
Meridian 1

Option 11C Compact

Network Message Service Feature Guide

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About this guide

This guide is intended to supplement the Option 11C Compact Centralized Services marketing package. The Option 11C Compact in this configuration does not contain Meridian Mail and has all the requirements to support Centralized Meridian Mail by using Network Message Service (NMS). It also supports Call Pickup Network Wide, Network Calling Line Identification, Network Call Trace, Network Intercom, Network Ring Again and Trunk Optimization.

These features are listed in the Contents page (page i). Regular features offered with Option 11C Compact can be found in the *Features and Services guide* and the *1.5 PRI/DTI Administration and Maintenance Guide* provided with the Option 11C Compact system.

Note: This document is intended to support the Meridian 1 Option 11C Compact. When only the term “Meridian 1” is referenced, it is meant to include all members of the Meridian 1 family (Meridian 1 Option 11 through Option 81C). Similarly, when a Meridian 1 is depicted in an illustration, it is intended to signify a Meridian 1 Option 11 through Option 81C.

Feature Implementation

This chapter describes Network Message Service (NMS) features and how to implement each feature in software. Information about other features and services provided with the Option 11C Compact can be found in the documentation provided with the system.

Note: When only the term “Meridian 1” is referenced in this chapter, it is meant to include all members of the Meridian 1 family (Meridian 1 Option 11 through Option 81C). Similarly, when a Meridian 1 is depicted in an illustration, it is intended to signify a Meridian 1 Option 11 through Option 81C, including Option 11C Compact.

Call Pickup Network Wide

The Call Pickup Network Wide feature enables the following functionalities to be extended over a Meridian Customer Defined Network ISDN network:

- Ringing Number Pickup
- Directed Call Pickup by Group Number
- Directed Call Pickup by DN, and
- Display Call Pickup.

With the exception of Display Call Pickup, user operation of the above features remains unchanged. To display Call Pickup, press the Display key, followed by the Call Pickup key. Display Call Pickup is modified so that the Ringing Number Pickup (RNP) key winks for five seconds once a local or remote ringing DN is found and displayed. During this time, the user can press the RNP key to initiate a Call Pickup directed to the displayed DN.

With Call Pickup Network Wide, users must be assigned to the same Call Pickup group regardless of network location. Each Ringing Number Pickup Group may be linked to a Speed Call List (SCL) which is used when there is not an applicable local set to pick up. Different groups may be linked to different SCLs.

To be able to route calls through the network from one originating node to a destination node, an ISDN Private Integrated Services Network Exchange (PINX) DN is defined for each node in the network. The ISDN PINX DN is a DN taken from the customer's numbering plan used to aid with the routing of network calls. It does not correspond to a real terminal on the node, so can never be busy. Each SCL contains a list of PINX DNs which correspond to the remote nodes or customers to be searched. Thus, the purpose of the Speed Call List is to let the system know where to look in the network to pick up the call. If a pickup group is linked to a Speed Call List, this group is considered as being network wide.

The search is conducted in an ascending order as programmed in the Speed Call List (i.e., entry 0 first). This Speed Call list is used when there is not an applicable local set to pick up.

When a network search is performed, a slight delay occurs before a call is connected or rejected, during which time the set will receive silence. This delay is traffic dependent. If for any reason the call cannot be rerouted to the requesting party, the call will ring again at the originally dialed DN and the requesting party will receive overflow tone.

Operating parameters

A Speed Call List must be configured with the PINX DNs of the remote switch. The local PINX DN must be configured in the Customer Data Block (LD15).

If on one single node two calls are ringing at the same time, the call with the higher priority will be picked up. But if on two nodes two calls are ringing at the same time (one call on each node), the call on the node searched first will be picked up (i.e., a normal ringing call on the local node is picked up before a priority ringing set on a remote node).

Feature interactions

Access Restrictions

All access restrictions applicable to Network Alternate Route Selection (NARS)/Basic Alternate Route Selection (BARS) calls (including Class of Service, Network Class of Service, Trunk Barring (TBAR), and New Flexible Code Restriction (NFCR) restrictions based on digit manipulation) apply to a redirected call from the receiving node to the requesting node. This means that there are no limitations added to the access restriction checks for calls being redirected by the Call Pickup Network Wide feature.

If the call is blocked because of any of these access restrictions on either the receiving, tandeming, or requesting node, the originally called party is re-rung and the party attempting to pick up the call receives overflow tone.

Attendant-Extended Calls

The Call Pickup Network Wide feature can be used to pick up attendant-extended calls to a remote station.

Automatic Call Distribution (ACD)

The Call Pickup Network Wide feature cannot be used to pick up a call to an ACD DN. Calls to ACD DNs will be skipped and queue scanning will search for another ringing call.

A call to a non ACD DN on an ACD set can be picked up as a normal call. A call transferred by an ACD agent can be picked up as a call transferred by a normal set. In addition, it is possible to pick up as a normal call a call originated by an ACD set on a non ACD DN key.

Call Back Queuing

A call redirected by the Call Pickup Network Wide feature cannot be subject to Call Back Queuing.

Call Collision (Glare)

A call redirected by the Call Pickup Network Wide feature will be treated as for normal ISDN calls. A new trunk will be found if possible; otherwise, the requesting party will receive overflow tone.

Call Park

The Call Pickup Network Wide feature cannot be used to pick up parked calls. A recall of a parked call can be picked up, in which case the call is unparked and answered by the requesting party.

Called Party Name Display

Network Call Party Name Display information will be exchanged during Call Pickup Network Wide calls if the sets involved in the call would normally exchange the information for calls over the routes that have been used for the original call and the call pickup. Conversely, if Network Called Party Name Display would not operate for a normal call from the originating party to the terminating party, the service will not be supported when Call Pickup Network Wide is involved.

Name displayed on the requesting party

If a remote ringing station is picked up, the originating party's name is always displayed, independent of the requesting party's Class of Service.

