X.25 PROTOCOL APPLICATION PROGRAM

This program provides the ability to extract information about an X.25 network at any level, gather performance data, compute performance statistics, provide error detection and alarms, and display the accumulated data in virtually any form.
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SECTION 1 X.25 PROTOCOL OVERVIEW

1.0 General Information

In X.25 protocol all information; e.g., polls, commands, data and acknowledgements, are collected and organized according to a strictly defined frame format. The frame is defined as the link level control and is used to carry the network data which is defined as the packet level control. The X.25 Protocol Application Program uses the components of these frames to interpret and analyze user data.

1.1 Frame Description

A frame is delineated by opening and closing flags, each a single byte of specific form. Between the flags are the address, control and frame check bytes. The Information field is optional in some frames and restricted in others, depending upon the frame identification contained in the control field.

![X.25 Frame Format Diagram]

---

**X.25 FRAME FORMAT**
SECTION 2 X.25 MONITOR MODE

2.0 General Information

The Monitor Mode provides the ability to observe X.25 data activity on a line and capture it for future analysis. For Monitor Mode operation and set up, consult the following sections in the basic User Manual:

CONFIGURATION CONTROL - 3.7
DISK OPERATING SYSTEM - 3.8
INTERFACE CONNECTION UNIT - 3.11
MONITOR MODE - 3.12

The Monitor Mode is selected from the Main Menu.

MAIN MENU

MONITOR DECODE ANALYSIS AUTOBASIC CONFIG CONTROL DISK CONTROL OPTION MENU

MONITOR

RUN MONITOR DISPLAY CONTROL TRAP MODE CONFIG CONTROL DISK CONTROL CHG L/S HEADERS MAIN MENU

TYPICAL X.25 MONITOR DISPLAY
SECTION 3 X.25 DECODE MODE

3.0 General Information

The X.25 decoding functions are provided so that X.25 data can be presented in readily understood form. Instead of having raw data only which would require considerable effort and time to break down and interpret, the AUTOSCOPE displays useful frame and packet level information (e.g., destination address, frame type and frame sequence number).

Decoding can be performed on real-time information or data retrieved off line from a micro floppy disk (replayed information). Whether live or off line, raw data is interpreted automatically by the AUTOSCOPE. The results can be displayed in one of three softkey selectable formats:

- Level 2 Only (Frame Information Level)
- Level 3 Only (Packet Information Level)
- Level 2 and Level 3 Simultaneously

The display format can be changed at any time.

Additional decoding capabilities are Bit-Level Decode and Selective Decode.

Bit-Level Decode is useful for more detailed study of packet data. Information is broken down to bit form. Only off-line data can be decoded. This is a SPECIAL CONTROL function found under X.25 MONITOR Mode.

Selective Decode is used to select a specific LCN or DTE address for decoding. Data is displayed in Level 3 format. Refer to Section 3.5.1.

NOTE

For Bit-Level Decode switch to MONITOR Mode and select SPECIAL CONTROL
3.1 Level 2 Decoding

Level 2 decoding provides frame level information. Both send and receive messages are displayed on a split screen. Decoded information includes:

- Time of message
- Address field number
- Frame type identifier
- Send Frame sequence number
- Receive Frame sequence number
- Poll/Final bit

Operating Sequence

1. Select Level 2 Decode
2. Run Decode
3. Stop Decode
4. Review results

3.1.1 Level 2 Decode Display Format

Typical Level 2 Decode Display
The split screen format permits simultaneous viewing of send and receive messages. Send data is displayed on the left side, receive on the right. As many as 16 message lines can be displayed per screen. The display headers identify decoded information presented for each message. Using softkey control it is possible to move back and forth through the display one line or one screen at a time. A cursor arrow indicates the line being decoded.

**NOTE**

If a receive message immediately follows a send message, both are displayed side by side on the same line.

If a send message follows a send message, the message will appear directly below the preceding message. The right (receive) side of the display will be blank.

System messages appear in the center of line 17. Reference 3.4 for message details.

3.1.1.1 X.25 Level 2 Decode Display Headers

- **TIME**
  - Displays Timestamp - Hours, Minutes, Seconds (HH.MM.SS) or Minutes, Seconds, Milliseconds (MM.SS.ms)

- **ADR**
  - Displays decoding of Frame's Address Field (First byte). Only 01 or 03 is valid - otherwise ADDRESS ERROR message is displayed

- **FRAME**
  - Displays decoding of Frame's Control Field in X.25 Mnemonics (Ref 3.1.1.2)

- **NS**
  - Displays Send Frame sequence number

- **NR**
  - Displays Receive Frame sequence number

- **PF**
  - Displays P/F Bit, indicates Poll (P) or Final (F) Frame
3.1.1.2 X.25 Level 2 Decode Display Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>INFO</td>
<td>Information Transfer Format</td>
</tr>
<tr>
<td>RR</td>
<td>Receive Ready</td>
</tr>
<tr>
<td>RNR</td>
<td>Receive Not Ready</td>
</tr>
<tr>
<td>REJ</td>
<td>Reject</td>
</tr>
<tr>
<td>DM</td>
<td>Disconnected Mode</td>
</tr>
<tr>
<td>SABM</td>
<td>Set Asynchronous Balance Mode</td>
</tr>
<tr>
<td>SABME</td>
<td>Set Asynchronous Balance Mode Extended</td>
</tr>
<tr>
<td>DISC</td>
<td>Disconnect</td>
</tr>
<tr>
<td>UA</td>
<td>Unnumbered Acknowledgement</td>
</tr>
<tr>
<td>FRMR=INV CMD</td>
<td>Frame Reject = Invalid Command</td>
</tr>
<tr>
<td></td>
<td>Indicates that control received and returned was invalid or not implemented.</td>
</tr>
<tr>
<td>FRMR=I-FIELD</td>
<td>Frame Reject = I Field</td>
</tr>
<tr>
<td></td>
<td>Indicates that frame contained an information field that is not permitted or a format frame with incorrect length.</td>
</tr>
<tr>
<td>FRMR=I-SIZE</td>
<td>Frame Reject = I Size</td>
</tr>
<tr>
<td></td>
<td>Indicates frame contained an information field that exceeded maximum established capacity.</td>
</tr>
<tr>
<td>FRMR=INV N(R)</td>
<td>Frame Reject=Invalid N(R)</td>
</tr>
<tr>
<td></td>
<td>Indicates that control field received and returned contained an invalid Receive Sequence Number(N(R)).</td>
</tr>
</tbody>
</table>
3.1.1.3 X.25 Level 2 Decode Error Messages

Error messages will be displayed in reverse video.

<table>
<thead>
<tr>
<th>Error Message</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCC ERROR</td>
<td>Indicates a Frame Check Sum error occurred in Frame.</td>
</tr>
<tr>
<td>ABORT ERROR</td>
<td>An Abort sequence was detected, indicating transmission of a Frame was terminated.</td>
</tr>
<tr>
<td>ADDRESS ERROR</td>
<td>Indicates Frame contained an invalid Address for X.25 Protocol.</td>
</tr>
<tr>
<td>INCOMPLETE FRAME</td>
<td>Indicates the Frame was missing either Address or Control byte.</td>
</tr>
<tr>
<td>INV S-CODE</td>
<td>Indicates Frame contained an unassigned Supervisory format code.</td>
</tr>
<tr>
<td>INV U-CODE</td>
<td>Indicates Frame contained an unassigned Unnumbered format code.</td>
</tr>
</tbody>
</table>
3.2 Level 3 Decoding

Level 3 decoding provides packet level information. Send and receive messages are displayed on a single screen. Decoded information includes:

- Time of message
- Logical channel number
- Packet type identifier
- Send packet sequence number
- Receive packet sequence number
- QD bit
- DTE address
- Special information

Operating Sequence

1. Select Level 3 Decode
2. Run Decode
3. Stop Decode
4. Review results

3.2.1 Level 3 Decode Display Format

**SET UP DECODE**

- **X.25 L-2 Decode**
- **X.25 L-3 Decode**
- **X.25 L283 Decode**
- **SELECTIVE DECODE**
- **EXIT**

**RUN DECODE**

- **DISPLAY CONTROL**
- **SET UP DECODE**
- **CONFIG CONTROL**
- **DISK CONTROL**
- **MAIN MENU**

**TYPICAL LEVEL 3 DECODE DISPLAY**
A single screen is used to display all Level 3 information. Receive messages are underlined to set them apart. The display headers identify the decoded information presented for each message. Using softkey control it is possible to move back and forth through the display one line or one screen at a time. A cursor arrow indicates the line being decoded.

System messages appear in the center of line 17 just above the softkeys. Reference 3.4 for message details.

3.2.1.1 X.25 Level 3 Decode Display Headers

<table>
<thead>
<tr>
<th>TIME</th>
<th>Displays Timestamp - Hours, Minutes, Seconds or Minutes, Seconds, Milliseconds (HH.MM.SS / MM.SS.ms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCN #</td>
<td>Displays decoding of: Logical Channel Group Number - 0 through F (First digit in number) Logical Channel Number - Decimal 0 - 255 (Last three digits in number)</td>
</tr>
<tr>
<td>PACKET</td>
<td>Displays description of Packet Type in X.25 Mnemonics (Ref 3.2.1.2).</td>
</tr>
<tr>
<td>PS</td>
<td>Displays Send Packet sequence number.</td>
</tr>
<tr>
<td>PR</td>
<td>Displays Receive Packet sequence number.</td>
</tr>
<tr>
<td>QDM</td>
<td>Displays Qualifier bit (Q), Delivery confirmation bit (D) or More data mark (M).</td>
</tr>
<tr>
<td>DTE ADDR</td>
<td>Displays the DTE Address in called DTE Packet area, if present.</td>
</tr>
<tr>
<td>SPECIAL</td>
<td>Displays reset and clear cause codes, diagnostic codes and/or facilities field length.</td>
</tr>
</tbody>
</table>
3.2.1.2 X.25 Level 3 Decode Display Abbreviations

DATA                  Data
RR                    Receive Ready
RNR                   Receive Not Ready
REJECT                Reject
CODE 3                (UNDEFINED)

DIAG CODE = XXX
CODE 5                (UNDEFINED)
CODE 6                (UNDEFINED)
CODE 7                (UNDEFINED)

CALL REQ              Call Request
CALL CONF             Call Confirmation
CLEAR REQ             Clear Request
CLEAR CONF            Clear Confirmation
RESET REQ             Reset Request
RESET CONF            Reset Confirmation
INTERRUPT             Interrupt
INTERRUPT CONF        Interrupt Confirmation
RESTART REQ           Restart Request
RESTART CONF          Restart Confirmation

FACILITIES = XXX

CAUSE = XX

DIAG = XX             X = Numerical Digit
3.2.1.3 X.25 Level 3 Decode Error Messages

Error messages are displayed in reverse video.

**LEVEL 2 ERROR**
Indicates that a Level 2 error has occurred.
(BCC ERROR, ABORT ERROR, ADDRESS ERROR, INCOMPLETE FRAME, INV S-CODE, INV U-CODE)

**INCOMPLETE PACKET**
Indicates missing mandatory Level 3 data.
(General Format Identifier, Logical Channel Identifier, Packet Type Identifier)
3.3 Level 2 & Level 3 Decoding

Level 2 & 3 decoding allows simultaneous decoding of both frame and packet data. All information is presented on a single screen. Decoded information includes:

- Time of message
- Address field number
- Frame type identifier
- Send Frame sequence number
- Receive Frame sequence number
- Poll/Final bit
- Logical channel number
- Packet type identifier
- Send packet sequence number
- Receive packet sequence number
- QDM bit
- DTE address

Operating Sequence

1. Select Level 2 & 3 Decode
2. Run Decode
3. Stop Decode
4. Review results

3.3.1 Level 2 & Level 3 Decode Display Format

**SET UP DECODE**

**RUN DECODE**

**MESSAGE LINE**

**SYSTEM MESSAGE**

**DISK STATUS LINE**

**TYPICAL LEVEL 2 AND LEVEL 3 DECODE DISPLAY**
A single screen is used to display all Level 2 and Level 3 information. Receive messages are underlined to set them apart. The display headers identify the decoded information presented for each message. Using softkey control it is possible to move back and forth through the display one line or one screen at a time. A cursor arrow indicates the line being decoded.

System messages appear in the center of line 17 just above the softkeys. Reference 3.4 for message details.

3.3.1.1 X.25 Level 2 & Level 3 Decode Display Headers

The Column Headers are a combination of the Level 2 and Level 3 with the exception of the "Special" field.

3.3.1.2 X.25 Level 2 & Level 3 Decode Display Abbreviations

The abbreviations are a combination of both Level 2 and Level 3.

3.3.1.3 X.25 Level 2 & Level 3 Decode Error Messages

The messages displayed are a combination of both Level 2 and Level 3 error messages.

3.4 X.25 Decode System Prompt Line Messages

<table>
<thead>
<tr>
<th>Buffer Limit</th>
<th>Indicates that the upper or lower limit of input buffer has been reached when viewing stored data in Display Control function.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buffer Empty</td>
<td>Indicates that data has not been captured in input buffer.</td>
</tr>
</tbody>
</table>
3.5 Selective Decode

Using selective decoding a single LCN or called DTE address can be chosen for Level-3 decoding and subsequent display on the AUTOSCOPE CRT. When decoding a DTE, the AUTOSCOPE tracks the LCN used by the DTE.

Operating Sequence

1. Select SELECTIVE DECODE
2. Select LCN or DTE address
3. Run Decode
4. Stop Decode
5. Review results

SET UP DECODE

<table>
<thead>
<tr>
<th>X.25 L-2 DECODE</th>
<th>X.25 L-3 DECODE</th>
<th>X.25 L2&amp;3 DECODE</th>
<th>SELECTIVE DECODE</th>
<th>EXIT</th>
</tr>
</thead>
</table>

SELECTIVE DECODE

<table>
<thead>
<tr>
<th>LCN</th>
<th>DTE</th>
<th>EXIT</th>
</tr>
</thead>
</table>

Typical Selective Decode Display

X.25 SELECT DECODE

** PRINTER TIMEOUT **

DISK STATUS LINE

SYSTEM MESSAGE

SOFTKEY/LABEL

HEADER

TIMESTAMP

CURSOR

DECODE SELECTION

TYPICAL SELECTIVE DECODE DISPLAY
3.5.1 Selective Decode Set Up

After selecting either LCN or DTE, the address can be entered from the keyboard or the softkeys in response to the AUTOSCOPE’s prompt. If softkeys are used, the address digits must be entered individually by positioning the cursor block at each address position (7 for LCN and 14 for DTE) and changing its value.

NOTE
If the new address is not ENTERed before exiting, the old address will be decoded.

SELECTIVE DECODE

| LCN | DTE |   |   |   |   | EXIT |

LCN(SELECT NUMBER)

| CURSOR LEFT < | CURSOR > RIGHT | CHANGE CHARACTER |   |   | ENTER | EXIT |

X.25 LEVEL 3 SELECTIVE DECODE BY LCN WILL DISPLAY ONLY THE ACTIVITY PERTAINING TO A SELECTED LCN.

SELECT THE LCN BY ENTERING ITS FOUR-DIGIT NUMBER:

3087

X.25 SELECT DECODE

DECIMAL 0-9

WM SD REPLAY TRK: 15

ENTER EXIT

LCN SELECTION DISPLAY
SELECTIVE DECODE

DTE (SELECT NUMBER)

X.25 LEVEL 3 SELECTIVE DECODE BY DTE ADDRESS WILL DISPLAY ONLY THE ACTIVITY PERTAINING TO A SELECTED DTE.

SELECT THE CALLED DTE BY ENTERING ITS FOURTEEN-DIGIT NUMBER: 12345678901234

ENTER the address, exit the selective decode setup and RUN decode.

SET UP DECODE

X.25 L-2 DECODE  X.25 L-3 DECODE  X.25 L2&3 DECODE

RUN DECODE

3.5.2 Selective Decode Display Format

The decoded data for the selected address is displayed in Level 3 format.
3.6 Reviewing and Printing Decode Results

After stopping any decode procedure, the data captured in the 64K buffer can be reviewed using the Decode Display Controls. You can scroll up or down through the buffer one line at a time or a page at a time (16 lines). The decoded information will be displayed in the format you select, starting with the format that was being used while running DECODE. For example, after halting Level 2 decoding, you can move up or down through the buffered data which will be displayed initially in Level 2 format.

You can change to another format anytime by returning to the Decode Set Up softkeys and selecting the format desired. To view the new format, execute Display Control.

For a hard copy of the decode results, you can print selected screens or the entire buffer.

Operating Sequence

1. Stop Decode
2. Select display controls
3. Move to line or page
4. To print, select print control (screen or buffer)

RUN DECODE

---

![Diagram showing the display and print controls with various options for cursor movement, page control, and print control selections.]
3.7 X.25 Decode Mode Softkey/Label Display Descriptions

3.7.1 DECODE Softkey/Label Display

**SOFTKEY/LABEL**

**FUNCTION**

**RUN DECODE**

Initiates Decode process.

**DISPLAY CONTROL**

Sets-up softkey/label display to search and replay buffer or set-up data print out mode.

(Ref 3.7.7 - DISPLAY CONTROL)

**SET UP DECODE**

Sets-up softkey/label display to select X.25 level decode. (X.25 LEVEL 2, X.25 LEVEL 3, X.25 LEVEL 2 and 3) (Ref 3.7.3 - SET UP DECODE)

**CONFIG CONTROL**

Initiates softkey/label displays for system operating configuration modifications.

(Ref 3.7 - Configuration Control User Manual)

**DISK CONTROL**

To set-up and begin disk operating functions.

(Ref 3.8 - Disk Operating System User Manual)

**MAIN MENU**

Not Used

Return to MAIN MENU
### 3.7.2 RUN DECODE Softkey/Label Display

**X.25 Select Decode**

<table>
<thead>
<tr>
<th>Softkey/Label</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stop Decode</strong></td>
<td>Stops Decode process. (No live data is being displayed or captured.)</td>
</tr>
<tr>
<td><strong>Freeze Display</strong></td>
<td>Freezes/Resumes data displayed on screen only. All other decoding functions continue including data capture. (Flip-flop type action).</td>
</tr>
<tr>
<td><strong>Not Used</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Not Used</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Not Used</strong></td>
<td></td>
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<td><strong>Not Used</strong></td>
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<td><strong>Not Used</strong></td>
<td></td>
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<tr>
<td><strong>Not Used</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Not Used</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Diagram:**

```
X.25 SELECT DECODE       WM SD REPLAY TRK: 15
STOP DECODE             FREEZE DISPLAY
                       
                       
                       
                       
                       
                       
                       
                       
                       
```

3-17
3.7.3 SET UP DECODE Softkey/Label Display

SOFTKEY/LABEL | FUNCTION
---|---
X.25 L-2 DECODE | Selects X.25 Level 2 decode format.
X.25 L-3 DECODE | Selects X.25 Level 3 decode format.
X.25 L2&3 DECODE | Selects the combination of X.25 Level 2 and Level 3 decode format.
SELECTIVE DECODE | Selects Selective decode format (LCN - DTE).
(Ref 3.7.4 - SELECTIVE DECODE)
Not Used
Not Used
Not Used
EXIT | Returns to previous softkey/label display.
(SET UP DECODE - Ref 3.7.1)
3.7.4 SELECTIVE DECODE Softkey/Label Display

**SOFTKEY/LABEL FUNCTION**

- **LCN**
  - Sets up softkey/label display to select or change Logical Channel Number.
  - (Ref 3.7.5 - LCN)

- **DTE**
  - Sets up softkey/label display to select or change DTE address.
  - (Ref 3.7.6 - DTE)

- **Not Used**
  - Not Used
  - Not Used
  - Not Used
  - Not Used
  - Not Used

- **EXIT**
  - Return to previous softkey/label display.
  - (SELECTIVE DECODE - Ref 3.7.1)
3.7.5 LCN Softkey/Label Display

X.25 LEVEL 3 SELECTIVE DECODE BY LCN WILL DISPLAY ONLY THE ACTIVITY PERTAINING TO A SELECTED LCN.

SELECT THE LCN BY ENTERING ITS FOUR-DIGIT NUMBER: 1007

<table>
<thead>
<tr>
<th>SOFTKEY/LABEL</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>CURSOR LEFT &lt;</td>
<td>Moves cursor one (1) character position left in parameter line to be changed.</td>
</tr>
<tr>
<td>CURSOR &gt; RIGHT</td>
<td>Moves cursor one (1) character position right in parameter line to be changed.</td>
</tr>
<tr>
<td>CHANGE CHARACTER</td>
<td>Changes character in cursor location. Characters will cycle sequentially when softkey is depressed. (Decimal - 0 to 9)</td>
</tr>
<tr>
<td>ENTER</td>
<td>Enters new number for LCN. (Must be initiated to complete and store change). Return to previous softkey/label display. (LCN - Ref 3.7.4)</td>
</tr>
<tr>
<td>EXIT</td>
<td>Return to previous softkey/label display. (LCN - Ref 3.7.4)</td>
</tr>
</tbody>
</table>
3.7.6 DTE Softkey/Label Display

X.25 LEVEL 3 SELECTIVE DECODE BY DTE ADDRESS WILL DISPLAY ONLY THE ACTIVITY PERTAINING TO A SELECTED DTE.

SELECT THE CALLED DTE BY ENTERING ITS FOURTEEN-DIGIT NUMBER:

\[ \text{Example: 34507} \]

**SOFTKEY/LABEL FUNCTION**

- **CURSOR LEFT <**
  - Moves cursor one (1) character position left in parameter line to be changed.

