

SX.25 User's Guide

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About this Guide

SX.25 includes a packet assembler/disassembler (*pad*) terminal program that lets you log in to the hosts available on a local area network (LAN) or a wide area network (WAN). This guide describes the *pad* program included with SX.25.

This guide is organized into the following chapters, followed by the Glossary and the Index:

Chapter 1, "Getting Started," is an overview of the *pad* program and outlines the use of the different operating modes.

Chapter 2, "SX.25 Pad Program Commands," contains a detailed description of the available commands.

Chapter 3, "Troubleshooting," details some problems you might come up against and suggests solutions. It also lists the V profile and CCITT standard parameter values.

Other manuals related to using SX.25 include:

SX.25 Administrator's Guide

SX.25 Release Notes

IRIX Advanced Site and Server Administration Guide

Getting Started

This chapter contains the following sections:

- “The User Interface”
- “Editing Command Input”
- “Starting a Session”
- “Establishing a Connection”
- “Returning to Command Mode”
- “Closing a Connection”

The SX.25 *pad* program fully supports the packet assembler/disassembler (*pad*) functionality defined in the X.3/X.28/X.29 recommendations.

The X.3 recommendation defines a set of parameters that the *pad* program uses to identify and control the terminal; for example, echo or data forwarding. The parameter values can be preset, set by the terminal user, and/or set by the remote host. A complete set of parameter values is called a *profile*.

The X.28 recommendation defines control procedures, user commands, and the service signals sent by the *pad* program to your terminal.

The X.29 recommendation defines the control messages sent between the *pad* program and the remote host. These messages are carried as X.25 qualified data packets.

When you use the *pad* program in SX.25, you use either command mode or call mode. In command mode, the *pad* program expects one of the commands described in Chapter 2, “SX.25 Pad Program Commands.” In call mode, all the characters you enter are treated as data to be sent to the host you have called. The exception to this is the *BREAKIN* sequence <Ctrl-P a>, which returns you to command mode.

The User Interface

The user interface of the *pad* program provides the commands defined by the X.28 recommendation, plus a set of more user-friendly commands. Refer to Chapter 2, “SX.25 Pad Program Commands.”

The concepts of message, native, and transparent modes are recognized. Use these commands to select a combination of X.3 parameter values. Refer to “Selecting an Operating Mode” later in this chapter.

Editing Command Input

Commands are recognized as complete words or as fixed abbreviations. The abbreviated form has exactly the same effect as the full command.

You can enter commands to the *pad* program in either uppercase or lowercase.

After typing the command

pad

you enter command mode and the prompt is:

PAD:

If you make a mistake when typing a command, but notice this before pressing the Return key, you can correct the line as you go along. The *pad* program lets you delete the previous character in the command line using the Backspace key. Commands are not processed until you press the Return key.

Notation

A control character is a single character obtained by holding down the key marked “Ctrl” while pressing another key. For example, to get <Ctrl x>, hold down “Ctrl” and press “x”.

Starting a Session

There are two steps in logging on to a host using SX.25 across either the remote or the local network.

1. Run the *pad* program. At the system prompt enter:

```
pad
```

The *pad* program prompt is displayed:

```
PAD:
```

2. Call a host.

Alternatively, you can supply a hostname as a parameter to the *pad* command. Enter:

```
pad hostname
```

Selecting the Terminal Type

The *pad* program acts according to the terminal type setting defined by the profile being used. You can select the profile by means of the *profile* command. This lets you choose one of the standard profiles. Your network administrator will know which profile is best for you. If you are using a display terminal, you can set the current terminal type by typing:

```
PAD: vdu
```

For details, see Chapter 2, "SX.25 Pad Program Commands."

Selecting an Operating Mode

When you are making a call, you are connected from a terminal to a remote host and characters typed on the keyboard appear on your video screen. How do the characters get there?

This is known as “echoing” and depends on the type of host machine you are connected to and, in some cases, on the application program you are running. Some types of terminal output echo characters to the screen, which restricts the number of ways they can be used. Most terminals rely on the machine they are attached to for the “echo.” There are a number of ways this can be achieved:

If you are using a screen editor or similar application, the host application program must carry out all the screen formatting functions, so the *pad* program transfers the data directly, without interpreting it at all.

With less critical applications, or simple command line entry, the *pad* program itself can provide the echo and format the data, relieving the host computer of these tasks and reducing the load on the network.