Call Redirection

Network Call Redirection

Call redirection only has an interaction if the call being picked up has already been redirected. In this case, the original redirecting number will be passed on instead of the DN of the set from which the call is being picked up. The redirection reason displayed will remain as the previous displayed redirection reason if the Called Party Name Display is involved.

Call Transfer

Network Call Transfer

A call may be picked up before or after the transferring party has completed the transfer.

For pickup before transfer completion, the transferring party is displayed updated information by the Call Pickup Network Wide feature when the call is picked up. Then, when the transfer is completed, normal call transfer information is exchanged by each party involved in the final call.

For pickup after call transfer completion, everything happens as if the call had been made directly from calling to ringing party. After pickup is performed, displays are updated as for normal Call Pickup.

Call Waiting

Call Waiting calls cannot be picked up.

Call Waiting Redirection

A call that is redirected by the Call Waiting Redirection feature to the active set's Call Forward No Answer DN may be picked up.

Conference

Call Pickup Network Wide may be used to pickup an enquiry call from a conference, subject to the same limitations as apply to Call Transfer.

Data Calls

The Call Pickup Network Wide feature cannot be used to pick up data calls.

Dial Intercom

The Dial Intercom feature is not supported network wide. Any pickup attempt from a distant node to a local intercom call will be rejected, because the far-end user is considered as not being in the same intercom group.

Group Call

The Group Call feature does not allow having a remote party in a Group Call list. Therefore, a Group Call cannot be picked up by a remote station. If during the network scanning a Group Call is found, it will be ignored and the network scanning will continue.

Network HOT Type D Intercom

It is not possible to pick up a HOT type I call; however, it is possible to pick up a HOT type D call.

Network Routing Restrictions**NARS Anti-Tromboning**

At the receiving node where the set is ringing, NARS Anti-Tromboning does not apply to a call being redirected by the Call Pickup Network Wide feature.

Night DN

The Call Pickup Network Wide feature can be used to pick up a call to the night number if it is ringing an ordinary station (i.e., analog (500/2500 type) telephone, 16-button Dual-tone Multifrequency, or proprietary set).

Off-Hook Queuing

A call redirected by the Call Pickup Network Wide feature cannot be the subject of Off-Hook Queuing.

Path Optimization

Trunk Route Optimization Before Answer

The Call Pickup Network Wide feature does not support Trunk Route Optimization Before Answer.

Secondary DN

For calls to, from, or picked up from a secondary DN, all line IDs displayed after a successful pickup will follow the current rules for Calling Line ID and Connected Number. The exception is for Display Call Pickup; if the call is ringing at a secondary DN, the line ID on the requesting user's display will be the ringing DN (that is, the secondary DN). Once the pickup is completed, the displays will be as for normal pickup.

Vacant Number Routing

The Call Pickup Network Wide feature fully supports Vacant Number Routing (VNR) if the route or the set of routes given by the customer for VNR contains at least one MCDN link.

Feature packaging

The Call Pickup Network Wide feature is included in Integrated Services Digital Network (ISDN) package 145.

The following packages must also be provisioned to activate this feature:

- Directed Call Pickup (DCP) package 115
- Advanced ISDN Network Services (NTWK) package 148, and
- 1.5 Mbps PRA package 146

Feature implementation

LD 10 – Assign a Ringing Pickup Group number to an analog (500/2500 type) telephone, and define with the Class of Service which of the Call Pickup features are allowed to be activated from this station.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	500	Telephone type.
TN	c u	Terminal Number.
...		
RNPG	(0)-4095	<p>Ringing Number Pickup Group (RNPG). If the RNPG is set to 0 (the default) on a station, it is not possible to pick up any call ringing this station from any other set. Enter 0 to remove a station from the RNPG.</p> <p>Note: If the RPNG is two or more digits in length, it must be configured in the Customer Data Block (LD 15), so that it may use the Group Pickup key. See the procedure which follows LD 11.</p>
...		
CLS	(PUD), PUA	Ringing Number Pickup (denied) allowed.
	(DPUD), DPUA	DN pickup (denied) allowed.
	(GPUD), GPU A	Group pickup (denied) allowed.

LD 11 – Assign a pickup group to a Meridian 1 proprietary telephone. Define with the Class of Service which of the Call Pickup features are allowed to be activated from this station.

The configuring of different pickup keys is optional, since the Call Pickup and Directed Call Pickup features can be activated by dialing the SPRE + xx or by dialing a Flexible Feature Code. The Digit Display key is needed for the Display Call Pickup feature.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	aaaa	Telephone type, where: aaaa = SL1, 2006, 2008, 2009, 2016, 2018, 2112, 2216, 2317, 2616, and 3000.
TN	c u	Terminal Number.
...		
RNPG	(0)-4095	Ringing Number Pickup Group (RNPG). If the RNPG is set to 0 (the default) on a station, it is not possible to pick up any call ringing this station from any other set. Enter 0 to remove a station from the RNPG. Note: If the RPNG is two or more digits in length, it must be configured in the Customer Data Block (LD 15), so that it may use the Group Pickup key. See the procedure which follows.
...		
CLS	(PUD), PUA	Ringing Number Pickup (denied) allowed.
	(DPUD), DPUA	DN pickup (denied) allowed.
	(GPUD), GPU A	Group pickup (denied) allowed.
...		
KEY	xx RNP yyyy	Key number, Ringing Number Pickup, Pickup Group number (optional). If the Group number is not entered, the key will pick up calls in the group assigned to the station. If the Group number is entered, the key will pick up calls in the specified group yyyy.
KEY	xx GPU	Key number, Group Number Pickup.
KEY	xx DPU	Key number, DN Pickup.
...		
KEY	xx DSP	Key number, Digit Display.

LD 15 - If the customer's Ringing Number Pickup Group is two or more digits in length (as configured in LD10/11, in response to the RNPG prompt), it must be configured in the Customer Data Block (in response to the PKND prompt); otherwise the Group Pickup key cannot be used by the group.