- **CURSOR > RIGHT**
  - Moves cursor one (1) character position right in parameter line to be changed.

- **CHANGE CHARACTER**
  - Changes character in cursor location. Characters will cycle sequentially when softkey is depressed. (Decimal - 0 to 9)

- **Not Used**

- **Not Used**

- **Not Used**

- **ENTER**
  - Enters new address for DTE. (Must be initiated to complete and store change).
  - Return to previous softkey/label display.
  - (DTE - Ref 3.7.4)

- **EXIT**
  - Return to previous softkey/label display.
  - (DTE - Ref 3.7.4)
3.7.7 DISPLAY CONTROL Softkey/Label Display

**SOFTKEY/LABEL FUNCTION**

- **Not Used**
- **Not Used**
- **Current UP**
- **Current DOWN**
- **Page UP**
- **Page DOWN**
- **Print Control**
- **Exit**

Data displayed on screen is scrolled down one (1) line at a time, allowing previous data captured to be displayed.

Data displayed on screen is scrolled up one (1) line at a time, allowing the most recent data captured to be displayed.

Depressing and holding the softkey down will allow continuous scrolling. Stops at ***BUFFER LIMIT***

Data displayed on screen is scrolled down one (1) page at a time, allowing previous data captured to be displayed.

Data displayed on screen is scrolled up one (1) page at a time, allowing the most recent data captured to be displayed.

Depressing and holding the softkey down will allow continuous scrolling. Stops at ***BUFFER LIMIT***

Sets up selection of the data amount to be transmitted to printer for print out. (Screen only or complete buffer) (Ref 3.7.8 - PRINT CONTROL)

Return to previous softkey/label display. (DISPLAY CONTROL - Ref 3.7.1)
### X.25 Application Program

#### Decode

**SOFTKEY/LABEL DESCRIPTION**

#### 3.6.8 PRINT CONTROL Softkey/Label Display

<table>
<thead>
<tr>
<th>FUNCTION</th>
<th>INITIATES PRINT-OUT OF DATA DISPLAYED ON SCREEN ONLY.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRINT SCREEN</td>
<td>Initiates print-out of complete buffer.</td>
</tr>
<tr>
<td>PRINTER CONFIG</td>
<td>Initiates softkey/label displays for modifying printer configuration. (Ref 3.10 - Printer Configuration User Manual)</td>
</tr>
</tbody>
</table>

#### Table

<table>
<thead>
<tr>
<th>TRK: 15</th>
<th>X.25 SELECT DECODE</th>
<th>WM SD REPLAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRINT</td>
<td>PRINT BUFFER</td>
<td></td>
</tr>
<tr>
<td>SCREEN</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Diagram

Return to previous softkey/label display. (PRINT CONTROL - Ref 3.7.7)
SECTION 4  BIT-LEVEL X.25 PACKET DECODING

4.0 General Information

A subset of the AUTOSCOPE MONITOR Mode, bit-level packet decoding permits detailed examination of each octet of a Level 3 packet. Decoded information includes:

Packet type
Octet number
Octet bit structure
Error conditions

<table>
<thead>
<tr>
<th>OPENING FLAG</th>
<th>ADDRESS</th>
<th>CONTROL FIELD</th>
<th>PACKET CONTROL INFORMATION (HEADER)</th>
<th>USER DATA</th>
<th>FRAME CHECK SEQUENCE</th>
<th>CLOSING FLAG</th>
</tr>
</thead>
</table>

LEVEL 3

Corresponding labels, hex or decimal equivalents and detailed comments will be displayed for each octet of each packet.

The packet types decoded are:

DATA PACKET
CONTROL PACKET
RECEIVE READY PACKET
RECEIVE NOT READY PACKET
REJECT PACKET
COMMAND PACKET
CALL PACKET
RESET PACKET
RESTART PACKET
INTERRUPT PACKET
DIAGNOSTIC PACKET

STOP MONITOR

DISPLAY CONTROL

SPECIAL CONTROL
4.1 Bit-level X.25 Packet Decode Display Format

A full-screen format is used to display the decoded information. At the top of the display a header message (in reverse video) indicates the type of packet being decoded. The information, arranged in three columns, shows the octet number being decoded, its bit string and, finally, any comments or decode error messages.

As many as 16 octets can be displayed per screen. To move between messages or from one octet to another within a message, use the softkeys displayed. A cursor arrow indicates the line being decoded.

System prompt messages appear in the center of line 17, directly above the softkeys. Reference 4.2 for message details.
### 4.2 X.25 Packet Decode System Prompt Line/Error Messages

<table>
<thead>
<tr>
<th>Error Message</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCC ERROR</td>
<td>Indicates a Frame Check Sum error occurred in Frame.</td>
</tr>
<tr>
<td>FRAME ABORTED</td>
<td>An Abort sequence was detected, indicating transmission of a Frame was terminated.</td>
</tr>
<tr>
<td>NO LEVEL 3 DATA</td>
<td>Indicates that only Level 2 data is present.</td>
</tr>
<tr>
<td>INCOMPLETE FRAME</td>
<td>Indicates the Frame was missing either Address or Control byte.</td>
</tr>
<tr>
<td>INCOMPLETE PACKET</td>
<td>Indicates missing mandatory Level 3 data.</td>
</tr>
<tr>
<td></td>
<td>(General Format Identifier, Logical Channel Identifier, Packet Type Identifier plus any other data specified for a given packet type.)</td>
</tr>
<tr>
<td>BUFFER EMPTY</td>
<td>Indicates that data has not been captured in input buffer.</td>
</tr>
<tr>
<td>BUFFER LIMIT</td>
<td>Indicates that upper or lower limit of input buffer has been reached when attempting to decode stored data.</td>
</tr>
<tr>
<td>PACKET DECODE LIMIT</td>
<td>Indicates that upper or lower limit of decoded data being viewed has been reached.</td>
</tr>
</tbody>
</table>

### 4.3 X.25 Packet Decode Error Messages

These messages will be in reverse video in the label/comment column.

<table>
<thead>
<tr>
<th>Error Message</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>INVALID DATA</td>
<td>Data in a particular octet is not within specified limits.</td>
</tr>
<tr>
<td>INVALID EXCESS DATA</td>
<td>Upon successful decoding of all specified data for a given packet, a check will be made for any remaining data. Since such data is unspecified, it will be considered invalid excess data.</td>
</tr>
<tr>
<td>MISSING</td>
<td>Indicates specified data is missing. A label will follow describing missing specified data.</td>
</tr>
</tbody>
</table>
4.4 X.25 Packet Decode Softkey/Label Descriptions

SOFTKEY/LABEL

FUNCTION

**BIT LEVEL DECODE**

Initiates Packet Decode functions and sets-up softkey/label display to select data amount for print-out. (Ref 4.4.2 - BIT LEVEL DECODE)

**HEX DISPLAY**

Monitor Mode Only. Allows quick change of configuration code (ASCII/EBCDIC) to HEX while in STOP Monitor mode. (Flip-flop type action)

**CODE DISPLAY**

Return from HEX to configuration code (ASCII/EBCDIC) while in STOP Monitor Mode.

**PROTOCOL CONTROL**

Not Used

**PRINT CONTROL**

Not Used

**EXIT**

SNA/SDLC only.

Monitor Mode Only. Sets-up selection of data amount to be transmitted to printer for print-out (screen only or complete buffer). (Ref 4.10 - Printer Configuration User Manual)

Return to previous softkey/label display. (Monitor SPECIAL CONTROL - Ref: 4.12.4.3 User Manual)
4.4.2 BIT LEVEL DECODE Softkey/Label Display

| OCTET 01 | 00010000 | Q=0 D=0 MODULO 8 SEQUENCING |
| OCTET 02 | 00000100 | LOGICAL CHANNEL NO. 0006 |
| OCTET 03 | 00001011 | CALL REQUEST PACKET |
| OCTET 04 | 01101111 | CALLING DTE LENGTH=07 CALLED DTE LENGTH=07 |
| OCTET 05 | 00010100 | 12 |
| OCTET 06 | 00101003 | 34 |
| OCTET 07 | 01010000 | 50 |
| OCTET 08 | 01101111 | 77 |
| OCTET 09 | 00000101 | 05 |
| OCTET 10 | 00000001 | 43 |
| OCTET 11 | 00000001 | 21 |
| OCTET 12 | 00000000 | FACILITY LENGTH = 00 |

**DATA DECODED**

OCTET 01 OCTET 02 OCTET 03 OCTET 04 OCTET 05 OCTET 06 OCTET 07 OCTET 08 OCTET 12 OCTET 10 OCTET 11 OCTET 12

**FUNCTION**

Moves cursor to previous message for Packet Decode.

Moves cursor to most recent message for Packet Decode.

Data displayed on screen is scrolled-down one (1) line at a time, allowing previous data messages to be displayed and selected for Packet Decode.

Data displayed on screen is scrolled-up one (1) line at a time, allowing the most recent messages to be displayed and selected for Packet Decode.

Depressing and holding the softkey down will allow continuous scrolling. Stops at ***BUFFER LIMIT***

Data displayed on screen is scrolled-down one (1) page at a time, allowing previous messages to be displayed and selected for Packet Decode.

Data displayed on screen is scrolled-up one (1) page at a time, allowing the most recent messages to be displayed and selected for Packet Decode.

Depressing and holding the softkey down will allow continuous scrolling. Stops at ***BUFFER LIMIT***
Sets-up softkey display for selecting Packet Decode and also print-out of data.
(Ref 4.4.3 - PRINT CONTROL)

Returns to previous display, where Packet Decode can be obtained for selected message.
(BIT LEVEL DECODE - Ref 4.4.1)
4.4.3 PRINT CONTROL Softkey/Label Display

<table>
<thead>
<tr>
<th>OCTET</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>00010000</td>
<td>0=D=0 MODULO B SEQUENCING</td>
</tr>
<tr>
<td>02</td>
<td>00000110</td>
<td>LOGICAL CHANNEL NO. 0006</td>
</tr>
<tr>
<td>03</td>
<td>00001011</td>
<td>CALL REQUEST PACKET</td>
</tr>
<tr>
<td>04</td>
<td>01110111</td>
<td>CALLING DTE LENGTH=07</td>
</tr>
<tr>
<td>05</td>
<td>00010010</td>
<td>CALLED DTE LENGTH=07</td>
</tr>
<tr>
<td>06</td>
<td>00110100</td>
<td>12</td>
</tr>
<tr>
<td>07</td>
<td>01010000</td>
<td>50</td>
</tr>
<tr>
<td>08</td>
<td>01110111</td>
<td>77 CALLED DTE ADDRESS=1234507</td>
</tr>
<tr>
<td>09</td>
<td>00000010</td>
<td>05</td>
</tr>
<tr>
<td>10</td>
<td>01000011</td>
<td>43</td>
</tr>
<tr>
<td>11</td>
<td>00100001</td>
<td>21 CALLING DTE ADDRESS=7054321</td>
</tr>
<tr>
<td>12</td>
<td>00000000</td>
<td>FACILITY LENGTH = 00</td>
</tr>
</tbody>
</table>

- **PRINT SCREEN**: Initiates print-out of data displayed on screen only.
- **PRINT DECODE**: Initiates print-out of data in Decode buffer.
- **Not Used**: Not Used
- **Not Used**: Not Used
- **Not Used**: Not Used
- **Not Used**: Not Used
- **PRINTER CONFIG**: Initiates display for modifying printer configuration.
- **EXIT**: Return to previous softkey/label display.

(REF 4.4.2)
SECTION 5 X.25 PERFORMANCE ANALYSIS

5.0 General Information

The ANALYSIS mode provides the ability to compute and display the performance data of a network line. Performance statistics and reports are displayed in clear, summarized, comparative graphic and numeric form. Line performance may be analyzed from live data (up to 24 hours at any one time) and/or from recorded/replayed data. A maximum of 64 logical channels may be analyzed.

X.25 Analysis is oriented toward session analysis. This is based on the state driven nature of the X.25 packet switching protocol which establishes sessions (virtual circuits) as transport vehicles for user data and control. The Logical Channel (LC) activity or session is analyzed and graphically interpreted by displaying three basic phases of every Session:

- Access (Calling)
- Information Transfer
- Disengagement (Clearing)

You can select from several analysis report formats:

- Single Logical Channel Activity Report
- Multiple Logical Channel Activity Report
- Daily Traffic Activity Report
- LCN Performance Report
- System Report (Total Link Activity)
- Billing Report
- Segmentation Filling Report
- Analysis Message Length Information Report

The AUTOSCOPE automatically defaults to the Single Logical Channel Activity Report if no selection is made when Analysis is run. If another report format is selected during a session, the screen will return to that report whenever Analysis is run. You can change from one report to another at any time. The raw data being analyzed is taken from the 64K RAM.

5.1 Generating Reports

In RUN ANALYSIS mode, the 64K RAM is dynamic; data is automatically accumulated from the line and analyzed.

In STOP ANALYSIS mode the 64K RAM is static; data is not accumulated. The reports generated are based on the data already stored in RAM.

If Analysis is to be performed on a Switched Virtual Circuit (SVC) only, the SVC PROCESS selection will require detection of a Call Request or Incoming Call Packet to initiate the LCN performance analysis displays.

For Analysis of a Permanent Virtual Circuit (PVC) or an already active link, the ALL PROCESS selection will require detection of a Call Request, Incoming Call or Data Packet to initiate the LCN performance analysis displays.
Note

By selecting ALL PROCESS, the LCN statistics may not reflect the appropriate values for all parameters from the start of the session.

Operating Sequence

1. Select ANALYSIS
2. Set up Analysis (report format, alarms or billing)
3. Run Analysis
4. Stop Analysis
5. Review results

Main Menu

Monitor Decode Analysis Autobasic Config Control Disk Control Option Menu

Analysis

Run Analysis Display Set Up Analysis Config Control Disk Control

5.2 X.25 Analysis Display Formats

Each X.25 Analysis Display has a unique format and will be described in following paragraphs.

Formats or functions common to all Analysis Displays; for example, START time and CURRENT or STOP times, are indicated on all X.25 analysis displays. Times are automatically reset when a session is started, reset, or completed. The START time displayed in the upper left-hand corner of the screen indicates the time that the current analysis session was initiated. START time is always displayed. The CURRENT time indicated in the upper right-hand corner of the display indicates the current real-time while in the RUN ANALYSIS mode. In STOP ANALYSIS mode, the STOP time replaces the CURRENT time and indicates the time that the analysis session was stopped by the user.

Note

Throughout this section the term "run time" means the time elapsed between the START time and the CURRENT/STOP time of running Analysis.
The CHANGE DISPLAY option is available on all X.25 Analysis Displays. This enables the user to view data in any of the Analysis Displays whenever desired.

FREEZE/RESUME DISPLAY option is available on all X.25 Analysis Displays. The data on any Analysis Display may be held static (FREEZE DISPLAY) for close study whenever desired. Dynamic display (RESUME DISPLAY) of data may then be resumed.

NOTE

While the display is "frozen", the analysis database continues to be updated.

In the X.25 STOP ANALYSIS mode, any display may be printed out by depressing DISPLAY CONTROL and then PRINT CONTROL and PRINT SCREEN softkeys. (Ref 3.10 - Printer Configuration User Manual)
5.3 X.25 Performance Analysis Softkey/Label Display Descriptions

5.3.1 ANALYSIS Softkey/Label Display

**FUNCTION**

- **RUN ANALYSIS**
  - Initiates Analysis process.

- **DISPLAY CONTROL**
  - Sets-up display to select/change report parameters for viewing/reviewing, review alarm reports and access print control functions.
  
  **NOTE**
  
  If Analysis had not been run, a message will appear:
  
  **NO DATA ACCUMULATED**

  (DISPLAY CONTROL; SINGLE LCN - Ref 5.4.5.2)
  (DISPLAY CONTROL; MULTIPE LCN - Ref 5.5.5.2)
  (DISPLAY CONTROL; LINE REPORT - Ref 5.6.1.2)
  (DISPLAY CONTROL; DAILY ACTIVITY - Ref 5.7.1.2)
  (DISPLAY CONTROL; LCN REPORT - Ref 5.8.1.2)

- **SET UP ANALYSIS**
  - Sets-up softkey/label display to select Analysis reports, set Alarm parameters and set Billing configuration.
  (Ref 5.3.2)

- **CONFIG CONTROL**
  - Not Used

- **DISK CONTROL**
  - Initiates operating configuration modifications. (Ref 3.7 - Configuration Control User Manual)

- **MAIN MENU**
  - To set-up and begin disk operating functions.
  (Ref 3.8 - Disk Operating System User Manual)

  **Not Used**

  - Return to MAIN MENU.
5.3.2 SET UP ANALYSIS Softkey/Label Display

SOFTKEY/LABEL FUNCTION

DISPLAY SET UP

Sets-up display to select analysis reports.

- SINGLE LOGICAL CHANNEL ACTIVITY
- MULTIPLE LOGICAL CHANNEL ACTIVITY
- DAILY TRAFFIC ACTIVITY REPORT
- LCN PERFORMANCE REPORT
- TOTAL LINE ACTIVITY REPORT
- BILLING INFORMATION
- SVC/ALL PROCESS SEGMENTATION FILLING

(Ref 5.3.3)

GENERAL ALARMS

Sets-up softkey/label display to select General Alarms. (Ref Section 6)

LCN ALARMS

Sets-up softkey/label display to select LCN Alarms. (Ref Section 6)

Not Used

Not Used

BILLING CONFIG

Sets up Billing Configuration Editor.

Not Used

EXIT

Return to previous softkey/label display.
(SET UP ANALYSIS - Ref 5.3.1)
5.3.3 DISPLAY SET UP Softkey/Label Display

CHANGE DISPLAY (Stop Mode) Softkey/Label Display

SOFTKEY/LABEL FUNCTION

MULTIPLE LCN Selects Multiple Logical Channel display. (Ref 5.5)

SINGLE LCN Selects Single Logical Channel display. (Ref 5.4)

LINE REPORT Selects Total Link Activity Report display. (Ref 5.6)

LCN REPORT Selects LCN Performance Report display. (Ref 5.8)

DAILY ACTIVITY Selects Daily Traffic Activity Report display (Ref 5.7)

ALL PROCESS Selects Single Virtual Circuit PROCESS (SVC) or Permanent Virtual Circuit (ALL) processing to be displayed. (Flip-flop type action softkey) (Ref 5.1)

SVC PROCESS Initiates softkey/label display to select additional analysis displays. (Ref 5.3.4)

NEXT MENU

EXIT Return to previous softkey/label display. (SET UP ANALYSIS - Ref 5.3.2)
5.3.4 NEXT MENU Softkey/Label Display

<table>
<thead>
<tr>
<th>SOFTKEY/LABEL</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>BILLING REPORT</td>
<td>Selects Billing Report display. (Ref 5.9)</td>
</tr>
<tr>
<td>SEGMENT FILLING</td>
<td>Selects Segmentation Filling Report display. (Ref 5.10)</td>
</tr>
<tr>
<td>Not Used</td>
<td></td>
</tr>
<tr>
<td>Not Used</td>
<td></td>
</tr>
<tr>
<td>Not Used</td>
<td></td>
</tr>
<tr>
<td>Not Used</td>
<td></td>
</tr>
<tr>
<td>Not Used</td>
<td></td>
</tr>
<tr>
<td>EXIT</td>
<td>Return to previous softkey/label display. (NEXT MENU - Ref 5.3.3)</td>
</tr>
</tbody>
</table>
5.3.5 CHANGE DISPLAY (Run Mode) Softkey/Label Display

- **MULTIPLE LCN**: Selects Multiple Logical Channel display. (Ref 5.5)
- **SINGLE LCN**: Selects Single Logical Channel display. (Ref 5.4)
- **LINE REPORT**: Selects Total Link Activity Report display. (Ref 5.6)
- **LCN REPORT**: Selects LCN Performance Report display. (Ref 5.8)
- **DAILY ACTIVITY**: Selects Daily Traffic Activity Report display (Ref 5.7)
- **ALL PROCESS**: Selects Single Virtual Circuit PROCESS (SVC) or Permanent Virtual Circuit (ALL) processing to be displayed. (Flip-flop type action softkey) (Ref 5.1)
- **SVC PROCESS**: Not Used
- **EXIT**: Return to previous softkey/label display.
5.3.6 PRINT CONTROL Softkey/Label Display

<table>
<thead>
<tr>
<th>SOFTKEY/LABEL</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRINT SCREEN</td>
<td>Initiates print out of data displayed on screen only.</td>
</tr>
<tr>
<td></td>
<td>Not Used</td>
</tr>
<tr>
<td></td>
<td>Not Used</td>
</tr>
<tr>
<td></td>
<td>Not Used</td>
</tr>
<tr>
<td></td>
<td>Not Used</td>
</tr>
<tr>
<td></td>
<td>Not Used</td>
</tr>
<tr>
<td>PRINTER CONFIG</td>
<td>Initiates display for modifying printer configuration. (Ref 4.10 - Printer Configuration User Manual)</td>
</tr>
<tr>
<td>EXIT</td>
<td>Return to previous softkey/label display.</td>
</tr>
</tbody>
</table>
5.4 SINGLE LOGICAL CHANNEL ACTIVITY Report

The Single Logical Channel Activity Report provides information about a selected Logical Channel in a network.

When ANALYSIS is selected from the Main Menu, the system automatically defaults to the Single Logical Channel Activity Report.

NOTE

This display can also be accessed while in the RUN ANALYSIS mode by depressing CHANGE DISPLAY and selecting SINGLE LCN.

