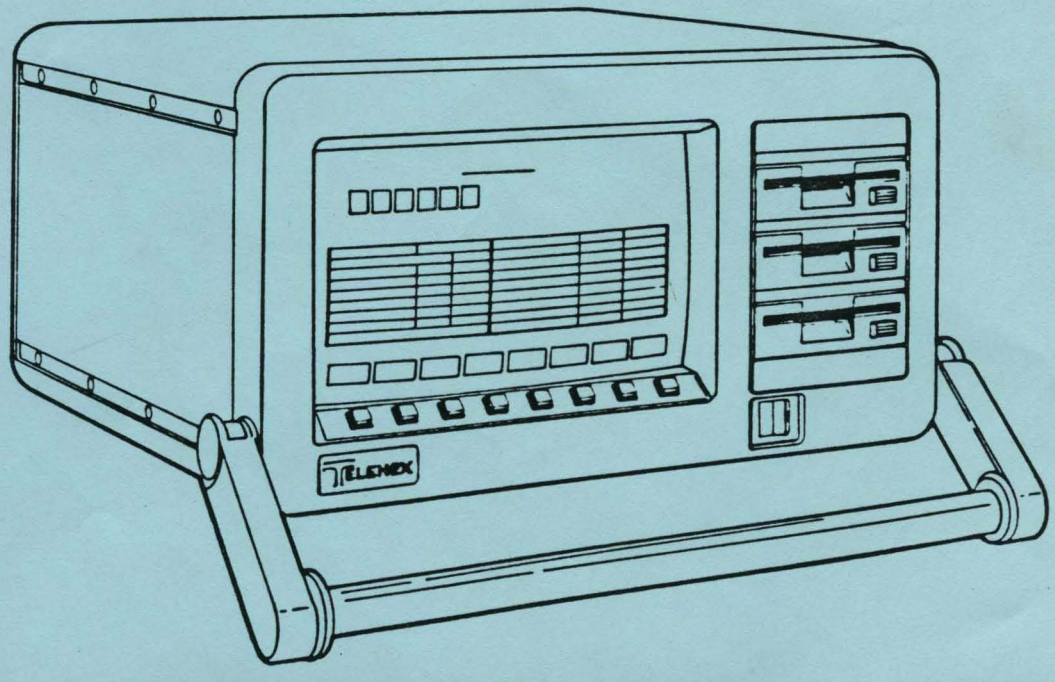
X.25 PROTOCOL APPLICATION PROGRAM



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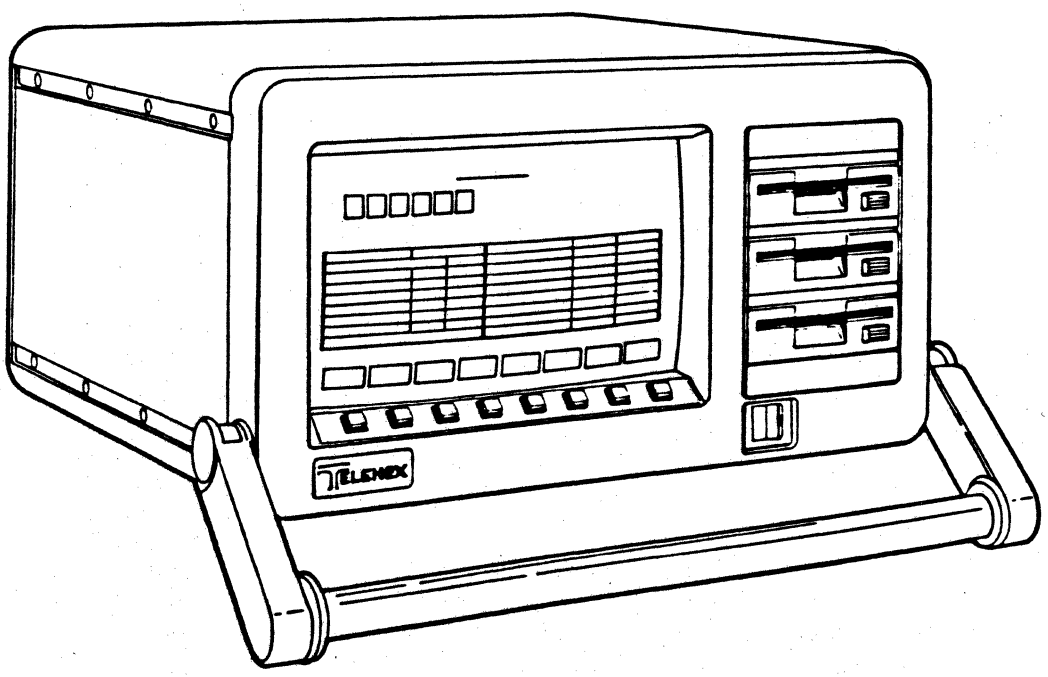
X.25 PROTOCOL APPLICATION PROGRAM



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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.

9101767-001-00 MARCH 1986

TABLE OF CONTENTS

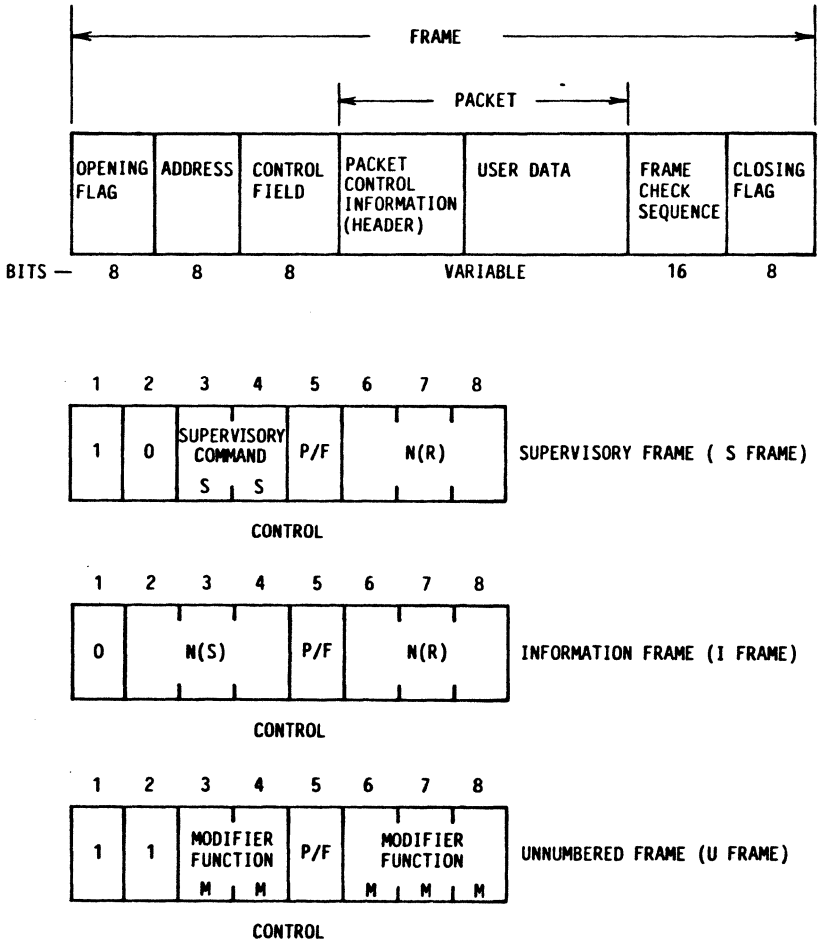
SECTION 1 X.25 PROTOCOL OVERVIEW

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

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

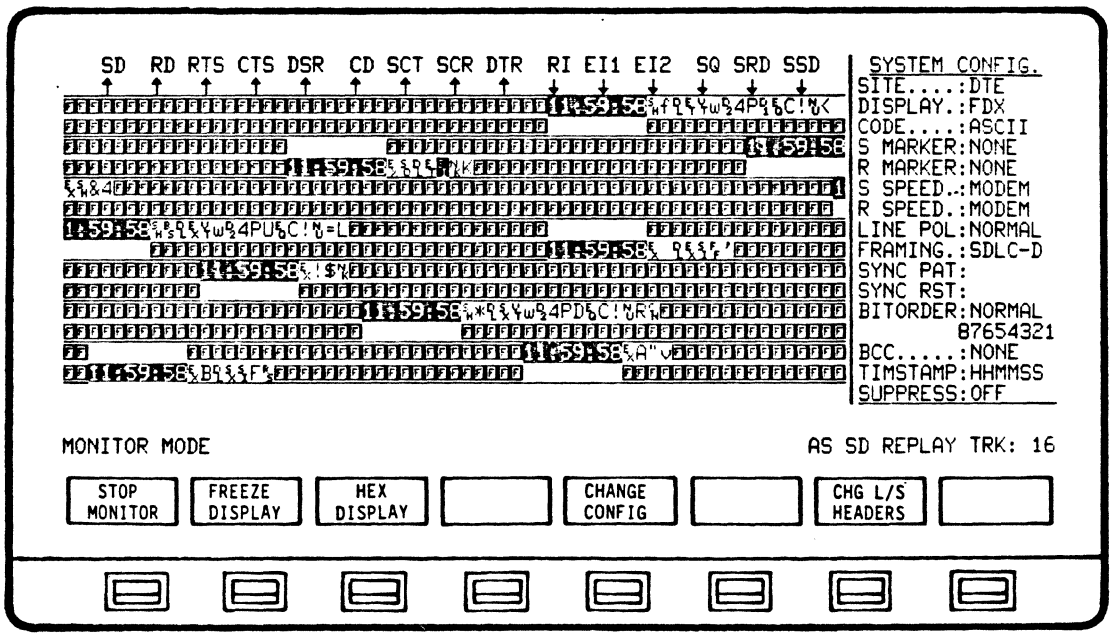
The Monitor Mode is selected from the Main Menu.

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

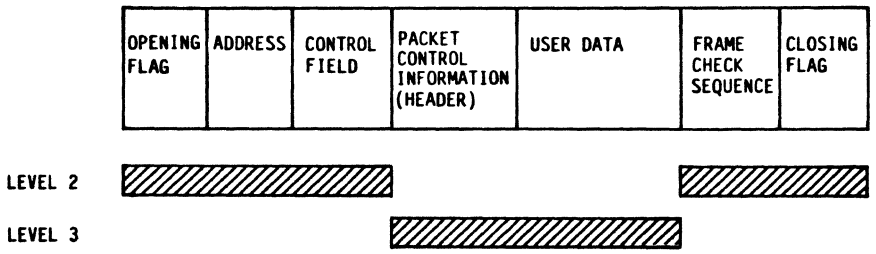
SECTION 3 X.25 DECODE MODE

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

MAIN MENU

MONITOR	DECODE	ANALYSIS	AUTOBASIC	CONFIG CONTROL	DISK CONTROL	OPTION MENU	

DECODE

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

SET UP DECODE

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

3.1 Level 2 Decoding

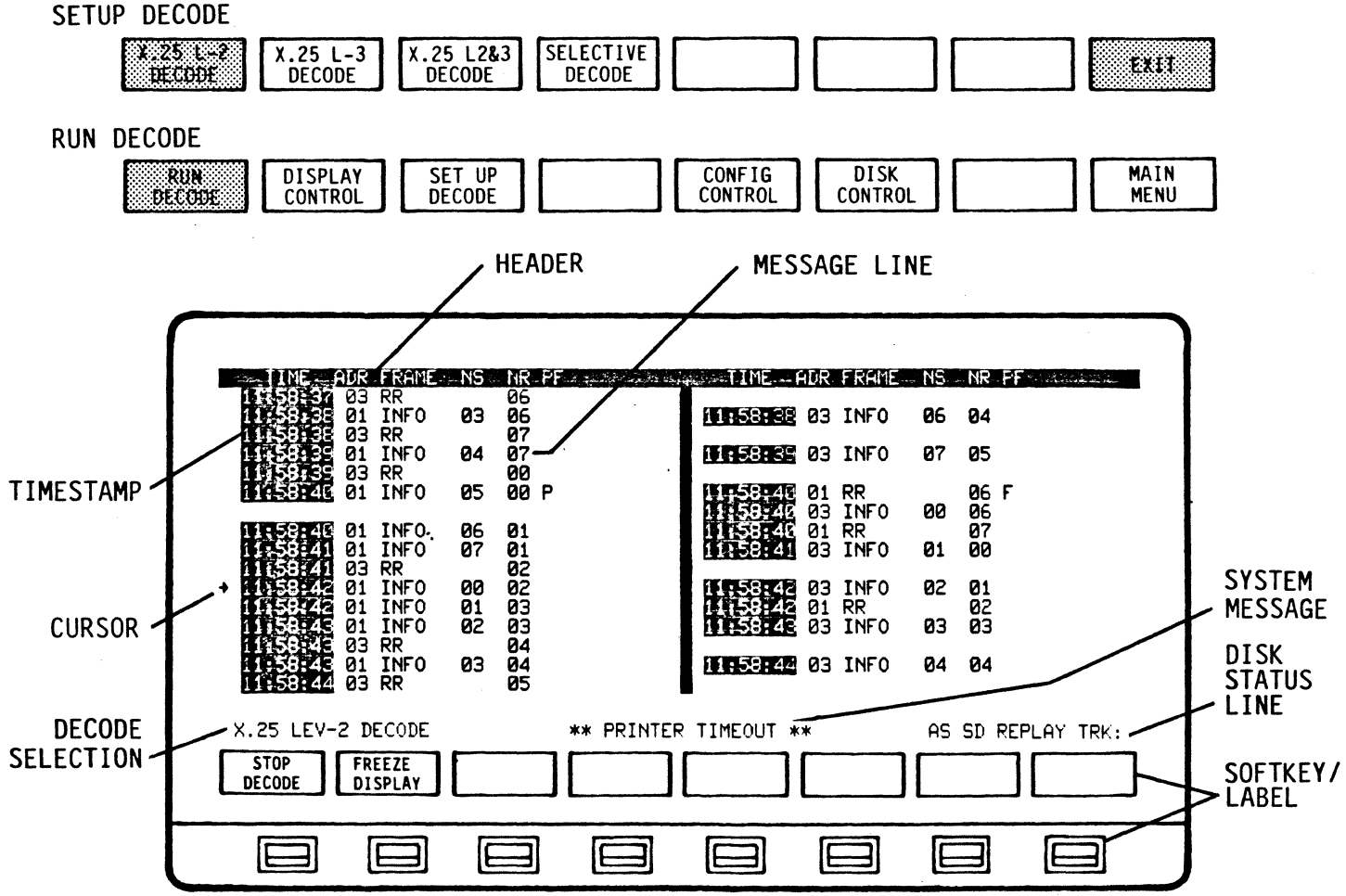
Level 2 decoding provides frame level information. Both send and receive messages are displayed on a split screen. Decoded information includes:

- 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

INFO	Information Transfer Format
RR	Receive Ready
RNR	Receive Not Ready
REJ	Reject
DM	Disconnected Mode
SABM	Set Asynchronous Balance Mode
SABME	Set Asynchronous Balance Mode Extended
DISC	Disconnect
UA	Unnumbered Acknowledgement
FRMR=INV CMD	Frame Reject = Invalid Command Indicates that control received and returned was invalid or not implemented.
FRMR=I-FIELD	Frame Reject = I Field Indicates that frame contained an information field that is not permitted or a format frame with incorrect length.
FRMR=I-SIZE	Frame Reject = I Size Indicates frame contained an information field that exceeded maximum established capacity.
FRMR=INV N(R)	Frame Reject=Invalid N(R) Indicates that control field received and returned contained an invalid Receive Sequence Number(N(R)).

3.1.1.3 X.25 Level 2 Decode Error Messages

Error messages will be displayed in reverse video.

BCC ERROR	Indicates a Frame Check Sum error occurred in Frame.
ABORT ERROR	An Abort sequence was detected, indicating transmission of a Frame was terminated.
ADDRESS ERROR	Indicates Frame contained an invalid Address for X.25 Protocol.
INCOMPLETE FRAME	Indicates the Frame was missing either Address or Control byte.
INV S-CODE	Indicates Frame contained an unassigned Supervisory format code.
INV U-CODE	Indicates Frame contained an unassigned Unnumbered format code.

3.2 Level 3 Decoding

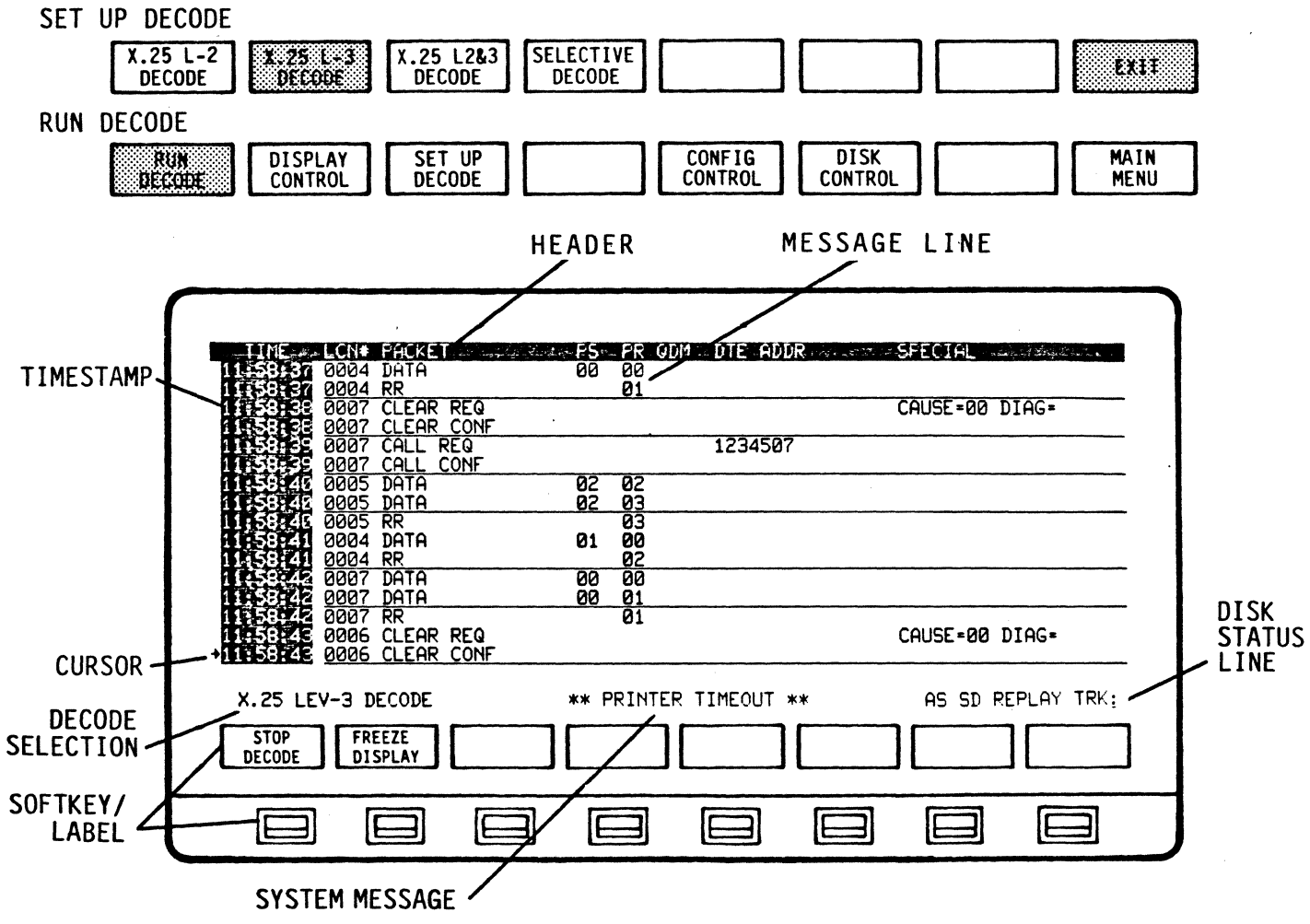
Level 3 decoding provides packet level information. Send and receive messages are displayed on a single screen. Decoded information includes:

- Time of message
- Logical channel number
- Packet type identifier
- Send packet sequence number
- Receive packet sequence number
- QDM 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



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

TIME	Displays Timestamp - Hours, Minutes, Seconds or Minutes, Seconds, Milliseconds (HH.MM.SS / MM.SS.ms)
LCN #	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)
PACKET	Displays description of Packet Type in X.25 Mnemonics (Ref 3.2.1.2).
PS	Displays Send Packet sequence number.
PR	Displays Receive Packet sequence number.
QDM	Displays Qualifier bit(Q), Delivery confirmation bit(D) or More data mark(M).
DTE ADDR	Displays the DTE Address in called DTE Packet area, if present.
SPECIAL	Displays reset and clear cause codes, diagnostic codes and/or facilities field length.

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

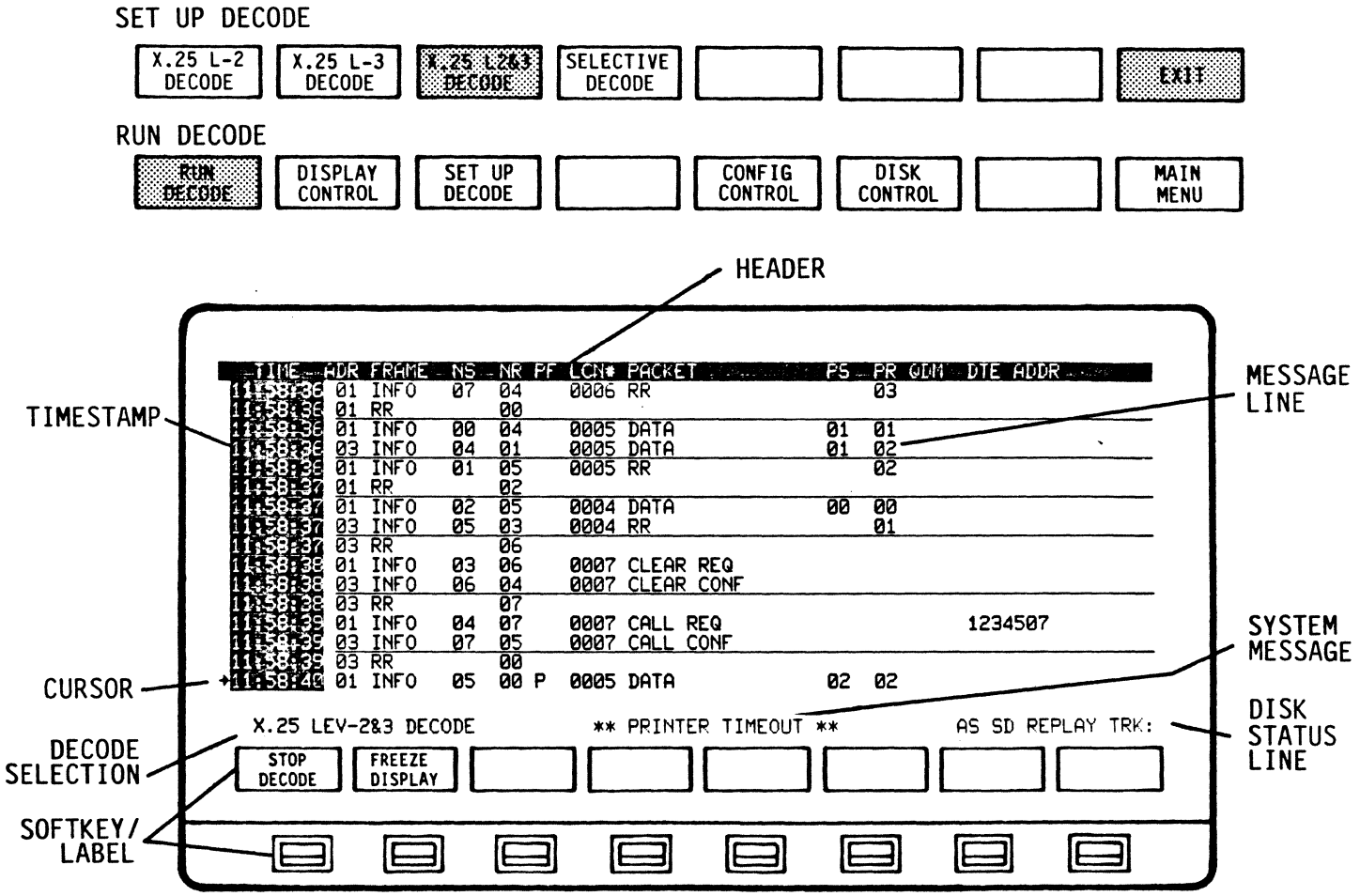
Level 2 & 3 decoding allows simultaneous decoding of both frame and packet data. All information is presented on a single screen. Decoded information includes:

- 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



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

BUFFER LIMIT	Indicates that the upper or lower limit of input buffer has been reached when viewing stored data in Display Control function.
BUFFER EMPTY	Indicates that data has not been captured in input buffer.

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

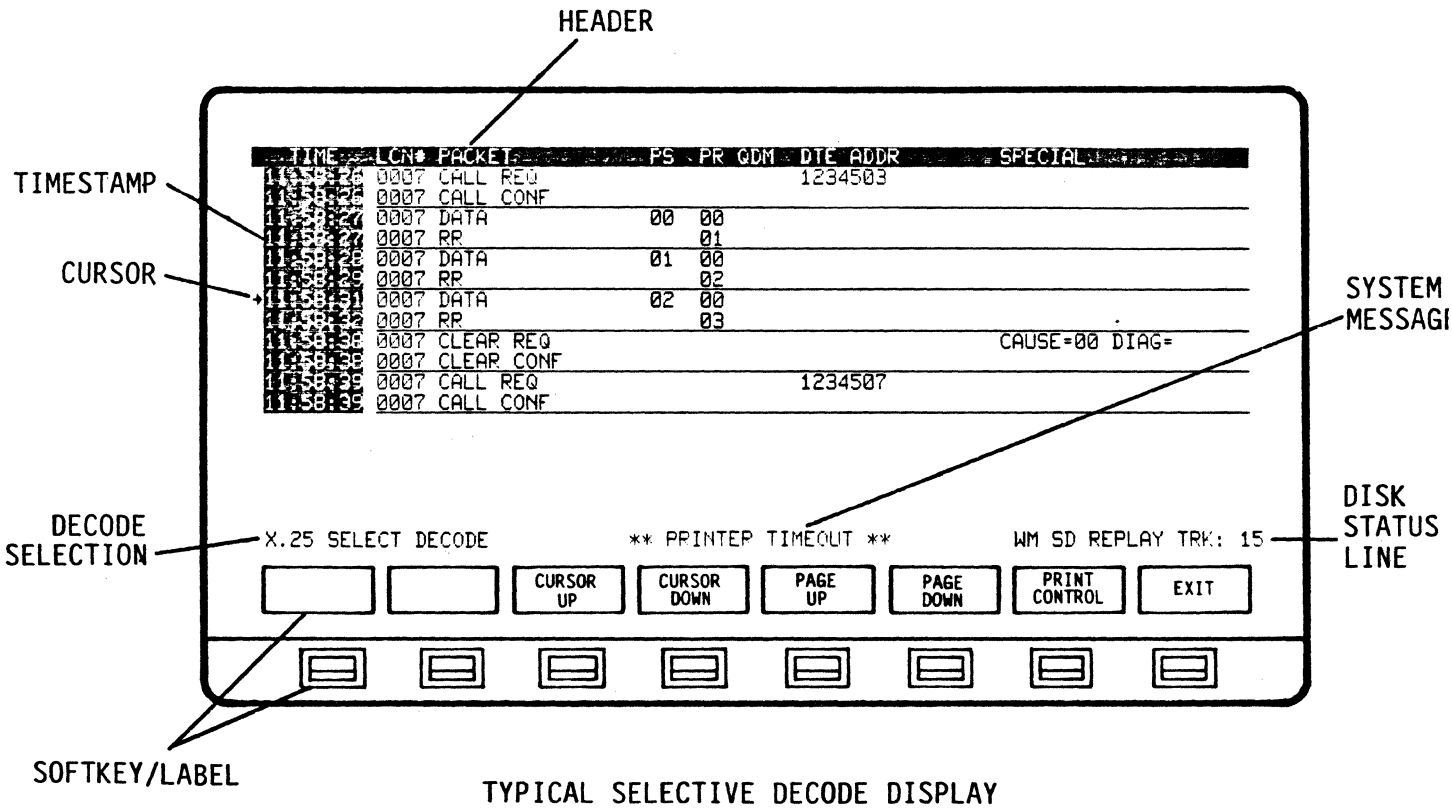
1. Select SELECTIVE DECODE
2. Select LCN or DTE address
3. Run Decode
4. Stop Decode
5. Review results

SET UP DECODE

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

SELECTIVE DECODE

LCN	DTE						EXIT



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 postion (7 for LCN and 14 for DTE) and changing its value.

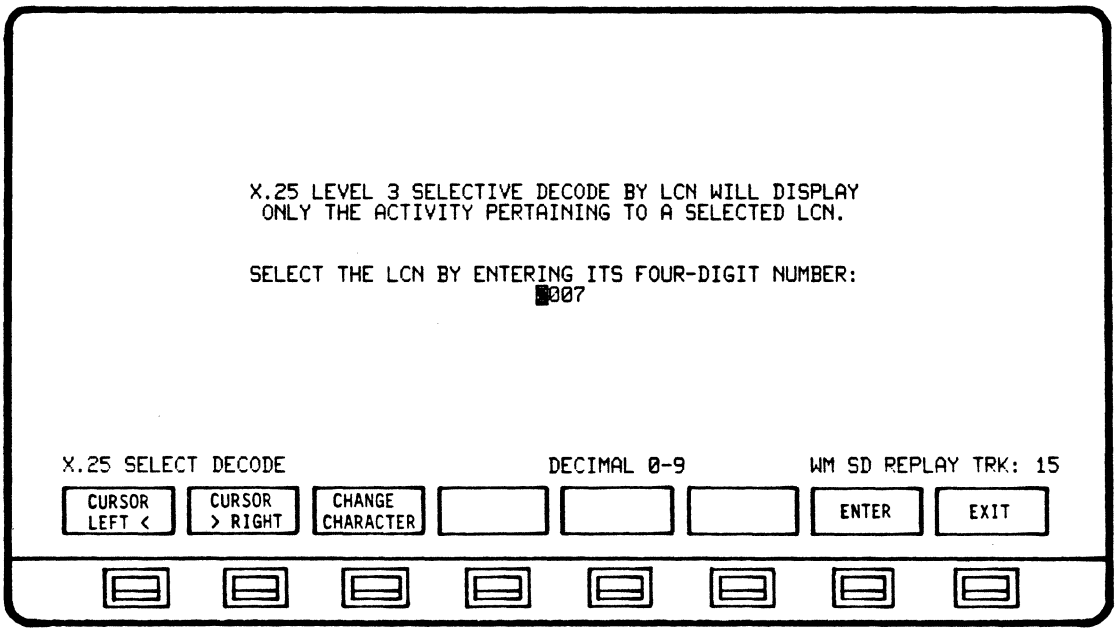
NOTE
If the new address is not ENTERed before exiting, the old address will be decoded.

SELECTIVE DECODE

LCN	DTE						EXIT

LCN(SELECT NUMBER)

CURSOR LEFT <	CURSOR > RIGHT	CHANGE CHARACTER				ENTER	EXIT



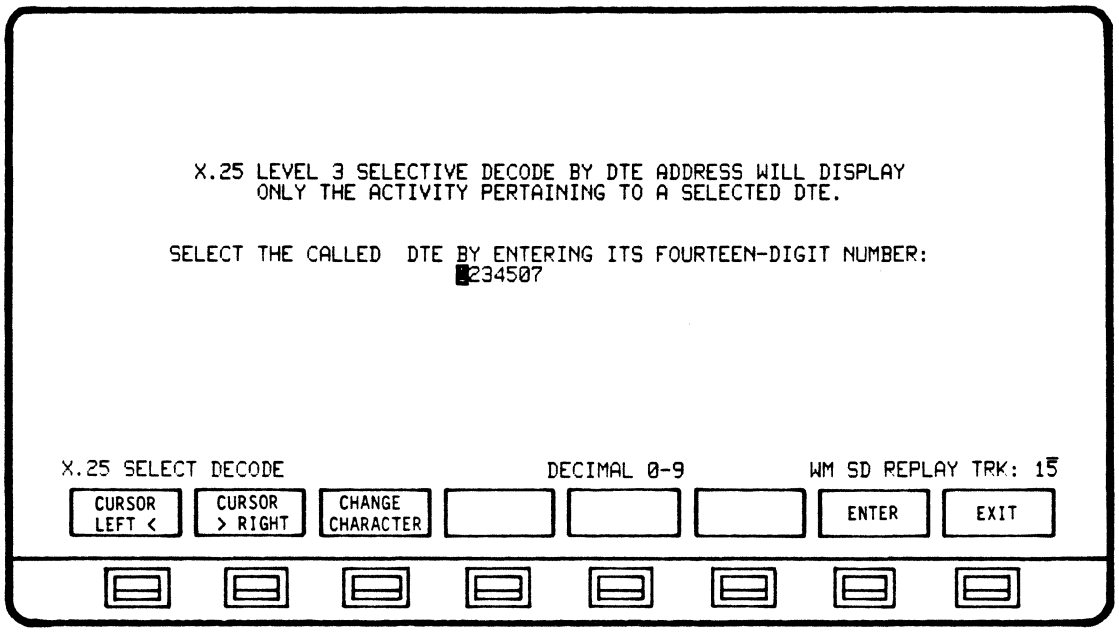
LCN SELECTION DISPLAY

SELECTIVE DECODE

LCN	DTE						EXIT

DTE(SELECT NUMBER)

CURSOR LEFT <	CURSOR > RIGHT	CHANGE CHARACTER				ENTER	EXIT



DTE SELECTION DISPLAY

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

CURSOR LEFT <	CURSOR > RIGHT	CHANGE CHARACTER				ENTER	EXIT

SET UP DECODE

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

RUN DECODE

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

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.

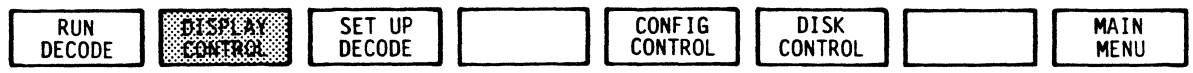
You can change to another format anytime by returning to the Decode Set Up softkeys and selecting the format desired. To view the new format, execute Display Control.

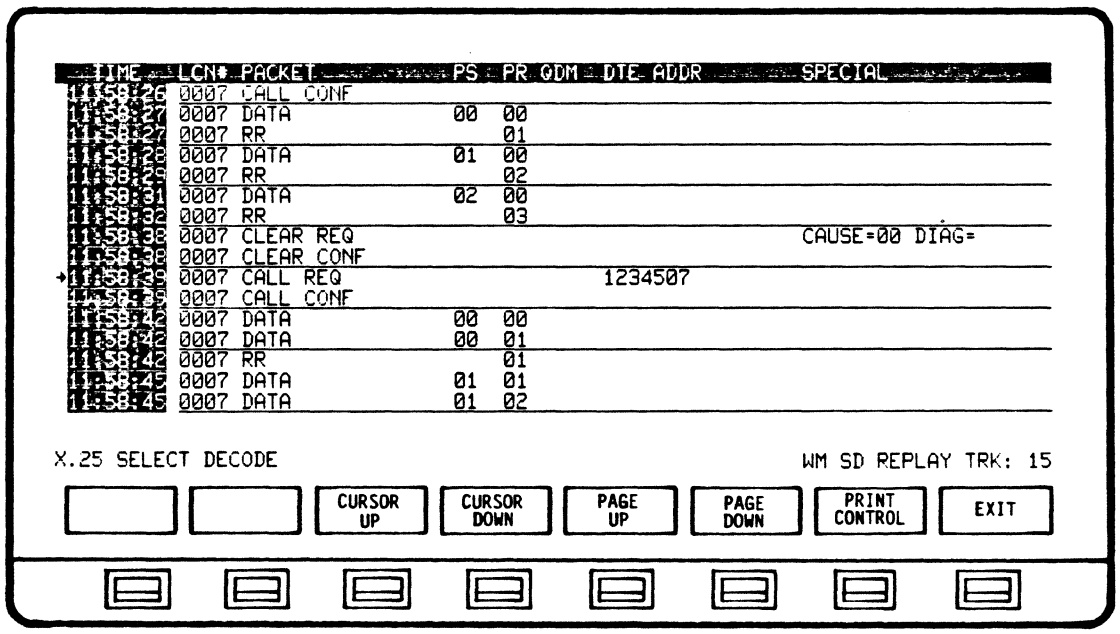
For a hard copy of the decode results, you can print selected screens or the entire buffer.

