

HP 18266A Enhanced X.25 Analysis

for the HP 4952A Protocol Analyzer



User's Guide



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Introduction

An Overview of the HP 18266A Features

The HP 18266A Enhanced X.25 Analysis Application broadens the X.25 frame and packet decode capabilities for the HP 4952A.

The main features are:

- User definable X.25 display formats (one or two column format)
- Ability to decode X.25 extended control
- Addition of frame arrival time information in Examine Data
- Addition of the expansion feature which decodes Facilities, Registration, Cause, Diagnostic, Call user data, and Calling/Called Address fields during Examine Data
- Display of Data in a Packet
- Link filtering of S-frames.

The HP 18266A features are described in the following paragraphs.

User Definable X.25 Display Formats

The user definable display format feature provides user definable decode formats which are available during run time or Examine Data. You can define up to five different display formats which can be either in one or two column format. You may choose to display or not display any of the frame and packet fields in any arrangement desired within the bounds of two lines. A user definable data field and frame arrival time can be also displayed.

These user defined formats can be stored away as an extended menu for later use.

X.25 Extended Control

This decode works with extended control selected in the Set Up menu to provide a more complete X.25 solution.

NOTE

The HP 4952A Level 2 or Level 3 string assisted entry assumes that extended control is OFF.

Frame Arrival Time

The frame arrival time feature displays the time that the frame was received during the Monitor or Simulate period. This time is relative to the start of the run. The frame arrival time feature is available only during Examine Data.

Expansion Feature

The expansion feature is available only during Examine Data. When the expansion function is entered, the Facilities, Registration, Cause, Diagnostic, and Calling/Called fields are displayed (if decoded) for the frame currently indicated by the cursor.

While in the expansion feature, information in the user data field is decoded by pressing [MORE], then <Dec/Data>. Up to 160 bytes of user data are displayed in place of the information decoded for the Cause, Diagnostic, and Address fields. These fields are redisplayed when you press the <Dec/Data> key again.

The expansion feature allows you to see all the decoded frame and packet information by pressing one key, without changing the display format.

Display of Data in Packet

This feature lets you (in the user definable display formats) display up to 32 bytes of data in a one column display, or 15 bytes in a two column display. The data field can be specified to start in any octet from 1 to 4096. If you wish to see all of the data, move the cursor to the desired frame and change the display format to the two line or data and state format. The cursor in the newly selected display format indicates the selected frame, and all of the data is displayed.

Link Filtering of S-Frames

NOTE

Link filtering of S-Frames is only available with the X.25 protocol selected.

To make more efficient use of the buffer and store only the information of interest, you can "filter" data before it enters the buffer.

The Enhanced X.25 Analysis filter selections are: the Supervisory Frame Filter, and the Timing and Leads Filter. They may be either Off or On. The default state is Off.

Loading and Storing Your Software

This chapter tells you how to load and store the HP 18266A Enhanced X.25 Analysis application program, the predefined and user-definable X.25 displays, and Sample Data into your HP 4952A Protocol Analyzer.

NOTE

After creating a user-definable X.25 display setup, store it as an extended menu (<Ext- Menu>) to disc. See *Storing and Loading Extended Menus* in this chapter.

The manual assumes that you are already familiar with the basic use of the protocol analyzer. For your convenience, brief instructions on how to get the analyzer running are given *here*.

For detailed information concerning voltage and grounding requirements, power cords, and operation refer to the HP 4952A Protocol Analyzer Operating Manual.

Making A Working Copy Of The Master Disc

Hewlett-Packard recommends that you make a working copy of the master disc. Use the working copy and retain the master as a backup in case your working disc fails due to wear or accidental erasure. Copying an application program for any reason other than your own backup violates copyright laws.

The HP 18266A Enhanced X.25 Analysis application includes a master disc and a blank disc. The blank disc is provided so you can make a working copy of the master disc. To make a working copy of your master disc, perform the procedure on the following page.

1. Locate your master disc copy and insert it into the disc drive.
2. In the top level menu, press [MORE], then <Mass Store>. The disc directory is read and displayed.
3. Use the arrow keys to locate and highlight the **ENHANC_X25** application.
4. Press <Load>, then <Execute> to load the application into the HP 4952A Protocol Analyzer's memory. The top level menu will be displayed when the load is complete.
5. Remove the master disc, and insert a formatted disc into the disc drive.
6. Press [MORE], then <Mass Store> to return to the mass store menu.
7. Press <Store>, then type ENHANC_X25 in the File Name field. Move the cursor down to the File Type field and press <Applic Prog>.
8. Press <Execute>. You now have a working copy of the master disc.

Looking At The Disc Directory

To look at the disc directory perform the following:

1. Insert the disc into the disc drive.
2. In the top level menu, press [MORE], then <Mass Store>. The disc directory is read and displayed.
3. Press [EXIT] to leave the Mass Store menu.

Loading The Application Program

1. Insert the Enhanced X.25 Analysis Application disc into the disc drive.
2. In the top level menu, press [MORE], then <Mass Store>. The disc directory is read and displayed.
3. Use the arrow keys to select the **ENHANC_X25** Application Program.
4. Press <Load>, then <Execute>.

