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Meridian SuperNode

Meridian SL-100

Meridian Modular Telephones Reference Manual

MSL11 Standard 10.02 November 1999

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The SL-100 system is certified by the Canadian Standards Association (CSA) with the Nationally Recognized Testing Laboratory (NRTL).

This equipment is capable of providing users with access to interstate providers of operator services through the use of equal access codes. Modifications by aggregators to alter these capabilities is a violation of the Telephone Operator Consumer Service Improvement Act of 1990 and Part 68 of the FCC Rules. This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

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This information was originally published prior to October 19, 1998. The foregoing legend applies retroactively in accordance with the U.S. Year 2000 Information and Readiness Act and on an ongoing basis

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August 1993

Version 02.01, BCS35. This version adds the Multiple Appearance Directory Number (MADN) Ring Forward feature as a station feature available to Meridian Modular Telephones. The version also adds the following information since the previous issue of this publication:

- NT8X49AC controller card
- Intelligent peripheral equipment
- NT keyboard dialing

September 1990

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Contents

About this document	xvii
When to use this document	xvii
How to check the version and issue of this document	xvii
References in this document	xvii
What precautionary messages mean	xviii
How commands, parameters, and responses are represented	xix
Input prompt (>)	xix
Commands and fixed parameters	xix
Variables	xix
Responses	xx
Introduction	1-1
Installation procedures	2-1
Unpacking or packing a modular telephone	2-1
Meridian modular telephone installation	2-1
Data terminal installation	2-3
Installing the Meridian Modular 2616 (M2616CT) cordless telephone	2-5
Meridian SL-100 (MSL-100) system administrator	2-6
Troubleshooting	2-6
Power failure	2-6
Vibrator signal alerter (optional)	2-7
Preparing and installing the MCA	2-8
Identifying the model number and date code	2-8
MCA hardware	2-9
Installing the analog terminal adapter (ATA)	2-11
Identifying the model number and date code	2-12
ATA hardware	2-13
Remove the power supply board (if installed)	2-14
Remove the external alerter interface board (if installed)	2-14
Jumper board installation	2-15
Replace the telephone base	2-15
MSL-100 system administration	2-16
Self-test and diagnostics	2-17
Installing or replacing the power supply	2-18
Installing and replacing the display option	2-23
Installing and replacing the external alerter	2-32
Installing or replacing the key expansion modules	2-34
Wall mount instructions	2-37
Self-test	2-37

Troubleshooting 2-39
 Troubleshooting MCA 2-41
Cross-connections 2-46

General description **3-1**

Voice 3-1
Data 3-1
Physical characteristics 3-2
M2006 3-4
M2008 3-5
M2008HF 3-6
M2016S 3-8
M2016S modular telephone keys and indicators 3-9
M2616 3-9
M2216ACD 3-11
M2216-2 3-11
MCA 3-13
 Diagnostics 3-13
 Download requests 3-13
 Escape sequence 3-14
 MCA responses 3-14
 Call disconnection 3-14
 Echo 3-15
 Keyboard dialing 3-15
 AT dialing 3-15
 Extended AT command dialing 3-15
 Parameter registers (S registers) 3-15
 Learn script file 3-15
Peripheral equipment 3-16
 Digital line module 3-16
 Intelligent peripheral equipment 3-16
 External alerter interface 3-17
Optional peripherals 3-17
 Display module 3-18
 Name Display Character Extension 3-20
 24 character name display for a basic call 3-22
 Key expansion module 3-22
 Brandline insert 3-23
 Power supply option 3-23
Table control 3-24
Call processing 3-24
Facilities maintenance 3-25
Restrictions and limitations 3-25

Performance specifications **4-1**

Environmental and safety considerations 4-1
 Temperature and humidity 4-1
 Electromagnetic interference 4-1
Line engineering 4-1
Alerting tone characteristics 4-2
Power requirements 4-4

Voice	4-4
Data	4-5
Power supply board	4-5
64k MCA +5V power boards	4-5
Local plug-in transformer	4-5
Closet power supply	4-7
MCA data characteristics	4-8

Basic set operation **5-1**

Hardware options	5-2
Display module	5-2
Name Display Character Extension	5-2
Key expansion module	5-2
Meridian communications adapter	5-3
Feature or line indicators	5-3
Fixed keys	5-4
Primary directory number	5-4
Volume control	5-4
Hold key	5-5
Release key	5-5
Handsfree (M2616, M2616CT and M2008HF)	5-5
Program key	5-7
00 Volume Control	5-8
01 Predial Recall	5-9
02 Contrast Adjustment	5-9
03 Call Timer Enable	5-10
04 Idle Screen Format	5-10
05 Language Select	5-11
07 Display Diagnostics	5-12
09 Key Click	5-12
On-hook dialing	5-13
Microphone muting (M2616, M2616CT and M2008HF)	5-14
Message Waiting lamp key	5-14
Data calls	5-14
Automatic Call Distribution (M2216)	5-16
ACD headset interface	5-17
Supervisor and agent positions	5-18
Supervisor position	5-18
Agent position	5-23
ACD set login/logout	5-27

Meridian SL-100 features **6-1**

General	6-1
Authorization Code	6-3
Automatic Answer Back (AAB)	6-4
Automatic Answer Back (AAB) Enhancement	6-4
Provisioning	6-4
Feature activation and deactivation	6-5
Feature verification	6-5
Limitations and restrictions	6-5
Automatic Dial	6-6

- Automatic Line 6-7
- Call Forward 6-8
- Call Park 6-9
- Call Pickup 6-10
- Call Transfer/3-Way Calling 6-12
- Call Waiting 6-13
- Conference 6-14
- Executive Busy Override 6-15
- Group Intercom 6-16
- Last Number Redial 6-17
- Make Set Busy 6-17
- Malicious Call Hold 6-18
- Message Waiting 6-19
- Multiple Appearance Directory Number Ring Forward 6-20
- Multiple Station Message Waiting Indication 6-21
 - MSMWI feature applications 6-23
- Privacy Release 6-23
- Ring Again 6-24
- Speed Call 6-25
- Trunk Member Display 6-27
- Line Music On Hold 6-27
 - Operation with the complete LMOH functionality 6-28
 - Example of feature assignment and operation 6-29
- Music On Transfer (MOT) 6-30
 - Agent support 6-30
 - Provisioning 6-31
 - CUSTSTN 6-31
 - AUDIO 6-31
 - Feature activation 6-31
 - Feature setup/feature eligibility 6-32
 - Limitations and restrictions for MOT 6-32
 - Feature interactions 6-32
 - Data schema 6-34

Keypad dialing

7-1

- M0200 display 7-1
 - Idle state 7-2
 - Setting the time and date 7-2
 - Setting the contrast 7-3
 - Setting the volume 7-3
- Programming from the keypad 7-4
- Manual Data Call (P#) 7-8
- Release Data Call (P*) 7-9
- Language Selection (P05) 7-9
- Asynchronous/Synchronous (P20, 21) 7-10
- Baud rates (P22) 7-10
- Parity assignment (P23, P24, P25, P26) 7-11
- Host or terminal mode (P28, P27) 7-11
- Hotline activation and deactivation (P30, P29) 7-12
- Virtual Leased Line activation and deactivation (P32, P31) 7-12
- Forced data terminal ready activation and deactivation (P34, P33) 7-13

Dynamic Carrier Detect activation and deactivation (P36, P35)	7-14
Remote loopback activation and deactivation (P38, P37)	7-14
Ring Again feature cancellation (P39)	7-15
Full duplex/half duplex (P40,P41)	7-15
Modem mode (P42)	7-16
Network mode (P43)	7-16
Internal clock/external clock (P44, P45)	7-16
PSDS on/off (synchronous) (P46, P47)	7-17
Enable/disable echo canceller (synchronous) (P48, P49)	7-17
SL-1 mode	7-17
SL-1/DMS-100 mode	7-17
V.25 bis mode (P54, P55, P56, P57)	7-18
RTS ON/OFF (P58, P59)	7-18
Autodial programming activation (P60, P61)	7-19
Display parameters activation (P62)	7-19
Data parameter display (P62 continued)	7-20
Status display (P63)	7-21
Incoming calls during programming mode (P64)	7-21
Incoming voice call	7-21
Incoming data call	7-22
Incoming data call during active voice call	7-22
Incoming data call while making a manual data call	7-22
Reset data parameters (P65)	7-22
Emulation selection (P66)	7-22
Locking data parameters (P67)	7-23
Voice Directory Number assignment (P68)	7-24

Nortel keyboard dialing

8-1

Database considerations	8-1
Operational guidelines	8-2
Initialization	8-3
Implementing the P66 command	8-3
MCA operational modes	8-5
Autobaud and autoparity	8-5
Terminal parameters	8-6
Nortel KBD menus	8-7
Main menu	8-7
Modify menu	8-7
User input characteristics	8-8
Message prompt characteristics	8-8
Nortel KBD dialing procedures	8-9
Manual dialing	8-9
Data speed call activation	8-10
Autodial call activation	8-11
Data call disconnection	8-12
Calling sequence	8-13
Local calls	8-13
Automated modem pool calls	8-14
Ring Again	8-14
Modify	8-15
Autodial number	8-15

- Speed call number 8-16
- Manual answer 8-17
- Remote loopback 8-18
- Script file 8-19
- Incoming calls 8-28
 - Manual answer 8-28
 - Auto answer 8-30

Hayes keyboard dialing **9-1**

- Initialization 9-1
 - Autobaud and autoparity 9-2
 - Implementing the P66 command 9-3
- S registers 9-5
 - Register S0—ring to answer ON 9-6
 - Register S1—ring count 9-6
 - Register S2—escape sequence character 9-6
 - Register S3—carriage return character 9-6
 - Register S4—line feed character 9-6
 - Register S5—backspace character 9-6
 - Register S7—wait time for carrier 9-6
 - Register S12—escape sequence guard time 9-6
 - Register S36—baud rate adapting 9-7
 - Register S51—delay until modem pool activation 9-7
 - Register S52 through S54—product code response 9-7
 - Register S66—Hayes/keyboard dialing autobaud interpretation 9-7
- Hayes keyboard dialing command syntax 9-7
 - User input characteristics 9-8
 - Hayes AT commands 9-10
- Result codes and message prompts 9-10
- Keyboard feature operation 9-11
 - Dialing modifiers 9-11
 - Establishing a Hayes keyboard call 9-12
 - Incomplete Hayes keyboard call 9-12
 - Auto answer 9-13
 - Manual answer 9-13
 - Incoming calls 9-14
 - Call disconnection 9-14

Testing and maintenance **10-1**

- Key/LCD indicator tests 10-1
- Volume adjustment tests 10-6
- MCA self test 10-8
 - XLANAME 10-9
 - IBNXLA 10-10
- Trouble locating procedures 10-11
- Automatic set relocation 10-14
 - ASR process 10-15
 - ASR audit 10-18

Service orders **11-1**

- Available line class codes 11-1
- Available ring types 11-2

Service order commands	11-2
Adding a Meridian modular telephone set	11-2
Establishing a directory number hunt group	11-4
Establishing a multiline hunt group	11-6
Adding a member to a hunt group	11-8
Assigning the Multiple Station Message Waiting Indication feature to an existing set	11-9
Adding the Handsfree feature to an M2008HF telephone set	11-10
Adding the Trunk Member Display (TRKDISP) feature	11-11
Adding the NAME option for Name Display Character Extension	11-12
Removing a feature from a telephone set	11-14
Adding CFB with Control field of "K" to a M2616 set	11-14

Ordering information	12-1
-----------------------------	-------------

Appendix A Hayes standard AT commands	13-1
--	-------------

Appendix B AT dialing parameter registers	14-1
--	-------------

Appendix C Basic AT command sets	15-1
---	-------------

Basic AT command sets for data calls	15-1
Basic AT command sets for voice calls	15-2

Appendix D MCA digit and word code responses	16-1
---	-------------

Appendix E Script file menus	17-1
-------------------------------------	-------------

List of terms	18-1
----------------------	-------------

Figures

View of jacks and tabs at base of telephone	2-2
Data terminal and MCA power supply connections	2-4
Identifying the model number and date code	2-8
Identifying the model number and date code	2-13
Placement of display cable on NT2K displays and NTZK phones	2-25
Display cable routing for NT2K28XX displays	2-28
Installing an NT2K in an NT2K M2008 or M2008HF set	2-31
Local plug-in transformer configuration	2-34
Meridian modular telephone connections	2-40
MCA troubleshooting flowchart	2-43
Meridian modular telephone cross-connections	2-46
M2006 modular telephone	3-5
M2008 modular telephone	3-6
M2008HF modular telephone	3-7
M2616 modular telephone	3-10
M2616 modular telephone	3-12
Back of telephone set showing the MCA	3-13
15 character name display for a basic call	3-21
M2616 with display and key lamp module	3-23
Block diagram of MCA and Meridian modular telephones	4-2
Local plug-in transformer configuration	4-6

- Local plug-in +5V transformer configuration 4-7
- Feature or line indicators 5-3
- Example of supervisor telephone set 5-19
- Display queue status format 5-22
- Example of agent telephone set 5-24
- LMOH feature assignment 6-29
- CUSTSTN datafills 6-29
- AUDIO datafills 6-30
- MCA flashing LED 8-3
- Main menu 8-7
- Modify menu 8-8
- MCA flashing LED 9-2
- Main menu 17-1
- Modify menu 17-2
- Script file menu 17-2
- Learn script menu 17-3

Tables

- Required MCA hardware 2-9
- Required ATA hardware 2-13
- Example of adding the ATA line class code for system configuration in SERVORD 2-16
- Miscellaneous troubleshooting tips 2-44
- LCD indicator states 3-3
- Meridian modular telephone programmable and fixed keys 3-3
- Features and options matrix 3-17
- Meridian telephones and corresponding MAP displays 3-25
- Temperature and humidity specifications 4-1
- M2006 and M2008 tone frequency combinations 4-3
- M2016S, M2216, and M2616 tone frequency combinations 4-3
- Power requirements 4-4
- MCA data characteristics 4-8
- Handsfree feature prompts 5-7
- Meridian modular telephone station features 6-1
- Valid terminals for MSMWI feature 6-22
- Data parameter display 7-20
- Database considerations 8-2
- Emulation selections 8-4
- Example script file 8-27
- P66 command screens 9-4
- Result codes 9-10
- Dial modifiers 9-11
- XLANAME datafill 10-10
- IBNXLA datafill 10-11
- Example service order commands to add an IVD station 11-2
- Example service order commands for establishing a DNH group 11-4
- Example service order commands for establishing a multiline hunt group 11-6
- Adding a member to a hunt group 11-8
- Assigning MSMWI to an existing set 11-9
- Adding the handsfree feature to an M2008HF set 11-10
- Adding the Trunk Member Display feature 11-11

Adding the NAME option allowing 15 characters	11-12
Adding the NAME24 option allowing 24 characters	11-13
Sample service order commands for removing a feature	11-14
Sample service order commands for CFB with the control field of "K" being added to a M2616 set	11-15
Meridian modular telephones	12-1
Meridian modular telephone accessories	12-2
M2616CT accessories	12-2
Supported accessories for manufacture discontinued products	12-3
Meridian modular telephone stocklist	12-4
Meridian modular telephone accessories and miscellaneous optional hardware stocklist	12-7
Standard Hayes keyboard dialing commands	13-1
Hayes keyboard dialing parameter registers	14-1
AT command sets for data calls	15-1
AT command sets for voice calls	15-2
Digit- and word-code responses	16-1

About this document

When to use this document

This publication provides information on the Meridian modular telephones and associated options. The Meridian modular telephone series contains the following telephone sets: M2006, M2008, M2008HF, M2016S, M2216, M2616, and the M2616CT.

These telephone sets and their options are introduced to the Meridian SuperNode (MSL-100) central control (CC) in the areas of table control, call processing, call progress indication, and facilities maintenance.

How to check the version and issue of this document

The version and issue of the document are indicated by numbers, for example, 01.01.

The first two digits indicate the version. The version number increases each time the document is updated to support a new software release. For example, the first release of a document is 01.01. In the *next* software release cycle, the first release of the same document is 02.01.

The second two digits indicate the issue. The issue number increases each time the document is revised but rereleased in the *same* software release cycle. For example, the second release of a document in the same software release cycle is 01.02.

To determine which version of this document applies to the software in your office and how documentation for your product is organized, check the release information in *Product Documentation Directory*, 297-8991-001.

This document is written for all DMS-100 Family offices. More than one version of this document may exist. To determine whether you have the latest version of this document and how documentation for your product is organized, check the release information in *Product Documentation Directory*, 297-8991-001.

References in this document

<Load Content Record (LCR)>is referred to in this document.

The following documents are referred to in this document:

- 297-1001-594, *Lines Maintenance Guide*
- 297-1001-822, *Commands Reference Manual*
- *Service Order Reference Manual*
- *Commercial Systems Customer Data Schema*

What precautionary messages mean

The types of precautionary messages used in NT documents include attention boxes and danger, warning, and caution messages.

An attention box identifies information that is necessary for the proper performance of a procedure or task or the correct interpretation of information or data. Danger, warning, and caution messages indicate possible risks.

Examples of the precautionary messages follow.

ATTENTION Information needed to perform a task

ATTENTION

If the unused DS-3 ports are not deprovisioned before a DS-1/VT Mapper is installed, the DS-1 traffic will not be carried through the DS-1/VT Mapper, even though the DS-1/VT Mapper is properly provisioned.

DANGER Possibility of personal injury



DANGER

Risk of electrocution

Do not open the front panel of the inverter unless fuses F1, F2, and F3 have been removed. The inverter contains high-voltage lines. Until the fuses are removed, the high-voltage lines are active, and you risk being electrocuted.

WARNING Possibility of equipment damage



WARNING

Damage to the backplane connector pins

Align the card before seating it, to avoid bending the backplane connector pins. Use light thumb pressure to align the card with the connectors. Next, use the levers on the card to seat the card into the connectors.

CAUTION Possibility of service interruption or degradation



CAUTION

Possible loss of service

Before continuing, confirm that you are removing the card from the inactive unit of the peripheral module. Subscriber service will be lost if you remove a card from the active unit.

How commands, parameters, and responses are represented

Commands, parameters, and responses in this document conform to the following conventions.

Input prompt (>)

An input prompt (>) indicates that the information that follows is a command:

>BSY

Commands and fixed parameters

Commands and fixed parameters that are entered at a MAP terminal are shown in uppercase letters:

>BSY CTRL

Variables

Variables are shown in lowercase letters:

>BSY CTRL ctrl_no

The letters or numbers that the variable represents must be entered. Each variable is explained in a list that follows the command string.

Responses

Responses correspond to the MAP display and are shown in a different type:

```
FP 3 Busy CTRL 0: Command request has been submitted.
```

```
FP 3 Busy CTRL 0: Command passed.
```

The following excerpt from a procedure shows the command syntax used in this document:

- 1 Manually busy the CTRL on the inactive plane by typing

```
>BSY CTRL ctrl_no
```

and pressing the Enter key.

where

ctrl_no is the number of the CTRL (0 or 1)

Example of a MAP response:

```
FP 3 Busy CTRL 0: Command request has been submitted.
```

```
FP 3 Busy CTRL 0: Command passed.
```

Introduction

The Meridian modular telephone (MMT) line of Nortel Networks products encompasses seven telephone sets, an integrated data module (the Meridian Communication Adapter (MCA)), a 22 key add-on option, a display module option, and three different types of external power options.

The Integrated Voice and Data (IVD) service provides simultaneous voice and data communications at speeds up to 19.2 Kbyte/s (asynchronous) and 64 kbit/s (synchronous) over a single twisted-pair subscriber loop.

This publication describes the following IVD telephones:

- M2006—a single line telephone with five programmable feature keys and a primary directory number (PDN) key
- M2008—a multiline telephone with seven programmable feature keys and a PDN key
- M2008HF—a multiline digital telephone with the same features, functionality, and attributes as the M2008 set, plus the addition of a built-in 2-way speakerphone. On the M2008HF, key 7 functions as the Handsfree/Mute key.
- M2016S—a telephone security group (TSG) class 2 type accepted digital telephone that provides the on-hook security required for certain government contractor applications
- M2216—a multiline IVD digital set for ACD with 15 feature keys and a PDN key, a factory-installed display module, and two RJ-32 jacks for modular electret headsets. (The M2216 has the same features as the M2216-1 set. The M2216-1 and M2216-2 have been manufacture discontinued.)

- M2616—a high performance multiline telephone with 15 programmable feature keys and a PDN key and an integrated handsfree unit
- M2616CT—a multiline 900Mhz cordless telephone with 14 programmable feature keys on the base and six keys on the handset which map to the six bottom programmable keys on the base. A primary directory number (PDN) key, program key and handsfree key are standard on the set.

The Meridian modular telephone is one of three different supported versions. First sets have ordering codes beginning with NTZK. Models developed from 1995 to 1997 have ordering codes beginning with NT2K. The latest version begins with NT9K. These sets provide a new analog terminal adapter (ATA) and MCA powering scheme. You can determine the version of your set easily by looking at the first four letters in the upper left-hand corner of the model identification label on the bottom of the set. In addition, the two jacks face in the same direction on the NT2K and NT9K sets, but face opposite directions on the NTZK sets.

There are some hardware differences between the three versions. When appropriate, the differences are noted in this document.

Installation procedures

Unpacking or packing a modular telephone

Use proper care while unpacking Meridian modular telephones. Check for damaged containers so that appropriate claims can be made to the transport company for items damaged in transit.

If a telephone must be returned to the factory, ensure that the telephone is packed in the appropriate container to avoid damage during transit. Remember to include all loose parts in the shipment, such as cords, the handset, the power unit, labels, and lenses.

Meridian modular telephone installation

The step-by-step routine in Procedure 2-1 details the installation procedures for any Meridian modular (M2000 series) telephone.

Procedure 2-1 Installing a Meridian modular telephone

- 1 Place telephone upside down on several sheets of soft, clean paper on a solid, level work surface to prevent damage to movable keys and telephone face plate.
- 2 Connect the handset cord 4-conductor TELADAPT connectors to the handset and to the telephone.

Response:

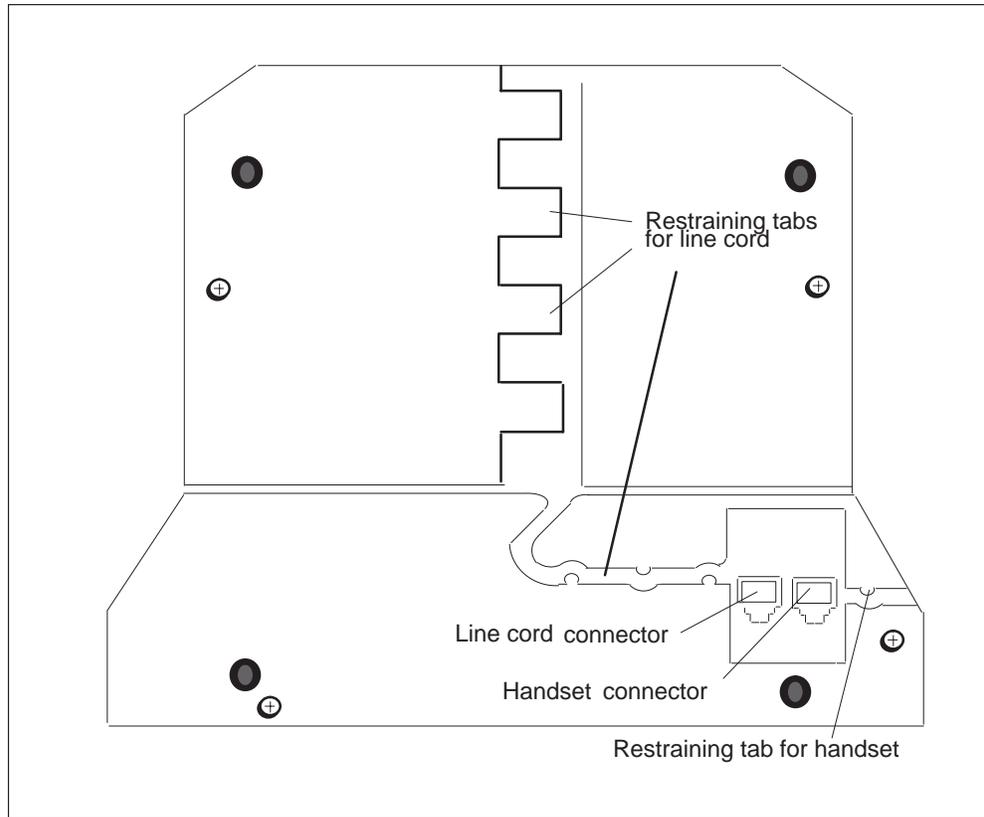
The TELADAPT connectors have a latch-tab to ensure correct alignment and prevent the cord from being pulled out inadvertently during service.

- 3 Ensure that this latch-tab is firmly snapped in place.
- 4 After connecting the handset cord to the connector in the base of the telephone, turn the smooth side of the handset cord up (away from telephone base) before tucking it under the restraining tab.

Response:

This ensures that the telephone sits level on the desk after installation is complete. See Figure 2-1.

Figure 2-1
View of jacks and tabs at base of telephone



5

If	Do
you are installing the the M2006, an older model M2008, M2008HF or newer model M2008 with display, or an M2616	Steps 6 through 9 and Steps 15 through 23

6 Connect the 2-conductor line cord to telephone base. See Figure 2-1.

7 Tuck the line cord under the seven restraining tabs.

Response:

This allows the telephone to sit level on the desk.

8 Insert line cord into wall jack.

Response:

The TELADAPT connectors have a latch-tab, which ensures correct alignment and prevents the cord from being pulled out inadvertently during service.

9 Ensure that this latch-tab is firmly snapped into place.

10

If you are installing

an older model M2008 with display,
M2616, M2016S, or M2216ACD,
any set with Meridian
Communications Adapter (MCA) or
external power

Do

Steps 11 through 23

11 Connect the 2-conductor line cord to the telephone base.

See Figure 2-1.

12 Tuck the line cord under the seven restraining tabs.

This allows the telephone to sit level on the desk.

13 Insert the line cord into connecting block.

The TELADAPT connectors have a latch-tab, which ensures correct alignment and prevents the cord from being pulled out inadvertently during service.

14 Ensure that this latch-tab is firmly snapped into place.

15 If the unit is so equipped, plug an electrical cord into the external power supply.

16 Turn telephone right side up, and place in the final position.

17 Print the directory number on designation card.

18 Remove the number lens by inserting the end of a paper clip into the hole at the middle of the lens and levering upwards.

19 Insert designation card.

20 Snap lens with card back in place.

21 Designate button labels for key designations.

22 Fold labels, insert inside plastic button cover, and snap button cover over the movable key, pressing down on key, as required.

23 Repeat Steps 21 and 22 for all keys.

24 You have completed this procedure.

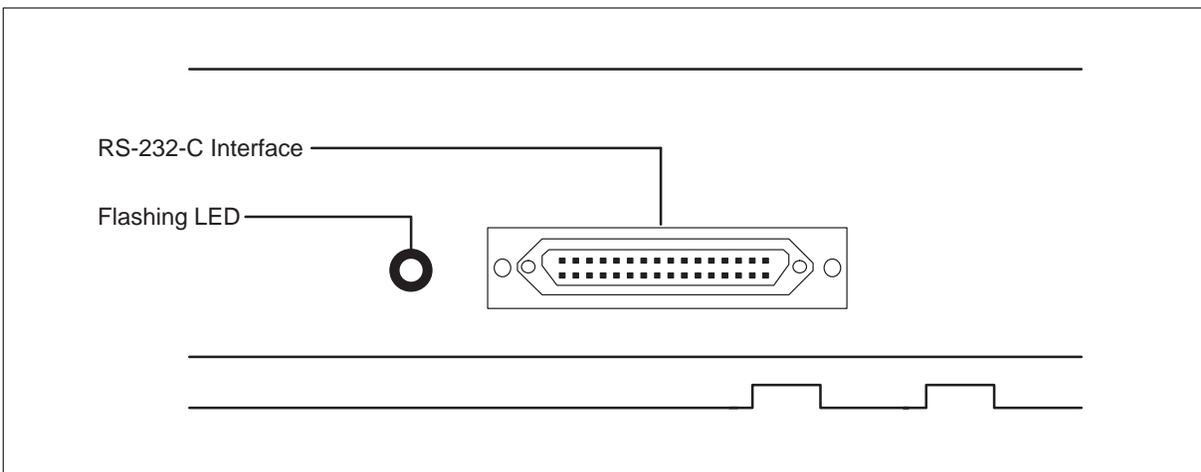
Data terminal installation

To connect a data terminal to the Meridian modular telephone, perform the steps in Procedure 2-2.

Procedure 2-2
Installing the data terminal

- 1 Connect the RS-232-C interface connector from the data terminal to the matching header connector in the back of the Meridian modular telephone. (See Figure 2-2.)
- 2 Insert the two captive screws in the connector body into the threaded holes in the header connector, and secure tightly to prevent accidental disconnection during data terminal operation.
- 3 Plug the power supply/converter connector securely into the power jack that is to the right of the RS-232-C connector.
- 4 Plug the power supply/transformer into the nearest ac outlet.
- 5 You have successfully completed this procedure.

Figure 2-2
Data terminal and MCA power supply connections



Installing the Meridian Modular 2616 (M2616CT) cordless telephone

The following procedures describe the Meridian Modular M2616 cordless telephone installation procedures.



WARNING

Risk of personal danger

The M2616CT should not be installed in an outside plant environment. The M2616CT has exposed contacts at the base of the set which allow foreign voltage and/or lightning to travel to the telephone line cord. Before installing the M2616CT set, read the Important Information section in the M2616CT User Guide.

Procedure 2-3 describes how to install the M2616CT.

Procedure 2-3 Installing the M2616CT

- 1 Complete the wiring and cross-connections (loop power) before connecting the telephone to the connecting block.
- 2 Place the telephone upside down on a padded level work surface to prevent damage to the telephone face.
- 3 Connect the line cord into the bottom of the telephone base. Route the cord through the channels.
- 4 Plug the AC adapter (Class 2 power supply) output DIN connector into the bottom of the M2616CT set next to the line cord connection. Route the cord through the channels.
- 5 Turn the telephone right side up and place it in the normal operating position.
- 6 Insert the line cord TELEADAPT connector into the connecting block and snap it into place.
- 7 Print the features available on the handset label supplied. Insert the handset label and snap the handset lens onto the handset.
- 8 Place the portable handset in the cradle on the base.
- 9 Plug the AC adapter (Class 2 power supply) input into the commercial 110V electrical main outlet.
- 10 Print the directory number on the designation card. Using a paper clip, remove the number lens from the telephone. Insert the designation card and snap the lens back into place.

- 11 Designate the feature keys.
- 12 Install the battery for the handset. Place the handset battery so it engages with the contact points at the base of the handset, and snap battery into place.
- 13 Install the battery for the base. Slide the spare battery (optional purchase) into the spare battery compartment (located at the top of the handset cradle) with contact points first. The battery makes contact in one direction only.

Charge the battery. The handset battery and the spare battery are charged by the base unit. Two battery status lights are located on the base unit.

- The handset battery indicator light is located above the Hold key. Red indicates the battery is charging. Green indicates the battery is fully charged.
- The spare battery indicator light is located on top of the spare battery charger port. The light is either yellow or off. Yellow indicates a spare battery is in the charge port.

Meridian SL-100 (MSL-100) system administrator

A new line class code (LCC) called M2616CT is available in software release MSL08. Follow the table to datafill the set:

Prompt	Response	Description
SO	NEW	Establish service for unassigned telephone lines.
SONUMBER (date)	\$	Use \$ to assign telephone now, otherwise enter date and time when telephone is assigned.
DN	NXX nnnn	Enter DN number to be assigned.
LCC	M2616CT	M2616CT line class code

Note: Refer to Service Order Reference Manual (555-4031-808) for complete information needed to configure Ringtype, Group, Subgroup, NCOS, SNPA, Key, and Ringing for example, for the M2616CT.

Troubleshooting

Power failure

- If the AC adapter (Class 2 power supply) fails, the optional spare battery in the spare battery charger powers the handset.

- The phone base continues to function in the handsfree mode even in the AC adapter fails and the spare battery is discharged or not available.

Vibrator signal alerter (optional)

You must purchase a special vibrating battery in order to use this feature. Contact your local Nortel distributor for part number.

Telephone field installation

The M2616CT range limit is approximately 150 feet. This depends on the building structure and environment in the area in which you are located. The set can accommodate up to 20 users in the 150 foot range. There are 20 900Mhz channels available to handle the traffic. If more than 20 customers are allocated within the 150ft. radius they could receive interference.

If there are any other foreign traffic that uses the 20 900Mhz channels, there is a mechanism provided to the installer to allocate individual 900Mhz channels to prevent interference.

- 1 Assign any Meridian 1 (M-1) or MSI-100 feature to Key 14 on M-1 (Key 15 on MSL-100 switch).
- 2 On the telephone, press the locator key (Key 14 on the M-1 switch, Key 15 on the MSL-100 switch).

This allows the installer to manually configure the 900Mhz channel to the telephone set. Under normal conditions the set defaults to AUTO. The telephone scans all channels to find an available channel for the customer to use.
- 3 Use the volume bar to change the setting from AUTO to CH19 through CH00.
- 4 Once you have found a channel that can be used, press the locator key.
- 5 Remove the M-1 or MSI-100 feature from the switch. This provides the locator feature back to the user.

Preparing and installing the MCA

Procedure 2-3 details the instructions required to install or replace the MCA in the Meridian modular telephone sets.

The MCA allows synchronous and asynchronous ASCII terminals and personal computers to connect to the Meridian modular telephone, using an RS-232C or V.35 interface on a DB-25 connector.



CAUTION

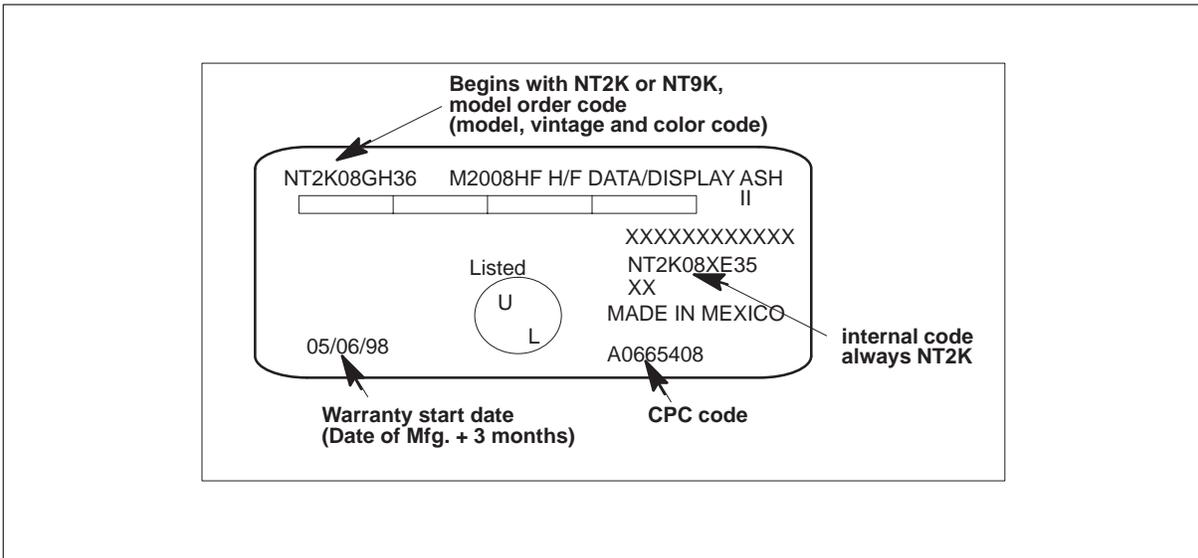
Risk of personal injury

Before handling internal set components, static electricity must be discharged by touching any grounded metal surface.

Identifying the model number and date code

Before installing the MCA, identify the Meridian modular telephone model number and date code. The model number and date code are printed on a label on the telephone base. The model number is NT2K, NT9K or NTZK. Figure 2-3 shows the model number and date code on the telephone base label.

Figure 2-3
Identifying the model number and date code



MCA hardware

Additional hardware is required to install the MCA. The hardware requirements are based on the Meridian modular telephone model number and date code. Refer to table 2-1 to determine the required MCA hardware.

Table 2-1
Required MCA hardware

Required MCA hardware	NT9K	NT2K later than April 24, 1998	NT2K prior to April 24, 1998	NTZK
MCA printed circuit board	X	X	X	X
24V AC power adapter	X	X	X	X
Jumper board	Pre-installed	Pre-installed	X	X
Redesigned footstand	Pre-installed	Pre-installed	X	X



WARNING

Risk of equipment damage

Do not wall mount a telephone with MCA installed. The wall mount knockout located on the bottom of the telephone footstand must be in place. If this knockout is damaged or missing you must replace the footstand with a new one before installing the MCA.

Procedure 2-3

Preparing the telephone for MCA installation

- 1 Disconnect and remove all cords (including the handset cord) from the telephone.
- 2 Place the telephone, upside-down, on a padded level surface.
- 3 If you have the NT2K (with a date code of April 24, 1998 or later) or NT9K telephone:
 - Remove the two screws from the footstand and separate it from the telephone base. After the MCA installation is complete, re-attach the footstand onto the telephone base.

2-10 Installation procedures

- Skip to the MCA installation instructions.

or

If you have the NT2K telephone (date code of April 24, 1998 or later) or NTZK telephone:

- Remove the two screws from the footstand and separate it from the telephone base. To remove the footstand from the base, press in the back edge of the footstand as you lift it from the telephone base.
- The footstand is not reused. Continue with step 4.

- 4 If you have an MPDA installed in the telephone, unplug the data line jack from the telephone base.
 - 5 Remove the back covering of the telephone base (four screws).
 - 6 Remove the power supply board (if installed). If the telephone is equipped with a power supply board and/or cable, you must remove them before installing the MCA.
 - Remove the two screws from the top of the power supply board.
 - To disconnect the power supply board from the NTZK telephone, grasp the board firmly on each side and slowly rock it while applying upward pressure, until it is released from the 2x7 pin connector.
- or
- To disconnect the power supply board from the NT2K or NT9K telephone set, lift the board out of the set and disconnect the ribbon cable from the 2x7 pin connector.
 - 7 Remove the external alerter board (if installed). If the telephone is equipped with the external alerter board, you must remove it before installing the MCA. The external alerter board is located inside the telephone base right of center.
 - Remove the screws from the external alerter interface board.
 - Grasp the board firmly on each end and pull upward to remove it from the 2x3 pin connector.
 - 8 Remove the knockout sections in the rear wall of the footstand for the MCA DB-25 connector and for the power transformer DIN connector. To remove the knockout sections, use a flat tip screwdriver to push out the plastic pins holding the knockout in place.
 - 9 Install the jumper board. If a power supply board was not installed on the NT2K or NTZK, remove the 2 jumper plugs on the 2x7 pin connector.
 - 10 Locate the appropriate jumper board to install in the telephone base.
 - 11 For NTZK sets, install the jumper board with the brown connector (J1) onto the 2x7 pin connector with the screw post facing toward the bottom of the set and away from the power supply screw post.

or

For NT2K sets, install the jumper board with the black connector (P1) onto the 2x7 pin connector (the jumper is keyed for orientation).

MCA installation

- 1 Install the MCA in the footstand:
 - Tilt the MCA PC board so that the DB-25 connector fits into the break-out section.
 - Lower the board into position on the bottom of the footstand.
 - Secure the board using the two screws provided.
- 2 Plug one end of the short 8-conductor line cord, provided with the MCA, into the data jack in the base of the telephone. Plug the other end of this cord into connector J1 on the MCA.
- 3 Reassemble the footstand onto the base using the four screws you removed.



WARNING

Risk of equipment failure

Use only the Class 2 power source included with your MCA. Specifications:

- NT A0367335
- Input rated: 120 Vac, 50-60Hz, 23 watts
- Output rated: 24 Vac, 600 mA, and 8 Vac, 400 mA

The transformer that accompanied the earlier MCA prior to April 24, 1998, MPDA or external alerter interface board does not work with the MCA dated after April 24, 1998.

- 4 Reconnect all cords, including the handset cord and new 24Vac wall transformer.
- 5 Locate the label that was included with the MCA, and place it on the telephone base close to the existing set label for future tracking purposes.
- 6 You are now ready to connect your ASCII terminals or personal computer to your telephone. Refer to the manufacturer directions for installation instructions.

The MCA installation procedure is complete.

Installing the analog terminal adapter (ATA)

Procedure describes the analog terminal adapter (ATA) installation procedures for Meridian modular telephones (M2006, M2008, M2008HF,

M2616, and M2216ACD). The ATA allows an analog device (FAX, modem or 500/2500 telephone) to work simultaneously with your Meridian modular telephone. The ATA board mounts inside the footstand of your Meridian modular telephone. The ATA is compatible with MSL08 and later.



CAUTION

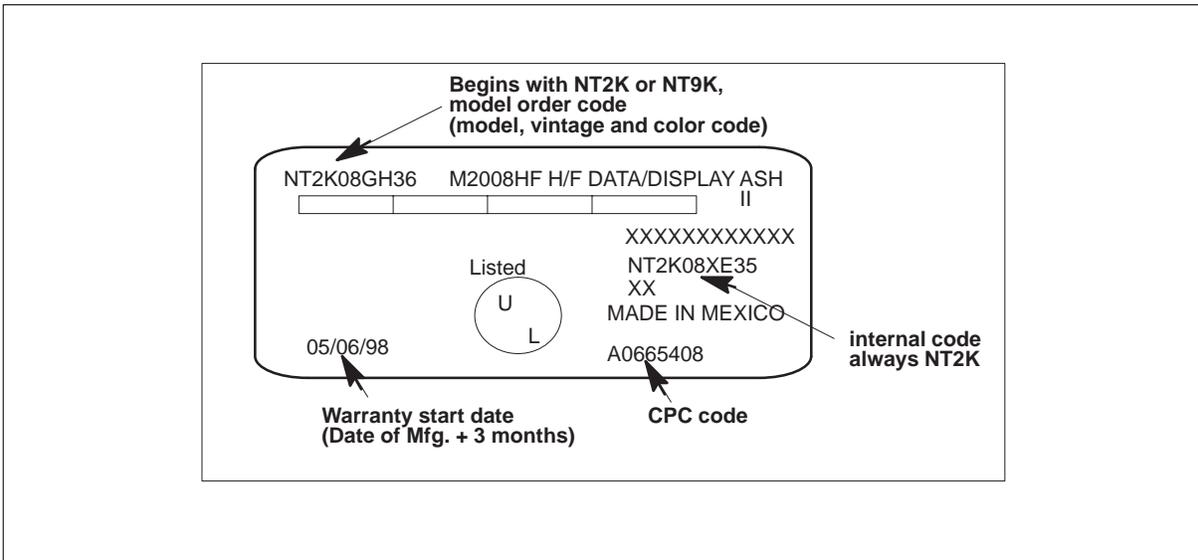
When handling internal telephone components, static electricity must be discharged by touching any grounded metal surface. The ATA is compatible with M2006, M2008, M2008HF, M2616, and M2216ACD Meridian modular telephones, with the following exceptions:

- The ATA cannot be used with telephones that require the NT2K10xx power board (for example, M2008 (NTZK08) telephones equipped with display and M2616 (NTZK16) telephones equipped with Key Expansion Modules).
- Meridian digital telephones cannot be equipped with both an ATA and external alerter interface.
- Footstands are not available to house both the ATA and Key Expansion Module (NT2K22).
- The ATA supports connections to POTS services only. Features such as Message Waiting, Switch-Hook Flash/LINK, Transfer, Conference, and CLASS type services are not supported.

Identifying the model number and date code

Before installing the ATA, identify the Meridian modular telephone model number and date code. The model number and date code are printed on a label on the telephone base. The model number is NT2K, NT9K or NTZK. Figure 2-4 shows the model number and date code on the telephone base label.

Figure 2-4
Identifying the model number and date code



ATA hardware

Additional hardware is required to install the ATA. The hardware requirements are based on the Meridian modular telephone model number and date code. Refer to Table 2-2 to determine the required ATA hardware.

Table 2-2
Required ATA hardware

Required ATA hardware	NT9K	NT2K April 24, 1998 or later	NT2K prior to April 24, 1998	NTZK
ATA printed circuit board	X	X	X	X
24V AC power adapter	X	X	X	X
Jumper board	Pre-installed	Pre-installed	X	X
ATA-ready footstand	Pre-installed	Pre-installed	X	X

Preparing the telephone for ATA installation

- 1 Disconnect and remove all cords (including the handset cord) from the telephone.
- 2 Place the telephone, face-down, on a padded level surface.
- 3 If you have the NT2K (with a date code of April 24, 1998 or later) or NT9K telephone:
 - Remove the two screws from the footstand and separate it from the telephone base.
 - Skip to the ATA installation instructions.
- 4 If you have the NT2K telephone (date code prior to April 24, 1998) or NTZK telephone:
 - Remove the two screws from the footstand and separate it from the telephone base. To remove and footstand from the base, press in the back edge of the footstand and lift it from the telephone base.
 - The footstand is not reused. Continue with step 5.
- 5 If an MCA or MPDA is installed in the telephone, unplug the data line jack from the telephone base.
- 6 Remove the back cover of the telephone base which is held in place by four screws.

Remove the power supply board (if installed)

- 7 If the telephone is equipped with a power supply board and/or cable, you must remove it/them before the ATA is installed:
 - Remove the two screws from the top of the power supply board.
 - To disconnect the power supply board from the NTZK telephone, grasp the board firmly on each side and slowly rock the power supply board while applying upward pressure until it is released from the 2x7 pin connector.or
 - To disconnect the power supply board from the NT2K or NT9K set, lift the board out of the set and disconnect the ribbon cable from the 2x7 pin connector.

Remove the external alerter interface board (if installed)

- 8 If the phone is equipped with the external alerter interface board, you must remove it before installing the ATA. The external alerter interface board is located inside the telephone base at the right of center (refer to the figure above for the external alerter interface location).
 - Remove the screw from the external alerter interface board.
 - Grasp the board firmly on each end and pull upward to remove the external alerter interface board from the 2x3 pin connector.

Note: The external alerter interface board is not compatible with the ATA.

Jumper board installation

- 9 If a power supply board was not installed on the NT2K or NTZK, remove the 2 jumper plugs on the 2x7 pin connector.
- 10 Locate the appropriate jumper board to install in the telephone base.
- 11 For NTZK sets, install the jumper board with the brown connector (P1) board onto the 2x7 pin connector with the screw post facing toward the bottom of the set and away from the power supply screw post.
or
For NT2K sets, install the jumper board with the black connector (J1) onto the 2x7 pin connector (the jumper is keyed for orientation).

Replace the telephone base

- 12 Replace the telephone base and the four screw onto the set.

ATA installation

- 1 Remove the plastic knockout labeled ATA on the back wall of the footstand by pressing the knockout inward (with finger pressure) and breaking it off.



WARNING

Be careful not to damage the MCA knockout. If the MCA knockout is damaged or missing, replace the footstand before installing the ATA.

- 2 Install the ATA printed circuit board into the footstand:
 - Hold the ATA printed circuit board (PCB) by the edges only, tilt the ATA board into the footstand and align the leading edge of the PCB into the retainer slots located on the inside of the back wall of the footstand.
 - Align the right edge of the ATA board along the top surface of the PCB retention clip located inside the footstand along the right side of the telephone.
 - Lower the board into position on the bottom of the footstand.
 - Press down, locking the ATA board into position.
 - The RJ11 and circular mini DIN connectors fit into the ATA knockout section.
 - Secure the board to the footstand using the two screws provided with the ATA.
- 3 Plug the ATA 8-conductor line cord, provided with the ATA, into the jack on the footstand. Plug the other end of the cord into the data jack on the base of the telephone.

- 4 Install the footstand into the telephone base by inserting the two footstand tabs into the notches on the base of the telephone.
- 5 Screw the footstand into position using the two screws provided and a Phillips screwdriver.
- 6 Plug the output of the external power module into the circular mini DIN connector located on the back wall of the footstand. Plug the input of the external power module into the commercial 110V electrical outlet.



WARNING

Use only the Class 2 power source included with your ATA. Specifications:

- NT A0688664
- Input rated: 120V ac, 50-60Hz, 23 watts
- Output rated: 24V ac, 600 mA, and 8V ac, 400 mA

The transformer that accompanied the earlier MCA, MPDA or external alerter interface board (NT A0367335) is not compatible with the ATA.

- 7 Place the power sticker on the back of the footstand. Place the bar code sticker on the base of the set.
- 8 You are now ready to connect the analog device to the RJ11 connector located on the back wall of the footstand. Refer to the installation documentation packaged with your analog device.

MSL-100 system administration

MSL-100 has added the ATA line class code in MSL08 for system configuration in SERVORD. The ATA is datafilled on the odd LEN of the IPE/DLM port along with a Meridian 2006, 2008, 2008HF, 2616 or 2216 datafilled on the even LEN.

Table 2-3
Example of adding the ATA line class code for system configuration in SERVORD

Prompt	Response	Description
SO	NEW	Establish service for unassigned telephone lines.
LCC	ATA	ATA line class code

Table 2-3
Example of adding the ATA line class code for system configuration in
SERVORD (continued)

Prompt	Response	Description
Ringtype, Group, Subgroup, NCOS, SNPA Key, Ringing	Follow normal administration procedures for an M2006 class telephone for these prompts.	the prompts require datafill specified by your customer site
LEN_OR_LTID	A B C D	A = IPE/DLM column B = IPE/DLM shelf C = IPE/DLM card slot D = IPE/DLM odd port
OPTKEY	\$	No options are available for the ATA.

Self-test and diagnostics

A red LED light is located on the back wall of the footstand. It indicates the status of the ATA.

- Flashing red indicates that the ATA is operating normally. For further troubleshooting advice, check the manufacturer's documentation that accompanied the analog device.
- Solid red indicates that the ATA is not operating normally. Contact the System Administrator.
- Red light off indicates that there is no power going to the ATA or the unit is not operating properly. Check the power connections to the ATA. If problems continue, contact the System Administrator.

Installing or replacing the power supply

Procedures 2-4 through 2-6 explain how to install and remove the power supply on various types of Meridian modular telephones.

Procedure 2-4

Installing or replacing the power supply on M2616, or M2216ACD NTZK sets

- 1 Complete wiring and cross-connections before connecting the telephone to the connecting block.



WARNING

Risk of equipment damage

Before handling internal telephone components, you must discharge static electricity from your hands and tools by touching any grounded metal surface or conductor.

- 2 Remove the handset. Place the telephone upside down on top of a level, solid surface covered with soft material or paper to prevent damage to movable keys and the telephone face.
- 3 Disconnect all cords from the telephone.
- 4 Loosen and remove the two screws from the stand assembly of the telephone. Unsnap stand assembly by grasping the plastic extension and pulling upwards. Set the screws aside taking care not to lose the mounting hardware.
- 5 If the telephone is equipped with an MCA, unplug the data cable from the appropriate jack.
- 6 Remove the four screws securing the bottom cover of the telephone set to the top cover.
- 7 Leaving screws in place, remove the bottom cover by lifting upward. Set the bottom cover aside.
- 8 If the set is equipped with a display, disconnect the display ribbon cable from the display board and move it out of the way.

9

If	Do
the telephone is not equipped with the power supply option	Step 12
you are removing an existing power supply from a set	Step 10

- 10 The power supply is located on the left side of the set. Remove two small screws from the power supply board near the top. Set them aside. If you are not replacing the power supply board, place the jumpers (A0288529) connecting the bottom two sets of the pins on the P1 connector.
- 11 Grasp the board firmly on each side. Work the board loose from the plug by slowly applying upward pressure to alternate sides of the board until it releases. To install a replacement, continue to Step 12.
- 12 Align the power supply board over the pins so that slot B fits into the alignment pin on the board. Align the mounting holes in the board near the top over the mounting holes in the telephone then carefully press down so that the H1 connector on the board slides onto the P1 pins.
- 13 Install the Phillips-head, self-tapping screw supplied with the power supply option into the mounting hole. Tighten the screw firmly with a #1 Phillips screwdriver.
- 14 If the telephone has a display, reconnect the display ribbon cable.
- 15 Reassemble the telephone bottom and top cover assemblies to the stand assembly.
- 16 If the telephone is equipped with an MCA, reconnect the data cable to the appropriate jack.
- 17 Tighten all screws. Reconnect new line cords supplied with the power supply option. Replace the telephone in the normal operating position.
- 18 Place the label supplied with the power supply option on the bottom cover of the set for tracking purposes.
- 19 Connect the telephone to a local transformer.
- 20 You have successfully completed this procedure.

Procedure 2-5**Installing or replacing the power supply on M2006 or M2008 NTZK sets**

- 1 Complete wiring and cross-connections before connecting the telephone to the connecting block.

**WARNING****Risk of equipment damage**

Before handling internal telephone components, you must discharge static electricity from your hands and tools by touching any grounded metal surface or conductor.

- 2 Remove the handset, and place the telephone upside down on top of a level, solid surface covered with soft material or paper to prevent damage to movable keys and the telephone face.
- 3 Disconnect all cords from the telephone.
- 4 Loosen and remove the two screws from the stand assembly of the telephone, and unsnap stand assembly by grasping the plastic extension and pulling upwards. Set the screws aside taking care not to lose the mounting hardware.
- 5 If the telephone is equipped with an MCA, unplug the data cable from the appropriate jack.
- 6 Remove the four screws securing the bottom cover of the telephone set to the top cover.
- 7 Leaving screws in place, remove the bottom cover by lifting upward. Set the bottom cover aside.
- 8 If the set is equipped with a display, disconnect the display ribbon cable from the display board and move it out of the way.

9

If	Do
the telephone is not equipped with the power supply option	Step 12
you are removing an existing power supply from a set	Step 10

- 10 The power supply is located on the left side of the set. Remove two small screws from the power supply board near the top of the board. Set them aside. If you are not replacing the power supply board, place the jumpers (A0288529) connecting the bottom two sets of the pins on the P1 connector.
- 11 Grasp the board firmly on each side. Work the board loose from the plug by slowly applying upward pressure to alternate sides of the board until it releases. To install a replacement, continue to Step 12.
- 12 Align the power supply board over the pins so that slot A fits into the alignment pin on the telephone. Align the mounting holes in the board near the top over the mounting holes in the telephone and carefully press down so that the H1 connector on the board slides onto the P1 pins.
- 13 If the telephone has a display, reconnect the display ribbon cable.
- 14 Install the Phillips-head, self-tapping screw supplied with the power supply option into the mounting hole. Tighten the screw firmly with a #1 Phillips screwdriver.