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

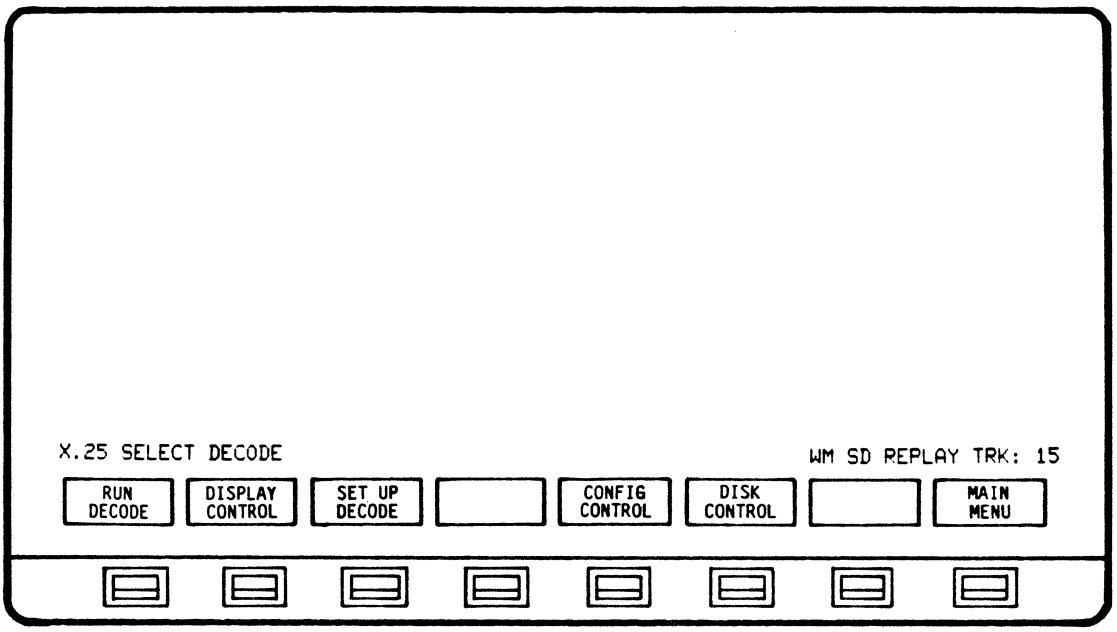




DISPLAY CONTROL

PRINT CONTROL

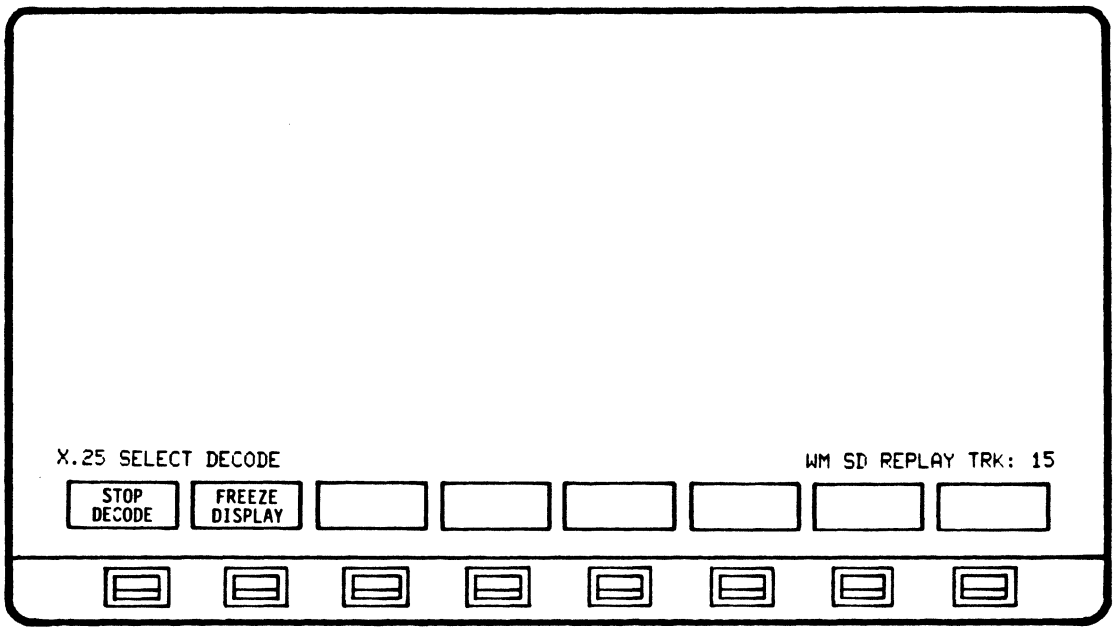
3.7 X.25 Decode Mode Softkey/Label Display Descriptions



3.7.1 DECODE Softkey/Label Display

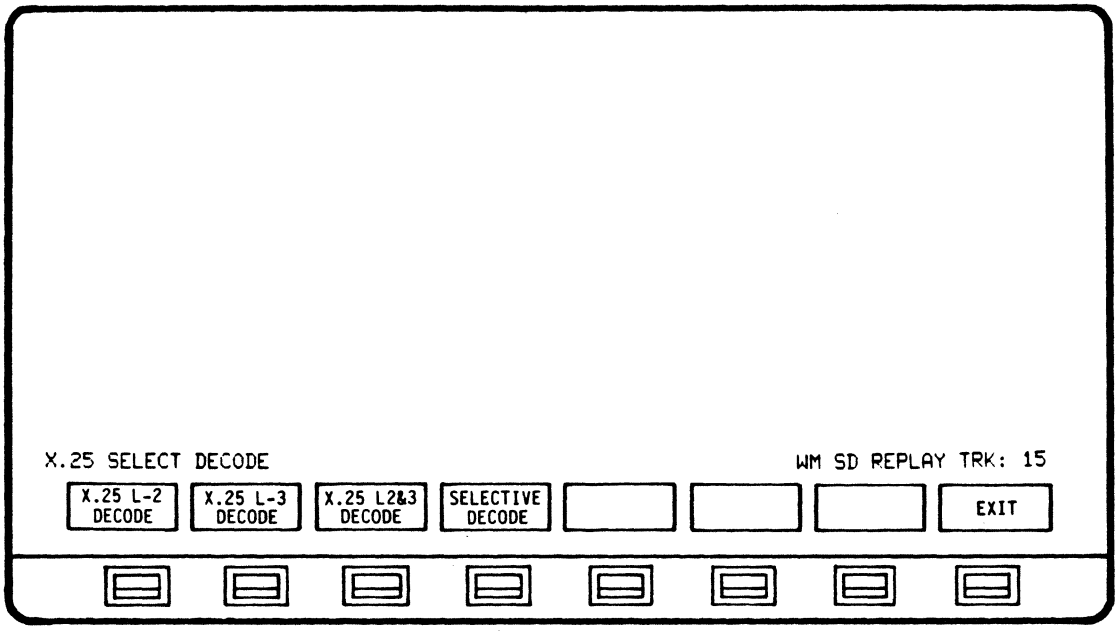
SOFTKEY/LABEL	FUNCTION
RUN DECODE	Initiates Decode process.
DISPLAY CONTROL	Sets-up softkey/label display to search and replay buffer or set-up data print out mode. (Ref 3.7.7 - DISPLAY CONTROL)
SET UP DECODE	Sets-up softkey/label display to select X.25 level decode. (X.25 LEVEL 2, X.25 LEVEL 3, X.25 LEVEL 2 and 3) (Ref 3.7.3 - SET UP DECODE)
	Not Used
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)
	Not Used
MAIN MENU	Return to MAIN MENU

3.7.2 RUN DECODE Softkey/Label Display



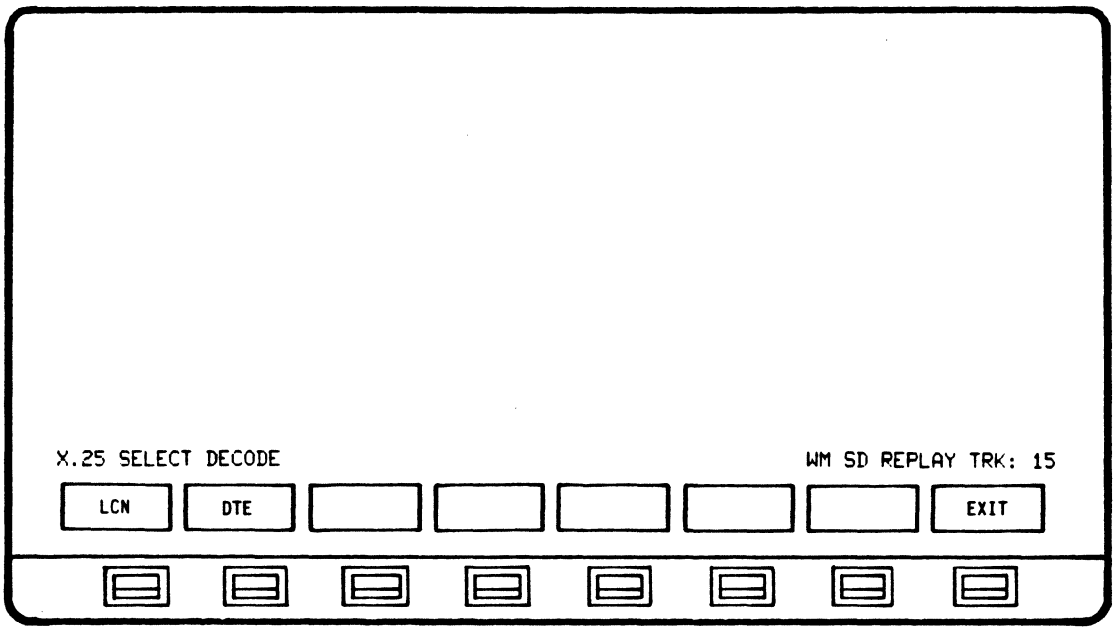
SOFTKEY/LABEL	FUNCTION
STOP DECODE	Stops Decode process. (No live data is being displayed or captured.)
FREEZE DISPLAY / RESUME DISPLAY	Freezes/Resumes data displayed on screen only. All other decoding functions continue including data capture. (Flip-flop type action).
	Not Used
	Not Used
	Not Used
	Not Used
	Not Used
	Not Used

3.7.3 SET UP DECODE Softkey/Label Display



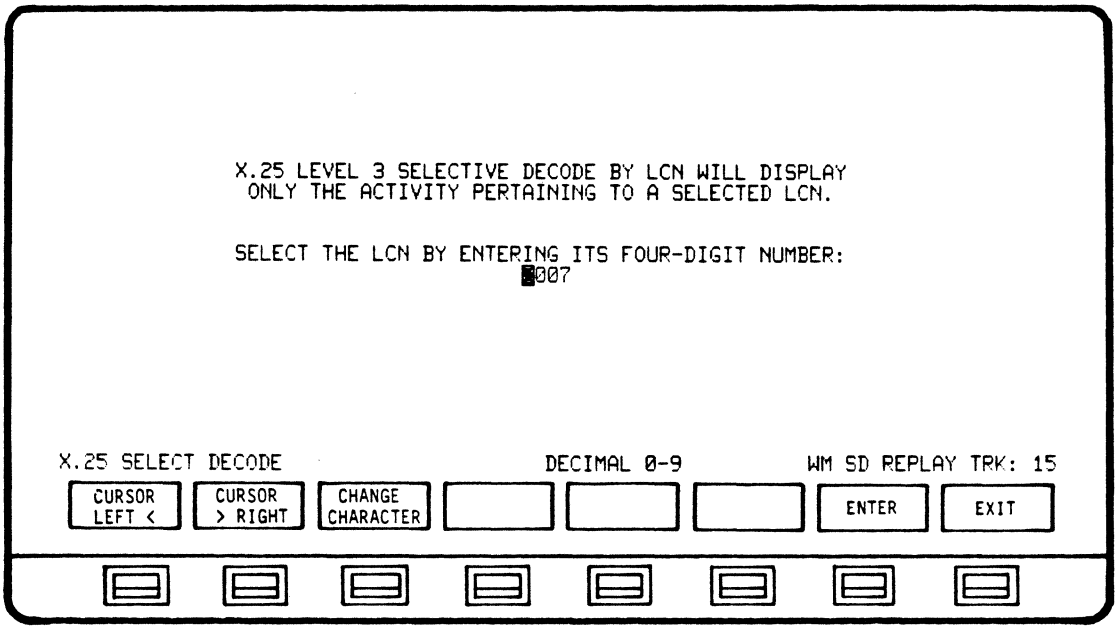
SOFTKEY/LABEL	FUNCTION
X.25 L-2 DECODE	Selects X.25 Level 2 decode format.
X.25 L-3 DECODE	Selects X.25 Level 3 decode format.
X.25 L2&3 DECODE	Selects the combination of X.25 Level 2 and Level 3 decode format.
SELECTIVE DECODE	Selects Selective decode format (LCN - DTE). (Ref 3.7.4 - SELECTIVE DECODE)
	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



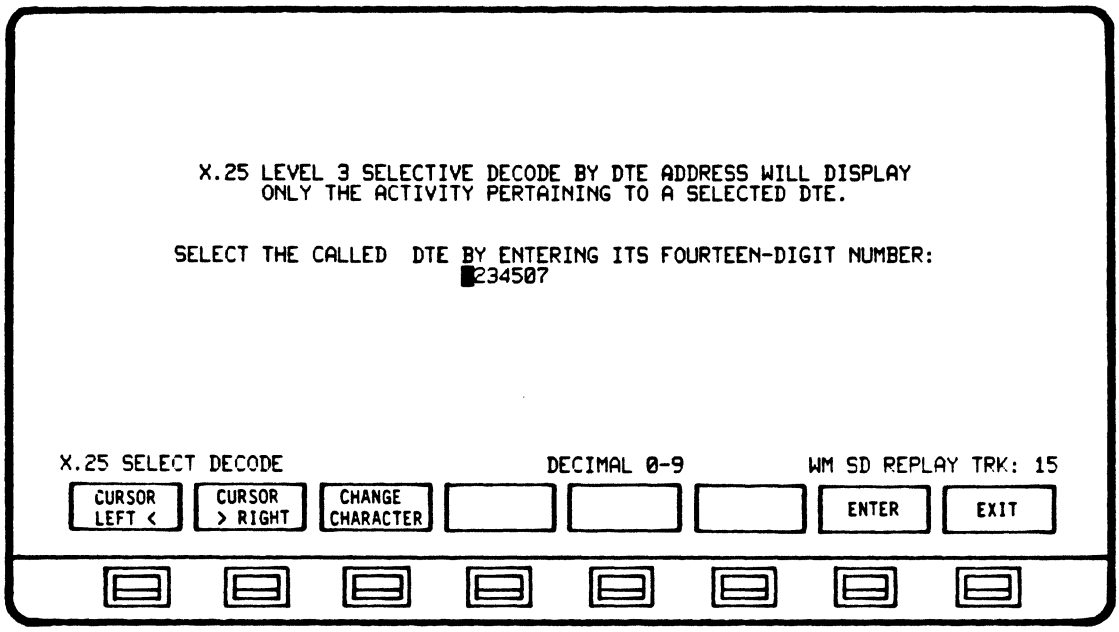
SOFTKEY/LABEL	FUNCTION
LCN	Sets up softkey/label display to select or change Logical Channel Number. (Ref 3.7.5 - LCN)
DTE	Sets up softkey/label display to select or change DTE address. (Ref 3.7.6 - DTE)
	Not Used
	Not Used
	Not Used
	Not Used
	Not Used
EXIT	Return to previous softkey/label display. (SELECTIVE DECODE - Ref 3.7.1)

3.7.5 LCN Softkey/Label Display



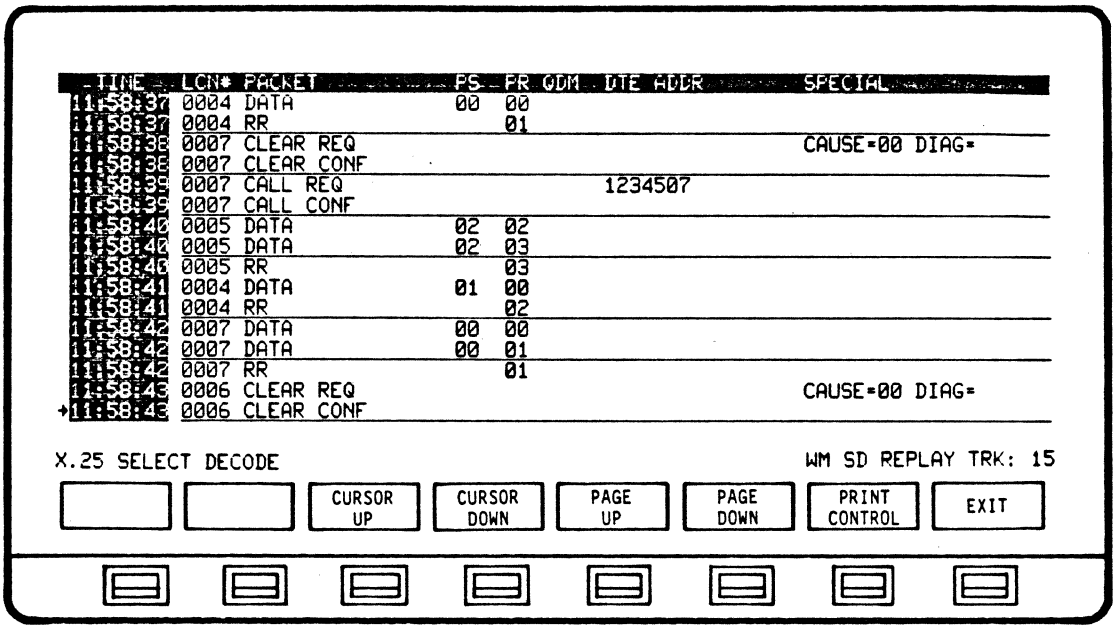
SOFTKEY/LABEL	FUNCTION
CURSOR LEFT <	Moves cursor one (1) character position left in parameter line to be changed.
CURSOR > RIGHT	Moves cursor one (1) character position right in parameter line to be changed.
CHANGE CHARACTER	Changes character in cursor location. Characters will cycle sequentially when softkey is depressed. (Decimal - 0 to 9)
	Not Used
	Not Used
	Not Used
ENTER	Enters new number for LCN. (Must be initiated to complete and store change). Return to previous softkey/label display. (LCN - Ref 3.7.4)
EXIT	Return to previous softkey/label display. (LCN - Ref 3.7.4)

3.7.6 DTE Softkey/Label Display



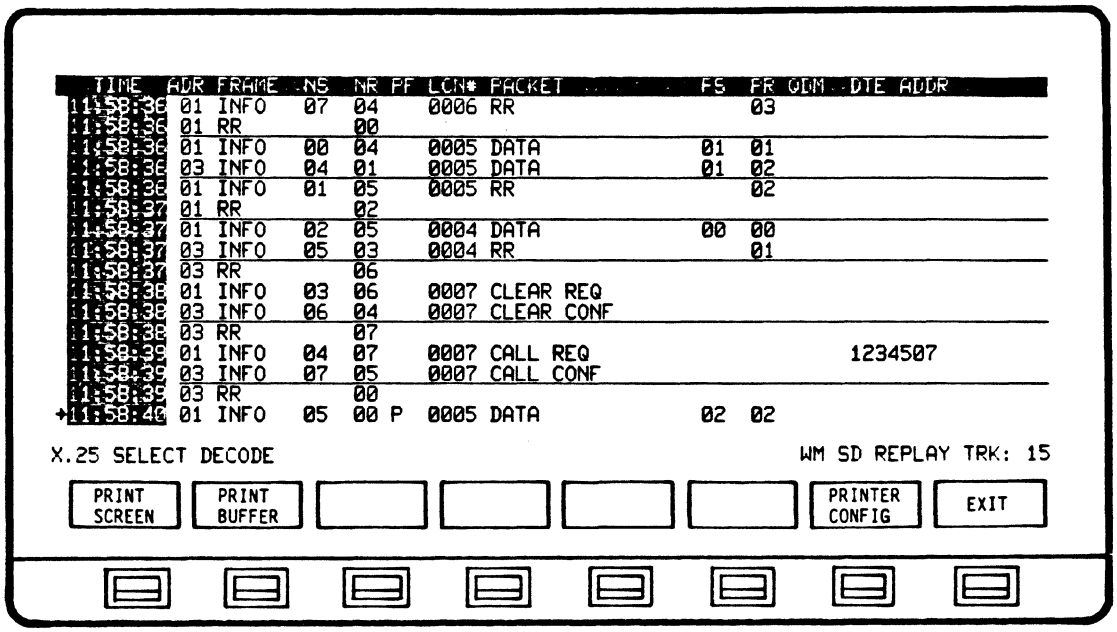
SOFTKEY/LABEL	FUNCTION
CURSOR LEFT <	Moves cursor one (1) character position left in parameter line to be changed.
CURSOR > RIGHT	Moves cursor one (1) character position right in parameter line to be changed.
CHANGE CHARACTER	Changes character in cursor location. Characters will cycle sequentially when 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
CURSOR UP	Data displayed on screen is scrolled down one (1) line at a time, allowing previous data captured to be displayed.
CURSOR DOWN	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***
PAGE UP	Data displayed on screen is scrolled down one (1) page at a time, allowing previous data captured to be displayed.
PAGE DOWN	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***
PRINT CONTROL	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)
EXIT	Return to previous softkey/label display. (DISPLAY CONTROL - Ref 3.7.1)

3.6.8 PRINT CONTROL Softkey/Label Display



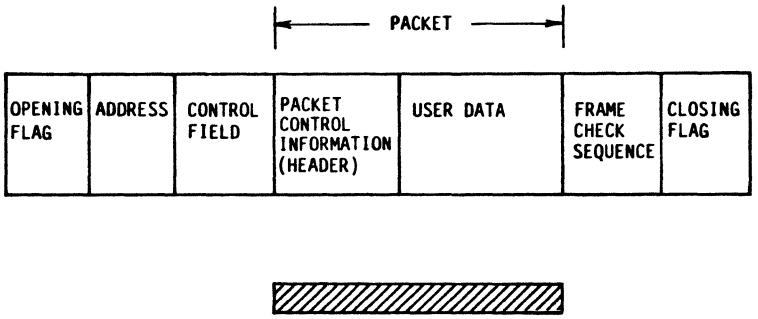
SOFTKEY/LABEL	FUNCTION
PRINT SCREEN	Initiates print-out of data displayed on screen only.
PRINT BUFFER	Initiates print-out of complete buffer.
	Not Used
	Not Used
	Not Used
	Not Used
PRINTER CONFIG	Initiates softkey/label displays for modifying printer configuration. (Ref 3.10 - Printer Configuration User Manual)
EXIT	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

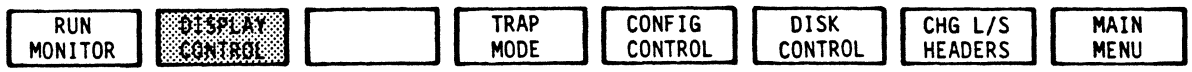


Corresponding labels, hex or decimal equivalents and detailed comments will be displayed for each octet of each packet.

The packet types decoded are:

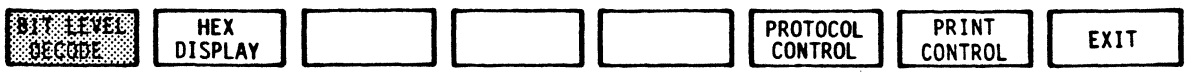
DATA PACKET
CONTROL PACKET
    RECEIVE READY PACKET
    RECEIVE NOT READY PACKET
    REJECT PACKET
COMMAND PACKET
    CALL PACKET
    RESET PACKET
    RESTART PACKET
    INTERRUPT PACKET
    DIAGNOSTIC PACKET

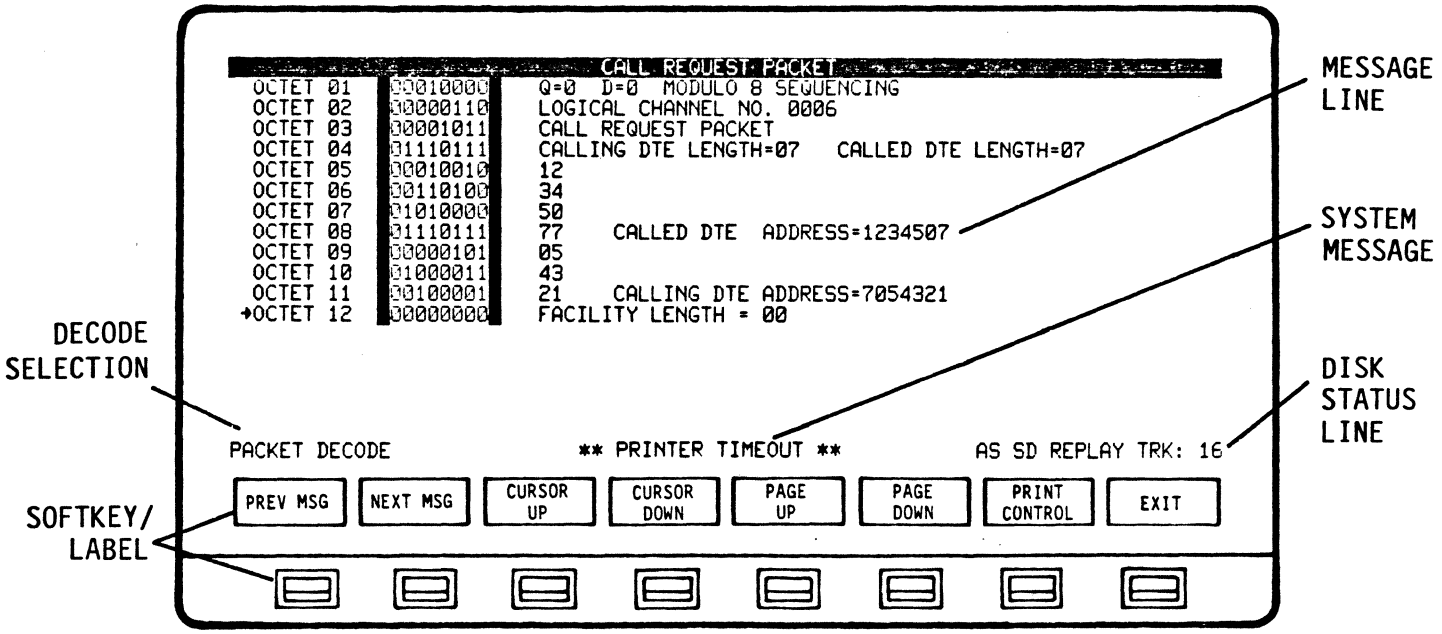
STOP MONITOR



DISPLAY CONTROL

SPECIAL CONTROL

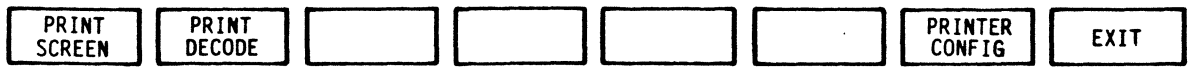




TYPICAL BIT LEVEL DECODE DISPLAY

BIT LEVEL DECODE

PRINT 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

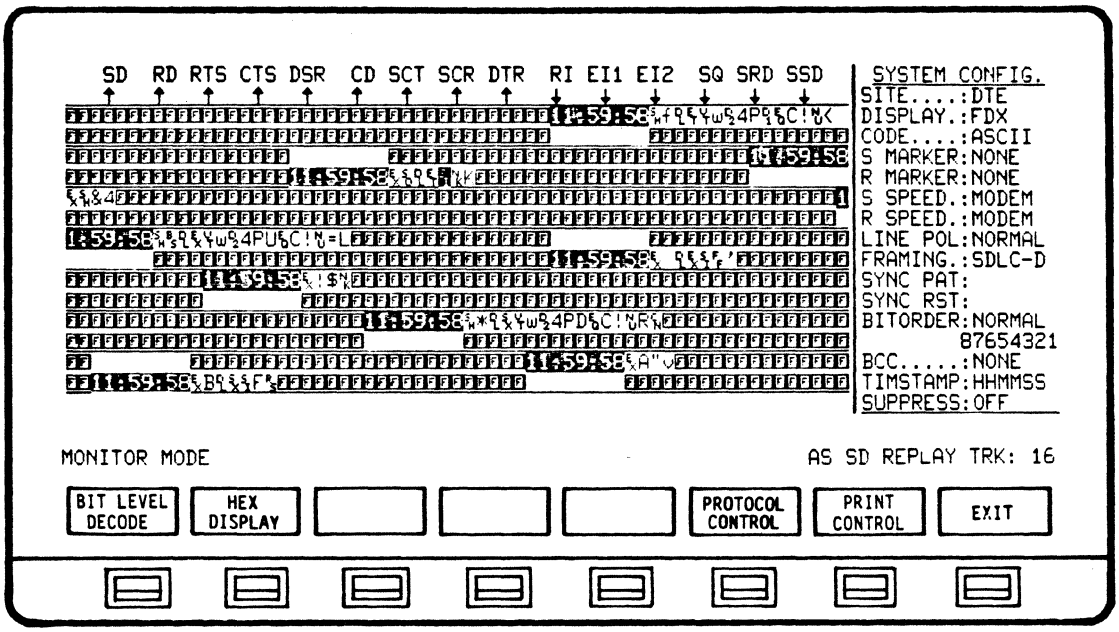
BCC ERROR	Indicates a Frame Check Sum error occurred in Frame.
FRAME ABORTED	An Abort sequence was detected, indicating transmission of a Frame was terminated.
NO LEVEL 3 DATA	Indicates that only Level 2 data is present.
INCOMPLETE FRAME	Indicates the Frame was missing either Address or Control byte.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

4.3 X.25 Packet Decode Error Messages

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

INVALID DATA	Data in a particular octet is not within specified limits.
INVALID EXCESS DATA	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.
MISSING	Indicates specified data is missing. A label will follow describing missing specified data.

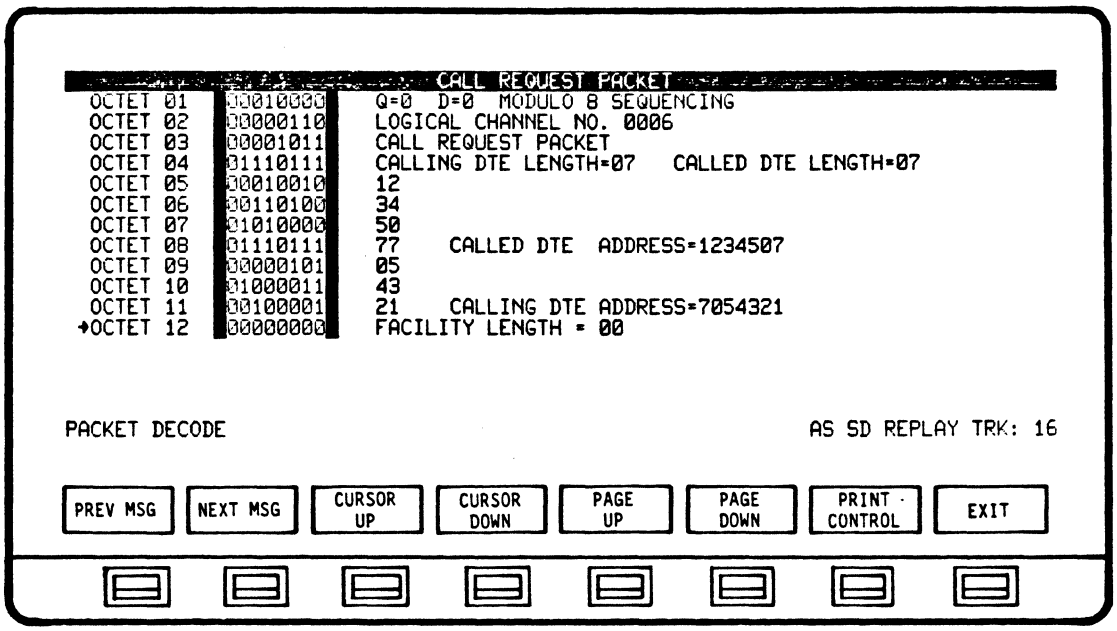
4.4 X.25 Packet Decode Softkey/Label Descriptions



4.4.1 X.25 PACKET DECODE (Monitor SPECIAL CONTROL) Softkey/Label Display

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.
	Not Used
	Not Used
	Not Used
PROTOCOL CONTROL	SNA/SDLC only.
PRINT CONTROL	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)
EXIT	Return to previous softkey/label display. (Monitor SPECIAL CONTROL - Ref: 4.12.4.3 User Manual)

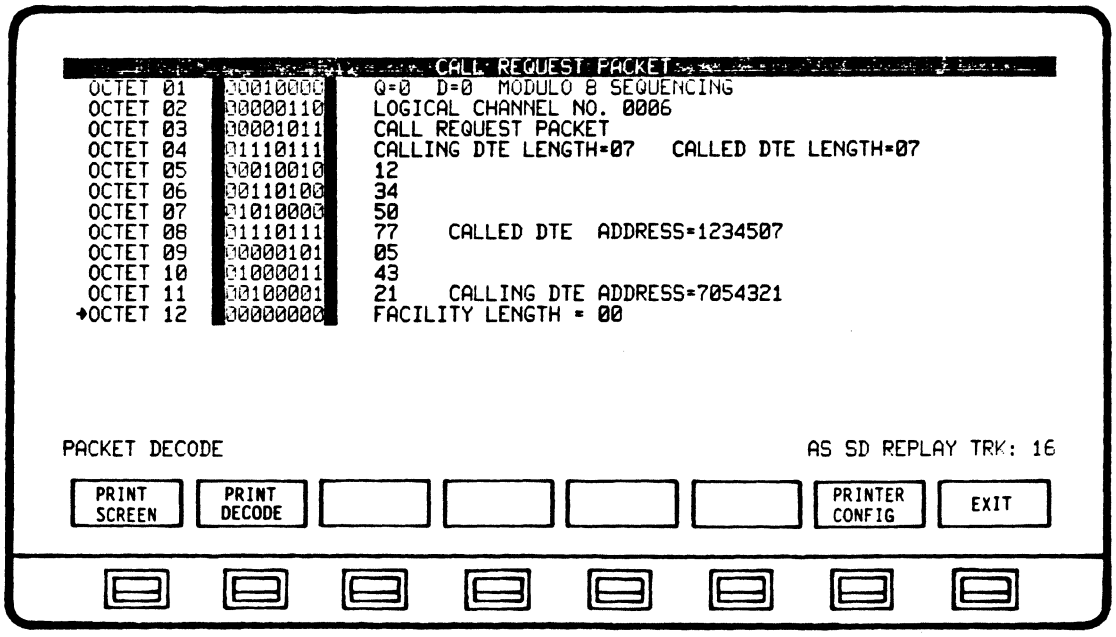
4.4.2 BIT LEVEL DECODE Softkey/Label Display



SOFTKEY/LABEL	FUNCTION
PREV MSG	Moves cursor to previous message for Packet Decode.
NEXT MSG	Moves cursor to most recent message for Packet Decode.
CURSOR UP	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.
CURSOR DOWN	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***
PAGE UP	Data displayed on screen is scrolled-down one (1) page at a time, allowing previous messages to be displayed and selected for Packet Decode.
PAGE DOWN	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***

PRINT CONTROL	Sets-up softkey display for selecting Packet Decode and also print-out of data. (Ref 4.4.3 - PRINT CONTROL)
EXIT	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



SOFTKEY/LABEL	FUNCTION
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
PRINTER CONFIG	Initiates display for modifying printer configuration.
EXIT	Return to previous softkey/label display. (PRINT CONTROL - 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 a 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.

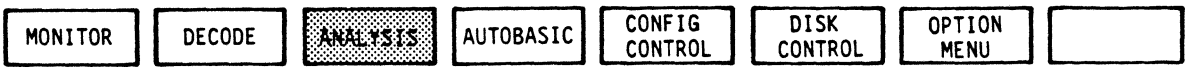
NOTE

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



ANALYSIS

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.