The disc is read and the Enhanced X.25 Analysis application program is loaded into the protocol analyzer memory. The top level menu reappears and shows that the application is active. Whenever you turn off the analyzer, or press <Reset>, then <Reset Aplic>, the application is cleared from memory.

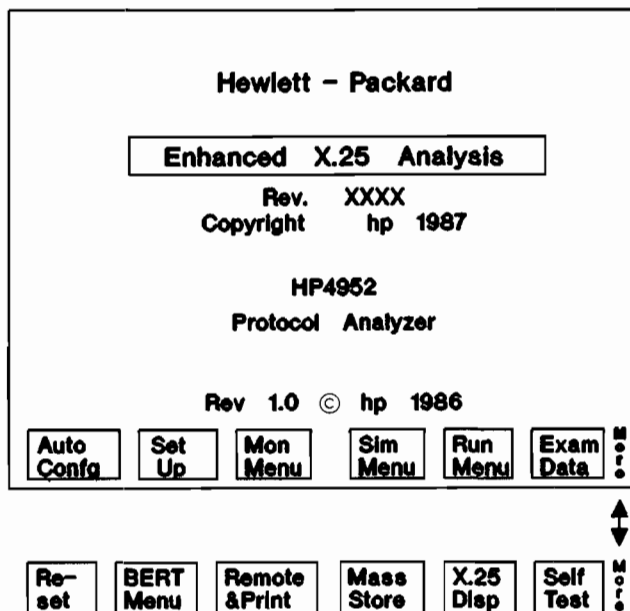


Figure 2-1. Top Level Menu

Storing and Loading Extended Menus

A feature of the HP 4952A is the storage of extended menus to disc. You must store your Enhanced X.25 Analysis user-definable display setups as extended menus.

To store an extended menu perform the following:

1. Insert a formatted disc into the disc drive.
2. From the top level menu press [MORE], then <Mass Store>.
3. Press <Store>.
4. Type in the file name you wish to call this menu in the File Name field.
5. Use the down arrow key to move to the File Type field. Press <Ext Menu> (extended menu), then <Execute> to store your user-definable displays as an extended menu.

To load an extended menu perform the following:

1. Insert the disc containing the files you wish to load in the disc drive.
2. From the top level menu press [MORE], then <Mass Store>. The directory of files on the disc is displayed.
3. Use the arrow keys to locate and highlight the extended menu file you wish to load.
4. Press <Load>, then <Execute>.

NOTE

Always go to the top level menu before turning off the analyzer. This saves your menus and buffer data in battery powered, nonvolatile memory.

Loading Sample Data

The sample data provided on your Enhanced X.25 Analysis application disc is a record of a Call used to demonstrate the "expand" feature in the Examine Data menu shown in chapter 4.

To load the sample data file, use the steps given below.

NOTE

Contents of the data buffer will be replaced by the sample data. Store any buffer data that you wish to keep before loading the sample data.

1. From the top level menu press [MORE], then <Mass Store>.
2. Use the arrow keys to highlight the **X25_DATA** file.
3. Press <Load>, then <Execute>.
4. Press [EXIT] to return to the top level menu.

Summary of Steps to Use This Application

Once you have loaded your Enhanced X.25 Analysis application software, you can do the following:

- Modify the Set Up menu according to your specifications. Select Extended Control ON or OFF in the Set Up menu. Select one of the X.25 user definable displays (default is X25-1).
See chapter 3.
- Define up to five Enhanced X.25 Analysis display setups with the new <X.25 Disp> key, or load a predefined Enhanced X.25 Analysis display setup from your application disc.
See chapter 3.
- Examine data while one of your five display setups is active. Press the <expand> key while in Examine Data to view frames and packet information.
See chapter 4.

Setting Up the Application

The Enhanced X.25 Analysis application makes two changes to the Set Up menu. The first is the ability to select Extended Control (Ext Ctrl field) when X.25 or X21/X.25 is selected for the protocol. See figure 3-1 below.