Prompt	Response	Comment
REQ:	CHG	Change existing data block
TYPE:	FTR_DATA	Customer Features and options
CUST	0-31	Customer number
- OPT	aaa	Options
- DGRP	(0)-2046	Maximum number of Dial Intercom Groups
- IRNG	(NO) YES	Intercom Ring
- PKND	(1)-4	Number of digits Dialed for Group Pickup
...		

LD 57 – Define the Flexible Feature Codes (FFCs) used to activate Call Pickup and Directed Call Pickup from a an analog (500/2500 type) telephone. The FFCs may also be used on Meridian 1 proprietary telephone sets.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	FFC	Flexible Feature Code.
CUST	0-31	Customer number.
...		
CODE	mmmm	Specific FFC type.
- PURN	xxxx	Pickup Ringing Number code.
- PUGR	xxxx	Pickup Group code.
- PUDN	xxxx	Pickup DN code.

LD 18 – Configure a Speed Call List. This Speed Call List will be used by a Ringing Number Pickup Group (RNPG) or a set of RNPGs as a search list to scan the MCDN network.

The Speed Call List entries should contain digits which can be used to route a network Call Pickup request to a remote node (e.g., mainly the ISDN PINX DNs of the remote nodes which will be scanned after a network Call Pickup request). There must be no gaps in the Speed Call List (i.e., each Speed Call List entry should be present).

Due to the time it takes to scan the remote node, it is strongly recommended to configure less than six entries in the Speed Call List.

Prompt	Response	Description
REQ	NEW, CHG, OUT	New, change, or remove.
TYPE	SCL	Speed Call List.
LSNO	0-8190	Speed Call List number
...		
DNSZ	4-(16)-31	Maximum size of DNs allowed for Speed Call list.
SIZE	1-1000	Maximum number of DNs allowed in Speed Call list. Note: The size cannot be greater than the value entered against the STOR prompt below.
...		
STOR	000-319 xxxx	Speed Call List entry number and digits (PINX DN) stored against it. Note: The STOR entry cannot be blank.

LD 18 – On a per customer basis, define the Ringing Number Pickup Groups that are network wide by linking them to one of the previous defined Speed Call Lists. Different RNPGs may be linked to different Speed Call Lists.

Prompt	Response	Description
REQ	NEW, CHG, OUT	New, change, or remove.
TYPE	CPNW	Call Pickup Network Wide data.
CUST	0-31	Customer number.
LSNO	0-8190	A Speed Call List associated with Call Pickup network wide groups.
- GRP	0-4095 X0-4095	Ringing Number Pickup Group (RNPG) using this Speed Call List. Repeat for all groups sharing the same list. Enter <CR> to reprompt LSNO. Enter X to remove an RNPG.

LD 17 – Define the software Release ID at the far end of the D-Channel.

Prompt	Response	Description
REQ	CHG	Change I/O device.
TYPE	ADAN	Action Device And Number.
...		
- RLS	21	Release ID of the switch at the far end of the D-channel.
...		

LD 15 – Define the customer’s Private Integrated Network Identifier (PNI) and Private Integrated Services Network Exchange (PINX) DN.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	NET	Networking data.
CUST	0-31	Customer number.
...		
ISDN	YES	Allow ISDN for this customer.
- PNI	1-32700	Define the Private Network Identifier.
- PINX_DN	xx...x	Node DN, up to seven digits with DN Expansion package 150.
	X	Enter X to remove.

LD 15 – Define the special prefix code (SPRE) to be able to activate the Call Pickup features by dialing SPRE + xx.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	FTR	Customer Features and options
CUST	0-31	Customer number.
...		
- SPRE	xxxx	Special Prefix number for this customer.
...		

LD 16 – Configure the PNI on the route. This PNI must correspond to the one configured in LD 15 on the target (remote) node.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	RDB	Route data block.
ROUT	0-511	Route number.
...		
ISDN	YES	ISDN is allowed on this route.
- PNI	1-32700	Define the Private Network Identifier.

Feature operation

Display Call Pickup

This feature is only supported on Meridian Digital Telephones (with the exception of the M2317, and M3000).

- 1 Press the DSP key.
 - The DSP key is lit.
- 2 Press the RNP key.
 - The RNP key is flashing.
- 3 The display will show: Hbbbb1 Haaaa2

Where 1 = The DN of the originating party if it is local or available from CLID. If no CLID is available for a remote, originating party, either the route access code and the route member number are displayed if the ringing set is local, or dashes (“----”) are displayed if the ringing set is remote. This is because the route access code of a route has no meaning on the requesting node. The “H” is displayed if the DN can be determined and it is located on another node.

Where 2 = The DN of the originally called (ringing) party. The “H” is displayed if the DN is located on another node than the requesting party.

- The RNP key is winking for five seconds.

- 4 Press the DN key.
 - The DN key is lit.
- 5 Press the RNP key. If the RNP key is pressed during the five seconds it is winking, Directed Call Pickup by DN is attempted. If the RNP key is dark when pressed, normal Ringing Number Pickup treatment takes place.
 - The RNP key is flashing.
- 6 You are connected to the call.
 - The RNP key becomes dark.
 - For sets with display the following is shown:
"Name"1
Hcccc2 Hbbbb3 "P"4

Where 1 = Either the originating party's name or the originally called party's name is displayed depending on the requesting party's Class of Service.

Where 2 = The DN of the originating party if it is local or available from CLID. If no CLID is available for a remote, originating party, either the route access code and the route member number are displayed if the ringing set is local, or dashes ("----") are displayed if the ringing set is remote. This is because the route access code of a route has no meaning on the requesting node. The "H" is displayed if the DN can be determined and it is located on another node.

Where 3 = The DN of the originally called party. The "H" is displayed if the DN is located on another node than that of the requesting party.

