

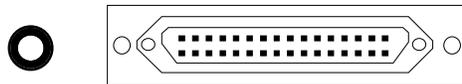
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Meridian 1 Options 201, 211

Meridian SL-100

Meridian Programmable Data Adapter (MPDA) Reference Manual

MSL03 Standard 02.01 March 1995



Meridian 1 Options 201, 211

Meridian SL-100

Meridian Programmable Data Adapter (MPDA)

Reference Manual

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About this document

When to use this document

This publication provides specific information on the Meridian Programmable Data Adapter (MPDA).

The MPDA is used with the following Meridian Modular Telephone sets:

- M2006
- M2008
- M2616
- M2216ACD-1
- M2216ACD-2

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

This publication does not cover in detail the interface with the Meridian SL-100 system.

Structure of this publication

This publication contains four chapters that describe the following topics in detail:

- Chapter 1-provides an introduction to the specifications and functions of the MPDA.
- Chapter 2-describes keypad dialing. Keypad dialing provides a user with the ability to originate data calls to local and remote hosts, Data Terminal Equipment (DTE), or both from the Meridian Modular Telephone keypad.
- Chapter 3-provides detailed information on the use of NT Keyboard Dialing (NT KBD). NT KBD provides a user with the ability to originate data calls to local and remote hosts, Data Terminal Equipment (DTE), or both using a terminal keyboard.

- Chapter 4-describes Hayes (A T) keyboard dialing. Hayes keyboard dialing, also known as AT keyboard dialing, allows the option of using commands compatible with the Hayes V-series Smartmodem 9600 to originate and answer data calls.

This publication also provides the following appendixes with reference material essential to the use and operation of the MPDA:

- Appendix A-describes the standard Hayes A T commands.
- Appendix B-provides information on A T dialing parameter registers (S registers).
- Appendix C-lists the basic A T command sets for voice and data calls.
- Appendix D-describes the script file menus.

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 either the *Meridian SL-100 Master Index of Publications*, 555-4031-001, or the *Defense Switched Network Master Index of Publications*, 555-4021-001.

This document applies to Meridian SL-100 offices that have BCS34 and above. Unless the document is revised, it also applies to offices with software releases greater than MSL03.

References in this document

The following documents are referred to in this document:

- *Meridian Modular Telephones Reference Manual*, 555-4001-114
- *Defense Switched Network Translations Guide*, 555-4021-350
- *Defense Switched Network Feature Description Manual*, 555-4021-801
- *Defense Switched Network Customer Data Schema*, 555-4021-851

- *Meridian SL-100 Customer Data Schema*, 555-4031-851 (for MSL03 and above) or 297-1001-451 (for BCS36 and previous)
- *Defense Switched Network Maintenance Guide*, 555-4021-550 (MSL03 and above only)
- *Meridian SL-100 Translations Guide*, 555-4031-350 (MSL03 and above only)
- *Meridian SL-100 Maintenance Guide*, 555-4031-550 (MSL03 and above only)
- *Meridian SL-100 Feature Description Manual*, 555-4031-801 (MSL03 and above only)
- *M2006 Modular Telephone User Guide*, 555-4001-115 (BCS36 and previous releases only)
- *M2008 Modular Telephone User Guide*, 555-4001-116 (BCS36 and previous releases only)
- *M2616 Modular Telephone User Guide*, 555-4001-117 (BCS36 and previous releases only)
- *M2216ACD-1 and M2216ACD-2 Modular Telephone User Guide*, 555-4001-121 (BCS36 and previous releases only)

What precautionary messages mean

The types of precautionary messages used in NT documents include danger, warning, and caution messages. Danger, warning, and caution messages indicate possible risks.

Examples of the precautionary messages follow.

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

Meridian Programmable Data Adapter (MPDA) is used to pass asynchronous data through Northern Telecom's Private Branch Exchanges (PBXs). Although it is not configured as a Data Terminal Equipment (DTE), the MPDA supports DTEs. There is no way to configure the MPDA to support Data Communications Equipment (DCE); but a null modem adapter can be used to allow DCE to have MPDA compatibility.

Just as your telephone has a unique Directory Number (DN) or extension, the MPDA must have its own Data Directory Number (DDN) configured in the software of the PBX.

Your dumb terminal or Personal Computer (PC) can be attached to the MPDA using its RS-232 serial port. The dumb terminal can talk directly to the MPDA. A personal computer needs a communication software package in order to access its serial port. Serial printers may also be connected to the MPDA.

After a data call has been established, you can perform data communications through the PBX to a far end service, such as a mainframe, a modem pool, other Personal Computers (PCs), or printers.

The MPDA uses nonvolatile read and write memory for permanent storage of settings and configuration parameters. Autodial and Speed Call numbers are stored at the PBX.

The Meridian Modular Telephone line of office products is composed of 5 telephone sets, an integrated data module (MPDA), a 22-key/lamp add-on option, a display module option, and 3 different types of external power options.

Integrated Voice and Data (IVD) is a service that provides simultaneous voice and data communications at speeds up to 19.2 kbps over a single, twisted-pair subscriber loop.

The following sets support the MPDA:

- M2006: a single line telephone with 5 programmable feature keys

- M2008: a multiline telephone with 7 programmable feature keys
- M2616: a high performance multiline telephone with 15 programmable feature keys and an integrated hands-free unit
- M2216ACD-1: a multiline ACD IVD digital set with 15 feature keys, a factory installed M0200 display module, and two RJ-11 jacks for electret headsets
- M2216ACD-2: a multiline ACD IVD digital set with 15 feature keys and a factory installed M0200 display module. It is similar to the M2216ACD-1, but with one RJ-11 jack for an electret supervisor headset and one PJ-327 jack for a carbon headset.

Keypad dialing

Keypad dialing operation

With the Meridian Programmable Data Adapter (MPDA), KeyPad 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's display screen are controlled through the keypad. The set's top right feature key functions as the local Program mode key, referred to here as the "P" key. Pressing the "P" key activates the program mode. The "P" key controls access to the display or MPDA for parameter selection.

KPD supports the following key features:

- automatic dial (Autodial)
- ring again
- display of caller's number

To place a data call using KPD, use Procedure 2-1. This procedure explains the steps, action or actions, and verification processes that occur when programming the MPDA from the keypad.

Procedure 2-1

Placing data calls using keypad dialing

- 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 MPDA controls the display.

2-2 Keypad dialing

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 MPDA.

6 Press "P" followed by one of the values listed in Table 2-1.

Response: The display shows responses to the entered values as listed in "Description" column in Table 2-1.

Table 2-1xxx
P command values

Entered value	Description
22	Enter baud rate
110	110-bps
150	150-bps
300	300-bps
600	600-bps
1200	1200-bps
2400	2400-bps
4800	4800-bps
9600	9600-bps
19200	19200-bps
23	Space Parity
24	Odd Parity
25	Even Parity
26	Mark Parity
27	Host Mode
28	Terminal Mode
29	Hotline Off
30	Hotline On
31	Virtual Leased Line Off
32	Virtual Leased Line On
33	Forced DTR Off
34	Forced DTR On
<p>Note 1: The following message displays if an invalid baud rate is entered: INVALID COMMAND/ENTRY, RE-ENTER :</p> <p>Note 2: Additional parameters can be seen, but are not supported by SL-100. Do not set unsupported parameters.</p>	
-continued-	

2-4 Keypad dialing

Table 2-1xxx
P command values (continued)

Entered value	Description
35	Dynamic Carrier Detect Off
36	Dynamic Carrier Detect On
37	Remote Loopback Off
38	Remote Loopback On
39	Cancel Data Ring Again
60	Autodial Programming
61	Autodial Call
62	Data Parameter Display
63	EIA Leads Status Display
64	Incoming Data Call Monitor
65	Reset to Default Parameters
66	Emulation Selection
67	Lock/Unlock Data Parameters
68	VDN Key Assignment

Note 1: The following message displays if an invalid baud rate is entered: INVALID COMMAND/ENTRY, RE-ENTER :

Note 2: Additional parameters can be seen, but are not supported by SL-100. Do not set unsupported parameters.