- 15 Reassemble the telephone bottom and top cover assemblies to the stand assembly.
- 16 If the telephone is equipped with an MCA, reconnect the data cable to the appropriate jack.
- 17 Tighten all screws. Reconnect new line cords supplied with the power supply option, then replace the telephone in the normal operating position.
- 18 Place the label supplied with the power supply option on the bottom cover of the set for tracking purposes.
- 19 You have successfully completed this procedure.

Procedure 2-6

Installing or replacing the -48V or 5V power supply on NT2K sets



WARNING

Risk of equipment damage

Before handling internal telephone components, you must discharge static electricity from your hands and tools by touching any grounded metal surface or conductor.

- 1 Remove the handset, and place the telephone upside down on top of a level, solid surface covered with soft material or paper to prevent damage to movable keys and the telephone face.
- 2 Disconnect all cords from the telephone.

3

If	Do
the telephone is not equipped with an MCA	Step 7
the set is equipped with an MCA	Step 4

- 4 Using a #1 Phillips screwdriver, remove both screws from the stand.
- 5 Remove the stand from the base by pressing in the back of the stand as you lift it from the base.
- 6 Unplug the MCA from the data line jack on the base and set the stand aside.
- 7 Loosen and remove the two screws from the stand assembly of the telephone. Unsnap stand assembly by grasping the plastic extension and pulling upwards. Set the screws aside taking care not to lose the mounting hardware.

- 8 If the telephone is equipped with an MCA, unplug the data cable from the appropriate jack.
- 9 Remove the four screws securing the bottom cover of the telephone set to the top cover.
- 10 Leaving screws in place, remove the bottom cover by lifting it upward. Set the bottom cover aside.

11

If	Do
the telephone is not equipped with the power supply option	Step 13 for -48V supply Step 16 for +5V supply
you are removing an existing power supply option	Step 12 for -48V supply Step 15 for +15V supply

- 12 The -48V power supply is located on the left side of the set. Disconnect the ribbon cable going to P1. Remove two small screws from the power supply board near the top. Set them aside. Lift the board from the telephone. If you are not replacing the power supply board, place the jumpers (A0288529) connecting the bottom two sets of pins on P1.
- 13 Align the -48V power supply board over the screw holes on the left side of the set. Install the Phillips-head, self tapping screw supplied with the power supply option into the mounting hole. Tighten the screw firmly with a #1 Phillips screwdriver.
- 14 Remove the two jumpers on the bottom two pins of P1 if available. Connect the power supply boards ribbon cable to P1. Continue to step 18.
- 15 (+5V power option) The jumper board is located on pin P2. The relay board is located on P1. Remove the boards from the pins. If you are not replacing the jumper and relay boards, place the jumpers (A0288529) connecting the bottom two sets of pins on P1.



WARNING
Risk of equipment damage
This is a polarity-sensitive connection.

- 16 (+5V power option) Connect the jumper board onto P2.
- 17 (+5V power option) Remove the two jumpers on the bottom two pins of P1 if available. Connect the relay board to P1. Continue to step 19.
- 18 Carefully fold the ribbon cable under the power board. Make sure that all ribbon cables are lying flat and are not caught on any posts on the telephone base.

- 19 Replace the base and insert. Tighten all screws.
- 20 If the telephone is equipped with an MCA, plug the MCA cable into the jack on the telephone base.
- 21 Install the stand and secure it with two screws.
- 22 Reconnect the line cord and handset.
- 23 Place the label supplied with the power supply option on the bottom cover of the set for tracking purposes.
- 24 You have successfully completed this procedure.

Installing and replacing the display option

Procedures 2-7 through 2-9 describe how to install and replace the display module. With MSL03, a new display module was introduced that combined the features of the previous NT2K24WA and NT2K25YL displays. The product engineering code (PEC) number for the new display module is NT2K28AA. The phone sets were also modified to accommodate this change. Older model Meridian modular telephones have a number in the NTZK series. PEC numbers for newer models now begin with NT2K. (See Chapter 12, “Ordering information” for more information about equipment codes for Meridian modular telephones and accessories.)

The older model displays are connected by a cable to a daughter board that plugs into the main board inside the phone set. With MSL03, the daughter board was eliminated. The cable that connects the display module to the phone set plugs directly into the set’s main board. The older model displays NT2K24WA and NT2K25YL can be installed on newer model phones (those having PEC numbers in the NT2K series). However installation of the older displays into a newer M2008 telephone requires an additional cable (product code P0738600).

To add or replace an older model NT2K24WA or NT2K25YL display module in an older model phone requiring a daughter board, follow the steps in Procedure 2-7.

Procedure 2-7

Installing or replacing an NT2K24WA or NT2K25YL display module in an NTZK series phone

- 1 Remove the handset, and place the telephone upside down on top of a level, solid surface covered with soft material or paper to prevent damage to the movable keys and the telephone face.
- 2 Disconnect all cords from the telephone.

- 3 Loosen and remove the two screws from the stand assembly of the telephone. Unsnap the stand assembly by pressing inward at the back of the stand where it meets the base pulling it upward. Set the stand assembly aside, taking care not to lose the mounting hardware.
- 4 Remove the four screws securing the bottom cover of the telephone set to the top cover.
- 5 Leaving the screws in place, remove the bottom cover by lifting it upward. Set the cover aside.
- 6 Loosen the screws that hold the fillerplate or existing display module.
- 7 Remove the fillerplate or display module, being careful not to touch the foam in the speaker housing.



CAUTION

Possible equipment damage

Before handling internal telephone components, you must discharge static electricity from your hands and tools by touching any grounded metal surface or conductor.

- 8 If the telephone is equipped with an MCA, unplug the data cable from the appropriate jack.
- 9 The power supply board (if the telephone is equipped with one) is located on the left side of the telephone. Remove the two small screws from the power supply board (near the top) and set them aside. Grasp the board firmly on each side. Carefully work the board loose until released.

10

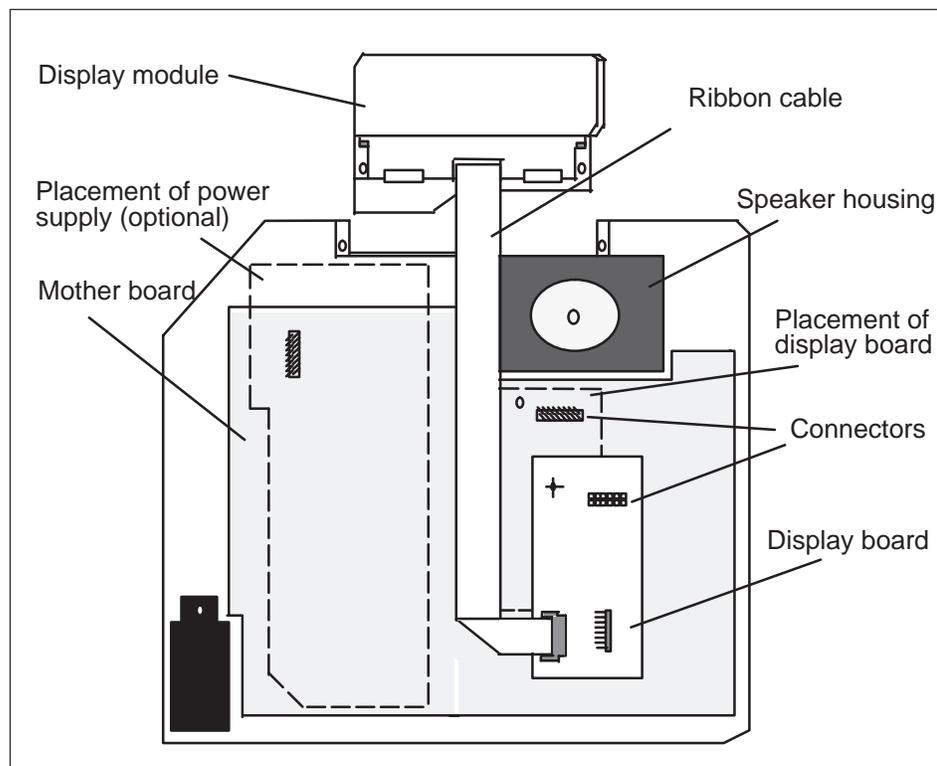
If	Do
the telephone is not already equipped with a display option	Step 15
you are replacing an existing display option	Step 11

- 11 ***Removing the existing display option board***
The display option board is located off-center (left) of the set. Remove the ribbon cable from J2 of the display option board.
- 12 Remove the screw from the card, and set it aside.
- 13 Grasp the card firmly on each end, and carefully pull it upward to disengage card J1 from P2 of the telephone set. To replace a defective board, continue to Step 15.

Note: If the set is an M2216ACD equipped with the power supply option, remove the power supply as described in Procedure 2-4.

- 14 **Removing the existing display**
Remove the two or three screws from the display module. Remove the display module from the telephone.
- 15 **Installing the new display option board**
Position the J12 connector of the new display board over the P2 pins of the telephone. Press down slowly until J1 slides onto the P2 pins and is firmly seated. See Figure 2-5

Figure 2-5
Placement of display cable on NT2K displays and NTZK phones



- 16 Take the Phillips-head, self-tapping screw supplied with the display option, and install it into the mounting hole. Tighten firmly with a #1 Phillips screwdriver.
- 17 **Installing the new display module**
Position the display module in place. Insert the self-tapping Phillips-head screws into the mounting holes. Tighten them firmly with a #1 Phillips screwdriver.
- 18 To reinstall the power supply option, configure the board with the set. Align the power supply board over the pins, and apply downward pressure until the board is secured on the alignment pins and plug.

Note: The power supply is not required on the M2616 models unless the set is equipped with other hardware options.

- 19 Install the Phillips-head, self-tapping screw supplied with the power supply option into the mounting hole. Tighten the screw firmly with a #1 Phillips screwdriver.
- 20 Fold the ribbon cable near the connector to align it with J2 pins on the display board, ensuring that the notch on the ribbon cable is facing toward the display board. Carefully work the ribbon cable connector onto the J2 pins until it is firmly seated. Route the cable flat beside the power supply board, gathering excess cable under the display. Be careful not to press the cable beneath alignment posts or studs of the base.
- 21 Replace the base. If the telephone is equipped with an MCA, reconnect the data cable to the appropriate jack.
- 22 Replace the footstand. Make sure the stand is firmly seated to the base.
- 23 Tighten all screws, reconnect all cords, and place the telephone in the normal operating position.
- 24 For tracking purposes, place the label supplied with the display option on the bottom cover of the set.
- 25 You have successfully completed this procedure.

To install or replace the new NT2K28AA display module in a newer NT2K series phone, follow the steps in Procedure 2-8.

Procedure 2-8

Installing or replacing an NT2K28AA display module in an NT2K series phone

- 1 Remove the handset. Place the telephone upside down on top of a level, solid surface covered with soft material or paper to prevent damage to the movable keys and the telephone face.
- 2 Disconnect all cords from the telephone.
- 3 Loosen and remove the two screws from the stand assembly of the telephone. Unsnap the stand assembly by pressing inward at the back of the stand where it meets the base and pulling upward. Set the stand assembly aside, taking care not to lose the mounting hardware.
- 4 Remove the four screws securing the bottom cover of the telephone set to the top cover.

- 5 Leaving the screws in place, remove the bottom cover by lifting it upward. Set the cover aside.



CAUTION

Possible equipment damage

Before handling internal telephone components, you must discharge static electricity from your hands and tools by touching any grounded metal surface or conductor.

- 6 Loosen the screws that hold the fillerplate or existing display module.
- 7 Remove the fillerplate or display module, being careful not to touch the foam in the speaker housing.
- 8 If the telephone is equipped with an MCA, unplug the data cable from the appropriate jack.
- 9 The power supply board (if the telephone is equipped with one) is located on the left side of the telephone. Remove the two small screws from the power supply board (near the top) and set them aside. Grasp the board firmly on each side. Carefully work the board loose until it is released.

10

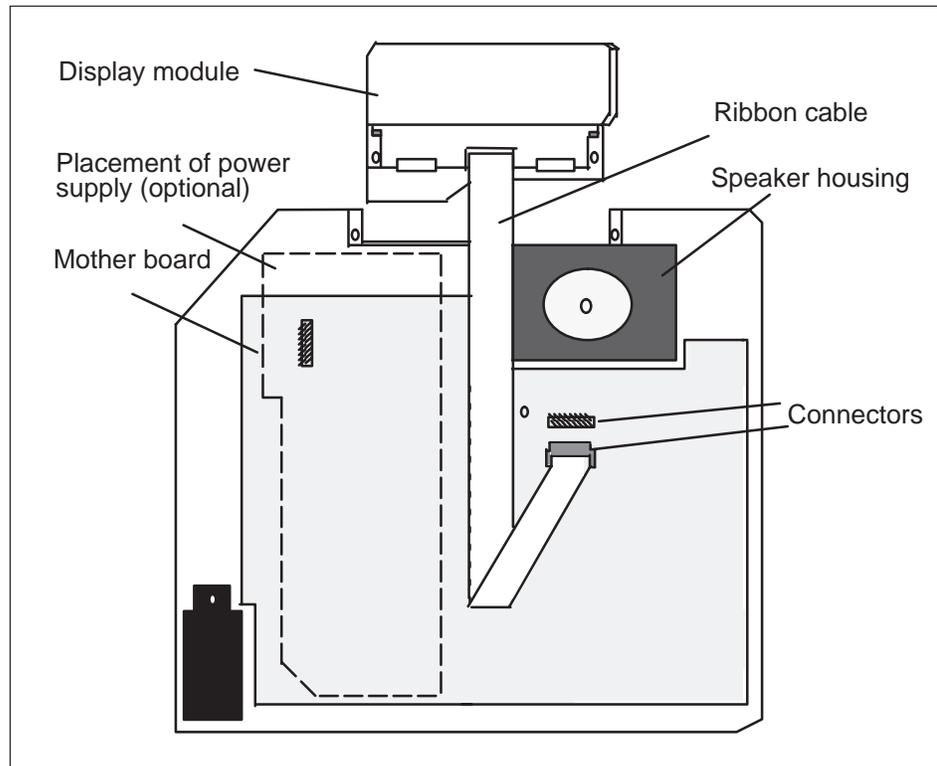
If	Do
the telephone is not already equipped with a display option	Step 12
you are replacing an existing display option	Step 11

- 11 **Removing the existing display**
Remove the two or three screws from the display module. Remove the display module from the telephone.
- 12 **Installing the new display module**
Position the display module in place. Insert the self-tapping Phillips-head screws into the mounting holes. Tighten them firmly with a #1 Phillips screwdriver.
- 13 Reinstall the power supply option (if the unit is so equipped) by referring to Procedure 2-4, Steps 12 and 13.

Note: The power supply is not necessary on the M2616 models unless the set is equipped with other hardware options.

- 14 Make sure the red line on the ribbon cable lines up with the white dot beside the J3 or P4 connector pins. Carefully work the ribbon cable connector onto the connector pins on the mother board until firmly seated. Route the cable flat beside the power supply board, gathering excess cable under the display. Be careful not to press the cable beneath alignment posts or studs of the base. (For the M2616, allow it to cover the screw post and do not replace the screw when reassembling.) See Figure 2-6.

Figure 2-6
Display cable routing for NT2K28XX displays



- 15 Replace the base. If the telephone is equipped with an MCA, reconnect the data cable to the appropriate jack.
- 16 Replace the footstand. Make sure the stand is firmly seated to the base.
- 17 Tighten all screws. Reconnect all cords. Place the telephone in the normal operating position.
- 18 For tracking purposes, place the label supplied with the display option on the bottom cover of the set.
- 19 You have successfully completed this procedure.

To install or replace an older model display (NT2K24WA or NT2K25YL) in the NT2K series phone that does not use the daughter board, follow the steps in Procedure 2-9. Note that if you are installing the older model display on an NT2K series M2008 or M2008HF phone, you will need cable P0738600. The other models allow you to connect the cable from the display module directly into the mother board on the phone.

Procedure 2-9**Installing an NT2K28AA display without an internal daughter board or replacing an NT2K24WA or NT2K25YL display module in a phone with an NT2K28XX**

- 1 Remove the handset. Place the telephone upside down on top of a level, solid surface covered with soft material or paper to prevent damage to the movable keys and the telephone face.
- 2 Disconnect all cords from the telephone.
- 3 Loosen and remove the two screws from the stand assembly of the telephone. Unsnap the stand assembly by pressing inward at the back of the stand where it meets the base then pull upward. Set the stand assembly aside, taking care not to lose the mounting hardware.
- 4 Remove the four screws securing the bottom cover of the telephone set to the top cover.
- 5 Leaving the screws in place, remove the bottom cover by lifting it upward. Set the cover aside.
- 6 Loosen the screws that hold the fillerplate or existing display module.
- 7 Remove the fillerplate or display module, being careful not to touch the foam in the speaker housing.

**CAUTION****Possible equipment damage**

Before handling internal telephone components, you must discharge static electricity from your hands and tools by touching any grounded metal surface or conductor.

- 8 If the telephone is equipped with an MCA, unplug the data cable from the appropriate jack.
- 9 The power supply board (if the telephone is equipped with one) is located on the left side of the telephone. Remove the two small screws from the power supply board (near the top) and set them aside. Grasp the board firmly on each side. Carefully work the board loose until released.

10

If	Do
the telephone is not already equipped with a display option	Step 13
you are replacing an existing display option	Step 11

11 ***Removing the existing display***

Remove the two or three screws from the display module. Remove the display module from the telephone.

12

If	Do
the telephone is an M2008 or M2008HF model	Step 13
the telephone is a model other than the M2008 or M2008HF	Step 15

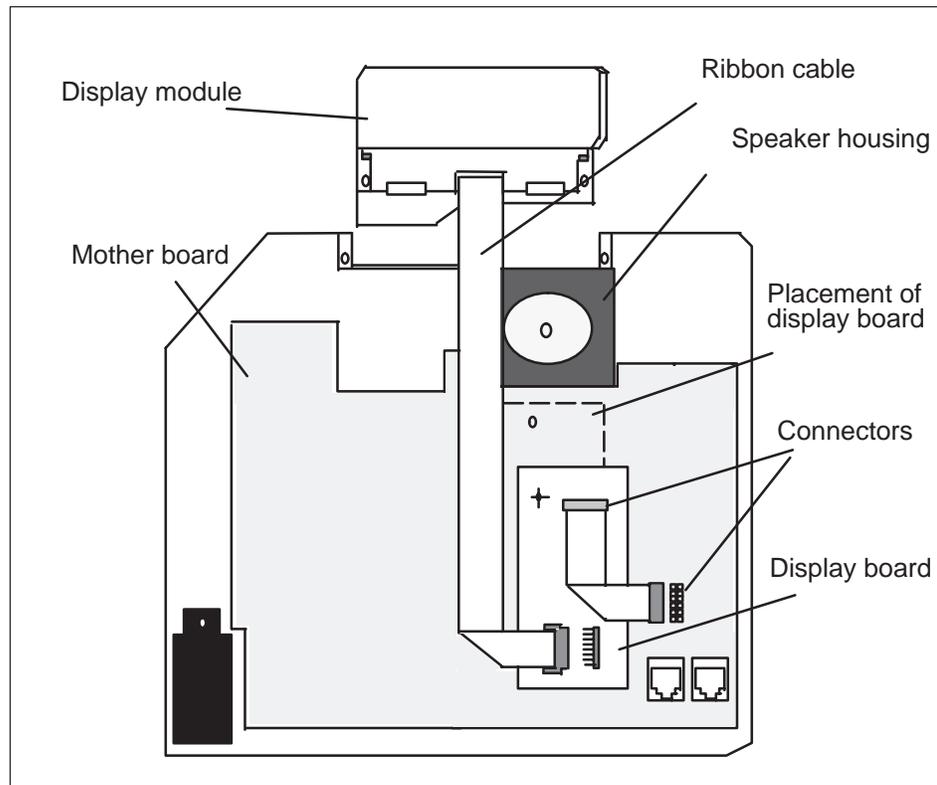
13 ***Installing the display option board***

Connect the P0738600 cable to the J12 connector of the display board. Place the board on the mounting post.

14 Insert the self-tapping Phillips-head screw into the mounting hole (near the top). Tighten it firmly with a Phillips screwdriver.

15 Connect the loose end of the P0738600 cable to the J3 pins of the telephone. Press down until the connector slides onto the J3 pins on the mother board and is firmly seated. See Figure 2-7.

Figure 2-7
Installing an NT2K in an NT2K M2008 or M2008HF set



- 16** To reinstall the power supply option (if the unit is so equipped), configure the board with the set. Align the power supply board over the pins. Apply downward pressure until the board is secured on the alignment pins and plug.
- 17** Install the Phillips-head, self-tapping screw supplied with the power supply option into the mounting hole. Tighten the screw firmly with a #1 Phillips screwdriver.

Note: The power supply is not required on the M2616 or models unless the set is equipped with other hardware options.

If	Do
the telephone is an M2008 M2008HF model	Step 19
the telephone is a model other than the M2008 or M2008HF	Step 18

- 18 Fold the ribbon cable near the connector and carefully work the ribbon cable connector onto the P4 pins of the mother board until it is firmly seated. Route the cable flat beside the power supply board, gathering excess cable under the display. Be careful not to press the cable beneath alignment posts or studs of the base.
- 19 ***Installing the new display module***
Position the display module in place. Insert the self-tapping Phillips-head screws into the mounting holes. Tighten them firmly with a #1 Phillips screwdriver.
- 20 Replace the base. If the telephone is equipped with an MCA, reconnect the data cable to the appropriate jack.
- 21 Replace the footstand. Make sure the stand is firmly seated to the base.
- 22 Tighten all screws, reconnect all cords, and place the telephone in the normal operating position.
- 23 For tracking purposes, place the label supplied with the display option on the bottom cover of the set.
- 24 You have successfully completed this procedure.

Installing and replacing the external alerter

Procedure 2-10 describes how to install and replace the external alerter in the Meridian modular telephone sets.

Procedure 2-10 Installing or replacing the external alerter

- 1 Remove the handset, place the telephone upside down on top of a level, solid surface covered with soft material or paper to prevent damage to movable keys and to the telephone face.
- 2 Disconnect all cords from the telephone.
- 3 Loosen and remove the two screws from the stand assembly of the telephone. Unsnap the stand assembly by grasping the plastic extension and pulling it upward.
- 4 Set the plastic extension aside taking care not to misplace the mounting hardware from the telephone.
- 5 If the telephone is equipped with an MCA, unplug the data cable from the appropriate jack.
- 6 Remove the four screws securing the bottom cover of the telephone set to the top cover.

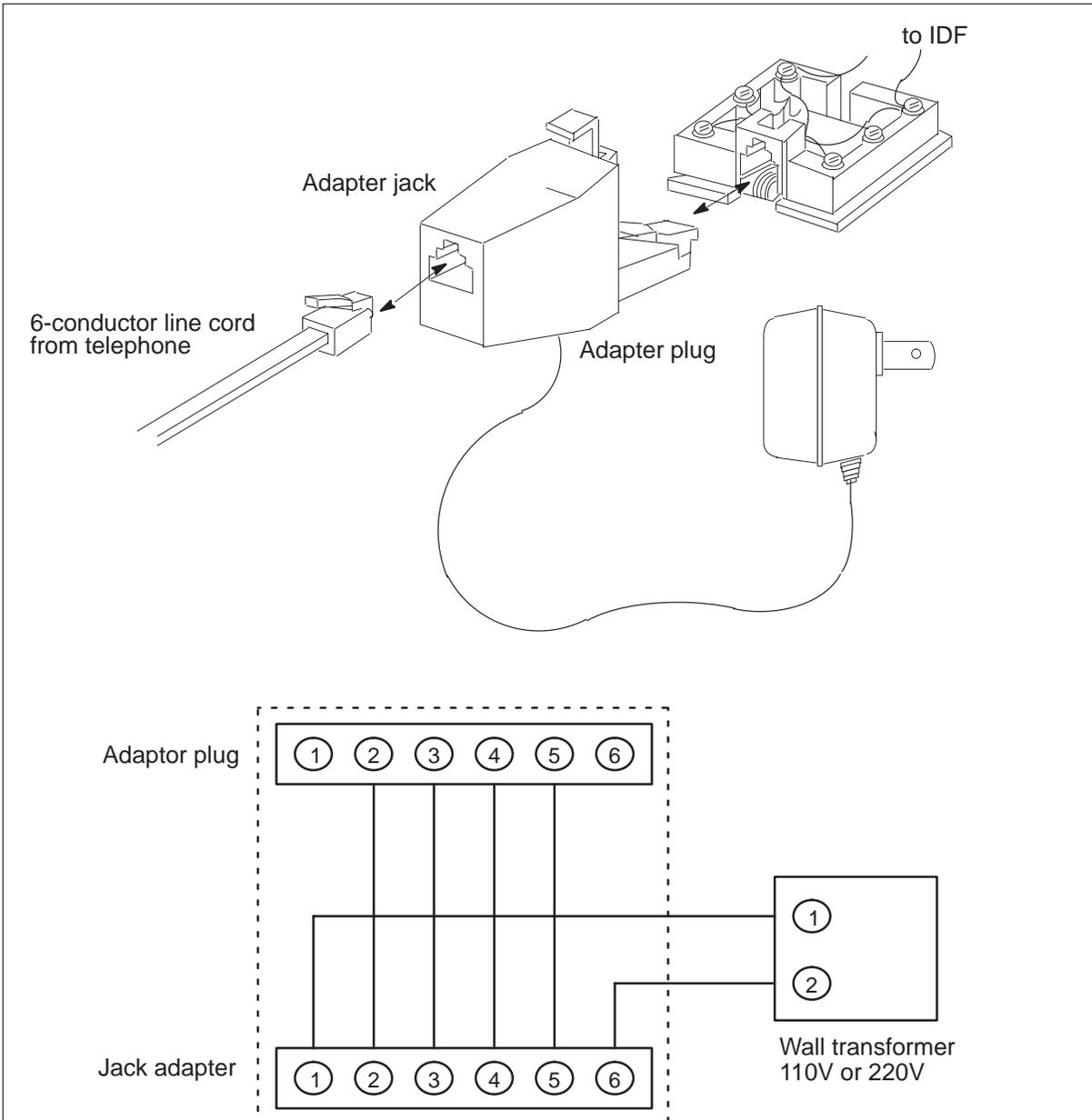
- 7 Leaving the screws in place, remove the bottom cover by lifting it upward. Set it aside.

If	Do
the telephone is not equipped with an external alerter option	Step 8
you need to replace an existing external alerter option	Step 10

- 8 ***Removing the external alerter***
The external alerter option card is located off-center (right) of the set. Remove the screw from the card, and set it aside.
- 9 Grasp the board firmly on each end, and pull it upward to disengage card H1 from P3 of the telephone set. To replace a defective board, continue to Step 10.
- 10 ***Installing the external alerter***
Place H1 of the display board over P3 of the telephone set.
- 11 Align the pins of the telephone set with slots A and B of the external alerter board. Press the pins down slowly ensuring the mounting hole is aligned over the mounting post until it is firmly seated.
- 12 Place the Phillips-head, self-tapping screw supplied with the external alerter into the mounting slot, and tighten it firmly with a #1 Phillips screwdriver.
- 13 To signal the external alerter when the telephone's handset or speaker is active, place the jumpers (A0288529) connecting the 2 right-most pins on the alerter board.

To signal the external alerter when the telephone is ringing or buzzing, place the jumpers connecting the 2 left-most pins on the external alerter board.
- 14 If the telephone is not yet equipped with the power supply board, install it, referring to Procedures 2-4 through 2-6.
- 15 Reassemble the telephone bottom and top cover assemblies to the stand assembly sections. If the telephone is equipped with an MCA, reconnect the data cable to the appropriate jack.
- 16 Tighten all screws. Reconnect all cords; Place the telephone in the normal operating position.
- 17 Place the label supplied with the external alerter option on the bottom cover of the set for tracking purposes.
- 18 For connecting block configuration, see Figure 2-8.
- 19 You have successfully completed this procedure.

Figure 2-8
Local plug-in transformer configuration



Installing or replacing the key expansion modules

Procedure 2-11 describes how to install and replace the key expansion modules. Before installing the key expansion module, the user must have the associated footstand. (Refer to Chapter 12, "Ordering information".)

Procedure 2-11
Installing or replacing the key expansion module

Use this procedure to add one or two key expansion modules to the M2616, and M2216ACD telephones.

Note: The key expansion module requires a power supply board and an additional power source on NTZK (Aries I) sets. See Procedure 2-4 for the procedure to add a power supply board.

- 1 Remove the handset. Place the telephone upside down on top of a level, solid surface covered with soft material or paper to prevent damage to the movable keys and the telephone face.
- 2 Disconnect all cords from the telephone.
- 3 Loosen and remove the two screws from the stand assembly of the telephone. Unsnap the stand assembly by grasping the plastic extension and pulling it upward.
- 4 Set the plastic extension aside taking care not to misplace the mounting hardware.
- 5 If the set is equipped with an MCA, it must be removed and installed into the key expansion module footstand. Refer to Procedure 2-3 for instructions.

6

If	Do
the telephone is not equipped with the power supply option	Step 9
the telephone is equipped with a power supply that you are replacing	Step 7

- 7 The power supply is located on the left side of the set. Remove the screw, and set it aside.
- 8 Grasp the board firmly on each side. Work the board loose from the plug by slowly applying upward pressure to alternate sides of the board until it releases. To install a replacement, continue to Step 12.
- 9 Align the power supply board over the pins, and apply downward pressure until the board is secured on the alignment pins and plug.
- 10 Install the Phillips-head, self-tapping screw supplied with the power supply option into the mounting hole. Tighten the screw firmly with a #1 Phillips screwdriver.

11	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; padding-bottom: 10px;">If</th> <th style="text-align: left; padding-bottom: 10px;">Do</th> </tr> </thead> <tbody> <tr> <td style="padding-bottom: 10px;">the telephone is not already equipped with the key expansion module</td> <td style="padding-bottom: 10px;">Step 15</td> </tr> <tr> <td>the telephone is equipped with a key expansion module that you are replacing</td> <td>Step 12</td> </tr> </tbody> </table>	If	Do	the telephone is not already equipped with the key expansion module	Step 15	the telephone is equipped with a key expansion module that you are replacing	Step 12
If	Do						
the telephone is not already equipped with the key expansion module	Step 15						
the telephone is equipped with a key expansion module that you are replacing	Step 12						

- 12 *Removing the key expansion module***
 Remove the screw from the stand assembly. Unsnap the stand assembly from the key expansion module and telephone by pressing inward at the back of the stand where it meets the base and pulling upwards.
- 13** Remove the interface cable from the telephone by pressing down on the locking tab.
- 14** Remove interface cable from the first key expansion module.
- 15 *Installing the key expansion module***
 Align the bottom of the key expansion module(s) to the bottom of the telephone.
- 16** Snap the ribbon cable connector into the bottom interface jack on the key expansion module.
- Note:** Newer model M2616 or phones require a longer cable between the key expansion module and the set. This cable is shipped with the newer models of the Key Expansion Module. The cable can also be ordered separately (A0671007) and easily replaces the existing cable on all older models of the key expansion module.
- 17** Snap the other end of the ribbon cable into the interface jack in the telephone. Gather the excess cable in the base of the key expansion module.
- 18** To add a second key expansion module, snap a second ribbon cable connector into the bottom interface jack on the second key expansion module. Snap the other end of the ribbon cable into the top interface jack on the first key expansion module. Gather the excess cable in the base of the second key expansion module.
- 19** If the telephone is equipped with an MCA, reconnect the data cable to the base telephone jack. Make sure the MCA cable and interface cable do not get pinched between the base and stand.
- 20** Secure the footstand to the key expansion module(s) and telephone by placing the tabs of the footstand into the slots provided on the base of the key expansion module and telephone and pressing down. Make sure the stand is firmly seated on the base.
- 21** Ensure that the ribbon cable(s) are not pinched between the footstand and mounting posts.

- 22 Insert the self-tapping Phillips-head screws (three if you have one module, four if you have two) supplied with the key expansion module into the mounting holes in the bottom of the footstand. Tighten firmly with a #1 Phillips screwdriver.
- 23 Place the label supplied with the key expansion module(s) on the outside of the bottom cover or footstand of the telephone. This allows proper identification and tracking of the option level of the set.
- 24 You have successfully completed this procedure.

Wall mount instructions

To wall mount the Meridian modular telephones (M2000 series), perform the steps in Procedure 2-12.

Note: The Meridian modular telephones (M2000 series) are equipped with a reversible footstand that allows for wall mounting. The footstand cannot be reversed for wall mounting if the MCA is installed.

Procedure 2-12

Wall mounting (option #2)

- 1 Remove the handset, and place the telephone upside down on top of a level, solid surface covered with soft material or paper to prevent damage to movable keys and the telephone face.
- 2 Disconnect all cords from the telephone.
- 3 Loosen and remove the two screws from the stand assembly of the telephone. Unsnap the stand assembly by grasping the plastic extension and pulling it upward.
- 4 Set the stand assembly aside, taking care not to misplace the mounting hardware.
- 5 Rotate the footstand 180 degrees. Snap it back into place on the telephone bottom cover.
- 6 Tighten all screws, and replace all cords.
- 7 Mount the telephone on a wall using the wall mount holes provided on the bottom of the footstand.
- 8 You have successfully completed this procedure.

Self-test

Meridian modular telephones (M2000 series) have self-test capability. Perform the self-test as described in Procedure 2-13 after installing a Meridian modular telephone or any of the hardware options to ensure proper operation.

Procedure 2-13
Performing the Meridian modular telephone self-test

- 1 Unplug the line cord from the telephone.
- 2 Begin the test by plugging in the line cord while holding down the RLS or Goodbye key.
Response:
Speaker beeps once and all LCDs flash. The Message Waiting lamps light steadily. The following messages appear on the display.

```
LOCAL DIAGNOSTIC MODE  
PRESS RLS KEY TO EXIT
```
- 3 Let go of the RLS or Goodbye key.
Result: The handset is on hook.
- 4 Press each function key, from key 1 to 16. If you have key or display-based expansion modules, continue pressing the function keys in any order.
Result:
Adjacent LCD goes off when a key is pressed.
- 5 Press the Hold key.
Result:
Speaker beeps.
- 6 Press each dial pad key.
Result:
Speaker beeps each time a key is pressed.
- 7 Lift the handset (if applicable).
Result:
Speaker beeps.
- 8 Press the dial pad keys.
Result:
Handset beeps.
- 9 Replace the handset.
- 10 Plug in the headset (if applicable).
Result:
Speaker beeps.
- 11 Press the dial pad keys.

Result:

Headset beeps.

12 Unplug the headset.

13 Press the right side of the volume control key.

Result:

Speaker beeps. Display is filled with dark squares.

14 Press the right side of the volume control key.

Result:

Speaker beeps. Display is blank.

15 Press the right side of the volume control key.

Result:

Speaker beeps. Display shows symbols, including upper and lowercase alphabet.

16 Press the right side of the volume control key.

Result:

Speaker beeps. Display shows various symbols.

17 Press the right side of the volume control key.

Result:

Speaker beeps. Display shows symbols.

18 Press the right side of the volume control key.

Result:

Speaker beeps. Display is filled with dark squares.

19 Press the RLS or Goodbye key.

Result:

Message Waiting lamp goes off. Display shows idle screen within 10 seconds.

20 You have completed this procedure.

Troubleshooting

Use the procedures in this section to troubleshoot problems encountered when installing Meridian modular telephones.

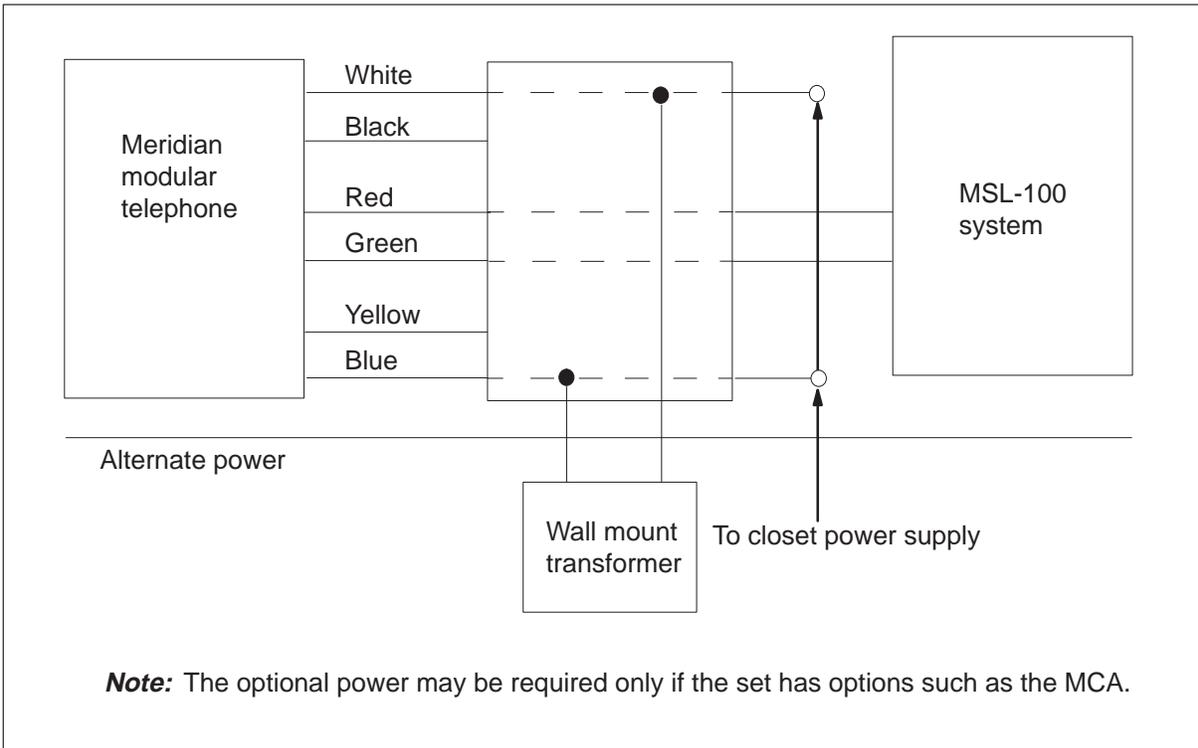
Procedure 2-14

Troubleshooting a set that does not work

1 Unplug the line cord from the telephone and plug it back in.

- 2
- | If the telephone | Do |
|-----------------------------|--------|
| uses external power | Step 3 |
| does not use external power | Step 4 |
- 3 Make sure the transformer or closet power supply is properly connected and that the power supply board is properly installed. Refer to Procedures 2-4 through 2-6. See Figure 2-7.
- 4 Make sure that the jumpers are placed connecting the bottom 2 sets of pins on the P1 connector on the main circuit board. Refer to Procedures 2-4 through 2-6.

Figure 2-7
Meridian modular telephone connections



Procedure 2-15
Troubleshooting a set that does not work and all LCDs are flashing

- 1 Press the Release (RIs) key.
- 2 Unplug the line cord from the telephone and plug it back in.

Procedure 2-16
Correcting a telephone that wobbles

- 1 Ensure that all cords are properly routed through channels underneath the restraining tabs on the footstand. Refer to Figure 2-9.
- 2 Check that the footstand is firmly seated on the telephone.
- 3 Ensure that all feet are firmly seated in the footstand.

Procedure 2-17
Troubleshooting a display that does not work

- 1 Unplug the line cord from the telephone and plug it in again.

If	Do
the set is an M2008	Step 2
the set is anything other than an M2008	Step 4

- 2 Ensure that the transformer is plugged in or the closet power is connected.
- 3 Ensure that the power supply board is installed properly. See Procedures 2-5 and 2-6.
- 4 Check that the display ribbon cable is properly connected to the display board and is not pinched.
- 5 Ensure that the display board is installed correctly and held securely with a mounting screw. Refer to Procedures 2-7 through 2-9.

Troubleshooting MCA

Use Procedure 2-18 when there is no response when you press Return or type **AT** at the terminal.

Procedure 2-18
Troubleshooting lack of response from the terminal

- 1 Press the P key and dial 28 to make sure you are in terminal mode.
- 2 Make sure your PC or terminal's power is on and you are online.
- 3 If the equipment connected to your MCA is not configured as data terminal equipment (DTE), you must connect it using a null modem cable. Refer to the equipment user guide provided by your vendor.
- 4 If you have a display on your phone, press the P key and dial 63 to get into Electronic Industries Association (EIA) monitor mode.

- 5 Be sure the MCA is receiving signals from your terminal by watching the display while entering carriage returns on the keyboard. If the indicator flashes, the connection is correct. If not, check the cable to make sure it is the standard RS-232 cable and is properly connected.
- 6 Press the P key followed by the asterisk key (*) to ensure that the MCA is in the idle mode.

Use Procedure 2-19 when you are connected to a host computer, but get no response when you try to log on.

Procedure 2-19
Troubleshooting logon problems

- 1 Release the call.
- 2 Turn Remote Loopback on.
- 3 Make the call again.
- 4 Type some characters on your terminal. If the characters you type echo back and appear on your terminal, the problem is on the far end data device. If they do not appear on your terminal, the problem is with the MCA and you should call your system administrator.

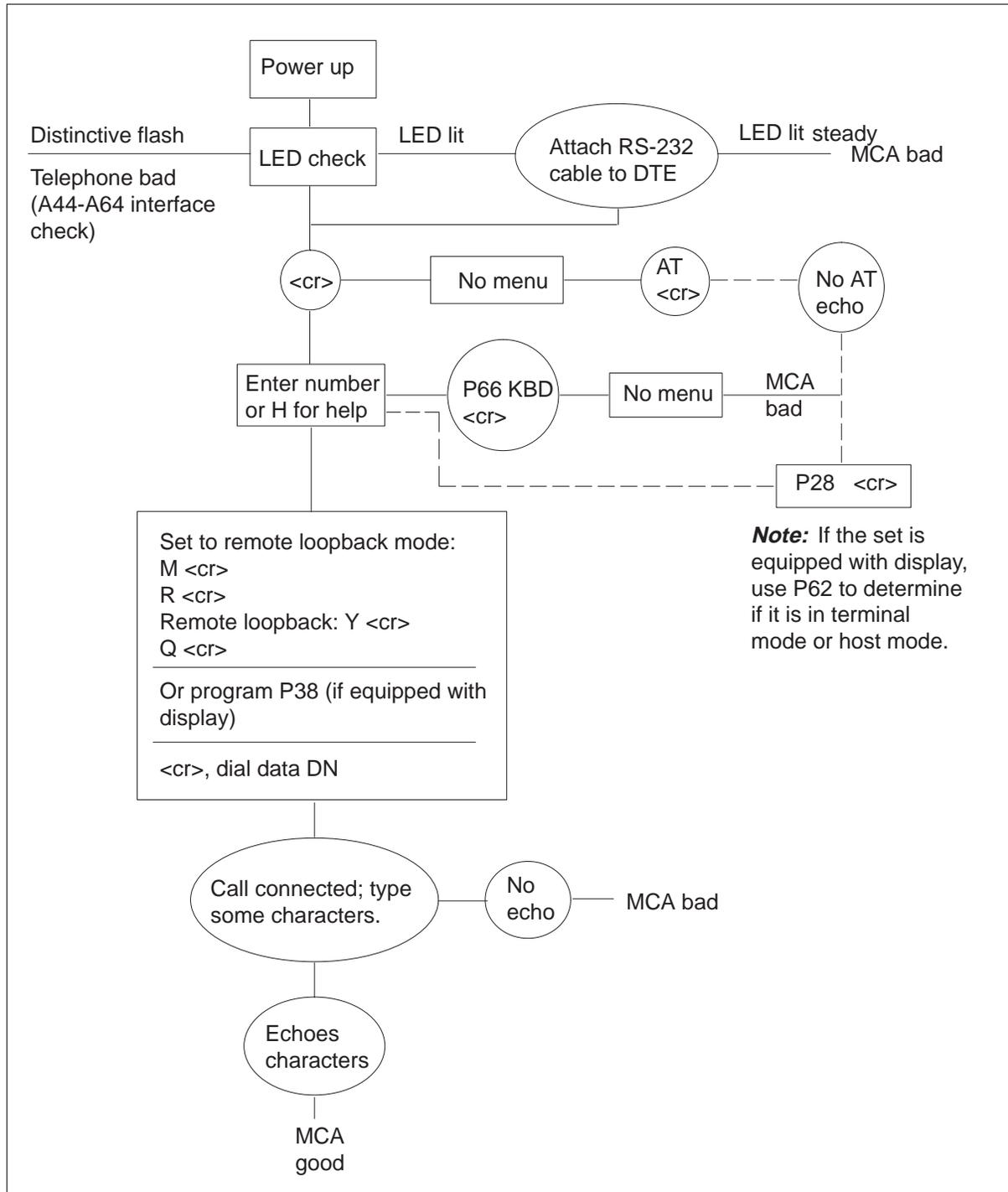
Use Procedure 2-20 if the MCA does not operate at all.

Procedure 2-20
Troubleshooting problems with the MCA

- 1 Check the LED in the back of the telephone to see if it is flashing. If the LED is steadily lit, the MCA may be defective or not configured for your system. If the LED is not lit, the MCA requires external power.
- 2 Make sure the cable from your terminal or PC is connected to the MCA.
- 3 Check the data parameters for your display.
- 4 Be sure the transformer is plugged in.
- 5 Be sure the cable between the MCA and the telephone is connected and is not pinched.
- 6 Be sure the power card is installed correctly and that the jumper settings are correct. Refer to Procedure 2-4, 2-5, or 2-6.

Figure 2-10 is a flowchart provided to help troubleshooting the MCA.

Figure 2-10
MCA troubleshooting flowchart



Procedure 2-21

Troubleshooting problems with the key expansion module

- 1 Unplug the line cord and plug it in again.
- 2 Ensure that the transformer is plugged in.
- 3 Ensure that the power supply board is installed properly.
- 4 Make sure that the ribbon cable connecting the telephone and the key expansion modules routed properly and is not pinched.

Procedure 2-22

Troubleshooting problems with the external alerter

- 1 Ensure that the external alerter board is installed properly.
- 2 Check that connections between the alerting device and the telephone connecting block are correct.
- 3 Make sure that the jumpers are placed on the pins on the external alerter board as described in Procedure 2-10.
- 4 Ensure that the transformer is plugged in.
- 5 Ensure that the power supply board is installed properly. Refer to Procedures 2-4 through 2-6.

Table 2-4 provides troubleshooting tips for additional kinds of problems.

Table 2-4

Miscellaneous troubleshooting tips

Symptom	Solution
Pseudorandom pattern 511 data is idle.	Telephone keypad is inoperative. Press the Release (RIs) key to clear this condition.
The prompt CALL CONNECTED. SESSION STARTS is followed by the RELEASE message.	Check the configuration parameters of the far end data device. If they do not match those of your MCA, the call is dropped. You must change the parameters of the MCA to match the parameters of the far end data device.
—continued—	

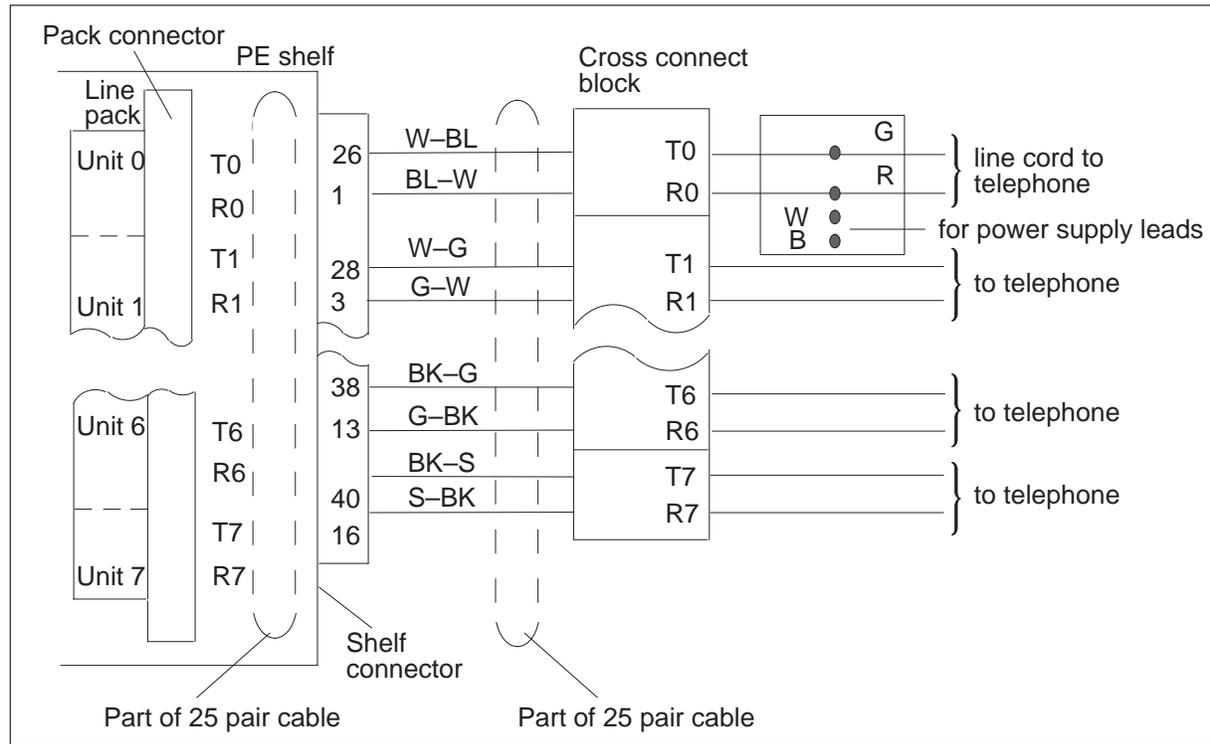
Table 2-4
Miscellaneous troubleshooting tips (continued)

Symptom	Solution
Garbled prompts are sent to your terminal when you press carriage return.	Enter a period (.) followed by carriage return to perform an autoparity.
The CALLING prompt is displayed when you try to make a data call from the initial prompt or Main Menu in keyboard dialing (KBD).	Hold down the break key(s) for two seconds and press carriage return. Try to make the data call again. If the problems persists, the MCA is probably disabled. Call your telephone system administrator.
<p>Note 1: If you are using an RS-232 cable to connect the MCA to an ADM3/5 terminal, be sure pin 22 is disconnected.</p> <p>Note 2: Some terminals may drop DTR with the break. If this happens, the Release message does not display.</p>	
—end—	

Cross-connections

Figure 2-11 is a cross-connect diagram for Meridian modular telephones.

Figure 2-11
Meridian modular telephone cross-connections



General description

The Meridian modular telephones are designed to provide cost-effective integrated voice and data communications capability. These telephone sets communicate with the MSL-100 Integrated Services Network, using digital transmission over standard twisted-pair wiring. The telephones interface with the MSL-100 system using the enhanced digital port card (EDPC), which has 16 ports that support 16 digital telephones and data units. No additional hardware is required in the loop circuit to provide data communications. Analog-to-digital and digital-to-analog conversion of voice signals are accomplished at the telephone set by a codec.

Meridian modular telephones are connected to the system through a two-wire loop carrying two independent 64-Kbyte/s pulse code modulation (PCM) channels with two associated 8-Kbyte/s signaling channels. One of the two PCM channels is dedicated to voice, and the other channel is dedicated to data traffic. Line cords and handset cords on all Meridian modular telephones are equipped with snap-in TELADAPT connectors for easy and quick connection.

Voice

Older model M2006 and M2008 sets are equipped with a piezo-disc transducer for alerting tones and on-hook dialing. Newer sets are equipped with a loudspeaker. The M2616 and M2008HF sets are equipped with a loudspeaker for both handsfree voice communications and alerting tones.

Data

Asynchronous ASCII terminals and personal computers can be connected through a RS-232-C interface directly to any Meridian modular telephone at speeds from 110 byte/s to 19.2 Kbyte/s asynchronous and 56 or 64 kbit/s synchronous to allow for data calls. Data capability is provided by the optional Meridian communication adapter (MCA), which is a single printed circuit pack (PCP) mounted within the telephone and works in conjunction with the digital interface chip also residing in the telephone. The firmware in the MCA serves as an interface between the user and the MSL-100 system for establishing data calls.

The firmware performs the following functions:

- scans for user keyboard input
- decodes and converts user inputs to appropriate key-press codes to send to the line group controller (LGC)
- interprets call sequencing commands from the LGC
- generates appropriate messages prompts, based upon call setup progress

The MSL-100 MCA keyboard dialing (KBD) provides user interaction with the MCA.

Using KBD, the following information is provided:

- command menus
- call progress messages
- user input prompts
- status and error information

With KBD, a menu of features displays on the data terminal. A user enters a number, and information displays call progress messages or error condition messages, all in English phrases. After the data call is established, KBD becomes inactive. When the call is disconnected, KBD resumes operation.

Physical characteristics

All of the Meridian modular telephones described in this document are equipped with the following:

- hold key
- message-waiting lamp
- program key
- release key
- speaker
- volume control key

Each modular telephone also has a number of programmable keys with liquid crystal display (LCD) indicators that can be assigned to any combination of directory numbers (DN) and features. The lower right-hand key (Key 1) is reserved for the primary directory number (PDN). The number of keys that are programmable can depend on the options that are installed in the phone.

Note 1: When equipped with a display module or MCA, Key 8 (Key 6 on M2006) is automatically assigned as the Program key and cannot be changed.

Note 2: There is only one DN for the M2006 telephone set. If more than one DN is assigned, it disables itself, and all LCDs light steadily. It returns to its normal operating state when all secondary DNs are removed.

Table 3-1 describes the LCD indicators and the four supported key and LCD states.

Table 3-1
LCD indicator states

Function	LCD state
Idle	Off
Ringing (or feature pending)	Flash (60 Hz)
Hold	Fast flash (120 Hz)
Active	On

Each programmable key has an associated LCD indicator, and all can be assigned in any combination of loops and features. Refer to Table 3-2.