Single Logical Channel activity is detected, analyzed and presented in graphical and numerical form. The screen is divided into four (4) areas:

1) Single LCN Session Activity
2) Total Channel Traffic Analysis (Single LCN)
3) Total Session Activities (Single LCN)
4) Single LCN Performance

Operating Sequence

1. Set up Analysis for single LC and exit
2. Run Analysis
3. Stop Analysis
4. Review results

ANALYSIS

RUN ANALYSIS  DISPLAY  SET UP ANALYSIS  CONFIG CONTROL  DISK CONTROL  MAIN MENU

SET UP ANALYSIS

DISPLAY CONTROL  GENERAL ALARMS  LCN ALARMS  BILLING CONFIG  EXIT

DISPLAY SETUP

MULTIPLE LCN  SINGLE LCN  LINE REPORT  LCN REPORT  DAILY ACTIVITY  ALL PROCESS  NEXT MENU  EXIT
Display Format

The top area of the screen displays the exact CALL, CALL CONFIRMATION, CLEAR, and CLEAR CONFIRMATION times for the single LCN being analyzed. The number of the LCN being analyzed appears in reverse video between the CALL and CONF (CALL CONFIRMATION) fields.

The LCN field includes a directional arrow symbol which indicates the direction of a call. The arrow points to the right (→) when a DTE has made the call being analyzed, and points to the left (←) when a DTE has received the call being analyzed. The arrow blinks to indicate that the LCN is waiting for a confirmation.

The top center area of the display indicates the number of data packets sent, received, or retried for the current session. The DTE ADDRESSES softkey selection will change this area of the screen in order to display the addresses of the calling and called DTEs. The DATA DISPLAY softkey selection changes this area of the screen to display the specific data packet information (this key operates in a flip-flop type manner).

When RESTART and RESET conditions occur, a special message will appear in the Clear Time area of the screen. The decoded Cause Code for either condition will also be displayed in the center of the Data Display area.

If a REJECT condition occurs, it is detected, but not displayed on the screen. REJECTS are included with RETRIES in the Total Session Activities area of the screen.
5.4.1 Single LCN Session Activity

The activity of the first Logical Channel detected by the Autoscope will be displayed.

The top area of the screen displays the exact CALL, CALL CONFIRMATION, CLEAR, and CLEAR CONFIRMATION times for the single LCN being analyzed. The number of the LCN being analyzed appears in reverse video between the CALL and CONF (CALL CONFIRMATION) fields.

The CHANGE LCN softkey allows the user to page through and analyze all the LCNs that have been detected by using the PREVIOUS ITEM and NEXT ITEM softkeys. The SELECT LCN softkey allows the user to actually change the LCN number.

The LCN field includes a directional arrow symbol which indicates the direction of a call. The arrow points to the right (→) when a DTE has made the call being analyzed, and points to the left (←) when a DTE has received the call being analyzed. The arrow blinks to indicate that the LCN is waiting for a confirmation.

The top center area of the display indicates the number of data packets sent, received, or retried for the current session. The DTE ADDRESSES softkey selection will change this area of the screen in order to display the addresses of the calling and called DTEs. The DATA DISPLAY softkey selection changes this area of the screen to display the specific data packet information (this key operates in a flip-flop type manner).

When RESTART and RESET conditions occur, a special message will appear in the Clear Time area of the screen. The decoded Cause Code for either condition will also be displayed in the center of the Data Display area.

If a REJECT condition occurs, it is detected, but not displayed on the screen. REJECTS are included with RETRIES in the Total Session Activities area of the screen.
The following activities are displayed:

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DISPLAY</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CALL</td>
<td>Hours, Minutes, Seconds (HH:MM:SS) or Minutes, Seconds, Milliseconds (MM:SS:ms). Upon call request, signal is timestamped according to configuration selected. (Ref 3.7 - Configuration Control).</td>
</tr>
<tr>
<td>2</td>
<td>LCN</td>
<td>Logical Channel Number (LCN) Displays number of logical channel being monitored, also direction indicator for call. LCN will blink until a call confirmation is received. &quot;ALARM&quot; will flash under LCN when an alarm condition is detected.</td>
</tr>
<tr>
<td>3</td>
<td>CONF</td>
<td>Minutes, Seconds (MM:SS.) Confirmation of call is timestamped.</td>
</tr>
</tbody>
</table>
### DATA DISPLAY ITEMS:

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DISPLAY</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>SEND</td>
<td>Counter indicates number (0 - 65,000) of data packets sent. Resets upon each new call.</td>
</tr>
<tr>
<td>5</td>
<td>RETRY</td>
<td>Counter indicates number (0 - 65,000) of data packets retried (Send). Retries are defined by P(S) and P(R) logic. Resets upon each new call.</td>
</tr>
<tr>
<td>6</td>
<td>RECV</td>
<td>Counter indicates number (0 - 65,000) of data packets received. Resets upon each new call.</td>
</tr>
<tr>
<td>7</td>
<td>RETRY</td>
<td>Counter indicates number (0 - 65,000) of data packets retried (Received). Retries are defined by P(S) and P(R) logic. Resets upon each new call.</td>
</tr>
</tbody>
</table>

**NOTE**

Items 4, 5, 6, and 7 will be overlaid on the display by items 11 and 12 when DTE ADDRESSES softkey is depressed. The DATA DISPLAY softkey will restore items 4, 5, 6, and 7 in this area of the screen. Outstanding packet counters will be displayed in reverse video on Reset Packet. If counter exceeds 99, counter will continue to count beyond 99; e.g., 10 in counter is equal to 110.
START- 11:58:22 SINGLE LC ACTIVITY ST
CALL  11:58:47 LCN  58:47 CONF  SEND RETRY RECV RETRY CLEAR 11:59:04
DTE ORIGINATED

CHANNEL TRAFFIC ANALYSIS

SINGLE LCN ACTIVITY STOP-18:33:00
CONF  SEND RETRY RECV RETRY CLEAR
30:45 0 0 0 2 0 OUT OF ORDER

CHANNEL TRAFFIC ANALYSIS

RSTR Indicates RESTART Cause Code. Only indicated if session is active.

RSET Indicates RESET Cause Code. Reset Indication packet detected.
(Only one Cause Code displayed at a time).

Decoded RESTART or RESET Cause Code appears in this space when appropriate condition is detected.

Possible Decoded RESTART Cause Codes:
DTE ORIGINATED
LOCAL PROCEDURE ERROR
NETWORK CONGESTION
NETWORK OPERATIONAL

Possible Decoded RESET Cause Codes:
DTE ORIGINATED
OUT OF ORDER
REMOTE PROCEDURE ERROR
LOCAL PROCEDURE ERROR
NETWORK CONGESTION
REMOTE DTE OPERATIONAL
NETWORK OPERATIONAL
INCOMPATIBLE DESTINATION
NUMBER BUSY

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CLEAR

Hours, Minutes, Seconds (HH:MM:SS) or Minutes, Seconds, Miliseconds (MM:SS:ms). Upon call clear, signal is timestamped in real time and according to configuration selected. (CONFIGURATION CONTROL - Ref:3.9). A direction indicator is also displayed. If a clear is not confirmed, then a retry will take place (RTY) will be displayed blinking in the directional indicator until a confirmation is received. A maximum of 7 retries will be displayed).

CONF

Minutes, Seconds (MM:SS). Upon receipt of clear confirmation, signal is timestamped in real time.
CHANNEL TRAFFIC ANALYSIS

RS 0 | TRANSMISSION ERRORS 0 | RETRIES 0
2 RCVD= 0 | DATA PACKETS SENT= 3 | RCVD= 6

DTE ADDRESS ITEMS:

11 CALLING DTE Address of DTE sending call.
12 CALLED DTE Address of DTE receiving call.
5.4.2 Total Channel Traffic Analysis (Single LCN)

Channel Traffic Analysis accurately measures the relation of user data and control packets as overhead. This relationship is indicated in numeric and graphic form.

A horizontal bar graph is displayed in the central area of the display, representing the ratio of data packets to control packets for the LCN being analyzed. Data packets are indicated by the upper, light-shaded bar, while control packets are indicated by the lower, dark-shaded bar. The run time total count in real numbers of data and control packets for the LCN being analyzed (overhead) is also displayed.

The following activities are displayed:

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DISPLAY</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>DATA PACKETS</td>
<td>Total number of data packets sent and received on the LCN being analyzed (number sent and received is displayed in Total Session Activities area Ref - 5.4.3).</td>
</tr>
<tr>
<td>14</td>
<td>CONTROL PACKETS</td>
<td>Total number of control packets sent and received on LCN being analyzed.</td>
</tr>
</tbody>
</table>
5.4.3 Total Session Activities (Single LCN)

This area of the screen appears below Channel Traffic Analysis. The run time totals are displayed for Protocol Errors, Transmission Errors, Retries, Calls made (MADE) and received (RCVD), and Data packets sent and received. These totals are based on the activity of the single LCN displayed during the run time.

The following activities are displayed:

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DISPLAY</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>PROTOCOL ERRORS</td>
<td>Number of protocol errors over total link detected by Auto Sentry.</td>
</tr>
<tr>
<td>16</td>
<td>TRANSMISSION</td>
<td>Number of BCC(FSC) errors over ERRORS total link.</td>
</tr>
<tr>
<td>17</td>
<td>RETRIES</td>
<td>Number of packet retries for single LCN being analyzed (includes number of REJECTS detected, also).</td>
</tr>
<tr>
<td>18</td>
<td>CALLS</td>
<td>Number of calls made and received by single LCN being analyzed.</td>
</tr>
<tr>
<td>19</td>
<td>DATA PACKETS</td>
<td>Number of data packets sent and received for single LCN being analyzed.</td>
</tr>
</tbody>
</table>
5.4.4 Single LCN Performance

The lower area of the screen displays the performance times for session access and clears, and the Packet and Frame Response times for the single LCN being analyzed. The MIN, MAX, and AVG times for the above are displayed with their Timestamps. The area labeled DATA PACKETS breaks the total number of data packets (displayed in Total Channel Traffic Analysis) into the number sent (SENT) or received (RCVD).

The following activities are displayed:

**TIME**

- **Seconds, Milliseconds (SS:ms)** or Hours, Minutes, Seconds (HH:MM:SS) according to configuration selected. (Ref 3.7 - Configuration Control User Manual). Displays Minimum, Maximum, Last and Average times to perform functions.

- You can set the state for the following leads:
  - **MAXIMUM**
  - **MINIMUM**
  - **LAST**
  - **AVG**

**MINIMUM**  **MAXIMUM**  **LAST**  **AVERAGE**

The following table shows the performance times:

<table>
<thead>
<tr>
<th>Protocol Errors</th>
<th>Transmission Errors</th>
<th>Retries</th>
<th>Calls Made</th>
<th>RCVD</th>
<th>DATA PACKETS</th>
<th>SENT</th>
<th>RCVD</th>
<th>AVG</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>6</td>
<td></td>
</tr>
</tbody>
</table>

**Access Time:**
- 0.293 at 11:58:47
- 0.320 at 11:58:30
- 0.293 at 11:58:47
- 0.305

**Clear Time:**
- 0.306 at 11:58:05
- 0.347 at 11:58:45
- 0.306 at 11:58:05
- 0.326

**Packet Resp Time:**
- 0.320 at 11:58:31
- 0.533 at 11:58:50
- 0.414 at 11:58:51
- 0.408

**Frame Resp Time:**
- 0.41 at 11:58:52
- 0.15 at 11:58:40
- 0.54 at 11:58:52
- 0.13

**X.25 Analysis**

- **As SD Replay Trk:** 8

---

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### X.25 Application Program Analysis

**Single Logical Channel**

#### Channel Traffic Analysis

<table>
<thead>
<tr>
<th>Data Packets</th>
<th>Control Packets</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Protocol Errors</th>
<th>Calls Made</th>
<th>Received</th>
<th>Data Packets</th>
<th>Sent</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Access Time</th>
<th>Clear Time</th>
<th>Packet Resp T</th>
<th>Frame Resp T</th>
</tr>
</thead>
<tbody>
<tr>
<td>00.293 at 11:58:47</td>
<td>00.320 at 11:58:30</td>
<td>00.306 at 11:59:05</td>
<td>00.533 at 11:58:50</td>
</tr>
<tr>
<td>00.347 at 11:58:45</td>
<td>00.320 at 11:58:31</td>
<td>00.533 at 11:58:50</td>
<td>00.533 at 11:58:52</td>
</tr>
<tr>
<td>00.293 at 11:58:47</td>
<td>00.320 at 11:58:30</td>
<td>00.533 at 11:58:50</td>
<td>00.347 at 11:58:45</td>
</tr>
</tbody>
</table>

#### Item Display

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>Access Time</td>
</tr>
<tr>
<td>21</td>
<td>Clear Time</td>
</tr>
<tr>
<td>22</td>
<td>Packet Resp T</td>
</tr>
<tr>
<td>23</td>
<td>Frame Resp T</td>
</tr>
</tbody>
</table>
### 5.4.5 Single Logical Channel Activity

**Softkey/Label Display Descriptions**

<table>
<thead>
<tr>
<th>Start Time</th>
<th>Activity Time</th>
<th>Stop Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:58:22</td>
<td>SINGLE LCN ACTIVITY</td>
<td>12:01:19</td>
</tr>
</tbody>
</table>

**Channel Traffic Analysis**

<table>
<thead>
<tr>
<th>Protocol Errors</th>
<th>Transmission Errors</th>
<th>Retries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calls Made</td>
<td>RCVD</td>
<td>Sent</td>
</tr>
<tr>
<td>Access Time...</td>
<td>00.018 at 11:59:32</td>
<td>00.021 at 11:59:33 00.019 at 11:59:55 00.015</td>
</tr>
<tr>
<td>Clear Time...</td>
<td>00.018 at 11:59:50</td>
<td>00.022 at 11:59:51 00.019 at 12:01:18 00.020</td>
</tr>
<tr>
<td>Packet Resp T.</td>
<td>00.019 at 11:59:41</td>
<td>00.033 at 11:59:50 00.027 at 12:01:18 00.025</td>
</tr>
<tr>
<td>Frame Resp T.</td>
<td>00.080 at 12:00:43</td>
<td>00.137 at 11:59:59 00.095 at 12:01:13 00.178</td>
</tr>
</tbody>
</table>

**X.25 Analysis**

**5.4.5.1 RUN ANALYSIS Softkey/Label Display**

<table>
<thead>
<tr>
<th>Softkey/Label</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stop Analysis</td>
<td>Stops analysis process.</td>
</tr>
<tr>
<td>Freeze Display</td>
<td>Freezes/Resumes data displayed on screen only. All other analysis functions continue, including data capture. (Flip-flop type action.)</td>
</tr>
<tr>
<td>Resume Display</td>
<td>Sets-up display to select/change data displayed from/to Single Channel LCN, Multiple Channel LCN, Daily Traffic Activity, LCN Performance, Total Line Activity or Billing Information. (Ref 5.3.5)</td>
</tr>
<tr>
<td>Change Display</td>
<td>Selects DTE addresses or data display (SEND,RETRY,RECV,RETRY) to be displayed. (Flip-flop type action softkey). (Ref 5.4.5.2)</td>
</tr>
<tr>
<td>Change LCN</td>
<td>Sets-up display to change/select Logical Channel Number. Selected LCN's data will be displayed for analysis. (Ref 5.4.5.3)</td>
</tr>
<tr>
<td>Alarm Report</td>
<td>Sets-up display to select and clear alarm reports. (Ref 6.0)</td>
</tr>
</tbody>
</table>

Not Used

Not Used
5.4.5.2 DISPLAY CONTROL Softkey/Label Display

START- 18:32:56  
SINGLE LCN ACTIVITY  
STOP-18:33:00

<table>
<thead>
<tr>
<th>CALL</th>
<th>LCN</th>
<th>CONF</th>
<th>SEND</th>
<th>RETRY</th>
<th>RECV</th>
<th>RETRY</th>
<th>CLEAR</th>
<th>CONF</th>
</tr>
</thead>
<tbody>
<tr>
<td>18:30:45</td>
<td>30:45</td>
<td>30:45</td>
<td>0</td>
<td>0.400+</td>
<td>2</td>
<td>0</td>
<td>OUT OF ORDER</td>
<td></td>
</tr>
</tbody>
</table>

CHANNEL TRAFFIC ANALYSIS

<table>
<thead>
<tr>
<th>PROTOCOL ERRORS</th>
<th>0</th>
<th>TRANSMISSION ERRORS</th>
<th>0</th>
<th>RETRIES</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>CALLS MADE</td>
<td>1</td>
<td>RCVD packets</td>
<td>0</td>
<td>DATA PACKETS SENT</td>
<td>0</td>
</tr>
<tr>
<td>ACCESS TIME...</td>
<td>000.41 at 18:30:45</td>
<td>000.41 at 18:30:45</td>
<td>000.41 at 18:30:45</td>
<td>000.41 at 18:30:45</td>
<td>000.41</td>
</tr>
<tr>
<td>CLEAR TIME...</td>
<td>000.00 at 00:00:00</td>
<td>000.00 at 00:00:00</td>
<td>000.00 at 00:00:00</td>
<td>000.00 at 00:00:00</td>
<td>000.00</td>
</tr>
<tr>
<td>PACKET RESP T.</td>
<td>000.24 at 18:30:46</td>
<td>000.57 at 18:30:47</td>
<td>000.57 at 18:30:47</td>
<td>000.57 at 18:30:47</td>
<td>000.41</td>
</tr>
<tr>
<td>FRAME RESP T.</td>
<td>000.00 at 00:00:00</td>
<td>000.00 at 00:00:00</td>
<td>000.00 at 00:00:00</td>
<td>000.00 at 00:00:00</td>
<td>000.00</td>
</tr>
</tbody>
</table>

X.25 ANALYSIS

| AS SD REPLY TRK: 96 |

<table>
<thead>
<tr>
<th>SOFTKEY/LABEL</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not Used</td>
</tr>
<tr>
<td></td>
<td>Not Used</td>
</tr>
<tr>
<td>CHANGE DISPLAY</td>
<td>Sets-up display to select/change data displayed from/to Single Channel LCN, Multiple Channel LCN, Daily Traffic Activity, LCN Performance, Total Line Activity, Billing Information or Segment Filling. (Ref 5.3.3)</td>
</tr>
<tr>
<td>DTE ADDRESSES</td>
<td>Selects DTE addresses or data display (SEND, RETRY, RECV, RETRY) to be displayed. (Flip-flop type action softkey).</td>
</tr>
<tr>
<td>DATA DISPLAY</td>
<td>Sets-up display to change/select Logical Channel LCN Number. Selected LCN's data will be displayed for analysis. (Ref 5.4.5.3)</td>
</tr>
<tr>
<td>CHANGE LCN</td>
<td>Sets-up display to select, review and clear Alarm reports. (Ref Section 6)</td>
</tr>
<tr>
<td>ALARM REPORT</td>
<td>Initiates Print Control Softkey/label display. (Ref 5.3.6)</td>
</tr>
<tr>
<td>PRINT CONTROL</td>
<td>Return to previous softkey/label display. (DISPLAY CONTROL - Ref 5.3.1)</td>
</tr>
</tbody>
</table>

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5.4.5.3 CHANGE LCN Softkey/Label Display

**SOFTKEY/LABEL**

- Not Used
- Not Used
- Not Used
- Not Used
- Not Used
- SELECT LCN
- PREVIOUS ITEM
- NEXT ITEM
- EXIT

**FUNCTION**

- Sets-up display to change logical channel number. (Ref 5.4.5.4)
- Selects previous LCN to be displayed for analysis.
- Selects next LCN to be displayed for analysis.
- Return to previous softkey/label display. (CHANGE LCN - Ref 5.4.5.2)
5.4.5.4 SELECT LCN Softkey/Label Display

**FUNCTION**

- **Cursor Left <**
  - Moves cursor one (1) character position left in Logical Channel Number indicator.

- **Cursor Right >**
  - Moves cursor one (1) character position right in Logical Channel Number Indicator.

- **Change Character**
  - Changes character in cursor location. Characters will cycle sequentially when softkey is depressed. (Hexadecimal - 0 to F)

- **Not Used**

- **Enter**
  - Enters new or changed number in LCN indicator. (Must be initiated to complete and store change). Return to previous softkey/label display. (SELECT LCN - Ref 5.4.5.3)

- **Exit**
  - Return to previous softkey/label display. (SELECT LCN - Ref 5.4.5.3)
5.5 MULTIPLE LOGICAL CHANNEL ACTIVITY Report

The Multiple Logical Channel Activity Report provides information about the activities of all Logical Channels on a physical link.

NOTE

When ANALYSIS is selected from the Main Menu, the system automatically defaults to the Single Logical Channel Activity display. The Multiple Logical Channel Activity report may be accessed using either CHANGE DISPLAY or STOP ANALYSIS, depressing the SET UP ANALYSIS softkey, and then selecting MULTIPLE LCN. This report may also be accessed from RUN ANALYSIS mode by depressing CHANGE DISPLAY and selecting MULTIPLE LCN.

Multiple Logical Channel activity is detected, calculated and presented in graphic and numeric form. The screen is divided into four (4) areas.