-end-

Baud rates (P22)

Procedure 2-2 describes how to assign a rate of speed for a data signal.

Procedure 2-2 **Assigning a baud rate**

- 1 Press "P22".
- 2 Enter one of the values listed in Table 2-1 to assign an allowable rate of speed to a data signal.
- 3 Press "P" to save then exit the command.

Response: The set exits the programming mode.

Parity assignment (P23, P24, P25, P26)

Procedure 2-3 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.

Procedure 2-3 Assigning parity

- 1 Choose one of the following commands: P23 (Space Parity), P24 (Odd Parity), P25 (Even Parity), or P26 (Mark Parity).
- 2 After entering any of these commands, press Program to save then exit the command.

Response: The set exits the programming mode.

Host or terminal mode (P28, P27)

Procedure 2-4 describes the commands required to determine whether or not prompts are sent to the terminal.

Procedure 2-4 Determining host or terminal receiver

- 1 Press "P28" to instruct the switch to send prompts to the terminal.
- 2 Press "P" to save then 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 then exit the command.

Response: The set exits the programming mode.

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 MPDA recognizes a positive transition of DTE or detects a carriage return from the keyboard. Procedure 2-5 describes the commands required to activate or deactivate a hotline.

Procedure 2-5 Activating or deactivating Hotline

- 1 Press "P30" to turn the hotline feature on.
- 2 Press "P" to save then exit the command.

Response: The set exits the programming mode.

- 3 Press "P29" to turn the Hotline feature off.
- 4 Press "P" to save then exit the command.

Response: The set exits the programming mode.

Virtual leased line activation and deactivation (P32, P31)

Procedure 2-6 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: If a power failure occurs while a Virtual Leased Line is on, the MPDA 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.

Procedure 2-6

Activating or deactivating a virtual leased line

- 1 Press "P32" to turn on a Virtual Leased Line.
- 2 Press "P" to save then 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 then exit the command.

Response: The set exits the programming mode.

Forced Data Terminal Ready (DTR) activation and deactivation (P34, P33)

Procedure 2-7 describes the commands required to turn a Forced 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.

Procedure 2-7

Activating or deactivating Forced DTR

- 1 Press "P34" to turn Forced DTR on.
- 2 Press "P" to save then exit the command.

Response: The set exits the programming mode.

- 3 Press "P33" to turn Forced DTR off.
- 4 Press "P" to save then exit the command.

Response: The set exits the programming mode.

Turn Dynamic Carrier Detect on and off (P36, P35)

Procedure 2-8 describes the commands required to turn a Dynamic Carrier Detect on or off. This feature is useful for communication software packages that require a transition of carrier detect from low (0) to high (1) in order to activate answer mode.

Procedure 2-8

Turning Dynamic Carrier Detect on and off

- 1 Press "P36" to turn Dynamic Carrier Detect on. Carrier detect follows the state of the call.
- 2 Press "P" to save then exit the command.
- 3 Press "P35" to turn Dynamic Carrier Detect off. Carrier detect is always high except for 100 ms when a call is first dropped.
- 4 Press "P" to save then exit the command.

Response: The set exits the programming mode.

Remote loopback activation and deactivation (P38, P37)

Procedure 2-9 describes the commands required to turn a remote loopback on or off.

Procedure 2-9

Activating or deactivating Remote Loopback

- 1 Press "P38" to turn Remote Loopback on. Remote Loopback is activated for the next data call only.
- 2 Press "P" to save then exit the command.
- 3 Press "P37" to turn Remote Loopback off.
- 4 Press "P" to save then exit the command.

Response: The set exits the programming mode.

Ring again feature cancellation (P39)

Procedure 2-10 describes the steps required to cancel a Ring Again previously activated by a keyboard command.

Procedure 2-10
Cancelling the Ring Again feature

- 1 Press "P39" to cancel a previously activated Ring Again.

Response: The display shows the following information:

```
DATA RING AGAIN CANCELLED
```

- 2 Press "P" to save the cancelation and then exit.

Response: The set exits the programming mode.

Autodial programming activation (P60, P61)

Procedure 2-11 describes the steps required to activate automatic dial (Autodial) programming.

Procedure 2-11
Activating Autodial programming

- 1 Press "P60" to activate automatic dial programming.

Response: The set enters autodial programming mode and displays the following information:

```
ADIAL XXXX  
ENTER DIGITS, THEN P
```

- 2 Enter "xxxP" (the autodial number).
- 3 Press "P61" to activate automatic call.

Response: The set enters data monitor mode and displays the following information:

```
ADIAL XXXX  
DATA CALL CONNECTED
```

- 4 Press "P" to save and exit either command.

Activate display parameters (P62)

Procedure 2-12 describes the steps required to activate display parameters. The display shows the established MPDA parameters that can be modified

through keypad dialing. The Volume Control key (<<<< >>>>) is used as a scroll key in Program mode.

Procedure 2-12
Activating the display parameters

- 1 Press "P62" to activate the display parameters.

Response: The display screen appears.

- 2 Scroll using the <<< >>> keys (see Procedure 2-13), or press "P" to exit.

Procedure 2-13 describes how to scroll through the screens that show the data parameter settings.

Procedure 2-13
Scrolling through the parameter display screens.

- 1 Press "P62".

Response: Set enters Program mode, and data parameters display, as shown in Example 1.

- 2 Press ">>>".

Response: Set scrolls forward to display Screen 2 settings, as shown in Example 2.

- 3 Press ">>>".

Response: Set scrolls forward to display Screen 3 settings, as shown in Example 3.

- 4 Press ">>>".

Response: Set scrolls forward to display Screen 4 settings, as shown in Example 4.

- 5 Press ">>>".

Response: Set scrolls forward to display Screen 5 settings, as shown in Example 5.

- 6 Press ">>>".

Response: Set scrolls forward to display Screen 1 settings (Example 1).

- 7 Press "<<<<".

Response: Set scroll backward to display Screen 5 settings (Example 5).

- 8 Press "P" key.

Response: Set exits from Program mode.

2-10 Keypad dialing

The following are some examples of the parameter display screens. 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:

```
RTS ON DEFAULT TLINK
ASYNC MODE TLINK INUSE
```

Note: The TLINK and ASYNC parameters as shown in this example reflect the only options for these parameters supported by SL-100. These parameters cannot be changed using keypad dialing.

Example 4:

```
DNN 4485655 VDN KEY 0
TIMEOUT OFF
```

Example 5:

```
SPEED RESTRICTION OFF
SMARTMODEM 9600
```

The P62 command uses the lower half of screen 5 to show the type of modem the MPDA is currently emulating. (See Example 5.) One of the

following screens appears as the fifth 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

For more information about modem emulation, refer to the “Implementing the P66 command” section in either Chapter 3, “NT keyboard dialing” or Chapter 4, “Hayes keyboard dialing”, depending on the type of keyboard dialing you are using.

Status display (P63)

Procedure 2-14 shows the layout of the RS-232-C leads information on the display. Use the volume control keys (<<<< >>>>) to scroll through the Program Mode selections.

Note: In this mode, the keypad can be used for voice calls.

Procedure 2-14 Displaying EIA leads status

- 1 Press “P63”.

Response: The RS-232-C lead indicators display the following information:

TXD	RXD	DCD	DTR	DSR
0	0	•	•	•

This indicates the status of the EIA leads of the RS-232 connected to the MPDA. 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

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 MPDA; therefore, no Calling Party Name Display (CPND) information is displayed. However, you can 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 2-15 describes the steps required to reset the MPDA configuration to default settings. This procedure locks configuration settings so that no data parameters can be changed.