Where 4 = The string defined in LD 95 for Call Pickup. The default is "P"

Ringling Number Pickup

To answer a call in your Call Pickup group from a Meridian Digital Telephone:

- 1 Lift the handset, or press a DN key.
 - The DN key is lit (if pressed).

- 2 Press the RNP key or dial SPRE + 3 or dial PURN FFC.
 - The RNP key is flashing.
- 3 You are connected to the call.
 - The RNP key becomes dark.
 - For sets with display, refer to step 3 under “Display Call Pickup”.

To answer a call in your Call Pickup group from an analog (500/2500 type) telephone:

- 1 Lift the handset.
- 2 Dial SPRE + 3 or PURN FFC.
- 3 You are connected to the call.

Directed Call Pickup by Group Number (Group Pickup)

To answer a call in another Call Pickup group from a Meridian Digital Telephone:

- 1 Lift the handset, or press a DN key.
 - The DN key is lit.
- 2 Press the GPU key or dial SPRE + 94 or dial PUGR FFC.
 - The GPU key is lit (if pressed).
- 3 Dial the pickup group number.
 - Once the group number is dialed completely, the GPU key is flashing to indicate that a search or scan is in progress.
- 4 You are connected to the call.
 - The GPU key becomes dark.
 - For sets with display, refer to Step 3 under “Display Call Pickup”.

To answer a call in another Call Pickup group from an analog (500/2500 type) telephone:

- 1 Lift the handset.
- 2 Dial SPRE + 94 or PUGR FFC.
- 3 Dial the pickup group number.
- 4 You are connected to the call.

Directed Call Pickup by Directory Number (DN Pickup)

To answer a call on a specified DN from a Meridian Digital Telephone:

- 1 Lift the handset, or press a DN key.
 - The DN key is lit.
- 2 Press the DPU key or dial SPRE + 95 or dial PUDN FFC.
 - The DPU key is lit (if pressed).
- 3 Dial the extension number.
 - Once the group number is dialed completely, the DPU key is flashing to indicate that a search or scan is in progress.
- 4 You are connected to the call.
 - The DPU key becomes dark.
 - For sets with display, refer to Step 3 under “Display Call Pickup”.

To answer a call on a specified DN from an analog (500/2500 type) telephone:

- 1 Lift the handset.
 - 2 Dial SPRE + 95 or PUDN FFC.
 - 3 Dial the extension number.
- You are connected to the call.

Network Call Identification

Refer to the *Calling Line Identification* feature in the *1.5 DTI/PRI Administration and Maintenance Guide* provided with the Option 11C Compact system.

Network Call Trace

Network Call Trace is available to trace a network call and to diagnose network problems. When a network call is blocked, trace data is output indicating the reason the call was blocked and the software procedure responsible.

A network call can be traced by dialing a SPRE code and the NCT feature code (9912) before the network number. When this is done, call set-up and status information is output to the system terminal as the call tandems through the network. The trace information is output to all the system terminals designated in LD 17 as ADAN = TTY and USER = MTC.

NCT provides useful information such as the following:

- the route used
- the facility accessed
- the routing control imposed
- the call-blocked location

There are two Network Call Trace functions: 01 and 02. They output different information as shown in the following sections.

Enhanced Trace command output

A time stamp is added to the call trace output. This time stamp appears on the first line of the output.

The TN or digital trunk prints out only when there has been a change to the call register. The TN or trunk is printed only once.

Sample time stamp output which will appear on the first line:

```
.14:00:02 12/25/1992
```

Configuring Network Call Trace

To configure Network Call Trace on the Meridian 1, log in to the system and do the following:

- enter CLTA in response to prompt CLS in LD 10 or LD 11 to allow a telephone to trace calls

Tracing a call

A call can be traced from any attendant console or a telephone with CLTA class of service (CLS). To trace a call dial the following:

SPRE + 9912 + xx + yyy...

where

SPRE = special function access code (defined in LD 15)

9912 = NCT feature code

xx = call trace function (01, 02)

Dial tone is provided after “xx” is dialed.

yyy... = digits normally dialed for the network call

Trace function 01

This function provides the common information related to ESN routing. It is the recommended function. The following is the call trace data for function 01:

```
**** NCT xx ****
<switch specific data>
--- OUT ---
<outgoing data>
--- IN ---
<incoming data>
--- STATE ---
<call state>
```

Where xx is the call trace ID for a traced call. The output data depends on the type of call and can be the following:

CAUSE xxxx—call reject cause

CREF xxxx—call reference number

DCH—D-channel number

DGT xxxxx...—outgoing: digits outpulsed

DGT xxxxx...—state: digits received (NODE=TBD), or

digits dialed when the call is rejected (STAT=REJ)
DN xxx—DN of ringing set
ENT xx—entry in the outgoing route list
FCI x—free calling area index
FRL x—facility restriction level
IFC xxx—outgoing D-channel interface (LD 17 prompt IFC)
 D100 = Meridian DMS-100
 D250 = Meridian DMS-250
 ESS4 = AT&T ESS4
 ESS5 = AT&T ESS5
 SL1 = Meridian SL-1
 S100 = Meridian SL-100
 SS12 = Norwegian SYS-12
 AXEA = AXE-10 (Australia)
 UNKN = unknown data received
LOC xxxx—call reject software location
MODE xxx—outgoing termination
 ALOG = analog trunk
 DTI = digital trunk interface–1.5 Mb/s
 DTI2 = digital trunk interface–2.0 Mb/s
 PRI = Primary Rate Interface
 UNKN = unknown data received
NCOS xx—Network class of service
NODE xxxx—type of node
 ORIG = originating node
 TAND = intermediate node (tandem)
 TERM = terminating node
 TBD = node undetermined
RLI xxx—ESN outgoing route list index
RLS xx xx—software release, issue number of node switch
RTE xxx—incoming or outgoing route number
SID xxxx—system identification (LD 17)
STAT xxxx—call state, where xxxx can be