Table 3-2
Meridian modular telephone programmable and fixed keys

Version	Programmable keys	Fixed keys
M2006	5	Hold Release Volume control
M2008 M2008HF	7	Hold Release Volume control
M2016S	15	Hold Release Volume control
—continued—		

Table 3-2
Meridian modular telephone programmable and fixed keys (continued)

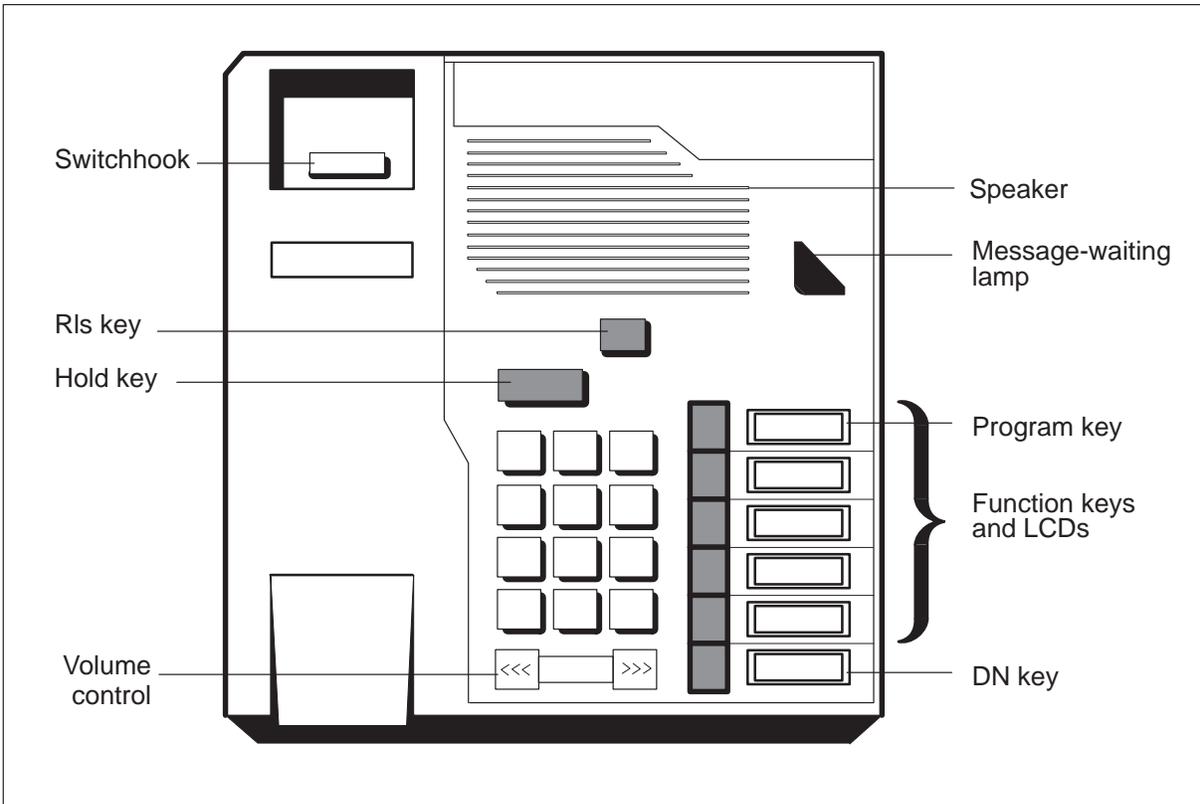
Version	Programmable keys	Fixed keys
M2216ACD-1 M2216ACD-2	15	Hold Release Volume control
M2616	15	Hold Release Volume control
—end—		

M2006

The M2006 modular telephone (Figure 3-1) is a single-line telephone with five programmable function keys having the following characteristics:

- There are five assignable key/LCD indicator pairs in addition to the PDN key (Key 1).
- A piezo-disc transducer on older phones or speaker on newer models provides alerting tones and on-hook dialing.
- It is loop-powered, but when equipped with the MCA, it requires an external power supply option.
- If equipped with the MCA, the top right feature key (Key 6) becomes dedicated as the local program mode key.

Figure 3-1
M2006 modular telephone



Dimensions for the M2006:

- length—8.42 in (216 mm)
- width—8.42 in (216 mm)
- height—3.61 in (92.6 mm)
- weight—2.65 lbs (1.1 kg)

M2008

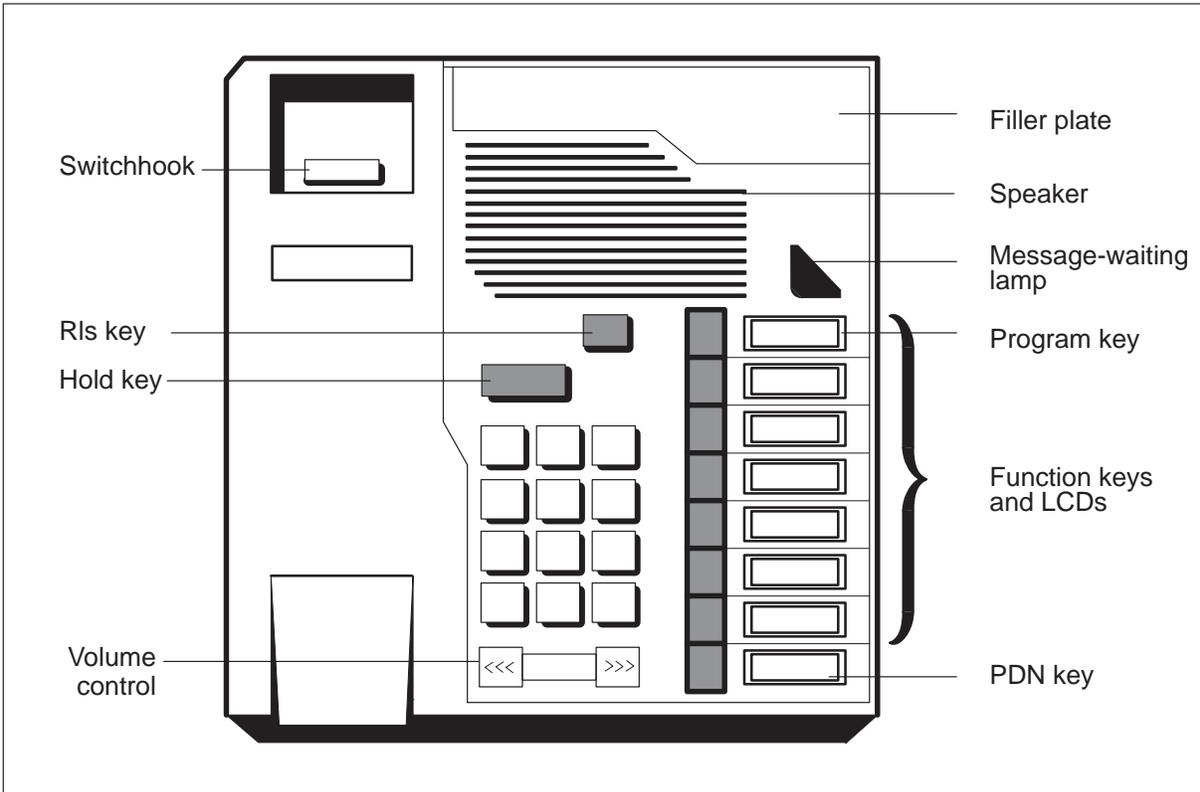
The M2008 modular telephone (Figure 3-2) is a multiline set with seven programmable function keys having the following characteristics:

- There are seven assignable key/LCD indicator pairs in addition to the PDN key (Key 1).
- A piezo-disc transducer (older models) or loudspeaker (newer models) provides alerting tones and on-hook dialing.
- If equipped with the MCA, the top right feature key (Key 8) becomes dedicated as the local program mode key.

3-6 General description

- It offers the display option.

Figure 3-2
M2008 modular telephone



Dimensions for the M2008:

- length—8.42 in (216 mm)
- width—8.45 in (216 mm)
- height—3.61 in (92.6 mm)
- weight—2.65 lbs (1.1 kg)

M2008HF

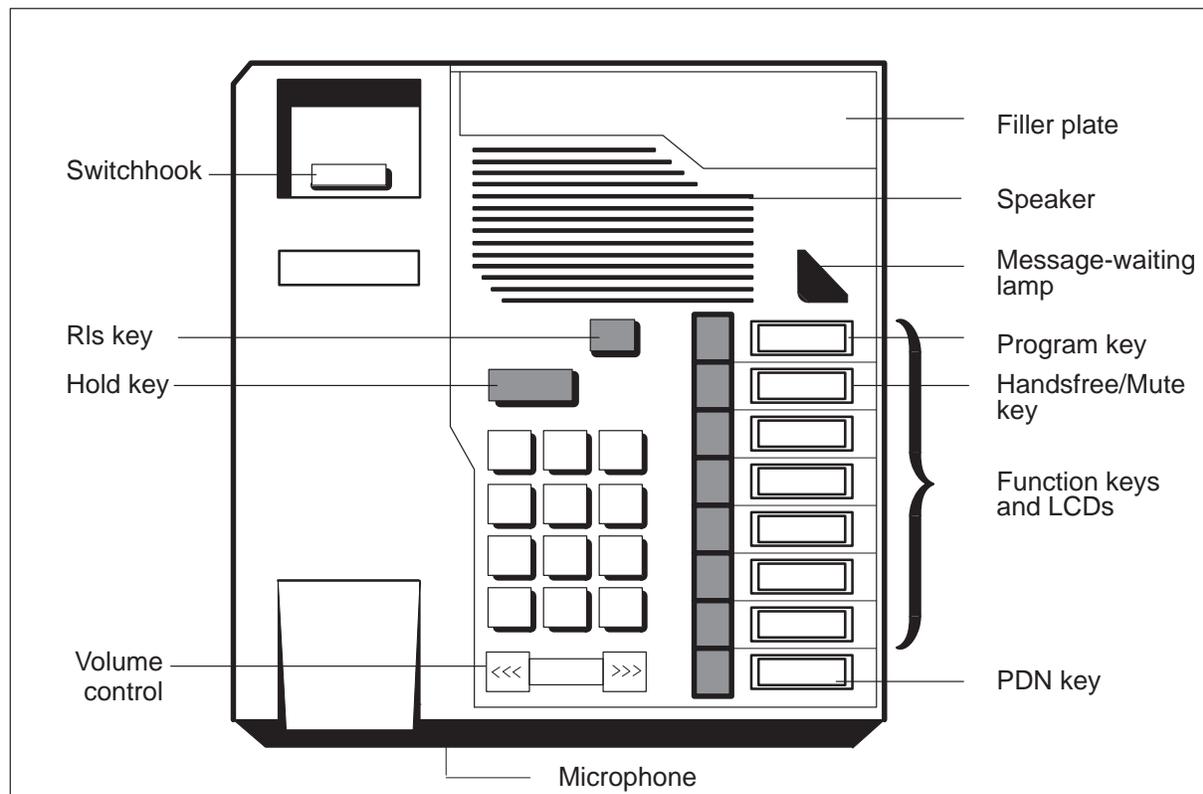
The M2008HF modular telephone (Figure 3-3) is a multiline digital telephone with the same features, functionality, and attributes as the M2008 set, plus the addition of a built-in 2-way speakerphone.

- If either the data option or display option (or both) is installed, the top right feature key (key 8) functions as a local program mode key.

- If neither the data option nor the display option is installed, key 8 operates as a normal system programmable key, sending key press and release messages to the PBX and receiving indicator status messages from the PBX.
- If Group Listening is enabled at the set (hardware plug), key 7 becomes the Group Listening key. In this capacity, this key will not send any message to the PBX.
- Key 7 is the programmable Handsfree key. It is controlled through software activation/deactivation using service order (SERVORD). This key functions the same as the Handsfree key on the M2616 sets. If the handsfree option is selected, then no other feature or DN can be assigned to key 7.

Note: If both handsfree and Group Listening are selected (both hardware plugs on), key 6 doubles as a Handsfree/Mute key and a Group Listening key. If the handset is off-hook, it is a Handsfree/Mute key. To go from off-hook to handsfree, you must press and hold feature key 6 while placing the handset on-hook, then release the key.

Figure 3-3
M2008HF modular telephone



Dimensions for the M2008HF:

- length—8.4 in (212 mm)
- width—8.5 in (216 mm)
- height—3.7 in (92.6 mm)
- weight—2.4 lbs (1100 grams)

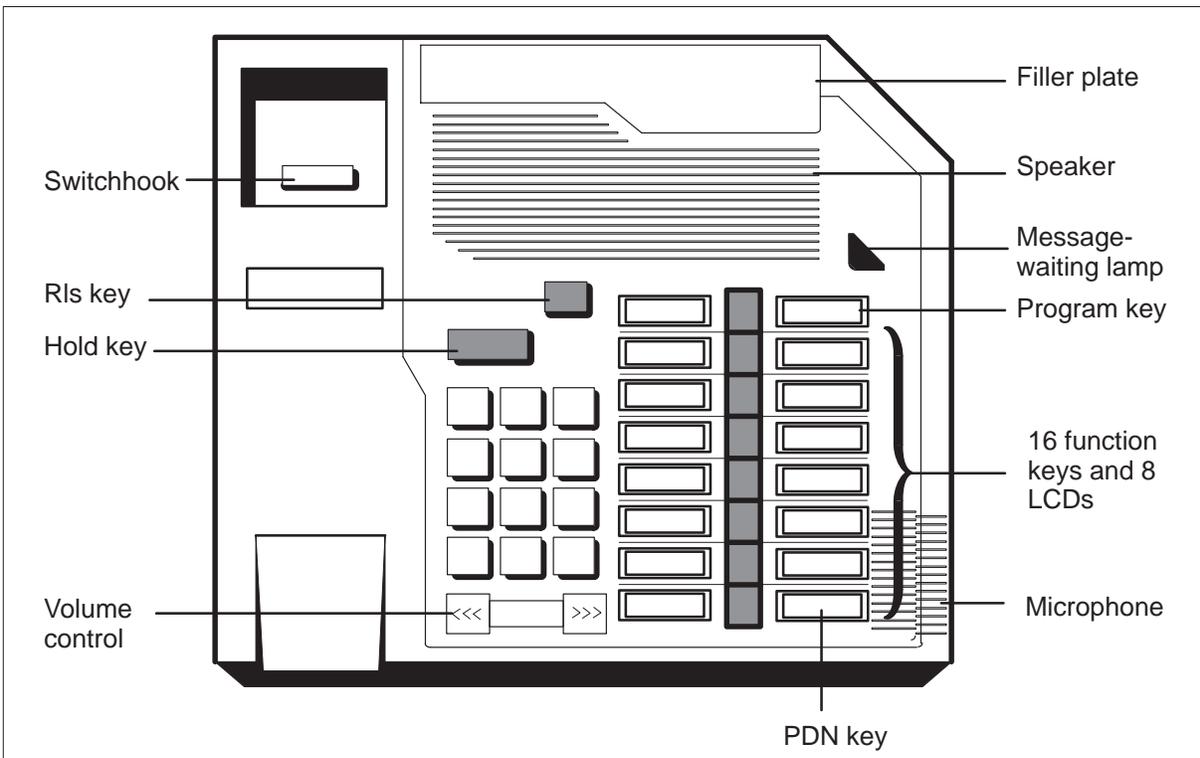
M2016S

The M2016S modular telephone is a telephone security group (TSG) Class 2 type accepted digital telephone designed to provide on-hook security that is required for certain government contractor applications. This security is accomplished through the use of relay circuitry that physically disconnects the handset and the piezo from the telephone circuit when the hook switch is pressed.

The message-waiting LCD in the upper right hand corner of the telephone provides a visual indication of security as well as message waiting. The red LED triangle lamp lights up when the telephone set is not secure and blinks when a message is waiting. (The telephone set is not secure when the hook switch is up, when the telephone is ringing, or any time that the handset or piezo relays are connected.) The indication of a non-secure state takes precedence over a message-waiting indication.

Due to the circuitry required to provide this on-hook security, the M2016S modular telephone requires auxiliary power and cannot accommodate the external alerter interface. When commercial power fails, the M2016S modular telephone cannot function unless the telephone is powered by a closet power supply that is backed up by an uninterrupted power supply (UPS).

Figure 3-4
M2016S modular telephone keys and indicators



Dimensions of the M2016S phone:

- length—9.75 in (251 mm)
- width—9.45 in (237 mm)
- height—3.64 in (92.6 mm)
- weight—2.65 lbs (1.10 kg)

M2616

The M2616 modular telephone (Figure 3-5) is a high performance multiline set with 15 programmable function keys and an integrated handsfree unit.

The M2616 set has the following characteristics:

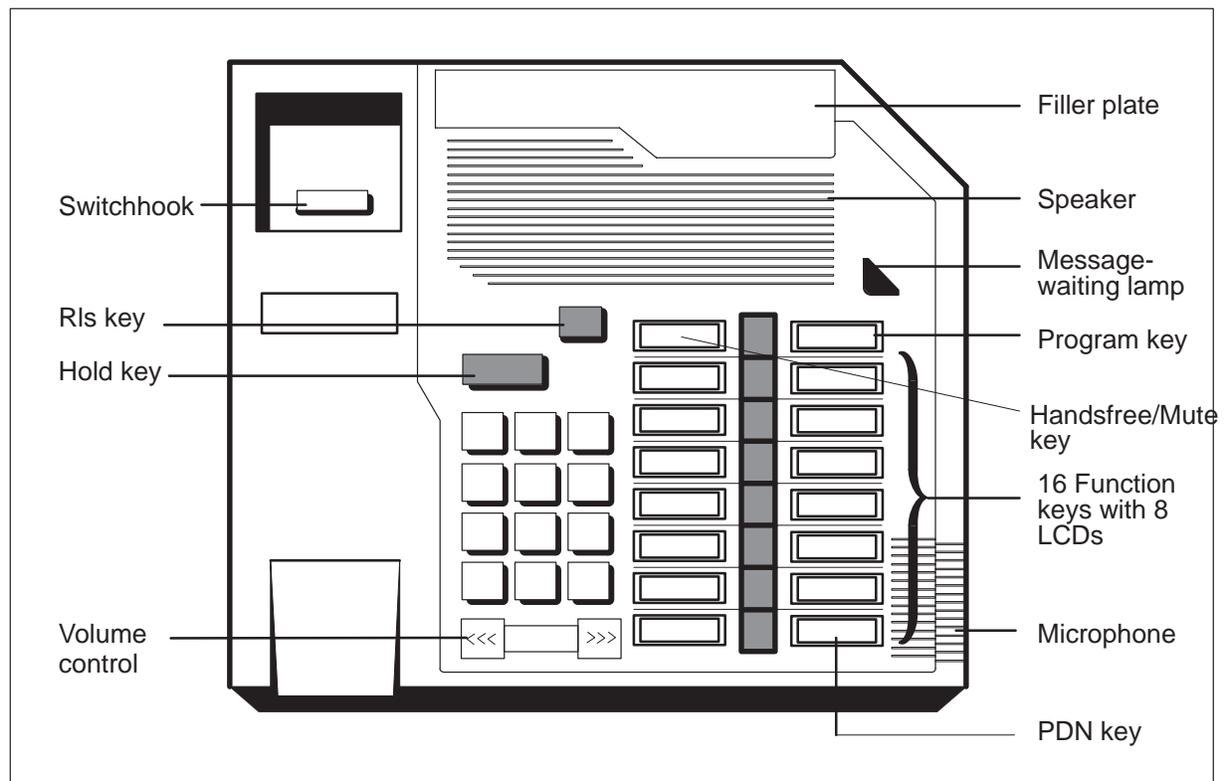
- There are 15 assignable key/LCD indicator pairs in addition to the PDN key/LCD indicator (Key 1). If selected, one pair is assigned for the use of the optional Handsfree/Mute function (Key 16).

Note: If handsfree is implemented on the telephone set, then the option is assigned to Key 16 and does not allow any other feature or directory number to be assigned to Key 16.

3-10 General description

- A loudspeaker is provided for alerting tone and for voice reproduction during handsfree operation.
- A microphone is included.
- If equipped with the MCA, it requires an external power supply option.
- If equipped with the MCA, the set's top right feature key (Key 8) becomes dedicated as the local program mode key.
- It may have the display option.
- One or two 22-key expansion modules may be added, giving the set from 38 to as many as 60 keys. New model phones require a longer cable (A0671007). This cable is provided with the key expansion module.

Figure 3-5
M2616 modular telephone



Dimensions of the M2616 phone:

- length—9.75 in (251 mm)
- width—9.45 in (237 mm)
- height—3.64 in (92.6 mm)

- weight—2.65 lbs (1.10 kg)

M2216ACD

The M2216 is a multiline set for ACD operations with 15 programmable function keys. See Figure 3-6.

Note: The M2216 replaces the M2216-1, which has been manufacture discontinued.

The M2216 has the following characteristics:

- There are 15 assignable key/LCD indicator pairs in addition to the PDN key/LCD indicator (Key 1).
- A special ACD display module is provided.
- A built-in power supply is optional.
- Two RJ-32 jacks for modular electret headsets are provided, one agent and one supervisor monitor.
- One or two 22-key lamp modules may be added giving the set a total of 38 to 60 keys.

One RJ-32 jack allows both receiving and transmitting, and the other jack allows receiving only. The set is completely loop-powered.

M2216-2

The M2216-2 is a multiline set for ACD operations with 15 programmable function keys. See Figure 3-6.

Note: The M2216-2 has been manufacture discontinued.

The M2216-2 has the following characteristics:

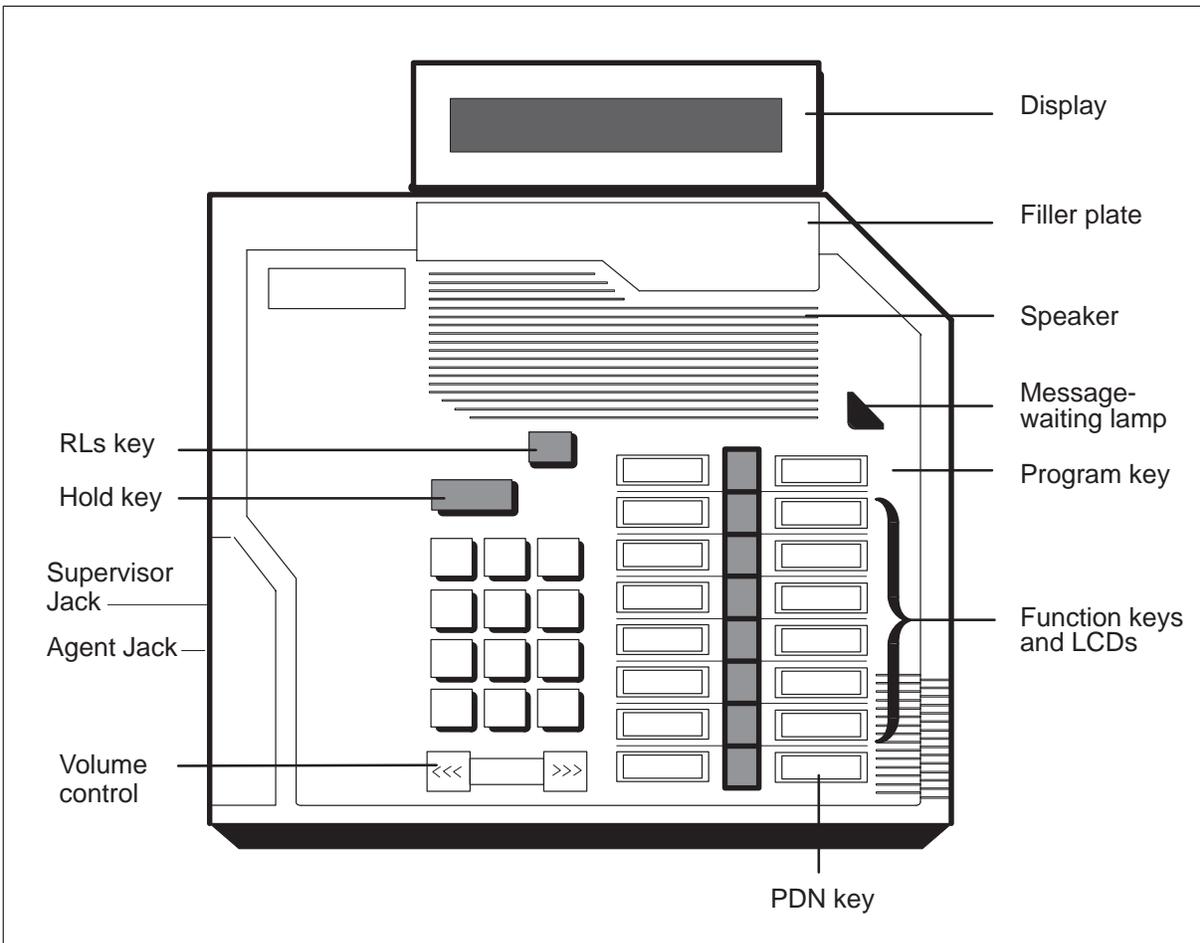
- There are 15 assignable key/LCD indicator pairs in addition to the PDN key/LCD indicator (key 1).
- A special ACD display module is provided.
- One RJ-32 jack for a modular electret headset is provided.
- One PJ-327 jack for a carbon headset is provided.
- A built-in power supply is provided.
- One or two 22-key lamp modules may be added giving the set a total of 38 to 60 keys.

It is similar to model 1, but with one PJ-327 jack for a carbon agent headset and one RJ-32 jack for an electret supervisor headset.

3-12 General description

Factory-installed power allows the use of a carbon set in the PJ-327 jack. When local power is present, the carbon headset is functional, and an electret headset may be used with the RJ-32 jack in a listen-only mode. When local power is not present, the PJ-327 jack is not functional, and an electret headset in the RJ-32 jack can be used. Sets with a display and an electret headset are loop-powered and function without local power.

Figure 3-6
M2616 modular telephone



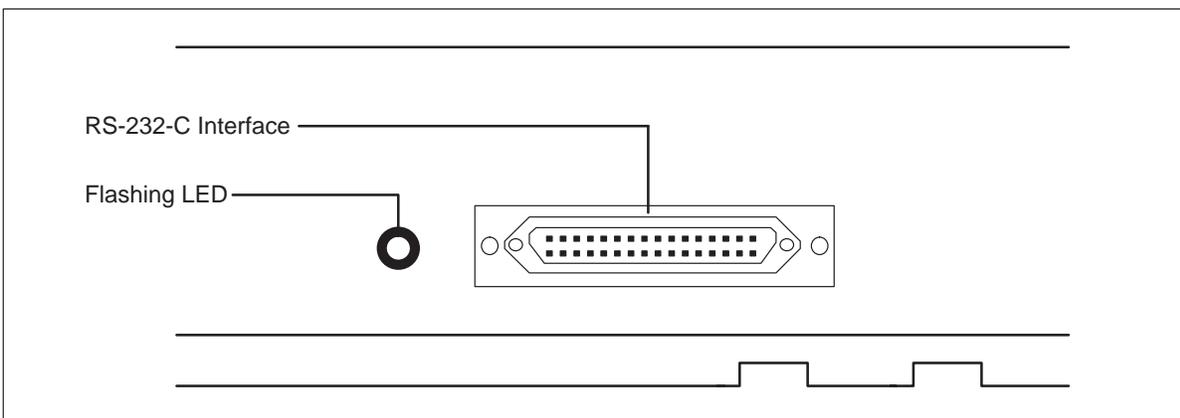
Dimensions for the M2216 (and M2216-1 and -2):

- length—9.75 in (251 mm)
- width—9.45 in (237 mm)
- height—3.64 in (92.6 mm)
- weight—2.65 lbs (1.1 kg)

MCA

The MCA is an integrated data module consisting of a single PCP that is mounted within the telephone and allows synchronous (64 kbit/s) and asynchronous (110 to 19,200 byte/s) ASCII terminals, personal computers, and printers to be connected to the set through an RS-232-C interface. The MCA is a part of data communications equipment (DCE). Figure 3-7 illustrates the back of a set, showing an MCA.

Figure 3-7
Back of telephone set showing the MCA



The MCA also requires an additional power supply. To indicate MCA as a data option, datafill the data option field in tables IVDINV and DPROFILE as MCA. The MCA includes the features described in the sections that follow.

Diagnostics

Each time the MCA's power is turned on, the MCA executes a self diagnostics routine.

The LED on the MCA indicates the results of the diagnostics as follows:

- LED off—no power or bad LED
- LED on—failed self test
- LED flashing (2 Hz)—operational
- LED distinctive flash—communication loss with set, MCA is good

Download requests

After the powering routine, the MCA sends a message requesting profile information on itself. When the message is received, the digital set interface processor (DSIP) downloads the information to the MCA. Profile information is also downloaded to the MCA from the central control (CC)

whenever the MCA is returned to service (RTS) or when the digital line module (DLM) or intelligent peripheral equipment (IPE) is returned to service.

Escape sequence

When the MCA is configured for Hayes-compatible keyboard dialing, the MCA has two operational states: command and online.

In the keyboard dialing command state, the user inputs are interpreted as call setup information. After the call is established (CONNECT on the display), the MCA enters the online state and transmits all data on the RS-232-C interface transparently across the network to the far-end duplex device. It is the responsibility of the DTE connected to the far-end MCA to respond to the user input.

To return from online state to command state, the user may execute an escape code sequence. The default escape sequence consists of a minimum of one second, with no data, followed by three plus signs, that are entered at less than one second between each adjacent +, followed by a minimum of one second of no data. It is extremely unlikely that such a sequence would be executed accidentally while in the online state.

Both the escape character (+) and escape guard time (one second) are programmable using registers S2 and S12, respectively.

MCA responses

All messages to the terminal are in upper case (capital letters). The response from the MCA can be in digits or word code. The default response is word code. To change the default, enter the V command. For more detailed information, refer to Appendix A, "Hayes standard AT commands". MCA responses can be found in Appendix D, "MCA digit and word code responses".

Call disconnection

A user can cause the far end of a data call to terminate by entering a control D (holding down both the control key and D key together).

If the terminal's power is switched off, the MCA disconnects the call. The data terminal ready (DTR) response is OFF. If the user presses a break key for 1.6 seconds, the local MCA disconnects the call. An alternative to pressing the break key for 1.6 seconds is to press the break key three times within the 1.6-second interval.

Echo

During call set-up, all user inputs are echoed by the MCA to the terminal. To turn the echo off (command state), enter the command E0 (zero).

Keyboard dialing

With keyboard dialing (KBD), the user can originate data calls to local and remote hosts or DTE by using the terminal keyboard. KBD is only supported for ASCII, asynchronous, character mode, interactive terminals equipped with an EIA RS-232-C interface.

Note: KBD does not support block mode terminals.

AT dialing

AT dialing refers to the capability of originating data calls to local and remote hosts or DTE using a terminal keyboard or personal computer. The AT dialing feature supports only ASCII, asynchronous, character mode, interactive terminals equipped with EIA RS-232-C interface. AT dialing is a part of Hayes keyboard dialing commands, therefore, all future references to AT dialing also mean Hayes keyboard dialing.

Hayes keyboard dialing supports AT-compatible communication software packages for personal computers. Terminal emulation packages can also be used with AT dialing.

For originating data calls using an intelligent modem command set (AT) similar to industry standard Hayes smart commands, refer to Appendix A, "Hayes standard AT commands".

Extended AT command dialing

This feature provides the user or the user's application software the capability to originate data calls from a data terminal or workstation to local and remote hosts and DTE from the MCA. Refer to Appendix A, "Hayes standard AT commands".

Parameter registers (S registers)

The parameter registers S0 through S12 may be used to program various call setup parameters. Querying the value of a particular S register may be accomplished by executing the command, **Sr?**, where **r** equals 1 to 12.

Refer to Appendix C, "Basic AT command sets", for information on the parameter registers compatible for AT dialing.

Learn script file

This feature allows the user to automatically dial the local or remote host and transmit the login sequence each time this feature is activated.

Examples of menus associated with this feature are illustrated in Appendix E, “Script file menus”.

Peripheral equipment

Digital line module

The telephone interfaces with the EDPC in the digital line module (DLM) of the MSL-100 system using time compressed multiplexed (TCM) transmission. The EDPC contains 16 integrated voice and data (IVD) ports, which support 16 Meridian modular telephones and MCAs.

The Meridian IVD sets are supported on the NT8X49 DLM with NT8X47BA EDPCs. The EDPC is a 16-port line card with 16 voice and 16 data channels. Each channel has two ports. The voice ports are even numbered (0, 2, 4, ..., 30), and the data ports are odd numbered (1, 3, 5, ... 31).

To determine whether a telephone is equipped with an MCA, look at the back of the phone. A Meridian modular telephone is equipped with an MCA if the data connector and MCA LED are visible at the back of the telephone. Adding 1 to the circuit number of the line equipment number (LEN) for the telephone will show the LEN for the corresponding data channel. See the following example.

voice LEN (telephone): DLM0 00 0 00 30

data LEN (MCA): DLM0 00 00 31

Examine table IVDINV for MCA datafill for a particular LEN.

For more information on the DLM, refer to the *Digital Line Module (DLM) Reference Manual*, 555-4001-101.

Intelligent peripheral equipment

The intelligent peripheral equipment or IPE consists of a shelf that is housed in a universal equipment module (UEM). The peripheral equipment controller card resides within the IPE. It also houses 16 slots for analog, digital, and message-waiting line cards.

These line cards perform the following functions:

- The analog line card (ALC) interfaces with the controller card and allows analog sets, such as 500/2500 sets, to transmit and receive calls. A maximum of 16 analog line interfaces are supported.
- The message-waiting line card (MLC) supports message-waiting lamp sets in addition to the 500/2500 sets.

- The digital line card (DLC) interfaces with the IVD digital terminals and supports the M2000 and M3000 series sets and their respective data options. The DLC inserts into any line card slot on the IPE shelf and can interface with a maximum of 16 digital sets for each DLC card, for a total of 32 ports.

The UEM is stackable in units of one to four. The UEMs rest on a pedestal base and are covered by a top cap. The UEMs, pedestal, and top cap are collectively called the IPE column (IPEC).

For more information on the IPE, refer to the *Intelligent Peripheral Equipment (IPE) Reference Manual*, 555-4001-129.

External alerter interface

The external alerter board provides an interface to standard remote ringing devices, such as a ringing unit installed in a location separate from the telephone. The external alerter interface is not the remote ringer itself, but provides access to standard, off-the-shelf remote ringing devices. You can program the external alerter interface to activate a ringer or lamp when the telephone rings, or when the telephone is in use (off-hook).

Note: The external alerter board requires additional power.

Optional peripherals

The modular design of the digital telephones described in this document makes adding any of the following hardware options easy. Each optional piece of equipment is described in the following information and summarized in Table 3-3.

Table 3-3
Features and options matrix

Feature or option	M2006	M2008	M2008HF	M2016-S	M2216ACD	M2616	M2616CT
programmable keys	5	7	7	15	15	15	14
handsfree microphone			Standard			Standard	Standard
Note: An "X" indicates that the feature is available for that particular set.							
—continued—							

Table 3-3
Features and options matrix (continued)

Feature or option	M2006	M2008	M2008HF	M2016-S	M2216ACD	M2616	M2616CT
<i>Optional hardware availability:</i>							
display		X	X		Standard	X	Standard
key expansion module					X	X	
MCA	X	X	X	X	X	X	
external alerter	X	X	X		X	X	
Headset	X	X	X	X	Electret	X	X (on handset only)
power supply	X	X	X	Required	X	Required with MCA	Standard for battery
Note: An "X" indicates that the feature is available for that particular set.							
—end—							

Display module

This modular 2-line by 24-character liquid crystal display (LCD) accessory makes the features easy to use. Screen prompts take the user step-by-step through the procedures.

The display module shows the following information:

- time and date
- call length
- name or number of the calling party (optional)
- name or number of the called party (optional)
- volume levels for ringing, buzzing, on-hook dialing, handset, headset, and handsfree
- MCA parameters

The display module displays information in the following languages:

- English

- Quebec French
- Spanish

Sets equipped with this display option have added local features over the basic set:

- display of call timers
- predial (only available after the display is physically attached to the set)
- independently setting volume levels for the following items:
 - ringing
 - buzzing
 - on-hook dialing
 - handset
 - headset
 - handsfree

Note: These volume levels may be set without a display option attached. If attached, a representation of the volume level is displayed on the module.

When the set is idle, the time and date are displayed.

Predial allows the user to enter digits before going off-hook. Entries must begin with a number, pound sign (#), or asterisk (*). Predial digits appear from left to right on the second line of the idle screen. Use the volume control toggle key (<<< >>>) to move the cursor and change or enter digits. Operation of the Rls key or a function key prior to seizing a line clears the screen, and the numbers are not saved. An incoming call also clears the screen.

When assigned the display module, the top right key of the telephone set (Key 8) becomes dedicated for use as a local program mode key. (Key 6 on the M2006 set functions as the local program mode key.) This key may be used to format the display for the time and date or set volume levels with the aid of display graphics. If the telephone set is equipped with the MCA, this key is used to set parameters for data service.

When the user is programming certain features, such as Speed Calling, the display module guides the user through the steps required to program the feature. Also, when activating or canceling certain features, the display module indicates which feature has been activated or canceled.

Name Display Character Extension

This feature provides the option to use up to 24 characters exclusively for the name field on the phone sets capable of handling the increase. The sets compatible with this feature are:

- M2006
- M2008
- M2016S
- M2216A
- M2216B
- M2616
- M2616CT
- M5208
- M5209
- M5212
- M5213
- M5216
- M5312

This extension increases the length of the name field on the display from 15 to 24 characters. The increase uses all 24 physical spaces on the top line of capable IVD and MBS phones, leaving no room for the DN.

Without this feature, when a call is received on the terminating end, the name of the caller and the DN displays across the top line. The call timer appears on the bottom line. With this feature, the DN is displayed on the bottom line with the timer, leaving room on the top line for all 24 digits to be used for the name field. Figures 3-8 and 3-9 give examples of the differences between the 15 character name display and the 24 character name display.

Figure 3-8
15 character name display for a basic call

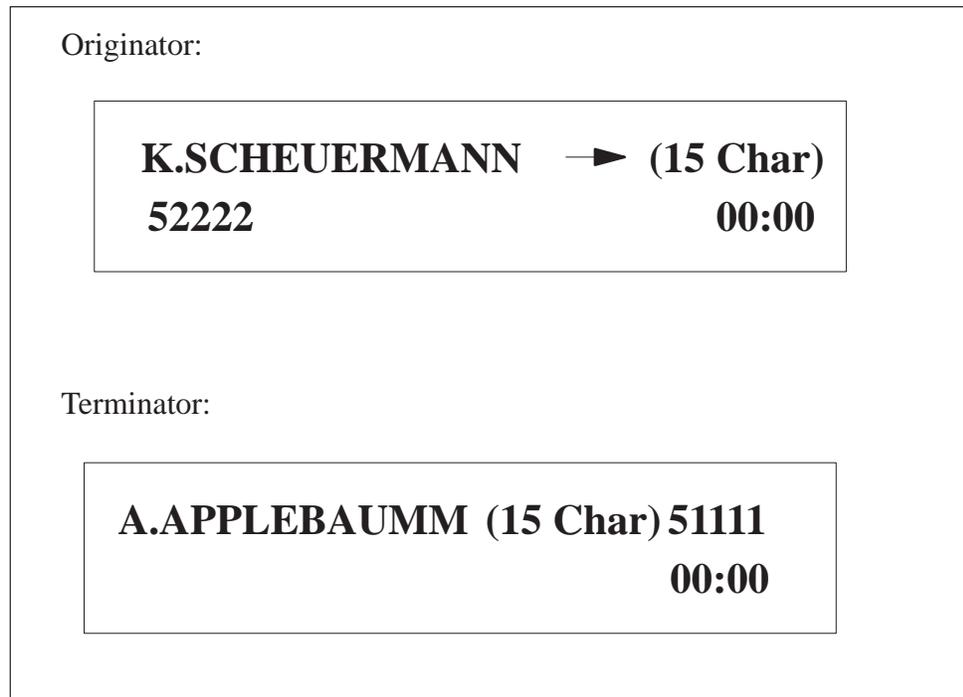
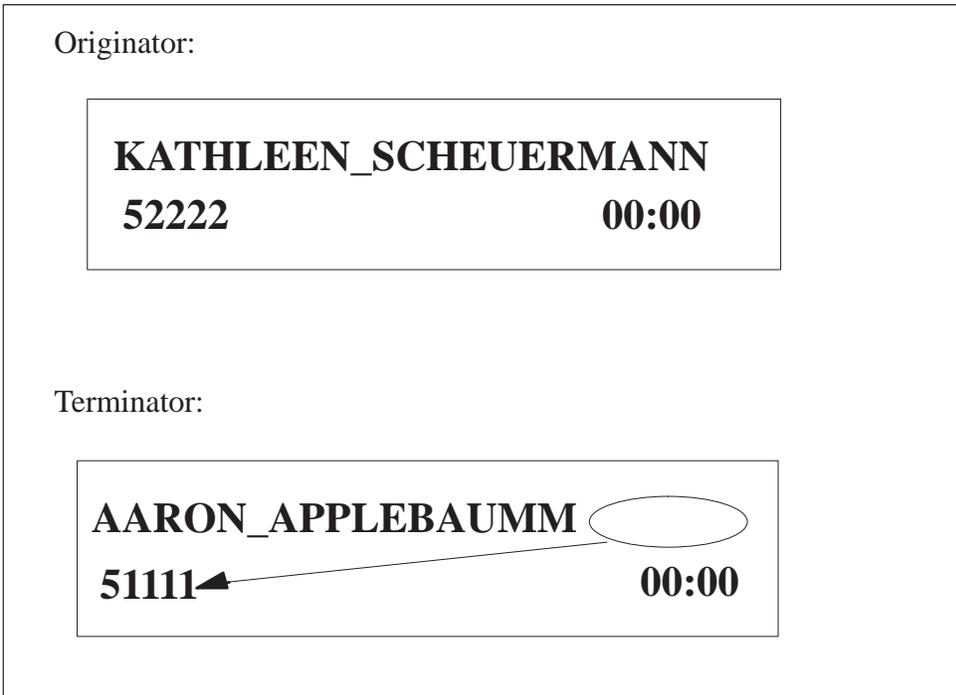


Figure 3-9
24 character name display for a basic call



The 24 character name is displayed internally only. This is accomplished by adding the feature in SERVORD.

Note: Both the existing 15 character name feature and the 24 character name feature are compatible. The user has the capability of displaying 24 characters internally while still being able to display 15 characters externally.

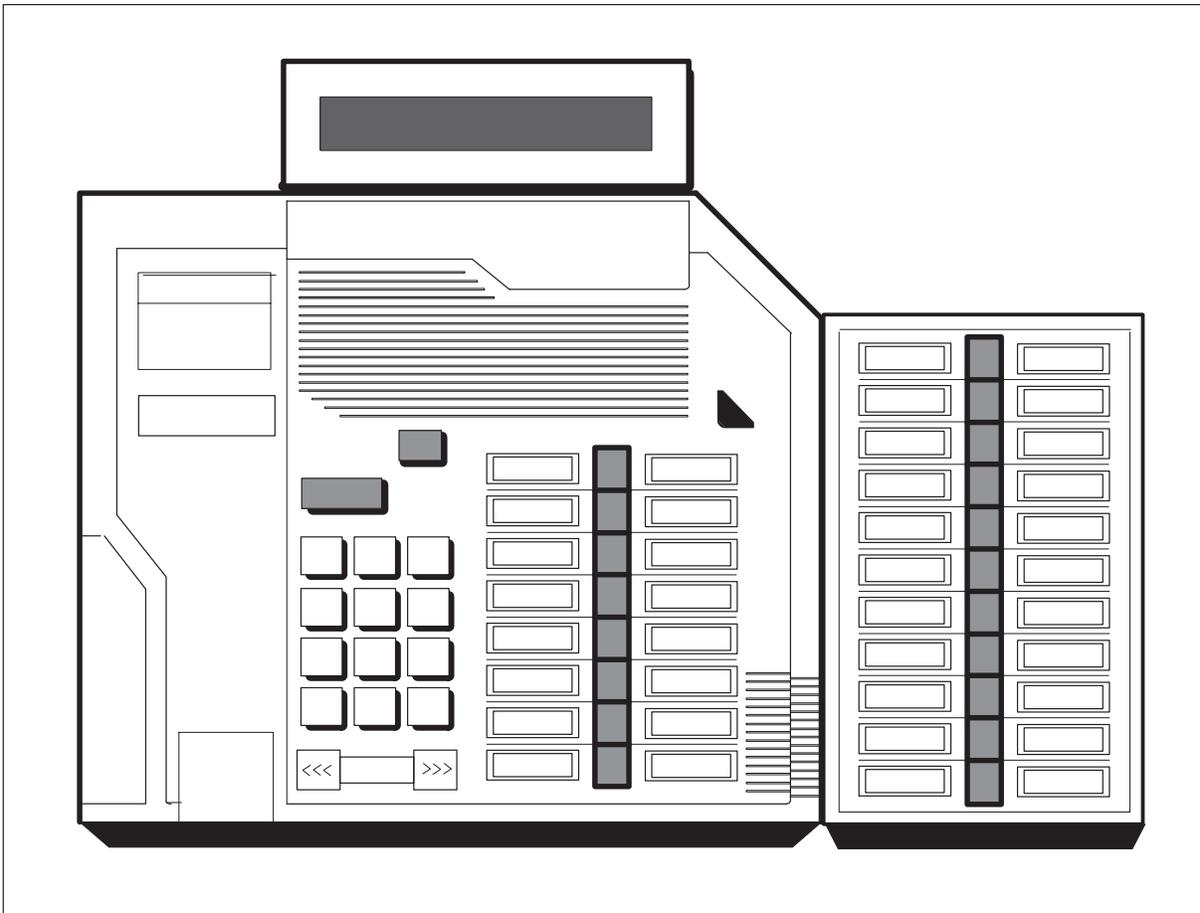
Key expansion module

A 22-key modular accessory may be connected to the M2216 and M2616 terminals and provides 22 additional programmable feature keys. When the terminals and modules are attached, they react as one integrated unit. This option is only available for 16-key sets.

A maximum of two modules can be added to a set giving the set 15, 37, and 59 programmable feature keys. Each key has an associated lamp and may be assigned a directory number or a feature. A separate footstand for each module is required. Refer to Chapter 12, "Ordering information".

Figure 3-10 shows an example Meridian modular telephone equipped with the optional display and key expansion module.

Figure 3-10
M2616 with display and key lamp module



Brandline insert

The filler plate on the telephone or display module contains a removable insert designed to accommodate custom labeling. You can order blank brandline inserts and have a printer silkscreen your company logo on them. Brandline inserts snap easily into and out of the filler plate.

Note: Telephone sets sent to Nortel (Northern Telecom) for repair are returned with the standard Meridian logo in the insert. Remove any customized brandline inserts before returning sets for repair.

Power supply option

The external power supply option provides additional power when various hardware options are added to a Meridian modular telephone. The M2616 set requires the power supply option for all hardware options except the display module and handsfree. The power supply option is also required for any set that uses a bit-mapped display.

The power supply options allow the terminal and all installed Meridian modular telephone options to use local power. They are used with the Meridian modular telephones whenever the installation requires an external alerter, an MCA, a boosted alerting volume, or carbon headsets.

Some set configurations and options need more than basic loop power to operate. For more information, refer to Chapter 4, "Performance specifications".

If the set is equipped with a display, the number of programmable keys is reduced by one. For example, the M2616 Key 8 (Key 6 on M2006 sets) automatically becomes the program mode key.

Table control

The Meridian modular telephones join the existing line of integrated voice and data (IVD) sets within table control. The configuration information is contained in table IVDINV.

The configuration information contains the following:

- an assigned set's LEN
- the type of Meridian modular telephone
- optional equipment

Table IVDINV uses the following format:

LEN	IVDTYPE	RINGING	OPTION
2 0 1 2	M2008	FH	\$

The Meridian modular telephones also join other IVD sets, as well as phones and data units, in tables KSETLINE and KSETFEAT for line and feature appearances, respectively.

The MCA profile information is stored in table DPROFILE. For information on how to datafill the options for these tables, refer to the *Commercial Systems Customer Data Schema*, 555-4031-851, or *Defense Switched Network Customer Data Schema*, 555-4021-851

Call processing

The Meridian modular telephone IVD sets follow the other IVD sets in call processing. If a call originates from or terminates to an MCA, then the call receives a call progress indicator (CPI). This allows the MCA to follow a call and display on the terminal different features to the user. For example,

if the user makes a call from the MCA and the far end is busy, the MCA asks if the user wants to invoke the Ring Again feature, assuming it is assigned to the MCA.

Facilities maintenance

The line test position (LTP) level of the MAP terminal is, among other things, used for posting a line, busying that line, and returning it to service. This level is also where the Meridian modular telephones may be posted, busied, or returned to service. Like other sets, when the Meridian modular telephones are posted, the type of set is represented by up to four characters at the left of the MAP display. Table 3-4 shows MAP displays that indicate particular sets or options.

Table 3-4
Meridian telephones and corresponding MAP displays

MAP display when posted	Corresponding set or option
M08	M2008
M16	M2616
M16H	M2616 Handsfree
M16A	M2216-1
M16B	M2216-2
MCA	MCA
—end—	

Restrictions and limitations

When assigning LENSs to a DLM, the user is restricted to entering only 0 to 9 in the drawer or line subgroup position of the LEN. For example, a user may want to assign a Meridian IVD set to LEN 2 0 1 10. The third position, 1 in this case, is the drawer number of the LEN.

When assigning a Meridian IVD voice set to a LEN number, the set may only be added to an even numbered LEN. For example, the set may be added to LEN 2 0 1 4, but not to LEN 2 0 1 5. Conversely, the MAD0 and MCA may only be added to odd numbered LENSs. For example, an MCA may be added to LEN 2 0 1 9, but not to 2 0 1 8. The reason for these restrictions is in the way that the Meridian IVD sets and their data options (MCAs and MADOs) are paired. The even LEN is for a Meridian IVD set's voice line, and the odd LEN is for that set's data option.

Meridian IVD port cards contain 32 lines for use, 16 voice and 16 data lines. These lines may not be physically detached from a port card as a line card may be removed from a drawer. If one of these lines becomes disabled, it can not simply be pulled out and replaced. Because this one line is attached to the port card, the operator may not remove the port card because 31 other lines are interrupted. To allow service to continue, another line (LEN) may be assigned to the user. This action frees up the bad LEN.

However, now that the LEN is free, it may be selected by someone else to use. To avoid assigning a bad LEN to another user, the bad LEN may be entered in table IVDTRBL. After a LEN is assigned to this table, it may not be used. Table IVDTRBL is checked before assigning a LEN for service.

The set must have a PDN assigned to Key 1 in table KSETLINE prior to assigning any other features or DNs to the set.

Performance specifications

Environmental and safety considerations

All Meridian modular telephones and their associated options meet the requirements of Electronics Industries Association (EIA) specification PN-1361.

Temperature and humidity

Table 4-1 lists temperature and humidity specifications for Meridian modular telephones.

Table 4-1
Temperature and humidity specifications

Temperature range	Relative humidity
<i>Operating state:</i> 32° to 104° F (0° to 50° C)	<i>Operating state:</i> 5% to 95% (noncondensing)
<i>Storage:</i> -58° to 158° F (-50° to 70° C)	<i>Storage:</i> 5% to 95% (noncondensing)
<p>Note 1: At temperatures above 93° F (34° C), relative humidity is limited to 52 mbar of water vapor pressure.</p> <p>Note 2: Meridian modular telephones should be stored at the maximum and minimum temperatures for no longer than 16 hours.</p>	

Electromagnetic interference

The radiated and conducted electromagnetic interference meets the requirements of Subpart J of Part 15 of the Federal Communications Commission (FCC) rules for Class A computing devices.

Line engineering

The Meridian modular telephones use twisted pair wiring on transmission lines. The maximum permissible loop length of the MSL-100 digital line circuit is 3,500 feet (1067 meters), assuming 24 AWG (0.5 mm) standard twisted wire with no bridge taps. A 15.5 dB loss at 256 kHz defines the loop

length limit (longer lengths are possible, depending on the wire's gauge and insulation).

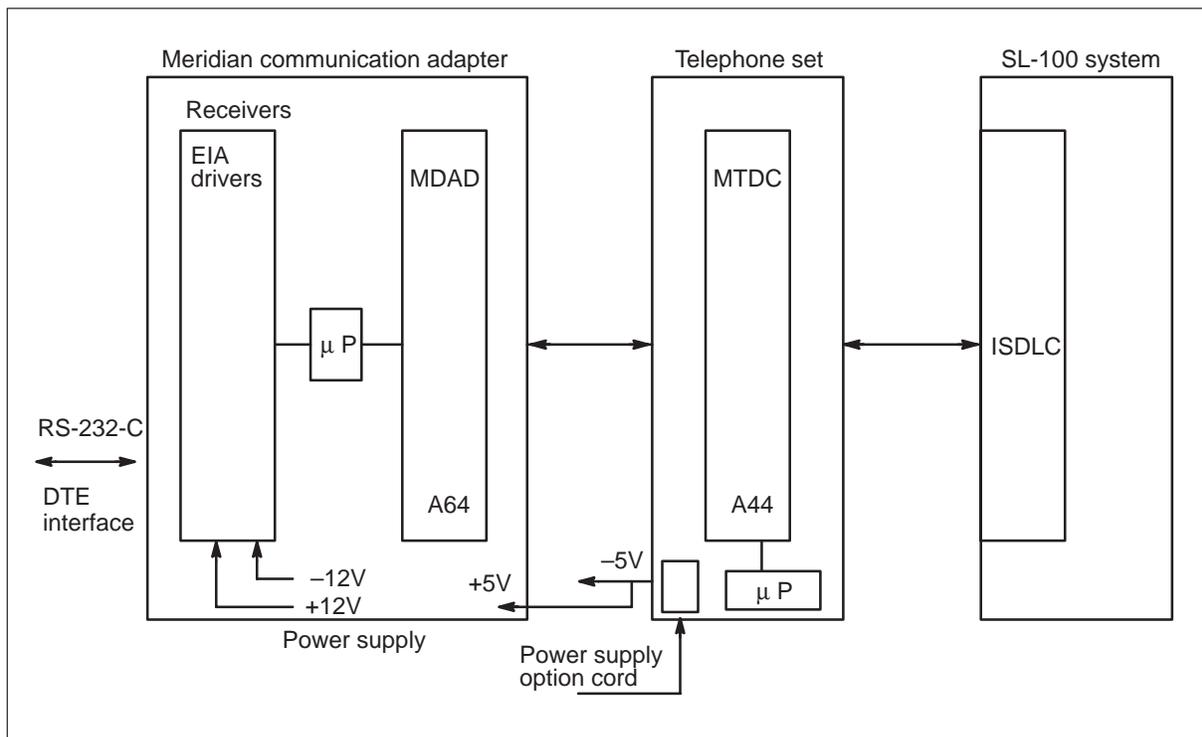
The Meridian modular telephones equipped with MCA use a 6-conductor line cord. Those without the MCA use a 2-conductor line cord.



