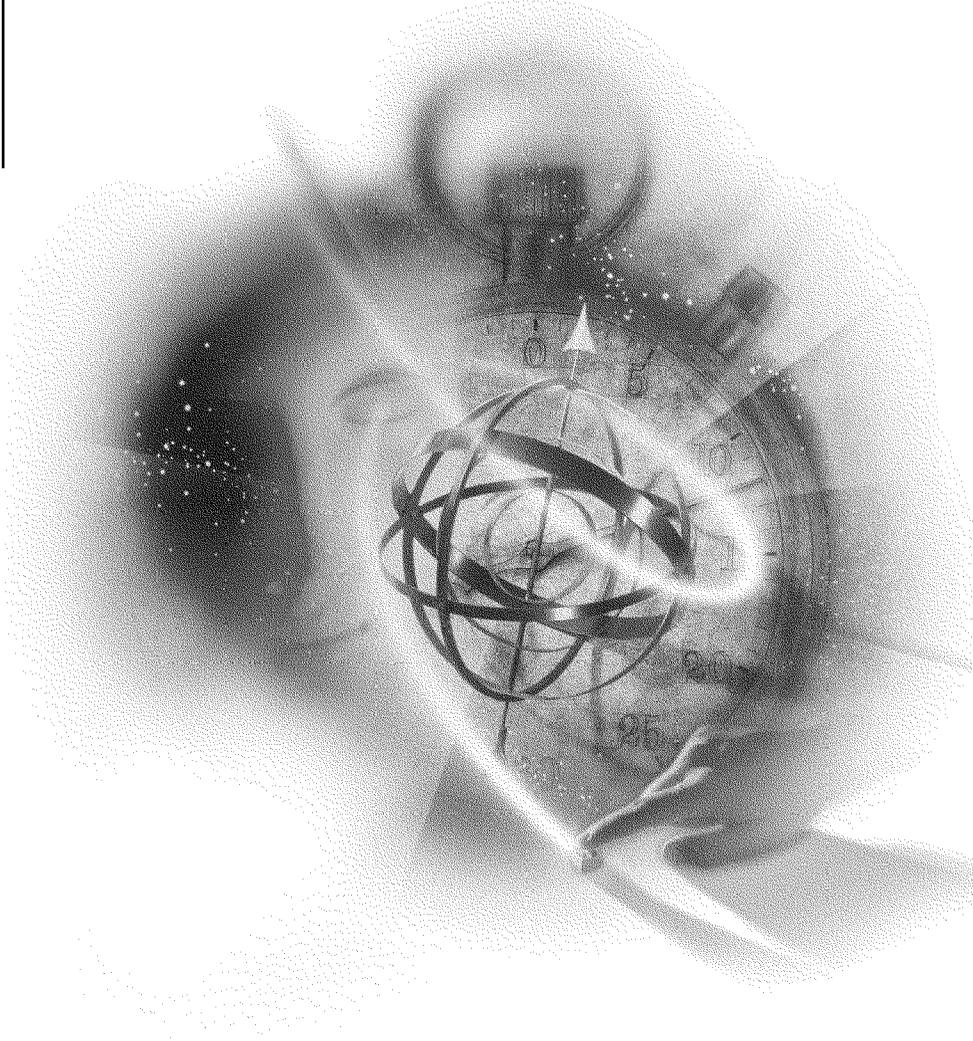


Remote Access References



Connectivity Services

Novell®

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Overview of Remote Access References

This collection of remote access references covers the following topics:

- ◆ Commands for Modem-Independent Ports
- ◆ AIOPAD Commands
- ◆ AIOPAD Service Signals
- ◆ PAD Parameters

1

Commands for Modem-Independent Ports

This reference lists the modem commands that a modem-independent port supports and describes how to set common DIP switches on modems.

Modem Commands

The modem-independence feature in the Novell[®] Internet Access Server 4.1 remote access software initializes a port independently of the modem attached to it by emulating a generic modem. This feature supports a generic modem by emulating common commands from a small set of industry-standard modems. [Table 1](#) lists the modem commands supported on modem-independent ports. This list is a subset of commands supported on most Hayes-compatible modems.

Entering Commands

You enter commands by entering the characters **AT** (attention), followed by a string of one or more command characters and ending with a carriage-return (CR) (that is, the Enter or Return key, ASCII 13). For example, to dial the number 555-1212 and go online, you would enter the command **ATDT5551212**, then press Enter or Return (**DT** is an instruction to dial using the tone method).

