameter set under `Lines►DIA lines►If busy`. If the DND busy feature is set on extension 221, the caller for the second DDI call attempt will hear Busy tone even though enough keys are available on the extension.

In the case of Ring Only appearances, as many simultaneous DDI calls are allowed as there are DIA key appearances and enough Intercom keys. For example, if Extension 221 has two Ring Only appearances of DIA line 101, it will be able to answer the calls simultaneously if, it has at least two Intercom keys. If only one Intercom key is available, only one DIA call to line 101 can be made. The other simultaneous calls either return Busy or route to the Prime extension.

Appearances

Receptionists can have the same appearances of the DIA line to share the load. Once a call is answered by receptionist A, the other appearances of the DIA line stop flashing at receptionist B. This gives a chance for a simultaneous call against the same DIA line to be answered at receptionist B. When traffic becomes high, the DDI calls can be routed to a Hunt Group key to facilitate call handling.

There is an upper limit for the number of the same DIA appearance for each extension. An average of four DIA keys per extension (Norstar, portable, ISDN...) is possible, but that number may be customised. It is possible to have more than four keys for the same DIA line by having less on other extensions. This memory management scheme supports receptionists equipped with ECAPS that need to have many appearances of the same DIA line. The default is 1.

See "[Terminals&Extns - Line Access - Line Assignment](#)".

Selective Line Redirection

Selective Line Redirection allows redirection to happen on simultaneous DDI calls. The outgoing resource needs to be a line pool with sufficient lines to support the traffic. When selecting a DIA line for redirection, all instances of it will be included. The user does not have to repeat the SLR programming for the other appearances of the same DIA line.

The quantity of redirection is not limited by the number of appearances of the DIA line on the extension on which the feature is invoked. All DDI calls that want to terminate on the DIA line are rerouted. For example, if Extension 221 has an appearance of DIA line 101 and the user reroutes calls against that line to go to a home phone number, an incoming will be rerouted accordingly. If there is a second incoming call, the second call will be rerouted even though there is not a second key appearance of DIA line 101 on this extension.

Answer Key

Answer Key supports simultaneous DDI calls. If extension B has an answer key for extension A and A takes a DDI call, the key/lamp pair on B will stop flashing so another DDI call can be answered by B.

1.2.5 Maintenance View

As in analog DDI lines, if digits are received on a non-DDI line, then an event is logged in the System Log.

An event code is logged if either Private or Public DIA line calls OCR to prime as a result of the inter-digit time-out being exceeded.

1.2.6 **EXTN/ **LINE

N/A

1.3 Technical Specification (Limits/Constraints)

**LINE shows Answer mode and Received number.

1.4 Interactions

Feature name	Interaction
Direct Dial Digit	Local extension user access only.
DIA lines SLR'd to DASS2	Public number will not be SLR'd. Private number is SLR'd. AC15 can be redirected.
Line copy	Line copy copies both the public and private received numbers. when copying between DIA lines.
Line pools codes	Is parsed for only Private DDI calls.
Local Extension numbers	Local extension user access only.
Originating Line Identification #	The OLI number returned to the network is administrable and in most cases is the extension's DIA line public received number.

Feature name	Interaction
Page feature	Is parsed for only Private DDI calls.
Privacy control	Privacy control is not supported on DDI calls for the same reason as for Transfer via Hold. This allowed a third party to join the call. It is suggested to use conference in that case.
Retrieved Park Code	Local extension user access only.
Routing codes	Is parsed for only Private DDI calls.
System Test Log	Log event for inter-digit time out for all DIA line calls.
Transfer via Hold	Transfer via Hold is not supported on DDI calls due to the fact that there can only be one key/lamp pair that monitors the call after it has been answered. However, direct transfer can be used to transfer the call.
All other features	Local extension user access only.

Direct Inward Access (DIA) Lines

1.1 Overview

1.1.1 Description

A DIA line is a specific communication path (incoming only) between the outside world and the end user. A DIA line call is generated by an incoming call on an autoanswer trunk. The DIA line call is based on digits received from one of the following sources

- the CO (typical for DID)
- the PBX (AC15 lines)
- digits dialed by the remote caller into system dial tone

1.1.2 Rationale for Feature

Direct Dial Inward (DDI) is supported from both PSTN lines and AC15 private circuits. Private and Public dialing plans can have different Extn lengths; therefore, two received number lengths are supported. Having two received numbers for each DIA line permits easier administration and maximum flexibility.

1.1.3 Scenarios for Usage

Using autoanswer trunks, the remote user can dial a DIA line directly to a desk top, (attendant bypass) or to a range of phones configured to ring for that DIA line.

In order to economize on the number of trunks required, a few autoanswer trunks can be used to access a larger number of DIA lines.

1.1.4 General Definitions

Term	Definition
Received number	Digits received from the host switch or dialed by the remote caller into system dial tone
DIA line call	Incoming external call that appears at a DIA line. DIA line calls receive the same call treatment and call coverage as other external calls.
DIA line Extn	Digit string associated with a particular DIA line

1.1.5 General Information

DIA line appearances represent incoming calls only. Outgoing calls cannot be made on DIA lines.

When connecting a call on a DID trunk, the CO automatically sends a digit string (the last few digits the caller dialed), which is interpreted by Norstar to route to the intended DIA line. With other autoanswer trunks, the user dials the DIA line Extn into system dial tone. (Prior to this step, depending on system programming, the user may need to pass through DISA by entering a password).

The DIA line number (for example, line 151) and the DIA line Extns (for example, Private#:123) are two different entities. DIA line Extns may or may

not be the same as set Extn numbers. A similarity does not necessarily imply that a given DIA line does, or does not, appear on a given set.

For Modular Plus, DIA lines are 255 to 382. For Compact Plus, DIA lines are 101 to 140.

1.2 Feature Details

1.2.1 Caller View

When a DIA line is busy, the caller may or may not hear Busy tone, depending on the value of the following parameters in OAM Programming

- If busy (applied to lines)
- DND on busy (applied to sets)

For more details, refer to “1.2.3.4 Setting whether DIA lines provide Busy tone” and the DND/DDI on Busy feature.

1.2.2 End-User View

A DIA line appearance or intercom key shows the status of a target call (alerting, active, held). An incoming DIA line call alerts visually at the indicator, if available, and rings if programmed to do so).

If the set has a line appearance associated with an autoanswer trunk (DID, AC15 or loopstart) as well as a DIA line key (or the intercom key has a DIA line assigned to Ring only) corresponding to the DIA line Extn, the user's set can have two keys in use. One key represents the trunk being used and the other represents the DIA line call. The user answers the call using the DIA line or intercom key, except in the case of overflow call routing and callbacks.

A DIA line call appears on the corresponding DIA line key at any set having an appearance of that line, and rings on the intercom key of any set where the DIA line is programmed to ring.

The user answers incoming calls on a DIA line in the same way that external CO calls are answered. For example, the user selects an alerting DIA line in some way (going offhook, pressing the key if Automatic Handsfree is enabled, pressing Handsfree).

1.2.3 OAM Programming View

The following table shows the levels of access required for users to program OAM changes.

Heading	Item				I	SC+	SC
Lines	Line data	DIA line					
			Line type:Public		X		
			Received numbrs	Private#:Extn#	X		
				Public#:Extn#	X		
			If busy: BusyTone		X		

See "Lines - Line Data - DIA lines".

See "Lines - Line Data - DIA lines - Received numbers".

Heading	Item	I	SC+	SC
System prgrming	Rec'd # lengths	Private length:3	X	
		Public length:3	X	

See "System Programming - Received Number Lengths".

1.2.3.1 Programming DIA lines

If autoanswer trunks are programmed, the installer can assign DIA lines to sets, in the same way as any other line is assigned, in `Lines▶Line data▶DIA lines`

Message Displays

Message	Description
Already in use	This message displays transiently if the user tries to change the received number to one that already exists (for example the DISA Extn, or the Auto Extn, or another DIA line).

1.2.3.2 Setting the Line Type

Line type is assigned in `Lines▶Line data▶DIA line▶Line type:Public`. Line type can be `Public` (appears on several desktops) or `Private` (goes to one desktop only).

1.2.3.3 Setting Received Numbers

Received numbers are assigned in `Lines▶Line data▶DIA line▶Received numbrs`. Private and Public dialing plans can have different Extn lengths; therefore, two types of received number, Public and Private, are supported. The default value for `Public#` and `Private#` is `Extn#`.

1.2.3.4 Setting whether DIA lines provide Busy tone

DIA lines are assigned to ring or not ring when busy in `Lines▶Line data▶DIA line▶If busy:BusyTone`. Values are `BusyTone` and `To prime`. For the effects of this setting, and its interaction with DND/DDI on Busy see "1.2.1 Caller View", the DND/DDI on Busy feature, and "1.4 Interactions".

1.2.3.5 Setting the Received Number Lengths

DIA line received number lengths are set in

`System prgrming▶Rec'd # lengths▶Public length:3` and
`System prgrming▶Rec'd # lengths▶Private length:3`.

Received number length refers to the length of

- the identifiers used to identify DIA lines to the outside world
- the DISA Extn (Public length only)

Received number lengths for `Public` and `Private` numbers can be from 1 to 7 digits. The length of Public and Private numbers can be different. The default is 3.

If `Rec'd # lengths▶Public length` is changed, the value of any existing DIA line Extn (or Auto Extn, or DISA Extn) is changed to `None`.

1.2.3.6 Setting the DIA line appearance

DIA lines can be programmed to appear on separate, dedicated keys or to ring at the intercom key in `Terminals&Extns▶Line access▶Line assignment`. For more information, refer to `Terminals&Extns`.

DIA lines are not assigned by default.

For Modular Plus, DIA lines are 255 to 382. For Compact Plus, DIA lines are 101 to 140.

1.2.4 **EXTN/ **LINE

N/A

1.3 Technical Specification (Limits/Constraints)

An indicator is required for appearances of DIA lines for all sets except the M7100 and ATA.

1.4 Interactions

Feature or condition name	Interaction
Answer keys	DIA line calls can generate alerting at Answer keys.
Autodial Speed Dial	The user cannot store DIA lines with Autodialers.
Call Duration Timer	The timer begins when the DIA line call is answered by user.
Callback (Park, Transfer, and Camp-On)	Alerting/ringing occurs at the DIA line if available, or at an intercom key. If the callback set is unable to ring, or the Callback call is not answered, the call is routed to the Prime extension for the DIA line, and then to the Prime extension for the trunk, if necessary, and the appropriate callback message displayed.
Copy	If the trunk types are the same, all information except the line number is copied. In cases where the trunk types are dissimilar, only parameters common to both lines are copied. If copying is from a DIA line to another DIA line, all information except the received numbers are copied. Users cannot copy Restrictions or Call Services features from a physical to a DIA line.
DND/DDI on Busy	If the DIA line is busy, the call is treated according to the value of the <code>If busy</code> parameter. When <code>If busy:Busy tone</code> is selected, the caller hears Busy tone. When <code>If busy:To prime</code> is selected, the caller is routed to the Prime extension for the DIA line. This is independent of whether the set has DND on Busy programmed. For more information see DND/DDI on Busy.

Feature or condition name	Interaction
Flexible Numbering Plan: Call Park Direct-dial External Line Access Line Pools Routing Service	<p>A DIA line number must not conflict with the</p> <ul style="list-style-type: none"> - Call Park prefix - Direct-dial number <p>It also must not conflict with the first digit of</p> <ul style="list-style-type: none"> - an external line access code <p>It must have at least one digit difference with</p> <ul style="list-style-type: none"> - a line pool access code - a Destination code <p>For more details of the programming interactions, refer to the Flexible Number Plan specification.</p>
Hold- Automatic Hold Mutual Hold	<p>If the user is active on a call, Autohold is applied to the line if the user answers a DIA line call.</p> <p>If a user is active on a call, and selects an idle DIA line, Error tone is provided and the transient message, <i>Incoming only</i>. The user remains connected on the active call just as when a user selects a busy line while on another call.</p> <p>DIA line call shows I-hold or U-hold as appropriate. Transfer using Hold supported for shared DIA line appearances.</p>
Hotline	A DIA line cannot programmed for a Hotline call.
Last Number Redial	LNR never uses a DIA line (since DIA lines are incoming only).
Line Pools	DIA lines cannot be assigned to line pools.
Line Selection	<p>A DIA line cannot be Prime Line at a set.</p> <p>A transient error message <i>Incoming only</i> is presented with Error tone if the user selects an idle DIA line.</p>
Maintenance	<p>If a trunk goes out of service the DIA line call is dropped.</p> <p>DIA lines cannot be taken out of service. Only trunks can be taken out of service.</p>
Onhook Dialing - Automatic Dial - Pre-dial	<p>DIA line can't be Prime Line.</p> <p>If the user selects a DIA line after pre-dialing, Error tone is provided and the transient message, <i>Incoming only</i>.</p>
Port/Extn	If no in-service set is programmed to ring, or there are no shared DIA line appearances, the call is routed to Prime extension for the DIA line.
Prime Line	DIA line cannot be Prime Line.
Prime extension(s)	DIA line can be programmed in to have a Prime extension.
Ringing Line Preference	DIA line can be programmed to ring (default) or not ring. If ringing is not programmed for the DIA line, ringing at the Prime extension for that line (if programmed) is activated.
Transfer	A DIA line call can be one of the Conference parties. The appearance of the DIA line remains lit (solid), at all sets having an appearance, for the duration of the call.

Disconnect Supervision

1.1 Overview

1.1.1 Description

The system software supports lines that monitor open switch intervals (OSIs) on external lines. In OAM Programming, the **Lines►Line data►Mode** setting allows the user to specify one of two modes: **LoopGuarded** or **LoopUnguard**.

If the Mode is set in OAM Programming to **LoopGuarded**, the software interprets an OSI to mean that the external call has been disconnected by the host system. In this case, the Norstar software disconnects the line as well. This feature is called Disconnect Supervision (also called Loop Supervision).

1.1.2 Rationale for Feature

The intent of this feature is to prevent an external line from being tied up by being considered on hold in Norstar, when, in fact, the external party has disconnected from the call.

1.1.3 General Definitions

Disconnect Supervision is not an end user feature. This specification refers only to lines that support Disconnect Supervision.

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 End User View

N/A

1.2.2 OAM Programming View

1.2.2.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item		I	SC+	SC
Lines	Line data (Exchange lines)	Mode:EarthCalling	X		

1.2.2.2 Programming Disconnect Supervision Programming Mode

The mode of operation of each line, that is, with or without the application of Disconnect Supervision, is determined by the type of Norstar hardware to which the line is connected, and by the OAM programming for mode. If a line is connected to hardware that supports Disconnect Supervision, and the mode setting for that line is **LoopGuarded**, the software interprets an open switch interval (OSI) as a signal that a far end disconnect has occurred.

Lines connected to the Modular CCU, a line cartridge, or a 1A2 cartridge can operate in LoopGuarded or LoopUnguard mode. An 1A2 cartridge cannot operate in 1A2 mode on a Modular system.

The `Mode` parameter appears in OAM programming, in the `Lines▶Line data▶Mode:EarthCalling`. Other values for `Mode` are: `LoopUnguard` and `LoopGuarded`. The default is `EarthCalling`.

[See "Lines - Line Data - Loop"](#).

The `Mode` prompt is available only if the line is loopstart. If the Disconnect Supervision feature is disabled for a line (`Mode:LoopUnguard`), any OSI messages from the line card for that line are ignored.

Changing the trunk mode setting from `LoopUnguard` to `LoopGuarded` has no effect on analog loopstart lines connected that cannot perform Disconnect Supervision.

The availability of Disconnect Supervision does not remove the prohibition against transferring an external party to another external party in the UK, even though Disconnect Supervision can clear the call when either of those parties disconnect.

1.2.3 ****EXTN/ **LINE**

N/A

1.3 Technical Specification (Limits/Constraints)

N/A

1.4 Interactions

Feature name or State	Interaction
AC15 lines	In the OAM, the Mode prompt is not displayed for AC15 lines because they are always supervised.
Autoanswer	For calls to be answered automatically by the system, Disconnect Supervision must be on the trunk.
Selective Line Redirection (SLR)	If a user attempts to redirect a line that does not have Line Supervision set to <code>LoopGuard</code> , <code>Unequipped line</code> is displayed transiently along with Error tone.

Diversion

1.1 Overview

1.1.1 Description

Diversion is a DPNSS 1 feature for Norstar that lets users forward their calls to a third party on the DPNSS 1 network. Functionality is identical to that of Call Forward on Norstar but takes advantage of the capabilities of DPNSS 1.

There are five variations on Diversion:

- Diversion Immediate diverts all calls to a programmed extension. This function is set by the user.
- Diversion On Busy diverts all calls to a programmed extension when an extension is busy. This function is set by an administrator.
- Diversion On No Reply diverts calls that go unanswered after a specified amount of time. This variation is set by an administrator.
- Bypass Call Diversion overrides all Call Forward features active on an extension over a DPNSS 1 line. An incoming call to an extension will not be forwarded; instead, the extension will continue to ring as if Call Forward were not active. This feature could be used to “insist” that a call should be answered at that location. Bypass Call Diversion is a receive-only feature on Norstar, and cannot be invoked from a Norstar extension.
- Follow-me Diversion is also a receive-only feature. It allows the Call Forwarded destination to remotely change the Norstar Call Forwarding programme (CFAC) to a different extension location. (Norstar CFAC must be active and the destination extension/PBX must support the feature.)

Diversion is one of the features supported on DPNSS 1 lines in Norstar systems. For a listing of these features, see the DPNSS 1 feature.

1.1.2 Rationale for Feature

The retry capability of Diversion On Busy is required to support the voice mail interface, which expects that a call is presented eventually at a free destination.

The forwarded to party may need to call the forwarded from party. Bypass Call Diversion makes such a call possible by overriding the Diversion feature (not cancelling it).

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls

1.2.1.1 Non-ISDN terminals

To activate Diversion (Immediate):

- , or programmed key

- Internal Autodial programmed keys, or digits entered from the dialpad

To cancel:

- 4, or # 4
- (or otherwise exiting without specifying a valid destination)

No control is required for Bypass Call Diversion.

1.2.1.2 ISDN terminals

To activate Diversion (Immediate):

1. Press * 4 *, or programmed key.
2. Press Internal Autodial programmed keys, or enter digits from the dialpad, followed by .
3. Enter the appropriate key to SEND.

To cancel:

1. Press # 4 #
2. Enter the appropriate key to SEND.

No control is required for Bypass Call Diversion

1.2.2 End User View

1.2.2.1 Activating Call Forward

Non-ISDN terminals

To activate Call Forward, the user presses the Call Forward key or 4. The prompt, Forward to: appears on the display. The user then dials the number of the destination extension, or presses a programmed Internal Autodial key to indicate the destination extension to which calls are to be forwarded.

If a Direct-dial extension exists, the Direct-dial digit is also a valid internal number.

Message Displays during the Programming of a non-ISDN terminal

Message	Description
Forward to:	Displays when the user activates Call Forward.
Forward> <name>	Displays the programmed name associated with the forward destination extension.
Forward denied	Displays if any of the following conditions exist: <ul style="list-style-type: none"> - an invalid internal number is specified - an invalid programmed key is pressed - the destination extension is not in service - the destination extension has Call Forwarded activated in such a way that a forward loop is created - the destination extension is in Do Not Disturb mode
Forward <name> CANCEL	Appears after three seconds when forwarding is enabled on M7210 and M7324 extensions, subject to message display priorities.

Message Displays during the Programming of a non-ISDN terminal

Message	Description
Cancel forward	Displays for three seconds when the feature is cancelled.

To allow activation of Call Forward, the following conditions must exist:

- the destination extension must be in service
- the destination extension must not have Call Forward activated in a way that creates a forward loop
- the destination extension must not be in Do Not Disturb or Administration mode

A forwarded extension receives visual indication of incoming calls on line keys, but does not ring for those calls. Call Identification appears briefly at the forwarded extension. To answer the call at the forwarded extension, the user presses the line key.

No indication is given if the forward destination is also forwarded, but the creation of a forward loop is not allowed. No limit is placed on the number of extensions that can be programmed in a Call Forward chain, provided that a loop is not created.

For example, forwarding can be chained A to B, and B to C; calls to A then appear at C. Since forwarding cannot be looped, an attempt by C to forward to A is denied. The forward destination can call the forwarded extension (but not any extension higher up in the forwarding chain) and override forwarding. For example, C can call B, and B can call A, and forwarding does not apply. If C calls A, or any extension higher in a forwarding chain, the call rings the extension immediately before C in the chain (in this case, B).

If the Call Forward key has an associated indicator, the indicator is turned ON when forwarding is activated.

The user can activate Call Forward while a call is ringing, but forwarding does not apply to that call. Only calls arriving after Call Forward has been activated are forwarded.

Forwarding to an external number is not supported.

Message Displays at programming extension when Call Forward is active (non-ISDN terminals)

Message	Description
Calling <originating setname>	Displays - transiently on an extension placing an internal call to a forwarded extension (three seconds). - on the calling extension if more than one extension is ringing for an internal call (for example, an extension with an Answer key is also ringing for the call).

Message Displays at programming extension when Call Forward is active (non-ISDN terminals)

Message	Description
<original destination name>> <final destination name>	Displays transiently, after the message Calling <original destination name> , on an extension placing an internal call to a forwarded extension (three seconds). It is followed by call status display for the forward destination.
Calling <name>	Displays if any extension in the Call Forward chain is performing OAM Programming (accompanied by Ringback tone). <name> is the name of the extension trying to forward the call to the extension performing OAM programming
Do Not Disturb	Status message that indicates the forward destination extension is in Do Not Disturb mode.
Not in service	Status message that displays if any extension in the Call Forward chain is out of service (accompanied by Reorder tone)
<final destination name> busy	Displays on the calling extension, accompanied by Overflow tone, if an internal call goes through the forwarded chain and no extensions are free.

The Basic extension is an exception, because it does not have physical line appearances upon which to present incoming calls.

Message Displays at destination extension when Call Forward is active (non-ISDN terminals)

Message	Description
<originating setname>> <forwarded setname>	Displays on a destination extension when it is ringing for a forwarded internal call.
<external linename> <forwarded setname>	Displays on an extension ringing for a forwarded external call. <external line name> refers to the line on which the call is coming into the forwarded extension.
<calling setname> <forwarded setname>	Displays, with attenuated ring tone, if - the forwarded destination extension is active on a call - the incoming call is the highest priority call ringing the extension.
<calling setname or linename> <original destination name>	Displays at the destination extension for an internal or external call unless the call is forwarded to a new destination by Call Forward No Answer

ISDN terminals

The Call Forward All Calls feature can be used from an ISDN terminal connected to Norstar. On most ISDN terminals, the user needs to press one or more keys to access feature services before entering the Norstar feature code for these features. To determine what keys to press, the user should consult the instructions that come with their ISDN terminal.

Although ISDN terminals may have Call Forward keys or display prompts, these keys do not activate the Norstar feature. The user must use the appropriate procedure to access feature services, then enter the Norstar feature code.

To activate Call Forward, after accessing feature services, the user presses ***8***. The user then dials the number of the destination extension, presses *****, and enters the appropriate key to SEND.

1.2.2.2 Cancelling Call Forward Non-ISDN terminals

When forwarding is enabled, pressing the Call Forward key cancels forwarding. Forwarding can also be cancelled by pressing **Feature #4** or the CANCEL display key on two-line display extensions.

ISDN terminals

To cancel Call Forward on an ISDN terminal, after accessing feature services, the user presses **Feature #4** and enters the appropriate key to SEND. (For instructions on accessing feature services, the user should consult the instructions that come with their ISDN terminal.)

1.2.2.3 Call Forward Behaviour

At the Forward to: prompt, the user presses **Rls**, or otherwise exits without specifying a valid destination, call forwarding is cancelled. The display is restored to the state it was prior to the call forwarding being cancelled.

Call Forward (All Calls) takes precedence over Call Forward On Busy, which in turn takes precedence over Call Forward No Answer. If the user activates Call Forward all Calls on their extension, the other types of Call Forward do not occur.

The following table illustrates some of the characteristics of Call Forward (All Calls), Call Forward No Answer, and Call Forward On Busy, when these features are active.

Characteristics at Forwarded From User's extension

Characteristic	Call Forward	Call Forward No Answer	Call Forward On Busy
Call is immediately forwarded	4	No	4
Transfers ringing to another Norstar extension specified by the user	4	4	4
Suppresses ringing of all incoming calls.	4	No	4
Displays visual alerting for all incoming calls (if a key is available for the call to be presented)	4	4	4
Call forwarded-user can pick up the call if it has not been answered elsewhere ¹	4	4	4
User can answer other incoming calls, if desired.	4	4	4
User can make outgoing calls	4	4	4

The Basic extension is an exception, because it does not have physical line appearances upon which to present incoming calls.

Calls that are forwarded to a destination extension appear on the appropriate key (line key, or intercom key). A forwarded call, or any other type of rerouted call, does not ring at an Answer key for the destination extension. For example, if Extension A is forwarded to Extension B, and Extension C has an Answer key for Extension A, the Answer key at Extension C will not ring or flash for Extension A's call.

If an extension (that has an Answer key for another extension) is forwarded, then the Answer key flashes and rings (if programmed to do so). For example, if Extension C has an Answer key for Extension A and Extension A is ringing for a call, then alerting occurs at the Answer key at Extension C. If Extension C is also on another call, then Call forward on Busy forwards the call at the Answer key to its appropriate destination.

If an extension with Call Forward On Busy has calls directed to an extension that also has Call Forward On Busy (or Call Forward All Calls) activated, then the call is again forwarded, creating a chain. The call is directed to (1) the first available extension in the forwarded chain, (2) an extension on which only Call Forward No Answer applies, or (3) the final extension in the forwarded chain. After the message `Calling <original destination name>` appears, the display of an extension making an internal call shows `<original destination name>><<final destination name>`, regardless of the number of intermediate extensions in the forwarded chain.

For Call Forward No Answer, an incoming call rings at an extension before the call is forwarded. When Call Forward all Calls or Call Forward On Busy apply at an extension, an incoming call is immediately forwarded. For Call Forward On Busy, messaging must therefore occur before the call can be directed to an available extension in the forwarded chain.

For each call, the first ten extensions in the chain that have any type of Call Forward active, are evaluated for the call. The total number of extensions in a system that can have Call Forward programmed is not limited to ten.

The chain includes extensions that have any type of Call Forward activated at their extension. Looping can occur in this chain. For example, extension A is forwarded to B, and extension B in turn is forwarded to extension C. Extension C could be forwarded to A, thus creating a loop. Such loops are not prevented from occurring, and are considered harmless.

If a forwarded call rings at an extension where Call Forward No Answer applies, Call Forward No Answer rules and display messages associated with Call Forward No Answer apply. If the call is forwarded from an extension again, the call searches for the next available extension. The caller continues to hear Ringback tone.

If a call is forwarded and the extension from where it was forwarded subsequently becomes free, the call does not ring at the now-available extension.

Call Forward does not present calls to intermediate extensions in a Call Forward chain.

An internal call to a forwarded extension can have two alerting appearances, one at the forwarded extension and one at the forward destination. When the call is answered at either extension, the visual indication at the other extension is removed.

If no intercom key is available at the forwarded extension when an internal call is forwarded, the call appears at the forward destination only.

If no intercom key is available at the forward destination when an internal call is forwarded, the calling extension receives busy tone, and the call does not appear at the forward destination. The call indication appears very briefly at the forwarded extension and is then removed. In this situation, the message `<name> busy` is displayed on the caller's extension, where `<name>` is the name associated with the forwarded destination (that is, the extension that the call has been forwarded to).

For internal calls, if the forward destination has Do Not Disturb enabled, the calling extension receives a Ringback tone, and sees the status message, `Do not disturb following the <original destination name>><final destination name>` message. The call gives visual ringing indication at both the forward destination and the forwarded extension, and can be answered at either extension.

All forwarded internal calls are made as Ringing Calls, even if other conditions are suitable for a Voice Call to be made.

The ring cadence for internal and external originating calls is different. When an external call is presented on an intercom key, the external ring cadence is maintained.

Call Forward Transfer to Prime Extension

For external calls, if the forward destination does not have an appearance of the external line, the call is presented on an intercom key if one is available. Similarly, if the forward destination has Do Not Disturb enabled, an attempt is made to present the call to the Prime Extension.

For incoming external calls, if either the following conditions exist:

- the forward destination has Do Not Disturb enabled
- the destination does not have an appearance of the external line and does not have an available intercom key

The alerting call is transferred to the Prime Extension for that line, if one exists.

If the Prime Extension, or the extension it is forwarded to, has Do Not Disturb enabled, or does not have an appearance of the line and does not have an available intercom key, the caller receives a Ringback tone, although the line may not be ringing on any extensions in the system.

1.2.2.4 Call Forward On Busy - Retries

For an incoming call on an external line, Call Forward On Busy keeps trying to find a free extension in a chain of Call Forward destinations. If no free extension is found in a chain of Call Forward destinations, a timer is starts, reactivating the new call every twelve seconds for a maximum of two minutes after which the call is forced to ring at an extension that has an available key.

This mechanism allows time for an extension to become idle and hence receptive to the new call. There is no limit on the number of extensions included in the call-forward loop.

An extension with Call Forward On Busy programmed receives only visual alerting when a call arrives at the extension (provided that a key is available at which the call can be presented). Call Forward On Busy then redirects the call. As long as the call has not yet been answered elsewhere, the user can select the visually alerting key to answer the call.

Calls that are forwarded to a destination extension appear on the appropriate key (line key or intercom key). A forwarded call, or any other type of rerouted call, does not ring at an Answer key for the destination extension. For example, if Extension A is forwarded to Extension B, and Extension C has an Answer key for Extension B, the Answer key at Extension C does not ring or flash for Extension A's forwarded call.

If an extension (that has an Answer key for another extension) is forwarded, the Answer key flashes and rings, if programmed to do so. For example, if Extension C has an Answer key for Extension A and Extension A is ringing for a call, alerting occurs at the Answer key at Extension C. If Extension C is also on another call, Call Forward On Busy forwards the call at the Answer key to its appropriate destination.

If there is an Answer key in the system for the original destination extension, the caller's display remains `Calling <original destination name>`. This occurs even if one of the extensions that has an appearance of the original destination's DN is subject to Call Forward On Busy.

The display messages that an internal caller sees when their call is forwarded to an extension that has Call forward on Busy activated are the same as for Call Forward all Calls. Existing display messages also apply for the destination extension to which calls are forwarded.

If an extension with Call Forward On Busy has calls directed to an extension that in turn has Call Forward On Busy (or Call Forward all Calls) activated, the call is again forwarded, creating a chain. The call is directed to

- the first available extension in the forwarded chain
- an extension on which only Call Forward No Answer applies
- the final extension in the forwarded chain

After the message `Calling <original destination name>` appears, the display of an extension making an internal call shows `<original`

destination name> <final destination name> regardless of the number of intermediate extensions in the forwarded chain.

For Call Forward On Busy, messaging must occur before the call can be directed to an available extension in the forwarded chain. For each call, the first 30 extensions in a chain that have Call Forward On Busy (or a combination of the other types of Call Forward and Call Forward On Busy) activated, are evaluated for that call. (The total number of extensions that can have Call Forward On Busy programmed on a system-wide basis is not limited to 30.)

The chain includes extensions that have any type of Call Forward activated. Looping can occur in this chain. For example, Extension A is forwarded to B, and Extension B in turn is forwarded to Extension C. Extension C could be forwarded to A, thus creating a loop. Such loops are not prevented from occurring, as they are considered harmless.

If a call goes through the forwarded chain and no extensions have an available line on which to receive the call, an internal caller's display shows <final destination name> busy. Overflow tone is given. Existing call capture rules for external calls apply.

If a call is forwarded and the extension from which it was forwarded subsequently becomes free, the call does not ring at the now-available extension.

Forwarding does not operate if any extension in the forwarded chain

- is out of service
- is in OAM Programming
- is in Maintenance
- has no key on which the call can be presented

An internal extension shows the appropriate display messages, such as Not in service or Busy. An external call is directed to the Prime Extension using Delayed Ring Transfer.

Basic extensions do not have physical line appearances or intercom keys upon which to present incoming calls. Thus, a basic extension that has calls forwarded to it receives only ringing indication (and the appropriate display message) for the incoming call.

1.2.2.5 Diversion On No Reply

When Call Forward No Answer occurs, visual alerting remains at the forwarding extension, and the call can be answered there if desired (as in normal Call Forward).

As with ordinary Call Forward, the forwarded call appears on an appropriate key (external line appearance, or intercom key) at the destination extension. If the forwarded call is already alerting an Answer Group key on the destination extension, it continues to do so at that Answer Group key, and a line key is not selected.

If Extension A is forwarded to Extension B, and Extension B has an Answer key for Extension A, the Answer key continues to ring or flash after calls at Extension A are forwarded (until the call is answered).

An extension placing an internal call affected by Call Forward No Answer receives the If the destination extension is not in service, or has no key on which to present the call, Call Forward No Answer does not extend the call beyond that extension.

As with Call Forward (All Calls), Call Forward No Answer does not redirect calls directed to an extension that is performing OAM Programming. Also, if any extension in the Call Forward chain is performing OAM Programming, forwarding does not operate through that extension. In these cases, the caller continues to hear a Ringback tone and sees the display `Calling <setname>` where `<setname>` is the name of the extension trying to forward the call to the extension performing OAM Programming.

The action of this feature is similar to Delayed Ring Transfer and Answer Groups, but has differences from both.

Unlike Answer Groups, Call Forward No Answer does not require a special key at the destination extension. It rings that extension after a programmable delay, rather than immediately.

Delayed Ring Transfer, if enabled system-wide in OAM Programming, applies to each external line for which a Prime Extension exists, and does not suppress ringing at any extension. In contrast, Call Forward No Answer applies to all ringing internal or external calls to an extension, and suppresses ringing at the original extension, as does Call Forward (All Calls). The Delayed Ring Transfer delay is a system-wide setting, whereas the Call Forward No Answer delay is programmed on an extension-specific basis.

1.2.2.6 Bypass Call Diversion

If the forwarded to party needs to contact the forwarded from party, to ask that forwarding be cancelled, or to transfer back a call forwarded from the forwarded from party's extension, Call Forward Override makes such a call possible by overriding the Call Forward feature.

This feature is sometimes called Secretarial Filtering. When a user forwards to an attendant's phone, the attendant can answer all calls directed to the forwarding user's extension, and can then transfer selected calls to the user using Hold or Conference.

1.2.2.7 Follow-me Diversion

Follow-me diversion can be cancelled from the forwarded location.

1.2.3 User Programming View

The user can program one Call Forward key for each extension, with or without an indicator. If present, the indicator is used.

1.2.4 OAM Programming View

1.2.4.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item			I	SC+	SC
Terminals&Extns	Individual extn	Capabilities	Fwd no answer	X	X	X
			Fwd on busy	X	X	X

1.2.4.2 Programming Diversión

See "Terminals&Extns - Capabilities - Fwd programming".

Call Forward On Busy (Fwd on busy) and Call Forward No Answer (Fwd no answer) are programmed on an extension-by-extension basis under Terminals&Extns▶ Capabilities.

At the Forward to prompt, the user can specify an internal DN, or a value of None.

For Call Forward No Answer, the user is then prompted for the Forward delay, which can be extension as 2, 3, 4, 6, or 10 rings. The default is 3.

You extension Diversión for DPNSS in the same way as Call Forward. You will need to enter the end extension number when prompted with Show extrn#: . You may also need to include the DPNSS 1 routing number. Norstar must have a private access code programmed that maps to a valid destination code or line pool code on the DPNSS line.

1.2.5 **EXTN**LINE

N/A

1.3 Technical Specification (Limits/Constraints)

If any extension in the forwarded chain is in the process of OAM Programming, Call Forward does not operate. End-user programming activities do not prevent an extension from participating in Call Forward.

An extension can receive messages when it is forwarded. Messages are not forwarded to the forward destination.

An extension cannot be programmed to forward calls to itself.

Forwarding to an external number is not supported.

Diversión on Busy and Diversión on No Reply cannot be cancelled from the nominated (forwarded) extensions. These are programmable only by the System Administrator or the Installer, and not by the user (as in Diversión Immediate).

If multiple extensions are programmed to take a call, the first extension to respond will act. Other extensions responding are ignored. Therefore, if the first extension to respond has Diversión extension, this feature will be invoked.

Norstar extensions cannot initiate a request for Follow-me Diversion.

Diversion is indicated differently on different types of extensions:

- All variations of the feature are supported on Norstar terminals M7000, M7100N, M7310N and M7324N.
- All variations of the feature are supported on ATA.
- All variations of the feature are supported on ISDN extensions except Diversion on Busy and CFWD Busy.
- All variations of the feature are supported on cordless handset extensions.
- Diversion features can be invoked from a Norstar extension connected on a DNA with boot up. This extension can act as a valid destination for DPNSS Diversion regardless of an extension being physically connected to the DNA or not.

When DPNSS Diversion is set using , certain digits and Feature codes cannot be used in the dialout number. This is because the digits received from the network must map to a valid extension in the PBX, and these will not. The following digits and codes are invalid: *, #, , , and .

When a nominated (forwarded) extension asks to register Diversion Immediate or Follow-me Diversion, Norstar checks the Originating Line Identifier (OLI) for the incoming request. If the extension matches the programmed Diversion Immediate destination, DPNSS 1 validates the new destination and overwrites the existing Diversion Immediate destination.

1.4 Interactions

Feature or condition name	Interaction
Callback	A call performing Callback is subject to Call Forward No Answer at any set it is trying to ring. A call performing callback is subject to Call Forward On Busy at any extension it is trying to ring. The Callback is forwarded to the destination extension. (For more information, refer to the Callback feature.)
Camp-on	A camped call that arrives at a busy extension that has Call Forward On Busy activated is not forwarded. For more details about forwarding camped calls, see the Camp-on feature.
Delayed Ring Transfer	If the Prime Extension has Call Forward enabled, Delayed Ring Transfer occurs at the forward destination, whether or not the forward destination has an appearance of the external line. The ring transfer message is displayed at the forward destination. Because Delayed Ring Transfer is line-based, and Call Forward No Answer is extension-based, both can occur for the same call.
Intercom keys	Call Forward presents an external call on an intercom key if the extension does not have an appearance of the external line.
Internal Autodial	Line selection does not occur (that is, a call attempt is not made) when the user presses an Internal Autodial key in response to a prompt for a destination when using Call Forward.

Feature or condition name	Interaction
Do Not Disturb	Both Call Forward and Do Not Disturb can be active at the same time, and can be activated in either order. When both features are active, the only effect of Do Not Disturb is to suppress incoming paging. Otherwise, Call Forward proceeds normally.
External Line access	Call Forward forwards the ringing of external lines and can be performed on external calls.
Held Line Reminder	Held Line Reminder Extension to Prime Extension is also forwarded, but the Held Line Reminder takes place at the Prime Extension.
Maintenance	If any extension in the forwarded chain is in Maintenance, forwarding does not operate.
OAM Programming	Forwarding does not occur for calls directed to an extension that is performing OAM Programming. Also, if any extension in the Call Forward chain is performing OAM Programming, forwarding does not operate through that extension. The caller hears busy tone and sees the message <code>Not in service</code> .
Page	Forwarding does not apply to Page calls.
Prime Extension	If a Prime Extension has Call Forward active, all alerting messages, line indications, and ringing associated with Prime Extension Call Capture features are forwarded from the Prime Extension to the destination extension. Held Line Reminder Extension to Prime Extension is also forwarded, but the Held Line Reminder takes place at the Prime Extension. This forwarding occurs even if the Prime Extension has Do Not Disturb active and/or has no line key on which to present the call. If Call Forward is in effect at the Prime Extension, the Call Capture features are forwarded to the destination extension regardless of Do Not Disturb status at the Prime Extension.
Priority Call	<p>An extension with Call Forward On Busy programmed can receive a Priority Call. If the user calling the original (Call Forward On Busy) destination extension activates a Priority Call, the Priority Call is directed to the original destination extension only, and not any other extension in the forwarded chain.</p> <p>If the Call Forward On Busy extension is part of a forwarded chain, a call may have already been forwarded to a second (or third, and so on) Call Forward On Busy extension. If the caller makes a Priority Call, the Priority Call applies to the original Call Forward On Busy destination extension only.</p> <p>The call then takes on the attributes of a Priority Call. Priority Calls, whether or not they are answered, are not reforwarded.</p>
Private Lines	Private lines can be directed to another extension by Call Forward.
Ring Again	If a user's call is being forwarded by Call Forward Busy, activating Ring Again On No Answer) applies to the original extension being called, and not the destination extension to which the call is forwarded. For example, Extension A is forwarded to Extension B. Extension C calls Extension A and activates Ring Again. The Ring Again applies to Extension A and not Extension B.
Line Assignment	If an Answer key is programmed not to ring, no forwarding occurs from the key.

Feature or condition name	Interaction
Set not in service	If Call Forward No Answer directs a call to an extension that is not in service, the caller continues to hear a Ringback tone, even though the call cannot ring or appear on that extension.
Transfer Callback	<p>If Call Forward is active at the set that attempted the Transfer, the Callback is forwarded to the forward destination, with the normal forward message, <party being transferred> > <transfer originator>. In this case, the Call Back Call does not alert at the set that attempted the transfer, and cannot be picked up at that set.</p> <p>If Call Forward is active at the set that attempted the Transfer, the Callback is forwarded to the forward destination, with the normal forward message, <party being transferred> > <transfer originator>. In this case, the Call Back Call does not alert at the set that attempted the transfer, and cannot be picked up at that set.</p>
Voice Call	Call Forward prevents the called set from receiving a Voice Call

Do Not Disturb (DND)

1.1 Overview

1.1.1 Description

The Do Not Disturb (DND) feature disables all audible alerting signals at a set, except Held Line Reminder.

1.1.2 Rationale for Feature

See “1.1.1 Description”.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls

, or programmed key, to activate

to cancel

1.2.2 End User View

The user activates the feature by pressing , or the DND programmed key.

The feature can be activated at any time.

1.2.3 Message Displays

Message	Description
Do not disturb	Displays when the feature is active and the set is idle. Displays transiently when activated and the set is not idle.
Do not disturb LATER	Displays at the calling set, accompanied by Ringback, for an internal call
Allow calls	Displays transiently when the feature is cancelled.
DND from <setname>	Displays at the Prime Extn for the line if the user activates DND when an external call is ringing at their set (called Selective Call Forward).
DND transfer	Displays at the Prime Extn if the following conditions are true <ul style="list-style-type: none"> - DND was activated prior to an external call arriving at their set - an external call rings the set in DND mode - transfer to Prime Extn occurs - the call has the highest priority alerting - no other set has a line appearance for the call, including sets that are out-of-service

Message	Description
No line selected	Displays if DND is active and a user responds to a call alerting on their Prime Line. Otherwise, Automatic Outgoing Line Selection occurs.

If Do Not Disturb is activated while an external call is ringing, it performs selective Call Forward to the Prime Extn.

When a Do Not Disturb transition from Off to On occurs, any audible ringing at the set stops immediately.

To minimize the possibility that the feature is activated unintentionally, Attention tone is presented when Do Not Disturb is activated. (No tone is presented when the feature is deactivated.)

When the set is in Do Not Disturb mode, incoming calls continue to appear on the line indicators, but Call Identification for incoming internal or external calls is not displayed. Automatic Incoming Line Selection does not apply when Do Not Disturb is active, but the user can answer a call by pressing its line key. The Do Not Disturb feature suppresses incoming Paging, Incoming Voice Calls, and all other types of alerting, except Held Line Reminder tones. Ring Again offers are not made to or from a set which is in Do Not Disturb mode.

No prohibition exists against all sets in the system having Do Not Disturb active at the same time. If this situation occurs, an internal or external caller hears Ringback tone, but the call does not ring anywhere.

The user deactivates this feature by pressing the Do Not Disturb key again, or by dialing # 8 5.

When the user cancels Do Not Disturb, the transient message `Allow calls` is displayed. If one or more calls are attempting to ring the set, the highest priority call begins ringing. If Paging is in progress and all conditions for receiving a Page are now met, the set joins the Page announcement.

1.2.3.1 Selective Call Forward

If the user activates Do Not Disturb when an external call is ringing at the set, the ringing is transferred immediately to the Prime Extn for the line, if one exists. The call is presented on an intercom key if the Prime Extn does not have an appearance of the external line. If other sets are also ringing for the call, they continue to do so, and the call can be answered there.

Selective Call Forward does not occur (that is, no special message appears at the Prime Extn) if the Prime Extn is already ringing for the call.

Selective Call Forward does not apply to internal calls. If the user activates Do Not Disturb when an internal call is ringing, the ringing is suppressed but is not transferred to the Prime Extn. The internal caller receives Ringback and the message `Do not disturb`. The caller can activate the Priority Call feature to override the DND status at the destination set.

1.2.3.2 Do Not Disturb Transfer to Prime Extn

If all sets with an appearance of an external ringing line have Do Not Disturb enabled, when a ringing call comes in, it is immediately transferred to the Prime Extn for the line, if one exists. The call is presented on an intercom key if the Prime Extn does not have an appearance of the external line. If there is no Prime Extn in the system, or if the Prime Extn itself has Do Not Disturb enabled or has no line keys available, ringing does not transfer. The calling party continues to receive Ringback, but the call is not ringing on any set.

When Do Not Disturb Transfer to Prime Extn occurs, the Prime Extn shows `DND transfer` if this becomes the highest priority alerting call at the Prime Extn. Do Not Disturb Transfer to Prime Extn does not occur if the Prime Extn is already ringing for the same call (that is, the line on which the call is coming in, is programmed to `Appear&Ring` at the Prime Extn).

When an internal set calls a set that has Do Not Disturb active, or that activates Do Not Disturb while the call is ringing, the caller's display shows `Do not disturb` while the caller hears normal internal Ringback tone. Do Not Disturb Transfer to the Prime Extn does not occur for internal calls.

1.2.4 User Programming View

One Do Not Disturb key can be assigned to each set, with or without an indicator. If present, the indicator is used.

If Do Not Disturb is programmed on a key, the state of the Do Not Disturb feature is toggled each time the key is pressed.

1.2.5 OAM Programming View

N/A

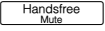
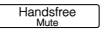
1.2.6 **EXTN/ **LINE

N/A

1.3 Technical Specification (Limits/Constraints)

N/A

1.4 Interactions

Feature or Condition	Interaction
Automatic Incoming Line Selection	If Do Not Disturb is enabled, automatic selection of alerting incoming calls is disabled because there is no audible alerting at the set. To answer an incoming call, the user either has to select the incoming line manually, or turn Do Not Disturb off before going offhook or pressing  .
Automatic Outgoing Line Selection	If Do Not Disturb is active and a call is alerting on the user's Prime Line, Automatic Outgoing Line Selection does not occur. If the user lifts the handset or presses  , the prompt <code>No line selected</code> is displayed, accompanied by Error tone.
Auxiliary Ringing	Auxiliary ringing does not occur for a set that is in Do Not Disturb mode.
Background Music	Do Not Disturb does not suppress Background Music.

Feature or Condition	Interaction
Busy Status Indication	For information on the relationship between Do Not Disturb and Busy Status Indication, refer to the description of the Busy Status Indication feature.
Call Forward	Both Do Not Disturb and Call Forward can be active at the same time. For information on the interaction between Do Not Disturb and Call Forward, refer to the Call Forward feature description. Transfer takes priority unless a Call Forward Override situation occurs, in which case, DND messages are displayed.
Call Identification	Call Identification for incoming calls is not presented when the set is in Do Not Disturb mode.
Page	Paging cannot be received when Do Not Disturb is enabled. An incoming page in progress is suppressed when the user activates Do Not Disturb. Paging in progress can be joined when Do Not Disturb is disabled.
Priority Call	The Priority Call feature can be used to make a Voice Call to an idle set in Do Not Disturb mode. However, activating Do Not Disturb after the Priority Call has been activated by the caller blocks the Priority Call.
Private Line	If the Prime Extn has an appearance of another set's Private Line, Do Not Disturb Transfer to Prime Extn can occur for that line.
Ring Again No Answer	DND suppresses presentation of incoming or outgoing Ring Again offers. Internal callers can set Ring Again No Answer on a set that is in Do Not Disturb mode, and will receive a Ring Again offer when the destination cancels Do Not Disturb.
Voice Call	If a user attempts to place a Voice Call to a set that has Do Not Disturb activated, the conditions for a voice call are not satisfied and the call is made as a ringing call. For details, see the Voice Call feature. If a Voice Call has been sent to a set in Do Not Disturb mode, and if the user at the destination set turns off DND while the call is alerting the set, a Ringing Call is not converted to a Voice Call, even if all conditions for receiving a Voice Call are now met.

DND on Busy / DDI Busy

1.1 Overview

1.1.1 Description

There are two aspects of Do Not Disturb (DND) on Busy: line-based and set-based. A call is handled differently depending on whether it arrives at the Norstar CCU on a manual answer line or an auto-answer line.

A new configuration parameter was added in DASS2-Enhancements so that, for busy DIA lines (DASS2-DDI lines, BRI-DDI lines and auto-answer AC15 lines), a caller to a Norstar system will either hear busy-tone, or be routed to the Prime extension for the DIA line.

The set-based aspect of DND on Busy has not changed since ENET. The functionality for PSTN lines, manual answer AC15 and internal calls has not changed. Manual answer DASS2 or BRI (non-DDI) lines will function the same as PSTN lines. The functionality for the UK-Compact product has not changed since ENET.

DND on Busy does not apply to ISDN terminals. If a line appears on both a Norstar set and at an S-loop and both are busy (defined as channels in use for the S-loop) then the S-loop processing prevails and the call is routed to prime rather than receiving Busy tone. This is the same processing as if DND on Busy is set to N.

1.1.1.1 Line Based aspect of DND on Busy

A call arrives from the network in one of two ways.

On a **manual answer** line, without received digits. The call is routed directly to the set, where Norstar determines whether the **set** is busy.

As per the following existing rules, if all sets that can ring for the line are busy and have DND on Busy administered, the line-based aspect of DND on Busy causes an incoming:

- manual answer AC15 call to be given busy treatment.
- manual answer (Non-DDI) DASS2, BRI or PSTN call to be routed immediately to the Prime extension.

On an **auto-answer** line, with received digits:

- Norstar must first find a DIA line to the set.

If the DIA line is **busy**, then the call never proceeds to the set, so it is immaterial whether DND on Busy is on or off because that is a set-based feature.

The treatment of the call depends on the value of the new Configuration parameter. Each DIA line can be configured to:

- return **busy-tone** to the caller, or
- route the call **to the Prime extension** for the DIA line.
- If the DIA line is **not busy**, the call is sent to the set, and the call is treated as

per the rules set out in the following section: Set Based aspects of DND on Busy.

- Norstar must then determine whether the **set** is busy.

1.1.1.2 Set Based aspect of DND on Busy

At busy sets for which DND on Busy is administered:

- audible alerting is suppressed for calls on analog PSTN, manual answer and auto answer AC15 calls, and all DASS2 & BRI calls (DDI and non-DDI calls), whether the call is presented on a line key or an I/C key.
- the arrival of internal calls is prevented. An internal caller hears Busy tone.

1.1.2 Rationale for Feature

Many Norstar PBX-template users are not accustomed to, and are bothered by, their phone ringing while they are already busy on a call, as they previously had only a standard two-wire, single line telephone. With DND on Busy administered at a set, a call will ring (audibly alert) only when the set is idle.

Callers want audible indication of the availability of the called party. Busy tone confirms the called party's presence. Without DND on Busy for instance, an internal caller at a set connected by an ATA cannot determine from the ring back whether the called party is absent or is busy on another call. This is particularly useful to DDI callers, private network callers and internal callers.

1.1.3 General Definitions

CRM - Call Reject Message (DASS2 specific, ISDN equivalent is Release with a Cause Value of User Busy)

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls

N/A

1.2.2 Message Displays

Message	Description
<name> busy	Displays at the internal caller's set if the called set is busy and has DND on Busy administered.

1.2.3 End-User View

1.2.3.1 Feature Consequence

DND on Busy may reduce the traffic on intercom keys by preventing the arrival of internal calls. (Note that PSTN, AC15, BRI, PRI and DASS2 lines can be configured to ring at intercom keys. Incoming calls on those lines will visually alert for 3 seconds at the intercom key when the set is busy and has DND on Busy on). With this reduction, a busy set with DND on Busy may have an intercom key which the user may use for consultation, transfer or conference.

1.2.3.2 When DND on Busy Applies

Line Based

For auto-answer lines, if the DIA line is busy, as described above, the call will be treated according to the configuration parameter. When `If busy:Busy tone` is selected, the caller will hear Busy tone. When `If busy:To prime` is selected, the caller will be routed to the Prime extension for the DIA line. This is independent of whether the set has DND on Busy administered.

For manual answer lines, there are two conditions for the line-based aspect of DND on Busy to apply:

1. when all sets that can ring for the line (that is, the line is configured to either `Appr&Ring` or `Ring only` at all of these sets): are busy and have DND on Busy administered; and,
2. if there any sets with answer keys, configured to `Appr&Ring` for any of the busy sets with DND on Busy, that all of these sets: are busy and have DND on Busy administered.

Note that the line-based aspect of DND on Busy will not apply if a busy set with DND on Busy only gives visual alerting (that is, the line is configured to `Appear only`) for calls on the line.

Set Based

There are two conditions for the set-based aspect DND on Busy to apply:

- A set is administered to have DND on Busy.
- The set is busy with any one of:
 - an active call
 - held call
 - an audibly alerting call

1.2.3.3 Feature Precedence

If the DIA line is available, Call Forward All Calls takes precedence over DND on Busy. When Call Forward All Calls is activated for a set that has DND on Busy administered, all calls will be forwarded preventing any call from ringing at the set. The result is dependent on the treatment offered by the forward destination.

From the called party's perspective, Do Not Disturb takes precedence over DND on Busy. That is, when Do Not Disturb is activated for a set that has DND on Busy administered, no calls will ring at the set. From the calling party's perspective, DND on Busy takes precedence over DND. That is, the calling party will be given DND on Busy treatment (appropriate for the call type, PSTN, AC15, DASS2, BRI, PRI, DDI or internal) when calling a busy set with DND on Busy and Do Not Disturb activated.

Call Forward Busy takes precedence over DND on Busy. When Call Forward Busy is administered for a set that has DND on Busy administered, all calls arriving at a busy set are forwarded. The result is dependent on the treatment offered by the forward destination.

1.2.3.4 Calling Party

Calling party's view when a call is made to a busy set with DND on Busy

Internal call	Manual answer network AC15	Auto answer - DIA line call (AC15 & DDI)	Analog PSTN & Non-DDI DASS2 or BRI calls
An internal caller will see: <name> and will hear Busy Tone. An internal caller at a set connected by an ATA will only hear Busy tone.	A network caller on a manual answer line will hear: a) Busy tone (for 3 minutes unless the caller hangs up) if all sets that can ring for the call are busy and have DND on Busy b) otherwise, Ring back. There is no DRT to the Prime extension	A caller on an auto-answer line will hear: If the DIA line is busy: a) Busy tone, or b) the call will be routed to the Prime extension for the DIA line. If the DIA line is not busy: a) the caller will hear Busy tone.	An analog PSTN or Non-DDI caller will hear: Ring back. Call capture rules apply immediately (for example, immediate DRT to Prime extension if no other set rings for the call).

1.2.3.5 Internal call - Calling party

When the called set is busy and has DND on Busy, the internal caller will hear Busy tone and see:

<name> busy

This is similar to the case when the called set has no available intercom key for the internal call. The following table lists internal call interactions for the calling party.

Internal call interactions - Calling party

Feature name	Interaction
Busy Status Indication	The Busy Status Indicator is ON for a set with an active call and with DND on Busy. An attempt to place an internal call to a busy set with DND on Busy and its Busy Status Indicator is ON results in the busy status message and Busy tone, even if the set has an available intercom key.
Call Forward All Calls	(Similar to case when forward destination has no available intercom key.) When a busy set with DND on Busy is the forward destination, an internal caller receives the message <name> busy and hears Busy tone. Note: There is no indication that a forwarding has taken place. The caller's display goes from Calling <dest1> to <dest2> busy where dest1 is the forwarded set, and dest2 is the set that dest1 forwarded to.
Call Forward No Answer	When a busy set with DND on Busy is the forward destination, an internal caller continues to hear ring back, because the caller had been given ring back when the call was ringing at the forwarded set. The call continues to visually alert at the original destination.
Callback	Callback occurs as soon as the system determines that the destination for Camp or Transfer is a busy set with DND on Busy.
Camp	Calls may be camped to a busy set with DND on Busy. A Callback occurs as soon as the system determines that the destination for Camp is a busy set with DND on Busy.

Feature name	Interaction
Priority Call	A Priority Call can be made to a busy set with DND on Busy.
Ring Again	A caller may activate Ring Again on a busy set with DND on Busy. The Ring Again offer will be made once the called set is idle.
Send Message	A caller may send a message to a busy set with DND on Busy.
Transfer	(Similar to case where internal transfer destination has no available intercom key.) When the transfer destination is busy and has DND on Busy, the internal caller will first see the transient message <code>Calling <name></code> and then will hear Busy tone and see <code><name> busy</code> . If a transfer completion action (pressing Release, hanging up, or using Call Queuing) occurs before the <code><name> busy</code> message appears, an immediate Callback for Busy will apply, if the transfer source call is PSTN or network. If the call is internal, the transfer source will see the busy status message for the transfer destination and hear Busy tone.
Voice Call	(Similar to case where a called set has no available intercom key.) After a caller specifies a busy set with DND on Busy for a Voice Call, the caller will first see the transient message <code><name></code> and then will hear Busy tone and see <code><name> busy</code> . The caller may make a Priority Call, if administration allows it, to make a Voice Call to a busy set with DND on Busy.

1.2.3.6 Manual answer AC15 - Calling party

The caller using a manual answer AC15 line will be given busy treatment (see Technical Specification (Limits/Constraints)) if all sets administered to ring for the line are busy and have DND on Busy. Otherwise, the caller will hear ring back.

Additionally, there is no automatic and immediate transfer of a manual-answer AC15 call to the Prime extension for the line, if it exists, if all sets administered to ring for the line are busy and have DND on Busy.

Once the call arrives at the Norstar system, the caller hears dead space for 3 seconds and then Busy tone. If there is at least one set alerting for the call, the caller hears ring back within 3 seconds of arrival at the Norstar system, until the call is answered somewhere (at another set where the line alerts) or until the caller hangs up.

Once an AC15 caller hears Ring back, the caller continues to hear Ring back, that is, there is no switch to Busy tone.

- An example when an AC15 caller continues to hear Ring back: an AC15 call arrives at a set with Call Forward No Answer and the caller hears Ring back. If the call is not answered and the forward destination is a busy set with DND on Busy, the caller continues to hear Ring back.
- An example when an AC15 caller hears Busy tone: an AC15 call arrives at set with Call Forward All Calls. If the call is not answered and the forward destination is a busy set with DND on Busy, the caller is given busy treatment.

The AC15 caller hears Busy tone until hanging up or for 3 minutes, at which point the line is released. When the caller hangs up, the line is released, and the facility is available for subsequent calls.

1.2.3.7 Auto-answer AC15 calls and DDI calls - Calling party

The caller using an auto-answer line (AC15 or DDI) will be given busy treatment if the DIA line is not busy, and if all sets administered to ring for the line are busy and have DND on Busy. Otherwise, if the DIA line is busy, the caller will either be given busy treatment or the call will be routed to the Prime extension, depending on the value of the `If busy` configuration parameter.

Once the call arrives at the Norstar system, the caller hears dead space for 3 seconds and then Busy tone. If there is at least one set alerting for the call, the caller hears ring back, within 3 seconds of arrival at the Norstar system, until the call is answered somewhere (at another set where the line alerts) or until the caller hangs up.

Once an AC15 or DDI caller hears Ring back, the caller continues to hear Ring back, that is, there is no switch to Busy tone.

- An example when an AC15 caller continues to hear Ring back:
 - an AC15 or DDI call arrives at a set with Call Forward No Answer and the caller hears Ring back. If the call is not answered and the forward destination is a busy set with DND on Busy, the caller continues to hear Ring back.
- An example when an AC15 or DDI caller hears Busy tone:
 - an AC15 or DDI call arrives at set with Call Forward All Calls. If the call is not answered and the forward destination is a busy set with DND on Busy, the caller is given busy treatment.

The AC15 caller hears Busy tone until hanging up or for 3 minutes, at which point the line is released. When the caller hangs up, the line is released, and the facility is available for subsequent calls.

The DDI caller hears Busy tone, as delivered by the PSTN, until hanging up (as per the network's rules). Busy tone is delivered by the network once Norstar informs the network that the call has been rejected (CRM). The line is available for subsequent calls.

AC15 or DDI call interactions - Calling party

Feature name	Interaction
Call Forward No Answer	If a busy set with DND on Busy also has Call Forward No Answer administered, the caller will hear Busy tone.
Call Forward (All Calls and No Answer)	If the forward destination is a busy set with DND on Busy, an incoming call is given Ring back if Ring back has already been supplied. Otherwise, the call is given busy treatment.

1.2.3.8 PSTN or non-DDI DASS2 or BRI call - Calling party

When the called party has DND on Busy and is busy, the PSTN caller will hear ring back until the call is answered at another set where the line alerts or until the caller hangs up.

Similar to DND, the call may be answered at the Prime extension, if it exists. If all sets administered to ring for the line are busy and have DND on Busy, then

ringing is automatically and immediately transferred to the Prime extension for the line if it exists.

PSTN & non-DDI call interactions - Calling party

Feature name	Interaction
Call Forward No Answer	If a busy set with DND on Busy also has Call Forward No Answer administered, the caller will hear ring back. The call is immediately transferred to the Prime extension and, after the administered number of rings (at the busy set), the call also is forwarded to the CFNA destination.
Call Forward (All Calls and No Answer)	(Similar to DND.) If the forward destination is a busy set with DND on Busy, an incoming call is presented to the Prime extension for the line, if one exists after 3 seconds. The caller hears ring back. (Similar to DND.) If the Prime extension (or the set it is forwarded to): (a) has DND enabled, (b) is busy and has DND on Busy, or (c) has no appearance of the line and does not have an available intercom key, the caller will hear ring back, but the line will not ring at any set.

1.2.3.9 Called Party

Called party's view when a call is made to a busy set with DND on Busy

Internal call	Manual answer network AC15	Auto answer - DIA line call (AC15 & DDI)	Analog PSTN & Non-DDI DASS2 & BRI calls
A busy called party with DND on Busy will have no call indication of internal calls.	A busy called party with DND on Busy will have only visual alerting for manual answer calls. The line appearance for the physical AC15 line is solid while the caller is given busy treatment. If the call arrives on an I/ C key, the indicator flashes for 3 seconds then clears, but the line may be busy for 3 minutes, or until both parties have released the line.	A called party, busy on another facility, with DND on Busy will have only visual alerting for DIA line calls (the DIA line is not busy). If the DIA line is busy when a second call comes in, the called party will not have any indication of the call's arrival.	A busy called party with DND on Busy will have only visual alerting for analog PSTN and non-DDI DASS2 & BRI calls.

Internal call - Called party

The called party does not receive internal calls, with the exceptions noted in the following table that lists internal call interactions for the called party.

Internal call interactions - Called party

Feature name	Interaction
Auxiliary Ringer – Set	The Auxiliary Ringer will not ring for a busy set with DND on Busy.
Background Music	DND on Busy does not suppress Background Music. Background Music will be presented when a set administered for Background Music has no active, held, nor alerting calls.
Call Forward No Answer	Internal calls are not presented at a busy set with DND on Busy and Call Forward No Answer.
Callback	(Similar to DND) Callbacks call back to a busy set with DND on Busy and are immediately presented at the Prime extension for the line for the call, and at any other set having a ringing appearance of the line.
Camp	Camped calls do not alert at a busy destination set with DND on Busy. This is because there is an immediate Camp Callback to the camp agent.
Making calls	A consequence of DND on Busy treatment is that there is possibility of idle intercom keys for making outgoing calls, such as for consultation, for a conference, or for transfer.
Page	Paging cannot be received at a set with an active call and with DND on Busy. If the user wants to receive the page announcement, then the call must be released or held. Note: this is the only instance where a held call does not mean the set is busy.
Priority Call	A busy set with DND on Busy can receive a Priority Call, even when there is no available intercom key.
Ring Again	The user at a busy set with DND on Busy may activate Ring Again on a busy set or a busy line pool. The Ring Again offer is made when the set is idle.
Transfer	Transferred calls do not alert at a busy destination set with DND on Busy. This is because there is an immediate Transfer Callback to the transfer agent.

Manual answer AC15 - Called party

The called party at a busy set with DND on Busy receives only visually alerting AC15 calls; there is no audible alerting and there is no Call Identification. The called party will see no difference in the way calls are presented at key/indicator pairs.

A user at a busy set with DND on Busy may select an alerting AC15 call by pressing the key for the call while it is flashing.

The indicator for the call continues to flash until the call is answered at another set, until the caller hangs up, or when the system determines that an AC15 call cannot ring at any set. In this last case, the call cannot ring because all sets that can ring for the call are busy and have DND on Busy.

When this determination is made, any indicator for the call goes solid since the caller is given Busy tone. If a user presses the associated key for this call, the user is presented with:

Line in use

and is given Error Tone.

If the call arrives on an intercom key, the indicator flashes for 3 seconds then clears, but the AC15 line may be busy for 3 minutes, or until both parties have released the line.

Auto-answer AC15 or DDI call - Called party

DIA line busy

The called party will not receive indication of the incoming call if the DIA line is busy. The indicator for the DIA line will remain solid until the call using the DIA line releases the call. If a user presses the associated key for this call, the user is presented with:

In use: xxx

and is given Error Tone.

DIA line not busy

The called party at a busy set with DND on Busy receives only visually alerting AC15 or DDI calls if the DIA line is not busy; there is no audible alerting and there is no Call Identification. The called party will see no difference in the way calls are presented at key/indicator pairs.

A user at a busy set with DND on Busy may select an alerting AC15 or DDI call by pressing the key for the call while it is flashing.

The indicator for the call continues to flash until the call is answered at another set, until the caller hangs up, or when the system determines that an AC15 or DDI call cannot ring at any set. In this last case, the call cannot ring because all sets that can ring for the call are busy and have DND on Busy.

When this determination is made for an AC15 call, any indicator for the physical line goes solid since the caller is given Busy tone. The indicator may remain solid for up to 3 minutes, or until both parties release the call. If a user presses the associated key for this call, the user is presented with

Incoming only

and is given Error Tone

When this determination is made for a DDI call, any indicator for the DIA line or physical line is released. New calls on the DDI trunk, either incoming or outgoing, will be dependent on how quickly the network releases the line.

AC15 or DDI call interactions - Called party

Feature name	Interaction
Auxiliary Ringer – Line	The Auxiliary Ringer will not ring for an incoming AC15 or DDI line, if administered to do so, once the system determines that no set can ring for the line. This is the point at which the caller is given Busy tone.
Auxiliary Ringer – Set	The Auxiliary Ringer will not ring for a busy set with DND on Busy.
Automatic Incoming Line Selection	(Similar to DND.) Because there is no audible alerting of an AC15 or DDI call at a busy set with DND on Busy, a user cannot use Automatic Incoming Line Selection to answer the call. The user must manually select the line.
Call Forward No Answer	A call arriving at a busy set with DND on Busy and Call Forward No Answer will only visually alert at the set, until it returns busy. If the call arrived on a line key, then the line key continues to track the call. (AC15 manual answer only)
Call Identification	(Similar to DND.) Call Identification for incoming calls is not presented at a busy set with DND on Busy.
Call Pickup	An AC15 or DDI call alerting at a busy set with DND on Busy may be picked up at another set using Call Pickup, provided there is at least one other set ringing for the call.
Call Queuing	Call Queuing can be used to answer a call alerting at a busy set with DND on Busy.
Held Line Reminder	(Similar to DND.) Held Line Reminder is presented at a busy set with DND on Busy.
Pre-selection	(Similar to DND.) A user at a busy set with DND on Busy may Pre-select a visually alerting AC15 or DDI line before going offhook or pressing Handsfree to answer the call.
DIA lines	An AC15 or DDI call arriving on a DIA line will be handled exactly like an AC15 or DDI call at a line key or intercom key.

PSTN & Non-DDI DASS2 & BRI calls - Called party

The called party at a busy set with DND on Busy receives only visually alerting Non-DDI or PSTN calls; there is no audible alerting and there is no Call Identification. The called party will see no difference in the way calls are presented at key/indicator pairs.

A user at a busy set with DND on Busy may select an alerting Non-DDI or PSTN call by pressing the key for the call.

The indicator for the call continues to flash until the call is answered at another set or until the caller hangs up.

Similar to DND, the call may be answered at the Prime extension, if it exists. If all sets administered to ring for the line are busy and have DND on Busy, then ringing is automatically and immediately transferred to the Prime extension for the line if it exists. When this transfer to the Prime extension occurs, the Prime extension shows **DND on busy** if this call becomes the highest priority alerting call at the Prime extension.

PSTN, DASS2 & BRI call interactions - Called party.

Feature name	Interaction
Auxiliary Ringer – Line	The Auxiliary Ringer will always ring for an incoming line, if administered to do so, though no set, including a busy set with DND on Busy, can ring for a call on the line.
Auxiliary Ringer – Set	The Auxiliary Ringer will not ring for a busy set with DND on Busy.
Automatic Incoming Line Selection	Because there is no audible alerting of a PSTN, DASS2, or BRI call at a busy set with DND on Busy, a user cannot use Automatic Incoming Line Selection to answer the call. The user must manually select the line.
Call Forward No Answer	A call arriving at a busy set with DND on Busy and Call Forward No Answer will only visually alert at the set. If the call arrived on a line key, then the line key continues to track the call.
Call Identification	(Similar to DND.) Call Identification for incoming calls is not presented at a busy set with DND on Busy.
Call Pickup	A PSTN, DASS2, or BRI call alerting at a busy set with DND on Busy may be picked up at another set using Call Pickup, provided there is at least one other set ringing for the call.
Call Queuing	Call Queuing can be used to answer a call alerting at a busy set with DND on Busy.
Do Not Disturb	One of the existing rules about Do Not Disturb is that immediately after Do Not Disturb is canceled, the highest priority call begins ringing. Thus a busy set with DND on Busy may have a ringing call. This happens in the following scenario: a set is administered with DND on Busy, the set has Do Not Disturb on, the set is busy, and there is a visually alerting call. If Do Not Disturb is cancelled, then ringing starts for the alerting call.
Held Line Reminder	(Similar to DND.) Held Line Reminder is presented at a busy set with DND on Busy.
Pre-selection	(Similar to DND.) A user at a busy set with DND on Busy may Pre-select a visually alerting PSTN line before going offhook or pressing Handsfree to answer the call. The Call Screening capability of Pre-selection is available at a busy set with DND on Busy.

Answer key - Called party

It is similar to DND. Following the rules for alerting at an Answer key, internal and external calls visually alert at an Answer key, configured to **Appr&Ring**, at a set regardless of the set being busy and having Do Not Disturb on Busy. This is because an Answer key is assigned to a user (usually an administrator) who may answer calls on behalf of other users (usually a boss) and so is likely to have incoming calls when already busy on a call.

Two significant rules for Alerting at an Answer key are: internal or external call attempting to ring the boss's set directly, or as a result of Transfer Direct – alert at the Answer key; internal or external call directed to boss's set by Call Forward, Prime extension call capture, or Service Modes – do not alert at Answer key.

Answer key call interaction - Called party.

Feature name	Interaction
Answer key	In the case of another call attempting to ring at a boss' set when the answer key at the administrator's set is already in use for an alerting, connected or held call, the call does not alert at the answer key.

Basic Set (M7100) - Called party

A Basic Set does not have line indicators, therefore calls must ring at the set for the user to be aware of an incoming call. This does not happen on a Basic Set with DND on Busy set to Y. A second call, arriving at a Basic Set with DND on Busy will not ring, and since it can not visually alert, the user has no indication of the arrival of the second call.

If the user puts an active call on hold, he/she may connect with a call that did not ring at the set. This will happen if the user places an active call on hold during the 3 seconds that a second call may be presented at the set (this is a maximum time prior to returning Busy tone to the caller, and would be shorter if the call is answered by another party). The chance of this happening increases as the number of calls to the set increases.

1.2.4 Differences between Do Not Disturb and DND on Busy

Condition	Set has Do Not Disturb	Set is busy and has DND on Busy
Busy Status Indication	An attempt to place an internal call to a set with DND and its Busy Status Indicator ON results in <code>Do not disturb</code> and Ring back, if the set has an available intercom key.	An attempt to place an internal call to a busy set with DND on Busy and its Busy Status Indicator ON results in <code><setname> busy</code> and Busy tone, even if the set has an available intercom key.
Call to an idle set	Caller will hear ring back. An internal caller will also see <code>Calling <setname> Do not disturb</code> . Called party will have only visual alerting.	Call will alert normally at an idle set with DND on Busy.
Forwarded Internal call	The caller will progressively see <code>Calling <setname> <setname1>><setname2> Do not disturb</code> and will hear Ring back	The caller will see <code>Calling <setname> <setname> busy</code> and will hear Busy Tone.
Priority Call blocking	A user can invoke DND to block a Priority Call. If a <code>BLOCK</code> softkey is presented, the user may press it to block a priority call.	DND on Busy is handled by system administration and so cannot be used to block a Priority Call. A user must use DND to block a Priority Call. If a <code>BLOCK</code> softkey is presented, the user may press it to block a priority call.

Condition	Set has Do Not Disturb	Set is busy and has DND on Busy
Transfer Announce	A transfer agent will see Do not disturb and will hear Ring back.	A transfer agent will see <setname> busy and will hear Busy Tone.
Transfer Direct of an internal call	A source caller will see Do not disturb and will hear Ring back.	A source caller will see <setname> busy and will hear Busy Tone.
User administration	A user can activate Do Not Disturb.	An administrator can activate DND on Busy through system administration.
Voice Calls	An internal caller will progressively see No voice call Do not disturb and will hear Ring back.	An internal caller will see <name> busy and will hear Busy Tone.

1.2.5 OAM Programming View

1.2.5.1 Levels of access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item			I	SC+	SC
Lines	Line Data	DIA line	If busy:BusyTone	X	X	
Terminals&Extns	Capabilities		DND on busy:221	X	X	

1.2.5.2 Programming If Busy

This feature can be enabled or disabled on a system-wide basis.

The If busy parameter is assigned on a DIA line-by-DIA line basis. From **Lines**►**Line Data**►**DIA line** after entering a valid DIA line number at the **Show line:** prompt, select **BusyTone** or **To Prime**.

Two values are available: **BusyTone** and **To prime**. The defaults for DIA lines are: **BusyTone** for the PBX template and **To prime** for the Hybrid and Square templates. **BusyTone** will ensure that the caller hears **Busy tone** when the DIA line is busy. By pressing the **CHANGE** softkey and choosing the **To prime** prompt, the DIA line can also be configured so that the call can be routed to the **Prime** extension for the DIA line.

This parameter is independent of the **DND on Busy:** parameter assigned to a set.

See "[Lines - Line Data - DIA lines](#)".

1.2.6 Programming DND on Busy

DND on Busy is enabled/disabled on a set-by-set basis in system administration.

From **Terminals&Extns**►**Capabilities**►**DND on Busy**. The heading prompts the administrator for enabling or disabling the DND on Busy feature.

The **CHANGE** softkey presents the values of **N** (do not suppress audible alerting of PSTN, Non-DDI DASS2 or BRI, DDI and AC15 calls, and allow internal calls) and **Y** (suppress audible alerting of PSTN, Non-DDI DASS2 or BRI, DDI and AC15 calls, and do not allow internal calls).

In a PBX environment, as an attendant answers PSTN calls, network calls (except for DIA line calls) and a variety of internal calls (such as direct-dial calls, and redirections to Prime extension), the attendant set should ring for all calls. Therefore, set 221 has a default value of **N** in the PBX startup template. As described in the *UK-ENET Commercial Specification*, other users in a PBX environment are not accustomed to the telephone ringing when they are on a call. Since these users would benefit from DND on Busy, all other sets in the PBX startup template have a default value of **Y**.

For Square and Hybrid templates, the default is **N** for all sets.

At the moment of change to the value of DND on Busy, there is no effect on currently alerting calls.

[See "Terminals&Extns - Capabilities".](#)

1.2.7 **EXTN/ **LINE

N/A

1.3 Technical Limitations

In the case of DDI lines, Norstar will not return a Busy tone since this would mean it answered and applied Busy tone, resulting in the customer being charged for the call. This is undesirable functionality. Instead, for DASS2 lines, from the moment Norstar knows that no set can answer the DDI call, it will return Call Reject Message (CRM) to the network. The network will then apply Busy tone to the caller. [See *Norstar UK DASS2 DDI Busy Functional Specification*.]. Similarly, BRI lines will return Release with a Cause Value of User Busy.

1.3.1 Busy Treatment on AC15 lines

A caller on an AC15 line that receives “busy treatment”, hears tones that are supplied by Norstar.

1.3.2 Busy Treatment on DDI lines

A caller on a DDI line that receives “busy treatment”, hears tones which are generated by the PSTN based on Norstar sending a CRM or User Busy to the PSTN.

1.4 Interactions

See “1.2.3 End-User View”.

DPNSS 1 Services

1.1 Overview

1.1.1 Description

DPNSS 1, the Digital Private Network Signalling System No. 1, was developed to give private network customers access to digital networks as soon as possible. DPNSS 1 can be used to extend the private networking capabilities of existing Norstar systems. DPNSS 1 provides access to Norstar features over multiple combined networks.

A single Norstar node, acting as a terminating node on the network, supports the following capabilities over DPNSS 1 lines:

- Direct Dial Inward (DDI) for incoming calls
- Originating Line Identification (OLI) for incoming and outgoing calls
 - For incoming calls, the Calling Line Identification (CLI/CLID) information is displayed to the user on extensions with line display (must be configured in programming).
 - For outgoing calls, the directory number of the originating party is sent out as OLI.
- Terminal Line Identification (TLI) for incoming and outgoing calls (referred to as Called Line Identification)
- Selective Line Redirection (SLR) and External Call Forward (ECF) on calls between DPNSS 1, and BRI/PRI, DASS2, Analogue, and AC15 lines
- remote access features DDI, line pool access code, destination codes, and remote page feature codes
- software keys (required to enable DPNSS 1)
- data calls and telephony calls

The following services are supported over DPNSS 1 lines:

- Call Offer
- Centralised Operator
- Diversion
- Executive Intrusion
- Loop Avoidance
- Message Waiting Indication
- Redirection
- Route Optimisation
- Three Party Service

1.1.2 Rationale for Feature

DPNSS allows a Norstar local node, acting as a terminating node, to communicate with other Private Branch Exchanges (PBXs) over the network. For example, corporate offices separated geographically can be linked over DPNSS 1 to other Norstar nodes, bypassing the restrictions of Public Switched Telephone Network

(PSTN) connections. This allows connected Norstar nodes to function like a private network, but with all the features of Norstar.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

For feature details, see the sections in this manual on the following services:

- Call Offer
- Centralised Operator
- Diversion
- Executive Intrusion
- Loop Avoidance
- Message Waiting Indication
- Redirection
- Route Optimisation
- Three Party Service

1.3 Technical Specification (Limits/Constraints)

Norstar DPNSS 1 works as a terminating node only. Norstar to Norstar DPNSS 1 is not supported.

DPNSS 1 features can be used on any Norstar extension. On most Norstar extensions, you must use specific keys or enter a number code to access the features.

With the exception of Loop Avoidance, Diversion, Redirection, and Three Party Service, all features are implemented as receive-only features.

1.4 Numbering Plan Description

Norstar provides flexibility with respect to the different numbering plans that can be adopted over the DPNSS 1 link. This flexibility is provided by means of a new configurable parameter called the local number length. This parameter is configurable for each DPNSS 1 link. This parameter specifies the length of the destination address (local number) expected over that particular link.

The destination address identifies an endpoint within Norstar. Within Norstar, two types of endpoints are supported. Sets identified by private receive digits and the system itself are identified by a private auto DN. Remote access to the system is therefore supported through the private auto DN. The lengths of private receive digits and the private auto DN are the same as the private receive length configured in the system.

The private receive length and the local number length are independently configurable parameters. The local number length is greater than or equal to the private receive length. Within Norstar, only a suffix of the received destination

address is used for routing. The length of the suffix used is the same as the private receive length.

Some numbering plans do require the destination address sent to an end PBX to be of multiple parts. Only the last part of such a multiple part destination address identifies the actual endpoint within the end PBX. The uniform dialing plan (UDP) is an example where a destination address consists of a home location code and then the actual endpoint identifier. Another example is the coordinated dialling plan (CDP) in which the destination address consists of a steering code and the actual endpoint identifier.

The mechanism adopted currently therefore allows only the actual endpoint identifier (the suffix) to be used for internal routing within Norstar. It allows Norstar to ignore the prefix part (such as home location codes and steering codes).

End-to-End Signaling

1.1 Overview

1.1.1 Description

Both short and long tones can be sent out on external calls. In order to send tones on an internal call, the End-to-End Signaling feature must be used.

End-to-End Signaling (Long Tones) allows the user to transmit variable-length DTMF tones on internal and external calls.

1.1.2 Rationale for Feature

See “1.1.1 Description”.

1.1.3 General Definitions

Term	Definition
DTMF tones	Dual-tone multifrequency
Long tones	Variable length tones. The tones are presented for as long as the key is pressed.
Short tones	120 ms tones

1.1.4 General Procedures

Tones are often used on external lines to access features on host PBX or Centrex systems, and to send information (for example, account numbers) to a far end destination. On an external line programmed for Pulse dialing, the user can access a secondary carrier (such as a long distance service) using Pulse dialing, and activate tone dialing in order to send tones to that carrier. (See the Dial Mode specification.)

End-to-End Signaling on both internal and external lines allows the user to control analog devices such as answering machines and dictation machines. End-to-End Signaling supports devices that cannot detect short, 120 ms tones, or that require long, continuous tones in order to perform a desired function (for example, rewind a tape).

Tone-controlled devices can be attached directly to the Norstar system using an Analog Terminal Adapter (ATA).

1.2 Feature Details

1.2.1 Controls

To activate: 8 0 8, or programmed key.

To cancel: End-to-End Signaling programmed key, or press .

1.2.2 End User View

End-to-End Signaling mode is activated using a feature code (8 0 8). The tone is generated by pressing the dialpad key lasts as long as the key is depressed.

In most situations, signaling is done on external lines set in OAM Programming for Tone dialing. The external lines are connected to switches or devices compatible with the same 120 ms timing used for dialing. On this type of line, each of the 12 dial pad keys generates a 120-ms DTMF tone when pressed.

On a line set in OAM Programming for tone dialing, no special user action is required to enable Tone mode for any of the dial pad keys.

1.2.2.1 Generating End-to-End Signaling (Long Tones) on Any Internal or External Call

On any internal or external call, the user can press the End-to-End Signaling feature code or programmed key in order to activate long tones. The set remains in the End-to-End Signaling mode until one of the following occurs:

- the call is placed on hold or is disconnected by either party
- the user presses Feature or any programmed key, except the End-to-End Signaling programmed key

When the End-to-End Signaling mode terminates, the call reverts to the signaling mode in use that it was in prior to the activation of End-to-End Signaling.

1.2.2.2 Generating End-to-End Signaling on External Paging

When the user activates the feature code used for paging a speaker, or both sets and speaker, the user can transmit long tones to the external paging circuit. This can be done in order to select one of several speaker paths supported by the external paging equipment. In this way, products connected to the external paging circuit can be controlled using End-to-End Signaling.

When the user activates a feature for paging to a speaker, End-to-End Signaling is automatically activated. No display indication is given to the user. Similarly, there is no programmed key for activating End-to-End Signaling on the external speaker.

No method is provided for activating or deactivating End-to-End Signaling manually while paging.

If the user presses a dial pad key while paging through the external speaker, the corresponding DTMF tone is transmitted through the speaker for the approximate duration of the key press. The digits are echoed on the display.

Tones generated during paging are not transmitted to any sets receiving the Page announcement. However, tones are transmitted to speakers during a Page announcement, if the announcement was directed to speakers, or speakers and sets. (For more information, see the Page feature.)

1.2.2.3 Using Tones

When tones are transmitted internally, there is no attenuation of the volume level at the destination device.

The system does not provide the user with DTMF feedback during End-to-End Signaling on any internal or external calls. In all cases, the user hears the normal fixed-length, set-generated, dial pad feedback tone (333 Hz for 16 ms) for each dial pad key press.

The system enforces a minimum interdigit time of 80 ms between tones transmitted manually or automatically.

1.2.2.4 Automatic Dialing

Norstar supports automatic dialing by means of features such as Speed Dial and Autodial, on external lines. If the line is in Pulse-dial mode, the stored digits are transmitted using that mode.

Automatic dialing does not generate End-to-End Signaling on external lines, because no way exists to determine what duration is desired for each digit. If an automatic dialer is activated while the set is in End-to-End Signaling mode, that mode is cancelled. The set reverts to its previous signaling mode (Pulse or short tones), and sends out the stored digits using that mode.

The End-to-End Signaling feature code cannot be stored in a dialer, and is not captured by Last Number Redial.

Last Number Redial does not store any digits dialed in End-to-End Signaling mode.

Message Displays

Message	Description
Long tones	Displays when the feature is activated.
Long tones:3	Displays when the feature is activated and the user presses the dial pad, for example the digit 3. The digit is erased when the key is released.
Tones denied	Displays transiently if either party activates the End-to-End Signaling feature when connected on a Conference call.

For a key press of given duration, the actual duration of a long tone can vary due to messaging delays in the system. The maximum variation expected is about 500 ms. After activation of End-to-End Signaling, there is a delay of approximately one second until the capability is turned on at the activating set.

The set exits from End-to-End Signaling mode under any of the following conditions:

- the **Rls**, **Feature**, **Hold** or any programmed key (except the End-to-End Signaling key) is pressed
- the other internal party releases the call
- the other internal party holds the call

Internally, tones are normally used only to control an analog device (such as an answering machine or a dictation machine) connected to the system by means of an ATA. However, no restriction is imposed by the system on the type of device to which these tones can be sent.

1.2.3 User Programming View

One End-to-End Signaling key can be programmed on a set, with or without an indicator. The indicator, if present, is not used.

1.2.4 OAM Programming View

N/A

1.2.5 **EXTN/ **LINE

N/A

1.3 Technical Specification (Limits/Constraints)

N/A

1.4 Interactions

Feature or condition name	Interaction
Autodial	Automatic dialing does not generate End-to-End Signaling on external lines, because no way exists to determine what duration is desired for each digit. If an automatic dialer is activated while the set is in End-to-End Signaling mode, that mode is cancelled. The set reverts to its previous signaling mode (Pulse or short tones), and sends out the stored digits using that mode.
Link	If the user activates Link after dialing has commenced, it resets call restriction checking. In some cases, the reset can cause the line to drop when the user attempts to perform End-to-End Signaling.
Conference	Tones are not transmitted to lines or devices involved in Conference calls. If the user activates the End-to-End Signaling feature when connected on a Conference call, a transient error message <code>Tones denied</code> is displayed.
Last Number Redial	<p>The End-to-End Signaling feature code cannot be stored in a dialer, and is not captured by Last Number Redial.</p> <p>Last Number Redial does not store any digits dialed in End-to-End Signaling mode.</p>
Page	<p>If the user activates End-to-End Signaling while making a Page announcement to sets only, the Page feature is terminated.</p> <p>The paging display key provided when a user Parks a call also causes End-to-End Signaling to be activated if the external speaker is selected.</p> <p>No method is provided for activating or deactivating End-to-End Signaling manually while paging.</p> <p>If the user presses a dial pad key while paging through the external speaker, the corresponding DTMF tone is transmitted through the speaker for the approximate duration of the key press. The digits are echoed on the display.</p> <p>Tones generated during paging are not transmitted to any sets receiving the Page announcement.</p>

Exchange code

1.1 Overview

1.1.1 Description

If an Exchange code is defined, a user at any type of set can dial it into internal dial tone, to select an idle external line. This functionality is part of the Routing Table mechanism.

1.1.2 Rationale for Feature

External line keys are used to initiate and answer calls for parties outside of Norstar. Basic sets do not have programmed external line keys. A single-digit Exchange code allows all users to access an external line by dialing the code into internal dial tone.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls

- Intercom key
- Dialpad keys

1.2.2 End User View

Especially for the Basic sets, the Exchange code is the digit dialed into internal dial tone to get an external line. It is only one digit, and can be the same as, or start with, the same digit as a Line Pool Access code. If the Exchange code is the same as any of the access codes for line pools assigned to the set, the Line Pool Access code takes precedence.

The following are assigned in OAM Programming

- Exchange code (see “1.2.5 OAM Programming View”)
- access to external lines (see Line Assignment)
- indirect access to external lines through a line pool (see Line Pools)

1.2.3 Error Conditions

Error conditions that give the message `No line selected` follow the same rules as are followed when the user activates an automatic dialing feature (external autodialer, user and system speed dialers) that attempts to use the Prime Line.

1.2.4 Message Displays

Message	Description
Access denied	Displays if no CO line is assigned to the set.
Denied in admin	Displays if a set does not have access to the line pool to which the Exchange code is assigned.
<digits dialed>	The dialed out digits are displayed.
Line in use	Appears transiently, accompanied by Error tone, if the user tries to access an external line already in use at another set.
No free lines	Displays transiently, accompanied by Busy tone, if there are no idle lines in the line pool accessed by the set's Prime Line
No line selected	Displays transiently if <ul style="list-style-type: none"> - the set's Prime Line is external and the Prime Line is in use (accompanied by Error tone) - the set is not assigned a Prime Line - the set's Prime Line is intercom and the set has access to a line pool, but there are no idle lines in the pool (accompanied by Busy tone) - the set's Prime Line is line pool and there are no idle lines in the pool, or no lines are assigned to the pool (accompanied by Busy tone)

The following examples assume the Exchange code is 9 (the default for Square systems).

When the Line Pool Access code 9 is dialed, the system checks to see if a line pool with an access code of 9 is assigned to that set. If so, the system selects a line from the pool. Otherwise, it selects the lowest numbered CO line assigned to that set. If no CO line is assigned, the message `Access denied` is displayed.

If a Line Pool code of 9, and an Exchange code of 9 are assigned, but a particular set does not have access to the line pool, if the user dials 9, overflow tone and the static message, `Denied in admin` (associated with no access to a line pool) are provided. The system does not attempt to try the Exchange code in this case.

1.2.5 OAM Programming View

1.2.5.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item		I	SC+	SC
System prgrming	Access codes	Exch code:9	X		

1.2.5.2 Programming the Exchange code

See ["System Programming - Access Codes"](#).

Exchange code is set in `System prgrming`►`Access codes`►`Exhc code`.

The code can be changed to any single digit that does not conflict with DNs and other system-wide identifiers. The code can also be blank (meaning no Exchange code is assigned).

Message Displays

Message	Description
Invalid code	Displays transiently if the user enters an Exchange code that conflicts with an existing system-wide identifier. (See "1.3 Technical Specification (Limits/Constraints)".)

The System Startup template defaults for external line and Prime Line assignments are shown in the following table. Line <xxx> represents a unique line for each set.

Template	Line Access	Prime Line	Exchange code	Line Pool Code (Pool A)
Square	Line 001 Line 002	None	9	--
Hybrid	Line 001 Line Pool A	Intercom	--	9
PBX	Line Pool A	Intercom	9	9

By default, for sets configured to the PBX and Hybrid templates, all users have access to Line Pool A that has an access code of 9.

Dialing the digit 9 for each of the system templates, if no additional programming has been performed, results in the following.

Template	Result of dialing the digit 9
Square	No line is selected.
Hybrid	A line from Line Pool A is selected, because Line Pool A has an access code of 9.
PBX	A line from Line Pool A is selected, because Line Pool A has an access code of 9.

1.2.6 **EXTN/ **LINE

N/A

1.3 Technical Specification (Limits/Constraints)

Line Pool Access codes and Exchange codes can conflict. However, if the codes are identical, the Line Pool Access code takes precedence.

1.4 Interactions

Interactions with External Line Access are listed in the Line Assignment specification.

Feature Name	Interaction
asterisk (*) and octothorpe (#)	Symbols such as asterisk (*) and octothorpe (#) cannot be used in Exchange codes.
Flexible Numbering Plan: Change DN, DN Length Routing Service DIA lines Call Park Direct-dial	<p>The first digit of a Exchange code must not conflict with the first digit of:</p> <ul style="list-style-type: none"> - a DN - a Destination code - a Received number (Modular) <p>It must also not conflict with the</p> <ul style="list-style-type: none"> - Call Park prefix - Direct-dial digit <p>External outgoing calls can be made using the Line Pool. If the user dials an Exchange code that is the same as any of the Line Pool Access codes, the Line Pool Access code takes precedence, and a line from the Line Pool is selected. Otherwise, the lowest numbered CO line assigned to the set is selected. If no CO line is assigned, the message <i>Access denied</i> is displayed. When a Line Pool code is accessed remotely, no conflict occurs.</p> <p>For other programming interactions, refer to the Flexible Numbering Plan specification.</p>
DIA lines	<p>An indicator is required for appearances of DIA lines for all sets except the M7100 and ATA. An incoming DIA line call visually alerts at the indicator, if available, and rings (if administered to do so).</p> <p>The system may attempt to route a call to a DIA line already in use. In this case, the call will behave as described in the Overflow Call Routing section of the DIA lines feature description.</p>

Executive Intrusion

1.1 Overview

1.1.1 Description

Executive Intrusion (EI) is a DPNSS 1 feature that allows an operator, or other calling party, to intrude on a line when it is busy.

EI is similar in functionality to Norstar Priority Call. It is, however, a receive-only feature on Norstar extensions; that is, EI cannot be initiated from a Norstar extension. The originating caller would be on another PBX on the DPNSS 1 network.

When EI is used to intrude on a call in progress, a three-way connection is established between the originating party and the two parties on the call. The result is very much like a conference call. When one of the three parties clears the line, the other two remain connected, and EI is terminated.

Executive Intrusion is one of the features supported on DPNSS 1 lines in Norstar systems. For a listing of these features, see the DPNSS 1 feature.

1.1.2 Rationale for Feature

This feature might be required, for example, in times of emergency or to make an important announcement when the recipient is on another call.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls

N/A

1.2.2 End User View

The extension receiving the intrusion displays “Intrusion Call” transiently for 3 seconds, and then the usual conference display takes over. A warning tone (conference tone) is heard by all three parties every 20 seconds once the Executive Intrusion takes place.

1.2.3 OAM Programming View

1.2.3.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item			I	SC+	SC
Terminals&Extns	Capabilities	Intrusion	Protect IVI	X	X	X

1.2.3.2 Programming Executive Intrusion IPL Value

Executive Intrusion is set in `Terminals&Extns▶Capabilities▶Intrusion▶Protect lvl.`

[See "Terminals&Extns - Capabilities".](#)

1.3 Technical Specification (Limits/Constraints)

Whether an extension accepts or rejects an Executive Intrusion request depends on the level of intrusion protection programmed. Each extension has an Intrusion Capability Level (ICL) and an Intrusion Protection Level (IPL):

- IPL determines the extension's ability to refuse intrusion. If the IPL is lower than the originating party's ICL and the IPL of the other party involved in the active call, EI is allowed. For general purposes, setting the IPL to None, Low or Medium is recommended, unless intrusion is not wanted. If IPL is set to High, no intrusions are allowed. Possible values are **None**, Low, Medium, and High.
- ICL determines the extension's ability to intrude. As long as the ICL is higher than the IPL of the wanted and unwanted parties, EI is allowed. Since EI is a receive-only feature, ICL is not an issue, and in fact cannot be set on Norstar.

Extension Administration Lock

1.1 Overview

1.1.1 Description

Extension Administration Lock controls access to features at a set. Access (full, partial or none) is set in OAM Programming on a extension-by-extension basis.

1.1.2 Rationale for Feature

Full Extension Administration Lock is useful for sets accessible to the public, such as in restaurants, stores, public institutions, and schools.

Partial Extension Administration Lock is needed for sets that are accessible to other people, but for which the set owner does not want any key changes.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Message Displays

Message	Description
Set locked	Appears, accompanied by Error tone on a fully or partially locked set if a user tries to change or use key or feature assignments that are inaccessible as a result of the locked setting.

1.2.2 End User View

Under Full Extension Administration lock, end users cannot perform changes (with a few exceptions) at a set to key assignments, feature assignments, or certain call processing features. Under Partial Extension Administration Lock, Call Processing feature changes can be performed by an end user. If no Extension Administration Lock is applied, the end user can change any attributes available at the set.

The following table summarizes which features the end user is able to access or program under Full and Partial Extension Administration Lock conditions.

Feature name	Can be Changed when Extension Lock = Full	Can be Changed when Extension Lock = Partial
Background Music	No	Yes
Call Forward	No	Yes
Custom Call Routing (for Compact Plus)	No	No
Display contrast	Yes	Yes
Do Not Disturb	No	Yes

Feature name	Can be Changed when Extension Lock = Full	Can be Changed when Extension Lock = Partial
Key Inquiry	Yes	Yes
Key Programming (Autodialers and features)	No	No
Language Choice	No	No
Last Number Redial	Yes	Yes
Message Send	No	Yes
Moving Lines	No	No
Dialing Options (Automatic, Standard, Pre-dial)	No	No
Page	Yes	Yes
Priority Call	Yes	Yes
Privacy Control	No	Yes
Ring Again	No	Yes
Ring Type	Yes	Yes
Saved Number Redial	No	No
Scheduled Services	No	Yes
Trunk Answer From Any Set	Yes	Yes
User Speed Dial	No	No
Voice Call	Yes	Yes
Voice Call Deny	No	No
Volume Control (Voice path and Ringer)	Yes	Yes

1.2.3 User Programming View

N/A

1.2.4 OAM Programming View

1.2.4.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item			I	SC+	SC
Terminals&Extns	Restrictions	Extn Restrns	Extn lock:None	X	X	X

1.2.4.2 Programming Extension Administration Lock

See "[Terminals&Extns - Restrictions - Extension Restrictions](#)".

Extension Administration Lock is programmed on a extension-by-extension basis under the `Terminals&Extns►Restrictions►Extn restrns►Extn lock:None` heading. The values are None, `Partial`, and `Full`. The default is underlined.

1.2.5 ****EXTN/**LINE**

N/A

1.3 Technical Specification (Limits/Constraints)

Extension Administration Lock settings are stored in NVRAM. They survive warm but not cold restarts.

1.4 Interactions

Feature	Interaction
OAM Programming	The installer or System Coordinator can perform OAM Programming on a set even if Extension Administration Lock is Full.
Custom Call Routing (CCR) (for Compact Plus)	CCR is password-protected in terms of enabling and disabling. It is therefore not in the list of features under the control of Set Lock.

Extension Length

1.1 Overview

1.1.1 Description

Extension Length allows you to make a system-wide change in the Extension length. An Extension is the same as an internal set number.

1.1.2 Rationale for Feature

Having an Extension length allows a private general network to have a coordinated network dialing plan.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 User View

Changing the Extension length drops all external data calls when the OAM programming session terminates. All other programming data is preserved. During programming of Extension length, the following query, `Drop data calls?`, to the installer questions if the length change is to proceed, given that it results in the dropping of any active external calls.

1.2.2 OAM Programming View

1.2.2.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item	I	SC+	SC
System prgrming	Extn length: 3	X		
**Startup	Start Extn	X		

1.2.2.2 Programming Extension Length

Extension length is set in one of two ways:

- In OAM Programming: `System prgrming`►`Extn length`
- By pressing `Feature` `*` `*` `S` `T` `A` `R` `T` `U` `P` (**Startup) and programming the Start Extension

Changing the Extension Length through System Programming

See ["System Programming - Extension Number Length"](#).

For both Modular Plus and Compact Plus, the Extension length is between three and seven digits. The default for both is three digits.

Changing the Extension Length through ****Startup**

See "Startup".

The value of the `Start Extn:` supplied in ****STARTUP** is the value of the lowest numbered Extension in the system. The length of this number determines the Extension length for the whole system.

The default value for both Modular Plus and Compact Plus is 221.

Press `CHANGE` to change the value. After one digit is entered, the `BKSP` display button appears. Press `OK` to complete the change.

1.2.3 ****EXTN/**LINE**

N/A

1.3 Technical Specification (Limits/Constraints)

In Compact ICS systems programmed with a two-digit DN length, a total of 99 DNs is allowed. The highest `Start DN:` value accepted is one that allows for the maximum number of B1 and B2 DNs plus 64 ISDN DNs, without requiring an extra digit to represent the number. If the user enters a `Start DN` that violates this requirement, the following three-second transient message is displayed:
<xxxxxxx> too high, where <xxxxxxx> is the start DN that was entered.

As part of the re-initialization during Startup, all external calls in the system are dropped.

1.4 Interactions

Feature	Interaction
Alarm Set	Changing individual Extns, or Extension length, preserves the relationship between an alarm set and its Extn.
Direct-dial	Changing individual Extns, or Extension length, preserves the relationship between a Direct-dial set and the Extn(s) assigned to call it.
Flexible Numbering Plan: Line Pools Routing Service External Line Access Call Park Direct-dial	The first number of an Extn must not conflict with the first digit of: - a Line Pool access code - a Destination code - an External Line access code It must also not conflict with the - Call Park prefix - Direct-dial digit If, as a result of changing the Extension Length or the Start Extn, the new Extensions clash with the Direct-dial digit, the Call Park prefix, or Line Pool access codes, those numbers are overwritten and set to <code>None</code> by the new Extensions. External Line access codes are left blank if they conflict with the new Extensions. For more interactions refer to the Flexible Numbering Plan specification.
Internal Autodial	Internal Autodial buttons are updated if Extension length is changed in OAM. They are not maintained over **Startup .

Feature	Interaction
Prime Set	Changing individual Extns, or Extension length, preserves the relationship between a Prime Set and the Extensions assigned to call it.
Private Lines	Changing individual Extns, or Extension length, preserves the relationship between a private line and the set to which it is assigned.

Extension Relocation

1.1 Overview

1.1.1 Description

Extension Relocation allows an existing M7000 extension to be physically moved to a new port (location) while retaining user and system programming.

1.1.2 Rationale for Feature

See “Figure 1.2.1 Description”.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 End User View

If Extension Relocation is enabled in OAM Programming, when a extension is unplugged from a port and then plugged into a new port, the system recognizes that the extension has been moved and copies the user data over to the new port.

Extension Relocation to new port

If the unplugged extension is plugged into a new port first, the user and system programming for the extension are retained. If a new extension of a different type is plugged into the old port before the old extension is plugged into a new port, the user data is lost. In this case, both extensions are reset to defaults, according to the Startup Template used.

Extension Replacement

If a new extension is plugged into the old port, and that extension is the same model as the old extension, the System and User programming for the extension are retained.

If the new extension is a different model from the old extension, no programming for the extension is retained, and the settings return to system defaults. The user must enter OAM Programming to customize the extension further.

Extension Swapping

Extension Relocation allows two existing sets to swap locations (ports) and retain user and system programming. The swapping capability allows any number of sets to be unplugged, moved to new ports, and reconnected in any order, and the sets retain their profiles and intercom numbers.

Effects of Extension Relocation

Following Extension Relocation, the dynamic profile of the extension, in terms of visual indication of extension status and system status, is restored when the extension is plugged in and is recognized by the system. This recognition may take several seconds, depending on

- the extension's position in the polling sequence when it is plugged in
- the number of sets initialized before a given extension

Data retained during moves when Extension Relocation is implemented in OAM Programming

Feature or Condition Name	Status or Setting Retained?
Allow Redirection	Y
Answer DN settings	Y
ATA Answer Timer	Y
Auxiliary Ringer	Y
Background Music	Y
Background Music Volume	N
Call Forward	Y
Call Log settings	Y
Class of Service	Y
Contrast Level	Y
Dialing Options	Y
Do Not Disturb	Y
DND on Busy	Y
Handsfree	Y
Handsfree Answerback	Y
Handset volume	N
Handsfree volume	N
Headset volume	N
Hotline	Y
Intercom Appearances	Y
Incoming and outgoing message lists	Y
Incoming Line Group access	Y
Key assignments	Y
Language Choice	Y
Last Number Redial buffer	N
Line Appearances	Y
Line Pool Access	Y

Data retained during moves when Extension Relocation is implemented in OAM Programming

Feature or Condition Name	Status or Setting Retained?
Night extension designation	Y
Paging	Y
Page Zone	Y
Prime Line	Y
Prime extension designation	Y
Priority Calls	Y
Ring Again (Incoming and outgoing)	N
Ring Type	Y
Ring Volume	Y
Run/Stop status	Y
User Speed Dial entries	Y
Saved Number Redial	Y
Extension Administration Lock	Y
Extension Name	Y
Voice Deny	Y

1.2.2 OAM Programming View

1.2.2.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item		I	SC+	SC
System prgrming	Featr settings	Extn relocation:N	X	X	

1.2.2.2 Programming Extension Relocation

See ["System Programming - Feature Settings"](#).

For Extension Relocation to be automatic, the feature must be set to Y under System prgrming►Featr settings►Set relocation:N. Otherwise, a relocated extension acquires the attributes of the extension originally at the new port or gets defaulted. The default is N.

1.2.3 **EXTN/**LINE

N/A

1.3 Technical Specification (Limits/Constraints)

When Extension Replacement occurs, no message is displayed. Extension Relocation information is stored in non-volatile memory (NVRAM). It survives warm but not cold restarts.

Extension Relocation only applies to M7000 series terminals. Other terminal types are not supported.

1.4 Interactions

Feature Name	Interaction
Custom Call Routing (CCR) (for Compact Plus only)	If the attendant extension is moved and Extension Relocation is OFF, and the caller dials a destination that ends up at the attendant extension, the caller hears Ringback.
I-Active or I-Hold calls	Whether or not Extension Relocation is enabled, if there are any I-Active or I-Hold calls at an extension when it is unplugged, these will be preserved if the extension is reconnected or replaced by an extension of the same type within one minute. If the extension is disconnected for a longer period, all calls associated with the extension are dropped.
OAM Programming	<p>If a port is programmed in OAM programming before an extension is plugged into that port, the settings are retained when the extension is plugged in, if the extension type was programmed properly.</p> <p>If the extension type was improperly configured during programming time, all settings that are specific to an extension type (i.e., Key programming) are lost. All other settings, however, are retained.</p>

Extension on S-Loops

1.1 Overview

1.1.1 Description

This functionality allows the installer to assign Extension numbers to S-loops, and choose one of those Extension numbers as the `Lp extn#` that will be associated with calls from that loop, unless otherwise specified by the terminal.

- Extension numbers are not assigned to T-loops. Only to S-loops.
- Norstar supports a maximum of 64 ISDN Extension numbers. By default, these fall in the range of (273 to 304 for Compact Plus and 477 to 540 for Modular Plus). The first 32 of these Extension numbers may be configured as Extension numbers for Portables (Modular Plus), or ISDN devices.
- The Default Extension number has been replaced by `Lp extn#`.
- `Lp extn#`: The `Lp extn#` is the Extension number assigned to the S-loop, so that the user can make a call on a non-MSN terminal without explicitly specifying the Extension number from which the call is being originated. The Extension number associated with a call is used by Norstar as the Caller ID; it is used to associate system data with calls originating from a particular loop.
 - In Norstar, the `Lp extn#` for a loop must be explicitly configured by an installer (under `Hardware►Extns on Lpnnn`).
 - The `Lp extn#` for a loop may be changed (under `Hardware►Extns on Lpnnn`).

1.1.2 Rationale for Feature

An ISDN terminal can not receive or make a call unless an Extension number is assigned to the S-loop on which the terminal is installed. A loop must have a `Lp extn#` assigned in order to make outgoing calls.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

This feature will be used on systems with BRI S-loops to assign Extension numbers to specific loops.

1.2 Feature Details

1.2.1 Controls

N/A

1.2.2 Message Displays

Message	Description
<code>Extns on Loop</code> or <code>Extns on Loop</code>	Heading in OAM Programming to permit assigning Extension numbers to BRI S-loops.
<code>Show S-loop: _</code>	Pressing <code>NEXT</code> goes the to the first S-loop on the system, or enter a loop number.

Message	Description
Extns on: LpXXX	Pressing NEXT & BACK cycle through S-loops on the system.
Assign extns	Subheading for assigning Extension numbers to the loop. Pressing NEXT goes to the Lp extn#: prompt.
Show extn#:_	Specify an ISDN Extension number. Pressing the SCAN display key displays the 1st assigned ISDN Extension number. Pressing NEXT displays the lowest ISDN Extension number on the system. Entering a Portable or Norstar Extension number results in the transient below. Entering an ISDN Extension number displays the current status of the Extension number, as described below.
Not an ISDN extn	A transient message is displayed if a Portable Extension number or Norstar Extension number are entered. The 3 seconds transient returns to the previous prompt.
nnnnnnn:<value>	Pressing the SCAN display key advances to the next Extension number assigned to the loop. Pressing the CHANGE display key may display any of the following values:
nnnnnnn:Availabl	The Extension number displayed is available to be assigned to the loop.
nnnnnnn:Assigned	The Extension number displayed is already assigned to the loop.
nnnnnnn:LpNNN	The Extension number displayed is assigned to another loop, as specified.
nnnnnnn:*LpNNN*	The Extension number displayed is the Lp extn# on another loop, as specified. CAUTION: Removing/reassigning this Extension number may result in the other loop being unable to make or receive calls.
Lp extn#:None CHANGE	Pressing the CHANGE display key cycles through the Extension numbers on the loop. Pressing NEXT or BACK assigns the Extension number on the display as the Lp extn#. Non-MSN terminals on a loop without a Lp extn# will be unable to make or receive calls.
No more assigned	If only one Extension number is assigned to the loop, pressing the SCAN display key will return this transient.
None assigned	This transient is displayed if the SCAN display key is pressed, and no ISDN Extension numbers are assigned to the loop. The installer is returned to the display from which the SCAN display key was pressed.

1.2.3 End User View

N/A

1.2.4 OAM Programming View

1.2.4.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item			I	SC+	SC
Hardware	Extns on loop	Assign extns	Show extn#:_	X		
		Loop extn#:None		X		

One or more Extension numbers must be assigned to an S-Loop before devices on that loop can make or receive calls.

There are two subheadings under `Extns on Loop`:

- `Assign extns` - This is where ISDN Extension numbers may be assigned or removed from an S-loop.
- `Lp extn#:` - This permits the installer to define a particular ISDN Extension number as being the `Lp extn#` for that loop.

See "Hardware - BRI parameters - Modular Plus".

See "Hardware - BRI Parameters - Compact Plus".

1.2.4.2 Assigning and Removing ISDN Extension numbers

The installer can cycle through the ISDN Extension numbers on the system and assign them to or remove them from the selected loop as desired. The various values associated with ISDN Extension numbers and the effect of pressing the `CHANGE` display key are described in the following table:

ISDN Extension number display	Description	Effect of <code>CHANGE</code>
<code>nnnnnnn:Availabl</code> <code>CHANGE</code>	This ISDN Extension number is available to be assigned to this S-loop.	Assigns the ISDN Extension number to this S-loop, changing the value to <code>Assigned</code> .
<code>nnnnnnn:Assigned</code> <code>CHANGE</code>	This ISDN Extension number is currently assigned to this S-loop.	Removes the ISDN Extension number from this S-loop, changing the value to <code>Availabl</code> .
<code>nnnnnnn:Lpxxx</code> <code>CHANGE</code>	This ISDN Extension number is currently assigned to <code>Lpxxx</code> .	Removes the ISDN Extension number from <code>Lpxxx</code> and assigns it to this S-loop, changing the value to <code>Assigned</code> .
<code>nnnnnnn:*Lpxxx*</code> <code>CHANGE</code>	This ISDN Extension number is currently the <code>Lp extn#</code> for <code>Lpxxx</code> .	Removes the ISDN Extension number from <code>Lpxxx</code> , sets the <code>Lp extn#</code> for <code>Lpxxx</code> to <code>None</code> , and assigns the ISDN Extension number to this S-loop.

Note that it is possible to cycle back to the original value using `CHANGE`, since the change is not actually made until the installer navigates away from the ISDN Extension number display.

1.2.4.3 Assigning a Lp Extn#

A `Lp extn#` can be assigned by the installer. Pressing `NEXT` from the `Assign extns` subheading displays the `Lp extn#` for that S-loop. If one has not been assigned, the value is `None`. The `CHANGE` display key cycles through the ISDN Extension numbers assigned to that S-loop. Pressing `NEXT` or `BACK` changes the value as selected.

The installer can explicitly set the value of the `Lp extn#` to `None`. This may be desirable if all of the ISDN devices on a particular loop are MSN terminals (which don't require a `Lp extn#`). This functionality is also necessary to remove all ISDN Extension numbers from a loop, given that:

- once assigned to a loop, the Extension numbers remain associated with the data for that loop regardless of the loop type (note that such Extension numbers will appear as `Availabl` – see “1.3.1 Interactions” for details).
- only valid S-loops appear in `Extns on Loop`.

This is similar to the interaction between Software Keys, Provisioning, and Line Data in that the ISDN Extension numbers must be explicitly reclaimed from the loop in order to reuse them elsewhere.

1.2.5 ****EXTN/**LINE**

N/A

1.3 **Technical Limitations**

Norstar will support a maximum of 80 loops.

Norstar will support a maximum of 64 ISDN Extension numbers.

Norstar will support a maximum of 64 TEIs (identifiers associated with ISDN devices).

An ISDN device may require more than one TEI.

There are not enough Extension numbers for all 80 loops to be configured as S-loops.

1.3.1 **Interactions**

Feature Name	Interaction
Change extn type (Modular Plus only)	Only Extension numbers which are configured to be ISDN in System prgrming►Change extn type appear in this feature. There is no interaction between ISDN Extension numbers which are shown as In use by system under System prgrming►Change extn type and assignment of ISDN Extension numbers to S-loops. An ISDN Extension number may exist in both states simultaneously.
Line Data - change card type or loop type	<p>If the installer changes the card type or loop type for an existing S-loop, that S-loop is no longer considered valid. Any ISDN Extension numbers previously assigned to that S-loop will appear as Availabl in Extns on Loop. These ISDN Extension numbers can then be reassigned to other S-loops or converted to Portable Extension numbers.</p> <p>However, if the installer later redefines the original S-loop in Line Data, any ISDN Extension numbers previously assigned to the loop which have not been reassigned elsewhere or converted to Portable Extension numbers in the meantime will again appear as Assigned to the S-loop.</p>

Extension Test

1.1 Overview

1.1.1 Description

The Extension Test feature allows end users to check whether or not their Norstar telephone set needs repairs.

M7100, M7208, M7310, and M7324 sets can be tested with this feature. Busy Lamp Fields (BLFs) and CAP modules attached to Norstar sets can also be tested.

1.1.2 Rationale for Feature

By allowing users to verify the behaviour of a Norstar telephone set, this feature reduces the number of sets returned to the factory that have No Fault Found (NFF) as the reason for return.

Some of the reasons that cause users to return Norstar sets to the distributor, and therefore back to the NT factory include:

- the user reports that a key is not working
- the user reports that the displays are not working properly, for example, an indicator does not light up if an indicator key is pressed
- the user reports that the speaker is not working
- the phone is resetting unexpectedly

The Extension Test feature can help a user determine if there is a physical problem with the Norstar set before they decide to return it.

This feature, along with the Bit Error Rate Test (BERT), allows an installer to check whether or not a Norstar telephone, and the link between it and the CCU, are working properly.

1.1.3 Scenarios of Usage

A user can use the Extension Test feature to test their phone if one of the following situations occurs:

- a user suspects that one of the keys on their telephone is not working
- a call is received at a telephone set, the phone resets itself, and the call is lost
- a user suspects that one of the indicators on their phone is not working
- a user cannot hear a caller through the handsfree speaker or the handset

1.1.4 General Definitions

Term	Meaning
NFF	No Fault Found - Occurs when a customer returns a set stating that it is not working, yet when it is tested, no fault with the phone can be found.

1.1.5 General Procedures

The feature is accessible through a feature code.

Once the user is in the feature, they are presented with a list of tests that they can run on their own phone. The list contains only tests that are appropriate for their phone type (that is, M7100, M7280, M7310, or M7324).

The user can interpret the results of each test. Afterwards, if they still think that there is a problem with their phone, they can then report the results to the vendor that sold them the system.

1.2 Feature Details

1.2.1 Controls

Feature 8 0 5

1.2.2 End User View

Before the feature can be activated, there must be no active calls at the set. If calls are active at the set and the user enters the feature code, the user is presented with an Error tone and the transient message `Release calls`. The user cannot access the feature until they release their calls.

To activate this feature, the user enters Feature 8 0 5.

If the user activates the feature successfully, they can navigate through a list of up to six tests, shown in the table “Availability of tests on specific sets”.

Availability of tests on specific sets

Test	M7100	M7208	M7310	M7324
Display	x	x	x	x
Keys	x	x	x	x
Handset Speaker	x	x	x	x
Headset Speaker	N/A	x	x	x
Speaker	x	x	x	x
Power	x	x	x	x

The Headset Speaker test is not available for the M7100, because this set does not have a separate headset plug. The Headset speaker is only available if a headset is plugged into the phone being tested.

As soon as the feature is active, the user cannot receive or make a call. The phone behaves as if the user were in OAM Programming. (The user is not actually in OAM Programming; that is, a separate OAM session is permitted to be active).

1.2.3 User Programming View

This feature cannot be programmed on a key.

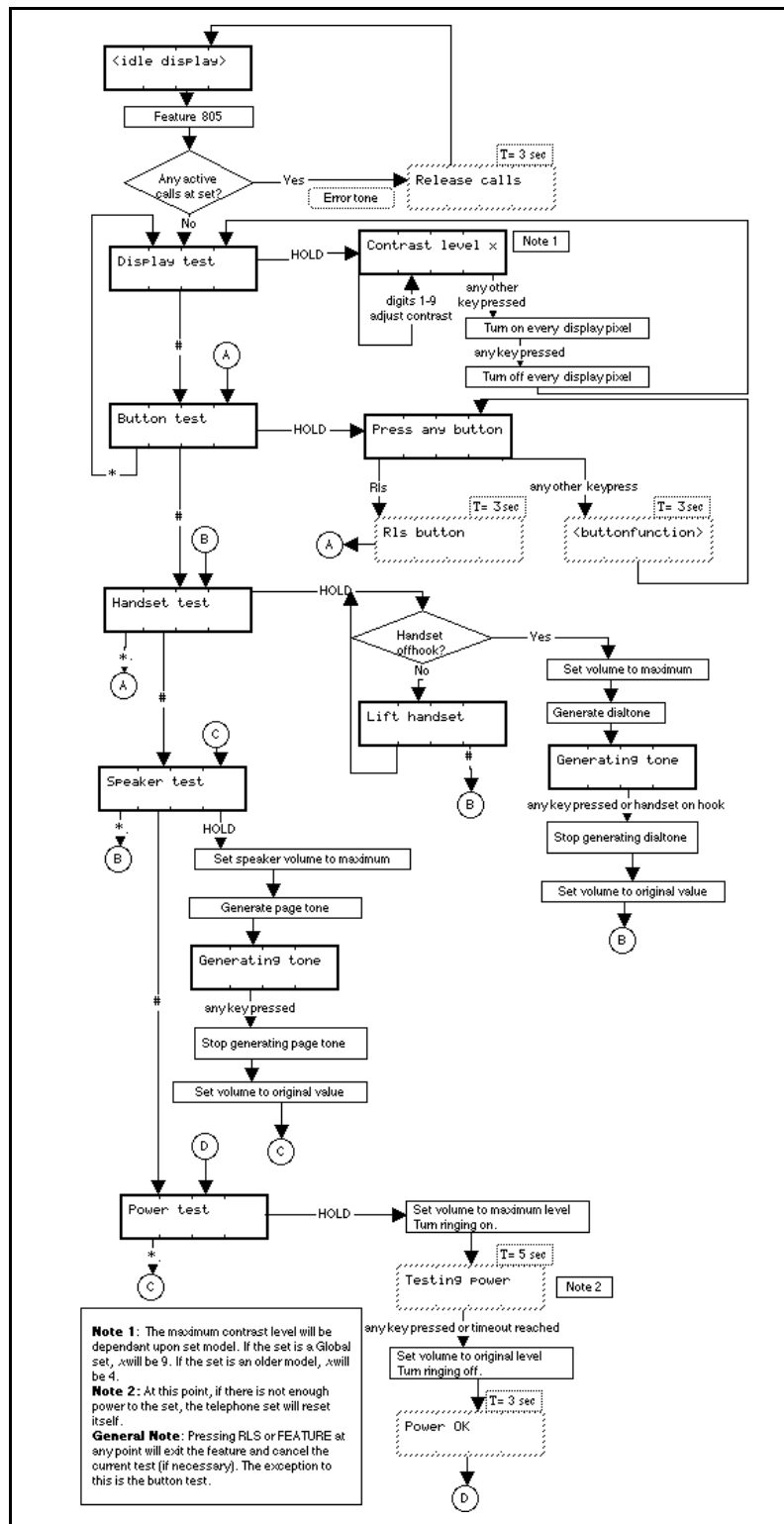


Figure 1-1: M7100 Extension Test

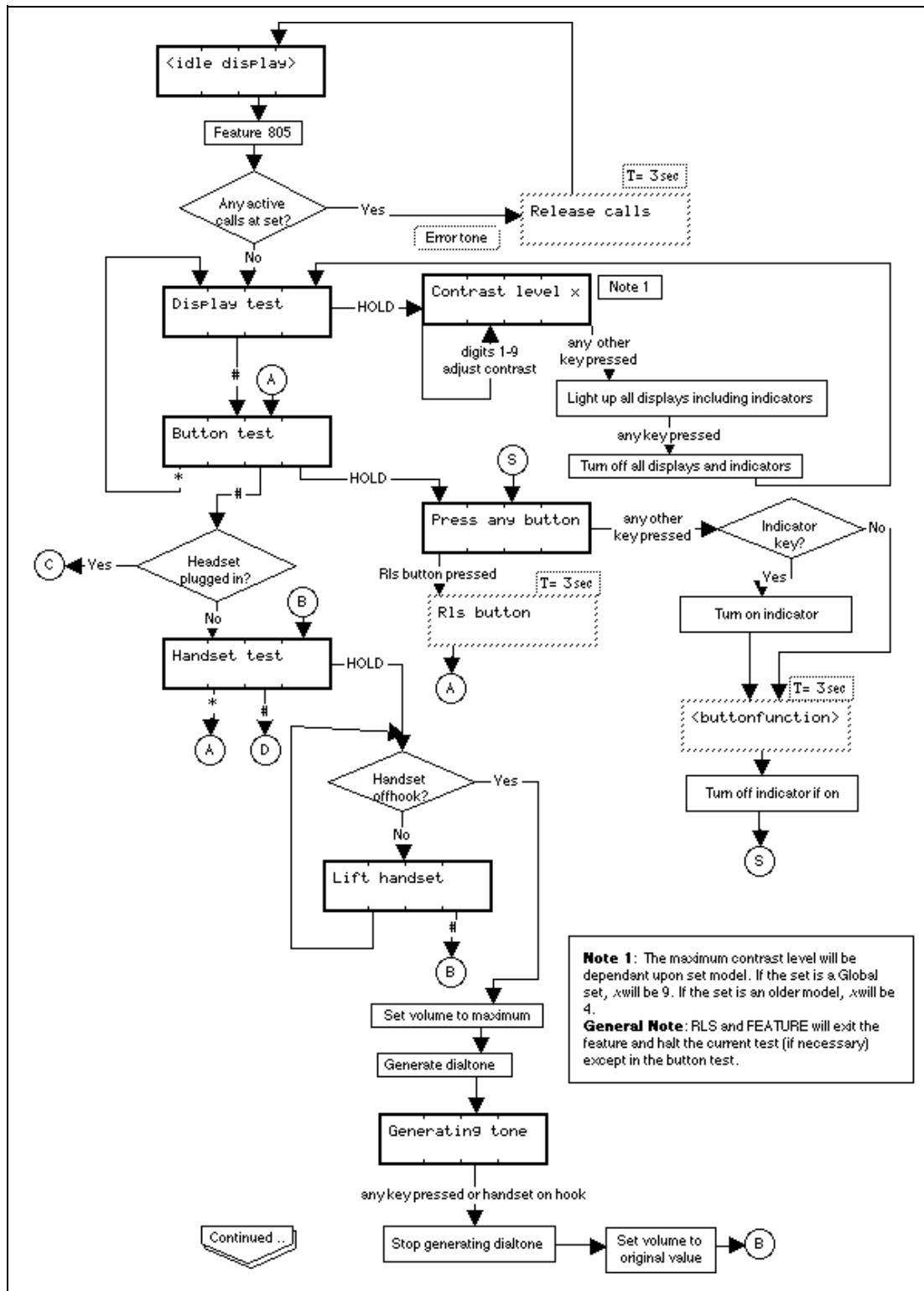


Figure 1-2: M7208 Extension Test (1 of 2)

1.2.3.1 Exiting the Feature

The feature times out after 30 minutes of no activity.