1) Multiple LCN Session Activity
2) Total Channel Traffic Analysis (Multiple LCN)
3) Total Session Activities (Multiple LCN)
4) Multiple LCN Performance

Operating Sequence

1. Set up Analysis for multiple LCs and exit
2. Run analysis
3. Stop analysis
4. Review results

ANALYSIS

<table>
<thead>
<tr>
<th>RUN</th>
<th>DISPLAY</th>
<th>SET UP</th>
<th>CONFIG</th>
<th>DISK</th>
<th>MAIN</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANALYSIS</td>
<td>CONTROL</td>
<td>ANALYSIS</td>
<td>CONTROL</td>
<td>CONTROL</td>
<td>MENU</td>
</tr>
</tbody>
</table>

SET UP ANALYSIS

<table>
<thead>
<tr>
<th>DISPLAY</th>
<th>SET UP</th>
<th>GENERAL</th>
<th>LCN</th>
<th>BILLING</th>
<th>EXIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>SET UP</td>
<td>LCN ALARMS</td>
<td>LCN ALARMS</td>
<td>LCN ALARMS</td>
<td>BILLING CONFIG</td>
<td>EXIT</td>
</tr>
</tbody>
</table>

DISPLAY SET UP

<table>
<thead>
<tr>
<th>MULTIPLE</th>
<th>SINGLE</th>
<th>LINE</th>
<th>LCN</th>
<th>DAILY</th>
<th>ALL</th>
<th>NEXT</th>
<th>EXIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCN</td>
<td>LCN REPORT</td>
<td>REPORT</td>
<td>REPORT</td>
<td>ACTIVITY</td>
<td>PROCESS</td>
<td>MENU</td>
<td>EXIT</td>
</tr>
</tbody>
</table>
Display Format

Multiple Logical Channel Report will monitor up to 64 LCNs and store data on each individual channel. A maximum of 32 LCNs will be displayed at any one time. An LCN is displayed when a Call Request packet or an Incoming Call packet is detected on the line.

The LCNs are displayed in a reverse video box form. A box contains the channel number and the status of the channel. As LCNs are detected, their boxes appear to the right of previously detected LCNs. In the event that more than 32 LCNs are being analyzed, the most recent LCN detected will appear in place of any previously detected LCN that is currently inactive. Data continues to be accumulated for all LCNs. This process continues as a maximum of 64 LCNs are analyzed.
5.5.1 Multiple LCN Session Activity

The Multiple Logical Channel activity will monitor up to 64 LCNs and store data on each individual channel. A maximum of 32 LCNs will be displayed at any one time. An LCN is displayed when a Call Request packet or an Incoming Call packet is detected on the line.

The LCNs are displayed in a reverse video box form. A box contains the channel number and the status of the channel. As LCNs are detected, their boxes appear to the right of previously detected LCNs. In the event that more than 32 LCNs are being analyzed, the most recent LCN detected will appear in place of any previously detected LCN that is currently inactive. Data continues to be accumulated for all LCNs. This process continues as a maximum of 64 LCNs are analyzed.

When an LCN is in the information transfer phase, it is displayed in high-intensity on the screen. When a Clear Confirmation has been detected, the LCN box reverts to low-intensity on the screen. If the LCN becomes active again, it is displayed in high-intensity on the screen.

To review a single logical channel activity, depress the CHANGE DISPLAY softkey and select SINGLE LCN (Ref: 3.2 Single Logical Channel Activity Display).

The following activities are displayed:

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DISPLAY</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CAL</td>
<td>Indicates that either a Call Request packet or an Incoming Call packet and its confirmation has been detected.</td>
</tr>
<tr>
<td></td>
<td>CLR</td>
<td>Indicates a clear packet and a clear confirmation packet were detected. (LCN box will go dim.)</td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>Indicates alarm status (Auto-Sentry has detected a catastrophic error during session).</td>
</tr>
<tr>
<td></td>
<td>AF</td>
<td>Indicates LCN alarm buffer full</td>
</tr>
<tr>
<td></td>
<td>INF</td>
<td>Indicates that the LCN is in information transfer phase, exchanging data packets.</td>
</tr>
</tbody>
</table>
## 5.5.2 Total Channel Traffic Analysis (Multiple LCN)

In the central area of the screen, a horizontal bar graph is displayed. The graph displays the ratio of data packets to control packets for all LCNs detected. Data packets are represented by the upper, light-shaded bar, while control packets are represented by the lower, dark-shaded bar. The graph also displays the run time total counts of data and control packets for all LCNs detected.

The following activities are displayed:

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DISPLAY</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>DATA PACKETS</td>
<td>Total number of data packets sent and received for all displayed LCNs. (Number sent and received is displayed in Total Session Activities area).</td>
</tr>
<tr>
<td>3</td>
<td>CONTROL PACKETS</td>
<td>Total number of control packets sent and received for all displayed LCNs. (Number sent and received is displayed in Total Session Activities area).</td>
</tr>
</tbody>
</table>
5.5.3 Total Session Activities (Multiple LCN)

This area of the screen appears below Channel Traffic Analysis. Here the run time totals are displayed for Protocol Errors, Transmission errors and Calls Active (count of currently active LCNs).

The following activities are displayed:

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DISPLAY</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>PROTOCOL</td>
<td>Number of protocol errors (Violations of ERRORS line procedure) detected by Auto Sentry.</td>
</tr>
<tr>
<td>5</td>
<td>TRANSMISSION</td>
<td>Number of BCC (FCS) errors (Hardware and ERRORS line oriented).</td>
</tr>
<tr>
<td>6</td>
<td>CALLS ACTIVE</td>
<td>Number of calls active.</td>
</tr>
</tbody>
</table>
5.5.4 Multiple LCN Performance

The lower area of the screen displays the performance times for Sessions Access and Clear Times, and the Packet and Frame Response Times for all LCNs being analyzed. The MIN, MAX and AVG. times for the above are displayed with their timestamps.

NOTE

The term "Frame Response Time", used in this section, is equivalent to what users refer to as "Network Response Time".

The following activities are displayed:

TIME
Seconds, Milliseconds (SS.ms) at Hours, Minutes, Seconds (HH.MM.SS). Displays Minimum, Maximum, Last and Average time to perform functions.

MAXIMUM
Longest time interval on LCNs.

MINIMUM
Shortest time interval on LCNs.

LAST
Last completed connection on LCNs.

AVG
Average completed connection on LCNs.
ITEM  | DISPLAY  | DESCRIPTION
7  | ACCESS TIME | Time measured between trailing flag (7E) of Call Request packet and trailing flag (7E) of Call Confirmation packet on logical channels. (Average time from CALL REQUEST to CALL CONFIRMATION from DTE TO DCE).
8  | CLEAR TIME | Time measured between trailing flag (7E) of Clear Request packet and trailing flag (7E) of Clear Confirmation packet on logical channels. (Average time from CLEAR REQUEST to CLEAR CONFIRMATION from DCE to DTE).
9  | PACKET RESP T | Response time based on PS/PR logic. Time is measured from trailing flag of data packet to trailing flag of data/control packet carrying PR confirmation.
10 | FRAME RESP T | Response time calculated only on frames with Poll/Final bit set to 1. Time is measured from trailing flag of frame with P bit set to trailing flag of frame with F bit set on opposite side.
5.5.5 Multiple Logical Channel Activity
Softkey/Label Display Descriptions

START- 12:08:02
MULTIPLE LCN ACTIVITY
STOP-12:26:38

CHANNEL TRAFFIC ANALYSIS

<table>
<thead>
<tr>
<th>PROTOCOL ERRORS</th>
<th>TRANSMISSION ERRORS</th>
<th>CALLS ACTIVE</th>
<th>AVG</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCESS TIME... 001.02 at 12:09:34 002.09 at 12:23:26 001.02 at 12:26:35 001.13</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CLEAR TIME.... 000.91 at 12:09:57 001.23 at 12:21:02 001.01 at 12:26:21 000.99</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PACKET RESP T. 001.03 at 12:17:23 002.14 at 12:19:11 001.04 at 12:26:37 001.02</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FRAME RESP T. 000.90 at 12:23:10 001.01 at 12:09:33 000.97 at 12:25:03 000.99</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5.5.5.1 RUN ANALYSIS Softkey/Label Display

SOFTKEY/LABEL FUNCTION

STOP ANALYSIS

Stops analysis process.

FREEZE DISPLAY

Freezes/Resumes data displayed on screen only. All other analysis functions continue, including data capture. (Flip-flop type action).

RESUME DISPLAY

CHANGE DISPLAY

Sets-up display to select/change data displayed from/to Single Channel LCN, Multiple Channel LCN, Daily Traffic Activity, LCN Performance, Total Line Activity or Billing Information. (Ref 5.3.5)

Not Used

Not Used

ALARMS REPORT

Sets-up display to select, review and clear Alarm reports. (Ref Section 6)

Not Used

Not Used

5-33
X.25 APPLICATION PROGRAM
ANALYSIS
MULTIPLE LOGICAL CHANNEL-SOFTKEY/LABEL DESCRIPTION

5.5.5.2 DISPLAY CONTROL Softkey/Label Display

START- 12:08:02  MULTIPLE LCN ACTIVITY  STOP-12:26:38

CHANNEL TRAFFIC ANALYSIS

<table>
<thead>
<tr>
<th>PROTOCOL ERRORS</th>
<th>MAXIMUM</th>
<th>MINIMUM</th>
<th>LAST</th>
<th>AVG</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCESS TIME... 001.02 at 12:09:34 002.02 at 12:23:25 001.02 at 12:26:35 001.13</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CLEAR TIME... 000.91 at 12:09:57 001.23 at 12:21:02 001.01 at 12:26:21 000.98</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PACKET RESP T. 001.03 at 12:17:23 002.14 at 12:19:11 001.04 at 12:26:37 001.82</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FRAME RESP T... 000.90 at 12:23:10 001.01 at 12:05:33 000.97 at 12:25:03 000.99</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

X.25 ANALYSIS AS SD REPLAY TRK: 96

SOFTKEY/LABEL FUNCTION

Not Used

Not Used

Sets-up display to select/change data displayed from/to Single Channel LCN, Multiple Channel LCN, Daily Traffic Activity, LCN Performance, Total Line Activity, Billing Information or Segment Filling. (Ref 5.3.3)

Not Used

Not Used

Sets-up display to select, review and clear Alarm reports. (Ref Section 6)

Initiates Print Control Softkey/label display. (Ref 5.3.6)

Return to previous softkey/label display. (DISPLAY CONTROL - Ref 5.3.1)

5-34
5.6 TOTAL LINK ACTIVITY REPORT (SYSTEM REPORT)

The Total Link Activity Report, or System Report, displays all LCN data traffic activity occurring at both the DCE and DTE devices. A more specific analysis of LCN activity is available through the Single LCN and Multiple LCN activity reports.

Total Link Activity is detected, calculated, and then presented in numeric form.

**Operating Sequence**

1. Set up Analysis for system report and exit
2. Run analysis
3. Stop analysis
4. Review results
### Display Format

The following activities are displayed:

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DISPLAY</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CALLS FROM DTE</td>
<td>Number of calls transmitted by all DTEs during Run Analysis mode.</td>
</tr>
<tr>
<td>2</td>
<td>CALLS FROM DCE</td>
<td>Number of calls transmitted by DCE during Run Analysis mode.</td>
</tr>
<tr>
<td>3</td>
<td>AVG CONNECT TIME</td>
<td>Average time of active sessions for all LCNs during Run Analysis mode.</td>
</tr>
</tbody>
</table>
START- 11:58:57  

TOTAL LINK ACTIVITY REPORT

CALLS FROM DTE 20  CALLS FROM DCE 0  AVG CONNECT

<table>
<thead>
<tr>
<th>PACKET TYPE</th>
<th>COUNTS</th>
<th>ERROR TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATA FROM DTE</td>
<td>239</td>
<td>PROTOCOL</td>
</tr>
<tr>
<td>DATA FROM DCE</td>
<td>115</td>
<td>TRANSMISSION</td>
</tr>
<tr>
<td>CONTROL FROM DTE</td>
<td>158</td>
<td>DTE PKT RETRIE</td>
</tr>
<tr>
<td>CONTROL FROM DCE</td>
<td>151</td>
<td>DCE PKT RETRIE</td>
</tr>
</tbody>
</table>

4  PACKET TYPE  
Shows specific number of data and control packets from all DTEs and DCE.

5  ERROR TYPE  
Shows specific number of protocol and transmission errors encountered on line. Also shows number of DTE and DCE packet retries.
### X.25 Application Program

**Analysis**

**Total Link Activity Report**

**MINIMUM**

- **Control from DCE**: 151
- **DCE PKT RETRIES**: 0

**MAXIMUM**

- **Control from DTE**: 151

**LAST**

- **TIME**

<table>
<thead>
<tr>
<th>TIME</th>
<th>MINIMUM</th>
<th>MAXIMUM</th>
<th>LAST</th>
<th>AVG</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCESS TIME</td>
<td>000.01 at 11:59:15</td>
<td>000.02 at 11:59:33</td>
<td>000.02 at 12:03:13</td>
<td>000.01</td>
</tr>
<tr>
<td>CLEAR TIME</td>
<td>000.01 at 11:59:50</td>
<td>000.02 at 11:59:33</td>
<td>000.02 at 12:02:56</td>
<td>000.01</td>
</tr>
<tr>
<td>PACKET RESP T.</td>
<td>000.01 at 11:59:41</td>
<td>000.04 at 12:01:27</td>
<td>000.03 at 12:03:13</td>
<td>000.02</td>
</tr>
<tr>
<td>FRAME RESP T.</td>
<td>000.09 at 12:00:43</td>
<td>001.01 at 12:03:05</td>
<td>000.44 at 12:03:13</td>
<td>000.13</td>
</tr>
</tbody>
</table>

**AVG**

- **TIME**

**Notes:**

- **Seconds, Milliseconds (SS.ms)**
- **Hours, Minutes, Seconds (HH.MM.SS)**
- Displays Minimum, Maximum, Last and Average times to perform functions.

- **TIME**
- Longest time interval on LCNs.
- **MINIMUM**
- Shortest time interval on LCNs.
- **LAST**
- Last completed connection on LCNs.
- **AVG**
- Average completed connection on the LCNs.
### X.25 Application Program Analysis

#### Total Link Activity Report

**Control from DCE**

<table>
<thead>
<tr>
<th></th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access Time...</td>
<td>000.01 at 11:59:15</td>
<td>000.02 at 11:59:33</td>
</tr>
<tr>
<td>Clear Time...</td>
<td>000.01 at 11:59:50</td>
<td>000.02 at 11:59:33</td>
</tr>
<tr>
<td>Packet Resp T.</td>
<td>000.01 at 11:59:41</td>
<td>000.04 at 12:01:27</td>
</tr>
<tr>
<td>Frame Resp T.</td>
<td>000.09 at 12:00:43</td>
<td>001.81 at 12:03:05</td>
</tr>
</tbody>
</table>

**X.25 Analysis**

- **Access Time**: Time measured between trailing flag (7E) of Call Request packet and trailing flag (7E) of Call Confirmation packet on logical channels. (Average time from CALL REQUEST to CALL CONFIRMATION from DTE to DCE).

- **Clear Time**: Time measured between trailing flag (7E) of Clear Request packet and trailing flag (7E) of Clear Confirmation packet on logical channels. (Average time from CLEAR REQUEST to CLEAR CONFIRMATION from DCE to DTE).

- **Packet Resp T**: Response time based on PS/PR logic. Time is measured from trailing flag of data packet to trailing flag of data/control packet carrying PR confirmation.

- **Frame Resp T**: Response time calculated only on frames with Poll/Final bit set to 1. Time is measured from trailing flag of frame with P bit set to trailing flag of frame with F bit set on opposite side.
5.6.1 Total Line Activity Report
Softkey/Label Display Description

START- 11:58:57
TOTAL LINK ACTIVITY REPORT
STOP-12:03:13

CALLS FROM DTE  20  CALLS FROM DCE  0  AVG CONNECT TIME  007.93

<table>
<thead>
<tr>
<th>PACKET TYPE</th>
<th>COUNTS</th>
<th>ERROR TYPE</th>
<th>COUNTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATA FROM DTE</td>
<td>238</td>
<td>PROTOCOL</td>
<td>0</td>
</tr>
<tr>
<td>DATA FROM DCE</td>
<td>115</td>
<td>TRANSMISSION</td>
<td>0</td>
</tr>
<tr>
<td>CONTROL FROM DTE</td>
<td>158</td>
<td>DTE PKT RETRIES</td>
<td>0</td>
</tr>
<tr>
<td>CONTROL FROM DCE</td>
<td>151</td>
<td>DCE PKT RETRIES</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MINIMUM</th>
<th>MAXIMUM</th>
<th>LAST</th>
<th>AVG</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCESS TIME...</td>
<td>000.01 at 11:59:15</td>
<td>000.02 at 11:59:33</td>
<td>000.02 at 12:03:13</td>
</tr>
<tr>
<td>CLEAR TIME....</td>
<td>000.01 at 11:59:50</td>
<td>000.02 at 11:59:33</td>
<td>000.02 at 12:02:56</td>
</tr>
<tr>
<td>PACKET RESP T.</td>
<td>000.01 at 11:59:41</td>
<td>000.04 at 12:01:27</td>
<td>000.03 at 12:03:13</td>
</tr>
<tr>
<td>FRAME RESP T..</td>
<td>000.99 at 12:00:43</td>
<td>000.81 at 12:00:50</td>
<td>000.44 at 12:03:13</td>
</tr>
</tbody>
</table>

5.6.1.1 RUN ANALYSIS Softkey/Label Display

SOFTKEY/LABEL FUNCTION

- **STOP ANALYSIS**: Stops analysis process.
- **FREEZE DISPLAY**: Freezes/Resumes data displayed on screen only. All other analysis functions continue, including data capture. (Flip-flop type action).
- **CHANGE DISPLAY**: Sets-up display to select/change data displayed from/to Single Channel LCN, Multiple Channel LCN, Daily Traffic Activity, LCN Performance, Total Line Activity or Billing Information. (Ref 5.3.5)
- **Not used**
- **Not Used**
- **ALARM REPORT**: Sets-up display to select, review and clear Alarm reports. (Ref Section 6)
- **Not used**
- **Not Used**

5-40
5.6.1.2 DISPLAY CONTROL Softkey/Label Display

START - 11:58:57
TOTAL LINK ACTIVITY REPORT
STOP - 12:03:13
CALLS FROM DTE 20 CALLS FROM DCE 0 AVG CONNECT TIME 007.93

<table>
<thead>
<tr>
<th>PACKET TYPE</th>
<th>COUNTS</th>
<th>ERROR TYPE</th>
<th>COUNTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATA FROM DTE</td>
<td>238</td>
<td>PROTOCOL</td>
<td>0</td>
</tr>
<tr>
<td>DATA FROM DCE</td>
<td>115</td>
<td>TRANSMISSION</td>
<td>0</td>
</tr>
<tr>
<td>CONTROL FROM DTE</td>
<td>150</td>
<td>DTE PKT RETRIES</td>
<td>0</td>
</tr>
<tr>
<td>CONTROL FROM DCE</td>
<td>151</td>
<td>DCE PKT RETRIES</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MINIMUM</th>
<th>MAXIMUM</th>
<th>LAST</th>
<th>AVG</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCESS TIME</td>
<td>000.01 at 11:59:15</td>
<td>000.02 at 11:59:33</td>
<td>000.02 at 12:03:13</td>
</tr>
<tr>
<td>CLEAR TIME</td>
<td>000.01 at 11:59:50</td>
<td>000.02 at 11:59:33</td>
<td>000.02 at 12:02:56</td>
</tr>
<tr>
<td>PACKET RESP T.</td>
<td>000.01 at 11:59:41</td>
<td>000.04 at 12:01:27</td>
<td>000.03 at 12:03:13</td>
</tr>
<tr>
<td>FRAME RESP T.</td>
<td>000.09 at 12:00:43</td>
<td>001.01 at 12:03:02</td>
<td>000.44 at 12:03:13</td>
</tr>
</tbody>
</table>

X.25 ANALYSIS
AS SD REPLAY TRK: 96

SOFTKEY/LABEL FUNCTION

Not Used

Not Used

CHANGE DISPLAY
Sets-up display to select/change data displayed from/to Single Channel LCN, Multiple Channel LCN, Daily Traffic Activity, LCN Performance, Total Line Activity, Billing Information or Segment Filling. (Ref 5.3.3)

Not Used

Not Used

ALARM REPORT
Sets-up display to select, review and clear Alarm reports. (Ref Section 6)

PRINT CONTROL
Initiates Print Control Softkey/label display. (Ref 5.3.6)

EXIT
Return to previous softkey/label display. (DISPLAY CONTROL - Ref 5.3.1)
5.7 DAILY TRAFFIC ACTIVITY REPORT

Using the Daily Traffic Activity Report you can compare the amount of data packets and control packets over a fifteen (15) minute sample period. Data may be accumulated and analyzed for up to 24 hours.

Daily Traffic Activity is detected and calculated, and then displayed as a vertical bar graph.

The fifteen minute intervals are based on the real-time clock in the AUTOSCOPE. Interval changes occur at even quarter-hour increments (00, 15, 30, 45). If the actual start time of the session is greater than fifteen minutes, the first quarter hour segment will remain blank and the first bar will appear in the second quarter hour segment.

Operating Sequence

1. Set up Analysis for daily activity and exit
2. Run analysis
3. Stop analysis
4. Review results

START-10:53:25
KILO PACKETS

STOP-16:54:07
Display Format

The lower, lighter-shaded portion of each bar indicates the number of data packets for the specific fifteen (15) minute time interval indicated. The upper, darker-shaded portion of each bar indicates the number of control packets for the specific fifteen (15) minute time interval indicated. The lower line of the bar graph is divided into hours, and each hour segment is subdivided into fifteen (15) minute intervals. CHANGE RANGE lets you choose the most useful display according to the amount of data being transmitted.