Using Numeric Parameters

Many modem command characters are followed by a numeric parameter, usually represented in [Table 1](#) as *n*. Omitting the parameter is the same as setting *n* to zero.

Table 1 **Commands for Modem-Independent Ports**

Command	Description
+++	Enter command mode while establishing a connection.
AT	Attention: begin the command line.
CR	The Enter or Return key; end the command line.
D	Go to originate mode, dial the number that follows, and attempt to go online.
En	$n = 0$ Do not echo command character. $n = 1$ Echo command character.
Hn	$n = 0$ Go on hook (hang up). $n = 1$ Go off hook.
In	$n = 0$ Request modem ID number.
Qn	$n = 0$ Return result codes. $n = 1$ Do not return result codes.
Sr = n	Store number n in register r to control an operating parameter.
Vn	$n = 0$ Display result codes tersely (as numbers). $n = 1$ Display result codes verbosely (as words).
Xn	Enable model-dependent features based on result codes.
z	Reset the modem to restore user default settings from nonvolatile RAM.
&F	Reset the modem to restore factory settings from ROM and switches.
&w	Save the modem setting.

Dialing and Using Dial Modifiers

The special command character **D** (dial) must be followed by a string of characters specifying at least one telephone number and optionally containing additional characters called *dial modifiers*.

For lines that require pulse dialing, precede the telephone number with a dial modifier that sets the modem accordingly. Use the character **P** (pulse) to do this. [Table 2](#) lists all available dial modifiers.

Table 2 Dial Modifiers on Modem-Independent Ports

Command Modifier	Description
0 -9	Regular phone numbers.
A -D	Alphanumeric, special characters, and digits in a phone number.
# (number sign)	
* (asterisk)	
T	Use a tone dial.
P	Use a pulse dial.

Modem Switches

Usually, you are not required to set your modem switches or functions. An automatic modem attached to your remote PC is usually configured correctly by remote access, regardless of the switch settings. However, for manual modems, you might be required to physically change your modem settings.

To enable switch settings for your modem, refer to your modem's documentation. Specific switch settings are not included in this appendix because they differ among modems.

On most modems, DIP switch settings should be set to support the following functions:

- ◆ Data terminal ready (DTR)
The DTR state depends on the interface state.
- ◆ Command responses enabled
- ◆ Autoanswer disabled
Enable the autoanswer switch for manual modems.
- ◆ Data carrier detect (DCD) and data set ready (DSR)
- ◆ Clear to send (CTS) forced to ON
- ◆ Asynchronous operation

2

AIOPAD Commands, Service Signals, and PAD Parameters

This reference lists and defines the commands, service signals, and PAD parameters for AIOPAD. The AIOPAD module in the Novell[®] Internet Access Server 4.1 remote access software implements the X.28, X.29, and X.3 ITU-T (formerly CCITT) standards.

Instructions for changing PAD parameter settings from the LAN workstation, before or after you connect to a remote host, are also provided.

Refer to the following sections:

- ♦ [AIOPAD Commands](#)
- ♦ [AIOPAD Service Signals](#)
- ♦ [PAD Parameters](#)
- ♦ [PAD Parameter Values](#)

AIOPAD Commands

The remote access software supports a subset of the ITU-T X.28 command set. The supported commands and their use are described in this section. If a command is not supported by remote access, you get the PAD prompt (AIOPAD>) after the message ERR INVALID COMMAND.

The following commands are supported.

CALL

Use this command to make a call to a remote DTE.

Syntax

```
[call] rem_DTE_address | call_destination_name  
      [call_user_data ]
```

rem_DTE_address is the destination number to connect to the X.25 network.

call_destination_name is a profile name that is defined in the WAN Call Directory option in the NIASCFG program.

call_user_data contains protocol-specific and application-specific information. This parameter does not affect the transmission of your call, but it is recognized by the host DTE. Use it to specify a password that identifies the computer you are calling, or to make a request to start an application. The maximum length for this parameter is 12 bytes. Because this parameter is defined within a particular host, ask the host administrator if the host uses the User Data field and, if so, what that field contains.

The CALL command is optional for dialing out from LANs and dialing in to NCS dial-in ports. However, for dialing in to a non-dial-in port, the CALL command must be specified with *call_user_data*.