CAUTION
Do not use other vendor line cords
 Use only the line cord provided with the Meridian modular telephone. Using a cord designed for other digital telephones could result in damage to the cord.

Figure 4-1 shows a simplified block diagram of the Meridian modular telephone, Meridian communication adapter (MCA), and integrated services digital line card (ISDL) in the MSL-100 system.

Figure 4-1
Block diagram of MCA and Meridian modular telephones



Alerting tone characteristics

Four alerting tones and a buzz signal are provided for the Meridian modular telephone series. The system controls the ringing cadence by sending

tone-ON and tone-OFF messages to the telephone. The alerting tone cadences cannot be changed from the telephone, but can be altered for individual Meridian modular telephones by datafill. One application can be a separate ringing tone for each of a series of Meridian modular telephones in the same office area to facilitate identification. All other telephone tones, such as dial tone or reorder tone, are provided by the MSL-100 system.

Table 4-2 lists the tone frequency combinations for the M2006, M2008, and M2008HF sets.

Table 4-2
M2006 and M2008 tone frequency combinations

Tone	Frequencies	Warble rate
1	667 Hz, 500 Hz	5.2 Hz
2	667 Hz, 500 Hz	2.6 Hz
3	1600 Hz, 2000 Hz	5.2 Hz
4	1600 Hz, 2000 Hz	2.6 Hz
Note: A 500-Hz buzz signal is provided for incoming call notification while the receiver is off-hook.		

Table 4-3 lists the tone frequency combinations for M2016S, M2216, and M2616 sets.

Table 4-3
M2016S, M2216, and M2616 tone frequency combinations

Tone	Frequencies	Warble rate
1	667 Hz, 500 Hz	5.2 Hz
2	667 Hz, 500 Hz	2.6 Hz
Note: A 500-Hz buzz signal is provided for incoming call notification while the receiver is off-hook.		
—continued—		

Table 4-3
M2016S, M2216, and M2616 tone frequency combinations (continued)

Tone	Frequencies	Warble rate
3	333 Hz, 250 Hz	10.4 Hz
4	333 Hz, 250 Hz	2.6 Hz
Note: A 500-Hz buzz signal is provided for incoming call notification while the receiver is off-hook.		
—end—		

Power requirements

Voice

The M2006, M2008, M2008HF, M2616, (basic configuration including display module), and M2216 are loop-powered. Loop power uses a 30-V dc source, and assumes 3500 foot (1067 m) maximum loop length of 24 AWG polyvinylchloride (PVC) (0.5 mm) standard twisted wire with no bridge taps. Cables longer than 3500 feet could exceed the maximum 15.5 dB loss at 256 KHz. For loop lengths longer than 3500 feet, the loop should use 24 AWG or larger wire with polyolefin, polyethelene, or Teflon insulation. Table 4-4 summarizes the power requirements.

Note: The loop length limit is defined by a 15.5 dB loss at 256 KHz. Longer lengths can be determined using the wire's gauge and insulation.

The Handsfree feature, which is integrated into the M2008HF, M2616, and the sets, requires no additional power.

Table 4-4
Power requirements

Set type	Loop power	Additional power (power supply board) required
M2006	Basic configuration	Data, external alerter
M2008	Basic configuration	Data, external alerter
M2008HF	Basic configuration (with handsfree and display)	Data, external alerter
M2016S	No	All configurations
—continued—		

Table 4-4
Power requirements (continued)

Set type	Loop power	Additional power (power supply board) required
M2216	Basic configuration (with display)	Data, external alerter
M2216-2 (manufactured discontinued)	No	All configurations
M2616	Basic configuration (with handsfree) and display	Data, external alerter
—end—		

Data

For data calls, the power supply option is needed in addition to the power from the loop.

Power supply board

The power supply option consists of a power supply board that mounts inside the telephone set, coupled with an external wall-mount transformer or closet power supply that provides power to the power supply board. The power supply board connects to the telephone through a 14-pin, bottom-entry connector and receives its power through pins 1 and 6 of the line cord.

The power supply board comes factory-installed with any configuration of the M2216-2 or M2016S sets. The M2006 set requires the power supply board with the addition of any option. The M2008, M2008HF, and M2616 sets require the power supply board with data or an external alerter.

64k MCA +5V power boards

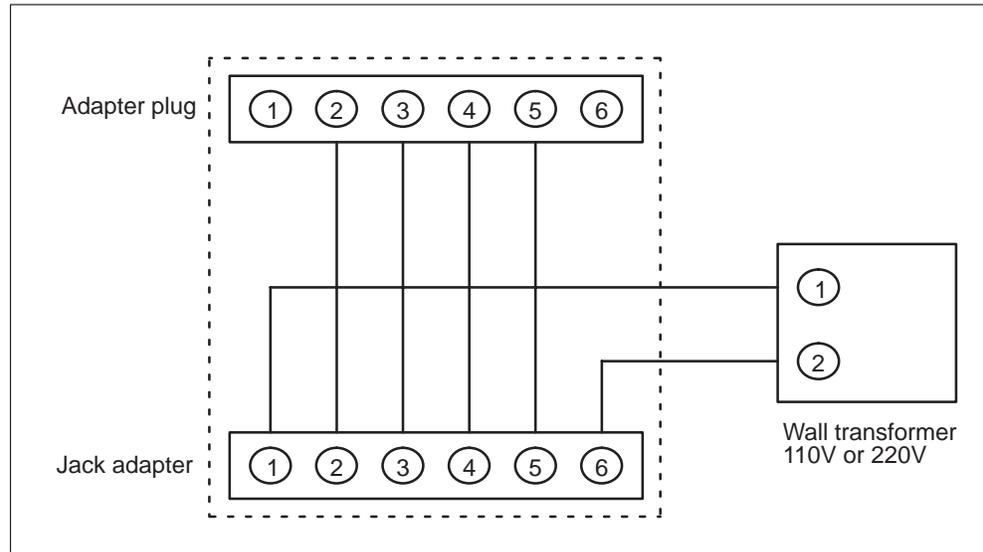
The 64k MCA has new circuitry to accept a +5V wall transformer available soon from Nortel. The power board is replaced by a jumper and relay on the Meridian digital terminal. All Meridian digital terminals with data ordered have the jumper and relay already inside. The +5V transformer (A0655850) will need to be ordered. The -48V transformer and power board can still be used with this MCA. You will need to order the power board (NT2K10WD) with the -48V, 110, or 220 transformer and install in the field.

Local plug-in transformer

A single winding transformer equipped with a 10 foot (3 m) cord of 22 AWG 2-conductor stranded and twisted wire and a modular RJ-11 duplex

adapter can provide the additional power needed to operate the telephone and its options. (See Figure 4-2.)

Figure 4-2
Local plug-in transformer configuration



CAUTION

Possible equipment damage

Do not plug any equipment (computer, modem, LAN card) other than the Meridian modular telephone into the RJ-11 transformer adapter, as damage to equipment may result.

The 110V to –48V transformer (AO367335 or equivalent) must meet the following specifications:

- Input voltage—110 V ac / 60 Hz
- No load output voltage—29 V ac maximum
- Voltage at rated current—26.7 V ac minimum
- Rated load current—700 mA

The 220V to –48V transformer (AO367914 or equivalent) must meet the following specifications:

- Input voltage—220 V ac / 50 Hz
- No load output voltage—29 V ac maximum
- Voltage at rated current—26.7 V ac minimum

- Rated load current—700 mA

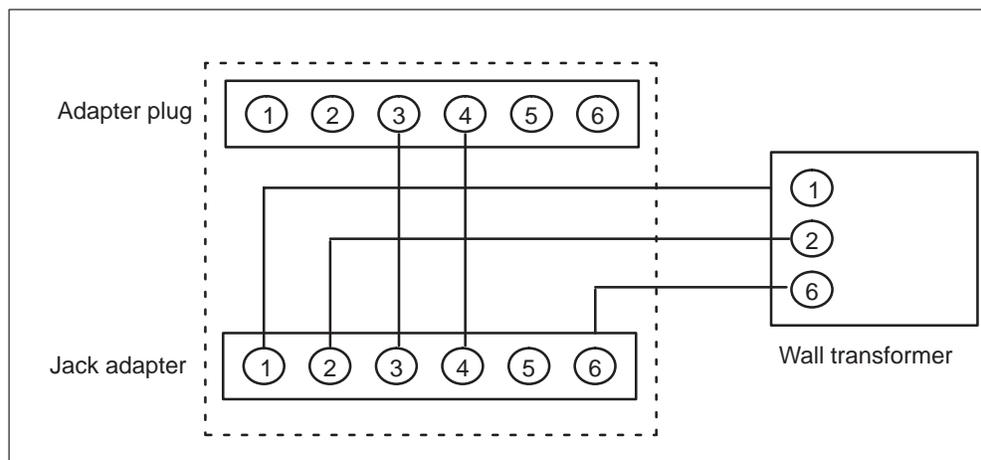
Note: The set cannot be wall-mounted over the wall jack when using a transformer because of the size of the RJ-11 adapter. Instead, mount the set above or to the side of the jack, and run the set and power cords to it.

The +5V transformer (A0655850 or equivalent) must meet the following specifications:

- input voltage—120Vac/60Hz 19.0 W
- output voltages—+5.2VDC @ 400mA
+16VDC @ 200mA

(See Figure 4-3)

Figure 4-3
Local plug-in +5V transformer configuration



Closet power supply

Closet power can be obtained from an alternating current (ac) transformer for loops of 100 feet (30 m) or less or from a dc transformer for loop lengths of 650 feet (198 m) or less. An equivalent power source can be used but must be UL listed to maintain isolation of outputs to the terminal.



CAUTION

Possible equipment damage

When using closet power, do not plug the TELADAPT connector into any equipment (computer, modem, LAN card) other than the Meridian modular telephone, as damage to equipment may result.

Note 1: All terminals must be isolated from the input winding, and each terminal must be isolated from all other terminal windings. A separate winding is required for each terminal, and grounds should not be connected.

Note 2: The QUT1 closet power supply source is not compatible with Meridian modular telephones.

The ac source should be rated at 29 V ac, 700 mA isolated. The dc source should be rated at 42 V dc, 300 mA isolated, with current limiting output of 1 amp.

MCA data characteristics

When a Meridian modular telephone is equipped with the MCA, you can make a data call using keyboard dialing from an attached terminal. It can carry on voice and data communications simultaneously without causing any mutual interference.

The MCA communicates with data terminal equipment (DTE). Table 4-5 describes the necessary parameters required for configuring the communication link between the telephone set and the terminal.

Table 4-5
MCA data characteristics

Characteristic	Specification
data type	ASCII (ANSI standard X3.4—1977)
synchronization	asynchronous and synchronous
number of bits	7 bits plus parity or 8 bits no parity
parity	none, odd, or even
data rate	110, 150, 300, 600, 1200, 2400, 4800, 9600, or 19200 bits per second 56k/64k
stop bits	1 bit for all speeds
data mode	full duplex

Note: The MCA configuration of data parameters is stored locally (although you can set the configuration in the MSL-100 system). The data parameters cannot be set in the system before installing the MCA in the telephone set. If data is entered for the parameters, the configuration information is not stored.

The keyboard dialing routine may vary with the data equipment being used. Therefore, reference to the user's data terminal manual may be necessary.

For more detailed information, see the *Meridian Communications Adapter (MCA) Reference Manual*, 555-4001-123.

The MCA is equipped with the Hayes dialing feature. This feature enables the user to originate data calls to local and remote DTE directly from a data terminal keyboard or personal computer if connected to the MCA.

Users of personal computers already equipped with a Hayes Smartmodem or users who have a stand-alone Hayes Smartmodem can substitute the MCA for MSL-100 data integration. The Hayes dialing feature, when used with third party communication software and the digital telephone, supports most of the Hayes Smartmodem features. Third party terminal emulation packages can also be used with Hayes dialing.

The MCA supports the following features:

- enhanced Hayes commands, including upper and lower case dialing, voice call origination through AT dialing, data call disconnection, and on-line disconnect of voice call,
- script files allowing you to program multiple data resources for automatic resource access.

Basic set operation

Meridian modular telephone sets are designed to be practical and functional with large feature and line keys and with adjustable volume control and distinctive visual indicators. In addition, the Meridian modular telephone offers a wide range of business telephone features. The features described in this publication that are best suited for your specific telecommunications needs can be assigned to your telephone. Contact your System Administrator for additional features.

The Meridian modular telephone series consists of the following types of integrated voice and data (IVD) telephone sets:

- M2006—a single line telephone with five programmable feature keys
- M2008—a multiline telephone with seven programmable feature keys
- M2008HF—a multiline telephone with seven programmable feature keys and integrated handsfree unit.
- M2016S—a telephone security group (TSG) class 2 type accepted digital telephone that provides the on-hook security required for certain government contractor applications
- M2616—a high performance multiline telephone with 15 programmable feature keys and an integrated handsfree unit
- M2216 and M2216-1—a multiline ACD IVD digital set with 15 feature keys, a factory-installed display module, and two RJ-11 jacks for electret headsets.
- M2216-2—a multiline ACD IVD digital set with 15 feature keys and a factory-installed display module. The M2216-2 is similar to the M2216 and M2216-1, but with one RJ-11 jack for an electret supervisor headset and one PJ-327 jack for a carbon headset.

Note: The M2216-1 and M2216-2 are manufacture discontinued.

- M2616CT—a multiline 900Mhz cordless telephone with 14 programmable feature keys on the base and six keys on the handset which map to the six bottom programmable keys on the base. A primary directory number (PDN) key, program key and handsfree key are standard on the set.

Hardware options

The Meridian modular telephone line of products also includes an integrated data module (the Meridian communication adapter), a 22 key and lamp add-on option, a display module option, and three different types of external power options. The M2616 modular telephone may already be equipped with these options. If not, contact the System Administrator for details about adding these options.

Display module

The display module is a 2-line by 24-character liquid crystal display accessory that makes the most sophisticated features easy to use with screen prompts that take the user step-by-step through procedures. In addition, messages inform the user of the status of various features such as Call Forward, Make Set Busy, and Automatic Answer.

The contrast can be adjusted by using the Program key and the volume control rocker switch. See Procedure 5-3, “Changing the contrast”. The display is tilt-adjustable for easier viewing depending on lighting conditions.

Note: The M2006 and M2016S sets do not use this option.

Name Display Character Extension

The Name Display Character Extension feature provides the option to use up to 24 characters exclusively for the name field on the phone sets capable of handling the increase.

The extension increases the length of the name field on the display from 15 to 24 characters. The increase uses all 24 physical spaces on the top line of the display, placing the DN and timer on the bottom line.

Note: This feature can be used on the M2006, M2008, M2016S, M2216A, M2216B, M2616, M2616CT, M5208, M5209, M5212, M5213, M5216, and M5312 sets.

Key expansion module

A 22-key modular accessory can be connected to the M2616 or M2216 modular telephones. This key expansion module provides 22 additional programmable feature keys. The telephone set and module, when attached, function as a single integrated unit.

A maximum of two modules can be added to a telephone set. Depending on whether one or two modules are attached to the telephone set, the total number of programmable feature keys increases to either 37 or 59, respectively. An associated lamp accompanies each key, which can be assigned a directory number (DN) or a feature. Each module requires a separate footstand.

Note: The M2006 and M2008 sets do not use this option.

Meridian communications adapter

The modular telephones may already be equipped with the Meridian communication adapter (MCA). This hardware option allows a user to establish data calls when the set is connected to a computer terminal.

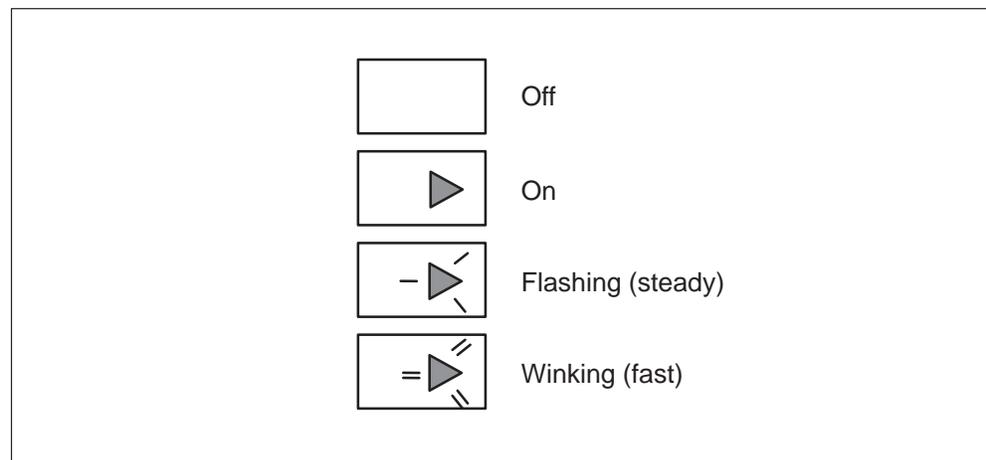
When the MCA is enabled, the top feature key serves as the Program key. Users can still make and answer voice calls while data connections are active.

For more information on MCA features, refer to the *Meridian Communications Adapter (MCA) Reference Manual*, 555-4001-123.

Feature or line indicators

Throughout this guide, references are made to lamp indicators that flash, come on, or go off. To help you understand which lamp indicator should appear, Figure 5-1 shows a list of these indicators.

Figure 5-1
Feature or line indicators



The triangular symbol, as shown in Figure 5-1, points to the active feature or line key.

Fixed keys

The following fixed keys are provided:

- Primary directory number (PDN)
- Volume control
- Hold
- Release (Rls)
- Handsfree/Mute (if activated for the M2616 set only)

Primary directory number

This fixed key is Key 1 on all Meridian modular telephones. M2006 sets only have one line, therefore, Key 1 on M2006 sets is simply called a directory number. The PDN (or DN) key is always positioned as the bottom right key (Key 1).

The DN key provides the only line for incoming and outgoing calls on the M2006 set. The primary directory number (PDN) provides the main line for incoming and outgoing calls for the M2008, M2008HF, M2616, M2216, and M2616CT sets. The PDN is the default directory number for various features. Use the PDN key for on-hook dialing and for taking PDN calls off hold.

Volume control

One key with two toggle positions controls volume (<<< >>>). It is located at the bottom of the set's numerical keypad. Pressing the right side of the toggle key (>>>) increases the volume, and pressing the left side of the toggle key (<<<) decreases the volume for the tone or sound that is currently active.

To change the volume of the ringing sound, press the key left or right (increasing or decreasing volume) during the interval when a burst of ringing occurs. The volume settings are retained for subsequent calls until new volume adjustments are made. If the telephone set is equipped with a display module, then the volume can be adjusted at any time with the setting displayed on the screen (in Program Mode).

You can adjust the volume of the following tones, while they are audible:

- buzz
- handset/headset
- handsfree (M2616 and M2008HF)
- on-hook dialing

- ringing

When the telephone is disconnected, has maintenance performed on the loop, or a restart occurs, both speaker and alerting tone levels return to their default values upon reconnecting.

When the set is operating on loop power alone, the highest (eighth) step in volume cannot be reached (as seen when using Display in Program mode).

For those hearing-impaired applications where an amplifier is appropriate, the MSL-100 NT TONE (NT8UX06-03) is available.

Hold key

The Meridian modular telephones provide a dedicated key for placing calls on hold:

- To place a call on hold, press the Hold key. The line indicator for the line being placed on hold flashes.
- To take a call off hold, press the line key on which the call resides as identified by the flashing indicator.

Release key

The Release key (Rls key) is the orange key that is located above the set's Hold key and to the right. The purpose of the key is to release a call from the telephone set. Use the Release (Rls) key as an alternative to placing the handset on-hook. Whenever you dial on-hook and get a busy signal or no answer, simply press the Rls key, and the telephone set disconnects the call. Also use the Rls key to terminate a handsfree call.

Handsfree (M2616, M2616CT and M2008HF)

The handsfree feature on the M2616 set is software-assigned. It allows the user to talk to another party without lifting the handset. To activate handsfree, press the handsfree/mute key (Key 16, top left) or select a DN without lifting the handset. When the handsfree feature is activated, the LCD remains lit. To deactivate the handsfree feature, pick up the handset, or end the call by pressing the Rls key. If the calling party disconnects before the handsfree user disconnects, the handsfree feature remains enabled unless the user presses the Rls key.

Note: If handsfree is not software-assigned, you can assign any other feature to Key 16. The M2616CT handsfree feature is automatically assigned and cannot be removed.

During a handsfree mute call, the microphone is deactivated but the speaker remains active, preventing the other party from overhearing local conversations. The handsfree LCD indicator flashes while the microphone

is muted. Pressing the handsfree/mute key again reactivates the microphone, and the handsfree LCD remains lit.

Handsfree operates as if an off-hook operation had been performed. For example, when the telephone is idle, pressing the handsfree/mute key turns on the handsfree unit and selects the PDN, allowing the user to make a call. When the telephone is ringing, pressing the handsfree/mute key turns on the handsfree unit and allows the user to answer the incoming (ringing) call by pressing a DN key without picking up the handset.

Handsfree control (M2008HF)

The handsfree control for the M2008HF phone set is software assigned. The M2008HF set is shipped from the factory with the handsfree switch set to enable.

To activate handsfree, press the handsfree/mute key (Key 7) or select a DN without lifting the handset. When the handsfree feature is activated, the liquid crystal display (LCD) remains lit. To deactivate the handsfree feature, pick up the handset, or end the call by pressing the RIs key. If the calling party disconnects before the handsfree user disconnects, the Handsfree feature remains enabled unless the user presses the RIs key.

Service order impact

The software activation of M2008 handsfree on the M2008HF phone sets are available with MSL06 and above. The handsfree feature can be enabled or disabled on physical key 7 through the service order utility (SERVORD). This is done by using the CHF command instead of the ADO command since handsfree is a feature and not an option.

Note: The following message displays after the handsfree feature is added: ENSURE THAT THE M2008 SET IS HANDSFREE CAPABLE. This message displays as a reminder to make sure that the set is a M2008HF set and not one of the older M2008 sets that are not capable of handsfree.

Data schema

The handsfree field was added to all of the M2008 sets. The default value for handsfree is set to N.

Restrictions and limitations

Adding the handsfree field for all M2008 sets allows for the original M2008 to be set to Y in SERVORD even though the phone is incapable of operating in the handsfree mode. This is why the “ENSURE THAT THE M2008 SET IS HANDSFREE CAPABLE” message is generated after handsfree is added to any M2008 set.

Key 7 can have other features assigned to it as long as handsfree is not set to Y in SERVORD.

Table 5-1 describes all new prompts implemented by the handsfree feature.

Table 5-1
Handsfree feature prompts

Prompt text	Valid input	Description	Areas affected by prompts
HANDSFREE	Y/N	Allows for the software activation/deactivation of handsfree for M2008 set types.	All M2008 set types.

Program key

Meridian modular telephone users have control over the display option or the communication adapter through a feature called program mode when the telephone is equipped with these options. The Program Mode allows users to change a variety of display features such as screen format, contrast, and language, as well as data parameters such as transmission speed, parity, and terminal mode. A Program key is assigned automatically to the upper right key (Key 6 on the M2006 set and Key 8 on all other sets) of every Meridian modular telephone that is equipped with a display, an MCA, or both.

To access the program mode features, press the Program key, then press the 2-digit code associated with the feature that you wish to change, activate, or deactivate, or scroll forward or backward through the available selection with the volume control key.

The following features are available through the Program key. For more detailed information, refer to the specific user guide for your Meridian modular telephone.

- 00—Volume Control
- 01—Predial Recall
- 02—Contrast Adjustment
- 03—Call Timer Enable
- 04—Idle Screen Format
- 05—Language Selection
- 07—Display Diagnostics

- 09—Key Click

Telephone calls can be received while the phone is in the Program mode. The display is devoted to program features while the phone is in Program mode and continues to display program features until the Program key is pressed a second time to exit.

Telephone calls cannot be placed while the phone is in the Program mode. Users can seize a DN in an attempt to place a call in the Program mode, but the telephone does not respond to dial pad input until the user exits the Program mode.

Data parameters, such as transmission speed and flow control, can also be changed through the program mode. For information on how to modify the data parameters, refer to the *Meridian Communications Adapter (MCA) Reference Manual*, 555-4001-123.

00 Volume Control

All volume levels can be set while the telephone is in an idle state. There is no need to wait for the phone to ring in order to adjust the ringer volume. The Meridian modular telephone maintains the volume setting until it is changed again. The range of adjustment for the handset volume eliminates the need for amplified handsets in 80% of hearing-impaired applications. Use Procedure 5-1 to select and adjust the volume control.

Procedure 5-1

Selecting and adjusting the Volume Control

- 1 Press the Program key, and dial 00.
Response:
The display shows four symbols.
- 2 Dial one of the following numbers to adjust the specified volume:
 - 1= Ringer
 - 2= Buzzer
 - 3= Speaker
 - 4= Handset
- 3 Use the volume control rocker switch to increase or decrease the volume.
Response:
The volume increases or decreases depending on the direction in which the user presses the rocker switch.
- 4 Press the Program key to save the volume level.
Response:

The telephone returns to the idle screen.

- 5 Exit, or repeat Steps 2 and 3 to adjust another volume level.

Note: For hearing-impaired applications where an amplifier is appropriate, the NT TONE (NT 8UX06-03) is available.

- 6 You have completed this procedure.

01 Predial Recall

This feature is useful when users are predialing a number and are interrupted by an incoming call, when misdialing a number and wanting to amend it instead of redialing, or when calling one number exclusively over a period of time. Use Procedure 5-2 to activate Predial Recall.

Procedure 5-2 Activating Predial Recall

- 1 Press the Program key, and dial 01.

Response:

The telephone recalls the last predialed number.

- 2 Press the Program key to exit.

Response:

This action allows the user to change the number.

- 3 Use the volume control rocker switch to edit the number, or dial the number by pressing a free extension.

Response:

The display shows the changed or entered number.

- 4 You have completed this procedure.

02 Contrast Adjustment

The Contrast Adjustment feature allows the user to change the contrast of the liquid crystal display (LCD) display. Use Procedure 5-3 to change the contrast.

Procedure 5-3 Changing the contrast

- 1 Press the Program key, and dial 02.

Response:

The display shows the intensity of dark and light.

- 2 Use the volume control rocker switch to increase or decrease the contrast.

Response:

The contrast increases or decreases depending on the direction in which the user presses the rocker switch.

- 3 Press the Program key to save and exit.

Response:

The telephone returns to the idle screen.

- 4 You have completed this procedure.

03 Call Timer Enable

When the Call Timer enables, all calls are automatically timed, and the timer displays for 10 seconds after each call is disconnected. Use Procedure 5-4 to activate the Call Timer feature.

Procedure 5-4

Activating the call timer

- 1 Press the Program key, and dial 03.

Response:

The display shows the Call Timer.

- 2 Press either side of the volume control rocker switch to change the call timer setting from on to off or off to on.

Response:

This action sets the call timer to either on or off.

- 3 Press the Program key to save and exit.

Response:

The telephone returns to the idle screen.

- 4 You have completed this procedure.

04 Idle Screen Format

The telephone provides the following eight different time and date formats (using May 4, 2:05 pm as an example):

- MAY 04 14:05
- 5 04 14:05
- 04 MAY 14:05
- 04 5 14:05
- MAY 04 2:05 P
- 5 04 2:05 P

- 04 MAY 2:05 P
- 04 5 2:05 P

Use Procedure 5-5 to set the Idle Screen Format.

Procedure 5-5
Setting the Idle Screen Format

- 1 Press the Program key, and dial 04.
Response:
The display shows first Idle Screen Format.
- 2 Press the volume control rocker switch to scroll through the idle screen formats.
Response:
The display shows eight different time and date formats.
- 3 Press the Program key to save the desired selection and to exit.
Response:
The telephone returns to the idle screen.
- 4 You have completed this procedure.

05 Language Select

Newer model Meridian modular telephones display information in the following languages:

- English
- Quebec French
- Spanish

The language select option selects the language in which the telephone displays features, prompts, and messages. Use Procedure 5-6 to select and activate a specific language.

Procedure 5-6
Selecting and activating a specific display language

- 1 Press the Program key and dial 05.
Response:
The display shows a language.
- 2 Press the volume control key to scroll through the languages.
Response:

Each language is displayed in its own language, such as English, Francais, and Espanol.

- 3 Press the Program key to save and exit.

Response:

The telephone returns to the idle screen.

- 4 You have completed this procedure.

07 Display Diagnostics

The Display Diagnostics feature provides a self diagnostic test for the display. Use Procedure 5-7 to activate the Display Diagnostics feature.

Procedure 5-7

Activating the Display Diagnostics feature

- 1 Press the Program key, and dial 07.

Response:

The display indicates that it is in Display Diagnostics mode.

- 2 Use the volume control rocker switch to scroll through the display diagnostics.

Response:

The display shows various character sets.

- 3 Press the Program key to save and exit.

Response:

The telephone returns to the idle screen.

- 4 You have completed this procedure.

09 Key Click

The Key Click option provides audible feedback when the user presses a dial pad key. The audible beep occurs through the handset or through the piezo/speaker when dialing on-hook. This feature is active as a default, but can be deactivated on a phone that is equipped with a display option. Use Procedure 5-8 to activate or deactivate the Key Click option.

Procedure 5-8

Activating or deactivating the Key Click option

- 1 Press the Program key, and dial 09.

Response:

The display shows the current Key Click option status.

- 2 Use the volume control rocker switch to toggle between on and off.

Response:

This action turns the Key Click option either on or off.

- 3 Press the Program key to save and exit.

Response:

The telephone returns to the idle screen.

- 4 You have completed this procedure.

Telephone calls can be received while the telephone is in the Program mode. However, the display remains in Program mode until the user presses the Program key a second time. Telephone calls cannot be placed while the telephone is in the Program mode. The user can seize a DN in an attempt to place a telephone call in Program mode, but the phone does not respond to dial pad input until the Program mode is exited by pressing the Program key.

Data parameters, such as transmission speed and flow control, can also be changed through the Program mode. Refer to the *Meridian Communications Adapter (MCA) Reference Manual*, 555-4001-123, for a complete list of those features.

On-hook dialing

Users can dial a number, using the PDN key or any other DN, while the handset is still on-hook. Use Procedure 5-9 to dial calls while the handset is on-hook.

Procedure 5-9

Making a call while the handset is on-hook

- 1 Press the DN key.

Response:

The indicator next to the DN key comes on. The caller receives dial tone.

- 2 Dial the phone number.

Response:

The caller receives ringing or a busy signal.

- 3 Pick up the handset when the called party answers.

- 4 Press the RIs key to disconnect from a busy signal or no answer or to terminate the call.

Response:

The active key indicator goes off if the called party does not answer or if the number is busy.

5 You have completed this procedure.

Microphone muting (M2616, M2616CT and M2008HF)

When a user activates the Handsfree feature by pressing the Handsfree/mute key during a telephone conversation, the microphone is turned off. However, the speaker remains on and prevents the other party from overhearing local conversation. The Handsfree/mute LCD indicator flashes while the Handsfree feature is in the mute mode. Pressing the Handsfree/mute key a second time restores microphone operation, and the Handsfree/mute indicator remains lit.

Message Waiting lamp key

Each Meridian modular telephone has a red triangle in the upper right-hand corner that lights brightly to indicate that a message is waiting. This LED is the primary message waiting indicator and lets you know a message is waiting, regardless of whether the telephone has a message waiting key/lamp pair. (You must have Message Waiting allowed Class of Service.)

If you do assign a message waiting key/lamp pair, the red Message Waiting triangle lights indicate that there is a message waiting.

You can assign an Autodial key that dials the message center (or voice mail system) to avoid the double indication, or choose to have no key/lamp pair assigned to the message center.

The Message Waiting lamp is also used to indicate security of the M2016S. The red LED triangle lights steadily when the phone is not secure. (The phone is not secure when the handset is off the hook, when the phone is ringing, or whenever the handset/piezo relays are connected.) The red LED triangle blinks when a message is waiting.

Data calls

When a Meridian modular telephone is equipped with the MCA, the user can make a data call using MSL-100 keyboard dialing (KBD) or Hayes keyboard dialing from the attached terminal. Voice and data communications can be carried on simultaneously without interference.

The MCA is compatible with all data terminals having the characteristics described in Chapter 4, "Performance specifications". Any Meridian modular telephone equipped with an MCA can originate or terminate data calls from other MCA-equipped Meridian modular telephones or any MSL-100 datapath data product.

The MSL-100 KBD feature provides data terminal equipment (DTE) users a means to establish a switched data call to multi-host sites and activate

selected telephone features, such as Speed Calling, Autodial, and Ring Again.

Again, the KBD routine may vary with the data equipment being used, and reference to the user's data terminal manual may be necessary. For a MSL-100 MCA keyboard dialing routine, refer to Chapter 8, "Nortel keyboard dialing".

The AT Dialing feature (Hayes) provides DTE users with a means to use personal computer software packages requiring a Hayes-type keyboard dialing command protocol. Refer to Chapter 9, "Hayes keyboard dialing", for more detailed information and to the *Meridian Communications Adapter (MCA) Reference Manual*, 555-4001-123.

Only one type of keyboard dialing (MSL-100 KBD or Hayes) can be active at a time.

The MCA can exist in one of four states: autobaud, MSL-100 KBD, Hayes keyboard dialing, or data mode. When the MCA is powered up, the autobaud state is active until an acceptable autobaud character is entered. The keyboard dialing type is determined by the characters used to set autobaud and autoparity.

If a period (.) and a carriage return are entered, the standard MSL-100 KBD is activated. If AT is entered, Hayes keyboard dialing is activated.

For incoming calls, the keyboard dialing specified in the profile is used. Hayes keyboard dialing is the default.

While in the Hayes keyboard dialing state, the MCA returns to the autobaud state after each command is entered or after a call is taken down. While in the MSL-100 KBD state, the MCA returns to the autobaud state at the completion of any call origination attempt or a status display. The user does not automatically return to the autobaud state after using the Modify menu.

Any action that causes the DTR to drop (power loss at the DTE or disconnection of the RS-232-C cable) returns the DTR to the autobaud state.

Incoming calls activate the most recently used keyboard dialing method. The prompts are transmitted at the previously connected data rate. If the data rate of the DTE changes and no autobaud exists, the prompts transmit at an incompatible data rate.

If the MCA has no stored data rate, the incoming call prompt is transmitted at 19.2 Kbs (asynchronous) or 64 Kbs (synchronous). If the DTE is not set to either rate, unreadable data may be displayed. Hit return on the keyboard for your MCA to adapt to your DTE rate.

Automatic Call Distribution (M2216)

The M2216, M2216-1, and M2216-2 modular telephones are designed for the Automatic Call Distribution (ACD) system. The M2216 telephone set is not limited to ACD applications only. For detailed information on ACD features and operations, refer to the *Automatic Call Distribution Product Guide*, 297-2041-010.

Note: The M2216-1 and M2216-2 sets are manufacture discontinued.

ACD provides the capability of distributing a large number of incoming calls placed to one or more central directory numbers among a fixed group of agent positions. This configuration results in a call management system suitable for service industries where a large number of incoming calls are answered by a group of agents.

An ACD group can receive calls from up to 17 DNs. Each DN is assigned a priority level ranging from zero to three, with zero being the highest priority. Incoming calls are assigned the priority of the DN that received them. An ACD group has a primary DN and up to 16 supplementary DNs. The primary DN is assigned two priorities: one for incoming calls that arrive over a trunk and one for incoming calls that arrive over a line.

The following new screens allow call center managers and agents to more efficiently manage their business by easily checking to see which agents are logged out or not ready:

- Logged out, provides the capability to display the LOGGED OUT message on the agent and supervisor telephone displays when they are logged out of the ACD queue
- Not ready, displays on the agent's telephone when the agent is in the not ready state

Supervisory capabilities allow the supervisor to monitor the quality of service being provided to incoming callers. These supervisory capabilities include observing agents during call handling, monitoring the current status of each agent position, and displaying the status of the incoming call queue; including the number of calls currently in queue and the longest amount of time a call has been waiting in queue. In addition, the supervisor is given access to ACD configuration and status information from a MAP terminal.

If there are idle agent positions, incoming calls are distributed in the order in which they were received to the position that has been idle the longest. If no agents are available, calls are placed in an incoming call queue according to their priority and order of arrival. As agents become available, the calls are removed from the queue and terminated at an agent position.

ACD agent positions are telephone sets assigned ACD features. ACD supervisors are telephone sets that may be assigned the same ACD features, but are assigned with additional feature keys. These additional supervisor functions include monitoring the work load of agents within their ACD group, observing ACD calls, and assisting agents requesting information.

ACD headset interface

The following section describes the ACD headset interfaces for M2216 and M2216-1, and M2216-2 sets.

M2216 and M2216-1

You can control the headset interface for the M2216 and M2216-1 even while a call is in progress. Use Procedure 5-10 to adjust the headset interface of the M2216 and M2216-1.

Note: The M2216-1 and M2216-2 modular sets are manufacture discontinued.

Procedure 5-10

Adjusting headset interface

- 1 Press the Program key, and dial 10.

Response:

The display shows three symbols.

- 2 Dial one of the following values to select the headset interface:

1= Plantronics Polaris

2= GN Netcom 105-3160

3= legacy headset

- 3 Press the Program key to save and exit.

Response:

The telephone returns to an idle screen.

- 4 You have completed this procedure.

The M2216 and M2216-1 are compatible with the following electret headsets:

- Plantronics (the Polaris line)
 - model OH2001 (monaural headset with 0.75-inch headband)
 - model OH2002 (binaural headset)

- GN Netcom
 - model 105-3160 (lightweight monaural headset with over-the-ear hook, quick disconnect, and a coil cord)
- Nortel Liberation

M2216-2

You cannot adjust the headset interface for the M2216-2. Because a standard exists for carbon headset design, and the M2216-2 supports carbon headsets, there is no need for an adjustable headset interface.

The M2216-2 is designed for a standard carbon headset in the agent headset jack, and a Plantronics Polaris headset in the supervisor headset jack. The supervisor and agent headset jacks are not interchangeable on any of the ACD phone sets.

The M2216 telephone sets only receive ACD calls if a headset is plugged into an agent headset jack.

Supervisor and agent positions

ACD agent positions are telephone sets assigned ACD features. ACD supervisor positions are telephone sets that may be assigned the same ACD features, but are assigned with additional feature keys that allow the following supervisor functions:

- monitoring the work load of agents within their ACD group
- observing ACD calls
- assisting agents requesting information

Supervisor and agent positions are established through SERVORD. The SERVORD system automatically datafills the line tables for supervisor and agent telephones and features.

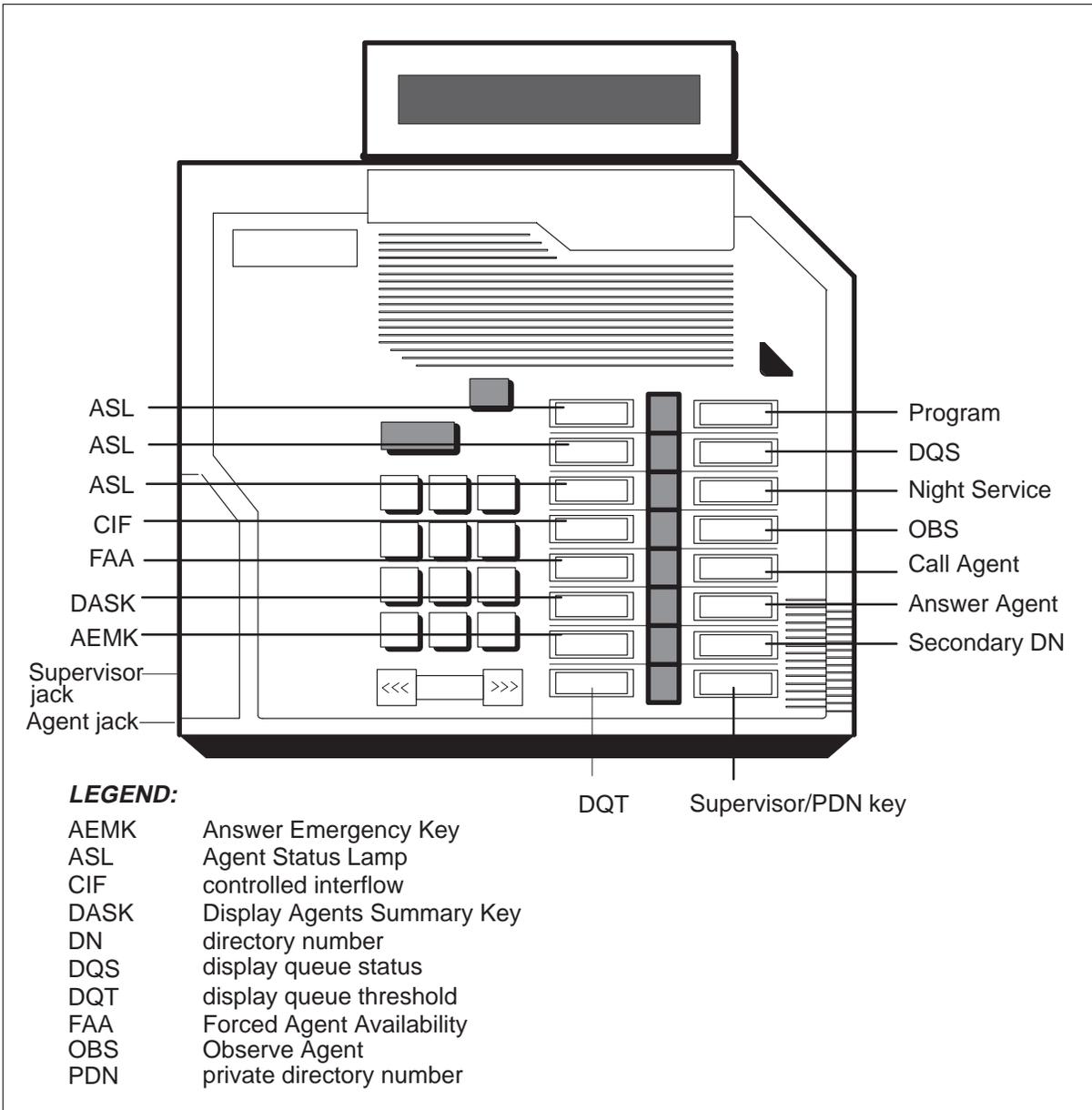
Note: In this procedure, a supervisor is considered an agent once the supervisor has logged into an ACD agent position.

The following sections describe the basic features of both the supervisor and agent phone sets.

Supervisor position

Figure 5-2 illustrates an example of the Meridian M2216 and M2216-1, or the M2216 modular telephone set configured for a supervisor. Note that the supervisor does not have the ACD option, so Key 1 is labeled as a primary directory number (PDN) key.

Figure 5-2
Example of supervisor telephone set



Supervisor key

To distinguish an ACD supervisor set from an ACD agent set within the software, a supervisor set is designated by assigning the SUPR option to Key 1. The SUPR option must be assigned to an ACD subgroup that is in the same customer group as the PDN or INCALLS key of the supervisor set.

The SUPR option must be assigned to a supervisor set before assigning Agent Status lamps and Answer Agent, Call Agent, Forced Agent Availability, Night Service, Display Queue Status, Display Queue Threshold, Answer Emergency, Display Agents Summary, or Controlled Interflow keys.

Answer Agent Key

The Answer Agent Key (AAK) provides the supervisor with a key that allows direct communication between the supervisor and the agent. The Call Supervisor (CLSUP) key acts as the corresponding agent key. If a supervisor set has no AAK assigned, any agent using the CLSUP key receives reorder tone.

Agent Status Lamp

The Agent Status Lamp (ASL) feature provides multiple functions to the supervisor. The lamp provides continuous monitoring of agent status, and the key acts as an autodial key for calling and observing agents and to force agents from a Not Ready to an Idle state. Refer to the “Call Agent key”, “Observe Agent key”, and “Forced Agent Availability key” sections for a detailed explanation of these functions.

Each ASL can be associated with one agent position. This agent position must be in the same customer group as the supervisor.

Call Agent key

The Call Agent (CAG) key allows the supervisor to establish direct communication with agents. This feature may be used in conjunction with Observe Agent and Agent Status Lamp. Use Procedure 5-10 to call or autodial an agent.

Procedure 5-10

Calling or autodialing an agent

- 1 Press the CAG key.
- 2 Press the ASL key for the desired agent.
Response:
The agent's CLSUP key illuminates.
- 3 You have completed this procedure.

Observe Agent key

The Observe Agent (OBS) key allows the supervisor to monitor calls to the agent station. Only calls to INCALLS and one secondary directory number (SDN) may be monitored. A supervisor may have multiple OBS keys, one for each defined ACD group, or the supervisor may define one key as

extended observe, allowing the key to access any ACD group. These capabilities are established in SERVORD. Use Procedure 5-11 to observe an agent.

Procedure 5-11
Observing an agent

- 1 Press the OBS key.
- 2 Press the ASL key for the desired agent.
Response:
The supervisor can monitor an active INCALLS call on the agent station.
- 3 Press the ASL key again.
Response:
The supervisor can monitor an agent SDN call, if both INCALLS and SDN calls are active on the agent station.
- 4 You have completed this procedure.

Forced Agent Availability key

The Forced Agent Availability (FAA) key allows the supervisor to force an agent out of ACD Not Ready and into an idle state. Use Procedure 5-12 to activate the Forced Agent Availability feature.

Procedure 5-12
Using the Forced Agent Availability feature

- 1 Press the FAA key.
- 2 Press the ASL key for the desired agent.
Response:
The supervisor forces the agent into an idle state and makes the agent able to receive calls.
- 3 You have completed this procedure.

Night Service

Each Night Service key on the supervisor station controls the activation of night service for one ACD group. Calls already in queue are presented to agents in the normal manner, while new calls are given the night treatment specified in SERVORD.

Display Queue Status key

A supervisor can query the current load status statistics for an ACD group by pressing the Display Queue Status (DQS) key for that ACD group. The information displayed resembles the format in Figure 5-3.

- CALLS—shows the number of calls waiting in the ACD incoming call queue.
- AGNT—displays the total number of occupied agent positions (Idle, Active, or Not Ready). This display does not include agents that are logged out (Make Set Busy).
- WAIT—indicates the waiting time (in seconds) of the call in the front of the queue with the highest priority.

Figure 5-3
Display queue status format

CALLS	AGNT	WAIT
0012	0024	0005

The information displays for 12 seconds or until the supervisor activates another feature requiring display. If the supervisor presses the DQS key again before the 12 seconds expire, the information is not updated.

This feature can only be assigned to a station with a display.

Display Queue Threshold key

The Display Queue Threshold (DQT) key can be assigned on both a supervisor and an agent position, although the feature is primarily a supervisor feature.

When the agent or supervisor presses this key, two lines of information display. The top line contains the headings for the information on the bottom line. The bottom line shows the current threshold range (1, 2, 3, or 4) of the call at the front of the incoming call queue and the call's waiting time in seconds. This information displays for 12 seconds or until the agent or supervisor activates another feature requiring display.

Answer Emergency key

The Answer Emergency key (AEMK) allows the supervisor to answer emergency calls and to distinguish emergency calls from other calls. Use Procedure 5-13 to activate the Answer Emergency key.

Procedure 5-13
Using the AEM key

- 1 The agent presses the AEM key.

Response:

The supervisor lamp flashes and rings for a maximum of 30 seconds (or buzzes if the supervisor is on another call). The agent's DN appears on the supervisor's display. After 30 seconds, the AEMK feature cancels.

- 2 The supervisor presses the AEM key.

Response:

The supervisor is conferenced into the agent's call.

- 3 The supervisor presses the RIs key or goes on-hook.

Response:

The supervisor exits the call.

- 4 You have completed this procedure.

Display Agents Summary key

The Display Agents Summary key (DASK) displays the status of all agents in a specified ACD group. Multiple Display Agents Summary keys can be assigned on a supervisor station, one key for each group.

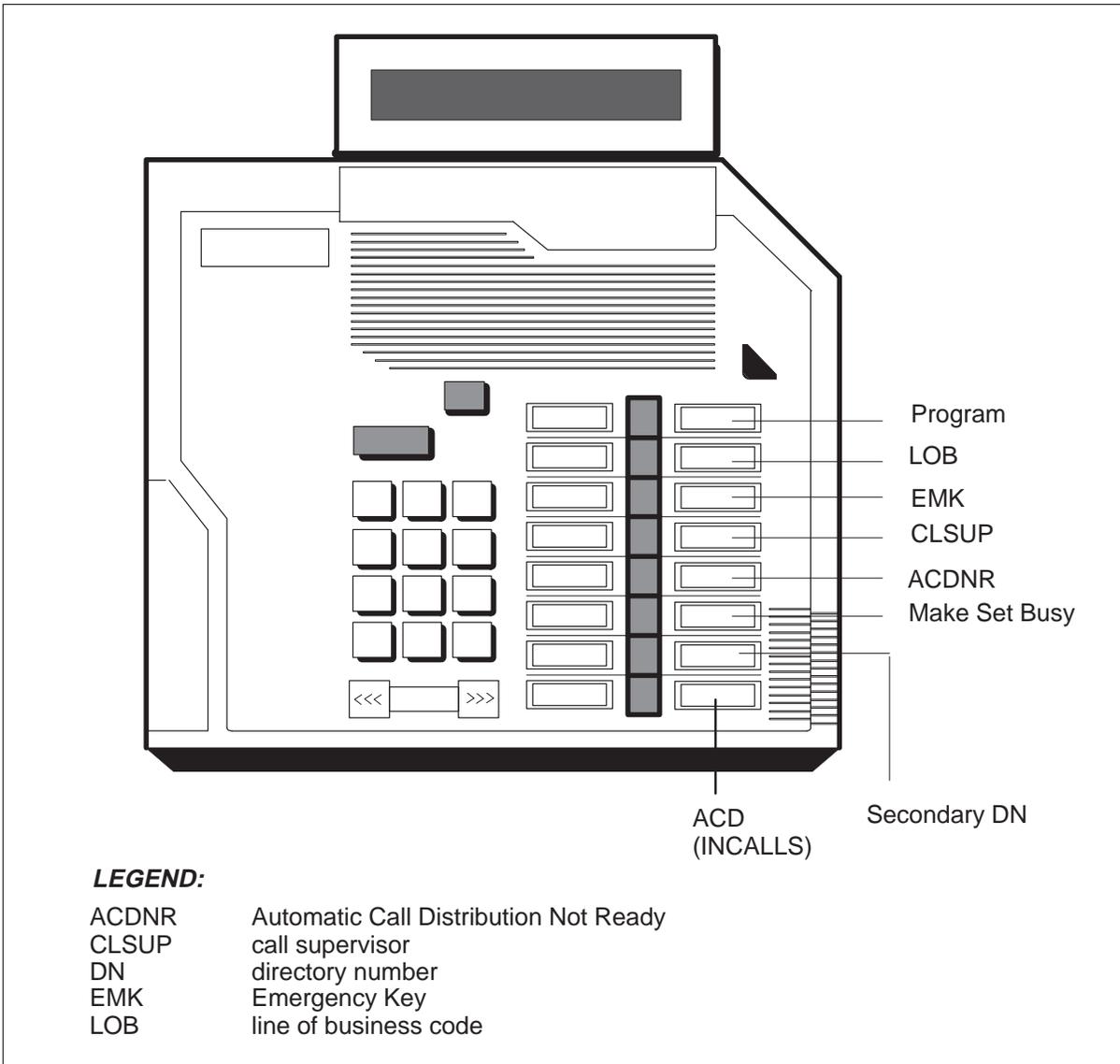
Controlled Interflow key

The Controlled Interflow (CIF) key allows incoming calls to a defined ACD group to be routed to a customer-defined location. Controlled Interflow does not affect calls already in queue. The agent receives no indication when a supervisor activates CIF. Multiple Controlled Interflow keys may be assigned to a supervisor set, however, only one Controlled Interflow key is allowed per ACD group.

Agent position

Figure 5-4 illustrates an example of the M2216, M2216-1 or M2216-2 modular telephone set configured for an agent. In this case, ACD, Make Set Busy, and ACD Not Ready (ACDNR) are assigned to Keys 1, 2, and 3.

Figure 5-4
Example of agent telephone set



INCALLS key

The INCALLS key is always Key 1 (the bottom feature key) on the M2216, M2216-1 and M2216-2. The INCALLS key is the only means by which ACD calls can be answered at an ACD agent position. The INCALLS key cannot be used to originate calls.

Secondary Directory Number key

The Secondary Directory Number key allows the agent to originate calls.

Make Set Busy key

The Make Set Busy (MSB) key provides a method for logging an agent out of the ACD queue. Make Set Busy overrides the Not Ready Queue.

If the agent activates the Make Set Busy feature, the agent is logged out. If an agent presses the Make Set Busy key while active on an ACD call, the agent is ineligible to receive new ACD or non-ACD calls, but the current active call is unaffected. When this call is released, the agent is logged out. When this feature is activated, the associated lamp lights.

Make Set Busy is canceled by pressing the Make Set Busy key a second time. When an agent cancels the condition while still active on an ACD call, the lamp extinguishes and makes the agent available to receive incoming ACD calls.

When all agents activate Make Set Busy, the ACD group is placed in Night Service. If an agent leaves an ACD position idle without pressing the MSB key and there is an incoming call, Make Set Busy is automatically activated after a specified number of seconds (as specified in SERVORD).