The vertical x-axis, labeled "PACKETS", provides a scale for comparing data packets to control packets. Depressing the CHANGE RANGE softkey initiates a display with seven different scales which may be applied to the Daily Activity bar graph (250; 500; 1,000; 2,000; 5,000; 10,000; 100,000) data/control packets. The Daily Traffic Activity Report automatically defaults to the 250 packet range.

CURSOR MODE allows you to scroll right or left to display the exact bar graph for any fifteen (15) minute interval. When depressed, a cursor appears under the bar representing the current time interval. (In RUN ANALYSIS, CURSOR MODE automatically defaults to the bar representing the most recent time interval. In STOP ANALYSIS, the cursor will remain where last positioned).

The CURSOR LEFT < and CURSOR RIGHT > softkeys may be held down to allow continuous scrolling in either direction. Upon exiting CURSOR MODE, the cursor will disappear and the fifteen (15) minute time interval currently being analyzed will be indicated.

NOTE

CHANGE RANGE and CURSOR MODE are available from the RUN ANALYSIS mode as softkey selections. From the STOP ANALYSIS mode, the user may select DISPLAY CONTROL and then CHANGE RANGE or CURSOR MODE.

The following activities will be displayed:

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATA</td>
<td>Number of data packets during current fifteen (15) minute time interval of data analysis.</td>
</tr>
<tr>
<td>CONTROL</td>
<td>Number of control packets during current fifteen (15) minute time interval of data analysis.</td>
</tr>
</tbody>
</table>
5.7.1 Daily Traffic Activity Report
Softkey/Label Display Description

START- 10:53:25
DAILY TRAFFIC ACTIVITY REPORT
STOP-16:54:07

5.7.1.1 RUN ANALYSIS Softkey/Label Display

SOFTKEY/LABEL FUNCTION

- **STOP ANALYSIS**
  - Stops analysis process.

- **FREEZE DISPLAY**
  - Freezes/Resumes data displayed on screen only.
  - All other analysis functions continue, including data capture. (Flip-flop type action).

- **RESUM DISPLAY**
  - Sets-up display to select/change data displayed from/to Single Channel LCN, Multiple Channel LCN, Daily Traffic Activity, LCN Performance, Total Line Activity or Billing Information. (Ref 5.3.5)

- **CHANGE RANGE**
  - Sets up display to select/change range (scale) of bar graph. Seven scale selections are presented. Select and exit to return to Run Analysis softkeys. (Ref 5.7.1.3)

- **CURSOR MODE**
  - Sets up cursor-movement softkey display. (Ref 5.7.1.4)

- **ALARM REPORT**
  - Sets-up display to select, review and clear Alarm reports. (Ref Section 6)

- **Not Used**

- **Not Used**
5.7.1.2 DISPLAY CONTROL Softkey/Label Display

START- 10:53:25  DAILY TRAFFIC ACTIVITY REPORT  STOP-16:54:07
KILO PACKETS

X.25 ANALYSIS  AS SD REPLAY TRK: 96
CHANGE DISPLAY  CHANGE RANGE  CURSOR MODE  ALARM REPORT  PRINT CONTROL  EXIT

SOFTKEY/LABEL  FUNCTION

Not Used

Not Used

Sets-up display to select/change data displayed from/to Single Channel LCN, Multiple Channel LCN, Daily Traffic Activity, LCN Performance, Total Line Activity, Billing Information or Segment Filling. (Ref 5.3.3)

Sets up display to select/change range (scale) of bar graph. Seven scale selections are presented. Select and exit to return to Run Analysis softkeys. (Ref 5.7.1.3)

Sets up cursor-movement softkey display. (Ref 5.7.1.4)

Sets-up display to select, review and clear Alarm reports. (Ref Section 6)

Initiates Print Control Softkey/label display. (Ref 5.3.6)

Return to previous softkey/label display. (DISPLAY CONTROL - Ref 5.3.1)
5.7.1.3 CHANGE RANGE Softkey/Label Display

SOFTKEY/LABEL      FUNCTION

250                Extends scale limit on bar graph to 250 packets.
500                Extends scale limit on bar graph to 500 packets.
1,000              Extends scale limit on bar graph to 1,000 packets.
2,000              Extends scale limit on bar graph to 2,000 packets.
5,000              Extends scale limit on bar graph to 5,000 packets.
10,000             Extends scale limit on bar graph to 10,000 packets.
100,000            Extends scale limit on bar graph to 100,000 packets.
EXIT               Returns to previous softkey/label display.

(CHANGE RANGE - Ref 5.7.1.1)
(CHANGE RANGE - Ref 5.7.1.2)
5.7.1.4 CURSOR MODE Softkey/Label Display

START- 10:53:25

KILO PACKETS

DAILY TRAFFIC ACTIVITY REPORT

STOP-16:54:07

X.25 ANALYSIS
CURSOR LEFT <
CURSOR > RIGHT

AS SD REPLAY TRV: 96

EXIT

SOFTKEY/LABEL FUNCTION

CURSOR LEFT <
Moves cursor one fifteen-minute time interval
(24-hour baseline) to left.

CURSOR > RIGHT
Moves cursor one fifteen-minute time interval
to right.

Not Used

Not Used

Not Used

Not Used

Not Used

Not Used

EXIT

Return to previous softkey/label display.
(CURSOR MODE - Ref 5.7.1.1)
(CURSOR MODE - Ref 5.7.1.2)
5.8 LCN PERFORMANCE REPORT

The LCN Performance Report display enables you to analyze the number of data and control packets per LCN for all LCNs detected. A maximum of 64 LCNs may be analyzed. The report displays data for 4 LCNs at a time.

LCN Performance is detected, calculated, and then presented in graphic and numeric form. The LCN Performance Report displays the number of data packets and control packets according to individual LCNs over the total run time. The number of data packets and control packets per LCN are represented as bars on a horizontal bar graph.

Operating Sequence

1. Set up Analysis for LCN performance and exit
2. Run analysis
3. Stop analysis
4. Review results
Display Format

A pair of bars appears next to each LCN. The upper, dark-shaded bars represent data packets, and the lower, light-shaded bars represent control packets. The exact number of control and data packets per LCN is displayed next to the LCN and in the column labeled COUNTS.

When CHANGE LCN is depressed, a choice of PREVIOUS ITEM and NEXT ITEM softkeys are presented. These softkeys allow you to scroll through the available LCNs. These keys may be held down for a continuous scrolling. A maximum of sixty-four (64) LCNs can be viewed in this manner.

The CHANGE RANGE selection presents seven different scales which may be applied to the LCN Performance bar graph (250; 500; 1,000; 5,000; 10,000; 100,000 and 1,000,000 packets). The LCN Performance Report automatically defaults to the 250 packet range upon selection.

By using CHANGE RANGE, you can choose the most useful display according to the amount of data being transmitted during a particular session. CHANGE RANGE is available from the RUN ANALYSIS mode as a softkey selection. From STOP ANALYSIS mode, select DISPLAY CONTROL and then CHANGE RANGE.

In the lower right-hand area of the display, the percentage of Total Line Usage is displayed. This represents the total percentage of line utilization for the total run time. The Total Line Usage is updated dynamically as data is accumulated and calculated.

NOTE

Utilization = Total number of productive characters on the line divided by total line characters.
5.8.1 LCN Performance Report
Softkey/Label Display Descriptions

START- 12:08:02  LCN PERFORMANCE REPORT  STOP-12:16:03

<table>
<thead>
<tr>
<th>LCN</th>
<th>COUNTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>0001</td>
<td>72</td>
</tr>
<tr>
<td>0003</td>
<td>64</td>
</tr>
<tr>
<td>0004</td>
<td>148</td>
</tr>
<tr>
<td>0008</td>
<td>55</td>
</tr>
</tbody>
</table>

TOTAL LINE USAGE 26%

5.8.1.1 RUN ANALYSIS Softkey/Label Display

SOFTKEY/LABEL FUNCTION

STOP ANALYSIS
Stops analysis process.

FREEZE DISPLAY
Freezes/Resumes data displayed on screen only. All other analysis functions continue, including data capture. (Flip-flop type action.)

RESUME DISPLAY
Sets-up display to select/change data displayed from/to Single Channel LCN, Multiple Channel LCN, Daily Traffic Activity, LCN Performance, Total Line Activity or Billing Information. (Ref 5.3.5)

CHANGE DISPLAY
Sets up display to select/change range (scale) of bar graph. Seven scale selections are presented. Select and exit to return to Run Analysis softkeys. (Ref 5.8.1.3)

CHANGE RANGE
Sets-up display to change/select Logical Channel Number. Selected LCN's data will be displayed for analysis. (Ref 5.8.1.4)

CHANGE LCN

ALARM REPORT
Sets-up display to select, review and clear Alarm reports. (Ref Section 6)

Not Used

Not Used
5.8.1.2 DISPLAY CONTROL Softkey/Label Display

**SOFTKEY/LABEL** | **FUNCTION**
--- | ---
| | Not Used
| | Not Used

**CHANGE DISPLAY**

Sets-up display to select/change data displayed from/to Single Channel LCN, Multiple Channel LCN, Daily Traffic Activity, LCN Performance, Total Line Activity, Billing Information or Segment Filling. (Ref 5.3.3)

**CHANGE RANGE**

Sets up display to select/change range (scale) of bar graph. Seven scale selections are presented. Select and exit to return to Run Analysis softkeys. (Ref 5.8.1.3)

**CHANGE LCN**

Sets-up display to change/select Logical Channel Number. Selected LCN's data will be displayed for analysis. (Ref 5.8.1.4)

**ALARM REPORT**

Sets-up display to select, review and clear Alarm reports. (Ref Section 6)

**PRINT CONTROL**

Initiates Print Control Softkey/label display. (Ref 5.3.6)

**EXIT**

Return to previous softkey/label display. (DISPLAY CONTROL - Ref 5.3.1)
5.8.1.3 CHANGE RANGE Softkey/Label Display

START- 12:08:02

LCN PERFORMANCE REPORT

STOP- 12:16:03

SOFTKEY/LABEL FUNCTION

250 Extends scale limit on bar graph to 250 packets.

500 Extends scale limit on bar graph to 500 packets.

1,000 Extends scale limit on bar graph to 1,000 packets.

5,000 Extends scale limit on bar graph to 5,000 packets.

10,000 Extends scale limit on bar graph to 10,000 packets.

100,000 Extends scale limit on bar graph to 100,000 packets.

1,000,000 Extends scale limit on bar graph to 1,000,000 packets.

EXIT Returns to previous softkey/label display.

(CHANGE RANGE - Ref 5.8.1.1)

(CHANGE RANGE - Ref 5.8.1.2)
5.8.1.4 CHANGE LCN Softkey/Label Display

START- 12:08:02  LCN PERFORMANCE REPORT  STOP-12:16:03

<table>
<thead>
<tr>
<th>LCN#</th>
<th>COUNTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>0001</td>
<td>72</td>
</tr>
<tr>
<td>0002</td>
<td>113</td>
</tr>
<tr>
<td>0003</td>
<td>64</td>
</tr>
<tr>
<td>0004</td>
<td>96</td>
</tr>
<tr>
<td>0005</td>
<td>140</td>
</tr>
<tr>
<td>0006</td>
<td>206</td>
</tr>
<tr>
<td>0007</td>
<td>55</td>
</tr>
<tr>
<td>0008</td>
<td>88</td>
</tr>
</tbody>
</table>

TOTAL LINE USAGE 26%

X.25 ANALYSIS AS SD REPLAY TRK: 96

SOFTKEY/LABEL FUNCTION

Not Used
Not Used
Not Used
Not Used
Not Used
Not Used

PREVIOUS ITEM
Selects previous LCN to be displayed for analysis.

NEXT ITEM
Selects next LCN to be displayed for analysis.

EXIT
Return to previous softkey/label display.

(CHANGE LCN - Ref 5.8.1.2)
5.9 BILLING INFORMATION

X.25 Billing Reports provide billing summaries for packet-oriented, switched circuits leased from a common carrier. Based on session duration and data volume, the reports convey the estimated charges over a given analysis period, up to 24 hours. The carrier services presently supported are:

- GTE Telenet
- UK - PSS
- DATEX - P

Usage statistics are collected for as many as 64 DTEs as the AUTOSCOPE runs its analysis functions. As soon as X.25 analysis is stopped, these statistics are automatically plugged into the X.25 Billing Report program, which then calculates charges for the sampled session(s) based upon the latest tariff issued by the carrier. Tariff data may be updated by using the Billing Report Configuration Editor options prior to generating a report. The Billing Configuration Editor supplies prompts when updating.

NOTE

DATEX - P tariff charges are based upon time of day and PAD type. There are three tiers related to time of day. All three can be entered, using the Configuration Editor. The actual PAD used to interface the X.25 network also is taken into account by the carrier, who adds a surcharge if other than the basic PAD (P10) is used. IF AN OPTIONAL PAD IS USED (P20, P32 and P42) ADD THE SURCHARGE TO THE DISPLAYED TOTALS PROVIDED IN THE REPORT(S).

Billing reports can be 99 pages long, having a maximum of 12 lines per page. Page totals are given at the bottom of each page. As a convenient reference, report totals also appear on each page.
Operating Sequence

1. Set up Billing Report Configuration Editor
2. Run X.25 Analysis
3. Access Billing Report
4. Print results

---

### ANALYSIS

- RUN ANALYSIS
- DISPLAY CONTROL
- SET UP ANALYSIS
- CONFIG CONTROL
- DISK CONTROL
- MAIN MENU

### SET UP ANALYSIS

- DISPLAY
- GENERAL ALARMS
- LCN ALARMS
- Billing Config
- MAIN MENU
- EXIT

### DISPLAY SET UP

- MULTIPLE LCN
- SINGLE LCN
- LINE REPORT
- LCN REPORT
- DAILY ACTIVITY
- ALL PROCESS
- NEXT MENU
- EXIT

### NEXT MENU

- BILLING REPORT
- SEGMENT FILLING
- EXIT

---

### BILLING INFORMATION

**START 11:58:22**

<table>
<thead>
<tr>
<th>DTE ADDRESS</th>
<th>LOCAL</th>
<th>REMOTE</th>
<th>VOLUME (K/SEG)</th>
<th>DURATION (MINS)</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>3054321</td>
<td>0.01</td>
<td>0.05</td>
<td>0.06</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6054321</td>
<td>0.01</td>
<td>0.04</td>
<td>0.05</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5054321</td>
<td>0.01</td>
<td>0.05</td>
<td>0.06</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4054321</td>
<td>0.01</td>
<td>0.02</td>
<td>0.03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1054321</td>
<td>0.01</td>
<td>0.02</td>
<td>0.03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7054321</td>
<td>0.01</td>
<td>0.02</td>
<td>0.03</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**PAGE TOTALS:**

<table>
<thead>
<tr>
<th>LOCAL</th>
<th>REMOTE</th>
<th>VOLUME (K/SEG)</th>
<th>DURATION (MINS)</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.06</td>
<td>0.20</td>
<td>0.26</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**REPORT TOTALS:**

<table>
<thead>
<tr>
<th>LOCAL</th>
<th>REMOTE</th>
<th>VOLUME (K/SEG)</th>
<th>DURATION (MINS)</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.06</td>
<td>0.20</td>
<td>0.26</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**ACTIVE SESSION**

---

**X.25 ANALYSIS**

---

**WM SD REPLAY TRK:** B

---

**TYPICAL BILLING INFORMATION REPORT**

---

5-55
### 5.9.1 BILLING INFORMATION Softkey/Label Display

**START 11:58:22**

<table>
<thead>
<tr>
<th>DTE ADDRESS</th>
<th>LOCAL</th>
<th>REMOTE</th>
<th>VOLUME (K/PKTs)</th>
<th>DURATION (MINS)</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>5004321</td>
<td>$0.05</td>
<td>$0.07</td>
<td>$0.11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6054321</td>
<td>0.04</td>
<td>0.05</td>
<td>0.11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6054321</td>
<td>0.06</td>
<td>0.05</td>
<td>0.11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5004321</td>
<td>0.06</td>
<td>0.05</td>
<td>0.11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4504321</td>
<td>0.05</td>
<td>0.05</td>
<td>0.10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7054321</td>
<td>0.05</td>
<td>0.05</td>
<td>0.12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1054321</td>
<td>0.04</td>
<td>0.04</td>
<td>0.08</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3054321</td>
<td>0.05</td>
<td>0.05</td>
<td>0.10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7054321</td>
<td>0.07</td>
<td>0.05</td>
<td>0.12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1054321</td>
<td>0.04</td>
<td>0.04</td>
<td>0.08</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5054321</td>
<td>0.04</td>
<td>0.04</td>
<td>0.08</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**PAGE TOTALS:** $0.43 $0.40 $0.83

**REPORT TOTALS:** $0.43 $0.40 $0.83

---

**SOFTKEY/LABEL FUNCTION**

- Not Used
- Not Used
- Not Used
- Not Used
- Not Used
- Not Used
- Data displayed on screen is scrolled-down one (1) page at a time, allowing previous data captured to be displayed.
- Data displayed on screen is scrolled-up one (1) page at a time, allowing the most recent data captured to be displayed.
- Depressing and holding the softkey down will allow continuous scrolling. Stops at ***BUFFER LIMIT***
- Sets-up selection of the data amount to be transmitted to printer for print-out. (Screen only)
- Return to previous softkey/label display. (NEXT MENU - Ref 5.3.4)
5.9.2 Billing Information Configuration Editor

Set Up the Billing Report Configuration Editor

For each carrier, billing is calculated according to data volume (thousands of packets or segments) and session duration. The Billing Report Configuration Editor is provided to allow you to determine which carrier will be used and revise the billing parameters.

When the Editor is accessed, the existing parameters are displayed. However, by using the softkeys, you can select any parameter and change its value. Prompts are displayed as you proceed through the parameter settings.

There is a separate configuration display for each of the carriers supported.

### ANALYSIS

<table>
<thead>
<tr>
<th>Run Analysis</th>
<th>Display Control</th>
<th>Set Up Analysis</th>
<th>Config Control</th>
<th>Disk Control</th>
<th>Main Menu</th>
</tr>
</thead>
</table>

### SET UP ANALYSIS

<table>
<thead>
<tr>
<th>Display Set Up</th>
<th>General Alarms</th>
<th>LAN Alarms</th>
<th>Billing Config</th>
<th>Exit</th>
</tr>
</thead>
</table>

### BILLING CONFIG

<table>
<thead>
<tr>
<th>GTE-TELENET</th>
<th>UK-PSS</th>
<th>DATEX-P</th>
<th>Previous Item</th>
<th>Next Item</th>
<th>Exit</th>
</tr>
</thead>
</table>

#### Configuration Set-Up

**Carrier - Choose the carrier providing this service.**

- **GTE - Telenet:** General Telephone Electronics - Telenet
- **UK-PSS:** United Kingdom - Packet Switch Stream
- **DATEX-P:** Data Exchange - Packet (Germany)

#### Billing Config List

<table>
<thead>
<tr>
<th>Carrier</th>
<th>STEL</th>
<th>Rate: Vol/KPKT</th>
<th>Rate: Dur/HR</th>
<th>Min: Vol/PKT</th>
<th>Min: Dur/MINS</th>
</tr>
</thead>
<tbody>
<tr>
<td>GTE</td>
<td></td>
<td>$1.55</td>
<td>$3.90</td>
<td>50</td>
<td>1</td>
</tr>
</tbody>
</table>

---

5-57
5.9.3 Billing Information Configuration
Softkey/Label Display Descriptions

<table>
<thead>
<tr>
<th>SOFTKEY/LABEL</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not Used</td>
</tr>
<tr>
<td></td>
<td>Not Used</td>
</tr>
<tr>
<td></td>
<td>Not Used</td>
</tr>
<tr>
<td>SELECT RATES</td>
<td>Sets up softkey/label display to change item rates in configuration.</td>
</tr>
<tr>
<td></td>
<td>Not Used</td>
</tr>
<tr>
<td>PREVIOUS ITEM</td>
<td>Moves highlighted cursor bar up one item for configuration change.</td>
</tr>
<tr>
<td>NEXT ITEM</td>
<td>Moves highlighted cursor bar down one item for configuration change.</td>
</tr>
<tr>
<td>EXIT</td>
<td>Return to previous softkey/label display.</td>
</tr>
</tbody>
</table>

(BILLING CONFIG - Ref 5.3.2)
5.9.3.2 SELECT RATES Softkey/Label Display

**Configuration Set-Up**

- **HEX VOLUME** - Select rate per 1000 packets.

Based on packet size of 128 characters.

Larger packet sizes are considered multiple packets, i.e. packet of 129-256 characters = 2 packets.

**Billing Config List**

<table>
<thead>
<tr>
<th>CARRIER</th>
<th>GTETL</th>
</tr>
</thead>
<tbody>
<tr>
<td>RATE/DUR/Hr</td>
<td>$ 3.90</td>
</tr>
<tr>
<td>MIN/DUR/MINS</td>
<td>50</td>
</tr>
</tbody>
</table>

**X.25 Analysis**

- **CURSOR LEFT <**
- **CURSOR > RIGHT**
- **CHANGE CHARACTER**
- **DECIMAL 0-9**
- **AS SD DISK IDLE**

**Softkey/Label Function**

- **CURSOR LEFT <**
  
  Moves cursor one (1) character position left in parameter line to be changed.

- **CURSOR > RIGHT**
  
  Moves cursor one (1) character position right in parameter line to be changed.

- **CHANGE CHARACTER**
  
  Changes character in cursor location.
  characters will cycle sequentially when softkey is depressed. (Decimal - 0 to 9)

- **ENTER**
  
  Not Used

- **EXIT**
  
  Not Used

Enters new or changed parameter in configuration. (Must be initiated to complete and store change.) Return to previous softkey/label display.