Here are some sample CALL commands:

```
rem_DTE_address  
rem_DTE_address [call_user_data ]  
call rem_DTE_address [call_user_data ]  
call call_destination_name  
call call_destination_name [call_user_data ]
```

Response

COM: The call was successful.

CLR xxx : There was an error in the call and xxx is the cause.

Call Error Invalid DTE Address

Call Error Invalid User Data

Call Error Invalid Facility Requested

Call Error Invalid CSL Target Name

CLR

Use this command to disconnect a connection. The virtual port automatically goes into command mode after the disconnect.

Syntax

```
clr
```

Response

CLR CONF: The disconnection was successful.

CLR ERR: An error occurred during the disconnection.

INT

Use this command to send an interrupt packet to the remote DTE.

Syntax

int

Response

Interrupt Packet Sent

STAT

Use this command to display the status of the virtual port.

Syntax

stat

Response

FREE: The PAD is not connected.

ENGAGED: The PAD is currently connected.

PROF

Use this command to select one of the profiles configured in the AIOPAD.

Syntax

prof *profile_name*

profile_name is the name of the profile defined in remote access.

PAR?

Use this command to display the current values of the virtual port's PAD parameters.

Syntax

par? [p1, . . . , p22]

p1 to *p22* are the parameter number(s) of the parameter or parameters being queried.

Response

PAR *parm:value1, ..., value22*

parm is the parameter number.

value is the value of the parameter.

RPAR?

Use this command to display the current value of the remote PAD's parameters.

Syntax

rpar? [*p1, ..., p22*]

p1 to *p22* are the parameter number(s) of the parameter or parameters being queried.

Response

RPAR *parm:value1, ..., value22*

parm is the parameter number.

value is the value of the parameter.

SET

Use this command to set the virtual port's PAD parameters.

Syntax

set *parm:value*

parm is the parameter number to be changed.

value is the new value of the parameter.

SET?

Use this command to set and display the new value of the virtual port's PAD parameters.

Syntax

set? [*p1, ..., p22*]

p1 to *p22* are the parameter number(s) of the parameter or parameters being queried.

Response

PAR *parm:value1, ..., value22*

parm is the parameter number.

value is the value of the parameter.

RSET

Use this command to set the parameters of the remote PAD.

Syntax

rset *parm:value*

parm is the parameter number to be changed.

value is the new value of the parameter.

RSET?

Use this command to set and display the new value of the remote PAD's parameters.

Syntax

rset? [*p1, ..., p22*]

p1 to *p22* are the parameter number(s) of the parameter or parameters being queried.

Response

RPAR *parm:value1, ..., value22*

parm is the parameter number.

value is the value of the parameter.

LISTEN

Use this command to put a remote access port in autoanswer mode. This allows a remote user to dial in to remote access through an X.25 network. The remote control third-party application must support X.25 connections.

Syntax

```
listen [call_user_data ]
```

call_user_data contains protocol-specific and application-specific information. This parameter does not affect the transmission of your call. The maximum length for this parameter is 12 bytes. This parameter can be used with the CALL command for dialing in to non-dial-in ports (NCS dial-in ports).

Response

Waiting for Incoming Call

CANCEL

Use this command to cancel the LISTEN command. It resets a remote access port that was set to autoanswer mode so that the port is not waiting for incoming calls.

Syntax

```
cancel
```

RESET

Use this command to reinitialize the link without disconnecting.

Syntax

```
reset
```

Response

Reset packet sent

AIOPAD Service Signals

The following are the AIOPAD service signals and their meanings.

RESET xxx

Indicates that a reset has occurred. xxx can be any one of the following:

- ◆ DTE: The host has sent a reset packet.
- ◆ ERR: A reset packet was sent due to a local procedure error.
- ◆ NC: The reset was due to network congestion.
- ◆ RPE: The reset was due to a remote procedure error.

CLR

Clearing has occurred. AIOPAD supports the following clear indication service signals:

- ◆ OCC: The remote DTE is busy.
- ◆ NC: The network is congested.
- ◆ INV: An invalid facility request was received.
- ◆ NA: Access is barred.
- ◆ ERR: A local procedure error occurred.
- ◆ RPE: A remote procedure error occurred.
- ◆ NP: No such number is obtainable.
- ◆ DER: The remote DTE is out of order.
- ◆ PAD: The call was cleared by the local PAD after receipt of an invitation to clear a packet from a remote PAD.
- ◆ DTE: The remote DTE has cleared the call.
- ◆ RNA: Reverse charging was not accepted.
- ◆ CONF: Clearing is confirmed.