ACD Not Ready key

Pressing the ACD Not Ready (ACDNR) key lights the ACD Not Ready lamp and makes the ACD position temporarily unavailable to receive ACD calls. This time typically allows an agent to complete paperwork between ACD calls. Pressing the ACD Not Ready key a second time extinguishes the ACD Not Ready lamp and makes the agent available to receive incoming ACD calls.

Pressing the ACD Not Ready key during an active ACD call disconnects the call and places the agent in Not Ready status. Other non-ACD features on the set continue to function normally.

If ACD Not Ready is activated while an ACD call is ringing on the INCALLS key, the call is either presented to the next available ACD agent or, if no agents are available, the call is re-queued at the front of the incoming call queue.

Call Supervisor key

The Call Supervisor (CLSUP) key establishes direct communication between the agent and the supervisor. To call the supervisor, press the Call Supervisor key, the supervisor set rings, and the Answer Agent key lamp flashes.

The Call Supervisor-Make Set Busy Override feature allows the agent to override a Make Set Busy condition on the supervisor set when CLSUP is used to call the supervisor.

The CLSUP-Different INCALL feature allows the agent call to be directed to a specific supervisor regardless of the ACD group on which the agent is associated.

Emergency key

If an agent receives a threatening or abusive call on the INCALLS key, the Emergency key (EMK) conferences in the supervisor or records the conversation while the call is still connected. When the call is directed to a recording device, activation of the agent Emergency key rings the recording device. When the device answers, it is conferenced into the call.

Whether the call is directed to the supervisor or the recording device, the Emergency key lamp goes to a solid state. The lamp extinguishes when the agent presses the RIs key or goes on-hook.

Line of Business Code key

The Line of Business Code (LOB) key enters a line of business code during an active ACD call. The line of business code defines the activity or call type (for example, billing information, order entry, or general inquiry). Up to three codes can be entered during a call. Use Procedure 5-14 to activate the LOB key, and use Procedure 5-15 to cancel the last LOB input.

Procedure 5-14 Using the LOB key

- 1 Press the LOB key.
Response:
The associated lamp flashes.
- 2 Dial the 3-digit code of the line of business.
Response:
The associated lamp extinguishes.
- 3 You have completed this procedure.

Procedure 5-15 Canceling the LOB code

- 1 Press the LOB key.
Response:
The associated lamp flashes.
- 2 Enter three asterisks (***) .
- 3 Press the LOB key again.

Response:

The associated lamp extinguishes.

- 4 You have completed this procedure.

ACD set login/logout

ACD agents are required to log in to an ACD agent position.

The ACD set login feature prevents ACD sets from receiving ACD calls until the agent completes the login procedure. Access to regular PBX features is allowed after the handset or headset is plugged into the set.

Login

Both Make Set Busy (MSB) and ACD Not Ready (ACDNR) keys must be assigned to the agent set. If these keys are not assigned, any INCALLS key pressed during login is ignored.

The Make Set Busy feature must be active while the agent is logging into the ACD agent position. Use Procedure 5-16 to log in.

Procedure 5-16

Logging in

- 1 Press the INCALLS key, go off-hook by lifting the handset, or plug the headset into the ACD set. The INCALLS lamp lights. The agent receives a special dial tone.

If	Then	Do
The INCALLS lamp does not light.	<p>The agent is already logged onto the ACD agent position.</p> <p>or</p> <p>Either the MSB or ACDNR keys are not assigned.</p>	<p>Go to Step 4</p> <p>or</p> <p>Assign MSB or ACDNR keys. Repeat Step 1.</p>

- 2 Enter the 4-digit agent login identification number. The INCALLS lamp and MSB lamp extinguish. The MSB key deactivates. The ACDNR key activates. The agent is placed in the ACDNR queue. The supervisor position winks. Go to Step 4.

If	Then	Do
You receive reorder tone.	You entered an invalid identification number.	Log in the correct identification number.
You receive special dial tone.	Your system requires that you enter the 4-digit password.	Go to Step 3.

- 3 Enter the 4-digit password. The INCALLS and MSB lamps extinguish. The MSB key deactivates. The ACDNR key activates. The agent is placed in the ACDNR queue. The supervisor position winks.

If	Then	Do
You receive reorder tone.	You entered an incorrect password.	Release the line, then repeat Steps 1 through 3.

- 4 Press the ACDNR key to deactivate the ACD Not Ready mode and to receive ACD calls. The agent is placed in the idle agent queue and can receive ACD calls. The ASL flashes on the supervisor set, which means that the agent is logged in, idle, and waiting for ACD calls.
- 5 Press the INCALLS key for incoming calls. The ASL key on the supervisor set stops flashing.

Note: If the electronic telephone set is equipped with a 32-character alphanumeric liquid crystal display (LCD) window, the agent login identification number is displayed as the digits are entered.

- 6 You have completed this procedure.

To cancel the login feature, press either the RIs key or the directory number key during the login procedure. If no agent login identification is entered before normal digit timeout occurs, reorder tone is given.

If the agent position is not occupied and the MSB feature is deactivated, the MSB lamp flashes. The agent must activate MSB before logging in at this position.

Logout

An agent can log out in one of two ways:

- If an agent is not active on an ACD call and presses the MSB key to activate the Make Set Busy feature, the agent is logged out.
- If agent is active on an ACD call and has the Make Set Busy feature activated, the agent is logged out if the Rls key is pressed to release the call.

If the agent deactivates Make Set Busy after logging out, the MSB lamp winks to indicate that the agent is not logged in. The ASL lamp on the supervisor set is extinguished.

Once the agent is logged out, no more ACD calls can be presented to that position until an agent logs back in. Outgoing and incoming non-ACD calls can be handled from a secondary directory number (SDN) while the agent is logged out. No information is sent to the display concerning these calls. To reactivate Make Set Busy, the MSB key must be pressed. The MSB lamp is steadily lit and the agent can now log in.

Meridian SL-100 features

General

Meridian modular telephones are equipped with keys that can be assigned various features. With the help of the System Administrator, the telephone set can be configured for any specific needs. All of the feature option keys use clear, removable plastic caps. Labels are also included with the telephone set for many of the features along with blank labels for typing or printing additional feature key names.

Table 6-1 lists the station features that the Meridian modular telephones support.

Table 6-1
Meridian modular telephone station features

Feature	Feature
Authorization Code	Group Intercom
Automatic Dial	Last Number Redial
Automatic Line	Make Set Busy
Call Forward	Malicious Call Hold
Call Park	Message Waiting
Call Pickup	Multiple Appearance Directory Number (MADN) Ring Forward
	Multiple Station Message Waiting Indication
Call Transfer/3-Way Calling	Privacy Release
<p>Note: 1. The M2006 Modular Telephone cannot use the Group Intercom feature. 2. The TRKDISP feature is not compatible with ISDN type sets.</p>	
—continued—	

Table 6-1
Meridian modular telephone station features (continued)

Feature	Feature
Call Waiting	Ring Again
Conference	Trunk Member Display (TRKDISP)
Executive Busy Override	Speed Call
<p>Note: 1. The M2006 Modular Telephone cannot use the Group Intercom feature. 2. The TRKDISP feature is not compatible with ISDN type sets.</p>	
—end—	

In addition to the station features, the following features can be used by dialing the appropriate feature access code:

Feature	Feature
Automatic Answer	Intercom
Directed Call Park	Privacy
Inspect	Stored Number Redial
<p>Note: The M2006 Modular Telephone does not support the Inspect feature.</p>	

In addition, the M2216 Modular Telephones also provide the following Automatic Call Distribution (ACD) supervisor capabilities:

Feature	Feature
Agent Status	Display Queue Status
Answer Agent	Display Queue Threshold
Answer Emergency	Forced Agent Availability
Call Agent	Night Service
Controlled Interflow	Observe Agent
Display Agents Summary	

In addition to the Supervisor capabilities, the M2216 Modular Telephones provide the following Automatic Call Distribution (ACD) agent capabilities:

Feature	Feature
ACD Not Ready	Line of Business Code
Call Supervisor	Make Set Busy
Emergency	

Meridian modular telephones support the features of the electronic telephone sets and are datafilled in the same way.

Authorization Code

This feature allows the user to charge long distance calls to a department or an account number using an authorization code. This can be done before the number is dialed or while the call is being set up. Use Procedure 6-1 to enter an authorization code before a number is dialed, or use Procedure 6-2 to enter an authorization code while setting up a call transfer or conference call.

Procedure 6-1

Entering an authorization code before dialing

- 1 Press the primary directory number (PDN) key.
Response:
The PDN indicator comes on.
- 2 Dial * or #, followed by the account number.
- 3 Enter the authorization code number.
Response:
The caller receives dial tone.
- 4 Dial the destination number.
- 5 You have completed this procedure.

Procedure 6-2

Entering an authorization code before dialing

- 1 Press the Transfer key.

or

Press the Conference key.

Response:

The Transfer or Conference indicator comes on.

2 Dial * or #, followed by the account code.

3 Enter the authorization code number.

Response:

The caller receives dial tone.

4 Dial the phone number.

5 Press the Transfer or Conference key.

6 You have completed this procedure.

Automatic Answer Back (AAB)

The Automatic Answer Back (AAB) feature allows any incoming call to the PDN of the set (equipped with a handsfree unit with an auto answerback applique circuit) automatically answered after four seconds of ringing.

Automatic Answer Back (AAB) Enhancement

The AAB Enhancement feature allows the AAB feature to work on secondary DNs and Group Intercoms (GIC). The user has the choice of activating AAB for any DN. Whenever a call is presented to any DN on the set for which AAB is active, the call is automatically answered after four seconds of ringing without any physical intervention. When the incoming call is answered, a special tone splash is heard by the called or terminating party to indicate that the call has been answered in handsfree mode. This feature works the same for GIC.

Provisioning

The AAB option is assigned to a business set using Service Order (SERVORD). The AAB option can be assigned on a per DN basis using SERVORD commands ADO (Add option) or NEW. When assigning AAB on a blank key using the ADO command, the user is prompted for a keylist. If AAB is required for all the DNs on the set then \$ is entered for keylist. If AAB is not required for all the DNs on the set, then the key numbers of those DNs which require AAB are entered.

When assigning AAB on a blank key using the NEW command, keylist is prompted only when it is being added for secondary DNs. When assigning AAB for primary DNs on a blank key using the NEW command, keylist is not prompted.

The CHF command is used to change the keylist of the DN keys on which AAB has already been assigned.

The DEO command is used to delete the option AAB entirely from the set.

Feature activation and deactivation

AAB is assigned on a dedicated key. The following are procedures for activation and deactivation of the feature. The set must be idle when you try to activate/deactivate the feature.

Procedure 6-3

AAB feature activation

- 1 Press the feature key on which AAB is assigned.
Response: The lamp next to the AAB feature key begins to flash.
- 2 Press the DN key or GIC key on which you want the AAB feature to be activated.
Response: The AAB feature key lamp becomes solid.

Procedure 6-4

AAB feature deactivation

- 1 Press the AAB feature key.
Response: The lamp next to the AAB feature key begins to flash.
- 2 Press the DN key or the GIC member key on which you want to deactivate AAB.
Response: The lamp next to the AAB feature key goes off unless there is at least one DN on the set on which AAB is still active.

Feature verification

If the AAB key has a solid lamp beside it, the user can verify if AAB is active for a DN on the set by pressing the DN key. If the user gets stuttered dial tone, then AAB is active for that DN. If the user gets normal dial tone, then AAB is inactive for that DN.

Limitations and restrictions

The following is a list of the limitations and restrictions associated with the AAB Enhancement feature.

- Whenever a call comes into a DN on which AAB is active, but the set is busy on another DN, the call on the new DN is not auto answered but must be answered manually.
- Whenever an incoming call to an IVD set DN or a KSET PDN is manually answered before four seconds of ringing, before the AAB timer expires and the call is automatically answered for example, then a tone splash is heard.

Automatic Dial

Automatic Dial provides a convenient, time-saving feature that allows the caller to dial a number automatically by pressing the Auto Dial key. This feature is especially useful for a frequently dialed number. Use the following procedures to activate specific Automatic Dial capabilities:

- programming the Auto Dial key—Procedure 6-5
- canceling programming before adding or changing the Automatic Dial number—Procedure 6-6
- deleting the Automatic Dial number—Procedure 6-7
- placing a call using the Auto Dial key—Procedure 6-8

Procedure 6-5

Programming the Auto Dial key

- 1 Press the Automatic Dial (AUD) key.

Response:

The AUD indicator flashes.

- 2 Dial the number to be stored.

- 3 Press the AUD key.

Response:

The telephone stores the number, and the AUD indicator goes off.

- 4 You have completed this procedure.

Procedure 6-6

Canceling programming before adding or changing an Automatic Dial number

- 1 Press the Hold or the Release (RIs) key before pressing the AUD key a second time.

Response:

The telephone does not store the number, and the AUD indicator goes off.

- 2 You have completed this procedure.

Procedure 6-7

Deleting the Automatic Dial number

- 1 Press the AUD key.

Response:

The AUD indicator flashes.

- 2 Press the pound key (#).

- 3 Press the AUD key.

Response:

The AUD indicator goes off.

Note: The telephone can not be on an active conversation. You must either place the active call on hold or release the call to delete an Automatic Dial number.

- 4 You have completed this procedure.

Procedure 6-8

Placing a call using the Auto Dial key

- 1 Press the directory number (DN) key.

Response:

The DN indicator comes on, and the caller receives dial tone.

- 2 Press the AUD key.

Response:

The call proceeds as if the directory number had been dialed manually.

- 3 You have completed this procedure.

Automatic Line

The Automatic Line feature may be assigned to any extension on the telephone, including the primary DN. If the automatic line is assigned to the PDN key, then use the PDN key to call a predetermined number very quickly. Use Procedure 6-9 to make an Automatic Line call, and use Procedure 6-10 to answer an Automatic Line call.

Note: The Automatic Line feature cannot be assigned to the PDN key in ACD applications because that key acts as the INCALLS key.

Procedure 6-9

Placing a call using the Auto Dial key

- 1 Lift the handset.

Response:

The PDN indicator comes on.

- 2 Press the extension key designated as the Automatic Line extension key.

Response:

The telephone automatically dials the number designated as the Automatic Line number.

- 3 You have completed this procedure.

Procedure 6-10
Answering an Automatic Line call

- 1 Lift the handset, and speak.
Response:
The DN indicator associated with the automatic line comes on.
- 2 You have completed this procedure.

Call Forward

This feature allows the user to forward calls to another telephone. For example, if the user is working in another area, they can forward their calls to that location. When Call Forward is activated, users can still make calls from their telephones as usual. Use the following procedures to activate specific Call Forward capabilities:

- programming the Call Forward feature—Procedure 6-11
- reinstating Call Forward to the same number—Procedure 6-12
- canceling the Call Forward feature—Procedure 6-13

If the user always uses Call Forward for the same number, the user does not have to reprogram that number each time.

Procedure 6-11
Programming the Call Forward feature

- 1 Press the Forward key.
Response:
The Call Forward indicator flashes.
- 2 Dial the number of the telephone to which calls are to be forwarded.
- 3 Press the Forward key.
Response:
The Call Forward indicator comes on.
Note: The Call Forward number is stored in memory until the number is replaced with another.
- 4 You have completed this procedure.

Procedure 6-12**Reinstating Call Forward to the same number**

- 1 Press the Forward key twice. The telephone forwards calls to the same number programmed previously.

Response:

The Call Forward indicator flashes after pressing the Forward key once. The Call Forward feature is set when the Forward key is pressed the second time.

- 2 You have completed this procedure.

Procedure 6-13**Canceling the Call Forward feature**

- 1 Press the Forward key.

Response:

The Call Forward indicator goes off.

- 2 You have completed this procedure.

Call Park

The Call Park feature allows the user to put any call, except a conference call, on hold without tying up a line. Anyone can then connect to the call from any telephone that has the Call Park feature. Users can park a call on a main extension or on an alternate extension. Use Procedure 6-14 to activate the Call Park feature, and use Procedure 6-15 to retrieve parked calls.

Procedure 6-14**Activating Call Park**

- 1 Press the Call Park key.

Response:

The Call Park indicator flashes.

Note: When a call is parked, the call park timer is set. When the call park timer expires, the parked call is recalled, and the parking party receives ringing. The parked call may still be retrieved from another station, thereby canceling the recall. However, once the recall is answered, the call is unparked.

- 2 You have completed this procedure.

Procedure 6-15**Retrieving parked calls**

- 1 Lift the handset.

Response:

The PDN indicator comes on. The caller receives dial tone.

- 2 Enter the Call Park Retrieve feature access code.
- 3 Dial the number that the call is parked against.
Response:
Two-way conversation between the caller and the parked call begins. The system un parks the call.
- 4 You have completed this procedure.

Call Pickup

If the telephone set is part of a Call Pickup group, calls for other people in the pickup group can be answered. Use the following procedures to activate specific Call Pickup capabilities:

- using Call Pickup—Procedure 6-16
- using Call Pickup feature access codes—Procedure 6-17
- answering a call in another Call Pickup group—Procedure 6-18
- answering a call in another Call Pickup group using the Directed Call Pickup access code—Procedure 6-19
- answering a call on a specific extension in another Call Pickup group using Directed Call Pickup—Procedure 6-20

Note: Call Pickup is a valid feature for the M2216 telephone sets; however, Call Pickup is incompatible with ACD applications. Therefore, this feature is unavailable in ACD applications.

Procedure 6-16 Using Call Pickup

- 1 Lift the handset.
- 2 Press an idle DN key.
Response:
The associated DN indicator comes on, and the user receives dial tone.
- 3 Press the Call Pickup (CPU) key.
Response:
Two-way conversation begins between the user and the incoming caller.
- 4 You have completed this procedure.

Procedure 6-17 Using the Call Pickup feature access codes

- 1 Lift the handset.

- 2 Press an idle DN key.

Response:

The associated DN indicator comes on, and the user receives dial tone.

- 3 Enter the Call Pickup feature access code.

Response:

Two-way conversation begins between the user and the incoming caller.

- 4 You have completed this procedure.

Procedure 6-18

Answering a call in another Call Pickup group

- 1 Lift the handset.

- 2 Press an idle DN key.

Response:

The associated DN indicator comes on, and the user receives dial tone.

- 3 Press the CPU key.

- 4 Dial the Call Pickup group number.

Response:

Two-way conversation begins between the user and the incoming caller.

- 5 You have completed this procedure.

Procedure 6-19

Answering a call in another Call Pickup group using the Directed Call Pickup access code

- 1 Lift the handset.

- 2 Press an idle DN key.

Response:

The associated DN indicator comes on, and the user receives dial tone.

- 3 Enter the Directed Call Pickup (DCPU) feature access code.

- 4 Dial the Call Pickup group number.

Response:

Two-way conversation begins between the user and the incoming caller.

- 5 You have completed this procedure.

Procedure 6-20

Answering a call on a specific extension in another Call Pickup group using Directed Call Pickup

- 1 Lift the handset.
- 2 Press an idle DN key.
Response:
The associated DN indicator comes on, and the user receives dial tone.
- 3 Enter the DCPU feature access code.
- 4 Dial the extension number of the ringing telephone.
Response:
Two-way conversation begins between the user and the caller.
- 5 You have completed this procedure.

Call Transfer/3-Way Calling

This feature allows the user to transfer a call to another person or add another person to the call. Use Procedure 6-21 to transfer a call or make a 3-way call, or use Procedure 6-22 to stop the transfer and return to the first party.

Procedure 6-21

Transferring a call or making a 3-way call

- 1 Press the Transfer key once.
Response:
The Transfer indicator comes on. The DN indicator flashes. The original party is automatically put on hold.
- 2 Dial the number where the call is to be transferred.
Response:
When the person to whom the call is transferred answers, you are connected to them alone and can confer with them privately.
- 3 Press the Transfer key again.
Response:
The Transfer indicator goes off, and the system establishes a 3-way call connection.
- 4 Press the Release (RIs) key, or hang up to exit from the 3-way conference call.

Response:

The system completes the transfer.

- 5 You have completed this procedure.

Procedure 6-22

Stopping the transfer and returning to the first party

- 1 Press the DN key.

or

Press the RIs key, and then press the DN key.

Response:

The second party that was dialed is disconnected.

- 2 You have completed this procedure.

Call Waiting

This feature allows the user to answer a call if the user is already on the telephone. The user receives a tone, and the Call Waiting indicator flashes. Use Procedure 6-23 to activate Call Waiting functions.

Procedure 6-23

Activating Call Waiting functions

- 1 Press the Call Waiting key.

or

Press the Hold key, and then press the Call Waiting key.

Response:

The first call is put on hold, and you are connected to the second call.

- 2 **To return to the first call:**

Press the RIs key.

Response:

The call on Call Waiting is disconnected.

- 3 Press the DN key.

Response:

You are reconnected to the original call (the first call).

- 4** *To place the second call on hold and return to the first call:*
Press the Hold key

or

Press the Call Waiting key.
Response:
The call on Call Waiting is put on hold.
- 5** Press the DN key.
Response:
You are reconnected to the original call (the first call).
- 6** *To release the first caller and return to the second caller:*
Press the Hold key.
Response:
Puts the second call or the Call Waiting call on hold. The Call Waiting lamp flashes.
- 7** Press the DN key.
Response:
The DN indicator changes from a flashing to an on indicator.
- 8** Press the RIs key.
Response:
Release the first call and the DN lamp goes off.
- 9** Press the Call Waiting call key.
Response:
Reconnects you to the second or Call Waiting call.
- 10** You have completed this procedure.

Conference

This feature allows the user to include more people on an existing call by using the Conference key. Use Procedure 6-24 to add an additional party on an active call.

Procedure 6-24 **Adding an additional party on an active call**

- 1** Press the Conference key.
Response:

The Conference indicator comes on. The active call is put on hold. The caller receives dial tone.

- 2 Enter the next conferee's DN.

Response:

The caller receives ringback until the conferee answers. Talk privately with this person before completing the conference or multi-party connection.

- 3 Press the Conference key to connect all parties.

Response:

The Conference indicator goes off. The system connects all parties.

- 4 Repeat Steps 2 through 4 for up to 6 conferees.
- 5 You have completed this procedure.

Executive Busy Override

This feature allows the user to interrupt a call within an organization when a busy signal is received. Use Procedure 6-25 to override a call after receiving a busy signal.

Note: Executive Busy Override is a valid feature for the M2216 telephone sets; however, Executive Busy Override is incompatible with ACD applications. Therefore, this feature is unavailable in ACD applications.

Procedure 6-25

Overriding a call after receiving a busy signal

- 1 After receiving a busy signal, press the Override key.

Response:

The party to be interrupted receives a warning tone. The system connects the calling and called parties.

- 2 Press the RIs key.

or

Hang up the handset.

Response:

The system disconnects the call.

Note: If you try to override a call that cannot be interrupted, the system provides a fast busy signal.

- 3 You have completed this procedure.

Group Intercom

The Group Intercom feature provides a grouping of telephones within an organization or department. This arrangement provides users within that intercom group to call each other by dialing a code assigned by the System Administrator. The following features can be used in conjunction with the Group Intercom feature:

- Automatic Dial
- Call Pickup
- Executive Busy Override
- Ring Again
- Speed Call
- Call Transfer

The Conference feature can also be used if all the people being added to the conference belong to the same intercom group.

Use Procedure 6-26 to answer a Group Intercom call, or use Procedure 6-27 to answer a Group Intercom call while active on another call.

Note: The M2006 set does not use the Group Intercom feature.

Procedure 6-26

Answering a Group Intercom call

- 1 The telephone rings.

Response:

The Group Intercom indicator flashes.

- 2 Lift the handset, and press the Group Intercom key.

Response:

The Group Intercom indicator comes on. The call is established.

- 3 You have completed this procedure.

Procedure 6-27

Answering a Group Intercom call while another call is active

- 1 A buzz occurs.

Response:

The Group Intercom indicator flashes.

- 2 Press the Hold key.

Response:

The current call is put on hold.

or

Hang up.

Response:

The current call is disconnected.

- 3 Press the Group Intercom key.

Response:

The Group Intercom indicator comes on. The call is established.

- 4 You have completed this procedure.

Last Number Redial

This feature allows the user to automatically redial the last number dialed by entering the Last Number Redial feature access code. Each number is automatically stored in memory, erasing the previously stored number. Use Procedure 6-28 to redial the last number dialed.

Procedure 6-28

Redialing the last number dialed

- 1 Press the DN key.

Response:

The caller receives dial tone.

- 2 Press the # key twice.

Response:

The telephone redials the last number called.

Note 1: This feature does not store Speed Call numbers.

Note 2: If the number of dialed digits exceeds the allowed maximum, the number is not stored, and the previously stored number is erased.

Note 3: If the last number dialed was invalid or had too many digits, the system provides a fast busy signal when the user enters the Last Number Redial feature access code.

- 3 You have completed this procedure.

Make Set Busy

If you do not want to be interrupted by telephone calls, use the Make Set Busy feature. This feature makes the telephone set appear busy to callers, but the user can still place outgoing calls. Use Procedure 6-29 to activate Make Set Busy, and use Procedure 6-30 to deactivate the feature.

Procedure 6-29
Activating the Make Set Busy feature

- 1 Press the Make Busy key.

Response:

The Make Busy indicator comes on. No calls ring to the DN. Incoming callers receive a busy signal.

- 2 You have completed this procedure.

Procedure 6-30
Deactivating the Make Set Busy feature

- 1 Press the Make Busy key.

Response:

The Make Busy indicator goes off.

- 2 You have completed this procedure.

Malicious Call Hold

This feature allows the user to trace nuisance or malicious calls. Use Procedure 6-31 to trace a call using the Malicious Call Hold key, or use Procedure 6-32 to trace a call using the Malicious Call Hold feature code.

Procedure 6-31
Tracing a call using the Malicious Call Hold key

- 1 Press the Malicious Call Hold (MCH) key.

Response:

The telephone puts the call on hold, and the system generates records with information on the caller.

- 2 Contact System Administration.

- 3 You have completed this procedure.

Procedure 6-32
Tracing a call using the Malicious Call Hold feature code

- 1 Press the Transfer key.

or

Press the Conference key.

Response:

The telephone puts the call on hold. The user receives dial tone.

- 2 Enter the Malicious Call Hold feature access code.

Response:

The system generates records with information on the caller.

- 3 Contact System Administration.

Note 1: After the Malicious Call Hold feature has been activated, the caller must be manually taken off hold. Hang up, or continue talking to the caller.

Note 2: When tracing a call using either of the preceding methods, the system prints a report showing the identity of the caller. The System Administrator has access to this report.

- 4 You have completed this procedure.

Message Waiting

This feature allows the telephone to be assigned to a message center, which collects telephone messages when the user cannot answer the telephone. If the Message Waiting indicator is on, then the message center has at least one message for the user. Use Procedure 6-33 to retrieve a message from the message center.

Procedure 6-33

Retrieving a message from the message center

- 1 Press the DN key.

Response:

The DN indicator comes on. The user receives dial tone.

- 2 Press the Message key.

Response:

The system dials the message center.

- 3 After the voice prompt, enter your mailbox number.

Response:

The system requests the password.

- 4 After the voice prompt, enter your password.

- 5 Dial the Call Request Retrieval code (available from your System Administrator).

Response:

First message is sent to you.

6 Hang up.

or

Press the Release (RIs) key.

Response:

The DN indicator goes off.

or

Message Waiting indicator goes off. If Message Waiting indicator is still on, more messages are waiting. Repeat Steps 2 and 3.

7 You have completed this procedure.

Multiple Appearance Directory Number Ring Forward

The MADN feature provides a directory number that appears on more than one station. The stations that are assigned these numbers are referred to collectively as a MADN group. MADN groups can be configured with either single call arrangement (SCA) or multiple call arrangement (MCA). The MADN SCA configuration allows only one telephone set to be active at a time, while MADN MCA allows more than one telephone set to be active simultaneously.

The MADN Ring Forward feature provides increased flexibility in the ringing options available to MADN SCA. Prior to this feature, each appearance of a MADN could be designated to ring or not ring for terminating MADN group calls. MADN Ring Forward (MRF) provides the capability for MADN SCA appearances to ring on a delayed or abbreviated basis, for a total of four ringing options: always ring, never ring, ring from call termination until MRF activation (abbreviated), or ring after MRF activation (delayed).

This feature also allows the ringing associated with a call terminating on a MADN SCA group to initially be applied to one set of appearances of the MADN and then forwarded to another set of appearances of the MADN. Ring forwarding can be activated on an automatic or a manual basis. Automatic ring forwarding is controlled by a timer that is set on a per-MADN-group basis. The automatic version of MRF can also be preempted manually by an EBS user by pressing the MRF manual (MRFM) feature key on the telephone set.

Use Procedure 6-34 to activate MRF on an active call for the associated MADN group. Only currently active calls to the MADN group can be affected by MRF activation. Subsequent incoming calls are not affected unless MRF is activated again.

Procedure 6-34
Activating MADN ring forward

- 1 Press the MRFM key.

Response:

The DN indicators are unaffected by feature activation. The DN indicators flash at all appearances of the MADN. Any MADN appearance can answer the call; only the ringing is forwarded by MRF.

Note 1: MRF can be manually activated by key access. This feature is not supported on 500/2500 sets although the sets may be appearances of a MADN group with the MRF feature assigned.

Note 2: When manual MRF is assigned to a MADN group, only manual activation is allowed.

Note 3: A telephone set can have more than one MRFM key assigned, and the keylists for the different MRFM keys can overlap. However, only one MRFM key can be assigned that affects all appearances of a MADN group.

- 2 You have completed this procedure.

Multiple Station Message Waiting Indication

The Multiple Station Message Waiting Indication (MSMWI) feature provides a visual indication of a message waiting for a primary terminal on one or more secondary terminals. This feature is assigned through service orders (SERVORD).

Table 6-2 describes those terminals which are compatible with the MSMWI feature.

Table 6-2
Valid terminals for MSMWI feature

Terminal description	Terminal type
Proprietary business sets	PSET
	PSET w/display
M2000 digital telephones (digital IVD sets)	M2009
	M2018
	M2112
	M2317
Meridian modular telephones (digital)	M2006
	M2008
	M2008HF
	M2016S
	M2216
	M2616
Meridian business sets	M5008
	M5009
	M5009S
	M5112
	M5208
	M5209
	M5212
	M5216
	M5312
M5316	

The primary terminal associated with the MSMWI key set feature can be a message station. A message station is a terminal with either MWT or EMW assigned to it. Such a message can function as a message center for a Multiple Appearance Directory Number (MADN) or Automatic Call Distribution/Uniform Call Distribution (ACD/UCD) group.

In order to use the MSMWI feature, a primary terminal must have one of the following features assigned to it:

- Message Waiting (MWT)
- Executive Message Waiting (EMW)

All attempts to remove MWT or EMW from the primary terminal will be blocked until all MSMWI assignments associated with that primary terminal are removed from the corresponding secondary terminals.

The visual indication on the secondary terminals consists of a lit liquid-crystal display (LCD) lamp associated with the MSMWI key. When message waiting indication is turned on for the primary terminal, the LCD lamp associated with the corresponding MSMWI key on the secondary terminal(s) is turned on (lit in a steady state). When message waiting indication is turned off for the primary terminal, the LCD lamp associated with the corresponding MSMWI key on the secondary terminal is also turned off.

The MSMWI feature does not provide any means of accessing messages left against a primary terminal. It only provides a visual indication of such messages. Existing methods for accessing messages are unaffected by this feature, and may still be used.

Note: If the terminal datafilled with the MSMWI key set feature has a light-emitting diode (LED), it will not be used in conjunction with this feature.

MSMWI feature applications

A typical application of the MSMWI feature is a help desk. Indication of messages left for a help desk is currently only provided on the help desk terminal itself. With the MSMWI feature, help desk personnel will have a visual indication of messages left for the help desk on their individual phone sets, provided that each terminal is of a terminal type compatible with the MSMWI feature.

Another application of the MSMWI feature is for an administrative position with responsibility for several managers. The administrative position can have several instances of the MSMWI key set feature assigned (one for each manager for which the position is responsible).

Privacy Release

The Privacy Release feature allows another person who shares your MADN to connect to your current call. Only one person with the same DN can use the Privacy Release key at a time. Use Procedure 6-35 to allow another person to join your conversation while on a call.

Procedure 6-35

Allowing another person to join your conversation while on a call

- 1 Press the Privacy Release key.

Response:

The DN indicator flashes on all phones that are in the same MADN group. When the second MADN group member joins the call, the DN indicator stops flashing.

Note 1: After the second MADN group member joins the call, the Privacy Release feature is deactivated. To let others with the same extension join the conversation, press the Privacy Release key again.

Note 2: If the second MADN group member does not join the call, deactivate the feature by pressing the Privacy Release key again.

- 2 You have completed this procedure.

Ring Again

This feature allows a caller to be alerted when a dialed busy line becomes free. Once the busy line is free, the system redials the call automatically. Use Procedure 6-36 to activate Ring Again, and use Procedure 6-37 to deactivate the feature.

Procedure 6-36

Activating the Ring Again feature

- 1 Press the Ring Again key after receiving a busy signal.

Response:

The Ring Again indicator comes on. When the busy line is free, the caller receives a tone.

- 2 Press the DN key.

Response:

The Ring Again indicator flashes.

- 3 Press the Ring Again key.

Response:

The system redials the number automatically.

Note: This feature is canceled if the user does not press the Ring Again key before the system-defined timeout period.

- 4 You have completed this procedure.

Procedure 6-37
Deactivating the Ring Again feature

- 1 Press the Ring Again key a second time before notification that the busy line is free.
Response:
The Ring Again indicator turns off.
- 2 You have completed this procedure.

Speed Call

This feature allows the user to dial a preprogrammed number using a 1- or 2-digit code.

Telephones can be designated as either Speed Call controllers or Speed Call users. Speed Call controllers can store and use numbers. Speed Call users only use the numbers. If the Speed Call list contains 10 or fewer telephone numbers, 1-digit codes (0–9) can be used for the Speed Call numbers. For lists with up to 30 numbers, 2-digit codes (00–29) must be used; for lists up to 50 numbers, 2-digit codes (00–49) must be used; and for lists up to 70 numbers, 2-digit codes (00–69) must be used.

Some of the Speed Call lists can be designated as system Speed Calls. Calls made using system Speed Call lists are unrestricted, even if the telephone is not normally allowed to make calls to the numbers in the list.

Use the following procedures to activate specific Speed Call functions:

- Making a Speed Call—Procedure 6-38
- Storing a Speed Call number—Procedure 6-39
- Changing or erasing a Speed Call number—Procedure 6-40
- Releasing from a Speed Call—Procedure 6-41

Procedure 6-38
Making a Speed Call

- 1 Press the DN key.
Response:
The DN indicator comes on. The user receives dial tone.
- 2 Press the Speed Call key.
Response:
The Speed Call indicator comes on.
- 3 Dial the 1- or 2-digit code for the number to be called.

Response:

The system dials the phone number automatically.

- 4 You have completed this procedure.

Procedure 6-39
Storing a Speed Call number

- 1 Press the Speed Call key.

Response:

The Speed Call indicator flashes.

- 2 Dial the 1- or 2-digit code to be associated with the number being stored.

- 3 Dial the number to be stored.

- 4 Press the Speed Call key again.

Response:

The Speed Call indicator goes off.

- 5 You have completed this procedure.

Procedure 6-40
Changing or erasing a Speed Call number

- 1 Press the Speed Call key.

Response:

The Speed Call indicator flashes.

- 2 Dial the 1- or 2-digit code of the number to be changed or erased.

- 3 To change the number the code represents, dial the new number.

or

To erase the number from the lists, press * (asterisk) on the dial pad.

- 4 Press the Speed Call key again.

Response:

The Speed Call indicator goes off.

- 5 You have completed this procedure.

Procedure 6-41
Releasing from a Speed Call

- 1 Press the Speed Call key.

Response:

The Speed Call indicator flashes.

- 2 Press the Release (Rls) key.

Response:

The Speed Call indicator goes off.

- 3 You have completed this procedure.

Trunk Member Display

The Trunk Member Display TRKDISP feature is used with the Meridian business set (MBS)/integrated voice and data (IVD) display sets. When the TRKDISP key is depressed, the feature is activated and displays the common language location identification (CLLI) and circuit member number of the trunk to which it is connected. After depressing the same key a second time, the feature updates the set with the previous display and cancels the feature. TRKDISP can display the trunk data from any trunk type.

TRKDISP is datafilled in SERVORD. The existence of this feature can be verified by the query line equipment number (QLEN), query directory number (QDN), query working line equipment number (QLENWRK), and query working directory number (QDNWRK) SERVORD commands.

The following are restrictions to this feature:

- TRKDISP cannot be assigned to any soft keys.
- TRKDISP is not compatible with any CLASS sets or features.
- TRKDISP is not applicable with the attendant console.
- TRKDISP is not compatible with ISDN type sets.
- TRKDISP and any Three Way Calling (3WC) or conference feature cannot be active simultaneously.
- The Display feature cannot be deleted before the TRKDISP feature.

Line Music On Hold

The Line Music On Hold (LMOH) feature offers large organizations the capability to provide multiple music sources (specific to the line) per each business unit, as opposed to only one Music On Hold source per customer group. This feature is assigned and applied on a per set basis.

Currently, LMOH works in conjunction with Permanent Hold (HLD), Call Hold (CHD), KSET Music On Hold (KSMOH), MBS Camp On (MBSCAMPO), and Call Park (PRK). It is provisionable on IBN, IVD,

MBS and ISDN lines. For MBS and ISDN sets, the feature is assigned and applied on a per set basis and is only assignable to key 1.

The user can assign LMOH through service order (SERVORD). SERVORD commands NEW or ADO are used to assign the option to a line, CHF to change the option and DEO to delete the option from a line. When assigning the line option, the user enters LMOH at the prompt for option and is then prompted for an audio group. The response is any AUDIO_GROUP key value (AUDIO1 to AUDIO512) regardless of whether or not it is datafilled in table AUDIO.

The result of the SERVORD operation is a new tuple in table IBNFEAT for IBN lines or table KSETFEAT for MBS and ISDN lines.

Operation with the complete LMOH functionality

Currently, the LMOH feature works in conjunction with HLD, CHD, KSMOH, MBSCAMPO, and PRK. If one of these options is assigned to the line in question and that line has LMOH, then that option uses the Audio Group associated with the line to find the correct Audio Route rather than the one datafilled in table CUSTSTN for that option.

The following is an example of this:

- Set A has CHD assigned
- Set A's customer group has CHD datafilled with Audio Group AUDIO1 in table CUSTSTN
- If Set A invokes CHD, then the far end of the call receives music as described by the tuple AUDIO1 CHD in table AUDIO
- Assign LMOH to Set A with Audio Group AUDIO2
- Now when Set A invokes CHD, the far end of the call receives music as described by the tuple AUDIO2 CHD in table AUDIO

The other Music on Hold features, KSMOH, HLD, PRK, and MBSCAMPO, behave in a similar fashion.

If LMOH is assigned to a line and no tuple exists for the LMOH Audio Group and the hold feature that is activated, then the audio source defaults to the one datafilled in table CUSTSTN for that particular hold feature.

If LMOH is not assigned to the line, then the audio source defaults to the one datafilled in table CUSTSTN for the hold feature that is activated.

Example of feature assignment and operation

Figure 6-1 shows how a customer group CUST_GRP uses AUDIO1 as its central music source and has the following configuration for features CHD, KSMOH, PHOLD and MBSCAMPO in table AUDIO.

Figure 6-1
LMOH feature assignment

AUDIOKEY		AUDIOKEY	
-----		-----	
AUDIO1	KSMOH	(MUSIC MUSICCLLI 0) \$
AUDIO1	PHOLD	(MUSIC MUSICCLLI 1) \$
AUDIO1	CHD	(MUSIC MUSICCLLI 2) \$
AUDIO1	MBSCAMP	(MUSIC MUSICCLLI 3) \$

Table CUSTSTN may have the datafills shown in figure 6-2, which specify the customer group wide music source per feature.

Figure 6-2
Table CUSTSTN datafills

CUSTNAME	CUSTNAME	OPTION
-----	-----	-----
CUST_GRP	KSMOH	KSMOH AUDIO1
CUST_GRP	MBSCAMPO	MBSCAMPO 12 Y AUDIO1

If this customer has five different business units and each of these units wants its own audio source, then new tuples must be added to table AUDIO. The assumption is that tuples are added as in figure 6-3.

Figure 6-3
Table AUDIO datafills

AUDIOKEY		AUDIOKEY
-----		-----
AUDIO1	KSMOH	(MUSIC MUSICCLLI 0) \$
AUDIO1	PHOLD	(MUSIC MUSICCLLI 1) \$
AUDIO1	CHD	(MUSIC MUSICCLLI 2) \$
AUDIO1	MBSCAMP	(MUSIC MUSICCLLI 3) \$
AUDIO2	KSMOH	(MUSIC MUSICCLLI 4) \$
AUDIO2	PHOLD	(MUSIC MUSICCLLI 4) \$
AUDIO2	CHD	(MUSIC MUSICCLLI 4) \$
AUDIO3	KSMOH	(MUSIC MUSICCLLI 5) \$
AUDIO3	PHOLD	(MUSIC MUSICCLLI 6) \$
AUDIO3	CHD	(MUSIC MUSICCLLI 7) \$

Music On Transfer (MOT)

The Music On Transfer (MOT) feature provides audio to the held party of 3WC or CXR as soon as the conference or transfer is initiated. When caller A is transferred or conferenced by caller B to caller C, caller A is connected to an audio source, such as music for example. When the call is completely transferred or conferenced, or the second leg is dropped by caller B, the call is re-established on the line and the audio source is terminated. The functionality is provisioned by assigning MOT through SERVORD on the PDN.

This feature was developed to provide audio on CXR/conference for IBN, MBS and IVD sets only.

The KSMOH feature can also be used when a held party is part of 3WC/CXR. However, the held party only hears music after the holding party completes the dialing sequence for the third party. In other words, the held party hears silence until all digits are dialed. The MOT feature provides audio immediately when the holding party begins the transfer process (flash and dial digits).

Agent support

The MOT feature supports IBN sets, all LCCs that are supported by key sets, and IVD sets.

Provisioning

The MOT feature is provisioned on the set using SERVORD and is controlled using the datafill of tables CUSTSTN and AUDIO.

Table CUSTSTN

The MOT feature adds a new CUSTSTN option known as MOT for the associated customer group.

In order to provide audio by this feature, the MOT option should be datafilled in table CUSTSTN. The audio group for MOT must be assigned in this table as well. The AUDIOGRP field of the MOT option allows the customer to datafill the desired audio source. Entering the MOT option for a specific entry assigns the MOT feature to the specific customer group as well as define the customer group's MOT audio group. For more information, refer to the *Commercial Systems Customer Data Schema*, document.

Table AUDIO

The MOT audio route lists are optionally assigned to the 512 allocated MOT audio groups in table AUDIO. For each of the audio groups (MOT AUDIO1 to MOT AUDIO512), an audio route list containing up to four audio sources can be optionally datafilled. For more information, refer to the *Commercial Systems Customer Data Schema*, document.

Feature activation

IBN sets

For IBN sets, a line-to-line call is established between two parties, set A and set B for example. Set B, which has the MOT and 3WC/CXR options assigned to it, flashes to activate 3WC/CXR. As soon as set B flashes, set A is put on hold and is provided with an audio source that is defined in table AUDIO and set B gets a dial tone to dial the destination digits on the second leg. Once the call on the second leg of set B is complete, set B flashes again to complete the conference or hangs up to transfer the call and the audio source from set A is automatically stopped.

MBS and IVD sets

For MBS and IVD sets, a line-to-line call is established between the two parties, set A and set B. Set B, which has the option MOT on PDN and 3WC/CXR on a separate key, presses the 3WC/CXR key to activate either Three-Way Call or Call Transfer. As soon as the 3WC/CXR key is pressed, set A is put on hold and is provided with an audio source that is defined in table AUDIO and set B gets a dial tone to dial the destination digits on the second leg. Once the call on the second leg of set B is complete, set B either presses the 3WC key to complete the conference or the CXR key to transfer

the call. Set B can also go on-hook to transfer. In any of these scenarios the audio source from set A is automatically stopped.

Feature setup/feature eligibility

Before a specific line is set up to initiate the MOT feature, the following sets of conditions must be true:

- The line must be an IBN, MBS, or IVD set which is datafilled with the MOT option on the PDN. However, the feature works for all of the DNs on the set.
- The line must be in a customer group which is datafilled with the option MOT and the audio group of the MOT must be datafilled in table CUSTSTN.
- The line must be in an MOT audio group which is datafilled with an audio route containing a valid audio source in table AUDIO.

Limitations and restrictions for MOT

The following is a list of the restrictions and limitations for the MOT feature:

- The MOT feature provides the audio when the agent has the 3WC/CXR and MOT options provisioned.
- If a participant in a three-way conference call puts the conference call on hold, then MOT does not provide audio to the other conferees. If the holding party is a line agent, then the call can be determined a conference call or not. In this case, audio is not provided if it is determined to be a conference call.

Feature interactions

The following section describes the interaction of MOT with the following features (it is assumed that the line has the option MOT and 3WC/CXR assigned):

- flash activated features
- Call Waiting (CWT)
- Conference (CNF)
- Call Hold (CHD)
- Permanent Hold (PHOLD)
- Key Set Music on Hold (KSMOH)

Flash activated features

The audio is provided by the MOT feature to the held party as soon as the holding party flashes. But the holding party may flash to activate any other feature (Call Park or Ring Again, for example). For activating any such

feature, the holding party first flashes and then dials the activation code for that feature. As a result the held party, due to this flash, has audio provided by the MOT feature during the time the holding party has completed the dialing of the activation code for that feature. While the feature is activated, audio is provided to the held party for a short duration. As a result, the held party is provided a short audio interlude.

Call Waiting (CWT)

When the CWT subscriber flashes to answer the waiting call, the call put on hold receives audio. If the subscriber then flashes again to put the active call on hold and returns to the original call, audio is removed from the first call and applied to the second call.

If a CWT subscriber has been put on hold and is receiving audio, and a waiting call is presented to that subscriber, the subscriber should hear the CWT indications overlaid on the audio. That is, the held party should hear:

MUSIC — CWI — MUSIC — CWI — MUSIC —

until the waiting call is answered or the Call Waiting indicator times out.

If the CWT subscriber goes on hook with a party on hold, the CWT subscriber is called again by that call. The held party should continue to receive audio while the CWT subscriber's phone is ringing.

Conference Call (CNF)

If a participant in a conference call puts the conference on hold, then MOT does not provide audio to the other conferees. The same interaction applies to the three-way conference call.

Call Hold (CHD)

When a set flashes to initiate Call Hold, the held party is provided audio or an announcement immediately, according to the audio source for MOT. After the user dials the call hold access code, audio is replaced with the audio or announcement from the audio source of the Call Hold feature.

Permanent Hold (PHOLD)

When a set flashes to initiate Permanent Hold, the held party is provided audio or an announcement immediately, according to the audio source for MOT. If the audio source of MOT is different from one of the Permanent Hold features, then after the user dials the permanent hold access code, then MOT's audio is stopped and the Permanent Hold feature audio starts.

Key Set Music On Hold (KSMOH)

If KSMOH is assigned on a line along with MOT, then KSMOH does not provide the audio for 3WC/CXR held calls, as it is already provided by MOT.

Data schema

Tables IBNLINES, KSETFEAT, CUSTSTN, and AUDIO have been modified with the MOT feature. Please refer to the *Commercial Systems Customer Data Schema*, document for more information.

Keypad dialing

With the Meridian communication adapter (MCA), key pad dialing (KPD) may be used to originate data calls to local and remote hosts, data terminal equipment (DTE), or both from the Meridian modular telephone keypad.

The display prompts and information on the telephone set display screen are controlled through the keypad. The top right feature key functions as the local Program (P) mode key. The Program mode is activated by pressing P. The P key controls access to the display or MCA for parameter selection.

M0200 display

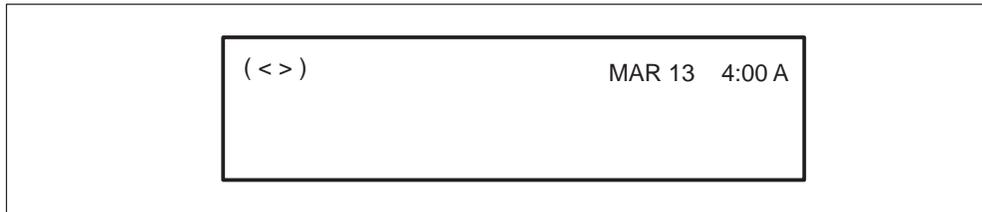
To place a data call using KPD, press the Program key (P) followed by #XXXX, where XXXX is the extension being dialed. After pressing the P key, the user is given the following choices on the display. The user selects one of the four categories by pressing the corresponding number on the keypad:

- 1—Format
- 2—Time/Date
- 3—Contrast
- 4—Volume

To return to the idle screen, the user must exit the Program mode by pressing the Program key (P). If the user selects one of the four categories, the corresponding screen appears. The following information describes these screens.

Idle state

The valid input characters in this screen format are the left and right arrows (volume control toggle key) indicated in the upper left of the display. The selection portion of this screen consists of one selection at a time.



The telephone provides the following eight different time and date formats (using May 4, 2:05 pm as an example):

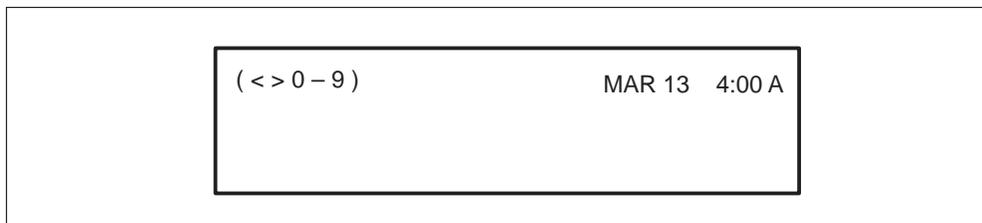
- May 04 14:05
- 5 04 14:05
- 04 May 14:05
- 04 5 14:05
- May 04 2:05 P
- 5 04 2:05 P
- 04 May 2:05 P
- 04 5 2:05 P

Format

To change the format, press the volume control toggle key to the left or right to view and select a format. When the desired format is displayed, either press the P key to return to the previous screen (Program mode) or press the Rls key to return to the idle state.

Setting the time and date

After selecting Option 2, the Time and Date setting screen appears. Depending on the choice for displaying the time and date, the screen could appear as follows:

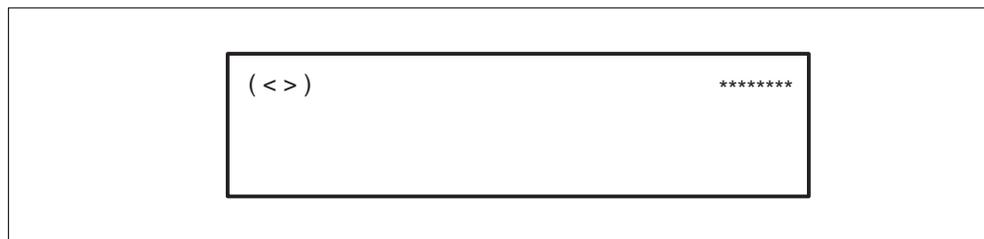


Each field in the time and date may be changed independently of the other fields. To select a field, press the volume control toggle key to the left or right, and scroll to the desired field. When a field is selected, it flashes. The valid input characters are displayed in the upper left. To change a selected field, type in the appropriate digits.

To exit the Time and Date screen but remain in the Program mode, press P. To return to the idle state, press the Rls key.

Setting the contrast

After selecting Option 3, the Contrast Adjustment screen displays. This screen allows the user to adjust the contrast of the display.

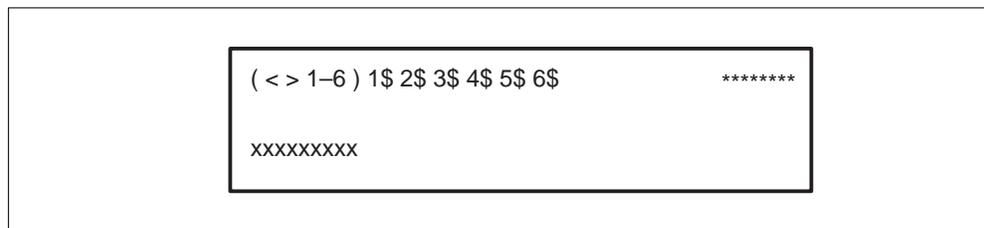


The volume control toggle key increases or decreases the contrast ratio. At minimum contrast, no asterisks are displayed. Asterisks are added as contrast increases and deleted as contrast decreases. At maximum, eight asterisks display. As the asterisks appear or disappear from the display, the actual contrast of the screen also changes.

To exit the Contrast Adjustment screen, press P to return to the Program mode or Rls to return to the idle state.

Setting the volume

After selecting option 4, the Volume Adjustment screen appears.



This screen allows the user to adjust the attributes on the set. The volume setting screen uses icons to denote the six different volumes that may be adjusted. The icons replace the “\$” shown in the sample screen and represent the following information:

- bell—ringer volume
- box containing a cross—buzzer volume
- speaker—speaker volume
- speaker and microphone—handsfree volume
- handset—handset volume
- headset—headset volume

The xxxxxxxx is replaced with one of the following words:

- buzzer
- handset
- handsfree
- headset
- ringer
- speaker

Select the volume to be changed by entering the digit next to the icon. For example, to adjust the ringer volume, press 1. The icon is selected and flashes. To increase the volume, press the volume control toggle key to the right (<<<). To decrease the volume, press the volume control key to the left (>>>). The number of asterisks on the display’s lower right corner of the screen changes as the volume changes.

To exit to the Program mode screen, press the Program key. To exit to the idle state, press the Rls key.

Programming from the keypad

KPD supports the following key features:

- automatic dial (autodial)
- ring again
- display of caller’s number

To place a data call using KPD, follow Procedure 7-1. This procedure explains the steps, action or actions, and verification processes that occur when programming the MCA from the keypad.

Note: The P in the following procedure represents the Program key.

Procedure 7-1
Dialing from the keypad

- 1 Press P.