(SELECT RATES - Ref 5.9.3.1)

Return to previous softkey/label display.

(SELECT RATES - Ref 5.9.3.1)
5.9.3.3 GTE-TELENET Configuration Displays

**Configuration Set-Up**

- **Net Volume**: Select rate per 1000 packets.
  - Based on packet size of 128 characters.
  - Larger packet sizes are considered multiple packets.
  - i.e.: packet of 129-256 characters = 2 packets

**Billing Config List**

- **Carrier**: GTE
- **Rate**: $1.55
- **Vol/Pkt**: $3.90
- **Vol/PKTs**: 50
- **Dur/Min**: 1

**X.25 Analysis**

- **Connection time**: The sum of all session durations.
- **Session**: The period beginning with a CALL REQUEST and ending with a CLEAR CONFIRMATION.
5.9.3.3 GTE-TELENET Configuration Displays

"Session" is the period beginning with a CALL REQUEST and ending with a CLEAR CONFIRMATION.

Enter value of 1 - 99
5.9.3.4 UK-PSS Configuration Displays

**CONFIGURATION SET-UP**

RATE: VOLUME - Select rate per 1000 segments.
One segment = 1 - 64 characters

**BILLING CONFIG LIST**

- CARRIER: UKPSS
- RATE: VOL/SEG: 0.25
- RATE: DUR/HR: 1.00
- MIN: VOL/SEG: 20
- MIN: DUR/MINS: 1

**X.25 ANALYSIS**

- SELECT RATES
- PREVIOUS ITEM
- EXIT

---

"Connection time" is the sum of all session durations.
"Session" is the period beginning with a CALL REQUEST and ending with a CLEAR CONFIRMATION.

---

**BILLING CONFIG LIST**

- CARRIER: UKPSS
- RATE: VOL/SEG: 0.25
- RATE: DUR/HR: 1.00
- MIN: VOL/SEG: 20
- MIN: DUR/MINS: 1

**X.25 ANALYSIS**

- SELECT RATES
- PREVIOUS ITEM
- EXIT

---

5-62
5.9.3.4 UK-PSS Configuration Displays

"Session" is the period beginning with a CALL REQUEST and ending with a CLEAR CONFIRMATION.

Enter value of 1 - 99

X.25 ANALYSIS

WM SD REPLAY TRK: 15

SELECT RATES  PREVIOUS ITEM  NEXT ITEM  EXIT
5.9.3.5 DATEX-P Configuration Displays

**Configuration Set-Up**

**Billing Config List**

<table>
<thead>
<tr>
<th>Carrier</th>
<th>Rate 1: Vol/Kseg</th>
<th>Rate 2: Vol/Kseg</th>
<th>Rate 3: Vol/Kseg</th>
<th>Rate 4: Dur/Min</th>
<th>Set-Up Charge</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATXP</td>
<td>0.33</td>
<td>0.18</td>
<td>0.09</td>
<td>0.60</td>
<td>0.05</td>
</tr>
</tbody>
</table>

**NOTE:** Add to each DTE volume charge the following charges for PAD usage:
- PAD P10 - No additional charge
- PAD P20 - 6 Pf/min.
- PAD P32 - 40% of volume charge
- PAD P42 - 30% of volume charge

**Connection time** is the sum of all session durations.

**Session** is the period beginning with a CALL REQUEST and ending with a CLEAR CONFIRMATION.
5.9.3.5 DATEX-P Configuration Displays

**CONFIGURATION SET-UP**

- **SET-UP CHARGE**: Select charge per successful call setup.

**BILLING CONFIG LIST**

- **CARRIER**: DATEXP
- **RATE 1: VOL/KSEG**: 0.33
- **RATE 2: VOL/KSEG**: 0.18
- **RATE 3: VOL/KSEG**: 0.09
- **RATE: DUR/HR**: 0.60
- **SET-UP CHARGE**: 0.05

**X.25 ANALYSIS**

- SELECT RATES
- PREVIOUS ITEM
- NEXT ITEM
- EXIT

**WM SD REPLAY TRK**: 15
5.10 SEGMENTATION FILLING REPORT Display and Format

Carriers charge for either the number of data characters or packets sent during a session. If the X.25 data packet is not at or near its capacity, the money paid to the carrier is spent to transport extraneous information (fill characters that are inserted to complete the packet). The AUTOSCOPE X.25 analysis feature can be used to determine how efficiently carrier facilities are being used by sampling active sessions over a period of time.

As X.25 analysis runs, the AUTOSCOPE counts the data packet characters for each LCN and DTE. Upon halting X.25 analysis, the individual counts are used to determine how efficiently packets were utilized.

Segmentation filling percentages are derived using the following algorithm:

\[
\text{Total Data Characters Sent During Session} \quad \frac{\text{Total Data Characters Sent During Session}}{(\text{Number of Segments})(64 \text{ Characters per Segment})} \times 100
\]

Results are presented in Segmentation Filling Reports.

For example, if 100 data characters were counted for a DTE, two segments of data (maximum of 128 characters) were required to carry the information. However, 28 character positions were empty, representing a 78% utilization of the facility.

The reports for LCN and DTE are accessed by depressing a series of softkeys, starting with the SETUP ANALYSIS softkey, which is presented immediately after stopping X.25 analysis.

The Segmentation Filling Report format presents four information columns: LCN NUMBER or DTE ADDRESS, NUMBER OF SEND CHARACTERS, NUMBER OF SEND SEGMENTS and SEGMENTATION FILLING FACTOR.

The default report displayed is for LCNs. To switch between the LCN and DTE reports, depress the DTE/LCN DISPLAY softkey. An asterisk appearing next to an LCN number or DTE address indicates that a session was active at the time Analysis was stopped. If more than 12 DTEs or LCNs are reported, page control keys are provided to move forward or backward through the report.

Operating Sequence

1. Select ANALYSIS Mode
2. Run Analysis
3. Stop Analysis
4. Review Segmentation Filling Report
5. Print results
TYPICAL SEGMENTATION FILLING REPORT

<table>
<thead>
<tr>
<th>LCN NUMBER</th>
<th>NUMBER OF SEND CHARACTERS</th>
<th>NUMBER OF SEND SEGMENTS</th>
<th>SEGMENTATION FILLING FACTOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>#0007</td>
<td>1416</td>
<td>23</td>
<td>96</td>
</tr>
<tr>
<td>#0006</td>
<td>1300</td>
<td>22</td>
<td>96</td>
</tr>
<tr>
<td>#0005</td>
<td>1398</td>
<td>21</td>
<td>97</td>
</tr>
<tr>
<td>#0004</td>
<td>1398</td>
<td>22</td>
<td>99</td>
</tr>
<tr>
<td>#0003</td>
<td>1092</td>
<td>18</td>
<td>94</td>
</tr>
<tr>
<td>#0002</td>
<td>1092</td>
<td>18</td>
<td>94</td>
</tr>
</tbody>
</table>

**start:** 11:58:22  
**stop:** 12:11:45  
**x.25 analysis**  
**as sd replay trk:**
5.10.1 Segmentation Filling Softkey/Label Display Descriptions

<table>
<thead>
<tr>
<th>START- 11:58:22</th>
<th>SEGMENTATION FILLING REPORT</th>
<th>STOP- 12:11:45</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCN NUMBER</td>
<td>NUMBER OF SEND CHARACTERS</td>
<td>NUMBER OF SEND SEGMENTS</td>
</tr>
<tr>
<td>*0007</td>
<td>1415</td>
<td>23</td>
</tr>
<tr>
<td>*0006</td>
<td>1390</td>
<td>22</td>
</tr>
<tr>
<td>*0005</td>
<td>1396</td>
<td>21</td>
</tr>
<tr>
<td>*0004</td>
<td>1398</td>
<td>22</td>
</tr>
<tr>
<td>*0003</td>
<td>1092</td>
<td>18</td>
</tr>
<tr>
<td>*0002</td>
<td>1092</td>
<td>18</td>
</tr>
</tbody>
</table>

* = ACTIVE SESSION

X.25 ANALYSIS

<table>
<thead>
<tr>
<th>DTE DISPLAY</th>
<th>PAGE UP</th>
<th>PAGE DOWN</th>
<th>PRINT CONTROL</th>
<th>EXIT</th>
</tr>
</thead>
</table>

### FUNCTION

- **Not Used**
- **Not Used**
- **Not Used**
- **Toggles between LCN and DTE Segmentation Fill Reports (dual function softkey)**

Data displayed on screen is scrolled-up one (1) page at a time, allowing the most recent data captured to be displayed.

Data displayed on screen is scrolled-down one (1) page at a time, allowing previous data captured to be displayed.

Depressing and holding the softkey down will allow continuous scrolling. Stops at **BUFFER LIMIT***

- **Initiates Print Control Softkey/label display. (Ref 5.3.6)**

- **Return to previous softkey/label display. (SEGMENT FILLING - Ref 5.3.4)**
SECTION 6  X.25 AUTO-SENTRY

6.0  General Information

X.25 Auto-Sentry provides the ability to specify session events as alarm conditions, capture alarms and create alarm reports.

Three alarm types, organized as general and LCN alarms, are monitored:

   General Alarms
   Threshold Alarms
   Leadstate Alarms
   LCN Alarms

Alarm types and parameters are selected through the SET UP ANALYSIS procedures, detailed in the following section devoted to General Alarms.

As alarms are generated and captured while running Analysis, they will be reported on the System Error Line (line 17 of the display) and elsewhere on an Analysis Report display. When running a Multiple LCN Report a blinking "A" will appear inside the address box of the affected LCN. If the alarm buffer for that LCN is full, the alarm indicator will be a flashing "A#". For the Single LCN Report, an alarm condition is reported by flashing the word "ALARM" below the LCN. If the alarm buffer is full, the alarm message will be "ALARM BUFFER FULL".

NOTE

The System Error Line is also used for other messages, and an alarm message may be erased before it can be viewed.

6.1  Generating Reports

Alarm Reports can be viewed as Analysis runs or after it is stopped. Depressing the ALARM REPORT softkey at any time will display softkeys to select either the General or LCN alarm reports. When Analysis is stopped, you can scroll through the alarm report, clear entries or clear the entire buffer.

Operating Sequence

1. Set up Analysis and exit
2. Run analysis
3. Stop analysis
4. Review results
6.2 General Alarm Reports

General Alarms consist of Threshold counts (for frame and packet level events) and Leadstate Alarms. All general alarms are captured in the General Alarm Buffer.

6.2.1 Threshold Alarms

Threshold alarms are generated if a particular condition exceeds a defined threshold limit you establish, using the AUTO-SENTRY configuration displays. As soon as a threshold alarm is posted, its counter is reset and another count begun. Threshold levels can be set for the following events:
FRAME LEVEL
- BCC ERRORS
- ABORTED FRAMES
- POLL WITHOUT FINAL
- FRAME RETRANSMISSIONS
- FRMR REJECT FRAMES

 PACKET LEVEL
- PACKET RETRANSMISSIONS
- CONTINUOUS RNR PACKETS
- QUALITY RATIO = XXX

All frame level alarms are captured in a GENERAL ALARM BUFFER; as many as 64 alarms can be stored. When the 64 alarm limit is reached, threshold counting and alarm capturing will be stopped. Processing can continue only after clearing the entire buffer, or at least one entry.

<table>
<thead>
<tr>
<th>X.25 AUTO-SENTRY ALARM SET UP</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>COUNTS</td>
<td>ALARM TYPE</td>
</tr>
<tr>
<td>FRAME LEVEL:</td>
<td></td>
</tr>
<tr>
<td>01 BCC ERROR</td>
<td></td>
</tr>
<tr>
<td>01 ABORTED FRAMES</td>
<td></td>
</tr>
<tr>
<td>01 POLL WITHOUT FINAL</td>
<td></td>
</tr>
<tr>
<td>01 FRAME RETRANSMISSIONS</td>
<td></td>
</tr>
<tr>
<td>01 FRMR REJECT FRAMES</td>
<td></td>
</tr>
<tr>
<td>PACKET LEVEL:</td>
<td></td>
</tr>
<tr>
<td>01 PACKET RETRANSMISSIONS</td>
<td></td>
</tr>
<tr>
<td>01 CONTINUOUS RNR PACKETS</td>
<td></td>
</tr>
<tr>
<td>01 QUALITY RATIO = 0.1%</td>
<td></td>
</tr>
<tr>
<td>TIME = 15 MINUTE INTERVAL</td>
<td></td>
</tr>
</tbody>
</table>

The PACKET RETRANSMISSION and RNR PACKET count threshold alarms, however, are captured in the LCN BUFFER of the affected logical channel. Continuous receiver-not-ready packet threshold alarms are also captured in the related LCN alarm buffer.

The quality ratio, which shows the ratio of control packets to data packets over a 15 minute period, is the basis of the Daily Traffic Activity Report. An alarm is recorded in the GENERAL ALARM if the ratio falls below the threshold value.
6.2.2 Leadstate Alarms

You can select the conditions (signal present, absent or don’t care) for the send and receive leadstates and then enable or disable them for alarms. During a session, the leadstate conditions for both Send and Receive messages will be compared to the your selections; if any leadstate changes state an alarm is generated.

You can set the state for the following leads:

RTS  CTS  DSR  DTR  RI  CD  EI1  EI2  SQ  SRD  SSD

---

X.25 AUTO-SENTRY LEADSTATE ALARM SET UP

**LEADSTATE SETTINGS ARE FOR THE NORMAL ACTIVE LINE CONDITIONS DURING THE SENDING AND/OR RECEIVING OF DATA TRANSMISSIONS. IF THE SELECTED CONDITIONS CHANGE, AN ALARM WILL BE GENERATED.**

<table>
<thead>
<tr>
<th>SEND CHAR LEADSTATE</th>
<th>RTS</th>
<th>CTS</th>
<th>DSR</th>
<th>DTR</th>
<th>RI</th>
<th>CD</th>
<th>EI1</th>
<th>EI2</th>
<th>SQ</th>
<th>SRD</th>
<th>SSD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td></td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RECV CHAR LEADSTATE</th>
<th>RTS</th>
<th>CTS</th>
<th>DSR</th>
<th>DTR</th>
<th>RI</th>
<th>CD</th>
<th>EI1</th>
<th>EI2</th>
<th>SQ</th>
<th>SRD</th>
<th>SSD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td></td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
</tbody>
</table>

DISABLED

---

X.25 ANALYSIS
AS SD REPLAY TRK: B

---

LEADSTATE ALARM SET UP DISPLAY

---

**NOTE**

SQ, SRD and SSD appear ONLY when an interactive ICU is attached to the AUTOSCOPE.

6.2.3 General Alarm Display Format

The General Alarm Report is composed of enabled general alarm events (threshold and leadstate alarms) captured during X.25 analysis. As many as 64 events can be listed. Each event is a single line entry, and each display page presents a maximum of 14 events. You can scroll through the list an event at a time or a page at a time.
### X.25 AUTO-SENTRY INTERFACE ALARM REPORT

**START- 11:58:22**  
**STOP- 12:10:07**

<table>
<thead>
<tr>
<th>TIME</th>
<th>ALARM TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:58:58</td>
<td>01 POLL WITHOUT FINAL</td>
</tr>
<tr>
<td>11:59:58</td>
<td>01 POLL WITHOUT FINAL</td>
</tr>
<tr>
<td>12:00:06</td>
<td>01 QUALITY RATIO * 01%</td>
</tr>
<tr>
<td>12:03:05</td>
<td>01 POLL WITHOUT FINAL</td>
</tr>
<tr>
<td>12:03:05</td>
<td>01 POLL WITHOUT FINAL</td>
</tr>
<tr>
<td>12:09:22</td>
<td>01 POLL WITHOUT FINAL</td>
</tr>
</tbody>
</table>

#### X.25 ANALYSIS

**AS SD REPLAY TRK: B5**

<table>
<thead>
<tr>
<th>CURSOR UP</th>
<th>CURSOR DOWN</th>
<th>CLEAR ALARM</th>
<th>CLEAR BUFFER</th>
<th>PAGE UP</th>
<th>PAGE DOWN</th>
<th>PRINT CONTROL</th>
<th>EXIT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### GENERAL ALARM REPORT DISPLAY

Report data, organized in columns and identified by headers, includes:

- Time of alarm
- Count of events
- Alarm type

The start and stop times for the analysis period are displayed in the top corners of the display.
6.3 LCN Alarm Reports

LCN alarms are generated for cause codes (CLEAR, RESET, RESTART and DIAGNOSTIC) you select using the X.25 Auto-Sentry Alarm Set Up utilities. As the selected cause codes are encountered alarms are generated and captured in the LCN buffer. Up to 6 alarms can be buffered for each of the 64 LCN numbers supported by the analysis program. When an LCN has 6 alarms in its buffer, alarm reporting for that LCN will stop until room is made by deleting at least one event.

NOTE

Selecting Cause Code 00 for CLEAR PACKETS will generate an alarm only if it is a rejected session.

Enabling diagnostic alarms will generate an alarm on any of the 255 possible cause codes.

Some LCN alarm events are interpreted by AUTO-SENTRY as Trace Buffer Entries and are captured in a separate TRACE BUFFERS. There are 8 Trace Buffers, and the first 8 TBEs generated (one LCN for each trace buffer) are entered in them. In addition to the first TBE, the next 10 LCN events (CLEAR, RESET, INTERRUPT AND DIAGNOSTIC packet events) are also captured in the trace buffer.

Trace Buffer entries can be cleared one at a time or be cleared as a group.
6.3.1 LCN Alarm Display Format

Divided in two, an LCN Alarm Report presents information for those LCNs that had alarm conditions while Analysis was running. The upper portion of the display shows the LCNs involved. In the lower half of the display is a list of alarm events for the LCN pointed to by the LCN selection cursor arrow. As many as 10 alarm events can be listed for each LCN. Each alarm is a separate line entry. Headers identify the information, including:

- Time of alarm
- Count of events
- Alarm type
- Cause of alarm

An LCN displayed in high intensity indicates the presence of a Trace Buffer Entry. The TBE code is also displayed in the count column. Trace Buffer contents can be reviewed via the BUFFER CONTROL option.

You can move from one LCN to another or scroll through the alarm list, using softkeys.
### X.25 APPLICATION PROGRAM
AUTO-SENTRY
GENERAL INFORMATION

**START- 18:58:24**

<table>
<thead>
<tr>
<th>DTE</th>
<th>LCN</th>
<th>DCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>CALLG*</td>
<td>0</td>
<td>CALL*</td>
</tr>
<tr>
<td>CALL REQUEST</td>
<td>DATA SENT (007)</td>
<td>DATA SENT</td>
</tr>
<tr>
<td>12 PKTS</td>
<td>10 PKTS</td>
<td>5 PKTS</td>
</tr>
<tr>
<td>RETRY</td>
<td>RETRY</td>
<td>RETRY</td>
</tr>
<tr>
<td>18:58:26</td>
<td>18:58:26</td>
<td>18:58:26</td>
</tr>
<tr>
<td>RESET REQUEST</td>
<td>CLEAR REQUEST</td>
<td>CLEAR REQUEST</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>10 PKTS</td>
<td>10 PKTS</td>
<td>10 PKTS</td>
</tr>
<tr>
<td>RETRY</td>
<td>RETRY</td>
<td>RETRY</td>
</tr>
<tr>
<td>18:58:26</td>
<td>18:58:26</td>
<td>18:58:27</td>
</tr>
<tr>
<td>INTERRUPT CONFIRMED</td>
<td>INTERRUPT CONFIRMED</td>
<td>INTERRUPT CONFIRMED</td>
</tr>
<tr>
<td>NO ADDL INFORMATION</td>
<td>NO ADDL INFORMATION</td>
<td>NO ADDL INFORMATION</td>
</tr>
<tr>
<td>18:58:26</td>
<td>18:58:26</td>
<td>18:58:26</td>
</tr>
<tr>
<td>NETWORK OPERATIONAL</td>
<td>NETWORK OPERATIONAL</td>
<td>NETWORK OPERATIONAL</td>
</tr>
<tr>
<td>16 PKTS</td>
<td>16 PKTS</td>
<td>16 PKTS</td>
</tr>
<tr>
<td>RETRY</td>
<td>RETRY</td>
<td>RETRY</td>
</tr>
<tr>
<td>18:58:26</td>
<td>18:58:26</td>
<td>18:58:26</td>
</tr>
<tr>
<td>RESET REQUEST</td>
<td>RESET REQUEST</td>
<td>RESET REQUEST</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5 PKTS</td>
<td>5 PKTS</td>
<td>5 PKTS</td>
</tr>
<tr>
<td>RETRY</td>
<td>RETRY</td>
<td>RETRY</td>
</tr>
<tr>
<td>18:58:26</td>
<td>18:58:26</td>
<td>18:58:27</td>
</tr>
<tr>
<td>INTERRUPT PKT</td>
<td>INTERRUPT PKT</td>
<td>INTERRUPT PKT</td>
</tr>
<tr>
<td>NO ADDL INFORMATION</td>
<td>NO ADDL INFORMATION</td>
<td>NO ADDL INFORMATION</td>
</tr>
<tr>
<td>18:58:26</td>
<td>18:58:26</td>
<td>18:58:26</td>
</tr>
<tr>
<td>INTERRUPT</td>
<td>INTERRUPT</td>
<td>INTERRUPT</td>
</tr>
<tr>
<td>NO ADDL INFORMATION</td>
<td>NO ADDL INFORMATION</td>
<td>NO ADDL INFORMATION</td>
</tr>
<tr>
<td>18:58:26</td>
<td>18:58:26</td>
<td>18:58:26</td>
</tr>
<tr>
<td>CLEAR REQUEST</td>
<td>CLEAR REQUEST</td>
<td>CLEAR REQUEST</td>
</tr>
<tr>
<td>DTE ORIGINATED</td>
<td>DTE ORIGINATED</td>
<td>DTE ORIGINATED</td>
</tr>
</tbody>
</table>

**STOP- 18:58:38**

---

### 6.3.2 Trace Buffer Display Format

The Trace Buffer display is provided as an auditing tool, presenting not only the Trace Buffer Entry (Entries) listed in the LCN Buffer Report, but also session events that immediately preceded and followed the TBE(s).