Pressing **RLS** or **Feature** exits the feature. The exceptions to this are:

- pressing **RLS** during the Key Test exits the Key Test only, not the entire feature

- pressing **Feature** during the Key Test displays **Feature**

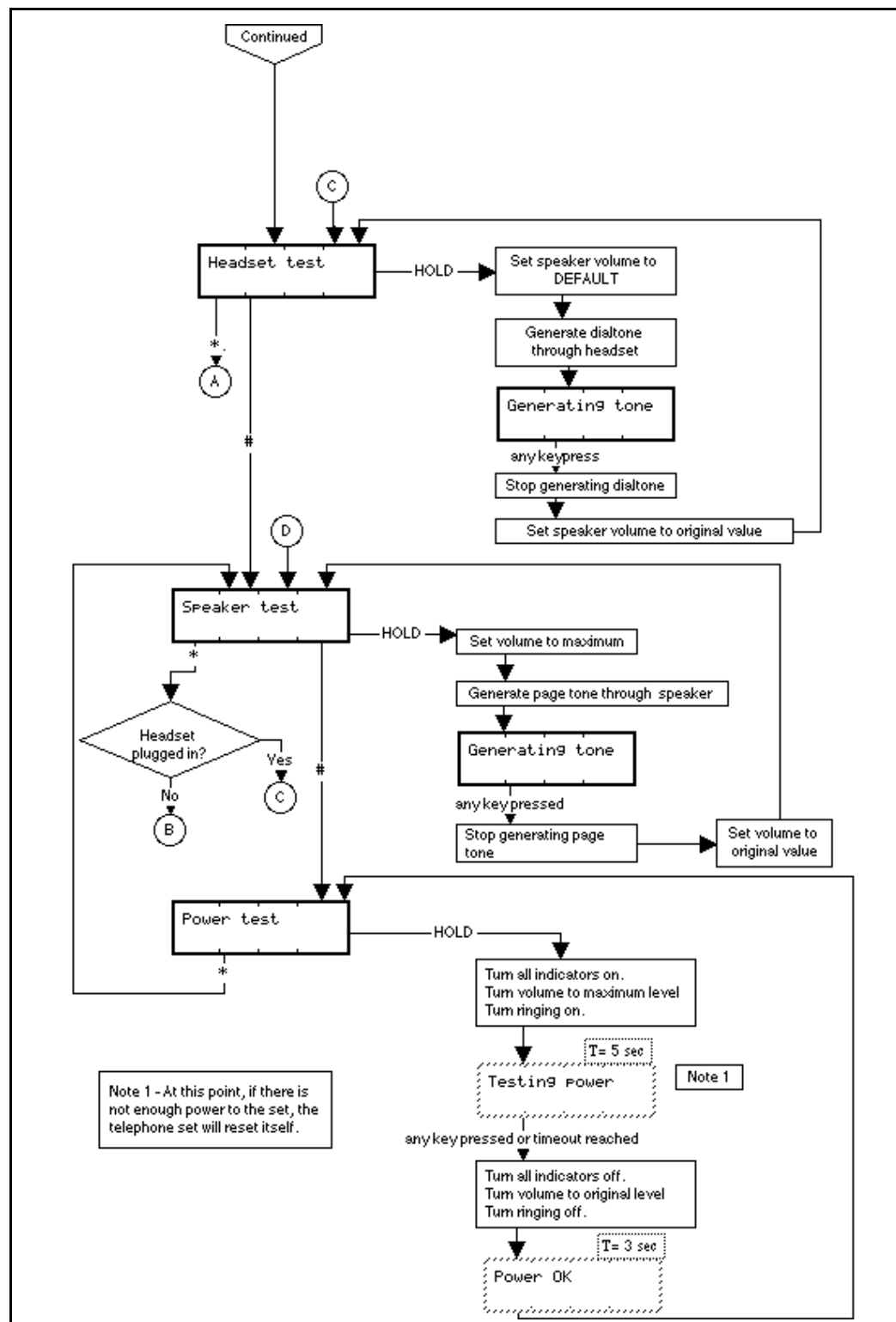


Figure 1-2: M7208 Extension Test (2 of 2)

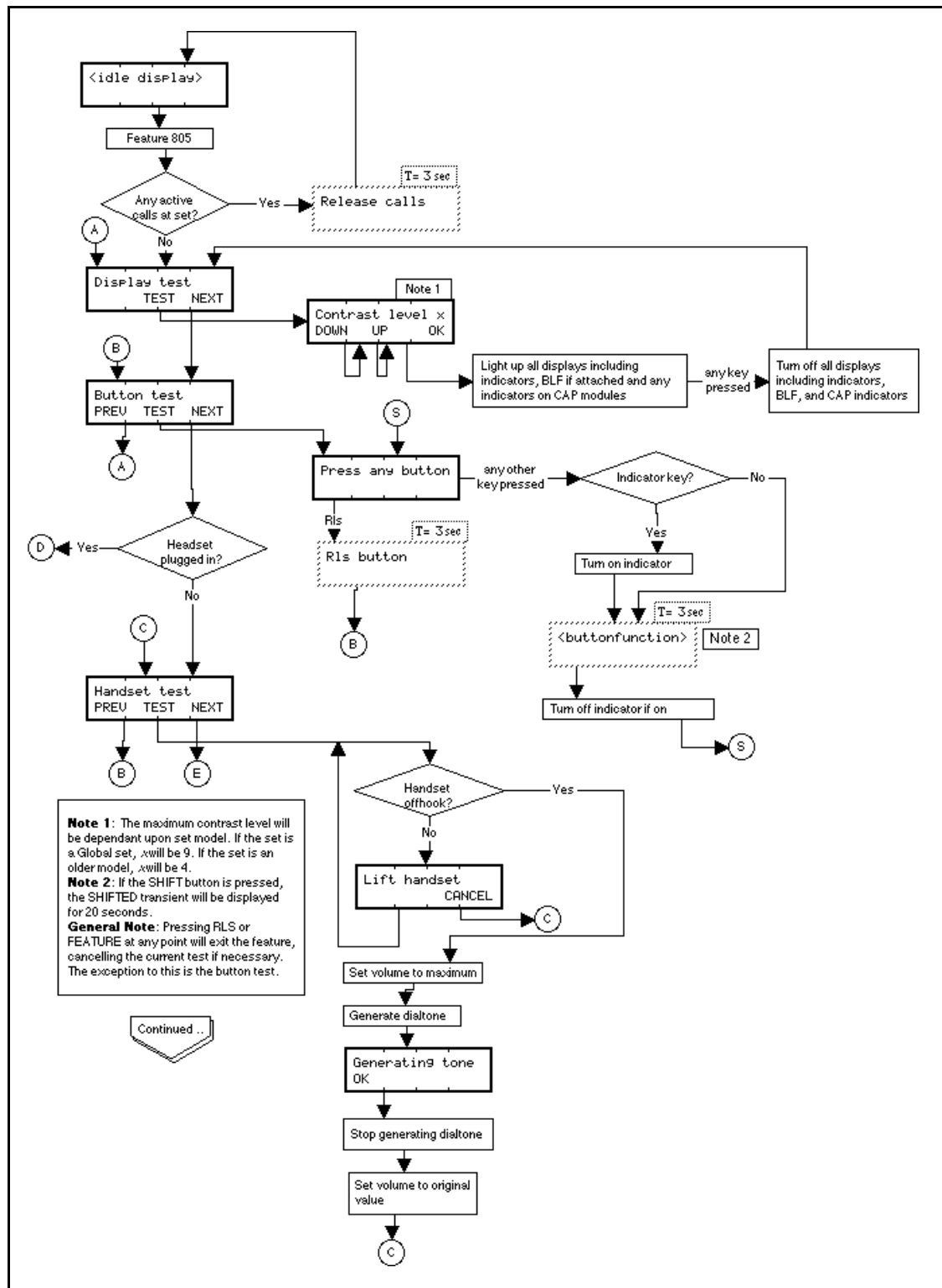


Figure 1-3: M7310 & M7324 Extension Test (1 of 2)

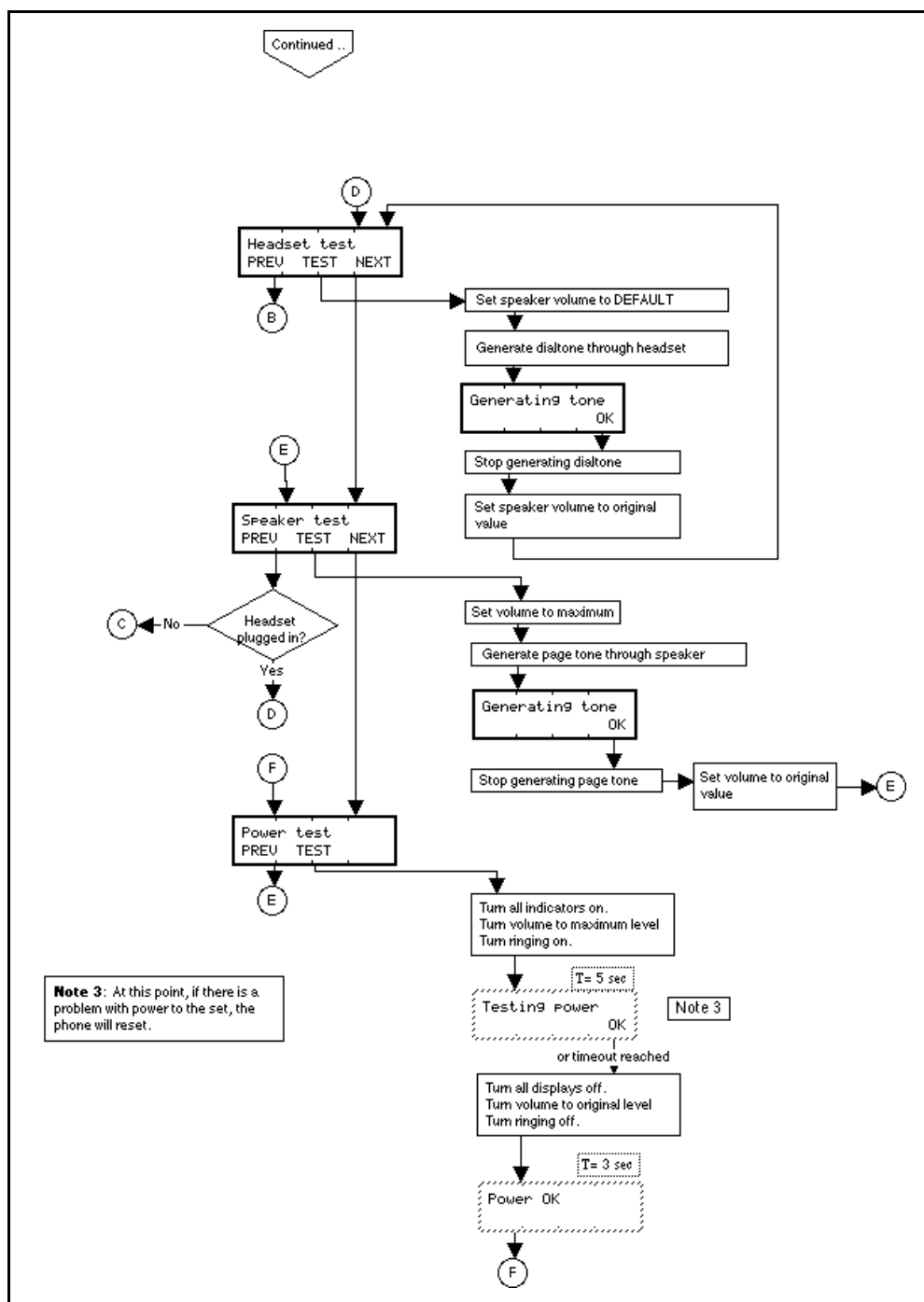


Figure 1-3: M7310 & M7324 Extension Test (2 of 2)

1.2.3.2 Display Test

The first step of the Display test allows the user to adjust the contrast level of their display. This ensures that the display is legible to the user before they initiate the test.

After the user has adjusted the contrast to the value that they want, the Display test is initiated. Every LCD component associated with the set is lit. This includes the display, any indicator keys, the BLF if it is attached to the M7310, and any indicators on any CAP modules attached to the M7324 set. They remain lit until the user presses any key. This gives the user a chance to examine the displays.

If the display is working properly, it appears as if a solid block had been written to every character.

1.2.3.3 Key Test

The Key test puts the user into a key press test mode. At this point, the user can press any key in any sequence. This allows users to test keys in any order that they want, and to focus on the keys they have questions about.

If the user presses a key, the display shows a three-second transient message showing the function of that key.

If the user presses the Shift key, the display shows `SHIFTED` and the shift function is activated for one key press. The `SHIFTED` transient message remains displayed for 20 seconds, as it does with the current Key Inquiry feature.

If the key has an indicator, the indicator lights up to show that it is working. If there is a BLF attached to an M7310 being tested, and the user presses one of the memory keys, the corresponding BLF indicator lights up if the key and the indicator are both working properly.

If the set is an M7324, and CAP modules are attached, the keys and indicators on the CAP modules are included as part of the test.






The user exits the test by pressing the `[Rls]` key and receives a transient message that the `[Rls]` key works.

The following table indicates the message displayed when a user presses a key.

Messages displayed as the result of key presses

Key	Message
<code>[Rls]</code>	Rls key
<code>[Feature]</code>	Feature key
<code>[Hold]</code>	Hold key
<code>[1]</code>	Dialpad 1
<code>[2]</code>	Dialpad 2
<code>[3]</code>	Dialpad 3
<code>[4]</code>	Dialpad 4
<code>[5]</code>	Dialpad 5
<code>[6]</code>	Dialpad 6
<code>[7]</code>	Dialpad 7
<code>[8]</code>	Dialpad 8
<code>[9]</code>	Dialpad 9
<code>[0]</code>	Dialpad 0

Messages displayed as the result of key presses

Key	Message
	Dialpad *
	Dialpad #
 up	Volume up
 down	Volume down
Display key 1	Softkey 1
Display key 2	Softkey 2
Display key 3	Softkey 3
	SHIFTED
Any other key except Autodialers, keys programmed with the Speed Dial feature, Last Number Redial, Saved Number Redial, or as an intercom or line key	Use same feedback as the Key Inquiry feature.
Key programmed with Speed Dial feature	Speed Dial
Key programmed with the Last Number Redial feature	Last No. Redial
Key programmed with the Saved Number Redial feature	Saved Number
Autodialers	If the number in the Autodialer key is longer than 16 characters the first 15 characters of the autodialer number plus suspension points ("...") is shown. If the number in the Autodialer key is 16 characters or less, the entire number is shown. There is no VIEW display key as there is in the Key Inquiry feature, because the purpose of the test is to ensure that keys are responding, rather than to determine for what each key is programmed.
Key programmed as an intercom	Intercom
Key programmed as a line	Line xxx, where xxx is the line number.

1.2.3.4 Handset Speaker Test

If a headset is plugged into the Norstar terminal, this test is not available.

The Handset Speaker test allows the user to verify that the handset speaker is working; that is, sound can be heard through it.

The user is prompted to lift the handset. As soon as the handset is offhook, the handset speaker volume is set to a maximum level and dial tone is generated. The

display indicates that a tone is being generated. The tone generation halts as soon as the handset is onhook (or, in the case of the M7310 and M7324, if the OK display key is pressed) and the handset volume returns to its original value.

Hanging up the handset does not cause the feature to be cancelled.

1.2.3.5 Headset Speaker Test

This test is available only if a headset is plugged into the Norstar set and the Norstar set has a Handsfree/Mute key.

The Headset Speaker test allows the user to verify that the headset speaker is working, that is, sound can be heard through it.

As soon as this test is initiated, the headset speaker volume is set to the default value and dial tone is generated. The display indicates that a tone is being generated. The dial tone halts as soon as the user presses any key (M7208) or the OK display key (M7310, M7324) and the volume returns to its original value.

1.2.3.6 Speaker Test

The Speaker test allows the user to verify that the speaker is working, that is, sound can be heard through it.

As soon as this test is initiated, the speaker volume is set to a maximum level and the Page tone is generated through the speaker. The display indicates that a tone is being generated. The tone halts as soon as the user presses any key (M7100, M7208) or the OK display key (M7310 and M7324) and the speaker volume returns to its original value.

1.2.3.7 Power-to-Set Test


The Power-to-Set test allows the user to do a rough check that the set has enough power to function properly. In the past, users have returned Norstar sets complaining that they were broken when in fact, the problem was that the physical line between the set and the CCU was too long, which resulted in not enough power for the set to operate properly. (Without an auxiliary power supply, the maximum length of the line is 300 metres or 1000 feet. With an auxiliary power supply, the maximum length is 790 metres or 2500 feet.)

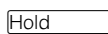
As soon as this test is initiated, the telephone is placed in a state where it is using as much power as possible, that is, the ringing volume is set to the maximum level, continual ringing is generated, and all indicators on the set are lit. The phone remains in this state for five seconds or until the user presses any key, whichever comes first. After the test is halted, the ringing volume returns to its original setting and the transient message `Power OK` displays, indicating that the power to the set is fine.


If there is not enough power, that is, less than eight volts, the telephone resets itself.

1.2.3.8 Key equivalents

In the case of a one-line display set, the following keys correspond to display keys:

 = display key 1

 = display key 2

 = display key 3

1.2.4 OAM Programming View

N/A

1.2.5 **EXTN/**LINE

N/A

1.3 Technical Specifications (Limits/Constraints)

N/A

1.4 Interactions

Feature or Condition	Interaction
Busy Lamp Field (BLF)	If Extension Test is activated on a set that has an attached BLF, and one or more BLF indicators are lit indicating that the DN it represents not idle, the BLF indicator turns off when the Extension Test feature is activated. Due to a known issue with the BLF, the indicator does not turn on again when the user exits the Extension Test feature, regardless of the state of the DN that the indicator represents.
Call Forward	An attempt to forward to a set that is in Extension Test mode displays the message <code>Not in service</code> on the forwarding set, accompanied by an Error tone.
External Calls	If an external caller attempts to call a station that is being tested, the call is treated, using existing rules, as if the set were not in service.
Internal Calls	Internal callers see a <code>Not in service</code> message on their telephones and hear Overflow tone if they call a set that is currently in Extension Test mode, or they are calling a set forwarded to the set that is in Extension Test mode.
Line Pool programmed on a key with indicator	If a set has a line pool programmed on a key with indicator and the indicator is lit (that is, the line pool is available) when user activates the Extension Test feature, the lamp remains lit throughout the duration of the feature. The only way it can be cleared is through one of the following: Display, Key, or Power test.

External Call Forward

1.1 Overview

1.1.1 Description

External Call Forward (ECF) supports forwarding calls to destinations external to the Central Control Unit (CCU). This enhancement applies to all three Norstar call forward features: Call Forward All Calls (CFAC), Call Forward Busy (CFB), and Call Forward No Answer (CFNA).

External Call Forward uses outgoing lines to forward calls to external destinations.

1.1.2 Rationale for Feature

Currently, only Centrex allows forwarding to external destinations. External Call Forward overcomes this limitation.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls

or programmed key to activate External Call Forward.

or programmed key to cancel External Call Forward. On sets with a two-line display, the CANCEL display key may also be used.

1.2.2 End User View

Extension displays "Forward to", followed by forwarded destination.

1.2.3 OAM Programming View

1.2.3.1 Levels of Access

For more information, see the Call Forward feature.

1.2.3.2 Programming External Call Forward

External Call Forward is set in **Terminals&Extns**►**Capabilities**.

[See "Terminals&Extns - Capabilities".](#)

1.2.4 **EXTN/**LINE

N/A

1.3 Technical Specification (Limits/Constraints)

For Call Forward All Calls, Selective Line Redirection permission must be set to TRUE for all extensions that will be allowed to program external call forward destinations.

Extensions allowed to use External Call Forward must have access to pre-programmed line pools. The line pools must also be linked to routing codes used in conjunction with destination codes or directly linked through line pool access codes.

The external destination must start with a valid destination code, that is, a valid routing code or line pool access code.

Since external forward destinations may contain as many as 24 dialing digits, it is not possible to view this entire string on extensions with a one-line display. Only extensions with a two-line display allow full viewing of all external dialing digits.

External Call Forward is not yet supported on wireless or IDSN extensions.

1.4 Interactions

Feature name	Interaction
Autodial Keys (maximum of 24 digits)	An autodial key is a valid destination in Call Forward All Calls.
Central Answering Position (CAP) module keys	A CAP module key is a valid destination in Call Forward All Calls.
Copy Extension Data	The external Call Forward Busy and Call Forward No Answer parameters will be copied by Copy Extension Data.
Dial Tone Detection: wait for dial tone, F804	F804 can be entered in an external call forward destination digit string.
Direct-dial Extension	A Direct-dial Extension is a valid destination in all External Call Forward features. Access is through the programmed Direct Dial Digit.
Direct-dial Extension: external network DN	External direct dial is a valid destination in Call Forward All Calls, Call Forward Busy, and Call Forward No Answer.
Enhanced Restrictions and Overrides	Rerouted extension takes on restriction privileges of the forwarding extension.
Last Number Redial	A Last Number Redial programmed key is a valid destination in Call Forward All Calls.
Line Pool(s)	A line pool used as an external destination must be assigned to the extension trying to use it. A line pool access code is valid as a facility for an External Call Forward destination.
Outgoing Name and Number Blocking (F819) (Calling Line ID Restriction)	Outgoing Name and Number blocking is activated on a per call basis. Therefore only the first external forward destination has its calling number blocked after being programmed.
PBX Reach Through	Link, pause, and wait for dial tone reach-through codes are supported in external call forward destination digit strings.

Feature name	Interaction
Prime Extension: call forward transfer to prime extension or external call forward to prime extension	External Call Forward extends to a line's prime set if the line is BUSY or in some way not available.
Routing Codes	A routing code is valid as a facility for an External Call Forward destination.
Saved Number Redial	A Saved Number Redial programmed key is a valid destination in Call Forward All Calls.
Selective Line Redirection: redirection setting	External Call Forward All Calls requires this setting be TRUE.
Service Modes: Extension Profile (**EXTN) Set Profile (**SET)	Can be used to view Call Forward No Answer and Call Forward Busy external forward destination data.
System Speed Dial: naming outgoing digits	External Call Forward All Calls uses this through Last Number Redial and Saved Number Redial.

External Ring Cadence

1.1 Overview

1.1.1 Description

This feature is modified from the Swedish product to simulate an external (PSTN) UK ring cadence and administrable on a system-wide basis.

The Exchange ring parameter designates the external ring cadence to be either a simulated exchange cadence or an echo cadence (which is slaved to the cadence of the PSTN line) on a system-wide basis. The two values for this parameter are `Echo` and `Preset`.

1.1.2 Rationale for Feature

Under certain circumstances, messaging limitations may result in some distortion of the UK PSTN ring cadence (400 ms on; 200 ms off; 400 ms on; 2 sec off) when echoed by the system. As a result, UK users have reported that the audio alerting for external calls sounds like it is breaking-up.

This feature will permit the installer to administer the system to either slave the PSTN ring cadence or have the system simulate it.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls

N/A

1.2.2 Message Displays

N/A

1.2.3 End-User View

If the `Echo` is assigned, the system slaves the ring to the PSTN ring cadence in the usual manner. This may produce a distorted ring as described in the Rationale for Feature.

If the value `Preset` is assigned, the system will simulate the UK PSTN ring cadence. The simulation will be made to sound as much like the original as possible in order that the user detects little or no difference and no distortion.

1.2.4 OAM Programming View

1.2.4.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item		I	SC+	SC
System prgrming	Featr settings	Exch ring:Preset	X		

1.2.4.2 Programming Exchange ring

This feature can be enabled or disabled on a system-wide basis. If enabled, it can be individually controlled by each user.

From System prgrming►Featr settings►Exch ring:Preset, press CHANGE to reset the value of Exhc ring, from Preset (the default) to Echo.

[See "System Programming - Feature Settings".](#)

This parameter applies to CO lines only. It does not apply to AC15 lines or DIA lines.

1.2.5 **EXTN/**LINE

N/A

1.3 Technical Specification (Limits/Constraints)

N/A

1.4 Interactions

Feature name	Interaction
Discriminating Ring Cadence	Depending on the external ring cadence (i.e., PSTN or PBX) from the CO, if echoing is selected, users could get cadence that is indistinguishable from the internal ring cadence.

Flexible Numbering Plan

1.1 Overview

1.1.1 Description

The numbering plan refers to the digits (identifiers) that the user dials to access other Norstar terminals, and to access features and outside lines. The numbering plan controls how many digits, and which digits, the user dials to access other Norstar sets and to access features and outside lines.

Identifiers include:

- Extension numbers
- Direct-dial digits
- Call Park prefix digit
- Line Pool access codes
- Exchange codes
- DIA line Extension numbers
- Destination codes

1.1.2 Rationale for Feature

Refer to the individual specifications.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

Extension numbers and access codes are assigned default values, depending on the Startup template used. These values can be modified in OAM programming. Refer to the following features for details:

- Change Extension number
- Extension number Length
- Direct-dial
- Exchange
- Line Pools
- Call Park
- Routing Tables
- Default Templates
- **Startup

The following table shows the default assignment at Startup for some of the identifiers.

Default assignment of first digit

Digit	Default Assignment
0	Direct-dial sets

Default assignment of first digit

Digit	Default Assignment
1	Call Park prefix
2 to 6	Extension numbers Depending on system size, some of these digits may not be used.
7 to 8	Not used
9	Square systems: Exchange code PBX and Hybrid systems: Line Pool access code

Feature codes are not considered to be part of the numbering plan. Flexible assignment of feature codes is not supported.

1.2 Feature Details

A brief description of the numbering plan components is provided in the following sections. For ease of explanation, the End User and OAM Programming views are combined. For details on how to program Extension numbers and access codes, refer to the OAM Programming View sections of the individual feature descriptions.

For an explanation of the restrictions on programming Extension numbers and access codes to avoid conflicts, refer to “1.4 Technical Specification (Limits/Constraints)”. Interactions between Extension numbers and access codes are described in “1.5 Interactions”. All other interactions are provided in the individual feature descriptions.

1.2.1 Extension numbers

Every Norstar set has a Prime Extension number that designates that set as the destination for internal calls and as the destination for features such as Send Message, Call Forward, Call Park, Routing Services, and Ring Again. Two sets cannot have the same Prime Extension number.

Each physical station port consists of a B1 port and a B2 port, each of which has a Prime Extension number. The Prime Extension number can be changed in OAM programming.

For more information, refer to the Change Extension number feature.

System-wide Extension number Length can be set from

- two to seven digits on a Compact system
- from three to seven digits in a Modular system.

The lowest default Extension number is

- 21 in a two-digit Extension number plan
- 221 in a three-digit Extension number plan
- 2221 in a four-digit Extension number plan

and so on. For more information, refer to the Extension Number Length feature.

1.2.2 Direct-dial Access

Regardless of the Extension number length specified for the system, one set can be programmed (in OAM programming) to respond to a single digit in addition to its normal Prime Extension number. This does not need to be a Prime Extension. By default, the set with Extension number 21, 221, or 2221 (depending on the system-wide Extension number length) is the Direct-dial set and can be called by dialing the Direct-dial digit on an internal line.

As well, any set can be programmed to respond to the Direct-dial digit while one of the Scheduled Services (for example, Routing Service) is in effect. This Extra-dial set can be the same as the normal Direct-dial set, or it can be a different set. Routing Service must be turned on from the normal Direct-dial set, regardless of whether it has been turned on from the regular Extra-dial control set.

For more information, refer to the Direct-dial and the Scheduled Services features.

1.2.3 Exchange Codes

The Exchange code is set in OAM programming, and can be any single digit that does not conflict with Extension numbers or other access codes. The code can also be blank (meaning no Exchange code is assigned).

For more information, refer to the Exchange code.

1.2.4 Line Pool Access Codes

For Modular systems up to fifteen line pools can be defined in OAM Programming. For Compact ICS, up to three line pools can be defined in OAM Programming. Each Line Pool access code is programmable, and can be one to four digits in length. The codes for different line pools can be different lengths, and this length is not dependent on the length specified for the Extension numbers in the system.

For more information, refer to the Line Pools feature.

1.2.5 Call Park Prefix and Retrieve Park IDs

Up to nine three-digit Retrieve Park IDs (of the form $x0n$) can be defined. The prefix (x) is set in OAM Programming, and its value can be None, or 0 to 9. The default value is 1. The value of n is 1 to 9.

Retrieve Park IDs are not affected by changing the Extension number length.

For more information, refer to the Call Park feature.

1.2.6 Destination Codes

To provide transparent private system networking, the user needs to reach remote destinations using dialed numbers (Destination codes) that look like local (intercom) numbers. A routing table defines which Destination code maps to which route.

Destination codes can be from one to seven digits. Up to 500 Destination codes can be defined for the Routing tables.

For more information, see the Routing Tables feature.

1.2.7 OAM Programming View

For details on how to program Extension numbers and the other identifiers, refer to the individual feature specifications.

1.2.8 **EXTN/LINE**

N/A

1.3 Technical Specification (Limits/Constraints)

This section describes the rules for avoiding conflicts when programming identifiers (Extension numbers and access codes) for a Norstar system.

1.3.1 Internal versus Remote Access Digits

The following digits are dialed internally and may not conflict:

- set Extension numbers
- Direct-dial digit
- Call Park prefix
- Line Pool access codes
- Exchange code
- Destination codes

The following digits are dialed using Remote Access and may not conflict:

- Line Pool access codes
- Destination codes
- DIA line Extension number

Features that are accessed from within the system do not interact with features that are accessed remotely.

Destination codes, which can be accessed internally or remotely, cannot conflict either with internal or with remotely accessed features.

Line pool access codes, which can be accessed internally or remotely, are an exception. A Line Pool access code can be programmed to be the same as an Exchange code, with the following results:

- When used remotely no conflict occurs, because the Exchange code cannot be used remotely.
- When used internally, the Line Pool access code takes precedence.

1.3.1.1 A One-digit Difference Between Identifiers Avoids Conflicts

Extension number's cannot conflict with other access codes.

Apart from Extension numbers, at least one digit must be different between any two identifiers, whether they be Direct-dial digits, Call Park digits, Line Pool access codes, Exchange codes, or Destination codes. The digit that differs can be in any ordinal position, but it must be explicit.

1.4 Interactions

If, during OAM Programming, a conflict is, or would be, created between two identifiers, one of two things happens, depending on the number of digits in the identifier being entered.

1.4.1 Single-digit Identifier

If the identifier to be entered is a single digit, the system cycles through the available choices when the `CHANGE` display key is pressed. Choices which would conflict with the digit to be entered are not presented.

For example, if a user wanted to program the Exchange code to be `X` (where `X` is a digit between 0 and 9), they would push the `CHANGE` display key and run through all the options. When the user cycles through the choices for an Exchange code, the digit `X` would not appear if any of the following cases were true

- the Direct-dial digit or the Call Park prefix was previously set to the value `X`
- the Extension number, Destination code, or received number was previously set to any multi-digit code beginning with `X`

1.4.2 Multiple-digit Identifier

If the identifier to be entered is more than one digit, it cannot match another identifier exactly (with the exception, described above, of Exchange codes and Line Pool access codes). As the user enters the digits for the identifier on the dialpad, the `OK` display key does not appear until the new identifier differs from the previously entered identifier. If a conflict is detected, further digit entry is blocked.

Conflicts with Extension numbers

If the user tries to enter a Destination Code that conflicts with a previously programmed Extension number, the system allows them to enter the first digit that would create a definite conflict with the Extension number, but does not permit them to continue. The system does not accept the first digit of a Line Pool access code if it conflicts with a previously programmed Extension number.

If, at Startup, the Extension number Length or the Start Extension number is changed, and the new Extension numbers clash with any of the Direct-dial digit, the Call Park prefix, or Line Pool access codes, those numbers are overwritten and set to `None` by the new Extension numbers. Exchange codes are left blank if they conflict with the new Extension numbers.

Gain

1.1 Overview

1.1.1 Description

The Gain feature allows the user to set the volume on each AC15 line for amplified or non-amplified PCcts.

1.1.2 Rationale for Feature

In a networked environment, AC15 PCcts require volume control to ensure that acceptable volume levels are maintained to other nodes.

1.1.3 General Definitions

This is not an end user feature.

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 User View

Volume is usually set once during installation, by an installer familiar with the technical details regarding losses on PCct trunks connected to other Norstar or non-Norstar systems.

If the installer has not programmed the correct volume settings for the PCct, the end user may find the volume levels are too high or too low for network calls. If the end user finds the levels unacceptable, a service call may be required. (Technical details of the PCct are not typically available to the customer and are necessary in order to program the optimum settings.)

The actual loss on the line associated with the various volume levels is different depending on whether the AC15 is amplified or non-amplified. The system automatically adjust the loss plan accordingly, depending on the type of PCct (amplified or non-amplified).

1.2.2 OAM Programming View

1.2.2.1 Levels of access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item		I	SC+	SC
Lines	Line data	Amplified AC15: Y	X		
		Vol. setting: 2	X		

1.2.2.2 Programming AC15 lines

See "[Lines - Line Data - AC15](#)".

An AC15 line is defined as amplified or non-amplified (on transmission end) in Lines▶Line data▶Amplified AC15:Y. Values are Y and N. The default is underlined.

Transmit and receive gain values are set together in `Lines▶Line data▶Vol. setting:2`. The value of this parameter can be set at 1, 2, or 3. The default is underlined.

1.2.3 ****EXTN/ **LINE**

N/A

1.3 **Technical Specification (Limits/Constraints)**

N/A

1.4 **Interactions**

N/A

Group Listen

1.1 Overview

1.1.1 Description

The Group Listen feature allows the user to have others in the office hear a caller through the speaker on the user's phone. When the user speaks, the caller hears only the user, and does not hear the other people in the office.

1.1.2 Rationale for Feature

N/A

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls

[Feature] 8 0 2, or programmed key

[Feature] # 8 0 2 to cancel

1.2.2 Message Displays

Message	Description
Group Listen ON	Displays transiently when the feature is activated.
Group Listen OFF	Displays transiently when the feature is cancelled.
Make call first	Displays transiently, accompanied by Error tone, if the user is not active on any call when the feature is activated. It also displays if a call is placed on hold and the user activates Group Listen.
Pick up receiver	Displays if the user remains onhook after Group Listen has been activated.

1.2.3 End User View

When the user is active on a call and activates the Group Listen feature ([Feature] 8 0 2) or presses the Group Listen programmed key, the speaker is turned on. The call is split over the handset and the speaker, and is heard through both the handset and the speaker. Other people present can hear the call, although they cannot be heard by the caller. The caller, or call members, are not aware that the call has been split unless they are told.

The Group Listen feature can only be activated once a call is active. The feature is activated on a call-by-call basis, such that it only affects an active call for which Group Listen has been activated. Other calls, either alerting, outgoing, or established, are not affected.

Group Listen lasts under the following conditions:

- for the duration of the call for which the feature has been activated
- until the user cancels it (Feature # 8 0 2)
- until the user activates another feature that affects the call state (such as Transfer)

If the user puts the Group Listen call on hold, and later returns to the call, group listening is preserved. Identification of the connected parties is shown on the display when the user returns to the call. If the user is offhook at this time, the call is reactivated without any action being required from the user.

If the user puts a Group Listen call on hold and later returns to the call while onhook, only the speaker is activated. For the feature to be activated, the user has to reactivate Group Listen on the call.

If a set is in speaker-only mode, and the user activates Group Listen, Group Listen rules apply. The user lifts the handset to converse. Group Listen ON is displayed when Feature 8 0 2 is entered.

1.2.4 User Programming View

Group Listen can be programmed on a key.

The Group Listen feature does not require an indicator. If an indicator is present, it shows the status of Group Listen for the current call. If the indicator key is pressed, it toggles the Group Listen status for the current call. The indicator is turned ON while Group Listen is active for the call, and turned OFF when Group Listen is cancelled. The user can select various calls on the set, and the indicator will reflect the Group Listen status of each active call.

1.2.5 OAM Programming View

N/A

1.2.6 **EXTN/ **LINE

N/A

1.3 Technical Specification (Limits/Constraints)

N/A


1.4 Interactions

Feature name	Interaction
Handsfree	<p>If the user is in Handsfree mode and then activates the Group Listen feature, Group Listen rules apply for that call. If the user is active on a Handsfree call, goes offhook and returns to a call that originally had Group Listen on, Group Listen is reactivated for that call.</p> <p>If the user is active on a Handsfree call, goes onhook and returns to a Group Listen call while still onhook, the call uses the existing voice path. Thus, Handsfree is still active for the call. The user can reactivate the Group Listen feature for the call.</p> <p>If the user activates the Group Listen feature and then presses the Handsfree key, Group Listen is terminated for that call. Handsfree rules apply for that call. Other established calls on which Group Listen has been previously activated remain Group Listen calls.</p>
Conference	<p>If the user has an active and held call at the set, and then creates a Conference, the conference call is assigned the properties associated with the active call.</p> <p>If Group Listen has been enabled on the active call, Group Listen attributes apply to the Conference call.</p> <p>If Group Listen has been enabled on the held call, but not on the active call, Group Listen does not apply to the Conference call.</p>
Hold	<p>Group Listen is preserved if the receiver is off hook when a call on Hold is reaccessed.</p> <p>Group Listen no longer applies if the receiver is onhook when a call on Hold is reaccessed.</p>
Volume Control	<p>When a user activates Group Listen, the volume is set at the highest level, regardless of the current setting at the user's telephone.</p> <p>During a Group Listen call, pressing the Volume bar controls the volume of both the receiver and the set speaker.</p> <p>In the set firmware, the speaker and handset paths are not treated independently.</p>

Handsfree


1.1 Overview

1.1.1 Description

The Handsfree feature allows the user to converse while they are onhook, using the Handsfree speaker and microphone. While on a Handsfree call, the user can mute and unmute the microphone by pressing .

Handsfree Answerback activates the Handsfree microphone automatically for an incoming Voice Call.

1.1.2 Rationale for Feature

When the Handsfree microphone is active, the user can press  to mute it. The user can do this to gain temporary privacy from the other party.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls




1.2.2 End User View

If the `Full Handsfree` parameter is set in Administration to Y, the set can then be administered to operate either in Automatic Handsfree mode (`Auto Handsfree:Y`) or Standard Handsfree mode (`Auto Handsfree:N`).

If `Auto Handsfree` is set to N

- a  key with indicator is provided at the set.
- the user must press  to activate the feature


If `Auto Handsfree` is set to Y, as well as a  key with indicator being provided at the set, when the user performs any of the following actions

- activates a feature code
- presses a programmed key
- selects a line (intercom key, line key, Answer key)

to answer an incoming alerting call or to place an outgoing call, the Handsfree microphone and speaker are activated automatically.



Handsfree can not be activated by means of a feature code.

If the headset is connected, it assumes the role of the Handsfree unit, and uses the same controls.


If Handsfree is set to None, Handsfree is disabled and no  key is provided. The user is limited to using the handset. A Handsfree key can not be programmed onto a set by the end user.

Once the set is in Handsfree mode, it stays in Handsfree mode provided that at least one I-Active or I-Hold call remains on the set, and provided that the user does not lift the handset to switch to handset mode. If the user is conversing in Handsfree mode and then holds the call, the set remains in Handsfree mode as long as the call remains in I-Hold state.




The Handsfree indicator is ON (or flashing, if muted) whenever the set is in Handsfree mode, whether or not a call is active on the set.

During a Handsfree call, the microphone can be muted and unmuted by toggling the  key. When muted, the  key indicator flashes at the I-Hold rate, and the Microphone muted message is displayed. Muting allows the user to listen using the speaker while the microphone is turned OFF.

If the user mutes the Handsfree microphone and selects another line, the microphone remains muted.

To resume a two-way conversation after muting the Handsfree microphone, the user can press  again, or lift the handset. Pressing the line key associated with the call does not re-activate the microphone.

If Full Handsfree=Y, and Handsfree is OFF and


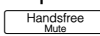
- a call is alerting the set
Pressing  answers an incoming Ringing Call in Handsfree mode. Automatic Incoming Line Selection occurs.
- the user is active on a handset call, a pre-selected call, or a speaker-only call (resulting from Onhook Dialing, Listen on Hold, or Mute)
Pressing  causes the set to enter Handsfree mode.
- the set is idle
Pressing  selects the idle Prime Line for an outgoing call and activates Handsfree. (For more information, refer to the Line Selection feature.)

If the user lifts the handset while active on a Handsfree call, Handsfree mode is turned OFF automatically, and the call switches to the two-way handset voice path. This rule is applied whether or not the Handsfree microphone is muted when the user lifts the handset.

If the user activates Handsfree while offhook and active on a call, the handset voice path is turned OFF, and the call uses the Handsfree voice path. If the user subsequently replaces the handset, Handsfree stays ON, and the call is not disconnected.

1.2.3 Message Displays

Message	Description
Microphone muted	Displays when a Handsfree call is muted. The indicator flashes at the I-Hold rate.


Message	Description
No line selected	Displays transiently if the user presses  and no call is active. Pressing a line key at this point activates the speaker only (Onhook Dialing), and the user must press  again in order to activate the microphone.

1.2.3.1 Rules for Handsfree state



Two conditions that remove the set from Handsfree mode:

- the user lifts the handset, thus switching to handset mode
- the set reaches a state where it has no I-Hold and no I-Active calls

These two rules determine whether Handsfree is ON or OFF in any situation. For example:

- When the user is in Handsfree mode on a call, switching directly from that call to another call (by pressing a line key or activating a feature that performs Line Selection - Automatic) leaves the set in Handsfree mode.
- Releasing a call removes the set from Handsfree mode only if no I-Hold calls exist on the set.
- Pressing a held line key preserves the Handsfree state of the set. If the set was in Handsfree mode, it remains in Handsfree mode.
- Pressing an idle line key preserves the Handsfree state of the set. If the set was in Handsfree mode, it remains in Handsfree mode.
- Similarly, Automatic Outgoing Internal or External Line Selection by a Feature preserves the current Handsfree state of the set. If the set was in Handsfree mode, it remains in Handsfree mode.
- If the user presses  when the set is idle, but no line is selected as a result of the key press (that is, no Prime Line is programmed for the set), the set does not enter Handsfree mode. The prompt `No line selected` is displayed.
- Holding a call and reconnecting to it does not alter the Handsfree state. When a call is unheld by pressing the line key, the Handsfree state—ON or OFF—remains the same.
- If the set is connected on a Handsfree internal call and the other party disconnects, the original set remains in Handsfree mode if an I-Hold call remains on it.

If the set is in Handsfree mode and one or more I-Hold calls exist on the set, the following rules apply:

- Pressing  has no effect on the Handsfree state or on any call.
- If a set is in Handsfree mode only because it has an I-Hold external call, the set leaves Handsfree mode if the held line is selected at another set where it appears.
- If a set is in Handsfree mode only because it has an I-Hold internal call, the set leaves Handsfree mode if the other party disconnects the call.
- Pressing  when no call is ringing at the set, but while the user is on an

active or held call, toggles


- the microphone muted state between ON and OFF
- the Handsfree indicator state between solid and flashing



Automatic Handsfree

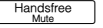
If `Auto Handsfree` is set to `Y` in Administration, the Handsfree microphone and speaker are activated automatically for all outgoing and incoming internal and external calls when a line is selected either by the user (without using the handset), or by a feature.

When the user selects a line and Automatic Handsfree is activated, the Handsfree indicator turns ON. The indicator remains ON while Handsfree is in effect.

Handsfree Answerback

Handsfree Answerback activates the Handsfree microphone automatically for an incoming Voice Call, thus allowing a user to reply to a Voice Call without lifting the receiver or pressing  to answer the call. All rules for intercom calls and Internal Autodial keys also apply.

When an incoming Voice Call occurs, a Voice Call Alert tone is given through the set speaker to announce the arrival of the call. Afterwards, a Microphone-On Warning tone is presented and repeated every 15 seconds until the called party physically acknowledges the call by lifting the handset or pressing , or by holding or releasing the call. If the user does not have a , key (that is, if Handsfree is not assigned to the set in OAM Programming), the user must lift the handset to suppress the Microphone On Warning tone.

Handsfree Answerback is an extension of the Voice Call feature. Handsfree Answerback can occur only if a Voice Call occurs. Handsfree Answerback can be activated independently of Handsfree, because it does not require a  key.

There is no limit to the duration of an unacknowledged Handsfree Answerback call. That is, the call remains connected, regardless of how long it has been receiving Microphone-On Warning tone. For details about Voice Call reception when Handsfree Answerback and Handsfree are enabled or disabled, see the Voice Call feature.

1.2.4 OAM Programming View

1.2.4.1 Levels of Access


The following table shows the levels of access required for users to program OAM changes.

Heading	Item		I	SC+	SC
Terminals&Extns	Capabilities	Handsfree:None	X	X	X
		HF answerback:Y	X	X	X

See "[Terminals&Extns - Capabilities](#)".


1.2.4.2 Programming Handsfree

Handsfree is programmed on a set-by-set basis in OAM Programming, `Terminals&Extns>Capabilities>Handsfree:None`. It can be set to `Std`, `Auto`, or `None`. The default is underlined.

If Handsfree is enabled, the set has a  key assigned to the bottom rightmost programmable key with an indicator.

1.2.4.3 Programming Handsfree Answerback

Handsfree Answerback capability is enabled or disabled on a set-by-set basis in OAM Programming, `Terminals&Extns>Capabilities>HF answerback:Y`. Values of `HF Answerback` are `Y` or `N`. The default is underlined.


This capability is independent of enabling or disabling of Handsfree capability, and does not require a  key.

1.2.5 **EXTN/**LINE

N/A

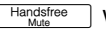
1.3 Technical Specification (Limits/Constraints)

Handsfree is not available for M7100 sets.

The  key always appears at the bottom rightmost key of the set.

1.4 Interactions


For more information on interactions, see the Voice Call feature.

Feature or condition name	Interaction
Extension Relocation	Handsfree and Handsfree Answerback settings are retained during Extension Relocation.
Handset offhook	If the user activates  when the handset is offhook, the handset microphone is muted temporarily to avoid feedback occurring.
Voice Call Voice Call Deny	Because Handsfree Answerback, on an enabled set, can occur only when a Voice Call occurs, pressing the Voice Call Deny key before receiving a Voice Call suppresses Handsfree Answerback as well as suppressing Voice Call reception. If Voice Call Deny is active, the destination party hears internal ringing rather than the Voice Call Warning tone. For details, see the Voice Call feature. When Handsfree Answerback is enabled during an incoming Voice Call, the Handsfree microphone is also enabled.

Headset

1.1 Overview

1.1.1 Description

A headset can be attached to the M7208, M7310 or M7324 set to allow the user to converse without using the handset or  key.

1.1.2 Rationale for Feature

See “1.1.1 Description”.

1.1.3 General Definitions


N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls


Physical attachment of the headset jack to the telephone base, and .

1.2.2 Message Displays

N/A

1.2.3 End User View

When attached, the headset automatically assumes the functionality of the Handsfree unit. All rules and interactions described in Handsfree apply to the Headset when it is attached.

The  key can be used to activate the headset and to control headset microphone muting. The volume adjustment bar controls the headset speaker volume when the headset is active.

When the set is idle, Page announcements are directed through the set loudspeaker, whether or not the headset is attached to the set.

Incoming Voice Calls are presented on the headset. If a Voice Call is received, it makes use of the headset microphone and earpiece if the headset is connected. Otherwise, it makes use of the Handsfree microphone and speaker. The volume level of Voice Call announcements presented to the headset may be uncomfortable. In this case, the user can disable Voice Call reception by pressing the Voice Call Deny programmed key (or dialpad code).

Voice Call reception, Onhook Dialing, and Listen on Hold use the headset earpiece if the headset is connected. These features are available to all set users, and are not dependent on programming.

The headset operates only if Handsfree is set to either `Auto` or `Std` in System Administration.

Dialpad feedback tones and call progress tones are presented through the headset when it is connected. The following tones are presented through the loudspeaker in the set and not through the headset

- Attention tone
- Attenuated Ringing
- Background Music
- Error tone
- Held Line Reminder tones
- Microphone On Warning tone
- Page Alert tone
- Priority Call Alert tone
- Ringing tone

1.2.4 OAM Programming View

Handsfree capability can be enabled or disabled for each set in

`Terminals&Extns:►Capabilities►Handsfree:None.`

[See "Terminals&Extns - Capabilities".](#)

For details on programming Handsfree settings, refer to the Handsfree feature.

1.2.5 **EXTN/ **LINE

N/A

1.3 Technical Specification (Limits/Constraints)

The M7100 set does not support the use of a headset. The headset operates only if Handsfree is set to either `Auto` or `Std` in OAM Programming.

1.4 Interactions

See also the Handsfree interactions.

Feature name	Interaction
Page	Announcements are directed through the set's loudspeaker whether or not a Headset is attached to the set.

Hearing Aid Compatibility

1.1 Overview

1.1.1 Description

The handsets on the M7310, M7208 and M7324 sets are hearing-aid compatible following the requirements of FCC Rules Part 68, Subpart D, and CS03 Specifications.

1.1.2 Rationale for Feature

See “1.1.1 Description”.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls

N/A

1.2.2 Message Displays

N/A

1.2.3 End User View

N/A

1.2.4 OAM Programming View

N/A

1.2.5 **EXTN/**LINE

N/A

1.3 Technical Specification (Limits/Constraints)

N/A

1.4 Interactions

N/A

Held Line Reminder

1.1 Overview

1.1.1 Description

This feature generates a transient message display and periodic Held Line Reminder Tones if an external line is held for a time exceeding a limit set in OAM Programming. This feature does not apply to internal calls.

1.1.2 Rationale for Feature

A person at a set with many calls on hold can read the display to see which line has been held longest.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls

N/A

1.2.2 Message Displays

Message	Description
Held by: <setname>	Displays transiently at the Prime Extension for the line when the call is first transferred to the Prime Extension.
On hold: <linename>	Displays transiently at the user's set when the line has held external calls. Also displays transiently on the Prime Extension for the line with the line name of the oldest line held. This displays at the Prime Extension after the Held by: <setname> has been displayed once.

1.2.3 End User View

Once Held Line Reminder is enabled in OAM Programming, it is automatic.

The user hears tones that remind them that an external line has been left on hold.

Held Line Reminder tone is presented through the set speaker, regardless of the set's calling state or its onhook or offhook status. If the set is active on another call, Held Line Reminder tone at attenuated volume is presented to the speaker.

The Held Line Reminder tone is repeated periodically at the time interval set in OAM Programming until the call is reaccessed. If the line does not have Disconnect Supervision set to *Super*, Held Line Reminder continues to be presented to a held line if the far end has disconnected. If the held call is disconnected by a system timeout, the Held Line Reminder tone is discontinued.

Held Line Reminder tone and message are suppressed on an outgoing external line if the user has been active on that line for less than ten seconds. This reduces the possibility of the Held Line Reminder message overwriting digits being dialed by the user. The situation is similar to the suppression of call display when busy for the first ten seconds of an outgoing external call.

If the set has more than one held line, only one Held Line Reminder is presented to the set. That is, if a second call exceeds the Held Line Reminder timeout when a previous call has already started presenting Held Line Reminder tones, no change occurs in the number of tones or their timing.

If a second call exceeds the Held Line Reminder timeout at the Prime Extension, it does not generate any additional tones at the Prime Extension as long as the original Held Line Reminder is in effect.

1.2.3.1 Held Line Reminder Extension to Prime Extension

If the call is still on hold 120 seconds after the first reminder, Held Line Reminder tone is extended to the Prime Extension for that line, if the line is not a Private Line. The message `Held by: <setname>` appears at the Prime Extension when the call is transferred. For each subsequent reminder, the message `On hold: <linename>` appears. When Held Line Reminder is extended to the Prime Extension, the indicator for that line at the Prime Extension changes to show I-Hold instead of U-Hold status. The held line is forwarded to the Prime Extension.

1.2.4 OAM Programming View

1.2.4.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item		I	SC+	SC
System progmring	Featr settings	Held reminder: N	X		
		Remind delay: 60	X	X	

1.2.4.2 Programming Held Line Reminder

Whether or not the system presents Held Line Reminder tones is based on the value of the `Held reminder` prompt in System programming. The values are Y or N. The default is underlined. The timeout from the time a call is held until the first Held Line Reminder tone (`Remind delay`) is programmable as: 30, 60, 90, 120, 150, or 180 seconds. The default is underlined.

[See "System Programming - Feature Settings".](#)

1.2.5 **EXTN/LINE**

N/A

1.3 Technical Specification (Limits/Constraints)

N/A

1.4 Interactions

Feature or condition name	Interaction
Active calls	If the set is active on another call, Held Line Reminder tone at attenuated volume is presented to the speaker.
Conference - Hold	External lines in held conference calls do not generate Held Line Reminder tones.
Call Forward Do Not Disturb	Generation of Held Line Reminder tone is not suppressed by Call Forward, Do Not Disturb, or any other feature active at the set. Held Line Reminder tone is generated regardless of the call processing state of the set.
Far end disconnect	If the line is not Disconnect Supervised, Held Line Reminder continues to be presented to a held line even if the far end has disconnected.
OAM Programming	Held Line Reminder does not apply to a set performing OAM Programming, because a set cannot enter OAM Programming while it has an I-Hold call.
Page	Held Line Reminder interrupts incoming paging at the set.
Prime Extension	When Held Line Reminder is extended to the Prime Extension, the indicator for that line at the Prime Extension changes to show I-Hold instead of U-Hold status.
Priority Call	Held Line Reminder applies to calls that are forced on Hold by the Priority Call feature (that is, a Priority Call arriving at a set forces an existing call to go on Hold).
Private Line	Held Line Reminder applies to a Private Line at a set. A Held Line Reminder Extension to Prime Extension does not occur for a Private Line.
System timeout	If the held call is disconnected by a system timeout, the Held Line Reminder tone is discontinued.
Set unassigned Set not in service	Held Line Reminder is not extended to the Prime Extension.

Hold

1.1 Overview

1.1.1 Description

An established external or internal call can be put on Hold by any of the following methods:

- manually
 - when the user presses (Manual Hold)
 - when the user presses and then , or 7 9 to place an external call on Exclusive Hold, which prevents all other users who have an appearance of that line from retrieving the call (Exclusive Hold)
- automatically
 - when a call is active, and another line is selected manually or automatically, and the system attempts to place the original call on hold (Automatic Hold)
 - when an external line on which no digits have been dialed is placed on hold, by the user's subsequent selecting of another line (Full Automatic Hold)

Once a call is on hold, the Listen on Hold feature option allows a user to monitor a held call without speaking.

From a caller's perspective, Music/Tone on Hold presents music or a periodic tone for held external calls. Silence on Hold is an absence of the music or tones that would be heard by the held external caller. Music on Hold and Tone on Hold do not apply to internal calls.

1.1.2 Rationale for Feature

Hold allows the user to suspend a conversation without losing the call. Hold also allows the user to deal with another incoming or outgoing call or without losing the first call.

1.1.2.1 Exclusive Hold

Normally, a call held by one Norstar set can be accessed by another set that has a line key for the same line. This is a standard method of transferring calls in a system that uses Square sets. Exclusive Hold prevents this access for a specific call, so that only the user who held the call can reaccess it.

1.1.2.2 Automatic Hold

Automatic Hold allows a user on a call to access another line without pressing or dropping the call. This reduces the number of key presses required to deal with multiple calls.

1.1.2.3 Full Automatic Hold

It may be undesirable to Hold an external line automatically when the user selects an idle external line and, without dialing on it, performs an action that selects another line. The Norstar system does not know the exact state of the original external line. The line may be in dial-tone state, in which case the user wants it to

be dropped rather than placed on hold. However, two cases occur for which the user does want the line to be held:

- glare (that is, selecting a line that was apparently idle resulted in answering an incoming call for which ringing was not presented)
- direct line or Hotline (that is, selecting the line initiated a call automatically, with no dialing required)

1.1.2.4 Music or Tones on Hold

Music or Tones on Hold is provided to reassure held parties that they are in a held state and have not been disconnected.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls

Feature Option	Control
Hold	<input type="text" value="Hold"/>
Automatic Hold	Line keys Intercom keys - External Autodial keys - Internal Autodial keys - Call Pickup - Last Number Redial - Line pool programmed keys - Page - Speed Dial - Voice Call
Full Automatic Hold	<input type="text" value="Hold"/>
Exclusive Hold	<input type="text" value="Feature"/> and then <input type="text" value="Hold"/> , or <input type="text" value="Feature"/> <input type="text" value="7"/> <input type="text" value="9"/>
Listen on Hold	<input type="text" value="Hold"/> Hookswitch Line key

1.2.2 Message Displays

Message	Description
<idle display>	When a call is held, the phone is placed in an idle state. The display shows the appropriate idle state message (for example, time and date)
Held exclusively	Displays transiently in response to the user activating the Exclusive Hold option, followed by idle display.

Message	Description
Line in use	Displays along with Error tone to other sets attempting to access an exclusively held line.

1.2.3 Caller View

1.2.3.1 Music/Tone/Silence on Hold

When an external line is put on hold either automatically or by the called party's pressing , the held line receives tone, music, or silence, depending on OAM programming.

The tone is internally generated by the system and is provided as intermittent bursts of tone to the held external line every eight seconds.

Music on held lines is provided by a customer-supplied music source, which is connected to the CCU. If the system is not programmed to provide music on held lines, plugging in the music source does not present music to the held line.

Music on Hold and Tone on Hold do not apply to internal calls.

1.2.4 End User View

1.2.4.1 Hold

If is pressed:

- internal calls in connected state are held
- internal calls in Dial tone, Ringback, Reorder, or Ringing state are disconnected
- external calls that are connected, or are in dial tone, busy, ringback, or reorder state are held
- A connected call is held automatically if the user presses another line key, or if the user presses a programmed key, the Transfer display key, or any display key that selects a line to make a call.

When a call is placed on hold, the associated line indicator flashes.

To reconnect to a held call, the user presses the associated line key.

If the user presses a held line key to unhold a call while onhook, the Listen on Hold feature option applies if the set is not in Handsfree mode. If set is in Handsfree mode, the call is connected with the Handsfree voice path enabled.

An external call is held publicly if it is not on a Private Line (as designated in Administration Programming). Other sets with an appearance of the line can remove it from Hold. An external call on a Private Line is usually held exclusively, which means that other sets cannot remove the call from Hold. (For more details, see the Private Lines feature.) Internal calls are always held exclusively.

An external call can be placed on Exclusive Hold by activating Exclusive Hold instead of pressing . For details, refer to “1.2.4.3 Exclusive Hold”.

A held external line call can be accessed by any other set having an appearance of that held line. Once the call is accessed by another set, the original set cannot reaccess the line, unless the call is placed on Hold again.

If an external call appearing on an intercom key at a set is held and then unheld by another set that has an appearance of the external line, the call is cleared from the intercom key when it is unheld. This occurs because the original set no longer has access to the call.

Norstar allows both parties in an internal call to place the call on hold at the same time (Mutual Hold). The call is reconnected when both parties have reselected the line.

An internal call held at one end can be disconnected by the user at the other end.

An active call is subject to Automatic Hold if another external line key or intercom key is selected.

To release a held call, the user must first reconnect the call, and then disconnect by pressing **[Ris]** or replacing the handset.

If a user holds a call and then unplugs the set, the call is dropped within a few minutes, as the result of maintenance routines in the software. The same rule applies to calls in other states.

If an external call remains on hold for two hours, it is disconnected. This timeout is a safeguard against tying up a line indefinitely.

1.2.4.2 Mutual Hold

Mutual Hold allows the internal parties involved in a call to place it on hold without the call being dropped. When the parties reaccess the call by pressing the held line key, the call is reconnected. Mutual Hold allows the user to activate the Listen on Hold feature option or deal with another call when placed on hold by an internal party.

1.2.4.3 Exclusive Hold

If Exclusive Hold is pressed (**[Feature]** and then **[Hold]** or **[Feature]** **[7]** **[9]**), only the original holding set can unhold the call. This is done by pressing the held line key, as for calls held normally.

To make an exclusively held call accessible to other sets, the call must first be unheld, and then placed on normal Hold.

1.2.4.4 Automatic Hold

A connected call is held automatically if

- the user presses another line key
- the user presses a programmed key or display keys that select a line to make a call

Automatic Hold allows the user to alternate between two or more calls by pressing a line key or intercom key to switch from one call to another.

If a user is active on a call and attempts to access another call, whether or not they intended to select another internal or external line directly or indirectly, the system attempts to place the active call on hold. A line held automatically behaves in an identical manner to a line held manually.

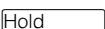
After activating Automatic Hold, the user proceeds normally, according to the status of the selected resource (for example, it can be unheld if held, picked up if idle, present Overflow tone if busy, and so on).


If an internal call is not in connected state, it is dropped rather than being placed on hold. An outgoing unanswered internal call cannot be held, and is automatically released if Hold is attempted. An attempt to automatically hold an internal line on which an Overflow tone is presented results in the line being released, and the Overflow tone being removed.

External lines on which no digits have been dialed are not held automatically unless the Full Automatic Hold feature option is enabled. For details, see “1.2.4.5 Full Automatic Hold”.

1.2.4.5 Full Automatic Hold

If enabled in OAM Programming, Full Automatic Hold places an external line on which no digits have been dialed on hold, if the user subsequently selects another line.

If Full Automatic Hold is disabled, the user who has not dialed on an outgoing external line and wishes to switch to another line without the call being dropped must press  before switching to the new line.


If Full Automatic Hold is enabled, the user who has not dialed on an outgoing external line and wishes to drop it when switching to another line must press  before switching to the new line.

Full Automatic Hold does not affect internal calls. The state of an internal call is known, and if it is put on hold before the destination answers, the call is dropped in all cases.


Dialing Status	Effect of internal or external line key press	
	Full Automatic Hold is off	Full Automatic Hold is on
Dialing has occurred	Call is held	Call is held
No dialing has occurred	Call is dropped	Call is held

1.2.4.6 Listen on Hold

If the user is conversing using the handset, and the other party holds the call or withdraws from it temporarily, the user can Hold the call, replace the handset, and press the held line key, and then attend to other matters while listening for the other party to resume the conversation.

To resume the two-way conversation, the user lifts the handset, or presses  if it is enabled.

Listen on Hold works in the same manner whether or not the set has Handsfree capability enabled in OAM Programming.

On sets with Handsfree capability enabled in OAM Programming, an alternative to Listen on Hold when conversing through the handset is to press  twice, once to activate the Handsfree feature, and once to mute the Handsfree microphone, and then replace the handset.

This feature option applies to any handset call, internal or external.

To activate this feature option, the user must place the call on hold and then place the handset onhook. Otherwise, the call is dropped.

Listen on Hold activates the speaker only, whether or not the set has Handsfree capability.

1.2.4.7 I-Hold and U-Hold Indication

The indicators for the M7208, M7310 and M7324 sets in Norstar have two flashing rates used for Hold status indication. The I-Hold rate is the rate seen at the set that has placed a call on hold. The U-Hold rate refers to the rate seen at a set when another set that has the same line appearance has placed a call on hold.

For internal calls, the line indicator flashes at the I-Hold rate at the Hold initiator's set, and continues to show active state at the other set. If both ends are held (Mutual Hold), the I-Hold flash rate appears on the line indicator at both sets. U-Hold is not displayed for internal calls.

For external calls, the appearance at the set holding the call flashes at the I-Hold rate, while all other appearances in the system flash at the U-Hold rate. If Exclusive Hold is used, there is no U-Hold appearance.

For information on indicator status for held Conference calls, refer to the Conference Hold section of the Conference feature description.

1.2.5 User Programming View

The user can program one Exclusive Hold key for each set. An indicator is not used.

1.2.6 OAM Programming View

1.2.6.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item			I	SC+	SC
Lines	Individual lines	Line Data	Full AutoHold:N	X		

Heading	Item		I	SC+	SC
System prgrming	Featr settings	On hold:Tones	X	X	

1.2.6.2 Programming Full Automatic Hold

See "Lines".

Each external line can be programmed in [Lines►Line Data►Full Autohold:N](#) to have Full Automatic Hold enabled or disabled for outgoing calls on which no digits have been dialed. The default is N (No).

1.2.6.3 Programming Music/Tone/Silence on Hold

See "[System Programming - Feature Settings](#)".

Held external lines can be programmed on a system-wide basis in [System prgrming►Featr settings►On hold:Tones](#) to be presented with Tones, Music, or Silence. The default is underlined.

1.2.7 **EXTN/ **LINE

N/A

1.3 Technical Specification (Limits/Constraints)

N/A

1.4 Interactions

Feature name	Interaction
Line Selection	Features that result in Automatic Incoming Line Selection (for example, Call Pickup) or Automatic Outgoing Line Selection (for example, Inside Autodial, Page), apply Automatic Hold to any active call.
Background Music	The music source for Music on Hold is the same as that used for Background Music.
Call Duration Timer	If an external call is held at one set, and then unheld at another, the total elapsed connect time, including time accessed at the first set, and held time, is displayed at the second set only.
Conference	For information on holding conference calls, refer to the Conference feature.
Intercom keys	In Norstar, Exclusive Hold is not relevant to internal calls, as intercom appearances do not occur on more than one set, and thus a held internal call cannot be accessed from another set. If the user activates Exclusive Hold on an internal call, it is treated as a normal hold. In this case, the idle state display appears, and no error indication is given.
Held Line Reminder	The Held Line Reminder system feature, if enabled through Configuration programming, generates a periodic reminder tone to the user if an external call is held for an excessive time. Held Line Reminder applies only to held external lines.
Page	A Page may not be held, transferred or conferenced. Page origination is terminated if another line key is pressed. The paging channel cannot be placed on hold. The user who has an active call can hold or release it in order to connect to a Page in progress. While receiving a Page announcement, the user can initiate a call, answer a call, or re-access a held call. In these cases, the announcement is suppressed until the set again becomes idle.

Feature name	Interaction
Priority Call	<p>If the calling user puts the call on hold, it is no longer a Priority Call.</p> <p>If the destination user puts the call on hold or transfers it, it is no longer a Priority Call.</p> <p>If the destination user puts the Priority Call on hold, any calls which were automatically held by the Priority Call feature are not reconnected.</p>
Private Line	<p>A Private Line maintains its privacy even when held. Only the holding set receives visual Hold indication. If the Prime Set for a line has an appearance of the Private Line, the indicator on the Prime Set does not show U-Hold status.</p>
Privacy Control	<p>An external call placed on hold has its Privacy feature removed while the call is on hold. Privacy is reinstated once that call is removed from the held state. For details, see the Privacy feature.</p>
Saved Number Redial	<p>When on an active call, if the caller presses a programmed Saved Number key, the number dialed on the active call is saved. Activation of the Saved Number feature does not dial the previous saved number or do an Automatic Hold.</p>
Voice Call	<p>If the destination user applies Handsfree Answerback to the call, a Microphone On Warning tone is produced through the loudspeaker when the call is answered and periodically thereafter, to remind the user that the microphone has been activated automatically. The called party can suppress this periodic Warning tone by lifting the handset or pressing the Handsfree key to acknowledge the call, or by holding the call and then reselecting it.</p> <p>If the user activates the feature in any other state, the set applies Automatic Hold to the current call (if any), and then attempts to obtain dial tone on an internal line.</p>
Volume Control	<p>For non-Global sets, placing a call on hold, either manually or automatically, resets the handset volume, even if the same call is retrieved. Headset and Handsfree volumes are not reset by placing a call on hold.</p> <p>For Global sets, the headset and handset volumes may or may not be reset, depending on the parameter set in OAM programming. (For more information, refer to the Volume Control feature.)</p>

Hospitality Services

1.1 Overview

1.1.1 Description

Hospitality Services (HS) is a group of new features designed to offer improved or automated services by telephone to customers or residents of small- to medium-sized hotels, motels, or hospitals.

The services offered are an alarm service, a room occupancy feature, and a room condition feature:

- The Alarm time feature gives alarm-clock capability to Norstar telephones and analogue telephones connected to an analogue terminal adapter (ATA). Both room extensions and common extensions can be programmed to sound an audible alert at a requested time.
- The Room occupancy (RO) feature allows front desk operators to assign dialling restrictions to room extensions. The RO feature does not apply to common extensions.
- The Room condition (RC) feature allows users to exchange information about the serviced state of a room. Users are front desk attendants, cleaning or maintenance personnel of an establishment. The RC feature is not available from a common extension.

The Notification of Expired Alarms enhancement makes it possible to indicate to a designated Norstar telephone that an alarm has reached its retry limit and has been abandoned.

1.1.2 Rationale for Feature

Operators of small- to medium-sized hotels, motels, or hospitals can reduce service overhead by having Hospitality Services available. Services normally performed by operator or room service personnel can now be automated or performed by room occupants.

Room occupants gain improved services through immediate access to basic functions like requesting wakeup calls, reminders, variable dial allowance levels in the room, and accurate tracking of the room's service requirements.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls

Feature 8 7 5 to activate the alarm feature for a room or common extension

Feature 8 7 7 to activate the alarm feature from an admin extension

Feature # 8 7 7 or Rls while programming to cancel the alarm feature

Feature 8 7 9 to activate the room occupancy feature

Feature 8 7 6 to activate the room condition feature for a room or common extension

Feature 8 7 8 to activate the room condition feature from an admin extension

1.2.2 End User View

1.2.2.1 Alarm Feature

The end user may see some or all of these prompts during programming:

Message	Description
Room #:	Allows desk admin extension to enter the room to program an alarm (AL) time for.
Enter time:	Prompt to get user to enter the AL time.
1=am or 3=pm	Prompt to get user to enter time period if no 24-hour time is entered.
rrrrr Alarm off	Prompt to inform desk admin using HS admin alarm access that all ALs pending/alerting in a room have been stopped.
Alarm off	Prompt to inform room occupant that an extension's AL pending/alerting has been stopped.
Alarm on hh:mmXM	Displayed on extension when an AL is programmed.
No last Alarm tm	Displayed on extension when a query for a last time an AL alert occurred for a room results in no last time being available.

1.2.2.2 Room Occupancy Feature

The end user may see some or all of these prompts during programming:

Message	Description
Show rm:	Prompts for the desired room or extension number.
Rm <room>:<state>	Shows the user the current state of the room and allows the user to change it.
Not admin extn	Displayed if this feature is accessed from a displayed extension that is not configured as a desk admin extension.
No rooms defined	Displayed if the SCAN display key is used and there are no extension assigned room numbers.
Invalid room#	Displayed if the user enters an invalid room number.

A password may be defined to restrict access to the feature (for example, the HS admin desk access password) on a per-extension basis.

1.2.2.3 Room Condition Feature

The end user may see some or all of these prompts during programming:

Message	Description
Needs Srvc	Status prompt indicating a room requires service.
Srvc Done	Status prompt indicating a room has been serviced.
Not Room Set	Prompt to tell user current extension is not a room-assigned extension.
Cd of rm#:	Prompts for the desired room or extension number.
<room> <state>	Shows the user the current state of the room and allows the user to change it.
Not admin extn	Displayed if this feature is accessed from a displayed extension that is not configured as a desk admin extension.
No rooms defined	Displayed if the SCAN display key is used and there are no extension assigned room numbers.
Undefined room#	Displayed if the user enters an invalid room number.

A password may be defined to restrict access to the feature for cleaning staff or desk administration or both.

1.2.3 OAM Programming View

1.2.3.1 Levels of Access

The following table shows the levels of access required to program OAM changes.

Heading	Item		I	SC+	SC
System prgrming	Hospitality	Room/desk info	X		
		Call prmissions	X		
		Service time	X	X	X
		Alarm	X	X	X
Passwords	Hospitality	Desk pswd	X		
		Cond pswd	X		

See ["System Programming - Hospitality"](#) and ["Passwords - Hospitality"](#).

1.2.3.2 Programming Hospitality Services

Hospitality Services is programmed in `System prgrming>Hospitality`. This is the main heading for all hospitality feature settings.

The following entries in the OAM structure apply to programming Hospitality Services:

- Hospitality — main heading for all hospitality feature settings

- Room/desk info — main heading for room number and desk extension assignment
- Call permissions — main heading for call permission filter settings (associated with the Room Occupancy feature)
- Service time — main heading for Room Condition service time
- Alarm — main heading for alarm settings

Room/desk Information

Room/desk info is programmed in `System prgrming►Hospitality►Room/desk info`. This is the main heading for room number and desk extension assignment.

Sub-entries are as follows:

- Show extn: _ prompts the user to enter an extension number. The SCAN display key displays the first extension with hospitality settings enabled. The LIST display key shows the first extension.
- Room #: shows the room number currently assigned to the extension. If no room number is set (None), the extension is considered a common set. CLR clears the room number, BKSP erases the last character, and OK sets the room number parameter. The CANCL display key restores the previous room number value.
- Adm pwd req'd: shows whether the current set is allowed to use the HS admin hospitality features. Note that only M7310 and M7324 sets have access to these features. The default is Y.

[See "System Programming - Hospitality".](#)

Call Permissions

Call permissions are programmed in `System prgrming►Hospitality►Call prmissions`. This is the main heading for call restriction filter settings.

Sub-entries are as follows:

- Vacant:00 shows the current vacant state dialing filter.
- Basic:00 shows the current basic state dialing filter.
- Mid:00 shows the current mid state dialing filter.
- Full:00 shows the current full state dialing filter.
- Filter: __ - allows the user to type in a new filter number. CANCL and navigating HEADING will return to the previous value.

[See "System Programming - Hospitality - Call Prmissions".](#)

Service Time

Service time is programmed in `System prgrming►Hospitality►Service time`. This is the main heading for room condition service time.

Sub-entries are as follows:

- Hour:00 shows the current service time hour. The default is 00. Hour: __ allows you to type in a new hour value. The CANCL display key or navigating HEADING returns you to the previous setting. The new value is applied once

two valid digits have been entered.

- Minute:00 shows the current service time minute. The default is 00.
Minute: __ allows you to type in a new minute value. The CANCL display key or navigating HEADING will return to the previous setting. The new value is applied once two valid digits have been entered.

Alarms

Alarms are programmed in System prgrming►Hospitality►Alarm. This is the main heading for alarm settings.

Sub-entries are as follows:

- Attn Attempts is the number of times an AL alert will attempt to get the user's attention before cancelling itself. CHANGE to change the value. The default is 3 seconds.
- Retry Intrvl is the duration in minutes between subsequent alert periods for the AL alert state. CHANGE to change the value. The default is 4.
- Attn Duration is the length of time in seconds for which an extension alerts when an AL alert state is entered. CHANGE to change the value. The default is 15 seconds.
- Time format indicates the choice of either 12 hour or 24 hour format.
- Expired alarms is the main heading for the Notification of Expired Alarms enhancement. Notify extn: and Use tone: are both subentries. Notify extension specifies the extension at which notification will occur, and Use tone indicates whether a tone will indicate the visual notification that an alarm has expired.

See "System Programming - Hospitality - Alarm".

Hospitality Passwords

Passwords for Hospitality Services are programmed in Passwords►Hospitality.

The sub-entries are as follows:

- Desk pswd shows the current desk admin extension password, and allows the user to alter it. The default is 4677 ("HOSP"). Desk pswd:_ prompts the user for a new "front desk" HS admin extension password. CANCL restores the previous value, OK terminates the input, and BKSP erases one digit.
- Cond pswd shows the current room condition password, and allows the user to alter it. CLR sets the password to "none". Cond pswd:_ prompts the user for a new room condition password. CANCL restores the previous value, OK terminates the input, and BKSP erases one digit.

See "Passwords - Hospitality".

1.2.4 **EXTN/**LINE

N/A

1.3 Technical Specification (Limits/Constraints)

Only extensions with assigned room numbers or desk admin extensions can access Hospitality Services.

Only desk admin extensions have access to the Room Occupancy feature.

Hospitality Services is an integrated set of features. It is not possible to assign only a sub-set of these features to a Norstar system.

Dialling restrictions for room extensions, defined in `Restrictions under Terminals&Extns` and `Call restrns under Hospitality in System prgrming`, replace dialling filters set under `Services`.

The Notification of Expired Alarms enhancement applies only to room-based alarms.

1.4 Interactions

Feature name	Interaction
Active Call	The extension to be alerting with alarm (AL) alerting is currently on an active call and it is the only extension in the room (or is a common extension). In this case the AL alerting will occur and the alert can be cancelled with any key press on the extension, but MUSIC will not be connected to the handset if an off-hook is performed.
Alarm	If a room is moved to vacant state, all extensions in that room have any pending AL times cancelled.
Room Condition	Room condition (RC) will change from service done to service required automatically only if the room occupancy (RO) state is not vacant. When a room is changed from occupied to vacant, its RC automatically moves to service required.
Room Occupancy	When a room's occupancy state is changed from an occupied state to vacant, its room condition automatically changes to service required and pending AL on all extensions in the room are cancelled.
Service Modes	Room Occupancy (RO) filter values override the service mode's filters for extensions assigned to rooms. Service Modes must inform RO of mode changes.
System Time	The room condition must operate properly during a daylight savings time change.

Host Delay

1.1 Overview

1.1.1 Description

Host Delay is the time between system selection of an external line and the time when the Norstar system begins to send digits on that line. This is specified in on a system-wide basis in programming.

1.1.2 Rationale for Feature

Host Delay maximizes the possibility that the far end is able to receive digits.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 End User View

When the software detects that an external line is to be selected, a delay (Host Delay) is generated. After this delay occurs, Norstar dials digits on the line. If a line is available, dial tone is presented to the user.

If Host Delay is set to a long delay, and user does not know this, if they select a line and dial digits immediately, they may not hear dial tone. Additionally, the end user may not be aware of this system delay if they use Onhook Dialing (Automatic Dial and Predial).

1.2.2 OAM Programming View

1.2.2.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item		I	SC+	SC
System prgrming	Featr settings	Host delay:3500	X	X	

1.2.2.2 Programming Host Delay

[See "System Programming - Feature Settings".](#)

Values are 1000, 1500, 2000, 2500, 3000, 3500, 4000, 4500, 5000, 5500, 6000, 6500, and 7000.

Host Delay is associated with Dial Tone Detect. The options are `Detect` or `Delay`. If `Delay` is chosen, the `Host delay` parameter is also used.

The defaults are underlined.

1.2.3 **EXTN/ **LINE

N/A

1.3 Technical Specification (Limits/Constraints)

N/A

1.4 Interactions

N/A

Hotline

1.1 Overview

1.1.1 Description

When the user goes offhook or presses the Handsfree key at a Hotline set, a predefined destination, internal or external, is called. The called set is termed the Hotline destination set.

1.1.2 Rationale for Feature

See “1.2.1 Description”.

1.1.3 General Definitions

Term	Definition
Hotline set	Set programmed to call another set when the handset is picked up, or the Handsfree key is activated.
Hotline destination set	Set to which the user of a Hotline set is automatically connected. (Sometimes called automatic connecting set.)
Hotline call	Call received on a Hotline destination set, from a Hotline set. (Sometimes called automatic call.)

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 End User View

A Hotline connection between two sets is programmed on a set-by-set basis in OAM Programming. Any M7000 series set can be a Hotline set.

When the user at a Hotline set goes offhook or presses the Handsfree key, the Hotline destination set is dialed immediately. An internal caller is provided with Attention tone, followed by immediate feedback indicating that a call is being made. (In Compact ICS, Attention tone is given to internal callers only. If the call is initiated too quickly, the second half of the Attention tone is attenuated.

1.2.2 Message Displays

Message	Description
Already joined	Displays transiently if the user puts an internal call to a given destination on hold, and then goes offhook or presses the Handsfree key (which attempts to make a second Hotline call to the same destination).
Calling <setname> LATER	Displays when a caller makes a Hotline call to an internal destination. <setname> is the set name of the destination set.
<Dialing info> TRANSFER	Display when a caller makes a Hotline call to an external destination.

Message	Description
In use: <setname>	Displays transiently, accompanied by Error tone, if the system coordinator or installer has specified that a Hotline call use a specific line, and that line is currently in use.
No key free	Displays transiently to the caller when they are attempting to initiate a Hotline call and there is no key on which to represent the call.
<setname> busy LATER	Displays at the initiating set when the receiving set does not have an available key on which to represent the Hotline Call.
Unknown number	Displayed to the caller at run time. The system cannot route the call as programmed. The programming is such that a destination code is expected (option Use routing tabl), but the numbers programmed do not fulfill that expectation.

It is recommended that Hotline sets have some form of identification, showing that the set calls another location automatically when the user goes offhook.

The action of going offhook or pressing the Handsfree key, when no other line or key selection has preceded the action, causes a Hotline call to be made. Therefore, if the user is established on a call and wants to make a Hotline call, the user must Hold or release the non-Hotline call and perform the equivalent of going offhook (hanging up the handset and lifting it up again, using the hookswitch mechanism, or pressing the Handsfree key).

The user can make or receive calls other than Hotline calls. To make another type of call, the user selects a line manually before making a call. To answer an incoming call, the user can go offhook (if idle), or select the ringing line and then go offhook, or press the Handsfree key if it is enabled.

Hotline sets are used in emergency situations, though they need not be used exclusively for emergency calls. Therefore, other features are accessible from Hotline sets. The system programmer or the installer can limit access to features at any type of set by locking the set fully or partially. (See Extension Administration Lock).

A set cannot make a Hotline call if the calling set, or the set being called, has no free lines to which the call can be presented. Existing rules and messages apply.

1.2.3 OAM Programming View

1.2.3.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item		I	SC+	SC
Terminals&Extns	Capabilities	Hotline:Internal	X	X	X

1.2.3.2 Programming Hotline

See "Terminals&Extns - Capabilities - Hotline".

See "Terminals&Extns - Capabilities - Hotline - Facility Selection".

The user is required to decide at the time of programming the Hotline whether the destination is internal or external. If the user specifies the destination to be internal, the call is not routed externally. Likewise, if the destination is defined as external, the system routes it externally, even if the entered numbers equal an internal DN.

As with (Network) Direct-dial, if the `Hotline: None/Intrnl/Extrnl` prompt is changed, but no number is then specified for its destination, or one is specified but then cancelled using the `CANCL` softkey, and then the user navigates away from the `Hotline: None/Intrnl/Extrnl` parameter, the transient message `Hotline unchanged` is presented and the previous value is restored.

If the user presses `[Rls]` before completing the entry of an internal or external number, the Hotline destination reverts to the previous setting.

1.2.3.3 Digit Entry and Navigation

For information on digit entry, navigation, and the behaviour of the display, refer to the Alpha entry feature.

1.2.3.4 Programming an Internal Connection

To specify the internal destination, the user enters an internal DN. If the user presses the `CHANGE` display key to clear the existing value, and then presses the `HEADING` key without specifying an internal number, the last specified internal Hotline number (either `None` or digits) is re-inserted as the internal value. If `None` is the internal value, the parameter `Hotline:Intrnl` is also updated to show `Hotline:None`.

1.2.3.5 Programming an External Connection

If the user presses the `CHANGE` display key, and then presses the `HEADING` key without specifying any digits, the last specified external Hotline number (either `None` or digits) is re-inserted as the external value. If `None` is the external value, then the parameter `Hotline:Extrnl` is also updated to show `Hotline:None`.

1.2.3.6 Programming the Facility

The user can program the facility to be used when the external number is automatically dialed, as one of

- Use line:_____
- Pool code: _
- Use prime line
- Use routing tabl

The default is `Use prime line`.

For more information on Facility selection, refer to the Facility specification.

1.2.4 **EXTN/**LINE

N/A

1.3 Technical Specification (Limits/Constraints)

A Hotline set cannot be programmed to connect to its own DN.

If the user selects Routing table as the external facility, the caller must have access to the line pool used by the routing table, or the Hotline call fails.

1.4 Interactions

Feature Name	Interaction
Dialing Options (Pre-dial)	If a user predials a number at an Hotline set, and then goes offhook, a Pre-dial call is made. A Hotline call does not occur.
External Autodial Internal Autodial System Speed Dial User Speed Dial	Can be programmed on a Hotline set. Existing rules for Autodialers are followed. The user can activate a dialer while onhook and then go offhook to complete the call, or select a line manually and then activate the dialer.
Handsfree	<p>Handsfree rules apply when the user is established on a call and presses the Handsfree key. If Automatic Handsfree is enabled at the set, Automatic Handsfree rules also apply. (See the Automatic Handsfree feature.)</p> <p>If a Handsfree call is on Hold, and the Handsfree key is pressed, and no call is alerting audibly at the set, then Handsfree remains On (muting does not occur), and a Hotline call is made.</p> <p>If a Handsfree call is on Hold, and the user goes offhook, Handsfree is turned Off. A Hotline call is not made.</p> <p>If a Handsfree call is active, and the user goes offhook, Handsfree is turned Off, and the parties are reconnected. A Hotline call is not made.</p>
Internal Autodial	If the user goes offhook to make an external Hotline call, and then presses an Internal Autodial key, the Hotline call (if external) is put on hold when the Internal Autodial call is made. If the user goes offhook for an external Hotline call, and then presses an External Autodial key or Speed Dial key, the External Autodial call is appended onto the Hotline digits.
Prime Line	If going offhook causes an external Prime Line to be selected, and the Hotline call is designated as an internal number, the setting for Prime Line is ignored, and the internal Hotline call is made. Similarly, if going offhook causes an internal Prime Line to be selected, and the Hotline call is designated as an external number, the setting for Prime Line is ignored, and the external Hotline call is made. Existing rules for Line Selection (Automatic Outgoing by a Feature) are followed.

Hunt Groups

1.1 Overview

1.1.1 Description

Call hunting provides the capability for a group of extensions to be called by a single directory number. Three modes of call distribution are provided:

- Broadcast hunting rings each extension in the group simultaneously.
- Sequential hunting presents the call to the first extension in the Hunt Group, and terminates when the first free extension has been found.
- Cyclical hunting presents the call to the extension after the last extension in the Hunt Group to which a call was completed.

1.1.2 Rationale for Feature

N/A

1.1.3 General Definitions

N/A

1.1.4 General Procedures

Hunt group can be accessed via DDI, direct line assignment, transfer, and internal calls.

All calls presented to a Hunt Group are queued up. The queue is big enough to handle all sources of incoming calls and can never be overflowed. The size of the queue is not programmable.

If all agents in the Hunt Group are busy, then one of three user programmable event can happen:

- the caller gets busy tone
- the call is routed to an overflow position
- the call stays in the system for a period of time.

Within this period, the call is presented to an available agent if one becomes available. When the timeout occurs, the call is presented to an overflow position such as voice mail.

When a call is presented to a cyclical Hunt Group that has available agents but nobody answers the call, then the call is re-presented to the extensions according to the hunt list until either a member answers the call or the queue timeout occurs in which case the call is diverted to the overflow position.

In the case of a sequential Hunt Group for the same scenario, the call goes through the list once and then terminates to the overflow position if nobody answers the call. The queue timeout does not override the call in this case.

This release supports simultaneous calls to Hunt Groups who use the cyclical or sequential mode. If a call hunts for an available member, other simultaneous calls are able to hunt as well. In the case of broadcast mode, only one call at a time hunts; the other calls are queued up until a member becomes available.

1.2 Feature Details

1.2.1 Controls

N/A

1.2.2 Message Displays

1.2.2.1 Call Metrics

Call metrics can be provided to monitor the performance of Hunt Groups. These can help site coordinators to optimally configure the HG. The metrics will show for each HG:

- Total number of calls (internal and external combined)
- Number and percentage of calls answered
- Average time it took to answer calls
- Number and percentage of calls abandoned
- Number and percentage of calls reaching a busy HG
- Number and percentage of calls reaching the overflow position
- Average time spent in queue. This metric measures the time spent for a call that reaches a busy HG (that has `If busy` set to `Queue`) until the call is answered or abandoned

It is possible to clear all metrics by one action. The recording of the metrics is always on; it is not possible to turn it off.

The metrics are stored in RAM which means that they will be lost if the power goes down.

It is possible for the NRU browser to retrieve the metrics. The data will show up in a tabular format.

[See "Usage Metrics".](#)

1.2.3 End User View

The auto-attendant is able to transfer calls to the HG.

Call forwards set on extensions that are members of a Hunt Group are overridden by the Hunt Group routing. This helps to obtain a deterministic call pattern.

As an example, consider the following conditions: Extn 221 has an appearance of HG 1 plus an appearance of line 031 and is CFAC to Extn 222. If a HG call arrives at Extn 221, it will override the CFAC settings and will make the extension ring. When a call to line 031 arrives at Extn 221, the CFAC settings take effect and the call is diverted to Extn 222.

Extensions that are members of a HG can temporarily leave a group by activating the DND feature. Using the same conditions as the example above, if Extn 221 does not have any diversion set to it but has DND turned on, then all calls coming to it will not make the set ring. DND will take precedence on HG or incoming calls. In the case of DND busy, when Extn 221 is busy and a HG call gets presented to Extn 221, the HG key will flash 3 seconds before the call is presented to the next member in the group. This maintains consistency with current DND busy operations.

1.2.3.1 Members

A total number of members can be partitioned into small chunks and associated to Hunt Groups according to end-user requirements.

- Compact Plus, supports 6 groups that can contain a maximum of 60 members in total
- Modular Plus supports 30 groups that can contain a maximum of 600 members in total.

For example, three Hunt Groups are used on a Compact Plus system. HG1 uses 6 members; HG2 uses 12 members, and HG3 can use a maximum of 42 members.

1.2.3.2 Routing calls

Hunt groups can be used to route calls to a service function such as a support. In the case of BT Advice Line for example, people dealing with calls for Compact Plus could be in one group and people dealing with calls for Modular Plus could be in another group. Calls would be distributed to members according to the hunt mode chosen.

1.2.3.3 Broadcast mode

When configuring a Hunt Group to operate in the broadcast mode, we essentially provide an incoming ringing group capability which does not have the limitations of the old ILG feature.

Broadcast Hunt Groups can be used in many situations:

- To differentiate between calls, for example, a different greetings for calls coming in for different purposes. For example, Lines 1 and 2, merged into HG1 could be used for support. Lines 3 and 4, merged into HG2 could be used for potential customers enquiring about products.
- Fast call disposition. Merge all incoming lines into a HG and put an appearance of the HG on the available attendant's extensions. This way, they all can share the load of answering large volumes of calls.
- Wireless twinning can be enabled if a HG appears on the portable as well as the wireline extension.

1.2.3.4 Line Appearance

There can only be one appearance of the same Hunt Group on a set. This means the called party needs to dispose of the present call in order to get another one. Disposal can happen through transfer or release.

Members of the group can be any Norstar extensions, DNAs, ISDN extensions, portables. The Hunt Group feature does not differentiate between the different bearer capabilities: it routes all calls.

1.2.4 OAM Programming View

1.2.4.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item			I	SC+	SC
System prgrming	Hunt Groups	HGn:<extn #>		X	X	
		Members extns:	M001:<extn#>	X	X	
			Line assignment	X	X	
			Show line:___	X	X	
		Mode: Sequential	Lnnn:Unassigned	X	X	
				X	X	
				X	X	
		Hunt delay: 4		X	X	
		If busy:BusyTone		X	X	
		Q Timeout: 60		X	X	
		Overflow: <extn #>		X	X	
		Name:HGn, __ (16 characters)		X	X	

1.2.4.2 Programming Hunt Groups

There are many programmable parameters in System prgrming▶Hunt groups▶namely:

- Line numbers that will present calls to the Hunt Group
- Extension of the members of the group and their relative position
- Time-out before the call is presented to the next agent in the list
- Call handling when all members are busy
- Time the call stays in the queue when all members are busy
- Extension of the overflow position

A line can only be in a group at a time. For example, line 1 can be in group 1 but not in group 2 at the same time.

A Hunt Group has a dialable Extension number, and a key that can Appear&Ring, Appear Only, or Ring at an extension.

[See "System Programming - Hunt Groups".](#)

1.2.5 **SET/**LINE

N/A

1.3 Technical Specification (Limits/Constraints)

1.3.0.1 Incoming Line Group (ILG) feature

Because the ILG functionality can be accomplished through HG, the ILG feature has been removed. When the old software cartridge for an existing customer is replaced by one that supports Hunt Groups, the ILG keys assigned on extensions are not replaced by equivalent HG keys. The default feature underneath these keys will appear according to the default key template for the extn type.

For details on default key templates see Compact Plus Default Templates or Modular Plus Default Templates.

1.3.0.2 Calls in Queue

Currently, callers will hear ringback even when the call reaches the queue.

A possibility would be to answer the call, provide some information to the caller to the fact that the call is now in a queue, and put the call on hold. Another possibility is to answer the call and to provide some alternate hold tones.

1.4 Interactions

See “1.2.3 End User View”.

Identifying Call Information

1.1 Overview

1.1.1 Description

The DASS2 protocol provides Calling Line ID (CLID) for incoming calls and Terminating Line ID (TLI) for outgoing calls. Once stored in the CCU, CLID or TLI data is combined with the Norstar line name to give Norstar users Identifying Call Information (ICI).

A Norstar system must be registered with the DASS2 network for CLID and TLI services.

Definition of Call Types for ICI, Call Information and Call Log

For Norstar DASS2, recipients of passive-ICI (CLID or TLI) information, and the ability to autolog CLID calls in the Call Log is dependent upon the type of call that is alerting the extension.

Four main types of calls can be defined for Norstar, in terms of how they are routed to an extension:

- Initially alerting calls
- Initially originated calls
- Explicitly re-routed calls
- Implicitly re-routed calls

Initially Alerting: these types of calls terminate at the extension without having been redirected or transferred (by any means). These types of calls terminate at the sets which are the intended recipients of the calls. DIA line calls fall into this category.

Initially Originated: these types of calls originated from an extension and have not yet been redirected or transferred (by any means).

Explicit re-routing: is the re-routing of a call explicitly to one extension, usually by another user. In this case the destination extension is more concerned with the CLID and TLI associated with the call, rather than with why the re-route occurred. Features in this category include Transfer Direct, and Camp-on.

Implicit re-routing: is the re-routing of a call by the system, mainly for call capture purposes. In this case the destination extension(s) are more concerned with why the re-route happened, than with who is calling. Features in this category include OCR, DND transfer, all Call Forward features, all re-routes to Prime and Callbacks.

Identifying Call Information

Identifying Call Information (ICI) consists of one of the following:

- CLID complete or partial number on incoming calls to identify the calling party
or

- TLI complete or partial number on outgoing calls to identify the called party.
- a Norstar line name

(A non-CLID/TLI call or an internal call has no ICI.)

ICI is available to sets that have access to the call. This information can accompany:

- Initially alerting and answered calls
- Initially originated calls
- Rerouted alerting and answered calls
- Calls on hold

Each line appearing at an extension can be administered to display ICI-CLID passively (automatically) for initially ringing calls at one extension only.

Each extension can be administered to transiently display ICI-TLI passively for initially originated calls from that extension.

Explicitly rerouted calls will always display ICI when they ring an idle (no active call) extension. Details can be found in the section Rerouted Calls.

When ICI is automatically displayed it is referred to as a passive-ICI in this document.

The first piece of ICI data displayed can be administered to be number (in the case of an incoming external call, the calling party's number in the case of an outgoing external call, the called party's number) or line name, on a per extension basis. This is defined as the extension's preferred-ICI. The preferred-ICI applies to both passive-ICI and ICI displayed by the Call Information feature. See the Call Information feature.

Non-CLID Calls

Norstar software can identify CLID and TLI calls from all other calls on a per call basis, depending on the presence or absence of CLID or TLI information. It may be the case that there is no CLID or TLI information on a line for which there is a subscription to CLID and TLI.

1.1.2 Rationale for Feature

Users will use ICI for different purposes, depending upon the business and on the job of the employee who is delivered the information. Some examples for CLID are:

- The information allows the user to answer incoming calls on a priority basis. For example:
 - If several calls are alerting at an extension at the same time, the user can request information about the calls to decide which may be more important.
 - If a user is already on a call, information about a second call starting to alert at the extension can help the user to decide whether to answer the second call or remain connected on the first call.

- If a user is in a meeting, the information associated with an incoming call can help the user determine whether or not the call is important enough to interrupt the on-going meeting.
- A person can answer a call with a personal greeting, if the caller is identifiable by the delivered information. This may be important if the caller is an important client.
- A busy user can jot down a note about the calling information, if unable to attend to it immediately.
- A busy user can shorten the interruption time of a call from a recognized person. For instance, the user can quickly answer the call, and let the party know that they are busy, but that they will call back soon.
- When the caller is identified before the call is answered, the user can prepare himself/herself by orienting to the expected discussion. For instance, any relevant documents can be retrieved while answering the call.
- Different users may need to see different ICI data first depending on their job. Each extension can have the user's preferred-ICI administered. For example: An attendant might wish to see the calling number first so they can use the geographic routing code to determine the sales region and transfer the call to the right salesperson.

Some examples for TLI are:

- A user wants to verify the dialing sequence with the number of the called party.
- A user wants to verify that an autodialer or speed dialer reaches the intended party.
- A user wants to know if the call has been redirected.

1.1.3 Rationale for Design

N/A

1.1.4 General Definitions

N/A

1.1.5 General Procedures

N/A

1.2 Feature Details

1.2.1 End-User View

For non-CLID/TLI calls and internal calls, users will not see any new call information.

For CLID and TLI calls, simulations of ICI in a simple Norstar-like environment indicated that the UI must appear stable (the user must know whether they are in the Call Information feature or not) and predictable (the user must get what they expect when an action is taken).

The following points summarize general user expectations:

- When not on a call, the information on the display must belong to the ringing call (highest priority ringing call)
- When on a call, the default information on the display must belong to the active call

The following sections describe the characteristics of a CLID or TLI call on Norstar.

1.2.1.1 Initially Alerting Calls – Specific Comments

A line can deliver passive-ICI (CLID) to only one extension at initial alerting. This constraint of delivering passive-ICI to one extension is required because system performance may decrease as the number of shared line appearances delivering passive-ICI increases.

An extension must have the right combination of two independent administration parameters so that passive-ICI for calls on a line is delivered at initial alerting. These two parameters and the values are:

- The line rings at the extension (under `Terminals&Extns`►`Line Access` and the line must be assigned as either `Appear&Ring` or `Ring only`)
- The line has this extension identified for delivery of passive-ICI at initial alerting (under `Terminals&Extns`►`Call Services`).

If there are any other values for these parameters, passive-ICI will not be delivered at initial alerting, and the user will have to use Call Information to see the CLID for the call. For example, if the line has the extension identified for passive-ICI delivery, but only appears at the extension, then passive-ICI will not be delivered at initial alerting. Passive-ICI does not apply to calls alerting on answer keys.

This independence of OAM programming is provided to accommodate situations where DASS2 features may be administered at a different time, and by a different person.

See “1.2.2 OAM programming View” for more details.

If a line is not administered to deliver passive-ICI to an extension, then the user must invoke the Call Information feature (see the Call Information feature) or preselect or answer the call to view the call's ICI.

1.2.1.2 Initially Originated Calls – Specific Comments

Once the user has dialed an external call (that is, the call is initially originated), passive-ICI (TLI) is delivered to the extension only if the extension is administered for this. The OAM programming occurs under `Terminals&Extns`►`Call Services`►`AutoCalled ID`. If not, the user must invoke the Call Information feature (see Call Information feature).

1.2.1.3 Initially Alerting Calls and Initially Originated Calls – General Comments

Transferred Direct and Camped calls will always (except for TLI calls dialed with a Named System Speed Dialer – see “Message That TLI Number Is Hidden” on page 8) deliver passive-ICI (CLID and TLI) to idle (that is, no active call) sets, no matter how the line is administered at the extension or the type of key the call appears on (see “1.2.1.6 Rerouted Calls” for more details). For sets on active calls, Call Display When Busy rules apply.

For incoming calls that are camped to an idle extension, the Call Waiting transient message will periodically overwrite the passive CLID.¹

For initially originated calls that are camped to an idle extension, the Call Waiting transient message will periodically overwrite the passive TLI, once the TLI has arrived at the extension (see “1.3 Technical Specification (Limits/Constraints)”).

Passive-ICI calls will have ICI on the display overwritten by any higher priority call (CLID or TLI or non-CLID/TLI call) arriving at the extension. Therefore, a new higher priority non-CLID/TLI call could overwrite the ICI with time and date or a re-route message.

1.2.1.4 Call Display When Busy

When the user is on an active call, and another call alerts at the extension, Call Display When Busy rules apply. That is, the new alerting call will display ENET Call Display When Busy messages, not passive-ICI.

This approach is taken because if a second ICI display for the new call were to overwrite the ICI of the active call, it is difficult to determine which ICI applies to the present active call.

Call Display When Busy rules apply to initially alerting calls, calls transferred by direct transfer, and calls camped to an extension.

If a second call arrives at an extension that is already alerting for a call, any information on the display will be replaced with the time/date idle display. This will prevent confusion as to which call the information belongs. Any call information can still be accessed via the Call Info or Preselection features.

1.2.1.5 Active Calls

When the user answers a call, the display will show the extension's preferred-ICI, and on two-line display sets, the display keys for Call Information and Transfer features.

The **INFO** (Call Information), and **TRANSFER** display keys will always appear for all active CLID or TLI calls. For non-CLID/TLI calls and internal calls, only the **TRANSFER** display key will appear. This is done to ensure that, for those customers that have not subscribed to CLID/TLI, the system will look and behave as it does in ENET.

1.2.1.6 Rerouted Calls

The system will display passive-ICI (CLID or TLI) (except for TLI calls dialed with a Named System Speed Dialer – see “Message That TLI Number Is Hidden” on page 8) or the reroute message depending on the feature used to reroute the call. Camped and Transferred Direct calls (Transfer without announcement) will ring the destination extension and display passive-ICI² according to the extension's preferred-ICI. (The display of TLI is the same as for CLID for rerouted calls.) To the Norstar user, these rerouted calls will look exactly like a new call to the system arriving directly at the extension. For these calls, rerouting information will never be available to the user because the system does not store the reroute message in a way in which it can be displayed.

-
1. This approach must be taken because the Call Waiting feature controls this display, and for Call Waiting to act the same as ENET in the absence of CLID, the functionality must remain the same.
 2. For an initially originated call, the TLI may be delivered to Norstar after the call has been rerouted, via Camp and Transfer Direct.

When the following features reroute a CLID or TLI call they will display the appropriate reroute message as they do now in ENET:

- Transfer with announcement
- Do Not Disturb transfer to prime
- DND on Busy route to prime
- Selective Call Forward to prime
- Overflow Call Routing
- Call forward
- Delayed Ring Transfer to prime
- Callbacks
- Services

For the above features, users will be able to view ICI by invoking Call Information while the call is ringing. ICI will appear on the extension when the call is answered.

For more details on specific feature interaction with ICI, see “1.4 Interactions”.

1.2.1.7 Tandem Calls

Norstar cannot retransmit CLID or TLI messages.

1.2.1.8 Getting ICI On The Display

Users will receive ICI, if available, when:

- For the delivery of passive-ICI (CLID) on initially alerting calls, a line is administered to ring at that extension, AND is administered to deliver passive-CLID to that extension (under `Terminals&Extns`►`Line Access` and the line must be assigned as either `Appear&Ring` or `Ring only`) and the line has this extension identified for delivery of passive-ICI at initial alerting (under `Terminals&Extns`►`Call Services`).
- For the delivery of passive-ICI (TLI) on initially originated and active calls, an extension is administered for passive-TLI under `Terminals&Extns`►`Call Services`►`AutoCalled ID`. The TLI is displayed transiently for 5 seconds.
- The user invokes the Call Information feature:
 - And there is an active call, information about the active call will be displayed by default
 - And there is no active call, but there are alerting calls; information for the highest priority ringing call will be displayed by default
 - And the user presses a key representing a call, the information associated with that call is displayed
- A CLID or TLI call is Transferred to, or Camped on their idle extension (passive-ICI)
- The user preselects a line with a CLID call
- The user selects a held line with a CLID call
- The user preselects a line with a rerouted TLI call
- The user selects a held line with a rerouted TLI call
- The user answers a CLID or rerouted TLI call (see “1.4 Interactions”)

1.2.1.9 Clearing ICI From The Display

ICI will be removed (cleared) and replaced by the appropriate display when:

- The user releases the call (near end release)
- The user holds the call
- The user auto holds the call (new call information will be presented if it is available on the selected line)
- A call is audibly alerting an extension with passive-CLID and another extension that shares the line answers the call (the line at this other extension could be a non-ringing line)
- The far-end hangs-up (far end release) while on the call
- The caller hangs-up (abandons) the call while it is initially ringing
- A preselected line times out (5 seconds)
- Pressing a dial pad key

For privacy reasons, active CLID or TLI calls will have the ICI cleared when the system receives a far-end release.

1.2.1.10 Services

When a line in a service mode is administered to ring at several sets, the system has, in effect, another form of shared lines. Due to messaging traffic, system performance may degrade as the number of shared line appearances administered with passive-ICI increases (see “1.3 Technical Specification (Limits/Constraints)”). The following prevents a Service mode from inadvertently adding to the problem.

The following rules for Services are derived from the ENET rules about a Service Ringing extension. That is, an extension designated as a Service Ringing Extension may alert in a different manner, depending upon whether it has a specific line assigned, and whether it is assigned to ring or not. If an extension is administered to ring for a line in Services and:

- Has an appearance of the same line administered with passive-ICI, then the extension will ring and visually alert at the line key, and display ICI according to the extension's preferred-ICI setting
- Has an appearance of the same line but is not administered with passive-ICI (i.e., ringing or non-ringing), then the extension will ring and visually alert at the line key, and display the reroute message. ICI is available by invoking Call Information.
- Has no appearance of the line, then the extension will ring and visually alert at an intercom key, and display the reroute message. ICI is available by invoking Call Information.

1.2.1.11 Answer Keys

Answer keys will always display the reroute message when they alert. The user may still use Call Information to view the ICI and greet the caller appropriately.

This approach clearly indicates to the user they are answering a call from a co-worker's extension and not a call intended for the user.

1.2.1.12 Number Presentation

TLI Numbers

To distinguish a TLI number from

- A CLID number (when using Call Information, or on alerting of an explicitly rerouted call), or
- A dialed digit sequence (when the call is initially originated) the TLI number is prefixed with a '+':

+0673678901

Message That CLID/TLI Number Is Truncated

It is possible for CLID or TLI numbers on international calls to be longer than 14 digits. The Norstar DASS2 product will not display or store numbers greater than 14 digits for CLID or TLI calls. CLID or TLI numbers greater than 14 digits are truncated to the last 14 digits and prefixed with the truncation symbol, '/'.

This is an example of a truncated CLID number:

/00487139283754
INFO TRANSFER

This is an example of a truncated TLI number:

+/03456713928217
INFO TRANSFER

Message That TLI Number Is Hidden

When a user uses a Named System Speed Dialer to originate a call, the display shows:

Hidden number
INFO TRANSFER

When a user uses a Named System Speed Dialer to originate a call to a called party whose number is Private, the display shows:

Hidden number
INFO TRANSFER

A call that shows Hidden number at the call originator's extension will be treated as if it has no TLI information after the call is explicitly rerouted to another extension, as in:

LINENAM
TRANSFER

Showing the TLI number would thwart the intent of Named System Speed Dialers, because the call originator could transfer the call and then investigate the TLI at the destination extension.) The user at the reroute destination can use the Call Information feature and will see that the number is Hidden.

Should the call be rerouted back to the extension where the call was initially originated, the user will see:

+Hidden number
INFO TRANSFER

Message That CLID/TLI Number Is Private

A user can subscribe to a public network service that blocks the delivery of her/his number at the other end of a call. The user's number is considered to be 'private'.

This is an example of a private CLID number:

Private number
INFO TRANSFER

This is an example of a private TLI number:

+Private number
INFO TRANSFER

Message That CLID/TLI Number Is Partial

The PBX of the calling party did not send information about the calling party's extension. The digits for display are the DASS2 routing digits for this PBX. The 'x' means that there is one or more missing digits. This is an example of a partial CLID number:

0716582x
INFO TRANSFER

This is an example of a partial TLI number:

+0669548x
INFO TRANSFER

This is an example of a partial international TLI number, and there are 14 digits in this number:

+ /...466954345868x
INFO TRANSFER

In this example, the first two digits are not displayed, but are available on the first screen shown by the Call Info feature. Note that the 'x' is NOT included in the count of digits. The user is given immediate information that the number is partial. This avoids the navigation through Call Information (through the **VIEW** display key) to get this partial number information.

Mixed Subscriptions

Customers may subscribe to DASS2 services on a per line basis. This means it is possible for a customer to have some lines subscribing to CLID and TLI, and others with no DASS2 services. This may be a common OAM programming where a system is shared by different companies such as in a small strip-mall, professional office, or multiple tenant industrial/warehouse buildings.

Norstar must be able, on a per call basis, to determine if the call is a CLID or TLI call. This is accomplished on a per call basis by means of the presence or absence

of a CLID or TLI message, and by the content of the CLID or TLI message. If the call is a CLID or TLI call, it is accompanied by a CLID or TLI message.

This functionality is needed so the `INFO` display key will not be displayed for non-CLID/TLI calls.

1.2.2 OAM programming View

Note that in order for a line to deliver passive-CLID to an extension, that line must be administered to ring at that extension, under `Terminals&Extns`►`Line Access`►`Line assignment` or `Terminals&Extns`►`Line Access`►`Answer extns`. If this OAM programming parameter is not set to ring, then even though passive-CLID is administered for that extension, CLID will not be delivered passively.

1.2.2.1 Preferred-ICI

The system will be administrable on a per extension basis to display the user's preferred first piece of ICI data: number or line name, for CLID or TLI calls. This functionality is required so users can see the data that is most useful to them first. This is defined as the extension's preferred-ICI. Number will be the preferred-ICI at start-up.

The parameter `1stDisplay` (under `Terminals&Extns`►`Call Services`) will set the preferred-ICI. This setting can be copied to other extensions. Go to `Terminals&Extns` and press the `Copy display` key.

1.2.2.2 Passive TLI Delivery

The passive delivery of TLI is administrable on a per extension basis under `Terminals&Extns`►`Call Services`►`AutoCalled ID`.

This setting can be copied to other extensions. Go to `Terminals&Extns` and press the `Copy display` key.

1.2.2.3 Passive-ICI Delivery At Initial Alerting

Each trunk and DIA line in the system can be administered to deliver ICI passively to one extension at initial alerting.

1.2.3 **EXTN/LINE**

N/A

1.3 Technical Specification (Limits/Constraints)

1.3.1 Passive-CLID Constrained To One Extension Only

System performance may degrade as the number of shared line appearances administered with passive-CLID increases. Therefore, only one extension can be assigned Passive-CLID for any given line. This may not meet the needs or expectations of users.

1.3.2 Administration of Passive-CLID/Ringing

Although the delivery of passive-CLID is dependent upon that line being assigned to ring at the given extension, administration of one parameter is independent of the other.

The persons assigning ringing and passive-CLID must be coordinated, or definitely informed about, the status of the corresponding parameter in order to assign functionality of Passive-ICI effectively.

1.3.3 Delivery Time For TLI

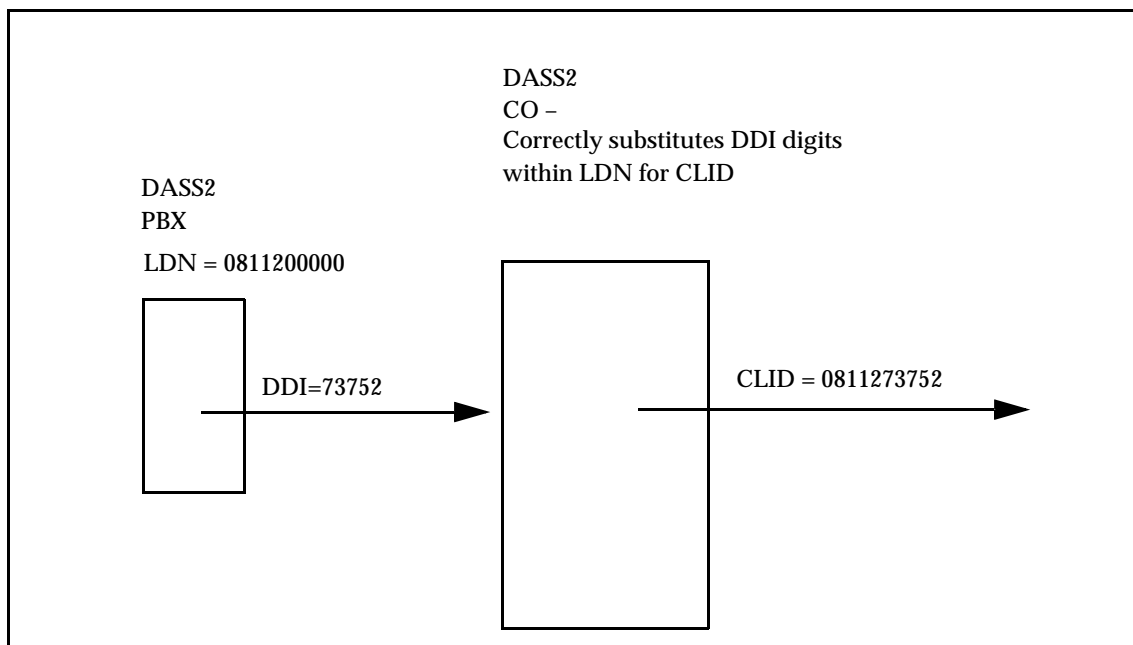
Typically, TLI for an initially originated call will be delivered to Norstar before the far-end starts ringing. It is possible for TLI to be delivered somewhat later (up to 30 seconds), such that if the call is explicitly and quickly rerouted, only the reroute destination will see the TLI. An example is when a secretary on behalf of the boss calls another party and upon hearing the ringback, transfers the call to the boss's extension.

1.3.4 Anomalies of DASS2 Protocol

Some switches are using the DASS2 protocol somewhat differently than specified in the standard. The following shows how Norstar is addressing known anomalies:

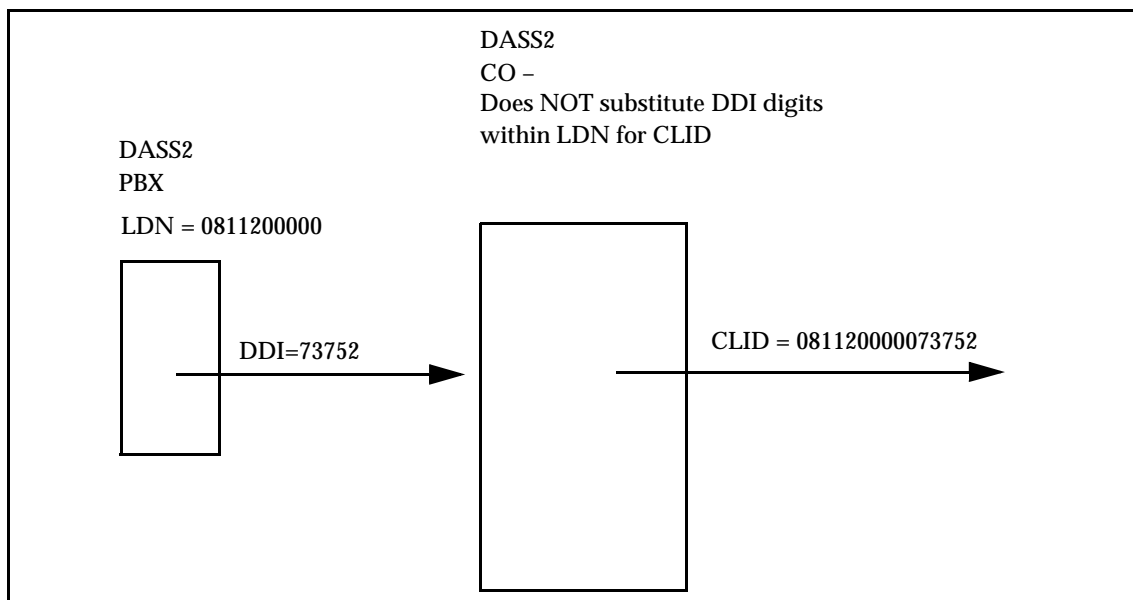
COs do not substitute DDI digits within a LDN for CLID or TLI

According to the BTNR190 Specification for DASS2, a CO, when composing a CLID or TLI, should substitute DDI digits within the Listed Directory Number for a DASS2 PBX. The following figure shows the correct substitution of DDI digits within a LDN to compose a CLID.



Correct substitution of DDI digits within LDN

The following picture shows the what happens to CLID when there is no substitution of DDI digits within a LDN to compose a CLID.



No substitution of DDI digits within LDN

There is an interaction with the Norstar truncation strategy for CLID and TLI with this CO absence of substitution. The CLID or TLI delivered will show only the last 14 digits, so that the National Trunk Access code '0' and some or all of the National Routing code will not be available. In the above example, the CLID presented on a display will be

/81120000073752

This may not be of any value to the user and may cause users to disregard CLID or TLI information.

1.4 Interactions

The interaction table for both Identifying Call Information and the Call Information feature have been combined since the features are so closely related.

Feature name	Interaction
AC15 lines	CLID and TLI are not available on AC15 lines.
Accidental Disconnect Protection	Current ICI or Call Information display maintained
Analog PSTN lines	CLID and TLI are not available on analog PSTN lines.
Alerting Extension, External	Passive according to OAM programming of each line appearance
Answer Groups/keys	Lines not shared with the master extension display the reroute message. ICI is available through Call Information.
Auto Answer DASS2 lines	CLID is delivered on Auto Answer DASS2 lines when there is a subscription to the DASS2 service.
Autodial Keys	Pressing an autodial key will terminate the Call Information feature.
Automatic Handsfree	ICI is delivered when the alerting line key is pressed to answer a call.

Feature name	Interaction
Automatic Line Selection - Incoming Line	The extension receives ICI when the user answers the call. ICI data will appear on the display when the user lifts the receiver or presses the Handsfree key when Automatic Line Selection is administered.
Automatic Line Selection - Outgoing Internal Line by a Feature	ICI on the display will be cleared
Automatic Line Selection - Outgoing Prime Line	ICI on the display will be cleared
Automatic Line Selection - Outgoing Prime Line by a Feature	ICI on the display will be cleared
Automatic Line Selection - Outgoing Prime Line by Handsfree/Off-hook	ICI on the display will be cleared
Automatic Extension Relocation	Re-deliver ICI information if extension is replaced during an active or alerting call within 1 minute. If extension is relocated, all calls are dropped.
Call Capture	The Prime Extn will receive ICI according to the extension's preferred-ICI.
Call Display When Busy (CDWB)	Also see "Passive-ICI Delivery At Initial Alerting" on page 10 and "Call Display When Busy" on page 5.
Call Forward	<p>The reroute message is shown while destination alerts. ICI is available for both the rerouting and destination sets by invoking Call Information. Information is displayed according to the extension's preferred-ICI. The rerouting extension's Forward message will not be overwritten by passive-ICI (all calls are non-ringing while the feature is active, therefore, the user will have to use the Call Information feature).</p> <p>The reroute message is only available during alerting, it is lost once the call is answered or Call Information is invoked (the reroute message is not included as a piece of ICI data).</p>
Call Forward All Calls	See 'Call Forward'
Call Forward Busy	See 'Call Forward'
Call Forward No Answer	See 'Call Forward'
Call Identification/Call Status Display	Inactive during Call Information
Call Park (with Callback)	<p>Extension that answers the parked call receives ICI when the call is active.</p> <p>A call that shows ►+Hidden number at the call originator's extension will be treated as if it has no TLI information after the call is picked up at another extension. This does NOT apply when the user invokes Call Information for this call. The user sees ►+Hidden number.</p>
Call Pickup (Group)	Extension that answers the call with Group Call pickup receives ICI when the call is active
Call Queuing	Cancels Call Information and selects highest priority ringing call. The extension that invokes Call Queue receives ICI when the call is answered

Feature name	Interaction
Callback (Park, Transfer and Camp)	<p>Reroute message on alerting. ICI is displayed according to the extension's preferred-ICI when the call is answered or Call Information is invoked. Callback message will not appear if callback arrives while Call Information is active.</p> <p>A call that shows ►+Hidden number at the call originator's extension will be treated as if it has no TLI information after the call is rerouted to another extension. On the Callback to the park/transfer/camp agent's extension, the Call Information feature will show ►+Hidden number. If the Callback arrives at another extension, the call will be treated as if it has no TLI information. This does NOT apply when the user invokes Call Information for this call. The user sees ►+Hidden number.</p>
Camp on	<p>Camped calls will always (except for TLI calls dialed with a Named System Speed Dialer – See “Message That TLI Number Is Hidden” on page 8) deliver passive-ICI (CLID and TLI) to idle sets, no matter how the line is administered at the extension or the type of key the call appears on (see “1.2.1.6 Rerouted Calls” for more details). For sets on active calls, Call Display When Busy rules apply.</p> <p>For calls that are camped to an idle extension, the Call Waiting transient message will periodically overwrite the passive CLID or TLI.</p> <p>Call Display When Busy rules apply to calls camped to an extension.</p> <p>Camped calls will ring the destination extension and display passive-ICI according to the extension's preferred-ICI.</p> <p>Users will receive ICI, if available, when a CLID or TLI call is Camped on their idle extension.</p> <p>The Call Information feature will not provide call information for incoming calls on virtual keys as used for camped calls.</p> <p>A call that shows ►+Hidden number at the call originator's extension will be treated as if it has no TLI information after the call is camped at another extension. This holds for when the call arrives at the extension. This does NOT apply when the user invokes Call Information for this call. The user sees ►+Hidden number.</p>
Conference	<p>ICI data is shown at the conference master's extension only when the user is connected to one of the callers, and the other is on hold. Otherwise the normal Conference message is displayed. If the user invokes Call Information, then ICI data can be viewed on each line separately while on the conference.</p>
Conference - Hold Conference	<p>Normal Conference message is displayed. If user invokes Call Information, then ICI data can be viewed on each line separately while on the conference.</p>
Conference - Split Conference	<p>Normal Conference message is displayed. If user invokes Call Information, then ICI data can be viewed on each line separately while on the conference.</p>
Conference - Transfer from Conference (internal and external)	<p>Internal destinations receive ICI according to the extension's preferred-ICI once the transfer is complete. For transfers to external destinations, no ICI is sent because Norstar cannot re-transmit a CLID or TLI message.</p> <p>A call that shows ►+Hidden number at the call originator's extension will be treated as if it has no TLI information after the call is transferred to another extension. This holds for when the call arrives at the extension. This does NOT apply when the user invokes Call Information for this call. The user sees ►+Hidden number.</p>

Feature name	Interaction
Copy, General Extension	Call information settings will be copied.
Dial pad key press	<p>The INFO display key remains available if the following applies:</p> <p>When the user does not have Call Info active AND any of the next three:</p> <ul style="list-style-type: none"> - The user is active on a TLI call that was transferred to the user - The user has unheld a held TLI call - The user has an active CLID call <p>AND</p> <p>The user has dialled digits.</p>
Direct Station Select (DSS) Keys	Pressing a DSS key terminates the Call Information feature and clears any ICI from the display and makes the internal call
Disconnect and Answer Supervision (Far End)	On trunks equipped with Disconnect Supervision (DS), a far end release will take down the call and clear the display of any ICI. If the user is active on a call and in Call Information, a far end release will take down the call and cancel the feature.
Do Not Disturb (DND)	An extension in DND will not display passive-ICI for alerting calls (all calls are non-ringing while the feature is active). To view the call's ICI, the user must invoke Call Information and select the alerting line.
DND on Busy	A busy extension with DND on Busy enabled will not display passive-ICI for alerting calls (all calls are non-ringing while the extension is busy). To view the call's ICI, the user must invoke Call Information and select the alerting line.
Exclusive Hold	Call Information cannot view ICI when line on exclusive hold at another extension, <code>In use: SETNAME</code> is displayed. Only the extension that placed the call on Exclusive hold can use Call Information to view the ICI.
Extra-Dial Extension	If a call is transferred to a Direct Dial Extension, and Services has been invoked that extends the call to an Extra-Dial Extension, the re-route message, not passive-ICI, will be extended to the Extra-Dial Extension.
Feature Access Keys	Pressing a feature access key (except for the Call Information key) clears any ICI from the display and terminates the Call Information feature. The feature is invoked.
Handsfree (Full) with Mute Capability	When used to answer a call, pressing Handsfree will display the preferred-ICI and cancel Call Information.
Hold/Mutual Hold	Holding a call will clear the ICI from the display and terminate the Call Information feature. Call Information can be used to view ICI on a line on I-hold.
Hot Line	<p>While Call Information is active, going off-hook will select the preselected line (as in ENET, preselection overrides Hotline when going off-hook). If the user is in Call Information, the user's intention, when going off-hook, is to access the line or call for which there is call information, and not dial up the Hotline number.</p> <p>Following ENET rules, if the user exits Call Information and there is a ringing call, that call is selected when the user goes off-hook. If there are only visually alerting calls, a Hotline call is attempted.</p>
Idle Line	Call Information feature will display ►No call.
Key Inquiry	A programmed Call Information key shows ►Call Information.

Feature name	Interaction
Line Pools, Multiple	Invoking the line pool access code or programmed key terminates the Call Information feature.
Listen on Hold	The extension first loses ICI when the call is placed on hold. The extension will receive ICI again when the held line with a CLID call or a rerouted TLI call is re-selected. The extension will not receive ICI when the held line has an initially originated call; the extension will receive the line name.
Manual Answer DASS2 lines	CLID is delivered on Manual Answer DASS2 lines when there is a subscription to the DASS2 service.
Manual Line Selection	An extension will receive ICI when manual line selection is used to answer a call. ICI information will be cleared from the display when manual line selection is used to make an outgoing call. While call information for a line is being viewed in Call Information, manually selecting the line with ICI information on the display will cancel Call Information.
Off-hook Extension	If the user is off-hook and not on a call, then ICI will not be delivered. Call Information can be invoked while the extension is off-hook and not on a call.
Onhook Dialing - Automatic Dial	The user must exit Call Information before attempting to dial. While the feature is active, dial pad entries are ignored. Except for the # key which is used to display the next screen of ICI data and the * key which is used to display the other part of a long CLID or TLI number.
Onhook Dialing - Dial Pad Modes	The user must exit Call Information before attempting to change the dialing mode. While the feature is active, dial pad entries are ignored. Except for the # key which is used to display the next screen of ICI data and the * key which is used to display the other part of a long CLID or TLI number.
Onhook Dialing - Predial	The user must exit Call Information before attempting to dial. While the feature is active, dial pad entries are ignored. Except for the # key which is used to display the next screen of ICI data and the * key which is used to display the other part of a long CLID or TLI number.
Onhook Dialing - Standard Dial	The user must exit Call Information before attempting to dial. While the feature is active, dial pad entries are ignored. Except for the # key which is used to display the next screen of ICI data and the * key which is used to display the other part of a long CLID or TLI number.
Power Interruptions	ICI for any active and alerting calls will be lost.
Pre-Selection/Call Screening	Pre-selection of a line with a CLID or TLI call will deliver the ICI to the extension. Call Information preselects all calls or lines selected by the user.
Prime Extn(s)	All calls rerouted to the Prime Extns will display the reroute message unless the call has been explicitly transferred by blind Transfer or Camp-on ICI is available if the user invokes Call Information.
Prime Extn(s) - Call Fwd. Transfer to Prime Extn	Implicit transfers or reroutes to prime, such as DRT and Call Fwd Transfer to Prime, are calls that were not originally intended for the Prime Extn so, these rerouted calls display the appropriate reroute message. ICI is available if the user invokes Call Information.
Prime Extn(s) - Callback Ext. to Prime Extn	See Prime Extn(s) above

Feature name	Interaction
Prime Extn(s) - Default Ringing	See Prime Extn(s) above
Prime Extn(s) - Delayed Ring Transfer (DRT)	See Prime Extn(s) above
Prime Extn(s) - DND Selective Call Forward	See Prime Extn(s) above
Prime Extn(s) - DND Transfer to Prime Extn	See Prime Extn(s) above
Prime Extn(s) - HLR Ext. to Prime Extn	User can invoke Call Information and select the held line to view ICI.
Priority Call	Priority calls will cancel Call Information and overwrite the display.
Privacy	Always on for Call Information feature. Call Information cannot view ICI on a CLID or TLI call active at another set.
Pulse-->Tone Conversion	While Call Information is active, all dial pad input is ignored (except for # key which is used for navigation and the * key which is used to display the other part of a long CLID or TLI number), therefore, Tone mode cannot be invoked.
Release	Pressing the [Ris] key cancels the Call Information feature and releases the active call
Ring Again	Offer will not be presented if Call Information is active.
Saved Number Redial	ICI number data cannot be used with SNR
Selective Line Redirection	Norstar has no ability to re-transmit CLID or TLI information out of the system.
Services Control Extension	While the control set is in a service mode, the status message will be overwritten by passive-ICI if the set has a ringing appearance of a call.
Services Dial-0 Extension	Transferred and Camped calls display passive-ICI, all other rerouted calls display the reroute message. ICI for the latter is available through Call Information.
Services Ringing Extension	<p>If an extension is administered to ring for a line in a service mode and:</p> <ul style="list-style-type: none"> —has an appearance of the same line administered with passive-ICI, then the set will ring and visually alert at the line key, and display ICI according to the set's preferred-ICI setting. —has an appearance of the same line but not administered with passive-ICI (i.e., ringing or non-ringing), then the set will ring and visually alert at the line key, and display the reroute message. ICI is available by invoking Call Information. —has no appearance of the line, then the set will ring and visually alert at an intercom key, and display the reroute message. ICI is available by invoking Call Information.
Extension Profile	Will show Call Info parameters: 1stDisplay: and Auto Called ID:.
Startup Template	The preferred-ICI at start-up will be number.
Tandem calls	Norstar has no ability to re-transmit CLID or TLI information out of the system.