COM

A connection has been established.

ERR

An error occurred in a command.

ENGAGED

The virtual port is currently connected.

FREE

The virtual port is not connected.

PAD Parameters

PAD parameters are defined in the X.3 ITU-T Recommendation and are used to identify and control terminals. These parameters are used to set line feed, data forwarding, echoing, editing, and so forth. The PAD values can be set by

the remote access administrator, by the user on a LAN workstation, or by an operator at the host computer.

The remote access software allows you to modify PAD parameters before establishing a connection with a remote host computer. Once you are online with the host computer, you can alter PAD parameter settings using procedures compatible with Recommendation X.28.

Because PAD parameters can differ from one host to another, changes must be made cautiously. Each AIOPAD virtual port maintains its own set of parameters. The PAD parameters that are changed online are valid for the duration of the session only. Once disconnected, PAD parameters revert to their defaults. Table 3 summarizes the PAD parameters and their default values.

Table 3 PAD Parameters with the Default Values

PAD Parameter	PAD Function	Values	Default Value
1	Recall Character	0, 1, 32-126 (user defined)	0
2	Echo	0, 1	1: Yes
3	Data-Forwarding Signal	0, 1, 2, 4, 8, 16, 32, 64	2
4	Idle Timer Delay	0 to 255	0
5	Ancillary Device Control	0, 1, 2	1: Yes
6	Service Signal	0, 1, 4, 5	5
7	Break Signal Action	0, 1, 2, 4, 5, 8, 16, 21	0
8	Discard Output	0, 1	0
9	Padding after CR	0 to 7	0
10	Line Folding	0 to 255	0
11	Terminal Speed (read only)	0 to 18	32
12	Terminal-to-PAD Flow Control	0, 1	1: Yes
13	Line Feed after CR	0, 1, 2, 4, 5, 6, 7	4
14	Padding after LF	0 to 7	0

PAD Parameter	PAD Function	Values	Default Value
15	Editing	0, 1	1: No
16	Character Delete	1 to 127	8
17	Line Delete	1 to 127	14
18	Line Display	1 to 127	18
19	Editing Service Signals	0, 1, 2, 8	0
20	Echo Mask	0, 1, 2, 4, 8, 16, 32, 64	64
21	Parity Treatment	Not supported	0
22	Page Wait	Not supported	0
23	Transparent Mode	0 (OFF), 1 (ON)	0 (Off)
24	User-Defined Forwarding Character	0-0xFF	0
25	Inactivity Timeout	0-255 minutes	0

NOTE: PAD parameters 23 through 25 in Table 1 are AIOPAD-specific and are not standard X.3 parameters.

Use the following syntax to read the X.3 PAD parameters:

PAD number :PAD value

For example, the characters 1:1 mean the PAD parameter 1 is set to 1.

The following paragraphs describe each PAD parameter more fully.

1. Recall Character

Use this parameter to escape from data transfer state to command mode when the character data link escape (DLE) is transmitted from the terminal.

PAD Values

0: Escape not possible

1: DLE (default)

32 to 126: User-defined escape character

NOTE: You can also escape from the data transfer state by setting parameter 7 (Break Signal Action) to 8.

2. Echo

Use this parameter to enable all characters to echo on your screen and to be forwarded to the remote DTE.

PAD Values

- 0: No echo
- 1: Echo (default)

3. Data-Forwarding Signal

Use this parameter to terminate the assembly of a packet and forward it to the network.

PAD Values

- 0: No data-forwarding characters
- 1: Alphanumeric characters (A-Z, a-z, 0-9)
- 2: CR (default)
- 4: ESC, BEL, ENQ, ACK
- 8: DEL, CAN, DC2
- 16: ETX, EOT
- 32: HT, LF, VT, FF
- 64: All other control characters

You can code parameter 3 as a single function or as the sum of any combination of the preceding functions. A useful combination is the value 126, which represents the sum of functions 2 through 64—that is, all control characters and DEL.

4. Idle Timer Delay

Use this parameter to set the time for data forwarding.

PAD Values

- 0: No data forwarding on timeout (default)
- 1 to 255: Units of 1/20 second, maximum 255

5. PAD-to-Terminal Flow Control

Use this parameter to instruct the PAD to read data from an auxiliary I/O device. The PAD must exert flow control.