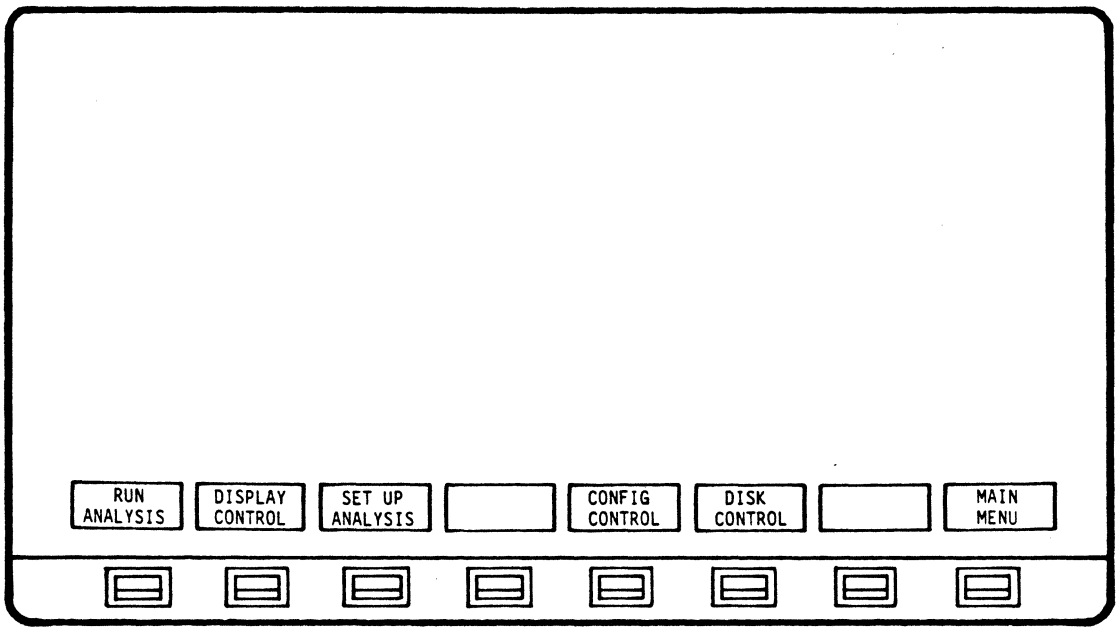
FREEZE/RESUME DISPLAY option is available on all X.25 Analysis Displays. The data on any Analysis Display may be held static (FREEZE DISPLAY) for close study whenever desired. Dynamic display (RESUME DISPLAY) of data may then be resumed.

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)

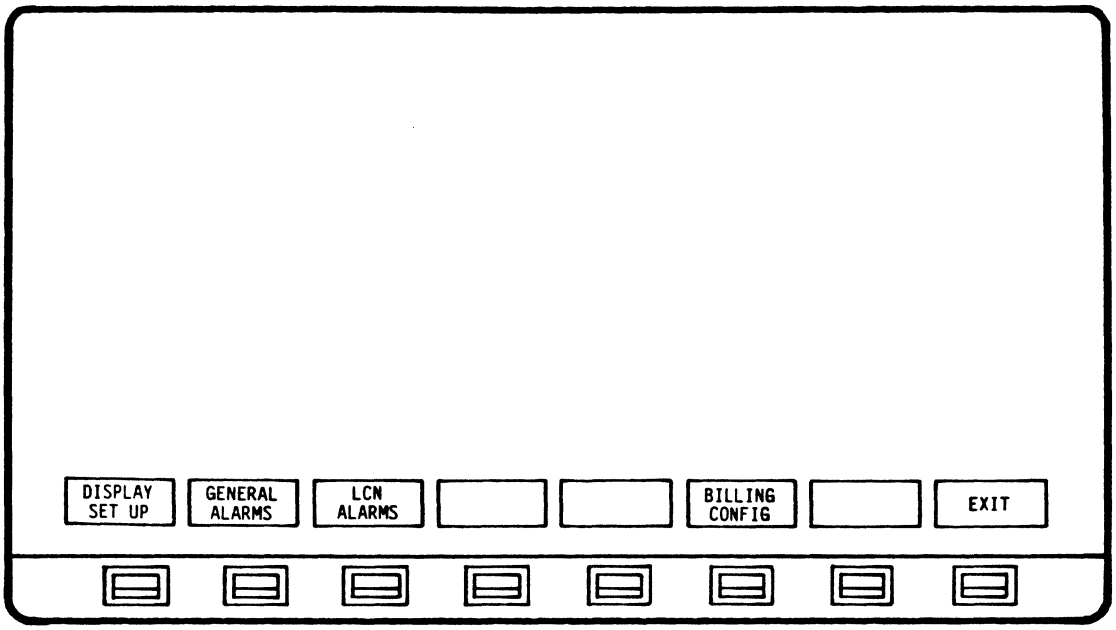
5.3 X.25 Performance Analysis Softkey/Labael Display Descriptions



5.3.1 ANALYSIS Softkey/Label Display

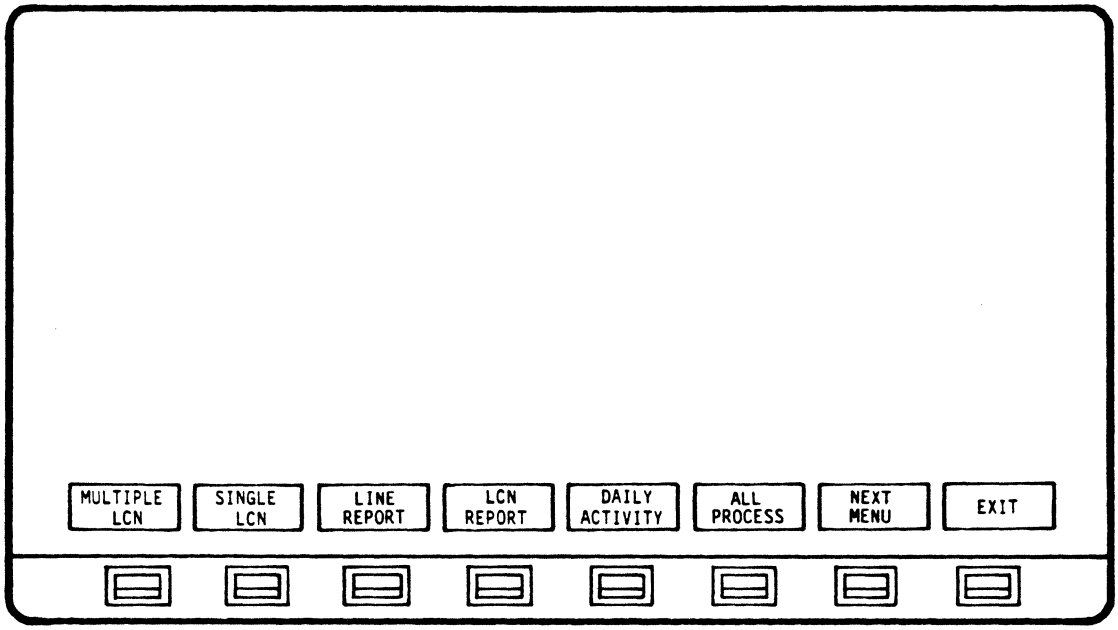
SOFTKEY/LABEL	FUNCTION
RUN ANALYSIS	Initiates Analysis process.
DISPLAY CONTROL	Sets-up display to select/change report parameters for viewing/reviewing, review alarm reports and access print control functions. NOTE If Analysis had not been run, a message will appear: **NO DATA ACCUMULATED** (DISPLAY CONTROL; SINGLE LCN - Ref 5.4.5.2) (DISPLAY CONTROL; MUTILIPLE 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)
	Not Used
CONFIG CONTROL	Initiates 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)
	Not Used
MAIN MENU	Return to MAIN MENU.

5.3.2 SET UP ANALYSIS Softkey/Label Display



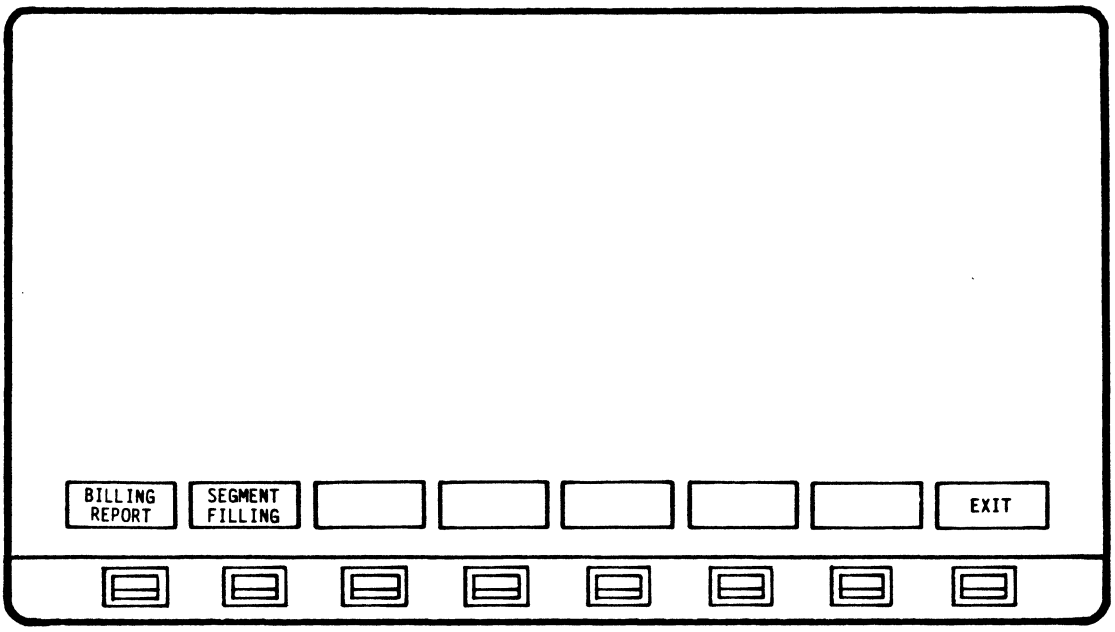
SOFTKEY/LABEL	FUNCTION
DISPLAY SET UP	Sets-up display to select analysis reports. (Ref 5.3.3) — SINGLE LOGICAL CHANNEL ACTIVITY MULTIPLE LOGICAL CHANNEL ACTIVITY DAILY TRAFFIC ACTIVITY REPORT LCN PERFORMANCE REPORT TOTAL LINE ACTIVITY REPORT BILLING INFORMATION SVC/ALL PROCESS SEGMENTATION FILLING
GENERAL 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



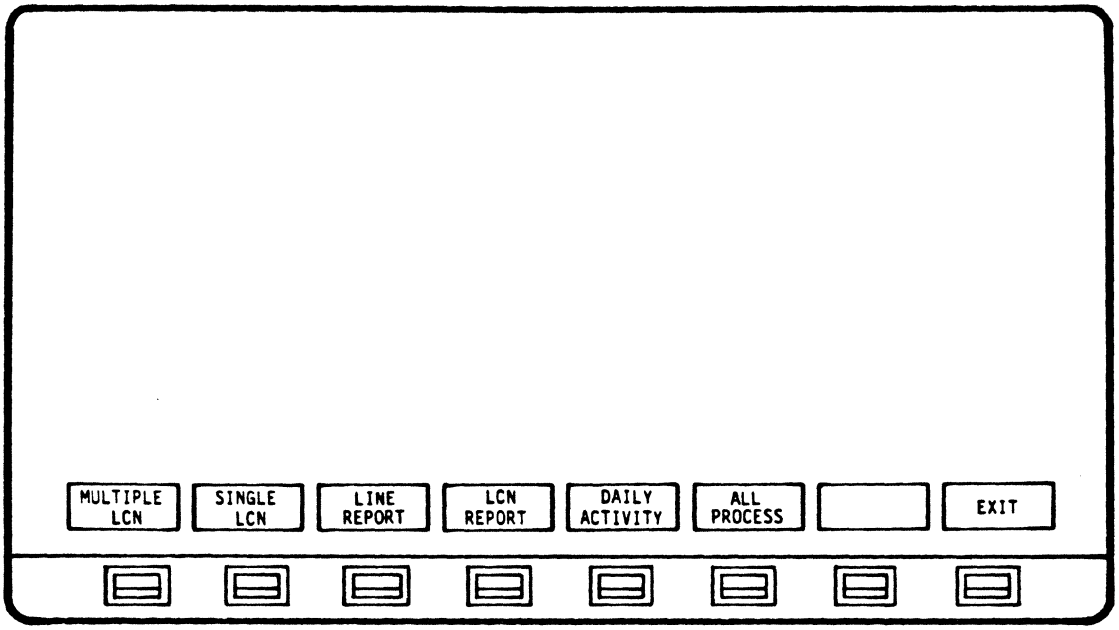
SOFTKEY/LABEL	FUNCTION
MULTIPLE LCN	Selects Multiple Logical Channel display. (Ref 5.5)
SINGLE LCN	Selects Single Logical Channel display. (Ref 5.4)
LINE REPORT	Selects Total Link Activity Report display. (Ref 5.6)
LCN REPORT	Selects LCN Performance Report display. (Ref 5.8)
DAILY ACTIVITY	Selects Daily Traffic Activity Report display (Ref 5.7)
ALL PROCESS / SVC PROCESS	Selects Single Virtual Circuit PROCESS(SVC) or Permanent Virtual Circuit (ALL) processing to be displayed. (Flip-flop type action softkey) (Ref 5.1)
NEXT MENU	Initiates softkey/label display to select additional analysis displays. (Ref 5.3.4)
EXIT	Return to previous softkey/label display. (SET UP ANALYSIS - Ref 5.3.2)

5.3.4 NEXT MENU Softkey/Label Display



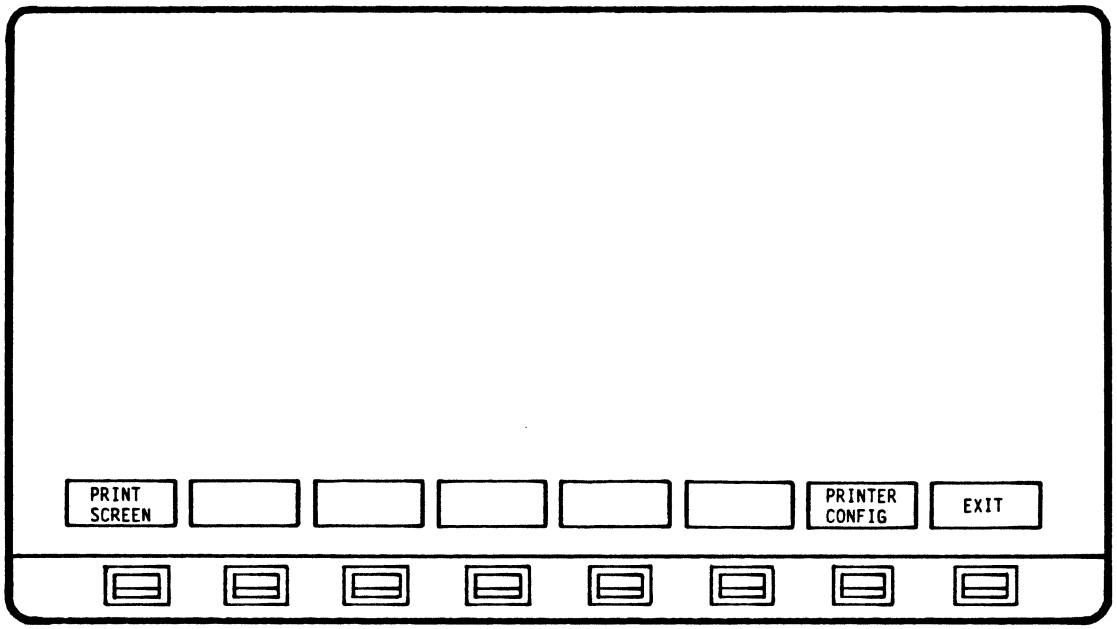
SOFTKEY/LABEL	FUNCTION
BILLING REPORT	Selects Billing Report display. (Ref 5.9)
SEGMENT FILLING	Selects Segmentation Filling Report display. (Ref 5.10)
	Not Used
	Not Used
	Not Used
	Not Used
	Not Used
EXIT	Return to previous softkey/label display. (NEXT MENU - Ref 5.3.3)

5.3.5 CHANGE DISPLAY (Run 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 / SVC PROCESS	Selects Single Virtual Circuit PROCESS(SVC) or Permanent Virtual Circuit (ALL) processing to be displayed. (Flip-flop type action softkey) (Ref 5.1)
	Not Used
EXIT	Return to previous softkey/label display.

5.3.6 PRINT CONTROL 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
PRINTER CONFIG	Initiates display for modifying printer configuration. (Ref 4.10 - Printer Configuration User Manual)
EXIT	Return to previous softkey/label display.

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.

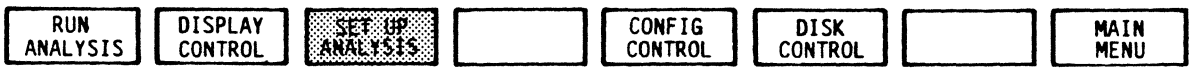
Single Logical Channel activity is detected, analyzed and presented in graphical and numerical form. The screen is divided into four (4) areas:

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

Operating Sequence

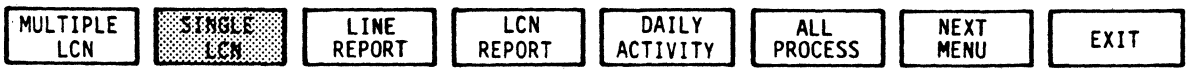
1. Set up Analysis for single LC and exit
2. Run Analysis
3. Stop Analysis
4. Review results

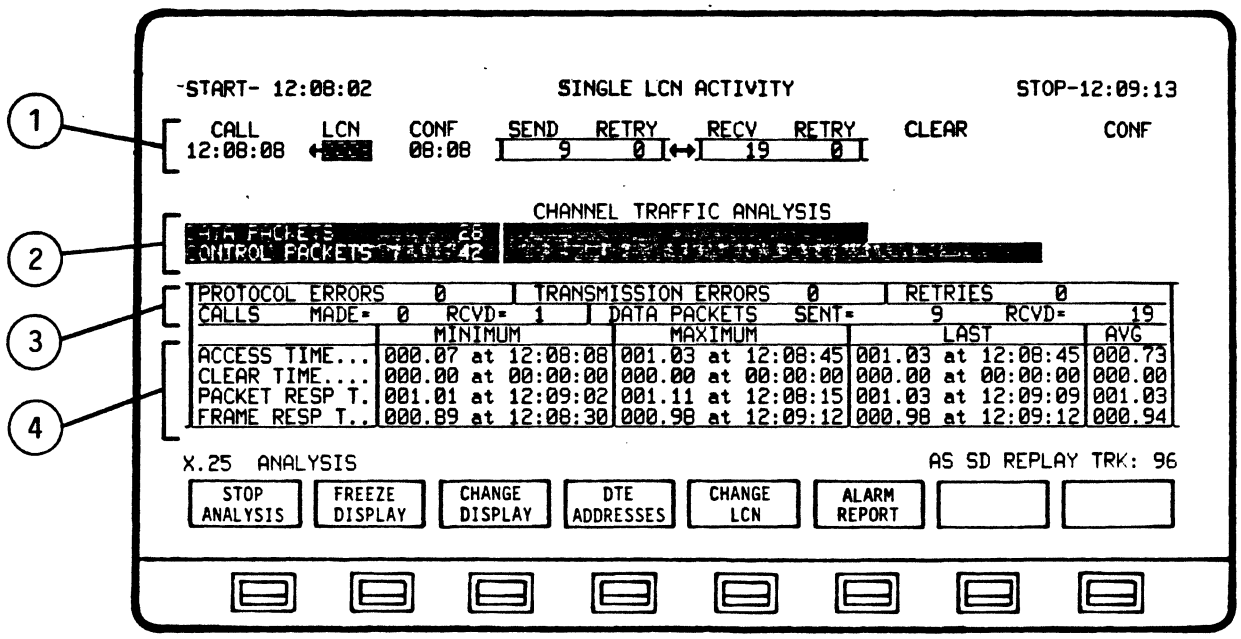
ANALYSIS



SET UP ANALYSIS

DISPLAY SETUP





TYPICAL SINGLE LOGICAL CHANNEL ACTIVITY REPORT

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.

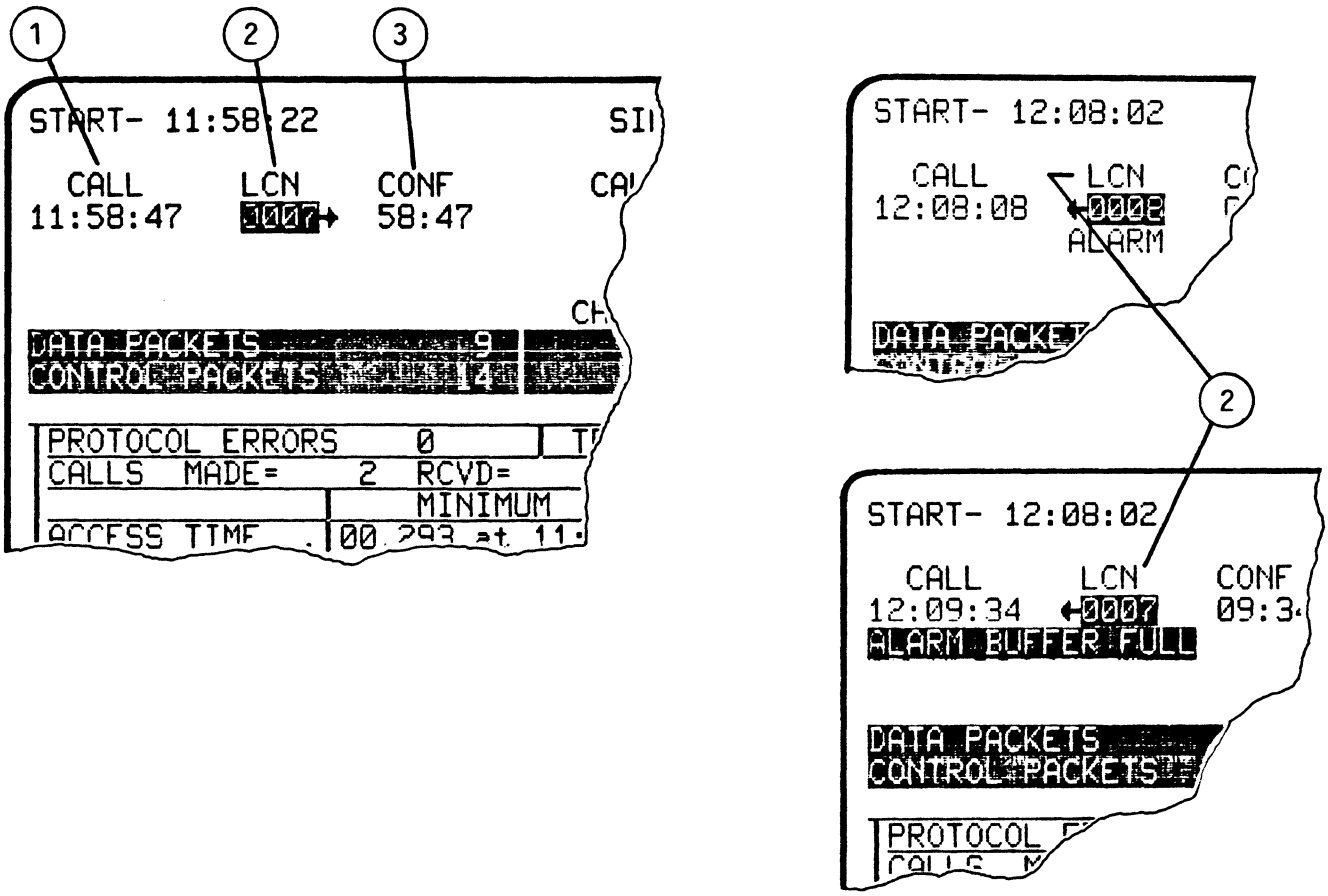
The CHANGE LCN softkey allows the user to page through and analyze all the LCNs that have been detected by using the PREVIOUS ITEM and NEXT ITEM softkeys. The SELECT LCN softkey allows the user to actually change the LCN number.

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).

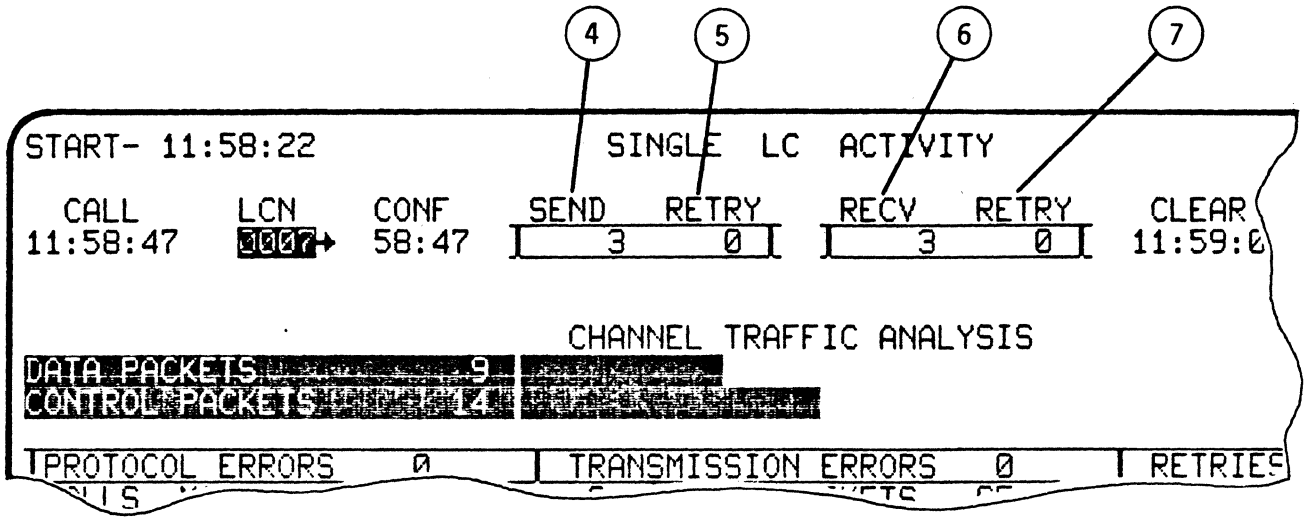
When RESTART and RESET conditions occur, a special message will appear in the Clear Time area of the screen. The decoded Cause Code for either condition will also be displayed in the center of the Data Display area.

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:

ITEM	DISPLAY	DESCRIPTION
(1)	CALL	Hours, Minutes, Seconds (HH:MM:SS) or Minutes, Seconds, Milleseconds (MM:SS:ms). Upon call request, signal is time-stamped according to configuration selected. (Ref 3.7 - Configuration Control).
(2)	LCN	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. "ALARM" will flash under LCN when an alarm condition is detected.
(3)	CONF	Minutes, Seconds (MM.SS.) Confirmation of call is time-stamped.

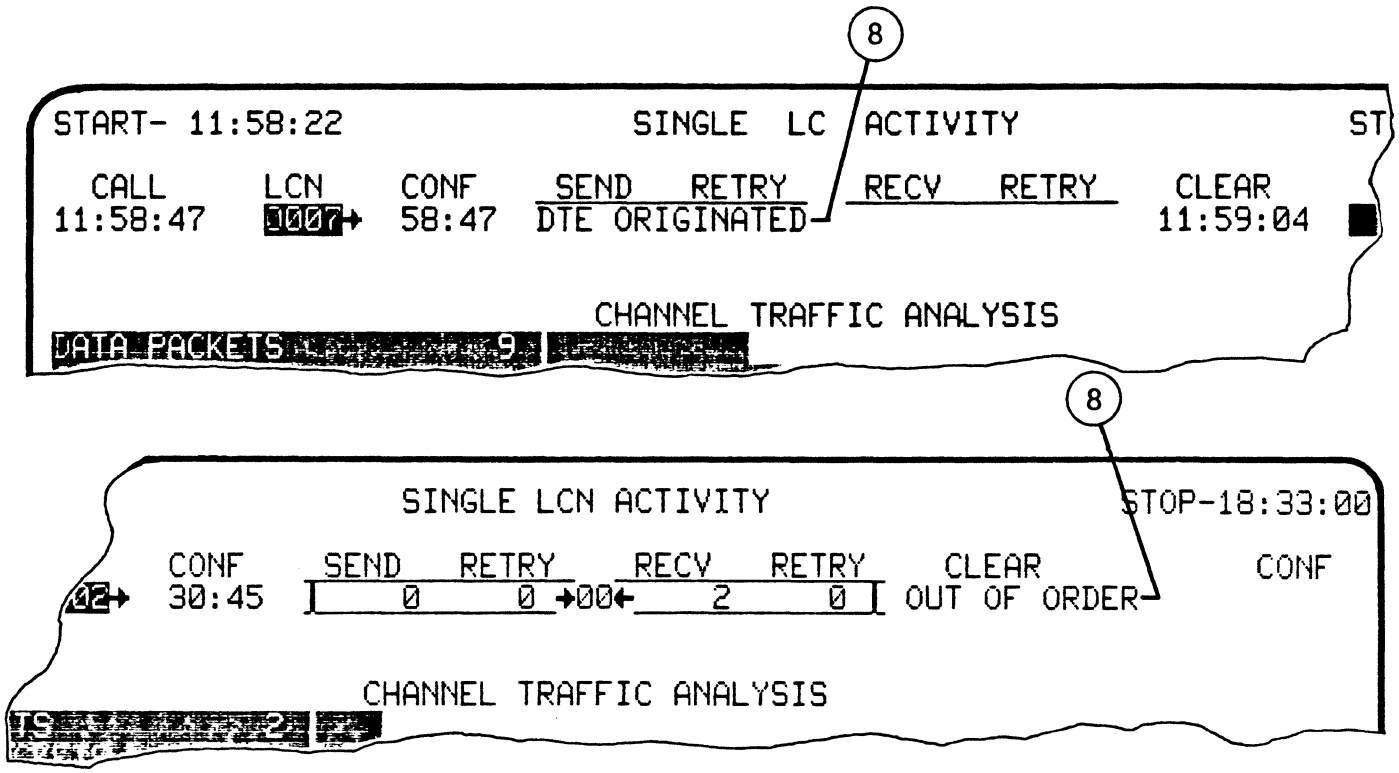


DATA DISPLAY ITEMS:

ITEM	DISPLAY	DESCRIPTION
(4)	SEND	Counter indicates number (0 - 65,000) of data packets sent. Resets upon each new call.
(5)	RETRY	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.
(6)	RECV	Counter indicates number (0 - 65,000) of data packets received. Resets upon each new call.
(7)	RETRY	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.

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.



(8) **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).

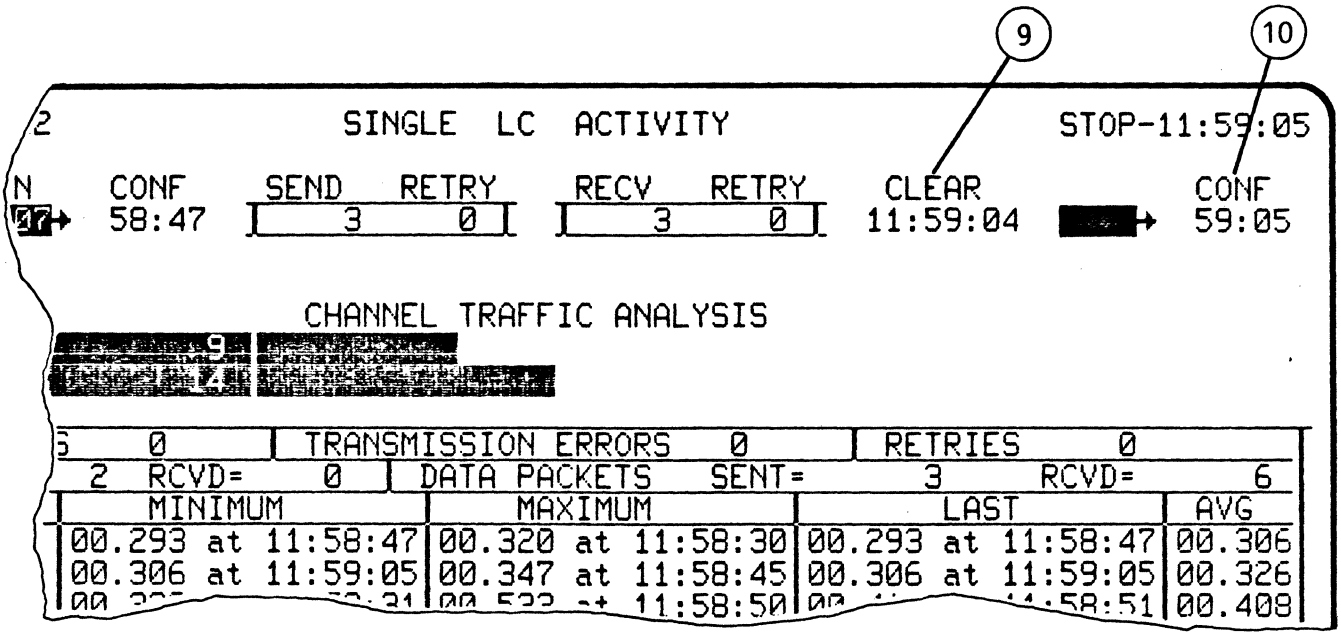
Decoded RESTART or RESET Cause Code appears in this space when appropriate condition is detected.

Possible Decoded RESTART Cause Codes:

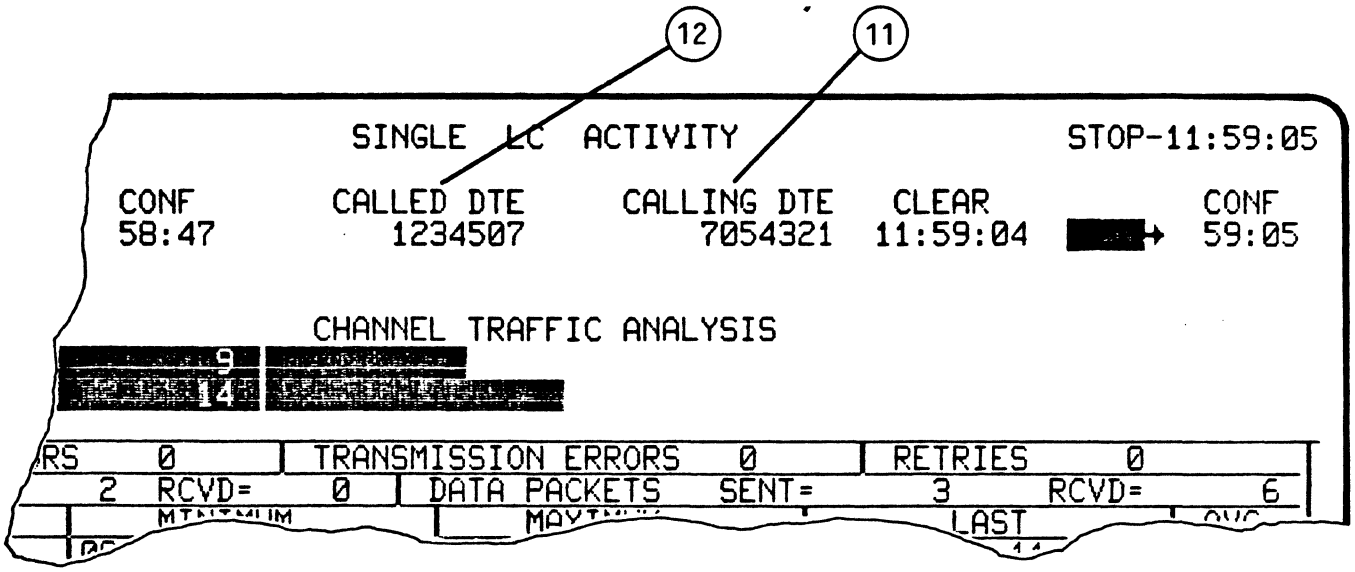
- DTE ORIGINATED
- LOCAL PROCEDURE ERROR
- NETWORK CONGESTION
- NETWORK OPERATIONAL

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



(9)	CLEAR	Hours, Minutes, Seconds (HH:MM:SS) or Minutes, Seconds, Milleseconds (MM:SS:ms). Upon call clear, signal is time-stamped 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).
(10)	CONF	Minutes, Seconds (MM.SS). Upon receipt of clear confirmation, signal is timestamped in real time.