Feature name	Interaction
Terminal Type - Analog Terminal Adapter (ATA)	<p>No ICI support.</p> <p>If ATA redirects a CLID or TLI call, then ICI will be available if the destination is a local Norstar set with a display.</p>
Terminal Type - Personal Computer Interface	ICI data can be accessed and used by PC applications
Transfer	<p>Passive-ICI to destination. The transfer destination extension's preferred-ICI settings are used.</p> <p>For transfers to external destinations, no ICI is sent because Norstar cannot re-transmit a CLID or TLI message.</p> <p>A call that shows ►+Hidden number at the call originator's extension will be treated as if it has no TLI information after the call is transferred to another extension. This holds for when the call arrives at the extension. This does NOT apply when the user invokes Call Information for this call. The user sees ►+Hidden number.</p> <p>If the transfer agent transfers an call before Norstar receives the TLI for it, the call is treated as if there is no TLI for it.</p>
Transfer Callback	<p>The extension receiving the Callback displays the Callback message. ICI on the call is available through the Call Information feature. Callback message will not appear if callback arrives while Call Information is active.</p> <p>A call that shows ►+Hidden number at the call originator's extension will be treated as if it has no TLI information after the call is transferred to another extension. On the Callback to the transfer agent's extension, the Call Information feature will show ►+Hidden number. This holds for when the call arrives at the extension and when the user invokes Call Information for this call. If the Callback arrives at another extension, the call will be treated as if it has no TLI information. This does NOT apply when the user invokes Call Information for this call. The user sees ►+Hidden number.</p>
Transfer Immediate	<p>Passive-ICI to destination. The transfer destination extension's preferred-ICI settings are used.</p> <p>For transfers to external destinations, no ICI is sent because Norstar cannot re-transmit a CLID or TLI message.</p> <p>A call that shows ►+Hidden number at the call originator's extension will be treated as if it has no TLI information after the call is transferred to another extension. This holds for when the call arrives at the extension. This does NOT apply when the user invokes Call Information for this call. The user sees ►+Hidden number.</p>
Transfer Using Conference	<p>ICI appears at destination once transfer is complete.</p> <p>For transfers to external destinations, no ICI is sent because Norstar cannot re-transmit a CLID or TLI message.</p> <p>A call that shows ►+Hidden number at the call originator's extension will be treated as if it has no TLI information after the call is transferred to another extension. This holds for when the call arrives at the extension. This does NOT apply when the user invokes Call Information for this call. The user sees ►+Hidden number.</p>

Feature name	Interaction
Transfer Using Hold	<p>ICI is displayed when the user answers the held CLID call or uses Call Information to query the call information.</p> <p>A call that shows ►+Hidden number at the call originator's extension will be treated as if it has no TLI information after the call is transferred to another extension. This holds for when the call arrives at the extension and when the user invokes Call Information for this call.</p>
Transfer With Announcement	<p>Deliver ICI Info to destination extension when transfer completed.</p> <p>For transfers to external destinations, no ICI is sent because Norstar cannot re-transmit a CLID or TLI message.</p> <p>A call that shows ►+Hidden number at the call originator's extension will be treated as if it has no TLI information after the call is transferred to another extension. This holds for when the call arrives at the extension and when the user invokes Call Information for this call.</p>
Trunk Answer From Any Station (Extended Ringing Service)	No ICI delivered, call must appear at the extension first. ICI is delivered when call is answered.
Voice Call	The Voice Call is presented and Call Information, if active, is canceled.
Volume Control	Volume control functions normally while in Call Information

Incoming Call Information

1.1 Overview

1.1.1 Description

The North American public network CMS/CLASS protocol provides incoming calling line identification (ICLID) in the form of Calling Number Identification, Calling Name Identification, or both, for incoming calls to CPE (customer premise equipment) that can interpret the information. Customers can subscribe to Name, Number, or both.

Incoming Call Information with passive CLID can deliver the same information about a particular call, to any number of sets on a Norstar system.

Incoming Call Information is distinct from Call Information, a display feature that the end user activates, as needed, using a feature code.

The CO switch transmits a CLASS message with ICLID information between the first and second rings to the CMS/CLASS trunk cartridge for off-core CO lines. The trunk cartridge decodes the information into a form readable by the Norstar CCU. Once stored in the CCU, ICLID data is combined with the Norstar line name to give Norstar users Incoming Call Information (ICI).

ICI consists of up to four pieces of data:

- ICLID name, if available
- ICLID full number (ten digits) or dialable destination number (DDN), if available
DDNs can be up to 24 digits delivered. Norstar truncates to the last 11 digits. (See the section Dialable DN's).
- long distance indication, if provided
- Norstar line name

ICI is delivered to sets that have access to the call. This information can accompany:

- initially alerting and answered calls
- rerouted alerting and answered calls
- calls on hold

For a description of initially alerting calls, rerouting calls, and answered calls, refer to the Call Logs feature.

Each line can be programmed to display ICI passively (automatically) for initially ringing calls at one set where it appears only.

Explicitly rerouted calls always display ICI when they ring an idle set; that is, a set with no active call.

When ICI is displayed automatically with a ringing call, it is referred to as a passive ICI.

The first piece of ICI data displayed can be programmed to be name, number or line name, on a set-by-set basis. This is defined as the set's preferred ICI. The first piece of information actually displayed also depends on the information delivered by the ICLID message. The preferred ICI applies to both passive ICI and ICI displayed by the Call Information feature. See the Call Information feature.

Non-ICLID calls

Norstar software can distinguish

- ICLID calls from non-ICLID calls
- ICLID subscription type
 - on a call-by-call basis, depending on the presence or absence of CLASS information.

Incoming calls on lines with no ICLID subscriptions behave the same as calls on ordinary CO lines.

1.1.2 Rationale for Feature

ICI is used for different purposes, depending upon the business and on the job of the employee who is delivered the information. Some examples are:

- The information allows the user to answer incoming calls on a priority basis.
For example:
If several calls are alerting at a set at the same time, the user can request information about the calls to decide which is most important.
If a user is already on a call, information about a second call starting to alert at the set can help the user to decide whether to answer the second call or remain connected on the first call.
If a user is in a meeting, the information associated with an incoming call can help the user determine whether or not the call is important enough to interrupt the meeting.
- A person can answer a call with a personal greeting, if the caller is identifiable by the delivered information.
- A busy user can jot down a note about the calling information, if unable to attend to it immediately.
- A busy user can shorten the interruption time of a call from a recognized person. For instance, the user can answer the call, and let the party know that they are busy, but that they will call back soon.
- When the caller is identified before the call is answered, the user can prepare themselves for the expected discussion. For instance, any relevant documents can be retrieved while answering the call.
- Different users may need to see different ICI data first, depending on their job. Each set can have the user's preferred ICI set in OAM Programming. For example, an attendant may wish to see the calling number first so they can use the area code to determine the sales region and transfer the call to the right salesperson. The salesperson's set can display the calling name so they can answer the call with a personal greeting.
- The long distance indicator alerts the user to the fact that an incoming call is a long distance call, and may therefore have higher priority over a local call.

1.1.3 General Definitions

Term	Definition
Call Information	The term Call Information (capitalized) is the name of the Norstar feature that displays call information on keys at which calls can appear.
call information	The term call information (not capitalized) is used as a general phrase to mean both ICI (which is specific to ICLID calls) and local Norstar call information (for non-ICLID and internal calls). Local Norstar call information can include the name of the line a call is on, or the set name of an internal caller.
CLASS	Custom local area signaling services
CMS	Call management services
ICI	Incoming call information, which is composed of ICLID data and the Norstar line number
ICLID	Incoming calling line identification. Call information for ICLID calls consists of <ul style="list-style-type: none"> - ICLID name, if available - ICLID full number, or dialable destination number (DDN) - long distance indication, if provided from the CO switch - the Norstar line name associated with the call

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 End User View

For non-ICLID calls and internal calls, users do not see any CLASS-related call information.

For ICLID calls, simulations of ICI in a simple Norstar-like environment indicated that the UI must appear stable (the user must know whether they are in the Call Information feature or not), and predictable (that is, the user must get what they expect when an action is taken).

The following points summarize general user expectations:

- when not on a call, the information on the display must belong to the ringing call (highest priority ringing call)
- when on a call, the default information on the display must belong to the active call.

The following sections describe the characteristics of an ICLID call on Norstar.

1.2.1.1 Initially alerting calls

A line can deliver passive ICI to one set only at initial alerting. This constraint is required because system performance can decrease as the number of shared line appearances delivering passive ICI increases.

A line need not be assigned to ring at a set, in order to be assigned to deliver passive ICI to that set. However, the line must be assigned to ring at the set for passive ICI to be activated. This independence is provided to accommodate

situations in which CLASS features are programmed at a different time, and by a different person, than the telephony features.

For more details, see OAM Programming View.

Blind transferred and camped calls always deliver passive ICI to idle sets (that is, sets that have no active call), no matter how the line is programmed at the set, or the type of key on which the call appears. (For more details, see Reroute section). For sets on active calls, Call Display When Busy rules apply.

For calls that are camped to an idle set, the `Line <xx> waiting` or `<Linename> waiting` transient messages periodically overwrite the passive ICLID. This approach must be taken because the Camp-On feature controls this display, and for Camp-On to act the same as DR4 in the absence of ICLID, the functionality must remain the same.

Passive-ICI calls have ICI on the display overwritten by any higher priority call (ICLID or non-ICLID call) arriving at the set. Therefore, a new higher priority non-ICLID call can overwrite the ICI with time and date or a reroute message.

If a line is not programmed to deliver passive ICI to a set, the user must activate the Call Information feature (see the Call Information feature) or preselect or answer the call to view the call's ICI.

1.2.1.2 Call Display When Busy

When the user is on an active call, and another call alerts at the set, Call Display When Busy rules apply. This means the new alerting call displays Call Display When Busy messages, not passive ICI.

This approach is taken because if a second ICI display for the new call overwrites the ICI of the active call, it is difficult to determine which ICI applies to the present active call.

Call Display When Busy rules apply to

- initially alerting calls
- calls transferred by Blind (direct) Transfer
- calls camped to a set

1.2.1.3 Active calls

When the user answers a call, they see the set's preferred ICI, and on two-line display sets, the display keys for Call Information and Transfer features.

The **INFO** (Call Information), and **TRANSFER** display keys always appear for all active incoming ICLID calls. For outgoing calls and non-ICLID calls, only the **TRANSFER** display key appears. This is done to ensure that, for those customers that have not subscribed to ICLID, the system will look and behave in the accustomed manner

For active ICLID calls, the display appears as follows:

Preferred-ICI	
INFO	TRANSFER

For active non-ICLID calls or any outgoing calls, the display looks as follows:

LINENAM
TRANSFER

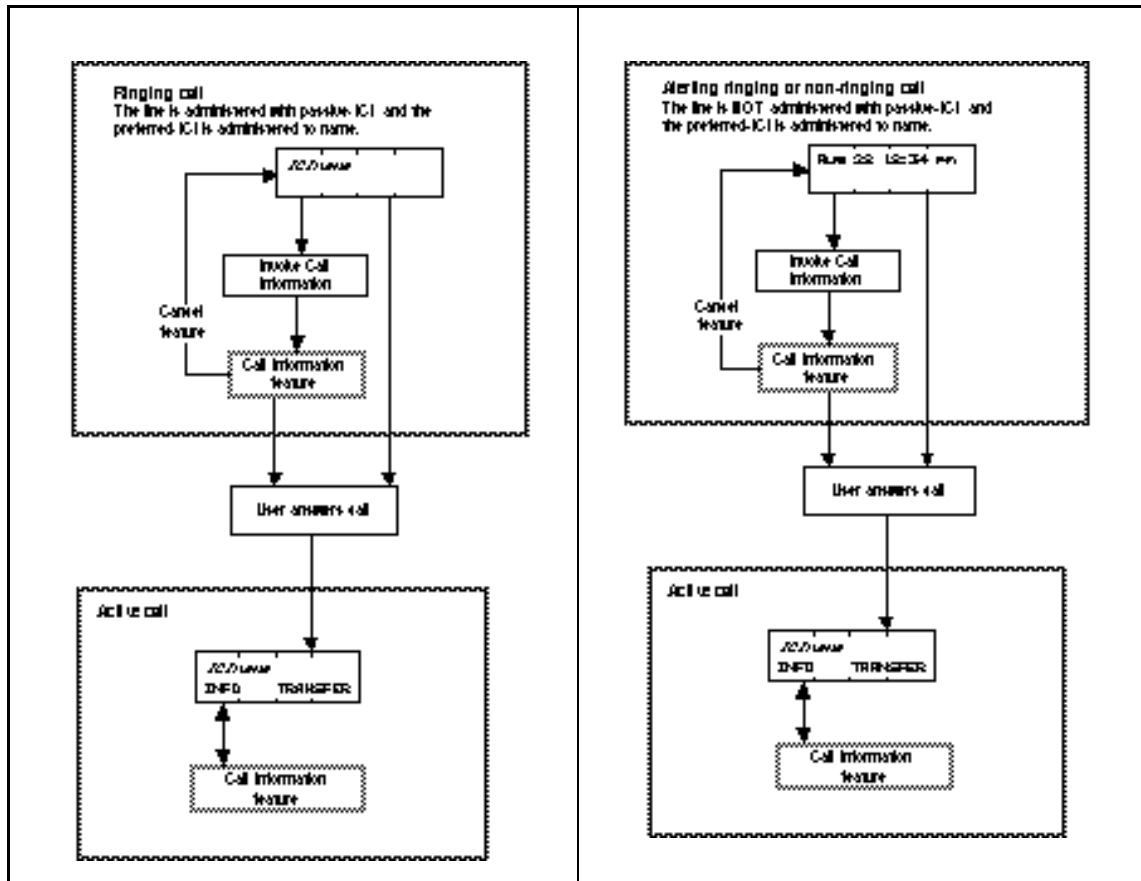


Figure 1-1: Alerting calls with and without passive ICI programmed

1.2.1.4 Rerouted calls

The system displays passive ICI or the reroute message, depending on the feature used to reroute the call. Camped and blind-transferred calls (transfer without announcement) ring the destination set and display passive ICI according to the set's preferred ICI. To the Norstar user, these rerouted calls look exactly like a new call to the system arriving directly at their set. For these calls, rerouting information is not available to the user because the system does not store the reroute message in a way in which it can be displayed.

When the following features reroute an ICLID call, they display one of the following reroute messages, as appropriate:

- Transfer with Announcement
- Do Not Disturb Transfer to Prime
- Selective Call Forward to Prime
- Overflow Call Routing
- Call Forward
- Delayed Ring Transfer to Prime
- Callbacks

- Scheduled Services

For the above features, users can view ICI by activating Call Information while the call is ringing. ICI appears on the set when the call is answered.

For more details on specific feature interaction with ICI, see Interactions.

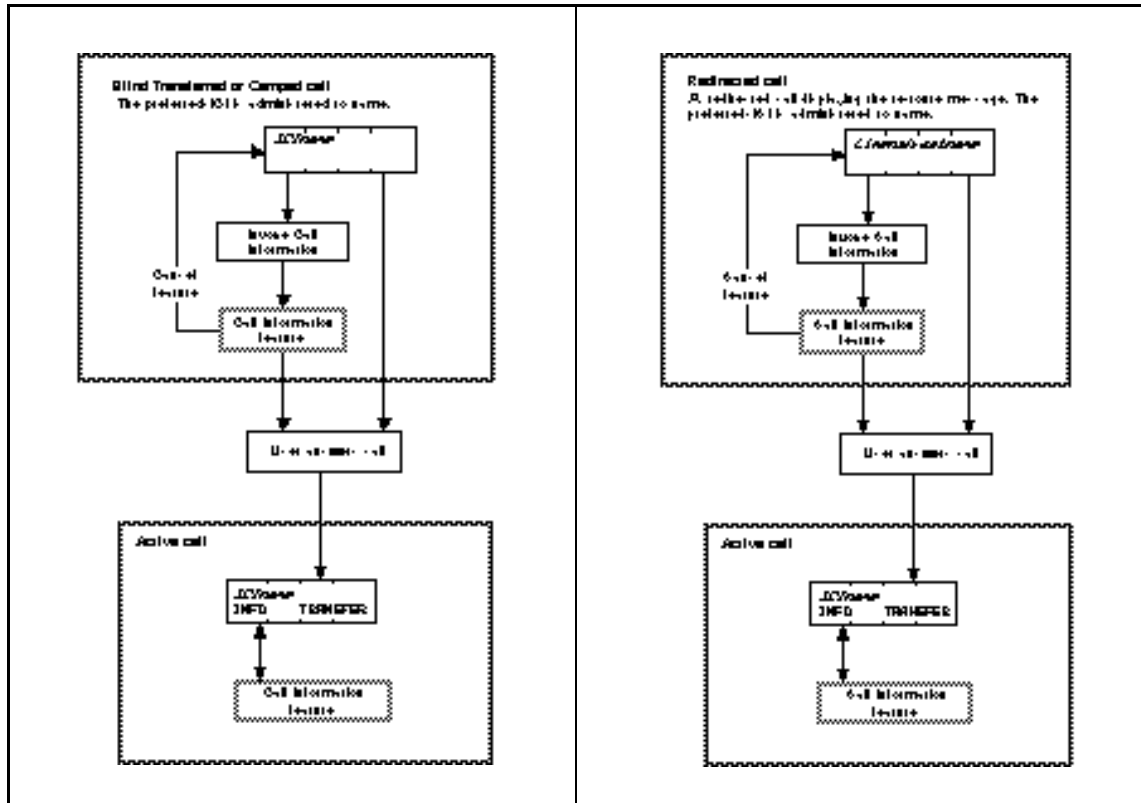


Figure 1-2: ICI on rerouted calls

Norstar/Centrex rerouted calls

Norstar cannot retransmit CLASS messages. A Norstar set that receives a rerouted call from another Norstar set through Centrex receives new ICI based on the new ICLID information delivered by Centrex. This can be the originator's ICLID information or the rerouting set's ICLID information, depending on the Centrex system (an AT&T switch may be different from a DMS).

1.2.1.5 Getting ICI on the display

Users receive ICI, if available, in the following circumstances:

- for initially alerting calls, a line is programmed to ring at that set, and is programmed to deliver passive ICI to that set, passive ICI is delivered to an idle set
- the user activates the Call Information feature:
 - and a call is active, information about the active call is displayed by default
 - and no call is active, but there are alerting calls, information for the highest priority ringing call is displayed by default
 - and the user presses a key representing a call, the information associated with that call is displayed

- an ICLID call is transferred to, or camped on their idle set (passive ICI)
- the user preselects a line with an ICLID call
- the user selects a held line with an ICLID call
- the user answers an ICLID call

(For details, see “1.4 Interactions”.)

1.2.1.6 Clearing ICI from the display

ICI is removed (cleared) and replaced by the appropriate display when:

- the user releases the call (near end release)
- the user holds the call
- the user autoholds the call (new call information is presented if it is available on the selected line)
- a call is audibly alerting a set with passive ICI and another set that shares the line answers the call (the line at this other set can be a non-ringing line)
- the caller on a trunk equipped with Disconnect Supervision hangs-up (far end release) while on the call, or has been rerouted away from the Norstar system (for example, Call Forwarded by Centrex)
- the caller hangs-up (abandons) the call while it is initially ringing.
- a preselected line times out (five seconds)

1.2.1.7 Scheduled Services

When a line in a scheduled service is programmed to ring at several sets, the system has another form of shared line. Due to messaging traffic, system performance can degrade as the number of shared line appearances programmed with passive ICI increases (see “1.3 Technical Specification (Limits/Constraints)”). The following rules for Scheduled services prevent a Scheduled service from inadvertently adding to the problem.

The rules for scheduled services are derived from the rules for a service Ringing set. That is, a set designated as a service Ringing set can alert in a different manner, depending upon whether it has a specific line assigned, and whether it is assigned to ring or not. If a set is programmed to ring for a line in a scheduled service and the set has:

- a ringing appearance of the same line programmed with passive ICI, the set rings and visually alerts at the line key, and displays ICI according to the set's preferred ICI setting
- an appearance (ringing or non-ringing) of the same line but not programmed with passive ICI, the set rings and visually alerts at the line key, and displays the reroute message. ICI is available by activating Call Information.
- no appearance of the line, the set rings and visually alerts at an intercom key, and displays the reroute message. ICI is available by activating Call Information.

1.2.1.8 Answer keys

Answer keys always display the reroute message when they alert. The user can still use Call Information to view the ICI and greet the caller appropriately.

This approach clearly indicates to the user they are answering a call from a co-worker's set and not a call intended for them.

1.2.1.9 Dialable DNs

It is possible for DDNs to be up to 24 digits in length in the CLASS protocol. Norstar CLASS/CMS does not display or store DDNs greater than 11 digits for ICLID calls, because the exact use of 24-digit DDNs is not clearly defined from the network side.

DDNs greater than 11 digits are truncated to the last 11 digits. (DDNs greater than 11 digits are expected to be a rare event in North America.)

When displayed, the truncated DDN are prefixed with a special truncation symbol, “/”. For example:

/12345678901

1.2.1.10 Missing and blocked ICLID information (Name and/or Number)

Long distance indicator is displayed if available, but is cannot be set in OAM Programming. Therefore, for the following discussion, long distance indicator is not relevant.

ICLID (calling name and number) data can be absent from the CLASS message for three reasons:

- The caller has blocked the ICLID information from their call. The CLASS protocol does support users selectively blocking one or both pieces of ICLID information. It is not clear at this time if telcos will actually support this. For a blocked call, the CLASS message contains the reason for absence code, the letter “P”, in place of the data.

Norstar displays `Private name` if the name is blocked and `Private number` if the number is blocked.

- The information is not available from the originating CO switch because it is out of the service area. In this case, the CLASS message contains the reason for absence code, the letter “O”.

Norstar displays `Unknown name` if the name is coded with the letter “O”, and `Unknown number` if the number is coded with the letter “O”.

- The originating CO has not sent the ICLID data the customer subscribes to at their local CO. Some COs may only have databases for numbers, others may not be permitted by law to provide one or the other piece of ICLID information. In this case, the CLASS message contains the reason for absence code, the letter “O”. Norstar displays the same messages as when the information is not available from the originating CO switch because it is out of the service area (see above).

Codes can also be mixed. For example, if the originating switch only delivers number and the caller blocks the call (P code), but the destination subscribes to both name and number, `Unknown name` (O code) is displayed for name and `Private number` (P code) is displayed for number.

If the preferred ICI is absent and an O code sent in its place, for lines with subscriptions to both name and number, the alternate ICLID data is presented first because it is more informative to the user.

If ICLID data is blocked, the message indicating that this is a private name or number is considered to be just as important as an actual name, and so it is not switched with the alternate data.

The following table shows the first piece of ICI for both name and number ICLID subscriptions according to the absence code and preferred ICI.

ICI Displays for lines with both name and number ICLID subscriptions

Code and Missing data	Preferred ICI		
	Name	Number	Line name
O code for Name	6138283465	6138283465	LINE001
O code for Number	Acme Toys	Acme Toys	LINE001
P code for Name	Private name	6138283465	LINE001
P code for Number	Acme Toys	Private number	LINE001

If both name and number are O or P codes, the preferred ICI is not switched for the alternate data. For example, if the preferred ICI is name, and both name and number are private, `Private name` is displayed followed by `Private number`.

For lines with single ICLID subscriptions, there are only two main pieces of ICI data, name or number, and line name (1 ICLID plus 1 Norstar). If the set's preferred ICI does not match the ICLID subscription for a line, the subscribed information is displayed first.

The following table shows the ICI for single-ICLID subscriptions according to the absence code and preferred ICI.

ICI Displays for lines with both name and number ICLID subscriptions

Code and Missing data	Preferred ICI	
	Name or Number	Line name
O code for Name	Unknown name	LINE001
O code for Number	Unknown number	LINE001
P code for Name	Private name	LINE001
P code for Number	Private number	LINE001

1.2.1.11 Long distance indication

When the CLASS message includes the parameter indicating the incoming call is long distance, the preferred ICI is prefixed with the special symbol, “☎”, to indicate a long distance call.

If the number is a truncated DDN (DDNs of 12 or more digits are truncated to their last 11 digits), ▶/12345678901 appears on the display.

Programming long distance symbol with preferred ICI for active calls or alerting lines with passive ICI

	Preferred ICI		
	Name	Number	Line name
Long Distance parameter received	▶Gord Moore INFO TRANSFER	▶6138283465 INFO TRANSFER	▶LINE001 INFO TRANSFER

- When this parameter is received, then for
- alerting lines delivering passive ICI
- ICLID calls for which the Call Information feature is used
- preselected ICLID calls
- active calls

the preferred ICI is always be prefixed with this symbol. Messages for absent data is also prefixed by the long distance symbol, for example:

▶Private number	▶Unknown name
▶Private name	▶Unknown number

For details on the interactions, refer to the Call Information feature.

1.2.1.12 Mixed subscriptions

Customers subscribe to CLASS services on a line-by-line basis and can choose the type of service they want. This means it is possible for a customer to have some lines receiving name only, others receiving number only, others with both name and number, and still others with no CLASS services. This can be a common configuration in which a system is shared by different companies such as in a small strip-mall, professional office, or multiple tenant industrial/warehouse buildings.

Norstar is able, on a call-by-call basis, to determine whether the incoming call is an ICLID call and if it is, whether there is a single or double (both name and number) subscription. This is accomplished on a call-by-call basis by means of the presence or absence of an ICLID message, and by the content of the ICLID message. If the call is an ICLID call, it is accompanied by an ICLID message. If it is a single subscription, no data field is included for the non-subscribed data field.

This functionality is provided so the INFO display key is not displayed for non-ICLID calls, and single subscriptions ignore an inappropriate preferred ICI setting. For example, name is the preferred ICI, but the line only has a subscription to number.

1.2.1.13 Centrex split lines

Like CO switches, Centrex can also be provisioned to deliver CLASS messages with ICLID information to Norstar.

Centrex splits or divides a line (support two calls on a single CO line by holding one while the other is active) in response to:

- the user selecting another extension key
- a second incoming Centrex call alerting the line, if Centrex Call Waiting is supported

The Norstar CMS/CLASS program does not include SCWID (Spontaneous Call Waiting Identification). This means Norstar is not equipped to read any ICLID data (sent between the Call Waiting tones) for the second incoming Centrex call. For split lines, only the first call can display ICI, and only if it is an incoming ICLID call.

Once the Centrex line is split, several outcomes are possible if either the active or held far end hangs up, or if the Norstar user releases the active call or attempts to return to the held call. What happens depends on the Centrex system to which Norstar is connected. It is beyond the scope of this document to describe what happens in all cases.

The following rule determines when ICI for the first call is displayed. Whenever the extension key for the first call appears active (the indicator is on), the preferred ICI is also displayed. When the first call is held, ICI is removed from the display and overwritten with the appropriate display (for example, ►Special call or ►Second call).

The Norstar/Centrex product has an existing problem where the key indicating the active call no longer represents the active call (becomes unsynchronized). Because this rule essentially maps displaying ICI to the state of the extension key indicator, now both the ICI and the key appearance can become unsynchronized with the active call when the user switches around between calls. With ICI on the display the Norstar user may find this more confusing than it already is. Norstar CMS/CLASS does not attempt to solve this problem.

1.2.1.14 Centrex Busy Override

This Centrex feature is similar to Norstar's Priority Call feature. When this feature is activated by a Centrex user, the Norstar system does not know a new call has been forced on the user and that Centrex has put the first call on hold. Therefore, the indicator for the first call and the information on the display are not updated to reflect the change in call status at the set. Under these circumstances, ICI for the first call remains on the display.

Like Call Waiting, the Centrex Busy Override feature call can send a CLASS message with ICLID information with the announcement (warning) tones. When Norstar is equipped with SCWID, it may be possible to develop a suitable UI to handle the Centrex Busy Override feature.

1.2.1.15 Error conditions

In North America, a CLASS message is delivered only once, starting about 600 ms after the first CO power ring signal and ending before the second. For residential sets such as Mæstro, if the call is answered before the CLASS message has been delivered, no ICLID information displays for that call. This error condition may not be a problem for Norstar. Even though Norstar slaves the CO

ring cadence, there is some lag in between the CO's power ring signal and the ringing the user hears at their set. If the lag is of sufficient length, it works in the user's favour, because the ICLID data has been received by the CCU before the user hears their set ring.

The delay between the arrival of ICLID information and when the set alerts (visually and audibly) needs to be tested.

Three situations result in an error condition:

- The user answers the call before the CLASS message arrives (glare condition). In this case, the CO never transmits the CLASS message. Norstar treats the call as a non-ICLID call. It appears exactly as in DR4.
- The CLASS protocol flags the message as corrupt. The following message is displayed, at sets with an appearance of the line, when ICI is displayed to indicate ICLID data is not available for the call:

LINENAM:No info

Note: Since such calls have no additional information to view, the **INFO** display key does not appear when the call is active. An event message is not logged.

- The user answers the call during the transmission of the CLASS message. This can be due to glare, or because the user has answered the call too fast, during or just after the first ring. This situation is treated as corrupt data, as described in the second case above.

For information on the arrival of a corrupt CMWI CLASS message when the line is idle, refer to the Message Waiting feature

A corrupt CLASS message is ignored by the Call Log feature. For details, see the Call Log feature.

1.2.2 OAM Programming View

1.2.2.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item			I	SC+	SC
Terminals&Extns	Call Services	Auto call Info	Linennn	Caller ID set:N	X	X
		1st Display:Name			X	X

1.2.2.2 Programming Incoming Call Information

Programming Caller ID

To deliver Call Information to a set, the line must be programmed to **Ring** or **Appear&Ring** at that set, under **Terminals&Extns**►**Line** access. Both the line and the set must be set up to use the feature.

See "[Terminals&Extns - Line Access](#)".

CLID capability is programmed for both the set and line in

Terminals&Extns►**Call Services**►**Auto call info**►**Linennn**►
Caller ID set:N by changing the value of **Caller ID set** to **Y**.

See ["Terminals&Extns - Call Services - Auto Call Info"](#).

In Compact Plus, with enhanced passive ICLID, each trunk and DIA line in the system can be programmed to deliver Call Information to any set that rings for the line, as soon as the call information is available on the system.

1.2.2.3 Preferred ICI

The system can be programmed on a set-by-set basis, to display the user's preferred first piece of ICI data, Name, Number or line name, for ICLID calls. This functionality is required so users can see the data that is most useful to them first. This is defined as the set's preferred ICI. Name is the preferred ICI at startup.

The parameter `1stDisplay` sets the preferred ICI and is located in `Terminals&Extns▶Call Services▶1st Display:Name`.

See ["Terminals&Extns - Call Services"](#).

1.2.3 **EXTN/**LINE

N/A.

1.3 Technical Specification (Limits/Constraints)

1.3.0.1 Performance impact when passive ICI is programmed for multiple sets

System performance can degrade as the number of shared line appearances programmed with passive ICI increases. Installers should be aware of the dip in performance that results from setting up more than one set with passive CLID. Users should be encouraged to be judicious when selecting the sets using the feature.

1.3.0.2 Programming of Passive ICI/Ringing

Although the delivery of passive ICI is dependent upon that line being assigned to ring at the given set, programming of one parameter is performed independently of the other.

The persons assigning ringing and passive ICI must be coordinated, or definitely informed about, the status of the corresponding parameter in order to assign functionality of passive ICI effectively.

1.3.0.3 Anomalies of CLASS/CMS protocol

Some switches are using the CLASS protocol somewhat differently than specified in the standard. Norstar is making the following adjustments to address the known anomalies:

1. Less or up to 11 digits delivered in ICLID field.

Norstar treats such a data field as Dialable DN, as follows:

- any digit strings longer than 11 digits are truncated for ICI and Call Log
- no area code stripping is done in Call Log

2. ASCII characters in Number field

Some telcos are using the number field to deliver ASCII characters instead of, or in addition to, digits. As far as we know, at this point in time, only switches in the US that are using the single message format, are using the protocol in this manner, for example:

- telcos use the ICLID field to deliver name instead of number
- telcos wish to deliver information to telemarketing firms for blocked (private) calls. They deliver area code information and city name information.

In this case, the field is treated as a name field.

If these anomalies occur in the multiple message format protocol, and two name fields result in the process, the first name received by the application from the base is the name preserved for that call, and the second one is discarded.

3. More than 15 characters in Name field

Telcos can send more than 15 characters in the name field. Norstar DR5 does not have the memory capacity to accommodate any more than 15 characters, therefore, the string is truncated, leaving only the first 15 characters.

1.3.0.4 Ring-stop detection failure

On initially alerting calls into the Norstar system, Norstar detects far end release by detecting ring/stop on the trunk. If an initially alerting call for which Norstar has already received ICLID information stops alerting, and a new call immediately starts to ring on that trunk, Norstar does not identify that there are two calls, because Norstar has not detected a stop in ringing on that trunk.

In this case, any ICLID information associated with the first call is discarded, and any ICLID information associated with the second call is maintained.

1.4 Interactions

The interaction table for both Incoming Call Information and the Call Information feature have been combined because the features are so closely related.

Feature or condition name	Interaction
**Startup	The preferred ICI at start-up is Name.
Accidental Disconnect Protection	Current ICI or Call Information display maintained.
Alerting Set, external	Passive according to programming of each line appearance.
Answer DN	Lines not shared with the master set display the reroute message. ICI is available through Call Information.
Autoanswer loopstart trunks	Autoanswer trunks must delay answering the line until the second ring cycle or until the ICLID data has been received.
Autodial keys	Pressing an autodial key terminates the Call Information feature.
Automatic Handsfree	ICI is delivered when the alerting line key is pressed to answer a call.

Feature or condition name	Interaction
Automatic Line Selection - Incoming Line	The set receives ICI when the user answers the call. ICI data appears on the display when the user lifts the receiver or presses the handsfree key when Automatic Line Selection is set in OAM Programming.
Automatic Line Selection - Outgoing Internal Line by a Feature	ICI on the display is cleared.
Automatic Line Selection - Outgoing Prime Line	ICI on the display is cleared.
Automatic Line Selection - Outgoing Prime Line by a Feature	ICI on the display is cleared.
Automatic Line Selection - Outgoing Prime Line by Handsfree/Off-hook	ICI on the display is cleared.
Call Display When Busy (CDWB)	While not in the program, a proposal has been made in this document to have CDWB set in OAM Programming on or off on a set-by-set basis. Also see text for interaction of Passive ICI and Call Display When Busy.
Call Forward	The reroute message is shown while destination alerts. ICI is available for both the rerouting and destination sets by activating Call Information. Information is displayed according to the set's preferred ICI. The rerouting set's forward message is not overwritten by passive ICI (all calls are non-ringing while the feature is active, therefore, the user must use the Call Information feature). The reroute message is available only during alerting, it is lost once the call is answered or Call Information is activated (the reroute message is not included as a piece of ICI data). In Norstar/Centrex, Call Forward does not forward the extra line key (or internally routed calls). It must be forwarded separately. If the set has been forwarded, but not the extra line key, and an ICLID call arrives on an extra line key, the ICI data overwrites the set's forward status display.
Call Identification/Call Status Display	Inactive during Call Information.
Call Park (with Callback)	Set that answers the parked call receives ICI when the call is active.
Call Pickup	Set that answers the call with Call pickup receives ICI when the call is active.
Call Pickup (Directed)	Set that answers the call with Directed Call Pickup receives ICI when the call is active.
Call Pickup (Group)	Set that answers the call with Group Call Pickup receives ICI when the call is active.
Call Queuing	Cancels Call Information and selects highest priority ringing call. The set that activates Call Queue receives ICI when the call is answered.

Feature or condition name	Interaction
Callback (Park, Transfer and Camp)	Reroute message on alerting ICI is displayed according to the set's preferred ICI when the call is answered or Call Information is activated.
Camp-on	See text.
Conference	ICI data is shown at the conference master's set only when the user is connected to one of the callers, and the other is on hold. Otherwise the normal Conference message is displayed. If the user activates Call Information, ICI data can be viewed on each line separately while on the conference.
Conference - Hold Conference	Normal Conference message is displayed. If user activates Call Information, ICI data can be viewed on each line separately while on the conference.
Conference - Split Conference	Normal Conference message is displayed. If user activates Call Information, ICI data can be viewed on each line separately while on the conference.
Conference - Transfer from Conference (internal and external)	Internal destinations receive ICI according to the set's preferred ICI once the transfer is complete. For transfers to external destinations, no ICI is sent because Norstar cannot retransmit a CLASS message.
Delayed Ring Transfer	The reroute message is displayed at the prime set while the call is alerting then the set receives ICI according to its preferred ICI.
Disconnect Supervision	On trunks equipped with Disconnect Supervision, a far end release takes down the call and clears the display of any ICI. If the user is active on a call and in Call Information, a far end release takes down the call and cancels the feature.
Do Not Disturb (DND)	A set in DND does not display passive ICI for alerting calls (all calls are non-ringing while the feature is active). To view the call's ICI, the user must activate Call Information and select the alerting line.
Exclusive Hold	Call Information cannot view ICI when a line is on exclusive hold at another set. Only the set that placed the call on exclusive hold can use Call Information to view the ICI.
Extension Copy	Call information settings are copied.
Extension Profile	Shows Call Info parameters: <code>1stDisplay:</code> . While not in the program, the proposed CDWB setting, if implemented, will also be included.
Extension Relocation	Redeliver ICI information if the set is reattached at the same position during an active or alerting call within one minute. If the set is relocated or if CAPs are newly attached to a set that is detached and reattached at the same position, all calls are dropped.
Extra-Dial Set	If a call is transferred to a Direct-dial set, and a Scheduled service has been activated that extends the call to an Extra-Dial set, the reroute message, not passive ICI, is extended to the Extra-Dial set.
Feature access keys	Pressing a feature access key (except for the Call Information key) clears any ICI from the display and terminates the Call Information feature. The feature is activated.

Feature or condition name	Interaction
Handsfree (Full) with Mute Capability	When used to answer a call, pressing Handsfree displays the preferred ICI and cancels Call Information.
Hold	Holding a call clears the ICI from the display and terminates the Call Information feature. Call Information can be used to view ICI on a line on I-Hold.
Hotline	While Call Information is active, going offhook selects the preselected line (preselection overrides Hotline). If the user is in Call Information, the user's intention is to access the line or call for which there is call information, and not dial up the Hotline number. If the user exits Call Information and there is a Ringing Call, that call is selected when the user goes offhook. If there are only visually alerting calls, a Hotline call is attempted.
Idle line	Call Information feature display ►No calls
Internal Autodial keys	Pressing an Internal Autodial key terminates the Call Information feature, clears any ICI from the display and makes the internal call.
Line Pools	Activating the line pool access code or programmed key terminates the Call Information feature.
Listen on Hold	The set first loses ICI when the call is placed on hold. The set receives ICI again when the held line is reselected.
Manual Line Selection	A set receives ICI when manual Line Selection is used to answer a call. ICI information is cleared from the display when manual line selection is used to make an outgoing call. While call information for a line is being viewed in Call Information, selecting the line manually with ICI information on the display cancels Call Information.
Offhook set	If the user is offhook and not on a call, ICI is not delivered. Call Information can be activated while the set is offhook and not on a call. (For display defaults, see the section on Call Information activation).
Onhook Dialing - Automatic Dial	The user must exit Call Information before attempting to dial. While the feature is active, dial pad entries are ignored. Except for the <input type="checkbox"/> key that is used to display the next screen of ICI data.
Onhook Dialing	The user must exit Call Information before attempting to change the dialing mode. While the feature is active, dial pad entries are ignored, except for the <input type="checkbox"/> key, which is used to display the next screen of ICI data.
Power Interruptions	ICI for any active and alerting calls is lost.
Pre-Selection	Preselection of a line with an ICLID call delivers the ICI to the set. Call Information preselects all calls or lines selected by the user.

Feature or condition name	Interaction
Prime Extension	All calls rerouted to the Prime Extensions displays the reroute message unless the call has been explicitly transferred by Blind Transfer or Camp-on. ICI is available if the user activates Call Information. Implicit transfers or reroutes to Prime, such as DRT and Call Forward Transfer to Prime, are calls that were not originally intended for the prime set so, these rerouted calls display the appropriate reroute message. ICI is available if the user activates Call Information. User can activate Call Information and select the held line to view ICI.
Priority Call	Priority Call cancels Call Information and overwrites the display.
Ring Again	If Call Information is active, offer is not presented.
Saved Number Redial (SNR)	ICI number data cannot be used with SNR.
Selective Line Redirection	Norstar has no ability to retransmit ICLID information outside the system.
Scheduled Services Control Set	While the Control Set is in a scheduled service, the status message is overwritten by passive ICI if the set has a ringing appearance of a call.
Scheduled Services Direct-dial Set	Transferred and camped calls display passive ICI, All other rerouted calls display the reroute message. ICI for Direct-dial is available through Call Information.
Scheduled Services Ringing Set	See text. ICI is available for Ringing Set through Call Information.
Terminal Type - Analog Terminal Adapter (ATA)	No ICI support. If ATA redirects an ICLID call, ICI is available if the destination is a local Norstar set with a display.
Terminal Type - Data Communication Adapter (DCA)	ICI cannot be received by the DCA.
Terminal Type - Personal Computer Interface - B-channel	ICI data can be accessed and used by PC applications.
Terminal Type - Personal Computer Interface - D-channel	ICI data can be accessed and used by PC applications.
Transfer	Provides passive ICI to destination. The Transfer destination set's preferred ICI settings are used.
Transfer Callback	The set receiving the Callback displays the Callback message. ICI on the call is available through the Call Information feature. The callback message does not appear if callback arrives while Call Information is active.
Transfer Immediate	Passive ICI to destination. The Transfer destination set's preferred ICI settings are used.
Transfer Using Conference	ICI appears at destination once Transfer is complete.
Transfer Using Hold	ICI is displayed when the user answers the held CLID call or uses Call Information to query the call information.

Feature or condition name	Interaction
Transfer With Announcement	Deliver ICLID Info to destination set when Transfer completed.
Trunk Answer From Any Station	No ICI is delivered. The call must appear at the set first. ICI is delivered when the call is answered.
Voice Call	The Voice Call is presented and Call Information, if active, is canceled.

Intercom Keys

1.1 Overview

1.1.1 Description

Intercom keys provide access to internal lines and can also be

- programmed to ring for incoming external calls (see Line Assignment),
- used to access external lines, using an Exchange code, a Line Pool access code, or a Destination code. (For more information, see Exchange code, Line Pools, and Routing Tables.)

1.1.2 Rationale for Feature

Intercom keys are required to access internal lines, and can be used to access external lines, if programmed to do so.

1.1.3 General Definitions


N/A

1.1.4 General Procedures


N/A

1.2 Feature Details

1.2.1 Controls

Intercom key, Dial pad keys, Handset or .

1.2.2 End User View

A minimum of one intercom key is required if internal calls are to be made or received at the set. The user selects an internal line manually by pressing the intercom key, or, if Automatic Outgoing Prime Line Selection is programmed, and the set is programmed to have an internal line as its Prime Line, by lifting the handset or pressing .

After an internal line has been selected, the user dials a two- to seven-digit intercom number, or dials a single digit to reach a direct-dial set, if one exists. (See the feature description for Direct-dial.)

A minimum of two intercom keys are required for establishing a conference call with two other internal sets. Only one intercom key is required if one of the sets is external.

The user can also dial another Norstar set by various other methods, including Internal Autodial keys, Message Reply (using a dial pad code, programmed key, or CALL display key from the Message Reply feature), Direct Dial, Hotline, and Ring Again acceptance. For more information, refer to the descriptions of these features.

When an internal line is selected manually or automatically, on M7208, M7310, and M7324 sets, the indicator is turned ON, and internal dial tone is presented.


Dial-tone timeout and interdigit timeout are not applied to internal calls, because system resources are not blocked by incomplete internal calls.

For outgoing external calls on a line pool, a call appears on an intercom key at the calling set.

Basic sets, which do not have line keys, use the intercom and dial an Exchange code or line pool code to make outgoing external calls. (See the Exchange code and Line Pools specifications.)



The destination set receives visual indication at an intercom key (if the set has indicators).

To answer an internal Ringing Call the user can

- press the alerting intercom key to preselect the line, then lift the handset or
- press  (if Handsfree is set to Standard or Automatic)

(For more details, refer to the Line Selection and Handsfree specifications.)

Once the internal call is established, the user can Hold, Transfer, or Conference it (see those specifications for more details).

An answered call can be disconnected by either party going onhook or pressing . An internal alerting call is disconnected if the originating party goes onhook, presses , or tries to hold the call.

If the set does not have an appearance of an external line, some Norstar features present an external call on an intercom key. Features that operate in this way include Transfer, Do Not Disturb Transfer to Prime Set, Night Service, Trunk Answer for any Station, Call Forward, Call Park retrieve, Offhook Call Queuing, and Call Pickup.

Intercom keys can be programmed to ring for incoming external calls (see Line Assignment).

1.2.3 Message Displays

Message	Description
Calling <setname>	Displays at caller's set while internal destination set is ringing.
<digits dialed>	The dialed out digits are displayed.
Invalid number	Displays transiently if an invalid internal number is dialed.
No free lines	Displays transiently, accompanied by Busy tone, for an external call, if the set's Prime Line is intercom, and the set has access to a line pool, and no lines are assigned to the pool.
Not in service	Displays transiently, accompanied by Overflow tone, if the destination set is not installed, in an OAM programming mode, or does not respond to status polling, or in forwarding chain with one set not in service.
Your number	Displays transiently, accompanied by Overflow tone, if the user dials their own intercom number.

Message	Description
Already joined	Displays transiently, accompanied by Overflow tone, if a call is in any state (for example, held) between two sets and a second call is attempted between those sets.
<setname>	Displays when the user is active on a call with another internal set.

Note: For other messages associated with internal calls, refer to the Call Identification/Call Status Display feature.

1.2.4 OAM Programming View

1.2.4.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item			I	SC+	SC
Terminals&Extns	Individual extn	Line access	Intercom keys:2	X	X	

1.2.4.2 Programming Intercom Keys

See ["Terminals&Extns - Line Access"](#).

From 0 to 8 intercom keys can be assigned in **Terminals&Extns**►
Line access►**Intercom keys:2**. Options are 0, 1, 2, 3, 4, 5, 6, 7, and 8. The default is underlined.

Each intercom key assigned during programming appears automatically at the set. The keys start with the lower right-hand key, or one key above it if the Handsfree feature is assigned to the set.

1.2.5 **EXTN/**LINE

N/A


1.3 Technical Specification (Limits/Constraints)

The user cannot program intercom keys. A Basic set does not have any intercom keys or indicators.

For sets other than Basic sets, a minimum of one intercom key is required if internal calls are to be made or received at the set, and line pools are to be accessed. In order for the user to create a three-party conference of internal parties, the set must have two intercom keys. (This is not required if one of the parties is external.)

1.4 Interactions

Feature or condition name	Interaction
Automatic Incoming Line Selection	The highest priority internal Ringing Call rings at the intercom if it is available, and can be picked up without pressing the intercom key.

Feature or condition name	Interaction
Automatic Outgoing Line Selection	If Prime Line is intercom, the user does not have to press the intercom key to pick up the call, just lift the handset or press  .
Background Music	Background Music stops when the intercom key is pressed.
Call Park	To retrieve a call, press the intercom key and then the Park number.
Last Number Redial Saved Number Redial	Internal numbers are not saved in the Redial buffer, only external ones.
Line Appearance	Any set with a Line Appearance set to Ring Only in OAM has external calls ring on its intercom keys.
No appearance of external line	In cases where there is no appearance of an external line, some features alert at the intercom key, (for example Transfer, Do Not Disturb Transfer to Prime Set, Night Service, Trunk Answer for any Station, Call Forward, Call Park retrieve, Offhook Call Queuing, and Call Pickup.)

ISDN Features

1.1 Overview

The ISDN Features list provides a detailed summary of features and their compatibilities with supported ISDN capabilities for the Compact Plus and Modular Plus systems. The following abbreviations are used throughout the table:

<blank>	Not supported in the product
N/A	This feature is not applicable to the corresponding terminal type.
N/S	This feature is not supported on the corresponding terminal type.
T/S	This feature is terminal-specific in ISDN. Its support depends on individual ISDN terminal of a given type. This may locally be available on a given ISDN terminal.
X	This feature (with any limitations noted) is supported on or accessible from the corresponding terminal type.

Feature	UK Norstar Plus ISDN	Comments
Accidental Disconnect Protection	N/A	
Answer Groups	N/S	
ATA Speakerphone	N/A	
Autodial Keys (max 24 digits)	T/S	
- Internal DSS Keys (F*1)	N/A	
- External Autodialer Keys (F*2)	N/A	
Automatic Line Selection	N/A	
Automatic Extension Relocation	N/A	
Auxiliary Ringing	X	
- through aux ringer port	X	
- through the paging port		
Background Music (F86)	N/S	
Busy Lamp Indication	N/A	A Norstar extension can keep track of the ISDN extn status (e.g. busy, idle), but an ISDN extn cannot keep track of the status of any type of extn (ISDN, Norstar, wireless).
- add-on BLF for M7310	N/A	
- on M7324 DSS key lamps	N/A	
- on Line Pool key lamp for busy line pool	N/A	
Call Capture	X	
Call Charge Information (F818)	N/S	
Call Display When Busy	T/S	ISDN terminal is responsible for its own display.
Call Duration Timer (F77)	N/S	

Feature	UK Norstar Plus ISDN	Comments
Call Forward (F4)	X	For ISDN, “*4*<DN>#” is used to activate the feature.
- All Calls	X	For ISDN, there are two subtypes: per-loop and per-DN. It depends on MSN or non-MSN terminal.
- Busy	N/S	
- No Answer	X	
- Override	X	
Call Identification	X	For ISDN, only the DN is given. Name of the calling/called party will not be available.
- Internal Calls	X	
- External (PSTN) Calls	X	
- Called Line Identification	X	
Call Inquiry (F811)	N/S	
Call Log (F812)	N/S	
Call Park (F74)	N/S	
- with callback	N/A	
- with callback timer admin	N/A	
- prefix administrable (including = nil)	N/A	
- call park retrieve	N/A	
Call Pickup	N/S	
- Group (F75)	N/S	
- Directed (F76)	N/S	
- TAFAS (F800)	N/S	
Call Retention	N/S	
Camp on (F82) Call Waiting	N/S	
Central Answering Position feature	N/S	
- ECAP	N/S	
Class of Service	X	
- Local access: Dialling restrictions	X	
- Remote Access: Dialling restrictions	N/A	Trunk specific. Not dependent on terminal type.
- Remote Access: Feature access	N/A	
- Time of Day Dialling restrictions	X	
- change via DISA		
- change via COS password (F68)	N/S	
Conference (F3)	N/S	
- 3 party	N/A	
- 2 internal parties	N/A	
- 2 external parties (PSTN, AC15A)	N/A	
- 2 external parties (PSTN, PSTN)	N/A	
- consultation	N/A	
- force release a conference party	N/A	
- hold conference	N/A	
- split conference	N/A	

Feature	UK Norstar Plus ISDN	Comments
- transfer via conference	N/A	
- tone on conference	N/A	
Contrast Adjustment (F*7)	N/A	
Delayed Ring Transfer to Prime	X	
Dial-Attendant Set	N/S	ISDN terminal can be an attendant extension but it cannot call any dial-attendant extension by dialling the direct-dial number.
- 5 sets administrable	N/S	
- administrable digit access	N/S	
- external network DN	N/S	
Dial External	X	
- Outgoing line identification	X	
- Terminating line identification	N/S	On an outgoing call from ISDN terminal, TLI is delivered to the terminal as "Display" IE.
Dial Intercom	X	
Dialling Transparency	X	
Dial Mode for lines - Pulse/Tone	N/A	It depends on the type of line being used.
Dial Pad Feedback	T/S	
Dial tone Detection	N/S	
- wait for dial tone, F804	N/S	
Direct Station Select Keys	N/A	
DISA		
- Change COS by Password (F68)		
Distinctive Ringing at Extension (Ring Type)	T/S	
Discriminating Ringing Cadence (internal, external)	N/S	
- administrable external cadence	N/A	
Do Not Disturb (DND on Busy)	N/S	
Do Not Disturb (F85)	N/S	
Emergency Power Fail Transfer	N/A	
End-To-End Signalling	T/S	
- short tones internal	N/A	
- short tones external	N/A	
- long tones internal (F808)	N/A	
- long tones external (F808)	N/A	
- long tones on external paging port	N/A	
Enhanced Restrictions and Overrides	N/S	
- system speed dial restrictions override	N/S	
- dialing filters	N/S	
- alternate toll restrictions (F872)	N/S	
External Line Access	X	
External Speaker	N/A	
Feature Access Key	N/A	
Group Listening (F802)	N/A	
Handsfree	T/S	

Feature	UK Norstar Plus ISDN	Comments
- answerback	N/A	
- automatic	N/A	
- with mute capability	N/A	
Headset	T/S	
Hearing Aid Compatibility	T/S	
Hold	N/S	
- Automatic Hold	N/S	
- Automatic Exclusive Hold	X	If an ISDN terminal invokes transfer, the source party will be automatically held.
I-Hold/U-Hold/Mutual Hold	N/A	
- Exclusive Hold (F79)	N/A	
- Held Line Reminder	N/A	
Hot Line	N/S	
Hung Line Clearing	N/S	
Hunt Groups	X	
Incompatible Extension Detection	N/A	
Installer Password	N/A	
Intercom Key Assignment	N/A	
Key Inquiry (F*0)	N/A	
Language Choice (F*501/502/503)	N/S	Only English is supported in I.420
Last Number Redial (F5)	T/S	
Line Key Relocation	N/A	
Line Pool BLF (outgoing)	N/A	
Line Pool(s) (F64)	X	For ISDN, line pool is accessed by dialing the line pool access code (F64 is not used).
- designation by letter	N/A	
Line Profile	N/S	
Line Types	X	
- pool	X	
- public	X	
- private	X	For incoming call only. No mechanism to access the private line for outgoing call.
Listen on Hold	N/S	
Loss Plan	X	
- administrable Loss Plan for ATA	N/S	Loss plan, however, can be administered by Norstar set.
- administrable loss plan for AC15A	N/S	
Manual Line Selection	N/A	
Messages	N/S	
- Send Message (F1)	N/S	
- Message Waiting/Reply (F65)	N/S	
Multiple Line Appearances	X	
On Hold Treatment (Music/Silence, Tones)	X	For ISDN, this feature is supported for external source call.

Feature	UK Norstar Plus ISDN	Comments
On Hook Dialing (F*82)	T/S	For ISDN, both enbloc & overlay dialling is supported on the S interface.
- predial	T/S	
- standard dial	T/S	
- automatic dial	N/A	
Paging (F60/61/62)	N/S	
- internal multiple zones	N/S	
- external speaker	N/S	
PBX Reach Through	N/S	
- with feature code compression	N/A	
- with timed break recall	N/S	
- with earth recall (F71)	N/S	
- programmed release, pause, run/stop (F*89/78/*9)	N/S	
- timed release (F72)	N/S	
- programmed wait for dial tone (F804)	N/S	
Periodic Ringing Attempts		
Periodic Pulse Metering (PPM)		
Pre-Selection/Call Screening	N/A	
Prime Line	N/S	
Prime Set(s)	X	
- call forward transfer to prime set	X	
- callback extension to prime	X	
- default ringing	X	
- delayed ring transfer	X	
- DND selective call forward	N/S	
- DND transfer to prime set	N/S	
- HLR extension to prime set	N/S	
- overflow call routing	X	
Priority Call (F69)	N/S	
Privacy on Lines	X	
Privacy Control (F83)	N/S	
- intrusion tone	N/A	
Private Lines	X	For ISDN, only incoming call is supported on private line. Outgoing call is not supported on private line.
Pulse to Tone Conversion	N/S	
Release	X	
- with network call clearing reasons	X	
Remote Access DNs	X	
- target line DNs	X	Provided that a line supports remote access using target line, ISDN terminal can be reached by using target line.
- DISA DN		
- auto DNs		

Feature	UK Norstar Plus ISDN	Comments
- change target line DN length	X	
Remote Access Features	N/A	This feature is based on the line (instead of the type of the set).
- page feature	N/A	
- dial target lines	N/A	
- line pool access	N/A	
Ring Again (F2)	N/S	
- On Busy Telephone	N/S	
- On Busy Line Pool	N/S	
- On No Answer	N/S	
Ringing Call	T/S	
- external call presentation on intercom keys	N/A	
- second call busy treatment on intercom keys	N/A	
Ringing Line Preference	X	
Saved Number Redial (F67)	N/S	
Selective Line Redirection (F84)	N/S	
- redirect to network DN	N/A	
- redirect to PSTN	N/A	
- redirect to private network	N/A	
- with busy route extend to prime set	N/A	
Service Modes (F871)	N/S	
- Night Service	N/S	
- Evening Service	N/S	
- Lunch Service	N/S	
- Service Mode Activation	N/S	
- Off	N/A	
- Manual	N/A	
- Automatic	N/A	
- Service Mode Control	N/S	
- Auto by System	N/S	
- Control Set	N/S	
- Extra Attendant Set	N/S	ISDN terminal can be an extra attendant extension but it cannot call any extra attendant extension by dialling the direct-dial number.
- Service Mode Ringing Set	X	
- TAFAS (F800)	N/S	
Extension Names	X	
Extension Profile	N/S	
Show Time (F803)	N/S	
Extension Speed Dial (F0/*4)	N/S	
- facility designation	N/S	
System Speed Dial (F0/*4)	N/S	
- facility designation	N/A	

Feature	UK Norstar Plus ISDN	Comments
- restriction override capability	N/A	
- naming outgoing digits	N/A	
State Advisories	N/A	Norstar system in general keeps track the state of sets/lines.
- Idle/Busy Line	N/A	
- Idle/Busy Set	N/A	
- Incompatible Extension Detection	N/A	
- Incompatible Line Cartridge		
- In Maintenance	N/A	
- In System Administration	N/A	
- In User Admin	N/A	
- Out of Service Port/DN	N/A	
Target Lines	X	
Time/Date Display	N/S	
- Background	N/S	
- User Invoked (F803)	N/S	
Transfer (F70)	X	For ISDN, “*70*<DN>#” is used to activate the feature.
- Automatic Camp-On	N/S	
- Camp-On Callback		
- Immediate	X	
- With Announcement	X	
- with Callback	X	Source should be external and the destination is internal.
- via Conference	N/S	
- via Hold	N/S	
- with recall on AC15A	N/S	
- network transfer (PSTN, AC15A)	X	
- network transfer (PSTN, PSTN)	X	
- with network no answer callback	N/S	
- with repeated call attempts option		
- on radio loss	N/A	
User Programmable Feature Keys (F*3)	N/A	
Voice Call (F66)	N/S	For ISDN, voice call will revert to normal ringing call.
Voice Call Deny (F88)	N/S	
Volume Control (F*80)	N/A	
Wait for Dial Tone (F804)	N/S	
Xfeature	N/S	For ISDN, StarTalk 180 can be accessed via end-to-end signalling if a given ISDN terminal supports DTMF tone.
Maintenance Features		
Alarms	N/S	
System Version(s)	N/A	
- Port/DN status	X	

Feature	UK Norstar Plus ISDN	Comments
- Module Status	X	
- Diagnostics	N/A	
- Connectivity Test	N/A	
- Dial Tone/Line Presence Test	N/A	
History Files	X	
- Test Log	X	
- Admin Log	X	
- Network Log		
Link Quality	N/A	
Provisioning	X	
- Port	N/A	
- Loop	X	
TEI Status	X	
Administrative Features		
Copy Extension Data	X	Only system admin. Data is copied.

ISDN Messages and Information Elements

1.1 Overview

The following tables document the ISDN messages and Information Elements that are supported on:

- BRI S interface connected to ISDN terminal (Table 1)
- BRI T interface connected to the PSTN using BTNR191 protocol table (Table 2)
- BRI T or PRI interface connected to the PSTN using ETSI 403 protocol table (Table 3)

For those ISDN messages and IEs which are not explicitly mentioned in the tables, they are assumed not supported. When such an ISDN message or IE is received, it will be ignored.

Abbreviations used within the tables:

IE	Information Element	
Dir	Direction	
	u->n	User-to-Network (i.e. Terminal-to-CCU in Table 1, CCU-to-BT network in Tables 2 and 3).
	n->u	Network-to-User (i.e. CCU-to-Terminal in Table 1, BT network-to-CCU in Tables 2 and 3).
both	Both directions	
Type	M	Mandatory
	O	Optional

1. NS by BT: not currently supported/available in a BT network
2. N1, N2, etc. the states on the CCU side (refer BNTR191 Section 2.1.2 “Network Call States”)
3. U1, U2, etc., the states on the CCU side (refer BNTR191 or ETS 200 102-1 Section 2.1.1 “Call states at the user side of the interface”)

TABLE 1. Supported ISDN Messages and IEs on the S Interface

Message	IE	Dir.	Type	Comment
Call Establishment Messages				
Alerting	Message Header ^a	both	M	
	Channel Identification	both	O	
	Display	n->u	O	For call initialised from ISDN terminal to DASS2 line, the TLI is sent to the terminal as "Display" IE. Besides, the Display IE is also used in internal call.
Call_Proceeding	Message Header	both	M	Instead of both directions, only "n->u" direction is currently supported.
	Channel Identification	both	O	
	Display	n->u	O	
Connect	Message Header	both	M	
	Channel Identification	both	O	
	Display	n->u	O	
	Connected Party Number	both	O	This is the COLP. NS by BT
	Connected Party Subaddress	both	O	
	Lower Layer Compatibility	both	O	NS by BT
	Date and Time	n->u	O	
Connect_Acknowledge	Message Header	both	M	
	Display	n->u	O	
Setup	Message Header	both	M	
	Sending Complete	both	O	
	Bearer Capability	both	M	
	Channel Identification	both	O	
	Display	n->u	O	
	Keypad Facility	u->n	O	Instead of both direction, only "u->n" direction is supported. See note 1.
	Calling Party Number	both	O	
	Calling Party Subaddress	both	O	
	Called Party Number	both	O	
	Called Party Subaddress	both	O	
	Low Layer Compatibility	both	O	
	High Layer Compatibility	both	O	

TABLE 1. Supported ISDN Messages and IEs on the S Interface (Continued)

Message	IE	Dir.	Type	Comment
Setup_Acknowledge	Message Header	both	M	
	Channel Identification	both	M	Mandatory for N1
	Display	n->u	O	
Call Information Phase Message				
none				
Call Clearing Messages				
Disconnect	Message Header	both	M	
	Cause	both	M	Cause is not passed from the user to the network for call being rejected by the ISDN terminal.
	Display	n->u	O	
Release	Message Header	both	M	
	Cause	both	O	Optional for states N11, N12, N19.
	Display	both	n->u	
Release_Complete	Message Header	both	M	
	Cause	both	O	Optional for states N11, N12,N19
	Display	both	n->u	
Miscellaneous Messages				
Information	Message Header	both	M	This message is only supported to invoke the call forward and call transfer features.
	Sending Complete	both	O	
	Display	n->u	O	
	Keypad Facility	both	O	See Note 1
	Called Party Number	both	O	
Messages used with the Global Call Reference				
none				

a. Message Header contains 3 IEs which are Protocol Discriminator, Call Reference and Message Type.

TABLE 2. Supported ISDN Messages and IEs on the BRI T interface using the BTNR191 protocol table

Message	IE	Dir.	Type	Comment
Call Establishment Messages				
Alerting	Message Header ^a	both	M	
	Channel Identification	both	M	Mandatory for U1
Call_Proceeding	Message Header	both	M	
	Channel Identification	both	M	Mandatory for U1
Connect	Message Header	both	M	
	Channel Identification	both	M	Mandatory for U1
	Progress Indicator	u->n	O	Only hard coded PI value #2 is used when a call is answered from a non-ISDN set.
	Connected Party Number	both	O	This is the COLP. NS by BT
	Connected Party Subaddress	both	O	
	Lower Layer Compatibility	both	O	NS by BT
Connect_Acknowledge	Message Header	both	M	
Setup	Message Header	both	M	
	Sending Complete	both	O	
	Bearer Capability	both	M	
	Channel Identification	both	M	Mandatory for state U0
	Progress Indicator	u->n	O	Only hard coded PI value #3 is used when a call is originated from a non-ISDN set.
	Calling Party Number	both	O	
	Calling Party Subaddress	both	O	NS by BT
	Called Party Number	both	O	
	Called Party Subaddress	both	O	
	Low Layer Compatibility	both	O	
	High Layer Compatibility	both	O	
Setup_Acknowledge	Message Header	both	M	
	Channel Identification	both	M	Mandatory for U1
Call Information Phase Message				
none				
Call Clearing Messages				
Disconnect	Message Header	both	M	
	Cause	both	M	

TABLE 2. Supported ISDN Messages and IEs on the BRI T interface using the BTNR191 protocol table (Continued)

Message	IE	Dir.	Type	Comment
Release	Message Header	both	M	
	Cause	both	O	Optional for U11,U12,U19
Release_Complete	Message Header	both	M	
	Cause	both	O	Optional for U11,U12,U19
Miscellaneous Messages				
Information	Message Header	both	M	
	Sending Complete	both	O	BT does not support overlap receiving.
	Called Party Number	both	O	BT does not support overlap receiving.
Messages used with the Global Call Reference				
Restart	Message Header	both	M	NS by BT
	Channel Identification	both	O	
	Restart Indicator	both	M	
Restart Acknowledge	Message Header	both	M	NS by BT
	Channel Identification	both	O	
	Restart Indicator	both	M	

a. Message Header contains 3 IEs which are Protocol Discriminator, Call Reference and Message Type.

TABLE 3. Supported ISDN Messages and IEs on the BRI T and PRI interface using ETSI protocol table^a

Message	IE	Dir.	Type	Comment
Call Establishment Messages				
Alerting	Message Header ^b	both	M	
	Channel Identification	both	M	Mandatory for U1
	Progress Indicator	both	O	Only hard coded PI value #2 is used when a call is answered from a non-ISDN set.
Call_Proceeding	Message Header	both	M	
	Channel Identification	both	M	Mandatory for U1

TABLE 3. Supported ISDN Messages and IEs on the BRI T and PRI interface using ETSI protocol table^a (Continued)

Message	IE	Dir.	Type	Comment
Connect	Message Header	both	M	
	Channel Identification	both	M	Mandatory for U1
	Progress Indicator	both	O	Only hard coded PI value #2 is used when a call is answered from a non-ISDN set.
	Connected Party Number	both	O	This is the COLP. NS by BT
	Connected Party Subaddress	both	O	
	Lower Layer Compatibility	both	O	NS by BT
	Date and Time	n->u	O	
Connect_Acknowledge	Message Header	both	M	
Progress	Progress Indicator	both	M	Only hard coded PI value #2 is used when a call is answered from a non-ISDN set.
Setup	Message Header	both	M	
	Sending Complete	both	O	
	Bearer Capability	both	M	
	Channel Identification	both	M	Mandatory for state U0
	Progress Indicator	both	O	Only hard coded PI value #2 is used when a call is answered from a non-ISDN set.
	Calling Party Number	both	O	
	Calling Party Subaddress	both	O	
	Called Party Number	both	O	
	Called Party Subaddress	both	O	NS by BT
	Low Layer Compatibility	both	O	
	High Layer Compatibility	both	O	
Setup_Acknowledge	Message Header	both	M	
	Channel Identification	both	M	Mandatory for U1
	Progress Indicator	both	O	Only hard coded PI value #2 is used when a call is answered from a non-ISDN set.
Call Information Phase Message				
none				
Call Clearing Messages				

TABLE 3. Supported ISDN Messages and IEs on the BRI T and PRI interface using ETSI protocol table^a (Continued)

Message	IE	Dir.	Type	Comment
Disconnect	Message Header	both	M	
	Cause	both	M	
	Progress Indicator	both	O	Only hard coded PI value #2 is used when a call is answered from a non-ISDN set.
Release	Message Header	both	M	
	Cause	both	O	Optional for U11,U12,U19
Release_Complete	Message Header	both	M	
	Cause	both	O	Optional for U11,U12,U19
Miscellaneous Messages				
Information	Message Header	both	M	
	Sending Complete	both	O	
	Called Party Number	both	O	
Messages used with the Global Call Reference				
Restart	Message Header	both	M	NS by BT
	Channel Identification	both	O	
	Restart Indicator	both	M	
Restart Acknowledge	Message Header	both	M	NS by BT
	Channel Identification	both	O	
	Restart Indicator	both	M	

- a. It should not be noted that the messages using BTNR191 and ETSI protocol tables are very similar. However, there may be some minor difference in the actual implementation. For example, the Cause value mapping used in BTNR191 is slightly different from the ETSI one to accommodate specific BTNT191 requirement.
- b. Message Header contains 3 IEs which are Protocol Discriminator, Call Reference and Message Type.

ISDN Network Overview

1.1 Overview

ISDN (Integrated Services Digital Network) is a term which refers to a set of access standards used by the entire network to provide a variety of services and capabilities to the end customers. As such, ISDN standards really only deal with customer access points to the public switched telephony network (PSTN). The PSTN itself generally uses a more sophisticated signalling system (usually SS7) which would carry an “ISDN User Part” or ISUP.

In the private network case inter-switch communication typically uses standards such as QSIG or DPNSS. There are exceptions to this however, where inter-office or inter-PBX implementations use Q.931 ISDN as an inter-switch protocol.

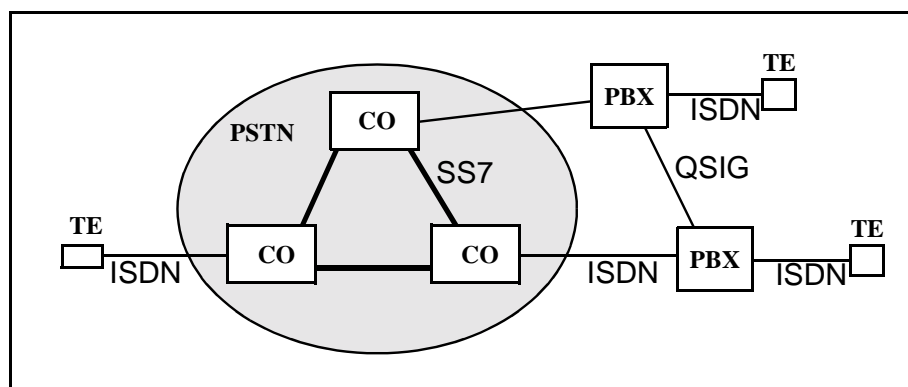


Figure 1-1: The ISDN Network

1.2 ISDN User-Network Reference Points

Services within ISDN apply differently under various situations. This is due to the complex nature of telecommunications. Various factors affect how a service is provided such as digital vs. analogue equipment or whether a PBX is involved.

As such, a reference model was suggested by ITU-T as depicted in Please refer to “figure 1-2 ISDN Reference Points and Functional Groupings” on page 1..

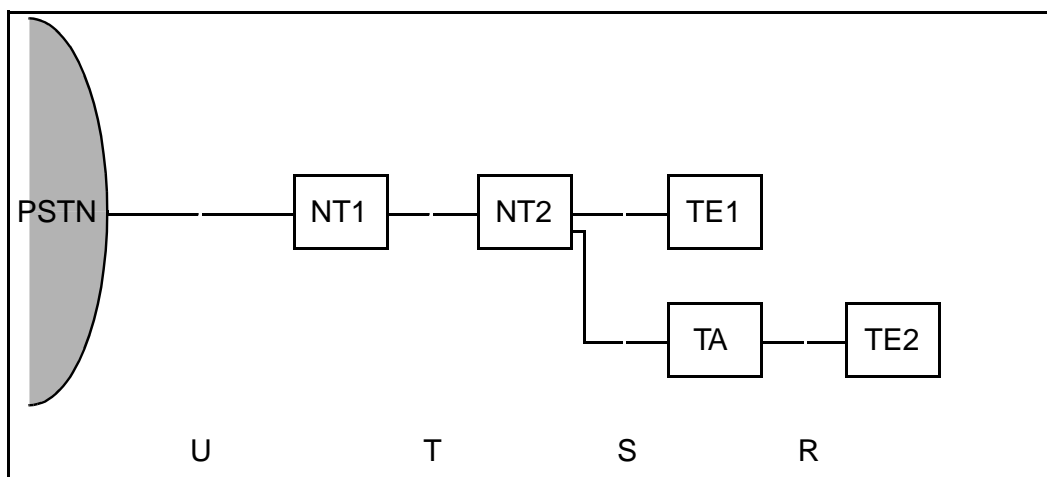


Figure 1-2: ISDN Reference Points and Functional Groupings

The functional groupings perform the following functions:

- NT1: Line Transmission termination
Line maintenance and performance functions
Layer 1 multiplexing
- NT2: Layers 2 and 3 termination
Layers 2 and 3 multiplexing
Switching and concentration
Interface termination
- TE1: ISDN compatible terminal equipment
- TE2: Non-ISDN terminal equipment (e.g. RS-232 PCs)
- TA: The terminal adaptor is used to adapt TE2 to ISDN
- It is important to note these are simply logical groupings and a single physical box may have one or more of these groups within it.

The following reference points exist:

- R: (Rate) provides a non ISDN interface between TE2 and a TA (e.g. RS-232).
- S: (System) provides an interface to individual ISDN terminals (TE2 and TA).
- T: (Terminal) provides a minimal ISDN network termination at the customer premises. Note that this is terminal in the sense of *termination* and not *terminal equipment*.
- U: (User) is the subscriber line.

It is important to note that the ITU-T specifications do not describe the U reference point. The main reason was that the technology was not considered mature enough to specify standards. In the U.S. however, the FCC ruled that the NT1 should be viewed as CPE which could connect to any subscriber loop. As such, the U reference point was defined in North America.

Using Please refer to “figure 1-2 ISDN Reference Points and Functional Groupings” on page 1. as a guide, the Norstar system fits as an NT2 in Europe and potentially as an NT2/NT1 combination in North America.

1.2.1 T-loops & Lines

The T interface represents the interface between the Norstar system and the Network. It is Point-To-Point. These loops act as ETSI compliant digital access lines, providing basic incoming and outgoing calls similar to DASS2 lines.

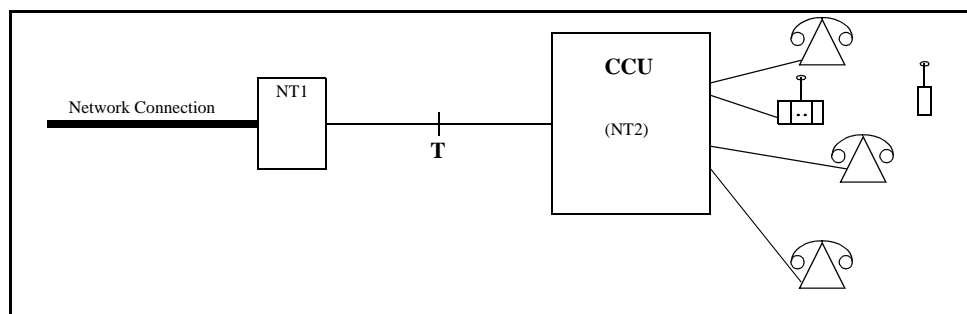


Figure 1-3:T-interface application

1.2.2 OAM Programming View

In the Norstar system, line numbers associated with T-loop are based on the physical location of the card.

BRI lines default to Manual Answer mode (for all templates).

1.2.2.1 Basic Incoming Call

There is no correlation between the B-Channel in use and the line number of the line. This means that a call involving a given line could use either the B1 or B2 channel.

When there is an incoming call from the Network, the Network specifies either the B1 or B2 channel. There is no indication of which “line” is being seized. The Norstar system could have used a fixed association (B1 implies Line X, B2 implies Line X+1), but instead opted for a more flexible method of assignment. When the incoming call is received, Norstar assigns the lowest line number that is available to the call. This means that an incoming call using B2 could use Line X instead of Line X+1.

The impact of this is that for a given interface, an incoming call could arrive on either line. This means that appearances of both lines need to be configured at a set in order to ensure that an incoming call is presented.

If the network configures an LDN over multiple interfaces, then all associated lines should be configured at a set.

Separate Channel Numbering is not an issue for DDI lines.

1.2.3 Maintenance View

The loop is considered busy if one or both B-channels are busy.

1.2.4 S-loops

Any, some, or all of the four interfaces may be configured as an S-loop.

An S interface is a terminal or set connection from the CCU’s perspective. This could be either a point-to-point, or a point-to-multipoint connection type and provides digital connectivity from the CCU to the desktop. The CCU arbitrates access to the network for S interface devices.

These types of connections do not necessarily require the CCU to be able to synchronize itself to the network.

The S-Loop has an administrable parameter which allows for the support of both short and long loop lengths.

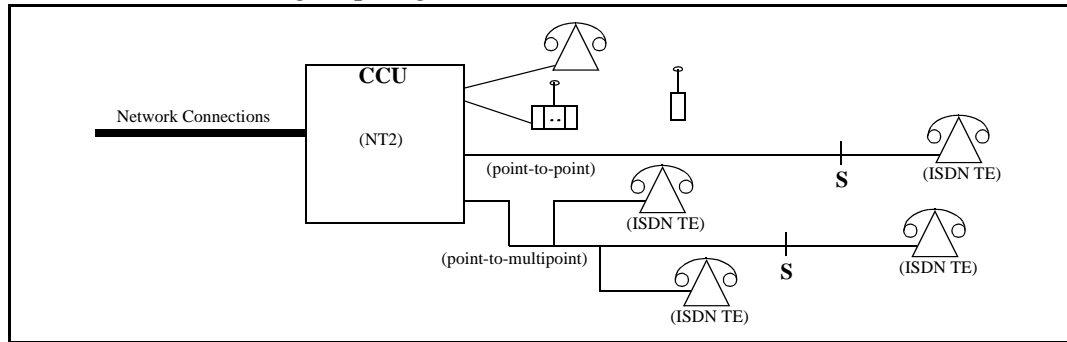


Figure 1-4:S Interface Application

1.2.5 S-loops & ISDN extension numbers

Each S-loop must have a Extension number assigned to it before an ISDN terminal can make or receive a call.

1.2.5.1 ISDN extension numbers

The Norstar system permits a maximum of 64 Extension numbers for ISDN terminals. That number of Extension numbers is reduced by the number of wireless terminals assigned to the system (system maximum of 32).

1.2.5.2 Loop extn & S-loops

When an ISDN terminal is plugged into an S-loop, one or more Extension numbers must be assigned to the loop before any calls can be made or received. The terminal must be configured to use that Extension number. Subsequent terminals, plugged into the same loop is assigned the same Extension number. Up to 8 ISDN terminals can be plugged into the same loop, and all can have the same Extension number. Unique Extension numbers can be assigned to individual ISDN terminals. The first ISDN terminal plugged into the next loop would get the next Extension number in the default number range.

1.3 ISDN Terminals

ISDN terminals are third party devices, the Norstar system has little knowledge of their existence, and no control over their functionality; this is compared to Norstar sets which are proprietary and for which we have full knowledge and control of the functionality.

The only means of communicating with these ISDN devices is via the BRI 2B+D S interface, which is a well-defined but non-proprietary signalling scheme.

The most important concept to realize is that the Norstar system has no specific knowledge of the device(s) on the S interface that it is communicating with. It may be talking to a “telephone”, but it could also be talking to a modem, a fax machine, or some other data device.

All the Norstar system can do is perform signalling as per the ISDN specifications with no control over how the device handles its end of the interface; in effect the S interface can be thought of as another type of trunk.

The impact to the providing of UI is that the ISDN specification defines the method and content that can be passed from the Norstar system to an ISDN device; this limits the type of UI that can be provided.

Since the Norstar system cannot control how an ISDN device handles the UI information provided; it is felt that any attempt to document such UI from an end-user's perspective can only be an approximation at best.

Each ISDN device could potentially have different processing; as well, different versions of each device could have slight variations.

1.4 Network Interfaces and Services

This section describes new and enhanced network interfaces and services. It is divided into two sub-sections. The first sub-section describes the interfaces and services applicable to both Modular and Compact Plus, the and the second describes those applicable to Modular only.

1.4.1 BRI Network Interface (for both Modular Plus and Compact Plus)

Support for the S/T interface is removed for both BTNR191 and ETSI. This has already been done in the I.420 Maintenance Release and the Compact Plus Maintenance Release.

A 2-port BRI card is introduced. It supports both the S and T interfaces, and the protocols supported by the current 4-port BRI card. Note that this new card cannot be used with earlier releases of Norstar UK products.

For the 2-port BRI card, the first 2 loops and associated 4 lines are available. For example, if the card sits in the first core slot, loops 201 and 202 are available with lines 001 to 004. If the card sits in the 2nd core slot, loops 231 and 232 are available with lines 031-034. Similarly for off-core line modules.

D-channel signalling is now supported on the BRI card (either 2 port or 4 port). This can be used to provide connection to the worldwide X.25 packet network and credit authorization services. The D-channel device, such as a point of sale terminal, would be connected to a Norstar S interface loop. Administration is provided to allow the user to send D-channel packets from this S loop out on a T interface on the same card. Access to this administration is controlled by a software key.

Compliance to ETS 300 403, being provided for the PRI interface, is also extended to the BRI T side interface. For compatibility reasons, the BRI S side interface is not compliant to ETS 300 403.

The ETSI protocol allows for the network to indicate to the CCU that as part of the call clearing process, inband tones are available before the call is released. Norstar software could respond to this in one of two ways:

1. Release the call immediately.
2. Leave the call connected so that the user may hear the tones. The call would be cleared when the user hung up or the network cleared the call.

In I.420 and Compact Plus, Norstar software chose option 2 for all occurrences of this scenario. This functionality was modified in the I.420 and Compact Plus

Maintenance Releases so that Norstar would use option 1 for outgoing calls which had been answered, and all incoming calls. Norstar would continue to use option 2 for unanswered outgoing calls. This new way of dealing with this have been added to UK Norstar Plus.

1.4.2 I.421 PRI Network Interface (for Modular Plus only)

1.4.2.1 Basic Call

The PRI Network Interface adapts the following functionality to existing Norstar line features. These features are ETSI compliant and are implemented on the PRI Network Interface to provide similar service to what is currently implemented on the BRI Network Interface, except that it follows the new 403 standard.

The specifications for this functionality may be found in:

- Basic incoming calls (ETS 300 403)
- Basic outgoing calls (ETS 300 403)
- Direct Dial Inward (DDI) (ETS 300 062)
- Bearer capabilities (ETS 300 403)
- Teleservices (ETS 300 403)

In addition, the Video Telephony and 7 KHz Audio Teleservices bearer capabilities are supported.

The existing DTI cartridge is used to support PRI.

The PRI line numbers are the same as those for DASS2. (001 - 030 for the first card and 031 - 060 for the second card.) The ability to provision individual lines is the same as for DASS2. Eight software credits for either DASS2 or PRI lines are provided as a system default. Please note that on the PRI interface there is no fixed mapping between channel number and line number. As a result, it is recommended that PRI lines be configured as DDI lines; otherwise each user would need line appearances for all lines on the interface.

PRI lines can be accessed from all devices which can currently access BRI, such as Norstar sets, ISDN sets, and wireless sets.

ETS 300-403 is the only protocol supported on the PRI interface.

The default trunk type for on-core slots remains as DASS2.

1.4.2.2 Line Identification

The Calling Line Identification Presentation (CLIP) supplementary service provides the called party with the possibility of receiving identification of the calling party. The network delivers the calling line identity to the called party during call establishment. Norstar support for this feature is the same as its support for this feature on the BRI ETSI T-side interface. The specification for this feature is found in:

- Calling Line Identification Presentation (CLIP) (ETS 300 089)

The Connected Line Identification Presentation (COLP) supplementary service provides the calling party with the possibility to receive identification of the

connected party. The network delivers the connected line identity to the calling party on call acceptance. Norstar support for this feature is the same as its support for this feature on the BRI ETSI T-side interface. The specification for this feature is found in:

- Connected Line Identification Presentation (COLP) (ETS 300 094)

1.4.2.3 ETSI Sub-Addressing

The Sub-addressing supplementary service provides an increased addressing capacity beyond the one given by the ISDN number. Norstar support for this feature is the same as its support for this feature on the BRI ETSI T-side interface. The specification for this feature is found in:

- SUB-addressing (ETS 300 059)

1.4.3 I.420 BRI Network Interface Improvements

BRI support on Modular provides improvements over I.420 functionality:

- In I.420, when the ISDN terminal is busy, the cause value returned is busy. The same cause value is returned if the extension is not responding to the call therefore the two events cannot be differentiated. Modular provides the mechanism to uniquely identify the two events.
- Modular provides support of Call Progress indicator on the following messages: alerting, connect, progress, setup, and disconnect.
- Incoming calls from BRI ETSI terminating to ISDN extensions present the national flag as part of the CLID information. Norstar supports this flag and transports it to the ISDN extensions, but Norstar digital extensions cannot display it.
- COLP is supported if provided by the network.
- Cause values from network to S terminals are transported without modifications.

1.4.3.1 DASS2 Network Interface

There is an increase in the number of software credits available to be used for either DASS2 or PRI lines. In the I.420 product, 6 credits were given as a default; in UK Norstar Plus this is increased to 8 credits.

The default answer mode for DASS2 lines are changed to auto-answer.

1.4.3.2 Network Clock Synchronization

Administration provides the option of choosing which on-core slot is the primary source for synchronization with the network. This does not change the network clock synchronization rules and recommendations specified for the I.420 product (listed below); it allows for the simplification of installing a DTI card into an already-programmed system where a BRI card was in the default primary slot (slot 4).

- It is recommended to have both core slots populated with digital trunks with reliable network connections, for a robust synchronization strategy.
- When the core is populated with both a DTI and a BRI the DTI must occupy the primary slot making it the clock master. This is needed because the DTI synchronization requirements are more stringent than the BRI requirements.

Key Inquiry

1.1 Overview

1.1.1 Description

Key Inquiry displays the feature name associated with a programmed key. It also shows the stored number associated with the intercom, Last Number Redial (LNR), Saved Number Redial (SNR), Selective Line Redirection (SLR) and Autodial keys.

1.1.2 Rationale for Feature

1.1.2.1 Scenarios

- When the set is first installed, to support the labelling of the Answer keys, line keys, Handsfree key, feature access keys, and Internal Autodial keys that have been assigned to the set by means of a System Startup template or through OAM Programming
- When key assignments are subsequently changed by the addition or removal of an Answer key, a line key, or the Handsfree key, or by the selection of a new System Startup template
- The installer, system coordinator or end user can display the intercom number, port number, and user name associated with a set. This is useful because the relationship between a set's intercom number and a port number can change as the result of Set Relocation, Set Replacement, Change DN, or System Startup. The port number identifies the set's physical connection.
- The end user has changed the feature content of the programmable keys on the set, and wants to check the contents without activating the feature.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls

Feature *

1.2.2 End-User View

In order for the user to activate the Key Inquiry feature successfully, the set must be idle, with no calls being initiated or connected, with no I-Active, I-Hold, or incoming alerting calls.

To initiate a Key Inquiry session, the user presses Feature * . During the Key Inquiry session, pressing any programmable key displays the contents of that key.

On the M7310 set, to display the contents of the shifted part of a dual-function programmable key, the user presses the shift key, Δ , prior to pressing the programmable key.

If the user wants to change an Autodial number after they have seen it using Key Inquiry, they must enter the feature code for programming stored numbers.

The following table shows the Key Inquiry procedure. The table illustrates how the displays appear on two-line display sets (M7310 and M7324). One-line display sets (M7208, M7100) do not use display keys, and use the **Hold** key instead of the **OK** display key. The **Rls** key is used instead of the **QUIT** display key. The Volume Up key corresponds to the **NEXT** display key.

The Key Inquiry procedure is shown in the following table.

User Action	Resulting Display	Set Response
1. Press Feature * 0	Key Inquiry Press a button EXIT	Transient display.
2. Press any feature programmable key (may be preceded by Shift key on the M7310 set) Repeat	<Feature name>	Transiently displays the key contents by the feature names listed in the next table, then returns to display in step 1.
3a. Press Feature or Press Rls or Press the EXIT display key (M7310/M7324 set) or Replace the handset or Wait for 60-second timeout or Press Hold	<Idle display> Press a key EXIT	Exit from Key Inquiry mode, and show the idle display.
3b. Remove the handset		Exit from Key Inquiry and line selected automatically. (Display will be consistent with Prime Line displays. For more information see that feature).
	No line selected	Exit from Key Inquiry and select a line to begin a call.

On Basic sets, Key Inquiry provides the user with the set information (the DN and the setname are shown). If the user presses “#”, the Prime Line and port information are shown. Pressing “#” toggles between the two displays with set information. If no input is provided for three seconds, the programmed key information display is shown. The name of the programmed key (for example, Do Not Disturb, or Last No. Redial) is shown for three seconds.

On all sets, the “#” key corresponds to the **SHOW** and **VIEW** (both **VIEW→** and **←VIEW**) display keys.

If a programmed key is a Dialer, the “#” key can be used to toggle between the first and second screen of dials that are more than 16 digits long. Once the user is viewing the programmed key display, no way exists to get back to the set information display. Note that when the programmed key is displaying a stored

number, if no key press is made, the timeout is 60 seconds (standard Key Inquiry timeout).

See "Key Inquiry" and "Line Inquiry".

1.2.2.1 Feature names displayed during Key Inquiry

Feature names are displayed during Key Inquiry as shown in the following table.

Feature Names Displayed during Key Inquiry

Key	Display	Description
Answer key	Answer <setname>	<setname> is the name of the receiver of attendant services.
Blank key	Blank Key	
End-to-End Signaling	Long Tones	
External line key	<linenumber> <linename> SHOW OK	<linenumber> is the external line number associated with the set, <linename> is the line name (up to seven characters)
Internal Autodial key	Autodial <setname>	<setname> is the seven-character identifier associated with the set in OAM Programming. The default <setname> is the set's intercom number.
External Autodial key	<linename>... <digits&feature code> ←VIEW→ OK	If the user presses an Autodial key for which a number is stored, the number is shown, in full or in part, depending on its length. The dialing information may include reachthrough feature symbols. (See the PBX Reach-Through specification.) If the number is longer than the display can accommodate, a VIEW→ display key is provided so the user can see the remaining part of the number. Subsequently, the ←VIEW display key is provided to toggle back to the first part of the number.
Handsfree key	Handsfree/Mute	
Intercom key	<DN> <setname>... NEXT VIEW,	<DN> is the intercom number associated with the set, <setname> is the seven-character identifier associated with that set in OAM Programming. The default <setname> is the set's <DN>.
VIEW→	...Port <portnumber> ←VIEW	Shows the port number to which the set in question is attached.
Last Number Redial (LNR)	Last No. Redial SHOW OK	If a stored number exists for the key, it is shown when the user presses the SHOW display key. The number is displayed in full or in part, depending on its length.

Feature Names Displayed during Key Inquiry

Key	Display	Description
SHOW	No number stored or Linennn... <dialing digits> VIEW→ OK	If a specific line (or line pool) has been stored with the number, it is shown on the display transiently for one second with an ellipsis character and no display keys (for example, Line001... or Line pool A to O...). The stored number is then presented.
Line pools	Line Pool <code>	<code> is the line pool code which is one of A to O for Modular systems.
Page zones	Page - General	
	Page Speaker	
	Page Zone <x>	Where <x> is the Page zone (1-6 for Modular systems).
Page	Page Zone <x>, Spkr	Where <x> is the Page zone (1-6 for Modular systems).
	Page All Zones	
	Page All, Spkr	
Saved Number Redial (SNR) SHOW	Saved Number SHOW OK <linename>... <dialing info> VIEW→ OK	If a stored number exists for the key, it is shown when the user presses the SHOW display key. The number is displayed in full or in part, depending on its length. The specific line (or line pool) that was stored with the number, it is shown on the display transiently for one second with an ellipsis character and no display keys, for example, Line001... or Line pool A to O... The stored number is then presented.
Speed Dial programmed key	Speed Dial SHOW OK Enter code: No number stored or <linename>... <dialing info> VIEW→ OK	Pressing SHOW prompts the user to Enter code so the user can view a stored number for a specific speed dial code. Pressing the OK display key returns the user to the Press a key prompt. If a line is stored with the Speed Dialer, it will display transiently.
Trunk Answer From any Station	Trunk Answer	
Feature access key for External Feature	Feature 9<xx>	9<xx> is the three-digit access code for the external feature.

Feature Names Displayed during Key Inquiry

Key	Display	Description
Other programmed feature access keys	<feature name>	<feature name> is one of the following: Background Music, Call Forward, Call Park, Call Timer, Cancel/Send Msg, Cancel Msg Wait, Conference, Contrast, Do Not Disturb, Exclusive Hold, Directed Pickup, Group Pickup, Link, Pause, Priority Call, Reply Message, Call Restr. Override, Ring Again, Send Message, SScheduled Services, Voice Call, Voice Call Deny.

1.2.3 Message Displays

Message	Description
Release calls	Displays transiently, accompanied by Error tone, if the user activates the feature while initiating or connected on a call, or while there is a held call or an incoming alerting call.
No number stored	Displays transiently if no number is stored on the key selected for the inquiry.
Not redirected	This specifies that the line about which the user has asked for more information (SHOW) is not redirected. This display is unchanged from that used by Key Inquiry of a line appearance.
Redir by <setname>	Specifies that the line about which the user has asked for more information (SHOW) was redirected by the set named. This display is unchanged from that used by Key Inquiry of a line appearance.

1.2.3.1 Presentation of stored numbers in Key Inquiry


If a specific line (or line pool) has been stored with the number, it is shown on the display transiently for one second with an ellipsis character and no display keys, for example, `Line001...` or `Line pool A to 0...`. The ellipsis character indicates to the user that there is more information. Additionally, the user would not think that the programmed key is a line key. The stored number is then presented.

If the stored number is 16 digits or less, the entire number appears on the display. Because stored numbers can be up to 24 digits long, users may require more than three seconds to view a stored number. Thus, an `OK` display key also appears with the stored number. When the user has finished viewing the stored number, pressing the `OK` display key returns the user to the `Press a button` prompt, and they can continue to see other stored numbers.



If the stored number is greater than 16 digits, the first part of the number is shown on the display. The display keys `OK` and `VIEW→` are provided. Two additional characters are also necessary in digit strings longer than 16 characters. An ellipsis character, `'...'` (taking up one character space) at the beginning of a group of digits indicates to the user that digits precede the digits appearing on the screen. An ellipsis at the end of a group of digits indicates to the user that more digits follow the digits appearing on the screen.

When the user is viewing the second half of the number, the **VIEW** key is provided.

1.2.3.2 Calls to a Set in Key Inquiry Mode

When a set is in Key Inquiry mode, the set rings to notify the user that a call has arrived. The incoming call does not overwrite the Key Inquiry display, and does not cancel Key Inquiry. The user can continue to press any key to view the contents of the display. Alternatively, the user can lift the handset to exit from Key Inquiry mode and answer the call automatically. To answer the call using Handsfree, the user must exit from Key Inquiry and then press .

1.2.3.3 Terminating Key Inquiry

The user exits from Key Inquiry mode by pressing , , or the **EXIT** display key on two-line display sets (M7310 set or M7324) or by removing or replacing the handset. If the user exits from Key Inquiry by removing the handset, a line may be automatically selected, depending on the settings for Prime Line.

Key Inquiry mode terminates automatically if no user input occurs for 60 seconds. No Error tone is present, unlike other feature timeouts.

1.2.4 OAM Programming View

N/A

1.2.5 **EXTN/**LINE

N/A

1.3 Technical Specification (Limits/Constraints)

N/A

1.4 Interactions

Feature or condition name	Interaction
Incoming calls	Incoming calls ring at the set but their call information does not overwrite the display. The user can answer the call by <ul style="list-style-type: none"> - lifting the handset - exiting Key Inquiry and pressing Handsfree, or lifting the handset
Pressing dialpad keys	Pressing a dialpad key during Key Inquiry resets the 60-second timer.
OAM Programming	Key inquiry cannot be performed during an OAM Programming session.
Remove handset during Key Inquiry	If the handset is removed during Key Inquiry, Key Inquiry terminates. If no Prime Line is programmed for the set, the user receives the message <i>No line selected</i> .
Hold	Held calls must be released before Key Inquiry can be performed.

Key Programming

1.1 Overview

1.1.1 Description

Each M7000 set has a number of memory (programmable) keys. Key Programming allows a number of features, as well as Internal and External Autodial numbers to be assigned to these keys.

This specification discusses:

- the general characteristics of Key Programming
- the keys that can be programmed for feature access
- the features that can be programmed on keys
- how to program keys for feature access

For information on programming Internal and External Autodial keys, refer to Internal Autodial and External Autodial specifications.

1.1.2 Rationale for Feature

Set keys are numbered for ease of use in OAM Programming. This allows the user to identify, navigate and program a key on any type of set, as well as any attached CAP modules at a destination set.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

Key Programming can be performed by an individual user at their set, using Feature keys (see End User View).

The list of features that can or cannot be programmed on a key, is shown in “Programming Keys” on page 9.


1.1.4.1 Default Key Assignments

When the system is first powered on, the programmable keys with indicators receive default assignments on all sets. These assignments are determined by the selection of a customer template in System Startup. (For more details, refer to **Startup and Default Templates.)

The Startup default template (PBX, Square or Hybrid) determines which internal and external lines appear on each type of set by default. Any remaining keys with indicators not assigned as Intercom keys, Answer keys, line keys or Handsfree keys receive features based on the customer template.

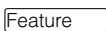


When an external line is added to a set, it displaces the feature, or Internal or External Autodial programming appearing on a key on that set. Similarly, when a line is removed from a set, a feature based on the customer template is added to the set. (Autodial keys are never added by default.)

Labelling Keys

The key caps for programmable keys are removable. Key caps for the most common features are inscribed with the feature name. Keys for other features, and for Internal and External Autodial, are labelled by inserting a printed or written feature label into a key cap that has a window on the top. Certain keys (such as ) are color-coded, to make the key easy to distinguish from other keys on the set.

1.2 Feature Details

1.2.1 Controls

  , programmable keys or dialpad




1.2.2 End User View

1.2.2.1 Displaying Key Assignments

When the end user is programming a key, no method is provided to allow the current contents of that key to be displayed. Before entering programming mode, the user can activate Key Inquiry to check the contents of any key.

1.2.3 User Programming View

The following table shows the steps taken by an end user to program feature access keys for their set. The table illustrates how the displays appear on two-line display sets (M7310 and M7324). One-line display sets (M7208, M7100) do not use display keys.

User Action	Resulting Display	Set Response
1. Press   	Program Feature Press a key	Transient, shows function activated. Prompts user to press a programmable key. (This display is not shown on the 7100.)
2. Press a programmable key (Can press Shift programmable key only on M7310 set)	Feature code: QUIT	Prompts user to enter a valid feature code.
3. Press the Feature key and digits for feature code	F<digits>_ QUIT CLEAR	Echoes input
4. Enter last digit of valid code	Programmed	Transient message advising user that the key is programmed.

The end user cannot program every feature to a key. Some features can be assigned to and moved from keys only through OAM Programming (for example, Intercom keys, Answer keys, line keys or Handsfree keys). See “1.3 Technical Specification (Limits/Constraints)”.

The following table lists the features that can be programmed on a key, and whether the feature uses an indicator, or not. Indicators are optional for all feature access keys. The table also shows which features can be cancelled by re-pressing

the key programmed to activate the feature (that is, pressing the key toggles between the activating and cancelling the feature.

Features that can be programmed on a key

Feature Code	Feature Name	Indicator used? (Y or N)	Feature is cancelled by re-pressing key (Y or N)
Feature <input type="text" value="8"/> <input type="text" value="1"/> <input type="text" value="5"/> Feature <input type="text" value="#"/> <input type="text" value="8"/> <input type="text" value="1"/> <input type="text" value="5"/>	Autobumping Cancel Autobumping	Y, if present	Y
Feature <input type="text" value="8"/> <input type="text" value="6"/> Feature <input type="text" value="#"/> <input type="text" value="8"/> <input type="text" value="6"/>	Background Music Cancel Background Music	Y, if present	Y
Feature <input type="text" value="4"/> Feature <input type="text" value="#"/> <input type="text" value="4"/>	Call Forward Cancel Call Forward	Y, if present	Y
Feature <input type="text" value="8"/> <input type="text" value="1"/> <input type="text" value="1"/>	Call Information	Y, if present	N
Feature <input type="text" value="8"/> <input type="text" value="1"/> <input type="text" value="2"/>	Call Log	Y, if present	N
Feature <input type="text" value="7"/> <input type="text" value="4"/>	Call Park	N	N
Feature <input type="text" value="7"/> <input type="text" value="7"/>	Call Timer	N	N
Feature <input type="text" value="8"/> <input type="text" value="2"/>	Camp-On	N	N
Feature <input type="text" value="*"/> <input type="text" value="8"/> <input type="text" value="3"/> <input type="text" value="2"/>	Custom Call Routing (CCR)	Y, if present	N
Feature <input type="text" value="3"/>	Conference/Transfer	N	N
Feature <input type="text" value="*"/> <input type="text" value="7"/>	Contrast	N	N
Feature <input type="text" value="7"/> <input type="text" value="6"/>	Call Pickup (Directed)	N	N
Feature <input type="text" value="7"/> <input type="text" value="5"/>	Call Pickup (Group)	N	N
Feature <input type="text" value="8"/> <input type="text" value="5"/> Feature <input type="text" value="#"/> <input type="text" value="8"/> <input type="text" value="5"/>	Do Not Disturb (DND) Cancel Do Not Disturb	Y, if present	Y
Feature <input type="text" value="7"/> <input type="text" value="9"/>	Hold (Exclusive)	N	N
Feature <input type="text" value="8"/> <input type="text" value="0"/> <input type="text" value="2"/> Feature <input type="text" value="#"/> <input type="text" value="8"/> <input type="text" value="0"/> <input type="text" value="2"/>	Group Listen Cancel Group Listen	Y, if present	Y
Feature <input type="text" value="5"/>	Last Number Redial	N	N
Feature <input type="text" value="6"/> <input type="text" value="4"/>	Line Pools	N	N
Feature <input type="text" value="7"/> <input type="text" value="1"/>	Recall	N	N
Feature <input type="text" value="8"/> <input type="text" value="1"/> <input type="text" value="3"/>	Logit	N	N
Feature <input type="text" value="8"/> <input type="text" value="0"/> <input type="text" value="8"/>	End-to-End Signaling (Long Tones)	N	N
Feature <input type="text" value="6"/> <input type="text" value="5"/> Feature <input type="text" value="#"/> <input type="text" value="6"/> <input type="text" value="5"/>	Message Waiting/Reply Cancel Message Waiting/ Reply	Y, if present	N
Feature <input type="text" value="8"/> <input type="text" value="0"/> <input type="text" value="1"/>	Offhook Call Queuing	N	N

Features that can be programmed on a key

Feature Code	Feature Name	Indicator used? (Y or N)	Feature is cancelled by re-pressing key (Y or N)
Feature <input type="text" value="6"/> <nn>	Page	N	N
Feature <input type="text" value="7"/> <input type="text" value="8"/>	Pause	N	N
Feature <input type="text" value="6"/> <input type="text" value="9"/>	Priority Call	N	N
Feature <input type="text" value="8"/> <input type="text" value="3"/>	Privacy Control	N	Y
Feature <input type="text" value="6"/> <input type="text" value="8"/>	Restriction Override	N	N
Feature <input type="text" value="8"/> <input type="text" value="7"/> <input type="text" value="2"/> Feature <input type="text" value="#"/> <input type="text" value="8"/> <input type="text" value="7"/> <input type="text" value="2"/>	Alternate Restriction Service Cancel Alternate Restriction Service	Y, if present	Y
Feature <input type="text" value="2"/>	Ring Again	Y, if present	N
Feature <input type="text" value="8"/> <input type="text" value="7"/> <input type="text" value="1"/> Feature <input type="text" value="#"/> <input type="text" value="8"/> <input type="text" value="7"/> <input type="text" value="1"/>	Extended Ringing Service Cancel Extended Ringing Service	Y, if present	Y
Feature <input type="text" value="8"/> <input type="text" value="7"/> <input type="text" value="3"/> Feature <input type="text" value="#"/> <input type="text" value="8"/> <input type="text" value="7"/> <input type="text" value="3"/>	Routing Service Cancel Routing Service	Y, if present	Y
Feature <input type="text" value="6"/> <input type="text" value="7"/>	Saved Number Redial	N	N
Feature <input type="text" value="8"/> <input type="text" value="4"/> Feature <input type="text" value="#"/> <input type="text" value="8"/> <input type="text" value="4"/>	Selective Line Redirection Cancel Selective Line Redirection	N	N (pressing the key brings up a dialogue)
Feature <input type="text" value="1"/> Feature <input type="text" value="#"/> <input type="text" value="1"/>	Send Message Cancel Send Message	N	N (pressing the key brings up a dialogue)
Feature <input type="text" value="8"/> <input type="text" value="0"/> <input type="text" value="3"/>	Show Time	N	N
Feature <input type="text" value="0"/>	Speed Dial	N	N
Feature <input type="text" value="8"/> <input type="text" value="7"/> <input type="text" value="0"/>	Show Service Modes	Y, if present	N
Feature <input type="text" value="*"/> <input type="text" value="8"/> <input type="text" value="3"/> <input type="text" value="1"/>	System Answer	Y, if present (at the Attendant Set only)	Y
Feature <input type="text" value="7"/> <input type="text" value="0"/>	Transfer	N	N
Feature <input type="text" value="8"/> <input type="text" value="0"/> <input type="text" value="0"/>	Trunk Answer From any Station (TAFAS)	N	N
Feature <input type="text" value="6"/> <input type="text" value="6"/>	Voice Call	N	N
Feature <input type="text" value="8"/> <input type="text" value="8"/> Feature <input type="text" value="#"/> <input type="text" value="8"/> <input type="text" value="8"/>	Voice Call Deny Cancel Voice Call Deny	Y, if present	Y
Feature <input type="text" value="8"/> <input type="text" value="0"/> <input type="text" value="4"/>	Wait for Dial Tone	N	N

Because external feature codes can be added to the system at any time by off-core applications, any three-digit feature code beginning with the digit 9 is considered valid.

To clear the display of input, the user (on a set with a two- line display) presses the CLEAR display key. There is no key (hard key) equivalent for the CLEAR display key.

An incomplete feature code is not stored. If the user presses the **[Ris]** key or the QUIT display key, or takes some other action to exit from user programming before entering a complete feature code, the new sequence is not stored.

Message Displays

Message	Description
Access denied	Displays if the user tries to activate the feature while OAM Programming is in progress at another set.
Hold or release	Displays if the user tries to program a programmable key while initiating or connected on a call.
Feature:	Displays when the [Feature] key is pressed to initiate a programming activity.
Feature moved	Displays this transient message when a feature or Internal Autodial number already on a key is programmed on another key.

Once a feature is programmed on a key, pressing the programmed key puts the user directly into the programmed activity.

1.2.3.1 Changing Key Assignments

Memory keys can be reprogrammed. However, if the user programs a key with a feature that already appears on another key at the set, the feature is automatically removed from its original location.

When this occurs, the original location becomes a blank key. This prevents complications that arise in cases where the feature makes use of an indicator. If access to a particular feature is moved from one key to another key, the new key retains the indicator status (that is, if the indicator was ON, it remains ON).

1.2.3.2 Erasing a Key

When **[Hold]**, **[Feature]**, or **[Ris]** keys are used as input terminators, the key does not get erased.

1.2.3.3 Command Mapping During End-User Programming

During end-user programming, the dialpad is used for selecting options and entering sequences to be stored. The **[Hold]** and **[Ris]** are used for control commands. Two-line display sets use display keys where possible, to make the commands more apparent and to provide the user with more control. No key overlay card is used, as it is in OAM Programming. Users should consult end user documentation in order to learn how to perform each programming activity.

The commands provided by display keys on the two-line display sets are mapped onto keys (hard keys) on all sets. The one-line display sets do not have display keys, so the user must use the key equivalents.

The following table describes the most frequently used display keys and their key equivalents, when programming a feature to a key. See the equivalent tables in Internal Autodial and External Autodial.

Meaning	Display key (Two-line Display sets)	Key (Hard Key) Equivalents
Quit this programming activity	QUIT	<input type="text" value="Rls"/> <input type="text" value="Hold"/> <input type="text" value="Feature"/> (if <input type="text" value="Feature"/> has already been pressed once)
Erase input	CLEAR (after <input type="text" value="Feature"/> has been pressed once)	No key equivalent

1.2.4 OAM Programming View

Feature access keys can be programmed for another user in one of two ways

- under the heading **Terminals&Sets**►**User preferences**►**Key prgrming** in OAM Programming, as shown in “1.2.4.1 Levels of Access”
- if the user is programming from a set with a two-line display, using the **User Preferences (**USER)** feature

See "Terminals&Extns - User preferences - Key programming".

See "Terminals&Extns - User preferences - Key programming - Feature key programming".

The user interface for customizing a set looks the same from within OAM Programming as from **USER. However, the steps to reach User Preferences are different. For more details on **USER, refer to the User Preferences feature.

1.2.4.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item			I	SC+	SC
Terminals&Extns	Individual Extn	User preferences	Key prgrming	X	X	X

1.2.4.2 Key numbers

Set keys are numbered starting at the top left with Key 1, with incrementing key numbers going down that column and, when appropriate, continuing the numbering at the top of the next column.

A two-digit numbering scheme is used. This accommodates any set model, as well as CAP modules.

1.2.4.3 M7100 memory key numbering

The M7100 has one programmable key.

B01

1.2.4.4 M7208 memory key numbering

The M7208 set has eight programmable keys with indicators.

B01
B02
B03
B04
B05
B06
B07
B08

1.2.4.5 M7310 memory key numbering

The M7310 set has ten single-memory (programmable) keys with indicators, and twelve dual-memory (shiftable programmable) keys without indicators.

The top left key/indicator pair (single-memory keys) is Key 1.

The dual-memory keys without indicators, appearing at the top of the M7310 set, can be programmed with one feature on the unshifted portion of the key and another feature on the shifted portion of the key. The user programs the shifted portion by pressing the Shift key and then pressing the key to be programmed.

A shifted dual-memory key is numbered before the unshifted one on the same key; this is so the key numbering matches the top-to-bottom labels on a key.

M7310 single-memory keys

B01	B06
B02	B07
B03	B08
B04	B09
B05	B10

M7310 dual-memory keys

B11	B19	B27
B12	B20	B28
B13	B21	B29
B14	B22	B30
B15	B23	B31
B16	B24	B32

M7310 dual-memory keys

B17	B25	B33
B18	B26	B34

1.2.4.6 M7324 memory key numbering

The M7324 set has 24 programmable keys with indicators.

B01	B13
B02	B14
B03	B15
B04	B16
B05	B17
B06	B18
B07	B19
B08	B20
B09	B21
B10	B22
B11	B23
B12	B24

CAP module key numbering

B01	B13	B25	B37
B02	B14	B26	B38
B03	B15	B27	B39
B04	B16	B28	B40
B05	B17	B29	B41
B06	B18	B30	B42
B07	B19	B31	B43
B08	B20	B32	B44
B09	B21	B33	B45
B10	B22	B34	B46
B11	B23	B35	B47
B12	B24	B36	B48

1.2.4.7 Programming Keys

The first display under `Button` programming shows the following information, depending on the set model or CAP module.

Model	Display
M7100	1 key
M7208	8 keys
M7310	10+24 keys
Quest cordless (See section "Key programming exception – Quest cordless terminal")	10+24 keys
M7324	24 keys
CAP module	48 keys

See "Terminals&Extns - User preferences - Key programming - Feature key programming".

Once the key to be programmed is selected, the user presses the `FEATR` display key.

The user can specify the feature to be programmed in one of two ways

- providing the feature code at the `Feature code:_` prompt
- pressing the `LIST` display key and selecting the feature by name (and code) from the list of programmable features

Selecting the feature using the Feature code prompt

This option is offered first, because the user may know the feature codes and does not need to scroll through the list of features. (For a list of these features as they display in User Preferences programming, see "Feature codes and Key programming" on page 12 at the end of this document.)

Pressing the `Feature` key is not required as the first key press. If the `Feature` key is pressed, the letter F is echoed to the display. (If the `Feature` key is pressed again, nothing happens.)

Only valid feature codes are accepted. Invalid feature codes are blocked. (See "Feature codes and Key programming" on page 12.) The hangman game style for data input is not used here, because feature codes can be one, two or three digits long.

Feature codes can include * (Language Choice, Display Contrast) and # (Cancel Send Msg, Cancel Reply Msg).

When programming a Line Pool key, the user must specify the feature code (64) and then the code for the specific line pool, as in

```
Feature code:6428_
or
```

Feature code:F6428_

Selecting the feature by name and code

A list of the programmable features is displayed by name and code (see “1.5 Feature codes and Key programming” at the end of this document). The user moves through the list by pressing the **NEXT** key, and selects a feature from the list by pressing the **OK** display key. This option is offered for a user who does not remember feature codes.

Where necessary, the feature name is abbreviated to 11 characters or less, to allow for key numbers of the format **Bnn**, and to allow for the more info character ‘...’.

No **UNDO** capability is available when the programming of a key is finished. To clear a programmed feature, an Internal Autodial number, or an External Autodial number from a key, the user presses the **CLR** display key. The display then shows **Bnn:Blank key**.

How Key Information is Shown in User Preferences

Only the keys that can be programmed in User Preferences (feature access, External Autodial, and Internal Autodial keys) have an associated group of display keys in User Preferences. The keys defined elsewhere in OAM Programming, that cannot be programmed by the end user, do not have associated display keys in User Preferences. For more information, see “Line, Intercom, Answer and Handsfree Keys” on page 10.

1.2.5 ****EXTN/**LINE**

N/A


1.3 Technical Specification (Limits/Constraints)

Key Programming is stored in non-volatile memory (NVRAM). It survives warm but not cold restarts.

Only M7000 series terminals can be programmed through User Preferences. Other terminal types are not supported.

Off-core applications that use feature codes cannot be programmed onto a key using User Preferences (****USER** or through OAM Programming). For another method, see Extn Copy in “1.4 Interactions”.

Line, Intercom, Answer and Handsfree Keys








Line keys, intercom keys, Answer keys, and the  key

- are assigned to, or removed from, a set only through OAM Programming
- cannot be reprogrammed by the end user

If the user attempts to reprogram these keys, the set exits from the programming activity, and performs the action associated with the key that was pressed.

1.4 Interactions

See also the Interactions in User Preferences.

Feature or condition name	Interaction
Active calls	The user cannot program a feature key while initiating or connected on a call. (The user can hold the call and then program the feature key.) If the user is programming a number, and answers an alerting call, programming ends and the programming is not stored. For more information, refer to User Preferences.
Call Identification	During an end-user programming activity, an incoming call does not show Call Identification on the display, but the call appears on a line indicator, rings, and can be answered (resulting in an exit from the programming activity).
Call Forward	If activated at the set before an end-user programming activity begins, Call Forward reroutes incoming calls in the normal manner while the set is in programming mode.
Custom Call Routing (CCR) Auto Attendant	If the Auto Attendant is turned off, the user will still be allowed to assign CCR to a programmable key. However, if CCR is programmed on a key when the Auto Attendant is OFF, and the user presses the key, <code>Denied in admin</code> will be displayed transiently.
Incoming calls	Ringing for incoming calls occurs normally during end-user Key Programming.
OAM Programming	A feature access key cannot be programmed (by an end-user) while OAM Programming is in progress on any set in the system.
Pressing other keys during Key Programming	<p>If an end user is involved in a programming activity other than Key Inquiry and presses either a line key or , or operates the hookswitch, the set exits from the programming activity and performs the telephony action.</p> <p>If the keys  and  are not mapped to display key functions during a programming activity, pressing them also causes an exit from the programming activity.</p> <p>The end user must press the  key to program a feature. The next press of the  key exits the session. In OAM Programming, the user has the option of pressing the  key to begin programming a feature, or not. The user is blocked from pressing the  key twice in a row in OAM Programming.</p> <p>Pressing the Volume bar does not backspace.</p>
Extension Copy	If the source and the destination set are the same model, programmed keys can be copied from one set to the other. This includes keys programmed for off-core applications such as Voice Mail.
Extension Relocation	Key Programming information is saved when a set is moved from one port to another when Extension Relocation is set to Y.

Feature or condition name	Interaction
System Answer	System Answer can be programmed to be on any programmable key at any set. If the key has a lamp associated with it and the key is on the attendant set, the lamp will reflect the status of the feature, i.e. it will be lit if System Answer is ON, and not lit if System Answer is Off. Due to technical limitations, it will not be possible to update the state of the feature on lamps at other sets that have system Answer on a programmable lamp key. Users at these sets will be able to access the feature through the key and subsequently view and change the state of the System Answer feature.

1.5 Feature codes and Key programming

This section lists the features that can be programmed on a key, and those that cannot. Feature names are at most 11 characters long, for example

```
Bnn : FEATURENAME...
1234567890123456
```

Feature names longer than 11 characters are abbreviated to fit the 16-character format.

The following table shows

- the features that can be programmed on a key
- the text that displays while the user is in the User Preferences feature in OAM Programming

The order of items in the feature name list follow the feature numbering scheme. The feature numbering scheme was originally designed to have the more frequently used features with single-digit codes, and the rest with two-digit codes. As more features were added, the shortage of two-digit codes necessitated the use of three-digit codes.

For more information on Key Programming, see the following specification:

- Key Inquiry

Feature codes that can be programmed on a key (displayed in User Preferences programming)

Display	Feature name
F 0	Speed Dial
F 1	Send Msg
F#1	Cancel Send Msg
F 2	Ring Again
F 3	Conf/Trans
F 4	Call Fwd
F 5	Last No.
F 60	Page Genrl

Feature codes that can be programmed on a key (displayed in User Preferences programming)

Display	Feature name
F 610	Pg zone All
F 611	Page zone 1
F 612	Page zone 2
F 613	Page zone 3
F 62	Page Spkr
F 630	Pg All, Spkr
F 631	Page Spkr+1
F 632	Page Spkr+2
F 633	Page Spkr+3
F 64	Line Pool <Line Pool code>
F 65	Reply msg
F#65	#Reply Msg
F 66	Voice Call
F 67	Saved No.
F 68	Rst O'ride
F 69	Priority
F 70	Transfer
F 71	Link
F 74	Call Park
F 75	Grp Pickup
F 76	Dir Pickup
F 77	Call Timer
F 78	Pause
F 79	Excl. Hold
F 800	Trunk Answr
F 801	Call Queue
F 802	Grp Listen
F 803	Show Time
F 804	Wait:Dial
F 807	Ringng call

Feature codes that can be programmed on a key (displayed in User Preferences programming)

Display	Feature name
F 808	Long Tones
F 811	Call Info
F 812	Call Log
F 813	Logit
F 815	Log O'flow
F 82	Camp-On
F 83	Privacy
F 84	Line Redir
F 85	DND
F 86	Music
F 870	Srvc Stat
F 871	Ring Service
F 872	Rstrn Service
F 873	Route Service
F 88	Voice Deny
F*501	Language (Toggles through all available languages.)
F*7	Contrast
F*831	System Ansr
F*832	CCR

Feature codes not used in any Norstar product

F 73	F 816
F 806	F 819
F 810	F 89
F 814	

The user is blocked from entering the last digit of these codes.

UK Feature codes not included in Compact Plus

Feature Code	Feature name
F 809	ATA Tones
F 818	Call Charge

The user is blocked from entering the last digit of these codes.

Feature codes that cannot be programmed on a key

Feature Code	Feature name
Feature 8 0 5	Station Set test
Feature 8 1 7	Transfer to IRAD
Feature * 0	Key Inquiry
Feature * 1	Program External Autodial
Feature * 2	Program Internal Autodial
Feature * 3	Program feature key
Feature * 4	Program User Speed Dial
Feature * 5 0 2	French
Feature * 5 0 3	Spanish
Feature * 6	Ring Type
Feature * 8 0	Ring Volume
Feature * 8 1	Moving Lines
Feature * 8 2	Onhook Dialing Options
Feature * 8 3 3	Greeting and CCR menu administration
Feature * 8 4	Call Log options (Autologging)
Feature * 8 5	Call Log password
Feature * 9	Run/Stop
Feature * * n...	Any of the feature codes with prefix of **

The user is blocked from entering the last digit of these codes, except for F**, which is blocked at the second asterisk (“**”).

Language Choice

1.1 Overview

1.1.1 Description

In the UK, this feature allows the display information to be available in English, and in a mode for use with VIOC (visually impaired operator's console).

1.1.2 Rationale for Feature

In many markets, an alternate language is used within an office. The language used varies. Programming this choice on a feature code allows individual sets to be customized.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

Language Choice is one of a set of User Preferences features that can either be programmed by

- an individual user at their set, using Feature keys (see "1.2.3 End User View")
- for another user by the installer, system coordinator plus, or system coordinator, through OAM Programming (see "1.2.4 OAM Programming View")
- for another user by a user with the Installer, System Coordinator Plus, System Coordinator, or Basic password, using the User Preferences feature, **USER (see "1.2.4 OAM Programming View", and the User Preferences feature)

1.2 Feature Details

1.2.1 Controls

Feature * 5 0 1, or programmed key

Feature * 5 0 2

1.2.2 Message Displays

Message	Description
In English	Appears transiently when the language is changed to English.
<In Operations>	Appears transiently when the language is changed to operations mode for a visually impaired operator's console (VIOC).

1.2.3 End User View

The display provides prompts and display keys in one of three languages, as specified by the individual user. To control whether the information on the display appears in English or one of the alternate languages, activate the appropriate feature code. The display changes immediately to the selected language.

The following tables show the steps taken by an end user to program Language Choice for their set.

To select the language used for messages on the display, proceed as follows in the UK.

User Action	Resulting Display	Set Response
Press <input type="text" value="Feature"/> * 5 0 1	In English...	Transient display, then return to display for current state using English format.
Press <input type="text" value="Feature"/> * 5 0 2	<In Operations>...	Transient display, then return to display for current state, using training mode (VIOC).

Foreign characters can be displayed. Other language-specific characteristics are also supported, such as differences in the formatting of time and date information.

The display language can be changed at any time, regardless of the telephony state.

Ringing for incoming calls occurs normally during Language Choice programming.

1.2.3.1 User Programming View

For cases in which the same set is being shared by English and alternate language users, feature code * 5 0 1 can be assigned to a programmable key. This Language Choice key cycles the set between the English and alternate language modes.

Feature codes * 5 0 2 and * 5 0 3 cannot be assigned to programmable keys. The key does not use an indicator.

1.2.4 OAM Programming View

Language Choice can be programmed two different ways

- from within OAM, when an installer or system coordinator is programming system data for a set, under the heading of
Terminals&Sets►User preferences►Language:English
- by using a feature code (**USER) and any one of the four OAM programming passwords: Installer, System Coordinator Plus, System Coordinator, or Basic

See ["Terminals&Extns - User preferences"](#).

1.2.4.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes in OAM Programming.

Heading	Item			I	SC+	SC
Terminals&Sets	Individual set	User Preferences	COPY	X	X	
			Language:English	X	X	X

1.2.4.2 Programming Language Choice through **USER

If the user is using a set with a two-line display, Language Choice can be programmed using **USER. The user, installer, or system coordinator changes

the language setting for the set by pressing the **CHANGE** display key to cycle through the options. For more details, refer to the User Preferences feature.

1.2.5 ****EXTN/ **LINE**

N/A

1.3 **Technical Specification (Limits/Constraints)**

Only M7000 series terminals can be programmed through User Preferences. Other terminal types are not supported.

On the M7208, M7310 and M7324 sets, the key caps for **Hold**, **Rls**, **Feature**, and the programmable keys are removable to support alternate language labeling.

1.4 **Interactions**

See also the interactions in the User Preferences feature.

Feature or condition name	Interaction
Extension Administration Lock	Language choice can not be changed if Extension Administration Lock is set to Full or Partial
Extension Relocation	Language Choice settings are preserved if a set is moved to a new port and Extension Relocation is ON .

Last Number Redial

1.1 Overview

1.1.1 Description

The Last Number Redial (LNR) feature allows a user to redial the last external number dialed from their set, automatically.

1.1.2 Rationale for Feature

See “1.1.1 Description”.

1.1.3 General Definitions

Term	Explanation
LNR	Last Number Redial
SNR	Saved Number Redial

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls

or Last Number Redial programmed key

1.2.2 Caller View

When a user makes an external call, the dialing sequence and the line used for the call are automatically stored in the Last Number Redial buffer. This occurs every time a user makes an external, even if the call does not connect successfully. The user can then access the Last Number Redial buffer by pressing or a key programmed for Last Number Redial.

The stored number can be up to 24 digits long.

If no line is stored or no line is selected before dialing, LNR attempts to select the set's Prime Line automatically.

The line selected can be incorporated as part of the stored number. If an external line is selected before LNR is activated, the digits are dialed on the selected line, rather than the line stored with the dialing sequence.

LNR is a special case of Autodialer, and supports the same features as external Autodialers. (For more information, refer to Autodial-External.)

A stored number can be entered in an External Autodial sequence by pressing the LNR or the Saved Number Redial (SNR) feature code. (For more information on Saved Number Redial, see the specification of that name.)

If LNR is used to dial a number for which a name has been defined in OAM Programming, that is, a System Speed Dialers, `Hidden number` is displayed at dial time.

The effect of activating Last Number Redial depends on the telephony state of the user's set. For more information, see the Automatic Outgoing Prime Line Selection by a Feature section of Line Selection.

If an external line is selected before LNR is activated, the digits are displayed and dialed on the selected line automatically.

1.2.3 Message Displays

Message	Description
No last number	Appears if no external number has been dialed since the set was last powered up.
No number stored	Displays transiently, with Error tone, while programming a Speed Dial sequence if the user activates LNR when the LNR buffer is empty.
Select a line	Displays transiently, accompanied by Error tone, if the user attempted Automatic Outgoing Line Selection, and the line used when the call was originally made is in use. Select a line and activate LNR again.
<last number digits>	Displays the digits of the last number redialed unless the number was generated from a named System Speed Dialer.
Last No. Redial SHOW OK	Transient display when Key Inquiry is activated. To view the stored dialing information, press the SHOW display key.
<linename>...	When the SHOW display key is pressed during Key Inquiry, transiently displays the line on which the call was made.
...<last number digits>... <-VIEW-> OK	Follows <linename> as display during Key Inquiry. Displays the dialing sequence associated with LNR Redial key, unless the number is hidden (see Hidden number). If the dialing sequence contains more than 16 characters, the VIEW display key is presented.
Hidden number	Transient message that displays - if the last number redialed is generated from a named System Speed Dialer, where (Display digits:N) in OAM Programming. - on Key Inquiry of LNR when it contains a named System Speed Dialer, or a System Speed Dialer, where Display digits:N in OAM Programming.

The digits dialed on an outgoing external line are stored, regardless of the duration or status of the external call. The software does not distinguish between digits dialed in dial-tone state and digits dialed on a connected call. If the user dials digits on an outgoing external line and then disconnects the call, the digits are stored in the Last Number Redial buffer, regardless of how soon the disconnection is performed.

The Last Number Redial buffer for the previous external call is cleared when the user begins dialing on the next external call.

Dialing an internal call or on an incoming external call does not affect the Last Number Redial buffer. Similarly, if the user activates the Last Number Redial feature while active on an incoming external call, or on an external outgoing call on which digits have been dialed, the activation is ignored, as the intent of such an activation is ambiguous. No message is displayed, and no tone is generated.