For this reason, the *pad* program in SX.25 supports three kinds of call modes:

1. Message mode is the default mode of operation. It involves line-at-a-time exchange between the terminal and the host. In other words, everything you type on one line is sent to the host after you press Return. The *pad* program is responsible for the detailed control of the terminal, including echoing typed input, input editing, and output formatting.
2. Transparent output mode of operation may be needed in some cases where the host application controls all output formatting and no characters are intercepted or generated by the *pad* program.
3. Native mode of operation means that the characters you type are forwarded to the host immediately. The host has total control of the terminal, including echoing user input, input editing, and output formatting.

From any of these modes, you can return to command mode by issuing the *BREAKIN* sequence:

`<Ctrl p> a`

That is, press `<Ctrl>` and `p` together, then `a`.

In normal operation, you should not need to change the mode yourself. However, the application that you are running (on the currently connected host) may change the mode of operation. For example, a screen editor as described above can select native mode. On exit, the application should reset the mode to its previous value.

The *MESSAGE*, *TRANSPARENT*, and *NATIVE* commands let you set the mode of operation explicitly, as required. These commands are described in Chapter 2, “SX.25 Pad Program Commands.”

Setting the mode type affects the values of the following X.3 parameters:

Echo	(parameter number 2)
Data Forwarding Timeout	(parameter number 4)
Line Folding Width	(parameter number 10)
Local Editing	(parameter number 15)

The effects of the mode changes on these parameters are shown in Table 1-1.

Table 1-1 Effects of Mode Changes on X.3 Parameters

Mode	Parameter Number			
	2	4	10	15
Native	0	1	0	0
Transparent	1	0	0	1
Message	1	0	80	1

Escape Code Sequences

Various escape code sequences are effective if you are currently in message or transparent mode.

An escape code sequence consists of pressing the current *BREAKIN* character (the default is `<Ctrl P>`), followed by one of the following characters:

- a enter *pad* program command mode
- b send a break signal to the currently connected host
- e reverse the current echo state (until `<Return>` typed)
- r reset the current call (if any)
- t forward the current buffered line
- char put the character into the buffer; used mainly for control characters DLE, DC2, and CAN.

Establishing a Connection

First, are you already connected to a host? If not, refer to “Starting a Session” earlier in this chapter. If you have just started a session as previously described, you are not yet connected to a host. If you have not started a session and there is no connection, check the options available by typing:

hosts

This lists all the available hosts to which you can connect, giving both their names and aliases. The list looks something like this:

```
HOSTS AVAILABLE
~~~~~
Name : Thirdfloor-mini-room4
Alias: mini34

Name : Thirdfloor-mini-room3
Alias: mini33

Name : Secondfloor-mini-room6
Alias: mini26
```

You can scroll through the list of hosts using *pg*, or another pager, if you have used the *PAGER* environment variable to specify one. For details, refer to the *pg* (1) manual page. Press `Return` to see the rest of the display.

For example, to make a new connection to the host **mini33**, enter:

```
PAD: call mini33
```

The *pad* program responds with:

```
Connecting ..
```

If the connection is successful, the following message appears:

```
Connected
```

If this message does not appear, turn to Chapter 3, “Troubleshooting.” Otherwise, the login prompt of the host appears.

You are now free to use your terminal as you would normally.

Specifying Your Terminal Type

To provide sophisticated screen management, a number of host computers need to know what type (make) of terminal you are using. Describe your terminal to the host computer you plan to use. When you access other computers, or access a computer from a different type of terminal, you need to describe your terminal again.

For example, on IRIX systems the terminal can be described by specifying “TERM” at run time. Alternatively, if you always use the same type of terminal, it can be permanently set up in your user environment file *.login* or *.profile*.

Returning to Command Mode

To return to command mode from call mode and regain access to the user commands, use the *BREAKIN* sequence **<Ctrl-p a>**.

The *BREAKIN* sequence defaults to `<Ctrl-p a>` but can be altered to any other key sequence by using the *BREAKIN* command. Refer to the description of this command in Chapter 2, "SX.25 Pad Program Commands."

Closing a Connection

An important point about closing a connection is that you may not need to, depending on the setup of the host to which you are connected. Most hosts close the connection automatically when you log off. Thus the most important thing about closing a connection is:

REMEMBER TO LOG OFF FROM THE HOST

If you do not log off, the network resources on the host may get used up. Eventually you cannot reconnect to the host unless your system administrator sorts things out.

An alternative way of closing the connection is to press the *BREAKIN* sequence to bring up the *pad* program prompt and enter:

```
clear <return>
```

This closes the connection. Now you can either enter

```
quit
```

to exit from the *pad* program or

```
CALL
```

to access another host.

Alternatively, you can close the connection and quit the *pad* program in one step by returning to the *pad* program prompt and entering:

```
quit
```

SX.25 Pad Program Commands

This chapter contains the following sections:

- "BREAK (B)"
- "BREAKACTION (BRA)"
- "BREAKIN"
- "CALL (C)"
- "CLEAR (CLR)"
- "ECHO (E)"
- "EMASK (EM)"
- "FLOW (F)"
- "FORWARD (FOR)"
- "HELP (?)"
- "HOSTS (H)"
- "INT"
- "LFINSERT (LF)"
- "LOGHOST (LOG)"
- "MESSAGE (MES)"
- "NATIVE (NAT)"
- "PAGEWAIT (PW)"
- "PARAM (PAR)"
- "PAR?"
- "PRINTER (PRT)"
- "PROFILE (PROF)"

- “QUIT (Q)”
- “RESET (RST)”
- “SET”
- “SET?”
- “STATUS (STAT)”
- “TRANSPARENT (TRA)”
- “VDU”
- “WIDTH (WID)”
- “Command Summary”

This chapter is an alphabetical list of the commands available to users of the SX.25 *pad* program. Most commands have abbreviations, which are shown in parentheses after the command name. A command summary is presented in the last section.

In this chapter, commands are presented in uppercase. You can enter commands in uppercase or lowercase. Where a command has an optional parameter, this is shown in lowercase in square brackets. The command may be entered without a parameter, to report the current value, or with one of the parameter values indicated. Where two values are alternatives, these are shown separated by the symbol ‘|’.

The full command and the appropriate abbreviation are the only commands accepted; these are exact equivalents.

In addition to the X.28 standard interface, the SX.25 *pad* program has a more user-friendly command interface. The rest of this chapter describes the details of each command.

BREAK (B)

This command sends a “break” signal to the currently connected host. The action depends on the setting of the *BREAKACTION* parameter.

BREAKACTION (BRA)

This command sets the action to be taken if you issue a *BREAK* command. You do not normally have to set *BREAKACTION*, as the host should set the value it requires.

The syntax is:

```
BRA [n]
```

where *n* is one of the following settings, causing the action described to be taken:

- 0* no action
- 1* send an interrupt signal
- 2* send a reset
- 5* send an interrupt signal and an indication of break (the default)
- 8* exit call mode to command mode
- 21* send an interrupt signal and an indication of break, then discard output from the host

If you do not supply a parameter, the current setting is displayed.

BREAKIN

This command allows you to alter the *pad* program recall character (the default is <Ctrl P>). There is no abbreviation.

CALL (C)

This command attempts to set up a connection to the named host system with the requested facilities. Hosts can be specified by name or by address. The syntax is:

```
C host [~CUD] [facilities] [G|B[BUG]] [NNUI] [TRPOA]
```

The various fields are described as follows.

The *host* field takes one of the following forms:

name The required name to address mapping must already have been set up by your system administrator; for example:

C host1

LAN addressing

For a call to a host on the LAN, the syntax is:

```
C S.LSAP[ [.N|X].NSAP] [~CUD] [facilities]
[G|B[CGU]] [NNUI] [TRPOA]
```

For example:

C C.080069021CC57E.N.9999

In this example, the *.N* is not necessary.

WAN addressing

For a call to a host on the WAN, the syntax is:

```
C S.DTE [ [.N|X].NSAP] [~CUD] [facilities]
[G|B[CGU]] [NNUI] [TRPOA]
```

If your system administrator has set up hostname/address equivalences, you can use a hostname instead of explicit addressing, such as:

```
C host [~CUD] [facilities] [G|B[CGU]] [NNUI]
[TRPOA]
```

Address components

The meanings of these fields are as follows:

S is the single character logical identifier that specifies the required subnetwork for the call.

DTE is an address of up to 15 decimal digits specifying the subnetwork point of attachment of the remote host. If X.25(88) TOA/NPI addressing is being used, the DTE may be up to 17 decimal digits.

N/X An uppercase *N* or *X* preceded by a period and followed by a period and (N) for an NSAP or (X) for a non-OSI address extension. This is not mandatory. If neither is given, the following field (if present) is read as an NSAP address.

<i>NSAP</i>	is an address of up to 40 hexadecimal digits specifying the point at which the Network Service is provided on the remote host.
<i>~CUD</i>	(Call User Data) is an optional parameter of up to 124 ASCII characters preceded by the character ~, which is passed to the host in the CALL request, following the X.29 protocol identifier bytes of 01000000.

Facility components

You can request any or all of the following facilities for the call. All these parameters are optional and your system administrator will have set up general default values or specific defaults for the host you have specified. These values are used if you leave them unspecified. See your system administrator for information on CUGs and other values for your system.

The facilities fields, entered as a string, are as follows:

<i>Packet Size</i>	to set both the incoming and outgoing sizes to 7, for example, use <i>p7/7</i>
<i>Window Size</i>	to set both the incoming and outgoing sizes to 2, for example, use <i>w2/2</i>
<i>Fast Select</i>	include <i>f</i> in the string
<i>Reverse Charge</i>	include <i>r</i> in the string
<i>Fast Select and Reverse Charge</i>	include <i>fr</i> in the string

Thus, the string may resemble this:

p7/7w2/2fr

<code>[G B]CUG</code>	<p>Closed User Group. Enter a closed user group number to make a call to the specified Closed User Group on the specified host. There are two classes of Closed User Group:</p> <ol style="list-style-type: none">1. A multi-user closed user group: enter the CUG (a number of up to four digits) preceded by <i>G</i>.2. A bilateral closed user group. This type of CUG has only two members. You can be a member of more than one bilateral CUG. Enter the CUG (a four-digit number preceded by <i>B</i>).
<code>NNUI</code>	<p>Network User Identifier. <i>NUI</i> is a string of up to 64 alphanumeric characters, preceded by an <i>N</i>, used to identify your call for the purposes of security or billing.</p>
<code>TRPOA</code>	<p>Recognized Private Operating Agency. This provides the network with additional routing information about your call. Enter <i>T</i>, followed by up to four RPOA numbers of four digits each with no spaces.</p>

CLEAR (CLR)

This command closes the current connection.

ECHO (E)

The syntax is:

`E [on|off]`

where:

on makes the *pad* program echo

off means all echoing must come from the remote host

If you do not supply a parameter, the current setting is displayed. The default setting is *on*.

EMASK (EM)

Use this command to choose which characters are not echoed to the screen. The profile set by your system administrator also determines which characters are echoed to the screen. You should not need to change the echo mask.

The syntax is:

EM [*n*]

where *n* is a mask that stops specified characters being echoed as shown in Table 2-1.

Table 2-1 Mask Commands for Specified Characters

Mask	Characters Affected
1	CR
2	LF
4	VT, HT, FF
8	BEL, BS
16	ESC, ENQ
32	ACK, NAK, STX, SOX, EOT, ETB, ETX
64	DEL, CAN, DC2
128	all other control characters

For example, to instruct the *pad* program **not** to echo the BEL and BS characters, use:

EM 8

To instruct the *pad* program not to echo a larger set of characters, add the values of the parameters. For example, if you do not want to echo VT, HT, FF or BEL or BS enter the following:

EM 12

If no parameter is specified, the current value of the Echo Mask is reported. The default is 192 (128 + 64) so that “all other control characters” and DEL, CAN, and DC2 are not echoed.

FLOW (F)

This enables or disables the local flow control processing of IXOFF and IXON characters by the *pad* program. The syntax is:

F [*on*|*off*]

where:

- on* If flow control is set *on*, you can use an IXOFF character (for example, <ctr1 s>) to halt output to the terminal, and the IXON character (for example, <ctr1 q>) to restart it.
- off* Flow control must be set to *off* if you wish to use these control characters for any other purposes, such as for EMACS type editors.

If you do not supply a parameter, the current state of the flow parameter is reported. The default is *on*, which enables the processing of IXOFF and IXON characters.

FORWARD (FOR)

This selects the data forwarding characters. You do not normally have to change the setting of this parameter; your system administrator should have decided on a sensible value for you.

The syntax is:

FOR [*n*]

The possible parameter settings are as follows:

- 0 no data forwarding characters
- 1 alphanumeric characters
- 2 CR

-
- | | |
|----|--|
| 4 | ESC, BEL, ENQ, ACK |
| 8 | DEL, CAN, DC2 |
| 16 | ETX, EOT |
| 32 | HT, LF, VT, FF |
| 64 | all other control characters not mentioned above,
except BS, XON, XOFF, DEL, CAN, DC2 |

Add two or more numbers together to forward a combination of the sets of characters. For example, to forward on alphanumeric characters (1) and ESC, BEL, ENQ, and ACK (4) enter:

for 5

If you do not specify a parameter, the current setting is displayed. The default is 48 (16 + 32), so that ETX, EOT, HT, LF, VT, and FF are forwarding characters.

HELP (?)

This command gives a one-line summary of a command or the full list of commands. An example screen is given later in this chapter, in the section "Command Summary". The syntax is:

? [*command*]

where *command* produces help for one command only. For example:

HELP breakaction

displays the following:

BREAKACTION [n] (or BRA) - set breakaction

HOSTS (H)

This command lists all the hosts available to you when using the *pad* program. These are hosts that have been set up in the hosts table by the

system administrator. Both standard and abbreviated names are given. The table looks something like this:

```
AVAILABLE
~~~~~
Name : Thirdfloor-mini-room4
Alias: mini34

Name : Thirdfloor-mini-room3
Alias: mini33

Name : Secondfloor-mini-room6
Alias: mini26
```

The hosts table is scrolled using *pg*, (or the pager you define in the *PAGER* environment variable) to control the display. To see more host details when the screen is full, press Return. For details, refer to the *pg(1)* online reference manual page.

INT

This command transmits an interrupt packet to the remote host. There is no abbreviation for this command.

LFINSERT (LF)

This command governs whether or not a linefeed (LF) is inserted after a carriage return (CR). You should not normally have to set this parameter as the host should set an appropriate value. The syntax is:

LF [*n*]

where *n* is one of the following:

- 0 no LF insertion
- 1 add LF after CR in the data from the host
- 2 add LF after CR in the data to the host
- 4 add LF after CR echoed

Add two or more numbers together to set forwarding for a combination of the conditions for LF insertion. For example, to set LF insertion after CR in the data *to* and *from* the host, enter the following:

LF 3

The value of this parameter has no effect in native mode unless echoing is on, in which case the setting of value 4 is allowed. (This is required because certain hosts operate in native mode, but leave local echo enabled.)

In transparent mode, the setting of value 1 has no effect.

If you do not supply a parameter, the current setting of the parameter is displayed. The default value is 6.

LOGHOST (LOG)

This command displays all incoming and outgoing X.29 messages to and from the host, for the purpose of fault diagnosis. You do not normally have to use this command. The syntax is:

```
LOG [on|off]
```

Parameter numbers and values are specified as pairs of hexadecimal numbers, separated by a space. The format of the message displayed is as follows:

```
X29 TX|RX Code <Parameter Value Parameter Value ....>
```

TX is used to display values for transmitted messages, *RX* for received messages. For example:

The following message reads parameters 02, 04, and 0F hex:

```
X29 RX 4: 02 00 04 00 0F 00
```

The following message sets parameters 02, 04, and 0F hex to 01:

```
X29 RX 2: 02 01 04 01 0F 01
```

Messages beginning like the following are parameter indication messages, showing the current values of specified parameters:

```
X29 TX 0
```

MESSAGE (MES)

The *MESSAGE* command sets the mode of operation to message mode. The parameter settings for message mode are shown in Table 2-2.

Table 2-2 Parameter Settings for Message Mode

Mode	Parameter Number			
	2	4	10	15
Message	1	0	80	1

This means that echoing is *on*, the data forwarding timeout is *off*, the line folding width is 80, and local editing is allowed. For details of the modes see the subsection “Selecting an Operating Mode” in Chapter 1.

This is the default mode of operation. Refer to the *NATIVE* and *TRANSPARENT* commands for other operating modes.

NATIVE (NAT)

This sets the mode of operation to native mode. The parameter settings for native mode are shown in Table 2-3.

Table 2-3 Parameter Settings for Native Mode

Mode	Parameter Number			
	2	4	10	15
Native	0	1	0	0

This means that echoing is disabled, data forwarding timeout is enabled, there is no line folding, and local editing is disabled. For more information about the different types of operating mode, see the subsection “Selecting an Operating Mode” in Chapter 1.