Note: Unplugging the telephone does not reset the MPDA configuration.

Note: Once P65 is done, do not change the default values to parameters that are not supported.

Procedure 2-15
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.

Response: The set exits the programming mode.

Emulation selection (P66)

Procedure 2-16 describes the steps required to select the modem type that the MPDA emulates.

Note 1: Unless the emulation type is NT keyboard dialing, carriage return <CR> is disabled and hitting <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 in order to work properly.

Note 3: If power drops while emulating Smartmodem 1200 or 2400, the selection defaults to Smartmodem 9600 upon power up. This does not apply to NT KBD dialing.

Procedure 2-16
Selecting modem type

- 1 Press "P66". Use the volume control key to scroll the telephone's display until the correct modem type appears.
- 2 Press "P" to save and exit the emulation setting.

Response: The set exits the programming mode.

For detailed information on P66, refer to Chapter 3 on "NT keyboard dialing" and Chapter 4 for "Hayes keyboard dialing" in this document.

Locking data parameters (P67)

Procedure 2-17 describes the steps required to lock data parameters. This procedure utilizes the volume control key to scroll the telephone's display until it reads DATA PARAMETERS LOCKED.

Procedure 2-18
Locking data parameters

- 1 Press "P67".

Response: The display shows the following information:

```
DATA PARAMETERS LOCKED
SCROLL <<< >>>
```

- 2 Press "P" to save and exit.

Response: The set exits the programming mode.

Voice Directory Number (P68)

Voice Directory Number (VDN) key assignment allows the user to instruct the MPDA on which VDN key to make its voice call originations. Procedure 2-19 describes the steps required to make a VDN key assignment.

Procedure 2-19
Assigning a VDN key

- 1 Press "P68", and enter the number that corresponds to the VDN key selection.

Note: Key assignments begin with zero.

- 2 Press "P" to save and exit.

Response: The set exits the programming mode.

In all the tables presented, the display shows the actual programmed parameters instead of the keypad inputs. The set sends the keypad information through the local communications of the MPDA. The MPDA decodes the local communications commands and passes them back to the telephone set's display.

NT keyboard dialing

NT Keyboard Dialing (KBD) allows data calls to be originated to local or remote hosts or Data Terminal Equipment (DTE) using a terminal keyboard. NT KBD is supported only for ASCII, asynchronous, character mode, interactive terminals equipped with Electronic Industry Association (EIA) RS-232-C interface.

Note: NT KBD is not supported for block mode terminals.

NT KBD provides the following capabilities:

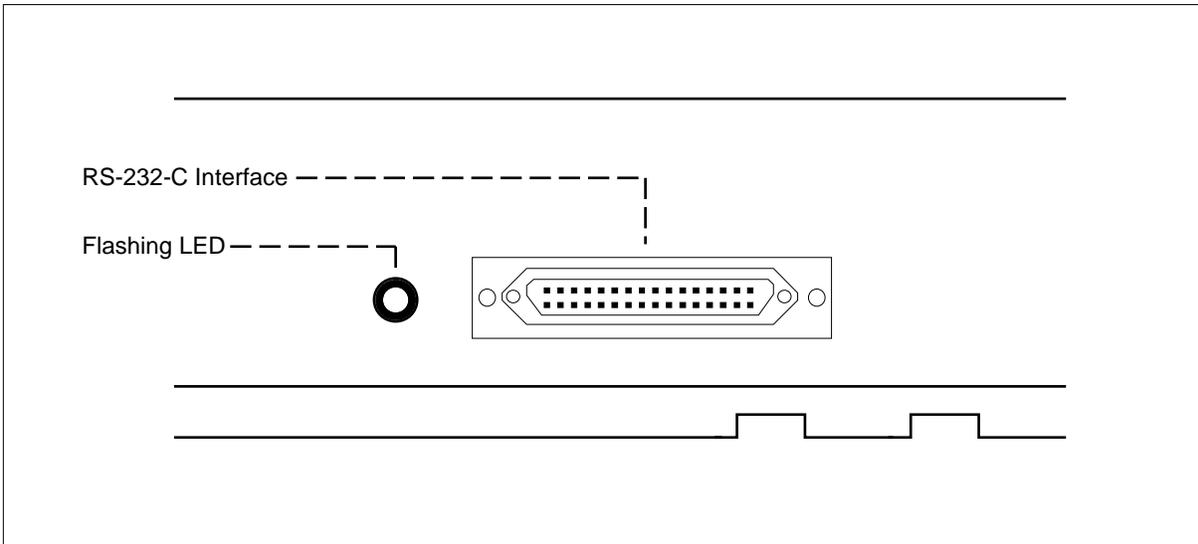
- automatic dial (Autodial)
- automatic and manual answering of incoming calls
- call origination and termination to and from local and remote data devices
- modem pooling
- programming of automatic dial numbers
- ring again
- speed calling
- speed calling programming (if designated as a controller)

Initialization

This section describes the guidelines applicable for accessing the NT KBD feature. Before using the NT 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 LED on the back of the MPDA is flashing at a constant rate to indicate that the MPDA is functioning properly. (See Figure 3-1.)

Figure 3-1xxx
MPDA flashing LED



Implementing the P66 command

The P66 key allows the user the flexibility of enabling and disabling NT keyboard dialing. The P66 command contains four scrolling screens that enable the user to select which type of modem the MPDA 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 3-1.

To select a specific emulation, press "P66". The default screen selection depends upon the Hayes KBDTYPE field of the MPDA profile. Scroll through the choices. To select an emulation choice, when the emulation choice appears on the screen, press "P".

Table 3-1xxx
P66 command screens

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.
-continued-		

Table 3-1xxx
P66 command screens (continued)

Screen	Emulation Selection	Action (Scroll <<< >>>)
Screen 3	SMARTMODEM 1200	Press "P" to select emulation and exit.
Screen 4	NT KBD DIALING	Press "P" to select emulation and exit.
-end-		

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 the chapter on Hayes keyboard dialing and Appendix B, "AT dialing parameter registers".

The user can see which P66 state is currently active by entering the P62 command. See Procedure 2-12 in Chapter 2, "Keypad dialing" for instructions on using the P62 command to display the current P66 state.

Note: If the user toggles from NT KBD to Hayes keyboard dialing, then NT KBD is disabled. The user still has access to NT KBD menus; however, when the user exits from the menus, the user is locked out of NT KBD. To return to NT KBD, the P66 command must be entered, and NT KBD must be reselected.

MPDA operational modes

While in NT KBD, the MPDA operates in one of three modes:

- autobaud
- command
- on-line

After initializing the MPDA, the autobaud mode becomes active. The user remains in the autobaud mode until an acceptable autobaud character is entered.

NT KBD is activated by entering a period (.) followed by a Carriage Return (CR). When the NT KBD state is active, the MPDA returns to the command mode at the completion of any call origination attempt. AT commands can be issued in autobaud mode to place the MPDA into Hayes keyboard dialing state. For information on Hayes keyboard dialing, refer to Chapter 4, "Hayes keyboard dialing".

Autobaud and autoparity

The MPDA 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 NT KBD. The default rate is 9600 bps during power-up. After the MPDA 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 craftsperson when datafilling tables. The user may change the parity by entering “AT” and a carriage return while in Hayes keyboard dialing or entering a period (.) and CR while in NT KBD. In the data transfer mode, the parity bit is padded transparently as data for 7 bit codes.