LNR stores the line pool access code and the external line access code as part of the predialed number. When LNR is activated, external line access codes are displayed together with the other digits, but line pool digits are not displayed

Calls made with LNR do not provide audible dialing feedback.

1.2.4 **EXTN/**LINE

N/A

1.3 Technical Specification (Limits/Constraints)

Named System Speed Dial numbers can be stored in, and subsequently dialed from, the LNR buffer; but the numbers remain hidden from the user, even on Key Inquiry. (The display shows `Hidden number`.)

If LNR contains an external System Speed Dial number, it can be used to program an Autodialer only if the Speed Dial number is not hidden in OAM Programming (`Sys speed dial▶Speed dial #:nn▶Display digits:N`).

The Last Number Redial buffer is not saved over power interruptions or set relocation.

1.4 Interactions

Feature name	Interaction
Autodial - External	LNR can be used to program an external autodialer.
Call Log	Calls dialed from the Call Log are captured in the Last Number Redial buffer.
* , # PBX Reach Through Pause Recall Run/Stop Time Release	Special keys *, #, and PBX Reach Through codes can be stored in the Last Number Redial buffer. Reachthrough code digits are immediately replaced with the appropriate symbol.
Direct-dial	LNR stores the Direct-dial digit if it is for an external destination.
Dial Pad Feedback	Calls made by Last Number Redial do not provide audible dialing feedback to the user.
Dialing Options	If Automatic Dialing is in progress but not completed, the dialing sequence associated with the Last Number Redial key is added to the end of the dialing sequence. If Predial Dialing is in progress, activating LNR replaces the digits previously dialed until a line is picked up.

Feature name	Interaction
End-to-End Signaling (Long Tones)	The End-to-End Signaling (Long Tones) feature code is not captured by Last Number Redial. Last Number Redial sequences do not generate End-to-End Signaling on external lines, because there is no way to determine the length of the tone for each digit. If Last Number Redial is activated while the telephone is in End-to-End Signaling mode, that mode is canceled. The telephone reverts to its previous signaling mode (pulse or short tones), and sends out the stored digits using that mode.
Expensive Route Warning	When the LNR buffer is for an external Direct-dial destination, only the Expensive Route Warning Tone is provided. The normal transient display is not shown.
Hold-Automatic	A connected call is held automatically if the user activates LNR.
Recall	The user can store Recall as part of a Last Number Redial sequence.
Routing Tables	Last Number Redial (LNR) and Saved Number Redial (SNR) work for calls across the private network just as they do for other external calls, even though transparency would dictate that such calls would be treated like internal calls (LNR and SNR do not work for internal calls). If a user uses Key Inquiry to determine the digits stored, digits dialed on the outgoing trunk are displayed. Routing Digits that were not transmitted are not displayed.
Selective Line Redirection	The digits stored in the Last Number Redial buffer can be used for programming Selective Line Redirection.
Set relocation	The LNR buffer is erased when a set is relocated.
Signaling mode	The signaling mode (pulse (DP) or tone (DTMF)) on an external line is determined by the line, and not by the mode used when the last number was saved.
User Speed Dial	If Last Number Redial is activated during the programming of a Speed Dialing sequence, the number stored in the Redial memory key is appended to the current digits of the Speed Dial programming. If not enough space is left in the 24-character limit to append the number stored in the Redial memory key, as many characters as possible are appended. If the Redial key is pressed, and no number is stored in the key, the transient message <code>No number stored</code> displays, together with Error tone.
System Speed Dial	If the number in the LNR buffer came from a named System Speed Dialer, it cannot be programmed onto an Autodial key. If the user selects LNR at the <code>Program</code> and <code>OK</code> prompt, they are presented with Error tone and the transient message <code>Hidden number</code> , and the Autodial feature is terminated.
Transfer	Last Number Redial can not be used to specify the destination of a Transfer.

Line Assignment

1.1 Overview

1.1.1 Description

External line keys provide direct access to calls originating or terminating outside the Norstar system.

Line appearances are assigned to appear and/or ring at sets in OAM Programming.

1.1.2 Rationale for Feature

The existence of multiple internal and external line keys provides a type of call waiting function, by allowing the user to be alerted of an incoming call while connected on another call, and to answer the waiting call if desired.

Having calls appear at separate line keys allows the user to switch between calls and manipulate Conference parties easily.

External line keys are used to initiate and answer calls for parties outside of Norstar.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls

- line keys (for sets other than Basic sets)
- programmed keys that access external lines (for example, External Autodial keys)
- dialpad keys

1.2.2 End User View

Every call on the M7208, M7310 and M7324 sets appears on a separate line key, if one is available. (If set in OAM Programming, an incoming external call can ring at the intercom, if all line keys are in use. See Intercom Keys.)

External line keys provide direct access to calls originating or terminating outside the Norstar system. External Line Access is assigned in OAM Programming. Indirect access through a Line Pool, External Line Access Code, or Routing Table can also be set in OAM Programming. (For more information, see those features.)

A user can dial an external call using the dialpad, a Speed Dial entry, an Autodial key, Saved Number Redial, or Last Number Redial.


Despite the fact that Basic sets do not have indicators, lines can be assigned to `Appear&Ring` at a Basic set. However, incoming calls will only ring at a Basic set. Outgoing external calls are placed by dialing the External Line Access code, Line Pool code or Destination code into an intercom dial tone followed by the

external number. For more information about incoming and outgoing external calls for Basic set users, see Intercom Keys and External Line Access Code.

Pressing an idle external line key or entering a Line Pool code or External Access code into internal dial tone produces external dial tone from either a host PBX or a CO trunk.

If the line is idle, or has been exclusively held at another set, the indicator is OFF. If normal Hold is applied at another set, the indicator shows the U-Hold flash rate. If Hold is applied at this set, the indicator shows the I-Hold flash rate. In all cases, the indicator changes to ON when the line key is pressed. For information on the behavior of external line indicators during a held Conference, see the Conference feature.

If the line is alerting at the set, the indicator shows the ringing flash rate, and goes ON when one of the following occurs:

- the user presses a line key (Preselection)
- the key is automatically selected (Automatic Incoming Line Selection)
- the user presses 

For more information on the behavior of the set when the user presses a line key in various situations, refer to the Line Selection feature.

Digits dialed on an external line are echoed to the display.

Dial-tone timeout and interdigit timeout are not imposed by Norstar on external lines. Such timeouts may be imposed by the remote switch, however.

Operations that can be performed on incoming external calls include the following:

- Call Forward
- Call Park
- Call Pickup
- Call Duration Timer
- Conference
- Do Not Disturb
- End to End Signaling
- Group Listen
- Hold (Manual, Automatic, Exclusive)
- Handsfree
- Privacy Control
- Release
- Saved Number Redial
- Transfer
- Trunk Answer from Any Station

The highest priority incoming external call controls the audible Ring Cadence at the set

1.2.3 Message Displays

Message	Description
<digits dialed>	The dialed out digits are displayed.
In use: <setname>	Appears transiently, accompanied by Error tone, if the user tries to access an external line already in use at another set.
Line denied	Displays when the user attempts to access another user's Private Line.

1.2.3.1 Ringing

Once ringing has been enabled for the line, incoming external calls on a line attempt to ring at the set.

Lines that ring at intercom are no different from lines that ring at other keys, except for the location of the flashing indicator.

If a line is not programmed to ring at any set, it automatically rings at the Prime Extension for that line, provided that the Prime Extension has an appearance of the line. Otherwise, it rings at the Prime Extension's intercom key.

The call does not ring anywhere in the system if one of the following conditions exists at the Prime Extension

- the set does not have an appearance of the line, and has no intercom key available for that call
- the set is in Do Not Disturb mode
- the set is forwarded to a set that cannot ring (for example, a set that is unplugged, out of service, in a OAM Programming session)

On a set where incoming lines are programmed to ring at the intercom, if no intercom keys are available to present a new incoming call, the caller hears Ringback, but the line does not ring audibly at the set.

1.2.4 OAM Programming View

1.2.4.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item			I	SC+	SC
Terminals&Extns	Individual extn	Line access	Line assignment	X	X	

1.2.4.2 Programming Ringing Line Preference

Line assignment and Ringing Line Preference is controlled in **Terminals&Sets**►**Line access**►**Line assignment**►. Each external line can be programmed to appear once for each set, on a key with an indicator. A line can appear on as many sets as desired and a set can be assigned to have as many lines as it has keys with indicators.

To set the ringing assignments for the lines on a given set, at the `Show line:` prompt, the user enters a valid line number from 001 to 008 to select the line. At the `Lnnn:<line assignment>` prompt, a line can be assigned to:

- not be assigned to the set at all (`Unassigned`)
- ring at the intercom (`Ring only`)
- ring and appear at a line key (`Appear&Ring`)
- appear at a non-ringing line key (`Appear only`)

The startup default for the Square template is for Lines 001 and 002 to `Appear&Ring`, and all other external lines are `Unassigned`.

Lines cannot appear on a Basic set. Assignment to appear is ignored in the case of the Basic set.

[See "Terminals&Extns - Line Access - Line Assignment".](#)

1.2.5 ****EXTN/ **LINE**

N/A

1.3 Technical Specification (Limits/Constraints)

If line keys are assigned to the set, the set must have indicators.

Basic sets do not have programmed line keys. External lines can be programmed to ring at the intercom key (see Ringing Line Preference). External lines can be accessed by dialing an External Line Access code into dial tone at the intercom key (see External Line Access Code).

1.4 Interactions

Feature or condition name	Interaction
Call Forward	The Call Forward feature forwards ringing of incoming calls.
Call Pickup	Call Pickup can be used to answer external Ringing Calls.
Call Restrictions and Overrides	<p>Call Restrictions and Overrides apply to outgoing external calls. Restrictions can be applied to outgoing external calls on a line-by-line, and set-by-set basis.</p> <p>An external line that appears on one or more sets can be set up so that only incoming calls are possible. This is done by assigning a Call Restriction of <code>*</code> to the line, meaning that all outgoing calls on that line are denied (except when the Restriction Override is used).</p>
Delayed Ring Transfer	If a line ringing at a set also appears on the Prime Extension, but that line is programmed not to ring at the prime set, Delayed Ring Transfer attempts to extend ringing to the Prime Extension for that line after the number of rings specified in OAM Programming.

Feature or condition name	Interaction
Line Selection	Automatic Outgoing Line Selection can be used to select an idle external line, if the set has no active calls and a Prime Line has been programmed for the set. Automatic Incoming Line Selection can be used to select a ringing external line.
No intercom keys free	On a set where incoming lines are programmed to ring at the intercom, if no intercom keys are available to present a new incoming call, the caller hears Ringback, but the line does not ring audibly at the set.
Private Line	The Private Line feature provides restricted access to external lines.
Prime Extension	See "1.2.3.1 Ringing".
Extension Copy	Line access attributes (such as Lines) can be copied from one set to another, one group at a time.

Line Pools

1.1 Overview

1.1.1 Description

This feature allows each external line CO line or AC15 line to be assigned to

- 3 outgoing line pools (A, B, and C) for Compact Plus systems
- 15 outgoing line pools (A to O) for Modular Plus systems

and accessed using line pool access codes defined in OAM Programming.

1.1.2 Rationale for Feature

With line pools, an office can reduce operational costs by renting fewer CO lines from the phone company. This is called line concentration. Most users are not on the phone making outside calls for 100% of their time. For example they may receive incoming calls, make internal calls, and have business to attend to that does not require a phone. Therefore, a business does not need a one-to-one relationship between CO lines and end user's sets.

Businesses can group several lines into a line pool, and give many people access to that pool for outgoing calls. The lines are accessed on a first-come-first-served basis. The ratio of CO lines to users varies, depending on the type of business.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls

- Intercom key plus line pool access code, or
- Line pool programmed key (for a specific line pool), or
- Feature 6 4 plus line pool access code
- Handset, if lifting it accesses the Prime Line

1.2.2 End User View

To access an idle line in the line pool, the user can:

- press a line pool programmed key
- dial the feature code and the line pool access code
- select an idle intercom key and dial the line pool access code
- go offhook or press Handsfree (if the set's Prime Line is assigned as line pool)
- use the Exchange code

If a line is selected as a result of one of these actions, and if the line appears on the set, the call appears on that line key. If the line does not appear at the set, an intercom key is used to represent the call.

1.2.3 Message Displays

Message	Description
Code :	Appears after <input type="text" value="Feature"/> 6 4 is entered. Prompts the user to enter a line pool access code.
Denied in admin	Displays if access to the requested line pool is denied by OAM programming. - accompanied by Overflow tone if accessed using the intercom key - accompanied by Error tone, if accessed using <input type="text" value="Feature"/> 6 4 .
Invalid code	Displays transiently if the user enters an incorrect line pool access code. - accompanied by Overflow tone if accessed using the intercom key - accompanied by Error tone, if accessed using <input type="text" value="Feature"/> 6 4 .
No free lines	Displays transiently, accompanied by Busy tone, if no lines are available in the designated pool.
No key available	Displays transiently, accompanied by Error tone, if there is no appropriate key on the set at which the line can appear.
Select a line	Displays, accompanied by Error tone, if an automatic external dialing feature is activated but no line pool is assigned to the set.

Line pool keys do not require indicators. If an indicator is associated with a Line Pool key, it becomes active (shows solid) when all the lines in the line pool are busy, or no lines have been placed in a line pool. When a line becomes available in the line pool, the indicator turns off. The status of the indicator permits the user to see whether an line in a line pool is available.

The indicator of the intercom key or external line key becomes active when it is selected by activation of the Line pool feature.

Once the line has been accessed, the indicator is solid, and the call follows the normal rules for outgoing external calls.

The fact that a line is in a line pool does not prevent it from appearing on any sets in the system (For example, in OAM Programming sets can also be assigned to have an appearance of the line). Incoming calls show visual indication at such appearances (the indicator flashes) and the line rings if set in OAM Programming to do so.

No requirement exists for any line to appear on any set, whether or not the line is in a line pool. If a line is in a line pool but does not appear on any set, and if no prime set is defined for that line, incoming calls on that line cannot be answered.

Incoming calls do not appear on a Line Pool key, and a Line Pool key cannot be used to answer calls.

A line pool can be assigned to a set as its Prime Line. For details, see the Line Selection feature.

If the Line Pool feature is selected and no lines are available in the designated pool, Busy tone is presented at the set, along with the message `No free lines`. If a one or more lines are placed in a line pool, the Ring Again feature allows users to queue on that specific line when it is busy, in order to receive notification when the line becomes available. This relieves the user of the need to make repeated attempts to access a specific line.

Ring Again on a line pool by more than one set at a time is allowed. For details, see the of the Ring Again feature.

Key inquiry of a programmed Line Pool key presents the line pool name (for example, Pool A) rather than identifying the pool by reference to the access code.

1.2.3.1 User Programming View

The user can program a different Line Pool key for each line pool. For the key to work, the set must be given access in OAM Programming to the line pool, and at least one outgoing line must be assigned to the line pool.

To program a key, when the display asks for `Feature code`, the user enters:

`Feature` and a one- to four-digit `<line pool access code>`.

Specific line pools can be specified for use in speed dialers and autodialers (although route transmission is handled differently in the two cases).

1.2.4 OAM Programming View

Programming line pools and line pool access involves three steps

- assign lines to line pools
- permit or deny each set access to one of the line pools
- program the access code for each line pool

These steps are discussed below.

1.2.4.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item			I	SC+	SC
Lines	Individual lines	Trunk/line Data	Line type:Public	X		
Terminals&Extns	Line access	LinePool access		X	X	
System prgrming	Access codes	Line pool codes	Line pool A:nnnn	X		
			Line pool B:nnnn	X		

1.2.4.2 Programming Line Pools

See "Lines".

In `Lines►Individual lines►Trunk/Line Data`, the user defines the `Line type` for a line as `Public`, `Private to`, or as a member of one of the line pools.

The `CHANGE` display key is pressed to cycle through the line pools (A through C in Compact Plus and A through O in Modular Plus) available for selection.

The template assigned to the set at Startup can assign the lines associated with trunks to line pools by default. For detail, see the Modular Plus Default Templates or Compact Plus Default Templates.

Installing Line Pools

To minimize the possibility of glare (that is, answering an incoming call before it starts ringing) when selecting a line from the line pool, the system selects the idle external line that has the highest line number in the pool. Therefore, the system should be installed so that for each line pool, the external line that is least likely to be used for an incoming call is attached to the port with the lowest port number (highest line number), and the external line that is most likely to be used for an incoming call is attached to the port with the highest port number.

1.2.4.3 Programming Set Access to Line Pools

See "[Terminals&Extns - Line Access](#)".

In `Terminals&Extns►Line access►LinePool access` each set can be allowed or denied access to each of the line pools.

Giving a set permission to access the line pool does not assign a Line Pool key to the set, except in the case where this assignment is done as the result of the template assigned in System Startup. If there is no key assigned by a template, if a key is desired, it must be assigned to the set through User Programming.

1.2.4.4 Programming Line Pool Access Codes

See "[System Programming - Access Codes](#)".

A one-to four-digit access code for each line pool is programmed in `System Prgming►Access Codes►Line pool codes`.

The codes for different line pools can be different lengths, and this length is not dependent on the length specified for the DNs in the system.

Changing a line pool access code does not change the function of a key programmed to access that line pool (that is, the key is associated with the line pool number rather than the line pool access code). When a line pool access code is changed in OAM Programming and a programmed key to access that line pool exists, the access code on that key is updated to reflect the access code change.

1.2.5 **EXTN/ **LINE

N/A

1.3 Technical Specification (Limits/Constraints)

Modular Plus systems allow 15 line pools to be defined: A to O.

Compact Plus allows 3 outgoing line pools to be defined: A, B, and C.

For consistent operation, all lines in a pool should have the same filters assigned for each Restriction mode.

In order to work properly Line Pools require appropriate parameter settings in OAM Programming. For example, in order for a line pool key to function, the set must be permitted to access the line pool, and at least one external line must be assigned to the pool. In a case where the settings are not correct, the user can still program the feature onto the key, with no error message displayed. However, the feature does not operate until the OAM Programming settings are altered.

1.4 Interactions

Feature or condition name	Interaction
Active or alerting line	If the system accepts a user's line pool request but the intended line enters active state or alerting state before it can be allocated to that user, the set generates Overflow tone and displays a <code>Line in use</code> message.
Call Capture	In some cases, an external line may be administered to allow it to be used for outgoing calls only. This is done by placing the line in a line pool, but not giving any set an appearance of the line. In this case, the line will not ring at any set.
Class of Service Remote capabilities	Once a remote user has successfully gained access to a Norstar system, they can dial a line pool access code.
Dialpad characters * and #	The dialpad characters asterisk (*) and octothorpe (#) cannot be included in any line pool access code.
DTMF appearances	DTMF appearances are not prevented from being programmed for pools.
Flexible Numbering Plan: Change DN, DN Length Routing Service DIA Lines Call Park Direct-dial	<p>The first digit of a line pool access code must not conflict with the first digit of:</p> <ul style="list-style-type: none"> - a DN - a Destination code - a target Extn <p>It must also not conflict with the</p> <ul style="list-style-type: none"> - Call Park prefix - Direct-dial digit <p>External outgoing calls can be made using the line pool. If the user dials an Exchange code that is the same as any of the line pool access codes, the line pool access code takes precedence, and a line from the line pool is selected. Otherwise, the lowest numbered CO line assigned to the set is selected. If no CO line is assigned, the message <code>Access denied</code> is displayed. When a line pool code is accessed remotely, no conflict occurs.</p> <p>For other programming interactions, refer to the Flexible Numbering Plan specification.</p>
Hold	<p>For external calls, activating the Line Pools feature applies Automatic Hold to any active call at the set, whether or not a line is selected successfully.</p> <p>For internal calls, if connected, Hold applies, if not connected, the line is dropped.</p>



Feature or condition name	Interaction
Keys - External Autodial System Speed Dial User Speed Dial	External autodialers, system, and user speed dialers can be programmed to have a line pool stored as part of the dialer. The line pool is then used when the dialer is activated (provided a line in the pool is idle). For more details, see the Keys - External Autodial, User Speed Dial, and System Speed Dial features. Sets must have Line Pool access set in OAM Programming.
Line Selection	<p>If a line pool is assigned in OAM Programming as the Prime Line for a set, the operation of Automatic Outgoing Prime Line Selection (by going offhook, pressing Handsfree, or using one of the automatic dialing features) results in the selection of one of the lines from the lowest numbered line pool assigned to the set to initiate a call.</p> <p>A line pool line does not ring at a set that has the line pool as a Prime Line, unless the set has an appearance of that line. Therefore, Automatic Incoming Prime Line Selection does not apply to the line pool.</p>
Line pool appearances	If a line pool line appears at one or more sets, the system updates these line appearances when a line is selected through the line pool.
Ring Again	<p>If a one or more lines are placed in a line pool, the Ring Again feature allows users to queue on that specific line pool when they are busy, in order to receive notification when a line in the line pool becomes available.</p> <p>Ring Again on a line pool by more than one set at a time is allowed.</p>
Selective Line Redirection	The user must explicitly specify a line or line pool for the call to go out on.
Set Copy	Line access attributes (such as Line Pools) can be copied from one set to another, one group at a time.
DIA lines	DIA lines cannot be assigned to line pools. Therefore, any line pool options are suppressed for target lines when cycling through the available options in Line Data.

Line Selection


1.1 Overview

1.1.1 Description

Line selection provides several feature options when choosing a line for either incoming or outgoing calls, including:

- Manual selection allows the user to press a line key to select any desired idle or ringing line.
- Pre-selection allows the user to preselect a ringing line on the set by pressing the ringing line key while onhook.
- Automatic Incoming selection allows a user to answer a ringing line by lifting the handset or pressing .
- Automatic Outgoing Internal (by a Feature) selection attempts to select an idle line automatically when a user activates a feature such as Internal Autodial keys, Reply Message, Voice Call, Page, or accepts a Ring Again offer that requires an outgoing internal line in order to proceed.
- Automatic Outgoing Prime Line (by a Feature) selection attempts to select the Prime Line automatically when the user activates an external dialing feature such as Autodial, Speed Dial, Saved Number Redial, or Last Number Redial.
- Automatic Outgoing Prime Line (by Handsfree/Offhook) selection allows the set to select an idle Prime Line automatically if the user presses  or goes offhook when no calls are ringing the set.

1.1.2 Rationale for Feature

Manual Line Selection allows the user to override the Automatic Incoming or outgoing Line Selection that might otherwise result from lifting the handset or pressing the  key. Manual Line Selection also allows the user to originate or answer a call in cases where Automatic Line Selection does not apply.

Pre-selection is an aspect of Manual Line Selection. This allows the user who is onhook with Handsfree Off, to override Automatic Incoming Line Selection to preselect any desired incoming call, in cases where Automatic Incoming Line Selection does not apply (that is, when audible alerting is not occurring) or is not desired.

1.1.3 General Definitions




N/A

1.1.4 General Procedures



N/A

1.2 Feature Details

1.2.1 Controls

Line Selection Feature Option	Controls
Manual	Line keys
Pre-selection	Line keys, and Hookswitch or 
Automatic Incoming	Hookswitch or 
Automatic Outgoing Internal (by a Feature)	One of: Internal Autodial keys Message Reply programmed key or dialpad code Voice Call key or code Page key or code Line pool code
Automatic Outgoing Prime Line (by a Feature)	One of: Autodial programmed keys Speed Dial key or code, and bin number Saved Number Redial programmed key, or dialpad code Last Number Redial programmed key, or dialpad code
Automatic Outgoing Prime Line (by Handsfree/Offhook)	Hookswitch or 

1.2.2 Message Displays

Message	Description
<set name> calling	This display appears when an internal call is alerting.
<linename> calling	This display appears when an external call is alerting.
No key available	Appears if no intercom key is available on the set.
Select a line	Appears when attempting an external dialing option if no Prime Line is assigned to the set, or the Prime Line is not available. Also appears if the Prime Line is an intercom line, and the set does not have line pool access enabled in OAM Programming.
No free lines	Appears if the Prime Line is an intercom line and line pool access is enabled in OAM Programming, but no lines are available in the line pool. Also appears if no intercom lines are available to the system.
No line selected	Appears if the user goes offhook or presses the  key when the set is idle and no Prime Line is defined for the set, or the Prime Line is in use. Also appears in response to the user lifting the handset or pressing  when a call is alerting visually but not audibly on the set's Prime Line.

1.2.3 End User View

1.2.3.1 Manual Line Selection


The user wishing to select a specific idle or alerting line can press a line key to select the desired line. This can be done to override Automatic Line Selection, or to select a line in cases for which Automatic Line Selection does not apply.

Manual Line Selection allows the user to preselect an incoming call that is alerting at the set visually but not audibly. Also, if more than one line is ringing at the set, Manual Line Selection allows the user to preselect the desired line. For outgoing calls, Manual Line Selection allows the user to select an outgoing line when

- no Prime Line is defined for the set
- the Prime Line is in use
- a specific line is desired
- the user is already active on another call

If the user is offhook or has the Handsfree feature activated, pressing a line key leaves the voice path active.


Manual Line Selection does not alter a set's Handsfree state.

If the user is onhook and has Handsfree Off, pressing an idle line key results in Onhook Dialing, and pressing a ringing line key results in Pre-selection. Refer to the descriptions of those options for details. After pressing the line key, the user must lift the handset or press  to converse.

1.2.3.2 Pre-selection


Pre-selection applies to any internal or external line alerting the set.



In order for Pre-selection to occur, the set must be onhook with Handsfree set to Off. If the set is offhook or has Handsfree On, pressing an alerting line key answers the call.

When the user presses the line key while onhook with Handsfree Off, the line indicator on the set turns on to show that the line has been preselected. However, the line indicator is not updated at any other set and the call state is not changed (that is, no receive or transmit voice path is established) until the user goes offhook or presses .

If the preselected line is ringing, the ringing stops at this set during the preselection period. However, the caller continues to hear ringback, and the call continues to ring at other sets.

The line is preselected for five seconds. If the user does not lift the handset within the preselection period, the indicator reverts to its previous state, and ringing can recommence at the set.

An external line is not actually reserved during the preselection period, and can be preselected or answered during this period by another set having an appearance of the line. If the call is answered elsewhere, any other user who preselected the line receives reorder tone when lifting the handset or pressing .


As mentioned, preselecting a call does not answer it. Thus, if the user preselects a call and presses  before lifting the handset or pressing , the call is not disconnected.




Pre-selection applies only to incoming alerting calls. If the user selects an idle line and dials or autodials digits on it without lifting the handset, Onhook Dialing occurs.

Call Screening

When the user preselects a line, the identifier <name> calling is displayed for internal calls and <linename> calling for external calls. In cases where the call has been rerouted by a feature, the rerouting information is displayed. This allows the user at an idle set to identify and screen calls which are not displaying Call Identification. This call screening capability can be useful when Call Identification is suppressed for a call alerting at an intercom key, because a higher priority call is ringing the set, or because a feature such as Do Not Disturb or Call Forward is in effect.

1.2.3.3 Automatic Incoming

Lifting the handset or pressing  when a call is ringing at the set causes the incoming call to be answered. If more than one call is ringing on the set, the call with the highest priority (as defined in the Call Capture feature description) is answered.

A user operating in Handsfree or headset mode and answering many calls can press  to answer the highest priority call, deal with this call (using Transfer or ), and then press  to answer the next call.


Automatic Incoming Line Selection does not apply if the set is active on a call.

Automatic Incoming Line Selection does not apply when there is no audible alerting.

Calls with only visual alerting indication are not answered automatically. Conditions that allow a call to give a visual alerting indication but no audible alerting are:

- Call Forward active
- Do Not Disturb active
- Ringing Line Preference for the line set to No ring in Line access►Line assignments


A line pool line that does not appear on a set for which the Prime Line is line pool does not provide audible or visual indications of incoming calls. Therefore, Automatic Incoming Line Selection cannot be used to select an incoming call on that line.

If the  key is used to answer the call, the two-way Handsfree (or headset) voice path is activated. If the call is answered by lifting the handset, the two-way handset voice path is activated.

1.2.3.4 Automatic Outgoing Internal Line Selection by a Feature

If the user obtains internal dial tone on a line before activating this option, that line is used.

If no intercom key is available on the set, the message No key available is displayed, and an Error tone is presented.

If the user is onhook and not in Handsfree mode on another call when the Line Selection occurs, then the call is in speaker-only mode, and the user must pick up the handset or press  to talk to the other party.

The Automatic Outgoing Internal Line Selection by a Feature option

- is not affected by the type of Prime Line (if any) defined for the set in OAM programming
- does not select a ringing line
- does not alter the Handsfree state of a set

1.2.3.5 Automatic Outgoing Prime Line by a Feature

An external dialing option selects the Prime Line automatically if the following conditions apply:

- the set is not active on an external line
- a Prime Line is defined for the set in OAM Programming
- the Prime Line is available

The behavior of an automatic external dialing feature such as Autodial, Speed Dial, Saved Number Redial or Last Number Redial depends on the state of the user's telephone set when they activate the feature, and on the Prime Line definition for the set.

If the set is idle when the user attempts an external dialing feature, if a Prime Line is defined for the set and is available, the system selects the Prime Line, pauses to allow dial tone to occur, and dials the stored digits. If a Prime Line is not defined or is not available, the user hears Error tone and is prompted to select a line.

If the user is active on an external call (appearing on either an external line key or an intercom key), using an external dialing feature dials the stored digits on that line. The dialing feature allows the user to

- initiate a call on a selected line
- to concatenate digits on a line
- perform end-to-end signaling on a connected call

If the user is active on an internal call, activating an external dialing feature applies Automatic Hold to that call. This results in the line being held or dropped, depending on its state. Automatic Hold can be applied, even if the dialing feature does not succeed in selecting a line. At this point, if a Prime Line is defined for the set and is available, the feature selects the Prime Line, pauses to allow dial tone to occur, and dials the stored digits. Otherwise, the user hears an Error tone and sees the `Select a line` prompt.


When the Prime Line is an intercom line, in order for Autodial or Speed Dial to select a line automatically, the set must have line pool access enabled in OAM Programming. If no lines are available in the line pool, the user sees the message `No free lines`. If the set has line pool access, a line is obtained from the lowest-numbered line pool to which the set has access.

If the Prime Line is an intercom line, and the set does not have line pool access enabled in OAM Programming, the message `Select a line` appears.

A user who has no Prime Line defined must access an external line manually before using an automatic external dialing feature.


Automatic Outgoing Prime Line selection by a feature does not select a ringing line, and does not alter a set's Handsfree state.


1.2.3.6 Automatic Outgoing Prime Line by Handsfree/Offhook

If a Prime Line has been defined for the set in OAM Programming, lifting the handset or pressing  (when the set is idle and has no ringing calls) selects the Prime Line, if it is not in use. If the Prime Line is selected, the user hears dial tone, and can initiate an outgoing call.

The Prime Line can be defined in OAM Programming as an internal line, a specific external line, or any available external line in a line pool.

Automatic Outgoing Prime Line Selection does not apply if the user is switching from Handsfree mode to handset mode (that is, if an active Handsfree call exists when the user lifts the handset).

If the user goes offhook or presses the  key when the set is idle and no Prime Line is defined for the set, the transient message `No line selected` is displayed. Similarly, if a Prime Line is defined but is in use, the message `No line selected` is displayed. Error tone is generated in this case.

If a call is alerting visually on the user's Prime Line but no ringing is occurring, Automatic Outgoing Line Selection is disabled temporarily. If the user lifts the handset or presses , the prompt `No line selected` is displayed. This prevents the user from answering a call inadvertently when no audible signal has been presented.

1.2.4 OAM Programming View

If a Prime Line (other than line pool) has been assigned in OAM Programming, a call ringing on that line has the highest priority for Automatic Incoming Line Selection.

The Prime Line for a set can be defined in OAM Programming as an external line, an internal line, or line pool. Alternatively, a set can be programmed to have no Prime Line, in which case Automatic Outgoing Line Selection is disabled. For more details, refer to the Prime Line feature.

1.2.5 **EXTN/ **LINE

N/A


1.3 Technical Specification (Limits/Constraints)



After selecting the idle Prime Line, the Automatic Outgoing Prime Line Selection by a Feature pauses for two seconds to allow an external dial tone to be presented. It then dials the stored digits.

1.4 Interactions

Feature name	Interaction
Accidental Disconnect Protection	This feature applies to Ringing Calls eligible for Automatic Incoming Line Selection, and to active calls (that is, calls that are being initiated or are connected) that are in speaker-only mode or Handsfree mode.

Feature name	Interaction
Autodial key	The effect of pressing an Autodial key depends on the user's telephony state. For a detailed description, refer to "1.2.3.4 Automatic Outgoing Internal Line Selection by a Feature", "1.2.3.5 Automatic Outgoing Prime Line by a Feature", and "1.2.3.6 Automatic Outgoing Prime Line by Handsfree/Offhook".
Automatic Hold	<p>The user can activate an internal dialing feature at any time. If the user activates the Automatic Outgoing Internal Line Selection by a Feature when active on a call, and if the Line Selection succeeds, Automatic Hold is applied to the original call.</p> <p>Feature keys that result in Automatic Incoming or Outgoing Line Selection (for example, Inside Autodial, Call Pickup, Page) apply Automatic Hold to any active call.</p>
Call Capture	<p>Determines the following Ringing Call priorities for Automatic Incoming Line Selection:</p> <ol style="list-style-type: none"> 1. Ringing Prime Line (if defined in OAM Programming, and if the Prime Line is not line pool) 2. Ringing external lines 3. Ringing Callback calls and Transferred calls on external lines 4. Ringing internal lines <p>When there are multiple Ringing Calls within the same priority level, the oldest Ringing Call is answered first.</p>
Call Forward	Automatic Incoming Line Selection does not apply to calls alerting at the forwarded set, since there is no audible alerting.
Delayed Ring Transfer	<p>With Delayed Ring Transfer (DRT) enabled, an incoming line call unanswered after a programmable number of ring cycles begins ringing at the prime set for that line. The audible alerting and visual indications still remain at the original set, but this line can now be answered by Automatic Incoming Line Selection at either set.</p> <p>The prime set displays the message <code>DRT <Name></code>, where <code><Name></code> is the name associated with the external line in OAM Programming.</p> <p>If more than one line tries to present DRT concurrently, the line carrying the oldest incoming call drives the ringing and the message display at the set, and will be selected if Automatic Incoming Line Selection occurs.</p>
Do Not Disturb	<p>Automatic selection of alerting incoming calls is disabled if Do Not Disturb is enabled, because there is no audible alerting at the set. To answer an incoming call, the user must either select the line manually or turn Do Not Disturb off, before going offhook or pressing Handsfree.</p> <p>If Do Not Disturb is active and a call is alerting on the user's Prime Line, Automatic Outgoing Line Selection does not occur. If the user lifts the handset or presses Handsfree, the prompt <code>No line selected</code> is displayed, accompanied by Error tone.</p>
External Line Access	Automatic Outgoing or Incoming Line Selection can be used to select an idle or ringing external line, if the set has no active calls.

Feature name	Interaction
Handsfree	<p>Pre-selection applies to all sets, whether or not they have Handsfree capability enabled through OAM Programming.</p> <p>If the user is offhook or has Handsfree enabled when pressing a held or ringing line key, the call is answered. That is, Pre-selection does not occur in such cases.</p> <p>The set enters Handsfree mode if the user presses the Handsfree key when the set is not in Handsfree mode, and the user is either active on a handset call, or Automatic Incoming or Outgoing Line Selection occurs as a result of the Handsfree key press.</p> <p>When the user is in Handsfree mode on a call, switching from that call to another call (by pressing a line key or activating a feature that selects a line automatically) leaves the set in Handsfree mode.</p> <p>Both Automatic Outgoing Internal, Automatic Outgoing and External Line Selection by a Feature preserve the Handsfree state of the set. If the set was in Handsfree mode, it remains in Handsfree mode.</p> <p>When Handsfree is Off, it cannot be activated by pressing a line key or activating a feature. The user must press the Handsfree key in order to do this. However, when Handsfree is On, pressing an Internal Autodial key or Voice Call key, or activating any feature that performs Automatic Line Selection, leaves Handsfree active.</p> <p>If the user presses the Handsfree key when offhook and idle, and if a line is selected as a result of this key press, the Handsfree voice path, not the handset voice path, is activated.</p>
Hold	<p>Pre-selection does not apply when the user reaccesses a held line. If the set is onhook with Handsfree Off, Listen on Hold occurs. Otherwise, the call uses the existing handset or Handsfree voice path.</p>
Internal Autodial keys	<p>Line selection does not occur (that is, a call attempt is not made) when the user presses an Internal Autodial key in response to a prompt for a destination in features such as Call Forward and Send Message.</p>
Last Number Redial	<p>The effect of activating Last Number Redial depends on the user's telephony state. For a detailed discussion, refer to "1.2.3.5 Automatic Outgoing Prime Line by a Feature".</p>
Line Pools	<p>Automatic Incoming Line Selection answers a call only if it is ringing at the set. If the Prime Line is defined as a line pool, Automatic Incoming Line Selection does not apply to the Prime Line. However, the set may have an appearance of a line that is in the line pool, in which case the line can ring at the set and be answered by means of Automatic Incoming Line Selection.</p> <p>Automatic Outgoing Prime Line Selection searches for an available idle line if the Prime Line is assigned as the line pool. As stated in the Line Pool feature description, line pool lines are searched from the highest port number to the lowest.</p>
Manual Line Selection	<p>Automatic Incoming Line Selection can be overridden by pressing a line key manually. This results in Pre-selection of the desired line. The user must then lift the handset or press  in order to converse. For more information, see "1.2.3.1 Manual Line Selection".</p>

Feature name	Interaction
Onhook Dialing Options	If the user is onhook when Line Selection occurs, and is not in Handsfree mode on another call, Onhook Dialing takes place. That is, the set is in speaker-only mode, where the Handsfree speaker is activated, but the microphone is not activated.
Prime Line	A set programmed for no Prime Line cannot use the  key or offhook action to select an outgoing line. Automatic Incoming Line Selection still applies if a line is ringing at the set.
Private Lines	If the prime set has an appearance of another set's Private Line, that line can be assigned as the prime set's Prime Line in OAM Programming. However, this assignment of Prime Line enables only Automatic Outgoing Line Selection, external dialing features, and Pre-selection of that Private Line for outgoing calls. It does not enable incoming call selection on that Private Line.
Saved Number Redial	<p>The Saved Number Redial feature attempts to select a line automatically, only if the set has an available Prime Line, to dial the digits on. If the user activates Saved Number Redial while the set is active on an outgoing external call on which no digits have been dialed, the set will dial the saved number and the saved number <code><digits></code> will be echoed on the display.</p> <p>If the user activates Saved Number Redial while the set is idle, the set attempts to perform automatic outgoing Line Selection. If this succeeds, the set dials the saved number on the selected line.</p> <p>If the user activates Saved Number Redial while the set is active on an internal call, the transient message <code>No number saved</code> is displayed, accompanied by Error tone.</p> <p>If the user activates Saved Number Redial while the set is active on an incoming external call, the transient error message <code>No number saved</code> is displayed, accompanied by Error tone.</p> <p>If an automatic outgoing Line Selection attempt is unsuccessful, the transient message <code>Select a line</code> is displayed, accompanied by Error tone. If the set has an appropriate line on which to dial a saved number but the saved number buffer is empty (that is, the user has not saved a number since the most recent System Startup), the transient message <code>No saved number</code> is displayed.</p> <p>As with other forms of automatic dialing, no audible feedback is provided to the user when dialing is performed by Saved Number Redial.</p>
User Speed Dial	The user dials a Speed Dial code between 71 and 94. These two speed dial codes are echoed on the display if Automatic Outgoing Line Selection is available, or if the user has preselected an external line.
Voice Call	Preselection does not apply to incoming Voice Calls, because they are answered automatically. If a Voice Call is received and Handsfree Answerback is not in effect, the user must lift the handset or press  to converse with the caller.

Loop Avoidance

1.1 Overview

1.1.1 Description

Errors in the configuration of a network may make it possible for a call to be misrouted and arrive at a PBX through which it has already passed. This would continue, causing a loop which would eventually use up all of the available channels. The Loop Avoidance service permits counting of DPNSS 1 transit PBXs and rejecting a call when the count exceeds a predetermined limit.

Loop Avoidance is one of the features supported on DPNSS 1 lines in Norstar systems. For a listing of these features, see the DPNSS 1 feature.

1.1.2 Rationale for Feature

Loop Avoidance prevents the using up of all available channels. This in turn makes possible more efficient use of network resources.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls

N/A

1.2.2 End User View

Loop Avoidance originates at the system level and is transparent to the user.

1.2.3 OAM Programming View

1.2.3.1 Levels of Access

The following table shows the levels of access required to program OAM changes.

Heading	Item			I	SC+	SC
Hardware	Cards on CCU	Cdx - CCU: DPNSS	Max transits	X		

1.2.3.2 Programming Loop Avoidance

Loop Avoidance is set in Hardware►Cards on CCU►Cdx-CCU: DPNSS►Max transits.

[See "Hardware - DPNSS parameters - Modular Plus".](#)

1.2.4 **EXTN/ **LINE

N/A

1.3 Technical Specification (Limits/Constraints)

Loop number must be between 0 and 25.

Loopback Tests

1.1 Overview

1.1.1 Description

Loopback tests loop an incoming digital signal back to the local exchange for evaluation of the transmission quality. They apply to

- BRI T-loops and
- DTI lines (Modular systems such as DASS2, I420, and I421)

Loopback tests do not apply to analog lines or to BRI S-loops.

Compact systems with BRI ISDN such as Compact Plus support one test, payload loopback.

In Modular systems, three network loopback tests can be run, depending on the card type (DTI or BRI).

Loopback tests should be conducted only under the guidance of the network supplier, and results from these tests returned to the network supplier.

Usually, loopback tests are performed for regulatory purposes and conformance testing, and are rarely used in the field.

1.1.2 Rationale for Feature

Network loopback tests are required to examine various aspects of the transmission quality of the digital link between the card and the public network.

1.1.3 General Definitions

In this feature description, the term BRI loops refers to T-loops only. Loopback tests have no application to BRI S-loops.

The craft interface is the physical faceplate of the DTI cartridge, including the LEDs, and the push-key switch that initiates the Continuity loopback test.

Loopback tests

Loopback test	Description	Valid card types
Line loopback	Loops the full signal received from the network back to the network. In North America, it is possible for the CO to initiate this test.	DTI only
Payload loopback	Loops the received information bits back to the network. In North America, it is possible for the CO to initiate this test. The payload loopback test must be run in coordination with the CO. Some test patterns can cause the DTI to reset. To avoid this, start the payload loopback test from the Norstar before the DTI service provider begins their test, and stop the payload loopback test after the CO ends their test.	DTI and BRI
Continuity loopback (push-key test)	Shorts the tip and ring pair of the receive signal path with the transmit signal path. Checks the metallic continuity of the external wiring.	DTI only

1.1.4 End User View

Once a loopback test is activated, all active, alerting and held calls on the DTI card or BRI loop being tested are dropped. The system does not provide any warning.

Message	Description
Not in service	Displayed transiently to a caller who tries to access a line on which a loopback test is running. Accompanied by Error tone.

1.1.5 OAM Programming View

The following table shows the levels of access required for users to enter a Maintenance session and run loopback tests in OAM Programming.

Heading	Item		I	SC+	SC
Maintenance	Tests	Loopback tests	X		
			X		

1.1.6 Maintenance View

[See "Maintenance - Tests - Loopback Tests".](#)

The Line and Payload loopback tests are run from inside OAM Programming, from Maintenance►Tests►Loopback tests.

The Continuity Loopback test for DTI cards is not activated from OAM Programming, but by the craft interface push-key. (See “1.1.6.7 Craft Interface Continuity Loopback Test (DTI cards only)”.)

The basic characteristics of a loopback test activated through a Maintenance session are:

- the test can only be activated on a system equipped with BRI T-loops or DTI lines
- As soon as the loopback test is started
 - the voice channels of the DTI card or BRI loop are cut off
 - all calls on the card being tested are automatically dropped
- start and stop times for a test are logged in the System Test log
- the test is terminated explicitly by the craftsperson or the CO
- a card reset terminates a test
- the “in Service” LED of a DTI card or a BRI loop is not lit during the test

1.1.6.1 Testing BRI loops

Only the Payload loopback test is performed on BRI loops.

The design takes into account the following:

- this test is supported on both on-core and off-core T-loops
- the loop must be provisioned throughout the test
- the trunks on the loop do not need to be deprovisioned

- a BRI card can have one test running for every loop on the card
- tests can be run on multiple cards at the same time

1.1.6.2 Testing DTI cards

Only one test can be run on any one DTI card at a time, with the exception of the push-key Continuity loopback test (See “1.3 Interactions” for details). One test (for each DTI card) may be run at a time.

1.1.6.3 Canceling A Loopback Test

There is no specified length of time for a loopback test to run. Once started, it runs until it is manually stopped through `Loopback tests` or stopped by the CO. A test is cancelled manually by pressing the `STOP` softkey from the `<name>` running display.

1.1.6.4 Module Status View

`Module status` shows the card as enabled. This is required because the D-channel for the card(s) must be up in order to log the start and stop times for the test(s). Disabling a card while a test is running stops all tests on the card, and the stop time(s) will be logged.

Disabling one card from `Module status` does not cancel the test(s) for other cards being tested.

1.1.6.5 System Test Log View

The log entry will show log events for when the test was started and stopped. The event code format will also show the module and card(s) tested. The following table gives the test numbers used to indicate the various loopback tests:

Test	Test number
Line loopback	500
Payload loopback	510
Continuity loopback (push-key test)	520

1.1.6.6 CCU and DTI/BRI Card Resets

If any one card in a loopback test resets, any test running on that card is canceled. The system test log shows a reset event, which indicates that the test has been stopped.

If the CCU resets while a loopback test is running, the test is canceled either when the CCU goes down or during the CCU rebooting sequence. In either case, the system test log shows a CCU reset event, which indicates that the test has been stopped.

1.1.6.7 Craft Interface Continuity Loopback Test (DTI cards only)

A push-key on the cartridge faceplate directly activates or cancels the push-key Continuity loopback test. This test affects all DTI lines on the card.

When this test is invoked, active calls are not actually dropped without warning or notification (as is the case with the other loopback tests), although it could appear that this happens. What actually happens is that the voice path for the call is

removed. The line indicator remains solid. Once the test completes (by a subsequent press of the push-key) the voice paths are restored. This apparent dropping of calls is a user requirement of the craft interface, for the following reasons.

- The user may be a network specialist with no specific understanding of Norstar operations.
- The user is coordinating the test with the CO and may require complete control over when the test is invoked and canceled.

Attempting to select a line disabled by a Continuity loopback test results in the prompt `Not in Service` being displayed.

As with the other loopback tests, start and stop event codes are logged in the System Test log.

1.1.6.8 Event Codes

The event code format is used to display the test results. While browsing the System Test Log, the user (installer) would see:

DTI cards	BRI cards
EVT210- yyyz S4 TIME EX IT	EVT210- yyyBxx S4 TIME EX IT
EVT211- yyyz S4 TIME EX IT	EVT211- yyyBxx S4 TIME EX IT

Where:

- EVT210 is the Test Started
- EVT211 is the Test Stopped
- yyy is the Loopback test number
- z is the DTI card number (1 or 2)
- B indicates a BRI card
- xx is the software loop number (1-80, see table “Software loop numbers” on page 5)
- S4 is Severity 4

Pressing the `TIME` softkey displays the time stamp for the event.

1.1.7 **EXTN/**LINE

N/A

1.2 Technical Specification (Limits/Constraints)

1.2.1 Call dropped

Once a loopback test is activated, all active, alerting, and held calls on the DTI card or BRI loop being tested are dropped. The system does not provide any warning.

1.2.2 CCU resets

If a CCU reset results in a warm start, knowledge of the provisioning status of the lines is retained in NVRAM. The lines remain provisioned or deprovisioned as they were prior to the warm start. The test can be started again or the user can investigate the reason for the CCU reset.

If a CCU reset results in a cold start, knowledge of the provisioning status of the lines is not retained in NVRAM. The test is stopped, and all voice channels will be provisioned according to the startup defaults.

1.2.3 Software loop numbers

The loop number given for loopback tests performed on a BRI loop is not the three-digit loop number seen elsewhere in the UI (that is, corresponding to the port number of the BRI loop) but the software loop number.

The software loop number can range from 01-80 and represents the location of the loop relative to the total number of loops possible on the system. The software loop number remains stable even during system growth. “Figure 1-1: Software loop numbers” shows the software loop numbers. On a Compact Norstar system such as Compact Plus, there are no extra modules; and on the CCU, slot 1 is on the left, and slot 2 is on the right.

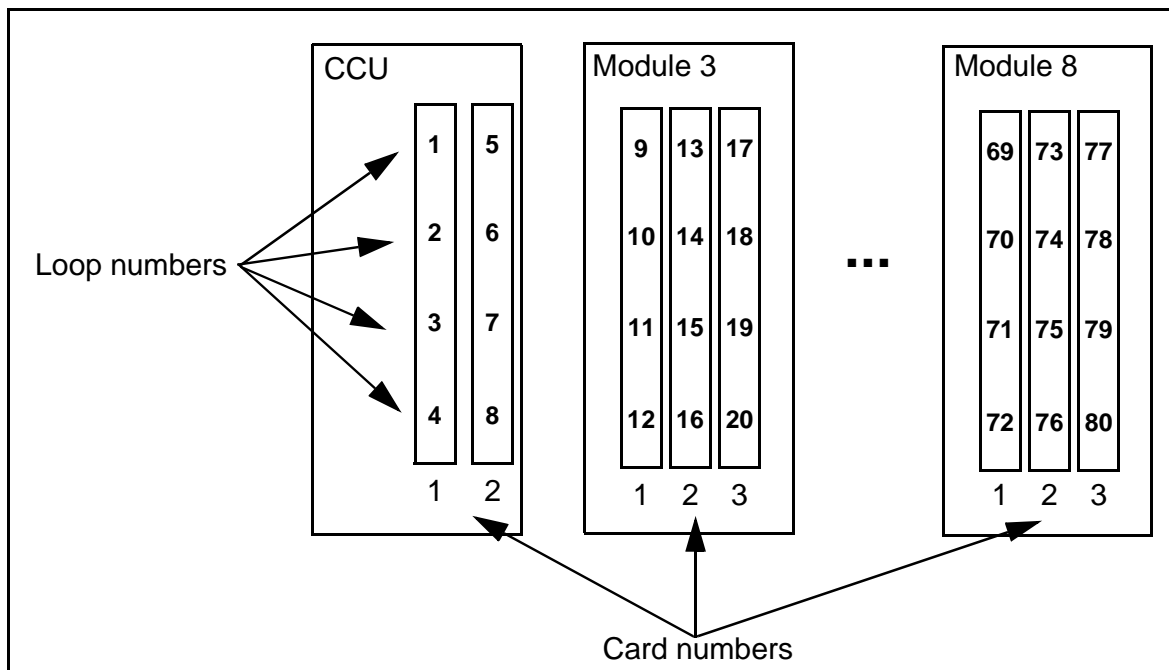


Figure 1-1: Software loop numbers

1.3 Interactions

Event	Interaction
Request to end maintenance session.	The loopback test continues running.
Select a DTI card or BRI loop from <code>Loopback tests</code> while a loopback test is running on that card or loop.	The system permits one test at a time to run on each DTI card or BRI loop. The system displays a message indicating which test is running.
Request configuration of lines on the card being tested.	Allow change in configuration. Changes do not take place until the test has stopped.
Provisioning lines while a loopback test is running.	Provisioning/deprovisioning lines is allowed while a loopback test is running.
Querying the Module status of a card or loop running a loopback test.	Show card as enabled. Disabling the module stops the test.
Running another loopback test while a continuity loopback test is running (DTI only)	The Continuity loopback test is a higher priority test than the Line loopback test. Therefore, if another test is in progress and the Continuity test is started, both tests continue to run. In <code>Loopback tests</code> , selecting the card will show <code>ContnuityRunning</code> . When the <code>STOP</code> softkey is pressed, and the card is selected again, <code><name> running</code> is displayed and this test will have to be stopped with the <code>STOP</code> softkey. There are no other interactions between the other loopback tests and the Continuity loopback test.
CCU reboot while a continuity loopback test is running (DTI only)	All LEDs flash until the software download to the DTI card begins or it is determined that it is not required. The test can be stopped by the push-key.
Card reset	Loopback tests are stopped. A stop test event is not be logged. The reset event in the log is used to indicate that the test has been stopped.

Mixed Numbering Plan

1.1 Description

Mixed trunking refers to the Norstar system's support of both digital and analog lines (loops) between Norstar and the CO on a single CCU. Each of the two on-core card slots can accept a mix of analog, DTI (I.420 and DASS2 Modular systems only), and BRI cards.

1.1.1 Rationale for Feature

The addition of BRI cards to Norstar requires a revised numbering scheme because

- BRI cards support more lines (8 lines) than analog cards (4 lines).
- On-core slots accept DTI, analog or BRI cards.
- In Modular systems, expansion modules support either analog or BRI cards in any combination).

1.1.1.1 Fixed Numbering Plan

Norstar uses a fixed numbering scheme for lines, which has blocks of line numbers with no supporting hardware.

The user is blocked from entering invalid line numbers. A valid line number is based on the card type selected in the **Hardware** section of the OAM.

1.1.2 General Definitions

N/A

1.1.3 General Procedures

N/A

1.2 Feature Details

1.2.1 User View

A Norstar system supports:

- BRI-ST cards (for T, or S-loops)
 - analog line cards
 - DTI (DASS2) line cards
- for public networking, and
- AC15A (analog) lines, for private networking
 - DIA lines

1.2.1.1 PSTN Lines

The two on-core slots on the CCU support any combination of the following card types:

- four-line UK analog line cards
- 30-channel DASS2 DTI cards

- four-loop UK BRI cards (up to eight lines on each card)

Loops configured as S-loops support ISDN terminals, not lines.

In an Modular system, off-core modules support three cards on each module. There are two types of off-core module, Analog and Global line modules. Analog line modules support analog line cards, and Global line modules support BRI cards.

The system supports any combination of Analog and Global line modules, but BRI and analog cards can not be placed in the same module.

1.2.1.2 DIA lines (Logical lines)

DIA lines are virtual communication paths between trunks and Norstar telephones. They are incoming lines only, and cannot be selected for outgoing calls. With DIA lines, incoming calls can be concentrated on fewer trunks.

Compact Plus supports forty DIA lines, numbered 101 to 140.

In Modular Plus, all system sizes (Mini, Midi, & Maxi) support 128 DIA lines, numbered 255 to 382.

1.2.1.3 AC15A Analog Lines

AC15A lines are used for private networking. They are connected through TCM ports.

Compact Plus supports up to two AC15 lines, numbered 61 and 62 respectively. The associated ports are 107 and 108.

Modular Plus supports fourteen AC15A lines, numbered 241 to 254. They are connected through the last (highest numbered) TCM ports.

1.2.1.4 Modular Plus AC15A Installation

In Modular Plus, AC15A lines are plugged into the last 14 TCM ports. The port numbers have not changed from DASS2, the line numbers have changed, as indicated above.

Table “Relationship of TCM connectors, Port #s, DN’s & AC15 line #s (I420)” on page 3 shows the port to set DN mapping and the port to AC15A line numbering

mapping. Note the reverse ordering. Note that either a Norstar set, AC15A line, or wireless base station can be plugged into ports in the range 119 – 132.

Relationship of TCM connectors, Port #s, DN's & AC15 line #s (I420)

	Port #	Set DN	AC15A line #
first TCM connector	101	221	—

	118	238	—
	119	239	254
	120	240	253
	121	241	252
	122	242	251
	123	243	250
	124	244	249
additional TCM connector	125	245	248
	126	246	247
	127	247	246
	128	248	245
	129	249	244
	130	250	243
	131	251	242
	132	252	241

1.2.1.5 Unequipped Lines

The installer uses the **Hardware** section to configure card-wide parameters for the cards installed on the Norstar. This can be done with or without the hardware installed (pre-configuration).

1.2.2 Modular systems

1.2.2.1 Growing The System

System size determines how many off-core PSTN lines are supported, adding more as the system grows.

1.2.2.2 Compact Plus systems

System Configuration

The Compact CCU has two card slots that take Universal-Slot-compatible line cards. Each slot can take either one of

- analogue line card (ALC)

- ISDN BRI/ST line card (ISDN LC)

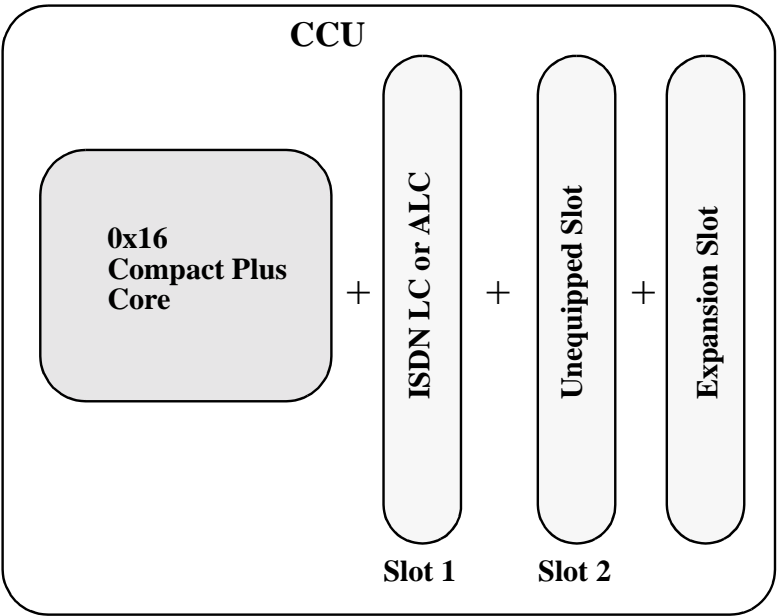


Figure 1-1: Compact Plus default configuration

The Default Compact Plus configuration is one line slot and the first eight TCM ports enabled.

With the appropriate software key password, the system can be expanded to include the other line card slot (slot 2) and eight more TCM ports (Standard configuration). The system can be further expanded to eight more TCM ports using the Combination (Clock Control and TCM Expansion) card (Expanded configuration).

Compact Plus configurations and system sizes

Configuration	Slot 1 Line Card	Slot 2 Line Card	Expansion Slot Card	System Size
Default: One line card slot	Analogue	--	No card	4x8
One line card slot	ISDN	--	Clock Control or Combination card	8x8
Standard-two line card slots	Analogue	Analogue	No	8x16
Standard-two line card slots	Analogue	ISDN	Clock Control card	12x16
Standard-two line card slots	ISDN	Analogue	Clock Control card	12x16
Standard-two line card slots	ISDN	ISDN	Clock Controlcard	16x16
Standard-two line card slots	Analogue	Analogue	TCM Expansion or Combination card	8x24

Compact Plus configurations and system sizes

Configuration	Slot 1 Line Card	Slot 2 Line Card	Expansion Slot Card	System Size
Expanded-two line card slots	Analogue	ISDN	Combination card	12x24
Expanded-two line card slots	ISDN	Analogue	Combination card	12x24
Expanded-two line card slots	ISDN	ISDN	Combination card	16x24

Line Numbering

The following table provides the line numbering scheme for Compact Plus.

Compact Plus Line Numbering Plan

Components	DS-30 port (Modules)	Slot	Analog Line #s	BRI Line Numbers	Port #
CCU	2	1	001-004	001-008	201-204
		2	031-034	031-038	231-234
AC15As (Use TCM ports not LCs) (2 trunks)	N/A	N/A	61-62	N/A	107-108
Logical lines (DIA lines) (40)	N/A	N/A	101-140	N/A	N/A

Note: 30 line numbers are reserved for each core slot for possible future support of DASS2 on Compact.

Default Set DN Numbering

The following tables reflect the default set directory numbers assigned at system start-up (i.e. 4x8 configuration). Note that effects from system growth are not reflected in this table.

Compact Plus Set Numbering Plan (Cold Start) 4x8 Configuration

CCU Location	B1 DNs	B2 DNs	Ports
Core	221 - 228	231 - 238	101 - 108
IATA	229	239	117
IRSD	230	240	118

The following tables reflect the directory numbers assigned in an 8x16 configuration.

Compact Plus Set Numbering Plan - 8x16 Configuration

CCU Location	B1 DNs	B2 DNs	Ports
Core	221 - 228 241 - 248	231 - 238 249 - 256	101 - 108 109 - 116

Compact Plus Set Numbering Plan - 8x16 Configuration

CCU Location	B1 DNs	B2 DNs	Ports
IATA	229	239	117
IRSD	230	240	118

The following tables reflect the directory numbers assigned in an 8x24 configuration.

Compact Plus Set Numbering Plan - 8x24 Configuration

CCU Location	B1 DNs	B2 DNs	Ports
Core	221 - 228 241 - 248	231 - 238 249 - 256	101 - 108 109 - 116
IATA	229	239	117
IRSD	230	240	118
Expansion	257 - 264	265 - 272	119 - 126

Portable and ISDN DN Numbering

Where Compact Plus has Wireless capability, it supports a combination of up to 32 portables and ISDN DNs. All of these DNs can be portables. Up to 8 (last 8) can be converted to ISDN DNs. In other words, the first 24 DNs are fixed as portables while the last 8 may be either portable or ISDN. The following table displays the DN ranges.

Compact Plus Portable/ISDN DN Numbering Plan

Portable DNs	ISDN DNs	Ports
273 - 304	297 - 304	N/A

Startup Defaults (Compact Plus)

By default, on startup, the system assumes that slot 1 is equipped with an analog loopstart card, and slot 2 is unequipped.

In a system configured for ISDN line cards, all loops default to T. They can be reconfigured as T, or as S to support ISDN terminals. See Mixed Trunking for details.

1.2.2.3 Modular systems

A mini system has a maximum capacity of 60 lines,
 a midi $(60+(24*2))=108$, and
 a maxi $(60+(24*6))=204$.

The following tables detail the complete Modular Plus numbering scheme.

Mini system numbering scheme

Components	DS-30 port (Modules)	Slot	Analog Line #s	DTI Line Numbers	BRI Line Numbers
CCU	2	1	001-004	001-030	001-008
		2	031-034	031-060	031-038
AC15As (Use TCM ports not LCs) (14 trunks)	N/A	N/A	241-254	N/A	N/A
Logical Lines (DIA Lines) (total 128)	N/A	N/A	255-382	N/A	N/A

Midi system numbering scheme

Components	DS-30 port (Modules)	Slot	Analog Line #s	DTI Line Numbers	BRI Line Numbers
CCU	2	1	001-004	001-030	001-008
		2	031-034	031-060	031-038
External Modules	4	1	061-064	N/A	061-068
		2	069-072		069-076
		3	077-080		077-084
	3	1	091-094	N/A	091-098
		2	099-102		099-106
		3	107-110		107-114
AC 15As (Use TCM ports not LCs) (14 trunks)	N/A	N/A	241-254	N/A	N/A
Logical Lines (DIA Lines) (total 128)	N/A	N/A	255-382	N/A	N/A

Maxi system numbering scheme

Components	DS-30 port (Modules)	Slot	Analog Line #s	DTI Line Numbers	BRI Line Numbers
CCU	2	1	001-004	001-030	001-008
		2	031-034	031-060	031-038
External Modules	8	1	061-064	N/A	061-068
		2	069-072		069-076
		3	077-080		077-084
	7	1	091-094	N/A	091-098
		2	099-102		099-106
		3	107-110		107-114
	6	1	121-124	N/A	121-128
		2	129-132		129-136
		3	137-140		137-144
	5	1	151-154	N/A	151-158
		2	159-162		159-166
		3	167-170		167-174
	4	1	181-184	N/A	181-188
		2	189-192		189-196
		3	197-200		197-204
	3	1	211-214	N/A	211-218
		2	219-222		219-226
		3	227-230		227-234
AC 15As (Use TCM ports not LCs) (14 trunks)	N/A	N/A	241-254	N/A	N/A
Logical Lines (DIA Lines) (total 128)	N/A	N/A	255 to 382	N/A	N/A

DS-30 Port Numbering Scheme

The 0x32T CCU has two expansion slots that accept the two-port or six-port expansion cards (ECs), or a service card(SC). SCs are used for network clock sourcing, and are placed in the left slot. The DASS2 software supports only a single EC and only in the right slot.

An EC in the left slot is ignored by the system at all times. An alarm is raised at the alarm extension if an EC is put in the left slot.

Upgrades

The system will grow from mini to midi to maxi, supporting DS-30 ports 3-4 or 3-8 when equipped with the appropriate EC.

1.2.3 OAM Programming View

The fixed port numbering ensures that each slot on each module reserves eight lines. Each loop of a BRI card reserves two line numbers. If the loop is configured as an S-loop (not requiring line numbers), the line numbers are still available in case the loop type is changed.

For more information, refer to the diagrams in OAM Hardware.

See "Hardware - Compact Plus" and "Hardware - Modular Plus".

1.2.4 ****EXTN/**LINE**

N/A

1.3 **Technical Specification (Limits/Constraints)**

In a Modular system, an alarm is raised if an expansion cartridge is placed in the left expansion slot on the CCU.

A system cannot be expanded from 8 to 24 TCM ports without the user's first having entered the software key to expand it from 8 to 16 ports.

1.4 **Interactions**

Feature or condition name	Interaction
System Test Log	Alarm is raised at the alarm extension for the system if an expansion card is placed in the left slot (on the CCU). This is also recorded in the System Test Log.

Mixed Trunking

1.1 Overview

1.1.1 Description

The ability to mix digital (DASS2, DPNSS 1, BRI and PRI) and analog card types on a single system is referred to as Mixed Trunking. Pure digital or analog systems are also supported by this design.

This is not an end user feature.

1.1.2 Rationale for Feature

In order to support a wide variety of connections to the PSTN and private networks, Norstar requires a means of configuring a variety of card types with different configuration needs. This ranges from simple cards with basic loopstart support to more capable cards that support a variety of line types and services (for example, BRI).

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Message Displays

Message	Description
Cds on CCU	Heading display for on-core cards.
Cdx on CCU:DASS2 CHANGE	Card type display for on-core cards. x represents the slot/card number (x= 1, 2) Pressing CHANGE cycles through valid card types (BRI-2, BRI-4, Loop for Compact) (DPNSS, DASS2, BRI-2, BRI-4, PRI, Loop for Modular).
Cards on Mod <i>m</i>	Heading display for off-core cards for Modular Plus systems. <i>m</i> represents the off-core module number. (m=3,4,5, ...8)
Cdx on Mod <i>m</i> :Loop CHANGE	Card type display for off-core cards. (x=1,2,3) <i>m</i> represents, the off-core module number.(m=3,4,5, ...8) Pressing CHANGE cycles through valid card types (BRI, Loop).
Updating state...	Appears transiently when the card type has been changed, or parameters associated with the card have been changed.
Disable cartridg	Appears transiently when the card type has been changed, or parameters associated with the card have been changed, and the conditions that the slot is empty or the card is disabled have not been met.

Message	Description
Lines <i>xxx-yyy</i>	Indicates which lines are associated with a particular card or BRI loop, where <i>xxx-yyy</i> indicates the range of line numbers.
Loops: <i>aaa-ddd</i>	BRI card display indicating which BRI loops are associated with a particular card, where <i>aaa-ddd</i> indicates the range of loop numbers. The Loop # = the physical port #
Loop <i>aaa</i>	Display indicating the BRI loop number being viewed.
Type: S CHANGE	Display indicating the BRI loop type. CHANGE cycles through the loop type values (<u>S</u> , T).
Protocol: Euro CHANGE	BRI card parameter, appears for T-loops only. CHANGE cycles through valid values (BTN191, <u>Euro</u>).
Sampling: Adaptiv CHANGE	BRI card parameter; appears for S-loops only. CHANGE cycles through valid values (Fixed, <u>Adaptiv</u>).

1.2.2 OAM Programming View

The following table shows the levels of access required for users to program OAM changes.

Compact Plus:

Heading	Item				I	SC+	SC
Hardware	Card	Cdn-CCU:Loop	Card type:Loop		X		
			Lines <i>nnn-mmm</i>		X		
		Cdn-CCU:BRI-ST (BRI-4, BRI-2)	Loops: <i>aaa-ddd</i>	Type:S	X		
				Protocol:Euro ^a	X		
				Sampling: Adaptiv ^b	X		
				Extns on Lpaaa ^b	X		
				Loop extn:None ^b	X		
				mmmmmm: Available ^b	X		
				Loop extn:None	X		

a.Appears only for type T. Protocol for T-type cards is fixed (Euro).

b.Appears only for type S.

Modular Plus

Heading	Item			I	SC+	SC	
Hardware	Card	Cdn-CCU:Loop	Card type:Loop		X		
			Lines <i>nnn-mmm</i>		X		
		Cdn-CCU:BRI-ST (BRI-4, BRI-2)	Loops: <i>aaa-ddd</i>	Type:S	X		
				Protocol:Euro ^a	X		
				Sampling: Adaptiv ^b	X		
				Extns on Lpaaa ^b	X		
				Loop extn:None ^b	X		
				mmmmmm: Available ^b	X		
				Loop extn:None	X		
				Clock Src: Primary		X	
		Cdn-CCU:PRI	Lines: <i>nnn</i>		X		
			Clock Src: Primary		X		
		Cdn-CCU:DASS2	Lines: <i>nnn</i>		X		
			Clock Src: Primary		X		
		Cdn-CCU:DPNSS1	Lines: <i>nnn</i>		X		
			Clock Src: Primary		X		
			Loc Num: 3		X		
			Max ransits: 25		X		
		Cards on Mod (module 3 to 8) (BRI-2, BRI-4, Loop) Cd1 on Mod_ Cd2 on Mod_ Cd3 on Mod_			X		
		If Loop	Card type:Loop		X		
			Lines <i>nnn-mmm</i>		X		
		If BRI card	Loops: <i>aaa-ddd</i>	Type:S	X		
				Protocol:Euro	X		
				Sampling: Adaptiv	X		
				Extns on Lpaaa	X		
				Loop extn:None	X		
				mmmmmm: Available	X		

a.Appears only for type T. Protocol for T-type cards is fixed (Euro).

b.Appears only for type S.

1.2.2.1 Programming Card Data

Card data is programmed in Hardware►Cdn►CCU:Loop►.

See "Hardware - Compact Plus" and "Hardware - Modular Plus".

To change the card type, the software requires the status of the card slot to be unequipped (no card in slot) or disabled. (To disable the card or module, refer to Module Status.)

To change cards on the CCU, the CCU must be powered down, resulting in a full system shutdown. For Modular Plus systems, to change off-core cards, only the affected module is powered down.

Changing Card Data On New Systems

To change the card type for a given card from the system default, if the card slot is empty (unequipped), perform the following steps. (These steps assume that the order of installation is programming first and installing the hardware second.)

1. Power up the CCU or affected modules.
2. Enter OAM Programming, change the card type, and perform any other related programming (for example, programming BRI loops). See "Changing the Card Type" on page 5 for details.
3. Power down the CCU or affected modules.
4. Install the new card(s).
5. Power up the CCU or affected modules.
6. Enter Maintenance and enable all modules.

Changing Card Data On Systems With Active Users

Systems with active users should be shut down gracefully. The users should be informed in advance that the system will be out of service temporarily, for example:

1. Use the Page feature to tell users that the system will be shut down temporarily. (This is the usual method for making software upgrades.)
2. Wean the users off the system by disabling all trunk and extension modules from Maintenance. Maintenance displays a message on all extensions informing them that the system is to be disabled shortly. This weans active users off the system in about one to two minutes. (The system does not disable the set used in the Maintenance session.)
3. Once all modules are disabled, proceed as in step 2 in "Changing Card Data On New Systems" on page 5.

Changing the Card Type

In Hardware, at the Cdn►CCU:Loop► prompt, press CHANGE to change the card type. Card type is: Loop, BRI-2, BRI-4 for Compact. For Modular, Card type is: Loop, BRI-2, BRI-4, DASS2 or PRI. The default is underlined.

Card type Loop refers to a loopstart analog line card. Each card slot "owns" a range of lines. (For details on line numbering, refer to Mixed Numbering Plan.)

Pressing SHOW from any card display shows the range of line numbers (for non-BRI cards) or BRI loops (for BRI cards) residing on that card.

1.2.2.2 Programming BRI Loops

See "Hardware - BRI Parameters - Compact Plus" and "Hardware - BRI parameters - Modular Plus".

Card type `BRI-ST` refers to an ISDN line card. (For details, refer to Mixed Numbering Plan.)

Loop Type is one of `T`, or `S`. The default is underlined.

T-loops

If the loop type is `T`, the `SHOW` key allows the lines associated with that BRI loop to be viewed. (The `SHOW` key is not presented for `S`-loops, because `S`-loops support ISDN terminals, not lines.)

The `Protocol:` parameter appears only for `T` loop. Value is `Euro` or `BTNR191`. The customer may subscribe to multiple ISDN carriers that require proprietary loop protocols. This prompt is suppressed when the market supports a single protocol for the loop type.

S-loops

The length of the loop is indicated to the system by the `Sampling:Adaptiv` parameter. Value is `Adaptiv` or `Fixed`. Changing the value may require the installer to modify the hardware configuration of the system (add or remove a jumper on the card and a special box on the end of the loop).

ISDN extensions are assigned or unassigned to the loop in `Extns on Lpaaa▶Assign extns`. The user presses `SHOW`, and then presses the `SCAN` display key or `NEXT`, or enters a valid ISDN extension number. The value of the extension number can be

- `Availabl`
- `Assigned` - assigned to this loop
- `*Lpaaa*` - assigned as the default extension of another loop
- `Lpaaa` - assigned to another loop

After one or more ISDN extension numbers are assigned to the loop, one of these extension numbers can be assigned as the loop extension number in `Extns on Lpaaa▶Loop extn #:None`. Assigning a loop extension number allows

- calls to be made from devices with no terminal address on the loop
- Norstar to distinguish the devices on that loop from devices installed on other loops
- the loop extension number associated with a call to be used as the outgoing ID (number displayed on called terminals)

A value of `None` means no loop extension number is assigned.

Changing the loop type from S-loop to a T-loop

Before changing an `S`-loop to a `T`-loop, the user must remove any extension numbers assigned to the `S`-loop.

1.2.2.3 Defaults for Modular

Modular Plus Startup Defaults for Card & Loop types shows the default card configurations for Mini, Midi, and Maxi systems. Underlined values represent the default. Shaded cells indicate that the card slot is not available to the particular system.

All loops in the Modular Plus product will default to:

Type: S

Sampling: Adaptiv

T loops use the Euro loop protocol, by default. The only protocol supported for S-loops is Euro, hence the Protocol prompt is suppressed for S-loops.

Startup Defaults for Card & Loop types.

Module	Card	Mini		Midi		Maxi	
		Card type	If <u>BRI</u> , Loop type	Card type	If <u>BRI</u> , Loop type	Card type	If <u>BRI</u> , Loop type
CCU	1	DASS2, BRI-2, BRI-4, Loop, PRI, DPNSS	<u>S</u> , T	DASS2, BRI-2, BRI-4, Loop, PRI, DPNSS	<u>S</u> , T	DASS2, BRI-2, BRI-4, Loop, PRI, DPNSS	<u>S</u> , T
	2	DASS2, BRI-2, BRI-4, Loop, PRI, DPNSS	<u>S</u> , T	DASS2, BRI-2, BRI-4, Loop, PRI, DPNSS	<u>S</u> , T	DASS2, BRI-2, BRI-4, Loop, PRI, DPNSS	<u>S</u> , T
Mod 3	1			BRI-2, BRI-4, Loop	<u>S</u> , T	BRI-2, BRI-4, Loop	<u>S</u> , T
	2			BRI-2, BRI-4, Loop	<u>S</u> , T	BRI-2, BRI-4, Loop	<u>S</u> , T
	3			BRI-2, BRI-4, Loop	<u>S</u> , T	BRI-2, BRI-4, Loop	<u>S</u> , T
Mod 4	1			BRI-2, BRI-4, Loop	<u>S</u> , T	BRI-2, BRI-4, Loop	<u>S</u> , T
	2			BRI-2, BRI-4, Loop	<u>S</u> , T	BRI-2, BRI-4, Loop	<u>S</u> , T
	3			BRI-2, BRI-4, Loop	<u>S</u> , T	BRI-2, BRI-4, Loop	<u>S</u> , T
Mod 5	1					BRI-2, BRI-4, Loop	<u>S</u> , T
	2					BRI-2, BRI-4, Loop	<u>S</u> , T
	3					BRI-2, BRI-4, Loop	<u>S</u> , T

Module	Card	Mini		Midi		Maxi	
		Card type	If BRI, Loop type	Card type	If BRI, Loop type	Card type	If BRI, Loop type
Mod 6	1					BRI-2, BRI-4, Loop	<u>S</u> , T
	2					BRI-2, BRI-4, Loop	<u>S</u> , T
	3					BRI-2, BRI-4, Loop	<u>S</u> , T
Mod 7	1					BRI-2, BRI-4, Loop	<u>S</u> , T
	2					BRI-2, BRI-4, Loop	<u>S</u> , T
	3					BRI-2, BRI-4, Loop	<u>S</u> , T
Mod 8	1					BRI-2, BRI-4, Loop	<u>S</u> , T
	2					BRI-2, BRI-4, Loop	<u>S</u> , T
	3					BRI-2, BRI-4, Loop	<u>S</u> , T

1.2.3 **EXTN/**LINE

N/A

1.3 Technical Specification

On cold start, warm start, or while running, if the card equipping a given slot does not match the card type declared in `Hardware▶Cdn▶`, the card does not boot, and the following alarm is raised:

Alarm 61-x-y - where x is the module number and y is the card number.

In Modular Plus, the system can support 80 loops, but only 64 ISDN extension numbers. Therefore, not all of the 80 loops can be configured as S-loops.

1.4 Interactions

Feature name	Interaction
Hardware, S-loops	<p>If the card type or loop type of an existing S-loop is changed, the S-loop is no longer considered valid (that is, it no longer exists) Any ISDN DNs assigned to that S-loop then appear as <code>Available in Extns on Lpaaa</code>. These ISDN DNs can be assigned to other S-loops or converted to Portable DNs.</p> <p>However, if the original S-loop is later redefined, any ISDN DNs previously assigned to the loop that have not been reassigned elsewhere or converted to Portable DNs, again appear as <code>Assigned</code> to that S-loop.</p>

Feature name	Interaction
Software Keys (Line credits) (DASS2 cards only) Provisioning	If any DASS2 lines are pre-provisioned in a slot where an analog card is to be placed, all lines for that slot should be manually deprovisioned before inserting the analog card. This is done to regain the line credits used up by the pre-provisioned DASS2 lines. After plugging in the analog card, provisioned lines for that slot are no longer accessible to the installer. The analog card must be removed and the card type set back to DASS2 before the line credits can be reclaimed.
Warm start	Potential 1.5 minute delay in getting the "Incompatible card" alarm condition raised (that is, getting the card state to unequipped), when changing cards on the CCU.

Modular Plus Default Templates

1.1 Overview

1.1.1 Description

All parameters receive default values following the initial application of power to the system and following System Startup. The templates containing the default values are called Default Templates.

This document contains the default templates for Modular Plus ICS. The possible Startup templates are Square, Hybrid, and PBX. The default template is underlined.

1.1.2 General Information

All references to Extn 221 in this document should be understood as referring to the extension attached to Port 101, which is typically the lowest numbered extension in a Modular system with a three-digit numbering plan.

The Modular Plus CCU supports two line cards. The cards can be any combination of the following:

- Analogue card
- a DTI (Digital Trunk Interface) card configured as either DASS2, DPNSS1 or PRI (I.421) or
- a two port or four port Basic Rate Interface (BRI) card

1.1.2.1 Line card capacity

- The Digital Trunk Interface (DTI) card (DASS2) provides connection of up to 30 DASS2 channels to the exchange network. This card requires the IVD services card for clocking support.
- The DTI card (I.421) provides connection of up to 30 PRI channels to the exchange network. This card requires the IVD services card for clocking support.
- The 2-port BRI card provides connection of the first two BRI loops (two 2B+D channels) of the 4-port BRI card. The loops can be configured as S or T, providing the first 4 channels/lines of the 4-port BRI card to the ISDN network. The 2-port BRI card requires the IVD services card for clocking support.
- The 4-port BRI card provides connection of up to four BRI loops (four 2B+D channels) that can be configured as S or T, providing eight channels/lines to the ISDN network. The 4-port BRI card requires the IVD services card for clocking support.
- Each Analogue card provides connection of up to four lines to the exchange network.

1.2 Startup

Heading	Options (PBX default is underlined)	Description
Reset memory?	Yes, Cancel	If canceled, then exit from Startup If Yes, then proceed
Template:	Square, Hybrid, <u>PBX</u> ,	Installer can change Template.
Start extn:	221 <3 to 7 digit entry>	This Start extn will be the lowest numbered set on the system, and all other extns numbered sequentially from the lowest extn. The highest Start extn which will be accepted is one which allows for the maximum number of B1 and B2 extension numbers, without requiring an extra digit to represent the number. If the new extns clash with any existing numbers, namely the Direct dial digit, Park prefix or Line pool codes, those numbers are overwritten (and set to <u>None</u>) by the new extns.

1.3 System & Extn Defaults

1.3.1 Terminals&Extns

Heading	Options (PBX default is underlined)	Description
Terminals&Extns		
Show extn#:	<valid extn number>	The installer enters an extension number.
Line access		
Line assignment		
Show line:	<valid line>	Enter valid line number. SCAN display key allows the user to view the list of lines assigned to the set.
<i>Lnnn</i>	Defaults are: Extn 221 All external lines: <u>Appear&Ring</u> DIA lines: Not assignd except for DIA line 101 which is <u>Appear&Ring</u> Other sets: All external lines: <u>Unassigned</u> All DIA lines: <u>Unassigned</u> except for DIA related to the port of the extn (i.e. 222 gets <u>Ring only</u> of DIA line 256).	A line can be assigned to: - not be assigned to the extension at all (Unassigned) - Ring at the intercom (Ring only) - Ring at a line key (Appear&Ring) - have a non-ringing line key (Appear only) In the case of Private lines, the value is Pvt>Setname with no CHANGE display key.
Line Pool access		Modular Plus has 15 pools: A, B, C ... O
Line pool A and Line pool O:	<u>Y</u> , N	Line Pool A and O have value Y and all other line pools have value N.

Heading	Options (PBX default is underlined)	Description
Prime line	<physical line assigned to the extension number being programmed>, Pool A, ... Pool O, <u>Intcm</u> , None	
Intercom keys	0, 1, <u>2</u> , 3, 4, 5, 6, 7, 8	
Answer Extns		
Show Extn:	<valid extn>	The installer enters an extension number.
Extn:	<u>Unassigned</u> , Appear&Ring, Appear only	The user assigns presence and absence, ringing or non-ringing
OLI #	<u>Extn #</u> (up to seven digits), None,	Number of digits is based on Rec'd length►Public length in System progrming
Capabilities		
Fwd no answer		
Fwd to: _	<valid extn>, <u>None</u>	If the set does not answer after the entered number of rings (see Forward delay), this feature automatically forwards the set's calls to the extn number entered.
Forward delay: _	2, 3, <u>4</u> , 6, 10	If CFNA is enabled
Fwd on busy		If the extension is busy, this feature automatically forwards the set's calls to the extension number entered.
Fwd to: _	<valid extn>, <u>None</u>	
DND on busy:	<u>Y</u> , N	Extn 221 has a default value of N
Handsfree:	Auto, Std, <u>None</u>	
HF answerback:	<u>Y</u> , N	
Pickup grp:	<u>None</u> , 1, 2, 3, 4, 5, 6, 7, 8, 9	
Page zone:	None, <u>1</u> , 2, 3, 4, 5, 6	
Paging:	<u>Y</u> , N	
D-Dial:	<u>Extn1</u> , Extn2, ... Extn5, None	
Priority call:	Y, <u>N</u>	
Hotline:	Intrnl, Extrnl, <u>None</u>	If this parameter is set to Intrnl or Extrnl, then the appropriate display appears as below
Intrnl #:	<valid extn>, <u>None</u>	Appears if Hotline is Intrnl.
Extrnl #:	<u>None</u> , <up to 24 digits>	Appears if Hotline is Extrnl.
<External facility choice>	<u>Use prime line</u> , Use line: __, Pool code: __, Use routing tabl	Appears if D-Dial is Extrnl and number specified. Use routing tabl option routes numbers through the Routing Table. DIA lines cannot be used as the facility.
Aux. ringer:	<u>N</u> , Y	
Redirect ring:	N, <u>Y</u>	Controls presence or absence of a ring splash reminder for Selective Line Redirection.

Heading	Options (PBX default is underlined)	Description
Receive tones:	<u>N</u> , Y	Feature that determines if ATA and non-ATA devices receive tones.
ATA Settings		
ATA ans timer	3, 5, <u>Z</u> , 10	
ATA mode	Tone, Pulse	
ATA tones	N, Y	
ATA use	On site, <u>Off site</u>	
Intrusion		
Protect lvl	<u>None</u> , Low, Med, High	
Name:	<extn name>	Up to 7 characters for an extn name.
User preferences		
Model:	M7000, M7100, <u>M7208</u> , M7310, M7324, Other	Note that M7xxx refers to both M7xxx and M7xxxN sets.
Key prgrming	If M7000: 4 keys If M7100: 1 key If M7208: 8 keys If M7310: 10 + 24 keys If M7324 - 24 keys.	
Show key	B01,.....B02 (M7000) B01 (M7100) B01,.....B08 (M7208) B01,.....B34 (M7310) B01,.....B24 (M7324) B01,.....B48 (CAP for M7324)	See "1.5 Defaults for Extn Keys" on page 27.
User speed dial		
24 Speed dialers		Spd#71...Spd#94 - up to 24 internal and/or external numbers (and names) can be programmed.
Speed dial #:	<valid speed dialer code>	The code for the speed dialer. Valid numbers are 71 to 94.
nn:		The phone number for the speed dialer.
<External facility choice>	<u>Use prime line</u> , Use line:____, Pool code:____, Use routing tabl	For external number speed dialers only. Specifies the facility the call will be made on. If Routing tabl is chosen, then the number is translated according to the Routing Table. DIA lines cannot not be used as the facility.
Call log opt'ns	Log all calls No auto logging <u>No one answered</u> Unanswered by me	
Dialing opt'ns	Standard dial Pre-dial <u>Automatic dial</u>	Automatic dial is available only when the extension has a prime line.
Language:	<u>English</u> , Opratng	
Display cntrst:	1, 2, 3, <u>4</u> , 5, 6, 7, 8, 9	
Ring type:	<u>1</u> , 2, 3, 4	

Heading	Options (PBX default is underlined)	Description
Restrictions		Values for the following parameters are: 0 to 9, *, #, and a wild card (appears when you press the ANY display key).
<i>Hidden global overrides</i>	999 and 112	These global overrides apply to all filters but cannot be viewed or changed by the user.
Restrn filters		
Show filter:	00, ... 99	
Restrn flt 00	No restrictions	The 00 filter is a null filter and cannot be edited. If the 00 filter is assigned to a set and/or a line, dialing is unrestricted.
Restrn flt 01		
Restrn 01:	0	Displays up to 4 characters from the Deny parameter (see below).
Deny:	<u>0</u> , <number up to 15 digits>	All calls that begin with 0 will not be permitted, but see the exception below.
Override 001:	<u>0800</u> , <number up to 16 digits>	Allows for toll-free calls.
Restrn 02:	1	
Deny:	<u>1</u> , <number up to 15 digits>	All calls that begin with 1 will not be permitted.
Override 001:	<u>No overrides</u> , <number up to 16 digits>	No overrides.
Restrn flt 02 to 04	No restrictions	The filters are empty. Specific filters are applied to specific facilities by default in order to aid programming. In this way, modifying the filter will automatically affect all the facilities it has been applied to.
Restrn flt 05		
Restrn 01:	010	Displays up to 4 characters from the Deny parameter (see below).
Deny:	<u>010</u> , <number up to 15 digits>	All calls that begin with 010 will not be permitted, but see the exception below.
Override 001:	<u>No overrides</u> , <number up to 16 digits>	No overrides
Restrn 02:	1	
Deny:	<u>1</u> , <number up to 15 digits>	All calls that begin with 1 will not be permitted.
Override 001:	<u>No overrides</u> , <number up to 16 digits>	No overrides.
Restrn 03:	00	
Deny:	<u>00</u> , <number up to 15 digits>	All calls that begin with 00 will not be permitted.
Override 001:	<u>No overrides</u> , <number up to 16 digits>	No overrides.
Restrn flt 06		
Restrn 01:	<ANY>	Displays up to 4 characters from the Deny parameter (see below).

Heading	Options (PBX default is underlined)	Description
Deny:	< <u>ANY</u> >, <number up to 15 digits>	All calls that begin with any digit will not be permitted, but see the exception below.
Override 001:	<u>No overrides</u> , <number up to 16 digits>	No overrides
Restrtn flt 07 to 99	No restrictions	The remaining filters are empty. Specific filters are applied to specific facilities by default in order to aid programming. In this way, modifying the filter will automatically affect all the facilities it has been applied to.
Extn restrns		
Filters		
Normal:	00, 01, <u>02</u> , ... 99	
Night:	00, 01, 02, ... <u>11</u> , ... 99	Filters 11, 12, 13 are three undefined restriction filter defaults. This effectively pre-administers the Alternate Restrictions so that the installer only needs to define the respective files for the corresponding restriction modes.
Evening:	00, 01, 02, ... <u>12</u> , ... 99	See above.
Lunch:	00, 01, 02, ... <u>13</u> , ... 99	See above.
Sched 4:	<u>00</u> , 01, 02, ... 99	
Sched 5:	<u>00</u> , 01, 02, ... 99	
Sched 6:	<u>00</u> , 01, 02, ... 99	
Extnlock:	<u>None</u> , Partial, Full	Prevents the user of the set from using certain features.
Allow last no	N, <u>Y</u>	Controls whether or not an extn can access the Last Number Redial feature.
Allow saved no	N, <u>Y</u>	Controls whether or not an extn can access the Saved Number Redial feature.
Allow recall	N, <u>Y</u>	Controls whether or not an extn can access the Recall feature.
Allow redirect	<u>N</u> , Y	
Line/extn restrn		Prevents the user from dialing numbers restricted by the dialing filter when they use a certain line(s) with their telephone.
Show line:	<valid physical lines that are assigned to the extn>	
Normal:	<u>None</u> , 00, 01, 02, ... 99	
Night:	<u>None</u> , 00, 01, 02, ... 99	
Evening:	<u>None</u> , 00, 01, 02, ... 99	
Lunch:	<u>None</u> , 00, 01, 02, ... 99	
Sched 4:	<u>None</u> , 00, 01, 02, ... 99	
Sched 5:	<u>None</u> , 00, 01, 02, ... 99	
Sched 6:	<u>None</u> , 00, 01, 02, ... 99	

Heading	Options (PBX default is underlined)	Description
Call Services		
Auto call info		
Show line:	<valid line>	
Call log set:	<u>N</u> , Y	For DIA line assigned to set default is Y.
Extl VMsg extn:	<u>N</u> , Y	
1stDisplay:	<u>Numbr</u> , Line	For trunks that provide Name information. If no name information, then Numbr is default.
Auto called ID:	<u>N</u> , Y	Feature that displays the number of the called party.
Log space		
Log: <i>nnn</i> Pool: <i>mmm</i>	<u>0</u> ... 600	Shows the number (<i>nnn</i>) of log entries for this set and how many (<i>mmm</i>) entries are left in the free pool. Default is 0 log entries for all sets. ADD and REMOVE keys are displayed.
Add:	nnn	Add more log entries to the log for this set. Add capability is available only if there are log entries in the Free pool.
Remove:	nnn	Remove log entries from the log for this set. Remove capability is available only if there are log entries assigned for this set.

1.3.2 Lines

Heading	Options (PBX default is underlined)	Description
Show line:	<valid line>	
Line data		
Trunk types:	DPNSS1 (on-core only), DASS2 (on-core only), PRI (on-core only), BRI, Loop, AC15 (on-core set ports only)	Read only screen. Not shown if line being programmed is a DIA line. Default size and position dependent. See below: MINI: Mod 2 = DASS2/PRI/DPNSS1 MIDI: Mod 2 = DASS2/PRI/DPNSS1 Mod 3-4 = Loop MAXI: Mod 2 = DASS2/PRI/DPNSS1 Mod 3-4 = <i>BRI-2 or BRI-4</i> Mod 5-8 = Loop
<i>DPNSS1, DASS2 or PRI lines 001 - 060 (on-core only)</i>		
Line type:	Public, Private to:<extn>, <u>Pool A</u> , ... Pool O	Pool A is the default for lines 001 to 030. Public is the default for lines 031 to 060.
PrimeExtn:	<u>221</u> , <extn>, None	
CLID extn:	<extn>, <u>None</u>	
Auto privacy:	<u>Y</u> , N	
Ans mode:	Manual, <u>Auto</u>	
Aux. ringer:	Y, <u>N</u>	Association of line with auxiliary ringer.
Full Autohold:	Y, <u>N</u>	
<i>BRI lines 001 - 008, 031 - 038 (on-core); 061 - 230 (off-core)</i>		
Line type:	Public, Private to:<extn>, <u>Pool A</u> , ... Pool O	Pool A is the default for lines 001 to 030. Public is the default for lines 031 to 240.
Prime extn:	<u>221</u> , <extn>, None	
CLID extn:	<extn>, <u>None</u>	
Auto privacy:	<u>Y</u> , N	
Ans Mode:	<u>Manual</u> , Auto	
Ans with DISA:	Y, <u>N</u>	Shown only if Answer mode is <u>Auto</u> and line being programmed is not a DIA line.
Aux. ringer:	Y, <u>N</u>	Association of line with auxiliary ringer.
Full Autohold:	Y, <u>N</u>	
<i>Loop lines 001 - 004, 031 - 034, 061 - 230</i>		
Line type:	Public, Private to:<extn>, <u>Pool A</u> , ... Pool O	Pool A is the default for lines 001 to 030. Public is the default for lines 031 to 230.
Dial mode:	<u>Tone</u> , Pulse	
PrimeExtn:	<u>221</u> , <extn>, None	
Auto privacy:	<u>Y</u> , N	

Heading	Options (PBX default is underlined)	Description
Mode:	<u>EarthCalling</u> , LoopGuarded, LoopUnguard	
Ans mode:	<u>Manual</u> , Auto	Shown only if mode is EarthCalling or LoopGuarded and line being programmed is not a DIA line.
Ans with DISA:	Y, <u>N</u>	Shown only if Answer mode is Auto.
Aux. ringer:	Y, <u>N</u>	Association of line with auxiliary ringer.
Recall:	<u>Timed brk</u> , Earth500, Earth1000, Earth1500	If the mode is set to <u>Earth calling</u> or LoopGuarded, the Recall option is suppressed.
Recall at EXCH:	Y, <u>N</u>	Allow sending of recall signal to exchange.
Dial tone:	<u>Detect</u> , Delay	Show only for Loop lines.
Full Autohold:	Y, <u>N</u>	
AC15 lines 241 - 254		
Line type:	Public, Private to:<extn>, Pool A, ... <u>Pool O</u>	
Dial mode:	<u>Tone</u> , Pulse	
Prime extn:	<u>221</u> , <extn>, None	
Auto privacy:	<u>Y</u> , N	
Ans mode:	<u>Manual</u> , Auto	
Amplified AC15:	<u>Y</u> , N	
Vol. setting	1, <u>2</u> , 3	This sets the transmit and receive gain settings.
Aux. ringer:	Y, <u>N</u>	Association of line with auxiliary ringer.
Recall at EXCH:	Y, <u>N</u>	
Full Autohold:	Y, <u>N</u>	
DIA lines 255 -382		
DIA line		Display only
Line type:	<u>Public</u> , Private to:<extn>, Pool A, ... Pool O	
Received numbrs		
Private #:	None, <valid received number>, <next extn number>	Cannot be the same as or the start digits of a line pool access code, a destination code, the DISA extension number, the Auto extension number or another private received number. The Private # length is set in System prgrming.
Public#:	None, <valid received number>, <next extn number>	Cannot be the same as or the start digits of a line pool access code, a destination code, the DISA extension number, the Auto extension number or another public received number. The Public # length is set in System prgrming.

Heading	Options (PBX default is underlined)	Description
If busy:	<u>BusyTone</u> , To Prime	For Square of Hybrid, the default is 'To Prime'.
Prime extn:	<u>221</u> , <extn>, None	
CLID extn:	<extn>, <u>None</u>	
Aux. ringer:	Y, <u>N</u>	Association of line with auxiliary ringer.
Name:Linenam	< <u>Linennn</u> >	Up to 7 characters for a name
Restrictions		This heading is not available for DIA lines.
<i>Hidden global overrides</i>	999 and 112	These global overrides apply to all filters but cannot be viewed or changed by the user.
Restrn filters		
Show filter:	00, ... 99	
Restrn flt 00	No restrictions	The 00 filter is a null filter and cannot be edited. If the 00 filter is assigned to a set and/or a line, dialing is unrestricted.
Restrn flt 01		
Restrn 01:	0	Displays up to 4 characters from the Deny parameter (see below).
Deny:	<u>0</u> , <number up to 15 digits>	All calls that begin with 0 will not be permitted, but see the exception below.
Override 001:	<u>0800</u> , <number up to 16 digits>	Allows for toll-free calls.
Restrn 02:		
Restrn 02:	1	
Deny:	<u>1</u> , <number up to 15 digits>	All calls that begin with 1 will not be permitted.
Override 001:	<u>No overrides</u> , <number up to 16 digits>	No overrides.
Restrn flt 02 to 04	No restrictions	The filters are empty. Specific filters are applied to specific facilities by default in order to aid programming. In this way, modifying the filter will automatically affect all the facilities it has been applied to.
Restrn flt 05		
Restrn 01:	010	Displays up to 4 characters from the Deny parameter (see below).
Deny:	<u>010</u> , <number up to 15 digits>	All calls that begin with 010 will not be permitted, but see the exception below.
Override 001:	<u>No overrides</u> , <number up to 16 digits>	No overrides
Restrn 02:		
Restrn 02:	1	
Deny:	<u>1</u> , <number up to 15 digits>	All calls that begin with 1 will not be permitted.
Override 001:	<u>No overrides</u> , <number up to 16 digits>	No overrides.
Restrn 03:		
Restrn 03:	00	

Heading	Options (PBX default is underlined)	Description
Deny:	<u>00</u> , <number up to 15 digits>	All calls that begin with 00 will not be permitted.
Override 001:	<u>No overrides</u> , <number up to 16 digits>	No overrides.
Restrnt flt 06		
Restrnt 01:	<ANY>	Displays up to 4 characters from the Deny parameter (see below).
Deny:	<ANY>, <number up to 15 digits>	All calls that require any digit will not be permitted.
Override 001:	<u>No overrides</u> , <number up to 16 digits>	No overrides
Restrnt flt 07 to 99	No restrictions	The filters are empty. Specific filters are applied to specific facilities by default in order to aid programming. In this way, modifying the filter will automatically affect all the facilities it has been applied to.
Line restrnts		In this section, filters are assigned for dialing restrictions to apply to the extension for the different schedules. Empty, or undefined filters, are assigned to all sets for all Services by default. That means that there are no restrictions until the filter is defined. The filter can be defined by copying one of the already defined filters (01,02 03) or by manual input, or a combination of both.
Normal:	00, 01, <u>03</u> , ... 99	
Night:	00, 01, 02, ... <u>21</u> , ... 99	Filters 21, 22, 23 are three undefined restriction filter defaults. This effectively pre-administers the Alternate Restrictions so that the installer only needs to define the filter for the corresponding restriction schedule
Evening:	00, 01, 02, ... <u>22</u> , ... 99	See above.
Lunch:	00, 01, 02, ... <u>23</u> , ... 99	See above.
Sched 4:	<u>00</u> , 01, 02, ... 99	
Sched 5:	<u>00</u> , 01, 02, ... 99	
Sched 6:	<u>00</u> , 01, 02, ... 99	
Remote restrnts		Prevents the user from dialing numbers restricted by the dialing filter when they use a certain line(s) with their telephone.
Normal:	00, 01, ... <u>04</u> , ... 99	
Night:	00, 01, 02, ... <u>31</u> , ... 99	Filters 31, 32, 33 are three undefined restriction filter defaults. This effectively pre-administers the Alternate Restrictions so that the installer only needs to define the filter for the corresponding restriction schedule.
Evening:	00, 01, 02, ... <u>32</u> , ... 99	See above.

Heading	Options (PBX default is underlined)	Description
Lunch:	00, 01, 02, ... <u>33</u> , ... 99	See above.
Sched 4:	<u>00</u> , 01, 02, ... 99	
Sched 5:	<u>00</u> , 01, 02, ... 99	
Sched 6:	<u>00</u> , 01, 02, ... 99	

1.3.3 Services

Heading	Options (PBX default is underlined)	Description
Ringing service		
Ring groups		
Show group:	01, ... 100	
Ring grp <i>nn</i>		
Show extn#:	<valid extn>	
<i>Extn:</i>	Assigned, <u>Unassign</u>	By default, Extn 221 is assigned to every ring group.
Sched: <i>Night</i>		
Service:	<u>Manual</u> , Off, Auto	
Trunk answer:	N, <u>Y</u>	Trunk answer from any station for all extns in this mode.
Extra-dial:	<u>221</u> , <extn>	
Line settings		
Show line:	<valid line>	
Ring grp:	<valid ring group>	
Aux. ringer	N, <u>Y</u>	
Sched: <i>Evening</i>		
Service:	<u>Manual</u> , Off, Auto	
Trunk answer:	N, <u>Y</u>	See above.
Extra-dial:	<u>221</u> , <extn>	
Line settings		
Show line:	<valid line>	
Ring grp:	<valid ring group>	
Aux. ringer	N, <u>Y</u>	
Sched: <i>Lunch</i>		
Service:	<u>Manual</u> , Off, Auto	
Trunk answer:	N, <u>Y</u>	See above.
Extra-dial:	<u>221</u> , <extn>	
Line settings		
Show line:	<valid line>	
Ring grp:	<valid ring group>	
Aux. ringer	N, <u>Y</u>	

Heading	Options (PBX default is underlined)	Description
Sched: <i>Sched 4</i>		
Service	<u>Manual</u> , Off, Auto	
Trunk answer:	N, <u>Y</u>	See above.
Extra-dial:	<u>221</u> , <extn>	
Line settings		
Show line:	<valid line>	
Ring grp:	<valid ring group>	
Aux. ringer	N, <u>Y</u>	
Sched: <i>Sched 5</i>		
Service:	<u>Manual</u> , Off, Auto	
Trunk answer:	N, <u>Y</u>	See above.
Extra-dial:	<u>221</u> , <extn>	
Line settings		
Show line:	<valid line>	
Ring grp:	<valid ring group>	
Aux. ringer	N, <u>Y</u>	
Sched: <i>Sched 6</i>		
Service:	<u>Manual</u> , Off, Auto	
Trunk answer:	N, <u>Y</u>	See above.
Extra-dial:	<u>221</u> , <extn>	
Line settings		
Show line:	<valid line>	
Ring grp:	<valid ring group>	
Aux. ringer	N, <u>Y</u>	
Restrtn service		
Sched: <i>Night</i>		
Service:	Manual, <u>Off</u> , Auto	If this setting is Manual or Auto, appropriate filters should be applied to lines, sets, line/sets and Remote filters for the Mode in Capabilities.
Sched: <i>Evening</i>		
Service:	Manual, <u>Off</u> , Auto	As above.
Sched: <i>Lunch</i>		
Service:	Manual, <u>Off</u> , Auto	As above.
Sched: <i>Sched 4</i>		
Service	Manual, <u>Off</u> , Auto	As above.
Sched: <i>Sched 5</i>		
Service:	Manual, <u>Off</u> , Auto	As above.
Sched: <i>Sched 6</i>		
Service:	Manual, <u>Off</u> , Auto	As above.

Heading	Options (PBX default is underlined)	Description
Routing service		
Routes		
Show route:	<valid route>	
Rtennn		
DialOut:	<u>No numbr</u> , <up to 24 digits/characters>	The digit string that will be outputted for this destination code.
Use:	<u>Pool A</u> , ... Pool O	The facility to be used for this destination code.
Dest codes		<p>User enters destination code. The Destination code is the string of digits that a user enters into Intercom, in this table, that results in selection of a facility, and translation of digits to a network destination. Invalid codes include:</p> <ul style="list-style-type: none"> • Destination codes with leading digits which conflict with the Call Park prefix, or Direct Dial digit. • Destination codes which are identical to other destination codes, an extension number or Pool code. <p>No default destination code is provided. This value depends on the dialing plan of the network.</p>
Show DstCode:_	<1 to 7 digits>	
DstCode:_	<1 to 7 digits>	User selects "ADD" display key in order to add a new dest code.
DstCode:nnnnnnn		
<i>Normal:</i>	nnn, <u>000</u>	Route 000 uses pool A and has no dial out number.
AbsorbLength:	<u>All</u> , 0,1, 2, 3, 4, 5, 6	The values vary with the length of DstCode (DstCode minus 1), e.g., if the DstCode is 4 digits, the values are: 1, 2, 3.
<i>Night:</i>	nnn, <u>None</u>	
AbsorbLength:	<u>All</u> , 0,1, 2, 3, 4, 5, 6	See above.
<i>Evening:</i>	nnn, <u>None</u>	
AbsorbLength:	<u>All</u> , 0,1, 2, 3, 4, 5, 6	See above.
Lunch:	nnn, <u>None</u>	
AbsorbLength:	<u>All</u> , 0,1, 2, 3, 4, 5, 6	See above.
<i>Sched 4:</i>	nnn, <u>None</u>	
AbsorbLength:	<u>All</u> , 0,1, 2, 3, 4, 5, 6	See above.
Sched 5	nnn, <u>None</u>	
AbsorbLength:	<u>All</u> , 0,1, 2, 3, 4, 5, 6	See above.
Sched 6	nnn, <u>None</u>	
AbsorbLength:	<u>All</u> , 0,1, 2, 3, 4, 5, 6	See above.

Heading	Options (PBX default is underlined)	Description
Sched:Night		
Service:	Manual, <u>Off</u> , Auto	If this setting is Manual or Auto, appropriate filters should be applied to lines, extns, line/extns and Remote filters for the Mode in Capabilities.
Overflow:	<u>N</u> , Y	
Sched:Evening		
Service:	Manual, <u>Off</u> , Auto	As above.
Overflow:	<u>N</u> , Y	
Sched:Lunch		
Service:	Manual, <u>Off</u> , Auto	As above.
Overflow:	<u>N</u> , Y	
Sched:Sched 4		
Service:	Manual, <u>Off</u> , Auto	As above.
Overflow:	<u>N</u> , Y	
Sched:Sched 5		
Service:	Manual, <u>Off</u> , Auto	As above.
Overflow:	<u>N</u> , Y	
Sched:Sched 6		
Service:	Manual, <u>Off</u> , Auto	As above.
Overflow:	<u>N</u> , Y	
Common settings		
Control extns		
For lines		
Show line:	<valid line>	After entering line number, the Control Extn for that line is specified. The Control Extn for a line controls both extended ringing AND Alternative Restrictions AND Least Cost Routing for that line.
Lnnn:	<u>221</u> , None, <extn>	The control extn for the line in question is displayed.
For extensions		
Show extn:_	<valid extn>	After entering the extn, the Control Extn for that extn is specified. The Control Extn for an extension controls Alternative Restrictions AND Least Cost Routing for that set.
Extn number:	<u>221</u> , None, <extn>	The Control Extn for the extension in question is displayed.
Schedule names		
Sched 1:	<u>Night</u> , <Name>	Names can use up to 7 characters.
Sched 2:	<u>Evening</u> , <Name>	As above.
Sched 3:	<u>Lunch</u> , <Name>	As above.

Heading	Options (PBX default is underlined)	Description
Sched 4:	<u>Sched 4</u> , <Name>	As above.
Sched 5:	<u>Sched 5</u> , <Name>	As above.
Sched 6:	<u>Sched 6</u> , <Name>	As above.
Schedule times		
Monday		
Sched: <i>Night</i>		
Start time:	23:00,hh:mm	Default times for AUTO services may be changed.
Stop time:	7:00,hh:mm	
Sched: <i>Evening</i>		
Start time:	17:00	Default times for AUTO services may be changed.
Stop time:	23:00	
Sched: <i>Lunch</i>		
Start time:	12:00	Default times for AUTO services may be changed.
Stop time:	13:00	
Sched: <i>Sched 4</i>		
Start time:	0:00	Default times for AUTO services may be changed.
Stop time:	0:00	
Sched: <i>Sched 5</i>		
Start time:	0:00	Default times for AUTO services may be changed.
Stop time:	0:00	
Sched: <i>Sched 6</i>		
Start time:	0:00	Default times for AUTO services may be changed.
Stop time:	0:00	
Tuesday		As above.
Wednesday		As above.
Thursday		As above.
Friday		As above.
Saturday		As above.
Sunday		As above.

1.3.4 System Speed Dial

Heading	Options (PBX default is underlined)	Description
Sys speed dial		Up to 70 system speed dial numbers can be assigned (01 to 70).
Speed dial#:	01, ... 70	The number of the speed dialer.

Heading	Options (PBX default is underlined)	Description
Speed dial# 01		
01:	<u>No Number</u> , <up to 24 characters incl. *, #, Feature>	The digits and characters for the speed dialer.
<External facility choice>	<u>Use prime line</u> , Use line:____, Pool code:____, Use routing tabl	Specifies the facility the call will be made on. If <u>Routing tabl</u> is chosen, then the number is translated according to the Routing Table. DIA lines cannot not be used as the facility.
Display digits:	<u>Y</u> , N	If N is specified, Name is displayed
Name:	<u>Sys Spd Dial <code></u> , <up to 16 characters>	Administrator enters a name or accepts the default name. The name can be up to 16 characters long. This heading is conditional on Display digits being set to N.
Bypass restr'n	Y, <u>N</u>	

1.3.5 Passwords

Heading	Options (PBX default is underlined)	Description
COS pswds		
Show pswd #:	00, ... 99	
COS pswd #nn		
Pswd nn:	None, <up to 6 digits>	Must be unique amongst COS passwords.
User flt:	<u>None</u> , <valid filter>	
Line flt:	<u>None</u> , <valid filter>	
Remote pkg:	<u>None</u> , <valid remote package>	
Call log pswds		
Show extn#:	extn#	
Extn:<etxn name>		
Log pswd:	None, ****	If the extension user has changed the log password, the setting "****" will be displayed. Pressing CLR will reset the password to "None".
Progrming pswds		
Installer:	266344 (CONFIG)	Up to 6 digits.
SysCoord+:	727587 (SCPLUS)	Up to 6 digits.
Sys Coord:	23646 (ADMIN)	Up to 6 digits.
Basic:	22742 (BASIC)	Up to 6 digits.
Hospitality		
Desk pswd:	4677 (HOSP)	Up to 6 digits.
Cond:	None	Up to 6 digits.
Reg. pswd	<u>72346</u> (RADIO)	Up to 6 digits. Portable registration password. Appears only if system has Wireless capability.

1.3.6 Time and Date

Heading	Options (PBX default is underlined)	Description
Hour:	<u>01</u> <u>AM</u> , PM	AM/PM option only appears if Hour=1 to 12.
Minutes:	<u>00</u>	
Year:	<u>99</u>	Supports years in the range of 1998 to 2097.
Month:	<u>01</u>	
Day:	<u>01</u>	

1.3.7 System Programming

Heading	Options (PBX default is underlined)	Description
Hunt groups		
Show grp: _		
Hgn:<Extn number>		
Members 01:<extn>	Appear only, <u>Appear & Ring</u> , Ring only	
Line assignment		
Show line: ____		
<u>Lnnn</u> :	<u>Unassigned</u> , Assigned	
Mode:	<u>Sequential</u> , Cyclic, Broadcast	
Hunt delay:	1, 2, 3, <u>4</u> , 5, 6, 7, 8, 9, 10	
If busy:	<u>BusyTone</u> , Overflow, Queue	
Q timeout:	15, 30, 45, <u>60</u> , 120, 180	
Overflow: ____	<extn number>	
Name:	Hgn_, <up to 7 digits/characters>	
Change extns		
Old extn#: _	<valid extn number>	
New extn#: _	<valid extn number>	
Featr settings		
Background music:	<u>N</u> , Y	
On hold:	<u>Tones</u> , Music, Silence	Music, tones, silence for external parties.
Receiver volume	<u>Use sys volume</u> , Use set volume	What happens to handset volume when the handset goes on hook. This affects only global sets.
Camp timeout:	30, <u>45</u> , 60, 90, 120, 150, 180	Values in seconds. If the camped call is not answered before the selected timeout, a Call back call occurs at the key that camped the call.
Park timeout:	30, 45, <u>60</u> , 90, 120, 150, 180, 300, 600	Values in seconds. If the parked call is not answered before the selected timeout, a Call back call occurs at the key that parked the call.
Park mode:	<u>Lowest</u> , Cycle	

Heading	Options (PBX default is underlined)	Description
Trnsfr callbk:	3, <u>4</u> , 5, 6, 12	Number of rings before the Call back call occurs.
Netwk callbk:	15, <u>30</u> , 45, 60, 90	Number of rings before the Call back call occurs on a network call.
DRT to prime:	<u>Y</u> , N	DRT - Delayed Ring Transfer.
DRT delay:	1, 2, 3, <u>4</u> , 6	Number of rings before the call is transferred. This is shown only if DRT to prime is set to Y.
EX-EX Tfr/Conf:	<u>Y</u> , N	Determines whether or not to allow exchange to exchange transfer or conference.
Held reminder:	<u>Y</u> , N	
Remind delay:	30, <u>60</u> , 90, 120, 150, 180	Values in seconds (if Held line reminder enabled).
Conference tone:	<u>Y</u> , N	
Directed pickup:	<u>Y</u> , N	
Page tone:	<u>Y</u> , N	
PageTimeout:	15, 30, 60, 120, <u>180</u> , 300, 600, 2700	
Call log space		
Reset all logs?	Yes, No	
Space/log:	<log space>	This is only show if <code>Reset all logs?</code> is YES. The system maximum is 600 entries.
<i>nn</i> extns:xx each?		The call log pool can be partitioned, based on the value set in <code>Space/log</code> .
Host delay:	<u>1000</u> , 1500, 2000, 2500, 3000, 3500, 4000, 4500, 5000, 5500, 6000, 6500, 7000	Sets the delay between line seizure and beginning of outpulsing on CO trunks.
Alarm extn:	<u>221</u> , <valid extn number>	
Extn relocatn:	<u>N</u> , Y	Determines whether sets will maintain their programmed characteristics when moved.
EXCH ring:	<u>Preset</u> , Echo	
PCct delay:	200, <u>800</u> , 1600	Determines the delay between line seizure and outpulsing for AC15As.
Ans. extn	<u>Basic</u> , Enhanced, Extended	
Direct-Dial		
D-Dial1:	<u>Intrnl</u> , Extrnl, None	
Intrnl#:	<valid extn number>	D-Dial1 defaults to 221; D-Dial2 ... 5 default to None.
Extrnl#:	<u>None</u> , <up to 24 digits>	
<External facility choice>	<u>Use prime line</u> , Use line:____, Pool code:__, Use routing tabl	For an external number. DIA lines cannot not be used as the facility.

Heading	Options (PBX default is underlined)	Description
CAP assignment		
CAP1: to CAP5	<u>None</u> , <valid M7324 extension number>	
Access codes		
Line pool codes		
Line pool A: to Line pool O:	<u>A=9</u> , B ...O= None, <1 to 4 digit code>	
Park prefix:	0, <u>1</u> , 2, 3, 4, 5, 6, 7, 8, 9, None	This value cannot be the same as the direct dial number, external code digit, a received number, or the first digit of an extn, route code or line pool access code.
Exch code:	0, 1, 2, 3, 4, 5, 6, 7, 8, <u>9</u> , None	Provides an external line if appropriately configured. If the Start extn has been changed to be 9x, then the default value is <blank>. This value cannot be the same as the direct dial number, park prefix, a received number, or the first digit of an extn, route code or line pool access code.
Direct-dial:	<u>0</u> , 1, 2, 3, 4, 5, 6, 7, 8, 9, None	Single digit only valid if not used as the park prefix, external code digit, a received number, or the first digit of an extn, line pool access code or routing digit.
Auto #:	<u>None</u> , <Received #>	An Auto-answer line auto-answers this received # and presents system dial tone for remote system access. The length of this number is set in System prgrming under Rec'd # length►Public length.
DISA #:	<u>None</u> , <Received #>	An Auto-answer line auto-answers this received # and presents stuttered dial tone for remote system access. The length of this number is set in System prgrming under Rec'd # length►Public length.
Remote access		
Rem access pkgs		Permits remote user access to the system's line pools and page feature.
Show pkg:	00, ... 15	
<Rem pkg 00>		Package 00 denies access to Remote Page and denies access to all line pools. It cannot be edited. <i>nnnn</i> is the line pool code; it is blank if no code has been defined.
LinePool access		
Pool A (<i>nnnn</i>) to ... Pool O:	N	
Remote page:	N	

Heading	Options (PBX default is underlined)	Description
<Rem pkg 01>		Permits default access to line pool A. Remote users access the system's page feature by dialing *60, *61, *62, or *63 into system dial tone (see Page feature for details on each code - Page is only available if access is administered, the default is No).
LinePool access		
Pool A (nnnn):	<u>Y</u> , N	
Pool B (nnnn) to Pool O (nnnn):	Y, <u>N</u>	
Remote page:	Y, <u>N</u>	
<Rem pkg 02 to 15>		
LinePool access		
Pool A (nnnn) to ... Pool O:	Y, <u>N</u>	
Remote page:	Y, <u>N</u>	
Rem line access		
Show line:	<valid physical line>	
Lnnn: Rem pkg:	<u>00</u> , ... 15	
Chnge extn type		When Portables and ISDN terminals share a fixed range of extension numbers.
Show extn #:	<u>Portable</u> , ISDN	Extn Maximum 64 ISDN extension numbers (477-540) if portable extension numbers are not used. Maximum 32 Portable extension numbers (477-540). Norstar extension numbers (221-348) cannot be changed.
Companion		The headings under Companion appear only if the Norstar system has Wireless capability.
Registration		
Registration:	<u>N</u> , Y	
Portable extns		
Show extn:	<valid portable extn>	
<extn>:	Registrd, <u>Availble</u> , Pending	
Radio data		
Radios		
Cell assignment		
Show radio:	<u>Unassigned</u> , in Cell mm	
Antenna type		
Show radio:	<u>Internal</u> , External	
Cells		
Show cell:	01, 02, 03, 04, 05, ... 16	
Cell radios		
Show radio:	<u>Unassigned</u> , Assigned	
Cell nghbrs		

Heading	Options (PBX default is underlined)	Description
Show nghbr:	<u>Unassigned</u> , Assigned	
Cell rad nghbrs		
Show RadNghbr:	<u>Unassigned</u> , Assigned	
System LID:	<4 hexadecimal numbers>	Hexadecimal value between 0401-FFFE
Rec'd # lengths		
Private length:	1, 2, 3, 4, 5, 6, 7	Number of digits for DIA lines for calls from the private network.
Public length:	1, 2, 3, 4, 5, 6, 7	Number of digits for DIA lines for calls from the public network.
Extn# length:_	<u>3</u> , 4, 5, 6, 7	Number of digits for extension number. This default value can be reset in **STARTUP when installer sets the Start extension number.
Loc code:		
Hospitality		
Room/desk info		
Show extn #:		
Room #:		
Adm pwd req'd:	<u>Y</u> , N	
Call prmissions		
Vacant:	00	
Use fltr:	00 to 99	
Basic:	00	
Mid:	00	
Full:	00	
Service time		
Hour:	00 (00 to 23)	
Minute:	00 (01 to 59)	
Alarm		
Attn attemps:	1, 2, <u>3</u> , 4, 5	
Retry intrvl:	2, <u>4</u> , 6, 8 (in minutes)	
Attn duration:	10, <u>15</u> , 20, 30, 40, 50 (in seconds)	
Time format:	<u>12hr</u> , 24hr	
Expired Alarms		
Notify extn:	<u>None</u> , <extn#>	
Use tone:	<u>N</u> , Y	
Network Services		
ETSI		

Heading	Options (PBX default is underlined)	Description
Network Diversion:	<u>N</u> , Y	

1.3.8 Network Services

Heading	Options (PBX default is underlined)	Description
VMsg ctr data		
Vmsg centre 1:		
Tel#:	<u>No number</u>	
MWI:	<u>AN*1#</u>	
MWC:	<u>AN*0#</u>	
Vmsg centre 2:		
Tel#:	<u>No number</u>	
MWI:	<u>AN*1#</u>	
MWC:	<u>AN*0#</u>	
Vmsg centre 3:		
Tel#:	<u>No number</u>	
MWI:	<u>AN*1#</u>	
MWC:	<u>AN*0#</u>	
Vmsg centre 4:		
Tel#:	<u>No number</u>	
MWI:	<u>AN*1#</u>	
MWC:	<u>AN*0#</u>	
Vmsg centre 5:		
Tel#:	<u>No number</u>	
MWI:	<u>AN*1#</u>	
MWC:	<u>AN*0#</u>	

1.3.9 Software Keys

Heading	Options (PBX default is underlined)	Description
Software Keys		Access granted only if user enters OAM programming menu with installer or system coordinator plus password.
SysID:		8 digits for the unique system identification number for the CCU. Displays only.
Password keys		
Key 1:		8 digits - supplied by distributor.
Key 2:		8 digits - supplied by distributor.
Key 3:		8 digits - supplied by distributor.

1.3.10 Hardware

Heading	Options (PBX default is underlined)	Description
Cdn-CCU:	Loop, BRI-2, BRI-4, PRI, DASS2, DPNSS1	
<i>If the card is a loopstart card</i>		
Card type:	Loop	Display only.
Lines:	<i>nnn-mmm</i>	Display only.
<i>If the card is a BRI-2 or BRI-4 card</i>		
Card type:	<i>BRI-2 or BRI-4</i>	Display only.
Loops:	<i>aaa-ddd</i>	Display only.
Loop <i>aaa</i>		
Type:	S, <u>I</u>	
<i>If the loop type is S</i>		
Sampling:	<u>Adaptive</u> , Fixed	
Extns on <i>Lpaaa</i>		
Assign extns		
Show extn #:	<valid ISDN extn number>	The installer enters an extension number.
<i>mmmmmmm:</i>	<u>Availabl</u> , Assigned, * <i>Lpnnn</i> *, <i>Lpnnn</i>	If the ISDN extn number is already assigned to another loop as the <i>Loop extn #</i> , it will show * <i>Lpnnn</i> *. If the ISDN extn number is already assigned to another loop, it will show <i>Lpnnn</i> .
Loop extn #:_	<u>None</u> , <ISDN extn numbers assigned to this loop>	

<i>If the loop type is T</i>		
Protocol:	Euro, BTNR 191	
ClockSrc:	Primary, Secndry, TimMstr	Default for Cd1-CCU is Primary; default for Cd2-CCU is Secndry. Only for on-core.
<i>If the card is a DTI card configured as a DASS2 or PRI</i>		
Card type:	DASS2 / PRI	Display only.
Lines:	<i>xxx-yyy</i>	Display only.
ClockSrc:	Primary, Secndry, TimMstr	Default for Cd1-CCU is Primary; default for Cd2-CCU is Secndry. Only for on-core.
<i>If the card is a DTI card configured as a DPNSS1</i>		
Card type:	DPNSS	Display only.
Lines:	<i>xxx-yyy</i>	Display only.
ClockSrc:	Primary, Secndry, TimMstr	Default for Cd1-CCU is Primary; default for Cd2-CCU is Secndry. Only for on-core.
Local num len:	1, 2, <u>3</u> , 4, 5, 6, 7, 8, 9, 10	
Max transits:	<u>25</u>	

Heading	Options (PBX default is underlined)	Description
<i>If card is off-core</i>		
Cd1-Mod03 to Cd3-Mod08	Loop, BRI-2 or BRI-4,	Default is system size and position dependent. MIDI: Loop MAXI: Mod03-04=BRI-2 or BRI-4, Mod05-08=Loop.
<i>If the card is a Loopstart card</i>		See above.
<i>If the card is a BRI-2 or BRI-4 card</i>		See above.

1.3.11 Maintenance

Heading	Options (PBX default is underlined)	Description
System Version		
Clear lines		
Port/Extn status		
Module status		
Sys test log		
Sys admin log		
Network evt log		
Link Quality		All units in seconds.
Log event at:	50	The range is 1 to 57 for the Link quality parameter.
Block link at:	55	The range is 2 to 58 where Block values <="Windows size".
Provisioning		
<i>If the card is a DTI card configured as DPNSS1, DASS2 or PRI</i>		
Cdn-CCU	DPNSS1, DASS2 or PRI	
Show line:____		CREDIT and PORT keys are displayed.
xx credits	<u>08</u>	User selected CREDIT key to display available DTI line credits.
Lnnn	<u>Provis'nd</u> , Deprovsnd	User selects <u>ADD</u> display key in order to provision a line. User selects <u>REMOVE</u> display key in order to deprovision the displayed line. All digital lines are provisioned by default.
<i>If the card is a BRI-2 or BRI-4 card</i>		
Cdn-CCU:	BRI-2 or BRI-4	If the card is a loop card, the transient <u>Need digital crd</u> will be displayed.
Lpnnn:	<u>Provis'nd</u> , Deprovsnd	User selects <u>ADD</u> display key in order to provision a loop. User selects <u>REMOVE</u> display key in order to deprovision the displayed loop. All loops are provisioned by default.

Heading	Options (PBX default is underlined)	Description
<i>Lnnn:</i>	<u>Provis'nd</u> , Deprovsnd	User selects <u>ADD</u> display key in order to provision a line. User selects <u>REMOVE</u> display key in order to deprovision the displayed line. All digital lines are provisioned by default.
Tests		
BERT extn tests		
Loopback tests		
Diagnostic tools		
Link Status		

1.3.12 Usage metrics

Heading	Options (PBX default is underlined)	Description
Hunt groups		
Show group: _		
Hg <n> metrics		

1.4 Template Specific Defaults

Heading	Square	Hybrid	PBX
Lines			
Show line: __			
Line data			
DIA line			
Received #s			
Private #	<u>None</u> , <1 to 7 digits>	<u>None</u> , <1 to 7 digits>	<next etxn#> <u>None</u> , <1 to 7 digits>
Public #	<u>None</u> , <1 to 7 digits>	<u>None</u> , <1 to 7 digits>	<u>None</u> , <1 to 7 digits>
If busy:	BusyTone, <u>To prime</u>	BusyTone, <u>To prime</u>	BusyTone, <u>To prime</u>
Line type	Lines 001: Pool A Lines 002-382: <u>Public</u>	Lines 001-004: Pool A Lines 241-368: <u>Public</u>	Lines 001-030: Pool A Lines 031-382: <u>Public</u>
Terminal&Extns			
Line access			
Line assignment			

Heading	Square	Hybrid	PBX
<i>Lnnn:</i>	Defaults are: Extn 221 Line001–004: <u>Appear&Ring</u> All other external lines: <u>Unassigned^a</u> DIA lines: <u>Unassigned</u> Other sets: Line001–004: <u>Appear only</u> All other external lines: <u>Unassigned</u> DIA lines: <u>Unassigned</u>	Defaults are: Extn 221 Line001: <u>Appear&Ring</u> All other external lines: <u>Unassigned</u> DIA lines: <u>Unassigned</u> Other sets: Line001: <u>Appear only</u> All other external lines: <u>Unassigned</u> DIA lines: <u>Unassigned</u>	Defaults are: Extn 221 All external lines: <u>Ring only</u> DIA lines: <u>Unassigned</u> except for DIA line 101 which is <u>Ring only</u> Other sets: All lines: <u>Unassigned</u> DIA lines: <u>Unassigned</u> except for DIA line related to the port of the extn (i.e. 222 gets <u>Ring only</u> of DIA line 256).
Prime line	Intercom	Intercom	Intercom
Line pool	Pool A:Y	Pool A:Y	Pool A:Y
System prgrming			
Access codes			
Line pool codes	Pool A: <u>9</u> Pool B ... O: <u>None</u>	Pool A: <u>9</u> Pool B, ... O: <u>None</u>	Pool A: <u>9</u> Pool B, ... O: <u>None</u>

- a. Note that the Unassigned status for lines at Extn 221 does not preclude calls on those lines ending up at the prime set due to DRT, etc.