Session events are listed in the center of the display in sequential order. Arrows indicate the direction for each item; i.e., whether it was originated by a DTE or DCE. Pertinent information for each event, if any, is displayed in the DTE and DCE columns.

The event that was flagged as a TBE is highlighted by a lightbar.

You can scroll through the event list or display another Trace Buffer Entry, using the softkeys. When scrolling through the event list, the TBE event will be highlighted to mark it as the starting point.

---

6-8
6.4 Reviewing and Printing Alarm Reports

The general and LC alarm reports can be viewed during or after Analysis. When displayed, you can clear the alarms (one at a time or the entire buffer) or print the report.

6.4.1 Viewing Alarm Reports While Running Analysis

To view the alarm reports as Analysis runs, select ALARM REPORT from the softkeys displayed, then select the desired report.

6.4.2 Viewing Alarm Reports After Running Analysis

After stopping Analysis, select DISPLAY CONTROL, then select the desired report for display.

6.4.3 Viewing the Trace Buffer

The Trace Buffer is accessed via BUFFER CONTROL, an option on the LCN Alarm Report menu.
6.5 Auto Sentry Softkey/Label Display Descriptions

6.5.1 AUTO-SENTRY Softkey

SOFTKEY/LABEL FUNCTION

- **GENERAL ALARMS**
  - Selects General Alarm Report for review and/or print out (Ref 6.5.2).

- **LCN ALARMS**
  - Selects LCN Alarm Report for review and/or print out (Ref 6.5.3).

- Not Used
- Not Used
- Not Used
- Not Used
- Not Used
- Not Used
- Exit

Return to previous softkey/label display.
6.5.2 GENERAL ALARMS Report Softkey/Label Display

START- 11:58:22  X.25 AUTO-SENTRY INTERFACE ALARM REPORT  STOP-12:10:07

<table>
<thead>
<tr>
<th>TIME</th>
<th>ALARM TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:59:59</td>
<td>Poll without final</td>
</tr>
<tr>
<td>11:59:59</td>
<td>Poll without final</td>
</tr>
<tr>
<td>12:00:06</td>
<td>Quality ratio = 01%</td>
</tr>
<tr>
<td>12:02:05</td>
<td>Poll without final</td>
</tr>
<tr>
<td>12:02:05</td>
<td>Poll without final</td>
</tr>
<tr>
<td>12:02:22</td>
<td>Poll without final</td>
</tr>
</tbody>
</table>

X.25 ANALYSIS  AS SD REPLAY TRK: 85

<table>
<thead>
<tr>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CURSOR UP</strong></td>
</tr>
<tr>
<td><strong>CURSOR DOWN</strong></td>
</tr>
<tr>
<td><strong>CLEAR ALARM</strong></td>
</tr>
<tr>
<td><strong>CLEAR BUFFER</strong></td>
</tr>
<tr>
<td><strong>PAGE UP</strong></td>
</tr>
<tr>
<td><strong>PAGE DOWN</strong></td>
</tr>
<tr>
<td><strong>PRINT CONTROL</strong></td>
</tr>
<tr>
<td><strong>EXIT</strong></td>
</tr>
</tbody>
</table>

SOFTKEY/LABEL  FUNCTION

- **Moves arrow cursor one (1) line position up on Alarm Report.**
- **Moves arrow cursor one (1) line position down on Alarm Report.**
- **Clears one (1) designated (cursor) alarm from the display.**
- **Clears complete alarm buffer.**
- **Report displayed on screen is scrolled-down one (1) page at a time, allowing previous alarms captured to be displayed.**
- **Report displayed on screen is scrolled-up one (1) page at a time, allowing most recent alarms captured to be reviewed.**
- **Sets up selection of the data amount to be transmitted to printer for print-out. (Screen only or complete buffer) (Ref 4.10 - Printer Configuration User Manual)**
- **Return to previous softkey/label display.**

(GENERAL ALARMS - Ref 6.5.1)
6.5.3 LCN ALARMS Report Softkey/Label Display

START- 11:01:13  
0048 0054  
0054 0055  

LCN ALARM REPORT  
STOP-11:02:21  

<table>
<thead>
<tr>
<th>TIME</th>
<th>COUNT ALARMS</th>
<th>ALARM CAUSE</th>
<th>ESE • TRACE BUFFER ENTRY</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:01:36</td>
<td>+33</td>
<td>PACKET RETRANSMISSIONS</td>
<td></td>
</tr>
<tr>
<td>11:01:37</td>
<td>+33</td>
<td>PACKET RETRANSMISSIONS</td>
<td></td>
</tr>
</tbody>
</table>

X.25 ANALYSIS  
AS SD REPLAY TRK:158

<p>| | | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SOFTKEY/LABEL FUNCTION**

**CURSOR UP**

Moves Cursor up one line at a time to a desired Alarm

**CURSOR DOWN**

Moves cursor down one line at a time to a desired Alarm

**CLEAR ALARM**

Clears selected alarm from buffer.

**BUFFER CONTROL**

Sets up softkey/label to review alarms in Trace Buffer (Ref 6.5.4)

**PREVIOUS LCN**

Moves cursor to previous LCN on the display to review the Alarms of that LCN.

**NEXT LCN**

Moves cursor to next LCN on the display to review the Alarms of that LCN.

**PRINT CONTROL**

Sets up softkey/label display for selecting print out of alarms. (Ref 6.5.7)

**EXIT**

Return to previous softkey/label display. (LCN ALARMS - 6.5.1)
6.5.4 BUFFER CONTROL Softkey/Label Display

START- 11:01:13 LCN ALARM REPORT STOP- 11:02:21
0049 0054 038

<table>
<thead>
<tr>
<th>TIME</th>
<th>COUNT ALARMS</th>
<th>ALARM CAUSE</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:01:36</td>
<td></td>
<td>PACKET RETRANSMISSIONS</td>
<td>CLEAR GENERAL</td>
</tr>
<tr>
<td>11:01:37</td>
<td></td>
<td>PACKET RETRANSMISSIONS</td>
<td>CLEAR LCN</td>
</tr>
</tbody>
</table>

X.25 ANALYSIS AS SD REPLAY TRK: 158

**SOFTKEY/LABEL**

**FUNCTION**

CLEAR GENERAL  
Clears General Alarm Buffer.

CLEAR ALL LCNs  
Clears all LCN Alarms from buffer.

CLEAR LCN  
Clears selected LCN Alarms from buffer.

Not Used  

TRACE DISPLAY  
Sets up softkey/label display to review Alarms in Trace buffer (Ref 6.5.5)

Not Used  

PRINT CONTROL  
Sets up softkey/label display for selecting print out of alarms. (Ref 6.5.7)

EXIT  
Return to previous softkey/label display. (BUFFER CONTROL - 6.5.3)
6.5.5 TRACE DISPLAY Softkey/Label Display

<table>
<thead>
<tr>
<th>START- 18:58:24</th>
<th>LCN TRACE BUFFER</th>
<th>STOP-18:58:38</th>
</tr>
</thead>
<tbody>
<tr>
<td>DTE</td>
<td>LCN = 2008</td>
<td>DCE</td>
</tr>
<tr>
<td>CALLG=          0</td>
<td>CALL REQUEST</td>
<td>CALLD=        0</td>
</tr>
<tr>
<td></td>
<td>CALL CONFIRMED</td>
<td></td>
</tr>
<tr>
<td></td>
<td>DATA SENT (007)</td>
<td>12 PKTS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 PKTS</td>
</tr>
<tr>
<td></td>
<td>RESET REQUEST</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>10 PKTS</td>
</tr>
<tr>
<td></td>
<td>RESET CONFIRMED</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>0 RETRY</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>DTE ORIGINATED</td>
</tr>
</tbody>
</table>

**X.25 ANALYSIS**

<table>
<thead>
<tr>
<th>NEXT ENTRY</th>
<th>CLEAR ENTRY</th>
<th>PREVIOUS ENTRY</th>
<th>PRINT CONTROL</th>
<th>EXIT</th>
</tr>
</thead>
</table>

**SOFTKEY/LABEL FUNCTION**

- **PREVIOUS ITEM**
  - Scroll back through listed LCN events.

- **NEXT ITEM**
  - Scroll forward through listed LCN events.

- **Not Used**
  - Deletes displayed trace buffer entry (TBE) and captured events from trace buffer.
  - Scroll back to and display preceding TBE.
  - Scroll forward to and display next TBE.

- **CLEAR ENTRY**
  - Initiates Print Control softkey/label display. (Ref 6.5.7)

- **PREVIOUS ENTRY**
  - Return to previous softkey/label display. (TRACE DISPLAY - Ref 6.5.4)

**EXIT**

---

6-14
6.5.6 PRINT CONTROL (GENERAL ALARMS) Softkey/Label Display

**SOFTKEY/LABEL FUNCTION**

- **PRINT SCREEN**: Initiates print out of data displayed on screen only.
- **Not Used**
- **Not Used**
- **Not Used**
- **Not Used**
- **Not Used**
- **Not Used**
- **EXIT**: Return to previous softkey/label display.
6.5.7 PRINT CONTROL (LCN ALARMS) Softkey/Label Display

<table>
<thead>
<tr>
<th>SOFTKEY/LABEL</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRINT SCREEN</td>
<td>Prints displayed LCN alarm only.</td>
</tr>
<tr>
<td>PRINT GENERAL</td>
<td>Prints contents of GENERAL ALARM BUFFER (not displayed).</td>
</tr>
<tr>
<td>PRINT LCN</td>
<td>Prints all LCN Alarms.</td>
</tr>
<tr>
<td>PRINT TRACE</td>
<td>Prints contents of all TRACE BUFFERS.</td>
</tr>
<tr>
<td></td>
<td>Not Used</td>
</tr>
<tr>
<td></td>
<td>Not Used</td>
</tr>
<tr>
<td>PRINTER CONFIG</td>
<td>Initiates softkey/label displays for modifying printer configuration. <em>(Ref 3.10 - Printer Configuration User Manual)</em></td>
</tr>
<tr>
<td>EXIT</td>
<td>Return to previous softkey/label display.</td>
</tr>
</tbody>
</table>
6.6 Setting Up AUTO-SENTRY Alarms

All AUTO-SENTRY alarms are selected from the X.25 Alarm Set Up displays. After selecting SETUP ANALYSIS from the RUN Analysis softkey menu, you can review the existing configuration for either the GENERAL ALARMS or the LC ALARMS.

6.6.1 General Alarm Configuration

There are two configuration displays for setting up the General Alarm configuration. After selecting the General Alarms option, you can choose to set up either the THRESHOLD ALARMS or the LEADSTATE ALARMS.

6.6.1.1 Threshold Alarm Set Up

Using the Threshold Alarm Set Up display you can scroll through the listed frame and packet level events and set count thresholds; either one of 7 standard values or a number you enter, from 1 to 255.
**X.25 APPLICATION PROGRAM**

**AUTO-SENTRY**

**ALARM SET UP**

---

**X.25 AUTO-SENTRY ALARM SET UP**

Enable alarm softkey will display the current threshold count in reverse video and enable the alarm reporting.

Disable alarm softkey will display the current threshold count in normal video and disable the alarm reporting.

Quality ratio is the % of control to data packets. Alarm conditions are when ratio exceeds selected %.

---

**Counts**

<table>
<thead>
<tr>
<th>Counts</th>
<th>Alarm Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRAME ERROR</td>
<td>01</td>
</tr>
<tr>
<td>ABORTED FRAMES</td>
<td>01</td>
</tr>
<tr>
<td>POLL WITHOUT FINAL</td>
<td>01</td>
</tr>
<tr>
<td>FRAME RETRANSMISSIONS</td>
<td>01</td>
</tr>
<tr>
<td>FRMR REJECT FRAMES</td>
<td>01</td>
</tr>
<tr>
<td>PACKET RETRANSMISSIONS</td>
<td>01</td>
</tr>
<tr>
<td>CONTINUOUS RNR PACKETS</td>
<td>01</td>
</tr>
<tr>
<td>QUALITY RATIO * 01%</td>
<td>01</td>
</tr>
</tbody>
</table>

Time = 15 minute interval

---

**X.25 ANALYSIS**

As SD REPLAY TPH: 8

---

**Threshold Alarms Set Up Display**

---

6-18
6.6.1.2 Leadstate Alarm Set Up

The Leadstate Alarm Set Up lets you set the level for both send and receive leads (RTS, CTS, DSR, RI, CD, E11, E12, SQ, SRD and SSD) and subsequently enable or disable the choices for alarming.

NOTE

SQ, SRD and SSD appear ONLY when an interactive ICU is attached to the AUTOSCOPE.

GENERAL ALARMS

<table>
<thead>
<tr>
<th>THRESHOLD ALARMS</th>
<th>LEADSTATE ALARMS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

LEADSTATE ALARMS

<table>
<thead>
<tr>
<th>SEND SET UP</th>
<th>RECV SET UP</th>
<th>ENABLE ALARM</th>
<th>DISABLE ALARM</th>
<th>PRINT CONTROL</th>
<th>EXIT</th>
</tr>
</thead>
</table>

X.25 AUTO-SENTRY LEADSTATE ALARM SET UP

LEADSTATE SETTINGS ARE FOR THE NORMAL ACTIVE LINE CONDITIONS DURING THE SEQUENCING AND/OR RECEIVING OF DATA TRANSMISSIONS. IF THE SELECTED CONDITIONS CHANGE, AN ALARM WILL BE GENERATED.

** X.25 ANALYSIS **

SEND SET UP | RECV SET UP | ENABLE ALARM | DISABLE ALARM | PRINT CONTROL | EXIT |

LEADSTATE ALARMS SET UP DISPLAY
6.6.2 LCN Alarm Configuration

There are 4 LCN Alarm Set Up displays for setting CLEAR CAUSE, RESET CAUSE, RESTART CAUSE and DIAGNOSTIC PACKET alarms. You can scroll through the three cause code displays, and enable or disable items for alarming. The diagnostic packets, on the other hand, are enabled or disabled as a group.

SET UP ANALYSIS

| DISPLAY SET UP | GENERAL ALARMS | LCN ALARMS | BILLING CONFIG | EXIT |

LCN ALARMS

| CLEAR CAUSE | RESET CAUSE | RESTART CAUSE | DIAG. PACKET | EXIT |

LCN ALARMS SET UP DISPLAY
6.6.2.1 Reset Cause Codes Set Up

An alarm will be generated for any enabled cause code. A TBE will also be created. Since the Reset packet causes the sequencing window to be set to zero, the trace buffer will save both the acknowledged and unacknowledged packet counts in the trace buffer for later display.

Reset Packet Cause Codes

00  DTE ORIGINATED
01  OUT OF ORDER
03  REMOTE PROCEDURE ERROR
05  LOCAL PROCEDURE ERROR
07  NETWORK CONGESTION
09  REMOTE DTE OPERATIONAL
0F  NETWORK OPERATIONAL
11  INCOMPATIBLE DESTINATION
6.6.2.2 Restart Cause Codes Set Up

**X.25 AUTO-SENTRY ALARM SET UP**

<table>
<thead>
<tr>
<th>RESTART CAUSE CODES</th>
</tr>
</thead>
<tbody>
<tr>
<td>+00 DTE ORIGINATED</td>
</tr>
<tr>
<td>01 LOCAL PROCEDURE ERROR</td>
</tr>
<tr>
<td>02 NETWORK CONGESTION</td>
</tr>
<tr>
<td>03 NETWORK OPERATIONAL</td>
</tr>
</tbody>
</table>

**X.25 ANALYSIS**

**RESTART CAUSE CODES SET UP DISPLAY**

When enabled, a cause code will generate an LCN alarm and TBE, but only if a session is currently active when a restart occurs.

**Restart Packet Cause Codes**

00 DTE ORIGINATED
01 LOCAL PROCEDURE ERROR
02 NETWORK CONGESTION
03 NETWORK OPERATIONAL
5.6.2.3 Clear Cause Codes Set Up

**X.25 AUTO-SENTRY ALARM SET UP**

**CLEAR CAUSE CODES**

<table>
<thead>
<tr>
<th>Code</th>
<th>Cause Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>DTE ORIGINATED</td>
</tr>
<tr>
<td>01</td>
<td>NUMBER BUSY</td>
</tr>
<tr>
<td>03</td>
<td>INVALID FACILITY REQUEST</td>
</tr>
<tr>
<td>05</td>
<td>NETWORK CONGESTION</td>
</tr>
<tr>
<td>09</td>
<td>OUT OF ORDER</td>
</tr>
<tr>
<td>0B</td>
<td>ACCESS BARRED</td>
</tr>
<tr>
<td>0D</td>
<td>NOT OBTAINABLE</td>
</tr>
<tr>
<td>11</td>
<td>REMOTE PROCEDURE ERROR</td>
</tr>
<tr>
<td>13</td>
<td>LOCAL PROCEDURE ERROR</td>
</tr>
<tr>
<td>15</td>
<td>RPOA OUT OF SERVICE</td>
</tr>
<tr>
<td>19</td>
<td>REFUSES REVERSE CHARGING</td>
</tr>
<tr>
<td>21</td>
<td>INCOMPATIBLE DESTINATION</td>
</tr>
<tr>
<td>29</td>
<td>FAST SELECT NOT ALLOWED</td>
</tr>
</tbody>
</table>

**ENABLE ALARM SOFTKEY**

Enable alarm softkey will display the cause code in reverse video and enable the alarm reporting for that cause code.

**DISABLE ALARM SOFTKEY**

Disable alarm softkey will display the cause code in normal video and disable the alarm reporting for that cause code.

**X.25 ANALYSIS**

An LCN alarm and TBE will be generated for an enabled clear cause code. Cause Code 00 will generate an alarm only for sessions rejected during call set up.

Clear Packet Cause Codes

- **00** DTE ORIGINATED
- **01** NUMBER BUSY
- **03** INVALID FACILITY REQUEST
- **05** NETWORK CONGESTION
- **09** OUT OF ORDER
- **0B** ACCESS BARRED
- **0D** NOT OBTAINABLE
- **11** REMOTE PROCEDURE ERROR
- **13** LOCAL PROCEDURE ERROR
- **15** RPOA OUT OF SERVICE
- **19** REFUSES REVERSE CHARGING
- **21** INCOMPATIBLE DESTINATION
- **29** FAST SELECT NOT ALLOWED
6.6.2.4 Diagnostic Packet Alarms Set Up

X.25 AUTOSENTRY ALARM SET UP

ENABLE ALARM SOFTKEY WILL ENABLE
THE ALARM REPORTING FOR ALL
DIAGNOSTIC PACKET CODES

DISABLE ALARM SOFTKEY WILL DISABLE
THE ALARM REPORTING FOR ALL
DIAGNOSTIC PACKET CODES

X.25 ANALYSIS

AS SD REPLAY TRK: 8

DIAGNOSTIC PACKET ALARMS SET UP DISPLAY

All diagnostic packet events are either enabled or disabled as a group. If ON, any diagnostic packet will generate an LCN alarm and TBE.
6.7 AUTO-SENTRY Alarms Set Up Softkey/Label Display Descriptions

6.7.1 GENERAL ALARMS Softkey/Label Display

<table>
<thead>
<tr>
<th>SOFTKEY/LABEL</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>THRESHOLD ALARMS</td>
<td>Sets up softkey/label display to select Threshold Alarm parameters.</td>
</tr>
<tr>
<td>LEADSTATE ALARMS</td>
<td>Sets up softkey/label display to select Leadstate Alarm parameters.</td>
</tr>
<tr>
<td>Not Used</td>
<td></td>
</tr>
<tr>
<td>Not Used</td>
<td></td>
</tr>
<tr>
<td>Not Used</td>
<td></td>
</tr>
<tr>
<td>Not Used</td>
<td></td>
</tr>
<tr>
<td>Not Used</td>
<td></td>
</tr>
<tr>
<td>Not Used</td>
<td></td>
</tr>
<tr>
<td>EXIT</td>
<td>Return to previous softkey/label display. (GENERAL ALARMS - Ref 5.3.2)</td>
</tr>
</tbody>
</table>
6.7.2 THRESHOLD ALARMS Softkey/Label Display

**X.25 AUTO-SENTRY ALARM SET UP**

<table>
<thead>
<tr>
<th>COUNTS</th>
<th>ALARM TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>TIME-LEVEL</td>
<td></td>
</tr>
<tr>
<td>+ 01 BCL ERROR</td>
<td></td>
</tr>
<tr>
<td>01 ABORTED FRAMES</td>
<td></td>
</tr>
<tr>
<td>01 POLL WITHOUT FINAL</td>
<td></td>
</tr>
<tr>
<td>01 FRAME RETRANSMISSIONS</td>
<td></td>
</tr>
<tr>
<td>01 FRMR REJECT FRAMES</td>
<td></td>
</tr>
<tr>
<td>01 PACKET RETRANSMISSIONS</td>
<td></td>
</tr>
<tr>
<td>01 CONTINUOUS RNR PACKETS</td>
<td></td>
</tr>
<tr>
<td>01 QUALITY RATIO * 01%</td>
<td></td>
</tr>
<tr>
<td>TIME = 15 MINUTE INTERVAL</td>
<td></td>
</tr>
</tbody>
</table>

**SOFTKEY/LABEL FUNCTION**

- **CURSOR UP**
  - Moves Arrow Cursor one(1) line up to select alarm counts and type

- **CURSOR DOWN**
  - Moves Arrow Cursor one(1) line down to select alarm counts and type

- **ENABLE ALARM**
  - Initiates Alarm reporting

- **DISABLE ALARM**
  - Disables Alarm reporting

- **STANDARD COUNTS**
  - Sets up softkey/label display to select threshold standard counts. (Ref 6.7.2.1)

- **SELECT COUNTS**
  - Sets up softkey/label display to select a custom threshold count. (Ref 6.7.2.2)

- **NEXT LIST**
  - Initiates a softkey/label display to select additional threshold parameters. (Ref 6.7.2.3)

- **EXIT**
  - Return to previous softkey/label display. (THRESHOLD ALARMS - Ref 6.7.1)
6.7.2.1 STANDARD COUNTS Softkey/Label Display

X.25 AUTO-SENTRY ALARM SET UP

**COUNTS**

<table>
<thead>
<tr>
<th>ALARM TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>TIME LEVEL</td>
</tr>
<tr>
<td>01 ALL ERROR</td>
</tr>
<tr>
<td>01 ABORTED FRAMES</td>
</tr>
<tr>
<td>01 POLL WITHOUT FINAL</td>
</tr>
<tr>
<td>01 FRAME RETRANSMISSIONS</td>
</tr>
<tr>
<td>01 FRMP REJECT FRAMES</td>
</tr>
<tr>
<td>01 QUALITY RATIO x 01%</td>
</tr>
<tr>
<td>TIME = 15 MINUTE INTERVAL</td>
</tr>
</tbody>
</table>

**X.25 ANALYSIS**

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>4</th>
<th>6</th>
<th>8</th>
<th>10</th>
<th>12</th>
<th>EXIT</th>
</tr>
</thead>
</table>

**SOFTKEY/LABEL FUNCTION**

1. Selects 1 as the standard count.
2. Selects 2 as the standard count.
4. Selects 4 as the standard count.
6. Selects 6 as the standard count.
8. Selects 8 as the standard count.
10. Selects 10 as the standard count.
12. Selects 12 as the standard count.
EXIT. Returns to previous softkey/label display.