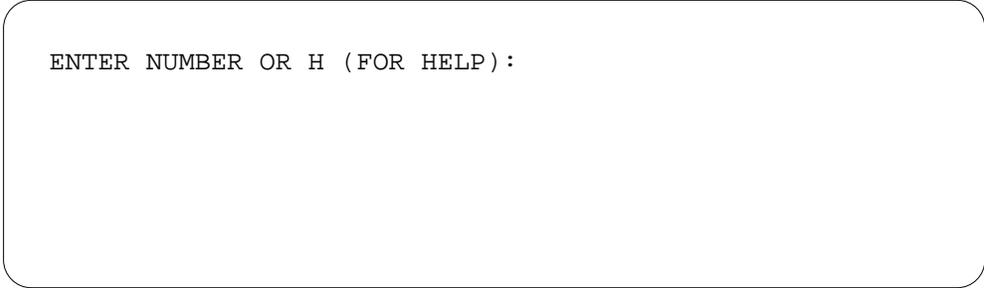
When the user is in the NT KBD state, the MPDA returns to the autobaud mode at the completion of any call origination attempt. Also, when the user is in NT KBD state, an AT command can be in autobaud mode to place the MPDA into Hayes keyboard dialing state. For information on Hayes keyboard dialing, refer to Chapter 4, “Hayes keyboard dialing”.

Terminal parameters

Terminal parameters, such as baud rate, can be printed on the user’s terminal. Procedure 3-1 describes the steps necessary to display the user’s terminal parameters.

Procedure 3-1 Displaying terminal parameters

- 1 Press the CR key. The screen displays the following information:



```
ENTER NUMBER OR H (FOR HELP):
```

A prompt appears on the screen. The only valid characters are those on the screen. Illegal characters result in the following prompt:

```
INVALID COMMAND/ENTRY, REENTER:
```

- 2 Enter "H". The screen displays the Main Menu.
- 3 Enter "P". The screen displays the following information:

```
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
```

NT KBD menus

Main menu

The Main Menu is displayed when the terminal is properly set up for operation and no NT 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. For an example of the Main Menu format, refer to Figure 3-2.

Figure 3-2xxx
Main menu

```
MAIN MENU

C - CALL                S - SPEED CALL
A - AUTODIAL           M - MODIFY
P - DISPLAY PARAMETERS D - SCRIPT FILE DIRECTORY
CTRL Z TO ABORT KEYBOARD DIALING
SELECT:
```

Modify menu

The Modify Menu is displayed when the 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 3-3.

Figure 3-3xxx
Modify menu

```
MODIFY MENU

A - AUTO NUMBER        M - MANUAL ANSWER
S - SPEED NUMBER       F - SCRIPT FILE
R - REMOTE LOOPBACK    Q - QUIT MODIFY
SELECT:
```

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 reenter.
- 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 characteristics listed below:

- Call progress tones are not provided while initiating data calls using NT 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 parenthesis (). 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.

NT KBD dialing procedures

Manual dialing

The following procedures present dialing instructions for NT KBD operation. The following procedure illustrates step-by-step the manual dialing instructions used for both local and remote data calls.

Procedure 3-2 Dialing manually

- 1 Press the CR key. The screen displays the following information:

```
ENTER NUMBER OR H (FOR HELP) :
```

3-8 NT keyboard dialing

A prompt appears on the screen. The only valid characters are those on the screen. Illegal characters result in the following prompt:

```
INVALID COMMAND/ENTRY, REENTER :
```

- 2 Enter "H". The screen displays the Main Menu.
- 3 Enter "C". The screen displays the following information:

```
ENTER NUMBER :
```

- 4 Enter a Directory Number (DN).

```
CALLING nnnn
```

Comments: nnnn = DN. The MPDA sends the digits to the switch to place the call. The host sends the dialed digits to the MPDA.

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 the user enters nnnn (CR) instead of H (CR), Steps 2 and 3 are skipped.

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 MPDA, the SL-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”.

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 3-3 describes how to activate a data speed call.

Procedure 3-3 Activating a data speed call

- 1 Press the CR key. The screen displays the following information:

```
ENTER NUMBER OR H (FOR HELP):
```

A prompt appears on the screen. The only valid characters are those on the screen. Illegal characters result in the following prompt:

```
INVALID COMMAND/ENTRY, REENTER:
```

- 2 Enter “H”. The screen displays the Main Menu.

- 3 Enter "S". The screen displays the following information:

ENTER ACCESS CODE

Comments: User selects Speed Call feature.

- 4 Select the Speed Call feature by entering the two-digit speed call code. The screen displays the following information:

CALLING nn

Comments: The MPDA sends the speed call and the entered digit to the switch to place the call. The switch places the predesignated number and sends the digits to the MPDA.

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 an excessive number of digits are entered, the system accesses the number of digits it needs and ignores the remaining digits.

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 MPDA, the SL-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".

Autodial is compatible with modem pooling.

An autodial number may 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 3-4.)

Procedure 3-4
Activating an autodial call

- 1 Press the CR key. The screen displays the following information:

```
ENTER NUMBER OR H (FOR HELP):
```

A prompt appears on the screen. The only valid characters are those on the screen. Illegal characters result in the following prompt:

```
INVALID COMMAND/ENTRY, REENTER:
```

- 2 Enter "H". The screen displays the Main Menu.
- 3 Enter "A". The screen displays the following information:

```
CALLING nnnn
```

Comments: The MPDA sends the DN and the Autodial command to the switch to place the call. The switch places the predesignated number and sends the digits to the MPDA.

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 sec, 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 above. 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.

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 MPDA. The MPDA 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 MPDA informing it that the number was incorrect. The MPDA sends the prompt “NOT IN SERVICE” and releases the call. When the switch idles the DN, the MPDA sends the prompt “RELEASED”.

Procedure 3-5
Placing local calls

- 1 Place a local call. The screen displays the following information:

```
RINGING
ANSWERED
```

Comments: The switch sends the call state to the MPDA.

- 2 The screen displays the following information after the called host answers.

```
CALL CONNECTED .
SESSION STARTED .
```

Comments: The MPDA sends the connected message to the switch.

- 3 Follow the log-in procedure.

Comments: The host sends the prompt for login, and the data session between the terminal and the host begins.

Modem pool calls

With automated modem pooling, 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.

Note: SL-100 does not support Prefix NRS outbound modem pooling.

Remote calls can be placed using either digital trunks or automated modem pooling. Speed calling and autodialing are compatible with modem pooling. The Ring Again feature is not available for remote calls on manual modem pooling.

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, the user can activate the call by entering a CR on the terminal keyboard. If a CR is not entered within the Ring Again timeout period, the switch cancels the Ring Again and the MPDA sends the prompt "RELEASED".

If the user changes the speed of the terminal without re-autobauding, the prompt displayed in Step 3 is meaningless.

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 3-6 for using the RAG feature.

Procedure 3-6 Using Ring Again feature

- 1 The screen displays one of the following messages after the user places a call to a busy number.

BUSY, RING AGAIN? (Y/N)

Note: The switch sends the call state to the MPDA.

```
BUSY, PREVIOUS RING AGAIN ACTIVE, REPLACE? (Y/N)
```

Note: This prompt indicates that Ring Again is already active.

- 2 Enter "Y". The screen displays the following information:

```
RING AGAIN PLACED  
  
RELEASED
```

Comments: The MPDA uses the Ring Again feature, or the MPDA cancels the previous Ring Again.

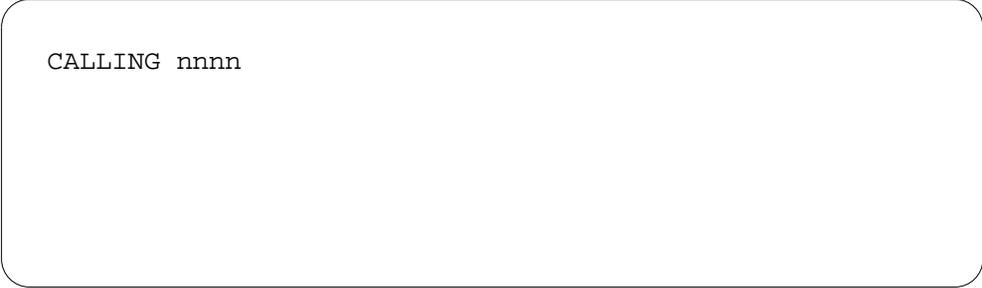
When the called number becomes free:

- 3 The screen displays the following information:

```
DATA STATION NOW AVAILABLE.  
PLACE CALL? (Y/N)
```

Comments: The MPDA sends a BELL character to the terminal. A carriage return indicates a Yes reply.