ANS = call answered
BUSY = termination busy
DIAL = call state is dialing (mainpm)
ERR = error detected in this message
OPULSE = digit outputting
PROC = call proceeding through this node (tandem)
REJ = call rejected or blocked
REOR = call state is dialing (mainpm)
RING = call ringing
SEIZ = trunk seized

STYP xx—terminating station type
500 = single line telephone (LD 10)
BCS = multi-line telephone (LD 11)
ATT = attendant console (LD 12)
TKTP TIE,COT,WAT...—incoming or outgoing trunk type
TKTN loop ch, l s c u—incoming or outgoing B-channel
TN l s c u
TN of originating telephone
TOD x—time of day schedule
TYP I,E —Initial/Extended set
XLT NPA,NXX,LOC...—ESN translation type

Example 1: Successful call with trace function 01

In this example, the following digits are dialed from a telephone at TN 0 0 5 1.

1+9912++01+78+6000

where,

1 = SPRE (defined in LD 15)
9912 = NCT feature code
01 = call trace function 01
78 = PRI route access code (ACOD)
6000 = remote extension

The resulting trace information is output on the maintenance terminal:

```
**** NCT # 22 ****  
NODE ORIG (SL1)  
SID 0  
RLS 17 53  
--- OUT ---  
TNS 0 0 5 1  
DCH 5  
IFC SL1  
CREF 22  
MODE PRI  
RTE 24  
TKTP TIE  
TKTN 18 22  
DGT 6000  
--- STATE ---  
STAT PROC
```

```
**** NCT # 22 ****  
NODE ORIG (SL1)  
SID 0  
RLS 17 53  
--- OUT ---  
DCH 5  
RTE 24  
TKTP TIE  
TKTN 18 22  
DGT 6000  
--- STATE ---  
STYP BCS  
DN 6000  
STAT RING
```

Example 2: Unsuccessful call with trace function 01

In this example, the same call is made as in example 1, but in this case the D-channel is down.

The resulting trace information is output on the maintenance terminal:

```
**** NCT # 22 ****  
NODE ORIG (SL1)  
SID 0  
RLS 17 53  
--- OUT ---  
TNS 0 0 5 1  
MODE UNKN  
--- STATE ---  
DGT 786000  
STAT REJ  
LOC 99
```

Trace function 02

Call trace function 02 provides the information from the active (main) call register, the incoming call state, and the outgoing call state (if any). Trace function 02 is intended as a debugging tool for system designers.

The information output by function 02 includes the following:

```
NODE ORIG,TAND,TERM,TBD  
SID xxxx—system identifier  
RLS xx xx—release of software, issue number of node  
TNS l s c u—TN of the originating set  
CREF xxxx—call reference number
```

Incoming call:

```
ISTATPM x—incoming state progress mark  
ITRKPM x—incoming trunk progress mark  
LOC xxxx—call reject software location
```

Outgoing call:

```
OSTATPM x—outgoing state progress mark  
OTRKPM x—outgoing trunk progress mark  
LOC xxxx—call reject software location
```

Main call register:

- Word 0—MainPM/AuxPM
- Word 1—CRlink
- Word 2—Queue_In
- Word 3,4—Son_Types/Processes
- Word 5—Aux_CRlink
- Word 6—OrigType/TerType
- Word 7—TTR_TN
- Word 8—OrigTN
- Word 9—TerTN
- Word 10—CallFwdTN
- Word 11—DISA_Call/XFER_indication
- Word 12,13—CR_Dialed_DN
- Word 14—Digitload/Digitunload
- Word 15-20—digits

Feature requirements

Network Call Trace is limited to basic ISDN PRI calls across Meridian 1 private networks.

NCT collects information only during initial call setup. It does not report on further call modification, such as Call Transfer.

Network call information is lost and the call trace ceases when any of the Meridian 1 nodes in which the call is being traced is initialized or any of the D-channels fails.

Although NCT requires PRI, calls can be traced to nodes that do not support Network Call Trace. Calls can also be traced to DTI or analog trunks. However, only the local node information is provided. These are the trunk types that are not supported: ADM, AWU, DIC, MDM, MUS, PAG, RAN, RLM, and RLR.

Call trace information is still output if the call is blocked before the trunk is seized. If queuing (Ring Again, CBQ or OHQ) is available, then the original call trace function is activated when the call is offered to the user.

When a remote Meridian 1 without NCT capability receives a Call Trace message, no call trace information is returned.

Network Intercom (Hot Type D and Hot Type I Enhancements)

Hot Line enables a designated telephone to place calls to a predetermined destination that may be internal or external to the Meridian 1. The call does not require attendant intervention. When the handset is lifted, or when a preprogrammed key is activated, the system speed calls a preprogrammed DN. Hot Lines access a set of Terminal Numbers programmed by direct entry using LD 11, or by list entry such as System Speed Call (SCC) using LD 18. Once a Hot Line call enters the ringing state, it is the same as a normal call.

Hot Type D provides the ability for Meridian Digital Telephones to have two-way calls on specially designated keys (not on the DN keys) with other Meridian Digital Telephone sets connected to Meridian 1 PBXs across a Meridian Customer Defined Network (MCDN) Integrated Services Digital Network (ISDN). A Hot Type D call can now terminate in three different modes: Voice, Ringing, and Non-ringing. With the Voice mode, speech path is automatically connected after a short ring. With Ringing and Non-ringing modes, the call must be manually answered by the called party; the difference between the two modes is that for Non-ringing no audible tone is given (the Hot Line key flashes to indicate the call).

Hot Type I

An option is available with Hot Type I to provide a No Answer Indication informing the called party that a Hot Line call was made during the called party's absence. If an Hot Line call cannot be completed on the Hot Line key, the calling party is informed via the set's display, and the call is completed over the network as a normally dialed call that attempts to terminate on the destination Prime DN.