PAD Values

0: No use of X-ON (DC1) and X-OFF (DC3)

1: Use of X-ON and X-OFF for auxiliary devices (data transfer) (default)

6. Service Signal Control

Use this parameter to determine whether or not service signals and the command prompt are transmitted to the terminal.

PAD Values

0: Suppress service signals

1: Transmit service signals other than the prompt

4: Transmit prompt signals only

5: Transmit service signals and prompt signals (default)

7. Break Signal Action

Use this parameter to specify the procedure upon receipt of a break signal.

PAD Values

0: No action (default)

1: Send an interrupt packet

2: Send a reset packet

4: Send to DTE an indication of break packet

5: Send interrupt and indication of break packet

8: Escape from data transfer state

16: Discard output

21: Discard output, interrupt, and indication of break (1 + 4 + 16)

The coding of parameter 7 can be a single function or the sum of any combination of functions.

8. Discard Output

Use this parameter to control the discarding of data pending output to the terminal.

PAD Values

- 0: Do not discard (default)
- 1: Discard output to terminal

9. Padding after CR

Use this parameter to determine the number of padding characters that the PAD automatically inserts into the character stream transmitted to the terminal following a carriage return (CR).

PAD Values

- 0: No padding after CR (default)
- 1 to 7: Number of padding characters after CR

10. Line Folding

Use this parameter to determine the maximum number of printable characters that can be displayed on the terminal before the PAD can send a format effector (CR or LF).

PAD Values

- 0: No line folding (default)
- 1 to 255: Number of characters per line

11. Terminal Speed

This parameter is set by the PAD when the terminal establishes a physical connection to the network. It indicates the speed of the terminal in bits per second. This is a read-only parameter.

PAD Values

- 0: 110
- 1: 134.5
- 2: 300
- 3: 1200

- 4: 600
- 5: 75
- 6: 150
- 7: 1800
- 8: 200
- 9: 100
- 10: 50
- 11: 75/1200
- 12: 2400
- 13: 4800
- 14: 9600
- 15: 19200
- 16: 48000
- 17: 56000
- 18: 64000
- 32: nonstandard (default)

12. Terminal-to-PAD Flow Control

Use this parameter to enable flow control of received data using X-ON and X-OFF characters. The X-ON character is DC1 Ctrl+Q , and the X-OFF character is DC3 Ctrl+S.

PAD Values

- 0: No flow control
- 1: Flow control using X-ON and X-OFF (default)

13. Line Feed after CR

Use this parameter to instruct the LAN workstation to insert a LF character into the data stream after each appearance of a CR character.

PAD Values

- 0: No LF insertion
- 1: Insert an LF after each CR in the received data stream
- 2: Insert an LF after each CR in the transmitted data stream
- 4: Insert an LF after each CR in the echo to the window (default)
- 5: Combination of 1 + 4

6: Combination of 2 + 4

7: Combination of 1 + 2 + 4

You can code parameter 13 as a single function or as the sum of any combination of the preceding functions. Any value from 0 to 7 is valid.

14. Padding after LF

Use this parameter to determine the number of padding characters that the PAD automatically inserts into the character stream transmitted to the terminal following a line feed (LF).

PAD Values

0: No padding after LF (default)

1 to 7: Number of padding characters after LF

15. Editing

Use this parameter to enable the user to edit either at the PC or at the host. If you enable local editing, the user can correct any data buffered locally rather than sending it across the network to the host for later correction. When editing is allowed, the PC monitors characters that are assigned as the delete, cancel, and display characters, or it refers to the editing functions described by parameters 16, 17, and 18.

PAD Values

0: No editing in the data transfer state

1: Editing in the data transfer state (default)

When you set this parameter to allow local editing, data forwarding timers are automatically disabled.

16. Character Delete

Use this parameter (provided local editing was enabled) to specify the character used to indicate that the previously typed character must be deleted from the buffer.

PAD Values

0: No delete character

1 to 126: Delete character

8: DEL character (default)

The standard character defined for this function is the backspace character (08h).

17. Line Delete

Use this parameter (provided local editing was enabled) to specify the character used to indicate that the previously typed line should be deleted from the buffer.

PAD Values

0: No line delete

1 to 127: Line-delete character

24: CAN character, `Ctrl+X` (default)

18. Line Display

Use this parameter (provided local editing was enabled) to specify the character used to indicate that the previously typed line should be displayed again.