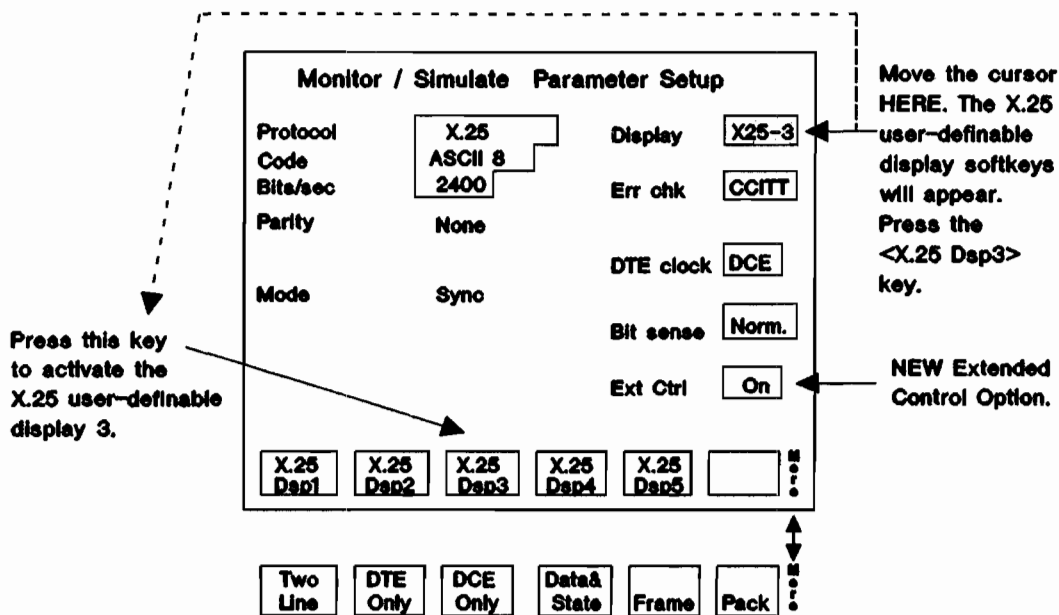


Figure 3-1. X.25 Dsp3 Selected and Extended Control On

The second change allows selection of the new X.25 user definable displays (X.25 Disp field). They are only selectable when X.25 or X21/X.25 is selected for the protocol. X.25 user definable displays are accessed when the cursor is in the Set Up menu's Display field. See figure 3-1.

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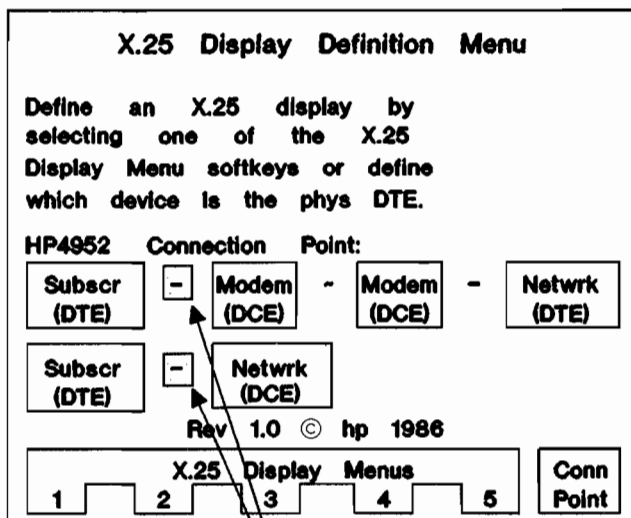
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Setting Up X.25 User Definable Displays

The X.25 user definable display menu allows you to define the format of up to five different X.25 displays, and to define where the subscriber is connected to the network (physical DTE or the physical DCE).

To define an X.25 display perform the following:

1. Press the [More] key in the main menu display.
2. Press the <X.25 Disp> key to access the X.25 Display Definition Menu shown in figure 3-2.



Connection points - Either Subscriber to Modem, or Subscriber to Network depending on whether you have a Modem connected.

Figure 3-2. X.25 Display Definition Menu

3. Select the X.25 Display Menu (one through five) that you wish to define or modify.

4. Define the user definable display Column, Header, and Data Field parameters as follows:
 - a. Select either a one or two Column display format.

The screenshot shows a menu titled "X.25 Display Menu 1". It contains several fields and buttons:

- Display Type :** A box containing "One Column". An arrow points to this box with the text "Cursor is Here."
- X.25 Display Header :** A large empty rectangular box.
- Data Field Parameters :**
 - Field Start Octet :** A box containing "6".
 - Field Length :** A box containing "32" followed by the text "octets".
- Rev 1.0 © hp 1986**
- Three buttons at the bottom: "One Col", "Two Col", and "Print Scrn".

Figure 3-3. One or Two Column Menu

In one column format, subscriber information is displayed in normal video, and network information is displayed in inverse video.

In two column format, subscriber information is displayed in the left block, and network information is displayed in the right block. Each block is 2 lines of up to 15 characters per line.

The one column format can contain up to 32 characters per line (2 lines). The two column format can contain up to 15 characters per line (2 lines). Each field, i.e., Addr, Ns, P/F etc. takes up a certain amount of header space. The amount of header space occupied by each field is given in the "X.25 Display Header Selection" section in this chapter. A field which ends after the header line will cause the error message "Field extends past header line" to appear.

When using the two column display, all fields entered will appear in both header blocks.

c. Define the Data Field Parameters

These parameters enable you to define where in a packet the data field will start, and how long it will be.

The "Field Start Octet" field lets you define on which octet to start the display. The "Field Length" field lets you specify how many octets (from the starting octet) that you want to display.

d. Press the [EXIT] key when you are finished.

X.25 Display Header Selection

The following table gives the amount of field space consumed in the header definition:

Field Name	Abbreviation	Space used
Frame Address	A	1
Frame Type	FType	5
Ns	Ns	3
Nr	Nr	3
Ps	Ps	3
Pr	Pr	3
P/F	P F	1
Q	Q	1
D	D	1
M	M	1
Mod	Mod	3
LCN	LCN	3
Packet Type	PkType	9
Data	dd...d	up to 32
Frame Arrival Time	FrTime	6
FCS	F	1

Frame Address (A)

The frame address (A) is displayed as a hex character.