- 4 Enter "Y" or a carriage return. The screen displays the following information:



CALLING nnnn

Modify

The Modify feature allows the user to manipulate the following information:

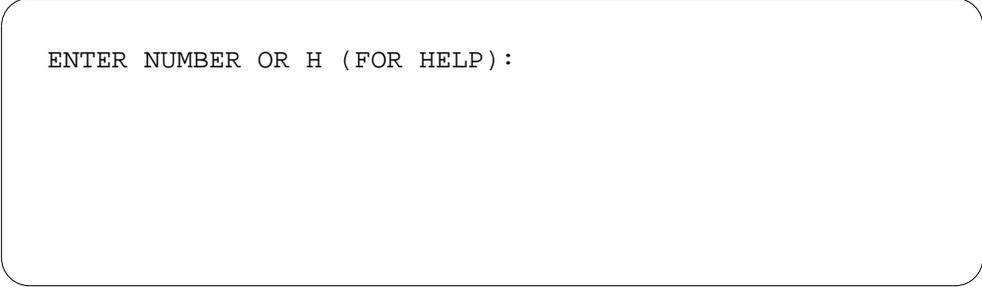
- change stored Autodial numbers
- change any of the stored Speed Call numbers
- set the MPDA into the Remote Loopback mode
- select manual or auto answer
- modify Script files

Autodial number

Procedure 3-7 describes how to modify an autodial number.

Procedure 3-7 Modifying an autodial number

- 1 Press the CR key. The screen displays the following information:



ENTER NUMBER OR H (FOR HELP):

A prompt appears on the screen. The only valid characters are those on the screen. Illegal characters result in the following prompt:

```
INVALID COMMAND/ENTRY, REENTER:
```

- 2 Enter "H". The screen displays the Main Menu.
- 3 Enter "M" to select the Modify Menu.
- 4 Enter "A" to select Auto Number. The screen displays the following information:

```
AUTODIAL NO.
```

- 5 Enter the new autodial number in the following format: nnnnnnn.
- 6 Enter "Q".

Comments: The screen displays the Main Menu, and the user can activate another feature.

Note: If the user releases the call at Step 5, the original Autodial number is retained by the switch.

Speed call number

Procedure 3-8 describes how to modify a speed call number.

Procedure 3-8
Modifying a speed call number

- 1 Press the CR key. The screen displays the following information:

ENTER NUMBER OR H (FOR HELP) :

A prompt appears on the screen. The only valid characters are those on the screen. Illegal characters result in the following prompt:

INVALID COMMAND/ENTRY, REENTER :

- 2 Enter "H". The screen displays the Main Menu.
- 3 Enter "M" to select the Modify Menu.
- 4 Enter "S" to modify the speed call number. The screen displays the following information:

ENTER ACCESS CODE :

- 5 Enter the new two-digit speed call number. The screen displays the following information:

SPEED NUMBER :

- 6 Enter the new directory number associated with the speed call number.
Comments: The user can either modify a speed call number or enter a new number. The user can keep the number the same by entering a carriage return only.
- 7 Enter "Q".
Comments: The screen displays the Main Menu, and the user can activate another feature.
Note: If the user releases the call before entering the new Speed Call number, the original number is retained by the switch.

Manual answer

Procedure 3-9 describes how to set manual answer.

Procedure 3-9 Setting manual answer

- 1 Press the CR key. The screen displays the following information:

ENTER NUMBER OR H (FOR HELP) :

A prompt appears on the screen. The only valid characters are those on the screen. Illegal characters result in the following prompt:

```
INVALID COMMAND/ENTRY, REENTER :
```

- 2 Enter "H". The screen displays the Main Menu.
- 3 Enter "M" to select the Modify Menu.
- 4 Enter "M" to select Manual Answer. The screen displays the following information:

```
MANUAL ANSWER (Y/N) :
```

- 5 Enter "Y" or "N".
Comments: The user can change manual answer by entering a "Y" or keep it the same by entering either "N" or a carriage return only.
- 6 Enter "Q".
Comments: The screen displays the Main Menu, and the user can activate another feature.

Remote loopback

In the Remote Loopback mode, the MPDA causes the called data unit to loop all the data back to the sending MPDA. (This is used to test the MPDA. For more information on testing, refer to the Testing and Maintenance chapter.) Procedure 3-10 describes how to set the remote loopback.

Procedure 3-10
Setting the remote loopback mode

- 1 Press the CR key. The screen displays the following information:

```
ENTER NUMBER OR H (FOR HELP) :
```

A prompt appears on the screen. The only valid characters are those on the screen. Illegal characters result in the following prompt:

```
INVALID COMMAND/ENTRY, REENTER :
```

- 2 Enter "H". The screen displays the Main Menu.
- 3 Enter "M" to select the Modify Menu.
- 4 Enter "R" to select Remote Loopback. The screen displays the following information:

```
REMOTE LOOPBACK (Y/N) :
```

- 5 Enter "Y" or "N".

Comments: The user can change remote loopback by entering a "Y" or keep it the same by entering either "N" or a carriage return only.

- 6 Enter "Q".

Comments: The screen displays the Main Menu, and the user can activate another feature.

Script file

The Script File feature allows users to store host/terminal dialogs in the MPDA, which can be recalled and used to automatically perform log-on procedures. Procedures in this section 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 involve accessing the Learn and Delete Script menus, and the third is for modifying the escape code.

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 Script 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 MPDA. The example directory in the "Accessing learn script menu" procedure 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 3-11
Accessing main script menu

- 1 Press the CR key. The screen displays the following information:

```
ENTER NUMBER OR H (FOR HELP):
```

A prompt appears on the screen. The only valid characters are those on the screen. Illegal characters result in the following prompt:

```
INVALID COMMAND/ENTRY, REENTER:
```

- 2 Enter "H". The screen displays the Main Menu.

```
MAIN MENU  
  
C - CALL                S - SPEED CALL  
A - AUTODIAL           M - MODIFY  
P - DISPLAY PARAMETERS D - SCRIPT FILE DIRECTORY  
CTRL Z TO ABORT KEYBOARD DIALING  
SELECT:
```

3 Enter "M" to select the Modify Menu.

```
MODIFY MENU

A - AUTO NUMBER           M - MANUAL ANSWER
S - SPEED NUMBER         F - SCRIPT FILE
R - REMOTE LOOPBACK      Q - QUIT MODIFY
SELECT:
```

4 Enter "F" to select Script File. The screen displays the following information:

```
L - LEARN SCRIPT
D - DELETE SCRIPT
E - ESCAPE SCRIPT
Q - QUIT
SELECT:
```

If	Do
you want to access the Learn Script menu,	Step 5
you want to access the Delete Script menu,	Step 6
you want to access the Escape Script menu,	Step 7
you want to quit,	Step 8

5 Enter "L" to select Learn Script. The screen displays the following information:

```
A - LEARN AUTODIAL SCRIPT
S - LEARN SPEED DIAL SCRIPT
D - SCRIPT FILE DIRECTORY
Q - QUIT
SELECT:
```

- 6 Enter "D" to select Delete Script. The screen displays the following information:

```
A - DELETE AUTODIAL SCRIPT
S - DELETE SPEED DIAL SCRIPT
D - SCRIPT FILE DIRECTORY
Q - QUIT
SELECT:
```

- 7 Enter "E" to select Escape Script. The screen displays the following information:

```
ESCAPE CODE = [xxh]
MODIFY (Y/N)?
```

- 8 Enter "Q" to quit and return to the Main Menu. (The user can now activate another feature.)