1.5 Defaults for Extn Keys

1.5.1 M7100 Extns- Key Defaults

Square	Hybrid	PBX
Last No. Redial	Last No. Redial	Last No. Redial

1.5.2 M7208 Extns - Key Defaults

Square	Hybrid	PBX
Line 1 (Group Pickup)	Line 1 (Pickup)	Line Pool A
Line 2 (Line Pool A)	Line pool A	Group Pickup
Line 3 (Last No. Redial)	Last No. Redial	Last No. Redial
Line 2 (Page Speaker)	Page Speaker	Page Speaker
Speed Dial	Speed Dial	Speed Dial
Transfer	Transfer	Transfer
Intercom (Call Forward)	Intercom (Call Forward)	Intercom (Call Forward)
Intercom (Saved No. Redial)	Intercom (Saved No. Redial)	Intercom (Saved No. Redial)

1.5.3 M7310 Sets – Key Defaults

1.5.3.1 Dual Memory Keys

The following table applies to all templates. This shows the default numbering for a system with a three-digit numbering plan and an expansion card.

Note: The table below is for Extn 227. This is why the Blank key appears below, the algorithm will skip over its own extension.

Extn 234 Extn 221	Extn 238 Extn 225	Extn 242 Extn 229
Extn 235 Extn 222	Extn 239 Extn 226	Extn 243 Extn 231
Extn 236 Extn 223	Extn 240 Blank	Extn 244 Extn 232
Extn 237 Extn 224	Extn 241 Extn 228	Extn 245 Extn 233

1.5.3.2 Template Key Defaults

Square		Hybrid		PBX	
Line 1 (Conference)	DND	Line 1 (Conference)	DND	Line Pool A	DND
Line 2 (Line Pool A)	Last No. Redial	Line pool A	Last No. Redial	Conf/Tran	Last No. Redial
Call Fwd	Page Speaker	Call Fwd	Page Speaker	Call Fwd	Page Speaker
Pick up	Intercom (Ring Again)	Pick up	Intercom (Ring Again)	Pick up	Intercom (Ring Again)
Speed Dial	Intercom (Saved No. Redial)	Speed Dial	Intercom (Saved No. Redial)	Speed Dial	Intercom (Saved No. Redial)

1.5.3.3 M7324 Sets - Key Defaults

Square		Hybrid		PBX	
Line 1	Call Fwd	Line 1	Call Fwd	blank	Call Fwd
Line 2	Speed Dial	Line pool	Speed Dial	blank	Speed Dial
blank	Last No. Redial	blank	Last No. Redial	blank	Last No. Redial
blank	Saved No. Redial	blank	Saved No. Redial	blank	Saved No. Redial
blank	Conference	blank	Conference	blank	Conference
blank	Transfer	blank	Transfer	blank	Transfer
blank	DND	blank	DND	blank	DND
blank	Group Pickup	blank	Group Pickup	blank	Group Pickup
blank	Voice Call	blank	Voice Call	blank	Voice Call
blank	Page Speaker	blank	Page Speaker	blank	Page Speaker
blank	Intercom (Ring Again)	blank	Intercom (Ring Again)	blank	Intercom (Ring Again)
blank	Intercom (Call Timer)	blank	Intercom (Call Timer)	blank	Intercom (Call Timer)

Module Status

1.1 Overview

1.1.1 Description

This feature allows the user to display information in OAM Programming about each module and card in the system, including how many sets or lines are attached to each, and how many are busy at the time of the query.

1.1.2 Rationale for Feature

Through Module Status, an installer can look at

- CCU modules
- line cards
- extension modules (EMs)
- line cartridges (LCs)
- check the state of a module or its cards
- disable or enable a module or its cards
- isolate any malfunctioning modules or devices
- disable a module before replacing it
- clear a hung line by disabling and enabling the affected card

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls

N/A

1.2.2 End User View

Norstar set users are notified if the set they are currently using is about to be disabled.

The system allows a total of 60 seconds for the user to release a call. Any calls not terminated by the user within this time period are dropped by the system and the set is disabled.

1.2.3 Message Displays

Message	Description
Please hang up	Displays, accompanied by Attention tone, to notify the set user that the module or card on a line is about to be disabled is about to be disabled. Alternates with the <code>Testing Line XXX</code> message until each has been displayed twice, or the user has release all calls.

Message	Description
Testing Line XXX	Transient three-minute display that alternates with the Please hang up message until each has been displayed twice, or the user has release all calls.
xx seconds until disconnect	Three-second transient display if the user has not released calls in response to the Please hang up and Maintenance test messages. On sets with single line displays, the prompt is given in two parts: xx seconds is displayed for three seconds, followed by until disconnect for three seconds.
In maintenance	Displays once all calls have been released or the line has been disabled.
Not in service	Displays, accompanied by Error tone, if a user attempts to access a line on which the module is disabled.

1.2.4 OAM Programming View

1.2.4.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item	I	SC+	SC
Maintenance	Module status	X		

1.2.4.2 Programming Module Status

See ["Maintenance - Module Status"](#).

The display seen when viewing a particular module varies, depending on the type of module. Possible module displays are shown in the following table.

Module Display	Occurrence
nn extns on CCU STATE	Appears when viewing Module 1, since Module 1 can only contain terminals (on core-sets).
n cards on CCU CARD STATE	Appears when viewing Module 2, on-core cards.
Mod X:nn extns STATE	Appears when viewing off-core station/extension modules.
Mod X:n cards CARD STATE	Appears when viewing a trunk/line module with cards installed.
Mod X:empty STATE	Appears if the trunk/line module being viewed has no cards installed.
Mod X:N/A STATE	Information about the module is not available.

Pressing the STATE display key from the module display shows the number of busy ports (not sets or lines) for the whole module. The module can contain a

mixture of card types. The `CARD` display key should be pressed to obtain details about a specific card on the module. The `CARD` display key is not provided for module 1 or for off-core extension modules as these modules do not contain individual cards.

Pressing `STATE` from the card display presents the current state of the card being queried. The `MODULE` display key returns to the display for the whole module.

1.2.4.3 State Displays

The following table lists the possible state values for modules and cards, as well as their meaning.

State Display	Meaning
Disabling...	The module or card is being disabled.
Disabled by sys.	The module or card has been disabled by the system because either it is faulty or there is a test running.
Disabled by user	The module or card has been disabled from a Maintenance session.
Enabling...	The module or card is being enabled.
Idle	The module or card is idle.
<code>nn sets busy</code> or <code>nn extns busy</code>	There are <i>nn</i> devices in use on the module; appears only for on-core module 1 and off-core station/extension modules
<code>nn lines busy</code>	Card state only; there are <i>nn</i> lines in use on the card.
<code>nn ports busy</code>	Module state only; there are <i>nn</i> ports in use on the module.
Unequipped	No module or card is connected to that DS-30.

The state displays are updated automatically every ten seconds to dynamically reflect changes in state. Users can watch the display to track changes in module or card status. The state display only gives an approximate picture of the current state; for example, the display can show a module or card to be idle when, in fact, it went busy up to ten seconds ago.

1.2.4.4 Disabling a Module or Card

If the card is currently enabled, a `DISABLE` display key is provided along with the state display. Pressing `DISABLE` prompts the user on whether they wish to disable at once. Pressing `YES` from this display drops all calls on the module or card being queried immediately if it is idle, or after 60 seconds if it is in use (see “1.2.2 End User View”). Pressing the `NO` display key returns to the previous screen. If nothing is done, the session is terminated.

If the user disables the module to which their set is attached, all sets on that module are disabled except for the current maintenance terminal. If this occurs, when the user queries the state of that module it is presented as `Disabled by user, not 1 sets busy`. This display is presented because it is more important to inform the user when the rest of the module is disabled rather than telling them the set which they are currently using is busy. Permitting the maintenance terminal to be active on a disabled module is desirable especially in

small systems, where there are few modules and the likelihood of disabling a module to which the maintenance terminal is attached is high. As such, the terminal engaged in the maintenance session cannot be disabled.

1.2.4.5 Enabling a Module or Card

If the card is currently disabled, an `ENABLE` display key is provided along with the state display. Pressing `ENABLE` enables the module or card being queried.

1.2.5 **EXTN/ **LINE

N/A

1.3 Technical Specification (Limits/Constraints)

N/A

1.4 Interactions

Feature	Interaction
Loopback tests	A card on which a loopback test is running must be enabled. Disabling the module stops the test.
Software download from CCU to DTI card	Module and card status show <code>Disabled by sys.</code>

Moving Lines

1.1 Overview

1.1.1 Description

This feature allows the user to move line keys on sets.

1.1.2 Rationale for Feature

A user may want to move line keys to group together lines used by people working in the same department.

1.1.2.1 Scenarios

An attendant at an Enhanced Central Answering Position (ECAP) can quickly identify the department being called.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls

* 8 1 or Line keys

1.2.2 End User View

Moving line keys applies to ECAPs and other sets, excluding the applications terminal and the Basic set (M7100). The end user cannot

- delete or add a line to a set or a CAP
- move a line key to an intercom, Handsfree, or Answer key.

Similarly, intercom, Handsfree, or Answer keys cannot be moved by the end user.

Users can switch Internal or External Autodial keys, programmed feature keys, line keys, or blank keys, with the line keys that exist on the set so long as these features are on keys with indicators. This capability allows the user to group frequently used keys together to suit personal preferences. (See also Key Programming.)

To move a line key, the user activates the Moving Lines feature (* 8 1). The prompt `Move line from:` is given. If the user presses a valid line key, then the user is prompted to `Move line to:`. At this point, the user presses the key to which the line is to be moved.

Valid keys are:

- feature key
- blank key
- another line key
- Autodial key

provided that an indicator is associated with the key.

When a line is moved successfully, the transient message `Exchanged` is given and the two functions are exchanged. The user can then move the key caps to correspond to the changes. The prompts for moving line keys repeat, allowing the movement of a number of lines at a time, without requiring the user to reactivate the feature code every time they wish to move a line. Pressing the `QUIT` display key or `[Rls]` ends the cycle.

If the user quits while in the process of moving lines, no changes are made since the last `Exchanged` message. If the user has not yet moved any lines, no changes are made.

1.2.3 Message Displays

Message	Description
<code>Move line from QUIT</code>	Appears when a user activates the Move Lines feature.
<code>Move line to: QUIT</code>	Appears after a user indicates a valid line to be moved. Prompts the user to select the key where the line is to be moved.
<code>Press a line</code>	Appears transiently, accompanied by Error tone, if the user presses a key other than a line key after the <code>Move line from:</code> prompt. The user is returned to the <code>Move line from:</code> prompt.
<code>Exchanged</code>	Appears transiently when a user successfully moves an existing line to another available location on a set. The user is returned to the <code>Move line from:</code> prompt.
<code>Invalid location</code>	Appears transiently, accompanied by Error tone, if the user tries to move a line key to an intercom key, Answer key, Handsfree key, a CAP or a key that does not have an indicator. The user is returned to the <code>Move line to:</code> prompt.

1.2.4 OAM Programming View

N/A

1.2.5 **EXTN/ **LINE

N/A

1.3 Technical Specification (Limits/Constraints)

A user cannot move a line key to an intercom, Handsfree, Answer key, or onto a CAP.

1.4 Interactions

Feature name	Interaction
Extn Administration Lock	When Extn Administration lock is <code>Full</code> or <code>Partial</code> for a given set, the user is prevented from moving lines.

Message Send

1.1 Overview

1.1.1 Description

A user can send a message to another internal set to call back. After sending a message, the user can display it, and can cancel it, if desired.

1.1.2 Rationale for Feature

See “1.1.1 Description”.

1.1.3 General Definitions

Term	Definition
Sent Message list	List of outgoing messages sent from a set. Available only to users of two-line display sets.
Message Waiting list	List of incoming message received at a set. Available only to users of two-line display sets.

1.1.4 General Procedures

Sending a message creates an entry in the caller's Sent Message list as well as an entry in the receiver's Message Waiting list. (See the Message Waiting/Reply feature.) Each list can contain a maximum of four entries.

The user of a two-line display set can view, and send or delete messages from the Sent Message list. The format of outgoing messages in the list is $x.<name>$, where x is the sequence number of the message in the list.

1.2 Feature Details

1.2.1 Controls

To activate: , or programmed key

To cancel: , or programmed key

1.2.2 End User View

A set can send a message at any time if both the originating and the receiving set have not exceeded their message limits. The limit is four incoming messages and four outgoing messages pending at one time for a given set. (An exception is made for the Direct-dial set and CAP sets, which are both allowed to send up to 30 outgoing messages.)

1.2.3 Message Displays

Message	Description
Cancel> <name>	Displays transiently after the user has cancelled a sent message.
Cancel denied	Displays transiently, accompanied by Error tone, if the user attempts to cancel a sent message and specifies a destination for which there is no message in the Sent Message list.

Message	Description
Cancel for:	Displays in response to the user activating the Cancel Send Message feature.
Can't send msg	Displays if the user tries to send a message to an incompatible set, for example, a wireless set.
Message denied	Displays transiently for three seconds, accompanied by Error tone, if the user attempts to send a message to an invalid destination (such as itself, or a set that is out of service, or an invalid set number).
Message to:	Displays in response to the user activating the Message Send feature when not initiating an internal call.
Message list SHOW ADD EXIT	Two-line display (M7310 and M7324) sets only, displays in response to the user pressing the ADD display key from the Sent Message list to activate the Message Send feature when not initiating an internal call. The SHOW display key is only available if the caller's list is not empty.
Message> <name>	Displays transiently in response to the user successfully sending a message. <name> is the name of the set that received the message
No messages	Displays transiently, accompanied by Error tone, if the user attempts to cancel a sent message when the Sent Message list is empty.
Ring Again? YES NO EXIT	Displays on two-line display sets when the user presses the LATER display key. If YES is pressed, the Ring Again feature is activated (See the Ring Again feature for details.) If NO is pressed, the user is taken to the Send message? prompt. EXIT goes to idle.
Send message? YES NO	Displays in response to the user's pressing the NO display key from the Ring Again? prompt.
Their list full	Displays transiently, accompanied by Error tone, if the user tries to send a message to a set whose message waiting list is full. The call is dropped.
Your list full	Displays transiently, accompanied by Error tone, if the user tries to send a message and their Sent Message list is already full. The call is dropped.
x. (name> ERASE EXIT	Displays when SHOW display key is pressed. Shows items in Send Message List

1.2.3.1 Sending a Message while receiving Ringback or Busy tone

To send a message while the set is receiving Ringback or Busy tone on an internal call, the user presses the Send Message programmed key or dialpad code. On sets with two-line display, the user can also press the LATER display key. The tone is discontinued and the user is then given the option to Ring Again? with the display keys YES, NO, and EXIT. Pressing NO displays the Send message? prompt.

Pressing YES from the Send message? prompt sends the message. The transient display Message> <name> displays at the originating set, where <name> is the name of the set that received the message.

Ringing stops as soon as the LATER display key is pressed or Feature 1 is pressed.

If a message is sent when the user is receiving Ringback or Busy tone on an internal call, the destination of the Send Message is assumed by the system, and the user cannot specify a different destination.

1.2.3.2 Send a Message from other Call Processing states

To send a message when the set is in a state other than when receiving internal Ringback or Busy tone, the user presses the Send Message key Feature 1, and then dials the number (or presses an Internal Autodial key) for the destination set.

If the destination set number is entered using the dialpad, each digit entered is checked to determine if it constitutes part of a valid set number. As soon as enough digits have been entered to make up a valid set number, the message is sent.

On sets with two-line displays, when the user presses the Send Message key or Feature 1, the outgoing message list is displayed, along with the ADD display key. The user can press the ADD display key and then specify a destination by dialing the internal number (or pressing an Internal Autodial key) in order to send a message.

At the destination set, the message creates a visual notification, and the user can activate the Message Waiting/Reply feature to call the originator. The Message Waiting/Reply feature describes Message Waiting notification, and describes the mechanism for calling the sender.

When the user's set is in a state other than receiving Ringback or Busy tone on an internal call, they can send a message to any set at any time, including while they are:

- in idle state
- connected on an internal call
- active on an external call

If the user sends a message to a set while connected to it, the call is not dropped.

1.2.3.3 Cancelling a Message After Sending It

A message is cancelled when an established call is created between the message originator and the destination, either with or without the help of the Message Waiting/Reply feature (see the Message Waiting/Reply specification for details). The call resulting in message cancellation can be initiated by either party.

A pending message can be cancelled explicitly by either the sender or the receiver. When a message is cancelled, it is removed from the Sent Message list at the set that sent the message and from the message waiting list at the set that received the message.

To cancel a message explicitly after sending it, the user dials the cancel sent message code, Feature # 1, (or presses the Cancel Sent Message programmed key), and receives a Cancel for : prompt. The user enters the intercom number (or Internal Autodial) of the destination for whom the message is to be cancelled.

A user of a two-line display set can cancel any pending outgoing message by pressing the Send Message key (or code), pressing the `SHOW` display key, scrolling (if necessary) to the desired message, and pressing the `ERASE` display key.

1.2.3.4 User Programming View

The user can program one Message Send key and one Cancel Sent Message key for each set. These keys do not use indicators.

1.2.4 OAM Programming View

N/A

1.2.5 **EXTN/ **LINE

N/A

1.3 Technical Specification (Limits/Constraints)

Each set can have a maximum of four outgoing and four incoming messages pending at one time. An exception is made for the Direct-dial and CAP sets, both of which can to send (and receive) up to 30 messages.

The `Send message?` prompt is presented whether or not the calling set's Sent Message list is full, and whether or not the called set's Message Waiting list is full.

A set can send only one message for a specific destination. If a set tries to send two messages to the same destination, the feature proceeds normally from the user's point of view, but the second message does not replace the first one in the destination set's message waiting list.

1.4 Interactions

Feature or condition name	Interactions
Destination set not in service	If the user cancels a sent message but the other set is not in service at the time, the cancellation proceeds normally from the user's point of view (that is, the transient display <code>Cancel></code> <code><name></code> displays, and the message is removed from the cancelling set's Sent Message list), but the message is not removed from the other set's Message Waiting list.
Send Message	Each Direct-dial set can send up to 30 messages. If the Direct-dial set is changed such that it is no longer a Direct-dial set, its list of sent messages is lost.

Message Waiting Indication

1.1 Overview

Message Waiting Indication (MWI) is a DPNSS 1 feature for Norstar Call Services. When voice message are received in the voice mailboxes at a centralised location, an indication can be displayed on the extension for which the message is left.

MWI allows users to reply or call back to the message centre. MWI also provides users with the ability to scroll through, erase and reply to messages.

Message Waiting Indication is one of the features supported on DPNSS 1 lines in Norstar systems. For a listing of these features, see the DPNSS 1 feature.

1.1.1 Rationale for Feature

Message Waiting Indication lessens the network processing load, making the system more efficient.

1.1.2 General Definitions

N/A

1.1.3 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls

N/A

1.2.2 End User View

When there are messages to be retrieved, *Message for you* is displayed at the extension. Once all the messages are retrieved by the user, a Message Waiting Cancellation (MWC) is sent from the call centre, and the user extension no longer displays MWI.

1.2.3 OAM Programming View

1.2.3.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item			I	SC+	SC
Terminals&Extns	Call services	Auto call info	Extnl VMsg extn			
Network Services	VMsg ctr data		Vmsg centre:	X	X	X
			MWI			
			MWC			

1.2.3.2 Programming Message Waiting Indication

There are three requirements:

- Provide the extension with the ability to access Direct Inward Access (DIA) lines for receiving messages.
- Programme available message centre(s).
- Set message centre(s) for use.

Accessing DIA Lines for Receiving Messages

Once an extension has been programmed to access DIA lines for receiving message waiting indication, the extension can log MWIs/MWCs received for those DIA lines.

Access to DIA lines for receiving messages is set in `Terminals&Extns`►`Call services`►`Auto call info`►`Show line: _`►`Extl VMsg extn`.

[See "Terminals&Extns - Call Services - Auto Call Info".](#)

Programming Available Message Centres

You need to assign any one of five, or None, of the message centres to the DIA lines for receiving messages. There can be as many as five message centres in a network. Extensions on a Norstar system can have mailboxes on different PBXs on the network. These PBXs may also be from different manufacturers.

Thus, for each message centre,

- there may be different numbers to dial to reach the mailbox from the set
- different MWI strings may be received, indicating that the centre has a message in the mailbox
- different MWC strings may be received, indicating that the voice mails have been retrieved.

When assigning message centres, you can program all three parameters for each.

Message centres are programmed in `Network services`►`VMsg centre`.

[See "Network Services \(Modular Plus only\)".](#)

Programming message centres involves entering a Non-Specified Information (NSI) string for the MWI and MWC expected from the message centre. In DPNSS 1, these strings depend on the supplier of the Private Branch Exchange (PBX). NSI strings have the structure `*58XXXXXX..*`, where

- `*58` identifies that it is an NSI string
- `X` is any letter from A to Z, or nothing
- `XXXXXX..` is a manufacturer-specific string that can contain any sequence of alphanumeric digits, or `*`
- `#` marks the end of the identifier

Only the `XXXXXX..#` portion of the string must be programmed for MWI and MWC. This portion of the string is programmed as `AN*1#` for Meridian MCI, as `AN*0#` for Meridian MWC. Private network strings differ if the message centre is not on M1. These should only be changed on the advice of a consultant from the Norstar Advice Line.

The following criteria must be met when programming NSI strings for MWI/MWC:

- No spaces are allowed, including spaces at the end of the string.
- The first character cannot be # or *.
- The last character must be #.

Setting Message Centre(s) for Use

Message centres are set for use in `Network services` ► `VMsg centre`.

[See "Network Services \(Modular Plus only\)".](#)

1.3 Technical Specification (Limits/Constraints)

MWI is supported only on Norstar DIA lines.

MWI is indicated differently on different types of extensions:

- On M7000 terminals, the associated LED flashes.
- ATA terminals do not support MWI.
- ISDN terminals do not support MWI.
- Cordless Handsets do not support MWI.
- DNA terminals do not support MWI.

Message Waiting/Reply

1.1 Overview

1.1.1 Description

This feature notifies the user when a message has been received from another set. The user can place an internal call to the party that sent the message, or can cancel the message without calling back.

This feature applies to internal calls only. Message Waiting capability for external calls is provided by the Class Message Waiting Indication (CMWI) feature.

1.1.2 Rationale for Feature

See “1.1.1 Description”.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls

Feature 6 5, or Message Waiting/Reply programmed key

Feature # 6 5, or Cancel Message Waiting programmed key

1.2.2 End User View

When a message is waiting at a set, the display prompts with `Message for you`, subject to the idle state display priorities. (The Message Waiting prompt is higher priority than time and date, but is lower than the display showing that Do Not Disturb or Call Forward is active.) If more than one message is waiting, the prompt is `Messages for you`. If the Message Waiting/Reply feature is programmed onto a key with an indicator, the indicator is on when one or more messages are waiting.

To reply to the message, the user can activate the Message Reply feature by one of

- pressing Feature 6 5 or the Message Waiting/Reply programmed key
- pressing the MSG display key (shown on the idle state display for two-line sets)

1.2.3 Message Displays

Message	Description
Can't send msg	Appears if the user tries to send a message to an incompatible set, for example a wireless set.
Do not disturb MSG	Displays when the set receives a message while in Do Not Disturb mode. Static display priorities on one-line display sets result in the Message waiting prompt being suppressed by the Do not disturb prompt until Do Not Disturb is cancelled.

Message	Description
Erased <setname>	Transient display appearing after a message has been cancelled.
Message for you MSG	Appears in the idle state when one message has been received at the set.
Messages for you MSG	Appears in the idle state when more than one message has been received at the set.
No button free	Appears if the user attempts to respond to a message and no intercom key is available.
No messages	Appears, accompanied by Error tone, if the user attempts to erase a message and no messages are at the set.
No more messages	Appears transiently when a user erases the last remaining message from their Message Waiting list.
<setname> called CALL ERASE	Display of message in message list if there is only one message.
<x>.<setname> called NEXT CALL ERASE	Display of message in message list if there are multiple messages. <x> is the sequence number of the message in the list.

The user can call the originator of the message back by activating the Message Waiting/Reply feature.

On two-line display sets (M7310 or M7324), activating the Message Waiting/Reply feature displays the received message. The user can call back the originator by pressing the CALL display key. If there is more than one message, the messages are displayed with sequence numbers, and a NEXT display key is provided to allow the user to scroll through them. The ERASE display key allows the user to cancel any message without calling back.

Key (hard key) mappings allow the user to scroll through the list. They are as follows

- # - oldest to newest (i.e., down the list)
- * - goes up the list
- 0 - calls the messenger (the person who left the message) from the message list
- erases the message

When the user replies to a message, the set selects an idle Intercom key and initiates the call. When the call is alerting, the message originator's name is displayed, as for a normal outgoing internal call.

The feature can be exited by pressing any key except the Volume bar or dialpad keys.

1.2.3.1 Erasing a Waiting Message

A message is erased when an established call is created between the message originator and the destination, with or without the help of the Reply Message feature. Either party can initiate the call that cancels the message.

A waiting message can be erased explicitly by the recipient

- by dialing # 6 5 or pressing the Cancel Message Waiting programmed key
- by dialing 6 5 (or pressing the MSG display key), scrolling to the message to be erased, and pressing the ERASE display key (two-line display sets only) or pressing

When a message is erased, it is removed from

- the Message Waiting list at the set that received the message
- the Sent Message list at the set that sent the message

Messages can be also cancelled by the sender. (See Message Send.)

1.2.3.2 Clearing the “Calls for You” message on the display

Users have the option of clearing the Calls for You message on the display in favour of the time and date information.

- press 8 0 6 to activate the Feature
- press # 8 0 6 to cancel the Feature.

1.2.3.3 User Programming View

One Message Waiting/Reply key and one Cancel Message Waiting key can be programmed by the user on each set. Neither of these keys requires an indicator. The indicator on the Message Waiting/Reply key is used, if present. The Cancel Message Waiting key does not use an indicator.

1.2.4 OAM Programming View

N/A

1.2.5 **EXTN/**LINE

N/A

1.3 Technical Specification (Limits/Constraints)

Sets, including Prime Sets, can send up to four messages and receive up to four messages. The Direct-dial set and the CAP set can send and receive a maximum of 30 messages.

1.4 Interactions

Feature name	Interaction
Call Forward	A set can receive messages when it is forwarded. If the calling set sends a message when it is not connected to the called party, or upon hearing Ringback from the called set, but before being forwarded, the message is received at the called set. If on the other hand, the calling set sends a message after the call is forwarded, the message is sent to the forwarded destination rather than to the called set.
Date and Time Display	Message Waiting overwrites the idle display.

Feature name	Interaction
Destination set not in service	If the user cancels a waiting message, but the other set is not in service at the time, the message is removed from the cancelling set's Message Waiting list, but the message is not removed from the other set's Sent Message list.
Do Not Disturb	The set can receive a message while in Do Not Disturb mode. Static display priorities on one-line display sets result in the <code>Message for you</code> prompt being suppressed by the <code>Do not disturb</code> prompt until Do Not Disturb is cancelled. On two-line display sets, the <code>MSG</code> display key appears on the second line of the display whenever the set is idle, unaffected by the message priorities of the first line.
Transfer	Message Waiting/Reply cannot be activated successfully within Transfer. An error message and Error tone are given.
Voice Call	Message replies cannot be made as Voice Calls. A Message Reply call made by pressing the <code>CALL</code> display key is always made as a Ringing Call. (However, if a Voice Call is made to the destination set that left a message, Voice Call cancels the message.)

Name

1.1 Overview

1.1.1 Description

Set names and line names can be programmed in OAM Programming.

1.1.2 Rationale for Feature

A line name provides a more meaningful display than the default `Line<nnn>`, to identify lines used for special purposes (WATS, for example), or to display the seven-digit phone number of the line (7654321, for example).

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 End User View

Set and line names have a maximum length of seven characters and are always displayed in upper case.

Depending on the call state and display priorities, users who place or receive

- an internal call
see the set name (shown as `<setname>` in Message Display tables)
- an external call
see the line name (shown as `<linename>` in Message Display tables if a name is programmed).

If no set name is programmed, the display shows `Set <DN>`.

If no line name is programmed, the display shows `Linennn`.

1.2.2 OAM Programming View

1.2.2.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item		I	SC+	SC
Terminals&Extns	Individual extn	Name	X	X	X

Heading	Item		I	SC+	SC
Lines	Individual line	Name	X	X	X

1.2.2.2 Programming Set Name

See ["Terminals & Extensions"](#).

Each set can be assigned a name of up to seven letters or digits in OAM Programming.

The default set name is Set <DN> where <DN> is the set's internal (intercom) number. Punctuation cannot be entered.

Programming Line Name

See ["Lines"](#).

Each line can be assigned a name of up to seven letters or digits in OAM Programming. Line numbers are entered as a two digit number between 001 and 008.

1.2.3 **EXTN/LINE**

N/A

1.3 Technical Specification (Limits/Constraints)

N/A

1.4 Interactions

Set name and line name are used by all the Norstar features that display information at the calling and called party's sets. Feature interactions and display priorities are discussed in the individual specifications.

Feature name	Interaction
# and *	The # and * symbols cannot be used in names
Duplicate names	OAM Programming blocks the entry of duplicate line names, to facilitate unique identification for lines in a system. The same name can be given to two or more sets, or to a set and a line in your system. To avoid confusion, avoid duplication; use creative combinations of initials, abbreviations, or even nicknames to give each set a unique name
OAM Programming	Even if a set name has been assigned to a set, the set number is used rather than the name during OAM Programming.
Extn Relocation	If Extn Relocation is turned ON, the name and internal number are saved if the set is moved within the same system

Network Event Log

1.1 Overview

1.1.1 Description

This feature provides the network event log, which records events and alarms specific to the network interfaces. For the most part, it uses the same structure and UI found in the existing System and Admin logs. Its basic characteristics are:

- appears as a separate log
- uses the existing log rules
- larger capacity
- uses the same event ordering rules as existing logs so the most severe events are retained

There are no analog line cartridges events of any type recorded in the network log. Analog line cartridges and trunk cartridges do not generate network events.

1.1.2 Rationale for Feature

N/A

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls

N/A

1.2.2 Message Displays

N/A

1.2.3 End-User View

N/A

1.2.4 OAM Programming View

1.2.4.1 Levels of Access

The following table shows the levels of access allowed.

Heading	Item	I	SC+	SC
Maintenance	Network evt log	X		

1.2.5 Maintenance View

To access the network log heading, go to Maintenance►Network Log.

See "Maintenance - Network Event Log" and "Maintenance - Network Event Log - Erase".

The network log operates exactly the same as existing logs.

The current display formats for alarms and event messages are used for network-specific alarms and messages.

The network log has a maximum of 20 entries.

High frequency network events are assigned a low severity level, so that they are the first to be overwritten by newer high severity events.

No ability exists to provide individual timestamps of multiple high frequency network events.

Event codes for network events follow the existing format:

Evt:<error number>-<instance>S<severity>

where the error number is a three-digit code and the instance is a number up to five digits representing the specific component (for example, bus/slot number, cartridge or module). Severity is a single-digit number from 1 to 9, where 1 is least severe and 9 is most severe.

1.2.6 **EXTN/ **LINE

N/A

1.3 Technical Specification (Limits/Constraints)

N/A

1.4 Interactions

Feature name	Interaction
Loopback tests results	Logged in the system test log.
Push-key LC or TC loopback test results	Logged in the system test log.

Offhook Call Queuing

1.1 Overview

1.1.1 Description

Offhook Call Queuing allows the user to gain access to the highest priority audibly alerting call that has arrived at the set by pressing the Offhook Call Queuing feature code or programmed key. The feature automatically holds the current call (if any), and connects the user to the next alerting call.

1.1.2 Rationale for Feature

Although this feature works at any Norstar set, the benefit of the feature is most beneficial at a CAP, where a large number of calls are processed.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

For this feature, the key cap label and the key Inquiry display are different. A label of "Answer Call" is usually used for the programmed key. It indicates that the key only answers calls, and does not initiate them. (Labelling the key "Call Queuing" is not as obvious.)

key Inquiry of the programmed key still shows `Call Queuing`.

1.2 Feature Details

1.2.1 Controls

`Feature` `8` `0` `1`, or programmed key

1.2.2 Message Displays

Message	Description
<code><linename> calling TRANSFER</code>	Displays when an alerting call is answered, identifying the calling party.
<code>No calls waiting</code>	Displays transiently, accompanied by Error tone, if there are no audibly alerting calls and the user activates the Answer Call feature.
<code>Release a call</code>	Displays if there is no intercom line or external line available at which to present a camped call, and the user presses the Answer Call key or activates the feature code to answer a Camped call.
<code>Pick up receiver</code>	Displays if the user presses the Answer Call programmed key or feature code to answer an alerting call and the user is onhook and Handsfree is not activated (and Automatic Handsfree is not programmed at the set).

1.2.3 End User View

If the user is using the headset, is offhook on a call, or using Handsfree on a call, the user can press the Answer Call programmed key or feature code (`Feature` `8` `0` `1`) to answer an alerting call. The active call (if any) is put on hold and the alerting call is answered automatically on the currently established voice path.

In order for a call to be answered, the set must have a suitable external line key or intercom key on which the call can be presented. The maximum number of calls that can alert at a set depends on the number of lines (external and intercom lines) that are allocated to a set.

1.2.4 User Programming View

The user can assign 8 0 1 to a key. The key does not use an indicator.

1.2.5 OAM Programming View

N/A

1.2.6 **EXTN/**LINE

N/A

1.3 Technical Specification (Limits/Constraints)

Answer Call cannot be used

- to make calls
- to answer a call for which there is no audible alerting

1.4 Interactions

Feature name	Interaction
Automatic Handsfree	If Automatic Handsfree is enabled at a set, its rules apply if the user is onhook and presses the Answer Call programmed key or feature code to answer an alerting call.
Camped Call	Offhook Call Queuing can be used to pickup a Camped call.
Call Information	Activating Offhook Call Queuing cancels Call Information and picks up the highest priority call.
Call Log	Activating Offhook Call Queuing cancels Call Log and picks up the highest priority call.
Call Priority	Offhook Call Queuing will answer calls in the following order: <ul style="list-style-type: none"> - ringing Prime Line (if programmed, and it is not <code>line pool</code>) - ringing external lines (includes all answerable calls associated with the new trunk types) - ringing callback, transferred, or camped calls on external lines - ringing internal calls.
Do Not Disturb	If Do Not Disturb is activated at a set, no audible alerting occurs to represent a call, but visual alerting still occurs. The user can answer the visually alerting call by selecting the appropriate line key. Answer Call cannot be used to answer calls for which there is no audible alerting.
DIA Lines	Offhook queuing can be used to answer calls at a DIA line.

Onhook Dialing Options

1.1 Overview

1.1.1 Description

Onhook Dialing Options allows the user to dial a call without picking up the receiver.


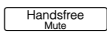
1.1.2 Rationale for Feature

N/A

1.1.3 General Definitions

Onhook Dialing Options include:

- **Standard Dial**

Allows the user to activate the loudspeaker and dial digits on an internal or external line without lifting the handset or pressing the  key. When the other party answers, the user lifts the handset or presses  to converse.

- **Automatic Dial**

Also known as Live Dial Pad. Allows the user to press a dial pad key to commence a dialing sequence and seize an idle Prime Line (Automatic Prime Line selection). The user dials the desired number, and Dial Pad Feedback tone is given through the set's speaker that corresponds to each press of a dial pad key.

- **Pre-Dial**

Allows the set to store a sequence of dial pad key presses before seizing a line. The user can edit these digits, and then select one of the following to initiate a call

- line key
- programmed line pool key
- intercom key

The options can be used from any Norstar telephone except the Basic set and the ATA (including a set connected through the ATA.)

1.1.4 General Procedures

An individual user programs Dialing Options at their set, using feature keys. (see “1.2.4 End User View”).

1.2 Feature Details

1.2.1 Controls


Dial pad keys

1.2.2 Caller View

Onhook Dialing results when the caller is onhook with Handsfree Off and

- presses an idle line key and dials by any method

- activates a feature option that uses Automatic Outgoing Line Selection.

During Onhook Dialing, the set speaker provides a receive-only voice path. The caller hears Dial Pad Feedback and call progress tones through the loudspeaker. On hearing the other party answer, the caller lifts the handset or presses  (if enabled) to converse.


This feature operates the same way on sets with or without Handsfree capability enabled in OAM Programming. On a set with Handsfree capability, Onhook Dialing is treated independently of Handsfree.

The Handsfree microphone and speaker are automatically activated for all outgoing and incoming internal and external calls when any of the following occur:

- the user is onhook with Handsfree Off, and selects a line manually
- the user is onhook with Handsfree Off, and activates an Automatic Dial feature
- the user Pre-Dials a number and then selects a line to initiate a call (or dials a number onhook if Automatic Onhook Dialing is enabled)
- the user activates a feature to answer a call (such as Call Pickup or Trunk Answer From Any Station)

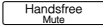
During Onhook Dialing, the line indicator shows active state for the line being used. The Handsfree indicator is not used.

For any dialing mode, the user can always select a line manually first, and then dial. Standard Dial results.

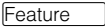
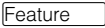
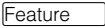
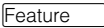
To end Onhook Dialing, the handset can be lifted or the  key pressed at any time. This can be done in the middle of dialing, without disruption.

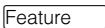
1.2.2.1 Automatic Dial

If a Prime Line has been programmed at the user's set, Automatic Dial can be activated at the set. When a user presses a dial pad key, an idle Prime Line is seized. If another call subsequently alerts at the set on another line, the user can answer the incoming call or continue to make their outgoing call. If the user answers the incoming call, the outgoing number is lost.

The user can lift the handset or press  (if enabled) in the middle of dialing a digit string. If the user continues to enter digits, the digits continue to be sent out on the Prime Line. If the user is now using the handset, tones (dial pad feedback) for each press of a dial pad key are heard through the handset.

With Automatic Dial, the user can use the following PBX Reachthrough codes

-  7 1 (Recall)
-  7 8 (Pause)
-  * 9 (Run/Stop)
-  * 8 9 (Programed Release)

When the user presses , Feature: replaces the dial-out string on the display. The next digits the user enters are added after the colon. If the user enters

a valid Reachthrough feature code, the appropriate symbol is appended to the dial-out digits which are again presented on the display. Invalid codes are met with the appropriate transient display (Invalid code, Denied in admin, and the like) and Error tone. The transient display times out and returns to the dialout string that was on the display before was pressed. (For more information on the rules for feature code compression, see the PBX Reach Through feature description.)

If the user has not entered enough digits to make a call, and no subsequent dial pad input is given, the result is the same as incomplete dialing for non-autodial calls. This can vary depending on the CO.

The user can dial a number onhook, go offhook, and then press to end a call. While offhook, the user can dial another number. Dial pad feedback is now presented through the handset, since Automatic Dial is in effect at the set. This allows the user to immediately dial another number, without having to obtain dial tone. Held calls at the set are not affected.

1.2.3 Message Displays

Message	Description
Select a line	Appears transiently during Automatic Dial, accompanied by Error tone, if the caller tries to dial a number while a held call is using the Prime Line. This also occurs during Automatic Dial if an alerting call is using the Prime Line, and the caller tries to dial a number.
Release a call	Appears, accompanied by Error tone, if the caller attempts to enter and edit digits for a Pre-dial number and all lines at the caller's set are in use.
Select a line	Appears transiently during Pre-dial if no caller input is given for ten seconds.

Automatic Dial cannot be used if the Prime Line is already in use, unless the Prime Line is designated as line pool in which a line is currently available. (See "1.4 Interactions".) If a call alerts on a line other than the Prime Line, and the Prime Line is not already in use, the user can still make a call using Automatic Dial.

1.2.3.1 Pre-dialing


Pre-Dial allows the user to enter and delete digits until they choose a line. When a line is selected, the entered digits are dialed automatically. The display then shows the appropriate internal or external calling message.

While entering a Pre-Dial number, the user can enter certain reachthrough feature codes, either by the dialup code or programmed key. Similarly, if the user presses a programmed key, the appropriate symbol also appears in the Pre-Dial string.


Valid reachthrough codes for Pre-Dial are:

- Recall ()
- Pause ()


Line Selection

When the user has finished editing a Pre-Dial number, the user selects a line to initiate the call. The user can press a line key, line pool code or programmed key, or  (if enabled) to dial a Pre-Dialed external number, or an intercom key to dial a Pre-Dialed internal number. The user can also go offhook. If the user dials an internal number and an external line is selected, or dials an external number and an internal line is selected, existing rules apply. For the call to be made successfully, the correct type of line needs to be selected.

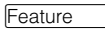


The user cannot continue to edit the Pre-Dial number after a line is selected by any of the following methods

- the user selects a line or intercom key manually
- the user goes offhook and a Prime Line is selected
- the user presses , if enabled, or presses a programmed Line Pool key)

The display keys disappear, and digits can only be added to the string.

For all types of Onhook Dialing, the user can dial a number onhook, go offhook, and then press  to end a call. While offhook, the user can Pre-Dial another number. This allows the user to immediately dial another number, without having to obtain dial tone. Held calls at the set are not affected.

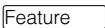



Pre-Dial and Line Pools

If the user wants to access a line from a line pool as part of the Pre-Dial sequence, the user can press the digit(s) representing the line pool access code at the beginning of the Pre-Dial number. The user then dials the digit string, and selects an intercom key. If the user Pre-Dials a number, then presses  followed by the line pool feature code ( ) and access code (or presses a line pool programmed key), an idle line from the line pool is selected, and the Pre-Dial call is made.

Do Not Disturb During Pre-Dial

The user can activate and cancel the Do Not Disturb feature while Pre-Dialing a number without ending the Pre-Dial feature option. In the middle of dialing a Pre-Dial number, the user may want to activate Do Not Disturb if another call alerts at the set, and the user does not want to answer it. If the Do Not Disturb programmed key is pressed, transient messages associated with Do Not Disturb appear on the display. If the user enters more Pre-Dial digits before the Do Not Disturb messages are finished, the user is returned to the entered Pre-Dial digits. If the transient message associated with Do Not Disturb finishes, the user is also be returned to the entered Pre-Dial digits.

1.2.4 End User View

The user programs Dialing Options by pressing    .

The following User Action table shows the steps taken by an end user to program Onhook Dialing for their set. The table illustrates how the displays appear on two-

line display sets (M7310 and M7324). One-line display sets (M7208, M7100) do not use display keys.

User Action	Resulting Display	Set Response
1. Press <input type="text" value="Feature"/> * 8 2	<dialing option> NEXT OK	<dialing option> is the dialing option currently in effect at the set, one of: Standard dial Pre-dial Automatic dial
2. Press the NEXT display key or <input type="text" value="#"/> to cycle through the options.	<dialing option> NEXT OK	Repeat this step until satisfied desired option is showing.
3. Press the OK display key, or the <input type="text" value="Feature"/> Hold <input type="text" value=""/> or <input type="text" value="Rls"/> keys to select the dialing option, e.g., Standard dial	<dialing option>	Displays transiently for three seconds to show the dialing option in effect. The dialing option stays in effect until the user selects another option using <input type="text" value="Feature"/> * 8 2 The last dialing option that appeared on the display takes effect.
4.	<Idle display>	Returns to idle state display.

The programmed Dialing Option is active until the user changes it to another option manually.

1.2.5 User Programming View

Dialing Options cannot be programmed on a key.

1.2.6 OAM Programming View

Onhook Dialing Options can be programmed two different ways:

- from with OAM, when an installer or system coordinator is programming system data for a set, under **Terminals&Extns** heading.
- by using a feature code (**USER) and any one of the four OAM programming passwords: Installer, System Coordinator PLus, System Coordinator, or Basic.

See "[Terminals&Extns - User preferences](#)".

1.2.6.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item			I	SC+	SC
Terminals&Extns	Individual extn	User Preferences	COPY	X	X	
			Dialing opt'ns	X	X	X

1.2.6.2 Programming Dialing Options

Dialing options is programmed in **Terminals&Extns>User Preferences>Dialing options**. Pressing the **CHANGE** display key cycles through the values of **Standard dial**, **Pre-dial**, **Automatic dial**. The default is underlined.

1.2.6.3 Programming Dialing Options through **USER

If the user is using a set with a two-line display, Dialing Options can be programmed using ****USER**. The user, installer, or system coordinator changes the dialing options for the set by pressing the **CHANGE** display key to cycle through the options. For more details, refer to the User Preferences feature.

1.2.7 **EXTN/**LINE

N/A

1.3 Technical Specification (Limits/Constraints)

Sets connected to an Analog Terminal Adapter (ATA) cannot use the Automatic Dial option.

1.4 Interactions

Feature name	Interaction
ATA	Automatic Dial is not available to devices attached through the ATA.
Active calls (with Pre-Dial)	If the user is active on a call and tries to Pre-Dial a number, digits are sent over the active line. The user can have held calls and still use Pre-Dial to dial a number on an idle line.
Alerting calls	If a line other than the set's Prime Line is alerting, and the Prime Line is idle, Pre-Dial or Automatic Dial can be used. If a Pre-Dial or an Automatic Dial call is abandoned before dialing is complete to answer the incoming call, the outgoing dialing information is lost.
Answer keys	If the user is Pre-Dialing a number and presses an Answer key to answer an incoming call, the call is answered, and Pre-dial ends. If the user presses an Answer key, but there is no incoming call, Pre-dial continues.
Basic Sets	Basic sets do not have explicit line appearances. The only way that Pre-Dial can be used on a Basic Set is if the user dials a number and then goes offhook.
PBX Reach Through Codes	Recall and Pause can be used in a Pre-Dial sequence. Run/Stop can be used in an Automatic Dial sequence.
Do Not Disturb (DND)	While dialing a number, if the user presses the Do Not Disturb programmed key or activates the DND dialup code, DND is activated.
External Autodial	If the user activates an External Autodialer while Automatic Dial is in progress, the digits are appended to the Automatic Dial number being entered.

Feature name	Interaction
Handsfree	<p>If the user is onhook with Handsfree On (for example, a Handsfree call has been placed on hold), pressing an idle line key does not result in Onhook Dialing. Instead, the handsfree voice path remains active for the new call. Onhook Dialing operates the same way, whether or not a set has Handsfree capability enabled in OAM Programming. On a set with Handsfree capability, Onhook Dialing is treated independently of Handsfree.</p> <p>If Automatic Handsfree is enabled at a set, selection of a line to dial a Pre-Dial number causes Automatic Handsfree rules to be applied.</p>
Headset	Onhook Dialing uses the headset earpiece if the headset is connected. This feature is available to all M7208 Set, M7310 Set and M7324 Set users, and is not dependent on programmed settings.
Held Line Reminder	Held Line Reminder does not disrupt Pre-Dial.
Hold	If a user Pre-Dials a number and then selects a held line, they are reconnected to the held party. The outgoing dialing information is lost.
Hotline	If a user Pre-Dials a number at an automatic connection set, and then goes offhook, the Pre-Dial call is made. A Hotline call is not made.
Incoming Call Information	Pre-Dial suppresses display information associated with incoming calls. The user receives visual alerting and ringing only.
Internal Autodial	If the user activates Internal Autodial while onhook with Handsfree Off, Onhook Dialing results.
Last Number Redial	If the user activates this feature while onhook with Handsfree Off, Onhook Dialing results.
Line Pools	Pre-Dial cannot be used to enter line pool access codes into internal dial tone, (that is, to make internal calls). This is the case even when the set's Prime Line is intercom, or when the user obtains internal dial tone manually before activating a dialer.
Line Selection (Pre-Selection)	Pre-Selection applies only to incoming alerting calls. If the user selects an idle line and dials or Autodials digits on it without lifting the handset, Onhook Dialing occurs.
Message Reply	If the user activates this feature while onhook with Handsfree Off, Onhook Dialing results.
Prime Line (with Automatic Dial)	<p>If the set does not have Prime Line, the Dialing Option <code>Automatic Dial</code> is not displayed.</p> <p>Automatic Dial cannot be used if the set's Prime Line is active, alerting or held, unless the Prime Line is a line pool in which a line is available.</p> <p>If the user tries to dial a number while active on a call that is using the Prime Line, the digits are sent over the line.</p> <p>If the user tries to dial a number while a held call is using the Prime Line, the user is given Error tone and the transient message <code>Select a line</code>.</p> <p>Similarly, if an alerting call is using the Prime Line, and the user tries to dial a number, Error tone and the transient message <code>Select a line</code> is given.</p> <p>If Prime Line is removed while Automatic Dial is active, the Onhook Dialing option is changed to <code>Standard dial</code>.</p>
Ring Again	If the user activates Ring Again while onhook with Handsfree Off, Onhook Dialing results.

Feature name	Interaction
Saved Number Redial	If the user activates SNR while onhook with Handsfree Off, Onhook Dialing results.
Speed Dial	If the user activates Speed Dial while onhook with Handsfree Off, Onhook Dialing results. If the user activates speed Dial while Automatic Dial is in progress, the digits are appended to the Automatic Dial number being ordered. Automatic Dial continues.
Voice Call	Activating the Voice Call feature when the set is onhook and idle results in Onhook Dialing. It does not automatically enable the calling set's Handsfree unit.

Originating Line Identification

1.1 Overview

1.1.1 Description

The CLID that a called party sees on the display is based on the calling party's Originating Line Identification (OLI) number, a set configuration parameter; this connection of CLID and OLI occurs only when the calling party makes the call on a DDI facility. The OLI number for a set may be the public network received digits for a DIA line that appears at the set or for a DIA line at another set.

- CLID is not supported on incoming calls from BRI lines.
- OLI will be supported on outgoing calls from Norstar sets to BRI Lines. The OLI will be sent as Calling Line Identification Presentation (CLIP).
- OLI is also used as the Connected Line Identification Presentation (COLP) for an incoming call on BR2 lines. However, BTNR191 does not support COLP.

1.1.2 Rationale for Feature

N/A

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls

N/A

1.2.2 Message Displays

N/A

1.2.3 End-User View

How OLI Number And Call Facility Relates To CLID

Where call originates	Facility for call	What Norstar sends for OLI	CLID displayed on set of called party (assuming the CO determines the OLI is valid)
from a set, and OLI number is other than None	DDI line	The OLI number for the set.	Complete CLID – consists of Norstar DASS2 number and the OLI number. A call can be directly returned to the preferred set.
from a set, and OLI number is None	DDI line	No OLI is sent.	Listed Extension Number for the calling Norstar. The called party can return a call to the calling Norstar, presumably to the attendant.

Where call originates	Facility for call	What Norstar sends for OLI	CLID displayed on set of called party (assuming the CO determines the OLI is valid)
from a set regardless of OLI setting	non-DDI line	There is no OLI for a non-DDI line, as there are no DDI digits for this line. OLI number is ignored.	Listed Extension Number for this line. The called party can return a call to a set which has an appearance of this line.
a tandem call	DDI line	No OLI, as the calling party cannot be reached directly	Listed Extension Number for calls from the Norstar. The called party can return a call to the last Norstar in the call path before the CO, presumably to the attendant
	non-DDI line	There is no OLI for a non-DDI line, as there are no DDI digits for a non-DDI line.	Listed Extension Number for this line. The called party can return to a set, on the last Norstar in the call path before the CO, which has an appearance of this line.

1.2.4 OAM Programming View

1.2.4.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item		I	SC+	SC
Terminals&Extns	Line access	OLI #: Extn #	X		

1.2.4.2 Programming Answer Extns

See "[Terminals&Extns - Line Access](#)".

The Originating Line Identification number is programmed at

Terminals&Extns►Line access►OLI # Extn #.

Typically, the installer will specify the public network received digits for a DIA line, which may or may not appear at this set or *None* if the user of the set, for privacy reasons, wishes to have the Listed Extension Number, not the number that would reach the user's set, shown at the called destination.

For Square and Hybrid templates, *None* is the default.

For the PBX template, every set's OLI number is defaulted to the public network received digits for the default DIA line for the set.

Input of digits for the OLI number occurs in exactly the same way as for the public network received digits for a DIA line.

The length of an OLI number is the same as for the public network received digits for a DIA line. There is no verification at programming time that the OLI number is the public network received digits for a DIA line. The verification happens at run time and is performed by the CO.

Verification of OLI number is handled at the CO which terminates the calling Norstar DASS2 lines. See “1.3 Technical Specification (Limits/Constraints)”.

1.2.5 ****EXTN/**LINE**

N/A

1.3 **Technical Specification (Limits/Constraints)**

1.3.1 **CO Verifying OLI Digits**

A CO performs one of two kinds of OLI verification: full or limited.

1.3.2 **CO That Performs Full OLI Verification**

If a Norstar sends an OLI that is longer than 6 digits, the DASS2 CO will analyze only the first 6 digits as the OLI.

The CO will verify the length of the OLI from the calling Norstar will be that registered within the DASS2 network for that Norstar.

The CO will also verify that the OLI provided by the calling Norstar falls within the numbering range(s) registered for that Norstar.

1.3.3 **CO That Performs Limited OLI Verification**

The CO only checks that the OLI is 6 or less digits long.

1.3.4 **Result Of Verification**

If the OLI passes the above screening tests, then the DASS2 network will supply a complete CLID towards the called PBX.

If the OLI does not pass the above screening tests, the CO discards it. The CO either

- Supplies a Listed Extension Number, for the calling Norstar, towards the called PBX, or
- Supplies a partial CLID, pertaining to the calling Norstar, toward the called PBX.

1.4 **Interactions**

Feature name	Interaction
ATA	OLI is sent to the network even when the call originates from an ATA. The programming and defaults for OLI are the same as any other set.
Automatic Set Relocation	OLI number will follow a set when it is relocated.
Changing length of public network received digits for DIA lines	The OLI number is reset to <i>None</i> , similar to how DIA line received digits are reset to <i>None</i> when the length is changed.
Copy extension data	The OLI number will be copied.
Line pool access codes	The OLI number can be a line pool access code, just as the public network received digits can be a line pool access code, assuming the line pool access code is the same length as the public received number for DIA lines.

Feature name	Interaction
Public network DIA lines	OLI is sent to the network only for calls on DASS2 public network DIA lines. (There is no OLI for DASS2 non-DDI lines, analog PSTN lines and private network AC15 lines.) The length of an OLI number is the same as that for the public network received digits for DIA lines.
Routing codes	The OLI number can be a routing code, just as the public network received digits can be a routing code, assuming the routing access code is the same length as the public received number for DIA lines.
SLR	The OLI number will not be propagated across lines tandemmed by SLR.
Extension profile	A heading in **EXTN shows the OLI number for a set.
Tandem call	No OLI is sent when Norstar is used as a tandem node.

Page

1.1 Overview

1.1.1 Description

A set can be programmed to be in no Page zone, or into one of three (for Compact) or six (for Modular) Page zones. End users can make a Page announcement to the sets in any desired zone, or to the sets in all zones. The announcement can be made to users' sets, or an external (wall-mounted) speaker, or both.

A Page Announce tone, 800 ms in duration, precedes the Page announcement.

1.1.2 Rationale for Feature

See "1.1.1 Description".

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls

Page General

Page Zone

Page Speaker

Page Zone and Speaker

1.2.2 Caller View

To make a Page announcement, the user dials a Page feature code, or presses a key programmed to Page a specific group of sets or all sets (with or without the external speaker). The General Page key (programmed with) allows the user on a two-line display set to specify the type of paging to be performed:

- **SETS** allows a group of sets (a zone) to be selected to receive the Page.
- **SPKR** selects the external speaker to receive the Page.
- **BOTH** allows a selected group of sets (a zone) and an external speaker to receive the Page.

If the user activates Page Zone or Page Zone plus Speaker, **ALL** specifies that all zones receive the Page.

A general Page display key, **PAGE**, is displayed when the user parks a call, to allow paging (Page General) to be done easily in this situation.

Two or more users can Page different groups simultaneously, provided that they do not both request the external speaker.

The Message Displays table show the messages for a two-line display set. One-line displays sets do not have display keys. “Display key and dialpad digit equivalents” shows the mapping between display keys and dialpad digits.

Display key and dialpad digit equivalents

Digit	Display key
0	ALL
1	SETS or BOTH??
2	SPKR?
3	PAGE?

1.2.3 Message Displays

Message	Description
Enter zone: ALL	Displays if the user activates Page Zone (<input type="text" value="Feature"/> <input type="text" value="6"/> <input type="text" value="1"/>) or Page Zone and Speaker (<input type="text" value="Feature"/> <input type="text" value="6"/> <input type="text" value="3"/>).
Page choice: SETS SPKR BOTH	Displays if the user activates Page General (<input type="text" value="Feature"/> <input type="text" value="6"/> <input type="text" value="0"/>).
Paging <x>	<x> is the zone number. Displays when the user does one of - presses <input type="text" value="Feature"/> <input type="text" value="6"/> <input type="text" value="1"/> plus zone number - presses <input type="text" value="Feature"/> <input type="text" value="6"/> <input type="text" value="0"/> plus SETS plus zone number (a valid zone digit: 0 to 3 for Compact Plus, 0 to 6 for Modular Plus)
Paging <x>-SPKR	<x> is the zone number. Displays when the user presses either of - <input type="text" value="Feature"/> <input type="text" value="6"/> <input type="text" value="0"/> plus BOTH plus zone number - <input type="text" value="Feature"/> <input type="text" value="6"/> <input type="text" value="3"/> plus zone number
Paging ALL	Displays when the user does one of - presses a Page All Zones programmed key - presses <input type="text" value="Feature"/> <input type="text" value="6"/> <input type="text" value="1"/> plus ALL - <input type="text" value="Feature"/> <input type="text" value="6"/> <input type="text" value="0"/> plus SETS plus ALL
Paging ALL-SPKR	Displays when the user has selected to Page All Zones by one of - pressing <input type="text" value="Feature"/> <input type="text" value="6"/> <input type="text" value="3"/> - pressing <input type="text" value="Feature"/> <input type="text" value="6"/> <input type="text" value="3"/> plus BOTH plus ALL
Paging SPKR	Displays if the user does any of - presses a Page Zone and Speaker programmed key - presses <input type="text" value="Feature"/> <input type="text" value="6"/> <input type="text" value="2"/>) - presses <input type="text" value="Feature"/> <input type="text" value="6"/> <input type="text" value="0"/>) plus SPKR
Paging busy	Displays, accompanied by Error tone, if a user activates Paging for a zone that is already being paged, or the speaker is already being paged. The user is reconnected to the existing Page if it is in the same zone. Otherwise the user's set returns to idle.
PageTimeout	Displays, accompanied by Error tone, if the duration of a Page call exceeds the value specified in PageTimeout in OAM Programming. The Page is disconnected.

To end the Page, the user presses **[Rls]**, or places the handset onhook. Pressing another line key also ends the Page. Pressing **#** on the dialpad ends the Page if the user is paging sets only.

Page Announce tone

A Page Announce tone precedes the Page announcement. The tone is an 500 + 667 Hz composite tone, 800 ms in duration.

1.2.3.1 User Programming View

Users can program the following to a key.

Feature **[6]** **[0]** Page General

Feature **[6]** **[1]** Page Zone plus zone number

Feature **[6]** **[2]** Page Speaker

Feature **[6]** **[3]** Page Zone and Speaker plus zone number

The Page key does not use an indicator. An indicator is used only at the intercom line used for the Page.

The following table describes the key Inquiry displays, feature activation codes, and associated display messages for the various types of paging available. (Display keys appear on two-line displays only.)

Feature	key Inquiry (Displayed Message)	Feature key	Activated Feature (Displayed Message)
Page -General	Page-General	Feature [6] [0]	Page choice: SETS SPKR BOTH
Page Zone	Page Zone 1	Feature [6] [1] [1]	Paging 1
	Page Zone 2	Feature [6] [1] [2]	Paging 2
	Page Zone 3	Feature [6] [1] [3]	Paging 3
	Page Zone 4	Feature [6] [1] [4]	Paging 4
	Page Zone 5	Feature [6] [1] [5]	Paging 5
	Page Zone 6	Feature [6] [1] [6]	Paging 6
Page All Zones		Feature [6] [1] [0]	Paging ALL
Page Speaker	Page Speaker	Feature [6] [2]	Paging SPKR

Feature	key Inquiry (Displayed Message)	Feature key	Activated Feature (Displayed Message)
Page Zone + Speaker	Page Zone1, Spkr	Feature 6 3 1	Paging 1SPKR
	Page Zone2, Spkr	Feature 6 3 2	Paging 2SPKR
	Page Zone3, Spkr	Feature 6 3 3	Paging 3SPKR
	Page Zone4, Spkr	Feature 6 3 4	Paging 4SPKR
	Page Zone5, Spkr	Feature 6 3 5	Paging 5SPKR
	Page Zone6, Spkr	Feature 6 3 6	Paging 6SPKR
	Page All, Spkr	Feature 6 3 0	Paging ALLSPKR

1.2.3.2 End-to-End Signaling on External Paging

When the user activates paging to the external speaker (with or without paging to internal sets), End-to-End Signaling (long tones) is activated automatically. No indication is given to the user that the feature has been activated. This selects one of several speaker paths supported by the external paging equipment to control products connected to the external paging circuit. Long tones generated during paging are not transmitted to any sets receiving the Page announcement.

1.2.4 End User View

If the user's set is not in internal dial tone state when Page is activated, the feature selects an intercom key automatically, turning the line indicator on. If no intercom keys are available, the transient prompt *No button free* is displayed, accompanied by Error tone, and the set is placed in the idle state. If an internal line is available, a Page Alert tone is generated at all sets programmed to receive the page and is in the correct state to receive this announcement.

The tone is an 500 + 667 Hz composite tone, 800 ms in duration.

No visual display or indication occurs at the receiving set that a Page is in progress.

The Page Alert tone is not generated at the external speaker.

Under normal circumstances, the originating set does not receive the Page Alert tone, but the appropriate message is shown on the display to indicate the type of announcement being made. This display is maintained for the duration of the Page announcement.

The originating set does receive a Page Alert tone if it tried to page a channel already in use.

Page reception at a set occurs through the loudspeaker, not through the Handsfree or headset receive path. Page reception volume is controlled in the same register as Background Music volume, and is controlled independently of handsfree/headset volume.

Paging is not presented to a set that has an active internal or external line. No audible or visible indication is provided to show that the announcement is not

being received. The user who has an active call can Hold or Release it in order to connect to a Page in progress.

When the user joins a Page in progress, the Page Alert tone is generated before Page reception begins.

While receiving a Page announcement, the user can initiate a call, answer a call, or reaccesses a held call. In these cases, the announcement is suppressed until the set again becomes idle.

1.2.5 OAM Programming View

1.2.5.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item		I	SC+	SC
Terminals&Extns	Capabilities	Page zone:None	X	X	X
		Paging:Y	X	X	X

Heading	Item		I	SC+	SC
System prgrming	Featr settings	Page Tone:Y	X	X	
		Page Timeout:2700	X	X	

1.2.5.2 Programming Paging and Page Zones

See ["Terminals&Extns - Capabilities"](#).

In **Terminals&Sets**►**Capabilities**, each set can be assigned to one of the three (for Compact) or six (for Modular) Page reception zones, or to no zone. All sets are in Page zone **None** by default. Each set can be in one zone only.

Paging can be turned On or Off for a given set. The default is On (Y).

The CCU has no method of detecting whether or not an external speaker is attached.

1.2.5.3 Programming Page Tone and Page Timeout

See ["System Programming - Feature Settings"](#).

In **System prgrming**►**Featr settings**, Page Tone is set to Y or N for the system. The default is Y.

Page Timeout (**PageTimeout**) can be set to 15, 30, 60, 120, 180, 300, 600, or 2700 seconds. The default is 2700 seconds (45 minutes).

1.2.6 **EXTN/**LINE

N/A


1.3 Technical Specification (Limits/Constraints)

Page announcements cannot be made to sets programmed to be in zone `None`.

To guard against improper use of the Page feature, the duration of a Page call is limited to the value specified in `PageTimeout`.

After the timeout period, the Page ends automatically, displaying the transient message `PageTimeout`.

1.4 Interactions

Feature name	Interaction
Background Music	Incoming paging overrides Background Music reception temporarily. After the end of the Page, Background Music is restored.
Call Forward	Call Forward does not suppress Page reception at the set.
Conference	A Page cannot be conferenced.
Do Not Disturb	Page reception does not occur if the user has activated Do Not Disturb. If Do Not Disturb is active, the user must cancel it in order to connect to a Page in progress.
End-to-End Signaling - Sets - Speaker	<p>If End to End Signaling is activated manually while making a Page announcement, the announcement is ended.</p> <p>End-to-End Signaling is activated automatically for Pages going to the Speaker. If the user presses a dialpad key while Paging through the external speaker, the corresponding DTMF tone is transmitted through the speaker for the approximate duration of the key press. The digits are echoed to the display.</p>
Feature access	If the user accesses a feature during Page reception, the reception is interrupted only if that feature uses a voice path. (Do Not Disturb is an exception to this rule.)
Handsfree (Standard)	If the user activates paging when onhook with Handsfree Off, the Page call is connected, but the user must lift the handset or press  in order to make the announcement. (With Handsfree Automatic, this is not necessary.)
Held Line Reminder	Held Line Reminder interrupts paging.
Hold	A user can Hold an active call and join a Page in progress. A Page cannot be held.
Incoming calls	Attenuated ringing occurs for incoming calls while the user is receiving a Page announcement.
Release	A user cannot release a received Page.
Transfer	A Page cannot be transferred.
Volume Control	Page reception at a set occurs through the loudspeaker, not through the Handsfree or headset receive path. Page reception volume is controlled in the same register as Background Music volume, and is controlled independently of Handsfree/headset volume. (There are 32 volume levels.)

Passwords

1.1 Overview

1.1.1 Description

Passwords protect access to system programming tasks. These passwords include:

- Class of service (COS) passwords
- Call log access passwords
- Programming passwords
- Hospitality passwords
- Registration passwords (where the system has Wireless capability)
- Remote Administration password (IRAD) for Compact Plus

These passwords are programmed in OAM Programming.

1.1.2 Rationale for Feature

See “1.1.1 Description”.

1.1.3 General Definitions

Term	Definition
IRAD	Integrated Remote Access Device which allows user to perform Remote administration. Used with Compact Plus.

1.1.4 General procedures

N/A

1.2 Feature details

1.2.1 User View

To enter OAM Programming, the user must first enter the appropriate feature code. The codes include:

- **CONFIG (Feature * 2 6 6 3 4 4) to access all of OAM Programming
- **USER (Feature * 8 7 3 7) to access User preferences
- **TIME (Feature * 8 4 6 3) to change time and date

The extent of access to programming is then determined by the user class password, which is one of:

- Installer
- System Coordinator Plus
- System Coordinator
- Basic

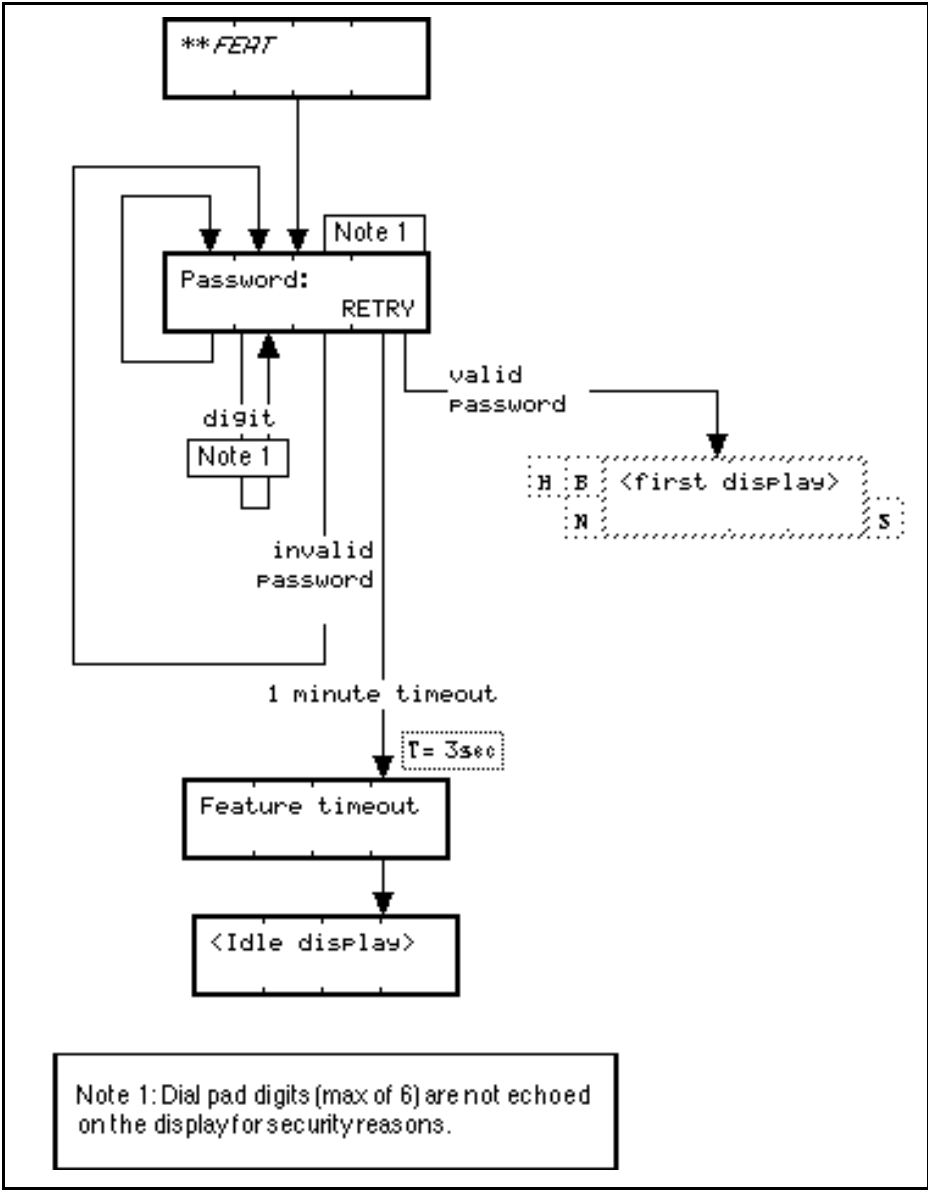


Figure 1-1: Password Entry Mechanism

The following table shows the default values for the system programming passwords.

Level	Default password
Installer	266344 (CONFIG)
System Coordinator Plus	727587 (SCPLUS)
System Coordinator	23646 (ADMIN)
Basic	22742 (BASIC)
Hospitality	
Desk pswd	4677 (HOSP)
Cond	Blank

Level	Default password
Reg. password	72346
IRAD	SysID (found in Software Keys)

For security purposes, the password entry mechanism

- does not echo password digits entered
- gives no indication as to the correctness of the sequence

Message Displays

Message	Description
Password: RETRY	If the correct password is not entered within one minute, the transient message, <code>Feature timeout</code> , is displayed and the user is returned to the idle display.

Null programming passwords are not allowed. If no digits are entered for a password, the feature times out unless the `RETRY` display key is pressed.

1.2.2 OAM programming view

1.2.2.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item		I	SC+	SC
Passwords	COS pswds	COPY (softkey)	X	X	
		COS pswd <i>nn</i>	COPY (softkey)	X	X
			Pswd: <i>nnnnn</i>	X	X
			User fltr: <i>nn</i>	X	X
			Line fltr: <i>nn</i>	X	X
			Remote pkg: <i>nn</i>	X	X
	Call log pswds	<i>DN:SETNAME</i>	Log pswd:****	X	X
	Progrming pswds	Installer:266344		X	
		SysCoord+:7587		X	X
		Sys Coord:23646		X	X
		Basic:22743		X	X
	Hospitality	Desk psd: 4677 (HOSP)		X	
		Cond: None		X	
	Reg. pswd: 72346 (RADIO)		X		
	IRAD pswd:<Sysid>		X		

1.2.2.2 Programmed Passwords

See "Passwords", "Passwords - COS Passwords", "Passwords - Call Log Passwords", "Passwords - Programming Passwords", "Passwords - IRAD Password", "Passwords - Hospitality".

For more information on...	See...
COS passwords	Class of Service feature
Call Log passwords	Call Log feature
Registration password	Registration feature (if Wireless capability is present)
Remote System Access password (RmteAdmin)	IRSD feature

1.2.3 **EXTN/**LINE

N/A

1.3 Technical Specification

The programming passwords and the COS passwords must be unique; that is, no two can be set to the same value.

For a one-line display set (M7100, M7208) the `RETRY` display key maps to the `HOLD` key.

1.4 Interactions

N/A

PBX Reach Through

1.1 Overview

1.1.1 Description

This feature allows Norstar users served by a PBX to access features provided by the PBX that require signals in addition to dialing. No provision is made for the external PBX system to control any indicators on the set.

1.1.2 Rationale for Feature

See “1.1.1 Description”.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls

Speed Dial/Autodial/Last Number Redial

dial pad keys

Feature

Recall programmed key

Feature 7 1 (Recall)

Feature 7 8 (Pause)

Feature * 9 (Run/Stop)

Feature * 8 9 (Programmed Release)

Rls

1.2.2 Message Displays

Message	Description
<digits>	When reachthrough is activated, the display echoes all ordinary digits in the sequence.

1.2.3 End User View

The user can create Autodial keys to use dial-access features on the host PBX system. As well as dial pad digits, the Autodial sequence can include feature codes for reachthrough features.

Norstar supports four special actions related to dialing on external lines. These actions are:

- Recall
- Pause
- Run/stop
- Programmed release

When the user activates a reachthrough sequence, the display echoes all the ordinary digits in the sequence. If Recall, Pause, or Programmed release are part of the sequence, they are shown on the screen as **25**, **5**, or **20** respectively, although these characters are not sent on the external line in this form (see “Code Compression Symbols”.) The run/stop code is not echoed.

Recall and Pause can be dialed manually (by means of a feature code, or a programmed key) on an external call. For PBX feature access dialed manually, run/stop can also be used to signal the PBX, while the user is active on an external call.

Recall and Pause can be stored in feature-access keys (that is, keys programmed with).

Recall and Pause can also be stored in the Last Number Redial buffer.

All four actions can be stored in Autodial and Speed Dial sequences; that is, dialers programmed with either of

The effects of these actions when the user presses the Autodial key or activates a Speed Dial entry are described in the following sections.

1.2.3.1 Recall

A Recall, also known as hookswitch flash, opens the line relay for a short time (see “1.2.5 OAM Programming View”). This is normally a signal to the host system that the user wishes to activate a feature related to the current call (such as activate Ring Again, Transfer, or Conference).

Disallow Recall

If the customer wishes to restrict this feature to some extensions, the Allow recall prompt can be amended under `Terminals&Extns►Restrictions►Extn retrns►Allow recall:Y`. The default is set to Yes.

1.2.3.2 Pause

A pause instructs the system not to send any further digits or signals on the line for 1.5 seconds. This can be used in dialers when a delay is necessary before digits can be dialed on a secondary carrier, or before an external device is ready to receive input.

1.2.3.3 Run/Stop

A run/stop functions as a breakpoint in a stored Autodial or Speed Dial sequence. After programming is complete, and the user presses the Autodial key or activates the Speed Dial entry for the first time, the system dials from the start of the sequence up to the first breakpoint. The next activation starts after this breakpoint,

and dials to the next breakpoint, or to the end of the string. After the end of the string is reached, the next activation restarts at the beginning of the string.

Run/stop allows the user to store two host-system feature codes (such as PBX Forward and Cancel Forward codes) in the same Autodial key, with each press of the key sending out alternate sections of the stored sequence.





1.2.3.4 Programmed Release

Programmed release disconnects the line from Norstar. It can be used to program an Autodialer so that, for example, a single key press could call forward to a host system and then disconnect from the host. The line does not have to be explicitly released.

1.2.3.5 Feature Code Compression

Reach-through feature codes can be entered by the user as part of a stored Autodialer or Speed Dial number. The entered characters appear on the user's display. Once a feature code is entered, it is converted into an appropriate one- or two-character symbol. If the user backspaces and removes a character representing a part of the feature code, the second character is automatically removed, thereby clearing the feature code.

Code Compression Symbols

Symbol	Name of feature	Feature code
	Pause	Feature <input type="text"/> 7 8
	Run/Stop	Feature <input type="text"/> * 9
	Recall	Feature <input type="text"/> 7 1
	Programmed Release	Feature <input type="text"/> * 8 9

1.2.4 User Programming View

One Recall key can be programmed for each set. An indicator is not used for these keys.

1.2.5 OAM Programming View

1.2.5.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item		I	SC+	SC
System prgrming	Featr setting	Recall time:600	X		

1.2.5.2 Programming Recall Time

For information on recall types and timings, refer to the Recall Signaling feature.

1.2.6 **EXTN/**LINE

N/A

1.3 Technical Specification (Limits/Constraints)

Only one Recall key can be programmed for each set. The system can store up to three run/stops in an Autodial or Speed Dial sequence.

1.4 Interactions

Any feature codes not listed above cannot be included in Speed Dial or Autodial strings. If the user enters one of these other feature codes during manual dialing on an external line, the rules for concurrent feature access apply.

Feature name	Interaction
External Direct-dial	PBX Reach-Through codes are not supported.
Pulse to tone conversion	The <input type="checkbox"/> and <input type="checkbox"/> keys have special meanings during pulse dialing. See the Pulse to Tone Conversion feature.
Last Number Redial System Speed Dial	See Last Number Redial and System Speed Dial features for details.

Port/Extn Status

1.1 Overview

1.1.1 Description

This feature allows the user to display status information in OAM Programming about a port's B-channels, one port or directory number (DN) at a time. The type of device, its version number, and the Extension number associated with each B-channel is available, along with information about add-on devices. Lines also appear in Port/Extn Status. As well, details about the state of each device can be displayed and the user is given the option to disable or enable devices (but not lines or loops) as required.

Unlike DTI lines, the B-channels of BRI loops can not be addressed as individual ports. Each loop is associated with a port, the port number coinciding with the loop number.

A Terminal Endpoint Identifier (TEI) is used to identify and address ISDN devices on an S-loop. One physical device may be represented by multiple TEIs. (i.e. a videophone could have separate TEIs for the voice and video channels). Norstar will support up to 64 TEIs, with a maximum of 8 TEIs per loop.

1.1.2 Rationale for Feature

Like other Maintenance features, this feature permits real-time examination of the devices and lines actually attached to the system, as opposed to planned or default configurations as displayed in OAM Programming.

Norstar can not keep track of ISDN devices on BRI loops using existing methods (as for Norstar sets). While each Norstar set is associated with a unique port number, there may be multiple ISDN devices associated with each S-loop. It is the S-loop that is associated with a unique port number.

This type of identifier is new to Norstar with the introduction of ISDN BRI. As a result, no current mechanism exists to check the inventory and status of the TEIs associated with the system.

1.1.3 General Definitions

Term	Definition
TEI	A Terminal Endpoint Identifier (TEI) is used to identify and address ISDN devices on an S-loop. One physical device may be represented by multiple TEIs. (i.e. a videophone could have separate TEIs for the voice and video channels). Norstar will support up to 64 TEIs, with a maximum of 8 TEIs per S-loop.
B-Channel	There are two Bearer channels and a data channel (2B+D) per BRI loop. A B-channel may carry voice or data signalling.

1.1.4 General Procedures

Port/Extn Status section of Maintenance allows the installer to display status information about a port's B-channels, one port or Directory Number (DN) at a time. The type of device, its version number, and the DN associated with each

B-channel is available, along with information about add-on devices. As well, details about the state of each device (except ISDN devices) can be displayed and the installer is given the option to disable or enable devices (but not lines or loops) as required. ISDN loops and lines are provisioned and deprovisioned in Maintenance►Provisioning.

1.2 Feature Details

1.2.1 Controls

N/A

1.2.2 End User View

Norstar set users are notified if the set they are currently using is about to be disabled.

The system allows a total of 60 seconds for the user to release a call. Any calls not terminated by the user within this time period are dropped by the system and the set is disabled.

Message	Description
Please hang up	Displays, accompanied by Attention tone, to notify the set user that the set is about to be disabled. Alternates with the Maintenance test message until each has been displayed twice, or the user has release all calls.
Maintenance test	Transient three-minute display that alternates with the Please hang up message until each has been displayed twice, or the user has release all calls.
xx seconds until disconnect	Three-second transient display if the user has not released calls in response to the Please hang up and Maintenance test messages. On sets with single line displays, the prompt is given in two parts: xx seconds is displayed for three seconds, followed by until disconnect for three seconds.
In maintenance	Displays once all calls have been released or the set has been disabled.
Not in service	Displays, accompanied by Error tone, if a user attempts to call a set that is disabled.

1.2.3 OAM Programming View

1.2.3.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item	I	SC+	SC
Maintenance	Port/Extn status	X		

1.2.3.2 Analog Line Ports

See "Maintenance - Port/Extension Status" and "Maintenance - Port/Extension Status - State".

The user cannot disable analog CO lines from Port/Extn status►. The whole card or module must be disabled in Module status►. To disable an analog line,

the card's D-channel must be disabled, which affects all lines on the card. Disabling any one line on the analog card disables all the other lines and the card as well. For this reason, ports that share a D-channel cannot be disabled in `Port/Extn status`. The `DISABLE` display key is not presented for any line or loop ports.

When the CCU is equipped with an analog card(s), the ports not actually connected to lines or loops are not displayed, resulting in gaps in the line numbering. That is:

- Ports 205-230 and 235-260 (for Modular Plus with BRI loops and analog cards offcore)

When querying an off-core Card Module (which supports both Analog lines and BRI loops), the ports not actually connected to lines or loops will not be displayed, resulting in gaps in the line numbering.

There are four possible states for the logical ports associated with analog voice channels, as shown in the following table.

Port/Extn Status display	Description
Idle	No call on the line.
Busy	On an active call.
Disabled by sys.	System has disabled the voice channel, possibly due to an alarm.
Unequipped	Equipment not installed.

1.2.3.3 DTI Lines and Ports (DASS2, PRI)

Compact ICS does not support digital lines.

No user enable or disable functionality is provided for DTI line and port numbers. This functionality is accomplished through Provisioning.

For each DASS2 line two version numbers can be displayed in Port/Extn Status.

- The card's ROM version number is displayed using the `VERSN` softkey at the `P201 Lnnn` display.
- The card's firmware version is displayed as the port's add-on device, by pressing the `SHOW` key. (`Pnnn 1: Card f/w`)

1.2.3.4 Portables

A portable or ISDN DN can be entered at the `Show extn:` prompt, however the transient `Invalid extn` is displayed.

1.2.3.5 TCM Ports

The `DISABLE/ENABLE` display keys appear for devices that use TCM ports, that is:

- sets

- AC15A lines
- base stations (Wireless only)
- ATAs

TCM ports disable individual B1 and B2 DNs.

The status of a base station can be queried using the port number or the extension number associated with that port.

1.2.3.6 Add-on devices and version numbers

See "[Maintenance - Port/Extension Status - Version and Add-ons](#)".

Add-on devices include the following:

- BLFs, CAP modules, for Norstar sets
- DTI software (card firmware), for DTI lines
- BRI loops: BRI software (Card firmware, Loop protocol)

Information about a port's add-ons is displayed by pressing the `SHOW` key from the port number display. `NEXT` and `BACK` then scroll through the port's add-ons. For add-on devices with no corresponding B2 channel, a BLF for example, no `>B2` display key appears (in the middle display key position).

Wireless basestations can contain two radios, using both B-channels.

A `VERSN` display key is provided for devices that have a version number associated with them. Pressing `VERSN` from the port number display gives the version number of the device attached to the port. Pressing `VERSN` from an add-on's display gives the version number of that add-on device. The `VERSN` display key is not shown for devices that do not have an associated version number.

1.2.4 States and the State display key

See "[Maintenance - Port/Extension Status - Version and Add-ons](#)".

The `STATE` display key is used to determine the status of a line or device. It reports the state of the port.

1.2.4.1 BRI

A BRI loop is considered `Busy` if one or both B-channels are busy.

A T-loop is considered busy if one or both B-channels are in use by a trunk. This may change when D-channel calls are supported on Norstar.

An S-loop is considered busy if one or both B-channels are in use by an ISDN device. This may change when D-channel calls are supported on Norstar.

The State of an ISDN device can not be determined by pressing the `STATE` key. (see TEI Inventory)

1.2.4.2 DTI Port States and Provisioning Service States

There are seven possible states for the logical ports associated with the voice channels on DTI cards, as shown in the following table.

Port/Extn Status Display	Provisioning status/ Module Status (BRI or DTI)	Description
Idle	Provisnd	No call on the line.
Busy	Provisnd	On an active call
Deprovisnd	Deprovisnd	Voice channel has been deprovisioned in Provisioning
N/A	Provisnd or Deprovisnd Disabled by user	If the cartridge or module has been disabled (in Module Status), the line can be provisioned or deprovisioned.
None	Unequipped	No card is in the slot or no station module is installed. The line or loop can be provisioned or deprovisioned.
Disabled by sys.	Provisnd or Deprovisnd	The system has disabled the voice channel, possibly due to an alarm. The line can be provisioned or deprovisioned.
Not available	Provisnd or Deprovisnd	<ul style="list-style-type: none"> • The DTI card exists on the CCU, but the digital line being queried is not known to the system. • The BRI card exists on the system, but the loop is not known to the system.

ISDN BRI Loop Ports

No user enable or disable functionality is provided for BRI loop port numbers. This functionality is accomplished through Provisioning.

Entering the port number of an ISDN loop at the `Show port:_` prompt displays that port number along with the corresponding loop number. If the loop is an S-loop, a `TEI` softkey will appear at the middle softkey position.

Both lines of a BRI loop may be deprovisioned (with the loop still provisioned), and the `STATE` of the port is displayed as `Idle`.

[See "Maintenance - Port/Extension Status - Loops or Lines".](#)

TEI Inventory

The `TEI` softkey appears in the middle position for S-loops. If no TEIs are available at the port, the `SHOW` key is suppressed.

```
P201: Lp201
VERSN TEI STATE
```

- Norstar supports a maximum of 8 TEIs per loop.
- Norstar supports a maximum of 64 TEIs per system.

- TEI numbers may range from 000 to 127. Two TEIs on the same loop may not have the same number.
- TEI information is dynamic. In other words, while a user is looking at a list of TEIs and devices (and hence their TEIs) may appear or disappear.
- An ISDN terminal may request a specific TEI (a static TEI). If not, Norstar will assign a TEI to the device when the device initializes with the system (a dynamic TEI).
- TEIs are assigned on a first come-first served basis. If two devices on a loop request the same TEI, the first device will get the requested TEI. Subsequent requests for an assigned TEI will not be acknowledged. Instead, Norstar will assign a dynamic TEI to the device, from those available to the loop.
- Currently, TEIs are presented in ascending order. (This is not guaranteed to be true in all future products. Currently, the TEI = the CES (Connection Endpoint Suffix). It is the CES that is sorted in ascending order for use by 'lower' layers of the software. If this relationship changes, it is not guaranteed that the TEIs will be presented in ascending order.)

1.2.5 ****EXTN/**LINE**

N/A

1.3 **Technical Specification (Limits/Constraints)**

N/A

1.4 **Interactions**

Feature/ Event	Interaction
Software download from CCU to DTI card	Module, cartridge and port status shows Disabled by sys.
Loopback test(s) running on DTI card	Port/Extn Status shows the state of the port as Not available.
Both lines of a BRI T loop are deprovisioned (loop is still provisioned)	STATE of the loop reads Idle (not Deprovisnd).

Power Fail Cut-Through

1.1 Overview

1.1.1 Description

This feature provides basic telephone service in the event of power loss, or failure of the CCU to update the hardware watchdog.

1.1.2 Rationale for Feature

N/A

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls

One or two customer-supplied analogue single-line sets (that don't require an external power source) must be connected to the system unit using the designated teladapt jack(s).

1.2.2 Message Displays

N/A

1.2.3 End User View

In the event of power failure, a relay in the Norstar CCU connects an analog set directly to an external analog line (1 set, 2 sets, or both, depending on the configuration), and bypasses all internal line interface hardware. This relay may also be activated by the system in the event of a catastrophic system-detected error. Basic telephone service is available on a 500 or a 2500 set, which then operates independently of the Norstar system. No internal calls can be made, and Norstar sets are not operational.

Any call in progress on an analogue set when power is restored, or when error recovery occurs, is disconnected.

When the system fails to update the internal hardware watchdog, the watchdog fires, resetting the system, and dropping any calls in progress. Some types of failure can result in continuous resets, in which case, the Power Fail Cut-Through feature cannot be used.

1.2.4 OAM Programming View

N/A

1.2.5 **EXTN/**LINE

N/A

1.3 Technical Specification (Limits/Constraints)

Unlike other systems, the ICS has only one position for an emergency telephone. The position is on the second port (trunk) of the card in slot 1 of the CCU, or Port 201.

1.4 Interactions

Feature Name	Interaction
Selective Line Redirection	During power failures, no redirection takes place until power is restored.

Prime Extension

1.1 Overview

1.1.1 Description

A Prime Extension is a set that provides backup answering functions for external calls.

Any set can be designated to perform backup answering functions for any external line. Each line can be associated with only one Prime Extension.

1.1.2 Rationale for Feature

See 1.2.1 Description.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

A number of features transfer or extend alerting to a Prime Extension to enhance Call Capture. Aside from these Call Capture features, the operation of a Prime Extension from the user standpoint is the same as the operation of any other set.

1.2 Feature Details

1.2.1 End User View

External calls are routed to a Prime Extension to enhance the system's Call Capture capabilities. For all of the features described here, the call drives audible alerting and displays a message at a Prime Extension only if it is the highest Priority Call at that set. If a higher Priority Call is ringing the Prime Extension, the message for the rerouted call is displayed only if that call is answered or preselected, or if that call subsequently becomes the highest priority Ringing Call. If the Prime Extension is already ringing for the rerouted call, the Call Capture message is not displayed.

Prime Extension Call Capture features apply to external calls only.

If the Prime Extension does not have an appearance of the line to which a Prime Extension Call Capture feature applies, the call is presented on an intercom key on the Prime Extension, if an intercom key is available.

1.2.2 Message Displays

Message	Description
<callingsetname/linename>> <forwarded dest name>	Displays at the Prime Extension, accompanied by audible and visual alerting, if an external call is forwarded to a set that cannot ring because it does not have an appearance of the external line, and no intercom key is available.
<linename> callback	Displays at the Prime Extension if Park Callback or Transfer Callback for an external call cannot ring at the set that parked or transferred the call (the keyed Ring Transfer to Prime Extension).
<linename> to prime	Displays at the Prime Extension accompanied by audible and visual alerting for any of the following reasons <ul style="list-style-type: none"> • the line does not appear on any set • the line is not programmed to ring on any set • no set where the line can ring is in service
DND from <setname>	Displays at the Prime Extension if any set ringing for an incoming external call activates Do Not Disturb while the call is ringing.
DND transfer	Displays at the Prime Extension accompanied by visual and audible alerting if no set can ring for an incoming external call, and one or more sets are not ringing because Do Not Disturb is active. If one set is able to ring for the call, while other sets are in Do Not Disturb mode, DND transfer does not occur at the Prime Extension.
DND Selective Call Forward	If any set that is ringing for an incoming external call activates Do Not Disturb while the call is ringing, the audible and visual alerting are transferred to the Prime Extension for that line, along with the message DND from <setname>, where <setname> is the name of the set that activated Do Not Disturb. This transfer of alerting occurs even if the call is ringing at other sets in the system.
DRT <linename>	Displays at the Prime Extension accompanied by audible alerting if Delayed Ring Transfer is enabled for the system and the Delayed Ring Transfer timeout occurs on a ringing external line for which a Prime Extension exists.
Held by <linename>	Displays at the Prime Extension along with the first Held Line Reminder for a held line.
Held call	The second transient message that appears at the Prime Extension along with subsequent held line reminders for a held line.
Line denied	Line is Private to another set.
Parked call	Displays when a parked call returns from the Call Park server.

1.2.2.1 Delayed Ring Transfer

Delayed Ring Transfer capability is enabled or disabled on a system-wide basis in OAM Programming. The length of the timeout before delayed ring transfer occurs is programmable as well.

1.2.3 OAM Programming View

1.2.3.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item			I	SC+	SC
Lines	Individual lines	Trunk/Line Data	Prime Extn: 221	X		

1.2.3.2 Programming Prime Extension

See "Lines".

Each external line can be programmed to be associated with one Prime Extension. The default Prime Extension is 221 for both Compact Plus and Modular Plus.

1.2.4 **EXTN/**LINE

N/A

1.3 Technical Specification (Limits/Constraints)

N/A

1.4 Interactions

Feature name	Interaction
Call Forward	If a Prime Extension has Call Forward active, all alerting messages associated with Prime Extension Call Capture features are forwarded from the Prime Extension to the destination set. (Held Line Reminder Extension to Prime Extension is included in these features.) Forwarding occurs even if the Prime Extension has Do Not Disturb active, or has no line key on which to present the call.
Change Extn Extn Length	Changing individual Extns, or Extn length, preserves the relationship between a Prime Extension and the Extns assigned to call it.
Direct-dial	The assignment of Direct-dial sets (and Scheduled Services Extra-dial sets) is independent of any Prime Extension designations. The customer can choose to program the Prime Extension for a particular line to also be a Direct-dial set.
Do Not Disturb	None of the Prime Extension Call Capture features occur at a Prime Extension in Do Not Disturb mode.
Held Call Reminder	If more than one Held Line Reminder situation exists concurrently on the Prime Extension, the oldest held line drives the Held Line Reminder tone and message. If this call is retrieved from Hold, the remaining held call displays the <code>Held call</code> message.
Private Lines	Prime Extension Call Capture features, except for Held Line Reminder Extension to Prime, apply to any Private Line for which a Prime Extension exists. The Prime Extension is not required to have an appearance of the Private Line in order for these features to operate.

Feature name	Interaction
Scheduled Services	OAM Programming supports the specific assignment of sets to control Scheduled Services, to ring during one of the Scheduled Services, and to respond to Direct-dial during Scheduled Services. None of these sets is required to be a Prime Extension. Similarly, specification of Scheduled Services ringing is completely independent of Prime Extension ringing assignments. For further details on Scheduled Services, refer to that feature.
Send Message/ Message Waiting	A Prime Extension is limited to sending four messages and receiving four messages, just like any other set. However, if the Prime Extension is also the Direct-dial set during normal service, the set can send and receive up to 30 messages.

Prime Line

1.1 Overview

1.1.1 Description

The Prime Line for a set is assigned in OAM Programming. A Prime Line is the first line automatically selected when a call is made from a set. Prime Line can be an external line, a line pool, an intercom, or None.

1.1.2 Rationale for Feature

See "1.1.1 Description".

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 End User View

If a Prime Line is assigned, a set is allowed to perform Automatic Outgoing Line Selection, and use external dialing features such as Autodial and Speed Dial, which select an outgoing line automatically. The existence of a Prime Line also affects Automatic Incoming Line Selection.

For more information, refer to Line Selection.

1.2.2 Message Displays

Message	Description
Select a line	Displays, accompanied by Error tone, if the user tries to dial a number using automatic dialing and any one of the following conditions is true <ul style="list-style-type: none"> - an alerting or held call is using the Prime Line - the line is in U-Active state - no Prime Line has been assigned, and the user has not selected a line manually

1.2.3 OAM Programming View

The following table shows the levels of access required for users to program OAM changes.

Heading	Item		I	SC+	SC
Terminals&Extns	Line access	Prime line:None	X	X	

1.2.3.1 Programming Prime Line

Prime Line is programmed in Terminals&Extns►Line access►Prime line:None.

See "Terminals&Extns - Line Access".

The options for are:

Compact Plus	Modular Plus
Line 001 to Line 008	Line 001 to Line 094
Pool A to Pool C	Pool A to Pool O
I/C (Intercom)	I/C (Intercom)
None	None

None is the default for both systems.

All lines assigned to appear at the set in `Line assignment`, and all line pools assigned to the set in `LinePool access` appear as available Prime Lines.

An assigned Prime Line is not associated with the assignment of a Prime Set.

1.2.4 **EXTN/ **LINE

N/A

1.3 Technical Specification (Limits/Constraints)

A line pool must be assigned to the set in `LinePool access` before a line pool can be assigned as the Prime Line to the set.

A line must be set to `Appear` or `Appear&Ring` at the set before it can be assigned as the Prime Line to the set.

1.4 Interactions

For more interactions with Prime Line, see also the Line Selection specification.

Feature or condition	Interaction
Automatic Line Selection	The user cannot use Automatic Line Selection to dial a number while an alerting or a held call is using the Prime Line, or the line is in U-Active state.
Autodial User Speed Dial System Speed Dial	If no line was stored with the Dialer, the stored number uses the Prime Line at the set. If the Prime Line is external, to Autodial a network destination, the user must program the Autodialer to use the intercom. See also the Buttons - External Autodial feature.).
Dialing Options	See the Dialing Options or the Line Selection feature.
Hotline	For a Basic set and the ATA, if a Hotline call is programmed to use a line other than Prime Line, and that line does not appear at the Hotline set, the Hotline call attempts to use the Prime Line. See also the Line Selection feature.
Extn Copy	Line access attributes (such as Prime Line) can be copied from one set to another, one group at a time.
DIA line	A DIA line, because it is incoming only, cannot be programmed as Prime Line.

Priority Call

1.1 Overview

1.1.1 Description

This feature allows a user who receives a Ringback or Busy tone on an outgoing internal call to try to force a voice connection with the destination set, regardless of that set's Do Not Disturb or call processing status.

Priority Call applies to internal calls only.

1.1.2 Rationale for Feature

1.1.2.1 Scenarios of usage

The following are possible usage scenarios for Priority Call.

- as an Executive Override (Barge In) feature, to allow a privileged user to interrupt a user who is on another call
- as a Voice Announce feature, to allow an attendant to give information to a user (for example, to announce a call or a visitor) when the user is on another call
- as a Do Not Disturb Override, to allow a selected user to override another user's Do Not Disturb status
- as a way to force a ringing internal call to be presented as a Voice Call, regardless of the destination set's status

If the target set is idle, the Priority Call feature makes a forced Voice Call to that set.

If the target set is active on a call, the Priority Call feature can be used to force that call on hold and connect with the target set. This attempt can be blocked by the target set within the initial eight seconds.

1.1.3 General Definitions

Term	Definition
Forced Call	Occurs when a user activates Priority Call to call another user who is already active on a call. The original call is put on hold, and the Priority Call is presented to the set as a Ringing Call.
Call Block window	An eight-second period following the Priority Call Warning tone in which the called party can either block the incoming call, or hold or release the original call. See "Call Block Window".

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls

At the calling set, Feature 6 9, or programmed key

At target set, Do Not Disturb Feature 8 5, or programmed key (for the first eight seconds)

1.2.2 End User View

If a caller is receiving Ringback or Busy tone on an outgoing internal call and they are authorized in OAM Programming, they can make a Priority Call by pressing the `PRIORITY` display key (on two-line sets), `Feature` `6` `9`, or the Priority Call programmed key.

If the target set is idle, the Priority Call feature creates a forced Voice Call to that set, whether or not it is in Do Not Disturb mode, and whether or not that set has an intercom key available.

If the Priority Call feature is activated when the target set is active on another call, the feature attempts to create a Forced Call between the caller and the destination set. If this attempt succeeds, Exclusive Hold is applied automatically to the original party (or parties) involved with the destination set.

If a user tries to make a Voice Call, and the call is converted to an alerting call because the target set is in one of the following conditions

- is in Do Not Disturb mode
- is in Voice Deny Mode
- has no intercom key available
- has another call ringing
- is active on a call

the Priority Call feature can be used to convert the call to a Forced Call.


1.2.3 Message Displays

Message	Description
Call blocked	Displays, accompanied by Error tone, if the target set blocks a Priority Call attempt.
Denied in admin	Displays, accompanied by Error tone, if access to the Priority Call feature is denied in OAM programming.
Make call first	Displays, accompanied by Error tone, if the caller attempts a Priority Call, but is not receiving Ringback or Busy tone.
Not in service	Displays after a three-second timeout if the target set is in an OAM programming session. The message is accompanied by Overflow tone. If the caller attempts to activate Priority Call during the three-second timeout, the attempt is ignored. If the caller attempts to activate Priority Call after the three-second timeout, the <code>Not in service</code> message is replaced with <code>Make call first</code> , and the Overflow tone continues.
Please wait	Displays during the eight-second Call Block window.
Priority call	Displays when a call attempt is successful.
Priority denied	Displays transiently if the target set is already engaged in a Priority Call.

A user who receives a Priority Call attempt while active on another call can use the Do Not Disturb feature, or the BLOCK display key, to block the attempt.

1.2.3.1 Characteristics of Forced Calls

Priority Call bypasses any conditions at the destination set (for example, Do Not Disturb, Voice Deny) that normally prevent a set from receiving a Voice Call.


If the target set has an active voice path, this path is used for the new call. If the calling set has no transmit path enabled (that is, the user is performing onhook dialing, or has the handsfree microphone muted) when the forced call occurs, the feature activates the calling set's handsfree microphone. The microphone is restored to its original state when the Priority Call terminates. The calling set must lift the handset or activate the  key to communicate with the called set.

Message Displays

Message	Description
Priority> <calling setname>	Appears during a Priority Call attempt, as well as for the duration of the Forced Call. If the target set was involved in activating a feature, that feature is cancelled by the Priority Call attempt.

If Priority Call is made to a set that has an intercom key available, the call appears on the intercom key.

Behaviour of Forced Calls

Condition	Description
When an intercom key is available	If an intercom key is available on the target set, once connected, a Priority Call is a normal internal call from both the caller's and recipient's point of view. There are no restrictions on the actions that the caller can perform. If either the destination or the calling user puts the call on Hold or Transfers it, the call is no longer a Priority Call. If the destination user puts the Priority Call on Hold, any calls automatically held by the Priority Call feature are not reconnected.
When intercom key is not available	If a Priority Call cannot appear at a key at the target set because no intercom key is available, the target set is placed in lockout mode for the duration of the call. In this case, the target user can only press the  key, go onhook or adjust the volume. All other user actions result in the transient message Release call, accompanied by Error tone.
Target set is idle	If the target set is in either the onhook or the offhook idle state, the call immediately activates the speaker and the Handsfree microphone at the target set and a Forced Call Warning tone is heard at the called set. This occurs whether or not Handsfree Answerback is enabled for that set in OAM Programming. This variety of the Priority Call feature cannot be used when the target set is connected to the system using an Analog Terminal Adapter (ATA) because this type of set cannot receive Voice Calls.

Condition	Description
Target set is active on another call	<p>When the Priority Call is activated for a set that is active on a call, a Priority Call Warning tone is generated at the target set. This tone is not transmitted to any party connected to the target set.</p> <p>When the call attempt occurs, the destination set receives Warning tone, and displays <code>Priority><caller's name></code>. If the Forced Call succeeds, this message persists for the duration of that call.</p> <p>This variety of the Priority Call feature can be used when the destination set is connected to the system using an Analog Terminal Adapter (ATA).</p>

Call Block window

An eight-second Call Block window follows the Warning tone. If the destination party takes no action for eight seconds, a Forced Call occurs. Automatic Hold is applied to any call (or calls) connected to the target set, and a two-way voice path is set up between the caller and the destination set.

If, during the eight-second window, the user at the target set holds or releases the active call, the calling set is connected immediately to the target set.

The calling set displays `Please wait` during the Call Block window. If the Forced Call succeeds, the calling set displays the static message `Priority call` during the Forced Call.

Blocking a Priority Call During the Call Block Window

During the Call Block window, the destination party can press the `BLOCK` display key (on two-line display sets) or press the Do Not Disturb programmed key or the Do Not Disturb feature code within eight seconds in order to block the Priority Call attempt. In this case, the caller sees a transient `Call blocked` message. The state of the call at the called set is not changed, and the calling set returns to idle. At this point, the caller can send a message to the target set. At this point, Ring Again on the target set cannot be activated

If the target set has a Do Not Disturb key with indicator, this indicator flashes during the Call Block window, to show that the user can press this key to block the call. The indicator is restored to its original state (idle or active) when the call is blocked or the Forced Call succeeds.

Terminating a Forced Call

Either party in a Priority Call can press the `[Ris]` key, or go onhook, in order to disconnect a Forced Call and return to the original call.

If either party in a Priority Call releases the Priority Call, once the `Priority><calling setname>` appears, any calls held by the Priority Call feature are reconnected.

When either set disconnects from the Forced Call, if the original call is still on hold, the Priority Call Warning tone is sounded again. The target set is reconnected to the original call, with the display showing the Call Identification for that call. If the user is offhook with Handsfree Off at this point, the handset voice path is used. If the user is onhook, the set is restored to the state it was in prior to the Forced Call: speaker only, Handsfree On, Handsfree muted, or unacknowledged Handsfree Answerback state.

When the caller or called party disconnects the Forced Call, the original two-party or three-party call is restored and a tone is sounded. The tone is sounded at the set that was released from the Priority Call, not at the set that released the call.

1.2.4 User Programming View

The user can program one Priority Call key for each set, provided that the set is programmed to use the feature. An indicator is not used.

1.2.5 OAM Programming View

1.2.5.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item			I	SC+	SC
Terminals&Extns	Individual Extns	Capabilities	Priority Call: N	X	X	X

Programming Priority Call

See "[Terminals&Extns - Capabilities](#)".

Permission to use Priority Call is programmed on a set-by-set basis.

1.2.6 **EXTN/ **LINE

N/A

1.3 Technical Specification (Limits/Constraints)

N/A

1.4 Interactions

Feature name	Interaction
Call Forward	If a call origination has been rerouted to another set by means of Call Forward (All Calls), Priority Call can be activated on the new destination, but cannot be activated on the original destination.
Conference	If the destination set is in a conference call when the Forced Call occurs, the other two Conference parties are placed on hold from the point of view of the destination set. The line indicator(s) associated with these parties flash at the I-Hold rate at the destination set. The two held parties can continue to converse (as in a normal held Conference). Exclusive Hold is applied to the automatically held call(s), so that the call(s) cannot be picked up at another set during the Forced Call between the caller and the target set. The held external party receives the programmed line treatment for held external lines (Music/Tones/Silence) while on Hold.
Do Not Disturb, Voice Deny	Priority Call bypasses any conditions at the destination set (for example, Do Not Disturb, Voice Deny) that normally prevent a set from receiving a Voice Call.
Handsfree Mute, Onhook Dialing	If the target set has an active voice path, this path is used for the new call. If the calling set has no transmit path enabled (that is, the user is performing Onhook Dialing, or has the Handsfree microphone muted) when the Forced Call occurs, the feature activates the calling set's Handsfree microphone. The microphone is restored to its original state when the Priority Call terminates.
Held Line Reminder	Held Line Reminder does not apply to calls held by Priority Call.

Privacy Control

1.1 Overview

1.1.1 Description

When a Norstar user is active on an external line for which the Privacy feature is in effect, other Norstar users are prevented from pressing an appearance of that line and joining the call. If Privacy is not in effect, another Norstar user can press the line appearance, and join the other parties in a conference, if conditions are appropriate.

1.1.2 Rationale for Feature

See “1.1.1 Description”.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls

Privacy Control, 8 3, or programmed key

Press the feature code or the programmed key again to cancel.

1.2.2 Message Displays

Message	Description
Privacy is OFF	Appears transiently when the user activates the Privacy Control feature and suspends Privacy on a line.
Privacy is ON	Appears transiently when the user activates the Privacy Control feature and applies privacy to a line.
Access denied	Appears transiently if the user attempts to suspend Privacy on an internal call or a conference call.
In use: <setname>	Appears transiently, accompanied by Error tone, if the user presses an appearance of a line in use by another set for which Privacy is in effect.
Make call first	Appears transiently if a user is not active on an external line and tries to activate the Privacy Control feature.
<setname> <linename>	Static message that displays at the conference controller's set, accompanied by Attention tone, if a Conference has been created with Privacy Control and another set joins the call.

1.2.3 End User View

The Privacy Control feature (8 3), or its programmed key, allows the user active on a two-party call on an external line to change that line's privacy status for the duration of the call. (Privacy Control can also be restored without ending the call.)

An external line on which a two-party call exists can have Privacy On or Off.

When the user alters a line's Privacy status with the Privacy Control feature, the new setting remains in effect until the user toggles the status again, until the call is released, or another party joins the call (so that a Conference is created). Activating another feature can cause the privacy status to be changed. For more details, see “1.4 Interactions”.

The presence or absence of Privacy on a line does not affect the line indication shown at any set. All sets with an appearance of the line show active (solid) indication when the line is active.

If a user places a two-party external call on hold (manually, automatically, or by means of Exclusive Hold) and then retrieves it from hold, the Privacy status of the line remains in effect.

If a connection exists between two internal sets, one of these sets can also have an external call on which Privacy is not in effect. The internal call between the sets does not prevent the other internal party from pressing an appearance of the external line to join to that call.

The user can apply the Privacy Control feature in turn to any number of two-party external calls on the set.

A user can apply the Privacy Control feature to a two-party external call regardless of the type of key on which that call appears—an external line key, an intercom key, or an Answer key.

It is possible for the user to suspend Privacy on a line that has no other appearance in the system. No error message is generated in this case, even though no other user can join the call.

If a user who is active on a call presses a U-Active external line appearance to attempt to join an existing call, and the set attempts to perform this action, Automatic Hold is applied to that user's original call if the attempt is successful.

If the attempt is not successful, Automatic Hold may or may not be applied to the call (if for example, another caller joins the call first).

1.2.3.1 Conference Using Privacy Control

If the user presses an active external line appearance when Privacy is not in effect on a line, a three-party conference is automatically created. With the creation of the conference, Privacy is re-instated on the line, for the duration of the conference call, regardless of the level of Privacy Control set in OAM Programming. The set that was first established with the external party is the conference controller. Both sets display a message identifying the other two parties. The transient message `Conference call` is not displayed for a conference created by activating Privacy. Each of the two Norstar sets display a static message showing the line name and the name of the other Norstar set. At the conference controller's set, this display is accompanied by Attention tone, to alert this user that someone else has joined the call.

In general, a conference call created by means of the Privacy feature is the same as one created by means of the existing Conference feature. If either of the internal parties disconnects from the call, the other parties remain connected in a normal two-party call. The major difference is that the conference created by activating Privacy does not use an intercom key at either set to represent the internal call. This difference leads to the following rules

- In the existing Conference feature, the controller can split the conference into two separate calls. In a conference created by activating Privacy, there is no support for splitting the conference. That is, there is no way for either set to force one of the parties out of the conversation and remain connected to the other. If either user involved in a conference created by activating Privacy presses the active line key, the action is ignored.
- The conference controller (Set A) can place the conference on hold manually or automatically, leaving the other parties connected. The line indicator on the other set (Set B) continues to show active indication. However, if Set B tries to Hold the conference manually or automatically, the system drops Set B out of the conference. If the user at Set B presses the line key at this point, the original rules apply. If Privacy is not in effect, the conference is recreated. If Privacy is in effect (for example, because the user at Set A has turned it on, or because someone else has joined to the call), the user receives a
In use: <setname> message, accompanied by Error tone.
- If Disconnect Supervision causes the external line to be disconnected, the internal connection is also dropped.

If one set leaves the conference, the conference is over. The default Privacy setting (ON by default) is reinstated.

The set that controls the call is the only set allowed to suspend privacy on that line. If a set gives up control of a call to another set, the ability to control Privacy for the call is also relinquished.

1.2.3.2 Pressing a U-Hold External Line

If the user suspends Privacy manually while on a call, and places that call on hold, another user with an appearance of that call can pick it up, thereby connecting to the call (that is, Transfer using Hold). A Privacy conference is not created.

1.2.3.3 User Programming View

The Privacy Control feature can be programmed onto a key. An indicator is not used. The feature can be toggled On and Off by re-pressing the key.

1.2.4 OAM Programming View

1.2.4.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item			I	SC+	SC
Lines	Individual lines	Line data	Auto privacy: Y	X		

1.2.4.2 Programming Privacy Control

Privacy Control is a feature through which the privacy of calls on individual lines can be controlled. Privacy is always ON unless it is released by the user activating the Privacy Control feature.

See "Lines".

1.2.5 **EXTN/**LINE

N/A

1.3 Technical Specification (Limits/Constraints)

No tone is generated on the voice path to an external party to indicate that Privacy has been suspended or restored.

1.4 Interactions

Feature name	Interaction
Call Park	If the user alters a line's Privacy status and then relinquishes control of the line by means of Call Park, the line's Privacy setting is restored. If the user alters a call's Privacy state, and subsequently attempts unsuccessfully to park the call, Privacy is returned to the default.
Call Transfer	If the user alters a line's Privacy status and then relinquishes control of the line by means of Call Transfer, the line's Privacy setting is restored. If this attempt is unsuccessful, the current Privacy state of the call is maintained. If the call is transferred, but a Callback occurs, the call's default Privacy (as defined in OAM Programming) is restored. In such a case, the call is still considered successful even though no one answered it, and a Callback subsequently occurred.
Camp-On	If the user alters a line's Privacy status and then relinquishes control of the line by means of Camp-On, the line's Privacy setting is restored. If the call is camped, but a Callback occurs, the call's default Privacy (as defined in OAM Programming) is restored. In such a case, the call is still considered successful even though no one answered it, and a Callback subsequently occurred.
Conference	If the user alters a call's Privacy state and subsequently performs a Conference, the line's Privacy setting is restored. If the Conference attempt is unsuccessful, the current Privacy state of the call is maintained.
Private Line	A Private Line can appear at a Prime Set, as in a situation with user who receives attendant services and an attendant. All rules associated with Private Line and Privacy Control apply. Either user can join an existing call on the line, if Privacy is not in effect.
Extn Administration Lock	When Extn Administration Lock is set to <code>Full</code> for a given set, the user is prevented from performing Privacy Control on a line. Privacy Control can still be manipulated when Extn Administration Lock is set to <code>Partial</code> .
Terminal Type	Sets without line appearances (for example, the Basic set, or an ATA- based set) do not have line keys with indicators, and therefore cannot join an existing two-party call. These sets can suspend Privacy on a call they control, however, so that a user at another type of set can join the call.

Private Lines

1.1 Overview

1.1.1 Description

This feature allows an external line to be assigned to one set as a Private Line. It can appear only on that set and on the Prime Extension for that line.

1.1.2 Rationale for Feature

See“1.1.1 Description”.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 End User View

Any external line can be designated through OAM Programming as a Private Line on a specific set. This prevents the line from appearing on any other set except the Prime Extension for that line. Normally, the Private Line cannot be accessed in any way except by the set to which the line belongs.

Private Lines cannot be accessed by Call Pickup or line pool access, but can be directed to another set by Transfer Using Conference, Call Forward, or Call Park.

1.2.2 Message Displays

Message	Description
Line denied	Appears, accompanied by Error tone, if the Prime Extension that has the appearance of another set's Private Line tries to access it when access is not allowed.

The following rules apply to the indications displayed at the Prime Extension for another set's Private Line.

Cases in which the Prime Extension can access the Private Line

Condition	Result
Line continues alerting and Delayed Ring Transfer to the Prime Extension occurs	Indicator shows alerting status (slow flash) at the Prime Extension, and the Prime Extension can answer the call
Do Not Disturb is in effect at the set which owns the Private Line and the line is alerting	Indicator shows alerting status (slow flash) at the Prime Extension, and the Prime Extension can answer the call
User activates Do Not Disturb while the Private Line is ringing	Indicator shows alerting status (slow flash) at the Prime Extension, and the Prime Extension can answer the call

Condition	Result
Line is accessed by the Prime Extension and is subsequently placed on hold	Indicator shows I-Hold status (fast flash) at the Prime Extension, and the Prime Extension can reaccess the line

Cases in which the Prime Extension cannot access the Private Line

Condition	Result
Line is idle	Indicator is OFF at the Prime Extension, and the Prime Extension cannot access the line
Line is active at the set which owns it	Indicator is ON at the Prime Extension, and the Prime Extension cannot access the line
Line begins incoming alerting	Indicator remains OFF at the Prime Extension, and the Prime Extension cannot answer the call
Line is placed on hold at the set that owns it	Indicator remains ON at the Prime Extension, and the Prime Extension cannot access the line

1.2.3 OAM Programming View

1.2.3.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item			I	SC+	SC
Lines	Individual lines	Line data	Line type:Public	X		

1.2.3.2 Programming Line Types

Lines can be programmed to be one of three types in OAM under **Lines**►
Line data►**Line type:Public**:

- **Line type:Public** (Public is the default)
- **Private to: <DN>**
- **Line type:Pool<X>** (where X is one of A, B, or C for Compact Plus systems and A to O for Modular systems)

A line can be programmed to be Private to one set. A Private Line can appear only on the set to which it is assigned, and on the Prime Extension for that line.

See "Lines".

1.2.4 **EXTN/**LINE

N/A

1.3 Technical Specification (Limits/Constraints)

N/A

1.4 Interactions

Feature name	Interaction
Call Pickup	A Private Line cannot be answered using Call Pickup. This rule applies even when the call has been rerouted by Call Forwarding.
Conference	A Private Line can be forwarded or conferenced to a different set, and can be transferred using the Conference feature. If the destination set is a Prime Extension with an appearance of the line, the call appears on that line key for the duration of the call. Otherwise, the destination set receives line indications on an intercom key appearance for the duration of the call.
Custom Call Routing	<p>If Answer mode is set to <code>Auto</code> and the line is programmed to be answered by CCR, the user is asked if they want to disable the CCR answering of the line.</p> <p>If they choose <code>No</code>, the Answer mode remains as <code>Manual</code>. If they choose <code>Yes</code>, the Answer mode is set to <code>Auto</code> but the line is changed so that it is no longer answered by CCR.</p>
Delayed Ring Transfer	Delayed Ring Transfer alerting at the Prime Extension for a set's Private Line can occur whether or not the Prime Extension has an appearance of the line. If necessary, an intercom key is used to present the call.
Do Not Disturb	Do Not Disturb alerting at the Prime Extension for a set's Private Line can occur whether or not the Prime Extension has an appearance of the line. If necessary, an intercom key is used to present the call.
Line Pools	A Private Line can not be a member of a line pool.
Prime Extension	<p>If the Prime Extension has an appearance of another set's Private Line, that line can be assigned as the Prime Extension's prime line in OAM Programming. However, this assignment of Prime Line enables only Automatic Outgoing Line Selection, external dialing features, and Preselection of that Private Line for outgoing calls. It does not enable Incoming Call Selection on that Private Line.</p> <p>If a Prime Extension exists for a Private Line, the following features extend alerting to the Prime Extension: Delayed Ring Transfer, Held Line Reminder, and Do Not Disturb.</p>
Transfer Using Hold	Transfer Using Hold cannot be used to transfer a call on a Private Line to the Prime Extension.

Provisioning

1.1 Overview

1.1.1 Description

Provisioning is a feature specific to BRI loops and digital lines (both BRI and DTI). It has no application to any type of analog line.

Provisioning removes or adds a digital line or BRI loop from service. It is also possible to pre-provision BRI loops and lines for empty slots, and DTI lines for empty on-core slots. Analog lines do not appear in Provisioning.

A Provisioned line or loop indicates that the line or loop is in service with the network. Simply put, the customer is being charged for using the line or loop. A deprovisioned line or loop indicates the line or loop is not in service with the network, and is not in use.

1.1.2 Rationale for Feature

The feature allows the installer to place individual digital lines or BRI loops on a card in and out of call processing service.

Prior to the introduction of DTI to Norstar, the task of enabling/disabling lines was handled in `Port/Extn Status`. However, disabling a line in such a manner disabled all the other lines on the same card. This was not a major issue with analog cards, as analog cards only support 4 lines. However, DTI cards support many more lines (30 in the UK); to take one line out of service via `Port/Extn Status`, thereby disabling all lines on the card, would significantly reduce the number of external lines the customer could access. In addition, customers do not necessarily require all available lines on a DTI card, and there are cost implications in some markets regarding the number of digital lines in service. Thus Provisioning was designed to facilitate placing individual digital lines into or out of service.

A DTI or BRI card as a whole can be user enabled/disabled from `Module status` while `Port/Extn Status` only provides status information about the line/loop/port.

Provisioning supports various maintenance activities while facilitating the number of digital lines or loops a customer is charged for:

- running loopback tests on DTI cards and BRI loops
- indicating which digital lines and BRI loops are in service from the network side
- the use of Software Keys

Provisioning has been redesigned to accommodate provisioning BRI loops and lines on-core and off-core, because although the UI structure implemented in DR6 accommodates provisioning of individual lines on an on-core DTI card, it does not accommodate the provisioning of lines and loops in off-core modules, nor does it accommodate the provisioning of BRI loops and the lines associated with T-loops.

1.1.3 General Definitions

The term “digital lines” includes both DTI lines and BRI lines. This contrasts with the term “analog lines”, which includes analog loopstart, analog DID, and AC15 lines.

In this feature description, the term ‘line’ refers to only either a DTI line or a BRI line. Provisioning has no application to analog lines. For the purposes of this feature description, the term ‘line’ excludes any type of analog line (for example loopstart).

A loop on a BRI card can be configured in `Hardware` as either an S-loop or a T-loop. Up to two individual external lines can be associated with either a T-loop. S-loops only support ISDN devices behind Norstar. Thus the term BRI line refers to a line associated with either a T-loop on a BRI card.

1.2 Feature Details

1.2.1 Controls

N/A

1.2.2 Message Displays

N/A

1.2.3 End User View

If a line or loop is provisioned, users can access the line or use an ISDN terminal on the loop to make outgoing calls or receive incoming calls.

If the user attempts to use a line or loop which is not provisioned, the transient `Not in service` appears accompanied by error tone.

Norstar set users receive indication if the line or T loop they are currently using is about to be deprovisioned.

If the user is currently using a line or T loop which is about to be deprovisioned, the transient `Please hang up` is displayed accompanied by attention tone. After 3 seconds, the transient `Testing Line xxx` is displayed. To give the user time to read the display, these messages toggle back and forth until each has been displayed twice or until the user releases all calls (held and otherwise).

If the user has not released all calls by this point, the display then shows:

<code>xx seconds</code> <code>until disconnect</code>

for 3 seconds followed by `Please hang up` for the remainder of the time until either all calls on the affected line or loop are released or the line loop is deprovisioned. For DTI lines and BRI loops, if the user doesn’t release their calls within 60 seconds the system releases the calls and the line or loop is deprovisioned. For individual BRI lines, this time limit is 55 seconds (there is a 5 second buffer to allow the appropriate system messaging to occur).

1.2.3.1 Sets With Single Line Displays

The display is given in two parts:

xx seconds

until disconnect

xx seconds is displayed for 3 seconds, followed by until disconnect for 3 seconds. All other functionality and prompts are as above.

1.2.4 OAM Programming View

1.2.4.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item	I	SC+	SC
Maintenance	Provisioning	X		

1.2.4.2 Provisioning a line or a loop

See ["Maintenance - Compact Plus"](#) and ["Maintenance - Provisioning"](#).

See ["Maintenance - Modular Plus"](#) and ["Maintenance - Provisioning"](#).

If the system is only equipped with analog cards, then when the user presses `SHOW` from the `Cdn on CCU` or `Cdn on Module y` display the transient `Need digital crd` is displayed.

1.2.4.3 On-core Cards (Module 2) (for both Compact and Modular)

If the slot is equipped with either a DTI or BRI card, and configured as such, the appropriate UI for provisioning (DTI or BRI) is provided.

To accommodate pre-provisioning, if the slot is unequipped and configured as analog (`Loop`, `AC15`) or DTI (`DASS2`, `PRI`), the installer will be presented with the UI for provisioning DTI lines. If the slot is unequipped and configured as BRI, the installer will be presented with the UI for provisioning BRI loops and lines.

1.2.4.4 Off-core Cards (Modules 3-8) (for Modular only)

If the slot is equipped with BRI card, or is unequipped and configured as either BRI or Loopstart, the UI for provisioning BRI loops and lines is provided (again, this accommodates pre-provisioning). Refer to “BRI Loops and Lines” for details.

1.2.4.5 DTI Lines

If the card to be viewed is a DTI card, pressing `SHOW` from the `Cdx on CCU` display presents the following display:

Show line: _
 CREDIT PORT

The user can either enter the line number for which they want information, or press `SHOW` to view the first line on the card. The `PORT` softkey switches the display to `Show port: _` to permit selecting the line by its physical port number.

Set port numbers or analog lines are not valid entries at this prompt and will be prompted with `Not digital port` with an error tone.

Refer to “Software Keys” for details on the `CREDIT` softkey.

Line information is displayed in the following format:

L001:Provisnd	
REMOVE	PORT

for lines in service, and

L001:Deprovisnd	
ADD	PORT

for lines not in service.

Scrolling through the lines will be done with the `NEXT` and `BACK` navigation keys as in `Port/Extn Status`.

Pressing `ADD` from the display for an unprovisioned line provisions it (i.e. puts it into service).

In markets where Provisioning is tied to the Software Keys feature, the `ADD` softkey is not presented if there are no credits available.

Pressing `REMOVE` for a provisioned line which is currently idle deprovisions the line (i.e. takes it out of service). If the line is currently busy, the installer is presented with:

Busy:remove now?	
YES	CANCEL

Pressing `YES` weans users off of their calls within 60 seconds (See “1.2.3 End User View”); `CANCEL` returns the user to the previous display.

Pressing `PORT` from the line number display shows the associated physical port number for the line:

P201:Provisnd	
	LINE

and is for information only; no provisioning action can be taken from this display. Provisioning is strictly line based for DTI lines. The installer can check on the port number for a given line, however, they cannot navigate through lines using port numbers. `LINE` returns the user to the line number display.

1.2.4.6 Software Keys (`CREDIT` softkey)

The `CREDIT` softkey (currently only provided in the UK) is related to the Software Keys feature (see the Software Keys feature description for details). Pressing

CREDIT transiently displays the number of credits available for provisioning DTI lines as follows:

```
xx credits
```

The number of credits is reduced for each DASS2 line that is provisioned. When a line is deprovisioned, the credits are regained.

If the installer wishes to change the card type from DASS2 to BRI or Loop in Configuration, the DASS2 lines must be deprovisioned first to regain the credits.

If there are no credits available, the ADD softkey is not presented at the line display.