Frame Type (FType)

All of the frame types are decoded and their 5 character abbreviations are as follows:

Frame Type	Abbreviation
Information	INFO
Receive Ready	RR
Receive Not Ready	RNR
Reject	REJ
Set Asynchronous Balanced Mode	SABM
Set Async Balanced Mode Extended	SABME
Disconnect	DISC
Disconnected Mode	DM
Unnumbered Acknowledgement	UA
Frame Reject	FRMR

Ns and Nr

Ns and Nr require three display spaces each regardless of whether extended control is selected.

Ps and Pr

Ps and Pr require three display spaces each regardless of whether the packet specifies mod 8 or mod 128.

P/F (P_F)

This field is a 1 when the P/F bit is set, and a blank when the P/F bit is not set.

Q, D and M

These fields are simply displayed as a 1 or a 0.

Mod

Mod is displayed as either "8", "128", or Undefined (Und).

Packet Type (PkType)

All of the packet types are decoded and their 9 character abbreviations are as follows:

Packet Type	Abbreviation
Incoming Call	Inc Call
Call Request	Call Req
Call Connected	Call Con
Call Accepted	Call Acc
Clear Indication	Clr Ind
Clear Request	Clr Req
Clear Confirmation	Clr Conf
DTE Clear Confirmation	Clr Conf
DCE Data	Data
DTE Data	Data
DCE Interrupt	DCE Int
DTE Interrupt	DTE Int
DCE Interrupt Confirmation	Int Conf
DTE Interrupt Confirmation	Int Conf
DCE RR	RR
DTE RR	RR
DCE RNR	RNR
DTE RNR	RNR
DTE REJ	REJ
Reset Indication	Reset Ind
Reset Request	Reset Req
DCE Reset Confirmation	Reset Con
DTE Reset Confirmation	Reset Con
Restart Indication	Restart I
Restart Request	Restart R
DCE Restart Confirmation	Restart C
DTE Restart Confirmation	Restart C
Diagnostic	Diag
Registration Confirmation	Reg Conf
Registration Request	Reg Req

LCN

LCN includes both the LCGN and the LCN. It is displayed as a hexadecimal number.

Data (dd...d)

Data is a generic field which you define. You can define the field to be any length up to 32 characters in a one column display or up to 15 characters in a two column display. You must also specify the frame octet with which the field is to begin. The data field can be displayed in either the data code selected in the setup menu or in hex.

This field allows you to display as much of the data in a data packet as desired up to the limit. It is also possible to display decoded data and undecoded data at the same time. For example, assume that the data field has been setup to be 1 octet long and to start at frame octet 5 (Packet Type Identifier field), and the Packet Type has been selected to be displayed. The Data field decode will show the Packet Type Identifier field in an undecoded format, and the Packet Type field will show the same information, but decoded to indicate the packet type as a mnemonic.

Frame Arrival Time (FrTime)

The frame arrival time is displayed ONLY during Examine Data. It is measured from the start of the run to the frame's end flag. The time is displayed as a 6 digit number in milliseconds and is accurate to 1 millisecond.

Frame Arrival Time Overflow. An overflow occurs after 99999 milliseconds. If an overflow occurs, the result will be followed by an *. If a second overflow occurs, the * is no longer displayed.

FCS (F)

The FCS is displayed as "G" for good, "B" for bad and "A" for abort. The "B" and "A" blink to indicate an error.

Defining the HP 4952A Connection Point

This feature allows you to indicate where the analyzer is connected to the network when capturing data, or where the analyzer was connected to the network when the buffer data was captured. If the proper connection point is indicated, the analyzer will decode information in the X.25 user definable display formats as follows:

For one column display formats:

Data from Subscriber is in normal video.

Data from the Network is in inverse video.

For two column display formats:

Data from Subscriber is in normal video (left side of display).

Data from Network is in inverse video (right side of display).

In addition, X.25 packets will be decoded into their proper mnemonics based on where the packet originated. For example, a packet with a Packet Type Identifier of 0B HEX will be decoded as a Call request packet if the packet was sent by the Subscriber, or as an Incoming call packet if the packet was sent by the Network.

The X.25 Display Definition menu as shown in figure 3-2, is a simplified diagram of two common Subscriber connections to an X.25 Network. The inverse video square(s) indicate where in the Network the HP 4952A is connected.

In the top connection diagram, the analyzer may be connected either between the Subscriber and the first Modem, or between the second Modem and the Network.

In the bottom connection diagram, there is only one point where the analyzer can be connected. This is between the Subscriber and the Network. That connection point is logically the same as connecting between the Subscriber and first Modem in the top diagram.

To indicate the proper connection point, move the connection point indicator to the desired location using the <Conn Point> key. The connection point is toggled between the two possible connection points each time the <Conn Point> key is pressed.

Selecting a User Definable Display

The steps required to access the user definable displays are as follows:

NOTE

You must set up the X.25 user definable displays (up to five) before using them. See Setting Up X.25 User Definable Displays in this chapter.

1. Select <Set Up> in the main level menu.
2. Move the cursor into the Display field in the Set Up menu. The Display field softkeys will appear. Keys select which X.25 user definable display you want use.
3. Select the X.25 display (one through five) that you wish to use.
4. Press [EXIT] to return to the main menu display.

or

1. Select <Examine Data> in the main menu.
2. Press [More] twice, then <Chang Dsply>.
3. Select the X.25 display (one through five) that you wish to use. After selecting the X.25 user-definable display you wish use, the display returns to the Examine Data menu with the cursor at the same frame you left from.