Procedure 3-12 describes the steps needed to access the learn script menu.

Procedure 3-12
Accessing learn script menu

- 1 Press the CR key. The screen displays the following information:

```
ENTER NUMBER OR H (FOR HELP):
```

3-26 NT keyboard dialing

A prompt appears on the screen. The only valid characters are those on the screen. Illegal characters result in the following prompt:

```
INVALID COMMAND/ENTRY, REENTER:
```

- 2** Enter "H". The screen displays the Main Menu.

```
                MAIN MENU

C - CALL                S - SPEED CALL
A - AUTODIAL           M - MODIFY
P - DISPLAY PARAMETERS D - SCRIPT FILE DIRECTORY
CTRL Z TO ABORT KEYBOARD DIALING
SELECT:
```

- 3** Enter "M" to select the Modify Menu.

```
                MODIFY MENU

A - AUTO NUMBER        M - MANUAL ANSWER
S - SPEED NUMBER       F - SCRIPT FILE
R - REMOTE LOOPBACK    Q - QUIT MODIFY
SELECT:
```

- 4** Enter "F" to select Script File. The screen displays the following information:

```
L - LEARN SCRIPT
D - DELETE SCRIPT
E - ESCAPE SCRIPT
Q - QUIT
SELECT:
```

5 Enter "L" to select Learn Script. The screen displays the following information:

```
A - LEARN AUTODIAL SCRIPT
S - LEARN SPEED DIAL SCRIPT
D - SCRIPT FILE DIRECTORY
Q - QUIT
SELECT:
```

If	Do
a script exists,	Steps 6 and 7
a script does <i>not</i> exist,	Steps 8-12

6 Enter "A" to select Learn Autodial Script or "S" to select Learn Speed Dial Script.

Comments: The system displays a question asking if existing script should be deleted. These prompts apply for both Autodial and Speed Call script types.

7 Enter "Y" to delete the script or "N" to retain the script.

Comments: If you enter "Y", the terminal displays the appropriate delete prompt. If you enter "N", the terminal displays the Learn Script Menu.

8 Enter "A" to select Learn Autodial Script or "S" to select Learn Speed Dial Script. The screen displays the following information:

```
xx BYTES (xx.x%) AVAILABLE FOR NEW SCRIPT.
ACTIVATE LEARN MODE (Y/N)?
```

- 9 Enter "Y" to activate learn mode. The screen displays the following information:

```
ENTER SCRIPT NAME :
```

- 10 Enter the script name. The screen displays the following information:

```
ESCAPE CODE = [xxh]  
MODIFY (Y/N)?
```

- 11 Enter "N" to retain the escape code and display the Learn Script Menu.

- 12 Enter "D" to display the Script File Directory. The screen displays the following information:

```
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.
```

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 the following procedure 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 3-13 Accessing delete script menu

- 1 Press the CR key. The screen displays the following information:

```
ENTER NUMBER OR H (FOR HELP):
```

A prompt appears on the screen. The only valid characters are those on the screen. Illegal characters result in the following prompt:

```
INVALID COMMAND/ENTRY, REENTER:
```

- 2 Enter “H”. The screen displays the Main Menu.

```
MAIN MENU  
C - CALL                      S - SPEED CALL  
A - AUTODIAL                  M - MODIFY  
P - DISPLAY PARAMETERS       D - SCRIPT FILE DIRECTORY  
CTRL Z TO ABORT KEYBOARD DIALING  
SELECT:
```

- 3 Enter "M" to select the Modify Menu.

```
MODIFY MENU  
  
A - AUTO NUMBER           M - MANUAL ANSWER  
S - SPEED NUMBER         F - SCRIPT FILE  
R - REMOTE LOOPBACK      Q - QUIT MODIFY  
SELECT:
```

- 4 Enter "F" to select Script File. The screen displays the following information:

```
L - LEARN SCRIPT  
D - DELETE SCRIPT  
E - ESCAPE SCRIPT  
Q - QUIT  
SELECT:
```

- 5 Enter "D" to display the Delete Script File menu. The screen displays the following information:

```
A - DELETE AUTODIAL SCRIPT  
S - DELETE SPEED DIAL SCRIPT  
D - SCRIPT FILE DIRECTORY  
Q - QUIT  
SELECT:
```

If	Do
you want to delete the Autodial script,	Steps 6 and 7
you want to delete the Speed Dial script,	Steps 8 and 9

- 6 Enter "A" to select Autodial script deletion. The screen displays the following information:

```
DELETE AUTODIAL SCRIPT [script name] (Y/N)?
```

- 7 Enter "Y" to delete the Autodial script, or enter "N" to retain the Autodial script.

Comments: If "Y" is entered, the screen displays the following information:

```
AUTODIAL SCRIPT [script name] DELETED
```

Comments: If "N" is entered, the screen displays the following information:

```
SCRIPT NOT DELETED
```

Note: If the script does not exist, the system returns the user to the Delete Script File menu.

- 8 Enter "S" to select Speed Dial script deletion. The screen displays the following information:

```
DELETE EXISTING SPEED SCRIPT FOR ACCESS CODE xx  
[script name] (Y/N)?
```

- 9 Enter "Y" to delete the Speed Dial script, or enter "N" to retain the Speed Dial script.

Comments: If "Y" is entered, the screen displays the following information:

```
SPEED SCRIPT DELETED FOR ACCESS CODE xx [script name]
```

Comments: If "N" is entered, the screen displays the following information:

```
SCRIPT NOT DELETED
```

Note: If the script does not exist, the system returns the user to the Delete Script File menu.

Example script

Table 3-2 shows an example script file.

Table 3-2xxx
Example script file

Prompt	User input
Tag (Access Code):	Autodial
Name:	Cocos
Actual Script:	
HOST PROMPT:	X25>
DTE RESPONSE:	C000004630100 (CR)
HOST PROMPT:	Password
DTE RESPONSE:	Meridian (CR)
HOST PROMPT:	Data Transfer mode
PAUSE	
DTE RESPONSE:	V
HOST PROMPT:	UserID
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 MPDA receives one escape character, it inserts one pause (lasting 1 second) into the script file. The user may enter as many consecutive pauses as needed.
- If the MPDA 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 MPDA'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

Use Procedure 3-14 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 prompt "RELEASED" is displayed. If the Digit Display feature is not assigned to the MPDA, the calling number is not displayed at Step 1.

Procedure 3-14

Answering incoming calls manually

- 1 The user receives an incoming call, and the screen displays the following information:

```
INCOMING CALL. ANSWER? Y/N
```

Comments: The MPDA sends a BELL character to the terminal. The screen displays the calling number. Entering a (CR) only is taken as a Yes reply.

- 2 Enter either "Y" or a carriage return only to answer the incoming call.

Comments: If the data call is established, the screen displays the following information:

```
INCOMING CALL CONNECTED
```

Comments: If the calling party requests the MPDA to loopback data, the screen displays the following information:

```
UNDER TEST
```

Comments: If the incoming data call connection failed because of a mismatch in baud rate or an unsupported data pattern, the screen displays the following information:

```
INCOMPATIBLE INCOMING CALL  
RELEASED
```

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 MPDA, the calling number is not displayed at Step 1. Procedure 3-15 describes how to establish Auto answer.

Procedure 3-15 Answering incoming calls automatically

- 1 The user receives an incoming call, and the screen displays the following information:

Comments: If the data call is established, the screen displays the following information:

INCOMING CALL CONNECTED

Comments: If the calling party requests the MPDA to loopback data, the screen displays the following information:

UNDER TEST

Comments: If the incoming data call connection failed because of a mismatch in baud rate or an unsupported data pattern, the screen displays the following information:

INCOMPATIBLE INCOMING CALL

RELEASED

Hayes keyboard dialing

Hayes KeyBoard Dialing (KBD) allows you the option of using commands compatible with the Hayes V-series Smartmodem 9600 to originate and answer data calls. This allows the MPDA 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
Note: SL-100 does not support Prefix NRS outbound 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 Meridian Communication Adapter (MPDA) power on.
- Ensure that the LED on the back of the MPDA is flashing at a constant rate to indicate the MPDA is functioning properly. (See Figure 4-1.)