1.2.4.7 BRI Loops and Lines

If the card to be viewed is a BRI card, pressing SHOW from the card display (Cdn on CCU for on-core cards, Cdn on Module Y for off-core cards) presents information for the first loop on the card in the following formats:

```
Lp201:Provisnd  
REMOVE
```

for provisioned loops, and

```
Lp201:Deprovisnd  
ADD
```

for loops which have not been provisioned. If the loop is configured as an S-loop the SHOW key is not provided, as S-loops do not have lines associated with them.

If the loop is configured as a T, the SHOW key is provided. Pressing SHOW presents the information for the lines on the loop in the following formats:

```
L001:Provisnd  
REMOVE
```

for provisioned lines, and

```
L002:Deprovisnd  
ADD
```

for lines which have not been provisioned.

Pressing ADD from the display for an unprovisioned line or loop provisions it (i.e. puts it into service).

Pressing REMOVE for a provisioned line or loop which is currently idle deprovisions the line or loop (i.e. takes it out of service). If the line or loop is busy, the user is presented with:

```
Busy:remove now?  
YES          CANCEL
```

A BRI loop is considered busy if at least one of its B-channels is busy. Pressing YES weans users off of their calls within 60 seconds (See “End User View”); CANCEL returns the user to the previous display.

0.0.1 **EXTN/**LINE

N/A

1.3 Technical Specification

N/A

1.4 Interactions

Event	Interaction
Cold start	DTI cards: DASS2: No lines provisioned; 6 credits available. BRI cards: Platform: Startup defaults for BRI cards are market specific. All BRI loops and lines are provisioned.
Warm start	Digital lines and BRI loops will be provisioned/deprovisioned as NVRAM admin data indicates.
Disabled by system or user	Digital lines and BRI loops can be provisioned or deprovisioned if the line or card has been disabled. Any change will be implemented after the line or loop is re-enabled.
Deprovisioning using a RAD	The RAD has the ability to deprovision the line or loop it has dialed in on to access the system. Other than indicating that the line is busy, no RAD specific checking is done by Norstar. The line the RAD is on will be dropped in 60 seconds.
Loopback test(s) running	The line or loop must be provisioned.
Pushkey continuity loopback test running (DTI lines only)	DTI lines can be provisioned/deprovisioned while test is running.

PSTN-PSTN Barring

1.1 Overview

1.1.1 Description

This feature provides an option to allow or bar two CO lines from being directly connected by 3-party Conference call or Transfer through the system. It always bars two CO lines from being directly connected by Selective Line Redirection. It does not prevent external lines from being connected with AC15 PCcts.

1.1.2 Rationale for Feature

The PSTN-PSTN barring feature in MUK 1 prevented two CO lines being joined in any way, such as in a conference, being transferred together, and for being connected by means of Selective Line Redirection.

This feature was created for regulatory reasons, to prevent users from setting up conference calls in order to short-cut tariffing. For example, two external parties could call a location mid-way between them (geographically) to reduce rates. To prevent this, external conference barring was set on a country-wide basis, as part of the system startup.

For ENET, British Telecom regulations required that Norstar provide configuration to either allow or bar PSTN-PSTN connections for transfers and conferences. This gives additional flexibility for the management of PSTN lines.

It will still be possible to restrict what may be dialed on CO lines.

If the PSTN-PSTN connection is barred, a three party conference cannot include two lines that are external to Norstar, whether they are PBX or PSTN lines.

1.1.3 General Definitions

The term CO-CO Barring is also used to refer to this feature.

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls

N/A

1.2.2 Message Displays

Message	Description
Conference denied	Displays if a user attempts to conference two CO lines.
Transfer denied	Displays if a user tries to transfer a call on a CO line to another CO line.
Already joined	Displays if a conference replacement transfer would result in a CO-CO conference.

Message	Description
Redirect denied	Displays if during selective line redirection, the user selects a CO line as the outgoing line and redirects another CO line as the incoming line.

1.2.3 End-User View

If the PSTN-PSTN connection is barred, users cannot directly connect lines from CO lines using:

- 3-Party Conference
- Transfer

External Transfer from Conference does not interact with this feature since a 3-Party conference call with any two lines from a trunk module will be denied, preventing the External Transfer from Conference from becoming available.

Regardless of whether or not the PSTN-PSTN connection is barred or allowed, users cannot directly connect lines from CO lines using Selective Line Redirection.

1.2.3.1 3-Party Conference

If the PSTN-PSTN connection is barred, when the user attempts to conference two CO lines, the message `Conference denied` is displayed transiently for 3 seconds, and is accompanied by Error Tone.

Regardless of the feature setting, CO-CO barring will permit a 3-party conference between any CO lines (whether supervised or not) and an AC15 external line. In such a conference, the `TRANSFER` softkey shall always be presented and operate as described in the External Transfer from Conference feature.

1.2.3.2 Selective Line Redirection

Regardless of the feature setting, users shall not be permitted to redirect a CO line to another CO line. It shall permit a CO line to be redirected to an AC15 PCct, or from an AC15 PCct to a CO line, or AC15 Line to/from AC15 line.

If the user has selected a CO line as the outgoing line and then attempts to redirect another CO line as the incoming line, then a three second transient message `Redirect denied` appears on the display when the user presses the incoming line key (the second CO line) (see the Selective Line Redirection feature for further details).

If the user selects a line pool as the outgoing facility and then attempts to select a CO line as the incoming facility, the system checks the first available line in the pool. If the line is a CO line, the message `Redirect denied` appears on the display. If the line is an AC15 PCct, then the redirection is permitted.

1.2.3.3 Transfer

If the PSTN-PSTN connection is barred, the Transfer feature shall not permit an incoming call on a CO line to be transferred to another CO line (see the Transfer feature for more details). If the user attempts to transfer a call on a CO line to another CO line, a three second transient message `Transfer denied` appears on the display.

When any party in a conference puts the conference on hold and tries to transfer another call to another member of the conference, the transfer may result in the transferred call appearing as a separate call at the destination set, or in the transferred call replacing the transfer initiator in the conference, or in the transfer being denied. This is detailed in the following three sections.

1.2.3.4 Transfer by Slave Party to Master of Conference

This section describes the interaction of Transfer, when invoked from a Conference Slave Set and transmitted to the other internal Conference Master Set of the conference. It assumes that the PSTN-PSTN connection is barred.

The following describes scenarios of using Transfer to differentiate three situations:

- Using Transfer Immediate or Transfer with Announce
- The method of specifying the destination of the transfer
- Whether a transfer would result in having two CO lines connected in a Conference (prevented by CO-CO Conference Barring)

Using Immediate Transfer: Destination Specified by DSS key or Dialpad Input of DN

When Transfer Immediate is invoked, and the transfer destination (Master Set) is specified by pressing a DSS key or by inputting the DN from the dialpad, the transferred call will appear on the destination set at an appropriate key, with attenuated ringing if it is the only new call at the set.

For an external call:

- on the Line key, if one exists for the line that the call is on
or
- on a free intercom key if the line appearance does not exist

For an internal call:

- on a free intercom key

Using Immediate Transfer: Destination Specified by Intercom Key Appearance of Conference Call

If the transfer destination (Master Set) is specified by pressing the intercom key that represents the established Conference Call, the Transfer will result in the transferred call replacing the Transfer initiator in the conference if such a replacement does not result in a conference containing two CO lines.

If the transfer (conference party replacement) would result in a CO-CO Conference, the transfer is denied and the message `Transfer denied` is presented, accompanied by Error Tone.

Transfer with Announce

If Transfer with Announce is requested, and the transfer destination (Master Set) is specified by any method, the transfer results in the transfer initiator being replaced by the transferred caller after the `JOIN` softkey is pressed, if such replacement does not result in a conference containing two CO lines.

If the transfer (conference party replacement) would result in a CO-CO Conference, the transfer is denied and the message `Already joined` is presented, accompanied by Error Tone.

In this case, the transfer initiator can use Transfer Immediate to transfer the call to the Master set so it will appear as a separate call.

1.2.3.5 Transfer By One Slave to Other Internal Slave of Conference

The section describes the interaction of Transfer, when invoked from a Conference Slave Set and transmitted to the other internal Conference Slave Set of the conference.

Note: In all these cases, CO-CO Conference Barring is not an issue, as there is no other CO party in the conference.

The following describes different scenarios of using Transfer to differentiate two situations:

- Using Transfer Immediate or Transfer with Announce
- The method of specifying the destination of the transfer

Using Immediate Transfer: Destination Specified by Internal Autodial key or Dialpad Input of DN

When Transfer Immediate is invoked, and the transfer destination (other Slave Set) is specified by pressing an Internal Autodial key or by inputting the DN from the dialpad, the transferred call will appear as a new intercom call on the destination set at an appropriate key, with attenuated ringing if it is the only new call at the set.

For an external call:

- on the Line key, if one exists for the line that the call is on
or
- on a free intercom key if the line appearance does not exist

For an internal call:

- on a free intercom key

Transfer with Announce

When Transfer with Announce is invoked, and the transfer destination (other Slave Set) is specified by pressing an Internal Autodial key or by inputting the DN from the dialpad, the announce call appears at the destination set as a new intercom call, with attenuated ringing if it is the only new call at the set. After the transfer initiator presses the `JOIN` softkey, the transferred call will appear on the destination set at an appropriate key.

For an external call:

- on the Line key, if one exists for the line that the call is on
or
- on the announce intercom key if the line appearance does not exist

For an internal call:

- on the announce intercom key

Specifying the location by pressing the Intercom key that represents the Conference Call will result in the transferred call replacing the Transfer initiator in the conference.

1.2.3.6 Transfer by the Master to either Slave Party

Using Immediate Transfer: Destination Specified by Internal Autodial Key or Dialpad Input of DN

When Transfer Immediate is invoked, and the transfer destination (either Slave Set) is specified by pressing an Internal Autodial key or by inputting the DN from the dialpad, the transferred call will appear as a new call on the destination set at an appropriate key, with attenuated ringing if it is the only new call at the set.

For an external call:

- on the Line key, if one exists for the line that the call is on
or
- on a free intercom key if the line appearance does not exist

For an internal call:

- on a free intercom key

Transfer with Announce

When Transfer with Announce is invoked, and the transfer destination (either Slave Set) is specified by pressing an Internal Autodial key or by inputting the DN from the dialpad, the transfer will be denied. The error message *Already joined* is presented accompanied by Error Tone.

Specifying the location by pressing one of the Intercom keys that represents the Conference Call slave parties will reconnect the Master with the Conference Call, and cancel transfer.

The following table summarizes the effect of allowing or barring PSTN-PSTN connections:

Feature	Configuration allows PSTN-PSTN connections	Configuration bars PSTN-PSTN connections
Conference	No barring applies to conferences. The TRANSFER softkey is available when the user forms a conference.	A Conference is allowed if at least one of the calls is on an AC15 line. Otherwise, the <i>Conference denied</i> message is presented.

Feature	Configuration allows PSTN-PSTN connections	Configuration bars PSTN-PSTN connections
Transfer Transfer from Conference	In the case when at least one of the calls is incoming and has disconnect supervision, the user may transfer the calls together. Also, when one of the calls is on an AC15 line, the user may transfer the calls together. Otherwise (including that the incoming line does not have disconnect supervision or both lines are outgoing), when the user tries to complete the transfer, the user will see: <code>Transfer denied</code> and hear Error tone.	Transfers are allowed only if at least one of the calls is on an AC15 line. Otherwise, when the user tries to complete the transfer, the user will see: <code>Transfer denied</code> and hear Error tone.
Selective Line Redirection	Users will be barred from making PSTN-PSTN connections, using SLR. However, users may make AC15-PSTN or PSTN-AC15 or AC15-AC15 connections with SLR.	Users will be barred from making PSTN-PSTN connections, using SLR. However, users may make AC15-PSTN or PSTN-AC15 or AC15-AC15 connections with SLR.

1.2.4 OAM Programming View

1.2.4.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item		I	SC+	SC
System prgrming	Featr settings	EX-EX Trf/Conf:Y	X		

1.2.4.2 Programming Ex-Ex Trf/Conf

This feature can be enabled or disabled on a system-wide basis.

From `System prgrming`►`Featr settings`►`EX-EX Trf/Conf:Y`, press `CHANGE` to reset the value from `Y` (the default) to `N`.

[See "System Programming - Feature Settings".](#)

1.2.5 **EXTN/**LINE

N/A

1.3 Technical Specification (Limits/Constraints)

Any two PSTN lines may not be connected by SLR.

1.4 Interactions

N/A

Reasons For Release

1.1 Overview

1.1.1 Description

In addition to any Public Network supplied tones and announcements, reasons for release on a DASS2 call or DASS2 call attempt are displayed to the user.

1.1.2 Rationale for Feature

Any Norstar set with its display is ready for ISDN information and services, including reasons for call failure or call termination. This information gives the user more information as to what happened to the call than with only the standard tones and announcements.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls

N/A

1.2.2 Message Displays

Messages are discussed in the next section.

1.2.3 End-User View

1.2.3.1 What the User Sees

DASS2 Public Network messages can be up to 24 characters long.

Messages that are up to 16 characters long can be shown as is. See Please refer to “figure 1-1 Messages up to 16 characters long” on page 1..

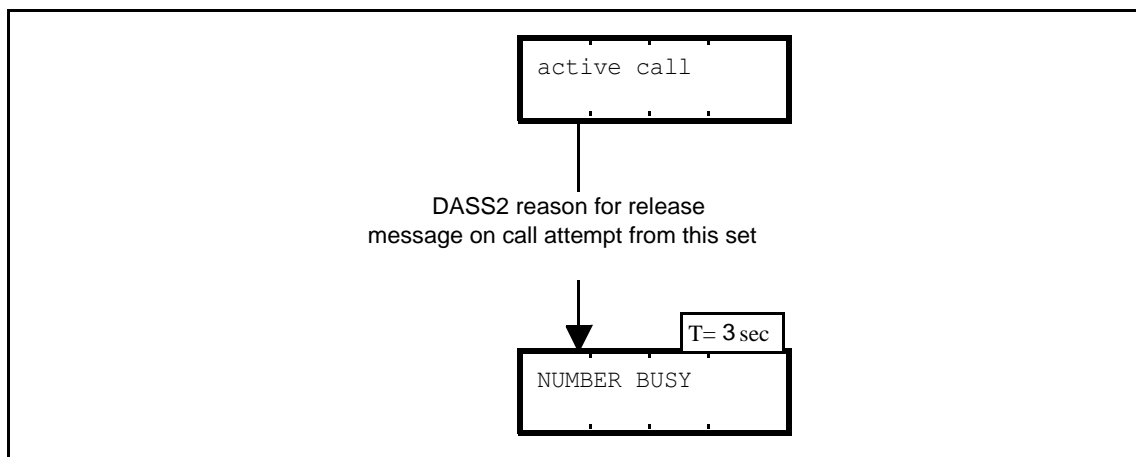


Figure 1-1: Messages up to 16 characters long

Messages that are longer than 16 characters long must be split up. The first screen shows characters from position 1 through 15, plus an ellipsis, transiently for 3

seconds. The second screen shows an ellipsis plus characters 16 through the last, transiently for 1 second. See the following figure.

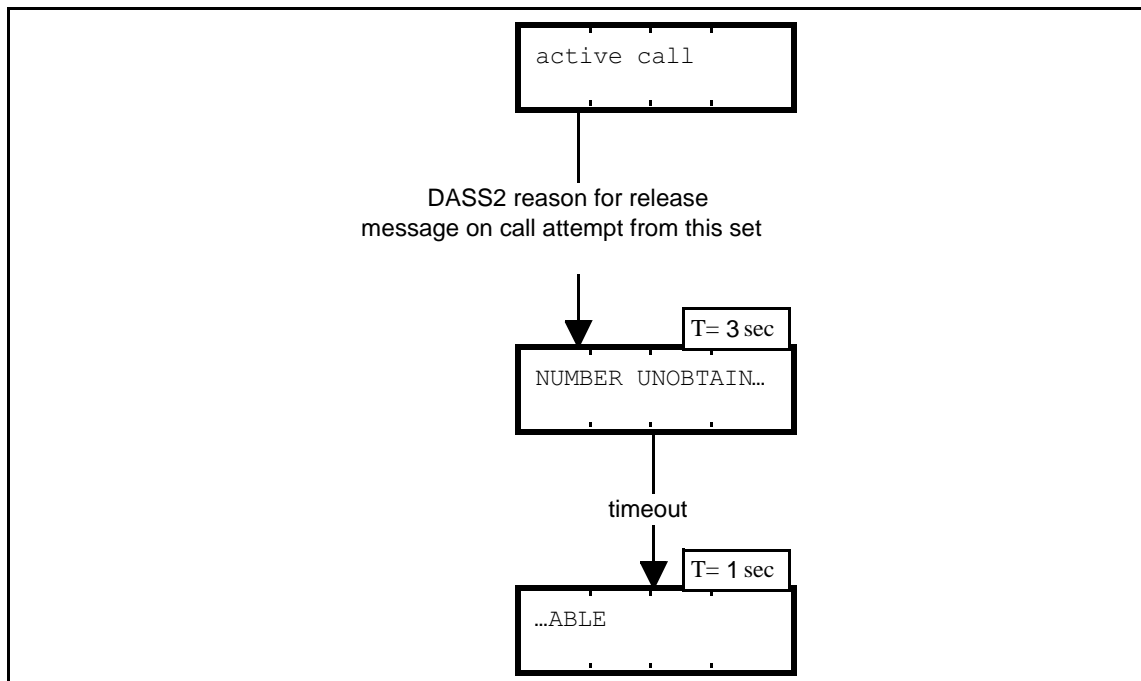


Figure 1-2: Messages longer than 16 characters

1.2.3.2 When the User Sees the Message

The user sees the reason for call release only for the active DASS2 call, or active DASS2 call attempt.

There is no reason for release on an internal, analog PSTN or AC15 call.

The message is shown immediately, overwriting any other messages on the display.

The message is not displayed if the user releases the call before the message arrives.

There is NO mechanism to retrieve and redisplay a reason for release.

1.2.3.3 Why the Message Disappears from the Screen

The display times out

Any user actions including the user invokes a feature (either programmed key or dial up code); the user presses Release; the user goes onhook; the user presses Hold; the user dials a call; the user answers a call

An alerting call arrives

Priority Call arrives

Voice Call arrives

In Conference, the reason for release message for the first call is overwritten by the reason message for the second call

What Messages the Norstar User May See from a CO and Why

Message from CO	Reasons
NUMBER UNOBTAINABLE	The called PBX does not recognize the number, or The called destination may not receive calls, or Called PBX has received invalid number information.
NUMBER INCOMPLETE	The called PBX has not received sufficient digits.
CLEARED	The DASS2 network has terminated the call.
NOT ALLOWED	The user has requested a Supplementary Service which is not provided to the user.
NETWORK BUSY	Network is busy.
NUMBER BUSY	The called destination is busy.
LINE OUT OF SERVICE	The called destination has been taken out of service.
ACCESS BARRED	The CO does not permit the user to make outgoing calls.
INCOMPATIBLE TERMINAL	There is incompatible service equipment at the called PBX.
ACKNOWLEDGEMENT	A response from a Supplementary Service that the user's requested action has been or is being performed.
ERROR (21)	There has been an invalid DASS2 signal for Supplementary Service information.
ERROR (26)	There has been an unrecognized invalid DASS2 signal.
NO REPLY	A time out on answering has occurred at the CO. This message is sent to the calling PBX.
SERVICE TERMINATION	The CO sends this message after a time out on a Recorded Information service.
CUG ACCESS BARRED	The user has attempted a Closed User Group call to a person who is not a member of the Group.
CLEARED	The other party to the call has released the call.
RESTRICTED ACCESS	The local CO is operational but has become isolated from the rest of the DASS2 network, because of a fault.

What Norstar Sends for Reason For Release when a Call is Terminated or Rejected and Why

Message Norstar sends	Reasons
CLEARED	User on Norstar has released the call.
INCOMPATIBLE TERMINAL	Norstar does not accept the incoming Category 1 call. (Norstar accepts Category 2 and Telephony calls.)
ERROR (21)	Norstar has detected an error in a DASS2 signal for Supplementary Service information. This message is NOT sent as a result of any Norstar user action.

Message Norstar sends	Reasons
ERROR (26)	Norstar has detected an unrecognized DASS2 signal on call setup. This message is NOT sent as a any Norstar user action.

Norstar does not send any of the following Reasons for release

- Number unobtainable – When the number does not exist, Norstar always routes the call to the prime set for the line.
- Number busy – When the destination is busy, Norstar always routes the call to the prime set for the line, if the prime set exists

1.2.4 OAM Programming View

N/A

1.2.5 **EXTN/ **LINE

N/A

1.3 Technical Specification (Limits/Constraints)

Network-provided reasons for release are available only on DASS2 calls; local translations are provided for ISDN calls.

Norstar does not propagate reasons for release on tandem or rerouted calls.

1.4 Interactions

Two basic rules guide the interactions for Reason for Release.

1. Reason for release will overwrite any other message on the screen.
2. Any new message for the set will overwrite the Reason for release message, except for background display updates. Background displays (such as Alarms, Calls for you, Message for you) will wait for the Reason for Release message to time-out.

Feature	Interactions
AC115 line	Reason for release is not propagated for tandem calls over AC15 lines. There is no reason for release on AC15 calls.
ATA	Reason for release is not displayed on ATAs.
Alarm terminal	Alarm message waits for the reason for release message to timeout.
Alerting call	There is no display of reason for release when the far-end calling party abandons the alerting call. Norstar will send a CLEARED reason for release when the near-end party abandons the alerting call.
Alerting call	The display of reason for release ends when an alerting call arrives at the set.
Analog PSTN line	Reason for release is not propagated for tandem calls over analog lines. There is no reason for release on analog PSTN calls.
Callbacks	The display of reason for release ends when there is a Callback call alerting at the set.

Feature	Interactions
Call Log	Calls for you waits for the reason for release message to timeout.
Conference	The reason for release message for the first call is overwritten by the reason message for the second call.
Hold	There is no display of reason for release for a call that was on hold.
Internal call	There is no reason for release for an internal call.
Language Choice	Reason for release displayed in the language used by the network, not in the language chosen by the user. There is no translation of messages into the alternate language. The Language Choice transient display is overwritten by reason for release if there is a release of the active call.
Priority Call	The display of reason for release ends when a Priority Call arrives.
Release	The message is not displayed if the user releases the call before a reason for release message arrives. If the user presses release while the message is on the display, the message is cleared.
Reply Message	Message for you waits for the reason for release message to timeout.
Ring Again	A Ring Again offer clears the display for the reason for release.
Remote Access	For Remote Access, when the timer expires while waiting for a digit, the call is routed to the prime set.
Selective Line Redirection	Reason for release is not propagated for SLRed calls.
Shared lines	Only the set which had the active call on a shared line has the display of the reason for release.
Tandem calls	Reason for release is not propagated for tandemed calls.
Transfer - transfer agent	If the source call is disconnected while the transfer agent is on the destination call, the reason for release is not displayed. This is because the source call is on hold.
Voice Call	The display of the reason for release ends when a Voice Call arrives.

Recall Signalling

1.1 Overview

1.1.1 Description

Switches in the UK recognize one of two Recall signal types: Timed Break Recall signal (recognized by PSTN switches), or Earth Recall signal (recognized by PBX switches).

See also the Transfer and Recall on AC15A feature.

1.1.2 Rationale for Feature

Some switches respond to a Recall signal by offering an alternate line, and others do not. If a host switch does not respond to the Recall signal by giving the Norstar user an alternate line, then the Restrictions/Overrides checking procedure should not be reset when the Recall feature is invoked, to avoid accidental restriction bypasses on outgoing calls.

Therefore, there is a requirement to be able to administer

- Recall type
- timing for Earth recall
- the resetting of the Restrictions/Overrides checking procedure.

However, in Modular Plus the recall settings are administrable on a per trunk basis, rather than on a system-wide basis as in Compact Plus. This change in administration supports Norstar installations that have trunks connected to more than one switch (PBX and/or PSTN) and therefore may require:

- different Recall types (Earth Recall for trunks going to PBX and Timed Break for others that go to PSTN)
- different timing for Earth Recall (for the situation where trunks may be connected to more than one PBX that have different timing requirements)
- ability to control resetting of the Restrictions/Overrides checking (for the situation where trunks may be connected to more than one switch that differ in their ability to provide an alternate line for initiating a new call).

Correct administration of the recall type, recall timing for Earth recall, and the Restriction/Override re-checking procedure, results in correct operation of the Recall feature from the end user's point of view.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls

Recall programmed button, or

1.2.2 Message Displays

N/A

1.2.3 End-User View

When the recall settings are properly administered for a given trunk, the end user view of the use of the Recall feature does not differ from Compact Plus.

1.2.3.1 Recall Types and Timing

As in North American DR3 (see the Recall feature), the user can invoke Recall, regardless of whether it has been administered to be Timed Break or Earth, by inputting the feature code, `Feature 7 1`, or by pressing a key that has been programmed with the feature, or by pressing an autodialler which has the feature programmed as part of the dialling string.

If the `Recall:` parameter is set to the value `Timed brk`, the timed break duration is 90 ms. When a user invokes the Recall feature, the system generates a Timed break of 90 ms.

If the `Recall:` parameter is set to the value `Earth`, the installer can choose among three recall values (500, 1000 and 1500 ms) based on the requirements of the host switch. When a user invokes the Recall feature, the system generates an Earth signal of the duration that has been set in OAM Programming.

If the wrong recall type or timing has been set in OAM Programming:

- the host switch will not recognize the signal as a recall signal
- the recall invocation attempt will not be successful
- the user will not receive the normal feedback from the host associated with successful recall invocation
- the effects of sending the inappropriate recall signal will be dependent upon the host's interpretation of the signal
- there will be no Norstar messages to indicate that an inappropriate OAM setting has been assigned
- the FCRO checking procedure will be reset if the `Recall at EXCH:` is set to Y (reset FCRO procedure). See the following section for details.

1.2.3.2 Disabling Resetting Of FCRO Checking Procedure at Recall Invocation

In North American Norstar, regardless of the host switch characteristics, if a user invokes the Recall feature, the FCRO checking procedure is reset. This Norstar functionality is based upon the assumption that the host switch offers a facility (alternate line) for making a second call.

If a user invokes Recall after having partially dialled a restricted dialling string behind a host that does not offer an alternate line (either because the Recall signal is not recognized, or because the feature is not offered), the following happens:

- the recall signal is sent
- the host does not provide an alternate line
- the FCRO checking procedure is reset, resulting in an accidental bypass of the restrictions applicable for that call.

The third result is unacceptable in the UK.

Some switches in the UK may (or may not) recognize one of the recall signal types (Timed break or Earth), but may or may not respond by offering to the Norstar user an alternate line for making a second call.

In the case where an alternate line is not offered, it is desirable that the invocation of the Recall feature not reset the FCRO checking procedure.

A new parameter `Recall at EXCH:` is added to the `Lines▶Line Data` so that the installer can specify whether the host switch will offer an alternate line upon the recall signal, or ignore it.

If the parameter is set to Y (Yes), it is assumed that the host switch will offer an alternate line upon the recall signal, and a new telephone number will follow the invocation of the Recall feature. Therefore, the FCRO checking procedure is reset.

If the parameter is set to N (No), it is assumed that the host switch will ignore the Recall signal (and NOT offer an alternate line). Therefore, the FCRO checking procedure is not reset (thereby preventing accidental bypass of the restrictions applying to that call).

Because the majority of installations in the UK will not respond to the Recall signal, the default setting is N

The recall signal specified under the parameter `Recall:` is sent to the host switch in all cases.

This host switch characteristic is specified on a trunk basis.

It is assumed that the installer knows the characteristics of the host switch in regards to the recall signal that should be sent, and the response of the host switch to the recall signal.

Note that if the host switch does offer an alternate line upon recognition of a recall signal, but the `Recall:` parameter has been assigned the wrong Recall type or timing, and the `Recall at EXCH:` parameter is set to Y (reset the FCRO procedure), then the same accidental bypass of restrictions may occur.

1.2.3.3 Recall and the ATA

When Recall is invoked from a set attached to the ATA, it is a local signal to the ATA. The ATA recognizes only Timed Break recall. When the local Recall signal to the ATA is accompanied by the Reach-through Recall code, `Feature 7 1`, the Recall rules described above apply.

1.2.3.4 Effects of Correct and Incorrect Settings

The following table illustrates the effects of correct and incorrect settings of the `Recall:<Type>` and `Recall at EXCH:` parameters. Cells in *italics* point out the settings that result in some error, given the characteristics of the host switch. Note that, if the host recognizes Earth Recall, the time setting must also be set

correctly to avoid an error state. Cells in **bold** represent correct settings for the given characteristic of the host switch.

		Recall at EXCH=Y		Recall at EXCH=N	
		Recall<Type>Setting			
		Earth	Timed Break	Earth	Timed Break
Host System Responds to:	Earth	<ul style="list-style-type: none">• Alt Line• FCRO reset	<ul style="list-style-type: none">• <i>No Alt Line</i>• <i>FCRO reset</i>• accidental restriction bypass on first call	<ul style="list-style-type: none">• <i>Alt Line</i>• <i>No FCRO reset</i>• accidental restriction bypass on 2nd call	<ul style="list-style-type: none">• <i>No Alt Line</i>• <i>No FCRO reset</i>• no access to Alt Line
	Timed Break	<ul style="list-style-type: none">• <i>No Alt Line</i>• <i>FCRO reset</i>• accidental restriction bypass on first call	<ul style="list-style-type: none">• Alt Line• FCRO reset	<ul style="list-style-type: none">• <i>No Alt Line</i>• <i>No FCRO reset</i>• no access to Alt Line	<ul style="list-style-type: none">• <i>Alt Line</i>• <i>No FCRO reset</i>• accidental restriction bypass on 2nd call
	Neither	<ul style="list-style-type: none">• <i>No Alt Line</i>• <i>FCRO reset</i>• accidental restriction bypass on first call	<ul style="list-style-type: none">• <i>No Alt Line</i>• <i>FCRO reset</i>• accidental restriction bypass on first call	<ul style="list-style-type: none">• No Alt Line• No FCRO reset	<ul style="list-style-type: none">• No Alt Line• No FCRO reset

1.2.4 User Programming View

As in other Norstar versions that support Recall, one user programmable key can be programmed with the Recall feature.

1.2.5 OAM Programming View

From OAM Programming go to **Lines**►**Line Data**►**Exchange lines**.

The Recall parameters apply only to the PSTN trunks (lines 001 to 004, 031 to 034 for Compact Plus and lines 001 to 004, 031 to 034, and 061 to 230 for Modular Plus).

[See "Lines - Line Data - Loop".](#)

1.2.5.1 Recall Type/Timing

The default value at startup is Timed Break for all PSTN Loop Calling, Unguarded Clearing trunks, with a fixed timing value of 90 ms.

The parameter to specify recall type is suppressed unless the Trunk Mode has been set for Loop Calling Unguarded Clearing, as this is the only trunk that supports both Timed Break and Earth Recall.

The **CHANGE** key cycles through the alternate values:

Timed brk	for Timed Break Recall with a fixed time value of 90 ms.
Earth500	for Earth Recall with a time value of 500ms (default).

Earth1000	for Earth Recall with a time value of 1000ms.
Earth1500	for Earth Recall with a time value of 1500ms.

The BACK key returns to the former trunk mode display, `Mode: LoopUnguard`.

1.2.5.2 Recall at Exchange

This is the only Recall parameter to appear for trunks administered to be Loop Calling Guarded Clearing and Earth Calling.

This parameter specifies whether the Restrictions/Overrides checking procedure restarts after invocation of the Recall feature, (`Feature` ☐ `7` ☐ `1`).

```
Recall at EXCH:N
CHANGE
```

The default value is N, or no. This setting indicates that the far-end switch does not provide an alternate line and that the checking procedure should not be reset.

The other option Y, or yes, indicates that the far-end switch does supply an alternate line and that the checking procedure should be reset after a user invokes the Recall feature.

1.2.5.3 Line Copy

The recall related data is copied with other trunk data when the COPY command is used at the `Show line:_` prompt.

1.2.6 **EXTN/**LINE

N/A

1.3 Technical Specification (Limits/Constraints)

If the recall-related parameters are improperly set, there can be accidental restriction bypassing on outgoing calls, and improper recall signalling to switches that support recall. It is therefore important that the installer understand the recall characteristics associated with each trunk.

See a previous section, “Effects of Correct and Incorrect Settings” for details about the errors that can occur under different faulty setting conditions.

1.4 Interactions

Line profile has entries for recall settings.

For lines administered to be Loop Calling Unguarded Clearing AND for Timed Break Recall:

```
Recall:Timed brk
BACK          NEXT
```

For lines administered to be Loop Calling Unguarded Clearing AND for Earth Recall:

```
Recall:Earth500
BACK          NEXT
```

or

Recall:Earth1000	
BACK	NEXT

or

Recall:Earth1500	
BACK	NEXT

For lines administered for all three trunk modes:

Recall at EXCH:N	
BACK	NEXT

Received Number

1.1 Overview

1.1.1 Description

The installer can specify which digits cause a DIA line to alert. Received Number only applies to DIA lines.

1.1.2 Rationale for Feature

N/A

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 End-User View

When a valid DIA line number is entered at the `Show line:___` prompt, the prompt `Received numbers` is provided followed by the option of entering values for `Private:` and `Public:`.

Valid DIA line numbers for Compact Plus are 101 to 140 and for Modular Plus, 255 to 382.

This prompt permits the installer to specify which digits will cause this particular DIA line to alert. The digits may be received from a CO (in the case of DID), a PBX (in the case of ESN), or dialed into system dial tone by a remote caller on an auto-answer loop start trunk, an auto-answer E&M trunk, or DID trunk.

A `CHANGE` softkey is provided at the `Public:` and a `Private:` prompts (which follow the `Received numbers` prompt). The softkey permits the installer to enter another digit string which, when received, will now alert this DIA line. Selecting `CHANGE` followed by `Next`, `Back`, or `Heading`. without entering any digits, or insufficient digits (less than the target `Extn` length for the system) changes the value to `None`.

Pressing `Next` at the `Received numbers` prompt takes the installer to the next heading `If Busy:Busy Tone.` Pressing `Back` or `Heading` at the `Received numbers` prompt takes the installer to the heading, `Show line:___`.

The parameters under `Line data` for DIA lines are the same as for all other lines.

In the event that the installer tries to change the received number to one which already exists (for another DIA line, the DISA DN or Auto DN, or tries to change the received number to one that starts with the first digit of a line pool access code), the original value is left unchanged.

Note that DIA line DNs may optionally be the same as set DNs, but similarities do not necessarily imply that a given DIA line does, or does not appear on a given set.

For both Compact Plus and Modular Plus, the number of digits received can be from 1 to 7. The length is specified in `Lines▶Line Data▶DIA line`.

`Rec'd # lengths` refers to the length of the identifiers used to identify DIA lines to the outside world. Note that the DIA line number (for example, line 255) and the DIA line DNs (for example, for `Private length: 1234` for line 255) are two different entities. In addition, the selected DIA line Extn length may be the same as the set Extn length, or may, because of network or CO constraints, be different.

The `Rec'd # lengths` prompt also indicates the length the Auto or DISA DN.

1.2.2 OAM Programming View

1. At `Lines▶Line Data▶DIA line`, press `SHOW` and `NEXT` to display `Show line: __`.
2. After entering a valid line number, press `SHOW` at the `Received numbers` prompt and enter up to seven digits for `Private:.`
3. Press `NEXT` and enter up to seven digits for `Public:.` `None` is the default for both.

[See "System Programming - Received Number Lengths".](#)

If the length of DIA line DNs is changed (see `System prgrming▶Rec'd# length`), then any existing specified digits are changed to `None`. For example, the `Private: 1234567` prompt would be changed to `Private: None`.

The default length for target DNs is 3 (e.g., `Private length:3`). The installer can change the value by pressing the `CHANGE` softkey to cycle through the available values, 1-7.

When changing the length of DIA lines (the installer changes the values at the `Private length:` or `Public length:` prompt, and then presses the `Next` key), a confirmation prompt is presented `Clear private#s?` or `Clear public #s?`. The installer answers using `YES` and `NO` softkeys. `YES` appears in the left-most softkey position. `NO` appears in the right-most softkey position. For example, at the `Public length:2` prompt, the installer changes the length from 2 to 3, and then presses `Next`. The prompt, `Clear public #s?` is given. If `NO` is pressed, then the previous DIA line Extn length is not changed, and the installer is returned to the `Public length:2` prompt. If `YES` is pressed, then the previous DIA line Extn length of 2 is changed to 3, and the installer is taken to the next prompt, `Line Data`.

Note that if the installer presses `CHANGE`, cycles through the values, and then re-assigns the existing value, then the `Private:<digits>` and/or `Public:<digits>` prompts of `Received numbers` is not affected. For example, at the `Private length:3` prompt, the installer presses `CHANGE`, cycles through the values 4 through 2, and then re-assigns `Private length:3`. In this case, the defined received numbers, if any, for `Private:` of `Received numbers` are NOT changed to `None`. This is the same rule that applies when changing the Extn length for the system (`System prgrming▶Extn# length`).

[See "System Programming - Extension Number Length".](#)

Note that if the installer presses `CHANGE`, followed by `Rls` (such that the `Clear public #s?` prompt is not asked or answered), then the configuration session is terminated, but the DIA line Extn length is not changed. This is similar to existing rules for Changing Extn length.

1.2.3 **EXTN/ **LINE

N/A

1.3 Technical Specification (Limits/Constraints)

N/A

1.4 Interactions

N/A

Redirection

1.1 Overview

1.1.1 Description

Redirection is a DPNSS 1 feature similar to Norstar Transfer Callback. Redirection lets a DPNSS1 call awaiting connection, or re-connection, be redirected by the originating party to an alternate destination after a time-out period. Failed calls can also be redirected. Priority calls are not redirected.

Redirection is one of the features supported on DPNSS 1 lines in Norstar systems. For a listing of these features, see the DPNSS 1 feature.

1.1.2 Rationale for Feature

Callback minimizes the chance of an external line ringing indefinitely if it is not answered or retrieved, and allows the person who parked or transferred the call to take further action to help the calling party.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls

N/A

1.2.2 Message Displays

Message	Description
Parked call	Displays at the extension that parked the call.
<name> busy	Displays at the extension that transferred the call if the destination extension is busy.
<name> DND	Displays at the extension that transferred the call if the destination extension is in Do Not Disturb mode.
Not in service	Displays at the extension that transferred the call if the destination extension is out of service.
<name> no reply	Displays at the extension that transferred the call if the destination extension does not reply.
<linename> > <setname>	Displays at the forward destination to which the originating extension is forwarded.
<linename> callback	Displays at the Prime Extn for the line (when originating extension is unavailable).

If the call is not answered, or is unable to ring at the originator's extension, the Callback call is routed to the Prime Extn for the external line, if that extension

exists. If no Prime Extn exists, the call continues to alert the extension to which it was transferred until it is answered at the transferred-to extension or the originating extension (now able to answer the Callback), or until the external party disconnects.

1.2.3 End User View

If a DPNSS 1 call to an operator transferred by the operator is not answered within the number of rings or the timeout period specified through programming, the call is redirected back to the operator. The user may occasionally see a call switch from one appearance key to another appearance key or from an appearance key to an intercom key.

1.2.4 OAM Programming View

1.2.4.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item		I	SC+	SC
System prgrming	Featr settings	Netwk callbk	X	X	

[See "System Programming - Feature Settings".](#)

The default value of the network callback timer is 30 seconds. Its minimum value is 15 seconds; other values are: 30, 45, 60, 90, and 120 seconds.

1.3 Technical Specification (Limits/Constraints)

Norstar redirects to the operator only outgoing DPNSS 1 calls that have been transferred by the operator.

Diversion on No Reply takes precedence over Redirection.

Redirection is indicated differently on different types of extensions:

- Norstar terminals M7310 and M7324 support all variants of the feature.
- For extensions without displays, the “#” key acts as MORE and the “*” key acts as VIEW
- ATA is not supported.
- All variations of the feature are supported on ISDN extensions.
- All variations of the feature are supported on cordless handset extensions.
- DNA is not supported.

Redirection applies only to unretrieved parked external calls, to unanswered transferred external calls, and to camped calls. Redirection is never activated for internal calls.

1.4 Interactions

Feature or condition name	Interaction
Answer DNs	A Callback from a park or transfer is directed to a specific set. For example, if the Callback is directed to the set of the person receiving attendant services, it does not alert at the attendant's set.
Automatic Incoming Line Selection	Callback calls are third in the priority rules for Automatic Incoming Line Selection, after a ringing external line, and before a ringing internal line.
Auxiliary Ringer	Callback can ring an auxiliary ringer if one is associated with the set being called back.
Call Capture	Call Capture defines the priority of the call. For example, new external calls have a higher priority than transferred calls.
Call Forward	<p>If Call Forward is active at the set that attempted the call park or transfer, the Callback is forwarded to the forward destination with the normal forward message, <code><line name> > <setname></code> (where <code><line name></code> is the name of the line performing the Callback, and <code><setname></code> is the name of the set that originated the call park or transfer). In this case, the Callback call does not alert at the set that attempted the transfer, and cannot be picked up at that set.</p> <p>If Call Forward is active at the set that attempted the transfer, the Callback is forwarded to the forward destination, with the normal forward message, <code><party being transferred> > <transfer originator></code>. In this case, Callback call does not alert the set that attempted the transfer, and cannot be picked up at that set.</p>
Call Forward No Answer	<p>If Call Forward No Answer (CFNA) is active at the destination set, the CFNA timeout activates the Callback, if that timeout is shorter than the Callback timeout.</p> <p>Callback does not apply to internal calls.</p> <p>A call performing Callback is subject to Call Forward No Answer at any set it is trying to ring.</p>
Call Forward on Busy	A call performing Callback is subject to Call Forward on Busy at any set it is trying to ring. The Callback is forwarded to the destination set.
Call Park	<p>Callback occurs if an external call is parked for an excessive time, generating ringback to the parked party.</p> <p>This feature, along with several others, ensures that calls are not forgotten, dropped or abandoned.</p>
Call Pickup	Call Pickup can be used to answer a call for a set ringing for Callback.
Camp Max	Call back immediately if destination has a call already camped.
Delayed Ring Transfer	Delayed Ring transfer can occur after the number of rings set in OAM Programming for an unanswered Callback, provided that a Prime Extn is associated with the external line and that Delayed Ring Transfer is enabled in OAM Programming.
DIA lines	In Callback cases, after overflow call routing has occurred, the Callback call alerts on the autoanswer appearance as well. For example, overflow call routing routes a call to Set A, which answers the call on an autoanswer line and transfers it (parks, or camps it, and so on) to Set B. If Set B doesn't answer and a Callback occurs, then the call appears on the autoanswer line at Set A.

Feature or condition name	Interaction
Do Not Disturb	Do Not Disturb suppresses ringing for Callback. Visual alerting persists at the line appearance for that call, or at the intercom key if no line key exists for that line. If Callback has no suitable line available, the original set does not ring.
Incoming Call Information (ICI)	The Callback message does not appear if Callback arrives while Call Information is active.
OAM Programming	Callback does not occur to a set involved in an OAM programming session. In this case, a Callback is made to the Prime Extn, if one has been assigned.
Set not in service	If Callback has no suitable line available, the original set does not ring. If a set attempts to transfer a call to a set that is not in service, Callback is made immediately.
Transfer	Callback rings only at the set that attempted the transfer, or at the Prime Extn for the external line, and not at any other set that has the appearance of an external line. If a valid DN has been specified, transfer completion actions taken before the appearance of the status/error message will result in an attempt to complete the transfer, along with associated Callback, if applicable. If a valid DN has been specified, transfer completion actions taken before the appearance of the status/error message will result in an attempt to complete the transfer, along with associated Callback, if applicable.
User Programming	User programming does not suppress Callback.

Registration of Portables

1.1 Overview

1.1.1 Description

This chapter clarifies the functionality in *Registration*, a subheading of *System programming Companion*. This functionality was introduced to the Norstar Modular product line in UK-DASS2 (DR6-0x32T), but has changed with the introduction of ISDN Extension numbers in the UK I.420 product, which is based on the ISDN Platform GPR02 (S-side).

This information is extracted from the 'Norstar Compact Wireless UK, Administration User Interface (CUK3) Issue 1.2, April 6, 1992.'

The registration feature is composed of two sections.

- The first controls when users can register from their portables (wireless handsets)
- The second allows the administrator to view registration status of each wireless Extension number

In the first section, the administrator can allow portables to register by changing the Registration status to Y. When the status is N, no portable can register. This toggle is provided to prevent any degradation of system performance when portables are trying to register on an adjacent wireless system. It also provides an additional level of security against unauthorized portables registering on the system.

The second section displays the registration status of each Portable extension. The administrator can deregister the portable with the `DEREG` display key. This function is necessary for two reasons:

- If the user's portable breaks, or is lost, the administrator must deregister the old, unavailable portable before the user can register at the old Extension number using a new portable.
- If a user leaves the company without de-registering their portable, the administrator needs a method to deregister the extension.

The administrator can designate one or more Extension numbers to be Guest Extension numbers by leaving the registration toggle set to Y and instructing the Installer to set the registration switch for the designated Extension numbers to Y. A guest to the site could register at the designated Extension number, use the facility and deregister when they leave. The next guest could do the same, once the first guest is deregistered. Thus a visiting executive could use the wireless facility without requiring the immediate attention of the system administrator.

1.1.2 Rationale for Feature

See previous section.

1.1.3 General Definitions

- 0x32T: the Turbo DR6 hardware platform
- DR6: Design Release 6. UK-DASS2, & NAT1

- ISDN Extension number: In products derived from the ISDN Platform GPR02 i.e. UK I.420, there are 64 Extension numbers (477-540) that may be configured as `ISDN` Extension numbers.
- Portable: a.k.a. cordless handset, wireless handset.
- Portable Extension number: In DASS2 there are 32 Portable Extension numbers 477-508. In products derived from the ISDN Platform GPR02 i.e. UK I.420, there are 64 Extension numbers (477-540), 32 of which can be configured as `Portable` Extension numbers.
- UK-DASS2: the DR6 UK product released on the 0x32T hardware platform.

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls

N/A

1.2.2 Message Displays

N/A

1.2.3 End-User View

Message	Description
Registration: Y CREDIT CHANGE	Values can be Y or N. This is the Master control that determines whether or not users can register portables.
xxx credits	After pressing the <code>CREDIT</code> display key, the number of available Portable credits is displayed. The number of credits is controlled by the <code>Software Keys</code> feature.
Registrd extn or Registrd set	Heading prompt for subsection where the status of Portable Extension numbers are viewed.
Show extn #:_ BKSP or Show set#:_ BKSP	A valid portable Extension number. The <code>SHOW</code> key will be suppressed if no Portable Extension numbers are defined in the system. If available, the <code>SHOW</code> key goes to the lowest Portable Extension number defined on the system. The <code>BKSP</code> display key appears while at least one digit is on screen.
nnnnnnn Registrd DEREG	A portable is registered at this Extension number The <code>DEREG</code> display key is used to deregister a portable at the specified Extension number.
nnnnnnn Availabl	No portable is registered at this Extension number

Message	Description
nnnnnn Pending	<ul style="list-style-type: none"> A portable will be able to register at this Extension number after the Config session has been terminated. Earlier in the same Config session, this Extension number was changed from an ISDN Extension number that was In use by sys to a Portable Extension number. The emulator associated with this Extension number will not be available (for a portable to register) until the Config session is released.

The end user can not register their portable unless the following is true:

- The Extension number is a Portable Extension number, as defined in `System prgrming►Change extn type`.
- The master registration switch is set to Y in `System prgrming►Companion►Registration►Registration:Y`.
- The status of the portable Extension number is Availabl.

The actual steps to register a portable are device specific and will not be defined here.

The administrator can deregister a portable at any time by pressing the DEREG display key.

The Extension number must be deregistered by the user, or in `System prgrming` before an installer, using `Change extn type` can change the Extension number type.

1.2.4 OAM Programming View

1.2.4.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item			I	SC+	SC
Systemprgrming	Companion	Registration	Registration:N	X	X	
			Portable extn Show extn#:_	X	X	

Heading	Item		I	SC+	SC
System prgrming	Change extn type	Show extn#:_	X	X	

Before an Extension number can be registered to a portable, the Extension number must be configured as a Portable Extension number as defined in `System prgrming►Change extn type`.

See "System Programming - Change Extension Type (Modular Plus only)".

Only Portable Extension numbers are considered valid Extension numbers under the `Registrd extn` subheading. If there are no Portable Extension numbers defined, the `SHOW` key will be suppressed at the `Show extn:_` prompt.

See "System Programming - Companion (Modular Plus only)".

1.2.5 **EXTN/ **LINE

N/A

1.3 Technical Limitations

With the introduction of ISDN Extension numbers in GPR02 (UK-I.420) it is now possible that the system has no Portable Extension numbers defined. i.e. all 64 Extension numbers are defined as ISDN Extension numbers. In this case, portables can not register on the system even if there are spare CREDITS.

1.4 Interactions

Feature	Interaction
Change extn type	<ul style="list-style-type: none"> • The Extension number must be defined as a Portable Extension number before a Portable can register at that Extension number. • A registered Portable Extension number must be deregistered in <code>System prgrming▶Companion▶Registration</code>, or by the user before its Extension number type can be changed. • The Portable Extension number state value in <code>System prgrming▶Companion▶Registration</code> matches the state value in <code>System prgrming▶Change extn type</code>. • The SHOW key, at <code>Show extn: _</code> is suppressed if there are no Portable Extension numbers defined.
Portable handsets	<ul style="list-style-type: none"> • If <code>Registration:N</code>, no portable can register. • To register a portable, the user must activate their on-air registration function (device specific) and enter the registration password followed by the Extension number. • If a generic CT2 portable registers, it will receive the administration parameters for that Extension number regardless of whether a different portable was previously registered at that Extension number. This is compatible with Norstar Wireline sets. If a wireline terminal is plugged into a TCM port previously occupied by the same type of terminal, the new terminal receives the administration data of the old terminal. • If the LID has been changed, a portable can re-register at its Extension number and receive the new LID without first de-registering and unlocking the registration lock for that Extension number. This permits the LID to be changed without creating more work for the installer or administrator. However, the master registration toggle must be set to <code>Y</code>.
Software Keys	If no CREDITS are available, registration will fail if a new portable terminal tries to register, even though the <code>CHANGE</code> display key is visible and <code>Registration</code> is set to <code>Y</code> .

Release

1.1 Overview

1.1.1 Description

The **[Rls]** key disconnects an active call and ends programming sessions.

1.1.2 Rationale for Feature

See “1.1.1 Description”.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 End User View

The user can press the **[Rls]** key to disconnect the currently active call. A call placed on hold by the user (I-Hold) is not affected by the **[Rls]** key. To release a held call, the user must reconnect to the call and then press **[Rls]** or replace the handset.

If one party places an internal call on hold, the held party can use **[Rls]** to disconnect the call.

For handset calls on one- and two-line display sets, pressing **[Rls]** is equivalent to depressing the hookswitch and holding it down. At this point, an offhook idle situation exists. To make another call, the user must do one of the following:

- press a line key
- press the **Handsfree Mute** key
- activate a feature that selects a line automatically
- press and release the hookswitch

1.2.2 OAM Programming View

N/A

1.2.3 **EXTN/**LINE

N/A

1.3 Technical Specification (Limits/Constraints)

N/A

1.4 Interactions

Feature name	Interaction
Call Information	If a user releases a call while Call Information is active, cancels Call Information.

Feature name	Interaction
Conference	<p>Acts to Transfer a call, if allowed.</p> <p>For information on the action of the [Rls] key during a conference call, refer to the Conference feature.</p> <p>If the second call (in a potential Conference) results in Busy or No answer, the user can disconnect it by pressing [Rls], without worrying about dropping the original call since the first call is in the I-Hold state.</p> <p>Once in a Conference, if an internal party presses [Rls], Transfer using Conference is activated.</p> <p>A user can force the release of a party in a Conference by pressing the line key associated with that party followed by the [Rls] key. This leaves the connection between the final two parties intact.</p>
Direct-dial	<p>If the user presses [Rls] before completing the entry of an internal or external number, the Direct-dial destination reverts to the previous setting.</p> <p>If the user presses [Rls] during the entry of the facility, the OAM programming session terminates and the facility reverts to Use prime line.</p>
Hotline	<p>When programming the destination for Hotline, if the user presses [Rls] before completing the entry of an internal or external number, the destination reverts to the previous setting.</p>
I-Hold	<p>Pressing the [Rls] key has no effect on any held calls.</p>
OAM Programming	<p>[Rls] ends the OAM programming session.</p>
Page	<p>[Rls] disconnects the user from the Paging channel.</p>
Pickup	<p>If a user presses the [Rls] key or [Feature] key before supplying a complete DN, the feature is cancelled and the set returns to its idle state.</p>
Priority Call	<p>If, during the first eight-seconds after a Priority Call attempt is made, the user at the target set holds or releases the active call, the calling set is connected immediately to the target set.</p> <p>If a user presses [Rls] during a Forced Call, Attention tone is presented at the dropped set.</p>
Transfer	<p>If a user presses the [Rls] key before a valid destination for the Transfer feature has been entered, Error tone is presented and Invalid number is displayed on the display screen.</p> <p>Pressing [Rls] during a Transfer transfers a call before the destination party answers.</p> <p>When [Rls] is pressed three times in a row, Transfer is cancelled.</p>

Remote Capabilities

1.1 Overview

1.1.1 Description

The Remote Capabilities feature allows public or private network remote users to use the system's capabilities, once they have passed through Remote System Access and gained access to a Norstar system,. Remote Capabilities is supported for users entering a system on an AC15 line.

For more information, see the Remote System Access feature.

1.1.2 Rationale for Feature

N/A

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 End User View

The procedure for getting onto a Norstar system from a remote location is described in the Remote System Access feature.

Once a remote user has successfully accessed a Norstar system (that is, they are receiving system dial tone), a user can use some or all of the system's capabilities, such as:

- dial a DIA line Extension number
- access outgoing facilities (external CO, private circuit lines, or AC15 lines in line pools)
- access features (Remote Paging)

If defined for the system, remote users can also change the existing Class of Service by using the DISA Extension number. For more information, see the Class of Service feature.

Access to the system's capabilities (except for DIA line Extension numbers) is determined by the Class of Service that is assigned either to the COS password entered by a remote caller, or to the Class of Service associated with the incoming trunk, in the case of access without a password. For more information, see the Class of Service feature.

When the remote user accesses a Norstar system and hears system dial tone, the sequence and feedback is as follows:

- after calling in remotely (possibly after entering a COS password), the user hears system dial tone
- the user dials digits/characters into system dial tone. When the first digit or

character (for example, “*”) is dialed, system dial tone is broken and replaced with silence

- the feedback that is then provided to the user when the user’s input (valid or invalid) is detected by the software is described in the text that follows.

Dialing a DIA line Extension number

There are no restrictions on DIA line calls. Any valid DIA line Extension number may be dialed. Any appearance of the DIA line then attempts to alert and ring (if programmed to ring). For more information, see the DIA line feature for more details.

DIA line calls follow existing call processing rules for external calls. For example, they can be held, transferred, parked, conferenced, and so on. For more information, see the DIA line feature.

Error Conditions:

- If a DIA line call is not answered for three minutes on a DID or loop start trunk, then the call is dropped. Ringing occurs indefinitely in the case of calls on AC15 lines.
- After receiving overflow or busy tone for three minutes for a DIA line call, the remote caller is returned to system dial tone. The remote caller can then try another DIA line, if they choose.
- A retry mechanism (allowing the remote caller to try again if their call is unsuccessful) is currently not supported during ringback, overflow or busy.
- If an invalid DIA line Extension number is entered (perhaps the caller has misdialed it), the DIA line call is routed to the prime set for the trunk, if one exists. The prime set receives the message, <line name> calling.

In cases where the customer wants all remote attendant-type calls to go to a single set, it may be desirable to change the DIA line Extension number of a direct-dial set to be similar to the direct-dial digit for the system. For example, if the direct-dial digit is 0 for a system whose DIA line Extension number length is four, then the direct-dial DIA line Extension number could be changed to 0000. This way, a remote caller would only have to remember the direct-dial digit and the Extension number length for the system to reach a direct-dial set, instead of having to know the specific DIA line Extension number for a direct-dial set.

Future considerations: For implementation reasons, the following is not currently supported. It is described here as an enhancement:

- If the DIA line call is unsuccessful (that is, the caller is receiving continuous ringback, busy tone, or overflow tone), then the user may press the octothorpe (#) key and the system will immediately return system dial tone. The user is thus permitted to try again.
- If the # key is not pressed during the first five seconds of busy or overflow tone, the user is returned to system dial tone anyway.
- The # key can be received at any time on an AC15 line, and the user is returned to system dial tone.

Dialing a line pool access code

After receiving system dial tone, the remote user may dial a line pool access code for the system. If the user has access to the line pool (as determined by the COS for the COS password, or the trunk the user called in on), and if a line is available in that line pool, then the user hears whatever feedback is provided by the far-end system (for example, dial tone or ringback).

Accessing AC15 lines sequentially from the line pools on different systems allows a user to tandem through the private network until the desired destination is reached. For example, a user calling into System A could dial 82, a line pool access code (which gets a line out of the line pool) to connect to System B, and receive system B's dial tone. The user could then dial line pool code 70 to reach System C, and so on.

Dialing restrictions associated with the Class of Service of the incoming trunk and with the outgoing line will be applied unless it is replaced using a Class of Service password. For more information, see the Call Restrictions and Override feature.

Error Conditions:

- If the user enters a valid line pool access code for the system (one that is defined in OAM programming), but one to which the remote caller does not have access, then overflow tone is provided for five seconds, after which time the caller is returned to system dial tone.
- If the user enters an invalid line pool code (no line pool is assigned for that code in OAM programming), then the digits entered by the user are compared against the DIA line Extension numbers (and the Auto Extension number and DISA Extension number) for the system. Previously specified rules for DIA line Extension number calls are followed.
- If the user enters a valid line pool access code, but there is no line available in that line pool (either there are no lines in the pool, or no lines are currently available because all lines are in use), then busy tone is provided for five seconds, after which time the caller is returned to system dial tone. Note that the DR3 Ring Again on Busy Line Pool feature is not supported remotely.
- If the user obtains a line from a line pool, and proceeds to dial restricted digits on that line, then overflow tone is provided for five seconds, after which time the call is dropped. The user has to reaccess the system and try again.
- If the user enters a line pool access code and immediately enters digits before hearing any feedback tones from the far-end system, some of the digits the user enters can be lost.

In situations where Norstar systems are networked together, a unified dialing plan for use of line pools should be considered. For example, if there are a lot of remote users using systems X and Y, and both X and Y have AC15 lines in line pool A that go to a particular location, for example, Toronto, then line pool A can be assigned a line pool access code of 78 for both systems. This way, users regularly accessing both systems to use a tie line from the line pool can use the same line pool access code to get to the same location (Toronto).

Future considerations: For implementation reasons, the following is not currently supported. It is described here as an enhancement:

If the line pool attempt is unsuccessful (that is, the caller is receiving busy tone, or overflow tone), then the user may press the # key and the system will immediately return system dial tone. The user is thus permitted to try again.

Remote feature access

Remote features are features that are activated by a remote user that has called into a Norstar system (as opposed to the user accessing a feature on their local Norstar system). For Modular Plus, the only remote feature that is supported is Remote Paging.

The remote user specifies that a feature is being activated by pressing the * key followed by the desired feature code, into system dial tone. For consistency, the same feature code for activating a feature locally is supported when activating the feature remotely. This way, Norstar users know, for example, that feature code 60 means general page, whether they access the feature locally or remotely.

Remote paging

After system dial tone is presented to the user, and providing the Class of Service permits access to the feature, the user can access all variations of the paging feature (* 60 through * 63)

The existing DR3 paging features already support the mapping of display keys onto dial pad digits. The user specifies page zones, and choices for paging sets, speaker, or both, by using the appropriate dial pad digits(s). For more information, see the Page feature.

Existing rules for paging are followed. For example, paging is not presented to a set that has an active (non-held) call or if the set is in Do not Disturb.

When activating a paging feature (that is, after a valid page code has been entered), the remote user hears the first three bursts of stuttered dial tone, followed by silence, indicating that the paging circuit is active. The user can then make a page announcement.

Error Conditions:

- If the user enters a feature code for a feature which they do not have permission to use, or the feature code is invalid (it doesn't exist for the system), then overflow tone is provided for five seconds. The caller is then returned to system dial tone.
- If the paging resource is already in use (for example, another user is using the external speaker for paging), then the user is given busy tone for five seconds, after which time the caller is returned to system dial tone.

If the remote user is calling from another Norstar system, the Feature key on their set cannot be used to activate a remote feature. If pressed, the Feature key is used to activate a local feature. For example, a remote caller can activate DND on their set by pressing a programmed key or dialing the feature code. The remote activity is not affected. Existing rules for use of the Feature key are followed.

If the remote page is unsuccessful (that is, the caller is receiving busy tone, or overflow tone), the user may press the # key and the system will immediately return system dial tone. The user is thus permitted to try again.

Changing a Class of Service

When hearing system dial tone, a remote user is permitted to change the existing Class of Service for that call, by dialing the system-defined DISA Extension number, followed by a Class of Service password. For more information, see the Remote System Access feature and the Class of Service feature.

Changing an existing Class of Service using 6 8 is not supported remotely.

1.2.2 OAM Programming View

N/A

1.2.3 **EXTN/ **LINE

N/A

1.3 Technical Specification (Limits/Constraints)

Access to remote features (remote paging) is restricted to sets that can generate DTMF signals.

1.4 Interactions

N/A

Remote System Access

1.1 Overview

1.1.1 Description

Remote System Access allows users elsewhere on the private or public network to call into a specific Norstar system and, once on that system, gain access to a subset of the system's resources.

See also Remote Capabilities feature.

1.1.2 Rationale for Feature

Remote System Access extends the usefulness of a customer's Norstar system beyond the local office. It provides a mechanism which permits people who are away from the office to make use of Norstar facilities and features while they are at their remote location, and, at the same time, bypass the normal tolls associated with using the public network. It also provides for using the Norstar as a tandem switch to reach other systems in a private network.

By supporting several different trunk types in DR4 (for example, AC15, loop start, and DID trunks), Remote System Access can be provided from both the private and public network.

There is an increasing trend in the UK to network small systems. Building on the functionality developed in Modular DR4, Modular Plus and Compact Plus provide simple mechanisms for essentially seamless access to individuals, and individual departments, across an extended network.

In the private network scenario, the Norstar system is a single network node, receiving calls from other nodes, either using direct AC15 connections or as part of a larger electronically switched network (ESN). Within a private network, security is usually not an issue so the Norstar administrator may want to allow remote users immediate access to Norstar system resources by providing access without DISA.

In the public network, access is typically through a Central Office (CO). For example, the user may be calling in from home, or from an off-site location. In this scenario, security is important, so the Norstar administrator typically requires callers to enter a valid password (access using DISA) before being given access to Norstar system resources.

Public network scenario

An employee working at home could call into work and use Remote system Access to get onto their system at work, and then call another customer location, across the private network facilities, without incurring the long distance charges associated with calling direct on the public network.

Private network scenario

Employees at head and branch offices in different cities, that communicate with each other on a daily basis, could use AC15 tie trunks to create a network linking them together. These trunks could be programmed, such that when accessed, the user would be directly connected to the other Norstar system, receiving that

system's dial tone, and could then dial directly to reach a specific department or individual's DIA line without the aid of an attendant.

1.1.3 Rationale for Design

The remote access overflow call routing time-out for a busy or unknown destination is changed from five seconds to three minutes, for consistency with DND on Busy. (Users were confused when a call was dropped so quickly.)

1.1.4 General Definitions

N/A

1.1.5 General Procedures

N/A

1.2 Feature Details

1.2.1 Message Displays

N/A

1.2.2 End User View

When a remote user wants to access a Norstar system, they select a line (for example, on the private network) or dial a phone number (for example, on the public network) to get onto the system.

Depending on the type of trunk being used, and how the trunk is configured, the sequence for Remote System Access varies slightly (for example, the caller may or may not have to enter a password). Remote System Access on the different trunk types is described below.

When the remote user tries to access a Norstar system (for example, by dialing an appropriate phone number), the call is auto-answered by the Norstar system. Auto-answer can provide the caller with system dial tone (auto-answer without DISA), or provide the caller with stuttered dial tone (auto-answer with DISA).

Auto-Answer without DISA (with System Dial Tone)

System dial tone is provided to the caller if the trunk the caller is using is configured to auto-answer without DISA. The user is not required to enter a COS password. The remote user can immediately access features and facilities (if permitted) on that Norstar system.

In this case, the line itself has a Class of Service. The Class of Service determines the system capabilities that are available to the user calling on that trunk. For more information, see the Class of Service and Call Restrictions and Override features.

Auto-Answer with DISA (with Stuttered Dial Tone)

Stuttered dial tone is provided to the caller if the trunk the caller is using is configured to auto-answer using DISA. Stuttered dial tone is the prompt to the user to enter a Class of Service (COS) password.

For security reasons, the user is given only one attempt to enter a password. If a valid COS password is entered, the system returns system dial tone to the caller. Each COS password has an associated Class of Service, which determines the

system capabilities that are available to the user of that password. For more information, see the Remote Capabilities feature.

For more information about entering and programming of COS passwords, see the Class of Service and Call Restrictions and Override features.

Error Conditions

- When receiving stuttered dial tone, if the user does not begin to enter digits for 15 seconds or takes more than 15 seconds between entering successive digits, the user is presented with overflow tone for five seconds. After this time, the call is dropped.
- If an invalid COS password (a password not defined for the Norstar system the user is trying to access) is entered by the user, overflow tone is provided for five seconds. If the user remains on the line after the timeout period, the line is dropped.

Remote System Access on a loop start or AC15 line

Remote System Access is only supported on loop start or AC15 lines programmed to be auto-answer.

Loop start trunks are used to provide Remote System Access from the public network while AC15 lines provide access from the private network. When the Norstar system detects an incoming call, one of two methods of automatically answering the call applies (as specified in OAM programming):

1. DISA answers the call and stuttered dial tone is provided to the caller (the default), or
2. the caller is immediately provided with system dial tone.

Error Conditions

- Auto-answer loop start trunks must be able to detect far-end disconnects in order to prevent hung lines. If a loop start trunk is unsupervised or is configured to be unsupervised, it cannot operate in an auto-answer mode. For more information, see the Loop Start Trunk feature.
- If a supervised trunk is programmed for auto-answer and is later programmed to have a trunk mode of unsupervised, an answer mode of auto-answer does not apply. The parameters for `Ans mode` are not presented to the installer. For more information, see `Line Data` in OAM programming.
- If the installer specified a trunk to be auto-answer (such as during pre-OAM programming of a system), and the system subsequently detects unsupervised trunk hardware in that position, the software generates a Maintenance alarm. Calls on that trunk are manually answered (not auto-answered). The maintenance alarm is Alarm:62-y-z, where y is the cartridge number, and z is the trunk port number (corresponding to the incoming loop start trunk trying to use a DTMF receiver when none are available). The alarm indicates that “Unsupported auto-answer setting”.
- Note that Alarm:62-y-z only occurs for loop start trunks. No other trunk type can be programmed to act as unsupervised.
- Remote System Access is only supported on expanded systems because it requires an AC15/DTMF trunk cartridge to provide the necessary DTMF tone decoding capabilities. The Norstar system then pools the DTMF receivers from the AC15 cartridges to be used for remote system access on loop start trunks if

no DTMF receivers are available for the system to use when an incoming auto-answer call is received on a loop start trunk. An alarm message is given. The maintenance alarm is Alarm:63-z, where z is the trunk port number. The alarm indicates that “No available DTMF receivers”.

- Note that Alarm:63-z only occurs for loop start trunks. DTMF receivers are only pooled for use by loop start trunks. AC15 cartridges have dedicated DTMF receivers that are used when incoming calls are received on AC15 lines.

Remote System Access on an AC15 line connected to ESN

For ESN access on the private network, existing rules for incoming calls on the ESN are followed. The intelligent network does all the necessary routing between nodes and delivers the last few digits that were dialed to the destination node for final routing on that system.

The Norstar system then attempts to map these received digits onto a DIA line Extension number or a remote feature Extension number. For more information, see “Remote Feature Extension numbers” on page 4.

In the case of a DIA line Extension number, the call is routed to all appearances of that specified DIA line. For more information and a description of the call handling, see the DIA line feature.

If the digits map onto a feature Extension number, the associated remote feature is activated. For more information, see “Remote Feature Extension numbers” on page 4.

Remote Feature Extension numbers

Remote feature Extension numbers (the Auto Extension number and the DISA Extension number) are specified in OAM programming. They allow a Norstar system to auto-answer ESN and DID calls, in the same ways that calls on auto-answer loop start and auto-answer AC15 lines can be answered, either with or without DISA.

If the digits received map onto the Auto Extension number or the DISA Extension number, the call is automatically answered as follows:

1. DISA Extension number: The call is answered with DISA (stuttered dial tone is provided to the caller), and the caller must enter a valid password in order to gain system access. The Class of Service that applies for the call is determined by the COS password entered by the user.
2. Auto Extension number: The call is answered without DISA and the caller is immediately provided with system dial tone. The Class of Service that applies for the call is determined by the COS for the trunk the user is calling in on.

Once a remote user is on a Norstar system, the DISA Extension number can also be used to change the existing Class of Service, and select another Class of Service. The user enters the DISA Extension number into system dial tone, and stuttered dial tone is returned to the user (at which point a COS password has to be entered). Entering the Auto Extension number is not prevented, but has no effect but to return system dial tone to the user. For more information, see the Class of Service feature.

1.2.3 OAM Programming View

1.2.3.1 Programming Remote System Access

The Auto Extension number and the DISA Extension number, if specified, correspond to digits received from the CO (in the case of DID trunks) or from a PBX (in the case of an ESN network), or digits dialed by a remote caller into system dial tone. For more information, see the Class of Service feature.

After the parameter `Direct-dial #:`, the parameter, `DISA Extn#:` `<digits>` appears. It is followed by the parameter, `Auto Extn#:` `<digits>`. The default for each is `None`.

A `CHANGE` display key is provided for both feature Extension numbers. When `CHANGE` is pressed, the existing value is cleared, and a cursor appears after the colon.

A `BKSP` display key is provided when the input area is non-blank. The length of the feature Extension number is the same as the length of the DIA line Extension numbers specified in `System prgrming▶Rec'd# length`. When the input is equal to the DIA line Extension number length for the system, the cursor and `BKSP` display key disappear and the `CHANGE` display key reappears. The installer can press `Next` (or `Back` and so on, as appropriate) to go to the next prompt.

If the installer presses the `CHANGE` display key and then the `Next` key without entering any digits or entering fewer digits than the DIA line Extension number length, the value is changed to `None`. The user remains at the prompt, either `DISA Extn#:` `None` or `Auto Extn#:` `None`.

If the installer specifies the digits for one feature Extension number and tries to specify the same digits for the other feature Extension number, an Error tone and the transient message `Already in use` is provided as soon as the error is detected. The installer is returned to the previous display. For example, if the installer was entering the `Auto Extn#:` `2623`, and specified the same digits as were entered for the DISA Extension number, the Error tone and message are provided and the installer is returned to the prompt, `Auto Extn#:` `2623`.

The installer does not have to wait for the transient `Already in use` message to finish before continuing with the programming. The installer can press the navigational keys to go to another section, or can re-enter digits during the transient message. For example, the installer enters `Auto Extn#:` `2623`, receives the `Already in use` message, and during the error message enters `5`. The display then returns to `Auto Extn#:` `5__`. The installer then finishes entering the new digits they want for the Auto Extension number.

Note that, as in previous releases, the installer must ensure that conflicts in the numbering plan are not created. The feature Extension numbers cannot conflict with any input that a remote user provides. The feature Extension number cannot conflict with a DIA line Extension number, or the first digit of the feature Extension number cannot conflict with the first digit of any line pool access code. If such a conflict is detected when the installer enters a feature Extension number, DIA line Extension number, or a line pool access code, an Error tone and the transient message `Already in use` is provided. The installer is returned to the previous display.

1.2.4 **EXTN/LINE**

N/A

1.3 Technical Specification (Limits/Constraints)

Remote system access is now provided on all systems for the UK. For NA, Remote System Access functionality is only supported on expanded system because it requires an AC15/DTMF trunk cartridge to provide the systems because it requires an AC15/DTMF trunk cartridge to provide the necessary DTMF tone decoding capabilities. Pulse decoding is only supported on AC15 lines.

Norstar auto-answer loop start trunks cannot detect pulse signalling; therefore, unless the incoming digits are DTMF, the call is dropped after 15 seconds, which is the standard Norstar feature timeout.

1.4 Interactions

Feature name	Interaction
CO-CO Conference barring	Does not apply since Remote Access only uses AC15 (UK only).
Enhanced Restrictions System	Line- and Line/set based restrictions are applied to calls which go out on AC15 lines. Set based restrictions do not. (UK only)

Ring Again

1.1 Overview

1.1.1 Description

Ring Again can be activated when calling internal destinations when

- a Norstar set or line pool is busy (Ring Again on Busy)
- Ringback is being received on a call (Ring Again on No Answer)

Ring Again on Busy alerts a user when a busy internal set becomes available or when a line in a line pool becomes available.

Ring Again on No Answer alerts a user when the next activity occurs at an internal set that previously failed to answer a call from the user.

1.1.2 Rationale for Feature

See “1.1.1 Description”.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls

, or programmed key, to activate

to cancel

The following table shows the steps taken by an end user to program Ring Again. The table illustrates how the displays appear on two-line display sets (M7310 and M7324). One-line display sets (M7208, M7100) do not use display keys.

Ring Again Steps

User Action	Display at Calling Set	Set or System Behaviour
1a.	<setname busy> LATER PRIORITY	Busy tone is generated from an internal call attempt. (The set is busy.) OR
or 1b.	No free lines LATER PRIORITY	Busy tone is generated from an internal call attempt. (The line pool is busy).
1c.	calling <setname>	Ringback tone is generated from an unanswered call.

Ring Again Steps (Continued)

User Action	Display at Calling Set	Set or System Behaviour
2a. Press the LATER display key or <input type="text" value="Feature"/> 2. or a programmed key (If the user presses PRIORITY, a Priority Call is made. EXIT returns the set to idle.)	Ring again? YES NO EXIT	
3. Press YES, <input type="text" value="Feature"/> 2 or a programmed key from the Ring Again? prompt. or Press NO from the Ring Again? prompt.	Ring Again ON Send Message? YES NO EXIT	Displays transiently in, response to activating Ring Again. The current call is released. If the user pressed YES, the Send Message feature would be activated.

1.2.2 Message Displays

Message	Description
Can't ring again	Displays transiently, accompanied by Error tone, if user tries to activate Ring Again - and has neither received Busy tone from an internal call attempt, nor the No free lines prompt in response to an attempt to access a line pool. (Implies that context is inappropriate for the feature, or the destination set is not in service.) - for a destination set that already has a Ring Again activated for it by another set (In this case, the call is not cleared, the caller continues to hear Busy tone unless they are on a two-line display set and press the LATER key.) - for a wireless set Also displays if the user accepts a Ring Again offer, but the destination set is not in service.
New Ring Again	Displays when a Ring Again activation cancels a previous one.

1.2.3 End User View

Ring Again on Busy. A caller encounters Busy tone on an internal call

- if the called party has no available intercom keys
- when dialing a line pool code on an internal line, or pressing a line pool key if there are no idle lines in the pool.

In both cases, the user can activate Ring Again on the busy resource by pressing the Ring Again key or dialpad code.

When the busy resource becomes idle and the original caller has an intercom key available, a Ring Again offer occurs. The original caller hears an alerting tone, and sees Call <name>? or Use line pool? on the display, along with a flashing intercom key. The user can initiate the call by pressing the line key or by pressing the Ring Again key or code. If not accepted, Ring Again offers are withdrawn after 30 seconds.

A Ring Again offer does not reserve the target resource. It is possible for the user to encounter Busy tone again after accepting the Ring Again offer.

A Ring Again offer is made even if the user who activated it is busy on another call, provided that the user has an intercom key available. This allows Ring Again to be used in setting up a conference, when the user is talking to one party while waiting for the other party to become available.

In the case where a set is forwarded, and the forward destination is busy, the caller can activate Ring Again on the forward destination. The Ring Again offer is made when the forward destination becomes idle. The Ring Again remains associated with this set even when the forwarding set cancels Call Forward.

Ring Again can be activated on a set that is performing programming. Also, a Ring Again offer can be made to a set which is performing programming, although the display does not show the Ring Again message.

If a set has Ring Again activated on another set and has Ring Again activated on itself by another set, and if conditions allow either Ring Again offer to occur, the outgoing call attempt has priority.

If a set is not in service when the destination set is ready to make a Ring Again offer to it, the pending Ring Again is cancelled at the destination set.

If a set that has had Ring Again activated on it by another set goes out of service, the Ring Again is cancelled at that set. The activating set is not notified of this cancellation.

The Ring Again key uses an indicator, if equipped with one. The indicator is on when Ring Again is active, flashing at the i-hold rate during a Ring Again offer, and off when Ring Again is inactive.

1.2.3.1 Activating Ring Again

Ring Again on Busy Set can be activated when the set is making an outgoing internal call, and the destination is busy or has not answered (see Ring Again on No Answer). Ring Again on Busy Line Pool can be activated when the user has received the message `No free lines` in response to an attempt to obtain a line pool line. Any attempt to activate Ring Again in other situations results in the transient message `Can't ring again`, accompanied by Error tone.

Only one Ring Again can be activated for a destination set. If a caller attempts to activate a Ring Again for a set which already has a Ring Again activated for it, by another user, the message `Can't ring again` Displays at the calling set, accompanied by Error tone. In this case, the call for which Ring Again was attempted is not cleared, and the user continues to hear Busy tone (except on the M7310 or M7324 set, if the user has pressed the `LATER` display key). If attempting an internal call, the user can then decide to leave a message for the busy destination.

1.2.3.2 Ring Again Offer

Ring Again notifies the activating set when the requested internal set is idle and has a free intercom key (for a Ring Again On Busy Set), or when there is at least one free line in the line pool (for Ring Again on Busy Line Pool).

For a Ring Again on Busy Set offer to be made, the activating set must have at least one free intercom key. For a line pool Ring Again offer to be made, the activating set must have a free intercom key, or an appearance of the available external line.

When a Ring Again on Busy Set offer occurs, the prompt `Call <name>?` is displayed, and an attention tone occurs to draw the user's attention to the display. The indicator for the selected internal line flashes at the i-hold rate. If Ring Again Displays on a key with an indicator, that indicator also flashes at the i-hold rate during the Ring Again offer. The user then has 30 seconds to respond to the offer by selecting the alerting line manually, or by pressing the Ring Again key. This places an internal call to the requested set, as if a Direct Station Selection key had been pressed. The called party's name appears on the display, as for a normal outgoing internal call.

For a Ring Again on Busy Line Pool offer, the message `Use line pool?` accompanies the alerting tone. An intercom key is always used for the offer. The indicator flashes at the i-hold rate while the offer is valid. Pressing the flashing key automatically attempts a line pool access. If the handset is onhook, pressing the line key places the user in onhook dialing mode. If a line pool line that appears as an external line key on the set is obtained, the call indication moves from the intercom key to the external line key.

A Ring Again offer is the highest priority display message.

The Ring Again offer message and line indication persist until cancelled or until the activating set responds. The user at the activating set can choose not to respond to the Ring Again offer by waiting for the 30-second timeout, by cancelling the Ring Again, or by accepting the offer and then disconnecting before the call is answered.

The attention tone is not repeated during the 30-second timeout.

If the set receiving the Ring Again offer has Ring Again on a programmed key with an indicator, the indicator is turned off when the user accepts the offer by any method.

Accepting a Ring Again offer is no guarantee that the requested resource will still be free, or that an internal call attempt will be successful. Ring Again is automatically cancelled when the user responds to the Ring Again offer in all cases. If the call attempt is unsuccessful and the user still wants Ring Again to be active, the feature must be activated again. The party must be called and Ring Again activated.

In summary, a Ring Again on Busy Set offer is made when the following conditions are met:

- the called set is idle and is not involved in accessing a feature
- the called set is not forwarded or in Do Not Disturb mode
- the calling set has an intercom key available

Accepting a Ring Again Offer

To accept a Ring Again on Busy offer, the user can do any of the following.

- press the flashing line key associated with the Ring Again offer
- press the Ring Again key (whose indicator, if present, is flashing)
- enter the Ring Again dial pad code ()
- press the YES display key in response to the prompt Call <name>? (M7310 or M7324 sets only)

1.2.3.3 Cancelling Ring Again

Ring Again can be cancelled by the activating set at any time by dialing . The transient message Ring Again OFF appears when the Ring Again is cancelled. If Ring Again is assigned to a programmable key, Ring Again activation can be cancelled by pressing that key. If a Ring Again offer is being made to the set (that is, the indicator beside the Ring Again key is flashing rather than on), pressing the key accepts the offer rather than cancelling it. When Ring Again is active and is not being offered, redialing the Ring Again feature code results in the transient message Can't ring again, accompanied by Error tone.

1.2.4 User Programming View

One Ring Again key can be programmed for each set, with or without an indicator. The indicator is used, if present.

1.2.5 OAM Programming View

N/A

1.2.6 **EXTN/**LINE

N/A

1.3 Technical Specification (Limits/Constraints)

A calling set can activate only one Ring Again at a time. Any subsequent activation on a different destination automatically cancels the previous Ring Again. When a Ring Again activation cancels a previous one, the transient message, New Ring Again, is displayed. Activating Ring Again twice on the same resource displays the Ring Again ON message.

Only one Ring Again can be activated for a destination set.

A maximum of three Ring Again activations can be made system-wide for a single line pool.

1.4 Interactions

Feature name	Interaction
Call Forward	A Ring Again offer can not be made to or from a set which has Call Forward active. Call Forward does not forward a pending Ring Again from the set that activated it or from the set on which it was activated. However, Call Forward activated at the original destination reroutes an outgoing call resulting from acceptance of the Ring Again offer by the activating set. A Ring Again offer can be made to a set that is forwarded, but Ring Again applies to the forwarded destination.

Feature name	Interaction
Do Not Disturb	A set in Do Not Disturb mode can have Ring Again set against it. The Ring Again offer is made when the user cancels Do Not Disturb, provided that the other conditions for a Ring Again offer are met.
Conference	Ring Again may be used when trying to create a conference and receiving busy or no answer from an internal party. The person attempting to set up the conference may re-connect to the original call and talk to that person while waiting for the Ring Again offer to occur.
Onhook Dialing Options	A number of features, if invoked while onhook with handsfree off, may result in Onhook Dialing. These features are Autodial, Speed Dial, Last Number Redial, Saved Number Redial, DSS, Reply Message, and Ring Again acceptance.
Remote Access	Ring Again is not supported for remote callers.
Voice Call	An outgoing call resulting from accepting a Ring Again offer must be made as a Ringing Call, not a Voice Call. Because Voice Calls are answered automatically, the user cannot use Ring Again after making a Voice Call. The user can activate Ring Again following an unsuccessful voice call attempt (that is, a call made as a Ringing Call because conditions for a Voice Call were not met).

Ring Detection

1.1 Overview

1.1.1 Description

This feature provides a Ring Detection window, which allows the Norstar system to monitor the ringing coming in from the CO, in order to know whether to continue alerting at the destination lines. If ringing is not detected for more than a certain length of time (ring detect window), the Norstar decides that the caller has hung up and behaves accordingly. The Ring Detection window is five seconds.

Ring Detection is unnecessary when Disconnect Supervision is present.

1.1.2 Rationale for Feature

See “1.1.1 Description”.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 End User View

Five seconds of ringing occurs after external callers have hung up. This is invisible to the user, beyond the fact that occasionally, when they answer a Ringing Call, no-one is there.

The Ring Detection window is five seconds. When a user attempts to answer a call, a check is first made to see whether a call is still present on the line. If no call is present, then the system will treat the user's action as though the missed call had never existed.

1.2.2 OAM Programming View

N/A

1.2.3 **EXTN/**LINE

N/A

1.3 Technical Specification (Limits/Constraints)

The Ring Detection window is five seconds.

1.4 Interactions

Ring detection is unnecessary when Disconnect Supervision is present.

Ring Type

1.1 Overview

1.1.1 Description

Ring Type allows the user to distinguish the ringing of the set from that of other sets nearby. The set is programmed to ring with one of four distinct tone combinations.

1.1.2 Rationale for Feature

See “1.1.1 Description”.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

Ring Type is one of a set of User Preferences features that can either be programmed by

- an individual user at their set, using Feature keys (see “1.2.2 End-User View”)
- for another user by the installer, system coordinator plus, or system coordinator, through OAM Programming (see “1.2.5 OAM Programming View”)
- for another user by a user with the Installer, System Coordinator Plus, System Coordinator, or Basic password, using the User Preferences feature, **USER (see “1.2.5 OAM Programming View”, and the User Preferences feature)

1.2 Feature Details

1.2.1 Controls

Feature *, 6, plus dialpad keys 1 to 4

1.2.2 End-User View

To program Ring Type, proceed as shown in the User Action table. The user can choose from four different ring types. The Ring Type selected is used for all subsequent incoming ringing at the set, for both internal and external calls.

1.2.3 Message Displays

Message	Description
Access denied	Displays, accompanied by Error tone, if the user tries to change the Ring Type while an OAM Programming session is in progress, or is initiated, anywhere in the system. (Ring Type programming is exited.)

The following table show the steps taken by an end user to program Ring Type for their set. The table illustrates how the displays appear on two-line display sets

(M7310 and M7324). One-line display sets (M7208, M7100) do not use display keys.

User Action	Resulting Display	Set Response
1. Press <input type="text" value="Feature"/> <input type="button" value="*"/> <input type="text" value="6"/>	Ring type: <n> NEXT OK	Generate ring type <n> for two seconds. Where <n> is the ring type number
2. Press a dialpad key between <input type="text" value="1"/> and <input type="text" value="4"/> or Press NEXT display key	Ring type: <n> NEXT OK	where <n> is the ring type number. Generate selected ring for two seconds. Invalid digits terminate the ringing but not the feature. Another key press starts the new ring without waiting for the current ring to complete. The NEXT display key wraps from ring type 4 to ring type 1.
3. Press OK, <input type="text" value="Hold"/> , <input type="text" value="Feature"/> , <input type="text" value="Rls"/> , Any programmable key or Wait for 15-second time out	New ring stored Does not show New ring stored in this case. Feature timeout	Transient display. Stores the new ring shown on the display at time of the key press. Stores the new ring shown on the display at time of the key press. Transient display accompanied by Error tone. The last setting is stored after a feature timeout (assuming the user did something in step 2).
4.	<Idle display>	Returns to idle state display.

1.2.4 User Programming View

Ring Type cannot be programmed on a key.

1.2.5 OAM Programming View

Ring type parameters can have the following values: 1, 2, 3 and, 4. The default is underlined. Ring Type can be programmed two different ways

- from within OAM, when an installer or system coordinator is programming system data for a set, under the heading of **Terminals&Extns**►
User preferences►Ring type:<n>
- by using a feature code (**USER) and any one of the four OAM programming passwords: Installer, System Coordinator Plus, System Coordinator, or Basic

[See "Terminals&Extns - User preferences".](#)

1.2.5.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item			I	SC+	SC
Terminals&Extns	Individual extn	User Preferences	COPY	X	X	
			Ring Type:<n>	X	X	X

1.2.5.2 Programming Ring Type through **USER

If the user is using a set with a two-line display, Ring Type can be programmed using **USER. The user, installer, or system coordinator changes the Ring Type for the set by pressing the CHANGE display key to cycle through the options. For more details, refer to the User Preferences feature.

1.2.6 **EXTN/**LINE

N/A

1.3 Technical Specification (Limits/Constraints)

Only M7000 series terminals can be programmed through User Preferences. Other terminal types are not supported.

When Ring Type is programmed in OAM Programming, a sample of the Ring Type is not provided.

The selected Ring Type is stored in non-volatile memory (NVRAM) during power interruptions. It survives warm but not cold restarts.

1.4 Interactions

Feature name	Interaction
OAM Programming	Ring Type cannot be programmed at a set while an OAM Programming session is in progress anywhere in the system. If the user is programming Ring Type and an OAM Programming session is started, the Ring Type programming is exited.
Extn Copy	Ring Type can be copied.
Extn Relocation	Ring Type data is retained, along with the profile of the set being moved.
Volume Control	Pressing the Volume bar while the ringing samples are in progress adjusts the ring volume level. The volume level is stored as well as the Ring Type.

Routing Tables

1.1 Overview

1.1.1 Description

The Routing Tables are used to specify how calls should be routed, based upon the leading digits (Destination codes) dialed into intercom dial tone by a user. This routing permits the selection of the outgoing facility to be used, as well as the option of inserting arbitrary digit strings to route the call across the public and private networks. Routing Tables facilitate the implementation of Least Cost Routing. (For details, refer to the Scheduled Services feature.)

1.1.2 Rationale for Feature

To provide transparent private system networking, the user needs to reach remote destinations using dialed numbers that look like local (intercom) numbers. The local system must therefore accept these numbers and route the call over outgoing lines to the remote system, inserting any other digits needed by the remote system or by any intervening nodes. This is achieved through Routing Tables.

Routing Service allows selection of specific predefined routes, for different time periods, for different days of the week.

Routing Service is also used to allow cheaper route selection for long distance calls, and as a speed dialing feature, by mapping a Destination code to a long distance string.

1.1.3 Rationale for Design

1.1.4 General Definitions

N/A

1.1.5 General Procedures

N/A

1.2 Feature Details

1.2.1 End User View

Routing Tables are intended to be transparent to the end user. When their sets are programmed correctly, end users are able to dial a number that looks like any other Norstar DN, but can be routed over the network. There are several instances where the transparency is not preserved. (Refer to "Transparency Exceptions" on page 4).

While the user is dialing a remote DN into dial tone, the display does not display the line pool employed, nor does it display the digits outputted. Only the user's input is displayed.

1.2.2 OAM Programming View

1.2.2.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item	Item	I	SC+	SC
Services	Routing service	Routes	X		
		Dest codes	X		

1.2.2.2 Programming Routing Table

See "Services - Routing Service - Routes" and "Services - Routing Service - Destination Codes".

The user's model of the Routing Table is intended to be similar to that of tables as illustrated below.

Route Number	Facility to use	Translated Digits
001	Pool A	6-342-6785
032	Pool B	763-0000 W ^a 32
033	Pool B	1-401-591-33
104	Pool C	726-1234 W 814
131	Pool C	591-0262

a. Dial Tone Detection and Pause are supported.

DestCode	Route to Use						
Schedules ->	Norm	1	2	3	4	5	6
321	001	-	-	-	032	033	104
37	002	-	-	-	121	023	078
72	112	-	-	112	113	113	113
131	101	-	-	101	102	102	101

A dash indicates that no route has been assigned to the mode for that Destination code.

Programming routing involves three separate but related activities

- defining the routes (the resource used and the dialout digits for each route number)
- creating a translation table that defines which route is used for each Destination code and service schedule
- defining the scheduled services (what services apply at each time period for each day)

The third activity, defining the scheduled services, is discussed in the Scheduled Services (Routing Services) feature.

The `Destcode` prompt provides access only to Destination codes that are already defined. To add a new Destination code, press the `ADD` display key. To change a Destination code, the user must first clear (`CLR`) it, and then add (`ADD`) the new Destination code. Up to seven digits can be entered at the `DestCode:` prompt. Only valid digits (digits that make up an existing Destination code) are accepted. Invalid digits are ignored. As soon as a complete Destination code has been entered, the interface goes to the `DestCode:xxxxxxx` prompt. (Likewise, when entering an added route, only digits that would form a valid Destination code are accepted.) Others are ignored. The `OK` display key appears only when a valid new Destination code is entered.

A Pause (`Feature` `7` `8`), or Dial Tone Detection (`Feature` `8` `0` `4`) can be entered at any time for dial-out digits only. When the `Feature` key is pressed, the letter `F` appears. Only acceptable feature codes are accepted, and, once the feature is fully entered, it is replaced with the feature symbol.

Once entered, new Destination codes are placed into the table, sorted on the left-hand digit(s), as illustrated below:

First 0000000

1

2099

21

221

222

Last 9999999

1.2.2.3 Wildcard character

Destination codes can be programmed is enhanced with a wildcard character (*). When programming destination codes, the user is presented with an `ANY` softkey. Pressing this softkey inserts a wildcard into the destination code to represent the digits 0-9 except for those already programmed as a destination code. This wildcard is intended to be used only as the last digit of the destination code.

For example, in order to route calls to 01394 XXXXXX and 01395 XXXXXX via route 5 and calls to 01391 XXXXXX, 01392 XXXXXX, 01393 XXXXXX, ..., 01399 XXXXXX via route 3, the routing table can be set up as follows:

Destination Code	Route
01394	5
01395	5
0139*	3

If the above example had been programmed without the wildcard entry, ten destination codes would have been required.

1.2.3 **EXTN/LINE**

N/A

1.3 Technical Specification (Limits/Constraints)

A total of 999 routes and 500 Destination codes can be defined for the tables. This allows for a mapping of area codes (as Destination codes) to a variety of routes, each with its own call charge rates for Least Cost Routing implementation. (For details, see the Scheduled Services (Routing Service) feature description.)

Destination codes must be between one and seven digits in length. At least one digit must be different between Destination codes and any other identifier. The digit that differs can be in any ordinal position, but it must be explicit. The following example uses DNs to illustrate this rule.

It is possible to support all of the following, simultaneously:

- DN = 3221
- Destination code = 3222 (where no DN 3222x exists)

(where x is zero, or any number of digits, of any value)

- DN = 3223
- Destination code = 33 (where no DN 33x exists)
- DN = 3411
- Destination code = 342 (where no DN 342x exists)

The following pairs are not accepted:

- DN = 222 and a Destination code = 22
- Direct-dial digit = 9 and a Destination code = 9x

1.3.0.1 Transparency Exceptions

- Incoming and outgoing calls across the private network are external calls. The only features or capabilities that are supported on the local Norstar for outgoing private network calls are dialing, Autodialers, LNR, SNR, Enhanced Transfer, Selective Line Redirection, External Transfer from Conference, Line Pool access.
- Under certain configurations, if the user pauses immediately after specifying the Destination code portion of a remote DN, and before dialing any subsequent digits, dial tone is delivered from the remote system.

1.4 Interactions

Feature name	Interaction
Autodialers Last Number Redial (LNR) Saved Number Redial (SNR)	Digits contained in these buffers are passed through the Routing Tables at dial time. Remote private network DNs must be programmed onto external Autodialers.

Feature name	Interaction
Call Forward (outgoing) Call Pickup Priority Call (incoming or outgoing) Receive Message Ring Again (outgoing) Send Message Voice Call (incoming or outgoing)	Call Forward (outgoing), Send Message, and Receive Message do not work across the network, nor does Ring Again (outgoing), Priority Call (incoming or outgoing), Voice Call (incoming or outgoing), and Call Pickup for calls ringing at the remote node. Should their use be attempted, appropriate Error tones or messages are provided.
Flexible Numbering Plan: Direct-dial digit Call Park Line Pools External Line Access Change DN, DN Length	<p>The Destination code cannot conflict with the</p> <ul style="list-style-type: none"> - Direct-dial digit - Call Park prefix <p>It also cannot conflict with the first digit of:</p> <ul style="list-style-type: none"> - a line pool access code - an External Line access code - a DN <p>For more information on programming interactions, refer to the Flexible Numbering Plan specification.</p>
Call Restrictions and Overrides	Digits outputted on CO lines are passed through restrictions. Only those digits being outputted are checked. Routing digits that are not transmitted are not checked.
Direct-dial	Network Direct-dial can also accept a network DN.
Discriminating Ring Cadence	Network calls alert with external cadence.
Hotline	A network DN can be entered as an external Hotline destination.
Line appearance	If the users have appearances of the lines accessed by Routing Tables, the call moves to those lines, even if the number was dialed into intercom.
Line Pools	Users may be prevented by line pool access restrictions, or by dialing restrictions (possibly only at certain times of day), from dialing network DNs. If the Routing Table cannot deliver a pool (for example, because it is programmed for Prime Line and Prime Line is <code>None</code> , or is <code>Linexxx</code>), attempts to program <code>Feature 6 4</code> onto a key, or dial it into dial tone are met with the message <code>Denied in admin</code> .
Remote Access	<p>If a route is programmed to use Prime Line, remote access users of that route are always given the lowest lettered line pool they have access to. A route that is programmed to be <code>Transmitted</code> is transmitted on the facility once it is identified.</p> <p>Remote access calls using Destination codes in routing to place outgoing calls are subject to same schedules and route selections as normal outgoing calls on routing.</p>
Ring Again	Blocked if a network call is busy.
Selective Line Redirection (SLR)	Selective Line Redirection asks for explicit entry of the outgoing facility, and displays it transiently. An intercom key, plus the regular destination digits identify the facility.
Speed Dial	Speed Dial digits are passed through the Routing Table at dial time.
Transfer	Network DNs can be dialed for Transfer.

Saved Number Redial

1.1 Overview

1.1.1 Description

Saved Number Redial (SNR) allows the user to save the digits dialed on an outgoing external call, so that they can redial the number later.

1.1.2 Rationale for Feature

See “1.1.1 Description”.

1.1.3 General Definitions

Term	Explanation
LNR	Last Number Redial
SNR	Saved Number Redial

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls

Feature 6 7 or Saved Number Redial programmed key

1.2.2 End User View

When the feature is activated, the action performed (saving or dialing) depends on the telephony state of the user's set.

When a user activates SNR while active on an outgoing external call, the number is stored. If the user activates SNR while idle or on at an external dial tone, the saved number is dialed.

The SNR buffer will only hold one number, ranging from 1 to 24 digits in length.

Calls made with SNR do not provide audible dialing feedback.

1.2.2.1 Saving a Number

If activated on an outgoing external call for which digits have been dialed, the feature stores the dialed number in a 24-digit buffer. The contents of the SNR buffer are the same as the Last Number Redial contents (see the Last Number Redial feature). The number is available, regardless of the means by which it was dialed, Manual Dial, Speed Dial, or Autodial key, with the exception that the numbers from named System Speed Dialers cannot be copied to the SNR buffer, and therefore cannot be redialed using SNR.

1.2.3 Message Displays

Message	Description
Number saved	Displays transiently when a number is saved.

Message	Description
No number saved	Displays transiently, accompanied by Error tone, if the set is active on an internal call or on an incoming external call, and the user tries to activate SNR.
Hidden number	This message is displayed along with Error tone when a user attempts to save a named System Speed Dial sequence to the SNR buffer.

When more than one external line is in use on the set at one time, Saved Number Redial stores the most recently dialed number, regardless of the line on which it was dialed. That is, the set does not store the most recently dialed number for each line. For example, if the user dials digits on external line A, and activates the Saved Number Redial feature, and then dials on external line B, and activates the Saved Number Redial feature, only the digits associated with line B will be stored in the Saved Number Redial Buffer. If the user reselects line A and, before dialing any digits, activates the Saved Number Redial feature, the digits dialed on line B and saved, are dialed.

This feature does not save digits for internal calls. The feature cannot save digits for incoming external calls, as the caller's number may not be known.

SNR stores the line pool access code or the external line access code as part of the predialed number. When SNR is activated, external line access codes are displayed together with the other digits, but line pool digits are not displayed

1.2.3.1 Dialing the Saved Number

If the line is selected before dialing begins, that line is used. Otherwise, the line stored with the Redial sequence is accessed.

If no line is stored or no line is selected before dialing, SNR attempts to select the Prime Line automatically.

SNR is a special case of Autodialer, and supports the same features as external Autodialers. (For more information, refer to Autodial-External.)

When programming an External Autodial sequence, the user can press the LNR or the SNR key. (For more information on Last Number Redial, see the specification of that name.)

If the user activates Saved Number Redial while the set is idle, the set attempts to perform Automatic Outgoing Line Selection. If this succeeds, the set dials the Saved Number on the selected line.

1.2.4 Message Displays

Message	Description
<digits>	Displays the digits of the Saved Number unless the number was generated from a named Speed Dial key.
No saved number	Appears if no external number has been saved since the last cold System Startup.

Message	Description
In use: <setname>	Displays transiently, accompanied by Error tone, if the user attempted Automatic Outgoing Line Selection, and the line used when the call was originally made is in use by another user. Select a line and activate SNR again.
Saved number SHOW OK	Transient display when Key Inquiry is activated. To view the stored dialing information, press the SHOW display key.
<linename>...	When the SHOW display key is pressed during Key Inquiry, the linename of the line on which the call was made is transiently displayed.
...<last number digits>... -<VIEW-> OK	Follows <linename> as displayed during Key Inquiry. Displays the dialing sequence associated with SNR Redial key, unless the number is hidden (See Hidden number). If the dialing sequence contains more than 16 characters, the VIEW display key is presented.

1.2.5 User Programming View

The user can program a Saved Number Redial key. This key does not use an indicator.

1.2.6 OAM Programming View

N/A

1.2.7 **EXTN/**LINE

N/A

1.3 Technical Specification (Limits/Constraints)

Saved Number Redial digits are stored in NVRAM and are saved over power interruptions.

1.4 Interactions

Feature name	Interaction
Autodial - External	SNR can be used to program an external autodialer.
Call Log	Calls dialed from the Call Log can be captured in the Saved Number Redial buffer.
* , # PBX Reach Through Pause Recall Run/Stop Time Release	Special keys * , # , and PBX Reach Through codes can be stored in the Saved Number Redial buffer. Reachthrough code digits are immediately replaced with the appropriate symbol.
Direct-dial	SNR stores the Direct-dial digit if it is for an external destination.
Dial Pad Feedback	Calls made by Saved Number Redial do not provide audible dialing feedback to the user.

Feature name	Interaction
Dialing Options	If Automatic Dialing is in progress but not completed, activating SNR will save the digits dialed to that point. If Predial is used, SNR replaces the digits until a line gets picked up; after which, activating SNR will save the dialed digits.
End-to-End Signaling (Long Tones)	The End-to-End Signaling (Long Tones) feature code is not captured by Saved Number Redial. Saved Number Redial sequences do not generate End-to-End Signaling on external lines, because there is no way to determine the length of the tone for each digit. If Last Number Redial is activated while the telephone is in End-to-End Signaling mode, that mode is canceled. The telephone reverts to its previous signaling mode (pulse or short tones), and sends out the stored digits using that mode.
Expensive Route Warning	When the SNR buffer is for an external Direct-dial destination, only the Expensive Route Warning Tone is provided. The normal transient display is not shown.
Incoming Call Information	Incoming Call information data can not be used for Saved Number Redial.
Routing Tables	Last Number Redial (LNR) and Saved Number Redial (SNR) work for calls across the private network just as they do for other external calls, even though transparency would dictate that such calls would be treated like internal calls (LNR and SNR do not work for internal calls). If a user uses Key Inquiry to determine the digits stored, digits dialed on the outgoing trunk are displayed. Routing Digits that were not transmitted are not displayed.
Selective Line Redirection	The digits stored in the Saved Number Redial buffer can be used for programming Selective Line Redirection.
Extension Administration Lock	When Extension Administration lock is <code>Full</code> for a given set, the user is prevented from activating Saved Number Redial.
Signaling mode	The signaling mode (pulse (DP) or tone (DTMF)) on an external line is determined by the line, and not by the mode used when the last number was saved.
Speed Dial	If Saved Number Redial is activated during the programming of a Speed Dialing sequence, the number stored in the Redial memory key is appended to the current digits of the Speed Dial programming. If not enough space is left in the 24-character limit to append the number stored in the Redial memory key, as many characters as possible are appended. If the Redial key is pressed, and no number is stored in the key, the transient message <code>No number stored</code> displays, together with Error tone.
System Speed Dial	Numbers from System Speed Dialers can be saved to the SNR buffer except for named System Speed Dialers. If the user attempts to save a named System Speed Dialer, they are presented with Error tone and the transient message <code>Hidden number</code> .
Transfer	Saved Number Redial can not be used to specify the destination of a Transfer.

Scheduled Services

1.1 Overview

1.1.1 Description

Scheduled Services provides three independent services or applications that reference a system-wide schedule

- Ringing Service
- Restrictions Service
- Routing Service (Least Cost Routing)

Scheduled Services supports four tasks, the first three of which are common to all Scheduled Services

- setting up a name for each of the six schedules
- defining the start/stop times for the six schedules, seven days a week
- assigning lines and extensions to Control Extension
- programming the parameters individual to each of the services

This specification contains a brief overview of Services and instructions for programming the common tasks. The service-specific tasks are described in the individual specifications for these Services.

1.1.2 Rationale for Feature

Customers require the ability to control unauthorized calls by changing the dialing restrictions after hours, on weekends and on holidays. The Scheduled Services feature enables Norstar to provide customers with a basic, yet flexible, restrictions feature, and a routing feature (to achieve Least Cost Routing), in addition to ringing service.

1.1.3 General Definitions

The following table shows the term in previous releases and the term in Norstar Plus.

Term under old Norstar OAM	Term in Norstar Plus
Service Modes	Scheduled Services
Alternate Restrictions Service	Restrictions Service
Extended Ringing Service	Ringing Service
Routing Service, Least Cost Routing	Routing Service
mode	schedule

Terms Specific to Scheduled Services

Term	Definition
Control Extension	Extension from which Scheduled Services are activated, cancelled, or modified. Defined in OAM Programming.

Terms Specific to Scheduled Services

Term	Definition
Extra-Dial Extension	Abbreviation for Extra Direct-Dial extension.
Schedule	One of six time frames within which a service operates. The schedules are: Night, Evening, Lunch, Sched 4, Sched 5, and Sched 6. Each schedule can have start and stop times set for it in OAM Programming.
Service	An application that can be applied to an extension or a line. Routing Service, Restrictions Service, and Ringing Service can be applied to extensions. Only the first two services can be applied to lines.

1.1.4 General Procedures

Ringing Service is a feature based on Scheduled Services that allows additional extensions to ring for incoming calls on external lines. It is also possible to activate Trunk Answer From Any Station, an Auxiliary Ringer, and an Extra-Dial Extension for each schedule.

Restrictions Service is a feature based on Scheduled Services that applies different restriction tables to calls depending on the schedule (for example, Normal, Night, Evening, Lunch, and so on) the service is in. In its common application, the service operates automatically to provide the customer with Time-of-Day-Restrictions (TDR). For example, from 8:00 a.m. to 5:00 p.m., most toll calls can be permitted. However, from 5:00 p.m. to 8:00 a.m. the next day, toll calls can be restricted. Alternatively, the customer can select other restriction schedules manually by activating the Scheduled Services feature code from one of the Control Extensions.

Routing Service is a feature based on Scheduled Services that permits the allocation of different routes for different destination codes depending on the time of day and day of week. This allows the customer to achieve Least Cost Routing (LCR) based on time of day and day of the week. In its most practical form, Routing Service uses its own independent set of schedules, so as not to interfere with start and stop times for schedules in other services.

The following figures and tables illustrate the model and the generic structure for schedules and services.

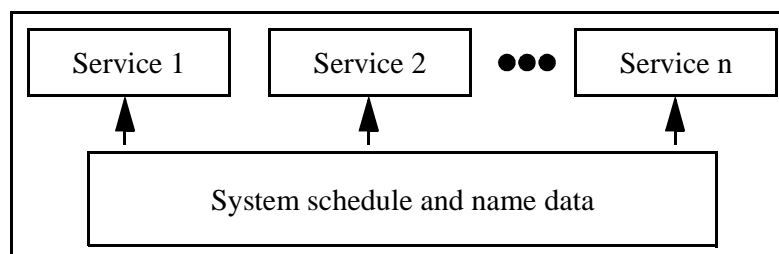


Figure 1-1: Conceptual structure

Generic structure for setting up schedules

Schedule	Name	Start	Stop
1	Night	23:00	07:00
2	Evening	17:00	23:00
3	Lunch	12:00	13:00
4	Sched 4	00:00	00:00
5	Sched 5	00:00	00:00
6	Sched 6	00:00	00:00

Generic structure for a service

Schedule	Operation	Parameter 1	Parameter 2	Parameter 3...
n	Auto/Manual/Off	Setting	Setting	Setting
n	Auto/Manual/Off	Setting	Setting	Setting
n	Auto/Manual/Off	Setting	Setting	Setting

1.2 Feature Details**1.2.1 Controls**

Feature 8 7 0 for Show Scheduled Services

To activate:

Feature 8 7 1 for Ringing Service

Feature 8 7 2 for Restriction Service

Feature 8 7 3 for Routing Service

or programmed keys

To cancel:

Feature # 8 7 1 cancels Ringing Service

Feature # 8 7 2 cancels Restrictions Service

Feature # 8 7 3 cancels Routing Service

or toggle the appropriate programmed key.

1.2.2 User View

Scheduled Services can be set in OAM Programming to

- operate automatically (auto-activated by the Start and Stop times)
- be activated from a designated Control Extension (manual)

- not operate (Off)

1.2.2.1 Control Extensions

A Control Extension is the extension from which Scheduled Services are activated, canceled, or modified.

Scheduled Services has two types of Control Extensions

- one that controls ringing, restrictions, and routing services for lines
- one that controls restrictions and routing for extensions

The same extension can be programmed to be both a Line Control Extension and an Extension Control Extension. Single-line display extensions can be Control Extensions.

A Line Control Extension accepts the following feature codes

Feature Ringing Service

Feature Restrictions Service

Feature Routing Service

Extension Control Extensions accept only

Feature Restrictions Service

Feature Routing Service

For more information see “1.2.5.3 Programming Control Extensions” and

[See "Services -Common Settings - Control Extensions".](#)

Status Displays at Control Extensions

A background display message indicates when one or more Scheduled Services have been activated. Only the schedules that are On are displayed. A LIST display key allows the user to determine which schedules are On.

Attention tone is not provided when a schedule takes effect, whether it is activated automatically or manually.

1.2.3 Message Displays

Message	Description
Denied in admin	Appears transiently, accompanied by Error tone, if an extension other than an appropriate Control Extension attempts to activate any of the Scheduled Services feature codes. Also appears if a valid Control Extension enters a Scheduled Services feature code, but all six schedules are set to Off.
Services ON LIST	Background display if one or more Scheduled Services have been activated. LIST allows the particular schedules currently in effect to be viewed.

Message	Description
Both services ON	Display indicating that both Ringing Service and Restrictions service are activated
<Sched> <service>	Display indicating that a particular Service is currently in effect, where <Sched> is the schedule name <service> is the service name
<Sched> <service> QUIT OK NEXT	Appears at a valid Control Extension in response to the feature activation code or programmed key. Allows the user to activate this service manually, or scroll to another service.
<Sched> until * QUIT OK NEXT	Appears at a valid Control Extension while the user is browsing the available schedules (after they have selected the service at the <Sched> <service> prompt). Indicates that if selected, the schedule is in effect until the next automatic schedule starts.
Expensive route	Three-second transient message display, accompanied by Expensive Route Warning tone, when overflow to a Normal route occurs.

1.2.3.1 Direct-Dial Extensions

Direct-Dial Extensions are permitted to activate ringing Service (Feature 8 7 1) to redirect calls to the Extra-Dial Extension. No other action is taken unless the Direct-Dial Extension has also been programmed to be a Control Extension.

Activation of Ringing Service at a Direct-Dial Extension differs from activation at a Control Extension. When Ringing Service is activated at a Control Extension, all settings associated with the selected Ringing Service take effect (TAFAS, Extra-Dial, Ringing extensions, Auxiliary Ringer). When Ringing Service is activated at a Direct-Dial Extension, ringing is extended to the Extra-Dial Extension (if assigned), but none of the other settings associated with the selected Ringing Service take effect.

If the Direct-Dial Extension is also a Control Extension and not a Line Control Extension, both Feature 8 7 1 and Feature 8 7 2 can be entered, however, Feature 8 7 1 only redirects calls to the Extra-Dial Extension, and does not activate Ringing Service.

1.2.3.2 Use of Passwords For Restriction and Routing Services

For security reasons, Restrictions and Routing Services require a password, which is entered using the Control Extension following a user interface mechanism similar to that used by the Call Log feature. The following table shows the password levels required.

Task	Password Level
All changes	Installer or System Coordinator Plus
Activating the features	Installer or System Coordinator Plus
Canceling the features	Installer or System Coordinator Plus or System Coordinator

Ringing Services does not require a password.

1.2.3.3 Call Restrictions and Restrictions Service

Norstar users

At any point in time, one dialing filter is in effect for each line and one for each extension (the extension filter or the line/extension filter). The system checks what Restrictions Service is in effect and uses the filter assigned to the extension and line for that service.

For more information on dialing filters, refer to the Call Restrictions and Overrides specification.

To make outgoing calls, the end user can use their COS password at any time to replace the extension or the line filter for the Restrictions Service in effect.

Remote users

Remote users are also subject to restrictions. This provides the same capability as Restrictions Services for extensions, managing what may be dialed through the system. In a tandem situation, the filter for the outgoing line applies.

As with local users, a remote user's COS password is associated with a filter. For details, refer to the Class Of Service feature.

1.2.3.4 Overflow and Expensive Route Warning Tone (ERWT)

A call originating from an extension for which a Scheduled Service is activated overflows to the Normal route, if the route assigned for the currently active Scheduled Service is busy and the following conditions are true:

- the value for `Overflow` is set to Y (Yes) for the given Service in OAM Programming
- a free line is available in the Normal route
- the caller's extension has access to the Normal route

Once the digits are dialed on the expensive route, restrictions may not be passed for the call.

At the point that the route for currently active Service is determined to be busy, the digits are dialed using the Normal route and the caller is presented with expensive route warning tone (ERWT).

ERWT is provided as three bursts of 440 Hz at -23dB. The sequence of bursts is 300 ms on, 200 ms off, 200 ms on, 200 ms off, 200 ms on.

Because ERWT is not a standard tone, a transient message is used to identify the tone as ERWT ("Three long beeps means a more expensive call.")

ERWT is supplied:

- over the handset if the user is on the handset
- over the speaker if the user is on handsfree
- over the headset if the user is on the headset

To avoid incurring increased expense for the call, the user can choose to release it.

Overflow is not available on tandem calls, or on incoming calls redirected by Selective Line Redirection; therefore ERWT is not given on these calls.

1.2.3.5 Activating a Service Manually

To activate Ringing, Routing, or Restrictions Service manually, proceed as follows.

1. Press the appropriate feature code or the programmed key.
2. Enter the Installer or System Coordinator Plus password at the `Password:` prompt. (This step is not required for Ringing Service.)
3. Press `NEXT` to step through each available schedule.
4. Press `OK` to select the schedule, or press `QUIT` to exit the feature without making any changes.

While viewing the schedules, proceed as follows

- To override service schedules set to automatic, press `<Schedule>` until an asterisk (“*”) appears. This indicates that the selected schedule overrides the currently set automatic schedule only. When the next automatic service is set to start, the automatic schedule will resume.
- If a schedule is Off, it is not shown at the Control Extension. Press `NEXT` to skip to the next available schedule.

For the key (hard key) mappings, refer to “1.3 Technical Specification (Limits/Constraints)”.

1.2.4 User Programming View

Each of the feature codes for activating a service manually can be programmed onto a key. The programmed key toggles the service On and Off.

When programmed onto a key/indicator pair, the indicator is On when the feature is active. (This also applies to BLF/dual-memory key/lamp pairs for M7310 extensions.)

1.2.5 OAM Programming View

1.2.5.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes

Heading	Item				I	SC+	SC	
Services	Ringing service	Ringing groups	COPY (softkey)		X	X		
			Ring grp 01	Extn #:Assigned	X	X		
			Ring grp 02	Extn #:Assigned	X	X		
				Extn #:Unassign	X	X		
		Night sched	Service:Off		X	X	X	
			Trunk answer:Y		X	X		
			Extra-dial:Extn #		X	X		
			Line settings	COPY (softkey)		X	X	
				Linenn	Ring grp:nn	X	X	
					Aux. ringer:N	X	X	
		Restrtn service		Night sched:Off			X	X
			Evening sched:Off			X	X	X
			Lunch sched:Off			X	X	X
	Sched 4 sched:Off			X	X	X		
	Sched 5 sched:Off			X	X	X		
	Sched 6 sched:Off			X	X	X		

Heading	Item					I	SC+	SC
Services	Routing service	Routes	Rte <i>nnn</i>	DialOut: <i>nnnnnnnn</i>		X	X	
				Use:Pool A		X	X	
		Dest codes	DstCode <i>nnnnnnnn</i>	Normal rte: <i>nnn</i>	AbsorbLength:All	X	X	
				Night rte: <i>nnn</i>	AbsorbLength:All	X	X	
				Evening rte: <i>nnn</i>	AbsorbLength:All	X	X	
				Lunch rte: <i>nnn</i>	AbsorbLength:All	X	X	
				Sched 4 rte: <i>nnn</i>	AbsorbLength:All	X	X	
				Sched 5 rte: <i>nnn</i>	AbsorbLength:All	X	X	
				Sched 6 rte: <i>nnn</i>	AbsorbLength:All	X	X	
				Night sched	Service:Off		X	X
		Overflow:N			X	X		
		Evening sched	Service:Off		X	X	X	
			Overflow:N		X	X		
		Lunch sched	Service:Off		X	X	X	
			Overflow:N		X	X		
		Sched 4 sched	Service:Off		X	X	X	
			Overflow:N		X	X		
		Sched 5 sched	Service:Off		X	X	X	
			Overflow:N		X	X		
		Sched 6 sched	Service:Off		X	X	X	
			Overflow:N		X	X		

Heading	Item				I	SC+	SC
Services	Common settings	Control Extensions	For lines	Linenn: <i>Extn #</i>	X	X	
			For extensions	<i>Extn #.Extn #</i>	X	X	
		Schedule names	Sched 1:Night		X	X	
			Sched 2:Evening		X	X	
			Sched 3:Lunch		X	X	
			Sched 4:Sched 4		X	X	
			Sched 5:Sched 5		X	X	
			Sched 6:Sched 6		X	X	
		Schedule times	Monday sched	COPY (Softkey)		X	X
				Night sched	Start time:22:00	X	X
					Stop time:07:00	X	X

1.2.5.2 Programming Scheduled Services

[See "Services".](#)

OAM Programming for Scheduled Services includes:

- programming common settings (shared parameters)
 - Control Extensions
 - Schedule names
 - Schedule times
- programming the parameters specific to each Scheduled Service

1.2.5.3 Programming Control Extensions

Programming of Control Extensions is completely flexible, permitting multiple Control Extensions, each of which is able to control a unique group of lines or extensions.

[See "Services -Common Settings - Control Extensions".](#)

Control Extensions are entity-based. A line or group of lines can be assigned to a Control Extension, which can then activate

- Ringing Service (Feature)
- Restrictions Service (Feature)
- Routing Service (Feature)
- or all three

for the assigned lines.

Following this, an extension or group of extensions can be assigned to a Control Extension, which can activate

- Restrictions Service (Feature)
- Routing Service (Feature)
- or both

for those extensions. This capability is needed because lines and extensions have a unique set of dialing restrictions.

Both lines and extensions can be assigned to the same Control Extension, as in the case of the start-up default, extension 221 (Compact Plus) or 221 (Modular Plus).

This structure permits independent control of line and extension restrictions.

1.2.5.4 Naming the Schedules

[See "Services -Common Settings - Schedule Names".](#)

Services▶Common settings▶Schedule names▶Sched 1:Night. Press the CHANGE softkey.

1.2.5.5 Setting Schedule times

[See "Services -Common Settings - Schedule Times".](#)

Please refer to “figure 1-2 Overlapping automatic Scheduled Services” on page 11., an example of how automatic schedules overlap, shows only three schedules (plus Normal), up to six schedules plus Normal service can be used. A service continues until another one starts. When this additional service completes, the previous service resumes.

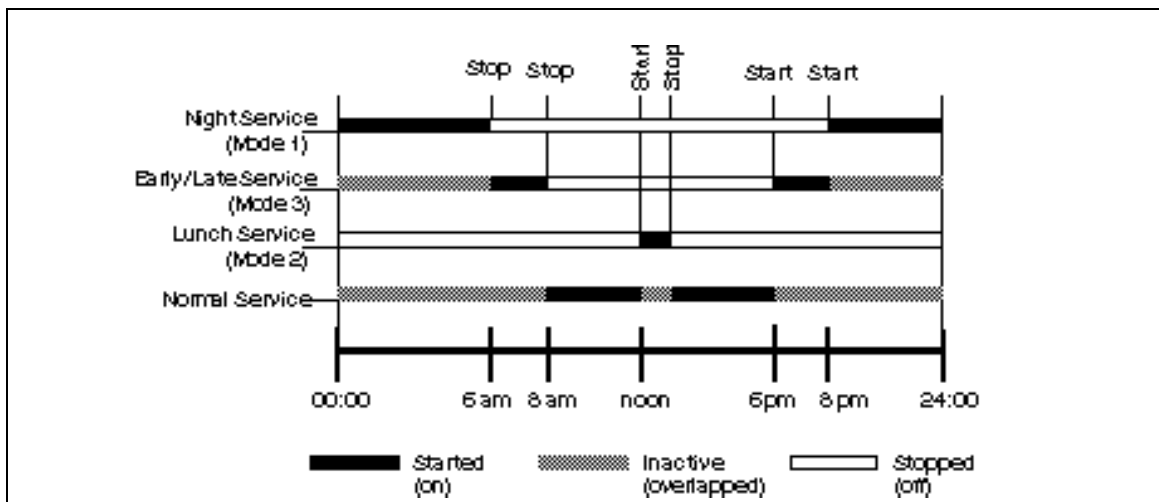


Figure 1-2: Overlapping automatic Scheduled Services

A service can be in only one schedule at a time. If schedules overlap, certain adjustments are made to prevent conflict.

If two Scheduled Services overlap, the service with the earlier start time is adjusted to remove the overlap. Consider the following example (Please refer to “figure 1-3 Overlapping Scheduled Services-1” on page 11.).

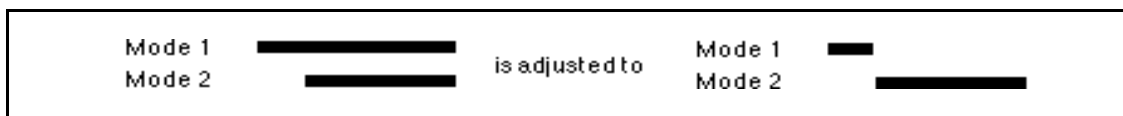


Figure 1-3: Overlapping Scheduled Services-1

Sched 1 was the one adjusted, because it started first.

Similarly, consider the following example (Please refer to “figure 1-4 Overlapping Scheduled Services-2” on page 11.).

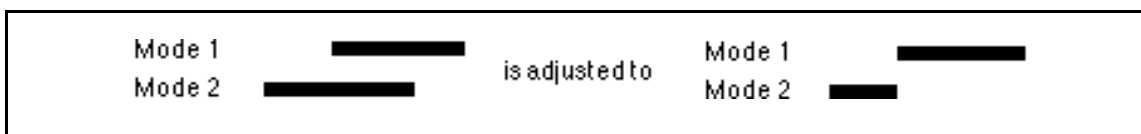


Figure 1-4: Overlapping Scheduled Services-2

Sched 2 is the one adjusted, because it started first. This covers all cases except the following (Please refer to “figure 1-5 Overlapping Scheduled Services-3” on page 12.).

1. Two schedules have the same start time:
The longer one is adjusted to remove the overlap.

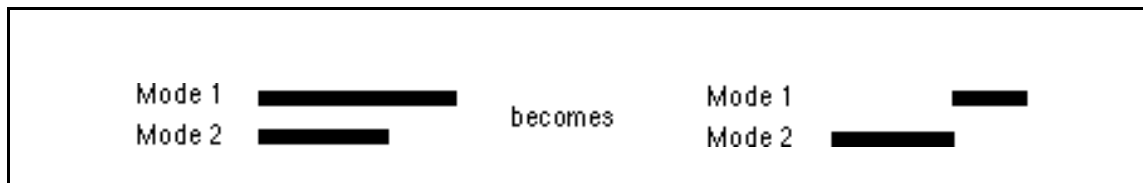


Figure 1-5: Overlapping Scheduled Services-3

2. One service is entirely contained within another:

In this case, no adjustment is required. This includes the case of two schedules with identical start/stop times.

Note that overlap between two schedules is not an issue unless:

- The overlapping schedules are each set to automatic for at least one service.
- There is at least one service in common between those that have the first service set to automatic and those that have the second service set to automatic.

Programming the operation on a service-by-service basis offers the customer increased flexibility. Ringing can operate automatically over the weekend, while Restriction service can be activated from a Control Extension manually, so that it can run in one service over the whole weekend. Routing service can be driven by the availability of discount calling rates.

1.2.5.6 Setting Ringing Service

Ringing service performs two tasks

- sets the operation for each service: Auto, Manual or Off
- sets the parameters for ringing for each line on a schedule-by-schedule basis

Ringing Service is programmed in **Services ▶ Ringing Service**.

To set Ringing Service, perform the following steps.

1. Press **SHOW**. Sched 1 : appears.
2. Press **CHANGE** to select between Manual, Auto, and Off.
3. Press **SHOW** to program the various ringing parameters for the schedule:
 - enable or disable Trunk Answer From Any Station
 - assign an Extra-Dial Extension
 - assign the extensions that ring for each line when the schedule is in effect
 - enable or disable the Auxiliary Ringer for each line
4. Press **NEXT** to move to the next ringing schedule.

Customers may need most of the ringing settings to be the same, with only small variations for different lines. For this reason, a copy function is provided at the **Show line:** prompt.

[See "Services - Ringing Service".](#)

[See "Services - Ringing Service - Ringing Groups".](#)

[See "Services - Ringing Service - Line Setting".](#)

1.2.5.7 Setting Restrictions Service

To program dialing filters (restrictions), refer to the Call Restrictions and Overrides specification. Restrictions Service is programmed to be either Off, Manual, Automatic in `Services►Restrictions Service`.

To set Restrictions Service, proceed as follows:

1. Press NEXT to move to Sched 1:Off.
2. Press CHANGE to select the operational setting Manual, Auto, and Off for the service.
3. Press NEXT to set the operational setting for the next Restrictions Service.

[See "Services - Restriction Service".](#)

1.2.5.8 Setting Routing Service

To use the Routing Service feature of Scheduled Services, a Routing table specifying destination codes and the route to use for a given schedule must be defined. For details on setting up routes, see the Routing Tables feature.

The other parameter associated with Routing Service (Off, Manual, Automatic) is assigned in `Services►Routing Service`.

In addition, overflow can be provided to another route if the normally selected route for a particular schedule is busy. This applies only to Scheduled Services 1 through 6, and the call overflow to the Normal service route for that destination code if the selected route is busy. This overflow feature can be turned On or Off for each schedule with the default being Off (N).

To set Routing Service, proceed as follows.

1. Press NEXT to move to Sched 1:Off.
2. Press CHANGE to select the operational setting Manual, Auto, and Off for the schedule.
3. Press SHOW to see the overflow setting. This value can be toggled between N and Y by pressing CHANGE.
4. Press HEADING or BACK to return to the schedule setting display.
5. Press NEXT to set the operational setting for the next routing schedule.

[See "Services - Routing Service".](#)

[See "Services - Routing Service - Routes".](#)

[See "Services - Routing Service - Destination Codes".](#)

1.2.6 **EXTN/**LINE

N/A

1.3 Technical Specification (Limits/Constraints)

See also the Call Restrictions and Overrides and Routing Tables specifications.