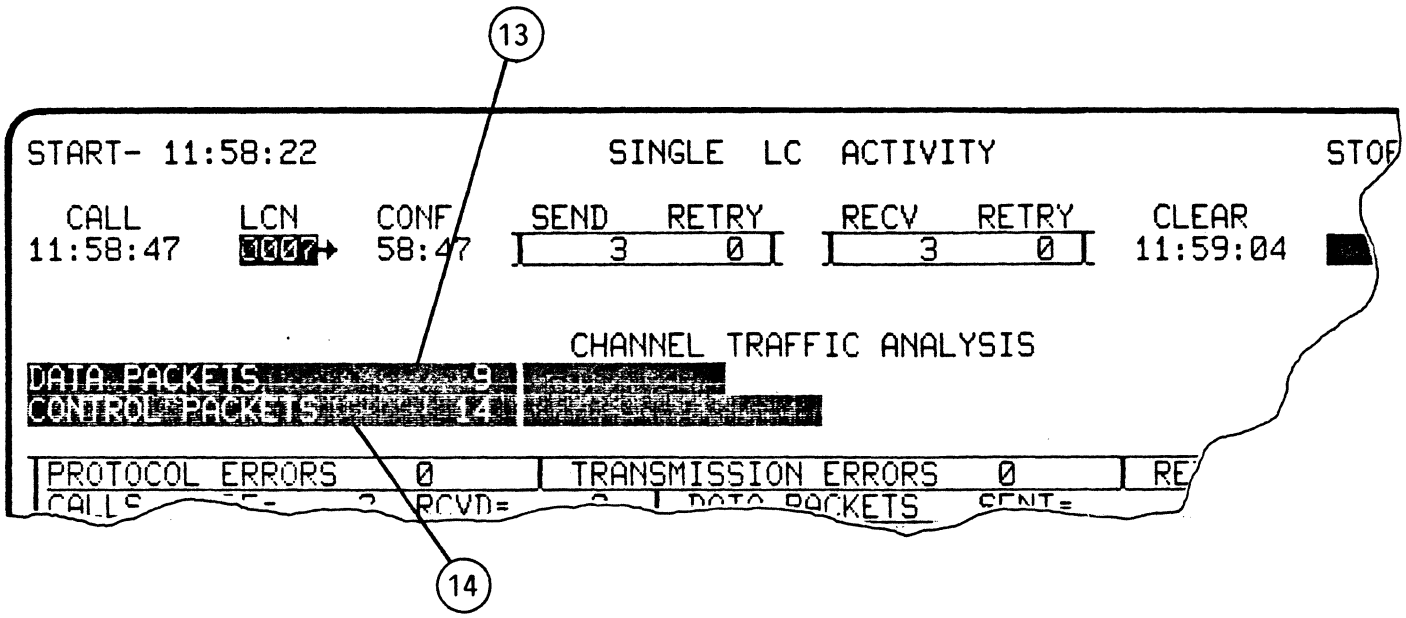
DTE ADDRESS ITEMS:

(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.

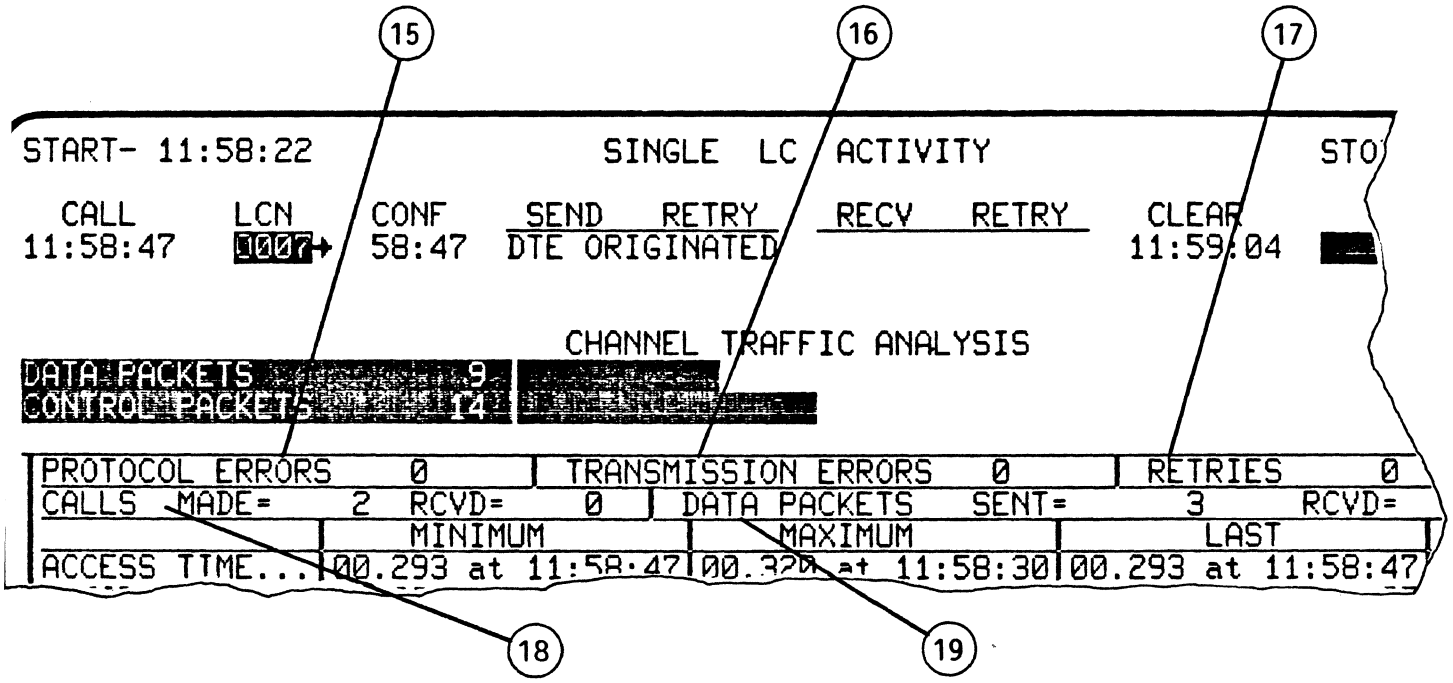


The following activities are displayed:

ITEM	DISPLAY	DESCRIPTION
(13)	DATA PACKETS	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).
(14)	CONTROL PACKETS	Total number of control packets sent and received on LCN being analyzed.

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.

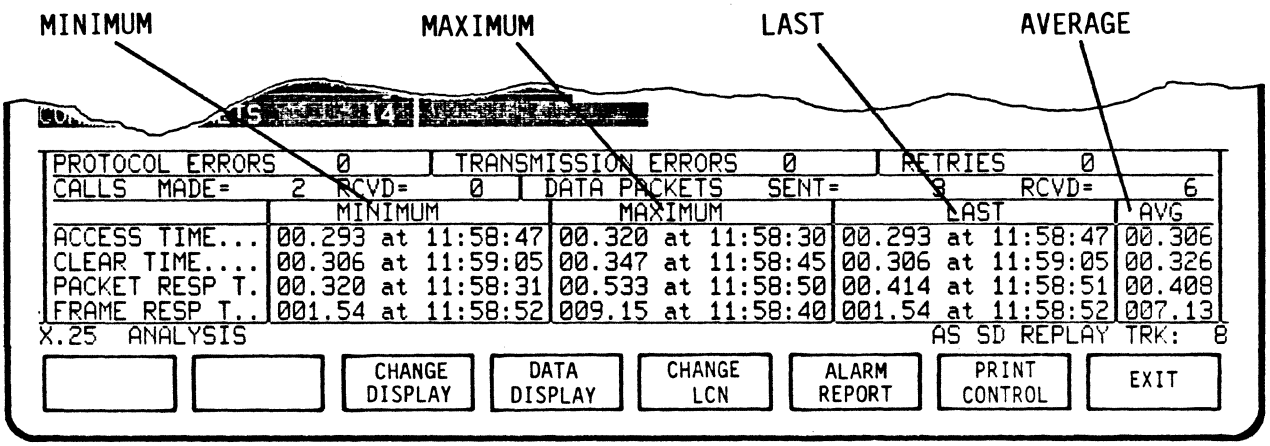


The following activities are displayed:

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

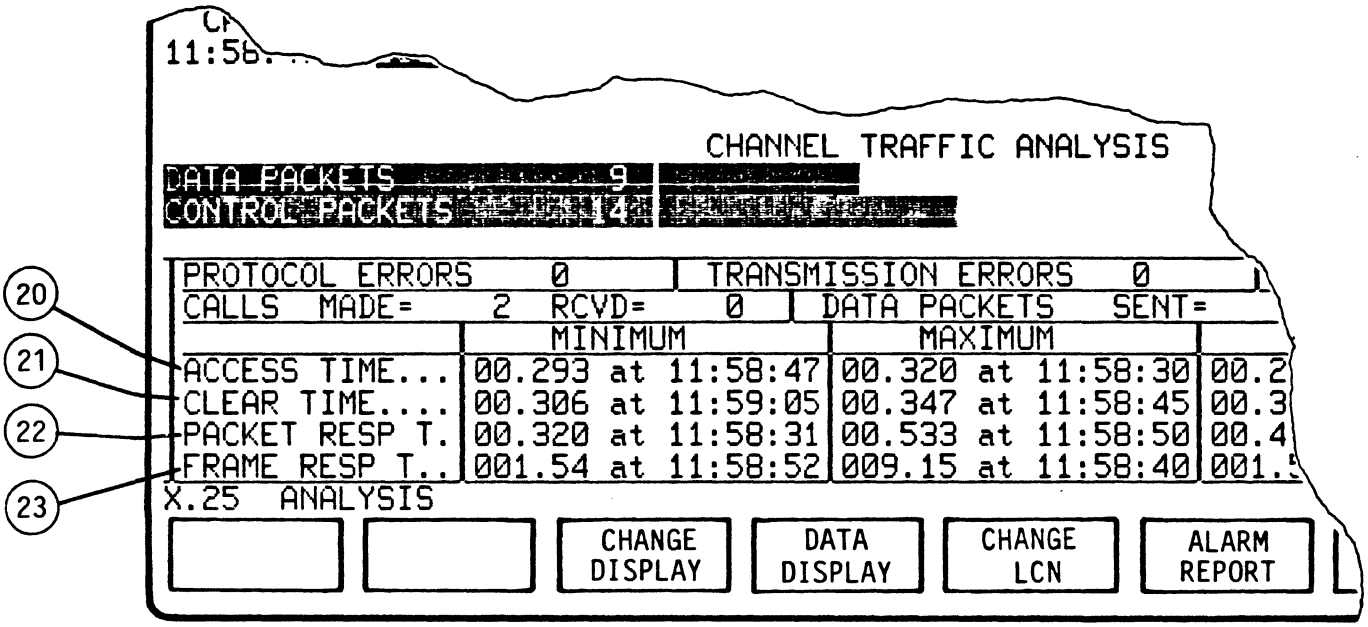
5.4.4 Single LCN Performance

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).



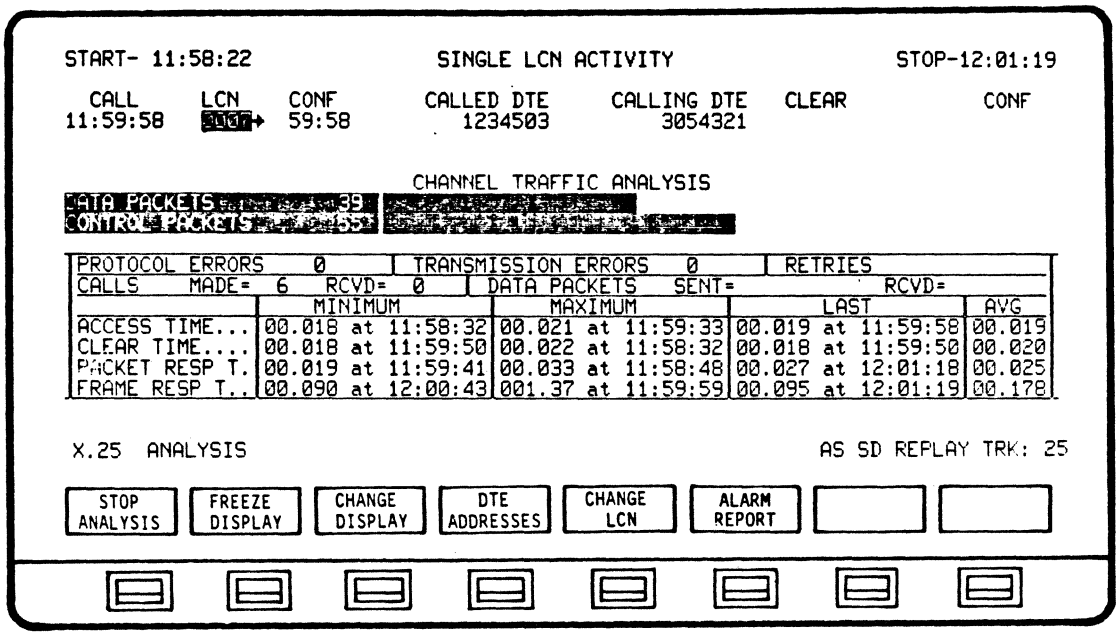
The following activities are displayed:

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	Longest time interval on LCN.
MINIMUM	Shortest time interval on LCN.
LAST	Last completed connection on LCN.
AVG	Average completed connection on LCN.



ITEM	DISPLAY	DESCRIPTION
(20)	ACCESS TIME	Time measured between trailing flag (7E) of Call Request packet and trailing flag (7E) of Call Confirmation packet on same logical channel. (Average time from CALL REQUEST to CLEAR CONFIRMATION).
(21)	CLEAR TIME	Time measured between trailing flag (7E) of Clear Request packet and trailing flag (7E) of Clear Confirmation packet on same logical channel. (Average time from CLEAR REQUEST to CLEAR CONFIRMATION from DCE to DTE).
(22)	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.
(23)	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.

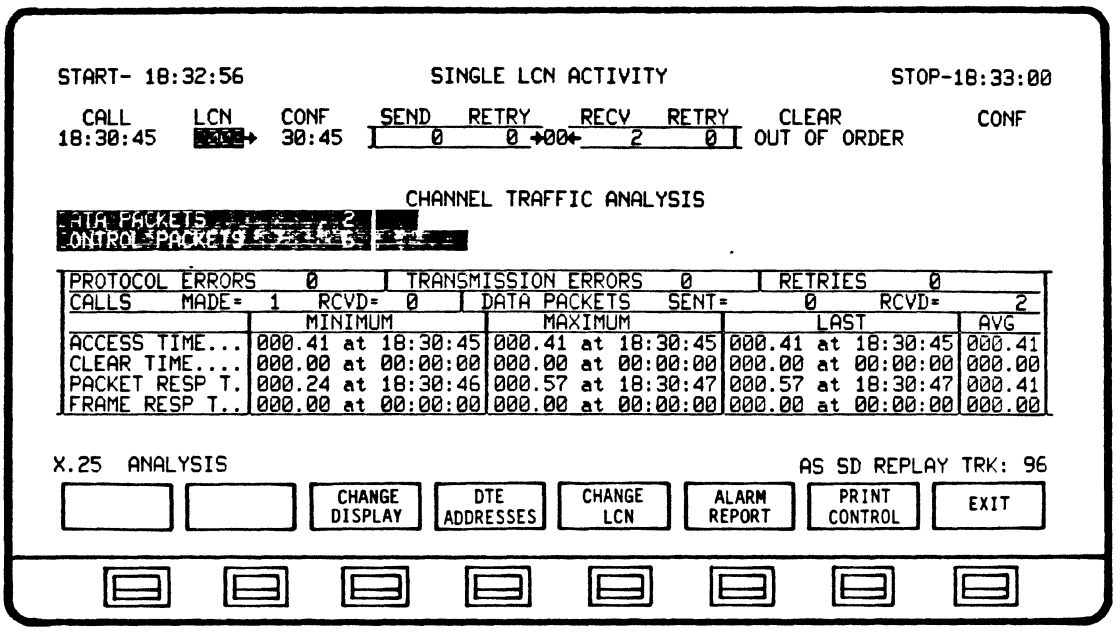
5.4.5 Single Logical Channel Activity Softkey/Label Display Descriptions



5.4.5.1 RUN ANALYSIS Softkey/Label Display

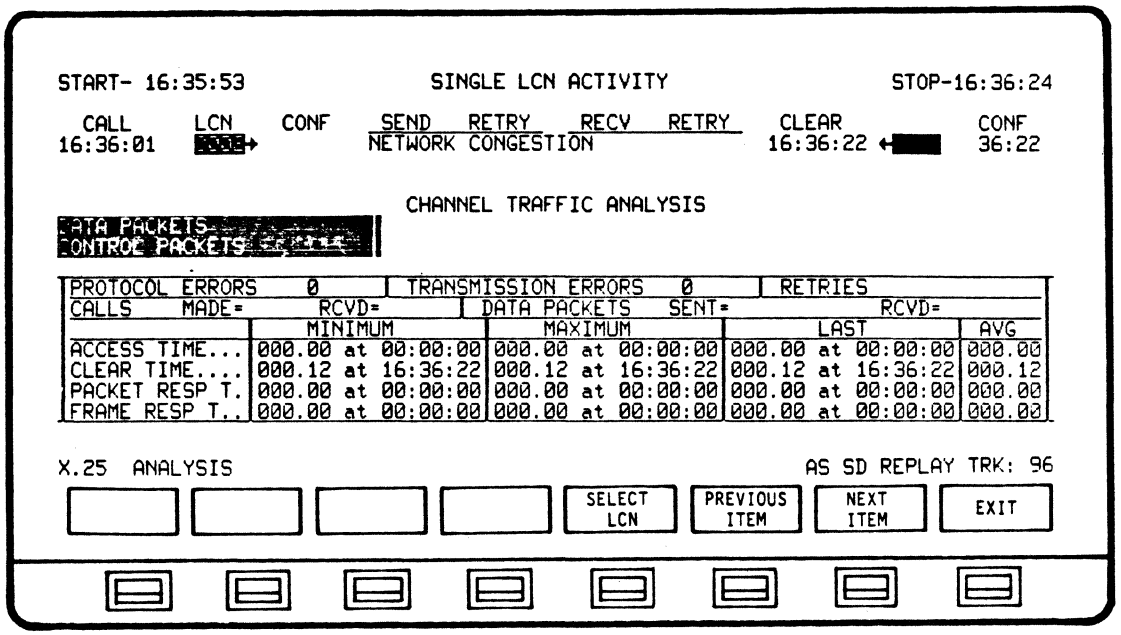
SOFTKEY/LABEL	FUNCTION
STOP ANALYSIS	Stops analysis process.
FREEZE DISPLAY / RESUME DISPLAY	Freezes/Resumes data displayed on screen only. All other analysis functions continue, including data capture. (Flip-flop type action.)
CHANGE DISPLAY	Sets-up display to select/change data displayed from/to Single Channel LCN, Multiple Channel LCN, Daily Traffic Activity, LCN Performance, Total Line Activity or Billing Information. (Ref 5.3.5)
DTE ADDRESSES / DATA DISPLAY	Selects DTE addresses or data display (SEND,RETRY,RECV,RETRY) to be displayed. (Flip-flop type action softkey). (Ref 5.4.5.2)
CHANGE LCN	Sets-up display to change/select Logical Channel Number. Selected LCN's data will be displayed for analysis. (Ref 5.4.5.3)
ALARM REPORT	Sets-up display to select and clear alarm reports. (Ref 6.0)
	Not Used
	Not Used

5.4.5.2 DISPLAY CONTROL Softkey/Label Display



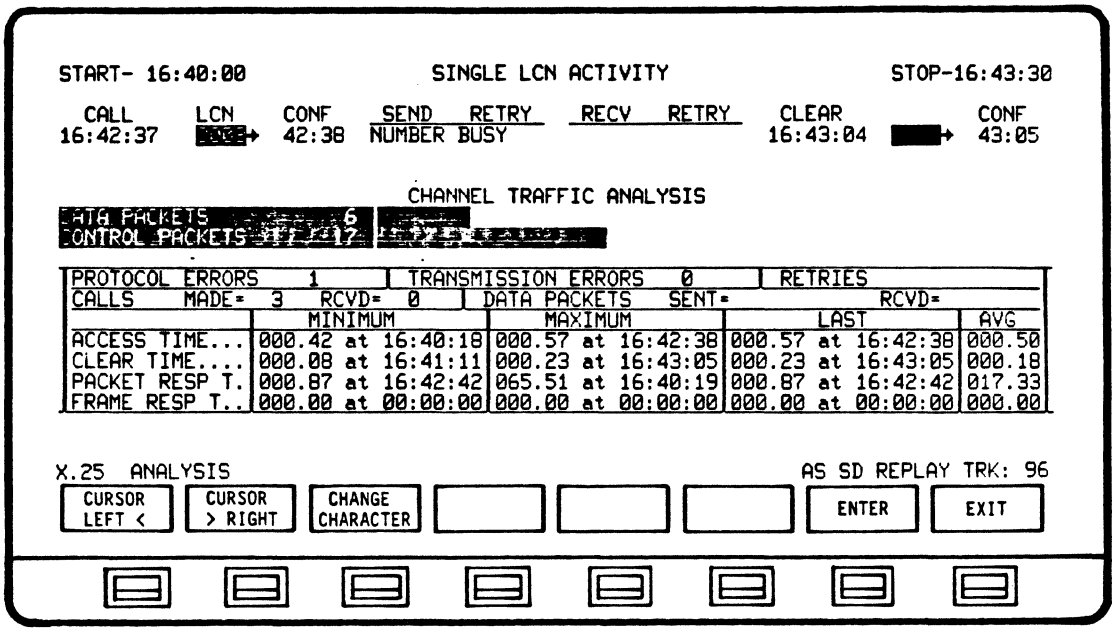
SOFTKEY/LABEL	FUNCTION
	Not Used
	Not Used
CHANGE DISPLAY	Sets-up display to select/change data displayed from/to Single Channel LCN, Multiple Channel LCN, Daily Traffic Activity, LCN Performance, Total Line Activity, Billing Information or Segement Filling. (Ref 5.3.3)
DTE ADDRESSES / DATA DISPLAY	Selects DTE addresses or data display(SEND,RETRY,RECV,RETRY) to be displayed. (Flip-flop type action softkey).
CHANGE LCN	Sets-up display to change/select Logical Channel LCN Number. Selected LCN's data will be displayed for analysis. (Ref 5.4.5.3)
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)

5.4.5.3 CHANGE LCN Softkey/Label Display



SOFTKEY/LABEL	FUNCTION
	Not Used
	Not Used
	Not Used
	Not Used
SELECT LCN	Sets-up display to change logical channel number. (Ref 5.4.5.4)
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 5.4.5.2)

5.4.5.4 SELECT LCN Softkey/Label Display



SOFTKEY/LABEL	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
	Not Used
	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

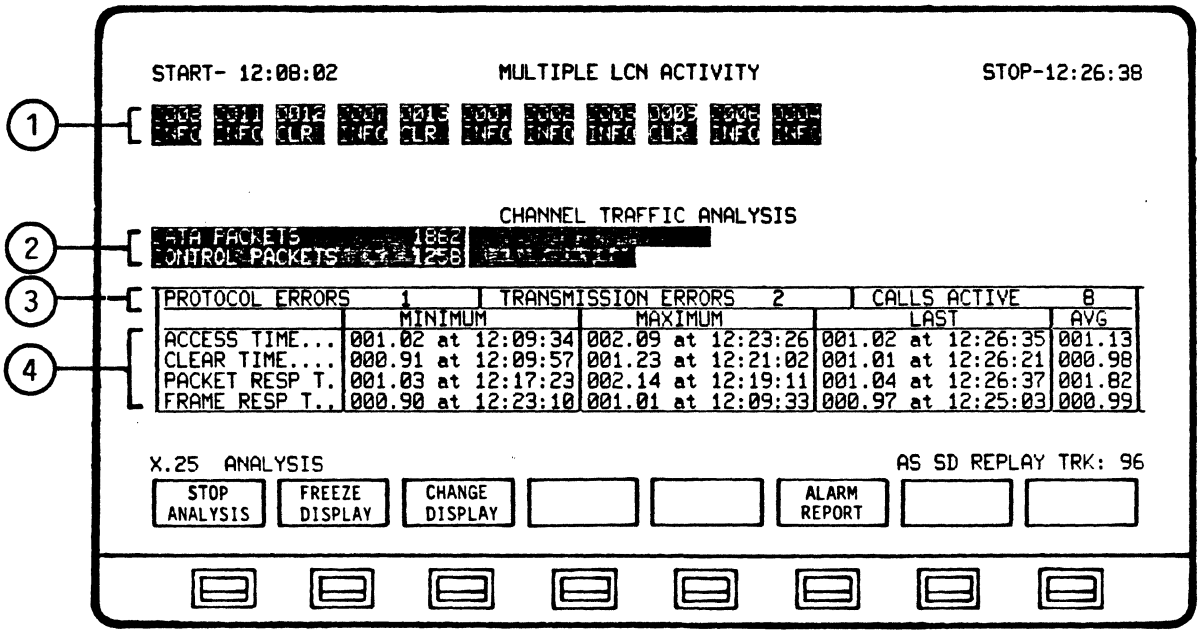
RUN ANALYSIS	DISPLAY CONTROL	SET UP ANALYSIS		CONFIG CONTROL	DISK CONTROL		MAIN MENU

SET UP ANALYSIS

DISPLAY SET UP	GENERAL ALARMS	LCN ALARMS			BILLING CONFIG		EXIT

DISPLAY SET UP

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



TYPICAL MULTIPLE LOGICAL CHANNEL ACTIVITY REPORT

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.

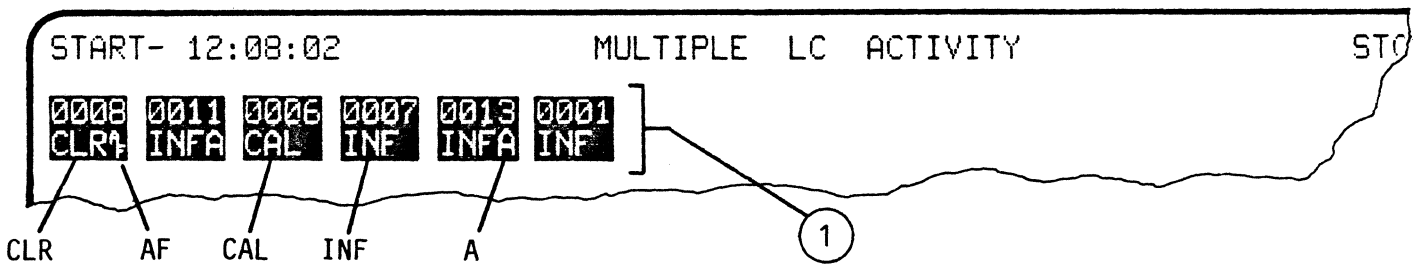
5.5.1 Multiple LCN Session Activity

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).

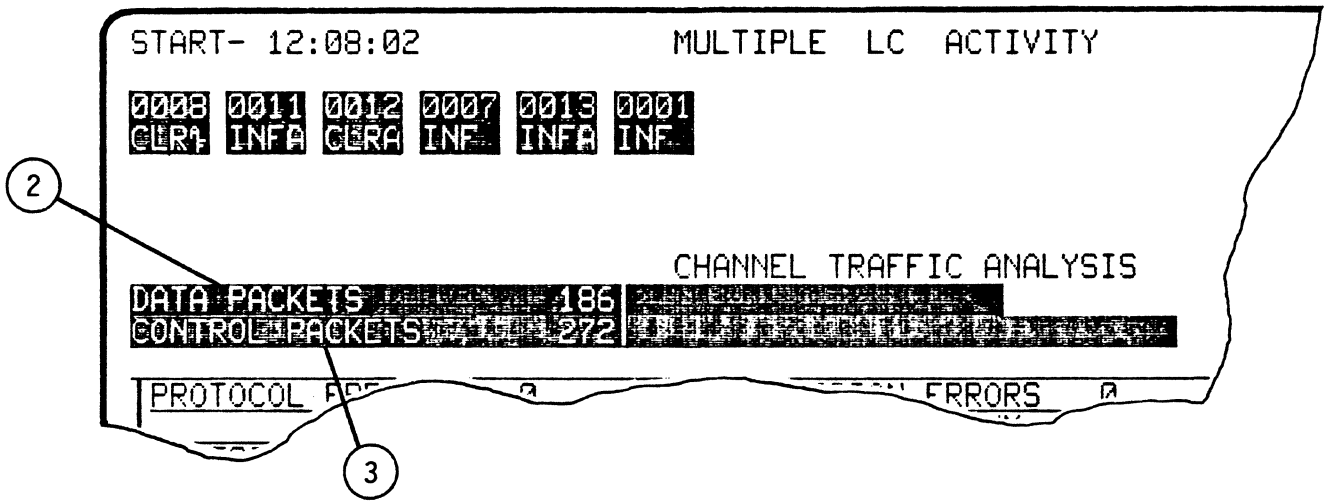


The following activities are displayed:

ITEM	DISPLAY	DESCRIPTION
(1)	CAL	Indicates that either a Call Request packet or an Incoming Call packet and its confirmation has been detected.
	CLR	Indicates a clear packet and a clear confirmation packet were detected. (LCN box will go dim.)
	A	Indicates alarm status (Auto-Sentry has detected a catastrophic error during session).
	A_F	Indicates LCN alarm buffer full
	INF	Indicates that the LCN is in information transfer phase, exchanging data packets.

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.

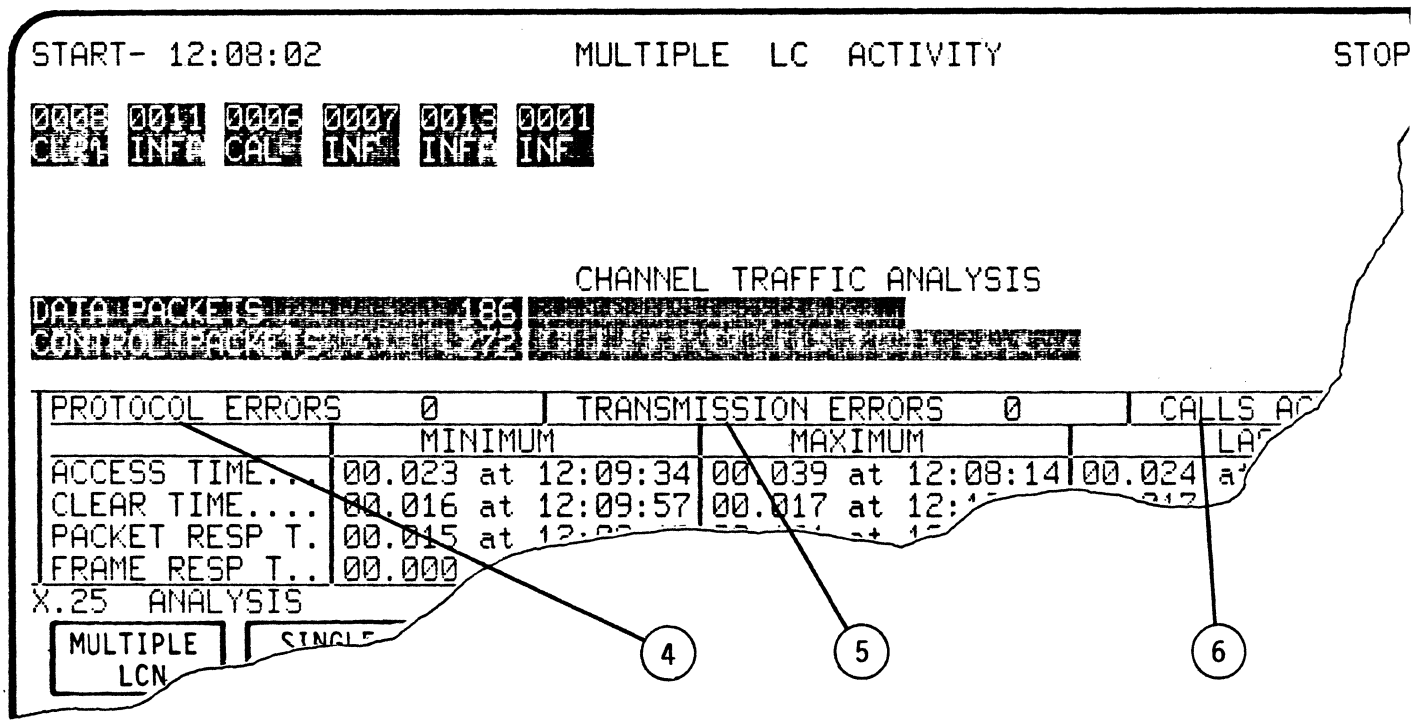


The following activities are displayed:

ITEM	DISPLAY	DESCRIPTION
(2)	DATA PACKETS	Total number of data packets sent and received for all displayed LCNs. (Number sent and received is displayed in Total Session Activities area).
(3)	CONTROL PACKETS	Total number of control packets sent and received for all displayed LCNs. (Number sent and received is displayed in Total Session Activities area).

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:

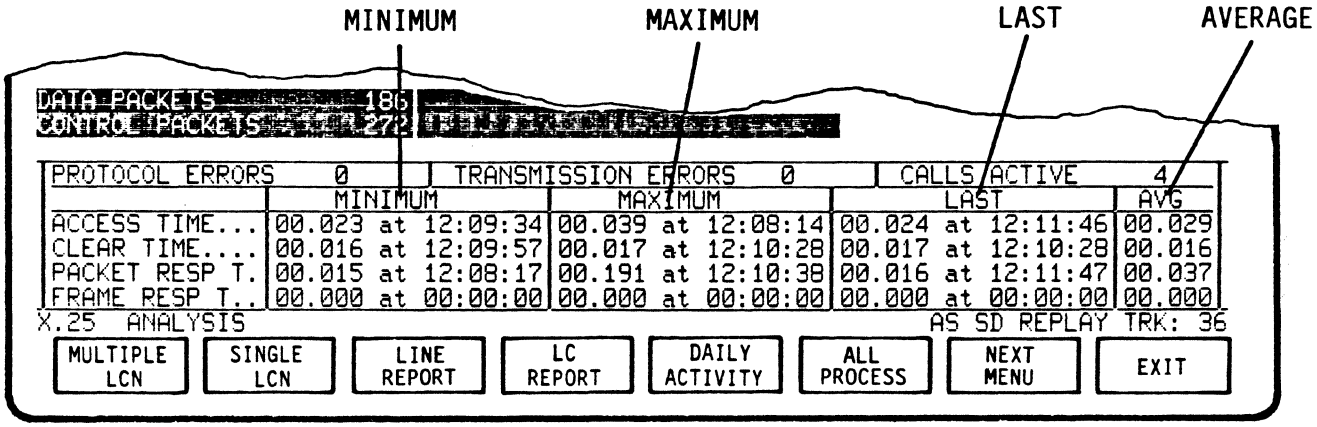
ITEM	DISPLAY	DESCRIPTION
(4)	PROTOCOL	Number of protocol errors (Violations of ERRORS line procedure) detected by Auto Sentry.
(5)	TRANSMISSION	Number of BCC (FCS) errors (Hardware and ERRORS line oriented).
(6)	CALLS ACTIVE	Number of calls active.

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.