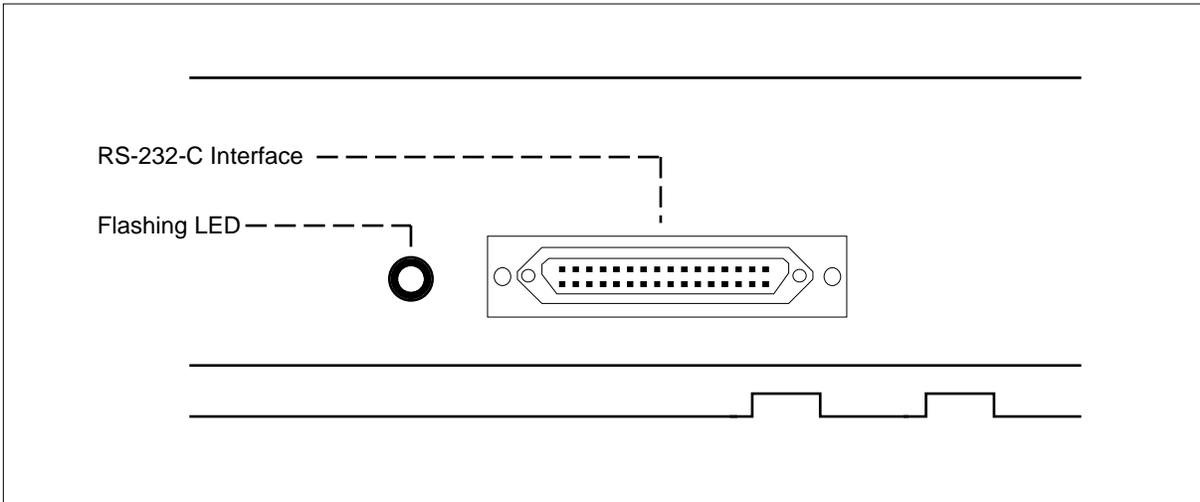
The MPDA operates in one of two modes: command or on-line. After initializing the MPDA, the command mode becomes active. The command mode continues until an acceptable autobaud character is entered. To activate Hayes KBD, enter "AT". AT must be either "AT" or "at". "At" and

4-2 Hayes keyboard dialing

“aT” are not recognized. If no autobaud character is entered, the S66 register determines the default keyboard version.

Hayes commands can be issued only when the MPDA is in this state. When you are in the Hayes KBD state, the MPDA returns to the command state after each command line is entered and after a call is completed.

Figure 4-1xxx
MPDA flashing LED



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 NT 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 MPDA 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 (NT KBD), the autobauding operates as follows:

- If a carriage return (0DH) is entered followed by a period (2EH) and another carriage return (0DH), the NT KBD becomes active. Autobaud and autoparity are performed.

- If only a carriage return (ODH) is entered, the NT KBD becomes active with only an autobaud performed. For more information about NT KBD, refer to the section on NT Keyboard Dialing (KBD).
- If “AT”, or “at”, or “A/”, or “a/” is entered, Hayes KBD 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 KBD), 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”, or “at”, or “A/”, or “a/” is entered, Hayes KBD 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 MPDA 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 MPDA 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 could be displayed.

Implementing the P66 command

The P66 key allows the user the flexibility of issuing Hayes commands while in NT KBD or exiting NT KBD and entering Hayes keyboard dialing. The P66 command contains four scrolling screens that enable the user to select which type of modem the MPDA can emulate. The product code with respect to each modem emulation is automatically set up. Unless otherwise requested, the screens are presented on the set's display as shown in Table 4-1.

To select a specific emulation, press “P66”. The default screen selection depends upon the Hayes KBDTYPE field of the MPDA profile. Scroll

through the choices. To select an emulation choice, when the emulation choice appears on the screen, press “P”.

Table 4-1xxx
P66 command screens

Screen	Emulation selection	Action (scroll <<< >>>)
Screen 1	Emulate Smartmodem 9600	Press P to select emulation and exit.
Screen 2	Emulate Smartmodem 2400	Press P to select emulation and exit.
Screen 3	Emulate Smartmodem 1200	Press P to select emulation and exit.
Screen 4	NT 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.

The user can see which P66 state is currently active by entering the P62 command. See Procedure 2-12 in Chapter 2, “Keypad dialing” for instructions on using the P62 command to display the current P66 state.

To return to Hayes keyboard dialing from NT 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 NT KBD state.

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:

- S52 = 57
Hayes = 9 (39h ASCII value)
- S53 = 54
Hayes = 6 (36h ASCII value)

- S54 = 48
Hayes = 0 (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 can not 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 MPDA, refer to Appendix B. Some registers defined in the Hayes keyboard dialing implementation are not applicable to the MPDA and are ignored.

To reset registers S0 through S49 to their default values, the software reset command, “Z”, “Z1”, “&F”, “&Y”, “&Y1” may be used. Registers S50 through S69 are reset to their default values only upon power up.

Register S0-ring to answer ON

S0 sets the ring for the MPDA to automatically answer a call. Setting S0 = 0 disables auto-answer.

Register S1-ring count

The MPDA 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, since 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 MPDA 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 MPDA hangs up if the baud rates are incompatible. If S36 is set to 1 and the MPDA is the answering party, then the MPDA 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 .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 1200), "240" (Smartmodem 2400 or Smartmodem 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 craftsperson. 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 MPDA 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 MPDA 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 (- ,) 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 MPDA 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 and the section on S-registers for detailed information).

A range check is not made on the value assigned to an S-register. The range in Procedure 4-1 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. For more information on S-registers, refer to the *Meridian Modular Telephones Reference Manual*, 555-4001-114.

The MPDA remains in or enters the command state:

- when the MPDA 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 MPDA detects an on-to-off transition of DTR
- when a semicolon “;” is entered at the end of the dial “D” command to return the MPDA to the command state
- when the escape sequence “+++” is entered while the MPDA is on-line
- when a call is dropped using a valid break sequence

Procedure 4-1

Using the Hayes keyboard dialing escape sequence

- 1 Wait at least one second after previous entry.
- 2 Enter “+++” with each character spaced less than 1 second apart.
- 3 Wait at least 1 second before next entry.

The MPDA returns to the command state, and the screen displays the following prompt: “OK”.

In the Hayes command state, your input is interpreted as call setup information. When the call is established (indicated by the CONNECT prompt), the MPDA enters the online state and transmits all data on the RS-232-C interface transparently across the network to the far end MPDA. The MPDA attempts to go on-line in the following situations:

- the dial command “D” is issued

- the on-line command “O0” or “O1” is issued
- the answer command “A” is issued
- the ring count (value of register S1) equals the numbers of rings to answer on (value of register S0)

In this state, the MPDA acts as a full duplex device and it is the responsibility of the DTE connected to the far end MPDA to respond to your input.

The return from on-line state to the command state may be performed by using an escape code sequence. The default escape sequence consists of a minimum of 1 second of no data followed by 3 plus signs “+++” with less than 1 second between each adjacent +, followed by a minimum of 1 second of no data. It is extremely unlikely that such a sequence would be executed accidentally while in the on-line 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 “Using the Hayes keyboard dialing escape sequence”.

After returning to the command state, you may, for example, release the call using the “H” command. Or you may re-enter the on-line state using the “O” command.

Hayes AT commands

Appendix A lists the AT commands supported by the MPDA. Refer to the *Meridian Modular Telephones Reference Manual*, 555-4001-114, for more information on Hayes commands.