Display key mappings

For single-line display extensions, the Show Scheduled Services feature is accessed so that keys (hard keys) can be used in place of the display keys **LIST**, **EXIT**, and **NEXT**. The Show Scheduled Services feature is accessed by pressing **Feature** **8** **7** **0**.

The display key mappings are:

- **EXIT** maps to **Rls** and cancels **Feature** **8** **7** **0**
- **OK** maps to **Hold**
- **NEXT** maps to the number sign key (**#**)
- **QUIT** maps to **Feature**

The schedule name (for example, **Night**) is displayed as the programmable seven-character name and is left-justified on the display.

1.4 Interactions

1.4.1 Ringing Service Interactions

Feature name	Interaction
Auxiliary Ringer	If the Auxiliary Ringer has been programmed to ring for extensions or lines during Normal service, this ringing continues to operate in the same manner when ringing is in effect. The Auxiliary Ringer can also be programmed to ring only when a Ringing Service is in effect. For more information, see the Auxiliary Ringing feature.
Direct-Dial Extensions	A Control Extension does not affect the extension of ringing for Direct-dial calls unless it is also the Direct-Dial Extension. If an extension is designated as both a Control Extension and a Direct-Dial Extension, activation of Ringing Service at that set affects Ringing Service for the lines that it controls, and for the Direct-dial capability. For more information, see the Direct-dial feature.
Line Appearances	There is no relationship between the lines that appear on a Control Extension and the lines for which it has ringing service responsibility.
Prime Extensions	No relationship exists between Prime Extensions and any aspect of Ringing Service.
Trunk Answer From Any Station (TAFAS)	If the Trunk Answer from Any Station feature is enabled for a Ringing Service, any user can dial the feature code from any set to answer a call ringing on any external line that is in the Ringing Service. For more information, see the Trunk Answer from Any Station feature.

1.4.2 Restrictions Service Interactions

Feature Name	Interaction
Class of Service (COS)	No toll schedule is available. The COS user filter replaces the current dialing service filter in effect. If Restrictions service is imposed while the COS feature is in progress, it does not cancel the COS filter.
Line pools	For consistent operation, all lines in a pool should have the same filters assigned for each restriction schedule.

1.4.3 Routing Service Interactions

Feature Name	Interaction
Analog Terminal Adapter (ATA)	A user at an extension with an ATA hears Expensive Route Warning Tone (ERWT) if there is overflow routing. No transient message is displayed to the user.
Direct-dial	When the Direct-dial destination is external, only the ERWT is provided. There is no transient display.
Last Number Redial	When the LNR buffer is for an external Direct-dial destination, only ERWT is provided. No transient message is displayed to the user. When the LNR buffer is for a named System Speed Dialer, the user sees only the message <code>Hidden number</code> .
Saved Number Redial (SNR)	When the SNR buffer is for an external Direct-dial destination, only ERWT is provided. There is no transient display.
Selective Line Redirection (SLR)	SLR supports Routing tables. SLR uses a facility from the line pool as specified by Least Cost Routing. The redirecting set may not have access to this the line pool.
Transfer	The transient <code>Expensive route</code> display is removed when a transfer agent dials another digit for the transfer destination.

Selective Line Redirection

1.1 Overview

1.1.1 Description

This feature permits redirection of all incoming calls on one or more user-selected external lines to external (only) destinations. Redirection can be performed by any user on any lines with explicit appearances at the set being used.

SLR is an external redirection feature. It cannot be used to redirect to internal destinations, nor to redirect internal calls.

Lines can ring at the IC and not appear on the set. For lines to be redirected they must be selected by pressing the line key. Therefore, it is not possible to redirect a line that rings without an explicit appearance.

SLR is enhanced for use with digital lines and operates in conjunction with NCD.

Diversion by SLR takes precedence over diversion by CFAC. An SLR line cannot be diverted by CFAC. If the call arrives on an extension with SLR programmed, a ring splash will sound (if programmed).

1.1.1.1 Sets, systems, and hardware supported

Sets must have explicit line appearances, and only those lines appearing on the set can be redirected. Intercom lines cannot be redirected.

M7100 sets, ISDN terminals, portable telephones and the ATA are not supported because they do not have explicit line appearances.

1.1.2 Rationale for Feature

The feature permits redirection of all incoming external calls on a line (or lines) that the user has selected to be redirected. The user can specify that incoming calls on different lines go to the same external destination or, by activating the feature more than once, to different external destinations.

This feature provides different functionality than the existing call forward features. The call forward features do not allow for selective forwarding of calls. All internal and external calls arriving at a set are forwarded. In addition, forwarded calls can only be forwarded to internal destinations.

Possible usage scenarios include the following:

- redirecting the Sales line to Bill's home, and the Customer Inquiries line to John's home in the evening
- redirecting a line home after hours
- redirecting some of the Sales lines to a remote branch office
- redirecting all the Sales lines to the west-coast office after hours

1.1.3 General Definitions

N/A

1.1.4 General Procedures

To activate the feature, the user first specifies an outgoing facility to which incoming calls are to be redirected, followed by the destination to which the incoming calls are to be routed using that specified facility. Then, the user specifies which line(s) receiving incoming calls are to redirect calls to that external destination.

When activating the feature, either by pressing `Feature` `8` `4` or a programmed key, the user performs the following steps.

- selects an outgoing facility
- enters the destination phone number
- presses the line(s) to be redirected (or presses the ALL display key)

The user performs selective cancellation, either by pressing `Feature` `#` `8` `4` or a programmed key then selecting the line(s) for which redirection is to be cancelled (or presses the ALL display key).

1.2 Feature Details

1.2.1 Controls

`Feature` `8` `4`

`Feature` `#` `8` `4` to cancel

Selective Line Redirection programmed key or Line keys

1.2.2 Message Displays

Message	Description
Feature timeout	Appears transiently accompanied by Error tone if no key is pressed for 15 seconds during activation or cancellation of the feature.
Access denied	Appears transiently, accompanied by Error tone, if the user attempts to activate the feature from an M7100 set.
In use:<SetName>	Appears transiently accompanied by Error tone, if the user attempts to activate the feature while it is in use by someone else.
Select line out QUIT	Appears in response to the user activating the feature by its feature code. QUIT terminates the feature.
Line Redirection QUIT ADD REMOVE	Appears in response to the user activating the feature by a programmed key. QUIT terminates the feature. ADD sends the user to the Select line out prompt. REMOVE sends the user to the Select line(s) prompt.
Linennn... or Line pool X or Intercom	A one second transient message showing the outgoing facility selected in response to the Select line out prompt.
Incoming only	Appears transiently accompanied by Error tone if the user attempts to select an incoming-only facility (for example, a DID or DIA line) from the Select line out prompt.

Message	Description
Enter digits QUIT OK	Appears after the user has selected a valid outgoing facility. QUIT terminates the feature. OK proceeds to the Select line(s) prompt.
Invalid number	Appears transiently accompanied by Error tone if the digits entered do not match either a valid line pool code, or routing code (when line out is intercom).
Select line(s) QUIT ALL	Appears if the user presses the OK display key from the Enter digits prompt without having entered any digits, or the ADD display key from the Line Redirection prompt, provided no lines have yet been successfully redirected. QUIT terminates the feature without making any changes. ALL selects all line appearances at the set for redirection. Also appears in response to Feature # 8 4, or the user pressing REMOVE from the Line Redirection prompt, provided no lines have yet had redirection taken off successfully.
Select line(s) ALL OK	Appears after the user has successfully redirected or taken redirection off at least one line. ALL selects all line appearances at the set for redirection or unredirection. OK terminates the feature, and changes are made.
Outgoing line	Appears transiently accompanied by Error tone if the user attempts to select the previously defined outgoing facility as an incoming line to be redirected.
Redirect denied	Appears transiently accompanied by Error tone if the user attempts to redirect calls from one PSTN line to another.
Redirecting...	Appears while lines are being redirected if the user pressed the ALL display key from the Select line(s) prompt when trying to redirect a line.
x line(s) denied	Pressing the ALL display key returns this message if one or more lines cannot be redirected for the same reasons as the Unequipped line response.
Unredirecting...	Appears while lines are being unredirected if the user pressed the ALL display key from the Select line(s) prompt when trying to cancel a redirection.
Redir by <setname> OVERRIDE	Appears transiently accompanied by attention tone if the user attempts to redirect or take redirection off (unredirect) a line that has already been redirected or unredirected by another user. OVERRIDE allows the user to redirect or unredirect the line, cancelling the other user's redirection or unredirection.
Unequipped line	Appears transiently accompanied by Error tone if the user attempts to redirect a line that cannot be redirected (for example, a PSTN line).
Programmed	Appears transiently if the feature is terminated and changes have been made.

1.2.3 End User View

This feature allows all incoming external calls on specific lines (including DIA lines) to be redirected to external destinations. When a call is being redirected, the two line key indicators involved (incoming and outgoing line) appear solid. When the line is not redirecting a call, the line is available for outgoing use as usual.

The feature can be programmed regardless of the status of the lines involved at the time of programming. That is, lines can be redirected or have redirection cancelled and outgoing facilities specified, even while those lines are in active use.

Allowing the feature to be programmed irrespective of the status of the lines is similar to the Call Forward All Calls feature. This means that using **RLS** during an active call terminates both the call and the redirection feature. The appropriate method for terminating the feature while on an active call is to press **Feature** or the **QUIT** display key. Pressing **Feature** or **QUIT** terminates the feature but does not drop any active calls.

In a similar fashion to Call Forward, the user can be onhook or offhook when programming the feature.

While the feature is being programmed (the user is redirecting or taking redirection off lines), it makes use of the indicators. When the feature code is entered for Selective Line Redirection, or the programmed key is pressed, the indicators for any intercom and external line keys are blanked (their indicators turn off). Indicators that are on for any programmed key(s) before the feature is activated remain on.

Because the feature makes use of the indicators, no call handling status is visible for lines. No visual alerting occurs for incoming calls. Alerting external calls only ring if set in OAM Programming to do so. Incoming calls do not overwrite the display. Thus, the user cannot press a line key to answer incoming calls selectively (even if automatic handsfree is administered at the set). The user can only answer incoming calls by going offhook or pressing the handsfree key, or using the offhook call queuing programmed key.

1.2.3.1 Activating the feature

Lines can be selectively redirected using **Feature** **8** **4**. Redirection can be cancelled on a selective line basis using **Feature** **#** **8** **4**. Pressing a key programmed with **Feature** **8** **4** provides access to both. See the sections below for details.

In all cases in which the user tries to activate or cancel the feature, the system first checks to see if the feature is already in use at another set, since only one user can have access to the feature at any one time. If another user is using the feature to set up or cancel line redirection, the transient message `In use:<SetName>` is provided with Error tone. The feature is not activated.

1.2.3.2 Activating the feature using a programmed key

If the user activates the feature by pressing the programmed key, and no other user is currently accessing the feature, the prompt:

Line Redirection

QUIT ADD REMOVE

is presented. The QUIT, ADD and REMOVE display keys map to the Feature, *, and # keys respectively in the case of non-display key sets.

Following existing rules, these keys can also be used on sets with display keys, as follows.

- If the user selects ADD, the processing continues (from the user perspective) as though the user had dialed Feature 8 4 directly (see below).
- If the user selects REMOVE, processing continues (from the user perspective) as if the user had activated Feature # 8 4 directly (see below).
- QUIT terminates the session, without making any changes.

As previously mentioned, pressing Rls (if any calls are active) terminates the feature programming, and drops any calls. If no calls are active, pressing Rls terminates the feature.

1.2.3.3 Setting line redirection

As previously described, the feature can be activated by means of a programmed key. It can also be activated by Feature 8 4.

When the feature is activated using Feature 8 4, the following message is displayed:

```
Select line out
QUIT
```

Programming proceeds as follows.

1. Norstar waits for an outgoing facility to be identified in any of the usual ways:
 - pressing an external line key
 - pressing an intercom key followed by a valid line pool access code or routing code
 - pressing a line pool programmed key
 - The same rules are followed as are used when the user programs external Autodialers.
 - QUIT or Rls terminate the feature. No changes are made.
 - The line indicator of the selected outgoing facility is not lit when it is selected. This follows the same rule as for programming an Autodialer.
 - At the `Select line out` prompt, the user can also press an external Autodialer. The facility that is stored with the Autodialer is used (an external line or line pool, but NOT the prime line if it is stored by default for the Autodialer). If the line is accessible to the user, the stored digits are used for the redirection destination (as described below). If there are 16 or fewer digits in the dialer, they are all displayed for one second. If there are more than 16 digits in the dialer, the last 15 digits of the dialer, preceded by the '...' ellipsis character are prescribed alone on the display for one second. (Programming of the feature then continues at step 6, below).

- Note that if the user has stored the prime line for an Autodialer (for example the user has pressed their prime line 001 to store with the Autodialer, even though it has been stored by default), the software treats the dialer as if an explicit line was stored with it. In this case, the prime line is used. (Programming of the feature then continues at step 6, below.)

Error Conditions

Pressing an External Autodial key not specifically programmed with an outgoing facility (that is, the Autodialer is programmed with the default of Prime Line) results in Error tone. The user remains at the `Select line out` display. (The line does not default to prime).

If the user presses a line pool programmed key, or an intercom key followed by a valid line pool access code, but no lines are assigned to the line pool, this error is trapped during programming of the feature. Error tone and the transient error message `No free lines` is presented. (This is the same message a user is given if they try to use a line pool that has no lines available, or no lines assigned to it.) The user is then returned to the `Select line out` prompt, so that they can specify another line or line pool. It is much better to trap this error during programming, than when a call is actually being redirected (at which point the redirection attempt would fail, and the system would drop the calls that the user thought were being redirected).

If the user presses a line pool programmed key, or an intercom key followed by a valid line pool access code, but their set is not assigned access to that pool, this error is trapped during programming of the feature. Error tone and the transient error message `Denied in admin` is presented. (This is the same message that a user is given if they actually tried to use a line pool to which they did not have access.) The user is then returned to the `Select line out` prompt so that they can specify another line or line pool.

Pressing any other key that is not part of a valid line-identifying sequence (or that is not a valid way to answer incoming calls) terminates the feature. In this way, the user is not prevented from making outgoing calls or activating other features, if they choose to do so.

Performing an action to answer an incoming call (handsfree, going offhook) when there is no incoming call allows programming of the feature to continue. Because the feature makes use of the indicators, the indicator for the prime line and the handsfree key do not light.

If the user presses the Offhook Call Queuing programmed key when there is no call to answer, the transient message, `No calls waiting`, (associated with the Offhook Call Queuing feature) is given with Error tone. The user can continue programming the Selective Line Redirection feature.

2. Once a valid outgoing facility is identified (by pressing a line key, line pool programmed key, or intercom) the system presents a one second transient prompt `Linennn`, `Line pool X` or `Intercom`, just as in programming an external Autodialer.
3. As with programming Autodialers, the user is then taken to the prompt
`Enter digits`
`QUIT` `OK`
The system waits for digits to be entered.

- QUIT or terminate the feature. No changes are made.
 - If the user presses OK without entering any digits and the selected outgoing facility is a specific line or line pool, the user is taken to the next prompt, `Select line(s)`. Processing continues as step 6, below. This permits a user to redirect lines that do not require a destination number to be entered. For example, a user wants to redirect an E&M trunk to another Norstar system that is set in OAM Programming to answer calls manually on that line.
 - If the user presses OK without entering any digits and the selected outgoing facility is intercom (for entering a route or line pool code), the transient prompt `Invalid number` is presented along with Error tone and the user is returned to the `Select line out` display. This ensures that the call can be routed out of the system.
 - An external Autodialer can also be pressed when `Enter digits` is presented.
 - The line stored with the dialer is ignored and the line selected by the user (as described in step 1 above) is used.
 - If there are 16 or fewer digits in the dialer, they are all displayed for one second. (Programming of the feature then continues at step 6, below.)
 - If the Autodialer has more than 16 digits, the last 15 digits of the dialer, preceded by the '...' ellipsis character are presented alone on the display for one second. (Programming of the feature then continues at step 6, below.)
 - If the outgoing facility is identified by means of an Autodialer (as described previously in step 1), the digits stored in it are used at this stage. The `Enter digits` prompt is therefore omitted entirely, and the interface continues as if the digits were entered and the OK display key pressed. (Programming of the feature then continues at step 6, below.)
4. When the user begins entering digits, the `Enter digits` prompt is replaced by the entered digits plus a cursor (just like programming an Autodialer).
- Whenever there is at least one digit in the display, the BKSP display key is added in the second display key position. It is removed if there are no digits. BKSP is mapped on the volume down portion of the volume bar. Because the volume bar is used for backspacing, if background music or page are active at the set, they are disabled when the user is entering digits. It also means that the volume of an active call cannot be adjusted during digit entry. The following are rules for digit entry:
 - OK maps to in non-display key sets.
 - A maximum of 24 digits are accepted (as with an external Autodialer).
 - Reach-through codes, entered by either the feature code or the programmed key, are permitted.
5. If intercom is selected as the outgoing facility, the system checks to see if the digits being input match a line pool code.
- If a match is detected, the user sees the one second message `Line pool X` transient. The interface proceeds from here as in step 3 above.

- Otherwise, when **OK** is pressed, the system checks to see if the digits match a valid routing code. If so, the interface proceeds as in step 6 below.
 - If the entered digits do not match either a line pool code or routing code, the user is presented with an **Invalid number** transient, and is returned to the **Select line out** prompt. The interface proceeds as in step 1 above.
6. If the call is not restricted, the user is then presented with the following message:
- Select line(s)
QUIT ALL
- QUIT or **RLS** terminate the feature. No changes are made.
ALL has no hard key mapping, and is not available to non-display key sets.
QUIT maps to **Feature**
- Lines can be selected by pressing line keys, or the **ALL** display key.
- If the line was not previously redirected by another set, and no other error condition applies (see below) then the line is immediately redirected. If a redirection attempt is successful, the line indicator stays on for the duration of the feature activation session, or until the user presses the line again during the session to toggle its current redirection status. If the activation is unsuccessful for any reason, feedback tone (Error tone or Attention tone, depending on the situation), is provided and the indicator does not go on.
7. Once one line has been successfully redirected, the **QUIT** display key is removed and an **OK** display key is added, as shown below:
- Select line(s)
ALL OK
- OK maps to the **Hold** key.
8. As described in step 1 above, if the user has chosen a specific line as an outgoing facility (or a line was specified through being stored in a dialer), and the user now chooses that same line (redirecting a line to itself), the transient message
- Outgoing line
- is presented with Error tone. The line key indicator does not light in this case. The user is returned to the **Select line(s)** display with the **ALL** and **OK** display keys if at least one valid line has been pressed. The user is returned to the **Select line(s)** display with the **QUIT** and **ALL** display keys if the invalid line is the first line the user has pressed.
- Due to regulatory requirements, a user cannot directly connect two CO lines together (that is, CO-CO barring is in effect). If the selected incoming and outgoing facilities are both public CO connections, the user sees the transient message **Redirect denied** and is returned to the **Select line(s)** display.
9. Lines can be deselected (unredirected) by pressing the line keys of lines previously selected during the same feature session. The line is changed to unredirected, and the indicator is turned off.

The ALL display key does not toggle the selection status. Whenever pressed it attempts to select all lines at the set (other than the line that the calls are directed out on, if it appears).

10. If the user presses the ALL display key, the message

Redirecting...

is presented while the lines are being redirected. The message indicates that the system is continuing to process the feature. The '...' is three characters long.

The Redirecting... message can be overwritten by other messages (see steps 11 and 12, below). For this reason, the Redirecting... message remains on the display for two seconds when ALL is pressed. After two seconds, the system then begins to redirect lines. A two second time delay gives the user a reasonable amount of time in which to read the display message before it can be overwritten. The user is thereby provided with feedback that the system has started redirection of lines.

If the user presses the ALL display key, the system behaves as if each line key were selected in turn. The user sees each indicator come on, if successful, as the processing takes place. The main difference is that the Redirecting... message appears if ALL is used.

When the last line has been redirected, the Select line(s) (with the ALL and OK display keys) display is presented as usual, (The user can still cancel redirection on the lines, if they wish.) To complete the feature, the user can press the OK display key.

At this point, if the user presses the ALL display key again (that is, a second time during the same feature session), then the system attempts to redirect any lines that are not already redirected (for example, lines that remain redirected by another set). If all lines at the set that can be redirected are redirected, pressing the ALL display key a second (or third time) produces Error tone and the transient message, All redirected. The user is again returned to the Select line(s) prompt. The user should press OK or to terminate programming.

While lines are being redirected, lines that have been redirected by other users are not implicitly overwritten. The Redir by <setname> display (described in the following section) appears, and attention tone is provided for any line redirected by someone else. The user can override the redirect line each time Redir by <setname> appears (as described below). The user can also choose to ignore the messages, and wait until all lines that can be redirected have been redirected. When the user is returned to the Select line(s) prompt (after Redirecting... is complete), they can then override the redirected lines on an individual basis.

11. If the user presses any line key already redirected (it has been redirected in a different session by any other set), or if the ALL operation has tried to redirect the line that has been redirected by any other set, the key indicator does not light, and attention tone is provided. The following transient prompt is presented for that line on which redirection was attempted:

Redir by <setname>

OVERRIDE

<setname> is the name of the set which redirected the line

In the case of non-display key sets (although also supported on sets with display keys), the * key is used for `OVERRIDE`.

The user can override the redirection during the transient display if they choose to do so. If the prompt disappears before they have decided, then pressing the same line key again, shows the `Redir by <setname> display`.

After the `Redir by <setname>` message, the display changes back to `Select line(s)`, or the `redirecting...` (if `ALL` had been pressed by the user and redirection of lines is still occurring)

If the user chooses `OVERRIDE`, the line (which was redirected by a user at another set) is redirected by the current user. The indicator is turned on, and the `Select line(s)`, `Redirecting...` display is presented.

If the line is subsequently deselected, (the user again presses the line whose status they have just overridden), then the indicator goes off, and the line is changed to unredirected.

If another line key is pressed while the transient message `Redir by <Setname>` appears for a redirected line, the already redirected line is not overridden and the operation continues for the last-pressed line key.

12. If the user attempt to select a line that cannot be redirected (for example, an auto answer line) the line key does not light, Error tone is provided, and the following transient display is presented:

`Unequipped line`

The `Unequipped line` message indicates to the user that the system does not support redirection of that type of line for some reason. If the proper type of line is administered, that is, one that is set in OAM Programming for manual answer, the line can be redirected.

13. After the user presses the `ALL` display key and scanning is complete, the three-second transient message `<x> lines denied` is presented if any of the lines can not be redirected because they do not support the feature (same as unequipped line). The display then returns to the `Select Lines(s)` prompt.
14. If the user presses `[Rls]` at any stage, the feature terminates immediately. Likewise, except for during digit entry, `[Feature]` terminates the feature immediately. Lines redirected or unredirected up to that point remain that way.
15. When the user presses `OK`, or `[Hold]`, or after feature timeout occurs, then the feature terminates. Lines redirected or unredirected up to that point remain that way.
16. If lines have been redirected when the feature terminates, the following transient message is presented.
`Programmed`
17. When the feature terminates, the set is restored to its normal state and the indicators are returned to their normal state.
18. Note that when a line(s) is redirected, no message appears on the idle display to indicate that line(s) are redirected. The user can use key inquiry (described later in this feature) to determine if a line is redirected.
19. A DIA lines cannot be used as the outgoing line.

1.2.3.4 Programming Extensions

The User Interface for programming NCD is the same as for ECF.

Different types of Call Forward are available depending on the extension being programmed. Programming an extension to forward calls externally requires the user to enter a destination code or line pool number, in addition to the external phone number. Therefore, care should be taken to identify your network line types and record the available codes and line pools.

You can program the functions:

Norstar—NCD functionality in CFAC, CFB and CFNO is supported on Norstar M72XXX extensions.

ISDN—NCD functionality in CFAC and CFNA is supported on ISDN terminals. CFB and SLR are not supported on ISDN.

Cordless handsets—NCD functionality in CFAC, CFB, and CFNA is supported on cordless handset extensions. SLR is not supported on cordless handsets.

1.2.3.5 Enhanced Caller ID

When a Norstar extension with Call Line Identifier (CLID) set receives a redirected call due to NCD, the user will see the DN for the Calling Number. This is followed by a “>” and the redirecting number. This is displayed for as long as the call is active (alerting or answered) at that set.

If the alerting extension is not the CLID extension for that line, the line appearance can be pressed to briefly display the information. Pressing **Feature** **8** **1** **1** or **INFO** while the call is active invokes Call Info. Call Info on DPNSS displays the redirecting number and the reason for the redirection.

When Norstar requests that an incoming call be redirected by the distance network, Norstar does not inform the network of the redirecting DN. In this case, the diverted-to party will not see the diverting party DN.

1.2.3.6 Canceling line redirection

1. Canceling line redirection can be activated by either **Feature** **#** **8** **4** or by pressing a key programmed with **Feature** **8** **4**.
2. The user is presented with the display

Select line(s)







QUIT ALL OK

QUIT and ALL appear when the user has not yet cancelled redirection for a line, ALL and OK appear once the user has taken cancelled redirection for a valid line.

On non-display key sets:

- QUIT maps to **Feature**
- ALL is not available, and
- OK maps to **Hold**
- QUIT terminates the feature, leaving the lines unchanged.
- ALL produces the same results as pressing each line key in turn. Similar to when ALL is used to redirect lines, an Unredirecting... message is provided when ALL is used to cancel the redirection of lines. When

Unredirecting... is completed, the user is returned to the `Select line(s)` display. (This is the same as when lines are redirected using ALL).

- If the `Redir by <setname>` transient message occurs when canceling of redirected line(s) is taking place (and the user doesn't use `OVERRIDE` (or ) to override the redirection), the user is returned to the `Unredirecting...` display if lines are still have redirection off. (These are the same rules as when lines are redirected using ALL.)
 - The `Unredirecting...` message can be overwritten by the `Redir by <setname>` message. For this reason, the `Unredirecting...` message remains on the display for two seconds when ALL is pressed. After two seconds, the system begins to take redirection off the lines. A two-second time delay gives the user a reasonable amount of time in which to read the display message before it is overwritten. The user is thereby provided with feedback that the system has begun to take redirection off the lines.
 - When the user is returned to the `Select line(s)` display, if the user presses the ALL display key again (that is, a second time during the same feature session), then the system attempts to cancel redirection for any lines that are not already unredirected (for example, lines that remain redirected by another set). If all lines at the set that can be redirected are redirected, pressing the ALL display key a second (or third time) produces Error tone and the transient message `All unredirected`. The user is again returned to the `Select line(s)` prompt. The user should press OK or  to terminate programming.
3. When canceling, pressing  or  at any time terminates the feature. If any lines have been cancelled, the message below is presented:
- Programmed
4. If the selected line was originally redirected by the user's set (or is not currently redirected by another set,) the line can be returned to is normal state. The line key indicator turns on if the attempt is successful, and the following prompt continues to be displayed:
- `Select line(s)`
ALL OK
5. If the selected line was redirected by another set, the indicator does not light, and the following transient display is presented, with attention tone (as described earlier):
- `Redir by <setname>`
OVERRIDE
`<setname>` is the set name that redirected the line.
- OVERRIDE maps to  for non-display key sets. OVERRIDE cancels redirection for the line and turns on the line indicator. The user is returned to the `Select line(s)` or the `Unredirecting...` prompt.
- Pressing a new line key continues with normal operation, leaving this line's status unchanged.
6. When the user presses OK, or , or after feature timeout occurs, the feature terminates. Lines that already have redirection cancelled, remain that way.

1.2.3.7 Call handling of Redirected Lines

If the outgoing facility associated with a redirected line is available, the incoming call is answered and is connected to the outgoing facility when the line is seized.

If the outgoing facility is not available, the incoming call is routed to prime.

When a call arrives at the system on a redirected line, any indicators associated with that line show active (solid) status, and stay that way until the call is dropped.

The line indicators of lines used to carry the call into and out of the Norstar system show active status (in use) for the duration of the call. Other users are denied access to the line. Following existing rules, if a user presses the line key, Error tone and the transient message, `Line in use`, are provided.

The set can be administered to receive redirect ring (ring splash) for any incoming redirected calls for line appearances that are also administered to ring. Redirect ring is defined as a 200 millisecond burst of ringing. Redirect ring follows existing rules for ringing.

If lines are programmed to be redirected, but they are not in use redirecting a call, they can be selected and used by internal users as usual.

The dialout digits must pass call restrictions at the time the call is redirected. If restrictions prevent the call from being redirected, it is routed to the prime set.

1.2.3.8 Line to line redirection

On a digital line to a digital line redirection, it is possible to delay the answer of the incoming line until the far end of the outgoing line has answered. If the far end is busy, or does not answer, this information will be propagated to the incoming line without answering it, so that the caller will not be charged to listen to ringback or busy tone. This applies only when both the incoming and outgoing lines are digital. In Modular, these are BRI, PRI, and DASS2 lines; in Compact Plus, this applies only to BRI lines.

If the incoming line is either Loop Calling Guarded or Loop Earth Calling, it can be redirected to AC15, BRI, PRI, or DASS2 lines. In this case, the incoming call remains unanswered until the outgoing line is answered.

PRI lines are subject to the same barring rules as BRI lines.

1.2.3.9 Key inquiry

Key inquiry for lines is as follows:

1. If a line is pressed during key inquiry, the following transient display is presented.

`nnn Linennn`

`SHOW OK`

- `SHOW` maps to `#`, `Rls` ends the feature, and `Hold` maps to the OK display key.
- If the user presses the OK display key (or does not press anything more for three seconds), the user is returned to the `Press a button` prompt.

- If the user presses `SHOW` and if the line is not redirected, the display shows transiently:

Ⓓ `Not redirected`

- The user is then returned to the `Press a button` display.

- If the user presses `SHOW` at the `nnn Linennn` display, and if the line is redirected, then the following transient prompt is presented:

Ⓓ `Redir by <setname>`

Ⓓ `SHOW OK`

- If the user presses the `OK` display key (or does not press any other key for three seconds), the user is returned to the `Press a button` display.

- If the user presses `SHOW` at the `Redir by <setname>` prompt, the outgoing facility is displayed for one second (this is exactly like key inquiry with an Autodialer):

`Line Pool <nnnn>...`

or

`Linennn...`

The display then shows, for example:

`123456789012345...`

`VIEW OK`

and, if necessary,

`...678901234`

`VIEW OK`

2. For a key programmed with the feature, the key inquiry display is:

`Line Redirection`

1.2.3.10 Error Conditions

Incorrect destination numbers are not trapped, beyond the dialing restriction checks applied.

1.2.4 User Programming View

`Feature` `8` `4` can be programmed onto a key. It does not use the indicator.

1.2.5 OAM Programming View

[See "Terminals&Extns - Capabilities".](#)

Redirect ring is administered in `Terminals&Extns`►`Capabilities`►`Redirect Ring`.

The prompt is: `Redirect ring:Y`. `CHANGE` cycles between `Y` and `N`, with a default of `Y` (yes).

If an incoming line changes in OAM Programming from manual to autoanswer, the redirection status of that line is cancelled. A call in the process of being redirected is not affected.

1.2.5.1 Allow Redirect

With Allow Redirect in **Terminals&Extns►Restrictions►Extn restrns►Allow Redirect** setting set to Y, all combinations of lines can be redirected, according to the restrictions, as indicated in the table below. With the Allow Redirect setting set to N, no redirections are allowed.

		FROM					
		AC15	Loop Earth Calling / Guarded	Loop Unguarded	BRI/PRI	DASS2	DIA
T O	AC15 / DPNSS	Allowed	Allowed	Allowed	Allowed	Allowed	Allowed
	Loop Earth Calling / Guarded	Allowed					Allowed for AC15 only
	Loop Unguarded	Allowed					
	BRI / PRI	Allowed	Allowed		Allowed	Allowed	Allowed
	DASS2	Allowed	Allowed		Allowed	Allowed	Allowed
	DIA						

1.2.6 **EXTN/**LINE

Redirect Ring is available in **EXTN.

1.3 Technical Specification (Limits/Constraints)

- Once a line is redirected, any calls arriving on that line cannot be answered anywhere within the system.
- Only one user can be active specifying lines to redirect, and their destinations, at any one time. This eliminates a potential problem of competition between different users if they try to redirect a line simultaneously.
- Lines can be redirected to external destinations only.
- Redirect ring (sing splash; a 200 millisecond burst of ringing) can be programmed for each extension (**Terminals&Extns►Capabilities►Redirect Ring**) to sound at every extension with a ringing appearance of the redirected line, when a call is redirected.
- The user is required to explicitly specify the line or line pool for the call to go out on (note that routing codes have a specific outgoing facility assigned to them when the routing table is defined).
- External Autodialers (but not other types of dialers) can be used in specifying the redirection line and destination.
- The outgoing dialing restrictions are those associated with the default remote filter (filter number 4) and the outgoing line at the time the call is redirected.
- The dialing restrictions for the lines are used to determine a valid destination for line redirection. They cannot be overridden by means of the Restriction Override feature (**Feature** **6** **8**). Furthermore, the remote access dialing restrictions in effect for the incoming line, during a redirection, have no effect.
- No checks exist for a valid redirect destination (that is, dialing errors that pass the restrictions are not detected).

- Lines associated with auto answer trunks (including lines associated with DID trunks) cannot be redirected (that is, the auto answer line appearance itself). DIA lines can be redirected.

1.4 Interactions

Feature name	Interaction
Alerting set	Incoming messages do not usually overwrite the display. However, during SLR programming, if the user is on a call, the first incoming call doesn't overwrite the display. A subsequent call or calls display a transient message, for example, <setname> calling. This follows existing rules for incoming calls.
Answer Extns	Pressing an Answer key during SLR programming terminates the SLR session.
Autodial keys	External Autodialers can be used to specify the outgoing line, the destination DN, or both. If an external Autodialer is pressed following the <i>Select line out</i> prompt, SLR uses both the facility and digits specified in the Autodialer. If no facility is specified, it is treated as a network DN. If an external Autodialer is pressed after intercom is chosen as the facility, the facility specified in the Autodialer is ignored, and the digits are treated as a Network DN.
Automatic Line Selection - Outgoing Prime Line	Automatic line selection is not permitted. The user is required to specify the outgoing facility.
Automatic Line Selection - Outgoing Prime Line by a Feature	Automatic line selection is not permitted. The user is required to specify the outgoing facility.
Auxiliary Ringing	If the line is redirected the Auxiliary Ringer does not ring (does not receive redirect ring).
Busy Line	Lines in use by other sets can be redirected. Redirecting or taking redirection off lines has no effect on established calls, or on a call that is currently being redirected. If a redirected call cannot be extended due to a busy or out-of-service line, the call is answered by Norstar, given overflow tone and dropped after five seconds.
Call Capture	A redirected line cannot be answered at a set within the redirecting system.
Call Forward	Line redirection has precedence over the call forward status of the set. If both are active at a set, incoming external calls on redirected lines are redirected to the specified external destination, and all other incoming calls are forwarded to the specified internal destination. Redirect ring (ring splash) is suppressed at call forwarded sets.
Call Identification/Call Status Display	The line indicators involved are lit for the duration of any call on a redirected line, from call arrival in Norstar to disconnection.
Call Pickup	Redirected lines cannot be answered internally.
Change Class of Service	Change Class of Service (<input type="text" value="Feature"/> 6 8) cannot be used to circumvent restrictions.

Feature name	Interaction
Class of Service	The Class of Service in effect at the time of programming line redirection remains in effect for the redirected calls until redirection is changed.
Dial external	Dialing from within Norstar is still permitted on a redirected line, whenever it is not busy.
Dial Intercom	Line redirection is only external, using lines or line pools.
Direct-dial	The Direct-dial digit is valid as an SLR destination if the Direct-dial destination is external, and if an explicit facility is programmed for Network Direct-dial. If Network Direct-dial is programmed with <code>Prime Line</code> , the user programming SLR sees the message <code>Invalid Number</code> .
Disconnect and Answer Supervision (Far End)	The feature makes no assumptions about answer supervision. If a line is changed in OAM Programming from supervised to unsupervised or manual to autoanswer then the redirection status of that line is cancelled. Note that a call in the process of being redirected is not affected.
DIA lines	May be redirected. May not be used for outgoing facility.
Do Not Disturb (DND)	Ring splash is suppressed. The user can activate DND when programming SLR. Because the software makes use of the indicators during selective line redirection programming, the indicator for the programmed DND key, if any, is not turned on until after the programming of the selective line redirection is finished.
DTMF	Because assignment of DTMF appearances is not prevented, the user can try to redirect these assigned appearances. Therefore, if the user selects a DTMF appearance at the <code>Select line out</code> prompt, then error tone and the transient message <code>Unequipped line</code> is given. The user is returned to the <code>Select line out</code> prompt. As with other transient messages, the user is not prevented from pressing another line key during the transient message. If the user selects a DTMF appearance at the <code>Select line(s)</code> prompt, the attempt is ignored. The indicator does not light, and the line is not redirected or unredirected. This is similar to user pressing a line key that does not have any hardware attached to it.
Feature Access Keys	Programmed line pool keys can be used for specifying the outgoing facility. Autodialers can be used in specifying outgoing facility or destination.
Enhanced Restrictions	The call restrictions applicable to the set and lines use apply. They are checked at the time of specifying the destination, and error tone and a transient prompt is delivered if the proposed target destination number is restricted. Calls are not subsequently checked against restrictions.
Incoming Call Information	Norstar cannot retransmit ICLID information out of the system.

Feature name	Interaction
Internal Autodial	During SLR programming, Internal Autodial keys continue to provide BLF capability. For example, Set A has an Internal Autodial key for Set B, and Set A is also programming SLR. The Internal Autodial key tracks the status of Set B. The indicator continues to go on or off during the SLR session, depending on the state of Set B. If the Internal Autodial key is pressed during SLR programming, programming terminates.
Key Inquiry	For a programmable key programmed with the feature, the display is: <code>Line Redirection</code> . The key inquiry display for a line has changed, as indicated in the body of this document.
Last Number Redial	Cannot be used for programming.
Line assignment	If lines are assigned to the set such that no lines can be selected for redirection (for example, no lines at all are assigned to a set, or only one line is assigned and the user has chosen it as the outgoing facility) then: If the user selects their only line manually, error tone and the transient message, <code>Outgoing line</code> is given. If the user selects the <code>ALL</code> display key at the <code>Select line(s)</code> prompt, error tone and the transient message, <code>No line to use</code> is presented. The user is returned to the <code>Select line out</code> prompt, and the feature can be attempted again. (When the software is checking to see if a line is selectable, it does not include DTMF appearances or line appearances with no attached hardware.)
Line Pool keys	Pressing a programmed line pool key after pressing intercom or a line key is ignored.
Network Direct Dial	The direct-dial digit is valid as an SLR destination if the direct-dial destination is external, and if an explicit facility is programmed for network direct dial. Prime line is not an explicit facility for SLR. If network direct dial is programmed with prime line, the user programming SLR sees the message <code>Invalid Number</code> .
Power Fail Cut-Through	During power fail no redirection takes place. On power restore, redirection is restored.
Prime Line	Prime line is not an explicit facility for SLR. If Network Direct-dial is programmed with Prime Line, the user programming SLR sees the message <code>Invalid Number</code> .
Priority Call	Other call processing messages do not overwrite the SLR programming display. Ideally, an incoming priority overwrites the display. The priority call tone (three ascending tones) is provided. A DND programmed key does not flash since SLR makes use of the set's indicators. The DND programmed key can still be used to block the priority call.
Reason for Release	The reason release is not propagated for calls that have been redirected by SLR.
Release	During programming it releases programming. It is similar to <code>QUIT</code> if no lines have yet been redirected or had redirection taken off. However, if <code>RLs</code> is pressed after lines have been redirected or unredirected, these lines retain their redirection status. If there is an active call, <code>RLs</code> also releases the active call.

Feature name	Interaction
Saved Number Redial	Cannot be used.
Set Administration Lock	If full lock is set, the status of line redirection is not alterable from the set. Full set locks the feature, as with Call Forward All Calls. SLR can be programmed if the set is partially locked, or not locked.
Speed dialer (set and system)	May not be used for programming.
Terminal Type - Analog Terminal Adaptor (ATA)	Cannot be used since has no line appearances.
Terminal Type - M7100 (Basic sets)	Cannot be used since it has no line appearances.
Terminal Type - M7900 (Touch Set)	<p>The touch set only supports autodial programming using the prime line (it is stored by default, and a line or line pool can't be stored with an autodialer). Because SLR does not accept an autodialer stored with the default of prime line, the touch set user should not use an autodialer at the <code>Select line out</code> prompt, but should explicitly press a line (which can be their prime line) or specify a line pool instead. Pressing an autodialer at this point results in error tone. The user remains at the <code>Select line out</code> prompt. Pressing an autodialer at the <code>Enter digits</code> prompt is a valid action.</p> <p>Touch set users, unlike users on other sets, can program a line pool key to use a line pool that is not defined for the system. If, at the <code>Select line out</code> prompt, the touch set user presses a line pool programmed key that has an invalid line pool code stored in it, then error tone and the transient message, <code>Invalid code</code> is presented. The user is returned to the <code>Select line out</code> prompt. If the touch set user wants to use programmed line pool keys, they should program them with system-defined line-pool access codes.</p>
Transfer and Recall	SLR applies only to non-split lines. Here is the scenario. An AC15 line, Line X, at Node A, is used as both the destination for SLR with respect to Line Y and as the source for SLR. A call arriving on Line Y at node A is redirected and is answered at Node B. The user at Node B wants to transfer the call and the conditions for the call to the transfer destination are such that Line X can be reused (split). This transfer destination call at Node A is not subject to SLR programming there. (Otherwise, the transfer destination call does not arrive at the destination intended by the transfer agent, but at the one specified by the user specifying SLR.)
Trunks - autoanswer	May not be redirected. See text.
Trunks - autoanswer	May not be redirected. See text.

Show Time

1.1 Overview

1.1.1 Description

The Show Time feature displays the date and time transiently for three seconds. The display then returns to the previous display.

1.1.2 Rationale for Feature

See “1.1.1 Description”.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls

, or programmed key.

1.2.2 End User View

The user activates this feature to see the date and time transiently for three seconds. If the user is active on a call, the date and time (appearing exactly as for the idle display) is shown transiently. The user is then returned to the previous display (for example, idle display, *Do not disturb*, etc.).

1.2.3 Message Displays

Message	Description
mmm dd hh:mm <am/pm>	Appears transiently in response to the user activating the Show Time feature. This display is for North American markets.

The user can activate this feature as often as they like.

If the user activates the feature while the display is idle (the date and time are already shown on the display), nothing happens.

1.2.4 User Programming View

The user can assign to a key. An indicator is not used.

1.2.5 OAM Programming View

N/A

1.2.6 **EXTN/**LINE

N/A

1.3 Technical Specification (Limits/Constraints)

N/A

1.4 Interactions

N/A

Software Keys

1.1 Overview

1.1.1 Description

The Software Keys feature is used to control the accessibility of certain Norstar features at the end-customer site. A software key is a feature-enabling password that, when entered makes certain purchased features available to the end customer.

The following features are keyed

- expansion of 4x8 configuration (Compact Plus)
- Companion, for Wireless capability
- Auto Attendant (Compact Plus)

1.1.2 Rationale for Feature

The original philosophy in the Norstar product line was to provide access to all product software specific features in every system sold. This philosophy is being modified such that systems come with a pre-defined set of features and any additional capabilities required (available in Norstar) by the customer must be purchased.

1.1.3 Scenarios of Usage

A company may not need access to a feature when a system is first installed, but may find as their business changes that they require more functionality.

1.1.4 General Definitions

Term	Meaning
System ID	An identifying code of eight digits, unique to a given Norstar CCU.

1.1.5 General Procedures

The System ID and the identification of the specific feature(s) to be activated are given to the purchaser, that is, the company that sells the features to the end customer.

The purchaser identifies a specific CCU by its unique system ID and requests that the incremental features be enabled. Based on this information, NT charges the appropriate fee and returns to the purchaser a password that, when entered in the system, makes a particular purchased feature (for example, 4x8 expansion) visible and available to the end-customer.

The feature-enabling password (software key) is a 24-digit number. To facilitate accurate entry, the password is broken into three password keys, each eight digits long. The three keys are input using OAM Programming (see “1.2.2 OAM Programming View”).

1.2 Feature Details

1.2.1 End User View

N/A

1.2.2 OAM Programming View

1.2.2.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item	I	SC+	SC
Software Keys	SysID:nnnnnnnn	X	X	
	Password Keys	X	X	

1.2.2.2 Programming Software Keys

See ["Software Keys"](#).

The user accesses `Software Keys` to complete the following tasks:

- query the system to obtain its unique System ID
- input the password keys

At the `Password Keys` heading, the user presses `SHOW` to display `Key 1: _____`. The user then enters the first eight digits of the software key. When eight digits have been entered, the user interface presents `Key 2: _____` for the second eight digits. When the second eight digits have been entered, the user interface presents `Key 3: _____`. When the final eight digits have been entered, the system validates the software key.

The digits of the software keys are visible to the user as they enter them.

Once the software key(s) are validated by the system, it is available in the system. The remote user must leave OAM Programming and then re-enter it to see the entire programming tree.

4x8 Expansion

For 4x8 expansion, after entering the software key, the user must perform a warm restart to make visible the second trunk card and the lines and DNs that were previously hidden.

For security reasons, the system does not

- provide feedback as to the specific feature activated (even though the software key was entered successfully)
- perform a check on the validity of the software key until the entire key has been entered

If the user has previously entered a software key successfully, and they enter it again at a later time, nothing happens. Features previously enabled through the use of the software key remain enabled.

1.2.3 **EXTN/**LINE

N/A

1.3 Technical Specifications (Limits/Constraints)

If the system is powered down for a long time, that is, NVRAM is lost, or if the system cold starts, the feature can be activated again with the same software key.

1.4 Interactions

Feature or Condition	Interaction
Auto Attendant Integrated Remote Set Device (IRSD)	Once the remote user has entered the software key correctly for the feature, they must leave OAM programming and then re-enter it to see the entire tree.
4x8 Expansion	Once the user has entered the software key correctly to expand the 4x8 configuration of the CCU, a prompt is displayed asking the user if they want to perform a warm restart. If the user chooses to do so, the system is restarted. After restarting, the second trunk card and the associated lines and DNs are visible.
Companion Mobility	Wireless basestations can be installed and pre-administered prior to obtaining the software keys required to enable functionality. The portable units will not be allowed to register until Software Key has unlocked wireless capabilities.
DTI Provisioning	When a software key unlocks new DASS2 channels, in <i>Maintenance-Provisioning</i> , the UI will reflect how many lines credits are available. The new channels must then be provisioned and configured. A software key does not change the subheadings of any sections in the UI. See the Provisioning feature for more details.
Pre-provisioning (Line credits)	If any digital lines are pre-provisioned in a slot where an analog card is to be placed, all lines for that slot should be manually deprovisioned before inserting the analog card. This is done to regain the line credits used up by the pre-provisioned digital lines. After plugging in the analog card, provisioned lines for that slot are no longer accessible to the administrator. The analog card must be removed and the card type set back to DASS2 before line credits can be reclaimed.

System Admin Log

1.1 Overview

1.1.1 Description

This feature provides the System Administration Log, which records administrative events such as system initializations, OAM Programming sessions in which a change was made, invalid password attempts, and password changes. and records them in a small circular buffer stored in NVRAM.

To view the log, the user must be in the Maintenance► section of OAM Programming.

1.1.2 Rationale for Feature

The intent of this feature is to guarantee a minimal trouble-shooting and fault recording facility.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 User View

The System Administration log allows the installer to

- check the items in the log
- check the current alarm (if one exists)
- check when each item in the log occurred
- check the number of consecutive occurrences of an event or an alarm
- erase the log

To display the System Admin Log, go to Maintenance►Sys Admin log heading in OAM Programming.

[See "Maintenance - System Admin Log".](#)

Upon entry, the user is shown the number of current items in this log. If updates occur while the user is viewing the log, the log is not updated until the user re-enters the log.

Each entry represents an item in the log. The capacity of the System Admin log is ten entries (not verified).

High frequency network events are assigned a low severity level so that they are the first to be overwritten by newer, high severity events.

1.2.1.1 Format of Alarms

The format for alarms which appear in the System Admin Log is as follows:

ALM: <component>S<severity>

where <component> is a two-digit number representing the type of component on which the fault occurred (for example, CCU-based sets or CCU-based trunks), and <severity> is a one-digit number (from 1 to 9) representing the seriousness of the fault (1 is least severe and 9 is most severe).

1.2.1.2 Format of Events

Events or faults are displayed in the following format:

EVT:<error number>-<instance>S<severity>

where <error number> is a three-digit number, and the <instance> is a number up to five digits representing the specific component (for example, bus/slot number, cartridge or module). The <severity> is a one-digit number from 1 to 9, where 1 is least severe and 9 is most severe.

High frequency network events are assigned a low severity level so that they are the first to be overwritten by newer, high severity events.

No ability exists to provide individual timestamps of multiple high frequency network events.

This feature keeps a record of system administrative events, and stores them in a log or file like the one described in the previous section. A record of user initiated initializations, password changes, invalid password attempts, and the like, can be queried in the System Admin Log.

The intent of this capability is to provide a record of system changes which have been programmed either by the system coordinator or the installer. Because this file is stored in non-volatile memory, information is not lost in the event of a power interruption. The file is cleared by System Startup in which case the message, `Evt:400 S9`, will appear at the top of the new log. Alarms are recorded in the `Sys test log`.

1.2.1.3 Format and Priority of Items in the Log

Events are recorded in the System Admin Log in chronological order.

Examples of items which might appear in the log include:

- System startup
- OAM changed
- Invalid password attempt
- Password changed
- Time changed

The order of this list is intended to imply the priority of each item: items at the top have higher priority than items at the bottom.

1.2.1.4 ALARM display key

The user can press the `ALARM` display key at the `Items in log:nn` prompt. Pressing the `ALARM` display key, displays the current highest priority alarm. All alarms are also recorded as individual entries in the System Admin Log.

1.2.1.5 TIME display key

Each item is stored with a time/date stamp. Pressing the `TIME` display key at any item displays the time and date at which the item occurred (for three seconds). After three seconds the original `<history text>` replaces the time/date display. The time is displayed as follows:

```
<date> <time>
```

where `<date>` has the format, YYYY/MM/DD, and `<time>` has the format, HH:MM. If the time stamp is associated with an item in the log which represents more than one instance of that item (that is, the event, alarm has been repeated), the time of the last occurrence is displayed.

No ability exists to provide individual timestamps of multiple high frequency network events.

1.2.1.6 REPEAT display key

To view the number of consecutive times a particular error or alarm has occurred, the user presses the `REPEAT` display key. Pressing `REPEAT` causes the transient message `<xx> times` to be displayed for 3 seconds after which the user is returned to the normal `<item text>` display. If there are no repetitions to be reported (that is, the error or alarm has not occurred more than once in row) the `REPEAT` display key is not displayed.

1.2.1.7 List handling when the list is full

When the Log is full (that is, when it contains 10 items) and a new item is to be added, the oldest message which is of equal or lower severity is dropped to make room for the new one. The new item is added to the bottom of the list. Items remain in chronological order with the oldest messages at the top of the list and the most recently added items at the bottom of the list. Thus, when the list is full, items at the top of the list tend to assume the highest priority.

1.2.1.8 Erasing the System Admin Log

See ["Maintenance - System Admin Log - Erase"](#).

To erase the entire System Admin Log, the user presses the `ERASE` display key that appears at the start of the log, and at the `--End of list--` prompt.

If system events cause the creation of new log items while the user is viewing the log, these items are buffered but not displayed to the user (new items can only be viewed by re-entering the log). When the user attempts to erase the log after new items have arrived, the `Cancl'd-new items` prompt is displayed transiently, and the `Items in log:nn` prompt is displayed

It should be noted that erasing the log raises an event, placing a new entry in the log.

1.2.2 OAM Programming View

The System Admin Log can only be opened in OAM Programming. See “1.2.1 User View”.

1.2.3 **EXTN/LINE**

N/A

1.3 Technical Specification (Limits/Constraints)

This log is not dynamically updated. If updates occur while the user is viewing the log, they are not shown until the user re-enters the log.

The capacity of the System Admin log is ten entries (not verified)

The System Admin Log is stored in non-volatile memory (NVRAM). It survives warm, but not cold, restarts. The file is cleared by cold restarts, or by the user.

1.4 Interactions

N/A

System Speed Dial

1.1 Overview

1.1.1 Description

System Speed Dial is used to dial external calls from any set by activating the System Speed Dial feature, and dialing a two-digit code associated with the desired number.

System Speed Dial numbers are programmed on a system-wide basis in OAM Programming. This feature allows up to 70 Speed Dial codes to be shared globally among all Norstar system users.

For Speed Dial numbers that can be programmed by the end user, see User Speed Dial.

1.1.2 Rationale for Feature

See “1.1.1 Description”.

1.1.3 General Definitions

Term	Definition
Autodial key	Key programmed to dial an Internal or External Autodial number.
Autodial number	Dialing sequence programmed by the end user on a programmable key, activated simply by pressing that key. Autodial keys can be programmed for internal or external numbers. (See the Internal Autodial and External Autodial specifications).
Dialer	Memory allocated to the storage of frequently used numbers that can be accessed by a feature code, or programmed key press. Features that use Dialers include: System Speed Dial, User Speed Dial, Internal Autodial, External Autodial, Last Number Redial (LNR), and Saved Number Redial (SNR) keys. Speed Dialers cannot be programmed on a key, while Autodialers, LNR and SNR can.
Facility	Method used to route an External Autodial, Speed Dial, Direct-dial or Hotline call; one of: Prime Line, line number, line pool, or Routing table.
Speed Dial code	Two-digit number associated with the Speed Dial number in OAM Programming, dialed by the caller after activating the Speed Dial feature (Feature <input type="text"/> 0).
Speed Dial number	Speed Dial sequence, which can be up to 24-digits long, and includes the facility used to dial the number. A Speed Dial number is associated with a bin (rather than a programmable key) and is accessed by activating the Speed Dial feature and dialing a code.
Stored number	Number stored by any of the methods described in the definition for “Dialer”.
System Speed Dial number	Speed Dial number programmed at a system-wide level in OAM Programming. All systems users have access to these numbers.
User Speed Dial number	Speed Dial number programmed at the set level for one set only.

1.1.4 General Procedures

System Speed Dial numbers are programmed and edited on a system-wide basis in OAM Programming. Speed Dial is used for external numbers only. End users can

program internal numbers on an Internal Autodial (DSS) key (see Internal Autodial).

The codes associated with System Speed Dial numbers are 01 to 70 inclusive.

1.2 Feature Details

1.2.1 Controls

`Feature` `0`, or programmed key plus dialpad keys

1.2.2 Caller View

To call an external number, the caller activates the Speed Dial feature by pressing `Feature` `0`, or presses a Speed Dial programmed key. At the `Speed dial>` prompt, the user enters a valid Speed Dial code. If a stored number exists for that code, the number is dialed automatically.

All other rules for the activation and effects of this feature are exactly the same as for the User Speed Dial feature.

If no facility was stored with the Dialer, it uses the set's Prime Line. If no Prime Line has been assigned to the set, and the caller has not selected a line manually, they are prompted to do so. The caller can always select a line manually and then activate the Speed Dialer. If the caller selects a line manually, the stored facility is not used.

A Speed Dial number can be up to 24 digits long. If the Speed Dial number is 16 digits or less, the number appears on the display as it is being dialed.

If the number being dialed is greater than 16 digits, the user sees '...', followed by the last 15 digits of the Dialer. After the call is connected, existing rules apply to the display.

1.2.3 Message Displays

Message	Description
<code>Speed dial></code>	Prompts the caller for a valid Speed Dial code when the feature is activated.
<code>Invalid code</code>	Displays transiently if any of the following is true <ul style="list-style-type: none">- the caller used a code outside the code range (01 to 70)- the programming was such that the system expected a Destination code (translation table entry), but the numbers programmed do not include a Destination code.
<code>Unknown number</code>	Displays transiently, accompanied by Error tone, if <ul style="list-style-type: none">- the system cannot route the call as programmed.- the programmed facility is <code>Use routing tabl</code> and the digits are not recognized by the system (The dialing attempt fails at run time, not in OAM Programming.)
<code>No number stored</code>	Displays transiently if no number is stored for the code the caller used.

1.2.3 Message Displays

Message	Description
Select a line	Displays transiently, accompanied by Error tone, if either of the following is true - the facility stored with the Dialer is not available (it is in use, or the set is not programmed to use that facility) - no line is stored with the Dialer, the Prime Line is not available at the set, and the caller has not selected a line manually To make the call, the caller must select a line manually.
<Speed Dial name>	Displays when the Speed Dial number is programmed not to display digits, and has been named in OAM Programming.
Sys Spd Dial <nn> TRANSFER	Displays when the Speed Dial number is programmed not to display digits, and the code is not named in OAM Programming. <nn> is a Speed Dial code between 01 and 70.

1.2.4 OAM Programming View

1.2.4.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item		I	SC+	SC	
Sys speed dial	Speed dial #:nn	01:nnnnnnnnnn		X	X	X
		Use prime line		X	X	X
		Display digits:Y		X	X	X
			Name:Name	X	X	X
		Bypass restr'n:N		X	X	

1.2.5 Programming System Speed Dial

See "System Speed Dial".

Up to 70 System Speed Dial numbers (dialing sequences) can be assigned codes in OAM Programming.

1.2.5.1 Valid Dialing Sequences

A Speed Dial number can contain up to 24 characters including:

- any transmitted routing digits
- PBX reachthrough codes: Recall, Run/Stop, and Pause
- asterisk (*) and octothorpe (#)
- dialed digits

Asterisk and octothorpe have special meanings in DTMF signaling mode. (For more information, see the PBX Reach Through and Pulse to Tone features).

An attempt to enter a digit for any other valid or invalid feature code, or to press another programmed key is ignored.

1.2.5.2 Digit Entry and Navigation

For information on digit entry, navigation, and the behaviour of the display, refer to the Alpha entry feature.

1.2.5.3 Programming the Facility and other parameters

See ["Terminals&Extns - Capabilities - Hotline - Facility Selection"](#).

As well as associating a given external number with a System Speed Dial code, the user defines:

- the facility (Use prime line, Use line:__, Pool code:_, Use routing tabl) to be used when a System Speed Dial code is activated
- whether the number appears on the display (Display digits) when the Speed Dial code is activated
- the name (Name) assigned to the Speed Dial code (if Display digits is set to N)
- whether existing restrictions are overridden in the case of this number (Bypass restr'n)

The default facility is Use prime line. If Use routing tabl is specified, the number is translated according to the Routing Table. (For more information, see Facility.)

The default for Display digits is Y (Yes). If Display digits is set to N, the user has the option of assigning a name of up to 16 characters to the Speed Dial code. The default name is Sys Spd Dial <code>, where <code> is that number's System Speed Dial code. If the user assigns a name to the code, and subsequently sets Display digits to Y, the name associated with the Speed Dial code is removed and not saved.

The default is for Bypass restr'n is N (No).

No checks are performed at programming time on the external number entered (nor on any routing code entered). It is the user's responsibility to ensure that the digits are in fact meaningful if dialed as specified.

1.2.6 **EXTN/**LINE

N/A

1.3 Technical Specification (Limits/Constraints)

Speed Dial numbers are stored in non-volatile memory (NVRAM). They are preserved over warm starts, but not over cold starts.

1.4 Interactions

Feature name	Interaction
<input type="checkbox"/> *, <input type="checkbox"/> # PBX Reach Through Pause Recall Run/Stop	Special keys <input type="checkbox"/> *, <input type="checkbox"/> #, and PBX reachthrough codes can be stored in the Last Number Redial buffer. Reachthrough code digits are immediately replaced with the appropriate symbol. For more information, see the Pulse to Tone Conversion and PBX Reach-Through features.

Feature name	Interaction
Last Number Redial (LNR)	Numbers dialed using System Speed Dial are stored in the LNR buffer. When LNR is used, or queried with Key inquiry, however, the number does not show if the Speed Dialer is programmed with <code>Display digits</code> set to <code>N</code> . Instead the user sees the transient display <code>Hidden number</code> .
Line Pools	System Speed Dialers programmed with a line pool as the facility use the line pool when the Dialer is activated if <ul style="list-style-type: none">- a line in the pool is idle- the set has access to that line pool defined in OAM Programming.
Saved Number Redial (SNR)	Numbers dialed using System Speed Dial can be stored in SNR only if the Speed Dialer is programmed with <code>Display digits</code> set to <code>Y</code> . If a <code>Display digits</code> set to <code>N</code> , activating SNR results in Error tone and the user sees the transient display <code>Hidden number</code> .

System Startup

1.1 Overview

1.1.1 Description

System Startup resets all OAM programming for a Norstar system to defaults by applying a selected system template. The template can be Square, Hybrid, or PBX. For both Compact Plus and Modular Plus systems, the default is PBX.

System Startup also allows the installer to set the Start DN for the system.

For a complete list of system defaults, see the Compact Plus Default Templates or the Modular Plus Default Templates.

1.1.2 Rationale for feature

See "1.1.1 Description".

1.1.3 General Definitions

N/A

1.2 Feature Details

1.2.1 End User View

N/A

1.2.2 OAM Programming View

1.2.2.1 Levels of Access

N/A

1.2.3 Message Displays

Message	Description
Applyng template	A transient message that remains displayed while the selected template is being applied to the system.
Feature timeout	A three-second transient message that appears if no activity has occurred for 30 minutes while the user in the **STARTUP feature.

1.2.3.1 Programming System Startup

See "Startup".

To perform System Startup, the installer enters the System Startup access code: **STARTUP followed by the installer password. To be accepted, the feature code and the correct password must both be entered within 15 minutes of powering on the CCU, or the feature times out and the system must be powered Off then On before re-entering **STARTUP.

The installer then selects a Startup template (Square, Hybrid, or PBX). The installer then selects the start DN, if they do not want to use the default Start DN (221 for both Compact Plus and Modular Plus).

The number entered for the Start DN determines the DN length used in the system.

System Startup is normally used only when the system is first installed. The System Startup procedure is not used when new lines or sets are added to an existing system. Instead, the user should use OAM Programming to assign new lines to a set.

The choice of a customer template in System Startup does not prevent the user from subsequently making manual changes to any OAM Programming parameter.

Other than the set involved in a session, lines or sets do not need to be connected to the system in order to be programmed. However, the normal installation sequence is to attach the lines and the sets before applying power to the system and commencing an OAM Programming session.

If an expansion card is added to Compact Plus or a Modular system, and the system is upgraded to have more than one port, the newly added station ports do not receive any default line assignments.

When the OAM Programming session ends, the system applies the selected template, and then continues as it would normally during a system power up. The indicators on each attached set flash repeatedly while the sets are initializing. The default idle date and time message is then displayed at all attendant sets. As part of the re-initialization, any calls in the system are dropped.

No changes are made if

- the installer turns off the power to the CCU instead of ending the System Startup session
- the installer provides no input for 30 minutes (at which point a feature timeout occurs and the session is cancelled)

When **STARTUP is complete, the user can re-enter the OAM Programming to customize system operation according to the customer's requirements. Automatic access from System Startup to OAM Programming is not provided, as this could lead a user to believe that System Startup (which resets all System programming data) is the correct way to initiate subsequent OAM programming sessions.

1.2.4 **EXTN/LINE**

N/A

1.3 Technical Specifications (Limitations/Constraints)

An example best serves the explanation of a valid DN:

If the DN length is 2, the sum of the Start DN plus the allowed DNs (total worst case number of B1, B2, ISDN DNs, plus the IRSD and ATA DNs must be less than or equal to 99.

1.4 Interactions

Feature name	Interaction
Calls	As part of System setup, all calls in the system are dropped.

Feature name	Interaction
Key Programming	System Startup resets key assignments on all sets to template defaults. For details, see the Key Programming feature.
DN Length	The number entered for the Start DN determines the DN length used in the system.
Extension Relocation	Resetting non-volatile memory at the end of the System Startup session restores the DN for each B1 and B2 port to its default value. This negates the effect of any extension relocations that have occurred.
Time and Date	Time and date are reset to default values by System Startup.

System Test Log

1.1 Overview

1.1.1 Description

The System Test Log captures and filters certain system events such as diagnostic test results, audits, system alarms, and fault occurrences, and records them in a small circular buffer stored in NVRAM.

To view the log, the user must be in the Maintenance section of OAM Programming.

1.1.2 Rationale for Feature

See "1.1.1 Description". The intent of this feature is to guarantee a minimal trouble-shooting and fault recording facility.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 User View

The System Test Log allows the installer to

- check the items in the log
- check the current alarm (if one exists)
- check when each item in the log occurred
- check the number of consecutive occurrences of an event or an alarm
- erase the log

To display the System Test Log, go to Maintenance►Sys test log heading in OAM Programming.

See "[Maintenance - System Test Log](#)".

Upon entry, the user is shown the number of current items in this log. If updates occur while the user is viewing the log, the log is not updated until the user re-enters the log.

Each entry represents an item in the log. The capacity of the System Test Log is 40 items. Items contain up to 16 characters and can include alarms, errors, events, and diagnostic test results.

1.2.1.1 Format of Alarms

The format for alarms which appear in the System Test Log is as follows:

ALM: <component>S<severity>

where `<component>` is a two-digit number representing the type of component on which the fault occurred (for example, CCU-based sets or CCU-based trunks), and `<severity>` is a one-digit number (from 1 to 9) representing the seriousness of the fault (1 is least severe and 9 is most severe).

1.2.1.2 Format of Events

Events or faults are displayed in the following format:

```
EVT:<error number>-<instance> S<severity>
```

where `<error number>` is a three-digit number, and the `<instance>` is a number up to five digits representing the specific component (for example, bus/slot number, cartridge or module). The `<severity>` is a one-digit number from 1 to 9, where 1 is least severe and 9 is most severe.

High frequency network events are assigned a low severity level so that they are the first to be overwritten by newer, high severity events.

No ability exists to provide individual timestamps of multiple high frequency network events.

Diagnostic results

BERT loopback test events are displayed in the Sys Test Log. For details, see the BERT feature

1.2.1.3 ALARM display key

The user can press the `ALARM` display key at the `Items in log:nn` prompt. Pressing the `ALARM` display key, displays the current highest priority alarm. All alarms are also recorded as individual entries in the System Test Log.

1.2.1.4 TIME display key

Each item is stored with a time/date stamp. Pressing the `TIME` display key at any item displays the time and date at which the item occurred (for three seconds). After three seconds the original `<history text>` replaces the time/date display. The time is displayed as follows:

```
<date> <time>
```

where `<date>` has the format, YYYY/MM/DD, and `<time>` has the format, HH:MM. If the time stamp is associated with an item in the log which represents more than one instance of that item (that is, the event, alarm has been repeated), the time of the last occurrence is displayed.

No ability exists to provide individual timestamps of multiple high frequency network events.

1.2.1.5 REPEAT display key

To view the number of consecutive times a particular error or alarm has occurred, the user presses the `REPEAT` display key. Pressing `REPEAT` causes the transient message `<xx> times` to be displayed for 3 seconds after which the user is returned to the normal `<item text>` display. If there are no repetitions to be reported (that is, the error or alarm has not occurred more than once in row) the `REPEAT` display key is not displayed.

1.2.1.6 List handling when the list is full

When the System Test Log is full (that is, when it contains 40 items) and a new item is to be added, the oldest message which is of equal or lower severity to that of the new item is dropped to make room for the new one. The new item is added to the bottom of the list. Items remain in chronological order with the oldest messages at the top of the list and the most recently added items at the bottom of the list. Thus, when the list is full, items at the top of the list tend to assume the highest priority.

1.2.1.7 Erasing the System Test Log

See "[Maintenance - System Test Log - Erase](#)".

To erase the entire System Test Log, the user presses the ERASE display key that appears at the start of the log, and at the `--End of list--` prompt.

If system events cause the creation of new log items while the user is viewing the log, these items are buffered but not displayed to the user (new items can only be viewed by re-entering the log). When the user attempts to erase the log after new items have arrived, the `Cancl'd-new items` prompt is displayed transiently, and the `Items in log:nn` prompt is displayed

It should be noted that erasing the log raises an event, placing a new entry in the log.

1.2.2 OAM Programming View

The System Test Log can only be opened in OAM Programming. See "1.2.1 User View".

1.2.3 **EXTN/**LINE

N/A

1.3 Technical Specification (Limits/Constraints)

The System Test log is not dynamically updated. If updates occur while the user is viewing the log, they are not shown until the user re-enters the log.

The System Test log has a maximum of 40 entries.

The System Test log is stored in NVRAM. It survives power interruptions and warm restarts. The file is cleared by cold restarts, or by the user.

1.4 Interactions

Feature name	Interaction
BERT Loopback Tests	Results for Bert Loopback Tests are stored in the System Test Log if <ul style="list-style-type: none"> - they are run remotely - if the test is Continuous

Three Party Service

1.1 Overview

1.1.1 Description

Three Party Service allows a user, usually an operator, to establish a three-party conference by calling two other parties from one extension. Once the connection is made, the party who established the call can hang up, leaving the other two connected. The controlling party can even put one party on hold and talk to the other party.

Three Party Service is one of the features supported on DPNSS 1 lines in Norstar systems. For a listing of these features, see the DPNSS 1 feature.

Three Party Services is similar to the Conference feature. In fact, using this feature at an extension is identical in all respects to the Conference feature. The main difference is that Three Party Service takes advantage of the capabilities of DPNSS 1.

1.1.2 Rationale for Feature

In Three Party Calling, the user establishes each call individually before activating the feature. If the second call results in busy or no answer, the user can disconnect by pressing **[Rls]**, without dropping the original call.

This feature allows operators to assist in the connection of calls from one main location.

1.1.3 General Definitions

This specification refers to AC15 lines and any other line type that supports Disconnect Supervision.

1.1.4 General Procedures

When the user is connected on a call and has a held call on the set, creating a Conference is a two-step sequence, as follows:

1. Initiate the Conference by pressing the Conference key (or feature code).
2. Press the held line key to join the held call to the connected call.

1.2 Feature Details

1.2.1 Controls

Feature **[3]** or programmed key, internal and external line keys, **Hold** **[]**,
Feature **[7]** **[0]** or programmed key and **Conf/Trans** **[]**

1.2.2 Message Displays

Message	Description
Press held line	Prompts the user to press the held line to include a user on hold in a Conference call.
Conference call	Displays transiently at the controlling set when a Conference call is created.

Message	Description
<party 1> <party 2>	Displays for the duration of a Conference call on the controlling set.
<initiator's name> <3rd party name>	Displays on the non-controlling sets when a Conference call is created.
3 parties only	Displays if the user tries to add a fourth party to a Conference call.
Conference busy	Displays transiently, accompanied by Error tone, if hardware resources are insufficient to create a Conference call.
Make calls first	Displays if the user tries to activate the feature without having one active call.
Make second call	Prompts the user to add a third party to an attempted Conference call.
Already joined	Displays, accompanied by Overflow tone, when a call in any state (alerting, held, connected, conferenced) exists between two sets and a second call is attempted between those two sets.

1.2.3 End User View

Each three-party Conference, has one controlling party (the initiator), and two other parties. The controlling party is always an internal party, and the other two parties can be internal or external.

1.2.3.1 Activating the Conference Feature

When the user presses either the Conference key or Feature 3, and the set is in the correct state to activate the Conference feature (that is, the set is active on a two-party call and has at least one other call on hold) the message *Press held line* displays.

To complete the Conference, the user selects the held call that is to be joined to the connected call. The user presses the line key for the held call, and the Conference is connected. The user at the controlling set sees the transient message *Conference call*, but the other internal parties receive no visual indication that the call is a Conference.

Once the Conference is created, the name associated with the Conference initiator's set appears on the display as well as the name of the other party in the Conference, <initiator's name> <3rd party name>. This message persists as long as the Conference is connected.

The user can terminate the Conference before pressing the held line key by pressing Feature, or by pressing any key that holds or Autoholds the active call. For example if the user presses an idle or alerting line key in response to the *Press held line* prompt, the Conference sequence is terminated, the active call is held automatically, and the line that was pressed is selected.

To switch a party from one Conference to another on the set, the user at the controlling set must split the original Conference. See “1.2.4.2 Conference - Split”.

If the other internal party replaces the handset or presses **[Rls]**, the call becomes a normal two-party call. The <party 1> <party 2> display at the controlling set changes to show the name of the remaining party (or line) only.

Failure to Complete the Conference

If no call is active at the beginning of the Conference sequence, the transient display **Make calls first** is presented. This provides guidance to novice users who attempt to create a Conference by pressing the Conference key before making any calls.

If the Conference initiator is already connected on a Conference and tries to Conference in a fourth party by pressing the Conference key or feature code, the transient display **3 parties only** appears. The Conference sequence is terminated, and the active Conference is not affected.

If one of the other parties to the Conference is already connected on a Conference (controlled at another set) and tries to Conference in a fourth party by pressing the Conference key or feature code, the transient message **Make calls first** appears. The Conference sequence is terminated, and the active Conference is not affected.

If the Conference sequence is started by pressing the Conference key or feature code with an established call at the set, but no held call, the transient message **Make second call** is displayed, and the Conference sequence is terminated, and the active call is not affected.

Pressing the Conference key does not affect the active call.

1.2.4 Options within the Conference feature

1.2.4.1 Conference - Hold

If any of the Norstar Conference participants presses **[Hold]** or selects another line while connected to the Conference, the call is placed on hold from that user's point of view.

When a Conference participant holds the Conference, the other two parties remain connected to each other and can continue talking.

After holding a Conference, the user can initiate or participate in another Conference. This can be repeated up to the limit of the Conference hardware resources, as the user places successive three-party Conference calls on hold. Only one Conference call can be in connected state on the set at any given time. The same two sets cannot be involved together in more than one Conference call.

After holding a Conference call, the initiator reconnects to it by pressing the line key of either of the held calls. When the Conference is reconnected, the call identification information <party 1> <party 2> is redisplayed.

If the internal party involved in a Conference with two external parties places the Conference on hold and leaves it on hold for two hours, the external lines are disconnected. The same timeout applies if both internal parties involved in a Conference with one external party place a Conference on hold for two hours. This timeout is to guard against tying up an external line indefinitely as a result of a user error.

A Conference initiator who wants to prevent held Conference parties from conversing, must split the Conference into two separate calls (see “1.2.4.2 Conference - Split”). To recreate a Conference after splitting it, the user must reactivate the Conference to join the calls together.

The line indicators on an initiator's set show no visual distinction between a held Conference and two separately held calls.

Mutual Hold is supported for Conference calls. That is, two or three internal parties can place a Conference on hold, and the Conference is reconnected when all parties reaccess the call.

1.2.4.2 Conference - Split

To split a connected Conference, the initiator presses one of the active line keys. The other line is automatically held, leaving the user connected to the selected line. The result is exactly as if the user had made two separate two-party calls and is connected to one of them with the other on hold. The user has one of the following options:

- alternate between the two calls by pressing one line key or the other
- force release the selected party and reconnect to the held party by pressing the held line key
- place the remaining call on hold as well

In the first and last cases, when connected to one of the parties, the user can re-establish the Conference with one party by pressing Conference, and with the other party by pressing the held line key.

1.2.4.3 Conference - Force Release a Party

To drop one of the parties from a Conference while remaining connected to the other (that is, to force release an external party), the initiator presses that party's line key (splitting the Conference) and then presses **[Ris]**. To reconnect to the remaining party, the initiator presses the held line key. Only the initiator can force release an external line in the Conference.

1.2.4.4 Conference - Transfer

Users can initiate a Conference with two external parties and drop it, leaving the other two parties connected, provided that one of the external parties joined as the result of an outgoing call.

In Conference, the **TRANSFER** display key is presented in the right-hand display key position when Norstar can leave the two external parties connected after the Conference originator disconnects.

If external transfer from Conference is valid, the Conference master can drop out, leaving the other two parties connected by any one of the following means:

- pressing **TRANSFER**
- pressing a key programmed to Transfer
- pressing **Feature** **[7]** **[0]** (Conference - Transfer From feature option)

Upon valid activation of Conference - External Transfer From, the user is presented with the following three- second transient display (the same as Conference - Transfer From): `Call transferred`, followed by the idle display.

When Conference - External Transfer From is valid, and the user presses the `[Rls]` key or goes onhook (with Handsfree OFF), the Conference is dropped. The user is returned to the idle display.

If Conference - External Transfer From is not valid, the `TRANSFER` display key is not presented. In these circumstances, the correct procedure is to `[Hold]` the Conference.

Pressing `[Rls]` or going onhook drops the Conference.

Other key presses provide the same results as using the `[Conf/Trans]` key.

Message Displays

Message	Description
Line in use or In use: <setname>	Displays one of these transient messages if the user tries to reaccess a terminated external transfer from Conference call.
Call transferred	Displays transiently if the controlling set transfers one of the internal parties in a Conference call.
Transfer denied	Displays transiently when the feature option is not valid and a transfer is attempted.
Line in use or In use: <setname>	Displays one of these transient messages if the user tries to reaccess a terminated external transfer from Conference call.
Call transferred	Displays transiently if the controlling set transfers one of the internal parties in a Conference call.
Transfer denied	Displays transiently when the feature option is not valid and a transfer is attempted.

Transfer Display Key

On a set with display keys, once the Conference is established, the `TRANSFER` display key is shown at the Conference initiator's set. This display key has the same effect on the Conference as pressing `[Rls]`. The `TRANSFER` display key is not offered if both other parties are external and outgoing, or if an internal party has held the Conference, because a transfer is not allowed in these cases.

1.2.5 User Programming View

One Conference key can be programmed for each set. An indicator is not used.

1.2.6 OAM Programming View

N/A

1.2.7 **EXTN/ **LINE

N/A

1.3 Technical Specification (Limits/Constraints)

Norstar does not support Hold over the DPNSS 1 link itself. As a result, the party on the distance end of the network cannot place a Three Party Service call on Hold.

Three Party Service is supported on M7100N and M7000 extensions, but in a receive-only fashion. These extension types cannot initiate Three Party Service.

1.3.1 Conference - Hold

After holding a Conference, the user can initiate or participate in other Conferences, up to the limit of the Conference hardware resources, as the user places successive three-party Conference calls on hold.

Only one Conference call can be in connected state on the set at any given time. The same two sets cannot be involved in more than one Conference call.

If the internal party involved in a Conference with two external parties places the Conference on hold and leaves it on hold for two hours, the external lines are disconnected.

If both internal parties involved in a Conference with one external party place the Conference on hold for two hours, the external line is disconnected.

In Hold, a set outside a Conference cannot access a held Conference line.

1.3.2 Conference - Transfer

Norstar currently does not provide for transfer of an incoming call to an external destination.

Once a transfer from a Conference is complete, the user cannot reaccess the Conference. If the user tries to reaccess the call, an Error tone and the transient messages, `Line in use` or `In use: <setname>` are provided.

At the controlling set, any intercom keys involved in the Conference show idle state when the transfer occurs. This rule holds true in cases in which an external call appeared on an intercom key at the initiator's set. In cases where an external call appeared on an external line key, the indicator continues to show the status of the line following the transfer.

When a set has an external call transferred to it, the call remains on the external line key at the destination set, if it has an appearance of the line. Otherwise, the call remains on the intercom key previously used by the Conference.

1.4 Interactions

Feature or condition name	Interaction
Background Music	Background music cannot be held, conferenced, or transferred.

Feature or condition name	Interaction
Call Duration Timer	The Call Duration Timer does not stop when a call is held, three-party conferenced, or transferred.
Call Park	Parking of Conference calls is not supported. An attempt to park a Conference results in a <code>Park denied</code> message, along with Error tone.
CO-CO Barring	For details, see the PSTN-PSTN Barring feature.
Disconnect and Answer Supervision (Far End)	Since there is no guarantee of receiving a disconnect signal on an outgoing call (that is, it might never be answered), the Conference - External Transfer From option requires that one of the calls be incoming (effectively providing an answer) on a line that can detect when the caller disconnects.
End-to-End Signaling	End-to-End Signaling is not transmitted to lines or devices involved in a Conference call.
External lines	External lines in a held Conference continue to show active line indication at any set that is outside the Conference and has an appearance of the line.
Group Listen	The three-party call has properties of the call that was active (that is, not held) when the Conference was created.
Held Line Reminder	Held Line Reminder is not generated for held Conference calls.
Hold	When Automatic Hold is applied to a Conference call, both lines involved in the Conference are placed on hold. The user can reconnect the Conference by pressing either of the held line keys.
Page	A Page cannot be Conferenced.
Privacy	<p>Privacy for external lines is maintained for held Conferences, even if all internal calls have placed the external line on hold. If a user presses an active external line appearance when Privacy is OFF on that line, a three-party Conference is automatically created, and Privacy is turned ON for the duration of the Conference call. Attention tone is generated at the Conference controller's telephone to indicate that the user has joined the call.</p> <p>The <code>Conference call</code> transient message does not appear for Privacy-created Conferences.</p> <p>The original programmed privacy setting is restored after the Conference ends. Privacy setting is maintained if a Conference is unsuccessfully activated.</p> <p>Privacy-created Conferences cannot be split.</p>
Private Lines	Private lines can be forwarded or transferred to another set by Conference-Transfer From.
Ring Again	Ring Again can be used when trying to create a Conference, and a busy signal or no answer is received from an internal party. The person attempting to set up the Conference can reconnect to the original call and talk to that person while waiting for the Ring Again offer to occur.

Feature or condition name	Interaction
Transfer	<p>In general, attempts by the party who initiated the transfer to activate another feature (for example, Conference) during a Transfer causes that feature to be activated and the Transfer feature to be cancelled.</p> <p>Because Conferences of more than three parties are not supported, attempts by one Conference member to transfer a call to another Conference member causes the transfer originator to be replaced in the Conference by the call it is transferring. This is only permitted if the party performing the transfer is not the initiator of the Conference. If the Conference initiator attempts to transfer another member into the Conference in place of himself, the other party is placed on hold, and the initiator returns to the Conference.</p>

Time and Date

1.1 Overview

1.1.1 Description

Date and Time appear on the display of an idle set. Time and Date can be programmed in OAM Programming, or through the **TIME feature.

Date and Time cannot be altered by a user without a password.

1.1.2 Rationale for Feature

See “1.1.1 Description”.

1.1.3 Usage Scenario

Some offices experience frequent power outages. A Norstar user with any of the OAM password can use the Time and Date feature to reset the clock.

1.1.4 General Definitions

N/A

1.1.5 General Procedures

N/A

1.2 Feature Details

1.2.1 Message Displays

Message	Description
In use:<setname>	Displays transiently, accompanied by Error tone, if a user attempts to run an OAM or mini-OAM session while another one is in progress. (Only one user can have one of OAM or mini-OAM session in progress at any time.) The user should try again later.
Access denied	Displays transiently for three seconds, accompanied by Error tone, if the user activates **TIME from a one-line display.

1.2.2 End User View

Date and Time are displayed in the following format:

month (maximum four letters), day (numerical), time, and am or pm.

For example

July 20 11:35 am

The abbreviations for months are:

Jan	Feb	Mar	Apr	May	June
July	Aug	Sept	Oct	Nov	Dec

Leading zeroes and superfluous blanks are not displayed.

The Time and Date display is updated once a minute at the set.

[See "Time and Date".](#)

1.2.3 OAM Programming View

Time and Date can be programmed by either of the following methods:

- by the installer, system coordinator plus, or system coordinator, through OAM Programming
- by a user with the Installer, System Coordinator Plus, System Coordinator, or Basic password, using ****TIME**

It can also be reset to the system default through System Startup.

1.2.3.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item	I	SC+	SC
Time & Date	Hour: <i>hh</i>	X	X	X
	Minutes: <i>mm</i>	X	X	X
	Year: <i>yy</i>	X	X	X
	Month: <i>mm</i>	X	X	X
	Day: <i>dd</i>	X	X	X

Heading	Item		I	SC+	SC
System prgrming	Featr settings	AutoTime&Date:Y	X	X	

1.2.3.2 Programming the Time and Date

All time and date values must be entered as two-digit numbers or as one-digit numbers followed by pressing the NEXT navigation key. Invalid digits are ignored, as are any digits the user attempts to enter after already supplying two valid digits.

OAM Programming does not allow the date to be set to February 29. To set the date to February 29, set the date to February 28, set the year to a multiple of 4 and set the time to 11:59 p.m. After a few minutes, the date will be February 29, and the time can be reset to the desired value.

Programming Time and Date through ****TIME**

The user must use a set with a two-line display.

The user must supply any of the four OAM programming passwords (Installer, System Coordinator Plus, System Coordinator, or Basic) at the prompt for password.

The heading indicator is not available through ****TIME**. It is available through OAM programming and returns to the top level prompt.

Setting Time and Date through **Startup

When power is first applied to a system, or when System Startup is performed, the default Time and Date setting is January 1, 1:00 a.m.

Changing the time by an hour using **FWD or **BACK

Norstar offers two features that let you adjust the time quickly for changes in British Standard Time. See also the Daylight Savings Time feature.

- You can move one hour forward with * * 3 9 3 (FWD).
- You can move one hour backward with * * 2 2 2 5 (BACK).

Programming Automatic Time and Date

When an ETSI BRI or PRI outgoing call is answered, the network may provide time and date information back to the Norstar system. Norstar can then use this information to automatically update the time and date if the network time and date is different from Norstar's time and date.

This functionality is automatically enabled, but may be turned off in OAM programming.

From System prgrming►Featr settings►AutoTime&Date:Y, press CHANGE to reset the value of AutoTime&Date, from Y (the default) to N.

1.2.4 **EXTN/**LINE

N/A

1.3 Technical Specifications (Limitations/Constraints)

Following a power interruption, the Time and Date values are retained in non-volatile memory (NVRAM). When the power is restored, the clock resumes running based on the stored time and date.

1.4 Interactions

Feature or condition name	Interaction
User-programmable features <input type="text" value="Feature"/> * 1 , <input type="text" value="Feature"/> * 2 , <input type="text" value="Feature"/> * 3 , <input type="text" value="Feature"/> * 4 , <input type="text" value="Feature"/> * 6 , <input type="text" value="Feature"/> * 7 , <input type="text" value="Feature"/> * 8 2 , <input type="text" value="Feature"/> * 8 4	The user cannot activate one of the user-programmable features when an OAM session or mini-OAM session (including **TIME) is in progress elsewhere. Similarly, if a user is in the middle of a user programming session, an OAM or mini-OAM session cannot be activated elsewhere.
Features that make use of the clock setting (Scheduled Services, Call Duration Timer, Call Log, Maintenance logs, Show Time, Auto Daylight Savings Time)	Changing the clock in **TIME has the same effect on these features as when it is changed in OAM programming
Language Choice	If the display language of the set on which Time and Date is being set is not English, then the AM/PM selection display will never appear. Hours in French and Spanish always use a 24 hour format.

Feature or condition name	Interaction
Status messages from other features	Date and Time is the lowest priority display of all Norstar features. At an idle set, it can be overridden by status messages from certain static features, including Message Waiting, Do Not Disturb, and Call Forward. The message <code>Services ON</code> also overrides Date and Time at the Scheduled Services Control Set. All call-related messages have higher priority than Date and Time.

Tones

1.1 Overview

1.1.1 Description

This feature contains a list of tones and the instances of their use as implemented in Norstar.

1.1.2 Rationale for Feature

See “1.1.1 Description”.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 User View

1.2.1.1 Dial Pad Feedback

Dial pad feedback tone, presented through the active voice path, acknowledges to the user that a key press has been received. The tone is composed of a single tone presented once for each key press. Dial pad feedback tone is not transmitted to the other party in a connected call, except by re-entering the handset from the handset earpiece or the Handsfree microphone from the Handsfree speaker. For a description of the characteristics of dial pad feedback tone, see “1.2.1.23 Tone Descriptions”.

Some exceptions exist to this rule. For example, when an External Autodial key is activated, no feedback tones are heard.

Many features also block the entry of invalid digits. For more information, refer to the individual feature descriptions.

1.2.1.2 Attention Tone

Attention tone, presented through the speaker, encourages the user to look at the display to read information there. Unlike Error tone, this tone does not imply that an error has occurred. Attention tone is composed of two chords (a chord is two notes presented simultaneously). Attention tone is generated once only for any event. It is not a periodic tone. For a description of the characteristics of Attention tone, see “1.2.1.23 Tone Descriptions”.

Features that generate Attention Tone

Feature or Condition Name	Instance
ATA	Cancellation of Call Forward is successfully completed at an ATA-based set. Group Pickup is successfully activated at an ATA-based set.
Call Log	A user is in the Call Log when space is being reallocated or removed and navigates through the list (NEXT or BACK).

Feature or Condition Name	Instance
Dial Tone Detection	No dial tone is detected by the system after 60 seconds on an active call. This does not occur in an I-Hold or U-Hold situation.
Do Not Disturb (DND)	Do Not Disturb is activated.
Hotline	A user at an assigned Hotline station goes offhook or presses the Handsfree key (if enabled). The tone occurs at the set originating the Hotline call. The second chord of the Attention tone is attenuated.
Line card programming	An installer attempts to make changes to a line card while it is still enabled.
Line programming	All lines appear in the UI even if there is no hardware to support the line (that is, the line is unequipped). Under <code>Show line: in Line Data</code> the user is notified if the line is unequipped by a three-second transient message accompanied by Attention tone.
Line Presence Test	A Line Presence test waits for three seconds and does not detect a dial tone (except on AC15 PC cts).
Priority Call	An attempt to make a Priority Call is blocked by the receiving set. This tone is heard at the originating set. If either set disconnects from the Forced Call, and the original call is still on hold, the Priority Call Warning tone is again sounded.
Privacy Control	Someone joins a call when Privacy Control is turned OFF at the Conference controllers set.
Ring Again	A Ring Again offer occurs.
Selective Line Redirection	The user attempts to redirect a line that is already programmed at another set to be redirected (including using the ALL operation).
Extn disabling	Before sets are immediately disabled and the set is active or holding a line.
System test	Upon completion of a System test, if the user chooses to view the results immediately following their completion.
Trunk cartridge configuration	An installer attempts to make changes to a trunk card without first disabling it.

1.2.1.3 Attenuated Ringing

Attenuated Ringing, presented through the speaker and not the headset, occurs at an attenuated volume level if the user is active on another call. The Ring Type remains the same as for normal ringing. The Ringing Cadence (internal or external) is also maintained at the reduced volume level. The call continues to generate ringing until it is answered or abandoned, or until the user suppresses ringing by the activation of the Do Not Disturb feature.

1.2.1.4 Busy Tone

Busy tone, presented through the active voice path, was designed to resemble the standard Busy tone of host PBX's, or the Busy tone in a Central Office. For a description of the characteristics of Busy tone, see "1.2.1.23 Tone Descriptions".

Features that Generate Busy Tone

Feature or Condition name	Instance
Answer DNs	Neither set is alerting, because there is no key at the service receiver's set at which to present the call, and another call is already alerting, held, or connected at the Answer key at the attendant's set.
Busy	A call cannot ring at any set because the appropriate sets are busy.
Call Forward	A set in the Call Forward chain is performing OAM Programming (does not apply when a set is performing user programming).
Intercom Keys	An internal call is placed but the called party has no available intercom keys.
Line Pool access	The user attempts to access a line pool when there are no available lines in that pool.
OAM Programming	A set in the Call Forward chain is performing OAM Programming (does not apply when a set is performing user programming).
Remote Capabilities	A user attempts to Page remotely when the paging resources are already in use.

1.2.1.5 Dial Tone

Dial tone, presented through the active voice path, was designed to resemble the standard dial tone of host PBX's or in a central office. For a description of the characteristics of the Busy Tone, see "1.2.1.23 Tone Descriptions".

1.2.1.6 DTMF

A brief, fixed-length, single tone is provided as feedback to the user each time a dial pad key is pressed (except when the phone is idle). All 12 keys generate the same tone. The user hears this feedback tone through the active voice path. This is a single tone of fixed duration, to avoid implying that the depression of a dial pad key is directly connected to the duration or frequencies of outgoing DTMF tones. For a description of the characteristics of DTMF tones, see "1.2.1.23 Tone Descriptions".

1.2.1.7 Error tone

Error tone, presented through the speaker, alerts the user that an error condition exists. This is a non-periodic tone that encourages the user to take action to correct the error. Error tone is composed of a chord (two notes presented simultaneously). For a description of Error tone, see "1.2.1.23 Tone Descriptions".

Features or Conditions that Generate Error Tone

Feature or Condition name	Instance
AC15	An installer attempts to copy data between CO and AC15 lines.
Analogue Port	An installer enters a port number that is not a digital port under Provisioning.
Answer key	The Answer key is pressed although no call is attempting to ring the service receiver's set. The user attempts to move a line key to an Answer key.

Features or Conditions that Generate Error Tone

Feature or Condition name	Instance
ATA	<p>7.5 seconds elapses between user inputs. A user dials the feature code for the following features:</p> <ul style="list-style-type: none"> - Background Music - Key Inquiry - Call Duration Timer - Call Identification/ Call Status Display - Contrast Adjustment - Date and Time Display - Dialing Options (Pre-Dial, Automatic Dial) - Do Not Disturb - End to End Signaling - External Autodial keys - Group Listen - Handsfree - Headset - Hearing Aid Compatibility - Hold (Listen on Hold) - Internal Autodial keys - Language Choice - Line Selection (Pre-selection) - Manual Line Selection - Message Waiting/Reply Message/Cancel Message Waiting - Moving Lines - Page Reception - Programming External Autodial keys - Programming Internal Autodial keys - Programming User Speed Dial - Programming feature keys - Ring Type - Ring Volume
	<ul style="list-style-type: none"> - Scheduled Services - Selective Line Redirection - Short tones - Transfer - User Speed Dial - User programmable keys - Voice Call Reception/Voice Call Deny - Volume Control <p>ATA is being used and an attempt is made to access Call Log, or Password programming. The user attempts to activate Selective Line Redirection from the ATA. The user attempts to make a Priority Call to an offhook ATA.</p>
ATA	<p>Dialing the feature codes for the following features in the Compact UK variant:</p> <ul style="list-style-type: none"> - Call Pickup - Camp-on - Offhook Call Queuing/ Answer Call - Tones On/Off
Auto DN	<p>A user specifies the digits for the Auto DN and those digits are the same for a DISA DN.</p>
Auto answer line	<p>The user attempts to select a line for Selective Line Redirection (SLR) that cannot be redirected because it is an autoanswer line.</p>

Features or Conditions that Generate Error Tone

Feature or Condition name	Instance
Autobumping	ATA is being used and an attempt is made to modify the Autobumping feature.
Autodial	When programming an Autodialer, the user selects a DIA line key for the facility.
Autodial key - programming	The user attempts to create a new Autodial key when there is no available memory in the system. The user attempts to program an Autodial key when on an I-Active call.
Autodial keys - programming	ATA is being used and an attempt is made to program Autodial keys.
Autodialer	An Autodialer is activated and no Prime Line is programmed for the set. The user attempts to store an Autodialer to a DIA line. The line the user stored with an Autodialer is in use (or unavailable at the set).
Autodialer - programming	The user attempts to store a number in an Autodialer or User Speed Dial but uses Last Number Redial as the source from a named System Speed Dialer or the number has been programmed not to show (that is, the Autodialer contains a hidden number).
Autologging options	ATA is being used and an attempt is made to access Autologging options.
Background Music	ATA is being used and an attempt is made to activate Background Music.
Basic set	The user attempts to activate Selective Line Redirection from a Basic set.
Busy line	A user dials the External Line Access code and the line is unavailable (if an external line is the set's Prime Line). The user attempts to enter digits when the set is programmed with the Pre-dial Onhook Dialing Option when all the lines at the user's set are in use. The user has specified that a Hotline call use a specific line, and that line is currently in use when activated. The line the user stored with an Autodialer is in use (or unavailable at the set)
Key Inquiry	The user attempts to activate Key Inquiry with calls in I-Hold, I-Active status, or a Ringing Call exists on the set. ATA is being used and an attempt is made to activate Key Inquiry.
Call Duration Timer	ATA is being used and an attempt is made to activate the Call Duration Timer.
Call Forward	The user attempts to forward a call to a set which is in OAM Programming.
Call Forward - programming	The user attempts to set the destination of Call Forward but enters an invalid internal number (including the user's own number), or pressing an invalid programmed key.

Features or Conditions that Generate Error Tone

Feature or Condition name	Instance
Call Handling	<p>A user selects a set's Prime Line when it is in use by another set.</p> <p>The user attempts to a second call on a split line using Trunk Answer from Any Station when the answering set was active on the first call. (ENET)</p> <p>The user attempts to access a line that is in use by another set and has Privacy set to ON.</p> <p>The user attempts to get an alerting call (other than by Call Queuing) while within the Transfer feature.</p> <p>The user attempts to obtain an idle line while within the Transfer feature.</p> <p>The Prime Line is busy, or no Prime Line has been assigned and the user attempts to select a line by going offhook, or pressing Handsfree.</p>
Call Identification/ Call Status Display	ATA is being used and an attempt is made to activate Call Identification / Call Status Display.
Call Information	<p>The user attempts to activate Call Information when there is no indication of any kind at the set.</p> <p>The user attempts to activate Call Information while on a Conference.</p>
Call Log	<p>A new log entry comes in but no Log space has been assigned.</p> <p>A user does not have an free intercom key and attempts to return internal item call from Call Log.</p> <p>ATA is being used and an attempt is made to access Call Log.- attempting to activate Call Log when the identified set is that sets' name.</p> <p>Call Log is activated for a call that has no Calling Line Identification (CLID) information to be logged.</p> <p>Call Log is activated when there is no active call.</p> <p>There is no room for a new log entry in Call Log, and Autobumping is set to OFF.</p>
Call Park	<p>A user retrieves a parked call on a split line when the retrieving set is active on the first call. The user attempts to park a call when</p> <ul style="list-style-type: none"> - no system Park ID is available - they are not connected on a call and have no call in I-Hold - the Call Park prefix has been set to None <p>The user attempts to Park a Conference call.</p> <p>The user attempts to retrieve</p> <ul style="list-style-type: none"> - a parked call from an invalid DN (either disabled, or the same DN as the one from which the pickup attempt is being made) - a parked call that does not have the appropriate external line key or intercom key at which to present the call - a previously parked call but enters an invalid code
Call Pickup	<p>A user uses Call Pickup to retrieve a second call on a split line when the retrieving set is active on the first call.</p> <p>ATA is being used and an attempt is made to activate Call Pickup.</p>

Features or Conditions that Generate Error Tone

Feature or Condition name	Instance
Call Pickup Directed	<p>The user attempts to activate Call Pickup (Directed) when</p> <ul style="list-style-type: none"> - no appropriate key is available on which to present that call - there is no call to be picked up <p>The user attempts to pickup a call originating from an internal party with whom the user already has a call (Directed Call Pickup).</p> <p>The Directed Pickup capability is disabled (system-wide) in OAM Programming and the user activates this feature.</p> <p>The specified DN in Call Pickup is invalid.</p> <p>The specified set in Call Pickup (Directed) is not in service.</p> <p>The specified set in Call Pickup is the same as the set from which the pickup attempt is being made.</p>
Call Pickup Group	No eligible calls are ringing in the group.
Camp-On	<p>A user activates Camp-On for a call on a split line when the camped set was active on the first call. (ENET)</p> <p>The user attempts to Camp an internal call.</p> <p>The user attempts to activate Camp-On while within the Transfer feature.</p>
CAP	Any CAP tries to send a message when the limit is reached (30 messages).
Class of Service - programming	A user tries to change a Class of Service (COS) password to one that already exists.
CO line	An installer attempts to copy data between CO and AC15 lines.
CO-CO Conference	A transfer destination is specified by pressing an intercom key that represents the established Conference Call and would result in a CO-CO Conference.
Conference	<p>A Transfer destination is specified by pressing an intercom key that represents the established Conference Call and would result in a CO-CO Conference.</p> <p>The user attempts to create a Conference when the hardware resources are unavailable.</p> <p>The user attempts to set up a Conference including two external lines. The user attempts to suspend Privacy on a Conference call.</p> <p>The user attempts to park a Conference call.</p>
Connection errors	Connection errors are detected by the system (only on the specified Alarm Extn).
Contrast Adjustment	ATA is being used and an attempt is made to adjust the Display Contrast.
Copy	<p>An installer attempts to copy data between CO and AC15 lines.</p> <p>The user attempts to access the Extn Copy feature while a Copy is running in the background.</p> <p>The user attempts to copy line data over dissimilar (on- or off-core) trunk cards.</p> <p>The user attempts to copy system or user programming data from or to a set that is not present on the system.</p> <p>The user attempts to copy system or user programming data from or to a set that is not the same type of set as the destination or source set.</p> <p>The user tries to perform some other action, or another Copy, while a Copy command in OAM Programming is still in progress.</p>

Features or Conditions that Generate Error Tone

Feature or Condition name	Instance
Date and Time Display	ATA is being used and an attempt is made to activate Date and Time Display.
DISA DN	A user specifies the digits for the DISA DN and those digits are the same for a Auto DN.
Disconnect Supervision	A user activates Transfer from Conference when the lines do not have Disconnect Supervision or both lines are outgoing (NA only).
Do Not Disturb	A user goes offhook or presses Handsfree, and Do Not Disturb is active and a call is alerting on the user's Prime Line. ATA is being used and an attempt is made to activate Do Not Disturb.
End-to-End Signaling	A user attempts to activate End-to-End Signaling when not on an active call. A user attempts to activate End-to-End Signaling when participating in a Conference call. ATA is being used and an attempt is made to activate End-to-End Signaling.
Extn Administration Lock	The user attempts to change or use key or feature assignments that are inaccessible as a result of Extn Administration Lock.
Extn disabling	A maintenance set tries to disable itself at the port level.
Extn Log Space	The user attempts to enter the <code>Set log space</code> while the system is still resetting all logs.
Extn Restrictions	The user attempts to add a new line/extn restriction which would exceed the available maximum number of entries.
External Autodial	A user activates an External Autodialer at the <code>Select Line Out</code> prompt for Selective Line Redirection when External Autodial is programmed using a Prime Line instead of an Autodialer specifically programmed with an outgoing facility.
External call	Saved Number Redial is activated while the set is active on an incoming external call.
External Line Access code	The set's Prime Line is a line pool and there are no available lines in the line pool. The set's Prime Line is an external line and the line is busy.
Feature access key	The user attempts to program a feature access key while a OAM Programming session is in progress elsewhere. The user attempts to program a Feature Access key when on an I-Active call.
Feature DN	A user specifies the digits for one feature DN (that is, Auto DN), and then tries to specify the same digits for the other feature DN (that is, DISA DN).
Feature keys - Programming	ATA is being used and an attempt is made to program Feature keys.
General	A feature times out.
Group Listen	A call is placed on hold and the user then activates the Group Listen. ATA is being used and an attempt is made to activate Group Listen. The user is not active on any call and activates the Group Listen feature.

Features or Conditions that Generate Error Tone

Feature or Condition name	Instance
Handsfree	ATA is being used and an attempt is made to activate Handsfree. The Prime Line is busy, or no Prime Line has been assigned and the user attempts to select a line by going offhook, or pressing Handsfree. ATA is being used and an attempt is made to activate Handsfree Answerback. The user attempts to move a line key to a Handsfree key.
Hidden numbers	The user attempts to store a number in an Autodialer or User Speed Dial but uses Last Number Redial as the source from a named System Speed Dialer or the number has been programmed not to show (that is, it contains a hidden number).
Hold	A call is placed on Hold and the user then activates the Group Listen feature.
Hold (Listen on Hold)	ATA is being used and an attempt is made to activate Listen on Hold.
Hotline	The user has specified that a Hotline call uses a specific line, and that line is currently in use when activated.
Hotline - Programming	Setting the facility to Use routing table when programming Hotline and the digits are not recognized by the system.
I-Active status	The user attempts to activate Key Inquiry when there is a call in I-Active status. The user attempts to program an Autodial, Speed Dial, Internal Autodial key, feature access key, or select a Ring Type when on an I-Active call. The user is active on a call, and tries to enter Programmed Release.
I-Hold status	The user attempts to activate Key Inquiry when there is a call in I-Hold status.
Incoming Call Info	Call Log is activated for a call that has no Calling Line Identification (CLID) information to be logged.
Intercom keys	The user attempts to use a Internal Autodial key when no intercom key is available at the originating set. A transfer destination is specified by pressing an intercom key that represents the established Conference call and would result in a CO-CO Conference. A user dials the External Line Access code and there are no available lines in the line pool (if intercom is the set's Prime Line). A user does not have an free intercom key and attempts to return internal item call from Call Log. An invalid Line Pool code is used when programming the facility for use with an intercom key. The facility for use with an intercom key has been programmed with an invalid Routing code at run time (that is, there are no checks performed at programming time). No intercom key is available to Automatic Outgoing Internal Line Selection (by a Feature). The set's Prime Line is intercom and there are no available lines in the line pool. The user attempts to move a line key to an intercom key. The user attempts to Page when no intercom keys are available.
Internal Autodial key	The user attempts to use a Internal Autodial key when no intercom key is available at the originating set.
Internal Autodial key - programming	The user attempts to program a Internal Autodial key when on an I-Active call. ATA is being used and an attempt is made to program Internal Autodial keys.

Features or Conditions that Generate Error Tone

Feature or Condition name	Instance
Internal call	An attempt is made to suspend Privacy on an internal call. The user attempts to Camp an internal call. Saved Number Redial is activated while the set is active on an internal call.
Language Choice	ATA is being used and an attempt is made to program Language Choice.
Last Number Redial	The user attempts to store a number in an Autodialer or User Speed Dialer but uses Last Number Redial as the source from a Named System Speed Dialer or the number has been programmed to not show (that is, contains a hidden number). The user attempts to use Last Number Redial while within the Transfer feature. The user activates Last Number Redial when the line that the feature wants to use (that is the line that was used to originally make the call) is in use. The user presses an empty Last Number Redial key while programming an Autodialer.
Line access	Privacy is in effect on a line, and a Norstar user is active on that line, any other Norstar user who presses an appearance of the line.
Line disabling	The user attempts to select a disabled line.
Line Pool	A user dials a route which maps to a line pool to which the user does not have access. A user dials the External Line Access Code and there are no available lines in the line pool (if Line Pool is the set's Prime Line). A user activates a Line Pool when there is no appropriate key on the set on which the line can appear. The user attempts to access a Line Pool to which they do not have access (as set in OAM Programming).
Line Pool code	An invalid Line Pool code is used when programming the facility for use with an intercom key. The user attempts to access an Line Pool but enters an invalid Line Pool code. Entering an invalid Line Pool code.
Line restrictions	The user attempts to add a new line/set restriction that would exceed available then maximum number of entries.
Line Selection	The user attempts to access a line that is in use by another set and has Privacy set to ON. The user attempts to select a disabled line.
Line Selection (Pre-selection)	An alerting call is using the Prime Line, and the user tries to dial a number. The user tries to dial a number while a held call is using the Prime Line.
Line Selection (Automatic Outgoing Internal)	The user attempts to call internally but no intercom key is available to Automatic Outgoing Internal Line Selection (by a Feature).
Line Selection (Automatic Outgoing)	A user goes offhook or presses Handsfree when Do Not Disturb is active and a call is alerting on the user's Prime Line. An Automatic Outgoing Line Selection attempt is unsuccessful in accessing an available line.

Features or Conditions that Generate Error Tone

Feature or Condition name	Instance
Line Selection (Automatic Outgoing Prime)	The user attempts to use a feature that uses Automatic Outgoing Prime Line Selection without programming a Prime Line for that set.
Line Selection (Manual)	ATA is being used and an attempt is made to activate Manual Line Selection.
M7100 set	The user attempts to activate Call Log on an M7100 set while there is an active or held call.
Message cancellation	The user attempts to cancel a sent message and specifies a destination for which there is no message. The user attempts to cancel a sent message when the Message List is empty. The user attempts to activate the Cancel Message Waiting feature when the Message Waiting list is empty.
Message sending	The user attempts to send a message - to a set that is not in service - to an invalid destination - to an invalid DN - to an SL-100 set The user attempts to send a new message when the destination set's Sent Message list is full.
Message Waiting / Reply Message / Cancel Message Waiting	ATA is being used and an attempt is made to activate Message Waiting/ Reply Message/ Cancel Message Waiting.
Moving Lines	ATA is being used and an attempt is made to move lines. The user attempts to move a line key to an intercom key, Answer key, Handsfree key, or a key that does not have an indicator. The user presses a key other than a line key when prompted with <code>Move line from:</code> when moving line keys.
Non-indicating key	The user attempts to move a line key to a key that does not have an indicator.
Not in service	The user attempts to send a message to a set that is not in service.
Not in service (set)	The user attempts to activate Ring Again when the service receiver's set is not in service.
OAM Programming	The user attempts to perform OAM Programming when - their set is not completely idle (including held lines) - any OAM Programming session is already in progress on another set
Offhook Call Queuing Answer Call	ATA is being used and an attempt is made to activate Offhook Queuing/ Answer call.
Onhook Dialing Options	ATA is being used and an attempt is made to program Onhook Dialing Options.
Outgoing call	The user attempts to use an ILG key for an outgoing call.

Features or Conditions that Generate Error Tone

Feature or Condition name	Instance
Paging	The user attempts to Page while within the Transfer feature. The user attempts to Page when there are no intercom keys available.
Password	A user enters an incorrect or invalid password. ATA is being used and an attempt is made to access Password programming. Entering a new password, a user's second attempt to enter a new password (used for verification purposes) does not match the user's first attempt to enter a new password.
Port number	A user enters a port number that is not a digital port under Provisioning. An invalid port number is entered when specifying ports to be tested.
Pre-Dial	The user attempts to enter digits when the set is programmed with the Pre-Dial dialing option when all the lines at the user's set are in use.
Pre-selection	ATA is being used and an attempt is made to preselect a line.
Prime Line	A user dials the External Line Access code and that set's Prime Line is unavailable. A user activates an External Autodialer at the <i>Select Line Out</i> prompt for Selective Line Redirection when the External Autodialer is programmed using a Prime Line instead of an Autodialer specifically programmed with an outgoing facility. A user selects a set's Prime Line when it is in use by another set. A user tries to dial a number while a held call is using the Prime Line. An Autodialer is activated and no Prime Line is programmed at the set (if the Autodialer is set to use the Prime Line). The user attempts to dial a number when there is a call alerting their Prime Line. The user attempts to select a line by going offhook or pressing Handsfree when the Prime Line is busy, or no Prime Line has been assigned to that set. The user attempts to use a feature that uses Automatic Outgoing Prime Line Selection without programming a Prime Line for that set. Do Not Disturb is active and a call is alerting on the user's Prime Line and the user lifts the handset or presses Handsfree.
Prime Extn	A Prime Extn that has appearance of another set's Private Line tries to access it when access is not allowed.
Priority Call	Any action other than Release, going onhook, and Volume adjustment are attempted when a Priority Call connects with a set on which there is no intercom key available. The user attempts to activate the Priority Call feature when access is denied to the set in OAM Programming. The user attempts to make a Priority Call to an offhook ATA. The user attempts to place a Priority Call while within the Transfer feature.
Privacy	The user attempts to access a line that is in use by another set and has Privacy set to ON.
Privacy Control	The user attempts to activate Privacy Control when not on an I-Active external call. The user attempts to suspend Privacy on an internal call or a conference call.
Private Line	A Prime Extn having appearance of another set's Private Line tries to access it when access is not allowed.
Programmed Release	The user is active on a call, and tries to enter Programmed Release.

Features or Conditions that Generate Error Tone

Feature or Condition name	Instance
Provisioning	A user enters a port number that is not a digital port under Provisioning.
PSTN line	The user attempts to transfer a PSTN call using a PSTN line out of the system.
Restriction Service	The user attempts to add a new Restriction by pressing the ADD display key or attempts a Copy command which would exceed available then maximum number of entries (400 restriction and exception entries). The user attempts to activate a System Speed Dial that conflicts with a programmed Restriction.
Restrictions - programming	A user enters a line number for a line which is not assigned to the set when programming the restrictions.
Ring Again	A Ring Again feature code is redialed while the Ring Again feature is already active but not being offered. The user attempts to activate a Ring Again for a set which already has a Ring Again activated for it, by another user. The user attempts to activate a Ring Again in situations other than for outgoing internal calls or busy line pools. The user attempts to activate Ring Again when the service receiver's set is not in service. The user attempts to use Ring Again while within the Transfer feature. The user attempts to use Ring Again on Busy while within the Transfer feature.
Ring Type - selecting	ATA is being used and an attempt is made to program Ring Type. The user attempts to select a Ring Type when on an I-Active call.
Ring Volume	ATA is being used and an attempt is made to program Ring Volume.
Ringing Call	The user attempts to activate Key Inquiry when there is a Ringing Call at the set.
Routing Code	The facility for use with an intercom key has been programmed with an invalid Routing code (Error tone is presented at run time, not programming time).
Routing Table	Setting the facility to <code>Use routing table</code> when programming Hotline and the digits are not recognized by the system.
Saved Number Redial	The user attempts to use Saved Number Redial while within the Transfer feature. Saved Number Redial is activated while the set is active on an internal or incoming external call. The user activates Saved Number Redial when the line that the feature wants to use (that is the line that was used to originally make the call) is in use. The user presses an empty Saved Number Redial key while programming an Autodialer.

Features or Conditions that Generate Error Tone

Feature or Condition name	Instance
Scheduled Services	<p>The user attempts to activate a Scheduled Service but no line responds to this request.</p> <p>The user attempts to activate a Scheduled Service at a set that is not the Control Extn or the Direct-dial extn.</p> <p>A second call on a split line is given existing handling by Scheduled Services, except when this second call would arrive on the set that was active on the first call. That is, the set is a ringing set for the line in the currently active Scheduled Services. A user activates the feature code for a Scheduled Services and all service schedules have been set to off in OAM programming.</p> <p>ATA is being used and an attempt is made to activate Scheduled Services.</p> <p>The user attempts to activate Trunk Answer from Any Station (Ringing Service) when no lines are in Scheduled Services.</p>
Selective Line Redirection (SLR)	<p>A Selective Line Redirection (SLR) attempt fails for any reason.</p> <p>A user dials a restricted number when dialing the destination for Selective Line Redirection.</p> <p>A user has chosen a specific line as the outgoing facility, then if the user chooses that same line as the line to be redirected (thereby attempting to redirect a line out of itself).</p> <p>A user activates an External Autodialer at the <code>Select line out</code> prompt for Selective Line Redirection, when the External Autodialer is programmed using a Prime Line instead of an Autodialer specifically programmed with an outgoing facility.</p> <p>ATA is being used and an attempt is made to activate Selective Line Redirection.</p> <p>The user attempts to access one of the two lines active in Selective Line Redirection.</p> <p>The user attempts to activate Selective Line Redirection from a Basic set or from the ATA.</p> <p>The user attempts to activate Selective Line Redirection when it is already in use at a different set.</p> <p>The user attempts to select a line for Selective Line Redirection which cannot be redirected because it is an autoanswer line or an unsupervised line.</p>
Short Tones	ATA is being used and an attempt is made to activate Short Tones.
SL-100 extn	A set tries to send a message to an SL-100 extn.
Speed Dial (System)	The user attempts to use a System Speed Dial while within the Transfer feature.
System Park ID	Call Park is activated when no system Park ID is available.
System Speed Dial	<p>A System Speed Dial conflicts with a programmed restriction.</p> <p>The user attempts to store a System Speed Dial to a DIA line.</p>
System Startup	<p>The user attempts to initiate a System Startup when their set is not completely idle (including held lines).</p> <p>The user attempts to use the system startup code (**Startup) any time after the first 15 minutes after powering up the system.</p>
DIA line	<p>A user presses a DIA line key when no call is alerting, active or held.</p> <p>The user attempts to store an Autodialer, User Speed Dial, or System Speed Dial to a DIA line.</p> <p>Programming an Autodialer and the user selects a DIA line key for the facility.</p>
Testing ports	An invalid port number is entered when specifying ports to be tested.
Tones ON/OFF	ATA is being used and an attempt is made to activate Tones ON/OFF.

Features or Conditions that Generate Error Tone

Feature or Condition name	Instance
Transfer	<p>A user hangs up (or presses Release) when transfer is not in a valid Transfer Completion State (that is, the line is not seized).</p> <p>A users attempts to activate a new feature while within the Transfer feature.</p> <p>An internal party about to be transferred disconnects before the transfer is completed.</p> <p>The user attempts to get an alerting call (other than by Call Queuing) while within the Transfer feature.</p> <p>The Transfer source or destination are the same as the set that had been active on another call, the call handling is as if the set has no available keys on which to present the call. The user attempts to get an idle line while within the Transfer feature.</p> <p>The user attempts to transfer a PSTN call using a PSTN line out of the system.</p> <p>The source call on a disconnect supervised line hangs up during the Transfer procedure.</p>
Transfer using HOLD reception	ATA is being used and an attempt is made to transfer using HOLD reception.
Transfer With Announcement	Transfer with Announce is activated, and the Transfer destination (either Slave Set) is specified by pressing a Internal Autodial key or by inputting the DN from the dialpad. ATA is being used and an attempt is made to activate Transfer with Announcement.
Trunk Answer From Any Station	The user attempts to activate Trunk Answer from Any Station (Scheduled Services) when no lines are in Scheduled Services.
Trunk Cards	The user attempts to Copy line data over dissimilar (on- or off-core) trunk cards.
Unsupervised Line	The user attempts to select a line for Selective Line Redirection (SLR) that cannot be redirected because it is an unsupervised line.
User-programmable keys	ATA is being used and an attempt is made to program user-programmable keys.
User Speed Dial	<p>ATA is being used and an attempt is made to program User Speed Dial.</p> <p>The user attempts to store an User Speed Dial to a DIA line.</p> <p>The user attempts to use a User Speed Dial while within the Transfer feature.</p>
User Speed Dial - programming	<p>The user attempts to create a new User Speed Dial entry when there is no available memory.</p> <p>The user attempts to program a Speed Dial number when on an I-Active call.</p> <p>ATA is being used and an attempt is made to program a User Speed Dial.</p>
Voice Call	The user attempts to use Voice Call while within the Transfer feature.
Voice Call Reception / Voice Call Deny	ATA is being used and an attempt is made to Deny or Receive Voice Calls.
Volume Control	ATA is being used and an attempt is made to program Volume Control.

1.2.1.8 Expensive Route Warning Tone (ERWT)

The expensive Route Warning tone, presented through the active voice path, warns a user when an outgoing call is forced through a path (in the Routing table)

that is more expensive than other routes. The expensive Route Warning tone is composed of two separate tones. For a description of the characteristics of the expensive Route Warning Tone, see “1.2.1.23 Tone Descriptions”.

1.2.1.9 Forced Call Warning Tone

See Priority Call Alert.

1.2.1.10 Held Line Reminder Tone

Held Line Reminder tone, presented through the speaker, reminds a user when they have a line on hold for what has been determined to be an excessive period of time. The length of time to the first Reminder tone is programmable, and the tone is subsequently repeated periodically as long as the line remains on hold. The Held Line Reminder tone is composed of one chord. For a description of the characteristics of the Held Line Reminder Tone see “1.2.1.23 Tone Descriptions”.

Features that Generate Held Line Reminder Tone

Feature or Condition name	Instance
Hold	An external call has been on hold for an excessive time.
Camped Call	An external call has been camped for an excessive time (also known as Camped tone).

1.2.1.11 Internal Ringback Tone

Ringback Tones, presented through the active voice path, is the tone heard by the caller when the receiving set is ringing. An Internal Ringback tone cycle is composed of one chord presented twice, separated by a pause. For a description of the characteristics of Internal Ringback Tones, see “1.2.1.23 Tone Descriptions”.

Features that Generate Internal Ringback Tone

Feature or Condition name	Instance
Answer DNs	At least one set in the system is alerting (visually or audibly). Only the service receiver's set is alerting (visually or audibly).
Busy Set	An internal call is made to a set which has an available intercom key but is active on another call.
Call Park	An external call has been parked longer than some specified amount of time.
Do Not Disturb	The receiving set is in Do Not Disturb mode.
Intercom key	The receiving set does not have an available intercom key and does not have an appearance of the line.
Line key	The receiving set does not have an appearance of the line and does not have an available intercom key.

1.2.1.12 Intrusion Tone

Intrusion tone applies only to Privacy Control and occurs before the third party joins a call. The Intrusion tone is presented through the active voice path. For a description of the characteristics of the Intrusion tone see “1.2.1.23 Tone Descriptions”.

1.2.1.13 Microphone-On Warning Tone

Microphone-On Warning tone, presented through the speaker, warns the user that the microphone has been turned on automatically. The tone is repeated periodically until the user takes an action to acknowledge the call. The Microphone-On Warning Tone cycle is composed of a single tone. For a description of the characteristics of the Microphone-On Warning tone, see “1.2.1.23 Tone Descriptions”.

Features that Generate Microphone-On Warning Tone

Feature or Condition name	Instance
Priority Call	A set receives a Forced Call (Priority Call) and the call has not been acknowledged.
Voice Call	A set receives a Voice Call and has Handsfree Answerback ON and the call has not been acknowledged.

1.2.1.14 Overflow / Reorder Tone

Overflow tone, presented through the active voice path, indicates to a caller that their call could not be successfully completed, typically due to an error or restriction. Overflow tone, resembles what could be described as a “fast busy” tone. For a description of the characteristics of the Overflow tone, see “1.2.1.23 Tone Descriptions”.

Features that Generate Overflow Tone

Feature or Condition name	Instance
Answer DN	Neither set is alerting, because both sets are out of service (Overflow heard at calling set)
Call Forward	An internal call goes through a forwarded chain and no sets have an available line on which to receive the call. Calling a set which is forwarded to the set which is in a programming session.
Call Handling	A set calls itself (for example, a user dials 223 from set number 223). The user attempts to call a disabled set. Calling a set which is involved in an OAM programming session, (including when the set is forwarded to another set). Extn A dials extn B when there is already a connection between them (regardless of the state of that connection). The user attempts to retrieve a Park ID for which no call is parked. The system accepts a user's line pool request but the intended line enters an active state or alerting state before it can be allocated to that user. When dialing the internal number of a set that is not yet installed or is responding to status polling.
Call Park	An invalid Park ID is dialed. Dialing an invalid internal number.
Class of Service	A user enters a feature code remotely for a feature for which they do not have Class of Service to use. (Remote Capabilities)

Features that Generate Overflow Tone

Feature or Condition name	Instance
COS Password	A user enters an incorrect Class of Service (COS) password. A user enters anything other than the digits zero to nine, with the exception of the octothorpe key (#) at the end of their password, when entering their Class of Service (COS) password. Accessing the system remotely, if the user takes longer than fifteen seconds to begin entering their Class of Service (COS) password or fifteen seconds elapses between any two digits of their password.
Direct-dial	A user activates Direct-dial when Direct-dial is programmed to call the calling set (note that programming a set to Direct-dial itself is not prevented in OAM). An internal user dials a Direct-dial digit when no Direct-dial extn is associated with the calling extn. An internal user dials a Direct-dial digit when no Direct-dial digit for the system is defined.
Disabled extn	The user attempts to call a disabled extn.
Exclusive Hold	The user attempts to access a line that has been held exclusively by another set.
Line Access	The user attempts to access a line that has been held exclusively by another set.
Line Pool	Access to a line pool is denied through programming. The system accepts a user's line pool request but the intended line enters an active state or alerting state before it can be allocated to that user.
Line Pool access code	A user remotely enters a valid line pool access code, but one to which they do not have access (Remote Capabilities). A user remotely enters an invalid line pool access code (Remote Capabilities). A user remotely gains access to a line pool code then proceeds to dial restricted digits on that line (Remote Capabilities).
Line Selection	A user selects a line that is not in service.
OAM Programming	The user attempts to place a Priority Call to a set in OAM Programming. Calling a set which is involved in an OAM programming session (including when the set is forwarded to another set).
Priority Call	The user attempts to place a Priority Call to a set in OAM Programming.
Restrictions	A user remotely gains access to a line pool code then proceeds to dial restricted digits on that line (Remote Capabilities)
Selective Line Redirection	The outgoing facility for Selective Line Redirection is not available.

1.2.1.15 Page Tone

Page Alert tone, presented through the speaker, encourages users to direct their attention to their sets in order to listen to an announcement that follows the Page Alert tone. Presently, it is composed of a single chord (two tones presented simultaneously). Page Alert tones are not received by users who are on another call. Should a user end the call while the page is still in progress, the Page Alert tone is presented at the time of disconnection and the user hears the remainder of the page.

A Norstar system can be programmed in OAM to not present the tone prior to a Page. In earlier versions, the Page Alert tone was composed of three separate tones but has been changed to a single chord in Compact ICS. For a complete description of the characteristics of the Page Alert tone, see “1.2.1.23 Tone Descriptions”.

1.2.1.16 Priority Call Alert (aka Forced Call Warning Tone)

Priority Call Alert, presented through the speaker, warns the receiving party that someone is attempting to force a call through (that is, another user has activated the Priority Call feature). The Priority Call Alert is composed of three tones. For a description of the characteristics of the Priority Call Alert, see “1.2.1.23 Tone Descriptions”.

Feature that Generates Priority Call Alert

Feature or Condition name	Instance
Priority Call	A Priority Call is made to a set. A Priority Call is disconnected. The tone is only sounded at the set that was released from the call.

1.2.1.17 Ringing Tones

Ringing tones, presented through the speaker, alerts the user of an incoming call. Internal and external incoming calls receive the same ringing tones. The user has a choice of four different ringing patterns to facilitate discrimination between nearby Ringing Sets as long as they have been programmed to ring differently. For a description of the characteristics of the various Ringing tones, see “1.2.1.23 Tone Descriptions”.

1.2.1.18 Tone on Conference

Tone on Conference, presented through the active voice path, informs two connected users that a third party has joined the call. The tone is heard by all three parties after the third party has joined the call (for the first time or returning from Hold). The Tone on Conference is composed of a single tone. For a complete description of the characteristics of the Tone on Conference, see “1.2.1.23 Tone Descriptions”.

1.2.1.19 Tone on Hold

Tone on Hold is presented to a held caller (internal or external). This feature generates periodic, reassuring tones to a held external party to indicate that the call is on hold rather than being disconnected. The Tone on Hold cycle is composed of a single tone followed by silence. For a description of the characteristics of Tone on Hold, see “1.2.1.23 Tone Descriptions”.

1.2.1.20 Stuttered Dial Tone

Features that Generate Stuttered Dial Tone

Feature or Condition name	Instance
Auto-Answer Trunk	May be presented to the caller when answered by an autoanswer trunk.

1.2.1.21 Voice Call Alert

Voice Call Alert is presented through the headset.

1.2.1.22 Path of Presentation of Tones

The tones, generated by Norstar, can be divided into:

- tones generated at the CCU

The tones are created at the CCU and sent down the voice path that is activated. Can be heard on the speaker, handset, or headset (for example, dial tone, Busy tone, and so on)

- tones generated at the set

The command to create the sound is created at the CCU and sent to the set. Once there, the set executes that command thereby generating the requested tone. This type of tone can only be heard over the speaker (for example, Error tone, Attention tone, and so on).