Examine Data Enhancements

Examine Data has been enhanced to add further decode capabilities. The new X.25 user-definable display formats are used in Examine Data as well as during run time.

The Enhanced X.25 Analysis application performs decoding of the Facilities, Registration, Cause, Diagnostic, Calling/Called Address fields, and User Data in the Examine Data menu. You can view the decoded fields by pressing [MORE], and then <Expand>. You can view the decoded User Data field by pressing [MORE], <Expand>, and then <Dec/Data>. These features are not available at run time.

Also, during Examine Data, the frame arrival time is displayed if it is selected for display in the X.25 user-definable display format. See the Frame Arrival Time description in chapter 3.

Viewing The Sample Data

Sample data and five predefined X.25 user-definable displays are provided on your Enhanced X.25 Analysis application disc.

The sample data is displayed in figures 4-2 and 4-3. This data was captured on the "network" side of a "modem" using the predefined X.25 user-definable display 3. To view the display on your HP 4952A as seen in figures 4-2 and 4-3, you will have to:

1. Load the sample data (file is X25_DATA) and predefined X.25 user-definable displays (file is DISP_DEFS). See chapter 2 for instructions on "Loading Sample Data and Menus".
2. Select the X.25 user-definable display 3. To do this perform the following:
 - a. From the top level menu, press <Set Up>.

- b. Move the cursor into the Display field, then press the <X.25 Dsp3> key.
 - c. Press [Exit] to return to the top level menu.
 3. Get into the X.25 user-definable display definition menu and change the connection point (See figure 4-1). To do this perform the following:
 - a. From the top level menu, press [MORE], then <X.25 Disp>.
 - b. Press <Conn Point> once. The highlighted connection point will move from "Subscriber - Modem" to "Modem - Netwrk".
 - c. Press [EXIT] to return to the top level menu.

After you have performed the previous steps, you are ready to view the sample data. Select <Exam Data> in the top level menu. The sample data will be displayed.

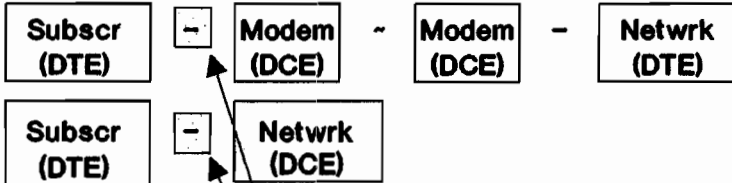
Use the down arrow key (not the <Roll Up> key) to move the cursor over the incoming call frame (Inc Call) as shown in figure 4-2.

Press [MORE], then <Expand>. The fields are decoded for the frame/packet that the cursor is on in Examine Data. In this example the frame was an incoming call. See figure 4-3.

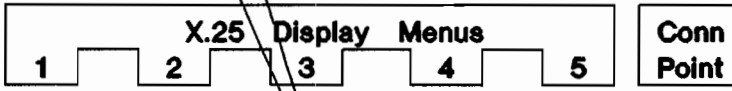
X.25 Display Definition Menu

Define an X.25 display by selecting one of the X.25 Display Menu softkeys or define which device is the phys DTE.

HP4952 Connection Point:



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Connection points - Either Subscriber to Modem, or Subscriber to Network depending on whether you have a Modem connected.