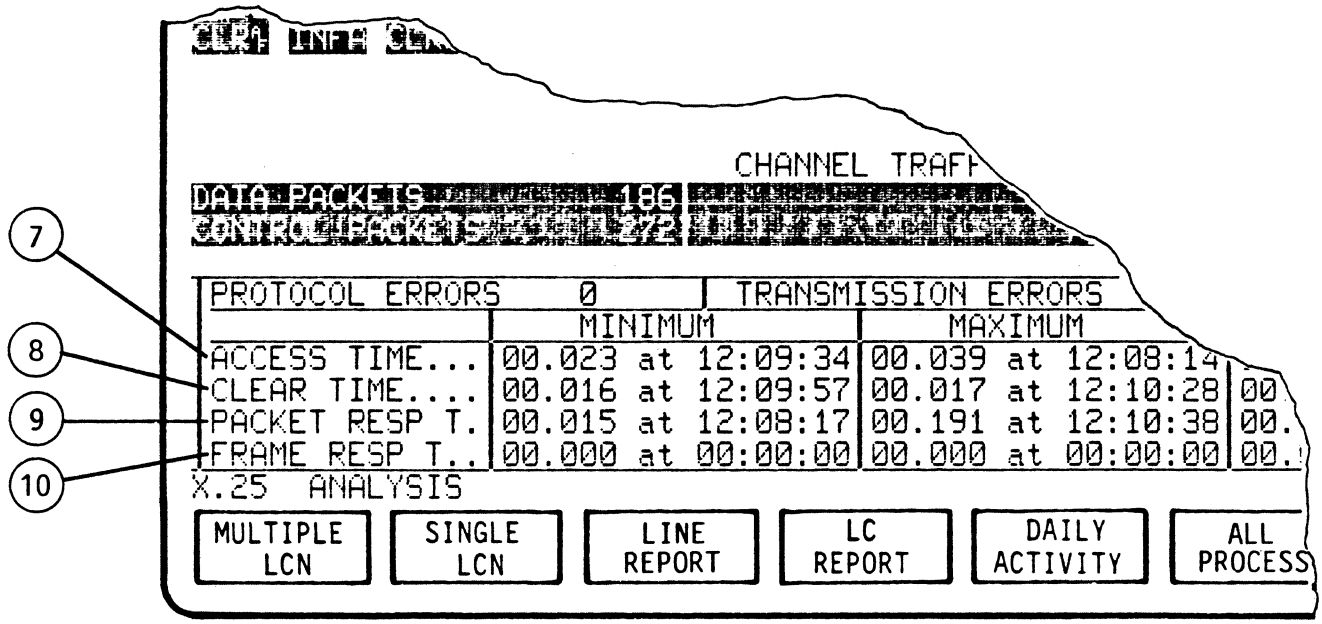
NOTE

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



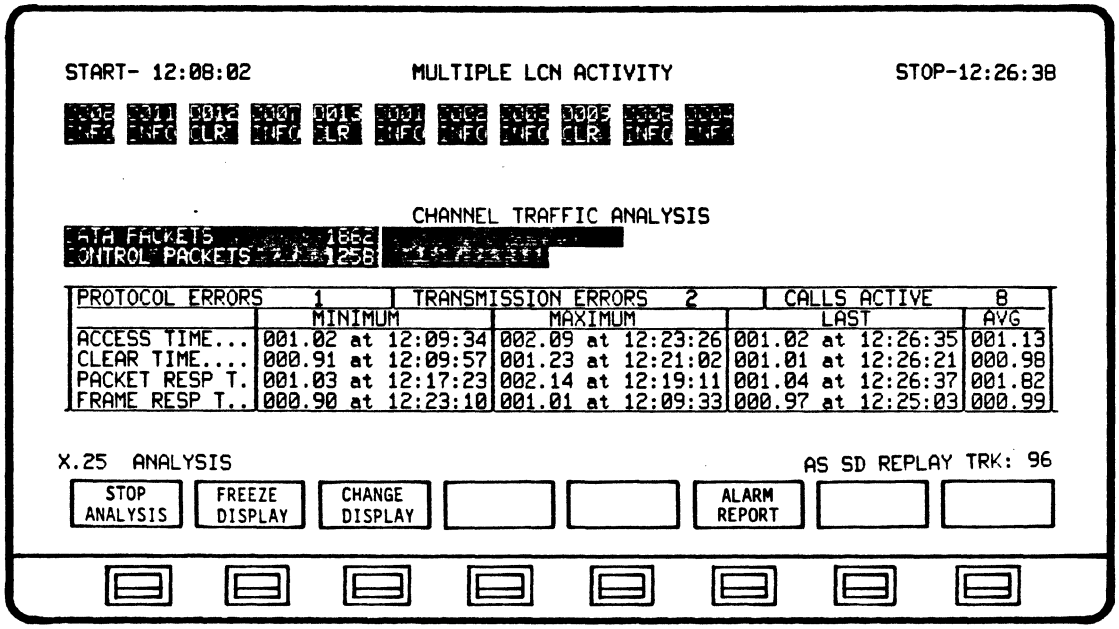
The following activities are displayed:

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.

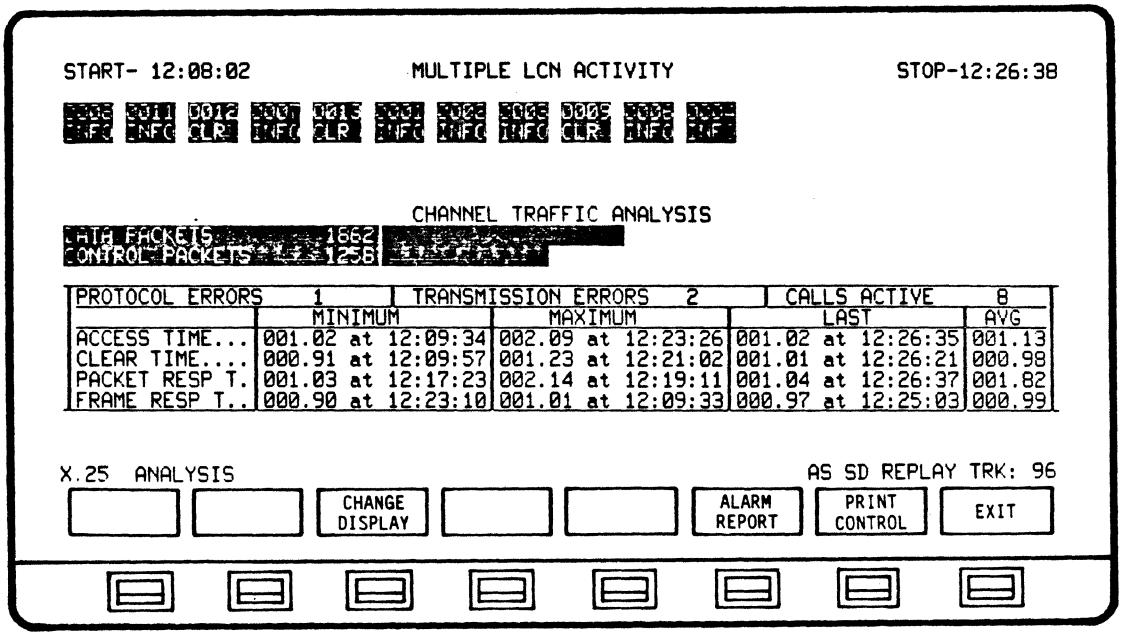
5.5.5 Multiple Logical Channel Activity Softkey/Label Display Descriptions



5.5.5.1 RUN ANALYSIS Softkey/Label Display

SOFTKEY/LABEL	FUNCTION
STOP ANALYSIS	Stops analysis process.
FREEZE DISPLAY RESUME 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

5.5.5.2 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 Segement 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)

5.6 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.

ANALYSIS

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

SET UP ANALYSIS

DISPLAY SET UP	GENERAL ALARMS	LCN ALARMS			BILLING CONFIG		EXIT

DISPLAY SET UP

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

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

PACKET TYPE	COUNTS	ERROR TYPE	COUNTS
DATA FROM DTE	238	PROTOCOL	0
DATA FROM DCE	115	TRANSMISSION	0
CONTROL FROM DTE	158	DTE PKT RETRIES	0
CONTROL FROM DCE	151	DCE PKT RETRIES	0

	MINIMUM	MAXIMUM	LAST	AVG
ACCESS TIME...	000.01 at 11:59:15	000.02 at 11:59:33	000.02 at 12:03:13	000.01
CLEAR TIME....	000.01 at 11:59:50	000.02 at 11:59:33	000.02 at 12:02:56	000.01
PACKET RESP T.	000.01 at 11:59:41	000.04 at 12:01:27	000.03 at 12:03:13	000.02
FRAME RESP T..	000.09 at 12:00:43	001.81 at 12:03:05	000.44 at 12:03:13	000.13

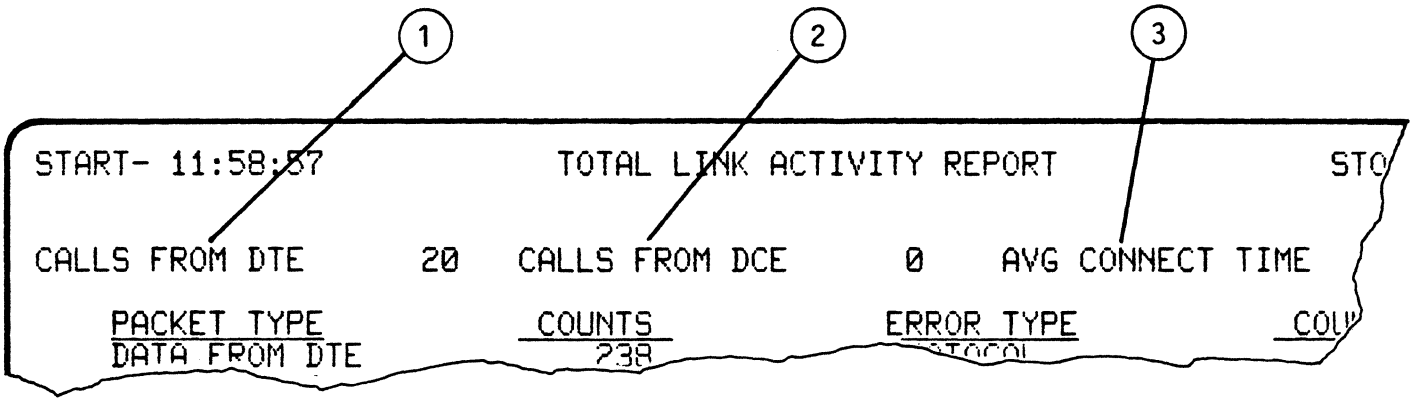
X.25 ANALYSIS AS SD REPLAY TRK: 96

STOP ANALYSIS	FREEZE DISPLAY	CHANGE DISPLAY			ALARM REPORT		

TYPICAL TOTAL LINK ACTIVITY REPORT

Operating Sequence

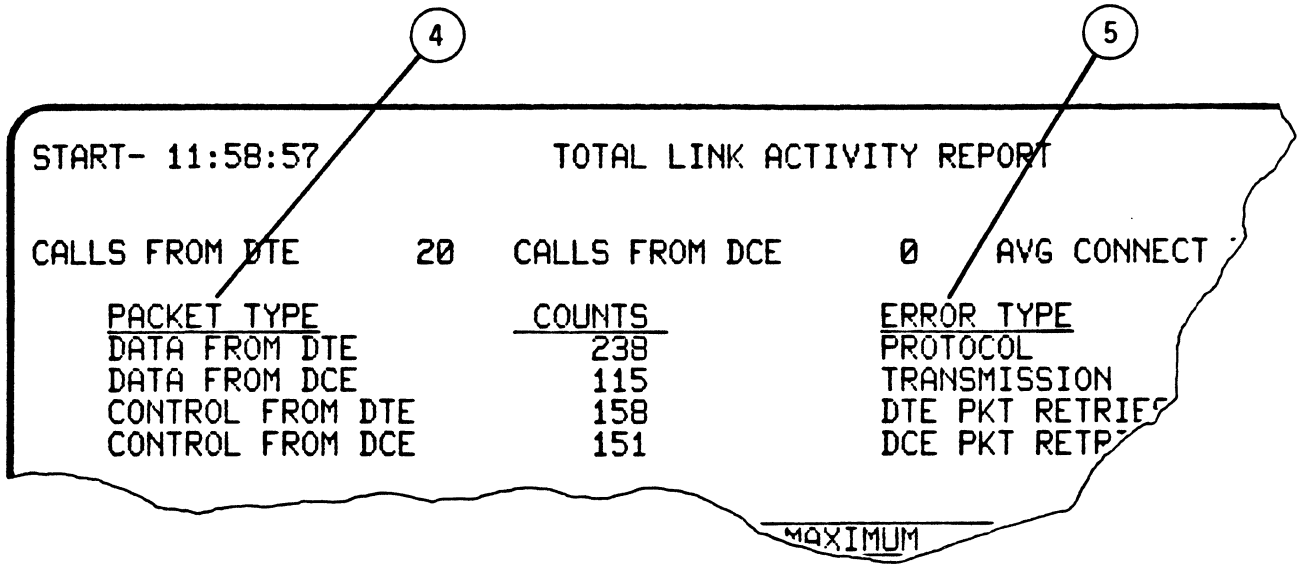
1. Set up Analysis for system report and exit
2. Run analysis
3. Stop analysis
4. Review results



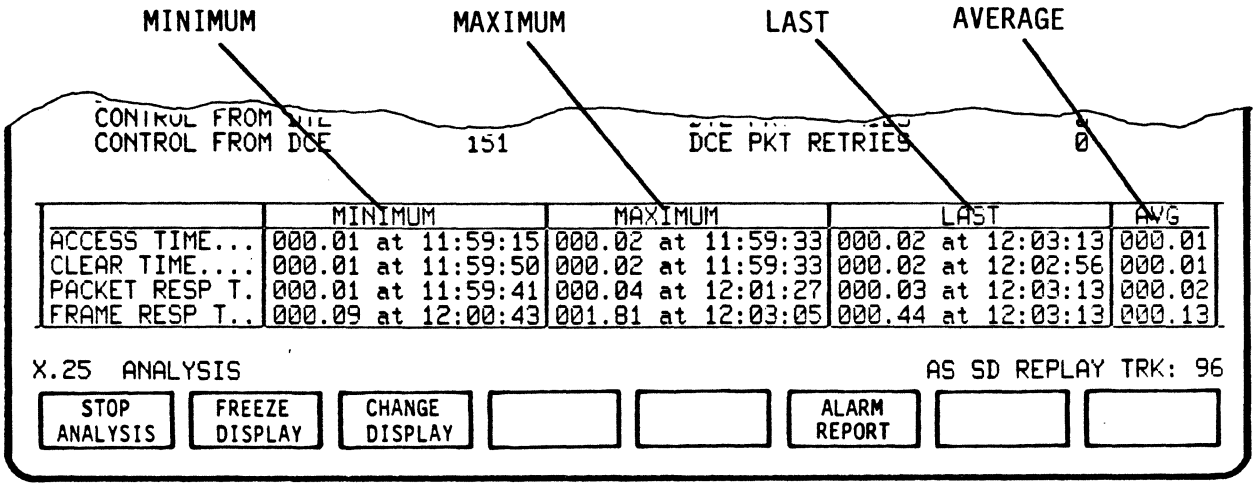
Display Format

The following activities are displayed:

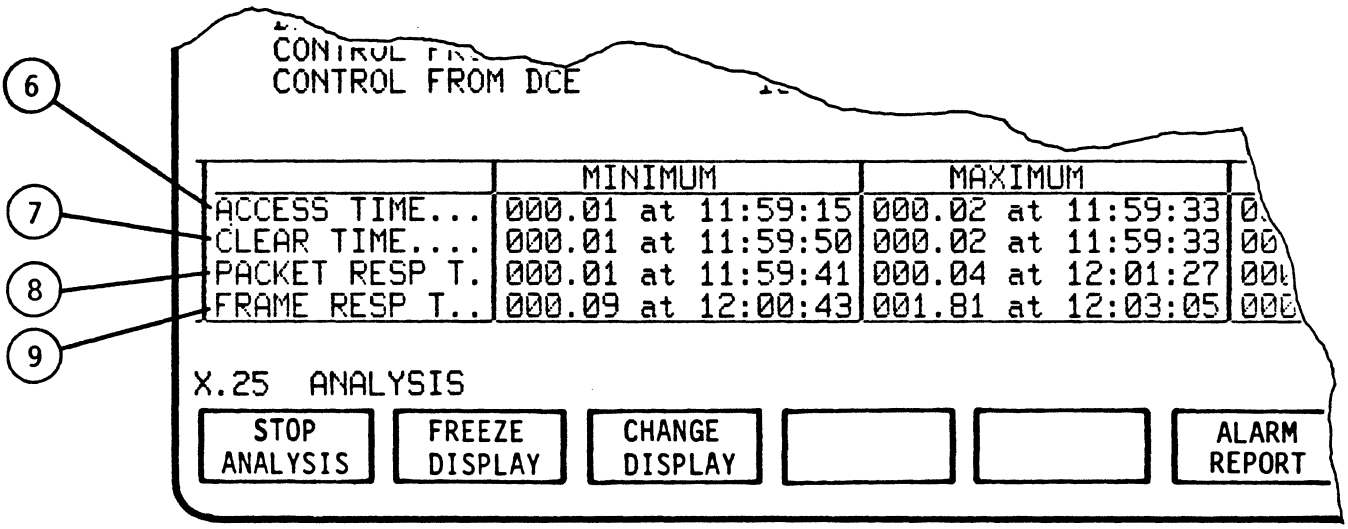
ITEM	DISPLAY	DESCRIPTION
(1)	CALLS FROM DTE	Number of calls transmitted by all DTEs during Run Analysis mode.
(2)	CALLS FROM DCE	Number of calls transmitted by DCE during Run Analysis mode.
(3)	AVG CONNECT TIME	Average time of active sessions for all LCNs during Run Analysis mode.



(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.

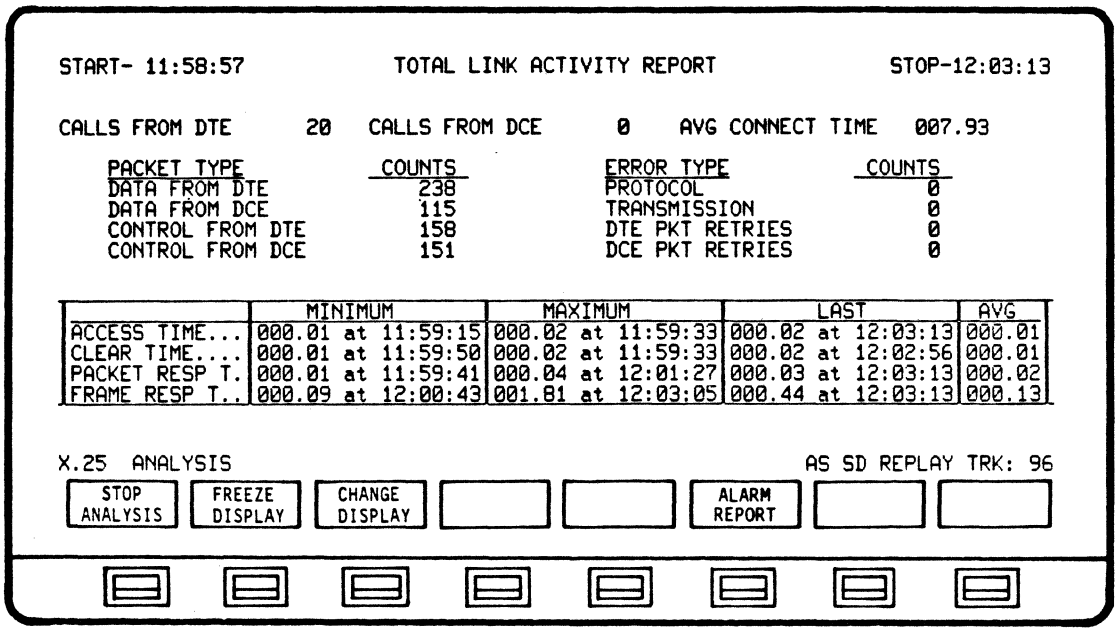


TIME	Seconds, Milliseconds (SS.ms) at Hours, Minutes, Seconds (HH.MM.SS) Displays Minimum, Maximum, Last and Average times to perform functions.
MAXIMUM	Longest time interval on LCNs.
MINIMUM	Shortest time interval on LCNs.
LAST	Last completed connection on LCNs.
AVG	Average completed connection on the LCNs.



(6)	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).
(7)	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).
(8)	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.
(9)	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.

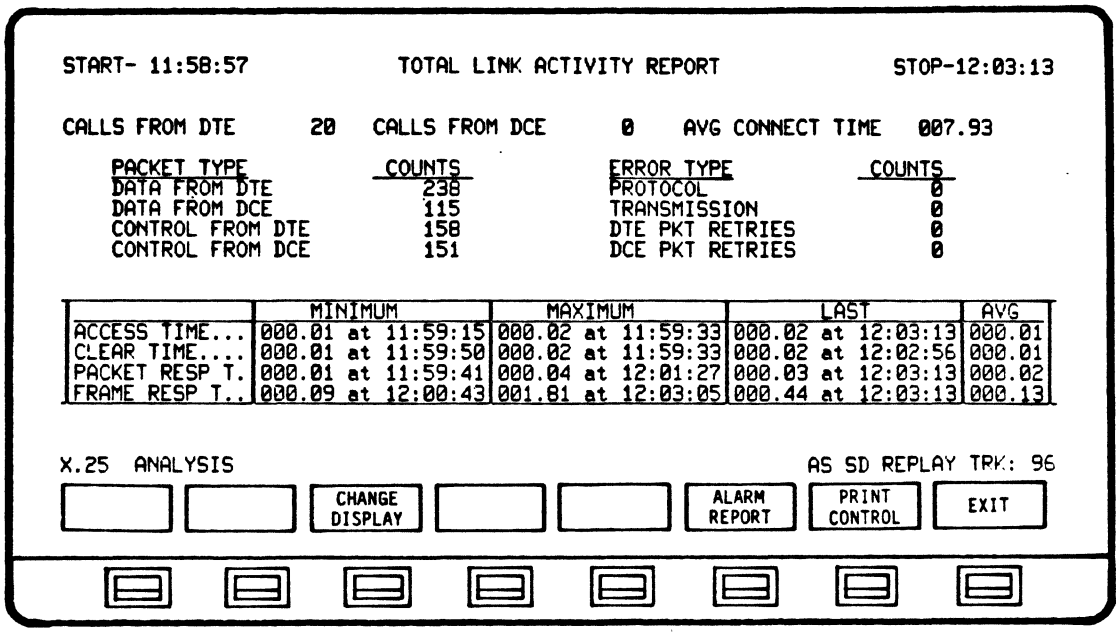
5.6.1 Total Line Activity Report Softkey/Label Display Description



5.6.1.1 RUN ANALYSIS Softkey/Label Display

SOFTKEY/LABEL	FUNCTION
STOP ANALYSIS	Stops analysis process.
FREEZE DISPLAY / RESUME 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

5.6.1.2 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 Segement 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.

ANALYSIS

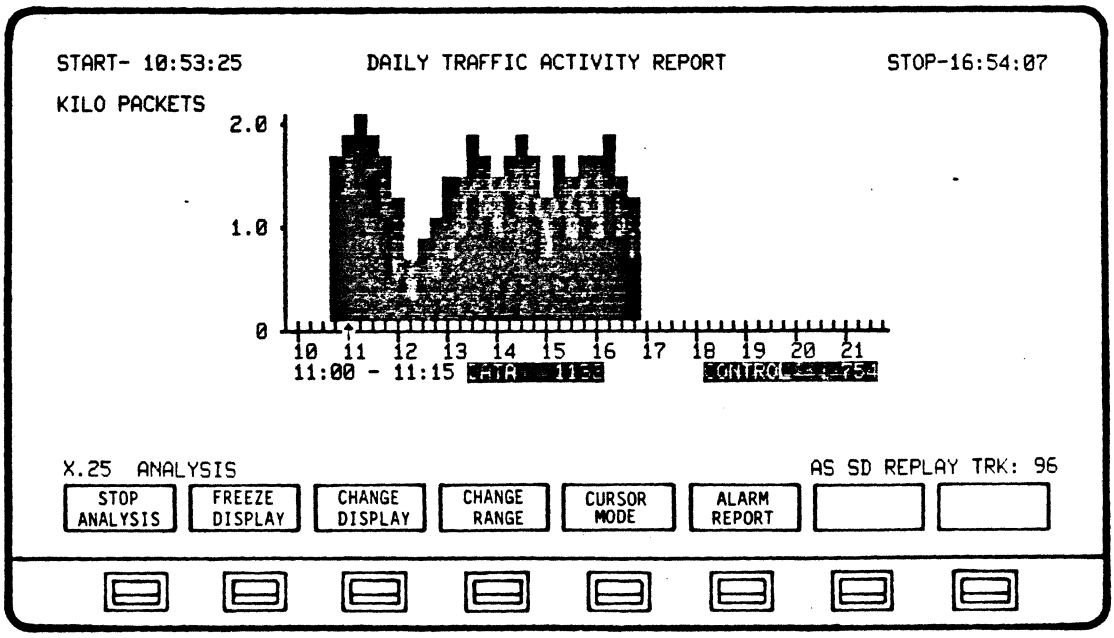
RUN ANALYSIS	DISPLAY CONTROL	SET UP ANALYSIS		CONFIG CONTROL	DISK CONTROL		MAIN MENU

SET UP ANALYSIS

DISPLAY SET UP	GENERAL ALARMS	LCN ALARMS			BILLING CONFIG		EXIT

DISPLAY SET UP

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



TYPICAL DAILY TRAFFIC ACTIVITY REPORT

Operating Sequence

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

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.

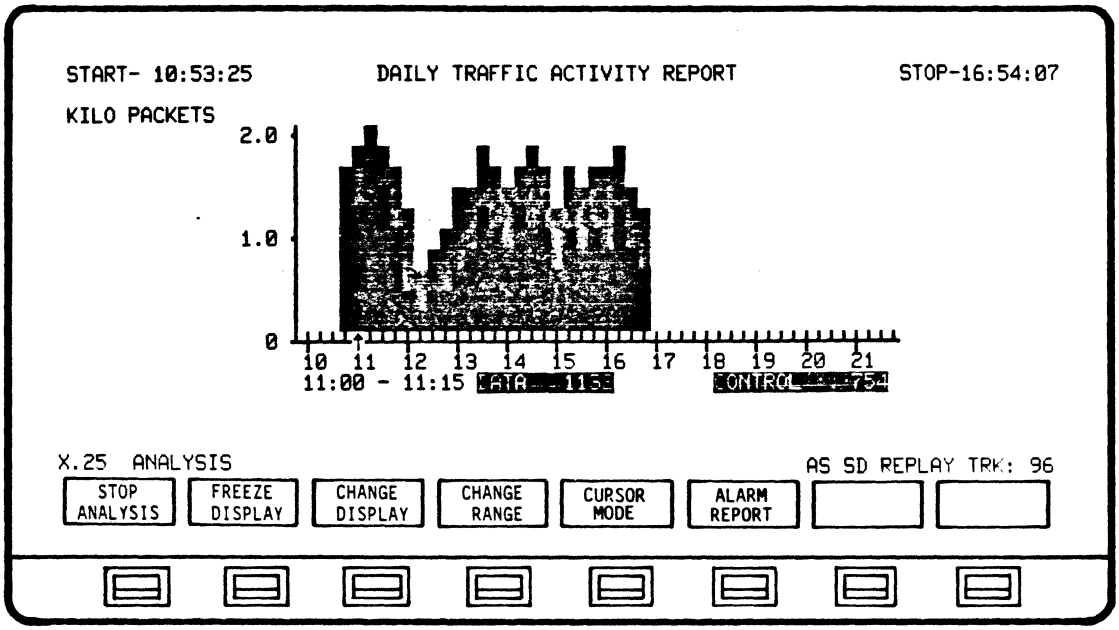
NOTE

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:

DATA	Number of data packets during current fifteen (15) minute time interval of data analysis.
CONTROL	Number of control packets during current fifteen (15) minute time interval of data analysis.

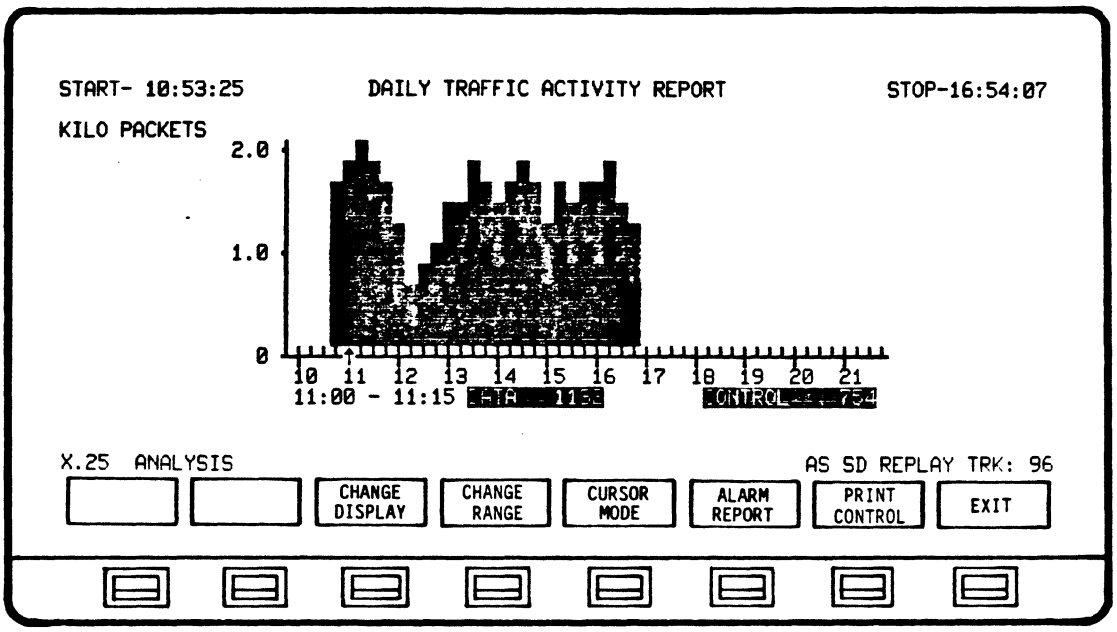
5.7.1 Daily Traffic Activity Report Softkey/Label Display Description



5.7.1.1 RUN ANALYSIS Softkey/Label Display

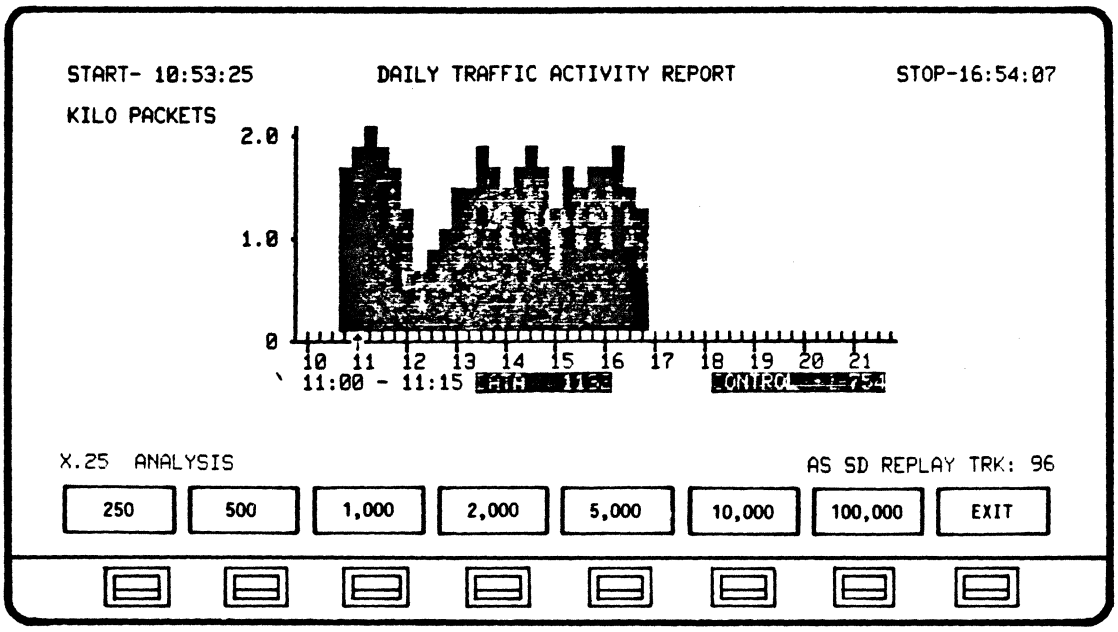
SOFTKEY/LABEL	FUNCTION
STOP ANALYSIS	Stops analysis process.
FREEZE DISPLAY / RESUME DISPLAY	Freezes/Resumes data displayed on screen only. All other analysis functions continue, including data capture. (Flip-flop type action).
CHANGE DISPLAY	Sets-up display to select/change data displayed from/to Single Channel LCN, Multiple Channel LCN, Daily Traffic Activity, LCN Performance, Total Line Activity or Billing Information. (Ref 5.3.5)
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



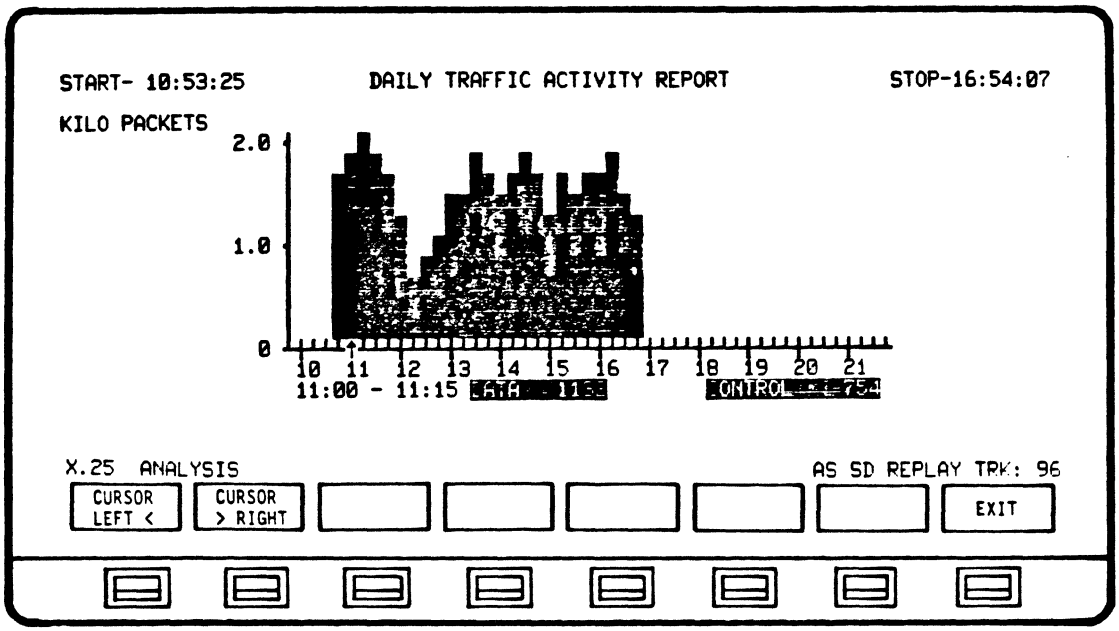
SOFTKEY/LABEL	FUNCTION
	Not Used
	Not Used
CHANGE DISPLAY	Sets-up display to select/change data displayed from/to Single Channel LCN, Multiple Channel LCN, Daily Traffic Activity, LCN Performance, Total Line Activity, Billing Information or Segement Filling. (Ref 5.3.3)
CHANGE RANGE	Sets up display to select/change range (scale) of bar graph. Seven scale selections are presented. Select and exit to return to Run Analysis softkeys. (Ref 5.7.1.3)
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)
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)

5.7.1.3 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



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
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.

ANALYSIS

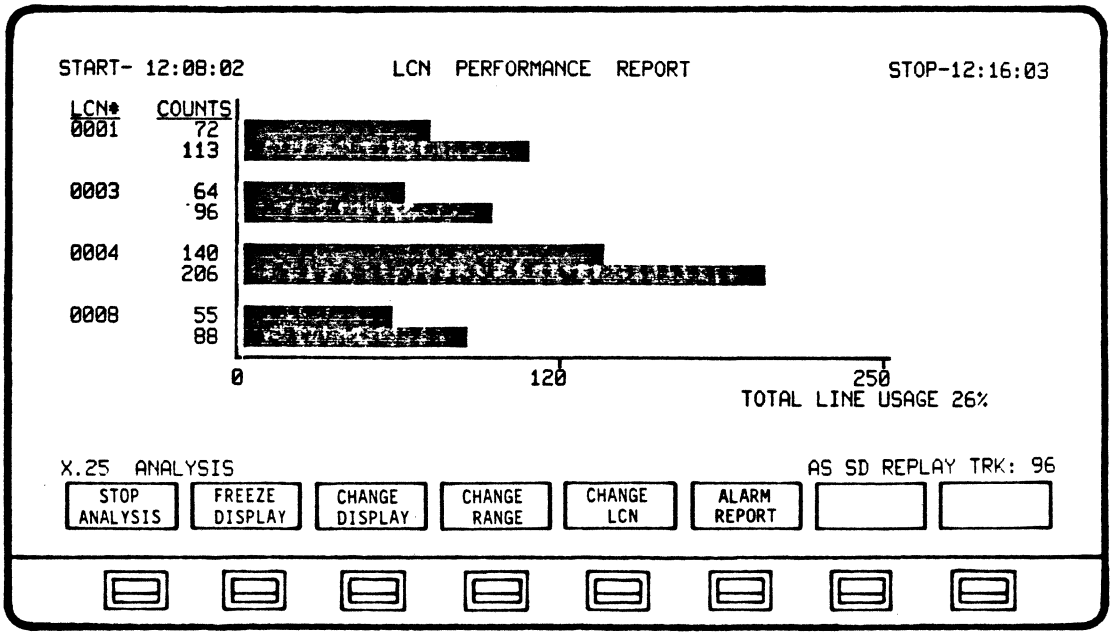
RUN ANALYSIS	DISPLAY CONTROL	SET UP ANALYSIS		CONFIG CONTROL	DISK CONTROL		MAIN MENU

SET UP ANALYSIS

DISPLAY SET UP	GENERAL ALARMS	LCN ALARMS			BILLING CONFIG		EXIT

DISPLAY SET UP

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



TYPICAL LCN PERFORMANCE REPORT

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.