Response:

The local program mode is activated.

- 2 Press P again.

Response:

The set returns to an idle state. (Time and date are shown if the set is equipped with the display module option.)

- 3 Press P followed by #, *, or two digits greater than 20.

Response:

If the set is equipped with the display module, the MCA controls the display.

- 4 Press P#xxxx.

Response:

P# emulates the data DN key with xxxx representing the data DN. After a successful call is made, the display shows:

```
MDIAL XXXX  
DATA CALL CONNECTED
```

If there is no terminal connected or if the DTR is off, the display shows:

```
MDIAL XXXX  
CHECK TERM AND TRY AGAIN
```

If a data call is made to an unknown or undefined data DN, the display shows:

```
MDIAL XXXX  
NOT IN SERVICE
```

When the DN is idled, the display shows:

```
RELEASED
```

When the station is busy, the display shows:

```
MDIAL XXXX  
RING AGAIN PLACED
```

When the station becomes available, the display shows:

```
ADIAL XXXX  
DATA CALL CONNECTED
```

- 5 Press P.

Response:

The display is no longer dedicated to the MCA.

6 Press P followed by one of the following values:

- #
- *
- 05
- 20
- 21
- 22
- 110
- 150
- 300
- 600
- 1200
- 2400
- 4800
- 9600
- 19200

- 23
- 24
- 25
- 26
- 27
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Response:

The display shows the following in response to the entered values as shown in the "Action" column:

Manual Data Call
Release Data Call
Language Selection
Asynchronous Mode
Synchronous Mode

Enter baud rate

110-bps
150-bps
300-bps
600-bps
1200-bps
2400-bps
4800-bps
9600-bps
19200-bps

Space Parity
Odd Parity
Even Parity
Mark Parity
Host Mode
Terminal Mode
Hotline Off
Hotline On
Virtual Leased Line Off
Virtual Leased Line On
Forced DTR Off
Forced DTR On
Dynamic Carrier Detect Off
Dynamic Carrier Detect On
Remote Loopback Off
Remote Loopback On

Cancel Data Ring Again
Full Duplex
Half Duplex
Modem Mode
Network Mode
Internal Clock
External Clock
PSDS Mode Off
PSDS Mode On
Enable Echo Canceller
Disable Echo Canceller
SL-1 Mode
SL-1/DMS-100 Mode
V.25 bis mode Off
V.25 bis mode On
Bisync On
HDLC On
Assert RTS Off
Assert RTS On
Autodial Programming
Autodial Call
Data Parameter Display
EIA Leads Status Display
Incoming Data Call Monitor
Reset to Default Parameters
Emulation Selection
Lock/Unlock Data Parameters
VDN Key Assignment

Note: The following message displays if an invalid baud rate is entered:

INVALID COMMAND/ENTRY, RE-ENTER:

- 7 You have completed this procedure.

Manual Data Call (P#)

Procedure 7-2 describes how to activate manual data call.

Note: The P in the following procedure represents the Program key.

Procedure 7-2 Assigning a baud rate

- 1 Press P#.
MDIAL
ENTER DIGITS< P TO EXIT
- 2 Dial number of far end data device and press P.
DATA CALL CONNECTED.

Release Data Call (P*)

Procedure 7-3 describes how to release a call in asynchronous and synchronous mode.

Note: The P in the following procedure represents the Program key.

Procedure 7-3

Releasing a data call while in asynchronous and synchronous mode

- 1 To release a call while in asynchronous mode, use any of the following methods:
 - Press P*.
 - Hold down break key(s) for 1.6 seconds or longer. Note that this method is not supported on terminals with non-overlapping timed break.
 - Press break key(s) three (3) times in quick succession. The break must be at least 100 milliseconds and all 3 breaks must be within 1 second.
 - Drop DTR.
 - If the far end data device releases the call, the MCA automatically drops its end.

- 2 To release a synchronous call use one of these methods:

- Press P*.
- Drop DTR.

When a data call is disconnected, the terminal displays the following:

RELEASED

or

NO CARRIER (in AT dialing mode).

Language Selection (P05)

Procedure 7-4 describes how to use the Language Selection feature.

Note: The P in the following procedure represents the Program key.

Procedure 7-4

Activating the Language Selection feature

- 1 Press P05. The display shows the name of the current language selection.
- 2 Use the volume control to scroll through the possible choices. The languages listed are those supported by your telephone.
- 3 Dial the number shown next to the language choice you desire and press P.

Asynchronous/Synchronous (P20, 21)

Procedure 7-5 describes how to choose between the asynchronous and synchronous modes.

Note: The P in the following procedure represents the Program key.

Procedure 7-5

Choosing between asynchronous and synchronous modes

- 1 Press P20 for asynchronous mode.
- 2 Press P21 for synchronous mode.

Baud rates (P22)

Procedure 7-6 describes how to assign a rate of speed for a data signal.

Note: The P in the following procedure represents the Program key.

Procedure 7-6

Assigning a baud rate

- 1 Press P22.
Response:
Enter baud rate.
- 2 Enter one of the following values to assign an allowable rate of speed to a data signal:
110
150
300
600
1200
2400
4800
9600
19200
Response:
110-bps
150-bps
300-bps
600-bps
1200-bps
2400-bps
4800-bps
9600-bps
19200-bps
- 3 Press P to save and exit the command.
Response:

The set exits the programming mode.

- 4 You have completed this procedure.

Parity assignment (P23, P24, P25, P26)

Procedure 7-7 describes how to specify the self-checking method of minimizing transmission errors in received data signals. An extra binary signal is added to each character signal to make the total number of 1s or 0s even or odd for each character. This self-checking method is called parity.

Note: The P in the following procedure represents the Program key.

Procedure 7-7 Assigning parity

- 1 Choose one of the following commands:

Press P23.
Press P24.
Press P25.
Press P26.

Response:

Space Parity
Odd Parity
Even Parity
Mark Parity

- 2 After any of these commands, press P to save and exit the command.

Response:

The set exits the programming mode.

- 3 You have completed this procedure.

Host or terminal mode (P28, P27)

Procedure 7-8 describes the commands required to determine whether or not prompts are sent to the terminal.

Note: The P in the following procedure represents the Program key.

Procedure 7-8 Determining host or terminal receiver

- 1 Press P28 to instruct the switch to send prompts to the terminal.

- 2 Press P to save and exit the command.

Response:

The set exits the programming mode.

3 Press P27 to instruct the switch to stop sending prompts to the terminal.

4 Press P to save and exit the command.

Response:

The set exits the programming mode.

5 You have completed this procedure.

Hotline activation and deactivation (P30, P29)

A hotline allows the user to have keyboard dialing initiate calls to an Autodial number. A Hotline call is placed when the MCA recognizes a positive transition of DTE or detects a carriage return from the keyboard. Procedure 7-9 describes the commands required to activate or deactivate a hotline.

Note: The P in the following procedure represents the Program key.

Procedure 7-9 Activating or deactivating hotline

1 Press P30 to turn the Hotline feature on.

2 Press P to save and exit the command.

Response:

The set exits the programming mode.

3 Press P29 to turn the Hotline feature off.

4 Press P to save and exit the command.

Response:

The set exits the programming mode.

5 You have completed this procedure.

Virtual Leased Line activation and deactivation (P32, P31)

Procedure 7-10 describes the commands required to turn a Virtual Leased Line on or off. Turning on a Virtual Leased Line gives the appearance of a dedicated line between the terminal and the far-end data device. This appearance is necessary for applications that require an active data call at all times.

Note 1: If a power failure occurs while a Virtual Leased Line is on, the MCA automatically calls back the Auto Dial number when power returns. At the same time, default parameters such as baud rate, parity, or forced DTR are set to those programmed by the keypad dialing functions. For example, the baud rate established by way of a carriage return in KBD are lost in the event of a power loss. To observe appropriate caution regarding the state of the download profile datafill, the user may choose to turn off the download when using this feature.

Note 2: The P in the following procedure represents the Program key.

Procedure 7-10

Activating or deactivating a Virtual Leased Line

- 1 Press P32 to turn on a Virtual Leased Line.
- 2 Press P to save and exit the command.
Response:
The set exits the programming mode.
- 3 Press P31 to turn off a Virtual Leased Line.
- 4 Press P to save and exit the command.
Response:
The set exits the programming mode.
- 5 You have completed this procedure.

Forced data terminal ready activation and deactivation (P34, P33)

Procedure 7-11 describes the commands required to turn a Forced Data Terminal Ready (DTR) on or off. This feature is useful for sending data to a printer or for PC to PC connections when neither is configured as the host.

Note: The P in the following procedure represents the Program key.

Procedure 7-11

Activating or deactivating Forced DTR

- 1 Press P34 to turn Forced DTR on.
- 2 Press P to save and exit the command.
Response:
The set exits the programming mode.
- 3 Press P33 to turn Forced DTR off.
- 4 Press P to save and exit the command.

Response:

The set exits the programming mode.

- 5 You have completed this procedure.

Dynamic Carrier Detect activation and deactivation (P36, P35)

Procedure 7-12 describes the commands required to turn a Dynamic Carrier Detect (DCD) on or off. This feature is useful for communication software packages that require a transition of carrier detect from low (0) to high (1) to activate answer mode.

Note: The P in the following procedure represents the Program key.

Procedure 7-12

Activating or deactivating Dynamic Carrier Detect

- 1 Press P36 to turn Dynamic Carrier Detect on.

Response:

Carrier Detect follows the state of the call.

- 2 Press P to save and exit the command.

Response:

The set exits the programming mode.

- 3 Press P35 to turn Dynamic Carrier Detect off.

Response:

Carrier detect is always high except for 100 ms when a call is first dropped.

- 4 Press P to save and exit the command.

Response:

The set exits the programming mode.

- 5 You have completed this procedure.

Remote loopback activation and deactivation (P38, P37)

Procedure 7-13 describes the commands required to turn a remote loopback on or off.

Note: The P in the following procedure represents the Program key.

Procedure 7-13

Activating or deactivating remote loopback

- 1 Press P38 to turn remote loopback on.

Response:

Remote loopback is activated for the next data call only.

- 2 Press P to save and exit the command.

Response:

The set exits the programming mode.

- 3 Press P37 to turn remote loopback off.

- 4 Press P to save and exit the command.

Response:

The set exits the programming mode.

- 5 You have completed this procedure.

Ring Again feature cancellation (P39)

Procedure 7-14 describes the steps required to cancel a Ring Again previously activated by a keyboard command.

Note: The P in the following procedure represents the Program key.

Procedure 7-14 Cancelling Ring Again

- 1 Press P39 to cancel a previously activated Ring Again.

Response:

DATA RING AGAIN CANCELLED

- 2 Press P to save and exit the command.

Response:

The set exits the programming mode.

- 3 You have completed this procedure.

Full duplex/half duplex (P40,P41)

Procedure 7-15 describes how to choose between half or full duplex.

Note: The P in the following procedure represents the Program key.

Procedure 7-15 Choosing between half or full duplex

To choose between half or full duplex:

- 1 Press P40 for full duplex.

- 2 Press P41 for half duplex.

Modem mode (P42)

Procedure 7-16 describes the steps required to dial a modem pool.

Note: The P in the following procedure represents the Program key.

Procedure 7-16 Modem pooling

- 1 When you dial a modem pool the MCA prompts:

ENTER REMOTE NUMBER

Enter number of external modem to access and <CR>.

CALL CONNECTED. SESSION STARTS.

Network mode (P43)

Procedure 7-17 describes the steps required to activate the Network mode.

Note: The P in the following procedure represents the Program key.

Procedure 7-17 Activating Network mode

- 1 Press P43.

Internal clock/external clock (P44, P45)

Procedure 7-18 describes the commands required to activate the internal clock.

Note: The P in the following procedure represents the Program key.

Procedure 7-18 Activating internal clock and external clock

To activate the internal clock:

- 1 Press P44.

To activate the external clock:

- 2 Press P45.

PSDS on/off (synchronous) (P46, P47)

Procedure 7-19 describes the commands required to turn Public Switch Data Services (PSDS) on or off. Having PSDS on allows you to use the PSDS feature.

Note: The P in the following procedure represents the Program key.

Procedure 7-19 Turning PSDS On or Off

To turn PSDS on or off:

- 1 Press P46 to turn it OFF.
- 2 Press P47 to turn it ON.

Enable/disable echo canceller (synchronous) (P48, P49)

Procedure 7-20 describes the commands required to turn PSDS on or off. Having PSDS on allows you to use the PSDS feature.

Note: The P in the following procedure represents the Program key.

Procedure 7-20 Enabling/disabling echo canceller

This applies when PSDS is on.

To enable or disable the echo canceller:

- 1 Press P48 to enable it.
- 2 Press P49 to disable it.

SL-1 mode

Procedure 7-21 describes the commands required to activate the SL-1 mode.

Note: The P in the following procedure represents the Program key.

Procedure 7-21 Activating SL-1 mode

- 1 Press P50.

SL-1/DMS-100 mode

Procedure 7-22 describes the steps required to activate the SL-1/DMS-100 Mode.

Note: The P in the following procedure represents the Program key.

Procedure 7-22
Activating SL-1/DMS-100 mode

- 1 Press P50 to choose SL-1 mode.
- 2 Press P51 to choose DMS-100 mode.

V.25 bis mode (P54, P55, P56, P57)

Procedure 7-23 describes the steps required to activate the V.25 bis mode options. The V.25 bis mode feature allows for calls to be answered automatically with DTE.

Note: The P in the following procedure represents the Program key.

Procedure 7-23
Activating V.25 bis mode

- 1 Press P54 to turn V.25 bis off.
- 2 Press P55 to turn V.25 bis on.
- 3 Press P56 for bisynch on. This required for video equipment.
- 4 Press P57 for high-level data link control (HDLC) protocol. This is required for G4 FAX.

RTS ON/OFF (P58, P59)

Procedure 7-24 describes the steps required to activate RTS ON/OFF.

When RTS is ON the MCA forces the RTS lead active and assumes the local DTE is always ready to transmit or receive data. There is no flow control.

RTS OFF allows RTS/CTS hardware flow control handshaking. The local DTE can stop the data flow by dropping the RTS lead, and the MCA will drop the CTS lead. The MCA then sends a message to the far end to drop the CTS lead. When the DTE is ready, it starts the flow by raising the RTS lead. The MCA raises the CTS lead and the data transmits again.

Note: The P in the following procedure represents the Program key.

Procedure 7-24
Activating RTS on/off

- 1 To turn RTS forcing on or off:
Press P58 to turn RTS off (active flow control).

- 2 Press P59 to turn RTS on (no flow control).

Autodial programming activation (P60, P61)

Procedure 7-25 describes the steps required to activate automatic dial (autodial) programming.

Note: The P in the following procedure represents the Program key.

Procedure 7-25

Activating autodial programming

- 1 Press P60 to activate automatic dial programming.

Response:

The set is in autodial programming and displays the following:

```
ADIAL XXXX  
ENTER DIGITS, THEN P
```

- 2 Enter xxxP (the autodial number).

- 3 Press P61 to activate automatic call.

Response:

The set is in data monitor mode and displays the following:

```
ADIAL XXXX  
DATA CALL CONNECTED
```

- 4 Press P to save and exit either command.

Response:

The set exits the programming mode.

- 5 You have completed this procedure.

Display parameters activation (P62)

Procedure 7-26 describes the steps required to activate display parameters. The display scrolls through use of the volume control key on the phone. The display shows those parameters of the MCA that can be modified through keypad dialing.

Note: The P in the following procedure represents the Program key.

Procedure 7-26

Activating display parameters

- 1 Press P62 to activate the display parameters.

Response:

The display screen appears.

- 2 Scroll <<< >>> P to exit.
- 3 You have completed this procedure.

Data parameter display (P62 continued)

The volume control key (<<< >>>) is used as a scroll key in Program mode. Table 7-1 shows examples of scrolling through the data parameter settings.

Note: The P in the following table represents the Program key.

Table 7-1
Data parameter display

User action	Telephone set response
Press P62.	Set enters Program mode and data parameter display.
Press >>>.	Set displays Screen 1 settings.
Press >>>.	Set displays Screen 2 settings.
Press >>>.	Set displays Screen 3 settings.
Press >>>.	Set displays Screen 4 settings.
Press >>>.	Set displays Screen 1 settings.
Press <<<.	Set displays Screen 4 settings.
Press <<<.	Set displays Screen 3 settings.
Press P key.	Set exits from Program mode.

Each parameter shown in the following examples contains the maximum number of characters for that particular field.

Example 1:

```
DTR OFF BAUD RATE 9600
DCD OFF SPACE PARITY
```

Example 2:

```
VLL OFF TERMINAL MODE
RLB OFF HOTLINE OFF
```

Example 3:

```
DNN 4485655 VDN KEY 0
TIMEOUT OFF
```

Example 4:

```
SPEED RESTRICTION OFF
SMARTMODEM 9600
```

Note: To scroll, press <<< >>>. To exit, press **P**.

Status display (P63)

Procedure 7-27 shows the layout of the RS-232-C leads information on the display. Use the volume control key (<<< >>>) to scroll through the Program mode selections.

Note 1: In this mode, the keypad can be used for voice calls.

Note 2: The P in the following procedure represents the Program key.

Procedure 7-27 Displaying EIA leads status

- 1 Press P63.

Response:

The RS-232-C lead indicators display the following information:

```
TXD RXD DCD DTR DSR
  o  o  •  •  •
```

This indicates the status of the Electronic Industry Association (EIA) leads of the RS-232 connected to the MCA. The dark circles represent active leads. This feature is useful during troubleshooting.

- 2 Press P to exit.

Response:

The set releases the data call, and the display shows the following status:

```
RELEASED
```

- 3 You have completed this procedure.

Incoming calls during programming mode (P64)

Regardless of what state the telephone set is in, some asynchronous events can occur.

Incoming voice call

The display is controlled by the MCA; therefore, no Calling Party Name Display (CPND) information is displayed. However, you may still answer the call.

Incoming data call

The data call is answered automatically, and an audible tone occurs. A data call cannot be manually answered using KPD. The Automatic Answer feature can be disabled through keyboard dialing in asynchronous mode. No prompts are displayed unless the display is in the data call monitor mode. To activate the incoming data call monitor mode on the display, press P64.

Incoming data call during active voice call

The data call is answered automatically, and a distinctive tone occurs. No call processing messages appear on the display. The Automatic Answer feature can be disabled through keyboard dialing in asynchronous mode.

Incoming data call while making a manual data call

If a voice call comes in during call set-up from the keypad, the CPND information is not displayed. The voice call can still be answered, but is kept on hold for the completion of the manual data call.

Reset data parameters (P65)

Procedure 7-28 describes the steps required to reset the MCA configuration to default settings. This procedure locks configuration settings so that no data parameters can be changed.

Note 1: Unplugging the telephone does not reset the MCA configuration.

Note 2: The P in the following procedure represents the Program key.

Procedure 7-28

Resetting data parameters

- 1 Press P65.
Response:
The display shows the following information:
DATA PARAMETERS RESET
- 2 Press P to save the lock setting and exit the command.
Response:
The set exits the programming mode.
- 3 You have completed this procedure.

Emulation selection (P66)

Procedure 7-29 describes the steps required to select the modem type that the MCA emulates.

Note 1: Unless the emulation type is Nortel (Northern Telecom) keyboard dialing, carriage return <CR> is disabled, and pressing <CR> does not invoke the Main menu. Smartmodem emulation only supports Hayes (AT) commands.

Note 2: Some software packages require Forced DTR to be active to work properly.

Note 3: If power drops while emulating Smartmodem 1200 or 2400, the selection defaults to Smartmodem 9600 at power up. This does not apply to Nortel keyboard dialing.

Note 4: The P in the following procedure represents the Program key.

Procedure 7-29
Selecting modem type

- 1 Press P66.
- 2 Use the volume control key to scroll the telephone's display until the correct modem type appears.
- 3 Press P to save the emulation setting and exit the command.
Response:
The set exits the programming mode.
- 4 You have completed this procedure.

For detailed information on the P66 command, refer to Chapter 8, "Nortel keyboard dialing", and Chapter 9, "Hayes keyboard dialing", in this document.

Locking data parameters (P67)

Procedure 7-30 describes the steps required to lock data parameters. This procedure uses the volume control key to scroll the telephone's display until it displays DATA PARAMETERS LOCKED.

Note: The P in the following procedure represents the Program key.

Procedure 7-30
Locking data parameters

- 1 Press P67.
Response:
The display shows the following information:

```
DATA PARAMETERS LOCKED
SCROLL <<< >>>
```

- 2 Press P to save and exit the command.

Response:

The set exits the programming mode.

- 3 You have completed this procedure.

Voice Directory Number assignment (P68)

Voice Directory Number (VDN) key assignment allows the user to instruct the MCA on which VDN key to make voice call originations. Procedure 7-31 describes the steps required to make a VDN key assignment.

Note: The P in the following procedure represents the Program key.

Procedure 7-31 Assigning a VDN key

- 1 Press P68, and enter the number that corresponds to the VDN key selection.

Response:

Key assignments begin with zero.

- 2 Press P to save and exit the command.

Response:

The set exits the programming mode.

- 3 You have completed this procedure.

Nortel keyboard dialing

Database considerations

Before configuring the Meridian modular telephone set for keyboard dialing, the following considerations are required to ensure proper operation of the keyboard dialing feature:

- The data directory number (DN) and secondary DN must have single appearances.
- For access to remote hosts, the class of service for the data DN must allow external calls.
- The data DN must be configured with the Digit Display feature. If it is not, then full display features are not implemented.
- The virtual keys of the data option must be assigned as shown in table 7-1 if the feature is implemented.
- The data option must have the following class of service:
 - Automatic Digit Display—ADD
 - Call Forward Busy Denied—FBD
 - Call Forward No Answer Denied—FND
 - Call Pickup Denied—PUD
 - Data—DTA
 - Warning Tone Denied—WTD
- If the Speed Call feature is implemented, all Speed Call numbers must be programmed in the MSL-100 database against the user's Speed Call list. The data option may be configured as either a Speed Call controller or as a Speed Call user. The numbers can be changed through the keyboard only if the data option is designated as Speed Call controller.
- If the Autodial feature is implemented, the predesignated number must be programmed in the MSL-100 database against the Autodial key. The Autodial numbers can be changed through keyboard dialing.

Table 8-1
Database considerations

Feature key assignments	Key number	Required or optional
Data DN	1	Required
Secondary DN	2	Required
Call Transfer key		Required
NRS key (with modem pooling)	3	Required
Autodial key	4	Optional
Ring Again	5	Optional
Speed Call key	6	Optional
Display key		Optional
Call Forward key		Optional

Operational guidelines

Nortel (Northern Telecom) keyboard dialing (KBD) allows data calls to be originated to local or remote hosts or data terminal equipment (DTE) using a terminal keyboard. Nortel KBD is supported only for ASCII, asynchronous, character mode, interactive terminals equipped with Electronic Industry Association (EIA) RS-232-C interface.

Note: Nortel KBD is not supported for block mode terminals.

Nortel KBD provides the following capabilities:

- Automatic Dial (autodial)
- automatic and manual answering of incoming calls
- call origination and termination to and from local and remote data devices
- modem pooling
- programming of automatic dial numbers
- Ring Again
- speed calling
- speed calling programming (if designated as a controller)

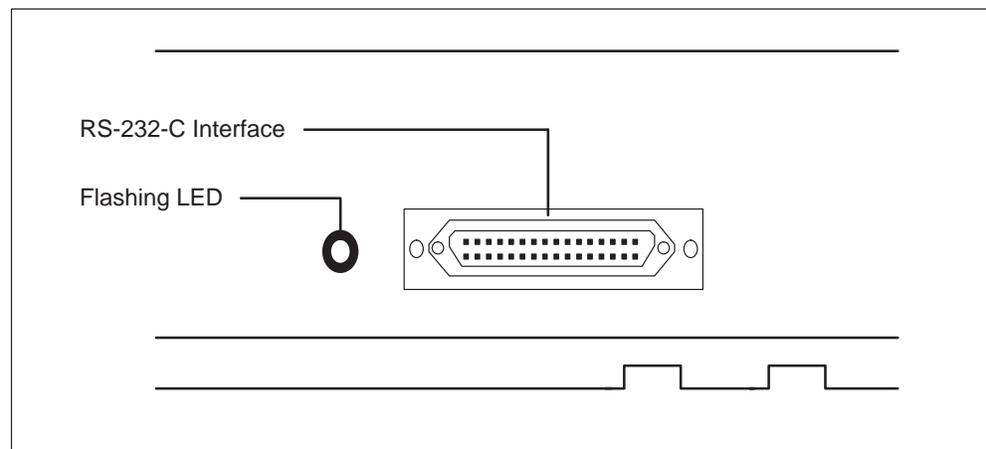
For more detailed information on the Meridian communications adapter (MCA), refer to the *Meridian Communications Adapter (MCA) Reference Manual*, 555-4001-123.

Initialization

This section describes the guidelines applicable for accessing the Nortel KBD feature. Before using the Nortel KBD feature, ensure that the following steps have been performed:

- Turn the data terminal power on.
- Set the data terminal on-line.
- Ensure that power is connected to the telephone set.
- Ensure that the light-emitting diode (LED) on the back of the MCA is flashing at a constant rate to indicate that the MCA is functioning properly. (See Figure 8-1.)

Figure 8-1
MCA flashing LED



Implementing the P66 command

The P66 key allows the user the flexibility of issuing Hayes commands while in Nortel KBD or exiting Nortel KBD and entering Hayes keyboard dialing.

The P66 command contains the initial screen and four scrolling screens that enables the user to select which type of modem the MCA can emulate. The product code with respect to each is automatically set up. Unless otherwise requested, the screens are presented on the set's display as shown in Table 8-2.

Note: The P in the following table represents the Program key.

Table 8-2
Emulation selections

Initial screen	Emulation selection	Action (Scroll <<< >>>)
Screen 1	Smartmodem 9600	Press P to select emulation and exit.
Screen 2	Smartmodem 2400	Press P to select emulation and exit.
Screen 3	Smartmodem 1200	Press P to select emulation and exit.
Screen 4	Nortel KBD Dialing	Press P to select emulation and exit.

The product codes associated with each are 960, 240, and 122, respectively, and correspond to the values that are assigned to the S52, S53, and S54 registers. For information on S registers, refer to Chapter 9, “Hayes keyboard dialing”, and Appendix B, “AT dialing parameter registers”.

The default screen selection depends upon the Hayes KBDTYPE field of the MCA profile. If the field specifies HAYES, the default is Screen 1. If the field specifies SYMB, the default is Screen 4.

The user can see which screen is currently active by entering the P62 command. The P66 command uses the lower half of Screen 4 to show the P66 current state. One of the following screens appear as the fourth screen of P62, where xxx represents ON or OFF:

- SPEED RESTRICTION xxx
SMARTMODEM 9600
- SPEED RESTRICTION xxx
SMARTMODEM 2400
- SPEED RESTRICTION xxx
SMARTMODEM 1200
- SPEED RESTRICTION xxx
HAYES COMPATIBLE MODEM
- SPEED RESTRICTION xxx
NT KBD DIALING

To select a specific emulation, press P66. Scroll through the choices. When the emulation choice appears on the screen, press P. For information on Hayes keyboard dialing and P66 implementation, refer to Chapter 9, “Hayes keyboard dialing”.

If the user toggles from Nortel KBD to Hayes keyboard dialing, then Nortel KBD is disabled. The user still has access to Nortel KBD menus; however, when the user exits from the menus, the user is locked out of Nortel KBD.

To return to Nortel KBD, the P66 command must be entered, and Nortel KBD must be reselected.

MCA operational modes

While in Nortel KBD mode, the MCA operates in one of three modes:

- autobaud
- command
- on-line

After initializing the MCA, the autobaud mode becomes active. The user remains in the autobaud mode until an acceptable autobaud character is entered.

Nortel KBD is activated by entering a period “.” followed by a carriage return (CR), ENTER, or RETURN. When the Nortel KBD state is active, the MCA returns to the command mode at the completion of any call origination attempt. AT commands can be issued in autobaud mode to place the MCA into the Hayes keyboard dialing state. For information on Hayes keyboard dialing, refer to Chapter 9, “Hayes keyboard dialing”.

Autobaud and autoparity

The MCA uses an autobaud and autoparity feature to automatically detect the speed and parity of the attached terminal. The baud rate and parity are detected by entering AT and a CR while in Hayes keyboard dialing or entering a period “.” and CR while in Nortel KBD. The default rate is 9600 bytes/s during power-up. After the MCA has been set to a new speed, it retains that speed until either another autobaud takes place or a power-off occurs.

The default parity is a space and may be changed by the user when datafilling tables. The user may change the parity by entering AT and a carriage return (CR) while in Hayes keyboard dialing or entering a period and CR while in Nortel KBD. In the data transfer mode, the parity bit is padded transparently as data for 7 bit codes.

When the user is in the Nortel KBD state, the MCA returns to the autobaud mode at the completion of any call origination attempt. Also, when the user is in Nortel KBD state, an AT command can be in autobaud mode to place the MCA into Hayes keyboard dialing state. For information on Hayes keyboard dialing, refer to Chapter 9, “Hayes keyboard dialing”.

Terminal parameters

Terminal parameters, such as baud rate, can be printed on the user's terminal. Procedure 8-1 describes the steps necessary to display the user's terminal parameters.

Note: (CR) indicates a carriage return.

Procedure 8-1 Displaying terminal parameters

- 1 Press carriage return.

Response:

The following prompt appears on the screen.

```
ENTER NUMBER OR H (FOR HELP):
```

Note: The only valid characters are those on the screen. Illegal characters result in the following prompt:

```
INVALID COMMAND / ENTRY,  
REENTER:
```

- 2 Type H (CR).

Response:

Terminal displays the Main Menu.

- 3 Type P (CR).

Response:

The screen display information shows the items listed with possible values for each as shown in the following example:

```
Engineering code = NT2K0009  
Release = 01  
Firmware = 3.5  
Baud Rate = 19200  
Parity = ODD  
DTR = ON  
DCD = ON  
VLL = OFF  
Hotline = OFF  
Remote Loopback = OFF  
Manual Answer = OFF  
Data directory number = 4000  
Auto Dial No. = 3600  
DCD = Data Carrier Detect  
DTR = Data Terminal Ready  
VLL = Virtual Leased Line
```

Note: The P in this procedure represents the Program key.

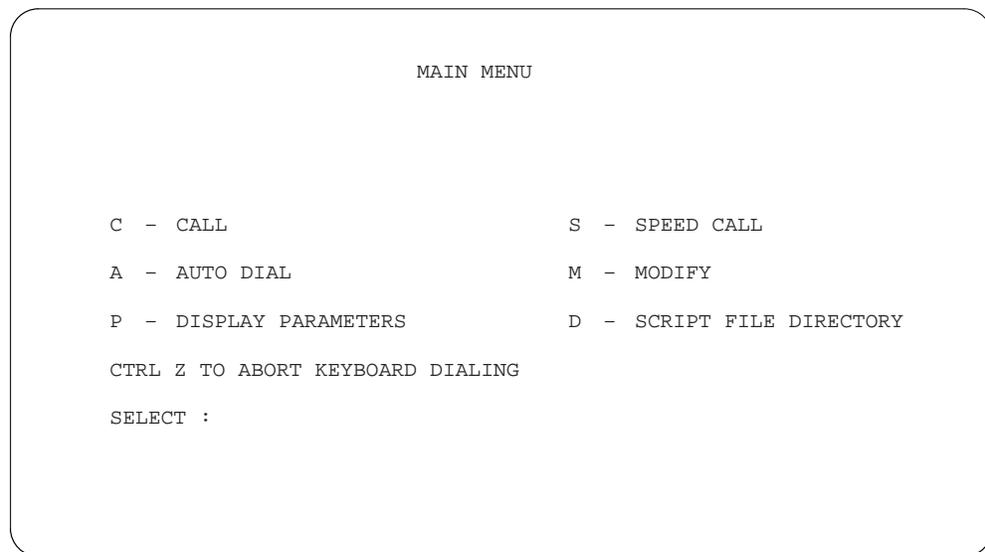
- 4 You have completed this procedure.

Nortel KBD menus

Main menu

The Main menu is displayed when the terminal is properly set up for operation and no Nortel KBD call is in progress. This menu contains feature operation selections and instructions. Functions can be selected by entering the letter representing the function required. Figure 8-2 shows an example of the Main menu.

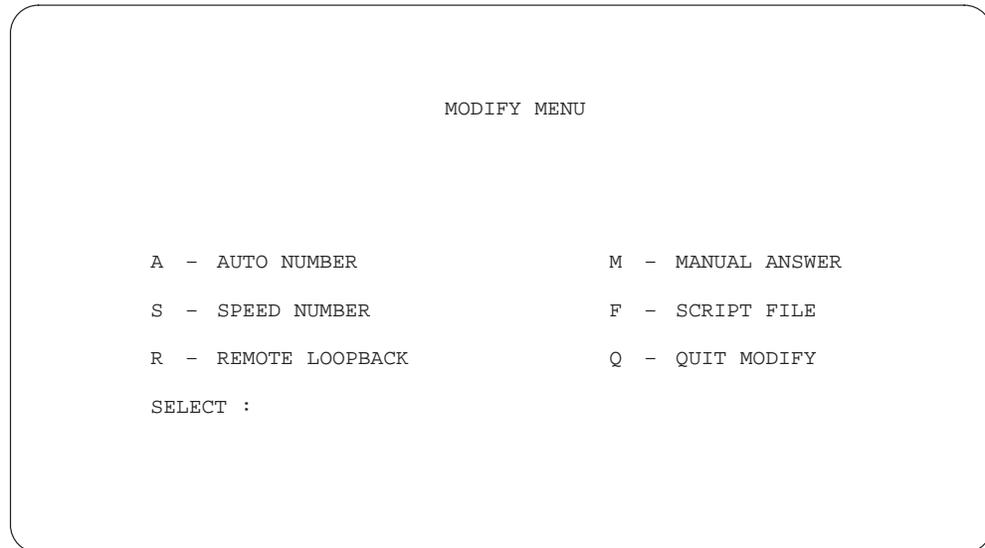
Figure 8-2
Main menu



Modify menu

The Modify menu is displayed when the M (Modify) function is selected from the Main menu. This menu allows the user to update features, verify the integrity of the data and signaling channels of the data loops, set the data call answer mode, and display information about the terminal parameters. Refer to the example in Figure 8-3.

Figure 8-3
Modify menu



User input characteristics

User keyboard dialing input must conform to the following characteristics:

- All input is echoed to the terminal screen. After the call is connected, the data option is transparent to the data activity between the terminal and the host. Therefore, the host performs the echo.
- Input can be either lower or upper case followed by a carriage return (CR).
- Input in response to prompts for numbers must be numeric.
- Invalid input results in a prompt to re-enter.
- Input can be edited by using the backspace key.
- An entire input line can be deleted by using the Delete key.
- The maximum number of characters allowed before a carriage return is 40. Exceeding this number of characters results in a re-prompt.
- The input session can be aborted before a data connection by entering a Ctrl-Z. (Hold down the Ctrl and Z keys simultaneously.) Refer to the “Data call disconnection” section in this chapter.

Message prompt characteristics

Message prompts have the following characteristics:

- Call progress tones are not provided while initiating data calls using Nortel KBD.
- All prompts are in upper case and are preceded by a line feed.

- Prompts requiring user input are followed by a colon (:) and three spaces.
- Questions requiring a yes or no response are followed by a question mark (?). Possible responses to the questions are in parentheses (). If a carriage return is allowed as a default, then the response is shown in brackets [].
- Other prompts end with a carriage return and a line feed.

Nortel KBD dialing procedures

Manual dialing

The following procedures present dialing instructions for Nortel KBD operation. Procedure 8-2 provides step-by-step instructions for manual dialing used for both local and remote data calls.

Procedure 8-2 Dialing manually

- 1 Press return (CR).

Response:

The following prompt appears on the screen.

```
ENTER NUMBER OR H (FOR HELP):
```

Note: The only valid characters are those on the screen. Illegal characters result in the following prompt:

```
INVALID COMMAND / ENTRY,  
REENTER:
```

- 2 Type H (CR).

Response:

Terminal displays the Main menu.

- 3 Type C (CR).

Response:

The following prompt appears on the screen.

```
ENTER NUMBER:
```

- 4 Enter the number in the following format:

nnnn = (CR)

where

nnnn = DN

Response:

The following message is displayed:

```
CALLING nnnn
```

The MCA sends the digits to the switch to place the call. The host sends the dialed digits to the MCA.

Note: The Digit Display feature supplies both the number called and the number that answers the call. These are separated by a space. If the Digit Display feature is not assigned to the data option, then no digits appear after CALLING (Step 4). If you type nnnn (CR) instead of H (CR), skip Steps 2 and 3.

- 5 You have completed this procedure.

Data speed call activation

This procedure is used to dial a data speed call through keyboard dialing. If an attempt is made to access the Speed Call feature and it has not been datafilled for the MCA, the MSL-100 system does not respond. The call is abandoned. The data option sends the prompt `NOT IN SERVICE` and releases the call. When the system idles the DN, the data option sends the prompt `RELEASED`.

Note: Speed calling is compatible with modem pooling.

A speed call number may be modified either by programming a new number using the Modify menu or a service change can be made to the database. Procedure 8-3 describes how to activate a data speed call.

Procedure 8-3 Activating a data speed call

- 1 Press carriage return.

Response:

The following prompt appears on the screen.

```
ENTER NUMBER OR H (FOR HELP):
```

Note: The only valid characters are those on the screen. Illegal characters result in the following prompt:

```
INVALID COMMAND / ENTRY,  
REENTER:
```

- 2 Type H (CR).

Response:

Terminal displays the Main menu.

- 3 Type S (CR).

Response:

The following prompt appears on the screen.

```
ENTER ACCESS CODE
```

- 4 Select the speed call feature using the following format:

nn (CR)

Response:

The following prompt appears on the screen.

```
CALLING nn
```

The MCA sends the speed call and the digit key pressed to the switch to place the call. The switch places the predesignated number and sends the digits to the MCA.

Note: The Digit Display feature supplies both the number called and the number that answers the call. These are separated by a space. If the Digit Display feature is not assigned to the data option, then no digits appear after calling. If an excessive number of digits are entered, the system accesses the number of digits it needs and ignores the remaining digits.

- 5 You have completed this procedure.

Autodial call activation

This procedure initiates a data call to a previously programmed Autodial number using KBD. If an attempt is made to access the Autodial feature and it has not been programmed for the MCA, the MSL-100 dial tone out occurs. The call is abandoned by the system. The data option sends the prompt NOT IN SERVICE and releases the call. When the system idles the DN, the data option sends the prompt RELEASED.

Note: Autodial is compatible with modem pooling.

An autodial number can be modified either by programming a new number using the Modify menu, or a service change can be made to the database. Refer to Procedure 8-4.

Procedure 8-4 Activating an autodial call

- 1 Press return (CR).

Response:

The following prompt appears on the screen.

```
ENTER NUMBER OR H (FOR HELP):
```

Note: The only valid characters are those on the screen. Illegal characters result in the following prompt:

```
INVALID COMMAND / ENTRY,  
REENTER :
```

2 Type H (CR).

Response:

Terminal displays the Main menu.

3 Type A (CR).

Response:

The following prompt appears on the screen.

```
CALLING nnnn
```

The MCA sends the DN and the Autodial key pressed to the switch to place the call. The switch places the predesignated number and sends the digits to the MCA.

4 You have completed this procedure.

Data call disconnection

After establishing a data call, it may be disconnected in one of the following ways:

- Called party disconnects—the user enters a command that causes the far end to disconnect the data call (Ctrl-D). The far end then drops the data terminal ready (DTR) lead to its data unit. This data unit then initiates the call disconnection.
- Terminal OFF-LINE—many terminals have an on-line switch. Setting this switch in the OFF-LINE position normally causes the DTR to drop the data option in the OFF state. This condition in turn causes the data option to release the data call.
- Terminal Power OFF—if the terminal power is switched OFF, then the data call is disconnected by the data option. However, if it remains connected, the Assert DTR feature is ON.
- Log Off—the user exits from the host system by signing off.
- Three short breaks—if the terminal sends three successive breaks lasting longer than 100 ms within 3 seconds, then the call is disconnected.

If the user wants to abandon the call during setup, then the user can release the call by executing a Ctrl-Z. (Hold down the Ctrl and Z keys simultaneously.) The data option is released. This method of releasing a call only works during call setup. After the call is established, the user must release the call as described previously. This also includes the Modify menu.

Calling sequence

Calls may be either local or remote. Remote calls can be placed using either digital trunks or automated modem pooling. After the call has been initiated, the call progression depends on which type of call has been placed. Procedure 8-5 explains how to place local calls.

Local calls

In some cases, the data call is not established. If the call is abandoned by the switch or terminated by the user, it could be for the following reasons:

- No answer—if the called number does not answer, the user is responsible for disconnecting the call.
- Busy number—if the called number is busy, the switch sends a busy notification to the MCA. The MCA sends the prompt `BUSY, RING AGAIN? (Y/N)` to the user. (The Ring Again feature is discussed later in this chapter.)
- Incorrect number—upon receiving an incorrect number, the switch sends a message to the MCA informing it that the number was incorrect. The MCA sends the prompt `NOT ON SERVICE` and releases the call. When the switch idles the DN, the MCA sends the message `RELEASED`.

Procedure 8-5 Placing local calls

- 1 Place a call.

Response:

The switch sends the call state to the MCA. The following message appears on the screen:

```
RINGING
ANSWERED
```

- 2 Called host answers.

Response:

The MCA sends the connected message to the switch. The following message appears on the screen:

```
CALL CONNECTED.
SESSION STARTED.
```

- 3 Follow log-in procedure.

Response:

Host sends prompt for login. The data session between the terminal and the host begins.

- 4 You have completed this procedure.

Automated modem pool calls

With this feature, the switch automatically determines if the called party must be reached by way of a modem. If so, then the modem is automatically accessed for the user. If the call cannot be connected, then the user is given a message prompt stating the compatibility.

Ring Again

Ring Again (RAG) is available for local calls and for queuing on trunk calls. This procedure is active until the user places a call to a busy number.

Note: RAG is not available for remote calls on manual modem pooling.

When the Ring Again feature is implemented, you can activate the call by pressing the Return key (CR) on the terminal keyboard. If the Return key is not pressed within the Ring Again timeout period, the switch cancels the Ring Again, and the MCA sends the prompt `RELEASED`.

Note: If you change the speed of the terminal without re-autobauding, ignore the prompt displayed in Step 3.

If a data call is in progress and the called number against which Ring Again was placed becomes free, no prompt is sent to the user. The switch cancels the Ring Again after the Ring Again timeout. Refer to Procedure 8-6 for using the RAG feature.

Procedure 8-6 Using Ring Again feature

- 1 User places a call to a busy number.

Response:

The switch sends the call state to the MCA. The screen displays the following prompt:

```
BUSY, RING AGAIN? (Y/N)
```

or

The screen displays the following prompt to indicate that Ring Again is already active:

```
BUSY, PREVIOUS RING AGAIN ACTIVE, REPLACE? (Y/N)
```

Note: If the input is not an upper- or lower-case Y or N, the message prompt "INVALID COMMAND/ENTRY, RE-ENTER" is given. A carriage return (CR) alone brings no response.

- 2 Type Y (CR).

Response:

The MCA uses the Ring Again feature, or the MCA cancels the previous Ring Again.

When the called number becomes free, the MCA sends a BELL character to the terminal. The screen displays the following prompt:

```
DATA STATION NOW AVAILABLE.  PLACE CALL? (Y/N)
```

- 3 Type Y (CR) or (CR).

Response:

The switch places the called number. The screen displays the following prompt:

```
CALLING nnnn
```

- 4 You have completed this procedure.

Modify

The Modify feature allows the user to manipulate the following items:

- change stored Autodial numbers
- change any of the stored Speed Call numbers
- set the MCA into the Remote Loopback mode
- select manual or auto answer
- modify Script files

Autodial number

Procedure 8-7 describes how to modify an autodial number.

Procedure 8-7 Modifying an autodial number

- 1 Press return (CR).

Response:

The following prompt appears on the screen.

```
ENTER NUMBER OR H (FOR HELP):
```

Note: The only valid characters are those on the screen. Illegal characters result in the following prompt:

```
INVALID COMMAND / ENTRY,  
REENTER:
```

- 2 Type H (CR).

Response:

Terminal displays the Main menu.

- 3 Type M (CR).

- 4 Enter a menu selection.
- 5 Type A (CR).
Response:
AUTODIAL NO.
- 6 Type **nnnnnnn (CR)**.
Response:
The telephone set modifies the autodial number.
Note: If you release the call at this step, the switch retains the original Autodial number.
- 7 Type Q (CR).
Response:
Terminal displays the Main menu.
- 8 You have completed this procedure.

Speed call number

Procedure 8-8 describes how to modify a speed call number.

Procedure 8-8 Modifying a speed call number

- 1 Press return (CR).
Response:
The following prompt appears on the screen.
ENTER NUMBER OR H (FOR HELP):
Note: The only valid characters are those on the screen. Illegal characters result in the following prompt:
INVALID COMMAND / ENTRY,
REENTER:
- 2 Type H (CR).
Response:
Terminal displays the Main menu.
- 3 Type M (CR) to make a selection from the menu.
- 4 Type S (CR).

Response:

The following prompt appears:

```
ENTER ACCESS CODE :
```

- 5 Type nn (CR).

Response:

The following prompt appears:

```
SPEED NUMBER :
```

- 6 Type nnnnnnn (CR). You can either modify a speed call number or enter a new number. You can keep the number the same by entering a (CR) only.

Note: If you release the call before entering the new Speed Call number, the switch retains the original number.

- 7 Type Q (CR).

Response:

The terminal displays the Main menu.

- 8 You have completed this procedure.

Manual answer

Procedure 8-9 describes step-by-step how to set manual answer.

Procedure 8-9

Setting manual answer

- 1 Press return (CR).

Response:

The following prompt appears on the screen.

```
ENTER NUMBER OR H (FOR HELP) :
```

Note: The only valid characters are those on the screen. Illegal characters result in the following prompt:

```
INVALID COMMAND / ENTRY ,  
REENTER :
```

- 2 Type H (CR).

Response:

Terminal displays the Main menu.

- 3 Type M (CR) to enter a menu selection.

Response:

The following prompt appears on the screen:

```
MANUAL ANSWER (Y/N) :
```

4	<table><thead><tr><th>If you</th><th>Do</th></tr></thead><tbody><tr><td>want to change the manual answer</td><td>Step 5</td></tr><tr><td>do not want to change the manual answer</td><td>Step 7</td></tr></tbody></table>	If you	Do	want to change the manual answer	Step 5	do not want to change the manual answer	Step 7
If you	Do						
want to change the manual answer	Step 5						
do not want to change the manual answer	Step 7						

- 5 Type Y (CR).
- 6 Go to Step 8.
- 7 Type N (CR) or just press the carriage return (CR).
- 8 Type Q (CR).
Response:
The terminal displays the Main menu.
- 9 You have completed this procedure.

Remote loopback

In the remote loopback mode, the MCA causes the called data unit to loop all the data back to the sending MCA. (This is used to test the MCA. For more information on testing, refer to the *Meridian Communication Adapter (MCA) Reference Manual*, 555-4001-123.) Procedure 8-10 describes how to set the Remote Loopback feature.

Procedure 8-10 Setting the remote loopback mode

- 1 Press return (CR).
Response:
The following prompt appears on the screen.

```
ENTER NUMBER OR H (FOR HELP) :
```

Note: The only valid characters are those on the screen. Illegal characters result in the following prompt:

```
INVALID COMMAND / ENTRY,  
REENTER :
```
- 2 Type H (CR).
Response:
Terminal displays the Main menu.
- 3 Type M (CR) to enter a menu selection.

- 4 Type R (CR).

Response:

The following prompt appears on the screen:

REMOTE LOOPBACK (Y/N) :

- 5

If you	Do
want to change the manual answer	Step 6
do not want to change the manual answer	Step 8

- 6 Type Y (CR).

- 7 Go to Step 9.

- 8 Type N (CR) or just press the carriage return (CR).

- 9 Type Q (CR).

Response:

The terminal displays the Main menu.

- 10 You have completed this procedure.

Script file

The Script File feature allows users to store host/terminal dialogs in the MCA, which can be recalled and used to automatically perform log-on procedures. Procedures 8-11 and 8-12 illustrate the Script File feature and associated menus. The first menu, Main Script menu, appears when accessing the Script File option from the Modify menu. From there, two other menus can be accessed: the Learn Script menu and the Delete Script menu.

Main script menu

The Main Script menu provides three possible options. The first two options involve accessing the Learn and Delete Script menus, and the third option is for modifying the escape code. Refer to Procedure 8-11.

Learn script menu

Script files are associated with either the Autodial feature or the Speed Call feature. The Learn Script menu allows a user to learn a script file for either feature.

If the feature selected already has an existing script, the user may either delete that script or quit the learn process.

After the learn set-up procedure, the user must initiate an Autodial or Speed Call for which the Learn Script mode has been set. If a call using the same feature specified in the Learn Script Menu is not made, the Learn Script mode is canceled; a script is not created.

After initiating an Autodial or Speed Call, the Learn Script mode executes, and the script is saved on receipt of the escape sequence.

The Learn Script menu allows the user to display existing scripts saved in the MCA. The example directory in Procedure 8-11 shows the Autodial feature distinguished from the Speed Call feature by the letter A in the Access Code field. The names, byte counts, space, bytes available, and percent space available are also shown.

Procedure 8-11
Accessing the main script menu

- 1 Press return (CR).

Response:

The following prompt appears on the screen.

```
ENTER NUMBER OR H (FOR HELP):
```

Note: The only valid characters are those on the screen. Illegal characters result in the following prompt:

```
INVALID COMMAND / ENTRY,  
REENTER:
```

- 2 Type H (CR).

Response:

Terminal displays the Main menu.

- 3 Type M (CR) to enter a menu selection.

- 4 Type F (CR).

Response:

The following display appears on the screen:

```
L - LEARN SCRIPT  
D - DELETE SCRIPT  
E - ESCAPE SCRIPT  
Q - QUIT  
SELECT:
```

- 5 Type L (CR).

Response:

The following display appears on the screen:

```

A - LEARN AUTODIAL SCRIPT
S - LEARN SPEED DIAL
    SCRIPT
D - SCRIPT FILE DIRECTORY
Q - QUIT

```

SELECT:

or

Type D (CR).

The following display appears on the screen:

```

A - DELETE AUTODIAL
    SCRIPT
S - DELETE SPEED DIAL
    SCRIPT
D - SCRIPT FILE DIRECTORY
Q - QUIT

```

SELECT:

or

Type E (CR).

Response:

The following prompt appears on the screen:

```

ESCAPE CODE = [xxh]
MODIFY (Y/N)?

```

or

Type Q (CR) to return to the Main menu.

6 You have completed this procedure.

Procedure 8-12 describes the steps needed to access the learn script menu.

Procedure 8-12 **Accessing the learn script menu**

1 Press return (CR).

Response:

The following prompt appears on the screen.

```

ENTER NUMBER OR H (FOR HELP):

```

Note: The only valid characters are those on the screen. Illegal characters result in the following prompt:

```

INVALID COMMAND / ENTRY,
REENTER:

```

2 Type H (CR).

Response:

Terminal displays the Main menu.

3 Type M (CR) to enter a menu selection.

4 Type F (CR).

Response:

The following display appears on the screen:

```
L - LEARN SCRIPT
D - DELETE SCRIPT
E - ESCAPE SCRIPT
Q - QUIT
SELECT:
```

5 Type L (CR).

Response:

The Learn Script menu appears on the screen:

```
A - LEARN AUTODIAL SCRIPT
S - LEARN SPEED DIAL
    SCRIPT
D - SCRIPT FILE DIRECTORY
Q - QUIT
SELECT:
```

6

If	Do
a script exists	Step 7
a script does not exist	Step 11

7 Type A (CR) or S (CR).

Response:

Terminal displays a prompt asking if existing script should be deleted. Refer to Procedure 8-13 for information about deleting a script.

Note: These prompts apply for both autodial and speed call script types.

8 Type Y (CR) or N (CR).

If you	Do
want to delete the script	Step 9
do not want to delete the script	Step 17

9 Type Y (CR).

Response:

The terminal displays the appropriate delete prompt.

10 Refer to Procedure 9-13 for instructions on deleting the script.

11 Type A (CR) or S (CR).

Response:

The following display appears on the screen:

```
xx BYTES (xx.x%) AVAILABLE FOR NEW SCRIPT. ACTIVATE LEARN
MODE (Y/N)?
```

12 Type Y (CR).

Response:

The following display appears on the screen:

```
ENTER SCRIPT NAME:
```

13 Enter a script file name, followed by a carriage return.

Response:

The terminal displays the following prompt:

```
ESCAPE CODE = [xxh]
MODIFY (Y/N)?
```

14

If	Do
you want to modify the script	Step 15
you do not want to modify the script	Step 17

15 Type Y (CR).

Response:

The following prompt appears:

```
ENTER ESCAPE CODE:
```

16 Enter the escape code, followed by a carriage return.

Response:

The following prompt appears:

```
LEARN MODE ACTIVATED
```

The terminal displays the Learn Script menu. Go to Step 18.

17 Type N (CR).

Response:

The terminal displays the Learn Script menu.

18 Type D (CR).

Response:

The following screen appears:

SCRIPT FILE DIRECTORY

ACCESS CODE	SCRIPT NAME	LENGTH (bytes)
A	COCOS	924
00	HP3000	615
01	X.25	154

291 BYTES (14.7%) AVAILABLE FOR A NEW SCRIPT.

or

Type Q (CR).

Response:

The terminal displays the Main Script menu.

19 You have completed this procedure.

Delete script menu

The Delete Script menu allows the user to specify the script file to be deleted by choosing the feature that the script file has been associated with in the Learn Script mode. The example directory in Procedure 8-13 shows the Autodial feature distinguished from the Speed Call feature by the letter A in the Access Code field. The names, byte counts, space, bytes available, and percent space available are also shown.

Procedure 8-13

Accessing the delete script menu

1 Press return (CR).

Response:

The following prompt appears on the screen.