Figure 4-1. X.25 Definition Menu Connection Point

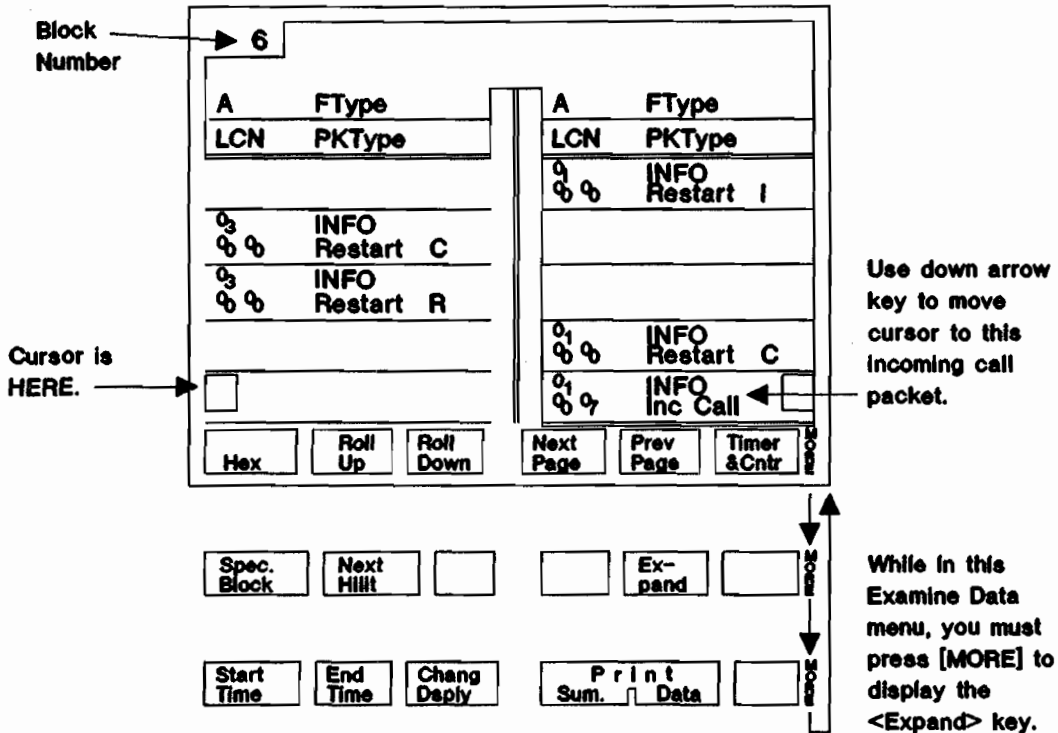


Figure 4-2. Examine Data Menu With Sample Data

The <Next Fr/Pk> and <Prev Fr/Pk> keys scroll thru the packets seen in the Examine Data menu.

Chan	A	FType	Ns	PF	Nr	F	FrTime
DCE	01	INFO	2		2	G	37089

Q	D	Mod	LCN	PkType	Ps	M	Pr
0	0	8	07	Inc Call			

Calling/Called Address
55552460098703/55551230045601

Facilities
Start International Facil
Reverse charge requested

Next Fr/Pk	Prev Fr/Pk	Dec/Data	Roll Up	Roll Down	Print Scrn
------------	------------	----------	---------	-----------	------------

Press this key to decode the User Data

Scrolls up/down thru either Facilities or Registration fields. These two keys only appear if there is a Facilities or Registration field present.

Figure 4-3. Expand Menu With Fields Decoded From Single Packet

Decoded Fields

The Enhanced X.25 Analysis application decodes fields as follows:

Cause Field

The Cause field is decoded in the following packets: Clear request, Clear indication; Reset request, Reset indication; Restart request, Restart indication; Registration confirmation.

The Cause Decode field is associated with WHY an operation occurred.

Clear Indication Cause. The clear indication cause is decoded as a single line of text which indicates the cause of the clear, plus the HEX value of the cause field

HEX	Clear Indication Cause	Display
1XXXXXXXXB	DTE originated	DTE origin
00	DTE originated	DTE origin
01	Number busy	Num busy
09	Out of order	Out of order
11	Remote procedure error	Remote proc err
19	Reverse charge acceptance not subscribed	Rev charge acc not sub
21	Incompatible destination	Incompat dest
29	Fast select acceptance not subscribed	Fast sel acc not sub
39	Ship absent	Ship absent
03	Invalid facility request	Invalid facil request
0B	Access barred	Access barred
13	Local procedure error	Local proc err
05	Network congestion	Net congest
0D	Not obtainable	Not obtainable
15	RPOA out of order	RPOA out of order

Reset Indication. The reset indication cause is decoded as a single line of text which indicates the cause of the reset, plus the HEX value of the Cause field.

The reset indication cause is decoded and displayed as follows:

HEX	Reset Indication Cause	Display
1XXXXXXXB	DTE originated	DTE origin
00	DTE originated	DTE origin
01	Out of order	Out of order
03	Remote procedure error	Remote proc err
05	Local procedure error	Local proc err
07	Network congestion	Net congest
09	Remote DTE operational	Rem DTE operat
0F	Network operational	Net operat
11	Incompatible destination	Incompat dest
1D	Network out of order	Net out of order

Restart Indication. The restart indication cause is decoded as a single line of text which indicates the cause of the restart, plus the HEX value of the Cause field.

The restart indication cause is decoded and displayed as follows:

HEX	Restart Indication	Display
1XXXXXXXB	DTE originated	DTE origin
00	DTE originated	DTE origin
01	Local procedure error	Local proc err
03	Network congestion	Net congest
07	Network operational	Net operat
7F	Registration/cancellation confirmed	Reg/cancel conf

Registration Confirmation. The registration confirmation cause is decoded as a single line of text which indicates the cause of the registration confirmation, plus the HEX value of the Cause field.

HEX	Registration Confirmation	Cause Display
7F	Registration/cancellation confirmed	Reg/cancel conf
03	Invalid facility request	Invalid facil request
13	Local procedure error	Local proc err
05	Network congestion	Net congest

Diagnostic Field

The Diagnostic field is decoded in the following packets: Diagnostic, Clear request, Clear indication, Reset request, Reset Indication, Restart request, Restart indication, and Registration confirmation.

The decode is a single line of text, plus the HEX value of the diagnostic field which indicates the cause of the problem.