Hot Type D Enhancement

Hot Type D allows more than one set having the same target DN defined for the Hot Type D key. This enhancement includes Voice, Ringing, and Non-ringing termination modes, and the capability to leave a No Answer Indication in some situations (i.e., the Hot Line key winks). A call terminating on an enhanced Hot Type D key operates the same as if terminating on a Hot Type I key, if the originating DN is the same as the target DN defined for the key. If it is not the same, but another Hot Line key exists on the set that has a target DN that matches the originating DN, a No Answer Indication is left on that key.

Operating parameters

Hot Type I calls are not allowed on analog (500/2500 type) telephones.

Hot Line keys cannot be defined for M3000 sets.

A Hot Line key should not be defined on a station without a Prime DN and likewise should not be defined on the primary key. If this is not done, the improved functionality will not work and the call is treated as a non-Hot Line call.

The network DN for Hot Type I and the No Answer Indication component of Hot Type D must be either a Coordinated Dialing Plan or a Universal Dialing Plan number that must terminate on a Prime DN of a Meridian Digital Telephone set; otherwise, the call is competed as a non-Hot Line call.

The network-wide application of Hot Type I is only applicable to nodes in a Primary Rate Interface (PRI), Virtual Network Services (VNS), and Basic Rate Interface network. The originating and terminating nodes of the Network Intercom (Hot Type D and Hot Type I Enhancements) feature must be Meridian 1 switches. Tandem nodes in the private network must be Meridian 1 or another MCDN node able to transfer Remote Operations Service Element (ROSE) facilities.

Hot Line keys must be defined with the same dialing plan.

The Hot Type D enhancements can also function across R2MFC trunks provided that the calling party's DN is provided.

Feature interactions

Attendant Blocking of DN

A Hot Type I key cannot be blocked by the attendant, because it has no DN.

Pressing a Hot Type D key that is attendant blocked establishes the call on the source side of the attendant.

Automatic Call Distribution (ACD)

Hot Type I calls cannot terminate on an ACD DN. A call attempting to terminate on an ACD DN receives overflow tone. Hot Line calls involving ACD sets must use the Hot Type D option.

Busy Forward Status (BFS)

In a Secretarial filtering scenario, the secretary's BFS lamp also will reflect that the boss' set is busy if the boss is on a Hot Type I call.

Call Forward

Hot Type I calls respect or override all kinds of Call Forward features (Busy, No Answer, All Calls, Internal, etc.) according to per-set definitions. If Call Forward is respected, the call becomes a normally dialed call and the originator will receive the appropriate indication on their display.

Call Join

Hot Type I calls can be moved to the Conference key with the Call Join feature.

Call Park

Hot Type I calls cannot be parked.

Call Party Name Display

Hot Type I calls display names the same as a normal call.

Hot Type I calls that become a normal call indicate on the originating station's display that the call is no longer a Hot Line call.

Call Pickup

Hot Type I calls cannot be picked up. An attempt to pick up a Hot Type I call results in an overflow tone.

Call Transfer

Hot Type I calls may be transferred to another Hot Line key or to a normal DN key; likewise calls on a normal DN key may be transferred to a Hot Line key.

Display Key

Hot Type I calls are supported by the Display key feature; pressing the Display key and then the Hot Type I key will show the target DN on the originating station's display.

Do Not Disturb (DND)

Hot Type I calls ignore the Do Not Disturb feature. Hot Line calls are presented to the defined target, even when DND is activated.

Last Number Redial

A Hot Line key cannot be redialed using the Last Number Redial feature.

Make Set Busy

Hot Type I calls terminating on a station in the Make Set Busy mode override Make Set Busy.

Multiple Appearance Redirection Prime (MARP)

If more than one set is allocated the same prime DN, the Hot Type I call will terminate on the set designated as the Multiple Appearance Redirection Prime (MARP). If the MARP DN is not the prime DN on the set, or if the set designated as the MARP DN is not a Meridian Digital Telephone set, the first Meridian Digital Telephone set with the prime DN will be used. If none of these conditions are met, the call will terminate as a non-Hot Line call and the calling party will be notified on the display.

Hot Type D calls can have voice termination only on a MARP Terminal Number (TN), or if there is no MARP TN, then on the first TN in the TN list. A No Answer Indication for Hot Type D can only be left on the MARP TN, or if there is no MARP TN, then on the first TN in the TN list.

Override

An internal Hot Type I call never returns busy, unless the call became a non-Hot Line call due to the Hot Line key being busy. In this case, the call behaves like a normally dialed call, and override can be used upon receipt of a busy signal.

Ring Again

Hot Line calls terminating on a busy key become normal calls. Hence, they may use the Ring Again feature under normal circumstances.

Ring Again – No Answer

If Ring Again No Answer is activated for a Hot Type I call, it is activated as if the call had been dialed normally.

Vacant Number Routing

Hot Types I keys and enhanced Hot Type D keys support vacant number routing.

Feature packaging

The Network Intercom (Hot Type D and Hot Type I Enhancements) feature is included in Enhanced Hot Line (HOT) package 70.

For Hot Type I in an ISDN network the following packages are required:

- Advanced ISDN Network Services (NTWK) package 148
- Integrated Services Digital Network (ISDN) package 145
- and at least one of 1.5 Mbps Primary Rate Interface (PRA) package 146 and Virtual Network Services (VNS) package 183.

Feature implementation**LD 11** – Define Hot Type D and I keys and Classes of Service as follows:

Prompt	Response	Description
REQ	NEW, CHG, OUT	Configure, change or remove.
TYPE	aaaa	Telephone type where aaaa cannot = M3000.
TN	c u	Terminal Number for the Option 11.
...		
CLS	FICA (FICD) NAIA (NAID)	Forward Hot Type I allowed. Forward Hot Type I denied. No Answer indication allowed. No Answer indication denied.
...		
KEY	nn HOT D dd target_num hot_dn R/V/N/(H)	Two-way Hot Line Key. dd = number of digits dialed. target_number = terminating DN (31 digits maximum). Hot_dn = two-way Hot Line DN. Termination mode: R = Ringing V = Voice N = Non-ringing, and H = Hot Line (the default).
KEY	nn HOT I dd target_number (V)/N/R	Hot Line key. dd = number of digits dialed. target_number = terminating DN (31 digits maximum). Termination mode: V = Voice (the default) N = Non-ringing, and R = Ringing.