(Standard Counts - Ref 6.7.2)
6.7.2.2 SELECT COUNTS Softkey/Label Display

**X.25 AUTO-SENTRY ALARM SET UP**

<table>
<thead>
<tr>
<th>COUNTS</th>
<th>ALARM TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ 01</td>
<td>BCC ERROR</td>
</tr>
<tr>
<td>01</td>
<td>ABORTED FRAMES</td>
</tr>
<tr>
<td>01</td>
<td>POLL WITHOUT FINAL</td>
</tr>
<tr>
<td>01</td>
<td>FRAME RETRANSMISSIONS</td>
</tr>
<tr>
<td>01</td>
<td>FRMR REJECT FRAMES</td>
</tr>
<tr>
<td>01</td>
<td>CONTINUOUS RNR PACKETS</td>
</tr>
<tr>
<td>01</td>
<td>QUALITY RATIO = 01%</td>
</tr>
<tr>
<td>TIME</td>
<td>15 MINUTE INTERVAL</td>
</tr>
</tbody>
</table>

**X.25 ANALYSIS**

**AS SD REPLAY TRK: 8**

<table>
<thead>
<tr>
<th>SOFTKEY/LABEL</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>CURSOR LEFT &lt;</td>
<td>Moves cursor one(1) character position left in parameter line to be changed.</td>
</tr>
<tr>
<td>CURSOR &gt; RIGHT</td>
<td>Moves cursor one(1) character position right in parameter line to be changed.</td>
</tr>
<tr>
<td>CHANGE CHARACTER</td>
<td>Changes character in cursor location. Characters will cycle sequentially when softkey is depressed. (Decimal - 0 to 9)</td>
</tr>
<tr>
<td>ENTER</td>
<td>Enters new or changed count in configuration (Must be initiated to complete and store change). Return to previous softkey/label display. (SELECT COUNTS - Ref 6.7.2)</td>
</tr>
<tr>
<td>EXIT</td>
<td>Return to previous softkey/label display. (SELECT COUNTS - Ref 6.7.2)</td>
</tr>
</tbody>
</table>
### 6.7.2.3 NEXT LIST Softkey/Label Display

**X.25 AUTO-SENTRY ALARM SET UP**

<table>
<thead>
<tr>
<th>COUNTS</th>
<th>ALARM TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>CONTROL</td>
</tr>
<tr>
<td>01</td>
<td>BCC ERROR</td>
</tr>
<tr>
<td>01</td>
<td>ABORTED FRAMES</td>
</tr>
<tr>
<td>01</td>
<td>POLL WITHOUT FINAL</td>
</tr>
<tr>
<td>01</td>
<td>FRAME RETRANSMISSIONS</td>
</tr>
<tr>
<td>01</td>
<td>FRMR REJECT FRAMES</td>
</tr>
<tr>
<td>01</td>
<td>UNRELIABLE</td>
</tr>
<tr>
<td>01</td>
<td>PACKET RETRANSMISSIONS</td>
</tr>
<tr>
<td>01</td>
<td>CONTINUOUS RNR PACKETS</td>
</tr>
<tr>
<td>01</td>
<td>QUALITY RATIO = 01%</td>
</tr>
<tr>
<td>TIME = 15 MINUTE INTERVAL</td>
<td></td>
</tr>
</tbody>
</table>

**X.25 ANALYSIS**

<table>
<thead>
<tr>
<th>SELECT TIME</th>
<th>STANDARD RATIO</th>
<th>SELECT RATIO</th>
<th>PRINT CONTROL</th>
<th>EXIT</th>
</tr>
</thead>
</table>

**SOFTKEY/LABEL FUNCTION**

- **SELECT TIME**
  - Sets up softkey/label display to select alarm time parameters. (Ref 6.7.2.4)

- **STANDARD RATIO**
  - Sets up softkey/label display to select a standard quality ratio. (Ref 6.7.2.5)

- **SELECT RATIO**
  - Sets up softkey/label display to create a custom ratio. (Ref 6.7.2.6)

- **Not Used**

- **Not Used**

- **Not Used**

- **PRINT CONTROL**
  - Initiates Print Control softkey/label display. (Ref 6.5.6)

- **EXIT**
  - Return to previous softkey/label display. (NEXT LIST - Ref 6.7.2)
6.7.2.4 SELECT TIME Softkey/Label Display

**X.25 AUTO-SENTRY ALARM SET UP**

<table>
<thead>
<tr>
<th>COUNTS</th>
<th>ALARM TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRAME ERRORS</td>
<td>01 BCC ERROR</td>
</tr>
<tr>
<td></td>
<td>01 ABORTED FRAMES</td>
</tr>
<tr>
<td></td>
<td>01 POLL WITHOUT FINAL</td>
</tr>
<tr>
<td></td>
<td>01 FRAME RETRANSMISSIONS</td>
</tr>
<tr>
<td></td>
<td>01 FRMR REJECT FRAMES</td>
</tr>
<tr>
<td></td>
<td>01 PACKET RETRANSMISSIONS</td>
</tr>
<tr>
<td></td>
<td>01 CONTINUOUS RNR PACKETS</td>
</tr>
<tr>
<td>TIME</td>
<td>15 MINUTE INTERVAL</td>
</tr>
</tbody>
</table>

**QUALITY RATIO** is the % of Control to data packets. Alarm conditions are when ratio exceeds selected %.

**X.25 ANALYSIS**

<table>
<thead>
<tr>
<th>SOFTKEY/LABEL FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 MINUTES</td>
</tr>
<tr>
<td>30 MINUTES</td>
</tr>
<tr>
<td>60 MINUTES</td>
</tr>
<tr>
<td>RUN TIME</td>
</tr>
<tr>
<td>Not Used</td>
</tr>
<tr>
<td>Not Used</td>
</tr>
<tr>
<td>Not Used</td>
</tr>
<tr>
<td>Exit</td>
</tr>
</tbody>
</table>

- **Selects 15 minutes as time interval.**
- **Selects 30 minutes as time interval.**
- **Selects 60 minutes as time interval.**
- **Selects RUN TIME as the time interval.**
- **Not Used**
- **Not Used**
- **Not Used**
- **Return to previous softkey/label display. (SELECT TIME - Ref 6.7.2.3)**
### 6.7.2.5 STANDARD RATIO Softkey/Label Display

#### X.25 AUTO-SENTRY ALARM SET UP

<table>
<thead>
<tr>
<th>COUNTS</th>
<th>ALARM TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>TIME</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>MINUTE INTERVAL</td>
</tr>
<tr>
<td>+</td>
<td></td>
</tr>
<tr>
<td>01</td>
<td>BCC ERROR</td>
</tr>
<tr>
<td>01</td>
<td>ABORTED FRAMES</td>
</tr>
<tr>
<td>01</td>
<td>POLL WITHOUT FINAL</td>
</tr>
<tr>
<td>01</td>
<td>FRAME RETRANSMISSIONS</td>
</tr>
<tr>
<td>01</td>
<td>FRMR REJECT FRAMES</td>
</tr>
<tr>
<td>01</td>
<td>PACKET RETRANSMISSIONS</td>
</tr>
<tr>
<td>01</td>
<td>CONTINUOUS RNR PACKETS</td>
</tr>
<tr>
<td>01</td>
<td>QUALITY RATIO = 81%</td>
</tr>
</tbody>
</table>

- **Enable Alarm Softkey** will display the current threshold count in reverse video and enable the alarm reporting.
- **Disable Alarm Softkey** will display the current threshold count in normal video and disable the alarm reporting.
- **Quality Ratio** is the % of control to data packets. Alarm conditions are when ratio exceeds selected %.

### X.25 ANALYSIS

<table>
<thead>
<tr>
<th>SOFTKEY/LABEL FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>5%</td>
</tr>
<tr>
<td>10%</td>
</tr>
<tr>
<td>15%</td>
</tr>
<tr>
<td>20%</td>
</tr>
<tr>
<td>30%</td>
</tr>
<tr>
<td>40%</td>
</tr>
<tr>
<td>50%</td>
</tr>
<tr>
<td>EXIT</td>
</tr>
</tbody>
</table>
6.7.2.6 SELECT RATIO Softkey/Label Display

**X.25 AUTO-SENTRY ALARM SET UP**

<table>
<thead>
<tr>
<th>COUNTS</th>
<th>ALARM TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>+01</td>
<td>BCC ERROR</td>
</tr>
<tr>
<td>+01</td>
<td>ABORTED FRAMES</td>
</tr>
<tr>
<td>+01</td>
<td>POLL WITHOUT FINAL</td>
</tr>
<tr>
<td>+01</td>
<td>FRAME RETRANSMISSIONS</td>
</tr>
<tr>
<td>+01</td>
<td>FRNR REJECT FRAMES</td>
</tr>
<tr>
<td>+01</td>
<td>PACKET RETRANSMISSIONS</td>
</tr>
<tr>
<td>+01</td>
<td>CONTINUOUS RNR PACKETS</td>
</tr>
<tr>
<td>+01</td>
<td>QUALITY RATIO &gt; 01%</td>
</tr>
<tr>
<td>TIME</td>
<td>15 MINUTE INTERVAL</td>
</tr>
</tbody>
</table>

**X.25 ANALYSIS**

**FUNCTION**

**SOFTKEY/LABEL**

- **CURSOR LEFT <**
  - Moves cursor one(1) character position left in parameter line to be changed.

- **CURSOR > RIGHT**
  - Moves cursor one(1) character position right in parameter line to be changed.

- **CHANGE CHARACTER**
  - Changes character in cursor location. Characters will cycle sequentially when softkey is depressed. (Decimal - 0 to 9)

- **ENTER**
  - Enters new or changed ratio in configuration (Must be initiated to complete and store change). Return to previous softkey/label display. (SELECT RATIO - Ref 6.7.2.3)

- **EXIT**
  - Return to previous softkey/label display. (SELECT RATIO - Ref 6.7.2.3)
6.7.3 LEADSTATE Softkey/Label Display

**X.25 AUTO-SENTRY LEADSTATE ALARM SET UP**

LEADSTATE SETTINGS ARE FOR THE NORMAL, ACTIVE LINE CONDITIONS
DEFINING THE SENDING AND/OR RECEIVING OF DATA TRANSMISSIONS.
ALL IF THE SELECTED CONDITIONS EXIST, AN ALARM WILL BE GENERATED.

SEND CHAR
LEADSTATE

SEND CHAR
LEADSTATE

RTS CTS DSR DTR RI CD EI E12
DISABLED

RECV CHAR
LEADSTATE

RECV CHAR
LEADSTATE

RTS CTS DSR DTR RI CD EI E12

**X.25 ANALYSIS**

**PRINTER TIMEOUT**

AS SD REPLAY TRK: 8

<table>
<thead>
<tr>
<th>SOFTKEY/LABEL</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEND SET UP</td>
<td>Sets up softkey/label display to select send leadstate parameters. (Ref 6.7.3.1)</td>
</tr>
<tr>
<td>RECV SET UP</td>
<td>Sets up softkey/label display to select receive leadstate parameters. (Ref 6.7.3.1)</td>
</tr>
<tr>
<td>ENABLE ALARM</td>
<td>Initiates alarm reporting.</td>
</tr>
<tr>
<td>DISABLE ALARM</td>
<td>Disables alarm reporting.</td>
</tr>
<tr>
<td>PRINT CONTROL</td>
<td>Initiates Print Control softkey/label display. (Ref 6.5.6)</td>
</tr>
<tr>
<td>EXIT</td>
<td>Return to previous softkey/label display. (LEADSTATE ALARM - Ref 6.7.1)</td>
</tr>
</tbody>
</table>
## 6.7.3.1 SEND SET UP/RECV SET UP Softkey/Label Display

**X.25 AUTO-SENTRY LEADSTATE ALARM SET UP**

LEADSTATE SETTINGS ARE FOR THE NORMAL/ACTIVE-LINE CONDITIONS DURING THE SENDING AND/OR RECEIVING OF DATA TRANSMISSIONS. IF THE SELECTED CONDITIONS CHANGE, AN ALARM WILL BE GENERATED.

<table>
<thead>
<tr>
<th>SEND CHAR LEADSTATE</th>
<th>RTS</th>
<th>CTS</th>
<th>DSR</th>
<th>DTR</th>
<th>RI</th>
<th>CD</th>
<th>E11</th>
<th>E12</th>
</tr>
</thead>
<tbody>
<tr>
<td>RECV CHAR LEADSTATE</td>
<td>RTS</td>
<td>CTS</td>
<td>DSR</td>
<td>DTR</td>
<td>RI</td>
<td>CD</td>
<td>E11</td>
<td>E12</td>
</tr>
</tbody>
</table>

**DISABLED**

### X.25 ANALYSIS

<table>
<thead>
<tr>
<th>Cursor Left &lt;</th>
<th>Cursor Right &gt;</th>
<th>DONT CARE</th>
<th>HIGH</th>
<th>LOW</th>
</tr>
</thead>
</table>

**HS SD REPLAY TPK: 8**

<table>
<thead>
<tr>
<th>Function</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CURSOR LEFT &lt;</td>
<td>Moves cursor left one(1) leadstate position</td>
</tr>
<tr>
<td>CURSOR RIGHT &gt;</td>
<td>Moves cursor right one(1) leadstate position.</td>
</tr>
<tr>
<td>DONT CARE</td>
<td>Selects DONT CARE as the alarm parameter for the leadstate.</td>
</tr>
<tr>
<td>HIGH</td>
<td>Selects the leadstate signal HIGH as the alarm parameter.</td>
</tr>
<tr>
<td>LOW</td>
<td>Selects the leadstate signal LOW as the alarm parameter.</td>
</tr>
<tr>
<td></td>
<td>Not Used</td>
</tr>
<tr>
<td></td>
<td>Not Used</td>
</tr>
<tr>
<td>EXIT</td>
<td>Return to previous softkey/label display.</td>
</tr>
</tbody>
</table>

(SEND SET UP - Ref 6.7.3)  
(RECV SET UP - Ref 6.7.3)
### 6.7.4 LCN ALARMS Softkey/Label Display

<table>
<thead>
<tr>
<th>SOFTKEY/LABEL</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLEAR CAUSE</td>
<td>Sets up softkey/label display to select Clear Cause alarm parameters. (Ref 6.7.4.1)</td>
</tr>
<tr>
<td>RESET CAUSE</td>
<td>Sets up softkey/label display to select Reset Cause alarm parameters. (Ref 6.7.4.1)</td>
</tr>
<tr>
<td>RESTART CAUSE</td>
<td>Sets up softkey/label display to select Restart Cause alarm parameters. (Ref 6.7.4.1)</td>
</tr>
<tr>
<td>DIAG. PACKET</td>
<td>Sets up softkey/label display to select enable or disable alarm parameter. (Ref 6.7.4.2)</td>
</tr>
<tr>
<td></td>
<td>Not Used</td>
</tr>
<tr>
<td></td>
<td>Not Used</td>
</tr>
<tr>
<td></td>
<td>Not Used</td>
</tr>
<tr>
<td>EXIT</td>
<td>Return to previous softkey/label display. (LCN ALARMS - Ref 6.7.1)</td>
</tr>
</tbody>
</table>
6.7.4.1 CLEAR CAUSE / RESET CAUSE / RESTART CAUSE
Softkey/Label Display

<table>
<thead>
<tr>
<th>SOFTKEY/LABEL</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>CURSOR UP</td>
<td>Moves Arrow Cursor one(1) line up to select alarm code.</td>
</tr>
<tr>
<td>CURSOR DOWN</td>
<td>Moves Arrow Cursor one(1) line down to select alarm code.</td>
</tr>
<tr>
<td>ENABLE ALARM</td>
<td>Initiates Alarm reporting.</td>
</tr>
<tr>
<td>DISABLE ALARM</td>
<td>Disables Alarm reporting.</td>
</tr>
<tr>
<td>PRINT CONTROL</td>
<td>Initiates Print Control softkey/label display. (Ref 6.5.6)</td>
</tr>
<tr>
<td>EXIT</td>
<td>Return to previous softkey/label display. (CLEAR CAUSE - Ref 6.7.4) (RESET CAUSE - Ref 6.7.4) (RESTART CAUSE - Ref 6.7.4)</td>
</tr>
</tbody>
</table>

X.25 AUTO-SENTRY ALARM SET UP

<table>
<thead>
<tr>
<th>CLEAR CAUSE CODES</th>
</tr>
</thead>
<tbody>
<tr>
<td>80 DTE ORIG.</td>
</tr>
<tr>
<td>01 NUM.BUSY</td>
</tr>
<tr>
<td>03 INV. FAC. REQUEST</td>
</tr>
<tr>
<td>05 NET. CONGESTION</td>
</tr>
<tr>
<td>09 OUT OF ORDER</td>
</tr>
<tr>
<td>0B ACCESS BARRED</td>
</tr>
<tr>
<td>0D NOT OBTAINABLE</td>
</tr>
<tr>
<td>11 REMOTE PROC. ERROR</td>
</tr>
<tr>
<td>13 LOCAL PROC. ERROR</td>
</tr>
<tr>
<td>15 RPOA OUT OF ORDER</td>
</tr>
<tr>
<td>19 REFUSES REVERSE CHARGING</td>
</tr>
<tr>
<td>21 INCOMPATIBLE DESTINATION</td>
</tr>
<tr>
<td>29 FAST SELECT NOT ALLOWED</td>
</tr>
</tbody>
</table>

X.25 ANALYSIS
AS SD REPLAY TRY: 8

6-36
6.7.4.2 DIAGNOSTIC PACKET Softkey/Label Display

<table>
<thead>
<tr>
<th>SOFTKEY/LABEL</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not Used</td>
</tr>
<tr>
<td></td>
<td>Not Used</td>
</tr>
<tr>
<td>ENABLE ALARM</td>
<td>Initiates Alarm reporting.</td>
</tr>
<tr>
<td>DISABLE ALARM</td>
<td>Disables Alarm reporting.</td>
</tr>
<tr>
<td></td>
<td>Not Used</td>
</tr>
<tr>
<td></td>
<td>Not Used</td>
</tr>
<tr>
<td>PRINT CONTROL</td>
<td>Initiates Print Control softkey/label display.</td>
</tr>
<tr>
<td></td>
<td>(Ref 6.5.6)</td>
</tr>
<tr>
<td>EXIT</td>
<td>Return to previous softkey/label display.</td>
</tr>
<tr>
<td></td>
<td>(DIAG. PACKET - Ref 6.7.4)</td>
</tr>
</tbody>
</table>

**X.25 AUTO-SENTRY ALARM SET UP**

<table>
<thead>
<tr>
<th>ENABLE ALARM SOFTKEY</th>
<th>DISABLE ALARM SOFTKEY</th>
</tr>
</thead>
<tbody>
<tr>
<td>WILL ENABLE THE ALARM REPORTING FOR ALL DIAGNOSTIC PACKET CODES</td>
<td>WILL DISABLE THE ALARM REPORTING FOR ALL DIAGNOSTIC PACKET CODES</td>
</tr>
</tbody>
</table>

**DIAGNOSTIC CODES**

<table>
<thead>
<tr>
<th>ALL CODES DISABLED</th>
</tr>
</thead>
</table>