PAD Values

0: No line display

1 to 127: Line-display character

18: DC2 character, `Ctrl+R` (default)

19. Editing Service Signals

Use this parameter to specify the service signal sent to the terminal once the editing functions described by parameters 16, 17, and 18 are performed.

PAD Values

0: No editing (default)

1: Editing for printing terminals

2: Editing for display terminals (default)

8: Editing using characters from IA5

20. Echo Mask

Use this parameter to specify the characters from the PC echoed by the network. The mask applies only when parameter 2 (echo) is set to 1.

PAD Values

0: No echo mask—that is, all characters are echoed except for X-ON and X-OFF in certain cases (see parameters 5, 12, and 22)

1: No echo of CR

2: No echo of LF

4: No echo of VT, HT, FF

8: No echo of BEL, BS

16: No echo of ESC, ENQ

32: No echo of ACK, NAK, STX, SOH, EOT, ETB, ETX

64: No echo of editing characters as designated by parameters 16, 17, and 18 (default)

You can code parameter 20 as a single function or as the sum of any combination of the preceding functions. If parameter 5, 12, or 22 is set to a nonzero value, then X-ON and X-OFF are not echoed.

21. Parity Treatment

AIOPAD does not support this parameter; therefore, you cannot change the default PAD value.

22. Page Wait

AIOPAD does not support this parameter; therefore, you cannot change the default PAD value.

23. Transparency During Data Transfer Mode

This parameter allows you to configure an AIOPAD port to bypass X.3 processing when data is received and transmitted during data transfer mode.

The possible values are 0 (Transparent Mode OFF) or 1 (Transparent Mode ON). The default value is 0 (OFF).

NOTE: This parameter is an AIOPAD-specific parameter, not a standard X.3 parameter.

24. User Defined Forwarding Character

This parameter allows you to specify your own data forwarding character tailored to fit your application. For example, if you are using PPP for your data link, you might set this parameter to 0x7E, which is the frame delimiter for a PPP packet.

The possible values are 0 through 0xFF. The default value is 0 (no user-defined forwarding character).

NOTE: This parameter is an AIOPAD-specific parameter, not a standard X.3 parameter.

25. Inactivity Timeout

This parameter allows you to configure an AIOPAD port so that if there is no data flow for the specified timeout period, the connection is terminated by AIOPAD.

The possible values are 0 to 255 units. Each unit is 10 seconds. For example, a value of 6 specifies a timeout of 60 seconds. The default value is 0 (no timeout).

NOTE: This parameter is an AIOPAD-specific parameter, not a standard X.3 parameter.

PAD Parameter Values

The string of 22 PAD parameters is enabled automatically with its default settings every time you start the AIOPAD module.

Because communication with different hosts might require different terminal characteristics and, therefore, different PAD parameter setups, you can change the values for individual PAD parameters. You can issue the SET? command from command mode to change these settings before or after going online to a host. Or, the administrator can create X.3 profiles in NIASCFG.

To change PAD parameter values, complete the following steps:

1. If you are online with a host computer, switch to command mode.

You can switch to command mode by pressing the data link escape character (DLE). Typically, this character is Ctrl+P.

The following prompt is displayed:

```
AIOPAD>
```

2. Enter the following command to display PAD parameters with their current values.

- ◆ To display a complete list of all the PAD parameters, enter

```
AIOPAD>PAR?
```

- ◆ To display only certain PAD parameters and their values, enter

```
AIOPAD>PAR? p1,p2,p3,...
```

Replace *p1*, *p2*, and so on, with the numbers of the parameters you want displayed.

AIOPAD returns the values for the parameters you requested. For example, if you enter **PAR? 2,3,15**, you receive a response like the following:

```
PAR 2:1,3:2,15:1
```

If you enter an invalid parameter value, an INV message is displayed with the parameter selection.

3. Set new PAD parameter values.

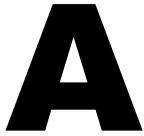
Use SET to set new parameter values. Use SET? to set new parameter values and request their display.

For example, if you enter **SET? 2:0,3:126,4:5,12:1,15:0**, you receive the following response:

```
PAR 2:0,3:126,4:5,12:1,15:0
```

4. If you were connected to a host, return to the host window.

Press the data link escape character, Ctrl+P, to return to your host window, or press Enter on a blank line of the LAN workstation display to return to command mode.



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