LD 95 – Configure the Calling Party Name Display:

Prompt	Response	Description
REQ	NEW, CHG	Configure or change.
TYPE	CPND	Calling Party Name Display.
CUST	0-31	Customer Number.
...		
NITC	aaaa (NI)	Non-Hot Line call. Indicates that the Hot Line call terminated as a normal call.

Feature operation

Press the Hot Type I or D key to initiate an Hot Line call to a target DN (the DN may be an external DN in an MCDN ISDN network).

The called party answers the call by pressing their Hot Type I or D key if configured. If the called party has no Hot Type I or D key configured, the call will behave as a normal call and is answered accordingly.

If the called party does not answer, and has No Answer Indication Allowed Class of Service, the Hot Type I or Hot Type D key will be winking as a form of No Answer Indication.

Network Message Services - Meridian Mail

Network Message Services - Meridian Mail allows a single Meridian Mail system to serve multiple network sites. Network Message Services offers network users complete call coverage regardless of their location in the customer's ISDN network. Users at any location in the network may access the Meridian Mail system as easily as if it were at their own location.

Option 11 systems can use this feature, but only as an originating remote site or a tandem node. The Option 11 cannot be the location that actually possesses the Meridian Mail hardware.

Access to Meridian Mail features is unchanged, regardless of whether Meridian Mail is being accessed by a user at the same location as Meridian Mail or by a user at a different location from the Meridian Mail system.

For example, with Network Message Services, an unanswered call to a user is forwarded across the ISDN network to Meridian Mail, which plays the user's mailbox greeting and takes the message. Meridian Mail then directs the Meridian 1/SL-1 serving the user to check the status of the user's message waiting light and turn the light on if necessary. Message waiting indication for users of 500/2500 sets is supported as well. The user accesses Meridian Mail and retrieves messages as usual.

Meridian Mail uses its unique link with the Meridian 1/SL-1 to match calling and called number information to user mailbox information as appropriate. Customers can centralize administration of Meridian Mail resources while still offering voice messaging to users throughout the network. Network Message Services enables customers to offer voice messaging to smaller network locations that might not be able to justify the purchase of a dedicated Meridian Mail system. All users have complete feature functionality, including message waiting indication and personal verification across the network.

Network Message Services complements other Meridian Mail options such as Meridian Mail networking by allowing customers maximum flexibility in providing voice messaging services to network users. Furthermore, shared and dedicated Meridian Mail systems can be linked via Meridian Mail networking, providing complete voice messaging access for all users on the network.

Network Message Services extends the value of ISDN Primary Rate Interface and ISDN Signalling Link networks by allowing shared access to Meridian Mail resources. The resources are used more efficiently and additional services are offered to network users.

Note: Password Suppression is not supported across a Meridian 1 network.

Package Requirements

Meridian 1/SL-1 requirements for NMS-Meridian Mail vary slightly, depending on whether the Meridian 1/SL-1 originates calls to the Meridian Mail location, terminates calls to the Meridian Mail location, or simply serves as a tandem node in the network, passing information between “originating nodes” and “terminating nodes”.

The Option 11C Compact can only be used as a “terminating node”. “Terminating” node requirements are as follows:

- ISDN Primary Rate Access or ISDN Signalling Link (Option 145/146) and associated prerequisites.
- Advanced ISDN features (Option 148)
- Network Message Services (Option 175)
- End-to-end signalling (Option 10)

Meridian Mail prerequisites:

- Auxiliary Processor Link (Option 109)
- IVMS Link (option 35)
- Meridian Mail Link (Options 77, 85)
- Basic ACD Features (Options 40, 45, 83)
- Message Center (Option 46)

Meridian Mail must be equipped with Release 7 software and the Network Message Services software option package. The Meridian Mail system should also be engineered to support the total number of users expected to be served throughout the network.

Network Message Services - Message Center

Network Message Services - Message Center extends the Message Center function to permit remote locations in a customer's network to be served by a single message center. Software messages are transported among Meridian 1/SL-1 PBXs via ISDN Primary Rate Interface or ISDN Signaling Link.

A caller to a station on one Meridian 1/SL-1 can leave a message with a Message Center located on another Meridian 1/SL-1 in the network. All existing Message Center types — message attendant, sets, and ACD sets — are supported.

Network Message Services - Message Center was developed to be transparent to end-users. Callers to a busy or unanswered station using sets without displays will not be aware that their call is being answered by a message center at another PBX location. The message center sends an indication of a message waiting to the user's station using the same mechanisms as are in place today (such as indication lamp or LCD key lamp). Users can call and retrieve their messages by simply pressing the Message Waiting Key on their telephone sets.

Package Requirements

Network Message Services requires the following:

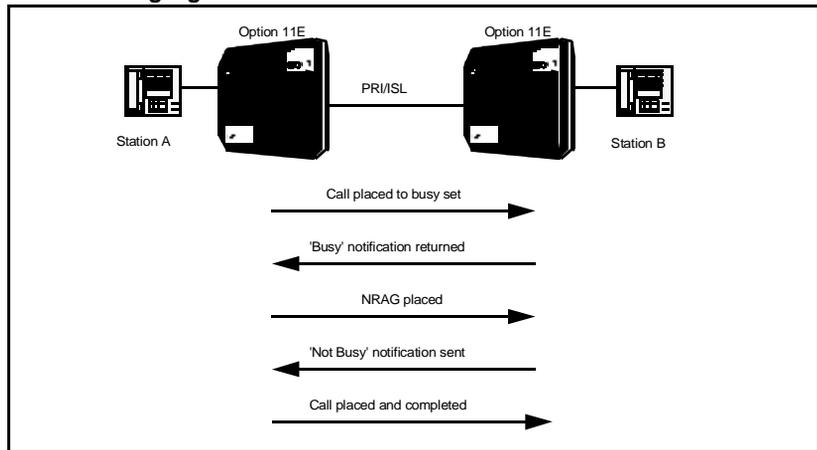
ISDN	option 145
PRI	option 146
NMS	option 175
NTWK	option 148

Note: If an ACD type Message Center is to be used, ACDA package #45 is required. The combination of packages # 46 (MWC), #40 (BACD), # 45 (ACDB) and # 42 (ACDC) provides ACD features and reports for the ACD type Message Center.