ENTER NUMBER OR H (FOR HELP):

Note: The only valid characters are those on the screen. Illegal characters result in the following prompt:

INVALID COMMAND / ENTRY,
REENTER:

2 Type H (CR).

Response:

Terminal displays the Main menu.

3 Type M (CR).

Response:

The Modify menu is displayed:

A - AUTO NUMBER
 M - MANUAL ANSWER
 S - SPEED NUMBER
 F - SCRIPT FILE
 R - REMOTE LOOPBACK
 Q - QUIT MODIFY
 SELECT:

- 4 Type F (CR) to display the Script File Directory choice.

Response:

The Script File Directory is displayed:

L - LEARN SCRIPT
 D - DELETE SCRIPT
 E - ESCAPE SCRIPT
 Q - QUIT
 SELECT:

- 5 Type D (CR) to select the Delete Script File choice.

Response:

The terminal displays the Delete Script menu.

A - DELETE AUTODIAL SCRIPT
 S - DELETE SPEED DIAL SCRIPT
 D - SCRIPT FILE DIRECTORY
 Q - QUIT
 SELECT:

- 6 Type A (CR) to select the Delete Autodial Script selection.

Response:

The following prompt displays

DELETE AUTODIAL SCRIPT [script name] (Y/N)?

7

If you	Do
want to delete the autodial script	Step 8
do not want to delete the autodial script	Step 10

- 8 Type Y (CR).

- 9 The following prompt is displayed:

SCRIPT NOT DELETED

The terminal returns you to the Delete Script menu.

10 Type N (CR).

11

If	Do
a script exists	Step 13
a script does not exist	Step 12

12 Type A (CR).

Response:

The following display appears on the screen:

SCRIPT DOES NOT EXIST

You are returned to the Delete Script menu.

or

S (CR)

Response:

The following display appears on the screen:

ENTER ACCESS CODE :

SCRIPT DOES NOT EXIST

User returns to the Delete Script menu.

13 The following display appears on the screen:

DELETE EXISTING SPEED SCRIPT FOR ACCESS CODE xx [script name] (Y/N)?

14

If	Do
you want to delete the script	Step 15
do not want to delete the script	Step 16

15 Type Y (CR).

Response:

The following screen appears:

SPEED SCRIPT DELETED FOR ACCESS CODE xx [script name]

You are returned to Delete Script menu. Go to Step 17.

16 Type N (CR).

Response:

The following screen appears:

```
SCRIPT NOT DELETED
```

The user returns to Delete Script menu. Go to Step 17.

17 Type D (CR).

```
SCRIPT FILE DIRECTORY
```

ACCESS CODE	SCRIPT NAME	LENGTH (bytes)
A	COCOS	924
00	HP3000	615
01	X.25	154

```
291 BYTES (14.7%) AVAILABLE FOR A NEW SCRIPT.
```

or

type

Q (CR).

Response:

The terminal displays the Main Script menu.

18 You have completed this procedure.

Example script

Table 8-3
Example script file

Prompt	User input
TAG (ACCESS CODE):	Autodial
NAME:	Cocos
ACTUAL SCRIPT:	
HOST PROMPT:	X25>
DTE RESPONSE:	C 000004630100 (CR)
HOST PROMPT:	Password
DTE RESPONSE:	Meridian (CR)
HOST PROMPT:	Data Transfer mode
PAUSE	
—continued—	

Table 8-3
Example script file (continued)

Prompt	User input
DTE RESPONSE:	V
HOST PROMPT:	User ID
DTE RESPONSE:	SLLEA01
HOST PROMPT:	Password
PRIVACY MODE	
END SCRIPT	
—end—	

Escape sequences

The escape code can be modified at either the Main Script menu or just before activating the learn mode in the Learn Script menu.

After establishing a call in the learn mode, the escape sequence performs one of the following tasks:

- If the MCA receives one escape character, it inserts one pause (lasting one second) into the script file. The user may enter as many consecutive pauses as needed.
- If the MCA receives two escape characters, it puts the user into the privacy mode. This mode is used for password protection because any additional characters entered by the user are not stored in the script. The privacy mode is terminated by a carriage return from the user.
- A sequence of three escape characters saves the script to the MCA's electronically erasable programmable read-only memory (EEPROM). The user is not interrupted, and the data call continues without losing data.

Incoming calls

Manual answer

Procedure 8-14 is used when the user's answer mode is set for Manual Answer and an incoming data call occurs. If the user changes the speed of the terminal without re-autobauding, the data displayed on the screen at Step 1 is meaningless. If the call is released at Step 1, the message RELEASED is

displayed. If the Digit Display feature is not assigned to the MCA, the calling number is not displayed at Step 1.

Procedure 8-14
Manual answer

- 1 Type nnnn (CR) Y.

Response:

The following prompt is displayed:

INCOMING CALL. ANSWER? Y/N

The MCA sends a Bell character to the terminal. The calling number is displayed. Entering only a (CR) is taken as a Yes reply.

- 2

If you	Do
want to manually answer the call	Step 3
do not want to manually answer the call	Step 4

- 3 Type Y (CR).

Response:

The following prompt is displayed:

INCOMING CALL CONNECTED (CR)

Both terminals are compatible. The data call is established. Go to Step 5.

- 4 Press return (CR).

Response:

The following prompt is displayed:

UNDER TEST

The calling party requests the MCA to loopback data.

- 5 The following prompt is displayed:

INCOMPATIBLE INCOMING CALL (CR)

RELEASED (CR)

Incoming data call connection failed because of mismatch in baud rate or unsupported data pattern. Data call is not established.

- 6 You have completed this procedure.

Auto answer

This procedure is used when the user's answer mode is set for Automatic Answer and an incoming data call occurs. If the user changes the speed of the terminal without re-autobauding, the data displayed on the screen at Step 1 is meaningless. If the Digit Display feature is not assigned to the MCA, the calling number is not displayed at Step 1. Procedure 8-15 describes how to establish Auto answer.

Procedure 8-15 Establishing auto answer

- 1** Type **nnnn (CR) (CR)**.

Response:

The terminal displays the following prompt:

```
INCOMING CALL CONNECTED
```

Both terminals are compatible. The data call is established.

or

Type **nnnn (CR)**.

Response:

The terminal displays the following prompt:

```
UNDER TEST
```

The calling party requests the MCA to loopback data.

- 2** Press return twice.

Response:

The terminal displays the following prompt:

```
INCOMPATIBLE INCOMING CALL  
RELEASED
```

Incoming data call connection failed because of mismatch in baud rate or unsupported data pattern. Data call is not established.

- 3** You have completed this procedure.

Hayes keyboard dialing

Hayes keyboard dialing allows you the option of using commands compatible with the Hayes V-series Smartmodem 9600 to originate and answer data calls. This allows the Meridian communication adapter (MCA) to be used with the following software packages that also support the Hayes protocol:

- Smartcom II V2.0
- Smartcom II V2.1
- Smartcom III V1.0
- Crosstalk V3.6
- Direct Access From Citibank (proprietary)

Hayes KBD or AT dialing provides you with the following capabilities:

- call origination to local and remote hosts
- modem pooling
- automatic and manual answering of incoming calls

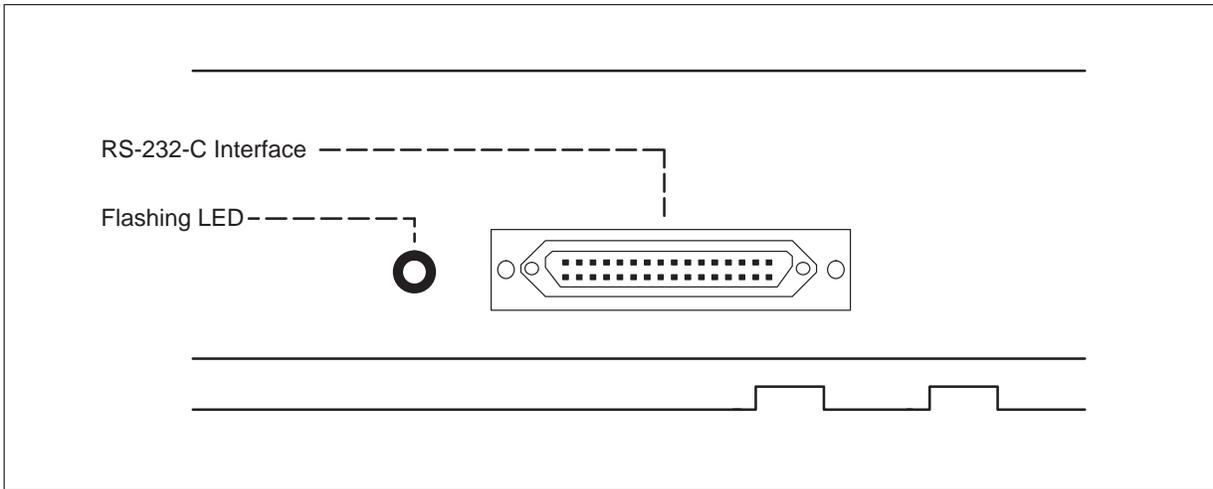
Initialization

Before using the Hayes KBD feature, make sure you have performed the following steps:

- Turn the data terminal power on.
- Set the data terminal on-line.
- Turn the MCA power on.
- Ensure that the LED on the back of the MCA is flashing at a constant rate to indicate the MCA is functioning properly. (See Figure 9-1.)

The MCA operates in one of two modes: command or on-line. After initializing the MCA, the command mode becomes active. The command mode continues until an acceptable autobaud character is entered. To activate Hayes keyboard dialing, enter AT. AT must be either AT or at. At and aT are not recognized. If no autobaud character is entered, the S66 register determines the default keyboard version.

Figure 9-1
MCA flashing LED



Hayes commands can be issued only when the MCA is in this state. When you are in the Hayes keyboard dialing state, the MCA returns to the command state after each command line is entered and after a call is completed.

Autobaud and autoparity

The parameter, S66 register, determines how autobaud and autoparity characters are interpreted. S66 allows Hayes compatible software packages to execute without inadvertently entering the Nortel (Northern Telecom) KBD state. The S66 default setting (the state which is active each time the autobaud state resumes) is originally determined by the KBDTYPE field within the MCA operating parameter download. Selecting Hayes in the download clears the S66 register while selecting KBD sets it. This register can also be manipulated with regular AT commands or with the P66 command from the keypad.

Note: A change made with the P66 command changes the default setting while a change made with AT commands does not.

Parameter S66 register (nonzero)

If the S66 register contains a nonzero value (Nortel KBD), the autobauding operates as follows:

- If a carriage return (0DH) is entered followed by a period (2EH) and another carriage return (0DH), the Nortel KBD becomes active. Autobaud and autoparity are performed.

- If only a carriage return (ODH) is entered, the Nortel KBD becomes active with only an autobaud performed. For more information about Nortel KBD, refer to Chapter 8, “Nortel keyboard dialing”.
- If AT, at, A/, or a/ is entered, Hayes keyboard dialing becomes active with an autobaud and autoparity performed. All other characters are ignored within the autobaud state.

Parameter S66 register (zero)

If the S66 register contains a zero value (Hayes keyboard dialing), the autobauding operates as follows:

- If a carriage return (ODH) is entered, it is echoed to the DTE.
Note: An autobaud is performed with the carriage return, but you remain in the command state.
- If AT, at, A/, or a/ is entered, Hayes keyboard dialing becomes active with an autobaud and autoparity performed. All other characters are ignored within the command state.

Incoming calls activate the most recently used keyboard dialing method. The prompts are transmitted at the previously detected data (baud) rate. At that time the proper incoming call prompt is displayed. If the data rate of the DTE is changed but no autobaud has occurred between the time the DTE was changed and the arrival of the incoming call message, the prompts are transmitted at an incompatible data rate.

The MCA does not have a previous data rate if it has not been autobauded since power up or since the line had maintenance performed on it. If the MCA has no previous data rate stored, the incoming call prompt is transmitted at the baud rate that was sent in the operating parameter download. You may change this rate by using the P22 command. This action saves your desired baud rate in the event of power loss. If the DTE is not set to that data rate, garbage may be displayed.

Implementing the P66 command

The P66 command contains the initial screen and four scrolling screens that enable you to select which type of modem the MCA can emulate. The product code with respect to each modem emulation is automatically setup. Unless otherwise requested, the screens are presented on the set display as shown in Table 9-1.

Table 9-1
P66 command screens

Initial screen	Emulation selection	Action (Scroll <<< >>>)
Screen 1	Smartmodem 9600	Press P to select emulation and exit.
Screen 2	Smartmodem 2400	Press P to select emulation and exit.
Screen 3	Smartmodem 1200	Press P to select emulation and exit.
Screen 4	Nortel KBD Dialing	Press P to select emulation and exit.

The product codes associated with each are 960, 240, and 122, respectively, and correspond to the values that are assigned to the S52, S53, and S54 registers.

To select the desired emulation, press P66. Scroll through the choices. When you have found the desired screen, press P. For information on Nortel KBD and P66 implementation, refer to Chapter 8, “Nortel keyboard dialing”, in the section titled “Implementing the P66 command”.

To return to Hayes keyboard dialing, you must either enter the P66 command and reselect one of the Hayes KBD dialing options or enter an AT command from the Nortel KBD state.

The default screen selection depends upon the KBDTYPE field of the MCA profile. If the field specifies Hayes, the default is Screen 1. If the field specifies SYMB, the default is Screen 4.

To see which screen is currently selected, use the P62 command. The fourth screen of the P62 command previously showed only the SPEED RESTRICTION state of ON or OFF. The P66 command uses the lower half of the screen to show the currently selected P66 state. One of the following screens appear as the fourth screen of P62 where xxx represents ON or OFF:

- SPEED RESTRICTION xxx
SMARTMODEM 9600
- SPEED RESTRICTION xxx
SMARTMODEM 2400
- SPEED RESTRICTION xxx
SMARTMODEM 1200

- SPEED RESTRICTION xxx
HAYES COMPATIBLE MODEM
- SPEED RESTRICTION xxx
NT KBD DIALING

The HAYES COMPATIBLE MODEM prompt appears when the S66 register is zero (modem emulation), but the values in registers S52, S53, and S54 do not match one of the standard Hayes product codes previously mentioned. To emulate a modem with a product code not mentioned above, select any one of the emulation screens from the P66 menu. (This is done to cause the S66 register to be zero. The S66 register can also be set to zero manually). Then, manually assign a different product code to the S52, S53, and S54 registers.

As an example, if Screen 1 of the P66 command is chosen, the registers contain the following values:

- S66 = Hayes
- S52 = 579 (39h ASCII value)
- S53 = 546 (36h ASCII value)
- S54 = 480 (30h ASCII value)

The values in the registers are not straightforward. The value of 57 in the S52 register is obtained by first taking the ASCII value of the desired number, 9 = 39h, and converting this 39h to the decimal value of 57. This conversion is necessary for two reasons. First, letter assignments are not allowed as part of the product code where the ASCII chart shows numeric values for letters as well as numbers; secondly, ASCII codes cannot be entered directly into the registers because all S registers must contain decimal values only.

Therefore, to change the value of the S52 register to number 5, first realize that the ASCII value for a 5 is 35h; then convert the ASCII value to the decimal value, 53. With this value known, then the S52=53 command is used to assign the value to the register.

Note: This allows the technician the capability to assign any ASCII character (letters included) to any of the S52, S53, and S54 registers as needed for product codes.

S registers

The S registers (S0 to S69) may be used to program various call setup parameters. To query the value of a particular S-register, enter the command as follows: Sr?

where

r equals 1 to 69.

For the S registers and their associated values used by the MCA, refer to Appendix B, “AT dialing parameter registers”. Some registers defined in the Hayes keyboard dialing implementation are not applicable to the MCA and are ignored.

To reset registers S0 through S49 to their default values, the software reset commands Z, Z1, &F, &Y, and &Y1 may be used. Registers S50 through S69 are reset to their default values only at power up.

Register S0—ring to answer ON

S0 sets the ring for the MCA to automatically answer a call. Setting S0 = 0 disables auto-answer.

Register S1—ring count

The MCA automatically tracks the number of rings, incrementing and writing the value in S1.

Register S2—escape sequence character

S2 holds the ASCII value of the escape sequence character.

Register S3—carriage return character

S3 holds the ASCII value of the carriage return character.

Register S4—line feed character

S4 holds the ASCII value of the line feed character.

Register S5—backspace character

S5 holds the ASCII value of the backspace character.

Register S7—wait time for carrier

Calls can fail to complete T-Link handshake successfully because of incompatible parameters or a noisy data path. Register S7 specifies the maximum time to wait for the handshake to complete. If data synchronization is not found in this amount of time, the call is released, and a NO CARRIER prompt is displayed.

Register S12—escape sequence guard time

S12 holds the value of the delay required prior to and following the escape sequence. The guard time also dictates how quickly the escape sequence characters must be entered, because the interval between entry of each of the

three characters must be of shorter duration than that specified for the guard time.

Register S36—baud rate adapting

When an attempt to make a connection fails due to incompatible baud rates, the MCA reads this register to determine whether to terminate the connection, or to adapt to the far end baud rate. If S36 is set to 0, the MCA hangs up if the baud rates are incompatible. If S36 is set to 1 and the MCA is the answering party, then the MCA adapts to the calling party's baud rate.

Register S51—delay until modem pool activation

S51 holds the value of delay before outbound modem pool activation. Each decimal increment of S51 represents a 0.25-second delay. This register is not altered by the software reset commands.

Register S52 through S54—product code response

These three registers contain the product identification code and are output in response to the I0 command. The default is 960 (Smartmodem V-series 960 modem). Other possible values are: 124 (Smartmodem V-series 1200), 240 (Smartmodem 2400 V-series 2400). These registers are not altered by the software reset commands.

Register S66—Hayes/keyboard dialing autobaud interpretation

S66 defaults to the value sent in the operating parameters download set up by the user. If no download of operating parameters occurs, the default value is zero (Hayes keyboard dialing).

Hayes keyboard dialing command syntax

All Hayes commands are prefixed by AT and followed by a carriage return. The carriage return executes the AT command. The repeat previous command (A/) is the only exception to the command line structure; it is sent without the AT prefix and must appear on a line by itself. The MCA examines the AT prefix and automatically determines the baud rate and parity settings of the data terminal equipment. Both letters of the AT prefix must be entered using all upper case or all lower case (at or AT). The MCA does not recognize an upper case A and a lower case t (At) or the reverse combination (aT).

Each command line can contain a number of commands concatenated together. However, each line is limited to a maximum of 40 characters (excluding the AT). Some commands must be entered on a line by themselves as they prevent other commands on the same line from being processed. Most AT commands have selectable numeric parameters. For example, E0 turns off character echo, while E1 turns it on. Punctuation characters (- or ,) are allowed for readability, but take up space in the

40-character command line buffer. A space (ASCII 20H) can also be used, but does not take up space in the buffer.

User input characteristics

When you enter data for AT dialing, it must conform to the following characteristics:

- Each command line must begin with the letters AT or at and end with a carriage return. If the MCA is in autobaud mode, AT is used to set autobaud and autoparity. Processing of the command line is not performed until the carriage return is received.
- You may enter data in either upper or lower case, but not mixed.
- You may edit each character on each command using the Backspace and Delete codes.
- Each command line can contain several commands without delimiters. Each line is limited to 40 characters, excluding the AT command.
- Punctuation characters, like commas or parentheses, are allowed but are included in the character count of the command line. A space can also be used, but it is not counted in the character count.
- Commands entered without a numerical parameter are assumed to be 0. For example, if you entered ATE, it is interpreted as ATE0 and disables the echoing of keyboard dialing commands.
- Call setup parameters may be programmed using a register set called the S registers. (Refer to Appendix B, “AT dialing parameter registers”, for more information.)

A range check is not made on the value assigned to an S register. The range in Procedure 9-1 describes only those values that give the expected results. Any other values may or may not function as desired and are not flagged as an error when the command is processed.

The MCA remains in or enters the command state under the following conditions:

- when the MCA is powered up
- when no carrier, no dialtone, or busy is detected while originating or answering a call
- when a carrier signal from the remote modem is lost
- when the &D1, &D2, or &D3 option is selected, and the MCA detects an on-to-off transition of DTR
- when a semicolon (;) is entered at the end of the dial D command to return the MCA to the command state

- when the escape sequence +++ is entered while the MCA is on-line
- when a call is dropped using a valid break sequence

Procedure 9-1**Hayes keyboard dialing escape code sequence**

- 1 Wait at least one second after previous entry.
- 2 Type +++. Space each keystroke less than one second apart.
- 3 Wait at least one second before the next entry.

Prompt:

The following message is displayed:

OK

The MCA returns to command state.

- 4 You have completed this procedure.

In the Hayes command state, your input is interpreted as call setup information. When the call is established (indicated by the CONNECT prompt), the MCA enters the online state and transmits all data on the RS-232-C interface transparently across the network to the far-end MCA. The MCA attempts to go online in the following situations:

- when the dial command D is issued
- when the online command O0 or O1 is issued
- when the answer command A is issued
- when the ring count (value of register S1) equals the numbers of rings to answer on (value of register S0)

In this state, the MCA acts as a full duplex device, and it is the responsibility of the DTE connected to the far-end MCA to respond to your input.

The return from online state to the command state may be performed by using an escape code sequence. The default escape sequence consists of a minimum of one second of no data followed by three plus signs +++ with less than one second between each adjacent +, followed by a minimum of one second of no data. It is extremely unlikely that such a sequence would be executed accidentally while in the online state.

To return to the command state while also dropping the call, execute an escape sequence of three “breaks”. This is not a conventional Hayes command sequence, but proves to be very useful. Both the escape guard time (one second) and escape character + are programmable using Registers

S12 and S2. A typical example of the escape sequence is described in Procedure 9-1.

After returning to command state, you may, for example, release the call using the H command. Or you may re-enter the online state using the O command.

Hayes AT commands

Appendix A, “Hayes standard AT commands”, lists the AT commands supported by the MCA.

If you enter commands without a numerical parameter, the parameter is assumed to be 0. For example, if you enter ATE, it is interpreted as ATE0 and disables the echoing of the keyboard dialing commands.

Result codes and message prompts

The MCA provides responses to commands in the form of result codes. Result codes are used as message prompts. These codes are either a numeric code or word code, depending upon the value of the V parameter. Unless disabled with the Q1 command, a result code is displayed after a command is entered. Table 9-2 describes the Hayes keyboard dialing result codes.

Table 9-2
Result codes

Digit code	Word code	Meaning
0	OK	Command line processed without error
1	CONNECT	Data connection established
2	RING	Incoming call
3	NO CARRIER	Data synchronization lost or never found
4	ERROR	Command line error
5	CONNECT 1200	Data connection established at 1200 baud
7	BUSY	Called number busy
10	CONNECT 2400	Data connection established at 2400 baud
—continued—		

Table 9-2
Result codes (continued)

Digit code	Word code	Meaning
11	CONNECT 4800	Data connection established at 4800 baud
12	CONNECT 9600	Data connection established at 9600 baud
14	CONNECT 19200	Data connection established at 19,200 baud
—end—		

Keyboard feature operation

Table 9-3 and Procedures 9-2 through 9-5 illustrate the dialing procedures for AT keyboard dialing.

Dialing modifiers

Dial modifiers are special parameters used to communicate to the MCA how to dial the telephone number. Table 9-3 describes the dialing modifiers.

Table 9-3
Dial modifiers

Dial modifier	Description
0–9	Digits for dialing
A B C D	Characters for dialing
#	If used in the SL-100 dialing phase, this character instructs the PBX to begin dialing the digits entered up to this point (ATD9974500#). If used after the SL-100 dialing phase, this character is outpulsed as a tone (ATD9974500,,,,1234#).
*	This character cannot be used in the SL-100 dialing phase. If used after the SL-100 dialing phase, this character is outpulsed as a tone (ATD9974500,,,,1234*).
,	This character delays processing the next character by one second (ATD4500,1234). This delay is fixed at one second and may not be altered by Register S0.
—continued—	

Table 9-3
Dial modifiers (continued)

Dial modifier	Description
;	This character returns the MCA to the command state after dialing (ATD9974500;).
! @	These characters can be used in the dialing string, but have no effect on the dialing sequence.
P R T W	These characters can be used in the dialing string, but have no effect on the dialing sequence.
—end—	

Establishing a Hayes keyboard call

Procedure 9-2 describes how to establish a Hayes keyboard dialing call.

Procedure 9- 2 Hayes keyboard dialing escape code sequence

- 1 Type ATDnnnn (CR).
Response:
MCA sends digits when (CR) is received.
- 2 Network connection is established.
Response:
The following message is displayed:
CONNECT
- 3 Data connection is established.
- 4 You have completed this procedure.

Incomplete Hayes keyboard call

Calls can fail to complete a T-Link handshake because of incompatible parameters or a noisy data path. You must maintain synchronization. If it is not attained, the call is released. The S7 register specifies the maximum time to wait for the handshake to complete. If data synchronization is not found in this amount of time, the call is released. Procedure 9-3 describes how to handle an incomplete data call with Hayes keyboard dialing.

Procedure 9-3
Incomplete Hayes keyboard call

- 1 Type ATDnnnn (CR). The MCA sends digits when (CR) is received and the network connection is established.
- 2 The data connection fails.
Response:
The following prompt is displayed:
NO CARRIER
The call is released.
- 3 You have completed this procedure.

Auto answer

Incoming calls are answered automatically if Register S0 is set to any value between 1 and 255. This value is the number of rings before the incoming call is answered by the MCA. Procedure 9-4 describes how to Auto Answer a Hayes data call.

Procedure 9-4
Auto answering a Hayes data call

- 1 When the MCA detects an incoming call, the following message displays on the screen:
RING
Response:
MCA counts rings up to the value of S0.
- 2 The MCA answers. The following message displays on the screen:
CONNECT
Response:
Data connection is established.
- 3 You have completed this procedure.

Manual answer

If Register S0 contains 0, the MCA does not answer automatically, and a data call must be answered using the ATA command. Procedure 9-5 illustrates how to answer a Hayes data call manually.

Procedure 9-5
Manually answering a Hayes data call

- 1 When the MCA detects an incoming call, the following message displays on the screen:

RING

Response:

The MCA counts rings.

- 2 Type ATA (CR).

Response:

The MCA answers. The following message appears on the screen:

CONNECT

The data connection is established.

Note: The MCA does not provide audible ringing. The RI lead of the RS-232-C connection is high for 2 seconds and low for 4 seconds. This cycle is counted like physical ringing. (CR) indicates a carriage return.

- 3 You have completed this procedure.

Incoming calls

Incoming calls activate the most recently used keyboard dialing type. The prompts are transmitted at the previously detected data rate.

If you have not set the autobaud, the MCA acts as though the autobaud is 19.2 Kbyte/s. If the terminal connected to the MCA is at any speed other than 19.2 Kbyte/s, then the display may be unreadable because of the incompatibility of the baud rates. Autobaud the MCA immediately following any MCA installation or maintenance.

If the data rate of the DTE changes and the autobaud has not been set, an incoming call is transmitted at an incompatible data rate.

Call disconnection

If a number has been dialed but a connection has not been established, the MCA is still in the command state. The call may be released by sending any character from the DTE to the MCA (an S7 time out) or by entering a valid break sequence.

If a data connection has been established, a call may be released by returning to the command state using the release sequence previously described followed by the H command. Alternatively, a call may be released by dropping DTR provided that the MCA is datafilled with the &D2 or &D3 commands.

Testing and maintenance

Meridian modular telephone testing consists basically of acceptance test procedures. Impulse noise, background noise, and crosstalk compatibility problems are unlikely. Examine loop length, connect the telephone, and check performance by establishing a communication path to another telephone (or data terminal) and going through the different call routines (enabled features) while observing and verifying the responses at the telephone and data terminal. Check polarity of tip and ring leads for reversals before going into more detailed follow-up tests. The Meridian modular telephones are polarity sensitive, and a dead loop or absence of dial tone may indicate reversed tip and ring polarities.

Key/LCD indicator tests

Some station access tests originate at the Meridian modular telephone by dialing a 2- or 3-digit access code, usually prefixed by a pound sign (#), and the last 5 digits of the directory number (DN). (The access code is typically 797, but is defined by the customer. The number of DN digits depends on the numbering plan used for extension dialing.) This access code sets the Meridian modular telephone to the maintenance state.

To test the Meridian modular telephone, perform the steps in Procedure 10-1. All responses must be as shown in the Response column for the digital telephone to pass the test. Each key need only be operated momentarily. The telephone passes the test if all required responses are met. Replace any telephone not meeting all test requirements.

If the last five digits of the DN are not correct for the telephone, reorder tone is received. The tester must press the RIs (Release) key to stop the test. If the digits are correct, all the liquid crystal displays (LCD) on the telephone illuminate.

The tester has 2 minutes to perform the test. When the test is completed or has timed-out, the telephone becomes idle with no dial tone.

This test is not valid for the Meridian communication adapter (MCA), and the test cannot be initiated from a data loop or the keyboard.

Each time a Meridian modular telephone is unplugged and a new one plugged in (for example, when replacing a defective telephone), a waiting period of at least 6 seconds is required before the new telephone can be tested.

Note: When testing the M2006, omit Steps 24–33 and Step 37 in Procedure 10-1. When testing the M2008, omit Steps 26–33 and Step 37.

Procedure 10-1

Key/LCD indicator tests (station ringer test)

- 1 Dial the access code and the last five digits of the directory number.

Response:

All key/LCD indicators come on.

- 2 Take the handset off-hook.

Response:

All LCDs flash. (See Note.)

- 3 Put handset on-hook.

Response:

All LCDs wink. (See Note.)

- 4 Take handset off-hook.

Response:

All LCDs come on. (See Note.)

- 5 Put handset on-hook.

Response:

All LCDs turn off. (See Note.)

- 6 Press dial pad key 1.

Response:

LCD 1 comes on.

- 7 Press dial pad key 2.

Response:

LCD 2 comes on.

- 8 Press dial pad key 3.

Response:

LCD 3 comes on.

- 9** Press dial pad key 4.
Response:
LCD 4 comes on.
- 10** Press dial pad key 5.
Response:
LCD 5 comes on.
- 11** Press dial pad key 6.
Response:
LCD 6 comes on.
- 12** Press dial pad key 7.
Response:
LCD 7 comes on.
- 13** Press dial pad key 8.
Response:
LCD 8 comes on.
- 14** Press dial pad key 9.
Response:
LCDs 1 and 8 come on.
- 15** Press dial pad key 0.
Response:
LCDs 2 and 8 come on.
- 16** Press dial pad key * (asterisk).
Response:
All LCDs come on. (See Note.)
- 17** Press dial pad key # (pound).
Response:
All LCDs turn off. (See Note.)
- 18** Press Function key 1.
Response:
LCD 1 comes on.

19 Press Function key 2.

Response:

LCD 2 comes on.

20 Press Function key 3.

Response:

LCD 3 comes on.

21 Press Function key 4.

Response:

LCD 4 comes on.

22 Press Function key 5.

Response:

LCD 5 comes on.

23 Press Function key 6.

Response:

LCD 6 comes on.

24 Press Function key 7.

Response:

LCD 7 comes on.

25 Press Function key 8.

Response:

LCD 8 comes on.

26 Press Function key 9.

Response:

LCD 9 comes on.

27 Press Function key 10.

Response:

LCD 10 comes on.

28 Press Function key 11.

Response:

LCD 11 comes on.

- 29** Press Function key 12.
Response:
LCD 12 comes on.
- 30** Press Function key 13.
Response:
LCD 13 comes on.
- 31** Press Function key 14.
Response:
LCD 14 comes on.
- 32** Press Function key 15.
Response:
LCD 15 comes on.
- 33** Press Function key 16.
Response:
LCD 16 comes on.
- 34** Press HOLD key.
Response:
The system provides dial tone, and LCDs one through five come on.
- 35** Take handset off-hook.
Response:
The system provides dial tone from the handset only, and all LCDs flash.
- 36** Put handset on-hook.
Response:
The system provides dial tone from the speaker, and all LCDs turn off.
- 37** Press Handsfree key.
Response:
LCDs one through three and Handsfree LCD come on.
- 38** Press RIs (Release) key.
Response:
All LCDs turn off.

- 39** Press HOLD key.
Response:
LCDs 6 through 9 come on, and the system provides buzzer tone.
- 40** Press HOLD key.
Response:
This step ends the test.
- 41** Press HOLD key.
Response:
The telephone set rings.
Note: The LCD response does not include the Handsfree LCD on the M2616. The Handsfree LCD remains OFF during these tests.
- 42** You have completed this procedure.

Volume adjustment tests

To check proper functioning of the volume adjustment feature, proceed with the steps as given in Procedures 10-2 and 10-3. The telephone passes the test if all required responses are received. Replace any telephone not meeting all test requirements.

Procedure 10-2 **Testing volume adjustment for M2006, M2008, M2016S, M2216ACD-1, and M2216ACD-2 sets**

- 1** Press a loop key (DN).
Response:
The system provides dial tone.
- 2** Press the volume key on the right side repeatedly.
Response:
The dial tone volume increases with each operation.
- 3** Press the volume key on the left side repeatedly.
Response:
The dial tone volume decreases with each operation.
- 4** Release the loop, then call the telephone to be tested from another telephone.
Response:
The system provides alerting tone.

- 5 Repeat Steps 2 and 3 for the alerting tone.

Response:

The volume of the alerting tone increases and decreases in the same manner as the dial tone.

- 6 You have completed this procedure.

Procedure 10-3

Testing volume adjustment for a handsfree M2616 set

- 1 Press a loop key (DN).

Response:

The system provides dial tone.

- 2 Press the volume key on the right side repeatedly.

Response:

The dial tone volume increases with each operation.

- 3 Press the volume key on the left side repeatedly.

Response:

The dial tone volume decreases with each operation.

- 4 Release the loop, then call the telephone to be tested from another telephone.

Response:

The system provides alerting tone.

- 5 Repeat Steps 2 and 3 for the alerting tone.

Response:

The volume of the alerting tone increases and decreases in the same manner as the dial tone.

- 6 Release the alerting tone, then press the Handsfree/Mute key, and dial a recorded announcement DN (such as, standard time).

Response:

An audible announcement is given over the handsfree speaker.

- 7 Repeat Steps 2 and 3 for the announcement.

Response:

The volume of the announcement increases and decreases in the same manner as the dial tone.

- 8 You have completed this procedure.

MCA self test

The MCA self test enables a user to test the MCA circuit board, even if there is no data terminal equipment (DTE) present. This test can be run in response to problems with keyboard functions.

While the MCA self test is running, the data line and associated voice line are call processing busy (CPB), causing a simultaneous test at the MAP workstation to fail.

The following restrictions and limitations apply to the MCA self test:

- No calls can be made or received on either the voice line or the data line of the Meridian modular telephone while the test is in progress.
- The test can only be initiated from the voice line of a Meridian modular telephone equipped with MCA.
- The test cannot be initiated on a voice line that is currently engaged in another feature.
- MCA self test only tests the MCA within the Meridian modular telephone that initiated the test.

The MCA self test may be unable to set up for the following reasons:

- A feature data block could not be allocated.
- The call is being blocked in the network.
- Another feature is already in progress on the line to be used for the test. MCA self test cannot be run on the third leg of a Conference or Call Transfer call.
- A maintenance process is currently being run on the Meridian modular telephone.
- The MCA line has not been datafilled.
- The MCA self test was initiated from a telephone other than a Meridian modular telephone.

Follow the procedures in Procedure 10-4 to test the MCA. The access code to activate the MCA self test feature must be datafilled in table XLANAME and table IBNXLA. Refer to sections “Table XLANAME” and “Table IBNXLA” in this chapter for a description of applicable fields.

Procedure 10-4 **Performing the MCA self test**

- 1 Press a loop (DN) key.
Response:
The system provides dial tone.

- 2 Enter the MCA self test access code (usually two or three digits as defined in table IBNXLA).

Response:

The DN LCD flashes. MCA IS UNDER TEST appears on the DTE screen.

If the LCD does not flash, MCA IS UNDER TEST does not appear on the DTE screen, and reorder tone is received continuously, the MCA self test could not be set up. Check to ensure that the power source is properly connected.

Replace the handset, and try the MCA self test again at a later time. If repeated attempts to set up the MCA self test fail, contact service personnel.

If confirmation tone is given and MCA TEST IS COMPLETE appears on the DTE screen, the MCA circuit board is in working order. If there is a data communications failure, the DTE, RS-232-C interface, or cable could be faulty.

If an audible reorder tone occurs for five seconds and MCA TEST IS COMPLETE appears on the DTE screen, the MCA self test failed. The power source may be disconnected. If the power source is securely connected, contact service personnel to replace the MCA circuit board.

- 3 Replace the handset.

Response:

MCA self test completes. The test is over when the handset is replaced, regardless of whether the test has been completed.

Note 1: If the HOLD key is pressed during the MCA self test, the test is over regardless of whether the test has been completed.

Note 2: If the MCA self test has been set up, and no tone is received within 15 seconds, reorder tone is given followed by normal call treatment.

- 4 You have completed this procedure.

Table XLANAME

Table XLANAME (translation name) controls the addition and deletion of translators to the IBN Translations table.

Each translator is assigned a one- to eight-character name plus the default data. This default data is used for that translator name whenever an access code is not specified in table IBNXLA.

Table 10-1 describes the fields to be entered. For more information on table XLANAME, refer to the *Commercial Systems Customer Data Schema*, 555-4031-851, or *Defense Switched Network Customer Data Schema*, 555-4021-851.

Table 10-1
Table XLANAME datafill

Field	Subfield	Explanation and action
XLANAME		<i>Translator name</i> Enter the one- to eight-character alphanumeric name assigned to the customer, feature, or preliminary translator.
DEFAULT		<i>Default data</i> This field consists of the following subfields: TRSEL, ACR, SMDR, and FEATURE.
	TRSEL	<i>Translation selector</i> Enter the following translation selector: FEAT.
	ACR	<i>Account code entry</i> Enter Y (Yes) when an account code entry is required for all calls to the special feature access, otherwise enter N (No) to specify that no account code entry is required.
	SMDR	<i>Station message detail recording</i> Enter Y (Yes) when all calls to the feature are recorded for billing purposes, otherwise enter N (No).
	FEATURE	<i>Feature</i> Enter the following feature assigned to the function code: MCA.

Table IBNXLA

Table IBNXLA assigns the access code that a Meridian modular telephone equipped with the MCA self test feature must dial to activate the test.

Table 10-2 describes the fields to be entered. For more information on table IBNXLA, refer to the *Customer Data Schema*.

Table 10-2
Table IBNXLA datafill

Field	Subfield	Explanation and action
KEY		<i>Key</i> This field consists of the following subfields: XLANAME and DGLIDX.
	XLANAME	<i>Translator name</i> Enter the one- to eight-character alphanumeric name assigned to the customer, feature, or preliminary translator.
	DGLIDX	<i>Digilator index</i> Enter the digit(s) assigned as the access code for the special feature.
DEFAULT		<i>Default data</i> This field consists of the following subfields: TRSEL, ACR, SMDR, and FEATURE.
	TRSEL	<i>Translation selector</i> Enter the following translation selector: FEAT.
	ACR	<i>Account code entry</i> Enter Y (Yes) when an account code entry is required for all calls to the special feature access, otherwise enter N (No) to specify that no account code entry is required.
	SMDR	<i>Station message detail recording</i> Enter Y (Yes) when all calls to the feature are recorded for billing purposes, otherwise enter N (No).
	FEATURE	<i>Feature</i> Enter the following feature assigned to the function code: MCA.

Trouble locating procedures

Trouble conditions are reported either by the telephone user (customer report) or by the MSL-100 trouble indicating system.

In addition to diagnostic tests performed at the Meridian modular telephones, facility maintenance actions are invoked manually through the following levels on the MAP workstation:

- line test position (LTP)
- line test position manual (LTPMAN)
- line test position line test access (LTPLTA)

Periodic maintenance actions are invoked on Meridian modular telephones through the automatic line test (ALT) level of the MAP workstation. For more information concerning online maintenance, refer to the *Lines Maintenance Guide*, 297-1001-594, and the *Commands Reference Manual*, 297-1001-822.

For a detailed diagnostic program description, refer to the *Digital Line Module (DLM) Reference Manual*, 555-4001-101. For recommended trouble locating routines, refer to Procedures 10-5 through 10-7.

Procedure 10-5

Data communication failure trouble locating procedure

- 1 If voice communication is normal but data communication fails, run the MCA self test. (Refer to Procedure 10-4.)
- 2 Check for DC output voltage at the power supply/converter connector pins or replace the power supply/converter plug-in transformer.
- 3 Attempt to make a data call from the terminal keyboard. (Refer to Chapter 8, "NT keyboard dialing".)

Response:

If the data call is not successful, proceed with Step 4.

- 4 Contact service personnel to replace the MCA circuit board.
- 5 Reconnect the MCA power supply/converter.
- 6 Make a new attempt to start a data call.

Response:

If trouble persists, continue with the enhanced digital port card failure procedure.

- 7 You have completed this procedure.

Procedure 10-6

Enhanced digital port card failure trouble locating procedure

- 1 Check the MAP workstation for displayed error code.

- 2 Replace faulty components.
- 3 Try to establish a call.
Response:
If the call attempt is unsuccessful, go to Procedure 10-1.
- 4 You have completed this procedure.

Procedure 10-7**Telephone (voice or dialing) failure trouble locating procedure**

- 1 Check the line cord and handset cord to determine if all TELADAPT connectors are firmly in place, and resecure if loose.
- 2 Lift the handset, listen for dial tone, and dial a directory number.
Response:
If unsuccessful, proceed with Step 3.
- 3 Wiggle the line cord, handset cord, or both while listening for sounds from the handset. If crackling or ticking sounds occur, replace the cord.
- 4 Try to establish a call.
Response:
If unsuccessful, proceed with Step 5.
- 5 Replace the Meridian modular telephone.
- 6 Try to establish a call.
Response:
If unsuccessful, proceed with Step 7.
- 7 Perform Procedure 10-1. If the test fails, try another port with the same phone.
- 8 Try to establish a call.
Response:
If unsuccessful, proceed with Step 9.
- 9 Check the wiring between the enhanced digital port card (EDPC), distribution panel, and telephone for breaks or loose connections. If necessary, rerun wiring.
- 10 Operate the Meridian modular telephone.
- 11 You have completed this procedure.

Automatic set relocation

Automatic set relocation (ASR) allows a telephone user to move integrated voice data (IVD) telephone sets from one location to another without the intervention of a service person. The ASR process involves two steps.

The first step is called the ASR Out process. This step requires the user to enter some special codes and unplug the telephone set. Entering these codes causes the switch to perform the equivalent of a CKLN SERVORD command on the set. All directory numbers and features associated with the set are transferred from the old line equipment number (LEN) to a virtual (temporary) LEN. All directory numbers and features are deleted from the old LEN and the old LEN state is set to hardware assigned, software unassigned (HASU).

The second step of the process, ASR In, requires the user to plug the set into any LEN in the HASU state that supports an IVD set. The user goes off-hook or presses the Primary Directory Number (PDN) key and dials the special ASR In code. This causes the switch to perform the equivalent of a CKLN SERVORD command on the set again. All directory numbers and features associated with the set are transferred from the virtual LEN to its new location.

This feature provides three advantages over the previous system. First, it avoids the loss of telephone service due to telephone service being in one location and the set in another location. Second, it reduces the workload of the service person. And finally, the SERVORD command CKLN provides the person the ability to complete the ASR In process.

Before invoking the ASR process, the following tasks must be accomplished to allow the ASR to function.

- Feature translator ASRI and ASRO must be added to tables IBNXLA and XLANAME.
- To use authorization codes, the codes must first be defined in tables AUTHCODE and AUTHPART.
- Table DNROUTE must be datafilled to accommodate up to 160 specific ASR DNs that may be added to the table.
- To enable a user to relocate a telephone set back into the system, the system must create a temporary datafill allowing the user to receive dial tone and dial the ASR In code. To accomplish this, the system must have a directory number to use, as well as having a customer group set aside for ASR In use, as follows:

- One DN must be set aside for ASR In use only. One DN must be set aside for each set that is to be relocated at the same time as other sets are being relocated. Up to 1023 DNs can be relocated at the same time. Therefore, up to 1023 DNs must be set aside for ASR use.
- A special customer group must be identified for ASR In use only. This customer group is entered in the system like any other customer group. However, this special ASR customer group must also be identified by the table OFCVAR for the entry ASR_CUSTGRP. If a customer group is not identified for ASR_CUSTGRP, then no sets can perform the ASR In or ASR Out process.

Note: It is recommended that this customer group be established such that the user can only dial the ASR In code. If the user is allowed to perform normal telephone functions with the temporary datafill, there is no incentive for the user to perform the ASR In process. If every user who performs the ASR Out process decides not to bring their set back into service by performing the ASR In process, the maximum number of sets allowed in the ASR Out state would be reached very quickly.

- The customer group identified in ASR_CUSTGRP is used for the temporary datafilled in table KSETLINE along with a SUBDRP of 0 and an NCOS of 0.
- The ASR feature is assigned on a customer group basis. Each customer group allowed to perform ASR must have an entry in table CUSTHEAD identifying the ASR feature translator.

For a relocation to be successful, the new location must be equipped and datafilled with the appropriate card type (NT8X47BA) in table LNINV.

ASR process

To perform the ASR Out process, follow the steps in Procedure 10-8. To perform the ASR In process, follow the steps in Procedure 10-9. If the user forgets the personal identification code in Procedure 10-8 Step 5, a service person can use the QUERY command ASRSHOW, based on the PDN of the set, to find the identification number dialed by the user.

If an error is made during the code collection, the user can press the asterisk (*) key to restart. However, if treatment has been given, pressing the asterisk will not allow the user to re-enter the digits for that step. The user must hang up and try the ASR process again.

Displays associated with IVD sets are not used for any ASR processing instructions.

Neither the ASR Out or the ASR In process is available during an image. If the user attempts to perform the ASR process, treatment is given.

If a user performs the ASR Out process and afterwards realizes that it was a mistake, only the user can return the LEN to service. The user must access table ASRTABLE and delete the entry corresponding to the personal identification code entered by the user. Next, the user must access the LTP level of the MAP station and busy the user's line before returning it to service.

Procedure 10-8
ASR Out process

- 1 Place the set off-hook with the PDN.

Response:

Dial tone occurs.

- 2 Dial ASR out code (datafilled in table IBNXLA).

Note: Attempting to dial the ASR Out code on a secondary DN of the set causes treatment to be given.

Response:

Special dial tone occurs.

- 3 Dial the required ASR authorization code.

Response:

Special dial tone is given for successful authorization. Dial tone is given for the first invalid code. Treatment is given for the second invalid authorization code.

- 4 Dial the required personal authorization code.

Response:

Special dial tone is given for successful authorization. Dial tone is given for the first invalid code. Treatment is given for the second invalid authorization code.

- 5 Dial the six-digit ID code.

Note: Remember this number. It is used again in Procedure 10-9.

Response:

Dial tone is given for the duplicate ID code. Confirmation tone is given for successful authorization and the system disconnects the call. The LEN associated with the set and LEN of the associated data device are taken out of service by setting the line states to INB. The set's datafill is moved from the old LEN to a virtual LEN.

- 6 Unplug the telephone set.

- 7 Take the set to its new location.

Procedure 10-9
ASR In process

- 1 Plug the set into any **properly** equipped jack.

**WARNING****Telephone set damage**

If the set is plugged into a wrong jack, several things could happen. If the jack belongs to a non-IVD line card, and an IVD set is plugged into this jack, damage to the digital set or line card, or both, can result. If the jack does belong to an IVD line card and the line is already datafilled, the user may receive no dial tone if the jack is out of service, or may receive normal dial tone if the jack is in service. Only plug the set into an IVD line card (NT8X47BA).

Response:

System recognizes the set and datafills the new LEN with temporary datafill.

- 2 Wait 30 seconds before proceeding to Step 3.
- 3 Lift handset of the telephone set.

Response:

Stuttered dial tone occurs.

Note: If no dial tone is received, release the call and try again. If no dial tone occurs again, contact the system administrator.

- 4 Dial ASR in code (datafilled in table IBNXLA).

Response:

Special dial tone occurs.

- 5 Dial the six-digit code specified in Procedure 10-8, Step 5.

Response:

Confirmation is given for successful code. Dial tone is given for first invalid code and treatment is given for the second invalid personal ID code.

- 6 Wait one minute before attempting to use the telephone set of the corresponding data device.

Response:

System moves the datafill for the telephone from the virtual LEN to the new LEN.

ASR audit

If a user performs the ASR Out process and takes the telephone set to an empty LEN and plugs the set in, the ASR process creates the temporary datafill. If the user does not perform the ASR In process, the temporary datafill is deleted by an ASR audit, which is run once a day. This audit searches table IVDINV for ASR-created entries. When it finds one, it deletes the directory number and line information from the corresponding entry in table KSETLINE and then removes the ASR entry in table IVDINV.

To allow flexibility in executing this audit each day, office parameter ASR_AUDIT_Time in table OFCVAR is provided. It is recommended that this audit be executed during non-peak hours. It is also recommended that the ASR audit not be executed during the time of the CC REX or XPM REX tests. These tests can affect the audit. The default time for the audit is 1:00 a.m.

Service orders

Service orders are used for adding, changing, or deleting features. Service orders go through the table editor to fill the customer tables as if entries were made directly into the tables.

To open a service order, log on to the MAP workstation and access the SERVORD (service order) system. For an explanation of general SERVORD commands, refer to the *Service Order Reference Manual*.

Available line class codes

Line class codes distinguish Meridian modular telephones, the Meridian communication adapter (MCA) from other types of service. The following line class codes can be assigned:

- M2006—for M2006 modular sets
- M2008—for M2008 and M2008HF modular sets
- M2016S—for M2016S modular sets
- M2216—for M2216 modular sets
- M2216A—for M2216-1 modular sets (manufacture discontinued)
- M2216B—for M2216-2 modular sets (manufacture discontinued)
- M2616—for M2616 modular sets
- M2616CT—for M2616CT modular sets
- MCA—for a data unit class (classdu) type added for Meridian modular telephones (M2006, M2008, M2016S, M2216, M2216A, and B, M2616, and M2616CT)
- M3901—for M3901 digital sets
- M3902—for M3902 digital sets
- M3903—for M3903 digital sets
- M3904—for M3904 digital sets
- M3905—for M3905 digital sets
- Key-based Expansion Module (KBA)—for digital sets

- Display-based Expansion Module (DBA)—for digital sets
- Analog Terminal Adapter (ATA)—for modular and digital sets

Available ring types

The following ring types are available to the system:

- FH—fast high
- FL—fast low
- SH—slow high
- SL—slow low

Service order commands

This chapter provides service order data for the following tasks specific to Meridian modular telephones:

- adding a Meridian modular telephone set
- establishing a directory number hunt group
- establishing a multiline hunt group
- adding a member to a hunt group
- adding the handsfree feature to an M2008HF telephone set
- adding the Trunk Member Display (TRKDISP) feature
- removing a feature from a telephone set
- adding Call Forward Busy (CFB) with the Control field of “K” to a M2616 set

Adding a Meridian modular telephone set

The service order command to add a Meridian modular telephone integrated voice and data (IVD) set option is ADO. The following service order commands provide an example of the service order command (NEW) to add an IVD station.

Table 11-1
Example service order commands to add an IVD station

Prompt	Response
> SO:	SERVORD
—continued—	

Table 11-1
Example service order commands to add an IVD station (continued)

Prompt	Response
>	NEW
SONUMBER: NOW 85 04 19 PM	
>	(press RETURN)
DN:	
>	7221000
LCC:	
>	M2216A
RINGTYPE:	
>	FH
GROUP:	
>	GROUP1
SUBGRP:	
>	4
NCOS:	
>	10
SNPA:	
>	613
KEY:	
>	1
RINGING:	
>	Y
LEN:	
>	2 0 0 0
OPTKEY:	
>	1
OPTION:	
>	M0022
M0022_COUNT:	
—continued—	

Table 11-1
Example service order commands to add an IVD station (continued)

Prompt	Response
>	2
OPTKEY:	
>	\$
—end—	

Establishing a directory number hunt group

The following service order commands provide an example of establishing a directory number hunt (DNH) group.

Table 11-2
Example service order commands for establishing a DNH group (continued)

Prompt	Response
>	SERVORD
SO:	
>	EST
SONUMBER: NOW 85 04 19 PM	
>	(press RETURN)
GROUPTYPE:	
>	DNH
PILOT_DN:	
>	7221001
LCC:	
>	M2616
RINGTYPE:	
>	FL
GROUP:	
>	GROUP1
SUBGRP:	
—continued—	

Table 11-2
Example service order commands for establishing a DNH group (continued)

Prompt	Response
>	0
NCOS:	
>	0
SNPA:	
>	613
KEY:	
>	1
RINGING:	
>	Y
PILOT_LEN	
>	2 0 0 3
DN_LEN:	
>	7224000
LEN:	
>	2 0 0 4
KEY:	
>	1
LINE_CLASS:	
>	M2008
RINGTYPE:	
>	SH
ON_LEN:	
>	\$
OPTION:	
>	\$
—continued—	

Table 11-2
Example service order commands for establishing a DNH group (continued)

Prompt	Response
GROUPSIZE: >	10
	—end—

Establishing a multiline hunt group

The following service order commands provide an example of establishing a multiline hunt (MLH) group.

Table 11-3
Example service order commands for establishing a multiline hunt group

Prompt	Response
>	SERVORD
SO:	
>	EST
SONUMBER: NOW 85 04 19 PM	
>	(press RETURN)
GROUPTYPE:	
>	MLH
PILOT_DN:	
>	7221002
LCC:	
>	M2216B
RINGTYPE:	
>	SH
GROUP:	
>	GROUP1
	—end—

Table 11-3
Example service order commands for establishing a multiline hunt group
 (continued)

Prompt	Response
SUBGRP :	
>	0
NCOS :	
>	0
SNPA :	
>	613
KEY :	
>	1
RINGING :	
>	N
PILOT_LEN :	
>	2 0 0 6
MEM_LEN :	
>	7224000
KEY :	
>	1
LINE_CLASS :	
>	M2008
RINGTYPE :	
>	SH
MEM_LEN :	
>	\$
OPTION :	
>	\$
GROUPSIZE :	
>	10
—end—	

Adding a member to a hunt group

The following service order commands provide an example of adding an M2616 member to a hunt group.