The default operating mode is message mode.

PAGEWAIT (PW)

Use this command to make the display pause after *n* lines. The syntax is:

```
PW [n]
```

where *n* is the range for the pagewait parameter, 0 - 255. If *n* is set to 0, there is no pagewait and the display scrolls off the screen.

To continue after a pagewait, press the space bar. All other characters, with the exception of the BREAKIN character, are ignored.

If you do not supply a parameter, the current setting is displayed. The default is 0, meaning that any display that is too long will scroll off the screen.

PARAM (PAR)

This command displays the current values of all the X.3 parameters in parameter *number:value* pairs. For example, when the default settings for the V5 profile are being used, the *PARAM* command returns:

```
1:1 2:1 3:48 4:0 5:0 6:1 7:5 8:0 9:0 10:80 11:14 12:1 13:6  
14:0 15:1 16:127 17:24 18:18 19:2 20:192 21:0 22:0
```

For an explanation of each of the parameters and their commonly used values, refer to the section “Parameter Values” in Chapter 3.

PAR?

This command displays the current values of the parameters you specify in *number:value* pairs. This call has no abbreviation. The syntax is:

```
PAR? <par list>
```

where <par list> is one or more numbers from the list presented in Chapter 3, separated by spaces or commas. For an explanation of the meaning and usage of the parameters, refer to the section "Parameter Values" in Chapter 3.

For example:

```
PAR? 2,4,10,15
```

returns:

```
PAR 2:1, 4:0, 10:80, 15:1
```

Separate the list of parameters you request with commas or spaces. If you do not specify parameters, all the parameters are displayed in *number:value* pairs.

PRINTER (PRT)

This is used to tell the *pad* program that you are using a hard-copy terminal. This command and the *VDU* command set parameter 19. If you want to see the current value, use the *PAR?* command. The value 1 is for a hard-copy terminal, the value 2 is for a video display unit.

PROFILE (PROF)

This command selects a set of terminal options pre-defined as a profile. These profiles contain default values for the X.3 parameters. The syntax is:

```
PROF [p]
```

where *p* is the name of the profile in either uppercase or lowercase. The following example sets the V2 profile:

PROF V2

The default profiles supplied are as detailed in “Parameter Values” in Chapter 3. Your system administrator can set the default profile and specify the set of usable profiles.

If you do not supply a parameter, the current profile will be displayed.

QUIT (Q)

The *QUIT* command closes the connection and you exit the *pad* program to the system prompt.

RESET (RST)

This command sends a *Reset Request* to the currently connected host.

SET

The *SET* command sets the parameters you specify to the values you supply. It lets you change the setting of parameters from the value used in the selected profile. Your system administrator can advise you about the profile and the parameter settings you should use. There is no abbreviation. The syntax is:

```
SET <parameter number:value, parameter number:value,...>
```

The number of the parameter is followed by a colon and the desired parameter value. For example, to set parameters 2, 10, and 13, enter:

```
SET 2:1, 10:72, 13:4
```

Number:value pairs in a list should be separated by commas or spaces.

If you supply the name of a parameter without a value, or with an invalid value (for example 13:8 rather than 13:4 in the above example), a message in the form `PAR 13:INV` is returned and the value of the parameter remains unchanged.

SET?

This command sets the parameters you specify to the values you give. Unlike the `SET` command, this displays the parameters and the values you specify. The number of the parameter is followed by a colon and the setting you want the parameter to have. There is no abbreviation. The syntax is:

```
SET? <parameter number:value, parameter number:value,...>
```

For example:

```
SET? 2:1,10:72,13:4
```

returns:

```
PAR 2:1,10:72,13:4
```

Number:value pairs in a list should be separated by commas or spaces.

If you supply the name of a parameter without a value, or with an invalid value (for example 13:8 rather than 13:4 in the above example), a message in the form `PAR 13:INV` is returned and the value of the parameter remains unchanged.

STATUS (STAT)

This command displays the status of the connection and the name of the host to which you are connected. If no parameter is specified, the current call connection status is reported. The syntax is:

```
STAT [all]
```

where the parameter *all* produces further status information. For example:

```

Echo = ON, Echomask = 192, Flow = ON, Lfinsert = 6,
Breakaction = 5 Pagewait = 0, Width = 80, Forward = 48,
Timeout = 0, Message Mode Profile = V3, Vdu, Loghost = OFF

Call Status: Call Connected

Host: centralhost

```

TRANSPARENT (TRA)

This command sets the mode of operation to transparent mode. The parameter settings for transparent mode are shown in Table 2-4.