Network Ring Again

Network Ring Again operates on stations called over the ISDN PRI network. The Network Ring Again feature allows a caller on station “A” encountering a busy signal at station “B” to be notified when the busy station “B” becomes available. This feature works on calls placed anywhere in the ISDN network. When user “A” accepts the “not busy” recall, a normal call setup is then placed to destination “B” without user “A” re-dialing the called number. Figure 1 illustrates this situation.

Figure 1
Network Ring Again



Network Ring Again (NRAG) can be originated by a station in the Make Set Busy mode, and is also allowed to be activated against a station in the Make Set Busy Mode.

Network Ring Again is supported in UDP and CDP networks. Network Ring Again is only supported if the originating set sends for CLID.

Please note that NRAG does not operate on redirected calls. NRAG requires that every switch in the network be equipped with either NARS or CDP software.

Package Requirements

The package requirements are as follows:

ISDN	option 145
PRI	option 145
Advanced Features (NTWK)	option 148

Trunk Optimization (Meridian-1 to Meridian-1 only)

Trunk Optimization provides better utilization of customer networking facilities. The Trunk Optimization feature allows the Meridian 1/SL-1 to optimize trunks for redirected calls before answer. Trunk Optimization works with Call Forward All Calls, Call Forward No Answer, Hunting, and Busy Conditions, and avoids unnecessary use of additional channels or trunks.

Trunk Optimization does not apply to DID calls or calls originated by a non-ISDN TIE trunk.

An example of Trunk Optimization is shown in Figure 2. If a call is placed from originating station A to a remote station B over route 1, and the call is forwarded to station C over route 3, the system can reconnect calls on the most economical route available. In this case, the call is physically directed over route 2, allowing routes 1 and 3 to be used for additional calls.

It is important to point out the mechanism used to achieve trunk optimization:

- The redirecting node will send a message to the originating node informing it of the redirection number and the redirection reason.
- If the originating node supports trunk optimization and has a first route choice member available to the destination PBX, it will send a message back accepting Trunk Optimization.

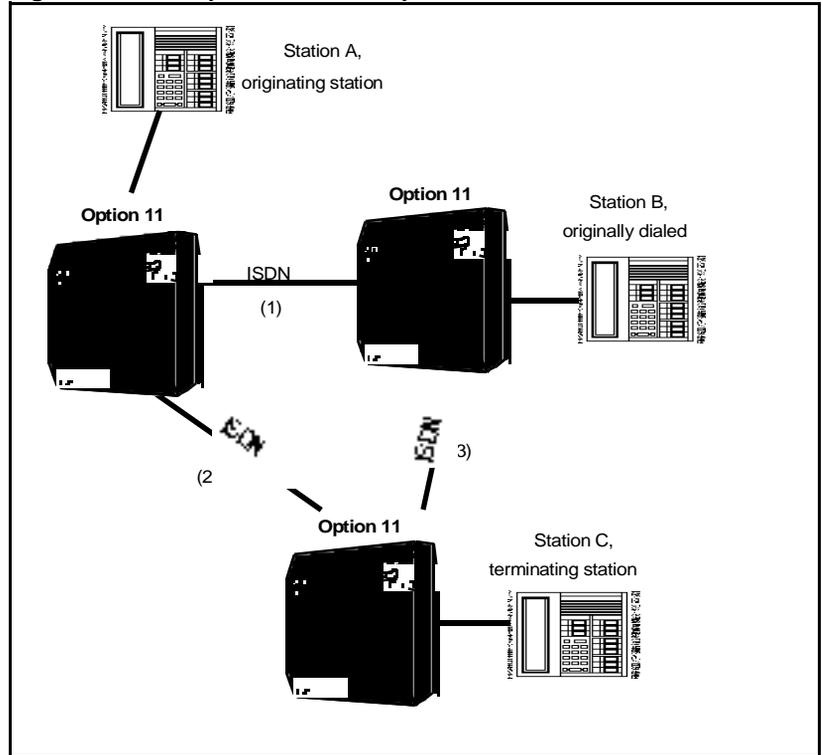
Note: First choice member is part of ESN route list entries in overlay 86.

- The redirecting node will send a message to release the connection.
- The originating node will confirm the disconnect and will establish a new non-redirectioned connection to the redirectioned number.

This process may repeat itself for every redirection hop that a call takes. The number of hops is software programmable.

If the originating node does not support Trunk Optimization, the call will then proceed without optimization on the current route. Trunk Optimization is programmable on a route basis using prompt TRO.

Figure 2- Trunk Optimization example



Note: TRO does not apply to DID calls or calls originated by a non-ISDN TIE trunk. TRO is transparent to users for NCRD.

If the users have alpha-numeric display telephone sets:

- the “calling party” will see:
 - the number originally dialed,
 - the number connected to, and
 - the reason for redirection

- the “called party” will see:
 - the originating number,
 - the originally called number, and
 - the reason for redirection

Package Requirements

The Trunk Optimization feature requires the following software options:

ISDN	option 145
NTWK	option 148
PRI	option 146

Meridian 1

Option 11C Compact

Network Message Service Feature Guide

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