If you enter commands without a numerical parameter, the parameter is assumed to be zero. 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 MPDA 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 4-2 describes the Hayes KBD result codes.

Table 4-2xxx
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
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

Keyboard feature operation

Table 4-3 and the following sections illustrate the dialing procedures for AT keyboard dialing.

Dialing modifiers

Dial modifiers are special parameters used to communicate to the MPDA how to dial the telephone number. Table 4-3 describes the dialing modifiers.

Table 4-3xxx
Dial modifiers

Dial modifier	Description
0 -9	Digits for dialing
A, B, C, or 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#).
-continued-	

Table 4-3xxx
Dial modifiers (continued)

Dial modifier	Description
*	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 1 second (ATD4500,1234). This delay is fixed at 1 second and may not be altered by Register S0.
;	This character returns the MPDA to the command state after dialing (ATD9974500;).
! or @	These characters can be used in the dialing string, but have no affect on the dialing sequence.
P, R, T, or W	These characters can be used in the dialing string, but have no affect on the dialing sequence.
-end-	

Establishing a Hayes keyboard call

Enter the command “ATDnnnn” to establish a Hayes KBD call. The MPDA then sends the digits once the carriage return is received. Once the network and data connections are established, the screen displays the following message: “CONNECT”.

Incomplete Hayes keyboard call

Calls can fail to complete the 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. The screen displays the following message: “NO CARRIER”.

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 MPDA.

The MPDA detects an incoming call, and the screen displays the following message: “RING”. The MPDA then counts the number of rings up to the value of register S0 and answers the call. Once the MPDA establishes the data connection, the screen displays the following message: “CONNECT”.

Manual answer

If register S0 contains 0, the MPDA does not answer automatically, and a data call must be answered using the “ATA” command. After this command is entered, the MPDA answers the call and establishes a data connection. The screen displays the following message: “CONNECT”.

Note: No audible ringing is provided by the MPDA. The RI lead of the RS-232-C connection is high for two seconds and low for four seconds. This cycle is counted like physical ringing.

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 MPDA acts as though the autobaud is 19.2 kbps. If the terminal connected to the MPDA is at any speed other than 19.2 kbps, then the display may be unreadable because of the incompatibility of the baud rates. Autobaud the MPDA immediately following any MPDA 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 MPDA is still in the command state. The call may be released by sending any character from the DTE to the MPDA (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 the MPDA is datafilled with the “&D2” or “&D3” commands.

Appendix A

Hayes standard AT commands

Table 5-1 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 5-1xxx
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).
I1	Returns a 2s compliment checksum of MPDA Read-Only Memory (ROM)
I4	Displays a037800c004420 b100000000 (same value as Smartmodem V-series 9600 returns)
O	Go into the on-line state
-continued-	

Table 5-1xxx
Standard Hayes keyboard dialing commands (continued)

Command	Description
O1	Go into the on-line state
Q0*	MPDA returns result codes.
Q1	MPDA 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 MPDA.
&C1	CD tracks far-end RTS. This command is the default if ASERTCD DPOPT is not datafilled for the MPDA.
&D0	Ignore DTR. This command is the default if ASERTDTR DPOPT is datafilled for the MPDA.
&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 MPDA.
&D3	Hang up and reset to default settings (i.e. MPDA profile configuration).
&Q0*	Disable baud rate ADAPTING. MPDA attempts to connect at the speed of last autobaud command. This command is the default if ADAPTING is disabled in the MPDA profile. This command is displayed by SMARTCOM III if the V-SERIES ERROR CONTROL option is set to "N".
<p>Note: The V-SERIES ERROR CONTROL option can be reached via the CONNECT SETTINGS menu of SMARTCOM III.</p>	
-continued-	

Table 5-1xxx
Standard Hayes keyboard dialing commands

Command	Description
&Q5	Enable baud rate ADAPTING. MPDA attempts connection at baud rate of far end. This command is the default if ADAPTING is disabled in the MPDA 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 via 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 MPDA.
&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 MPDA.
&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 MPDA.
&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 MPDA.
Z0	Reset MPDA to default settings.
Z1	Reset MPDA to default settings.
&F	Reset MPDA to default settings.
&Y0	Reset MPDA to default settings.
&Y1	Reset MPDA to default settings.
-end-	

Table 5-2 lists other commands that are supported. However, they are not executed, and no error messages are returned.

Table 5-2xxx
Supported commands not executed (no error messages)

B0	B1	C0	C1	F0	F1	H1	I2	L0	L1	L2	L3	M0
M1	M2	M3	N0	N1	W0	W1	Y0	&G0	&G1	&G2	&J0	&J1
-continued-												

Table 5-2xxx
Supported commands not executed (no error messages) (continued)

&K0	&K1	&K2	&K3	&K4	&K5	&L0	&L1	&M0	&P0	&P1	&T0	&W0
&W1												
-end-												

Appendix B

AT dialing parameter registers

The software reset command “Z” may be used to reset all the registers to their default values. Table 6-1 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 6-1 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 can disable the function associated with that S register. Values larger than 255 are accepted without an error, but are stored in module 256.

Table 6-1xxx
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 return	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 6-1xxx
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 7-1 describes the AT command sets for data calls.

Table 7-1xxx
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 = 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 7-2 describes the AT command sets for voice calls.

Table 7-2xxx
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

Script file menus

The following figures show access to the various script file menus:

- Figure 8-1-Main Menu
- Figure 8-2-Modify Menu
- Figure 8-3-Script File Menu
- Figure 8-4-Learn Script Menu

Figure 8-1xxx
Main menu

```
MAIN MENU

C - CALL                      S - SPEED CALL
A - AUTODIAL                  M - MODIFY
P - DISPLAY PARAMETERS        D - SCRIPT FILE DIRECTORY
CTRL Z TO ABORT KEYBOARD DIALING
SELECT:
```

Figure 8-2xxx
Modify menu

```
MODIFY MENU

A - AUTO NUMBER              M - MANUAL ANSWER
S - SPEED NUMBER            F - SCRIPT FILE
R - REMOTE LOOPBACK         Q - QUIT MODIFY
SELECT:
```

Figure 8-3xxx
Script file menu

```
SCRIPT FILE MENU

L - LEARN SCRIPT
D - DELETE SCRIPT
E - ESCAPE SCRIPT
Q - QUIT
SELECT:
```

Figure 8-4xxx
Learn script menu

```
LEARN SCRIPT MENU

A - LEARN AUTODIAL SCRIPT
S - LEARN SPEED SCRIPT
D - SCRIPT FILE DIRECTORY
Q - QUIT
SELECT:
```

The following procedure shows an example procedure of how to access and learn the autodial script after moving through the menus as shown in Figure 8-1 through Figure 8-4.

Learning the autodial script

- 1 Enter "A". The following message displays if a script already exists.

```
DELETE EXISTING AUTODIAL SCRIPT [script name] [Y/N]?
```

- 2 Enter "Y". The following message displays.

```
AUTODIAL SCRIPT [script name] DELETED
xx BYTES (xx.x%) AVAILABLE FOR A NEW SCRIPT
ACTIVATE LEARN MODE (Y/N)?
```

- 3 Enter "Y". The following message displays. ("xxxx" represents the script name entered by the user.)

```
ENTER SCRIPT NAME: xxxx
ESCAPE CODE = xxh
MODIFY (Y/N)?
```

- 4 Enter "N". ("YES" starts with autodial call; "NO" starts with access code xx speed call.)

```
LEARN MODE ACTIVATED
PASSWD: XXXXXXXX m (CR)
AUTO SCRIPT

YES    NO
```

- 5 Press **Ctrl-X**. After entering the escape code, the program exits the learn mode and returns to the Modify Menu, and the MPDA no longer recognizes this escape code.

Meridian 1 Options 201, 211
Meridian SL-100
Meridian Programmable Data Adapter
(MPDA) Reference Manual

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