Source of Tones

Tone	Medium
Attention tone	Speaker only
Attenuated Ringing	Speaker only
Background Music	Speaker only
Busy tone	Active voice path
Conference tone	Active voice path
Dial Pad feedback tone	Active voice path
DTMF	Active voice path
Error tone	Speaker only
Expensive Route Warning tone	Active voice path
Feedback tone	Active voice path
Forced Call Warning tone	Speaker only
Held Line Reminder	Speaker only
Intrusion tone	Active voice path
Microphone On Warning tone	Speaker only
Overflow tone	Active voice path
Page Alert tone	Speaker only
Priority Call Alert	Speaker only
Ringback	Active voice path
Ringling	Speaker only

Source of Tones

Tone	Medium
Tone on Conference	Active voice path
Tone on Hold	Active voice path (generated by CCU)
Voice Call Alert tone	Speaker only

1.2.1.23 Tone Descriptions

Tone Name	Time	Frequency
Attention tone	200 ms 200 ms	333 + 500 Hz 500 + 667 Hz
Busy tone	370 ms On, 380 ms Off	400 Hz
Busy tone	500 ms ON 500 ms OFF	480 + 620 Hz
Conference tone	300 ms	400 Hz
Dial Pad Feedback tone	16 ms	333 Hz
Dial tone	Continuous	333 + 462 Hz
Dial tone	Continuous	350 + 440 Hz
DTMF (long)	As long as key is pressed. (DR2)	Variable
DTMF (short)	120 ms (DR2)	Variable
Error tone	200 ms 200 ms	333 + 500 Hz 250 + 333 Hz
Expensive Route Warning tone	300 ms ON 200 ms OFF 200 ms ON 200 ms OFF	440 Hz 440 Hz
Held Line Reminder	200 ms	500 + 667 Hz
Internal Ringback tone	400 ms ON 200 ms OFF 400 ms ON 2 sec OFF	400 + 450 Hz 400 + 450 Hz
Intrusion tone	100 ms ON 1 sec OFF 100 ms ON 1 sec OFF	1400 Hz 1400 Hz
Microphone On	400 ms	333 Hz
Overflow tone	Continuous	400 Hz

Tone Name	Time	Frequency
* Page (Multiple tones)	200 ms 200 ms 200 ms	500 Hz 667 Hz 1000 Hz
Page (Single tone)	800 ms	500 + 667 Hz
Priority Call Alert (aka Forced Call Warning tone)	250 ms 250 ms 250 ms	1000 Hz 667 Hz 500 Hz
Ring 1	50 ms 50 ms	667 Hz 500 Hz
Ring 2	50 ms 50 ms	333 Hz 250 Hz
Ring 3	87.5 ms 87.5 ms	333 + 667 Hz 500 + 1000 Hz
Ring 4	137.5 ms 75 ms 75 ms	333 Hz 500 Hz 667 Hz
Ringback	2 sec ON 4 sec OFF	440 + 480 Hz
Tone on Hold	100 ms ON 3.5 sec OFF	400 Hz
Voice Call Alert tone		250 + 333 Hz

* No longer used.

1.3 Technical Specification (Limits/Constraints)

N/A

1.4 Interactions

Feature or Condition name	Interaction
Dialing Options	When either Automatic or Standard Dial is active, Dial Pad Feedback is presented for each dial pad key press. When Pre-Dial is active, Dial Pad Feedback is presented for each dial pad key press once the line is picked up.
End-to End Signaling	While the set is in End-to End Signaling mode, the user continues to hear only the fixed length, set generated dialpad feedback tones.
Last Number Redial Saved Number Redial System Speed Dial User Speed Dial Internal Autodial External Autodial	Dial Pad Feedback is not generated when a call is made using LNR or SNR. Dial Pad Feedback is not generated when a call is made using Autodial, User or System Speed Dial keys, or when programming them.

Feature or Condition name	Interaction
Restriction Override	When the user activates the Restriction Override feature, the display is cleared, that is, the digits are not echoed onto the display screen. However, dialpad feedback tones are still presented.

Transfer and Recall on AC15A

1.1 Overview

1.1.1 Description

Recall is automatically sent as part of the Transfer operation for an established call arriving on an AC15 line, and when the network destination is programmed to be reached using the same AC15 line. Once the transfer is completed, that AC15 line is free for another call.

Recall signalling in ENET Network Transfer is used to try to minimize the number of AC15 lines in transferring source and destination calls. This occurs after a determination that the destination call can be routed using the same AC15 line as for the source call. This usage of the same AC15 line for the destination call, rather than a different one, prevents a situation described as “tromboning”. UK-ENET Transfer is enhanced with “anti-tromboning” capability, which is transparent to the user. The benefit of Recall signalling is in the operation of a private network, by minimizing the number of AC15 lines between nodes in the network and therefore the cost of the network.

See also the Recall Signalling feature.

1.1.2 Rationale for Feature

Using the Recall signal in transfer situations will prevent the tromboning of AC15 lines in the same route. This is to reduce the number of AC15 lines (and cost of those lines) between nodes in a private network.

1.1.3 General Definitions

The Manual Recall feature for AC15 lines has the same, limited user interface support as for PSTN lines.

1.1.4 General Definitions

1.1.4.1 Tromboning

The following figure shows an example of the tromboning of AC15 lines in Network Transfer. The user on node C transfers the call from a user at node A to a user on node D. Only two of these lines (from node A to B and node B to D) are essential for connecting the users on nodes A and D. Without the anti-tromboning capability, a total of 4 lines are used when the call to the destination on node D is made and when the Transfer is completed. The tromboning occurs on two lines: from node B to C; and from node C to B. With the anti-tromboning capability, only three lines are used when the call is made to the destination on node D (the line from node B to node C is reused), and only two lines are used when the Transfer is complete.

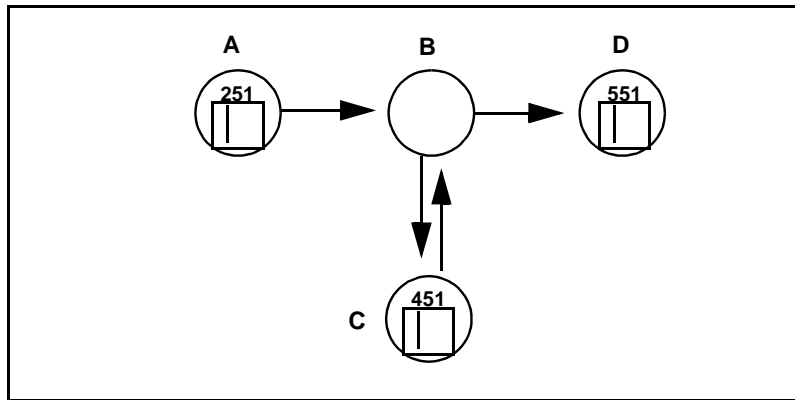


Figure 1-1: Tromboning of circuits resulting from Transfer

Recall signalling for Transfer

The Norstar system determines that the call to the user at node D can be made reusing the same AC15 line. The Norstar Transfer feature places the source call at node C on Exclusive Hold, and sends a Recall signal to node B. In response to the Recall signal, node B places the source call from node A on Exclusive Hold, and establishes a second call (in particular, providing dial tone) from C to B, on the same AC15 line. Routing digits are sent from node C for this second call; these routing digits are routed according to the node B's routing tables. Node B routes the call to node D. The user on node C can hear the call progress tones for the destination call. When the user on node C completes the transfer, a trunk release signal from node C to node B results in: the transfer, by node B, of the call from the user on node A to the user on node D; and the freeing of the line between nodes B and C.

Line reuse determination

For Network Transfer, line reuse determination requires that each set of AC15 lines that terminate at the same network node be configured to be in one separate line pool.

Line reuse is possible when:

- the call to be transferred arrives on an AC15 line that is a member of a line pool, and
- a line in that line pool would be selected for the transfer destination call, and
- the line has not been split (reused), and
- the line has Tone dialing mode, and
- the terminating node for the AC15 line processes Recall signals (this is, captured in the `Recall at EXCH` setting of Y in AC15 line programming).

1.1.4.2 Recall Originating node

A node is defined as a Recall Originating node when a user at that node invokes a feature that sends a Recall signal. In the previous figure, node C is a Recall Originating node when the user invokes Norstar Network Transfer, or invokes Manual Recall.

1.1.4.3 Control node

A node is defined as a Control node when it responds to a Recall signal and it transfers 2 calls together. In the previous figure, node B is a Control node. When a

Control node receives the first Recall signal on an AC15 line, the node places the call connected to the Recalled line (this call is labeled First call in the following figure) on Exclusive Hold (the caller will receive held line treatment from the Control node), establishes a session for a second call on the line (including supplying dial tone) and awaits routing digits to complete the second call.

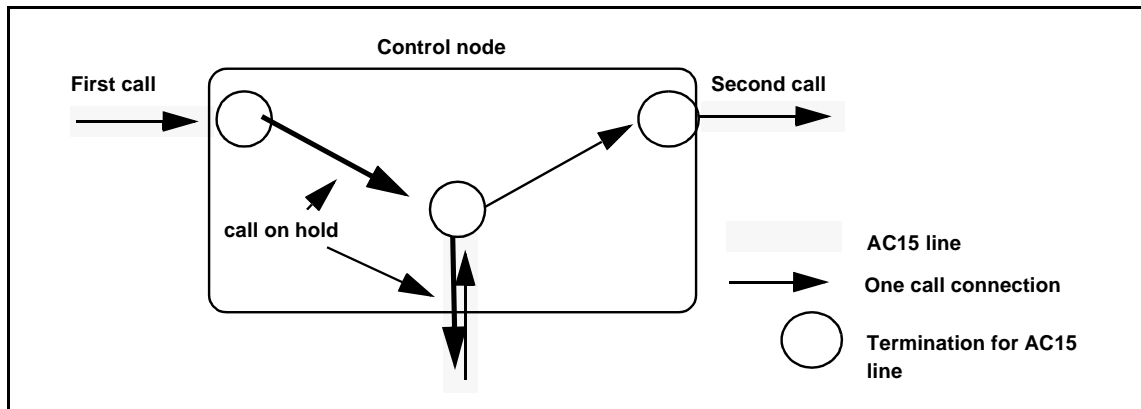


Figure 1-2: View of AC15 lines at a Control node

If a second Recall signal is received by a Norstar Control node and if the second call has been answered, the node will put the second call on Exclusive Hold and connect the Recall originator with the first call.

One or both of the calls on a split line may be at a set at the Control node.

1.1.4.4 Tandem node

A Tandem node is a Norstar node at which a line is established in a session with another line. After a Norstar Tandem node has received a Recall signal and has successfully translated the digits following the Recall, and if the AC15 line to be used to route the second call is the same one as the first call is using, the node will automatically send a Recall on that line and send out the digits. This is a cascading of Recall and routing digits.

1.1.4.5 Assumption about additional Recall signals to a Control node

Norstar makes the assumption that additional Recall signals sent to a Control node will result in the shuttling between calls on the split line. Shuttling is defined as placing the current call on hold, and unholding the held call so it becomes the current call. This is what a Norstar Control node does in UK-ENET.

There is no guarantee of compliance with SDX and other switches in any private network. In particular, a non-Norstar Control node may, in response to a second Recall signal, establish a conference between the Recall Originating set, the first call and the second call. This is inappropriate for the correct functioning of the Cancel and Retry capabilities of Transfer. Such a node should be viewed as one not processing Recall signals.

1.1.4.6 Split line

A line is said to be split when a Control node establishes a second call on an AC15 line in response to a Recall signal. (Tandem can also split lines, from the cascading of Recall signals.) There may be non-Norstar nodes that do not so respond to a Recall signal on an AC15 line.

Once a line has been split, it cannot be unsplit. There is no signaling capability back to a Control node or even the Recall Originating node to indicate if a destination user answered the second call using that line. Additionally, there is no signaling capability to the Recall Originating node to indicate if there has been a release of any call on a split line. Once a line has been split, it remains so until the whole trunk is released. See “Retry the transfer” on page 5 about a consequence of not allowing unsplitting of lines.

If the source call being held at the Control node releases, then the transfer agent at the Recall Originating node will hear dial tone from the Control node when cancelling the transfer action. At this point, the transfer agent could enter digits to call another destination. The transfer agent may reach a destination that is not intended, because the digits dialled are routed according to the Control node’s routing tables, not the Recall Originating node’s routing tables.

1.1.4.7 Automatic origination of Recall signals

In Norstar UK-ENET, the only feature that automatically sends Recall signals is Transfer (Feature).

A Recall signal is automatically sent when it has been determined that the destination call can reuse the line on which the source call arrived. A Recall signal is also automatically sent when the transfer agent cancels the transfer operation; this Recall signal is sent so that the source call, which was being held by the Control node, is made the current call.

1.1.4.8 Manual origination of Recall signals

Norstar UK-ENET provides the Manual Recall feature. A user can invoke the Manual Recall feature (Feature) for both AC15 and PSTN lines. MUK 1/ CUK 2 provides for the Manual Recall feature on PSTN lines; ENET adds the Manual Recall feature for AC15 lines.

AC15 and PSTN lines use different signalling characteristics for Recall, but the result is the same when the terminating node for the line processes Recall; that is, a second call can be made on the line. There is line programming data to identify which external nodes (CO and private network), connected to these lines, are able to process Recall signals sent by a Norstar node. (There is no programming data to identify which nodes (CO and private network) can originate Recall signals to a Norstar node.)

1.1.5 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls

Transfer programmed key, or Feature

Recall programmed key, or Feature

1.2.2 Message Displays

N/A

1.2.3 End-User View

1.2.3.1 Calling party - while the call is being transferred

Held line treatment

Initially the calling party is given held line treatment by the transfer agent's node when the transfer agent invokes Transfer and continues to hear this held line treatment (this may be several seconds while the transfer agent locates and then dials the destination) until the Control node receives a Recall signal. At this time, because the Control node places the call from the calling party on Exclusive Hold, the calling party will receive held treatment from the Control node, which may be different from the transfer agent's node!

1.2.3.2 Recall Originating Node

Transfer

A transfer agent sees no difference in the way Transfer operates.

To make use of the anti-tromboning capability of Transfer for a network call, the transfer agent must be in the Transfer context to enter digits for the destination. The transfer agent must dial digits that use the Routing Tables.

Any other technique for specifying the transfer destination (such as, pressing an explicit AC15 line key, or pressing a held line key) will not provide line reuse for the destination call.

The transfer agent is not given any indication that the AC15 line is reused. The destination call appears on a key (virtual or real) under existing rules.

Complete the transfer

There is no change to the way the transfer agent completes Transfer.

Transfer will send a trunk release signal to the Control node, so the Control node can connect the source and destination, and can free the AC15 line for another call. There is no longer any reference to either the source or destination call at the transfer agent's node (see "Callback - Transfer Direct" on page 6). The result is all indicators for that AC15 line show idle and any user may receive or make calls on it.

Cancel the transfer

There is no change to the way the transfer agent cancels Transfer. A second Recall signal is automatically originated to the Control node, with the assumption that the Control node holds the destination call and unholds the source call, so that the transfer agent is reconnected to the source call.

In the event the transfer agent invokes Manual Recall after canceling Transfer, the transfer agent will be connected to whatever is current for the second call path. If the destination has released, the transfer agent will be connected to dial tone from the Control node.

Retry the transfer

There is no change to the way the transfer agent retries Transfer, through the Retry actions or through the Cancel actions and re-invoking Transfer. Though the new

transfer destination may be reached using the same AC15 line, a different AC15 line will be used. This is because there is no capability for signalling the Control node to unsplit the line.

Callback - Transfer Direct

There will be no Callback if Network Transfer Direct reused the same incoming AC15 line for the destination call. This is because on Transfer Direct completion, the Control node will connect the source and destination, and free the AC15 line for new calls. That is, there is no instance of either call within the transfer agent's Norstar node, and so Callback cannot apply. It is the responsibility of the transfer agent listening to ringback at the destination to cancel the transfer and return to the source caller.

1.2.3.3 Following invocation of Manual Recall

Manual Recall

The user may invoke Manual Recall, using the dial up or a programmed feature key for Manual Recall.

If a user invokes Manual Recall on a network call so as to establish a second call on that line (splitting the line), the set does not give an indicator to the second call. The user sees only one indicator for the line on which there are two calls, and the line is treated as if there is only one call.

The user may use subsequent invocations of Manual Recall, to shuttle between calls on a line. There is no indication, through key/lamp pairs, or through the display, that the user is active on a different call.

If the user presses or invokes a feature that sends a trunk release on a split line, then if the Control node has two calls on the line when the release is received, the Control node will transfer the two calls.

Indicator

When a user invokes Manual Recall on an answered AC15 line, a Norstar Recall Originating Node does not assign an indicator for the second call on the line.

When a user presses the key for an indicator showing hold for a split line, the user returns to the call that was last current.

Conference

After a user has created a second call on a split AC15 line, it is not possible to create a conference with the two calls on that line. The Norstar system knows there is the user and the line, just two parties. (There exists no signaling to the Control node – it knows there are three parties – to make it establish the conference, if it could.)

1.2.3.4 At Control Node

Indicators show status of last active call

An indicator for the appearance of an AC15 line that is split will track the status of the last active call on the line as:

- when a user at the Control node is active on the call, the indicator shows solid
- when a user at the Control node having the active call places that call on hold, the indicator shows held
- when the Control node places the call on hold (because a user at the Recall Originating node is transferring this call, or because a user at the Recall Originating node invoked the Manual Recall feature to establish a second call), it is on Exclusive Hold and so the indicator shows solid. (If the indicator showed Held, then a user might assume there is a call to pick up. Only the Control node can unhold the call, and that is when there is another Recall signal from the Recall Originating node.).
- if a user at the Control node releases from the active call, the Recall originator user hears dial tone.
- once all calls have been released, the indicator shows idle.

Pressing the key for an indicator showing hold for a line that is split returns the user to the call that was last current.

There is no indication that the line is split.

Call presentation

Save for the exception noted in the next paragraph, the second call on a split line is presented at an intercom key, even though the set may have an appearance of the line. This is because prior to the arrival of the second call, the line indicator showed the line in use; the Control node put the first call on Exclusive Hold upon receipt of the Recall signal.

Denial of two calls on split line at one set

The exception is when the second call is to arrive at a set that had been active on the first call. Otherwise, there may be user confusion having two calls with the same party on the same line, as in the following example. A user is active on a call and has on the display `Line086`.

The line is split so the user is given held treatment by the Control node; the indicator for the call stays solid. This is quickly followed by a ringing call `Line086 calling`.

This confusion is avoided by denying the arrival of the second call at the set already connected with the first call on the same AC15 line.

The following table describes how a second call is handled, depending on how the call was routed to the set.

Call Forward chains	Call Forward features will not direct a second call on a split line to a set which has the first call. When the second call attempts to ring at some preceding set in a Call Forward chain, the call will ring at the set immediately preceding the first call set.
Initial alerting	The call handling is as if the set has no available keys on which to present the call. The call is routed to the Prime Extension, if there is a Prime Extension. If there is no Prime Extension for the line, the caller will hear ringback, but the call will be unable to ring anywhere.

Prime Extension	The call handling is as if the Prime Extension, which has an indicator for the first call, has no available keys on which to present the second call. That is, the caller will hear ringback, but the call will be unable to ring anywhere.
Transfer to Internal Destination	Sets A and B each have a call on a split line. The user at set A wants to transfer that call to Set B. The call handling is as if set B has no available keys on which to present the call. The transfer agent will see the message <code><Setname> busy</code> . If the transfer agent completes the transfer before the message, Callback on Busy will apply, as the source call is external (remember this call is the second call on a split AC15 line).

Call Park

A user can invoke Call Park for a call on a split line.

A user cannot retrieve a parked call on a split line, when the retrieving set was active on `Already joined` and hears Error tone.

Call Pickup

A user can use Call Pickup to retrieve a second call on a split line, except when the retrieving set was active on the first call. The user sees the message: `Already joined` and hears Error tone.

Camp

A user can invoke Camp for a call on a split line, except when the camped set was active on the first call. The user sees the message: `Already joined` and hears Error tone.

Music/Tones/Silence on Hold

Held Line treatment applies to calls put on hold by the Control node. Remember that on receipt of a Recall signal, a Control node puts the call connected to the Recalled line on Exclusive Hold. If the Control node gives Tones on Hold, the user whose call is put on hold by the Control node should conclude that the call is still connected and so should stay on the line.

Services

A second call on a split line will be given existing handling by Services, except when this second call would arrive on the set that was active on the first call. That is, the set is a ringing set for the line in the currently active Service Mode. The user sees the message: `Already joined` and hears Error tone.

Transfer

Invoking Transfer:

A user can invoke Transfer for a call on a split line. A user can use a call on a split line as the destination for Transfer. But if the transfer source or destination would be the same as the set that had been active on the other call, the call handling is as if the set has no available keys on which to present the call. The transfer agent will see the message `<Setname> busy` and hear Error Tone. If the transfer agent completes the transfer before the message, Callback on Busy will apply, as the source call is external (remember this call is a call on a split AC15 line).

Source and destination are on the same node:

There are two cases when the transfer agent at a Recall Originating node completes a transfer where both the source and destination are on the Control node. Transfer will be completed if the calls already appear at intercom keys, or if a set with the call appearing on a line key has a free intercom key such that the call is shifted from the line key to the intercom key. In either case, all indicators for the line go idle.

Transfer will be completed when either set has no free intercom key to which the call on a line appearance key can hop. In this case, the call hops to a virtual key. The user at the set then can only release the call; it is not possible to hold the call, or to answer an alerting call or return to a held call. Under existing rules, when the user tries to do anything other than release the call, the user will see the message `Release a call.`

Transfer via Hold

Pressing the key for an indicator showing hold for a split line returns the user to the call that was last current.

Trunk Answer from Any Set

A user cannot answer, using Trunk Answer from Any Set, a second call on a split line, when the answering set was active on the first call. The user sees the message: `Can't pick up` and hears Error tone.

1.2.4 OAM Programming View

1.2.4.1 Transfer

For the anti-tromboning capability of Network Transfer to operate, there are four OAM programming parameters.

1. `Recall at EXCH` for AC15 lines
2. `Dial mode of Tone` for these lines
3. AC15 lines are grouped in Line Pools
4. Uniform network-wide Held Line treatment

Identifying Private Nodes that process Recall

Each AC15 line must be identified as one for which the terminating node provides line splitting on a first Recall signal and shuttling between calls on subsequent Recall signals.

Go to `Lines▶Line Data▶Trunk type:AC15A▶Recall at EXCH:N`. `Recall at EXCH` appears when the AC15 line `Dial mode` is set to `Tone`. For Exchange lines, go to `Lines▶Line Data▶Trunk type:Loop▶Recall at EXCH:N`.

The values are N (the node does not process Recall signals) and Y (the node does process Recall signals). If the dialing mode of `Tone` is later changed to `Pulse`, the `Recall at EXCH` value will be treated as if it is set to N.

See ["Lines - Line Data - Loop"](#) and ["Lines - Line Data - AC15"](#).

Dialing Mode

An AC15 line must have `Tone` Dialing mode. Otherwise the terminating node cannot distinguish between a Recall signal (which is indistinguishable from a pulsed digit 1) and a pulsed digit 1 for the routing digits for the second call.

Line Pools

Each set of AC15 lines that terminate on the same node must be configured into one Line Pool. This is so the software mechanism for determining AC15 line reuse during Network Transfer will function correctly. See “Line reuse determination” on page 2”. This applies to even just one AC15 line.

Held Line Treatment

It is strongly recommended that Held Line treatment should be assigned to Tones.

There should be uniform tones on hold treatment across the network. Each node in a series of network nodes reusing the AC15 line for the destination call will put the incoming call on hold. Correspondingly, the calling party will hear a series of held line treatments. If there is no uniformity of held line treatment across the network, the calling party could hear, for example, music tones, music, tones in the case where the destination call is routed across four tandem nodes and line reuse occurs at each node. The calling party could interpret this variation as tampering with the call and so may hang up.

1.2.4.2 Manual Recall

A Recall signal can be sent, through use of the Manual Recall feature, on any AC15 line regardless of the settings for `Recall at EXCH`, `Dial mode` and `Line Pool` organization.

1.2.4.3 Control node

Recall is always processed by a Norstar Control node. The first Recall signal will establish a second call on the line and subsequent Recall signals will shuttle between the two calls. There is no programming to identify AC15 lines which can deliver Recall signals to a Norstar Control node. The `Recall at EXCH` setting is only for the handling of Recall signals by the far node terminating an AC15 line.

1.2.5 **EXTN/LINE**

N/A

1.3 Technical Specification (Limits/Constraints)

1.3.1 Caveats

Each Norstar node only has knowledge of what it does with respect to origination and receipt of Recall signals. Such a node does not have intelligence about the events happening on other nodes in the network. There is currently no capability to allow for fully integrated network intelligence. A consequence is that Norstar cannot provide its well-regarded user assistance for navigation through a variety of network call situations and configurations.

For features that automatically originate Recall signals, Norstar makes the assumption that second and subsequent Recall signal originations will result in the Control node shuttling between calls on a split line. Some non-Norstar Control nodes may follow Centrex rules, whereby a second Recall signal results in the node conferencing the parties on a split line.

1.3.1.1 Unexpected Transfer to destination

The source caller may be unexpectedly transferred to the destination. This can happen when the transfer agent, who after canceling the transfer operation, presses **[Ris]**, or invokes the Programmed Release feature, and the corresponding Trunk

Release signal reaches the Control node that still has the source and destination calls.

1.3.2 Transfer

An assumption Norstar Transfer makes is that a second Recall signal (to the Control node) results in: the Control node holding the destination call, and the Control node connecting the transfer agent with the source call. This assumption is needed so that the source call is made the current call in the event the transfer agent cancels or retries the transfer operation.

1.4 Interactions

The following interactions apply to Transfer.

Feature name	Interaction
Call Duration Timer	The destination call is the last call timed.
Last Number Redial	The LNR buffer has the digits dialed for the destination call.
Manual Recall before Transfer	For both situations below, the scenario is that the user has invoked Manual Recall, has heard dial tone from the Control node and has dialed a destination. Destination call: The user may use the current call on a line that has been split as the destination call. The calling party is given no indication there are two calls on the line. Source call: The user may use the current call on a line that has been split as the call to be transferred (that is as the source call). The transfer destination is given no indication there are two calls on the line. If Transfer determines that the line should be reused for the destination call, then a Recall signal will be sent, with the intention to split the line. However, as this is a subsequent Recall signal, the Control node will shuttle to the other call and this caller will hear the tones for the digits for the routing of the call to the destination.
Manual Recall in Transfer context	The user may invoke the Manual Recall feature (to shuttle between the source and destination calls), using the dial up feature code (Feature 7 1) or pressing a programmed feature key for Recall, within the Transfer context. Current displays, tones and rules apply.

The following interactions apply to following invocation of Manual Recall on AC15.

Feature name	Interaction
Call Duration Timer	There is only one Call Duration Timer for an AC15 line. It will show the elapsed time since the first call was created.
Call Park	A user may park the current call on a line that has been split. The user who retrieves the parked line will be connected with the current call on the line and will not see any indication that the line is split.
Callback	A Callback will occur when a camped or parked or internally transferred current call on a line that has been split goes unanswered.
Camp	A user may camp the current call on a line that has been split. The user who retrieves the camped line will be connected with the current call on the line and will not see any indication that the line is split.

Feature name	Interaction
Enhanced Restrictions	<p>After the user has invoked Manual Recall on an AC15 line, Call Restrictions are applied to the second call, when the line has the <code>Recall at EXCH</code> parameter set to Y. If the call does not pass the restrictions, the line is released, and the user sees the message <code>Restricted call</code> and hears Error tone.</p> <p>This is consistent with the dialing of a second call on a PSTN line to a CO that responds to the CO-appropriate Recall signal.</p>
Last Number Redial	<p>If the user made an outgoing AC15 call, then invoked Manual Recall and then entered digits for the second call, the LNR buffer will contain the digits for the first call, the digits representing Recall and the digits for the second call.</p>

The following interactions apply to Control node.

Feature name	Interaction
Auxiliary Ringing	The second call on a split line will ring the Auxiliary Ringer if the line is configured to ring the Auxiliary Ringer.
Call Duration Timer	There is a Call Duration Timer for each call on a split line.
Call Forward features	Call Forward features will not direct a second call on a split line to a set which has the first call. When the second call attempts to ring at some preceding set in a Call Forward chain, the call will ring at the set immediately preceding the first call set.
Held Line Reminder - Extension to Prime Extension	<p>Held Line Reminder - Extension to Prime Extension does not occur when the Control node places a call on hold.</p> <p>A call can be held indefinitely by the Control node; there is no timeout before the node drops the call.</p>
Maintenance	When a line that is split is to be disabled, any sets with calls on that line are notified.
Prime Extension	On call capture extended to the Prime Extension, if the Prime Extension had been active on the other call, the call handling is as if the Prime Extension has no available keys on which to present the call. That is, the caller will hear ringback, but the call will be unable to ring anywhere.
Programmed Release	The user may invoke the Programmed Release feature on a call on a split line. Because a trunk release is sent on the line, the result is the freeing of the AC15 for another call.
Releasing from a call	A user can release a call on a split line. The line indicator shows idle only when all calls are released.
Remote Access - Page	<p>Users may be hearing Paging from a remote user; the line for the Page is split. When this user releases from the Page, the trunk release from the Recall Originating node will only free the line. This release will not transfer the other call on the split line with Paging; this is an existing capability of Page.</p> <p>Users may be hearing Paging from a remote user; the line for the Page is unsplit. When this user invokes Manual Recall, the Paging session terminates and the AC15 line is split (giving Remote Access dialtone).</p>

Feature name	Interaction
Selective Line Redirection	SLR applies only to non-split lines. Here is the scenario. An AC15 line, Line X, at Node A, is used as both the destination for SLR with respect to Line Y and as the source for SLR. A call arriving on Line Y at node A is redirected and is answered at Node B. The user at Node B wants to transfer the call and the conditions for the call to the transfer destination are such that Line X can be reused (split). This transfer destination call at Node A is NOT subject to SLR programming there. (Otherwise, the transfer destination call would not arrive at the destination intended by the transfer agent, but at the one specified by the user specifying SLR.)
Set initialization	A set has an appearance of a line and the set is not in service. This line is split. When the set is initialized, it shows the status of the last active call.

Trunk Answer from Any Station

1.1 Overview

1.1.1 Description

This feature allows the user to answer a Ringing Call on any line that is in a Scheduled Service and for which Trunk Answer from Any Station (TAFAS) has been enabled.

1.1.2 Rationale for Feature

N/A

1.1.3 General Definitions

N/A

1.1.4 Scenarios of Usage

When all lines are in Scheduled Services, Trunk Answer from Any Station is equivalent to using the Group Call Pickup feature with all sets assigned to the same pickup group.

A system can be set in OAM Programming to be in one of the Scheduled Services at all times, to obtain both the system-wide call pickup capability of Trunk Answer from Any Station, and the selective call pickup capability of Group Call Pickup. The settings in OAM Programming can be as follows

- assign sets to various Pickup groups
- assign one set as the Control Set for all lines in the system, and assign the Service Ringing Set for all lines the value `None`
- enable Trunk Answer from Any Station system-wide in OAM Programming
- activate a Scheduled Service from the Control Set to place all lines into one of the Scheduled Services

In this scenario, a Scheduled Service is left active at all times. With this setup, users can activate:

- Group Call Pickup to answer a Ringing Call in their group
- Trunk Answer from Any Station to answer any Ringing Call in the system

Similarly, a system can assign selected lines to ring the Auxiliary Ringer at all times, and activate a Scheduled Service permanently on those lines, with Trunk Answer from Any Station enabled on the lines as well, so that any user can answer the lines at any time, without requiring a line appearance.

1.1.5 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls

Feature 8 0 0, or programmed key

1.2.2 End User View

If the feature is enabled, it is valid only when a call is ringing on a line that is in a Scheduled Service. To answer such a call, the user presses the Trunk Answer from Any Station feature code or programmed key, and the call is connected, using an appropriate intercom or external line key on the user's set, provided that the set is offhook or has Handsfree active. If the set is onhook with Handsfree OFF, the call is answered, but the user must activate a voice path in order to converse.

1.2.3 Message Displays

Message	Description
<linename> pickup	Displays when a call is answered using Trunk Answer from Any Station. <linename> is the name associated with the line or set being answered.
No key free	Displays transiently, accompanied by Error tone, if the feature is activated when there are no line or intercom key on which the call can be presented.
Pickup denied	Displays transiently accompanied by Error tone if the feature is activated when no lines are in a Scheduled Service, or when no call is ringing on a line that is in a Scheduled Service.

If more than one call is eligible to be picked up by Trunk Answer from Any Station, the oldest call is selected.

1.2.4 OAM Programming View

1.2.4.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item			I	SC+	SC
Services	Ringing service	Night sched	Trunk answer:Y	X	X	

1.2.4.2 Programming Trunk Answer from Any Station

Trunk Answer is programmed from Services►Ringing service►Night sched►Trunk answer:Y. There are six schedules (Sched): Night, Lunch, Evening, Sched 4, Sched 5, and Sched 6. The schedules can be renamed. (See the Scheduled Services specification.)

Values for Trunk answer are Y or N. The default is underlined.

[See "Services - Ringing Service".](#)

1.2.5 **EXTN**LINE

N/A

1.3 Technical Specification (Limits/Constraints)

N/A

1.4 Interactions

Feature name	Interaction
Call Log	Activation of TAFAS terminates Call Log.
Direct Inward System Access (DISA)	If TAFAS is using DISA, then the user is given stuttered dial tone and the user enters a valid password.
Directed Call Pickup, Group Call Pickup	A call cannot be picked up by Directed Call Pickup (or Group Call Pickup) if the call is ringing the Auxiliary Ringer but not alerting at any set. Such a call could be answered by TAFAS, assuming that the line is in Night Service and the Trunk Answer from Any Station feature is enabled in OAM programming.
Handsfree	If Handsfree is set to <code>Auto</code> , the Handsfree microphone and speaker are automatically activated for all outgoing and incoming internal and external calls when the user activates TAFAS. Any other setting of Handsfree would require the user to activate a voice path after the feature activation.
Incoming Call Information (ICI)	No ICI is delivered. The call must appear at the set first. ICI is delivered when the call is answered. If TAFAS or Call Queuing is activated it cancels Call Information and answers a call based on the operation of that feature, not Call Information. For example, Call Queue would answer the highest priority Ringing Call.
Private Lines	Trunk Answer from Any Station cannot be used to pick up Private Lines.

Trunk Modes

1.1 Overview

1.1.1 Description

Compact Plus and Modular Plus have three different PSTN trunk modes, or signalling methods:

- Earth Calling (disconnect supervised)
- Loop Call Guarded Clearing (disconnect supervised)
- Loop Calling Unguarded Clearing (not disconnect supervised)

The signalling method used dictates whether or not there is disconnect supervision on the trunk.

Because the different PSTN trunk modes do not require different hardware, trunks supporting any of the three modes can be installed at any Trunk port, and mode can be administered in OAM Programming on a per-trunk basis, for the lines numbered 001 to 004, 031 to 034 for Compact Plus and 001 to 004, 031 to 034, and 061 to 230 for Modular Plus.

Disconnect supervision capabilities and function will be applied to those trunks administered to be Loop Calling Guarded Clearing and Earth Calling.

Typically, Loop Calling Unguarded Clearing mode is used when Norstar is piggy-backed behind a PBX. All three modes are used for trunks not behind a PBX.

1.1.2 Rationale for Feature

N/A

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls

N/A

1.2.2 Message Displays

N/A

1.2.3 End-User View

If trunk mode has been administered incorrectly, the end user may not be able to seize a line, or may notice that a line is always hung.

When a user's attempt to seize the line fails because the mode setting is incorrect, one of the messages No dial tone, Not in service, or No free lines will appear with appropriate tones.

1.2.4 OAM Programming View

1.2.4.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item			I	SC+	SC
Lines	Line Data	Exchange line	Mode:EarthCalling	X		

See "Lines - Line Data - Loop".

The representations for the different modes are:

Loop Calling Guarded Clearing	LoopGuarded
Loop Calling Unguarded Clearing	LoopUnguard
Earth Calling	EarthCalling

The default mode is 'EarthCalling'. The CHANGE key cycles through the options:

Mode:EarthCalling
CHANGE

pressing CHANGE....

Mode:LoopGuarded
CHANGE

pressing CHANGE....

Mode:LoopUnguard
CHANGE

If the mode is set to EarthCalling or to LoopGuarded, then the parameter for recall type/timing, Recall:Timed brk, is suppressed, as Loop Calling Unguarded Clearing is the only mode which uses Earth recall as well as Timed Break. See the Recall Signalling feature.

1.2.5 Maintenance View

When the trunk mode is changed for one or more trunks in a trunk cartridge, all trunks in a cartridge are temporarily disabled by Maintenance when the System OAM Programming is ended in order to reset the trunks. Therefore, all messages associated with a maintenance disable apply during the disable period.

1.2.6 **EXTN/**LINE

N/A

1.3 Technical Specification (Limits/Constraints)

If trunks are administered for the wrong type of mode, Norstar software will not be aware of the fact.

The following chart describes possible effects of administering trunks incorrectly. However, these are theoretical predictions and the real effects are not yet known.

The bottom line is that trunk mode must be administered correctly, or the effects on line seizure and line release are unknown.

Trunk Installed is

Trunk Administered as	Loop Calling Guarded	Loop Calling Unguarded	Earth Calling
Loop Calling Guarded	OK	Seizure: Seizure normal Release: Norstar will not be able to complete the release if the PSTN/PBX does not provide a clearback signal. This signal may not be available on unguarded clearing trunk. Line may be 'hung'	Seizure: All outgoing calls will likely fail, because PSTN will be unable to detect Norstar's seize signal. Trunk F/W will detect fault, as there will be no current in the loop after seizure attempt. Automatic test will relay info to Application level so that an error message can be generated when necessary. Release: Possibility 1: If loop current supervision threshold on PSTN side is higher than the guarded current, release procedure can be completed. (However, seizure will probably not be successful.) Possibility 2: If loop current supervision threshold on PSTN side is lower (unlikely) than the guarded current, Norstar will wait for clearback indefinitely.

Trunk Installed is

Trunk Administered as	Loop Calling Guarded	Loop Calling Unguarded	Earth Calling
Loop Calling Unguarded	Seizure: Seizure normal Release: Norstar believes the release is complete, and the line is made available for use after the 2 second delay. Because protocol is not proper, PSTN switch may not have recognized the release, and therefore not completed its release procedure. Potentially subsequent outgoing line seizure may not be successful	OK	Seizure: All outgoing calls will likely fail, because PSTN will be unable to detect Norstar's seize signal. Trunk F/W will detect fault, as there will be no current in the loop after seizure attempt. Automatic test will relay info to Application level so that an error message can be generated when necessary. Release: Norstar believes the release is complete, and the line is made available for use after the 2 second delay. Because protocol is not proper, PSTN switch may not have recognized the release, and therefore not completed its release procedure.
Earth Calling	Seizure: Will go through. Release: Unknown	Seizure: Will go through. Release: Norstar will not be able to complete the release if the PSTN/PBX does not provide a clearback signal. This signal may not be available on unguarded clearing trunk. Line may be 'hung'	OK

1. If an Earth Calling trunk is administered as a Loop Calling Trunk, or vice versa, a request for line seizure will probably fail.
2. If a Loop Calling Unguarded Clearing Trunk is administered as Loop Calling Guarded Clearing, seizure can occur, but because the near end is waiting for a far-end disconnect signal before releasing the trunk, the trunk may remain hung indefinitely.

Trunk mode must be administered correctly, or the effects on line seizure and line release are unknown.

3. If the mode is set to a value that mismatches the actual trunk type, there is no warning message because the Norstar system does not know what trunk type is attached. The line will be dysfunctional in a manner commensurate with the

mismatch.

4. When the mode for one trunk in a cartridge is changed, after the OAM Programming is ended, all trunks in the cartridge will be temporarily disabled by Maintenance while the trunk reset is implemented.

1.4 Interactions

Line profile has new entries, depending upon the OAM Programming of the trunk:

For lines administered for Loop Calling Guarded Clearing:

```
Mode: LoopGuarded
BACK      NEXT
```

For lines administered for Loop Calling Unguarded Clearing:

```
Mode: LoopUnguard
BACK      NEXT
```

For lines administered for Earth Calling:

```
Mode: EarthCalling
BACK      NEXT
```

Feature name	Interaction
Conference	If a trunk has disconnect supervision, and it is involved in a Norstar conference, if the far end hangs up: <ul style="list-style-type: none"> • the trunk will be disconnected by Norstar, • the conference will be cancelled, and • the conference call will be converted to a two-way call between the remaining two parties.
Copy Line Data	Mode information will be included in the Copy Line data procedure. There is no warning to installer if there is a mismatch of administered mode and actual line type.....a mismatch will result in a dysfunctional trunk. If the mode of one trunk in a cartridge is changed, all trunks in that cartridge will undergo a temporary 'Maintenance disable' at the end of the OAM Programming, while the trunk reset takes place.
Disconnect Supervision (Far End)	Provided on Loop Calling Guarded Clearing and Earth Calling trunks.
External Transfer via Conference	If a trunk without Disconnect supervision is involved in this tandem scenario, hung lines may occur. See also Conference
Exclusive Hold	If the far end on a held call on a disconnect supervised line disconnects, the trunk will be released by Norstar and the call will disappear from the line key(s).
Held Line Reminder	If the far end on a held call on a disconnect supervised line disconnects: <ul style="list-style-type: none"> • the trunk will be released by Norstar • the call will disappear from the line key(s) • held line reminder will cease
HLR Extension to Prime Extension	If the far end on a held call on a disconnect supervised line disconnects: <ul style="list-style-type: none"> • the trunk will be released by Norstar • the call will disappear from the line key(s) • held line reminder will cease • held line reminder extension will cease

Feature name	Interaction
Hold/Mutual Hold	If the far end on a held call on a disconnect supervised line disconnects, the trunk will be released by Norstar and the call will disappear from the line key(s).
Maintenance - Diagnostics - Line Presence Test	If improper OAM Programming of mode has resulted in line seizure failure, this test will generate an event in the Test Admin Log
Maintenance - Test Log	See Maintenance - Diagnostics - Dial Tone/Line Presence Test
Prime Extension(s) - Call Forward Transfer to Prime Extension	If the far end on a disconnect supervised trunk disconnects: <ul style="list-style-type: none"> • the trunk will be released by Norstar • the call will disappear from the line key(s) • alerting will cease
Prime Extension(s) - Callback External to Prime Extension	If the far end on a disconnect supervised trunk disconnects: <ul style="list-style-type: none"> • the trunk will be released by Norstar • the call will disappear from the line key(s) • alerting will cease
Prime Extension(s) - Default Ringing	If the far end on a disconnect supervised trunk disconnects: <ul style="list-style-type: none"> • the trunk will be released by Norstar • the call will disappear from the line key(s) • alerting will cease
Prime Extension(s) - Delayed Ring Transfer (DRT)	If the far end on a disconnect supervised trunk disconnects: <ul style="list-style-type: none"> • the trunk will be released by Norstar • the call will disappear from the line key(s) • alerting will cease
Prime Extension(s) - DND Selective Call Forward	If the far end on a disconnect supervised trunk disconnects: <ul style="list-style-type: none"> • the trunk will be released by Norstar • the call will disappear from the line key(s) • alerting will cease
Prime Extension(s) - DND Transfer to Prime Extension	If the far end on a disconnect supervised trunk disconnects: <ul style="list-style-type: none"> • the trunk will be released by Norstar • the call will disappear from the line key(s) • alerting will cease
Prime Extension(s) - HLR External to Prime Extension	See Held Line Reminder Extension
Priority Call - Destination Active	If the call put on hold by the priority call is on a disconnect supervised trunk, and the far end disconnects: <ul style="list-style-type: none"> • the trunk will be released by Norstar • the call will disappear from the line key(s).
Release	See Notes to Documentation under OAM Programming View
Selective Line Redirection	If a trunks without Disconnect supervision is involved in this tandem scenario, hung lines may occur.
Transfer	If a call being transferred is on a trunk with disconnect supervision, and the far end disconnects: <ul style="list-style-type: none"> • Norstar will release the trunk • alerting at an internal destination will cease • agent will get message 'Linenam hung up'

Feature name	Interaction
Transfer Callback	If a call being transferred is on a trunk with disconnect supervision, and the far end disconnects before the 3 minute timeout period: <ul style="list-style-type: none">• Norstar will release the trunk• alerting at an internal destination and callback set will cease
Transfer Immediate	See Transfer
Transfer Using Conference	See Conference
Transfer Using Hold	See Hold/Mutual Hold
Transfer With Announcement	See Transfer

Trunks - Analog Loopstart

1.1 Overview

1.1.1 Description

Loopstart trunks use either manual or autoanswer mode. The answer mode for each trunk type determines the type of call treatment applied to incoming calls on that analog trunk to a Norstar system. Manual and autoanswer trunks are also used to make outgoing calls. Each analog loopstart card has four trunks.

1.1.2 Rationale for Feature

See “1.1.1 Description”.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 End User View

The user makes and receives calls on a manual-answer loopstart trunk by selecting a ringing line appearance of the trunk to answer a call, or selects a line pool containing the trunk to make a call. The user can also receive incoming calls on a Hunt Group (HG).

1.2.1.1 Manual answer mode

Manual answer loopstart trunks are the standard means of connecting to a Central Office (CO). Incoming calls on this type of trunk appear at external line keys (for example, Line003) at any set or sets programmed to have an appearance of that line. The default names are `Linennnn` where `nnn` can be 001 to 004 and 031 to 034 for Compact Plus and 001 to 004, 031 to 034 and 061 to 230 for Modular Plus.

Manual answer loopstart trunks support (but do not require) Disconnect Supervision.

1.2.1.2 Autoanswer mode

Autoanswer loopstart trunks are used to provide remote access to a Norstar system's resources from the public network.

Incoming calls on autoanswer loopstart trunks are answered by the system. Stuttered dial tone or system dial tone is presented to the caller.

In order for calls on autoanswer trunks to be autoanswered by the system, autoanswer trunks must be programmed with Disconnect Supervision. (For details, see the Disconnect Supervision specification.)

Autoanswer trunks are used for remote access (see the Remote System Access feature). Sets can have appearances of lines associated with autoanswer loopstart trunks, for monitoring the status of the trunk. These appearances are not normally

selected to answer calls. (The overflow call routing case and Callbacks associated with overflow call routing, described in the DIA lines feature, is an exception to this rule.) Autoanswer trunks can, however, be selected for making outgoing calls.

1.2.1.3 Line Appearances associated with Autoanswer Loopstart Trunks

Autoanswer loopstart trunks are set in OAM Programming to appear at a set or sets. An indicator is required on all sets except for the M7100 and ATA.

Line appearances associated with autoanswer trunks allow monitoring of the Busy status of trunks. For example, when the trunk is in use as a result of a remote Page or a tandem call, the indicator is solid. If the user tries to select it, existing rules for selecting a busy line are followed. (For more information, see Remote Access.)

These rules also apply to incoming DIA line calls (except in the case of overflow call routing, or Callbacks.)

Message Displays

Message	Description
In use: <setname>	Displays transiently, accompanied by Error tone, if the user tries to select a busy autoanswer loopstart trunk when the line is in use at a particular set and Privacy is ON.
Line in use	Displays transiently, accompanied by Error tone, if the user tries to select a busy autoanswer loopstart trunk when the line is in use by the system and Privacy is ON.

1.2.1.4 Incoming calls in autoanswer mode

Incoming calls on autoanswer loopstart trunks are automatically answered by the system. By default, incoming calls on these trunks are answered by DISA, which requires the entry of a password. The password determines which system capabilities are provided to the caller.

Loopstart trunks can also be programmed to answer incoming calls and immediately return system dial tone, without requiring the user to enter a password. In this case, the system capabilities provided to the caller are determined by the Class of Service associated with the loopstart trunk. For more information, see the Remote System Access, Remote Capabilities, and Class of Service features.

1.2.1.5 Outgoing calls

Selecting a line appearance associated with the trunk permits the user to make outgoing calls using that specific facility. Outgoing calls are made by the user's dialing or autodialing a phone number on an external line.

If the trunk is being used for an outgoing call, the indicator shows the current line status (for example, flashing if on hold).

1.2.2 OAM Programming View

1.2.2.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item			I	SC+	SC
Lines	Line Data	Loop	Ans mode:Manual	X		

1.2.2.2 Programming Loopstart Trunks

Answer mode can be set to Manual or Auto in **Lines▶Line data▶Ans mode:Manual**. This section of OAM appears only if **Lines▶Line data▶Mode:EarthCalling** is set to **LoopGuarded**.

A trunk cannot be programmed to be autoanswer unless it has Disconnect Supervision. If a loopstart trunk is programmed to be autoanswer and it does not support Disconnect Supervision (for example, the system is pre-programmed, and the installer then adds an unsupervised trunk card), incoming calls on that trunk are treated as manual-answer calls. If a supervised trunk is installed later, the autoanswer capability applies immediately.)

Line Data parameters are common across different trunk types.

[See "Lines - Line Data - Loop".](#)

1.2.3 **EXTN/**LINE

N/A

1.3 Technical Specification (Limits/Constraints)

N/A

1.4 Interactions

Feature name	Interactions
Alerting set	Manual answer appearance: alerting calls alert and ring (if programmed to ring) at all line appearances associated with the trunk. Autoanswer appearance: All line appearances associated with the trunk show active. No ringing or alerting occurs except for the case where, due to overflow call routing (and callbacks associated with overflow call routing), a call is routed to a set with a line appearance for the trunk. No alerting or call display messages are associated with autoanswer trunks, only the DIA lines. Alerting and call display messages occur in the overflow call routing, and for Callback scenarios associated with overflow call routing.
Auto Extension number	On autoanswer loopstart trunks, instead of dialing a DIA line Extension number, the remote caller enters the Auto Extension number (if defined) into system dial tone. The remote caller is returned to system dial tone. For more information, see Remote System Access.
Conference (External Transfer From)	This feature is supported only if the loopstart trunk is supervised.

Feature name	Interactions
Copy	Data can be copied between trunks of same cartridge type. If the user attempts to copy a line of one cartridge type to another line which has been defined to be of a different cartridge type, the <i>Incompatible LCs</i> prompt is presented with Error tone, and the Copy is not allowed.
Custom Call Routing (CCR) Auto Attendant	Only manual answer lines that are not private to a Extension number are available to be used by CCR. If a caller calls in to the CCR on a line that is configured to be disconnect supervised and hangs up just before the call is answered by the Auto Attendant (usually a window of around 2-3 seconds before the call is answered by the CCU), the system will not be able to detect the caller's disconnect. The Auto Attendant will play its greeting to the now-dead line, and wait for the non-existent caller to dial digits. Since no digits are dialed, the Auto Attendant will transfer the call to the Attendant set (if CCR is in the business-is-open state) or repeat the menu and hang up (if CCR is in the business-is-closed state). If the call is transferred to the attendant, that person will likely hear dial tone or a "Please hang up and try your call again" message from the far end.
DIA lines	Calls coming in on autoanswer loopstart trunks can result in DIA line calls. For more information, see the DIA lines feature.
DISA Extension number	On autoanswer loopstart trunks, instead of dialing a DIA line Extension number, the remote caller can enter the DISA Extension number (if defined) into system dial tone. The remote caller is returned to stuttered dial tone. For more information, see Remote System Access.
Disconnect Supervision (Far End)	Disconnect supervision is required for autoanswering of incoming calls. If a trunk is programmed to be autoanswer, but the trunk hardware does not support Disconnect Supervision, incoming calls on the trunk are treated as manual-answer calls.
Privacy Control	Privacy can be turned ON or OFF for incoming and outgoing calls (appearing at the set) on manual trunks, or autoanswer trunks, for outgoing calls or for incoming calls on a autoanswer trunk answered by the user in the case of overflow call routing or callbacks.
Scheduled Services	If an autoanswer loopstart trunk is assigned to a scheduled service, the assignment is ignored. Calls on that trunk (that is, before the calls are DIA line calls) are not placed in a scheduled service, unless the calls are alerting at an appearance, due to overflow call routing or callbacks.
Selective Line Redirection	Supervised trunks (manual or autoanswer) can be selected for redirection. If, after the feature has been activated, a trunk is changed from supervised to unsupervised, redirection for that line is cancelled.
Terminal Type	Trunks can be assigned to all set types. On the Basic set and the ATA, no line appearance is associated with the trunk.

User Preferences

1.1 Overview

1.1.1 Description

The User Preferences feature provides an alternative and bulk method for programming a group of set-related features that would otherwise be programmed by an end user on an individual feature basis at their own set, using feature codes. These features are listed in the following table.

Feature Name	Key Programming
External Autodial	Feature <input type="text"/> * <input type="text"/> 1
Internal Autodial (Keys - DSS)	Feature <input type="text"/> * <input type="text"/> 2
Programmed feature keys	Feature <input type="text"/> * <input type="text"/> 3
User Speed Dial	Feature <input type="text"/> * <input type="text"/> 4
Language Choice	Feature <input type="text"/> * <input type="text"/> 5 <input type="text"/> 0 <input type="text"/> 1 Feature <input type="text"/> * <input type="text"/> 5 <input type="text"/> 0 <input type="text"/> 2 Feature <input type="text"/> * <input type="text"/> 5 <input type="text"/> 0 <input type="text"/> 3
Ring Type	Feature <input type="text"/> * <input type="text"/> 6
Display Contrast	Feature <input type="text"/> * <input type="text"/> 7
Dialing Options	Feature <input type="text"/> * <input type="text"/> 8 <input type="text"/> 2
Call Log options (autolog options)	Feature <input type="text"/> * <input type="text"/> 8 <input type="text"/> 4

The User Preferences feature is available in two different ways.

- from within OAM, when an installer or system coordinator is programming system data for a set, under the heading of **Terminals&Extns**►
User preferences
- by using a feature code (**USER) and any one of the four OAM programming passwords: Installer, System Coordinator Plus, System Coordinator, or Basic

This specification provides an overview of the feature. For details on any of the User Preferences features, refer to the individual specifications.

1.1.2 Rationale for Feature

This feature is provided to reduce installation time. It is also provided as a tool for one user to support another. **USER allows direct access to the User Preferences section of OAM Programming. Unlike OAM Programming, **USER can be used by a user with only the Basic password, to perform most of the User Preferences tasks. (For details, see “1.2.3 OAM Programming View”.)

User Preferences programming can define the set model type for an equipped or an unequipped Extension number. This option is available only to an installer or system coordinator. The option is especially useful to the installer when preprogramming a system and a service order shows set models installed to set

ports. The system coordinator can change the model because system programming for this Extension number is also allowed. An end user who is not the system coordinator is not able to change the set model, because they may not understand the overall system programming or plans.

Note: This design assumes programming of User Preferences on M7000 terminals only.

1.1.3 Scenarios for Usage

Installation Scenarios

An installer can personalize each user's set while programming the other set parameters, such as line assignment, restriction filters, and the Call Forward Busy destination.

By using User Preferences from within OAM, the installer does not have to walk to every set and use a series of user-programmable features to personalize each set. It is anticipated that installation will be quicker because installers need not travel to all sets, and fewer key presses are required for the user-programmable settings.

On a follow-up visit, the installer can personalize a set by activating **USER with the installer's OAM password.

System Coordinator Scenarios

A system coordinator changes system programming for a new user to reflect the new user's name and job responsibilities. At the same time the system coordinator can change key programming, including clearing any programmed features or autodialers that the former set user had defined.

The system coordinator can also use **USER with the system coordinator's OAM password.

User Support Scenarios

Information gathered during customer visits identified a user type who had become the Norstar guru in the office. These individuals had learned, among other tasks, how to program personalized features and autodialers, thereby reducing the need to learn to do these features by other users.

With User Preferences, this type of user can customize and support the programming of features and autodialers from their own set, provided they have at least the Basic password. Users do not need to travel to the target set to complete the set personalization.

1.1.4 General Definitions

User Preferences is not an end-user feature. In this document, the term "user" means the person performing User Preferences programming, which includes any user with the Installer, System Coordinator Plus, System Coordinator, or Basic passwords. (A user with the Basic password can only program User Preferences through **USER.)

Term	Meaning
CAP	Central Answering Position The CAP consists of one M7324 telephone and one or two CAP modules. The CAP provides backup answering and can be used to monitor other telephones.
CAP assignment	The user can designate which Norstar telephone can be an Central Answering Position. CAP assignment is in OAM programming in <i>System prgrming</i> .
CAP module	A CAP Module provides 48 additional key/indicator pairs. It is connected to a M7324 terminal. A maximum of two CAP modules can be connected to a M7324 terminal.
Mini-OAM session	Mini-OAM sessions, components of Spectra's OAM structure, are available as end user features. They include - User Preferences (**USER) - Time and date changes (**TIME)

1.1.5 General Procedures

The user interface for customizing a set looks the same from within OAM Programming as from **USER. However, the steps to reach User Preferences are different. For more information, refer to "1.2.3 OAM Programming View".

The user must use a set with a two-line display. A programming template is useful to make sense of the navigation keys, which are the Installer, System Coordinator Plus, System Coordinator, or Basic pairs.

1.2 Feature Details

1.2.1 Controls

**USER

1.2.2 End User View

N/A

1.2.2.1 User Programming View

As with other ** feature codes, **USER cannot be programmed on a feature key.

1.2.3 OAM Programming View

The User Preferences feature is available in two different ways.

- from within OAM, when an installer or system coordinator is programming system data for a set, under the heading of *Terminals&Extns*►
User preferences
- by using a feature code (**USER) and any one of the four OAM programming passwords: Installer, System Coordinator Plus, System Coordinator, or Basic

See ["Terminals & Extensions"](#) and ["Terminals&Extns - User preferences"](#).

1.2.3.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes to User Preferences in OAM Programming.

Heading	Item			I	SC+	SC
Terminals&Extns	Individual set	User Preferences	COPY	X	X	
			Model:7100	X	X	X
			Key prgrming	X	X	X
			User speed dial	X	X	X
			Call log opt'ns	X	X	X
			Dialing opt'ns	X	X	X
			Language:English	X	X	X
			Display cntrst:1	X	X	X
			Ring Type:1	X	X	X

1.2.3.2 Programming User Preferences

To program User Preferences using **USER, the user presses **USER (* * 8 7 3 7) and then enters one of the four OAM passwords

- Installer
- System Coordinator Plus
- System Coordinator
- Basic

If the Basic password is supplied, the user can do all User Preference programming, except for selecting the set model when no set is installed at the set port.

If the Installer or System Coordinator (Plus) password is supplied, the user can do all User Preference programming, including selecting the set model when no set is installed at the set port.

Message Displays

Message	Description
In use:SETNAME	Displays transiently for three seconds, accompanied by Error tone, if a user attempts to run an OAM or mini-OAM session while another one is in progress. The user should try again later.
Access denied	Displays transiently for three seconds, accompanied by Error tone - if a user attempts to activate one of the user-programmable features and an OAM session or mini-OAM session is in progress elsewhere - if an end user is in the middle of a user programming session and another user attempts to activate an OAM or mini-OAM session elsewhere

Message Displays

Message	Description
Connect set	Displays transiently for three seconds, accompanied by Error tone, if a user has accessed User Preferences using the Basic password, and no set is plugged into the associated port.

See Please refer to “figure 1-1 Selecting a set from which to use **USER” on page 6..

After supplying the password, a user can select a specific set by one of:

- scrolling through the list of all sets (including those Extension numbers for which no set is installed) and pressing **SHOW** when looking at this set. This list model is used extensively in OAM. It helps a user to identify a set by its set name, rather than its Extension number. It also allows for verification of Extension number by inspection of the set name.

or,

- pressing the **FIND** display key, and then at the prompt, specifying the Extension number of the set. This is the traditional technique for identifying an object, which in User Preferences is a set Extension number. The “hangman game” style is used to indicate the length of the Extension number. The user is then shown the **Extn:ExtnNAME▶** entry in the list of sets, where this entry is for the specified Extension number. The user must press the **SHOW** navigation key to get to the User preferences for this set.

The user can use the **FIND** display key to select a particular set, instead of scrolling through the list of sets. This is a tool for a power user and is valuable when there are many sets.

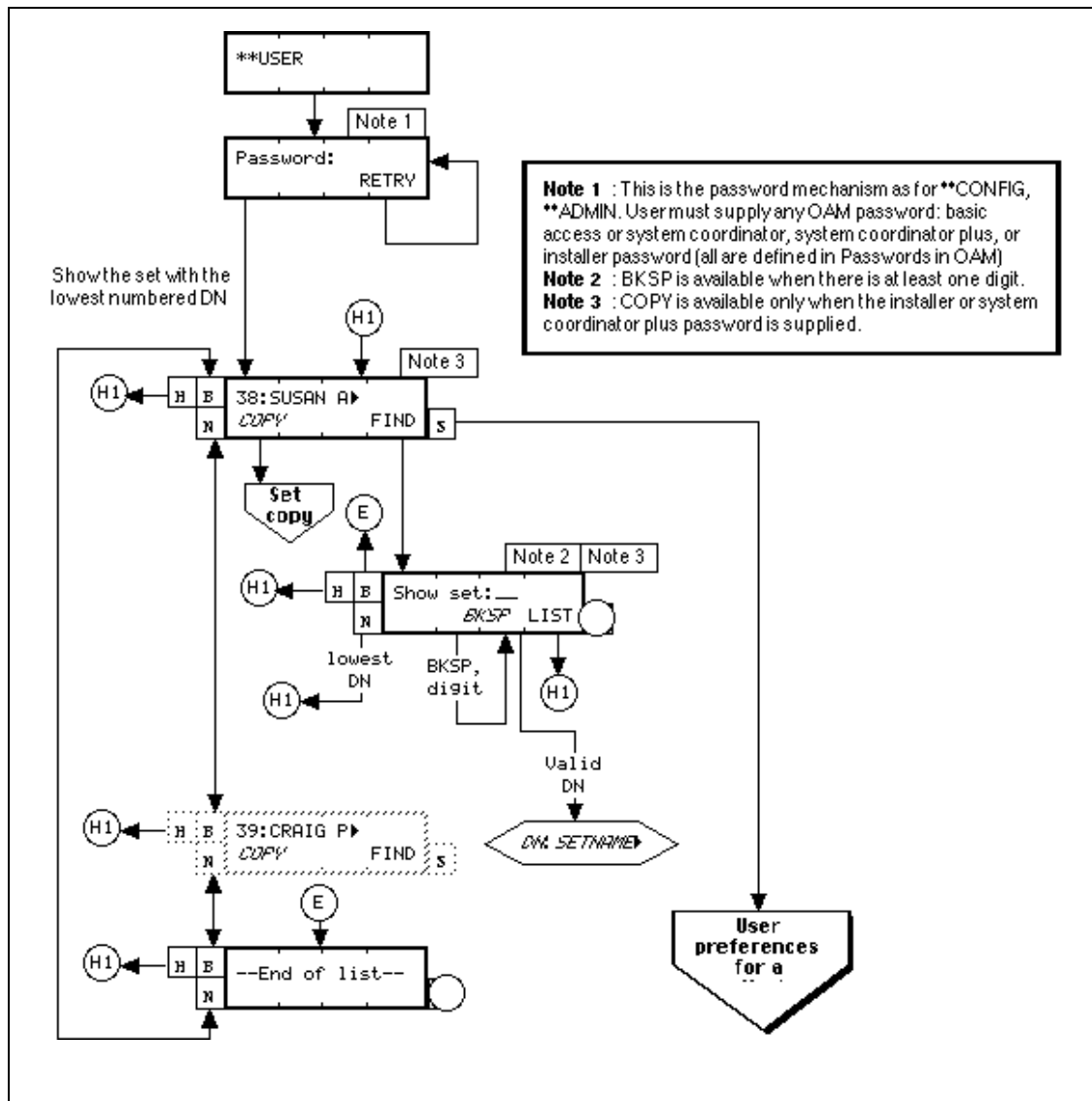


Figure 1-1: Selecting a set from which to use **USER

After specification of the set, (see "Set Model") the user proceeds to program User Preferences. (For details, refer to the individual features.)

Release terminates the feature. The 30-minute OAM timeout also terminates the feature.

Set Model

While a user cycles through the set model values, any existing programming for User Preferences remains unchanged.

If the set model has been changed from the initial value, once the user navigates away from this prompt (by pressing the **HEADING**, **BACK** or **NEXT** display keys, or by pressing **[Ris]** to end the session), the following are returned to the system defaults: key programming defaults for the last value chosen for the model; Language Choice; Ring Type; Display Contrast; Call Log options; Dialing Options. (This is what happens when a set of one type is replaced by one of a different type, and Extension Relocation is set to Off.) No changes are made to the

programming of lines, Answer keys, intercom keys, and Handsfree keys; because these keys are programmed in *System prgrming*.

If the user navigates away from the set model prompt and if the set model has not changed from the initial value, no changes are made to key programming or any other user-programmable data.

Interactions with Set Model

If no set is plugged into the associated port, the installer or system coordinator can specify the set model using the *CHANGE* display key, which provides a list of available set models. This information is essential, because the set model defines the number of keys. (For more information, refer to the Key Programming feature.)

When no set is plugged into the associated port, the default is M7208, as there are more sales of this model than others.

If no set is plugged into the associated port, the user who has accessed the feature using the basic password cannot specify the set model. The user is given the three-second transient message *Connect set* and Error tone.

If the set at the associated port is not enabled, no user is allowed to access User Preferences for that set until it is enabled.

If the Extension number has one or two CAP modules, the set model also shows the number of attached CAP modules. A M7324 set can be programmed with one or two CAP modules in *System prgrming*.

If the set model is chosen as *Other* (which can be ATA, PCIB, and so on), no further programming of User Preferences is required.

Extension Models and Display

Model	Display
M7000	M7000
M7100	M7100
M7208	M7208
M7310	M7310
Quest cordless	M7310
M7324	M7324
M7324+1CAP	M7324+1CAP
M7324+2CAP	M7324+2CAP
ATA, Global ATA, PCI-B, PCI-D, RAD, DCI	Other

Interactions with Copy

An installer or system coordinator plus can press the *COPY* display key to copy only user-programmable data for a selected set to another set, to a range of sets, or

to all sets. **COPY** succeeds fully only if the source and destination sets are the same model; **COPY** succeeds only partly if the source and destination sets are different models (Key Programming is not copied).

If the source and destination sets are different models, no notification occurs.

Extension Copy by Model

Parameter	When source and destinations are same model	When source and destinations are different models
Key programming	Y	N
User (Personal speed dial)	N	N
Language	Y	Y
Call log options	Y	Y
Dialing options	Y	Y
Ring type	Y	Y
Display contrast	Y	Y

If the destination set is of the same model as the source set, copying user preferences data results in copying ALL keys, not just the keys with autodialers and programmed features. In order to do this, if the user chooses to copy User Preferences data, line access data is also copied.

COPY can be used even when the destination set(s) is (are) unequipped. This is especially useful for preprogramming a system for which the language preference is other than the default.

COPY is not available to the user who enters the Basic or the System Coordinator (Plus) password, because of the extent of **COPY** capabilities and interactions.

If display contrast is copied from a Global set (which has nine levels of contrast) to an North American set (which has four levels of contrast), and the display contrast value is in the range of five to nine, the new display contrast value on the North American set is four.

Message Displays

Message	Description
Copy in use	A three-second transient message which displays, accompanied by Error tone if the user presses the COPY display key while a copy activity is already in progress. The user can try again later.

For more details on Extension Copy, see the Extension Copy feature.

1.2.4 **EXTN/**LINE

N/A

1.3 Technical Specifications (Limitations and Constraints)

Parameters changed in User Preferences with ** USER take effect immediately, without waiting for the specified set to become idle.

If no set is plugged into the associated port, the user who accessed the feature using the Basic password cannot specify the set model.

If the set at the associated port is not enabled, no user is allowed to access User Preferences for that set until it is enabled.

1.4 Interactions

Feature or Condition	Interaction
Active calls	<p>If a Extension number has active calls, Key Programming is unavailable for that Extension number. The user attempting to access Key Programming is presented with a three-second transient message <code>Extn busy</code>, and Error tone.</p> <p>The reason for this message is that changes to line access programming (Line assignment, Answer Extension numbers, and so on) for a Extension number does not occur until OAM programming has been exited. In order to ensure that the keys presented in Key Programming reflect line access programming (that is, the keys available to be programmed with features, Autodialers), the changes to a Extension number are made as soon as the user presses SHOW from the Key Programming heading. However, if active calls on the Extension number are being programmed, this updating cannot take place, because it can disturb active calls. The user doing the programming is told that the set is busy.</p>
OAM programming	<p>User Preferences (entered through **USER) cannot be used when an OAM session is in progress.</p> <p>Similarly, if a user tries to enter OAM Programming when the User Preferences (entered through **USER) is in progress, the attempt is denied.</p>
Extension Copy	See "Interactions with Copy" on page 7.
Set Model	See "Interactions with Set Model" on page 7.
User-programmable features Feature <input type="text"/> * <input type="text"/> 1 Feature <input type="text"/> * <input type="text"/> 2 Feature <input type="text"/> * <input type="text"/> 3 Feature <input type="text"/> * <input type="text"/> 4 Feature <input type="text"/> * <input type="text"/> 6 Feature <input type="text"/> * <input type="text"/> 7 Feature <input type="text"/> * <input type="text"/> 8 <input type="text"/> 2 Feature <input type="text"/> * <input type="text"/> 8 <input type="text"/> 4 Feature <input type="text"/> * <input type="text"/> 5 <input type="text"/> 0 <input type="text"/> 1 Feature <input type="text"/> * <input type="text"/> 5 <input type="text"/> 0 <input type="text"/> 2 Feature <input type="text"/> * <input type="text"/> 5 <input type="text"/> 0 <input type="text"/> 3	<p>When a user tries to activate one of the user-programmable features and an OAM session or mini-OAM session is in progress elsewhere, the attempt is denied.</p> <p>If a user is in the middle of a user programming session and a user attempts to activate an OAM or mini-OAM session is activated elsewhere, the attempt is denied.</p>

User Speed Dial

1.1 Overview

1.1.1 Description

The User Speed Dial feature allows a user to dial one of up to 24 prestored external numbers automatically, by activating the Speed Dial feature and dialing a two-digit code between 71 and 94 associated with the desired number. User Speed Dial numbers are specific to a particular set (see “1.2 Feature Details”). For shared System Speed Dial numbers, see System Speed Dial.

1.1.2 Rationale for Feature

The Autodialer stores explicit selection of `Intercom` as a facility in exactly the same way that explicit selection of a line or line pool is handled. Speed Dial also allows the dialer to use the routing table.

1.1.3 General Definitions

Term	Definition
Autodial number	Dialing sequence programmed by the end user on a programmable key, activated simply by pressing that key. Autodial keys can be programmed for internal or external numbers. (See the Internal Autodial and External Autodial specifications).
Dialer	Memory allocated to the storage of frequently used numbers that can be accessed by a feature code, or programmed key press. Features that use dialers include: System Speed Dial, User Speed Dial, Internal Autodial, External Autodial, Last Number Redial (LNR), and Saved Number Redial (SNR) keys. Speed dialers cannot be programmed on a key, while Autodialers, LNR and SNR can.
Facility	Method used to route an External Autodial, Speed Dial, Direct-dial or Hotline call; one of: Prime Line, line number, line pool, or Routing table.
Speed Dial code	Two-digit number associated with the Speed Dial number in OAM Programming, dialed by the caller after activating the Speed Dial feature (<code>[Feature]</code> <code>[0]</code>).
Speed Dial number	Speed Dial sequence, which can be up to 24-digits long, and can include the facility used to dial the number. A Speed Dial number is associated with a bin (rather than a programmable key) and is accessed by activating the Speed Dial feature and dialing a code.
Stored number	Number stored by any of the methods described in the definition for “Dialer”.
System Speed Dial number	Speed Dial number programmed at a system-wide level in OAM Programming. All systems users have access to these numbers.
User Speed Dial number	Speed Dial number programmed at the set level for one set only.

1.1.4 General Procedures

User Speed Dial is one of a set of User Preferences features that can either be programmed by

- an individual user at their set, using Feature keys (see “1.2.4 End User View”)
- for another user by the installer, system coordinator plus, or system coordinator, through OAM Programming (see “1.2.6 OAM Programming View”)

- for another user by a user with the Installer, System Coordinator Plus, System Coordinator, or Basic password, using the User Preferences feature, **USER (see “1.2.6 OAM Programming View”, and the User Preferences feature)

Speed Dial codes are used for external numbers only. End users can program internal numbers on an Internal Autodial (DSS) key (see Internal Autodial).

The codes associated with User Speed Dial numbers are 71 to 94 inclusive.

1.2 Feature Details

1.2.1 Controls

To program: * 4 plus dialpad keys

To activate: 0 or Speed Dial programmed key plus dialpad keys

1.2.2 Caller View

To call an external number, the user activates the Speed Dial feature by pressing 0 or the Speed Dial programmed key. At the `Speed dial>` prompt, the user enters a valid Speed Dial code. If a stored number exists for that code, the number is dialed automatically.

If no facility was stored with the dialer, it uses the set's Prime Line (default facility). If no Prime Line has been assigned to the set, and the user has not selected a line manually, they are prompted to `Select a line`. The caller can always select a line manually and activate the speed dialer. If the user selects a line manually, the stored line is not used.

A Speed Dial number can be up to 24 digits long. If the Speed Dial number is 16 digits or less, the number appears on the display as it is being dialed. If the number being dialed is greater than 16 digits, the user sees'...' (one space), followed by the last 15 digits of the dialer. Existing rules then apply after the call is connected.

User Speed Dial accommodates Network DN's transparently.

User Speed Dial entries can be cleared by supplying the input terminator or OK display key) without providing any input during the Speed Dial programming sequence.

Exiting the feature by any means other than OK leaves the original contents of the autodialer unchanged.

1.2.3 Message Displays

Message	Description
No free lines	Displays when there are no lines available in the line pool.
Speed dial>	Prompts the caller for a valid Speed Dial code when the feature is activated.

Message	Description
Speed dial> n	n is the dialed digit Digits are echoed on the display if automatic outgoing line selection is successful, or if the user has pre-selected an external line.
Invalid code	Displays, accompanied by Error tone, if at run time, the caller enters a code outside the code range (71 to 94).
No number stored	Displays, accompanied by Error tone, if no number is stored for the code the caller used.
Select a line	Displays, accompanied by Error tone, if either of the following is true - the facility stored with the dialer is not available (it is in use, or the set is not programmed to use that facility) - no line is stored with the dialer, the Prime Line is not available at the set, and the caller has not selected a line manually To make the call, the caller must select a line manually.
Unknown number	The leading numbers of the number stored in a User Speed Dial bin and dialed into I/C do not match any destination codes in the Routing Table.

1.2.4 End User View

To program User Speed Dial numbers, the user presses * , and enters the speed dial code (71 to 94) to be programmed. The user enters the telephone number. The number can include a line, line pool or intercom (not available on the M7100 telephone). Then the user presses or OK.

The user can program up to 24 User Speed Dial numbers.

1.2.4.1 Valid Dialing Sequences

A Speed Dial number can contain up to 24 characters including:

- any transmitted routing digits
- PBX reachthrough codes: Recall, Run/Stop, and Pause
- asterisk (*) and octothorpe (#)

Asterisk and octothorpe have special meanings in DTMF signaling mode. (For more information, see the PBX Reach Through and Pulse to Tone features).

An attempt to enter a digit for any other valid or invalid feature code is blocked.

If the user is programming a key or a Speed Dial entry, the sequence is stored if the user presses the key (or the OK display key on the M7310 set or M7324 set). If the user presses the key or the QUIT display key, or takes some other action to exit from programming mode, the new sequence is not stored.

When programming a dialer, the user can enter the following feature codes:

- Do Not Disturb (DND)
- Last Number Redial

- Saved Number Redial

Interaction with Do Not Disturb

If the user enters the feature code (or presses the programmed feature key) for Do Not Disturb while programming a Speed Dial number, Do Not Disturb is activated, and programming continues.

This scenario can occur if, in the middle of the user's entering a number, another call subsequently alerts at the set. If the user does not want to answer the call, they activate Do Not Disturb.

When the Do Not Disturb programmed key is pressed, the messages associated with Do Not Disturb appear transiently on the display. If the user enters more digits before the Do Not Disturb messages are finished, or if the Do Not Disturb messages finish before any user input is given, the user is returned to the Speed Dial number being programmed. The user can then continue with programming.

If the user activates Do Not Disturb by entering the feature code number, the feature code, (Feature), is shown transiently on the display, as part of the number being programmed.

The Do Not Disturb feature can be cancelled without ending the Speed Dial programming.

Digit Entry and Navigation

For information on digit entry, navigation, and the behaviour of the display, refer to the Alpha entry feature.

Choosing the Facility

As well as associating a given external number with a Speed Dial code, the user can store a facility (Prime Line, line number, line pool, Routing table) to be used when the Speed Dial Code is activated. If no facility is chosen, the default is Prime Line. If a Destination code is stored, the number is translated according to the Routing table.

For more details, see Please refer to “table Differences in Programming User Speed Dial” on page 6. and the Facility specification.

Message Displays

Message	Description
Access denied	Displays if the user tries to program a Speed Dial key while a OAM Programming session is in progress elsewhere.
Hold or release	Displays if a call is initiated or connected and the user tries to program a Speed Dial key.
Intercom	Displays transiently if the Intercom key was selected for use as the facility on which to place the call.

The following table show the steps taken by an end user to program Speed Dial for their set.

The table illustrates how the displays appear on two-line display sets (M7310 and M7324). One-line display sets (M7208, M7100) do not use display keys, and use the HOLD key instead of the OK display key. The **Ris** key is used instead of the QUIT display key, and Volume Down is used for backspacing.

User Action	Resulting Display	Set Response
1. Press Feature * 4	User Speed Dial Enter code:	Transient display showing feature activated. Prompts user to enter Speed Dial bin number.
2. Enter a two-digit bin number from 71 to 94	Enter code: <xx>	Echoes a valid code. Digits for invalid bin numbers are ignored.
3.	Program and OK QUIT OK	Prompts user to enter dialing information. One-line displays show Program and HOLD.
4. Enter programming information to be stored (can include feature codes)	<dialing information> QUIT BKSP OK	For more information, see "1.2.5 User Programming View".
5. Press Hold or press OK display key	Entry <xx> stored	Transient message to indicate that the dialing information had been stored with the Speed Dial bin number.
	Entry <xx> erased	No digits were entered in step 4. The specified bin has been erased.
	Autodial full	Transient message accompanied by Error tone. For more information, see the "Memory Full Errors" section in this feature.
	<idle display>	Returns user to the idle display.

1.2.5 User Programming View

Access to the User Speed Dial feature can be programmed on one of the memory keys. An indicator is not used.

1.2.6 OAM Programming View

1.2.6.1 Levels of Access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item			I	SC+	SC
Terminals&Extns	Individual extn	User Preferences	User speed dial	X	X	X

See "Terminals&Extns - User preferences - User speed dial - Facility Selection" and "Terminals&Extns - Capabilities - Hotline - Facility Selection".

1.2.6.2 Programming User Speed Dial keys

User Speed Dial keys can be programmed for another user in one of two ways

- under the heading Terminals&Extns►User preferences►User speed dial► in OAM Programming.
- if the user is programming from a set with a two-line display, using the User Preferences (**USER) feature

The user interface for customizing a set looks the same from within OAM Programming as from **USER. However, the steps to reach User Preferences are different. For more details on **USER, refer to the User Preferences feature.

1.2.6.3 Programming User Speed Dial

The programming structure for User Speed Dial using User Preferences is consistent with that for OAM Programming System Speed Dial. The difference in programming User and System Speed Dial is in the choice of facility to be used.

For User Speed Dial, the choice for line facility is limited to those lines that programmed to Appear or Appear&Ring at the set. The choice for line pool facility is limited to those line pools the set can access.

The following tables shows the differences between programming User Speed Dial with User Preferences (**USER) and with * 4 .

Differences in Programming User Speed Dial

User Preferences (**USER/OAM Programming)	End User (<input type="text" value="Feature"/> * 4)
Destination digits first, facility second	Facility first, destination digits second
Use prime line (Use prime line)	Prime line is the facility if none is specified. That is, Prime line is the default.
A particular line appearance can be specified as the facility	A particular line appearance is pressed to identify the facility

Differences in Programming User Speed Dial

User Preferences (**USER/OAM Programming)	End User (<input type="text" value="Feature"/> * 4)
A particular line pool can be specified as the facility	A particular line pool can be a facility when identified by one of <ul style="list-style-type: none"> - pressing a programmed line pool key - pressing intercom and entering leading digits that map to a line pool code
Leading digits in destination do not need to map to a pool code, because of the explicit line pool facility choice using a pool code.	To use line pool as a facility, leading digits in destination must map to a line pool code, after intercom is pressed
The routing table can be specified as the facility.	The routing table is assumed when intercom is pressed and the leading digits in a destination map to a route.

1.2.7 **EXTN/**LINE

N/A

1.3 Technical Specification (Limits/Constraints)

Only M7000 series terminals can be programmed through User Preferences. Other terminal types are not supported.

All User Speed Dial numbers are subject to the Call Restrictions and Overrides in place, at the time of dialing, on the lines used.

If no user input is given for 15 seconds, feature timeout rules apply.

All User Speed Dial numbers are stored in non-volatile memory (NVRAM). They survive warm restarts, but not cold restarts.

Memory Full Errors

The system imposes a limit on the combined total of Autodial keys and Speed Dial entries that can be programmed for the system. An individual set can have up to 24 Speed Dial entries plus any desired number of Autodial keys (limited by the number of keys on the set), so long as space remains in the system's memory pool. A user's attempt to program a Speed Dial key can be denied because all memory in the pool has been used.

If the pool is full, the number the user tried to program is not stored. The user can store a new number by re-executing the sequence and altering the contents of an existing User Speed Dial entry. Otherwise, this programming cannot be done until this user or another user in the system erases an existing User Speed Dial entry or an Autodial key.

Similarly, because dialer memory is not reserved for any individual set, there is no guarantee that a new set added to the system can program any User Speed Dial entries or Autodial keys.

Memory full errors are unlikely, because systems are rarely equipped with the maximum number of sets, and users do not often program the maximum number of Autodial keys.

1.4 Interactions

Feature	Interaction
*, # PBX Reach Through Pause Recall Run/Stop	Special keys *, #, and PBX Reachthrough codes can be used. Reachthrough code digits are immediately replaced with the appropriate symbol. For more information, see the Pulse to Tone Conversion and PBX Reach-Through features.
Do Not Disturb	Do Not Disturb can be activated or cancelled when a dialer is being programmed. (For more information, refer to “Interaction with Do Not Disturb”).
Extn Copy	Extn Copy cannot be used to copy User Speed Dial settings from one set to another.
Extn Relocation	Extn Relocation saves the User's Speed Dial entries.
Last Number Redial (LNR) Saved Number Redial (SNR)	User Speed dial can be programmed using the information from Last Number Redial and Saved Number Redial.
Line Pools	User speed dialers with a line pool stored as the facility use the line pool when the dialer is activated if <ul style="list-style-type: none"> - a line in the pool is idle - the set has access to that line pool defined in OAM Programming.
Volume Control	If the user is programming a dialer and uses the volume down portion of the volume bar to backspace over entered digits while a call is ringing at the set, using the volume bar both lowers the volume of the ringing call and backspaces over digits. At the end of each ring cycle, the volume is restored to the original volume level. (Except for Global sets, which can be programmed differently. See the Volume Control feature.)

Voice Call

1.1 Overview

1.1.1 Description

This feature allows the user to make a call that connects immediately with the destination set, if the destination set is idle. Depending on the Handsfree settings for the destination set, the users can begin speaking immediately following the Voice Call Alert tone.

1.1.2 Rationale for Feature

See “1.1.1 Description”.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls




Feature 6 6, or programmed key

1.2.2 Message Displays

Message	Description
Calling<setname> LATER	Appears after the No voice call display at the originating set of a Voice Call attempt if the destination set has activated Voice Call Deny.
Dial voice call	Appears after the user activates the Voice Call feature. The system is waiting for the user to dial the Extn of the destination set.
No button free	Appears transiently, with Error tone, if the user activates the feature and there are no available Intercom keys on which to represent the call.
No voice call	Appears transiently, if the called set has activated Voice Call Deny (Feature <input type="text"/> 8 8), which blocks Voice Call attempts).
<setname> TRANSFER	Appears on the display after the Voice call transient display has timed out.
<setname> busy LATER	Appears at the originating set of a Voice Call attempt if the destination set does not have any free Intercom keys on which to represent the call.
<setname> calling	Appears at the destination set of a Voice Call attempt if that set has activated Voice Call Deny.
Voice call	Appears transiently at the calling set when a Voice Call attempt is successful.

1.2.3 Caller View

The user cannot convert a Ringing Call to a Voice Call, or a Voice Call to a Ringing Call. An exception is the use of the Priority Call feature, which forces a Voice Call if the destination is idle. The call is converted automatically from a Voice Call to a Ringing Call if the destination set does not meet the conditions for receiving a Voice Call.

To initiate a Voice Call, the caller presses the Voice Call key (or dials   ) before dialing the call. The user can either dial a number or press an Internal Autodial key for the destination.

If the caller activates the feature in any other state, the set applies Automatic Hold to the current call (if any), and attempts to obtain dial tone on an internal line. If the line selection attempt fails, the transient prompt `No button free` appears. If the line selection attempt succeeds, the user hears a dial tone and sees the `Dial voice call` prompt, and can proceed as outlined above.

In order for a Voice Call to succeed, the destination must be in the correct state to receive a Voice Call. Any one of the following conditions at the called set prevents it from receiving a Voice Call


- all intercom keys are in use
- the user is active on another call
- another call is ringing the set
- Call Forward is active
- Voice Call Deny is active
- Do Not Disturb is active


If any of these conditions are in effect at the destination (except for all intercom keys are in use. See “1.2.2 Message Displays”), the caller sees a transient `No voice call` message on the display. The Voice Call activation is ignored, and the call proceeds as though an ordinary Ringing Call were being initiated. If all the intercom keys are in use, the call fails and Busy tone is given to the caller.

A set can not receive a Voice Call if another call is ringing at the set. Incoming calls which are alerting visually but not audibly do not prevent Voice Call reception.

A Voice Call is connected after the initial Alerting tone, and therefore can be held, parked, conferenced, or transferred. Distinctions between Voice Calls and Ringing Calls do not exist after the calls are connected.

If the Voice Call succeeds, the called set generates a Voice Call Alert tone once, answers the call automatically, and activates its Handsfree/Headset receive path (if set in OAM Programming). If the destination set has Handsfree Answerback enabled in OAM Programming, this set also activates its Handsfree/Headset microphone when accepting the Voice Call, so that a two-way conversation can take place without the need for the destination party to touch the set. When a Voice Call attempt is successful, the caller sees a `Voice call` message on the display, as a prompt to begin talking. The intercom key indicator on the called set is updated to active state as soon as the Voice Call occurs.



If the destination set is programmed with Handsfree Answerback, a Microphone On Warning tone is produced through the loudspeaker when the call is answered and periodically thereafter to remind the user that the microphone has been activated automatically. The called party can suppress this periodic warning tone by lifting the handset or pressing the  key to acknowledge the call, or by holding the call and then reselecting it. For details, see the Handsfree Answerback feature description.

If the destination is not programmed with Handsfree Answerback, the set remains in receive-only mode until the called party answers the call using the  key or the handset.

If the headset is attached at the destination set, it is used for Voice Call reception and Handsfree Answerback. Otherwise, Handsfree is used.

The settings of Handsfree and Handsfree Answerback affect the results of a Voice Call attempt at the destination set as outlined in Table 1.

Table 1 - Effect of Handsfree/Handsfree Answerback Settings on Voice Call Attempt at Destination Set

		Handsfree	
		YES	NO
Handsfree Answerback	YES	Microphone is ON from beginning of call. Voice Call causes Microphone ON Warning tone. Microphone can be muted by pressing  twice.	Microphone is ON at beginning of Voice Call. Voice Call causes Microphone ON Warning tone. To turn the microphone OFF, the user can only lift the handset since there is no Handsfree control.
	NO	Microphone is OFF (muted). Display message is <code>microphone muted</code> .  will be blinking. User can unmute microphone and converse.	Microphone is OFF (muted). Display message is <code>microphone muted</code> . User must lift handset to answer.

A Voice Call can be placed on hold by the destination set. Again, the settings of Handsfree and Handsfree Answerback affect the results, as outlined in Table 2.

Table 2 - Effect of Handsfree/Handsfree Answerback Settings on Hold at Destination Set

		Handsfree	
		YES	NO
Handsfree Answerback	YES	Intercom key is put on hold. User can lift handset and press held line key. User can press held line key while onhook and perform Handsfree communication (if Auto Handsfree) is programmed or push a line key for Handsfree if Standard Handsfree is programmed at the set.	Intercom key is put on hold. User can lift handset and press intercom held key. User can press held intercom key with handset onhook but no microphone is available (speaker only).
	NO	Both Intercom key and Handsfree key are put on hold. User can lift the handset and press held intercom key. User can press held intercom key.	Microphone is OFF. User can answer only if the handset is lifted and the held line key is pressed.

1.2.3.1 User Programming View

One Voice Call key can be programmed by the user for each set.

Voice Call can appear on a feature key with or without an indicator, and does not make use of the indicator, if present.

1.2.4 **EXTN/LINE**

N/A

1.3 Technical Specification (Limits/Constraints)

N/A

1.4 Interactions

Feature or Condition name	Interaction
Answer Extns	If a user initiates a Voice Call to a set which is in the correct state to receive a Voice Call, the call is connected at once. When the service receiver's set receives a Voice Call, no alerting occurs at the attendant's set. If conditions for a Voice Call are not correct and the call is converted to a Ringing Call, this call is directed to the service receiver's set only, and does not alert at the Answer key on the attendant's set. This rule is made on the assumption that the caller is interested in calling a specific set only.
Autologging option programming	An Autologging option programming session is terminated upon the arrival of a Voice Call.
Auxiliary Ringing	The Voice Call Alert tone does not activate the Auxiliary Ringer.
Call Duration Timer	Because a Voice Call can be turned into a two-way call, timing is maintained for Voice Calls. Therefore, Voice Call reception resets the stored timer value for the most recent call.
Call Forward	All forwarded internal calls are made as Ringing Calls, even if other conditions are suitable for a Voice Call to be made.
Call Log	Call Log sessions are cancelled upon the arrival of a Voice Call.
Change Extns	Voice Calls do not need to be dropped when a set's Extn is changed in OAM Programming.
Do Not Disturb	The Do Not Disturb feature suppresses incoming Voice Calls. If a user attempts to place a Voice Call to a set which has Do Not Disturb activated, the conditions for a Voice Call are not satisfied and the call is made as a Ringing Call. The indicator at the called set flashes but does not ring. If the user at the destination set turns off DND while a call is alerting the set, the Ringing Call is not reconverted to a Voice Call even if all conditions for receiving a Voice Call are now met.
Handsfree Answerback	When this feature is enabled in OAM Programming for a set, it activates the handsfree microphone for an incoming Voice Call, thus allowing a user to reply to a Voice Call without lifting the receiver or pressing Handsfree (if enabled) to answer the call.
Headset	Voice Call reception uses the headset earpiece if the headset is connected.

Feature or Condition name	Interaction
Hold Call Park Conference	A Voice Call can be held, parked and conferenced.
Identifying Call Information (ICI)	Identifying Call Information is cancelled by the arrival of a Voice Call.
Incoming Call	A set can not receive a Voice call if another call is ringing the set. Incoming calls which are alerting visually but not audibly do not prevent Voice Call reception.
Internal Autodial	If the user presses the Voice Call key (or dial code) before pressing an Internal Autodial key, the call is made as a Voice Call.
Line Selection (Automatic Outgoing Internal by a Feature)	When the user activates Voice Call the feature attempts to select an idle line automatically.
Message Reply	Message Replies cannot be made as a Voice Call. However, if a Voice Call is made to the destination set that left a message, the message is cancelled. If the target set is in the Message List, the Voice Call is successful. Message Waiting List feature remains intact. If user attempts to use the Message Waiting callback function, the Voice Call is put on autohold.
Onhook Dialing	Activating the Voice Call feature when onhook and idle results in Onhook Dialing; that is, it does not automatically enable the calling set's Handsfree unit unless it is programmed for Auto Handsfree.
Onhook Dialing Options	Automatic Dial: If Automatic Dialing is in progress, the Voice Call is completed as a regular call. If Automatic Dial is active, but no digits have been entered, the Voice Call is completed as described in the Voice Call feature description. Pre-Dial: If the user activates the Voice Call feature while entering a Pre-Dial number, Pre-Dialing ends, and Voice Call takes effect.
Password programming	A password programming session is terminated upon the arrival of a Voice Call.
Pre-Selection of a Line	Pre-Selection of a line does not apply to Voice Calls because the call is answered automatically.
Reason for Release	The display of the reason for release ends when a Voice Call arrives. (DASS2)
Ring Again	An outgoing call resulting from accepting a Ring Again offer must be made as a Ringing Call, not a Voice Call. Ring Again can be activated after an unsuccessful Voice Call, because the call is converted to a Ringing Call.
Ring Again on No Answer	The caller cannot activate Ring Again on No Answer on a Voice Call, since the Voice Call is connected by definition, even if the destination party does not explicitly answer the call.
Transfer	If a Voice Call is transferred successfully, it alerts as a Ringing Call. Attempting to activate the Voice Call feature before a valid Extn is entered for the destination of a transfer results in Error tone accompanied by <i>Still in trnsfer</i> , shown on the display.

Voice Call Deny

1.1 Overview

1.1.1 Description

This feature allows the user to prevent the set from receiving Voice Calls, so that all incoming internal calls will be received as ringing calls.

This is an end user feature with no OAM component.

1.1.2 Rationale for Feature

This feature allows the user to maintain privacy by blocking Voice Calls.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls

To activate: , or programmed key

To cancel: , or toggle

1.2.2 Message Displays

Message	Description
Allow voice call	Appears transiently when the user cancels the Voice Call Deny feature.
No voice calls	Appears transiently when the user activates the Voice Call Deny feature.

1.2.3 End-User View

To prevent Voice Calls from being received, the user presses the Voice Call Deny key (or dialpad code). The display shows `No voice calls` transiently. If the Voice Call Deny key has an associated indicator, it is ON while this feature is active. To allow Voice Calls to occur, the user presses the Voice Call Deny key again, or dials the cancellation code. `Allow voice calls` is displayed transiently. Once the state of the feature is changed, it remains in the new state until changed again.

Handsfree Answerback, an extension of incoming Voice Calls, cannot occur when Voice Calls are prohibited.

Enabling Voice Call Deny is one of several conditions that prevent Voice Calls from being received. Voice Call Deny is the only feature that is specifically designed to prevent Voice Call reception and has no other function.

The status of Voice Call Deny is shown on the display only when the status changes, and then only transiently. To get an ongoing status display for this feature, assign it to a key with an indicator. The indicator is ON when incoming voice calls are not allowed, and OFF otherwise.

Activation of Voice Call Deny does not prevent the user from initiating a Voice Call to another set.

1.2.3.1 User Programming View

The user can program one Voice Call Deny key for each set, with or without an indicator. The indicator is used if present.

Toggling the key turns the feature ON and OFF.

On the M7310 sets with busy lamp field (BLF), programming this feature onto a key associated with BLF does not show the status of the feature on the BLF.

1.2.4 OAM Programming View

N/A

1.2.5 **EXTN/LINE**

N/A

1.3 Technical Specification (Limits/Constraints)

The status of Voice Call Deny is stored in non-volatile memory (NVRAM). It is preserved over warm, but not cold restarts.

1.4 Interactions

N/A

Volume Control

1.1 Overview

1.1.1 Description

The volume bar controls the volume level of the handset, handsfree speaker, headset, ringing, background music and paging through the set speakers.

For Global sets, a system-wide parameter can be programmed that allows the handset (receiver) and headset volume level to do one of

- return to a default value when the user goes onhook, or is going off hold
- retain the adjusted value as the permanent setting until it is changed by the user again

For non-Global sets, handset volume is reset to a default level each time the handset is place onhook.

1.1.2 Rationale for Feature

Provides users with greater control over their environment. Enables users to adjust volume according to background noise, office environment, and personal preference.

1.1.3 General Definitions

N/A

1.1.4 General Procedures

N/A

1.2 Feature Details

1.2.1 Controls

The Volume adjustment bar or * 8 0 which gives a burst of ringing to allow the user to adjust ringing volume.

1.2.2 Message Displays

N/A

1.2.3 End-User View

Pressing the left or right side of the volume bar adjusts the level down or up, respectively.

- If the set is ringing, the ringing volume is affected.
- If the headset is active, the headset earpiece volume is affected.
- If the handset is in use, the handset receiver volume is affected.
- If the handsfree speaker is on, its volume is affected.
- If paging or background music is being received, their volume is affected.
- If none of these conditions exists, the volume bar has no effect.

No indication of the current volume level is displayed when the user is changing the volume.

The volume adjustment cannot be used to turn a signal completely off.

When the volume bar is being used to control the receiver, handsfree or headset voice path, it auto repeats when it is held down.

When the volume bar is being used to control ringing, it does not auto repeat when it is held down. A separate press is required for each change in volume level.

Users with Global sets may or may not have the volume level of the handset and the headset returned to the default value, depending on how the parameter is set in OAM programming. Ringing, and music/paging volume settings are retained until the user changes them.

Users without Global sets have the handset volume level returned to the default value when they go onhook or hold a call automatically or manually, even if the same call is subsequently reselected. Handsfree/headset, ringing, and music/paging volume settings are retained until the user changes them.

Regardless of the set used, ringing volume is preserved during power interruptions.

1.2.3.1 Handset volume

When the handset is in use, the handset receiver volume can be raised or lowered by pressing the volume adjustment bar. There are 32 possible volume settings.

1.2.3.2 Handsfree /Headset Volume

Pressing the right or left side of the volume bar while the handsfree or headset is active adjusts the handsfree/headset receiver volume. There are 32 volume levels available for the single register controlling these two voice paths.

The handsfree and headset volume level is a single value. For example, if the user adjusts the handsfree speaker level on a handsfree call and then connects the headset, the headset has the same volume setting.

1.2.3.3 Ringing Volume

The ringing volume can be adjusted by pressing the left or right side of the volume bar while the set is ringing. Pressing the volume bar during the OFF period in the ringing cycle has no effect. If no calls are ringing, the user can dial * 8 0 to generate a timed burst of ringing during which the volume bar can be pressed to adjust ringing volume.

An alternate way to force the phone to ring to allow volume adjustment to be done is to call it from another set. As well, the Ring Type feature generates ringing (two seconds) during which the ring volume can be adjusted.

There are eight levels of ringing volume. Ringing remains audible at the lowest volume setting.

Attenuated ringing occurs if a call rings the set when the user is active on another call.

If the user presses the volume bar while attenuated ringing is occurring, the volume level of the current speech path is adjusted, and the volume level of attenuated ringing is not affected.

When the user adjusts normal ringing volume, attenuated ringing volume is adjusted indirectly. The user cannot adjust the level of attenuated ringing directly, and cannot adjust it when it is occurring.

1.2.3.4 Background Music/Page Volume

The level of background music and page reception are controlled through a common register, which has 32 levels.

1.2.4 OAM Programming View

1.2.4.1 Levels of access

The following table shows the levels of access required for users to program OAM changes.

Heading	Item		I	SC+	SC
System prgrming	Featr settings	Receiver volume:Use sys volume	X	X	

1.2.4.2 Programming Receiver volume

See ["System Programming - Feature Settings"](#).

For Global sets only, Receiver volume is set in System prgrming►Featr settings. It allows users to select what happens to the receiver or headset volume when a user goes onhook or holds a call automatically or manually. The two choices are:

- Return to the default setting, Use sys volume
- Preserve the volume setting, Use extn volume

The default is Use sys volume.

1.2.5 **EXTN/**LINE

N/A

1.3 Technical Specification (Limits/Constraints)

N/A

1.4 Interactions

Feature	Interaction
CCU warm start	Receiver and headset volume, as adjusted by the user, is not preserved across CCU warm starts. The system-wide setting for receiver and headset volume is preserved over warm starts.
Extension Copy	The system-wide setting for receiver and headset volume is not available in Extension Copy. (Ringing volume can be done in Extension Copy.)

Feature	Interaction
Extension Relocation	Ring Volume (Feature * 8 0), Contrast Adjustment (Feature * 7) and Ring Type (Feature * 6) are not preserved when a set is relocated (Extension relocation is ON). Similarly, receiver volume is also not preserved on set relocation, when the Receiver volume setting is Use set volume.
Hold	<p>Non-Global sets: placing a call on hold, either manually or automatically, resets the handset volume, even if the same call is retrieved. Headset and handsfree volumes are not reset by placing a call on hold.</p> <p>Global sets: the headset and handset volumes may or may not be reset, depending on the parameter set in OAM programming.</p>

Wireless Features

1.1 Overview

This section lists the features, any limitation and reason for limitation. Alternate Line Selection and Recall have been copied from the CUK3 UI Specification as they are referred to in the other sections.

1.2 Alternate Line Selection

1.2.1 General Overview

This feature allows the user to access the other line on the portable.

1.2.1.1 Rationale

The Link Set model provides access to two calls without line indicators. As previously discussed in the High Level Design (see Wireless Terminal UI Spec, Issue 1.1, March 91), the Recall key is used to access the alternate line.

1.2.2 End user's view

When active on a call, the user presses the Recall key to obtain internal dial tone.

Recall is also used to create a conference. See the Conference feature for details.

Recall is also used to access a second call (Call Waiting feature).

1.2.3 Feature details

The following diagram shows the rules followed for alternate line selection. See also the table on page 7 in the Recall feature section for details.

The reader is cautioned that:

- When the Recall key is pressed, the signal is processed by the local CCU and is not to be confused with Host Recall (Reach Through codes) which applies to a remote CCU.
- The Norstar CCU is also capable of sending a Recall (the Host Recall feature) signal to the host system to which it is connected. The user must enter a Norstar feature code (71) to send a Recall signal to the network. Feature 71 is described in the section on PBX Reach Through.

The user can have a maximum of 2 calls at any one time (1 internal and 1 external, 2 external, 2 internal, or one conference call, where the portable is the master).

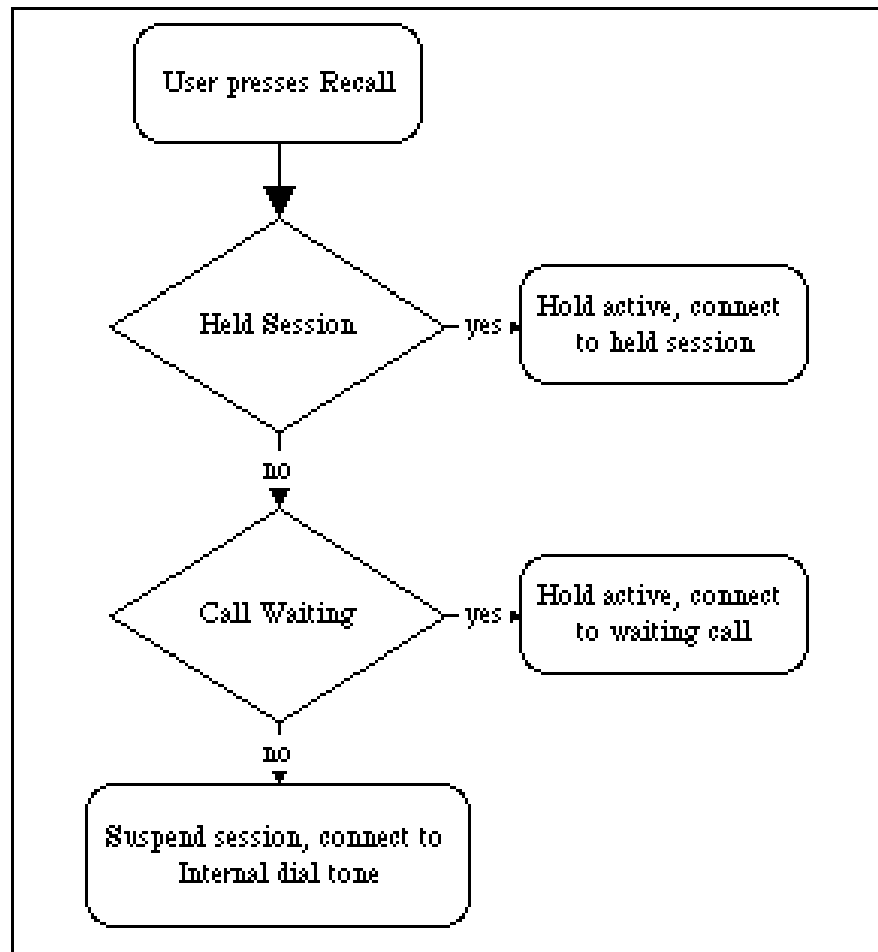


Figure 1-1: Rules for Alternate Line Selection

1.2.3.1 Obtaining the other line

When active on a call, the user can press the Recall key to get the other line.

- If there is a call on the other line, then the active call is held. The user is connected to the other call. The call is not suspended but is held in this case, since the other line is immediately picked up.
- If there is no call on the other line, then the active call is 'suspended'. The user hears internal dial tone. The user can then make a call, or activate a feature.

Note that if the active call is suspended, then it is not held. The call becomes held (and the far-end receives held line treatment) after a second call attempt is successful. See the Recall feature for more information.

1.2.3.2 Toggling between calls

If the user has two calls at the set, and the youngest call was not made by the user (it was incoming), then the user can toggle between the two active calls by pressing Recall. Successive presses of Recall will continue to toggle between the two calls.

If the user is active on a call, and there is no call on the other line, then pressing Recall suspends the active call and connects the user to internal dial tone. Successive presses of Recall will continue to toggle between the active call and internal dial tone.

If the user has two calls at the set, and the youngest call was made by the user (an outgoing call), then Recall does not toggle between the two calls. A conference is created. A conference call uses both lines. It cannot be held. Recall does not toggle between the two conference parties. Pressing Recall will split the conference and drop the youngest call.

See the Conference feature for details.

1.2.3.3 Answering a call while on a call

If another call arrives while the user is active on a call, and the user doesn't already have two active calls, then the user hears a Call Waiting tone (one beep, provided periodically) to indicate a call is waiting. The user cannot have an active call and receive a ringing call. This functionality is similar to the ATA. This happens if DND on Busy is set to No and Forward on Busy is set to None.

The user presses the Recall key to answer the incoming call. The first call (the active call the user was on before receiving the waiting call) is put on hold.

The portable user can receive a second call, and be notified by Call Waiting tones when:

- connected to any Norstar DN (i.e. there is a connected voice path), or
- connected to an external line (hearing external dial tone, or dialling digits out on the line, or there is a connected voice path)

Note that if the user is on an active call and receives a waiting call, and the far end of the active call releases, the user receives internal Dial Tone. The Call waiting tones continue to be presented in this case, so that the user is aware that the call waiting call is not gone. The user is not automatically connected to the waiting call. (Automatic connection to the waiting call could be confusing, especially if the user has not heard the call waiting tones, or is not aware of what they mean.) The user can answer the waiting call by pressing Recall, or by using Full Release.

A second incoming call will receive busy treatment if the user:

- is receiving internal dial tone
- is dialling an internal call
- is entering a feature code (feature activation or cancellation).
- is receiving a confirmation tone, error tone, reorder tone, receiving internal ringback or busy tone
- has two active calls already
- is on a conference call
- has a ringing call already
- Has DND on Busy set to Y in OAM Programming
- Has the Forward on Busy feature configured in OAM Programming to forward calls when the set is active on another call.

See the Call Forward Transfer to Prime feature, and Call Forward on Busy feature.

1.2.4 Interactions

When the set is idle and a call is ringing the set, the user can press either the Intercom key or the Recall key to answer the call.

If the portable is already active on a call, the user can press either the Line or Recall keys to answer an incoming (Call Waiting) call.

The Recall key can be used to access an internal dial tone when on another call. At that point, feature activation can be performed.

If the user is in the middle of invoking a feature and presses the Recall key, then the feature is aborted. See Recall feature for details.

The Call Forward No Answer delay for a set (administered in Capabilities) controls the length of time Call Waiting tones are provided for an incoming call because once the call is forwarded, it can not be answered by the portable and is thus no longer waiting at the portable.

1.2.4.1 Holding an active call

When active on a call, and the other line has no active or incoming call, pressing Recall suspends the active call, and gives an internal dial tone as it activates the other internal line (i.e., in effect, performing Automatic Hold).

Dial timeout rules apply to the dial tone being received if the user does not return to the call (see the Dial Timeout feature for details). Therefore, the portable's local Mute function is the recommended way to hold a call.

1.3 DND on Busy

The Do Not Disturb on Busy (also known as DND on Busy) feature on wireline sets is available to wireless sets. Once activated through administration on a Norstar set, a second DDI call arriving at the portable will not ring when the user is active on a call, has an alerting call or has held calls.

1.3.1 Error Conditions

Wireline sets display `<name> busy` if DND on Busy has been activated. As with an internal caller at a set connected by an ATA, the wireless caller will only hear busy tone. Except for the `<name> busy` prompt, wireless sets behave in the same manner as wireline sets whether as called sets with DND on Busy activated, or as a calling set to a set with DND on Busy activated.

In theory, a special alert tone could be designed for this situation, but it is not recommended as there is no easy way to ensure that users understand what the tone signifies.

1.4 Network Dialling

Modular Plus allows wireless users to access an answering position which may be located on another Norstar on the private network with a single digit.

Network dialling capabilities for wireless sets have been enhanced to include I/C dialling, System Speed Dial across a network, and External Direct Dial. From a user perspective, these enhancements will be fully transparent, and the user should

not perceive any difference from the current practice in making and receiving calls. From whose perspective in terms of wireline vs. wireless.

Wireless sets usually follow the operation of ATA and Basic sets on a Norstar system.

1.5 General Conditions

1.5.1 Error Conditions

The information in this section does not apply solely to Networks and/or does not apply to Networks.

Because alpha prompts are not supported, tones are used to alert the user to abnormal conditions. Depending on the condition, the tone can be a re-order tone or a busy tone. In both cases, the digits the user has entered remain on the display until the user takes some action. The entered digits on the display may give the user some indication of the error (for example, if they have dialled an invalid number).

1.5.1.1 Reorder Tone

The reorder tone is provided if:

- the user dials an invalid DN or code not recognized by the system
- the user dials an invalid or unsupported feature code
- the user dials their own number
- the user waits too long to enter a digit (interdigits or dial timeout occurs)
- the user calls a Norstar set that is not in service (in admin, unplugged)
- the user dials an internal number to which the user is already connected (ringing, held, conferenced, or connected)
- the user attempts to access a line pool to which they do not have access.

1.5.1.2 Busy Tone

The information in this section applies to both Networks and non-Network conditions.

For an error associated with a busy line or busy line pool, busy tone is provided instead of the reorder tone. Busy tone is provided if the user has tried to access:

- a specific external number and it is in use
- a line in a line pool where no idle line is available or no lines are assigned to the pool.

1.6 Network Transfer Callback

The information in this section has been tested against Internal Callback but not Network Callback.

If an external call that has been transferred from a wireless terminal to a network DN remains unanswered (i.e. no answer signal) and the Recall feature has not been used to route the call, then Callback to the wireless terminal will occur. In cases where a Callback to the portable fails, extending the call to the Prime set for that line provides backup answering capability.

This feature, allows callback of a call transferred to a network DN if it is unanswered or has not returned an answer signal within a defined time period. The callback is to the transfer agent, that is, the set which originated the network transfer.

The user implications of callback to a wireless set are the same as for the existing callback to wireless sets in the local environment. If a Callback for a transferred call cannot callback to the set that transferred it, then the call attempts to perform Callback to the Prime Set for that line, if one exists.

On a wireless set this would occur if:

- there are no free lines at the set
- the wireless set cannot be found (out of range, low in power, switched off)
- the set is active on a call and DND on Busy is ON

1.7 Recall

1.7.1 General Overview

Recall is a multi-purpose command. Pressing the Recall key can:

- give alternate dial tone or alternate between two active calls (if the youngest call was incoming)
- establish a conference (if the youngest call was an outgoing call from the portable)
- provide a dial tone to facilitate the activation or cancellation of features that require codes
- enable the transfer mode
- split a conference and drop the youngest call.

1.7.1.1 Rationale

Recall is a multi-purpose command in the model used for Wireless.

1.7.1.2 Reference

- Link: Norstar Modular DR2 System Reference Manual.
- Alternate Line Selection: ATA UI spec, Issue 1.9.
- Alternate Line Selection: in this document
- Wireless Terminal UI Spec, Issue 1.1, March 91

1.7.2 End User's View

The Recall key provides a dial tone to facilitate the activation or cancellation of features that require codes and alternate between calls on the portable.

1.7.3 Feature Details

Recall is local to the Norstar System. See 'Host Recall' in the section on PBX Reach Through for details of sending Recall to a switch beyond the Norstar system.

The table on page 7 shows possible portable states and the result of pressing the Recall key.

In the table, external dial tone is always suspended, but it may be dropped when a successful call attempt is made on the alternate line depending on the Full Auto Hold setting (see the Dial tone timeout feature for details). For example, external dial tone is held if Full Autohold is Y, but dropped if Full Autohold is N. The Full Autohold setting has no effect on an external line while it remains in a 'suspended' state.

All references to a conference being established assumes that conference barring requirements have been passed.

Recall Feature Interactions

Portable State	Impact of Recall
Set idle, no ringing call	Internal line is seized.
Set ringing, no internal dial tone nor active call	Ringing line is seized.
Receiving internal dial tone	Dial tone dropped. User is given internal dial tone.
Receiving external dial tone	Dial tone suspended. User is given internal dial tone.
Receiving internal dial tone, held call at set	Dial tone dropped. The user is reconnected to the held call.
Receiving external dial tone, held call at set	Dial tone is held or dropped depending on the status of Full Auto Hold. The user is reconnected to the held call.
One Call Active	Active call is suspended. User is given internal dial tone.
Active on a call; Call Waiting alert	Active call is held, Waiting call answered
One call held, one call active	Active call becomes held, held call becomes active, if alternate line selection applies. See that feature for details. A conference may be created if the youngest call is outgoing. See that feature for details.
User has one outgoing internal call at the set and is receiving ringback, or busy tone for that one call	Suspend call. User is given internal dial tone. If the internal destination then answers the ringing call, they will hear dead air.
User has one outgoing internal call attempt that resulted in reorder tone for that one call	Drop call. User is given internal dial tone.
User has one outgoing internal call at the set and is receiving ringback, or busy tone for that call, with a call on hold	Drop outgoing call. Return user to held call. can't suspend it since already have 2 calls
User has one outgoing internal call at the set and is receiving error followed by reorder tone for that call, with a call on hold	Drop outgoing call. Return user to held call.
User is in the process of dialling an outgoing external call, no call on hold	Suspend outgoing call. User is given internal dial tone.
User has one outgoing external call at the set and is receiving ringback, or busy or reorder tone for that call	Suspend outgoing call. User is given internal dial tone.

Recall Feature Interactions

Portable State	Impact of Recall
User has one outgoing external call at the set and is receiving ringback or busy for that call, with a call on hold	Conference established. User must press Recall again to drop the youngest leg of the conference (the last outgoing call)
User is in the process of dialling an external call, with internal or AC-15 call on hold	Conference established, between the held call and outgoing digits. User must press Recall again to drop the youngest leg of the conference (the outgoing digits) because no digits can be dialled in a conference, from the conference controller.
One call held, youngest call is internal or external, outgoing and connected	Conference is established. See the Conference feature for details.
Active in a conference as the controller Conference controller presses Recall	The youngest leg of the conference (the last outgoing call made by the user) is dropped. The user remains connected to the other conference party.
Active in a conference Conference user (other than controller) presses Recall	Call is held. The other parties can continue to talk. The user is given internal dial tone or their held call, if any.
Enter incorrect digit during feature activation but no error tone yet	Drop feature session. User is given internal dial tone.
Enter incorrect digit during feature activation but no error tone yet, call on hold	Drop feature session. Return user to held call
Feature activation or cancellation in progress (no error made)	Drop feature session. User is given internal dial tone.
Feature activation or cancellation in progress (no error made), call on hold	Drop feature session. Return user to held call

1.7.4 Interactions

If the user dials the wrong digit(s) on an outgoing external call, and uses CAI Full Release or Clear, then the user hears Reorder tone and the call is ended.

- If the user dials the wrong external number, then Partial Release should be used for error correction. See the Transfer feature and “Alternate Line Selection” on page 1 and “Recall” on page 6.

1.7.5 Feature Activation

N/A

1.8 Recall On AC15 Trunks

This section has not been tested against actual AC15 lines.

This product allows wireless terminals to initiate recall either manually via feature code (same as for wireline sets) or automatically when a transfer or conference is invoked.

Recall signalling was introduced in ENET to minimize the number of AC15 lines used in transferring a call to another part of the network. It can be used if the system determines that the destination call can be routed on the same AC15 line as the source call. Essentially, the feature is transparent to the user. Details of the

'Transfer and Recall on AC15A' feature for wireline sets are provided in the ENET Incremental UI Design Specification.

On a wireless set, the user view is the same as for "Alternate Line Selection" on page 1 and "Recall" on page 6.

1.9 System Speed Dial

1.9.1 Dialling Transparency

A number of features were modified in ENET to use the uniform numbering plan. System Speed Dial has been expanded to include numbers on other portions of the private network. Using System Speed Dial is exactly the same as in the current operation.

1.9.2 Error Conditions

As in other network dialling, there are two possible error tones, Reorder and Busy.

1.9.2.1 Reorder Tone

If the line pool, or prime line stored with the speed dialler is not available (for example, no prime line is defined for the set, or no access to any line pool is defined for the set), then the user will receive reorder tone. The display will show 0 nn where nn is the speed dial bin number dialled by the user.

If the user enters an invalid bin number or a speed dial code for which there is no stored number, then the user will receive reorder tone. The display will show 0 nn.

1.9.2.2 Busy Tone

If an external or network number stored in the speed dialler is in use then the user is given Busy tone. The dialled number or the dialled bin number will be displayed.

1.10 Uniform Numbering

When a call is made from a wireless terminal, or when a system feature is invoked from a wireless terminal, digits are parsed using the Routing Tables. Uniform numbering now applies for both wireline and wireless terminals.

1.11 Wireless Feature Interaction List

The following list provides a detailed summary of features and their compatibilities with supported wireless capabilities for Modular Plus. The following abbreviations are used throughout the table:

<blank>	Not supported in the product
N/A	This feature is not applicable to cordless handsets
N/S	This feature is not supported on cordless handsets. Any corresponding OAM Programming changes associated with this feature will not be recognized by the cordless handset. (Note that programming error messages are not presented indicating that the requested change is not supported.)
X	Supported feature (with any limitations noted.)

Feature	UK Norstar Plus	Comments
Accidental Disconnect Protection	N/A	
Answer Groups	N/S	
ATA Speakerphone	N/A	
Autodial Keys (max 24 digits)	N/A	
- Internal DSS Keys	N/A	
- External Autodialer Keys	N/A	
Automatic Line Selection	N/A	
Automatic Extension Relocation	N/A	
Auxiliary Ringing	X	
- through aux ringer port	X	
- through the paging port		
Background Music	N/S	
Busy Lamp Indication	X	
- add-on BLF for M7310	X	
- on M7324 DSS key lamps	X	
- on Line Pool key lamp for busy line pool	N/S	
Call Capture	X	
Call Charge Information	N/S	
Call Display When Busy	N/S	
Call Duration Timer	N/S	
Call Forward	X	
- All Calls	X	
- Busy	X	
- No Answer	X	
- Override	X	
Call Identification	X	
- Internal Calls	X	
- External (PSTN) Calls	X	
- Called Line Identification	X	
Call Inquiry	N/S	
Call Log	N/S	
Call Park	N/S	Call park retrieve supported only.
- with callback	N/A	
- with callback timer admin	N/A	
- prefix administrable (including = nil)	X	
- call park retrieve	X	
Call Pickup	N/S	
- Group	N/S	
- Directed	N/S	
- TAFAS	N/S	
Call Retention	N/S	
Camp on Call Waiting	N/S	
Central Answering Position feature	N/S	

Feature	UK Norstar Plus	Comments
- ECAP	N/S	
Class of Service	X	
- Local access: Dialling restrictions	X	
- Remote Access: Dialling restrictions	N/A	
- Remote Access: Feature access	N/A	
- Time of Day Dialling restrictions	X	
- change via DISA		
- change via COS password	X	
Conference	X	
- 3 party	X	
- 2 internal parties	X	
- 2 external parties (PSTN, AC15A)	X	
- 2 external parties (PSTN, PSTN)	X	
- consultation	X	
- force release a conference party	X	
- hold conference	N/A	
- split conference	X	
- transfer via conference	X	
- tone on conference	X	
Contrast Adjustment	N/A	
Delayed Ring Transfer to Prime	X	
Dial-Attendant Set	X	
- 5 sets administrable	X	
- administrable digit access	X	
- external network DN	X	
Dial External	X	
- Outgoing line identification	X	
- Terminating line identification	N/S	
Dial Intercom	X	
Dialling Transparency	X	
Dial Mode for lines - Pulse/Tone	X	
Dial Pad Feedback	X	Local set feature
Dial tone Detection	X	
- wait for dial tone	X	
Direct Station Select Keys	N/A	
DISA		
- Change COS by Password		
Discriminating Ringing at Extension (admin)	N/A	
Distinctive Ringing Cadence (internal, external)	X	
- administrable external cadence	X	
Do Not Disturb (no DND on Busy)	N/S	
Do Not Disturb (DND on Busy)	X	
Emergency Power Fail Transfer	N/A	
End-To-End Signalling	X	

Feature	UK Norstar Plus	Comments
- short tones internal	N/S	
- short tones external	X	
- long tones internal	N/S	
- long tones external	N/S	
- long tones on external paging port	N/S	
Enhanced Restrictions and Overrides	X	
- system speed dial restrictions override	X	
- dialing filters	X	
- alternate toll restrictions	X	
External Line Access	X	
External Speaker	N/S	
Feature Access Key	N/A	
Group Listening	N/A	
Handsfree	N/A	
- answerback	N/A	
- automatic	N/A	
- with mute capability	N/A	
Headset	X	For C3050 only
Hearing Aid Compatibility	N/A	
Hold	X	
- Automatic Hold	N/A	
- Automatic Exclusive Hold	X	
I-Hold/U-Hold/Mutual Hold	N/A	
- Exclusive Hold	N/A	
- Held Line Reminder	X	Far end only
Hot Line	N/S	
Hung Line Clearing	X	
Hunt Groups	X	
Incompatible Extension Detection	N/A	
Installer Password	N/A	
Intercom Key Assignment	X	
Key Inquiry	N/A	
Language Choice	N/S	
Last Number Redial	X	Local set feature
Line Key Relocation	N/A	
Line Pool BLF (outgoing)	N/A	
Line Pool(s)	X	
- designation by letter	X	
Line Profile	X	
Line Types	X	
- pool	X	
- public	X	
- private	X	
Listen on Hold	N/S	

Feature	UK Norstar Plus	Comments
Loss Plan	X	
- administrable Loss Plan for ATA	X	
- administrable loss plan for AC15A	X	
Manual Line Selection	N/A	
Messages	N/S	
- Send Message	N/S	
- Message Waiting/Reply	N/S	
Multiple Line Appearances	X	
On Hold Treatment (Music/Silence, Tones)	X	
On Hook Dialing	N/A	
- predial	N/A	
- standard dial	X	
- automatic dial	N/A	
Paging	N/S	
- internal multiple zones	N/S	
- external speaker	N/S	
PBX Reach Through	N/A	
- with feature code compression	N/A	
- with timed break recall	X	
- with earth recall	X	
- programmed release, pause, run/stop	X	Through routing table
- timed release	X	Through routing table
- programmed wait for dial tone	X	Through routing table
Periodic Ringing Attempts		
Periodic Pulse Metering (PPM)		
Pre-Selection/Call Screening	N/A	
Prime Line	X	
Prime Set(s)	X	
- call forward transfer to prime set	X	
- callback extension to prime	X	
- default ringing	X	
- delayed ring transfer	X	
- DND selective call forward	N/S	
- DND transfer to prime set	N/S	
- HLR extension to prime set	X	
- overflow call routing	X	
Priority Call	N/S	
Privacy on Lines	X	
Privacy Control	N/S	
- intrusion tone	X	
Private Lines	X	
Pulse to Tone Conversion	X	Local set feature
Release	X	
- with network call clearing reasons	N/S	

Feature	UK Norstar Plus	Comments
Remote Access DNs	X	
- DIA line DNs	X	
- DISA DN		
- auto DNs		
- change DIA line DN length	X	
Remote Access Features	N/A	
- page feature	N/A	
- dial DIA lines	N/A	
- line pool access	N/A	
Ring Again	N/S	
- On Busy Telephone	N/S	
- On Busy Line Pool	N/S	
- On No Answer	N/S	
Ringing Call	X	
- external call presentation on intercom keys	N/A	
- second call busy treatment on intercom keys	X	
Ringing Line Preference	X	
Saved Number Redial	N/S	
Selective Line Redirection	N/S	
- redirect to network DN	X	
- redirect to PSTN	X	
- redirect to private network	X	
- with busy route extend to prime set	X	
Service Modes	X	
- Night Service	X	
- Evening Service	X	
- Lunch Service	X	
- Service Mode Activation	X	
- Off	X	
- Manual	X	
- Automatic	X	
- Service Mode Control	X	
- Auto by System	X	
- Control Set	N/S	
- Extra Attendant Set	X	
- Service Mode Ringing Set	X	
- TAFAS	X	
Extension Names	X	
Extension Profile	N/S	
Show Time	N/S	
Extension Speed Dial	X	Local set feature
- facility designation	N/S	
System Speed Dial	X	Use uniform numbering plan
- facility designation	X	

Feature	UK Norstar Plus	Comments
- restriction override capability	X	
- naming outgoing digits	X	
State Advisories	N/A	
- Idle/Busy Line	N/A	
- Idle/Busy Set	N/A	
- Incompatible Extension Detection	N/A	
- Incompatible Line Cartridge		
- In Maintenance	N/A	
- In System Administration	N/A	
- In User Admin	N/A	
- Out of Service Port/DN	N/A	
DIA lines	X	
Time/Date Display	N/S	
- Background	N/S	
- User Invoked	N/S	
Transfer		
- Automatic Camp-On	N/S	
- Camp-On Callback		
- Immediate	X	
- With Announcement	X	
- with Callback	X	
- via Conference	X	
- via Hold	X	
- with recall on AC15A	X	
- network transfer (PSTN, AC15A)	X	
- network transfer (PSTN, PSTN)	X	
- with network no answer callback	X	
- with repeated call attempts option		
- on radio loss	X	
User Programmable Feature Keys	N/A	
Voice Call	N/S	
Voice Call Deny	N/S	
Volume Control	N/A	
Wait for Dial Tone	X	
Xfeature	X	Only for Star Talk 180.
Maintenance Features		
Alarms	N/S	
System Version(s)	N/A	
- Port/DN status	X	Base station ports only.
- Module Status	X	Base station ports only
- Diagnostics	X	Base station ports only
- Connectivity Test	N/A	
- Dial Tone/Line Presence Test	N/A	
History Files	X	

Feature	UK Norstar Plus	Comments
- Test Log	X	
- Admin Log	X	
- Network Log		
Link Quality	X	
Provisioning	X	
- Port	X	
- Loop	N/A	
TEI Status	N/A	