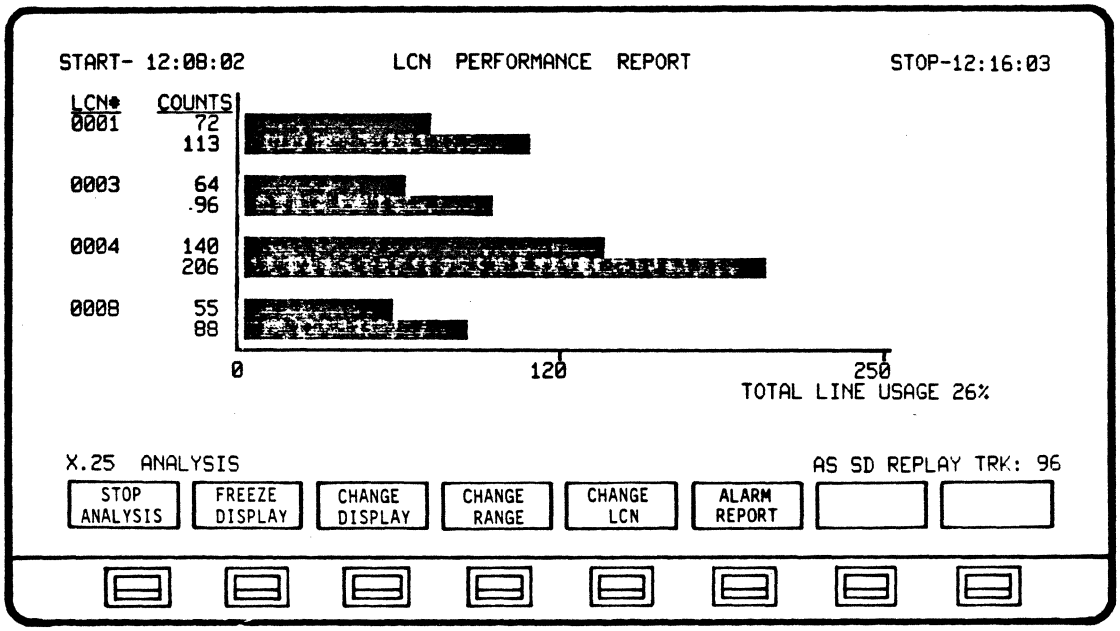
By using CHANGE RANGE, you can choose the most useful display according to the amount of data being transmitted during a particular session. CHANGE RANGE is available from the RUN ANALYSIS mode as a softkey selection. From STOP ANALYSIS mode, select DISPLAY CONTROL and then CHANGE RANGE.

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.

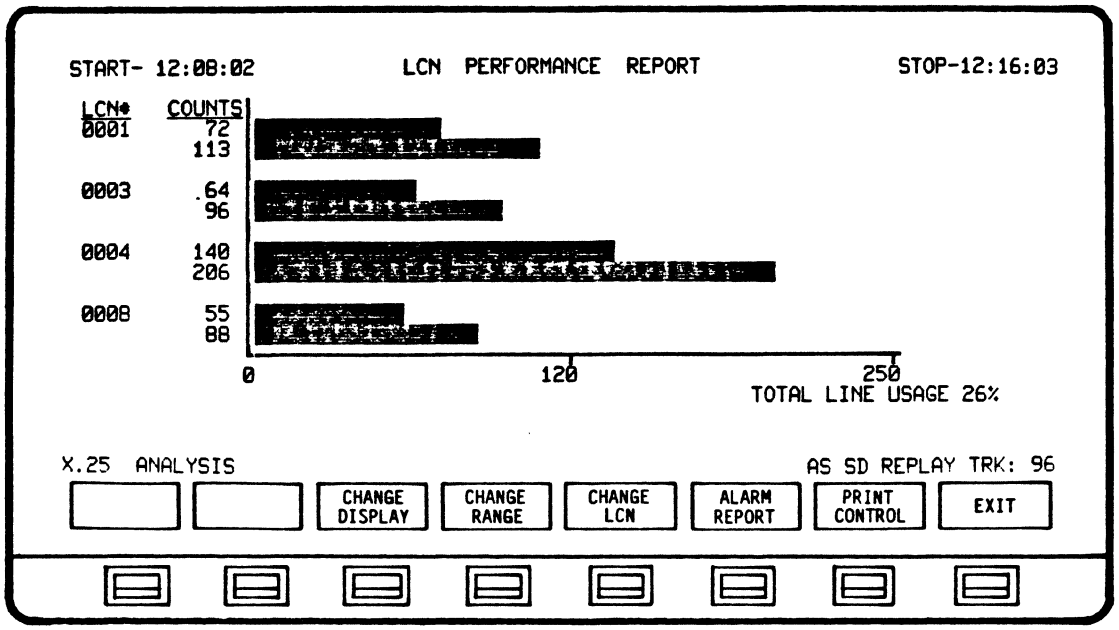
5.8.1 LCN Performance Report Softkey/Label Display Descriptions



5.8.1.1 RUN ANALYSIS Softkey/Label Display

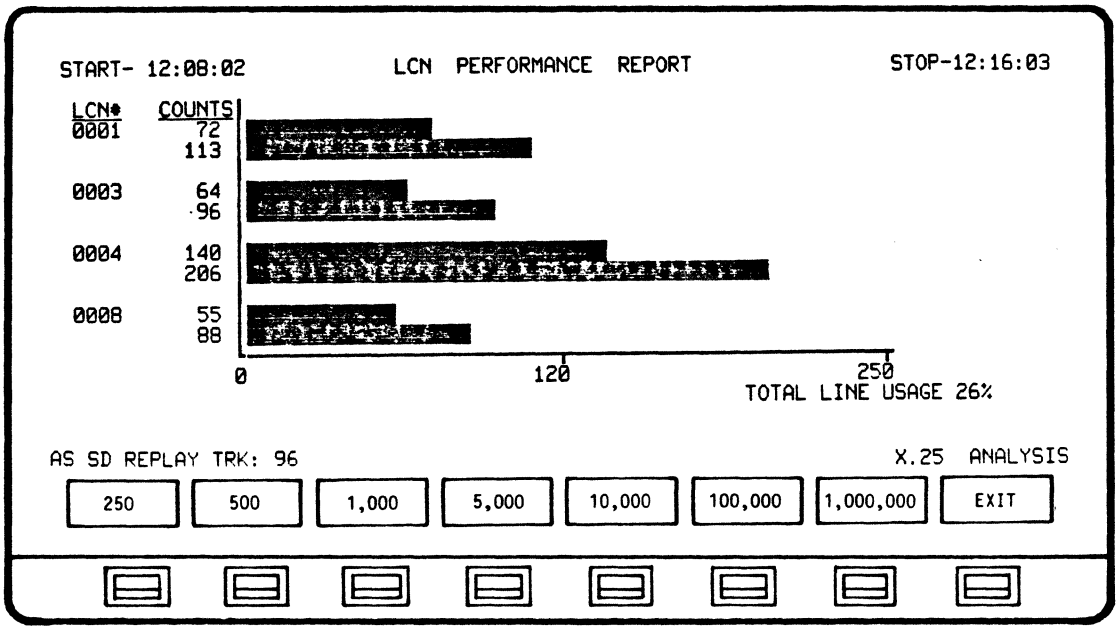
SOFTKEY/LABEL	FUNCTION
STOP ANALYSIS	Stops analysis process.
FREEZE DISPLAY / RESUME DISPLAY	Freezes/Resumes data displayed on screen only. All other analysis functions continue, including data capture. (Flip-flop type action.)
CHANGE DISPLAY	Sets-up display to select/change data displayed from/to Single Channel LCN, Multiple Channel LCN, Daily Traffic Activity, LCN Performance, Total Line Activity or Billing Information. (Ref 5.3.5)
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)
	Not Used
	Not Used

5.8.1.2 DISPLAY CONTROL Softkey/Label Display



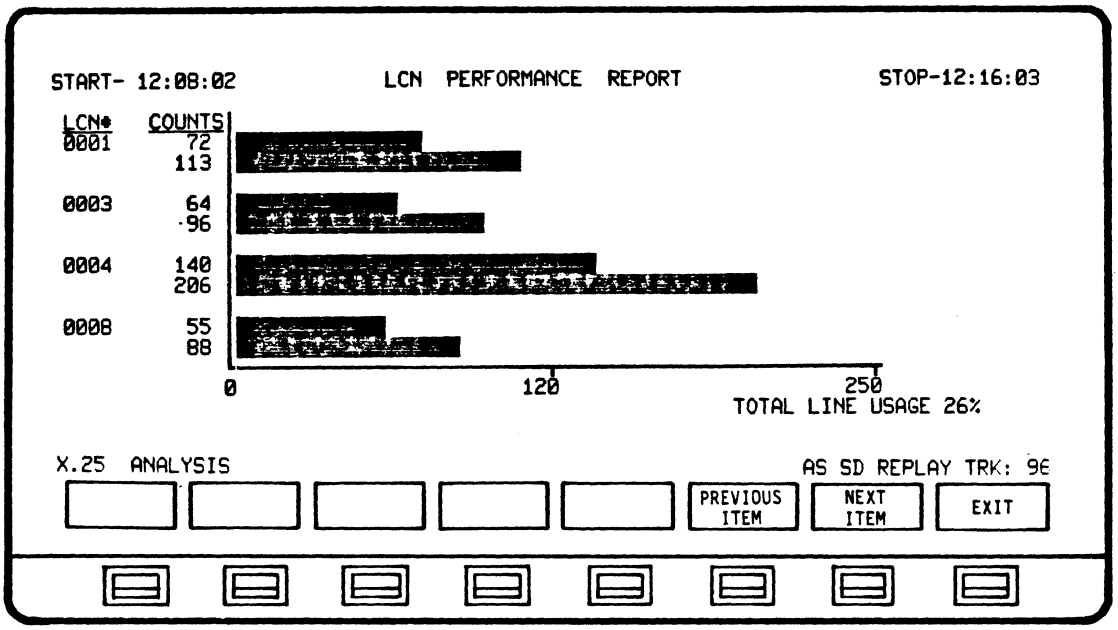
SOFTKEY/LABEL	FUNCTION
	Not Used
	Not Used
CHANGE DISPLAY	Sets-up display to select/change data displayed from/to Single Channel LCN, Multiple Channel LCN, Daily Traffic Activity, LCN Performance, Total Line Activity, Billing Information or Segement Filling. (Ref 5.3.3)
CHANGE RANGE	Sets up display to 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



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



SOFTKEY/LABEL	FUNCTION
	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 sesion(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 SET UP	GENERAL ALARMS	LCN ALARMS			BILLING CONFIG		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

START 11:58:22 BILLING INFORMATION STOP-11:58:49

	DTE ADDRESS LOCAL	DTE ADDRESS REMOTE	VOLUME (K/SEGS)	DURATION (MINS)	TOTAL
	3054321		0.01	0.05	0.06
	6054321		0.01	0.04	0.05
	5054321		0.01	0.05	0.06
*	4054321		0.01	0.02	0.03
	1054321		0.01	0.02	0.03
	7054321		0.01	0.02	0.03
PAGE TOTALS:			0.06	0.20	0.26
REPORT TOTALS:			0.06	0.20	0.26

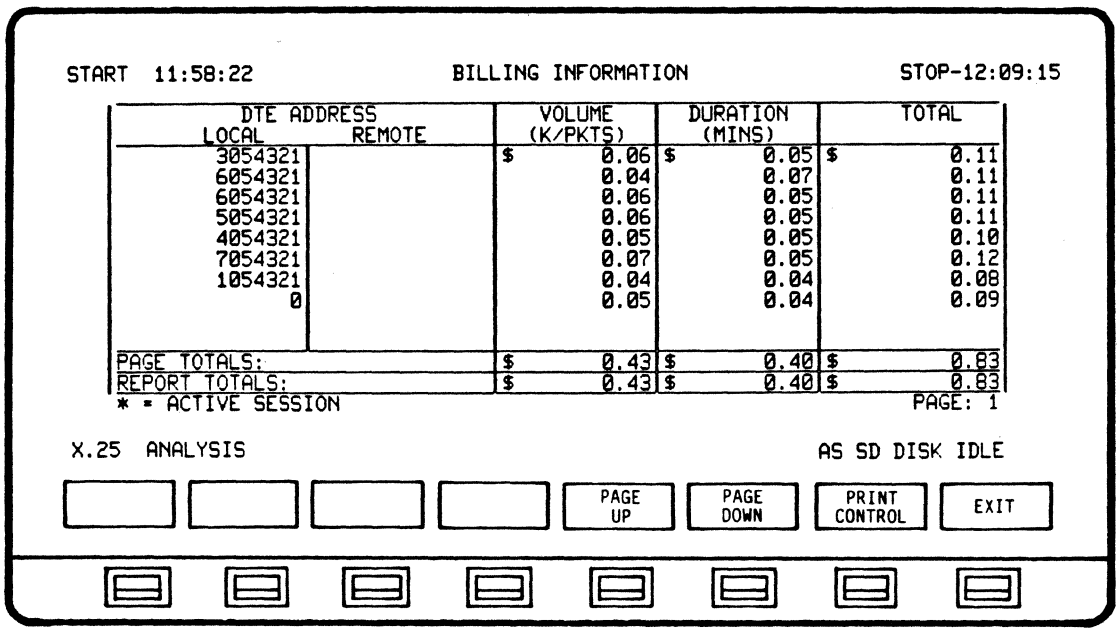
* = ACTIVE SESSION PAGE: 1

X.25 ANALYSIS WM SD REPLAY TRK: 8

				PAGE UP	PAGE DOWN	PRINT CONTROL	EXIT

TYPICAL BILLING INFORMATION REPORT

5.9.1 BILLING INFORMATION Softkey/Label Display



SOFTKEY/LABEL **FUNCTION**

[ ]	Not Used
[ ]	Not Used
[ ]	Not Used
[ ]	Not Used
PAGE UP	Data displayed on screen is scrolled-down one (1) page at a time, allowing previous data captured to be displayed.
PAGE DOWN	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***
PRINT CONTROL	Sets-up selection of the data amount to be transmitted to printer for print-out. (Screen only)
EXIT	Return to previous softkey/label display. (NEXT MENU - Ref 5.3.4)

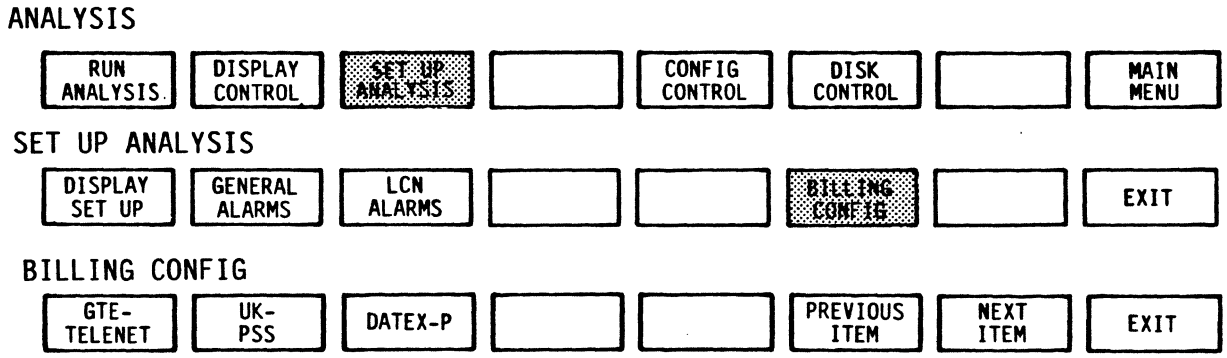
5.9.2 Billing Information Configuration Editor

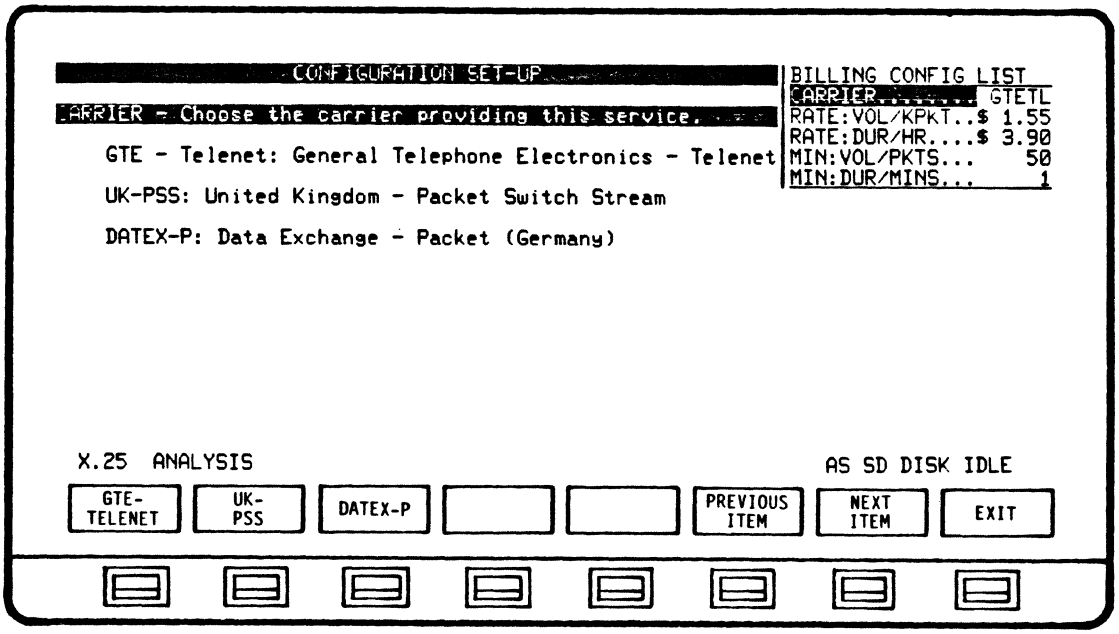
Set Up the Billing Report Configuration Editor

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.

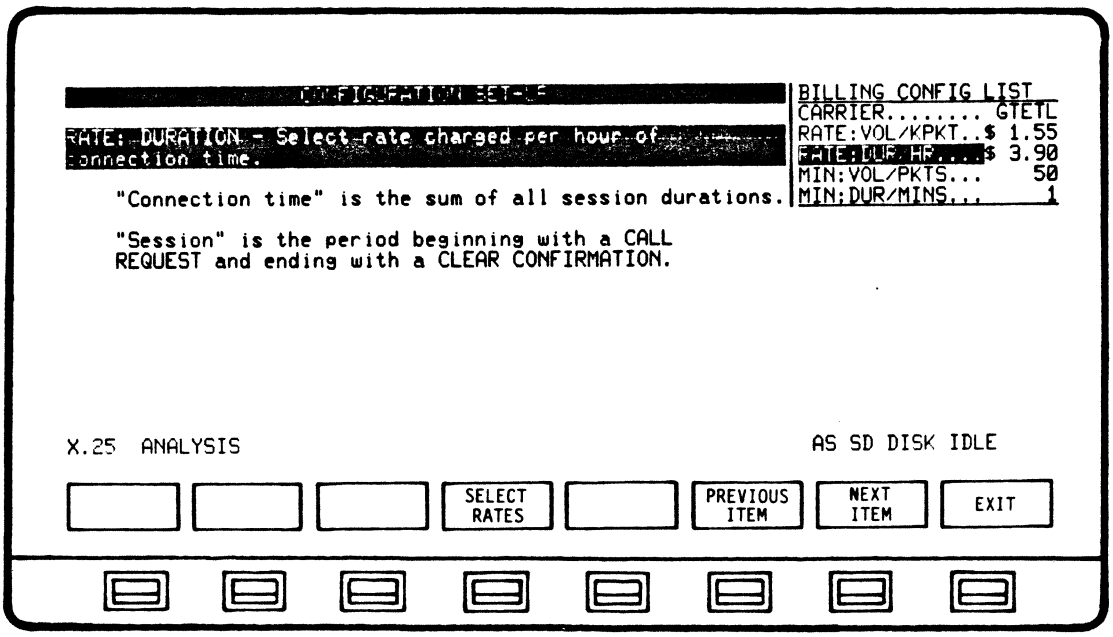
When the Editor is accessed, the existing parameters are displayed. However, by using the softkeys, you can select any parameter and change its value. Prompts are displayed as you proceed through the parameter settings.

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





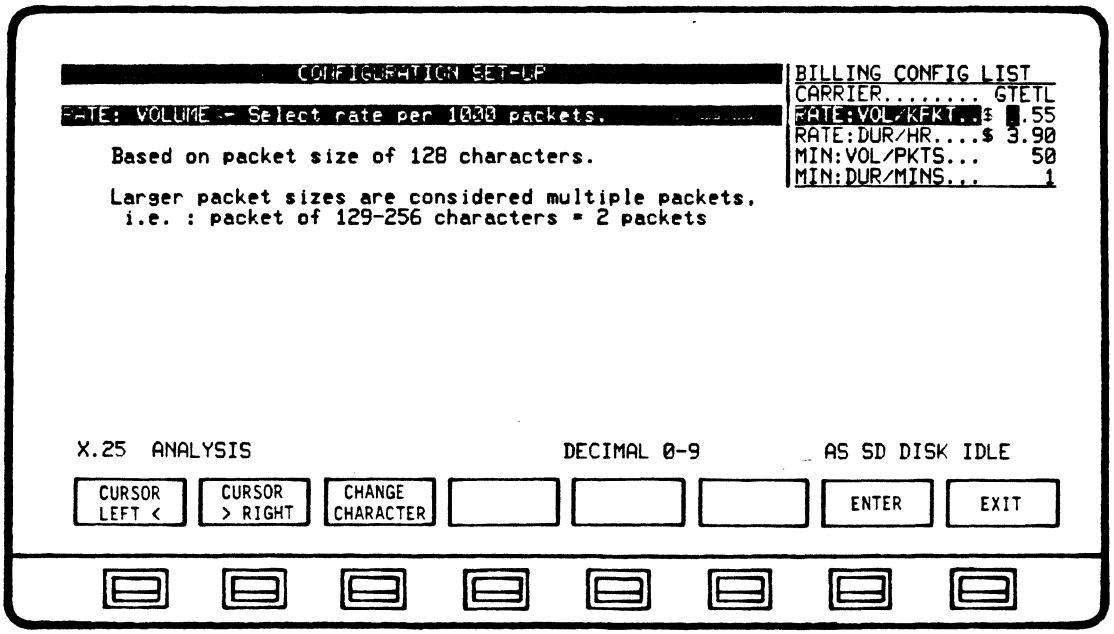
5.9.3 Billing Information Configuration Softkey/Label Display Descriptions



5.9.3.1 BILLING CONFIG Softkey/Label Display

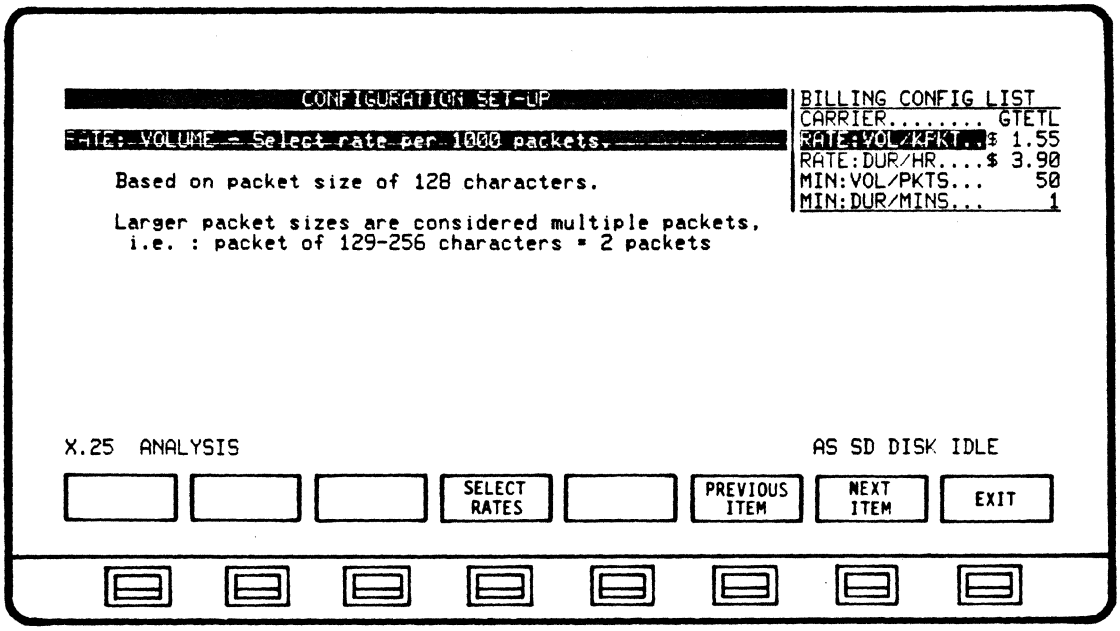
SOFTKEY/LABEL	FUNCTION
[ ]	Not Used
[ ]	Not Used
[ ]	Not Used
[SELECT RATES]	Sets up softkey/label display to change item rates in configuration.
[ ]	Not Used
[PREVIOUS ITEM]	Moves highlighted cursor bar up one item for configuration change.
[NEXT ITEM]	Moves highlighted cursor bar down one item for configuration change.
[EXIT]	Return to previous softkey/label display. (BILLING CONFIG - Ref 5.3.2)

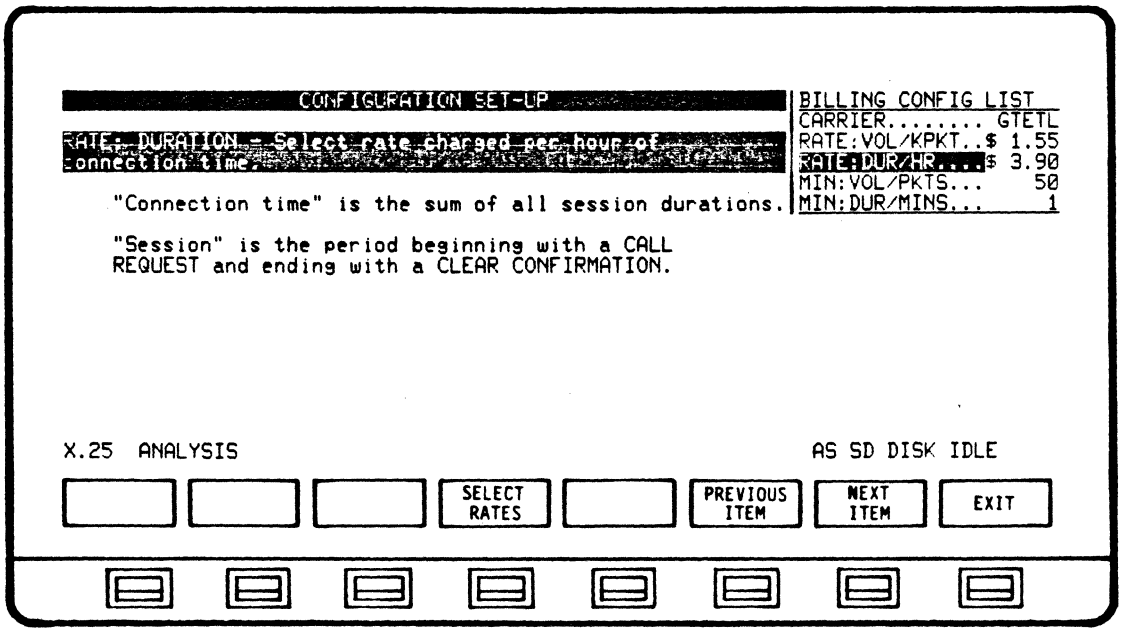
5.9.3.2 SELECT RATES Softkey/Label Display



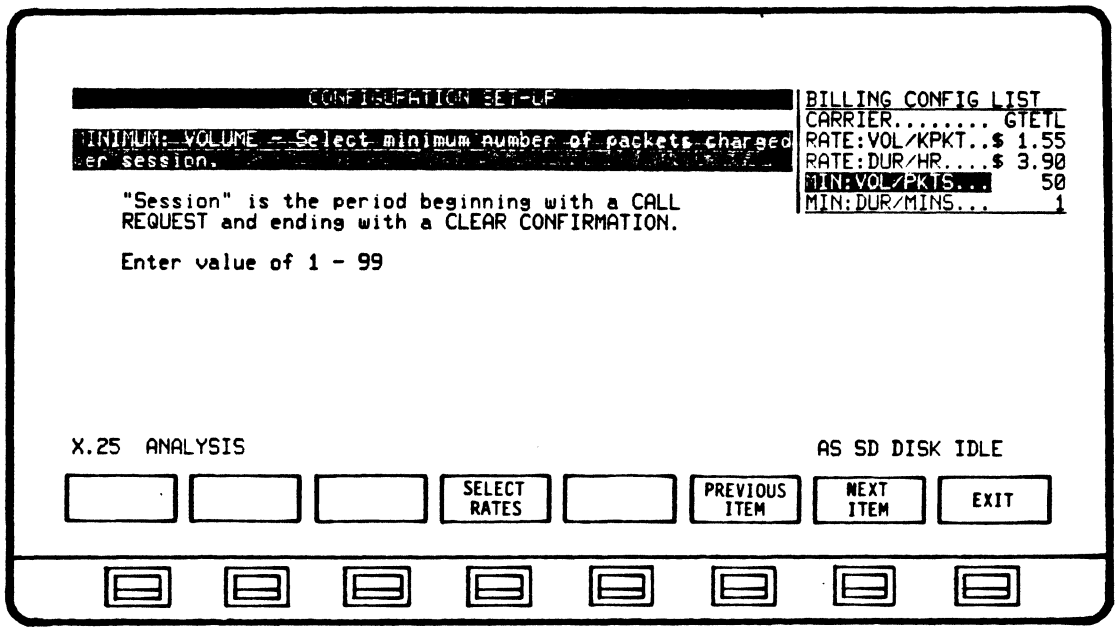
SOFTKEY/LABEL	FUNCTION
CURSOR LEFT <	Moves cursor one (1) character position left in parameter line to be changed.
CURSOR > RIGHT	Moves cursor one (1) character position right in parameter line to be changed.
CHANGE CHARACTER	Changes character in cursor location. characters will cycle sequentially when softkey is depressed. (Decimal - 0 to 9)
	Not Used
	Not Used
	Not Used
ENTER	Enters new 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)
EXIT	Return to previous softkey/label display. (SELECT RATES - Ref 5.9.3.1)

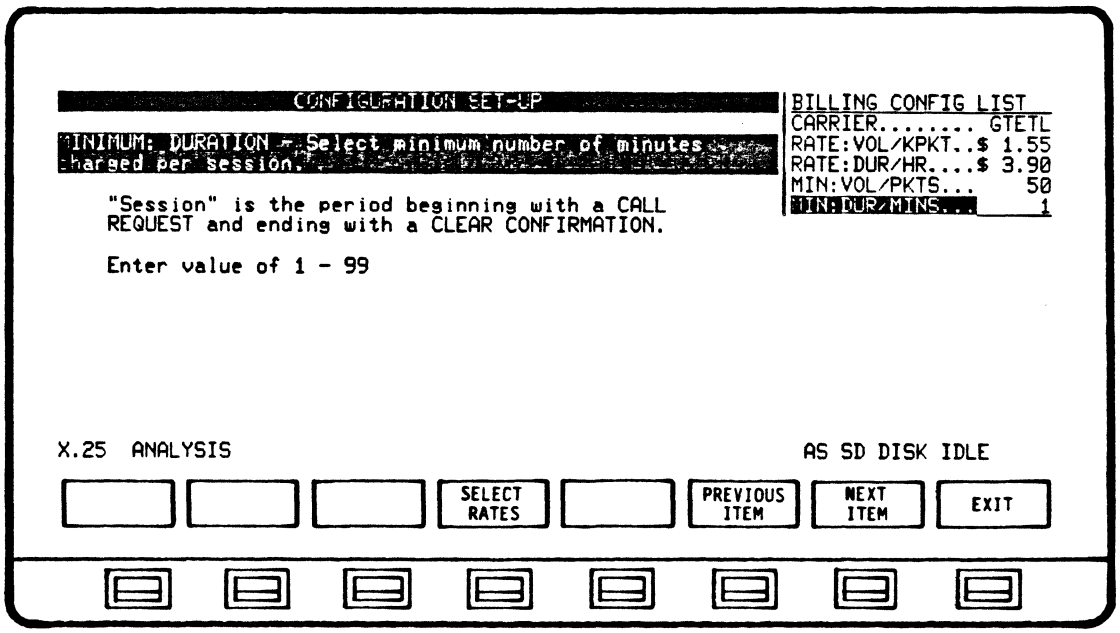
5.9.3.3 GTE-TELENET Configuration Displays



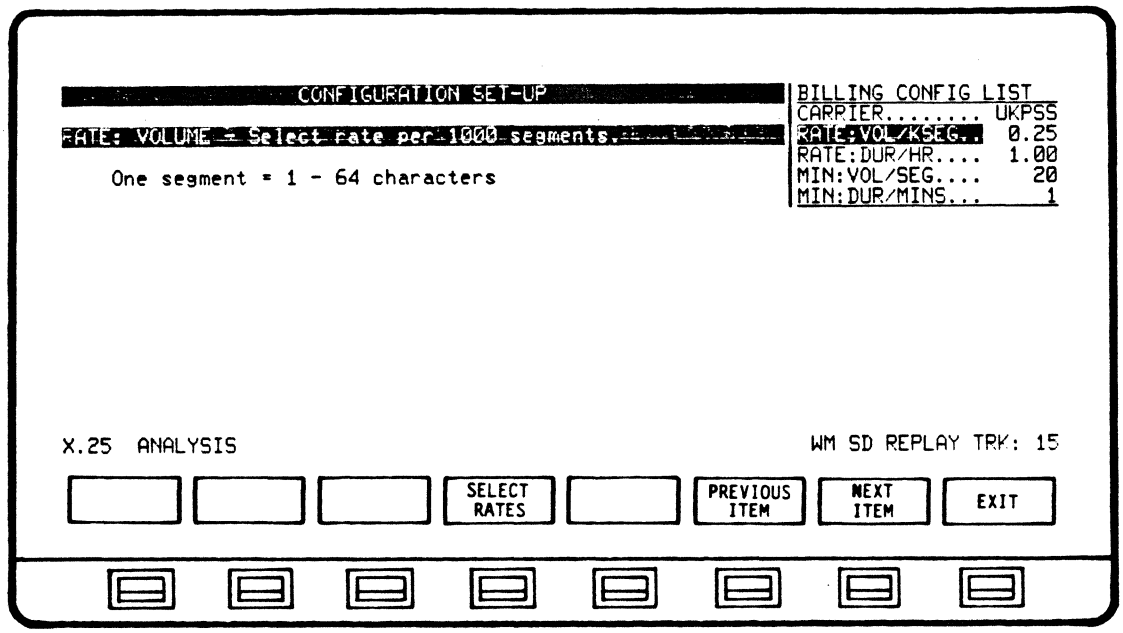


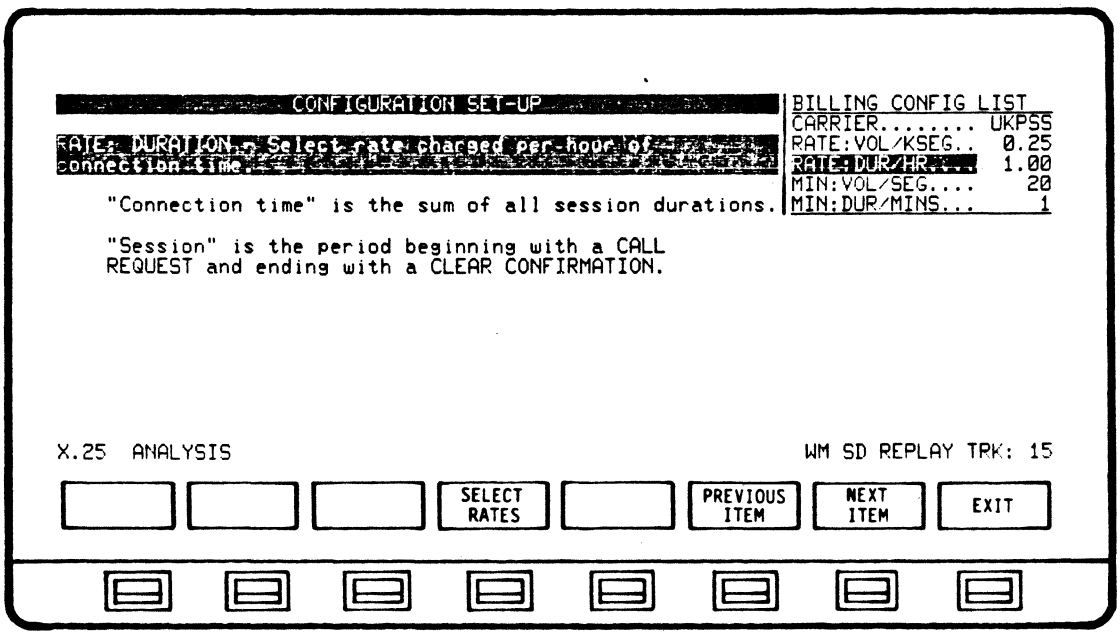
5.9.3.3 GTE-TELENET Configuration Displays