Table 2-4 Parameter Settings for Transparent Mode

Mode	Parameter Number			
	2	4	10	15
Transparent	1	0	0	1

This means that echoing is *on*, data forwarding is disabled, there is no line folding, and editing is enabled. For more details about the use of the different operating modes, see “Selecting an Operating Mode” in Chapter 1.

The default operating mode is message mode.

VDU

The *VDU* command (for video display unit) is used to tell the *pad* program that you are using a display terminal. There is no abbreviated form.

This command and the *PRINTER* command set parameter 19. If you want to see the current value, use the *PAR?* command. The value 1 is for a hard-copy terminal, and the value 2 is for a VDU (the default).

WIDTH (WID)

This is used to define the width of the terminal screen in use. On output, when this width is reached, a “newline” is inserted. The syntax is:

WID [*n*]

where *n* is the screen width. The range for the parameter is 20 - 255. If you do not supply a parameter, the current setting is displayed. The default screen width is 80.

Command Summary

If you enter *HELP* or *?* while using the *pad* program, a one-line description of each of the commands available in the current interface is displayed. The screen is scrolled using *pg*, (or the pager you define in the *PAGER* environment variable). Press Return to see the remaining display.

Table 2-5 provides a quick summary of the available commands. For more details about *pg* options, refer to the *pg(1)* online reference manual page.

Table 2-5 Command Summary

Command	Abbreviation	Description
<i>BREAK</i>	(or <i>B</i>)	send break signal to the host
<i>BREAKACTION</i> [<i>n</i>]	(or <i>BRA</i>)	set breakaction
<i>BREAKIN</i>		set <i>pad</i> program recall character
<i>CALL</i> <i>host</i>	(or <i>C</i>)	set up a connection to the named host
<i>CLEAR</i>	(or <i>CLR</i>)	close the current connection
<i>ECHO</i> [<i>on</i> <i>off</i>]	(or <i>E</i>)	enable/disable terminal echo
<i>EMASK</i> [<i>n</i>]	(or <i>EM</i>)	set terminal echo mask to <i>n</i>
<i>FLOW</i> [<i>on</i> <i>off</i>]	(or <i>F</i>)	enable/disable terminal flow control
<i>FORWARD</i> [<i>n</i>]	(or <i>FOR</i>)	set data forwarding conditions
<i>HELP</i>	(or <i>?</i>)	display help information

Table 2-5 (continued) Command Summary

Command	Abbreviation	Description
<i>HOSTS</i>	(or <i>H</i>)	list all the hosts available
<i>INT</i>		send an interrupt packet
<i>LFINSERT</i> [<i>n</i>]	(or <i>LF</i>)	set linefeed insertion action
<i>LOGHOST</i> [<i>on</i> <i>off</i>]	(or <i>LOG</i>)	display X.29 messages
<i>MESSAGE</i>	(or <i>MES</i>)	enable message mode of operation
<i>NATIVE</i>	(or <i>NAT</i>)	enable native mode of operation
<i>PAGEWAIT</i> [<i>n</i>]	(or <i>PW</i>)	set page wait to <i>n</i> lines
<i>PARAM</i>	(or <i>PAR</i>)	display current X.3 parameters
<i>PAR?</i> [<i>par list</i>]		display specified X.3 parameters
<i>PRINTER</i>	(or <i>PRT</i>)	define terminal as hardcopy device
<i>PROFILE</i> [<i>p</i>]	(or <i>PROF</i>)	set terminal profile
<i>QUIT</i>	(or <i>Q</i>)	exit the <i>pad</i> session
<i>RESET</i>	(or <i>RST</i>)	reset the current call
<i>SET</i> [<i>par list</i>]		set specified X.3 parameters
<i>SET?</i> [<i>par list</i>]		set and display specified X.3 parameters
<i>STATUS</i> [<i>all</i>]	(or <i>STAT</i>)	list the status of the connection
<i>TRANSPARENT</i>	(or <i>TRA</i>)	enable transparent mode of operation
<i>VDU</i>		define terminal as display device
<i>WIDTH</i> [<i>n</i>]	(or <i>WID</i>)	set terminal width to <i>n</i> characters