The diagnostic code field is decoded and displayed as follows:

HEX	Diagnostic Information	Display
00	No additional information	No additional info
01	Invalid Ps	Invalid Ps
02	Invalid Pr	Invalid Pr
10	Packet type invalid	Pack type invalid
11	For state r1	Pack type invalid (r1)
12	For state r2	Pack type invalid (r2)
13	For state r3	Pack type invalid (r3)
14	For state p1	Pack type invalid (p1)
15	For state p2	Pack type invalid (p2)
16	For state p3	Pack type invalid (p3)
17	For state p4	Pack type invalid (p4)
18	For state p5	Pack type invalid (p5)

HEX Diagnostic Information**Display**

19	For state p6	Pack type invalid (p6)
1A	For state p7	Pack type invalid (p7)
1B	For state d1	Pack type invalid (d1)
1C	For state d2	Pack type invalid (d2)
1D	For state d3	Pack type invalid (d3)
20	Packet not allowed	Pack not allow
21	Unidentifiable packet	Unidentif pack
22	Call on one way logical channel	Call on one way log chan
23	Invalid packet type on permanent virtual circuit	Inv pack type on PVC
24	Packet on unassigned logical channel	Pack on unass log chan
25	Reject not subscribed to	Rej not sub to
26	Packet too short	Pack too short
27	Packet too long	Pack too long
28	Invalid general format Identifier	Invalid GFI
29	Restart or registration packet with nonzero in bits 1 to 4 of octet 1, or bits 1 to 8 of octet 2	Restart with nonzero LCI
2A	Packet type not compatible with facility	Pack not compat with facil
2B	Unauthorized interrupt confirmation	Unauthorized int confirm
2C	Unauthorized interrupt	Unauthorized int
2D	Unauthorized reject	Unauthorized rej
30	Timer Expired	Timer Expired
31	Timer Expired for incoming call	Timer Expired for incom call
32	Timer Expired for clear indication	Timer Expired for clear ind
33	Timer Expired for reset indication	Timer Expired for reset ind
34	Timer Expired for restart indication	Timer Expired for restart ind
40	Call setup, call clear or registration problem	Call setup, clr or reg prob
41	Facility/registration code not allowed	Facil/reg code not allow
42	Facility parameter not allowed	Facil param not allow
43	Invalid called address	Invalid called addr
44	Invalid calling address	Invalid calling addr

HEX	Diagnostic Information	Display
45	Invalid facility/registration length	Invalid facil/reg length
46	Incoming call barred	Incoming call barred
47	No logical channel available	No log chan avail
48	Call collision	Call coll
49	Duplicate facility requested	Dup facil req
4A	Non zero address length	Non zero addr length
4B	Non zero facility length	Non zero facil length
4C	Facility not provided when expected	Facil not prov when exp
4D	Invalid CCITT-specified DTE facility	Invalid DTE facil
50	Miscellaneous	Misc
51	Improper cause code from DTE	Improp cause code from DTE
52	Not aligned octet	Not align octet
53	Inconsistent Q bit setting	Incons Q bit setting
60	Not assigned	Not assigned
70	International problem	Internat prob
71	Remote network problem	Rem net prob
72	International protocol problem	Internat prot prob
73	International link out of order	Internat link out of order
74	International link busy	Internat link busy
75	Transit network facility problem	Trans net facil prob
76	Remote network facility problem	Rem net facil prob
77	International routing problem	Internat rout prob
78	Temporary routing problem	Temp rout prob
79	Unknown called DNIC	Unkn called DNIC
7A	Maintenance action	Mainten act
80	Reserved for network specific diagnostic information	Net spec diag info

Calling/Called Address Field

The Calling/Called Address field is decoded in the following packets: Clear request, Clear indication, Clear confirmation, Registration confirmation, Call request/Incoming call, Call accepted/Call connected, and Registration request.

Facilities Decode Field

The CCITT specified international facilities field is decoded in the following packets: Incoming call/Call request, Call connected/Call accepted, Clear indication/Clear request, DCE clear confirmation/DTE clear confirmation.

Up to 109 bytes of facility information will be decoded in a single packet.

The CCITT specified international facilities field is decoded and displayed as follows:

Facility	Display
Flow control parameter negotiations packet size	Flow cont param negotiations Called DTE pack size = xxxx Calling DTE pack size = xxxx xxxx values: 16, 32, 64, 128,... 2048, 4096
Flow control parameter negotiations window size	Flow cont param negotiations Called DTE wind size = xxx Calling DTE wind size = xxx xxx values: 1-127 (8-127 with extended control only)
Throughput class negotiation	Throughput class negotiation Called DTE = xxxxx Calling DTE = xxxxx
Closed user group selection basic format	Closed user group select = xx xx values: 0-99
Closed user group selection extended format	Closed user group select = xxxx xxxx values: 0-9999
Closed user group with outgoing access selection basic format	Closed user group select with outgoing access = xx xx values: 0-99

Facility	Display
Closed user group with outgoing access selection extended format	Closed user group select with outgoing access = xxxx xxxx values: 0-9999
Bilateral closed user group selection	Bilateral closed user group select = xxxx xxxx values: 0-9999
Reverse charging not requested	Reverse charge not requested
Reverse charging requested	Reverse charge requested
Fast select not requested	Fast select not requested
Fast select requested with no restriction on response	Fast select request, no restrict
Fast select requested with restriction on response	Fast select request, restrict
Network user identification	Network user id = xxx...x xxx...x values: variable length, HEX values
Charging information requested	Charging info req
Charging information not requested	Charging info not req