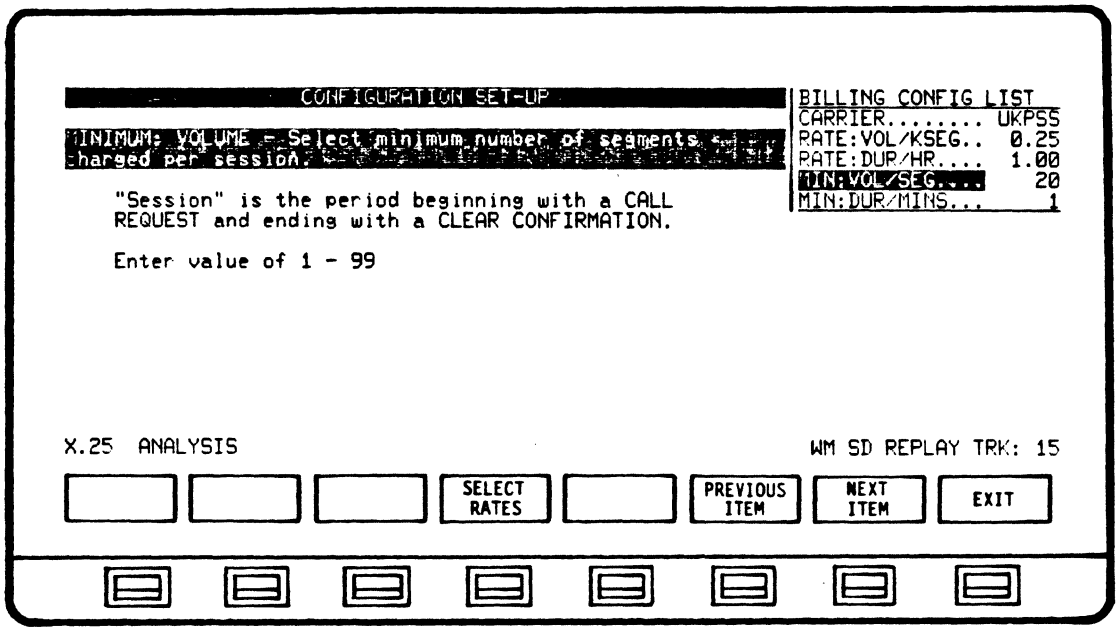


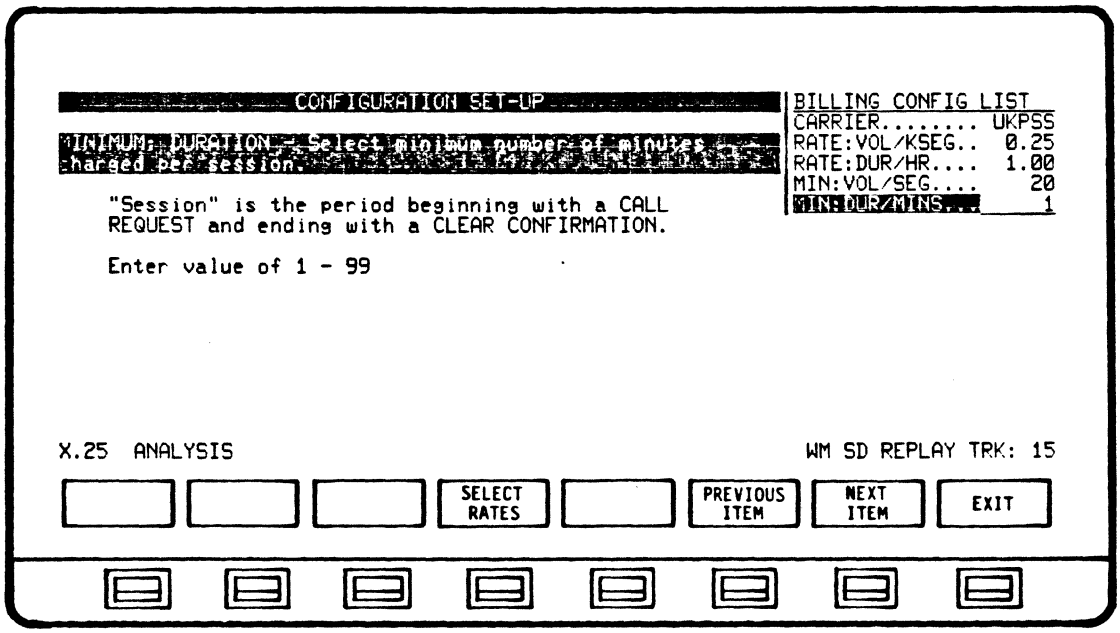
5.9.3.4 UK-PSS Configuration Displays



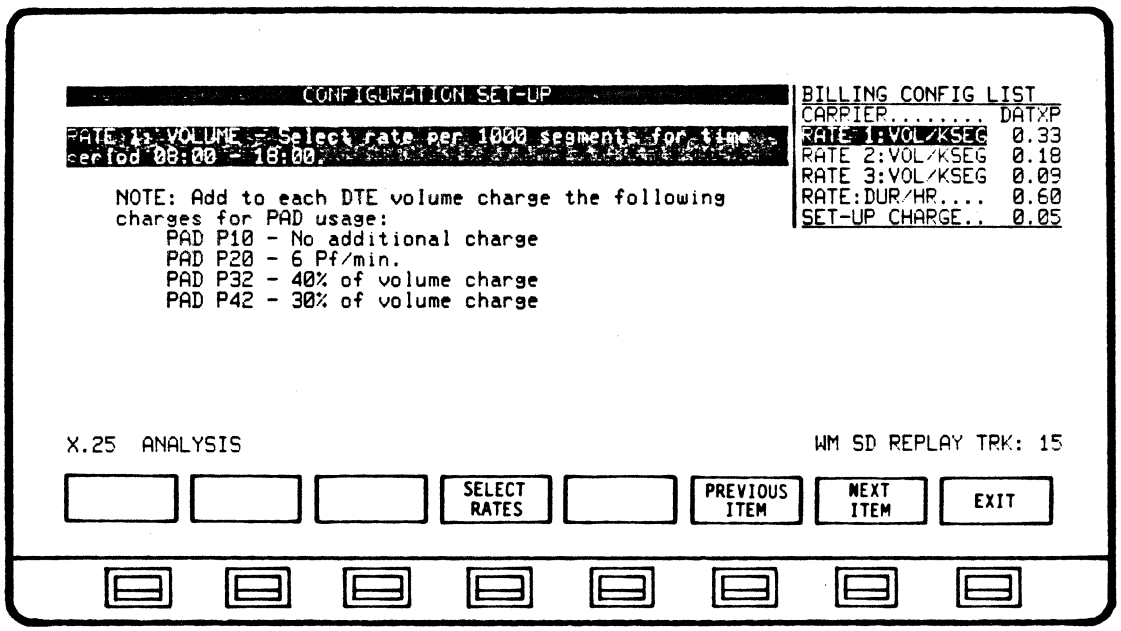


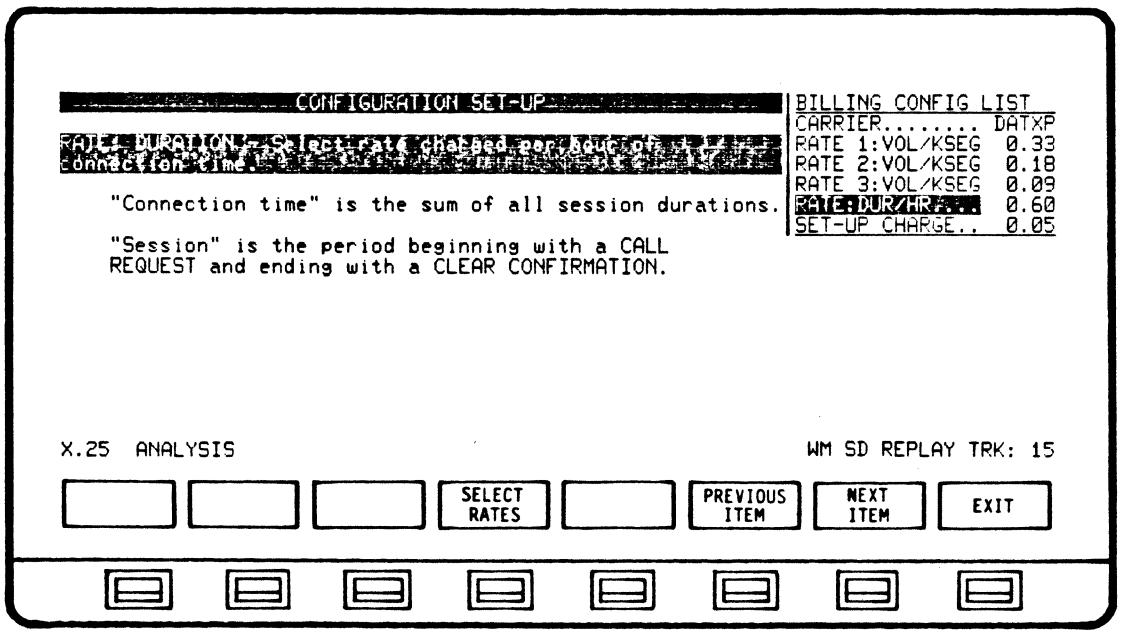
5.9.3.4 UK-PSS Configuration Displays



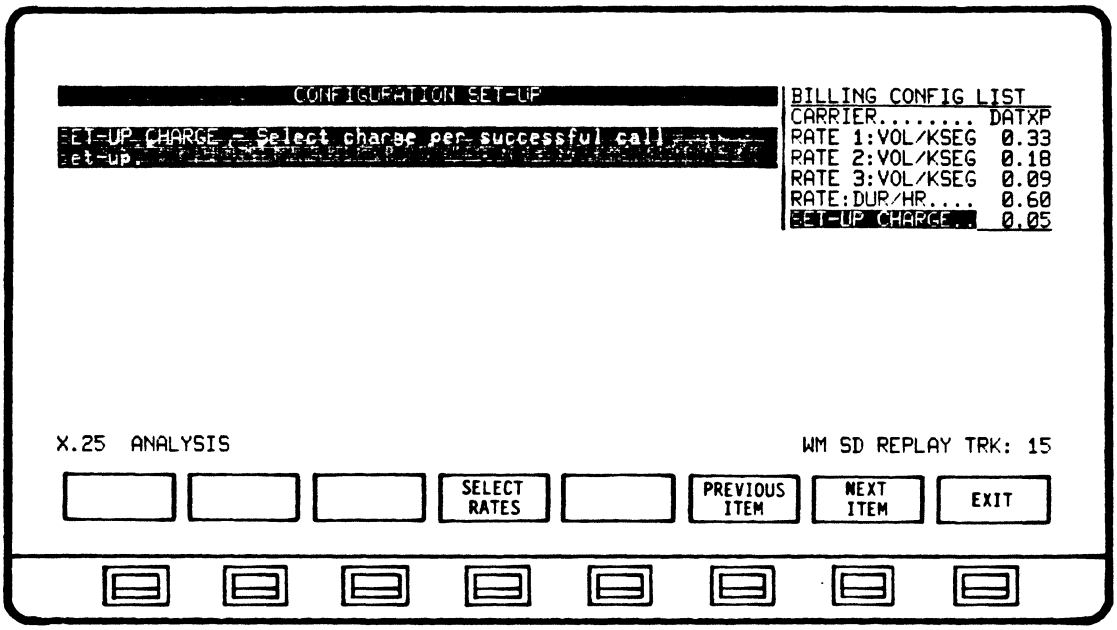


5.9.3.5 DATEX-P Configuration Displays





5.9.3.5 DATEX-P Configuration Displays



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:

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

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

ANALYSIS

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

SET UP ANALYSIS

DISPLAY SET UP	GENERAL ALARMS	LCN ALARMS			BILLING CONFIG		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

START- 11:58:22 SEGMENTATION FILLING REPORT STOP- 12:11:45

LCN NUMBER	NUMBER OF SEND CHARACTERS	NUMBER OF SEND SEGMENTS	SEGMENTATION FILLING FACTOR
*0007	1416	23	% 96
*0006	1380	22	98
*0005	1308	21	97
*0004	1398	22	99
*0003	1092	18	94
*0002	1092	18	94

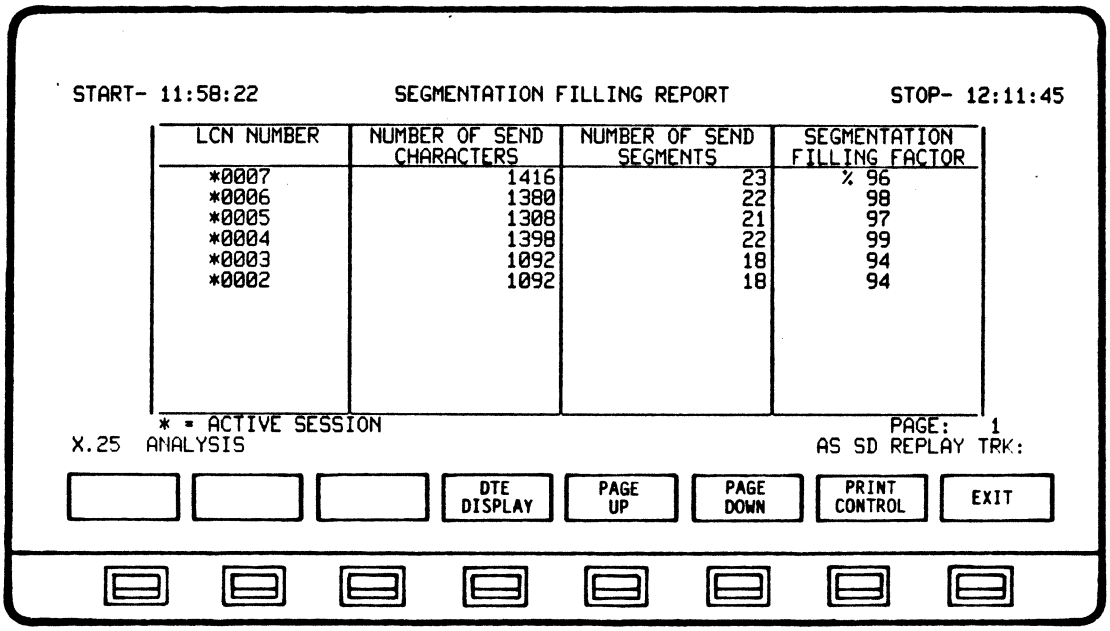
* = ACTIVE SESSION PAGE: 1

X.25 ANALYSIS AS SD REPLAY TRK:

			DTE DISPLAY	PAGE UP	PAGE DOWN	PRINT CONTROL	EXIT

TYPICAL SEGMENTATION FILLING REPORT

5.10.1 Segmentation Filling Softkey/Label Display Descriptions



SOFTKEY/LABEL	FUNCTION
[ ]	Not Used
[ ]	Not Used
[ ]	Not Used
[DTE DISPLAY] / [LCN DISPLAY]	Toggles between LCN and DTE Segmentation Fill Reports (dual function softkey)
[PAGE UP]	Data displayed on screen is scrolled-up one (1) page at a time, allowing the most recent data captured to be displayed.
[PAGE DOWN]	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***
[PRINT CONTROL]	Initiates Print Control Softkey/label display. (Ref 5.3.6)
[EXIT]	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 "AF". 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

RUN ANALYSIS

STOP ANALYSIS	FREEZE DISPLAY	CHANGE DISPLAY	DTE ADDRESSES	CHANGE LCN	ALARM REPORT		

STOP ANALYSIS

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

DISPLAY CONTROL

		CHANGE DISPLAY	DTE ADDRESSES	CHANGE LCN	ALARM REPORT	PRINT CONTROL	EXIT

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

TIME	ALARM TYPE	15 MINUTE INTERVAL
11:59:58	01	POLL WITHOUT FINAL
11:59:58	01	POLL WITHOUT FINAL
12:00:06	01	QUALITY RATIO = 01%
12:03:05	01	POLL WITHOUT FINAL
12:03:05	01	POLL WITHOUT FINAL
12:09:22 →	01	POLL WITHOUT FINAL

X.25 ANALYSIS AS SD REPLAY TRK: 85

CURSOR UP	CURSOR DOWN	CLEAR ALARM	CLEAR BUFFER	PAGE UP	PAGE DOWN	PRINT CONTROL	EXIT

TYPICAL GENERAL ALARM REPORT

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.

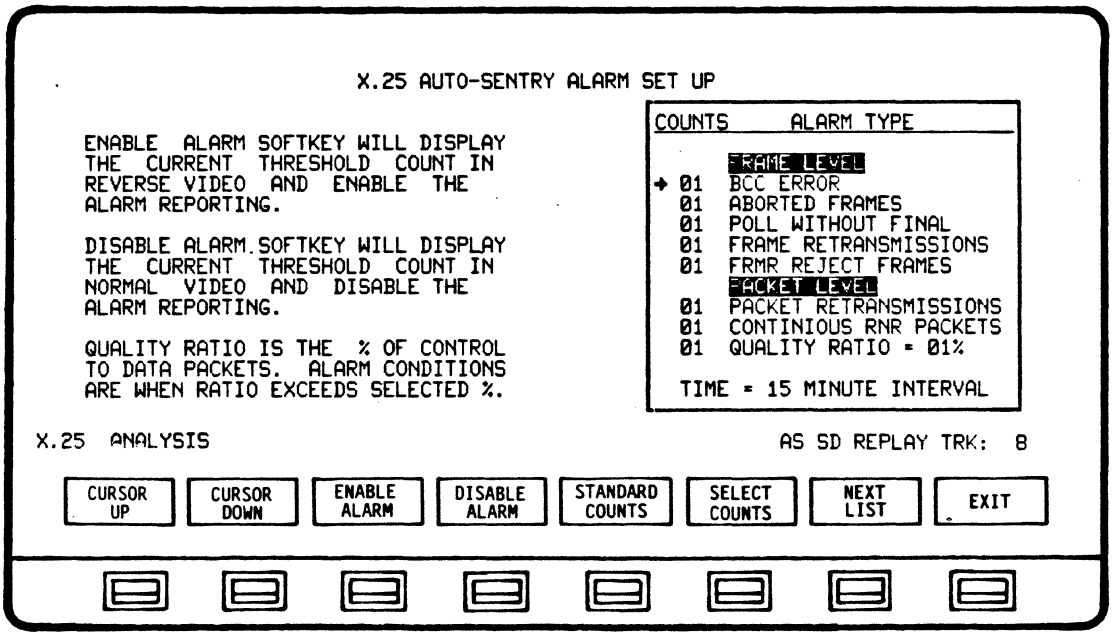
6.2.1 Threshold Alarms

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.



THRESHOLD ALARM SET UP DISPLAY

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.

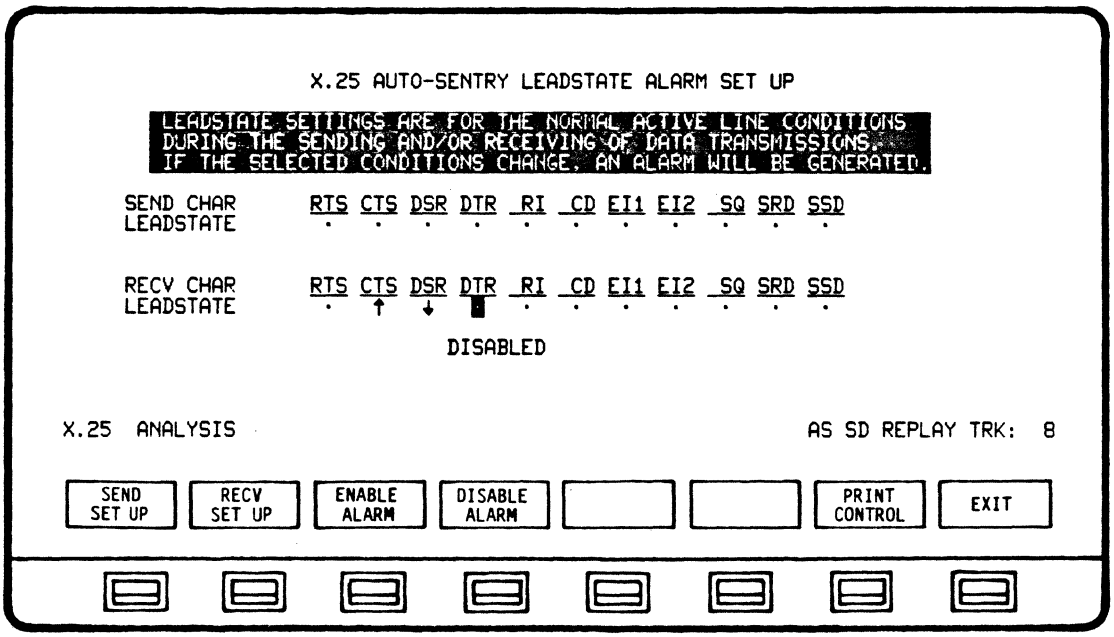
The quality ratio, which shows the ratio of control packets to data packets over a 15 minute period, is the basis of the Daily Traffic Activity Report . An alarm is recorded in the GENERAL ALARM if the ratio falls below the threshold value.

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



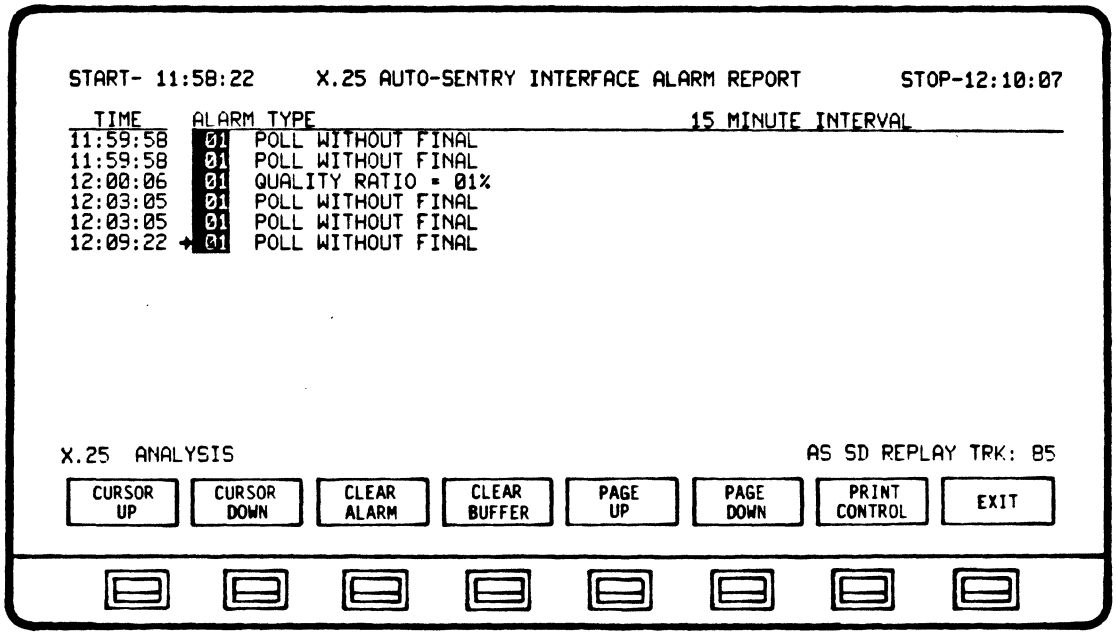
LEADSTATE ALARM SET UP DISPLAY

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.

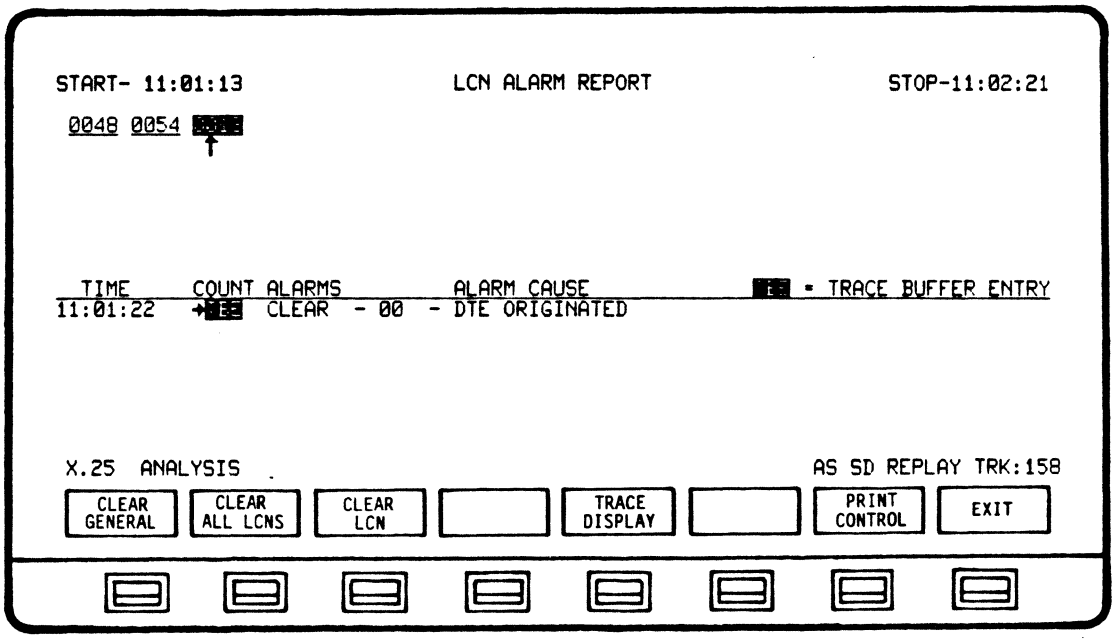


GENERAL ALARM REPORT DISPLAY

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.



TYPICAL LCN ALARM REPORT

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.

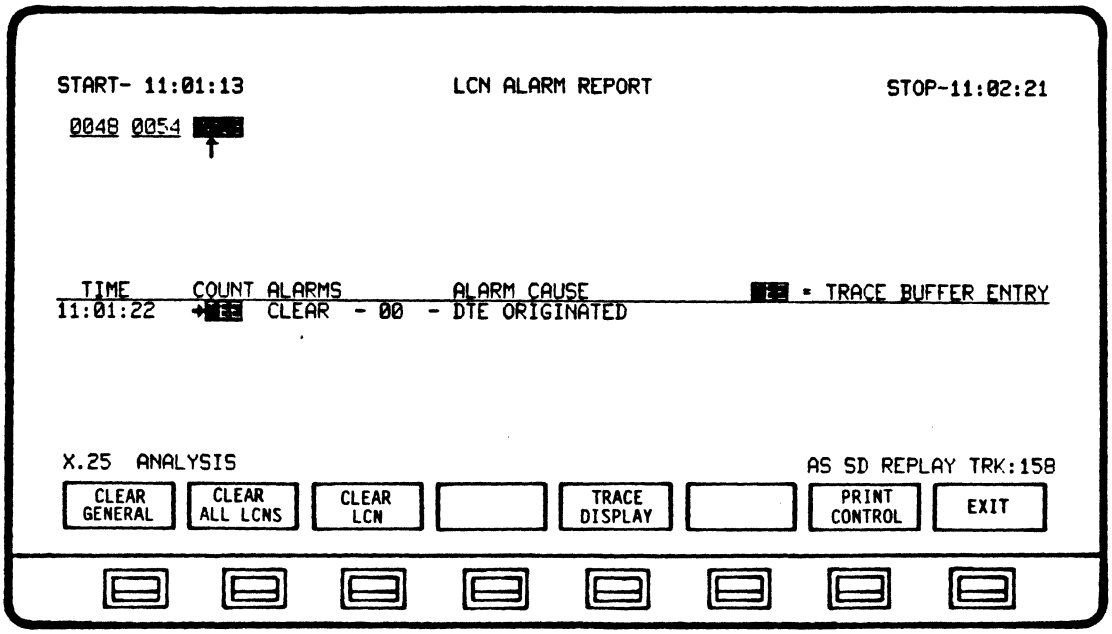
NOTE

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.



LCN ALARM REPORT DISPLAY

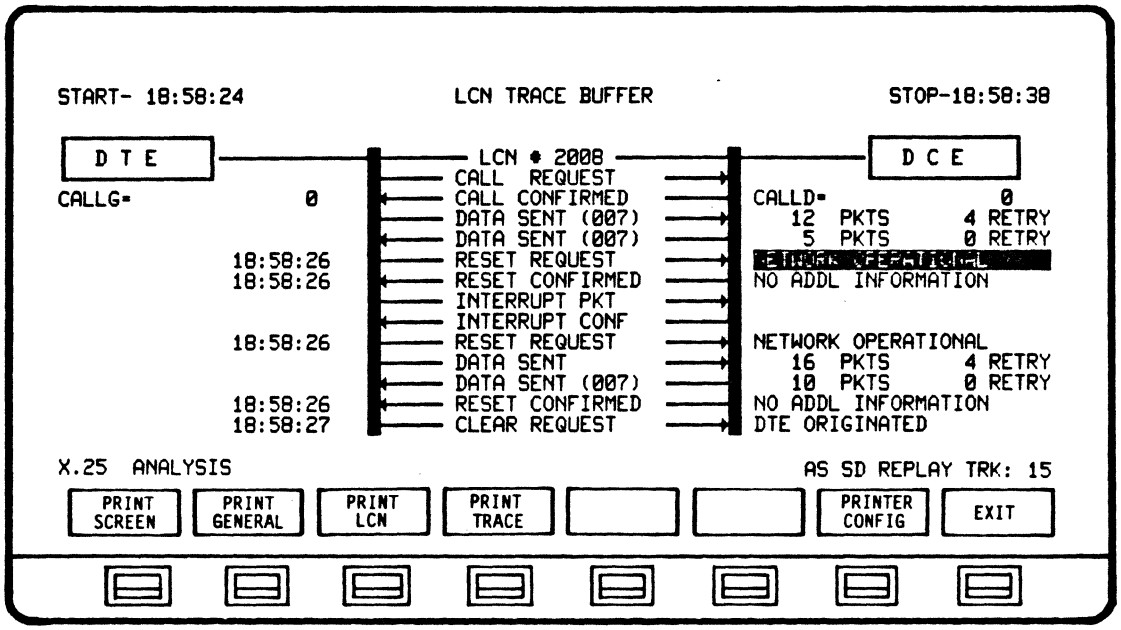
6.3.1 LCN Alarm Display Format

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.



TRACE BUFFER DISPLAY

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.

6.4 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.

ANALYSIS

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

RUN ANALYSIS

		CHANGE DISPLAY	DTE ADDRESSES	CHANGE LCN	ALARM REPORT	PRINT CONTROL	EXIT

6.4.2 Viewing Alarm Reports After Running Analysis

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

RUN ANALYSIS

STOP ANALYSIS	FREEZE DISPLAY	CHANGE DISPLAY	CHANGE RANGE	CHANGE LCN	ALARM REPORT		

ANALYSIS

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

DISPLAY CONTROL

		CHANGE DISPLAY	DTE ADDRESSES	CHANGE LCN	ALARM REPORT	PRINT CONTROL	EXIT

6.4.3 Viewing the Trace Buffer

The Trace Buffer is accessed via BUFFER CONTROL, an option on the LCN Alarm Report menu.