Troubleshooting

This chapter contains the following sections:

- “Connection Problems”
- “Using a Hard-Copy Terminal”
- “Parameter Values”

Connection Problems

If a connection to a host is rejected or disconnected, the *pad* program displays a message giving a reason for the call being cleared. The message includes a hexadecimal error code. There are two types of problems:

1. Problem with the network between the *pad* program and the remote host.

This happens if a wrong LSAP address is called, or if the remote host is down or not switched on, or if the network between the host and the *pad* program is down. The message is:

```
Call Cleared Out of Order (0900)
```

2. Rejection or disconnection caused by the remote host.

In this case, the message is of the form:

```
Call Cleared By Remote (00E8)
```

The first two hexadecimal digits are 00 and the last two identify the reason for the rejection or disconnection. Table 3-1 is a list of the more common reasons reported:

Table 3-1 Disconnection Codes

Error Code	Error Code Interpretation
E1& E2	The connection was disconnected. The remote host has gone down or the network between the <i>pad</i> program and the remote host has failed.
E3 & E4	The connection request was rejected by the remote host for unspecified reasons.
E7	The connection request was rejected. The called NSAP address on the remote host is busy.
E8	The connection request was rejected. The called NSAP address on the remote host is permanently unreachable. This code may be returned if the host name is passed to a gateway and the gateway cannot find the name in its tables.
EB	The connection request was rejected. The called NSAP address on the remote host is unknown.
F1	The connection was disconnected. Normal disconnection by the remote host.
F2	The connection was disconnected. Abnormal disconnection by the remote host.

Using a Hard-Copy Terminal

If you are using a hard-copy terminal, set the terminal type by typing:

printer

If you are on a hard copy terminal and you type `<Ctrl x>`, the sequence "XXX" followed by a Newline is echoed. Also, when you delete characters, your data input may appear confused. The deleted characters are echoed between `'\'` and `'\'` characters. You can redisplay the whole edited line by typing `<Ctrl r>`.

Parameter Values

Table 3-2 summarizes the PSS V profiles and CCITT standard parameters, which are used with the *PAR* and *PARM* commands. For more information on the meanings of parameters, refer to the CCITT X.3 Recommendation.

Table 3-2 Parameter Values

Parameter and Meaning	PSS V profile	CCITT Transparent	CCITT Simple
1. Escape to <i>pad</i> prompt	1	1	0
2. Echo	1	1	0
3. Data forwarding	48	126	0
4. Data forwarding on timeout	0	0	20
5. Flow control by <i>pad</i>	0	1	0
6. Suppression of <i>pad</i> service signals	1	1	0
7. Action of <i>pad</i> on break	5	2	2
8. Data delivery	0	0	0
9. Padding after CR	0	0	0
10. Line folding	*	0	0
11. Terminal speed	9600	14	14
12. Flow control by terminal	1*(0)	1	0
13. LF insertion after CR	6	0	0
14. Padding after LF	0	0	0
15. Editing	1	0	0
16. Character delete character	127	127	127
17. Buffer delete	24	24	24
18. Display character	18	18	18
19. Terminal type	2	1	1

Table 3-2 (continued) Parameter Values

Parameter and Meaning	PSS V profile	CCITT Transparent	CCITT Simple
20. Echo mask	192	0	0
21. Parity	0	0	0
22. Page wait	0	0	0

Note: The line folding values as denoted with an "*" in Table 3-2 differ depending on the V profile number: V1-72, V2-120, V3 -80, V4-132, or V5-80.

Glossary

CCITT

The International Consultative Committee for Telephony and Telegraphy, the X.25 regulatory body.

CUG

Closed User Group.

DCE

Data Circuit-Terminating Equipment.

DLE

Data Link Escape.

DTE

Data Terminal Equipment. The user equipment (computer, terminal, etc.) connected to a network.

ISO

International Organization for Standardization.

NSAP

Network Service Access Point.

PAD

Packet Assembler/Disassembler. A means of interfacing a character terminal to an X.25-based network.

PSS

Packet SwitchStream. British Telecom's X.25 Packet Switched Network (PSN).

RPOA

Recognized Private Operating Agency.

TOA/NPI

Type Of Address / Numbering Plan Identification. An address format that provides increased addressing capacity suitable for communication with ISDNs.

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