Facility	Display
Charging information monetary unit	Monetary charge = xxx...x xxx.x values: variable length, HEX values
Charging information segment count	Segment count Per 1 = xxxxxxxx sent xxxxxxx rcvd . . Per n = xxxxxxxx sent xxxxxxx rcvd xxxxxxx values: 0-99999999
Charging information call duration	Call duration Per 1 = dd:hh:mm:ss . . Per n = dd:hh:mm:ss
RPOA selection basic format	RPOA selection = xxxx xxxx values: 0-9999
RPOA selection extended format	RPOA selection = aaaa bbbb . . zzzz aaaa - zzzz values: 0-9999

Called Line Address Modified Notification Facility

Call distribution within hunt group	Call distrib within hunt group
Call redirection, originally called DTE busy	Call redirect, DTE busy
Call redirection, DTE out of order	Call redirect, DTE out of order
Systematic call redirection	Systematic call redirection
DTE originated	DTE origin

Call Redirection Notification Facility

Call redirect notification originally called DTE busy	Call redirect, DTE busy Called DTE = xxx...xx
Call redirect notification originally called DTE out of order	Call redirect, DTE out of order Called DTE = xxx...xx
Call redirect notification systematic call redirection	Systematic call redirection Called DTE = xxx...xx
Transit delay selection and indication	Transit delay = xxxxx msec xxxxx values: 0-65535

Registration Decode Field

The Registration field is decoded in the following packets: Registration request, Registration confirmation, and Call request.

The Registration field is used to determine what facilities are available and to change the available facilities.

The facility registration conditions "Rev" (revoked) and "Inv" (invoked) are displayed to the left of the decoded facility to indicate whether the facility is supported by the DCE, or is permitted by the DCE to be negotiated by the on-line facility registration family.

The Registration field is decoded and displayed as follows:

Facility	Display
Facilities that may be negotiated only when all logical channels used for virtual calls are in state p1.	Negot facil only in state p1:
D bit modification	D bit mod
Packet transmission	Packet retrans
Extended packet sequence numbering	Extended pack seq num
Facilities that may be negotiated at any time	Negot facil at any state:
Charging information (per interface basis)	Charge info (per int)
Throughput class negotiation	Throughput class negot
Flow control parameter negotiation	Flow control negot
Reverse charging acceptance	Rev charge acc
Fast select acceptance	Fast sel acc
Outgoing calls barred	Outgoing calls barred
Incoming calls barred	Incoming calls barred

Facility	Display
Availability of facilities	Avail of facilities:
Reverse charging	Rev charge
Reverse charging acceptance	Rev charge acc
Charging information (per call basis)	Charge info (per call)
Charging information (per interface basis)	Charge info (per int)
Called line address modified notification	Called line addr mod
D bit modification	D bit mod
Packet retransmission	Packet retrans
Extended packet sequence numbering	Extended pack seq num
RPOA selection (per call basis)	RPOA sel (per call)
Logical channel types ranges registration	Logical chan ranges
Non-standard default packet sizes	Non-stand packet sizes
Non-standard default window sizes	Non-stand window sizes
Default throughput classes assignment	Default throughput class
Non-negotiable facilities values	Non-negot facilities:
Local charging prevention	Local charge prev
Default throughput classes assignment	Default throughput class: from DTE = xxxxx from DCE = yyyy

Facility	Display
Non-standard default packet sizes	Non-stand packet sizes: Called DTE pack size = xxxx Calling DTE pack size = yyyy
Non-standard default window sizes	Non-stand window sizes: Called DTE wind size = xxx Calling DTE wind size = yyy
Logical channel types ranges registration	Logical chan ranges: LIC = aaaa HIC = bbbb LTC = cccc HTC = dddd LOC = eeee HOC = ffff # chans for vir calls = gggg

User Data

Information included in the packet's User Data field can be displayed while in the Examine Data menu. To view the User Data field while in the Examine Data menu, press [MORE], <Expand>, then <Dec/Data>.

By pressing <Dec/Data>, up to 160 bytes of user data are displayed in place of the information decoded for the Cause, Diagnostic, and Address fields. Return to the decoded Cause, Diagnostic, and Address fields by pressing <Dec/Data> again.

Link and S-Frame Filtering

Introduction

To make more efficient use of the buffer and store only the information of interest, you can "filter" data before it enters the buffer.

The data filter is accessed from the Run menu. After selecting the Run menu, press the <Data Filter> key.

The following Enhanced X.25 Analysis filter selections are displayed: Supervisory Frame Filter, and the Timing and Leads Filter. They may be either Off or On. The default state is Off.

Supervisory Frame Filter Capture Info & Unnum Only

NOTE

S-Frame filtering is only available with the X.25 protocol selected.

When the supervisory frame filter is selected (On), all RR, RNR, and REJ frames will be filtered and will not appear in the buffer.

Timing and Leads Filter

Timing and lead information is put into the buffer at regular intervals so that the data can be time stamped. If a small amount of data is stored in the buffer over a long period of time, it is possible that timing information will eventually overwrite the data.

When enabled (On), timing and lead filter stops timing information from being put into the buffer. This allows more data to be captured over a longer period of time, but the timing information provided by the cursor timing feature will be inaccurate. This also effects the Frame Arrival Time field of the X.25 user definable displays.

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