Table 11-4
Adding a member to a hunt group

Prompt	Response
>	SERVORD
SO:	
>	ADD
SONUMBER: NOW 85 04 19 PM	
>	(press RETURN)
GROUPTYPE:	
>	MLH
LINK_LEN:	
>	2 0 0 6
KEY:	
>	1
LINE_CLASS:	
>	M2616
RINGTYPE:	
>	SL
HANDS_FREE:	
>	Y
MEM_LEN:	
>	\$
OPTION:	
>	\$
GROUPSIZE:	
>	10

Assigning the Multiple Station Message Waiting Indication feature to an existing set

The Multiple Station Message Waiting Indication (MSMWI) feature can be assigned to a set through the use of the ADO command. The following table represents an instance of the MSMWI feature on an existing set.

Table 11-5
Assigning MSMWI to an existing set

Prompt	Response
CI:	
>	servord
SO:	
>	ado
SONUMBER: NOW 96 2 13 PM	
>	(press RETURN)
DN_OR_LEN:	
>	9975098
OPTKEY:	
>	5
OPTION:	
>	msmwi
PRIMARY_LEN:	
>	ipe1 01 0 08 14
PRIMARY_KEY:	
>	4
OPTKEY:	
>	\$
COMMAND AS ENTERED:	
ADO NOW 96 2 13 PM 9975098 (5 MSMWI IPE1 01 0 08 14 4) \$	
ENTER Y TO CONFIRM,N TO REJECT OR E TO EDIT	
>Y	
>	

Adding the Handsfree feature to an M2008HF telephone set

The following service order commands provide an example of what the prompting will look like for the activation of handsfree on a M2008. The handsfree prompt is not new, but is now valid for M2008HF set types. The OPTKEY 1 in the following table indicates that a feature is being added to the DN, not that key 1 will be assigned the handsfree feature. The assignment of the key is automatically handled by the software.

Table 11-6
Adding the handsfree feature to an M2008HF set

Prompt	Response
SO:	
	CHF
SONUMBER: NOW 95 12 21 AM	
>	(press RETURN)
DN_OR_LEN:	
>	d1m0 0 0 30 0
OPTKEY:	
>	1
OPTION:	
>	hndsfree
HANDS_FREE:	
>	Y
OPTKEY:	
>	\$
HANDS_FREE:	
>	Y
COMMAND AS ENTERED:	
>CHF NOW 95 12 21 AM DLM0 00 0 00 30 (1 HNSDFREE Y) \$	

Adding the Trunk Member Display (TRKDISP) feature

Table 11-7 shows an example of adding the TRKDISP feature.

Table 11-7
Adding the Trunk Member Display feature

Prompt	Response
SO:	
	ado
SONUMBER: NOW 97 3 11 AM	
>	(press RETURN)
DN_OR_LEN:	
>	9975120
OPTKEY:	
>	5
OPTION:	
>	trkdisp
OPTKEY:	
>	\$
COMMAND AS ENTERED:	
ADO NOW 97 3 11 AM 9975003 (CFIND ANNC ANBLPR) \$	
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT	
>y	
MACHINES ARE OUT OF SYNC, SERVICE ORDERS NOT ALLOWED	
JOURNAL FILE IS INACTIVE, SERVICE ORDERS NOT ALLOWED	
SHOULD ORDER BE DONE ANYWAY? (Y OR N)	
>y	

Adding the NAME option for Name Display Character Extension

For Name Display Character Extension, both the existing 15 character name feature and the 24 character name feature is compatible. The user can have 24 characters displayed internally and still have 15 characters displayed externally. This is accomplished by first adding the NAME option in SERVORD, and datafilling the NETNAME field to PUBLIC. Then the DISPLAYNAME field is datafilled with up to 15 characters, allowing for 15 characters to be displayed over the network as shown in Table 11-8.

Table 11-8
Adding the NAME option allowing 15 characters

Prompt	Response
SO:	
	ado
SONUMBER: NOW 98 6 23 AM	
>	(press RETURN)
DN_OR_LEN:	
>	9975111
OPTKEY:	
>	1
OPTION:	
>	NAME
NETNAME:	
>	PUBLIC
DISPLAYNAME:	
>	K_SCHEUERMANN
COMMAND AS ENTERED:	
ADO NOW 98 6 23 AM 9975111 (NAME (PUBLIC K_SCHEUERMANN)\$)	
\$	
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT	
>y	

The 24 character name is displayed internally only. This is accomplished by adding the NAME24 option in SERVORD and datafilling the DISPLAYNAME field with up to 24 characters as shown in Table 11-9.

Table 11-9
Adding the NAME24 option allowing 24 characters

Prompt	Response
SO:	
	ado
SONUMBER: NOW 98 6 23 AM	
>	(press RETURN)
DN_OR_LEN:	
>	9975111
OPTKEY:	
>	1
OPTION:	
>	NAME24
DISPLAYNAME:	
>	KATHLEEN_SCHEUERMANN
COMMAND AS ENTERED:	
ADO NOW 98 6 23 AM 9975111 (NAME24(KATHLEEN_SCHEUERMANN)\$)	
\$	
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT	
>y	

Removing a feature from a telephone set

The following service order commands provide an example of removing a feature from a Meridian modular telephone set.

Table 11-10
Sample service order commands for removing a feature

Prompt	Response
SO:	
>	DEO
SONUMBER: NOW 85 04 19 PM	
>	(press RETURN)
DN_OR_LEN:	
>	2 0 0 6
OPTKEY:	
>	1
OPTION:	
>	M0022
M0022_COUNT:	
>	2
OPTKEY:	
>	1
OPTION:	
>	HNSDFREE
HANDS_FREE:	
>	N
OPTKEY:	
>	\$

Adding CFB with Control field of "K" to a M2616 set

When selecting the CFB/Call Forward Don't Answer (CFD) feature through SERVORD, the user enters a "K" in the Control field for Per Key. The CFB/CFD feature has four different control types: Normal, Fixed, Programmable, and Per Key. The first three control types only allow one forwarding DN to be assigned to the DN keys entered in the KEYLIST for CFB and/or CFD. The CFB/CFD Per Key Destination option allows the

user to assign different forwarding DN's to the keys specified in the KEYLIST of the CFB/CFD feature. This was done with the creation of the control type of "K" for Per Key.

To implement the CFB/CFD Per Key feature, the user selects "K" for the CFB/CFD Per Key control field and specifies the desired DN keys on which the feature is allowed in the KEYLIST. Once this is done, the user programs the forwarding DN.

Note: This feature is supported on Meridian business sets (MBS), IVD, and Integrated Services Digital Network (ISDN) sets.

Table 11-11 gives an example of CFB with the control field of "K" being added to a M2616 telephone set.

Table 11-11
Sample service order commands for CFB with the control field of "K"
being added to a M2616 set

Prompt	Response
>	SERVORD
SO:	
>	ado
SONUMBER: NOW 97 2 26 AM	
>	(press RETURN)
DN_OR_LEN:	
>	86640351
OPTKEY:	
>	1 cfb
CFBCNTL:	
>	k
KEYLIST:	
>	\$
OPTKEY:	
>	\$
COMMAND AS ENTERED:	
—continued—	

Table 11-11
Sample service order commands for CFB with the control field of "K"
being added to a M2616 set (continued)

Prompt	Response
	<pre>ADO NOW 97 2 26 AM 8664035 (1 CFB K \$) \$ ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT >y MACHINES ARE OUT OF SYNC, SERVICE ORDERS NOT ALLOWED JOURNAL FILE IS INACTIVE, SERVICE ORDERS NOT ALLOWED SHOULD ORDER BE DONE ANYWAY? (Y OR N) >y</pre>
	<p style="text-align: center;">—end—</p>

Ordering information

The Meridian modular telephones can be ordered through your distributor. Table 12-1 lists the available Meridian modular telephones.

Table 12-1
Meridian modular telephones

Meridian modular telephones
M2006 Single Line set
M2008 Multiline Business set
M2008 Multiline Business set with Display
M2008HF Multiline Business set with Handsfree
M2008HF Multiline Business set with Display and Handsfree
M2616 Multiline Business set with Handsfree
M2616 Multiline Business set with Display and Handsfree
M2616CT Multiline Cordless Business set with Display and Handsfree
M2216 Multiline ACD Business set
Meridian Modular Telephone User Guide
Meridian Telephone Quick Reference Guide
M2216 MSL-100 User Guide

Table 12-2 lists the accessories for the Meridian modular telephones.

Table 12-2
Meridian modular telephone accessories

Accessories
Communicator PC interface card
Meridian External Alerter Interface
Meridian Communications Adapter (MCA)
Analog Terminal Adapter (ATA)
MCA/ATA Wall Transformer
MCA/ATA Footstand
MCA/ATA Jumper/relay kit
MCA User Guide
ATA User Guide

Table lists the accessories for the M2616CT.

Table 12-3
M2616CT accessories

Accessories
M2616CT 700mAh Battery Pack
M2616CT 700mAh Vibrate Alert Battery Pack
M2616CT 1000mAh Vibrate Alert Battery Pack
M2616CT Wall Transformer
M2616CT Belt Clip
M2616CT Leather Pouch
M2616CT User Guide
M2616CT Handset Labels
Single-key module footstand
Double-key module footstand
Wall Mount Clip
—continued—

Table 12-3
M2616CT accessories

Accessories
Blank Brandline insert Corded Legacy Handset 7, 14, or 25 foot 6 conductor line cord
—end—

Table 12-4 lists the supported accessories for manufacture discontinued products.

Table 12-4
Supported accessories for manufacture discontinued products

Accessories	Order code
48V power supply board and interconnect cable	NT2K10WD
110V wall transformer	A0367335
220V wall transformer	A0367314

The Meridian modular telephones can be ordered alone or with the Meridian communication adapter (MCA), display module (where available), and power supply board factory-installed. Any factory-installed hardware option that requires additional power automatically comes with the power supply board.

Table 12-5 lists the ordering codes for the Meridian modular telephones alone and with hardware options installed.

Table 12-5
Meridian modular telephone stocklist (continued)

Description	Ordering code
M2006 modular telephone (basic):	
Black	NT2K05GD-03
Chameleon Ash	NT2K05GD-35
Dolphin Grey	NT2K05GD-93
M2006 modular telephone (with MCA):	
Black	NT2K05GV-03 (with power board)
Chameleon Ash	NT2K05GV-35 (with power board)
Dolphin Grey	NT2K05GV-93 (with power board)
M2008 modular telephone (basic)	
Black	NT2K08GD-03
Chameleon Ash	NT2K08GD-35
Dolphin Grey	NT2K08GD-93
M2008 modular telephone (with MCA)	
Black	NT2K08GV-03 (with power board)
Chameleon Ash	NT2K08GV-35 (with power board)
Dolphin Grey	NT2K08GV-93 (with power board)
M2008 modular telephone (with display)	
Black	NT2K08XF-03
—continued—	

Table 12-5
Meridian modular telephone stocklist (continued)

Description	Ordering code
Chameleon Ash	NT2K08XF-35
Dolphin Grey	NT2K08XF-93
M2008 modular telephone (with MCA and display)	
Black	NT2K08GG-03 (with power board)
Chameleon Ash	NT2K08GG-35 (with power board)
Dolphin Grey	NT2K08GG-93 (with power board)
M2008 HF (basic)	
Black	NT2K08ZC-03
Chameleon Ash	NT2K08ZC-35
Dolphin Gray	NT2K08ZC-93
M2008HF (with display)	
Black	NT2K08ZL-03
Chameleon Ash	NT2K08ZL-35
Dolphin Gray	NT2K08ZL-93
M2008HF (with MCA and display)	
Black	NT2K08ZS-03
Chameleon Ash	NT2K08ZS-35
Dolphin Gray	NT2K08ZS-93
M2008 HF (with data)	
Black	NT2K08GX-03
Chameleon Ash	NT2K08GX-35
Dolphin Gray	NT2K08GX-93
M2016-S modular telephone	
Chameleon Ash	NTZK20AA-35
M2216 (basic)	
Black	NT2K18XF-03
Chameleon Ash	NT2K18XF-35
—continued—	

Table 12-5
Meridian modular telephone stocklist (continued)

Description	Ordering code
Dolphin Grey	NT2K18XF-93
M2216 (with MCA)	
Black	NT2K18GG-03 (with power board)
Chameleon Ash	NT2K18GG-35 (with power board)
Dolphin Grey	NT2K18GG-93 (with power board)
M2616 modular telephone (basic)	
Black	NT2K16GD-03
Chameleon Ash	NT2K16GD-35
Dolphin Grey	NT2K16GD-93
M2616 modular telephone (with MCA)	
Black	NT2K16GV-03 (with power board)
Chameleon Ash	NT2K16GV-35 (with power board)
Dolphin Grey	NT2K16GV-93 (with power board)
M2616 modular telephone (with display)	
Black	NT2K16XF-03 (with power board)
Chameleon Ash	NT2K16XF-35 (with power board)
Dolphin Grey	NT2K16XF-93 (with power board)
M2616 modular telephone (with MCA and display)	
Black	NT2K16GG-03 (with power board)
Chameleon Ash	NT2K16GG-35 (with power board)
Dolphin Grey	NT2K16GG-93 (with power board)
—end—	

Table 12-6 lists the hardware options that can be purchased separately.

Table 12-6
Meridian modular telephone accessories and miscellaneous optional hardware stocklist

Description	Ordering Code	Additional requirements
Meridian communications adapter	NT2K65XR	Power supply board
3 language display option		Power supply board with Aries I NTZK telephone sets
Black	NT2K28AD-03	
Chameleon Ash	NT2K28AD-35	
Dolphin Grey	NT2K28AD-93	
22-key expansion module		Power supply board with Aries I NTZK telephone sets
Black	NT2K22VH-03	
Chameleon Ash	NT2K22VH-35	
Dolphin Grey	NT2K22VH-93	
Single-key module footstand		
Black	PO780103-03	
Chameleon Ash	PO780135-35	
Dolphin Grey	PO780193-93	
Double-key module footstand		
Black	PO780203-03	
Chameleon Ash	PO780235-35	
Dolphin Grey	PO780293-93	
External alerter interface	NT2K40WA	Power supply board
MCA +5V power kit	NT2K14AA	
Transformer +5V	A0655850	
Jumper/relay kit	NT2K15AA	
—continued—		

Table 12-6
Meridian modular telephone accessories and miscellaneous optional hardware stocklist (continued)

Description	Ordering Code	Additional requirements
48V power supply board and interconnect cable	NT2K10WD	Transformer or closet power
110V transformer	AO367335	Power supply board
220V transformer	AO367314	Power supply board
Cable, power supply board (individual cables as ordered separately)	P0723443	
Cable, display (for original displays requiring a daughter board)	P0738600	
Cable, power board (to transfer older NTZK power board into newer NT2K M2008 or M2006 telephone)	P0723443	
Handset, Legacy (global)		
Black	NT0C9EK-03	
Chameleon Ash	NT0C9EK-35	
Dolphin Grey	NT0C9EK-93	
Six conductor line cord-silver satin, 7 ft. (2m10)	A0346862	
Six conductor line cord-silver satin, 14 ft. (4m20)	A0346863	
Six conductor line cord-silver satin 25 ft. (7m60)	A0346864	
Jumper	A0292488	
Blank brandline insert		
Black	P07844-03	
Chameleon Ash	P07844-35	
Dolphin Grey	P07844-93	
Filler plate		
—continued—		

Table 12-6
Meridian modular telephone accessories and miscellaneous optional hardware stocklist (continued)

Description	Ordering Code	Additional requirements
Black	P07845-03	
Chameleon Ash	P07845-35	
Dolphin Grey	P07845-93	
M2006/M2008 key cap package	NT2K81AB	
Wall mount clip	P0670793	
Lens directory identification	P0652720	
Meridian Telephone Quick Reference Guide	NT5F53AB	
Meridian Modular Telephone User Guide	NT5F5DAB	
M2216 MSL-100 User Guide	NT5F55BA	
MCA User Guide	NT5F54AB	
—end—		

Appendix A

Hayes standard AT commands

Table 13-1 describes the standard Hayes AT commands. Each command must be preceded by AT or at when entered on a separate line. If the AT command is concatenated, then the AT is only used at the beginning of the command with a maximum of 40 characters.

Note: An asterisk (*) indicates default settings.

Table 13-1
Standard Hayes keyboard dialing commands

Command	Description
A/	Re-execute previous command line; not preceded with the letters AT nor followed by a carriage return.
A	Go into answer mode and attempt to go into the on-line state.
AT (CR)	Command line syntax
D	Go into originate mode; dial number that follows; and attempt to go into the on-line state.
E0	Disable character echo in the command state.
E1*	Enable character echo in the command state.
H0	Go on-hook.
I0	Request product identification code and output contents of S registers S39–S41: Values are: 960 (Smartmodem V-series 9600) 124 (Smartmodem 1200) 240 (Smartmodem 2400 or Smartmodem V-series 2400)
—continued—	

Table 13-1
Standard Hayes keyboard dialing commands (continued)

Command	Description
I1	Returns a 2s compliment checksum of MCA read-only memory (ROM)
I4	Displays a037800c004420 b100000000 (same value as Smartmodem V-series 9600 returns)
O	Go into the on-line state.
O1	Go into the on-line state.
Q0*	MCA returns result codes.
Q1	MCA does not return result codes.
Sr	Set point to register r.
Sr=n	Set Register r to value n.
Sr?	Display value stored in register r.
V0	Display result codes in numeric form.
V1*	Display result codes in verbose form (as words).
X0	Enable result codes 0–4.
X1	Enable result codes 0–5, 10–12, and 14.
X2	Enable result codes 0–5, 10–12, and 14.
X3*	Enable result codes 0–5, 7, 10–12, and 14.
X4*	Enable result codes 0–5, 7, 10–12, and 14.
&C0	Assume data carrier always present. This command asserts the control lead CD. This command is the default if ASERTCD DPOPT is datafilled for the MCA.
&C1	CD tracks far-end RTS. This command is the default if ASERTCD DPOPT is not datafilled for the MCA.
&D0	Ignore DTR. This command is the default if ASERTDTR DPOPT is datafilled for the MCA.
&D1	Assume command state when on-to-off transition of DTR occurs.
&D2	Hang up when on-to-off transition of DTR occurs. This command is the default if ASERTDTR DPOPT is not datafilled for the MCA.
—continued—	

Table 13-1
Standard Hayes keyboard dialing commands (continued)

Command	Description
&D3	Hang up and reset to default settings (for example, MCA profile configuration).
&Q0*	Disable baud rate ADAPTING. MCA attempts to connect at the speed of last autobaud command. This command is the default if ADAPTING is disabled in the MCA profile. This command is displayed by SMARTCOM III if the V-SERIES ERROR CONTROL option is set to N. Note: The V-SERIES ERROR CONTROL option can be reached using the CONNECT SETTINGS menu of SMARTCOM III.
&Q5	Enable baud rate ADAPTING. MCA attempts connection at baud rate of far end. This command is the default if ADAPTING is disabled in the MCA profile. This command is displayed by SMARTCOM III if the V-SERIES ERROR CONTROL option is set to Y or H. Note: The V-SERIES ERROR CONTROL option can be reached through the CONNECT SETTINGS menu of SMARTCOM III.
&R0	CTS and DSR tracks far-end DTR or CD. (Near-end RTS maps to far-end CD, which maps back to near-end CTS.) This command is the default if ASERTCD DPOPT is not datafilled for the MCA.
&R1	Assume CTS and DSR always present. This command asserts the EIA control leads CTS and DSR. This command is the default if ASERTRTS DPOPT is datafilled for the MCA.
&S0	Assume CTS and DSR always present. This command asserts the EIA control leads CTS and DSR. This command is the default if ASERTRTS DPOPT is datafilled for the MCA.
&S1	CTS and DSR tracks far-end DTR or CD. (Near-end RTS maps to far-end CD, which maps back to near-end CTS.) This command is the default if ASERTCD DPOPT is not datafilled for the MCA.
Z0	Reset MCA to default settings.
Z1	Reset MCA to default settings.
—continued—	

Table 13-1
Standard Hayes keyboard dialing commands (continued)

Command	Description
&F	Reset MCA to default settings.
&Y0	Reset MCA to default settings.
&Y1	Reset MCA to default settings.
—end—	

The following is a list of other commands that are supported. These commands are not executed, and no error messages are returned.

- B0
- B1
- C0
- C1
- F0
- F1
- H1
- I2
- L0
- L1
- L2
- L3
- M0
- M1
- M2
- M3
- N0
- N1
- W0
- W1
- Y0
- Y1

- &G0
- &G1
- &G2
- &J0
- &J1
- &K0
- &K1
- &K2
- &K3
- &K4
- &K5
- &L0
- &L1
- &M0
- &P0
- &P1
- &T0
- &W0
- &W1

Appendix B

AT dialing parameter registers

The software reset command Z may be used to reset all the registers to their default values. Table 14-1 describes the Hayes keyboard dialing parameter registers.

Note 1: All values are in decimal form.

Note 2: The firmware does not perform a range check on the value assigned to an S register. The range in Table 14-1 only indicates those values that give the expected results. Any other values may or may not function as desired and are not flagged as an error when the command is processed. Valid ASCII codes range from 0 to 127. Values larger than 127 may disable the function associated with that S register. Values larger than 255 are accepted without an error, but are stored in module 256.

Table 14-1
Hayes keyboard dialing parameter registers

Register	Range	Default	Description
S0	0–255 rings	0	number of rings before answer
S1	0–255 rings	0	counts number of rings
S2	Any valid ASCII code	43	escape code character
S3	Any valid character used for carriage	13	ASCII code return
S4	Any valid ASCII code	0	character used for line feed
S5	0–32, 127 ASCII codes	8	character used for Backspace
S7			wait time for carrier
S8	0–255 sec	2	pause time for comma (,) (not supported)
S10	1–255 x (0.1) sec	7	loss of carrier timeout (not used)
—continued—			

Table 14-1
Hayes keyboard dialing parameter registers (continued)

Register	Range	Default	Description
S12	20–255 x (0.02) sec	50	escape sequence guard time
S21			RESERVED
S22			RESERVED
S36	0, 1	0	0 = no adapting 1 = adapting
S37–S50	0–255	0	NOT USED
S51	0–255 x (0.25) sec	16	delay until modem pool activation
S52	Any valid ASCII code	39	most significant product code character
S53	Any valid ASCII code	36	middle character of product code
S54	Any valid ASCII code	30	least significant product code character
S55–S65	0–255	0	NOT USED
S66	0, 1	0	Hayes keyboard autobaud interpretation (Download value overrides the default.)
S67–S69	0–255	0	NOT USED
—end—			

Appendix C

Basic AT command sets

Basic AT command sets for data calls

Table 15-1 describes the AT command sets for data calls.

Table 15-1
AT command sets for data calls

Command	Parameter	Result
A		answer calls manually
Cn	n = 0 or 1	0 = carrier defect asserted 1 = carrier detect not asserted
Dnnnn or DTnnnn	n= 0–9	Dial the data number (nnnn).
En	n = 0 or 1	0 = Your commands are not echoed on the terminal screen. 1 = Your commands are echoed on the terminal screen.
Qn	n = 0 or 1	0 = Prompts are sent to the terminal (default). 1 = Prompts are not sent to the terminal screen.
S0=n	n = 0–99	0 = manual answer 1–99 produces auto answer (default = 1).
Vn	n = 0 or 1	0 = Number prompts are sent. 1 = Word prompts are sent (default).
Z	None	All parameters are reset to the default values.

Basic AT command sets for voice calls

Table 15-2 describes the AT command sets for voice calls.

Table 15-2
AT command sets for voice calls

Command	Parameter	Result
+++		AT attention key for switching between data or voice transmission mode to AT command mode
A		manual answer for handsfree and on-hook dialing
DPnnnn	n = 0–99	voice call origination command for dialing the data number (nnnn)
Fn	n = 0–2	0 = handsfree mute (ON/OFF toggle) 1 = voice call on hold 2 = select voice call on hold
HP		Release a voice call
TSP!		transparent mode—Using a PC with the application software for requesting keymap download, originating voice call, and disconnection
?		AT HELP command display

Appendix D

MCA digit and word code responses

Table 16-1 describes the digit and word code responses returned by the Meridian communications adapter (MCA).

Table 16-1
Digit- and word-code responses

Digit code	Word code	Meaning
0	OK	command line processed without error
1	CONNECT	data connection established
2	RING	incoming call
3	NO CARRIER	data synchronization lost or never found
4	ERROR	command line error
5	CONNECT 1200	data connection established at 1200 baud
7	BUSY	called number busy
10	CONNECT 2400	data connection established at 2400 baud
11	CONNECT 4800	data connection established at 4800 baud
12	CONNECT 9600	data connection established at 9600 baud
14	CONNECT 19200	data connection established at 19,200 baud

Appendix E

Script file menus

The following figures show access to the various script file menus:

- Figure 17-1 Main menu
- Figure 17-2 Modify menu
- Figure 17-3 Script File menu
- Figure 17-4 Learn Script menu

Procedure 17-1 shows an example procedure of how to access and learn the autodial script after moving through the menus as shown in Figure 17-1 through Figure 17-4.

Figure 17-1
Main menu

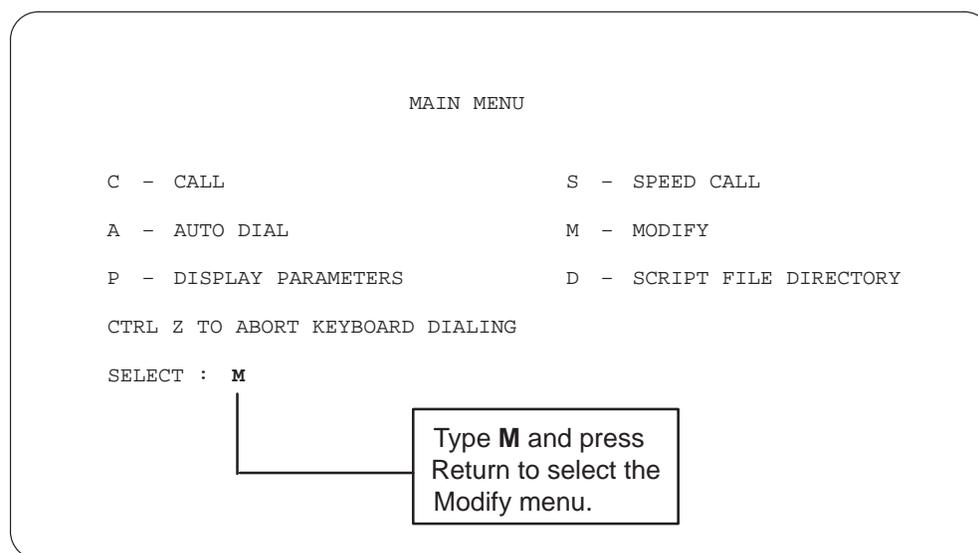


Figure 17-2
Modify menu

MODIFY MENU

A - AUTO NUMBER M - MANUAL ANSWER

S - SPEED NUMBER F - SCRIPT FILE

R - REMOTE LOOPBACK Q - QUIT MODIFY

SELECT : F (CR)

Enter F(CR) to select the Script File menu.
Enter Q(CR) to return to the previous menu.

The screenshot shows a terminal window titled 'MODIFY MENU'. It lists six options: A (AUTO NUMBER), S (SPEED NUMBER), R (REMOTE LOOPBACK), M (MANUAL ANSWER), F (SCRIPT FILE), and Q (QUIT MODIFY). The prompt 'SELECT : F (CR)' is shown, with a vertical line extending downwards from the 'F' and a horizontal line extending to the right, leading to a rectangular callout box. The callout box contains two lines of text: 'Enter F(CR) to select the Script File menu.' and 'Enter Q(CR) to return to the previous menu.'

Figure 17-3
Script file menu

SCRIPT FILE MENU

L - LEARN SCRIPT E - ESCAPE CODE

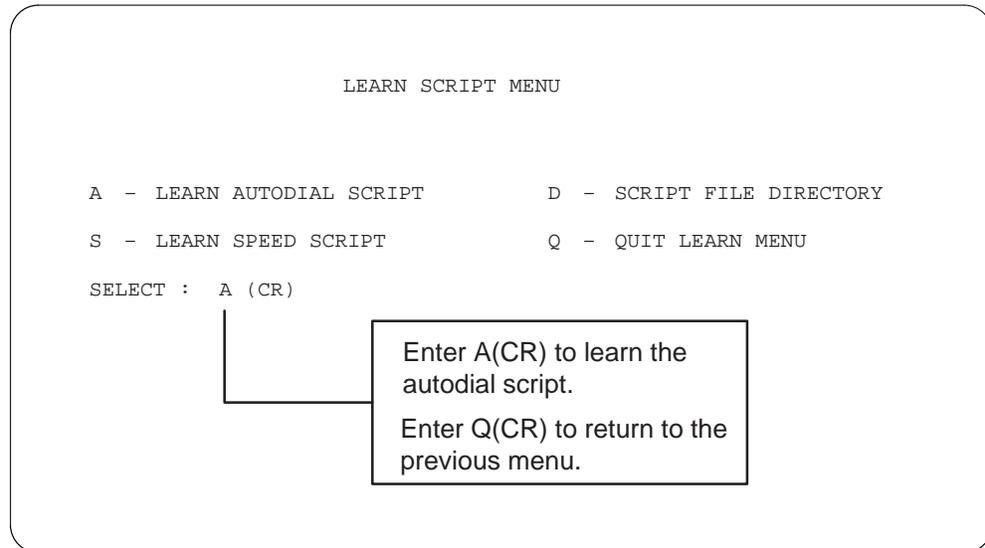
D - DELETE SCRIPT Q - QUIT SCRIPT MENU

SELECT : L (CR)

Enter L(CR) to select the Learn Script menu.
Enter Q(CR) to return to the previous menu.

The screenshot shows a terminal window titled 'SCRIPT FILE MENU'. It lists four options: L (LEARN SCRIPT), D (DELETE SCRIPT), E (ESCAPE CODE), and Q (QUIT SCRIPT MENU). The prompt 'SELECT : L (CR)' is shown, with a vertical line extending downwards from the 'L' and a horizontal line extending to the right, leading to a rectangular callout box. The callout box contains two lines of text: 'Enter L(CR) to select the Learn Script menu.' and 'Enter Q(CR) to return to the previous menu.'

Figure 17-4
Learn script menu



Procedure 17-1 shows an example procedure of how to access and learn the autodial script after moving through the menus as shown in Figure 17-1 through Figure 17-4.

Procedure 17-1
Learning the autodial script

- 1 Type A (CR).

Response:

If a script already exists, the following message is displayed:

```
DELETE EXISTING AUTODIAL SCRIPT [script name] (Y/N)?
```

- 2 Type Y (CR).

Response:

The following screen displays:

```
AUTODIAL SCRIPT [script name] DELETED
xx BYTES (xx.x%) AVAILABLE FOR A NEW SCRIPT
ACTIVATE LEARN MODE (Y/N)?
```

- 3 Type Y (CR).

Response:

The following screen displays:

```
ENTER SCRIPT NAME:  xxxx
ESCAPE CODE = xxh
MODIFY (Y/N)?
```

Note: **xxxx** represents the script name entered by the user.

- 4 Type N (CR).

Response:

The following screen displays:

```
PASSWD: XXXXXXXX m (CR)
AUTO SCRIPT
```

```
YES
```

```
NO
```

YES starts with autodial call. NO starts with access code XX speed call.

Ends with escape code sequence.

- 5 Press Ctrl X.

Response:

After entering the escape code (Ctrl X), the program exits the learn mode and returns to the Modify menu, and the MCA no longer recognizes this escape code.

- 6 You have completed this procedure.

List of terms

AAB

See Automatic Answer Back.

AAK

See answer agent key.

ac

See alternating current.

ACB

See Automatic Call Back

ACD

See automatic call distribution.

ACDNR

See automatic call distribution not ready.

ADD

See automatic digit display.

AEMK

See answer emergency key.

agent status lamp (ASL)

The agent status lamp allows the supervisor to monitor an agent's status continuously. The key also acts as an autodial key for calling and observing agents and to force agents from Not Ready to Idle.

ALC

See analog line card.

alternating current (AC)

Alternating current is an electric current that reverses its direction at regularly recurring intervals.

American National Standards Institute (ANSI)

ANSI is an organization supported by U.S. industry to establish uniformity of standards.

American Standard Code for Information Interchange (ASCII)

ASCII is a code with seven information signals plus one parity check signal, designed for interworking between computers.

American Wire Gauge (AWG)

AWG is a standard American method of classifying wire diameter.

analog line card (ALC)

The ALC is an analog line card that interfaces with the controller card. The ALC allows analog sets, such as the 500 and 2500 sets, to receive and make telephone calls. The ALC can be inserted into any line card slot in the IPE shelf. Each ALC supports a maximum of 16 analog sets and can support the MSL-100 attendant console.

analog message waiting line card (MLC)

The MLC functions the same as an ALC that supports message waiting lamp sets in addition to the 500/2500 sets. The MLC can be inserted into any line card slot in the IPE shelf. Each MLC supports a maximum of 16 analog sets with message waiting lamps and can support the MSL-100 attendant console.

analog terminal adapter (ATA)

The ATA adds an analog port to a digital terminal, and is designed to fit into the base of the M2006, M2008, M2008HF, M2216, M2616, and M2616CT, and M3902, M3903, M3904, and M3905 sets. It has the same interface and control into the MSL-100 switch as the M2006 terminal.

ANSI

See American National Standards Institute.

Answer Agent key (AAK)

The Answer Agent Key is the supervisor key that makes direct communication between the supervisor and the agent possible. The agent key corresponding to this key is the Call Supervisor (CLSUP) key.

Answer Emergency key (AEMK)

The Answer Emergency Key allows the supervisor to answer emergency calls.

ASCII

See American Standard Code for Information Interchange.

ASL

See agent status lamp.

ASR

See automatic set relocation.

ATA

See analog terminal adapter.

AT dialing

AT dialing refers to Hayes keyboard dialing, which is a method used to make data calls through the MSL-100 system by entering a command starting with the letters AT, followed by a few characters to distinguish the command, and then a carriage return.

Automatic Answer Back (AAB)

The Automatic Answer Back (AAB) feature allows any incoming call to the primary directory number (PDN) of the set (equipped with a handsfree unit with an auto answerback applique circuit) automatically answered after four seconds of ringing.

Automatic Answer Back (AAB) Enhancement

The Automatic Answer Back (AAB) Enhancement feature allows the AAB feature to work on secondary DNs and Group Intercoms (GIC).

automatic call distribution (ACD)

Automatic call distribution is a set of MSL-100 system features that assigns answering priorities to incoming calls and then queues and distributes those calls to a predetermined group of telephone sets designated as answering positions.

automatic call distribution not ready (ACDNR)

The ACDNR feature makes the agent position temporarily unavailable to receive calls. ACDNR is typically used to allow an agent to complete paperwork between ACD calls.

automatic digit display

A data option class of service used required for keyboard dialing.

automatic set relocation

A feature that allows a user to move a telephone set from one location to another without the intervention of a service person.

AWG

See American Wire Gauge.

Batch Change Supplement (BCS)

Prior to BCS36, a DMS-100 Family release.

BCS

See Batch Change Supplement.

CAG

See Call Agent key.

Call Agent key (CAG)

The Call Agent key allows the supervisor to establish direct communication with agents. This key is used in conjunction with observe agent and agent status lamp.

CFB/CFD Per Key Destination

This feature allows the user to assign different forwarding DNs to the keys specified in the KEYLIST of the CFB/CFD feature. This is done by using the control type of “K” for Per Key.

Calling Party Name Display (CPND)

This feature enables the name of the calling party to display on the called party’s phone set.

Call Pickup (CPU)

This feature allows the user to answer calls for other people in the group.

Call Processing Busy (CPB)

CPB is a state in which call processing is taking place, and the equipment involved cannot be seized for maintenance.

Call Supervisor (CLSUP)

The Call Supervisor key establishes a direct communication between the agent and the supervisor. The key acts as an autodial to the supervisor and as a terminating directory number for calls from the supervisor. The corresponding supervisor key is the Answer Agent Key (AAK).

Call Supervisor-Different (CLSUP-DIFF)

The Call Supervisor-Different key allows an agent’s calls to be directed to a specific supervisor regardless of the ACD group with which the agent is associated.

Call Supervisor-Make Set Busy (CLSUP-MSB)

This feature allows the agent to override a make set busy condition on the supervisor’s set when CLSUP is used to call the supervisor.

carriage return (CR)

same as pressing the RETURN key

carriage return (0DH)

same as pressing the RETURN key

CC

See central control.

central control (CC)

The central control comprises the data processing functions with associated data store and program store.

CIF

See Controlled Interflow key.

CLSUP

See Call Supervisor.

CLSUP-DIFF

See Call Supervisor-different.

CLSUP-MSB

See Call Supervisor-Make Set Busy.

Controlled Interflow key (CIF)

The Controlled Interflow key allows incoming calls to a defined ACD group to be routed to a customer-defined location.

CPB

See Call Processing Busy.

CPND

See Calling Party Name Display

CPU

See Call Pickup.

CR

See carriage return.

DASK

See Display Agents Summary key.

data carrier detect (DCD)

Data carrier detect is a terminal parameter that specifies that data carrier detection is either on or off.

data communications equipment (DCE)

Data communications equipment provides for the movement of encoded information by means of electric transmission systems by way of one or more data links according to a protocol.

data directory number (DDN)

A data directory number is the number that designates a subscriber data station within a numbering plan area.

data terminal equipment (DTE)

Data terminal equipment consists of digital end instruments that convert user information to data signals for transmission or reconvert the received data signals into user information. A DTE is also the functional unit of a data station that serves as a data source and provides the data communications control function to be performed in accordance with link protocol.

Data Terminal Ready (DTR)

Data Terminal Ready is a parameter that indicates that the terminal is ready to receive data.

dc

See direct current.

DCD

See data carrier detect.

DCE

See data communications equipment.

DCPU

See Directed Call Pickup.

DEO

delete option

Delete Script menu

The delete script menu allows the user to specify the script file to be deleted by choosing the feature that the script file has been associated with in the learn script mode.

digital line card (DLC)

The DLC is a digital line card that interfaces to Meridian Integrated voice and Data (IVD) digital terminals. These terminals include the M2000 series, the M3000 Touchphone, and their respective data options. The DLC inserts into any line card slot on the IPE shelf and can interface with a maximum of 16 digital sets for each DLC card for a total of 32 ports.

digital line module (DLM)

The digital line module is a 23-position peripheral module developed to allow the MSL-100 system to interface with the M2000 series of telephone sets.

digital set interface processor (DSIP)

The digital set interface processor performs the messaging and control functions to support the parallel space time switch in the digital line module.

direct current (dc)

Direct current is an electric current flowing in one direction only and substantially constant in value.

Directed Call Pickup (DCPU)

Directed call pickup allows the user to answer a call in another call pickup group.

directory number (DN)

A directory number designates a subscriber station within a numbering plan area.

Directory Number Hunt (DNH)

DNH is a service-related telephony feature that permits calls to a busy line to be rerouted. Lines in the hunt group are searched in order of their directory number.

Display Agents Summary key (DASK)

The Display Agents Summary key displays the status of all agents in a specified ACD group.

display option

The display option is a modular 2-line by 24-character liquid crystal display accessory that shows the following information: time and date, call length, volume levels, and MCA parameters. The display can also optionally show the called and calling party's name and number.

Display Queue Status key (DQS)

The Display Queue Status key allows the agent to query the current load status statistics for an ACD group.

Display Queue Threshold key (DQT)

The Display Queue Threshold key shows the current threshold range of the call at the front of the incoming call queue and its waiting time in seconds.

DLC

See digital line card.

DLM

See digital line module.

DN

See directory number.

DNH

See Directory Number Hunt.

DQS

See Display Queue Status key.

DQT

See Display Queue Threshold key.

DSIP

See digital set interface processor.

DTE

See data terminal equipment.

DTR

See data terminal ready.

EDPC

See enhanced digital port card.

EEPROM

See electronically erasable programmable read-only memory.

EIA

See Electronic Industries Association.

Electronic Industries Association (EIA)

The Electronic Industries Association is an organization made up of manufacturers of a wide variety of electronic products, including telecommunications equipment. The EIA is active in industry standard-setting.

electronically erasable programmable read-only memory (EEPROM)

EEPROM is a memory storage state.

Emergency key (EMK)

The Emergency key conferences in the supervisor to an agent or records the conversation while the call is still connected. This key is used if an agent receives a threatening or abusive call on the INCALLS key.

EMK

See Emergency key.

enhanced digital port card (EDPC)

The Meridian modular telephones interface with the MSL-100 system through the enhanced digital port card, which houses 16 ports that support 16 digital telephones and data units.

external alerter

The external alerter board provides an interface to standard remote ringing devices, such as a ringing unit installed in a location separate from the telephone.

FAA

See Forced Agent Availability key

FBD

Call Forward Busy Denied

FCC

See Federal Communications Commission.

Federal Communications Commission (FCC)

The FCC is a board composed of seven commissioners with the power to regulate all interstate and foreign electrical communications systems originating in the United States, including radio, television, facsimile, telegraph, telephone, and cable systems.

FH

fast high

FL

fast low

FND

call forward no answer denied

Forced Agent Availability key (FAA)

The Forced Agent Availability key allows the supervisor to force an agent out of ACD Not Ready and into an idle state.

INCALLS key

The INCALLS key is always Key 1 on the M2216 telephone sets for ACD applications. The INCALLS key is the only means by which ACD calls can be answered at an ACD agent position. The INCALLS key cannot be used to originate calls.

integrated voice and data (IVD)

The integrated voice and data service provides simultaneous voice and data communications at speeds up to 19.2 kbps over a single, twisted-pair subscriber loop.

intelligent peripheral equipment (IPE)

The IPE is a single-shelf module containing a controller card and 16 slots available for analog and integrated voice and data (IVD) digital lines. IPEs are packaged as modular, stackable units. Up to four IPEs can be contained in one intelligent peripheral equipment Column (IPEC). The IPE also provides a simplex, single common peripheral with common line cards for the MSL-100, SL-1, and Meridian SuperNode, as well as a cost-effective solution for system upgrades and extensions.

intelligent peripheral equipment column (IPEC)

The IPEC houses all equipment for IPE functionality, which includes up to four universal equipment modules (UEMs), up to four IPE modules, a pedestal base, an expansion kit, two module side cover panels, a top cap, cable harnesses, trim panels and labels, and the extended system monitor (XSM) card.

IPE

See intelligent peripheral equipment.

IPEC

See intelligent peripheral equipment column.

IVD

See integrated voice and data.

KBD

See keyboard dialing.

keyboard dialing (KBD)

Nortel keyboard dialing allows data calls to be originated to local or remote hosts or data terminal equipment using a terminal keyboard. Nortel keyboard dialing is supported only for ASCII, asynchronous, character mode, interactive terminals equipped with Electronic Industries Association RS-232-C interface.

key lamp option

The key lamp module is a 22-key modular accessory to the M2216ACD-1, M2216ACD-2, and M2616 sets and provides 22 additional programmable feature keys. When the terminal and module are attached, they react as one integrated unit.

keypad dialing (KPD)

With the Meridian programmable data adapter, keypad dialing can be used to originate data calls to local and remote hosts, data terminal equipment, or both from the Meridian modular telephone keypad using the Program (P) key.

KPD

See keypad dialing.

LCD

See liquid crystal display.

Learn Script menu

Script files are associated with either the Autodial feature or the Speed Call feature. The learn script menu allows a user to learn a script file for either feature.

LED

See light-emitting diode.

LEN

See line equipment number.

LGC

See line group controller.

light-emitting diode (LED)

The LED is a solid-state device that emits light when the appropriate voltage is applied to it. Several LEDs are used in components as a front panel indicators. They are usually off when the status of the equipment is normal.

Line Music On Hold (LMOH)

The Line Music On Hold (LMOH) feature adds the capability to assign a new line option to IBN, IVD, MBS and ISDN phone sets. This allows a line or group of lines to be given a private music on hold audio source.

Line of Business code key (LOB)

The Line of Business Code key is used to input a line of business code during an active ACD call.

line equipment number (LEN)

The LEN provides a seven-digit function reference used to identify line circuits. The LEN provides physical location information on equipment such as site, frame number, unit number, line subgroup (shelf), and circuit pack.

line group controller (LGC)

A line group controller is a peripheral module that connects DS30 links from the network to line concentrating modules.

line test position (LTP)

The LTP is a MAP workstation position that has been specifically equipped for performing line tests.

liquid crystal display (LCD)

A liquid crystal display is located alongside the telephone set feature keys to indicate a particular functioning state: off, on, flashing (60 times per minute), and winking (120 times per minute).

LOB

See Line of Business Code key.

LTP

See line test position.

maintenance and administration position (MAP) workstation

A MAP workstation refers to a group of components that provides a user-machine interface between maintenance personnel and the system. A MAP workstation consists of a visual display unit, a voice communications module, testing facilities, and MAP furniture.

M2006 modular telephone

The M2006 modular telephone is a single-line telephone with five programmable feature keys.

M2008 modular telephone

The M2008 modular telephone is a multiline telephone with seven programmable feature keys.

M2008HF

The M2008HF modular telephone is a single-line telephone with five programmable feature keys and an integrated handsfree unit.

M2616CT cordless telephone

The M2616CT cordless terminal is the cordless equivalent to the M2616 terminal, and has the same interface and control into the MSL-100 switch.

M2216 modular telephone

The M2216 modular telephone is a multiline ACD IVD digital set with 15 feature keys and a factory-installed M0200 display module, and two RJ-11 jacks for electret headsets.

M2216-1 modular telephone (manufacture discontinued)

See M2216 modular telephone.

M2216-2 modular telephone (manufacture discontinued)

The M2216-2 modular telephone is a multiline ACD IVD digital set with 15 feature keys and a factory-installed M0200 display module. The M2216-2 set is similar to the M2216 set, but with one RJ-11 jack for an electret supervisor headset and one PJ-327 jack for a carbon headset.

M2616 modular telephone

The M2616 modular telephone is a high performance multiline telephone set with 15 programmable feature keys and an integrated handsfree unit.

M

See Modify menu.

MADN

See multiple appearance directory number.

MADO

See Meridian asynchronous data option.

Main Script menu

The main script menu provides the following options: accessing the learn script menu, accessing the Delete Script menu, and modifying the escape code.

Make Set Busy key (MSB)

The make set busy key provides a method for logging an agent out of the ACD queue.

Malicious Call Hold (MCH)

Malicious Call Hold allows you to trace a nuisance or malicious call.

MAP workstation

See maintenance and administration position workstation.

MCA

See Meridian communications adapter.

MCH

See Malicious Call Hold.

Meridian asynchronous data option (MADO)

The Meridian asynchronous data option provides data capabilities to the M2000 Digital Telephones with an interface to ASCII terminals and personal computers at data speeds from 110 bps to 19.2 kbps.

Meridian communications adapter (MCA)

The Meridian communications adapter is an integrated data module consisting of a printed circuit board that is mounted within the Meridian modular telephone and allows asynchronous (110 to 19,200 bps) ASCII terminals, personal computers, and printers to be connected to the telephone set through an RS-232-C interface.

Meridian modular telephone (MMT)

The Meridian modular telephone line of Nortel products encompasses five telephone sets, an integrated data module (the Meridian Programmable Data Adapter), a 22-key/lamp add-on option, a display module option, and three different types of external power options.

MLC

See analog message waiting line card.

MLH

See Multiline Hunt.

MMT

See Meridian modular telephone.

MOT

See Music On Transfer.

modify (M)

The Modify menu allows the user to update features, verify the integrity of the data and signaling channels of the data loops, set the data call answer mode, and display information about the terminal parameters.

MRF

See Multiple Appearance Directory Number (MADN) Ring Forward.

MSB

See Make Set Busy key.

Multiline Hunt (MLH)

MLH is a service-related telephony feature that permits calls to a busy line to be routed to other specified lines without assigning a directory number to each line.

Multiple Appearance Directory Number (MADN)

A MADN is a directory number that appears on more than one station. The stations that are assigned these numbers are referred to collectively as a MADN group. MADN groups can be configured with either single call arrangement or multiple call arrangement.

multiple appearance directory number (MADN) Ring Forward (MRF)

The MADN Ring Forward feature provides increased flexibility in the ringing options available to a MADN single call arrangement. MADN Ring Forward provides the capability for MADN single call arrangement appearances to ring on a delayed or abbreviated basis, for a total of four ringing options.

Multiple Station Message Waiting Indication (MSMWI)

The Multiple Station Message Waiting Indication feature provides a visual indication of a message waiting for a primary terminal on one or more secondary terminals.

Music On Transfer (MOT)

The Music On Transfer feature provides audio to the held party of 3WC or CXR as soon as the conference or transfer is initiated.

Name Display Character Extension (NAME 24)

The Name Display Character Extension feature increases the length of the name field on the display from 15 to 24 characters.

Nortel

See Northern Telecom.

Nortel Networks

See Northern Telecom.

Northern Telecom (Nortel)

A part of the tricorporate structure, which consists of Nortel Technology, Bell Canada, and Northern Telecom.

Northern Telecom publication (NTP)

An NTP is a document that contains descriptive information about Nortel hardware or software modules and performance-oriented practices for installing, testing, and maintaining the system. NTPs are often supplied as part of the standard documentation package provided to a customer.

NTP

See Northern Telecom publication.

OBS

See Observe Agent key.

observe agent key (OBS)

The observe agent key allows the supervisor to monitor calls to the agent station.

P

See Program key.

PBX

See private branch exchange.

PC

See personal computer.

PCM

See pulse code modulation.

PDN

See primary directory number.

PEC

See product engineering code.

period (2EH)

Same as pressing the period “.” key

peripheral module (PM)

All hardware or modules of the system that provide interfaces between the network module and external line, trunk, or service facilities. A PM contains peripheral processors that perform local routines, thus relieving the load on the central processing unit.

personal computer (PC)

A PC is a small-scale computer that can operate independent of other computers.

PM

See peripheral module.

polyvinylchloride (PVC)

Polyvinylchloride is a thermoplastic made of polymers.

power supply option

The external power supply option provides additional power when various hardware options are added to a Meridian modular telephone. The M2006 and M2008 sets need the power supply option for any additional hardware option. The M2616 set requires the power supply option for all hardware options except the display module and handsfree.

primary directory number (PDN)

The primary directory number is the directory number assigned to Key 1 of a Meridian modular telephone. The primary directory number uniquely identifies the telephone set from among the many directory numbers that can be assigned to it. (The M2006 set is only a single-line set; therefore, Key 1 is the only directory number key.)

private branch exchange (PBX)

A PBX is a small local telephone office, either automatic or manually operated, serving extensions in a business complex and providing access to the public network.

product engineering code (PEC)

A PEC is an eight-character code that provides a unique identification for each marketable product manufactured by Nortel.

Program key

The Program key (P key) controls access to the display or Meridian programmable data adapter for parameter selection. The Program Mode is activated by pressing P.

pseudorandom pattern

A transmission pattern with the properties of random data generated in such a manner that another circuit can synchronize on the pattern and detect individual transmission bit errors. Pattern 511 follows CCITT specification O.152.

PUD

Call Pickup Denied

pulse code modulation (PCM)

Pulse code modulation is a form of modulation in which the modulating signal is sampled and the sample quantized and coded, so that each element of information consists of different kinds or numbers of pulses and spaces.

PVC

See polyvinylchloride.

RAG

See Ring Again.

Release key (RIs)

This fixed key is located above the Hold key and to the right. This key is used to release a call from the telephone set.

Return To Service (RTS)

The RTS command is a MAP command that restores communications among or between the components of the remote, communications between the remote and the host, or subscriber service.

Ring Again (RAG)

Ring Again is one of the message prompts that is given if the user cannot be connected. RAG is available for local calls and for queuing on trunk calls.

RIs

See Release key.

RTS

See Return To Service.

Script file

The script file feature allows users to store host/terminal dialogs in the Meridian programmable data adapter, which can be recalled and used to automatically perform log-on procedures.

SDN

See secondary directory number

secondary directory number (SDN)

A directory number on a single-party flat-rate line, different from the primary directory number. Up to six SDNs can be supported on a single line.

service order (SERVORD)

SERVORD is a user interface consisting of commands used to change, add, or delete subscriber lines. SERVORD uses standard telephone industry command format.

SERVORD

See service order.

SH

slow high

SL

slow low

S registers

S registers may be used to program various call setup parameters for Hayes keyboard dialing.

TADO

See touch asynchronous data option.

touch asynchronous data option (TADO)

The touch asynchronous data option provides data capabilities to the M3000 Touchphone with an interface to ASCII terminals and personal computers at data speeds from 110 bytes/s to 19.2 Kbyte/s.

TSG

telephone security group

Trunk Member Display (TRKDISP)

The TRKDISP feature is used with the Meridian business set (MSB)/integrated voice and data (IVD) display sets. When the TRKDISP key is depressed, the feature is activated and displays the common language identification location (CLLI) and circuit member number of the trunk to which it is connected.

UEM

See universal equipment module.

universal equipment module (UEM)

The UEM provides the framework for housing the IPE module.

VDN

See voice directory number.

virtual leased line (VLL)

A virtual leased line is a circuit that is part of a communications arrangement in which data may be passed over various real circuit configurations during a single period of communication. Typically this circuit is rented from a local telecommunications administrations carrier, and use of it is dedicated.

VLL

See virtual leased line.

voice directory number (VDN)

A voice directory number represents the number that designates a voice subscriber station within a numbering plan area.

WTD

warning tone denied

ODH (carriage return)

Same as pressing the Return key.

Meridian SuperNode
Meridian SL-100
Meridian Modular Telephones Reference Manual

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This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules, and the radio interference regulations of Industry Canada. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at the user's own expense.

The SL-100 system is certified by the Canadian Standards Association (CSA) with the Nationally Recognized Testing Laboratory (NRTL).

This equipment is capable of providing users with access to interstate providers of operator services through the use of equal access codes. Modifications by aggregators to alter these capabilities is a violation of the Telephone Operator Consumer Service Improvement Act of 1990 and Part 68 of the FCC Rules. This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

YEAR 2000 READINESS DISCLOSURE

This information was originally published prior to October 19, 1998. The foregoing legend applies retroactively in accordance with the U.S. Year 2000 Information and Readiness Act and on an ongoing basis

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How the world shares ideas.