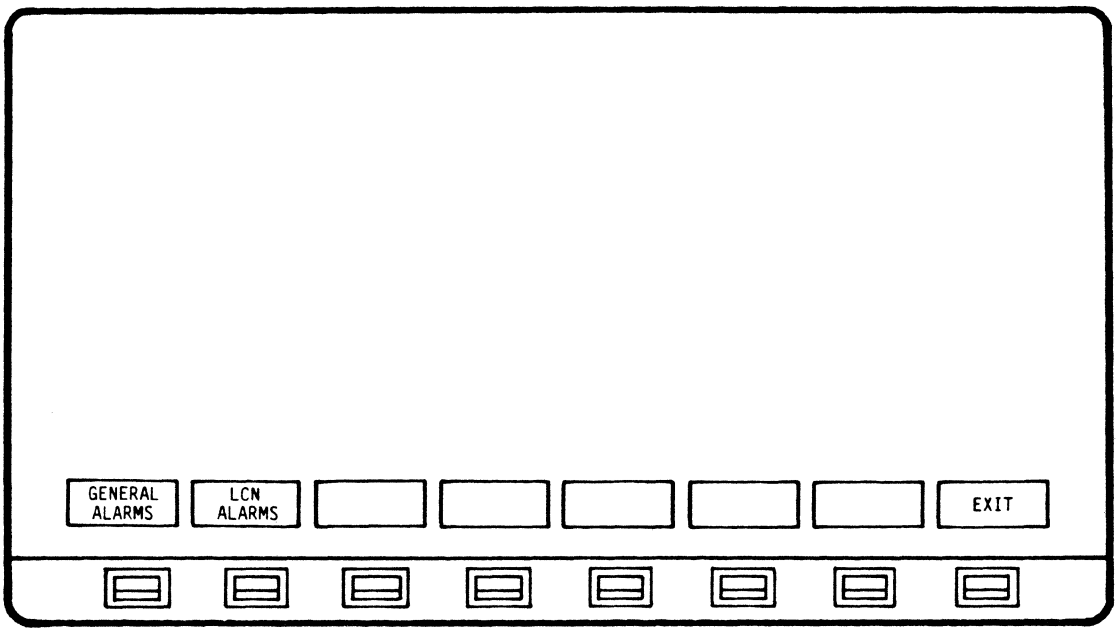
LCN ALARMS

CURSOR UP	CURSOR DOWN	CLEAR ALARM	BUFFER CONTROL	PREVIOUS LCN	NEXT LCN	PRINT CONTROL	EXIT

BUFFER CONTROL

CLEAR GENERAL	CLEAR ALL LCNS	CLEAR LCN		TRACE DISPLAY		PRINT CONTROL	EXIT

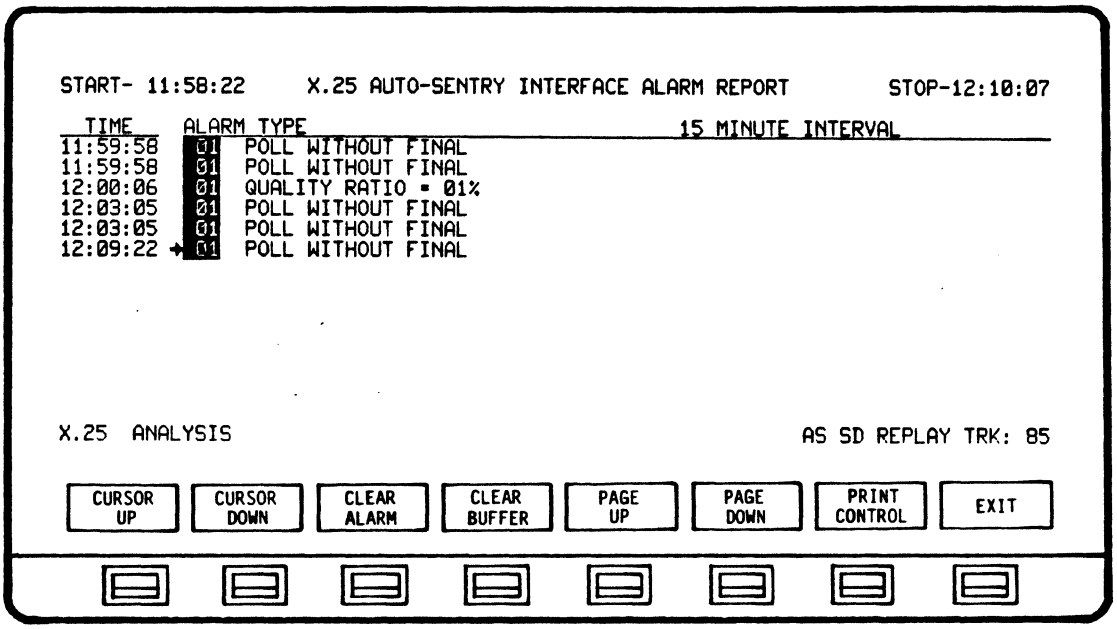
6.5 Auto Sentry Softkey/Label Display Descriptions



6.5.1 AUTO-SENTRY Softkey

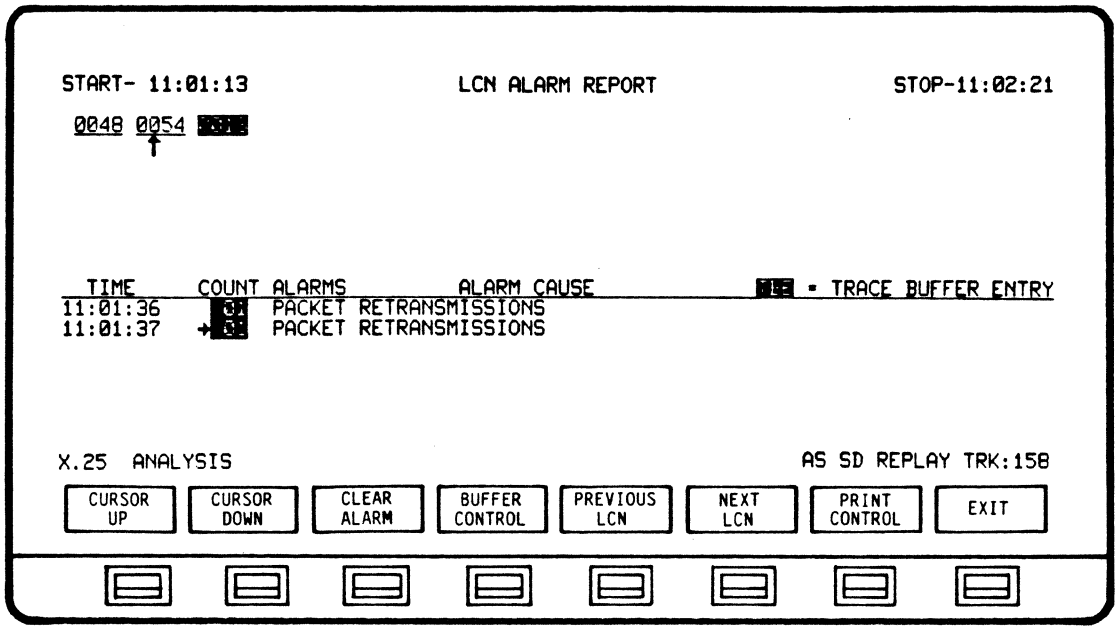
SOFTKEY/LABEL	FUNCTION
GENERAL ALARMS	Selects General Alarm Report for review and/or print out (Ref 6.5.2).
LCN ALARMS	Selects LCN Alarm Report for review and/or print out (Ref 6.5.3).
	Not Used
	Not Used
	Not Used
	Not Used
	Not Used
EXIT	Return to previous softkey/label display.

6.5.2 GENERAL ALARMS Report Softkey/Label Display



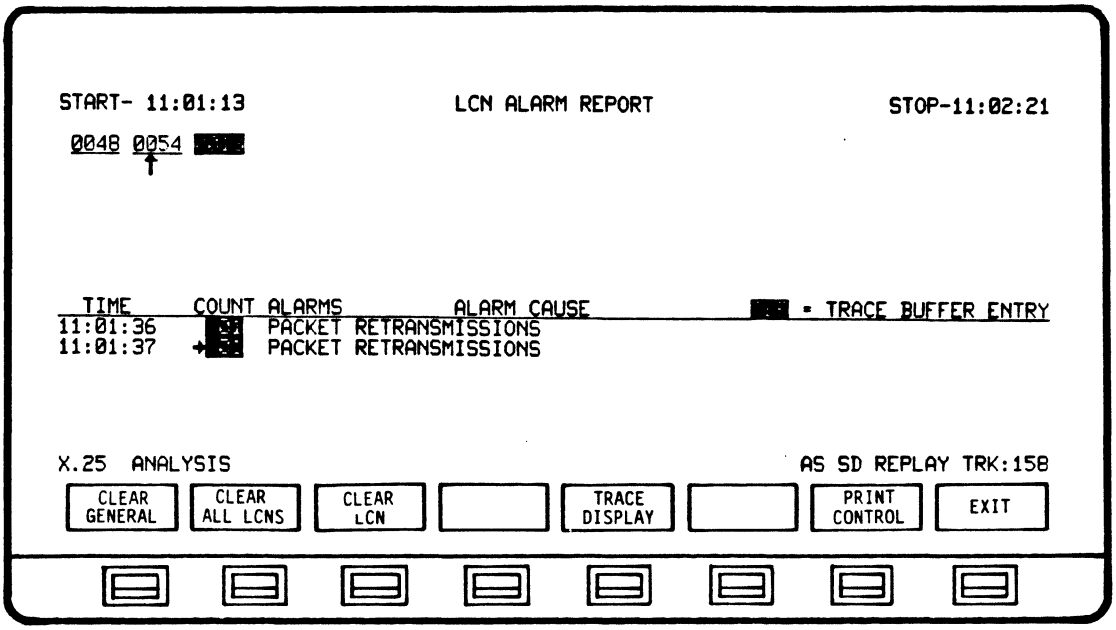
SOFTKEY/LABEL	FUNCTION
CURSOR UP	Moves arrow cursor one(1) line position up on Alarm Report
CURSOR DOWN	Moves arrow cursor one(1) line position down on Alarm Report.
CLEAR ALARM	Clears one(1) designated (cursor) alarm from the display.
CLEAR BUFFER	Clears complete alarm buffer.
PAGE UP	Report displayed on screen is scrolled-down one(1) page at a time, allowing previous alarms captured to be displayed.
PAGE DOWN	Report displayed on screen is scrolled-up one (1) page at a time, allowing most recent alarms captured to be reviewed.
PRINT CONTROL	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)
EXIT	Return to previous softkey/label display. (GENERAL ALARMS - Ref 6.5.1)

6.5.3 LCN ALARMS Report Softkey/Label Display



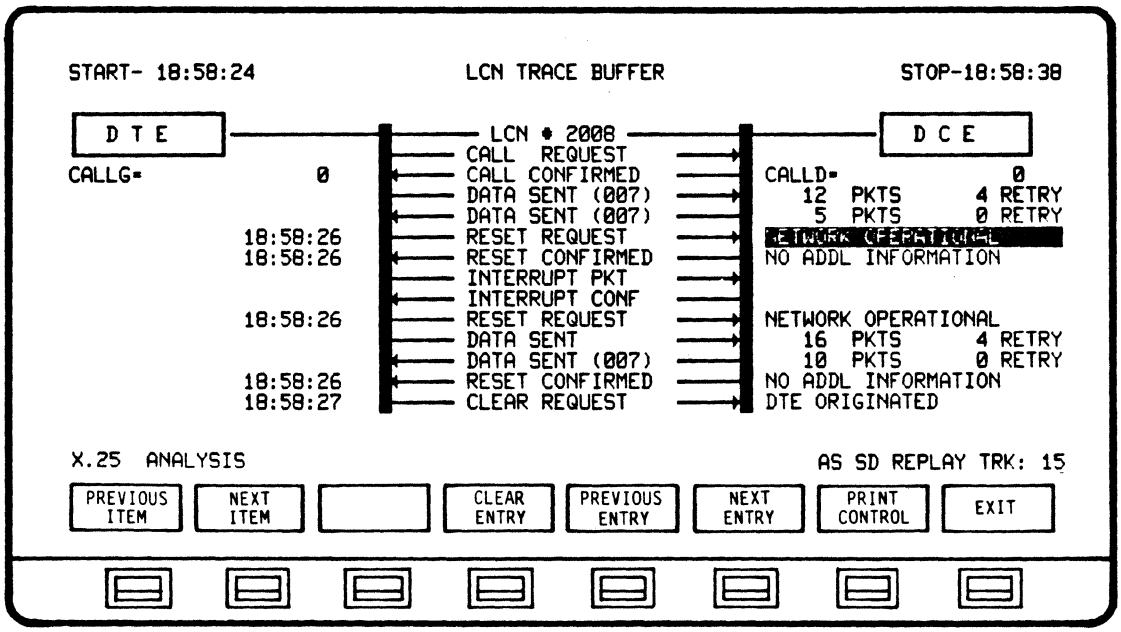
SOFTKEY/LABEL	FUNCTION
CURSOR UP	Moves Cursor up one line at a time to a desired Alarm
CURSOR DOWN	Moves cursor down one line at a time to a desired Alarm
CLEAR ALARM	Clears selected alarm from buffer.
BUFFER CONTROL	Sets up softkey/label to review alarms in Trace Buffer (Ref 6.5.4)
PREVIOUS LCN	Moves 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



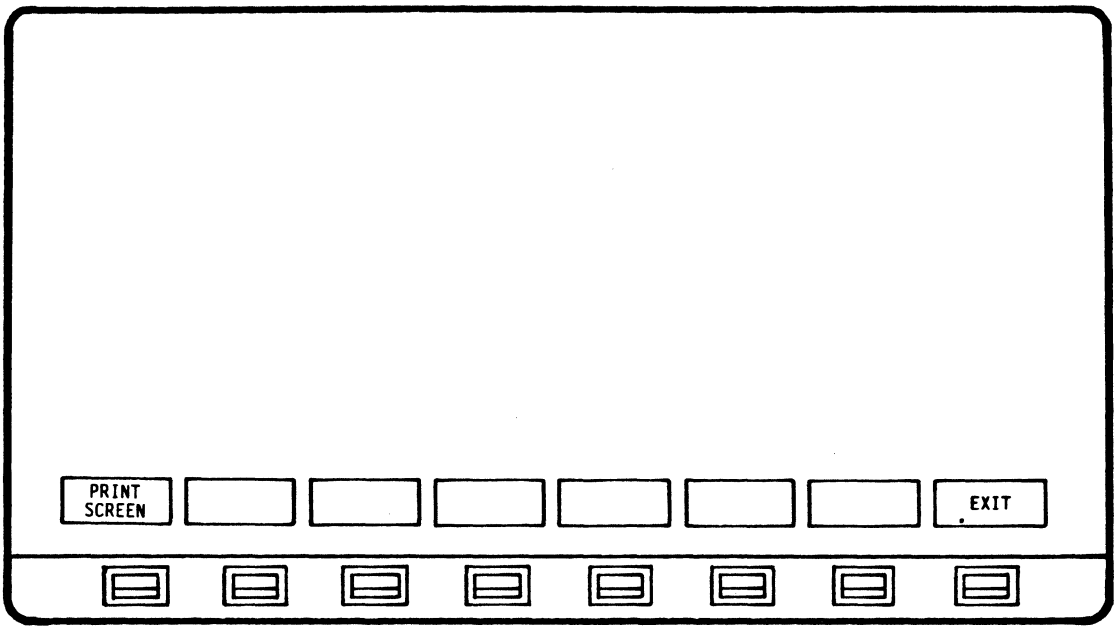
SOFTKEY/LABEL	FUNCTION
CLEAR GENERAL	Clears General Alarm Buffer.
CLEAR ALL LCNS	Clears all LCN Alarms from buffer.
CLEAR LCN	Clears selected LCN Alarms from buffer.
	Not Used
TRACE DISPLAY	Sets up softkey/label display to review Alarms in Trace buffer (Ref 6.5.5)
	Not Used
PRINT CONTROL	Sets up softkey/label 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



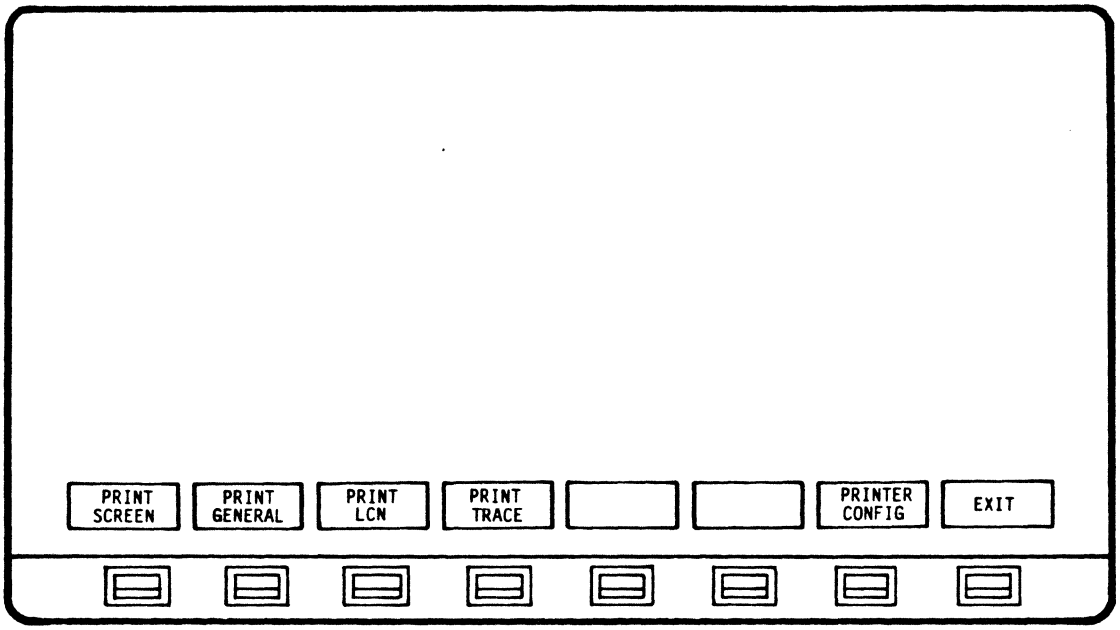
SOFTKEY/LABEL	FUNCTION
PREVIOUS ITEM	Scroll back through listed LCN events.
NEXT ITEM	Scroll forward through listed LCN events.
	Not Used
CLEAR ENTRY	Deletes displayed trace buffer entry (TBE) and captured events from trace buffer.
PREVIOUS ENTRY	Scroll back to and display preceding TBE.
NEXT ENTRY	Scroll forward to and display next TBE.
PRINT CONTROL	Initiates Print Control softkey/label display. (Ref 6.5.7)
EXIT	Return to previous softkey/label display. (TRACE DISPLAY - Ref 6.5.4)

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



SOFTKEY/LABEL	FUNCTION
PRINT SCREEN	Prints displayed LCN alarm only.
PRINT GENERAL	Prints contents of GENERAL ALARM BUFFER (not displayed).
PRINT LCN	Prints all LCN Alarms.
PRINT TRACE	Prints contents of all TRACE BUFFERS.
	Not Used
	Not Used
PRINTER CONFIG	Initiates softkey/label displays for modifying printer configuration. (Ref 3.10 - Printer Configuration User Manual)
EXIT	Return to previous softkey/label display.

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.

ANALYSIS

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

SET UP ANALYSIS

DISPLAY SET UP	GENERAL ALARMS	LCN ALARMS			BILLING CONFIG		EXIT

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.

SET UP ANALYSIS

DISPLAY SET UP	GENERAL ALARMS	LCN ALARMS			BILLING CONFIG		EXIT

GENERAL ALARMS

THRESHOLD ALARMS	LEADSTATE ALARMS						EXIT

6.6.1.1 Threshold Alarm Set Up

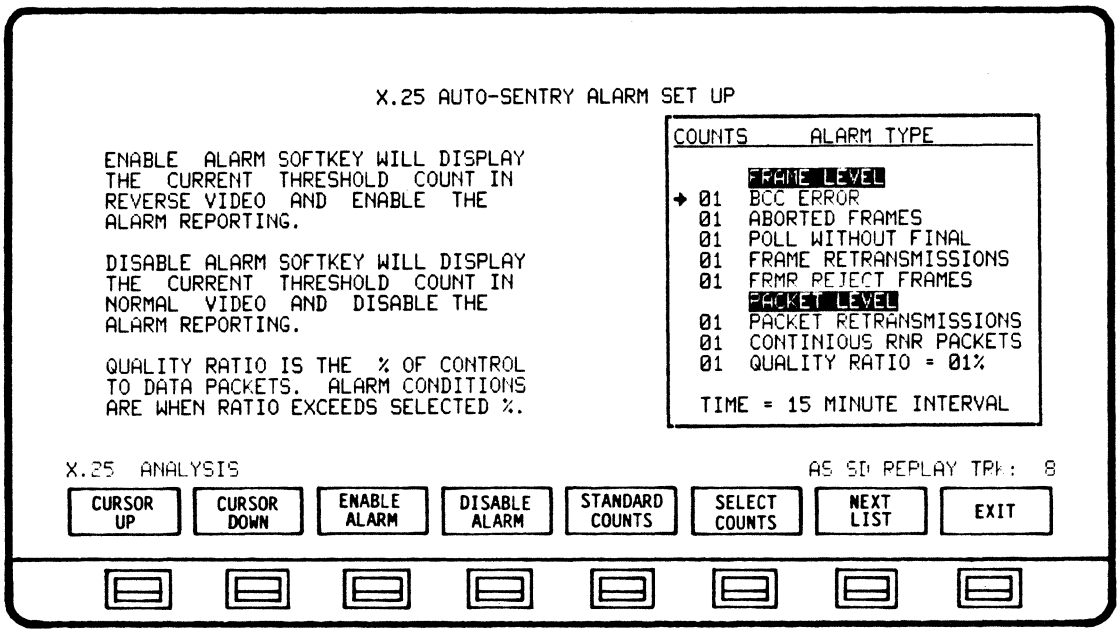
Using the Threshold Alarm Set Up display you can scroll through the listed frame and packet level events and set count thresholds; either one of 7 standard values or a number you enter, from 1 to 255.

GENERAL ALARMS

THRESHOLD ALARMS	LEADSTATE ALARMS						EXIT

THRESHOLD ALARMS

CURSOR UP	CURSOR DOWN	ENABLE ALARM	DISABLE ALARM	STANDARD COUNTS	SELECT COUNTS	NEXT LIST	EXIT



THRESHOLD ALARMS SET UP DISPLAY

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, EI1, EI2, SQ, SRD and SSD) and subsequently enable or disable the choices for alarming.

NOTE

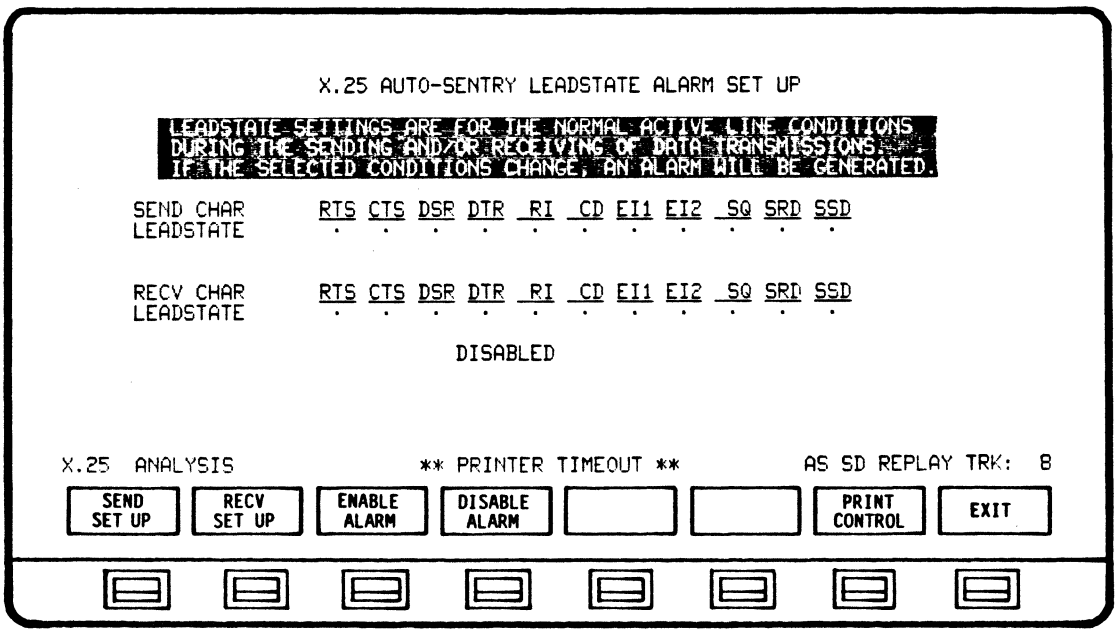
SQ, SRD and SSD appear ONLY when an interactive ICU is attached to the AUTOSCOPE.

GENERAL ALARMS

THRESHOLD ALARMS	LEADSTATE ALARMS						EXIT

LEADSTATE ALARMS

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



LEADSTATE ALARMS SET UP DISPLAY

6.6.2 LCN Alarm Configuration

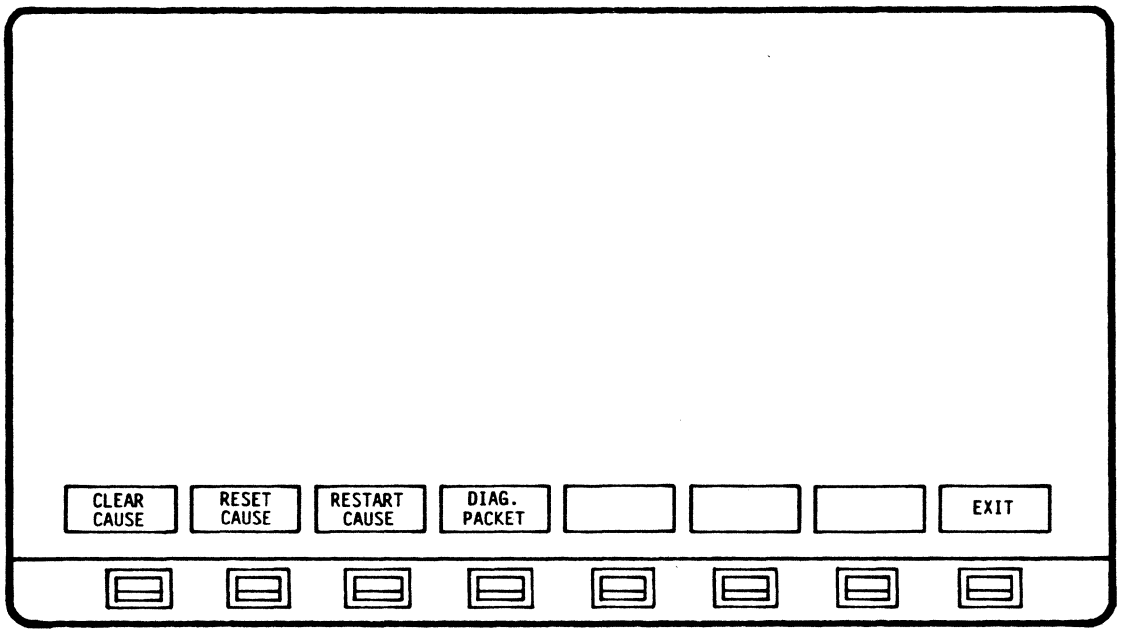
There are 4 LCN Alarm Set Up displays for setting CLEAR CAUSE, RESET CAUSE, RESTART CAUSE and DIAGNOSTIC PACKET alarms. You can scroll through the three cause code displays, and enable or disable items for alarming. The diagnostic packets, on the other hand, are enabled or disabled as a group.

SET UP ANALYSIS

DISPLAY SET UP	GENERAL ALARMS	LCN ALARMS			BILLING CONFIG		EXIT

LCN ALARMS

CLEAR CAUSE	RESET CAUSE	RESTART CAUSE	DIAG. PACKET				EXIT



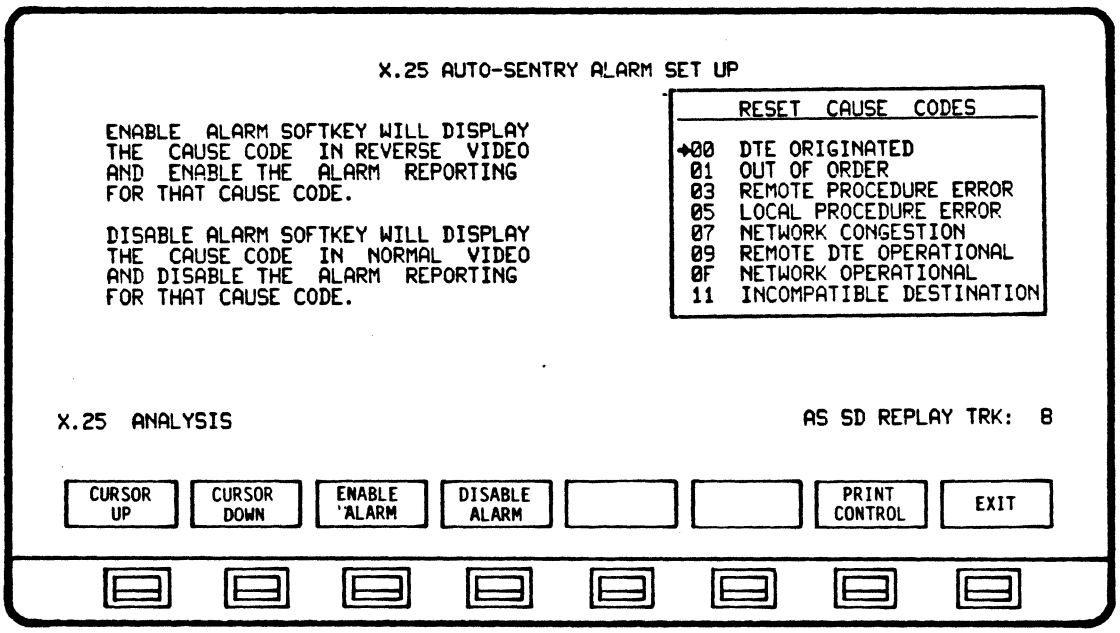
LCN ALARMS SET UP DISPLAY

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.

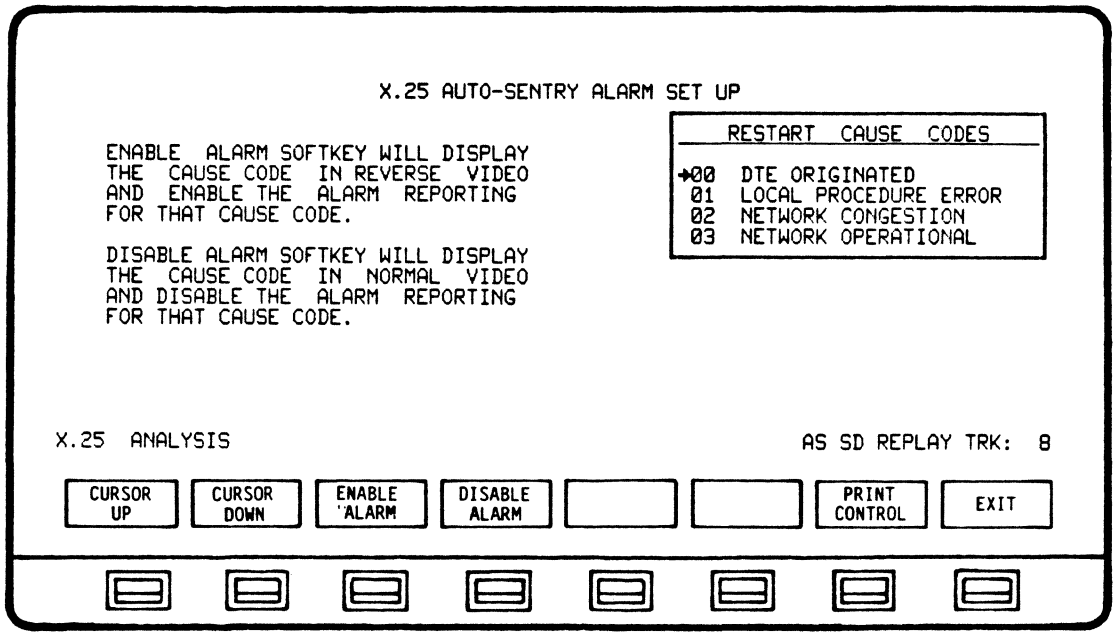
Reset Packet Cause Codes

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



RESET CAUSE CODES SET UP DISPLAY

6.6.2.2 Restart Cause Codes Set Up



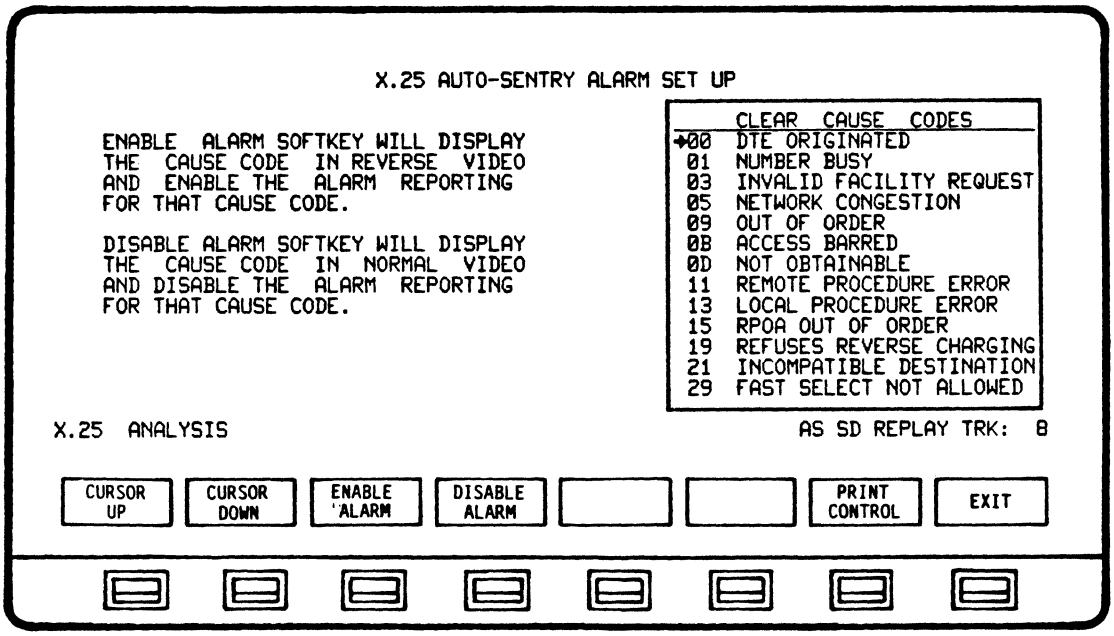
RESTART CAUSE CODES SET UP DISPLAY

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



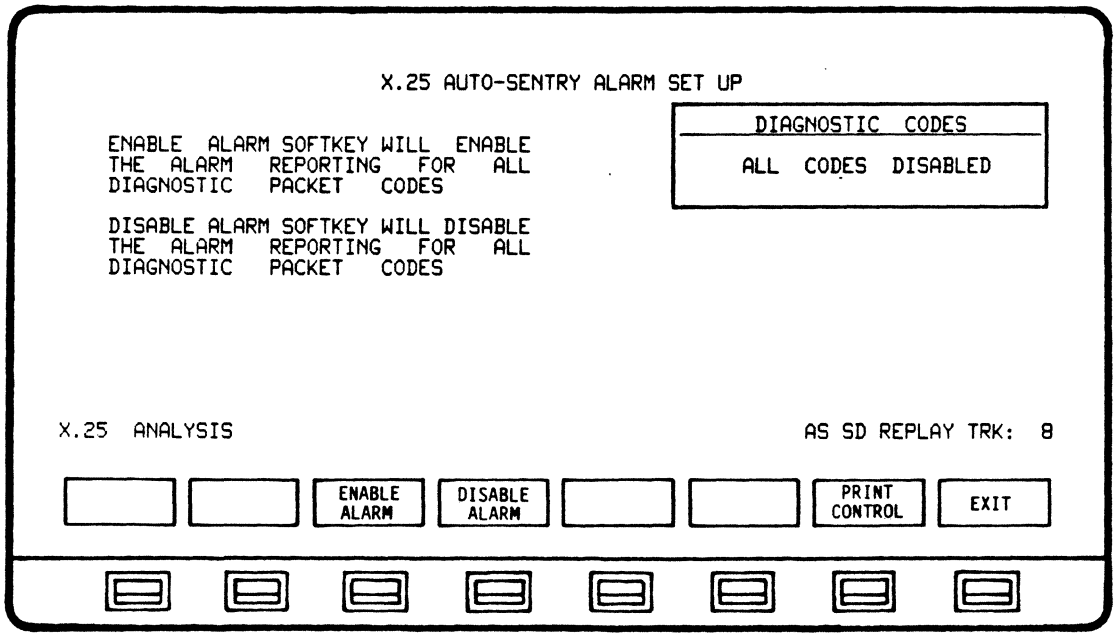
CLEAR CAUSE CODES SET UP DISPLAY

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

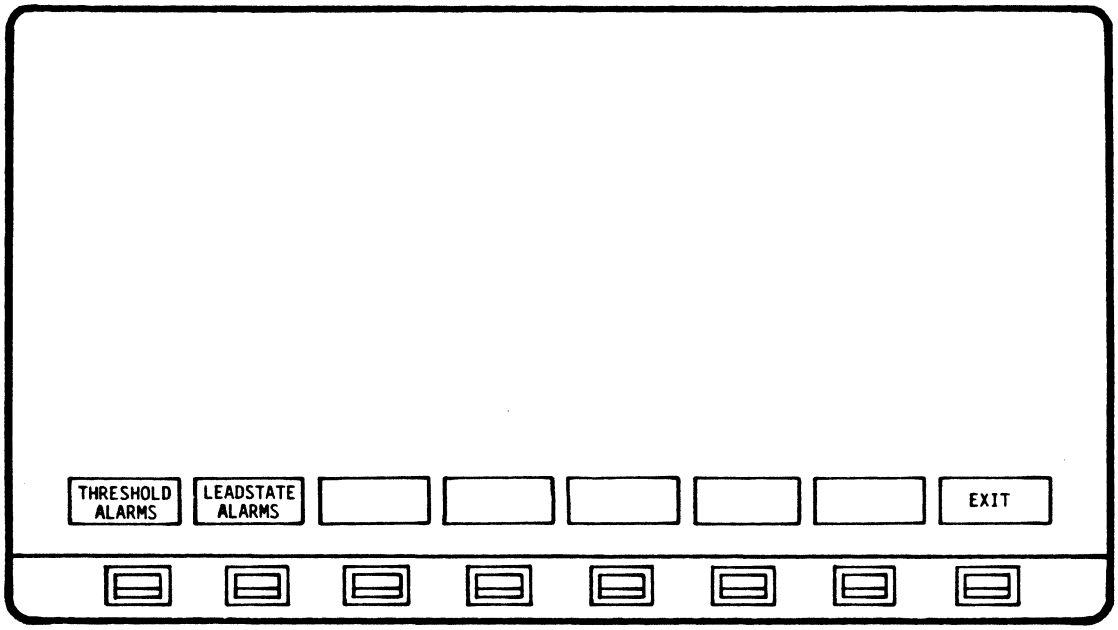
6.6.2.4 Diagnostic Packet Alarms Set Up



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.

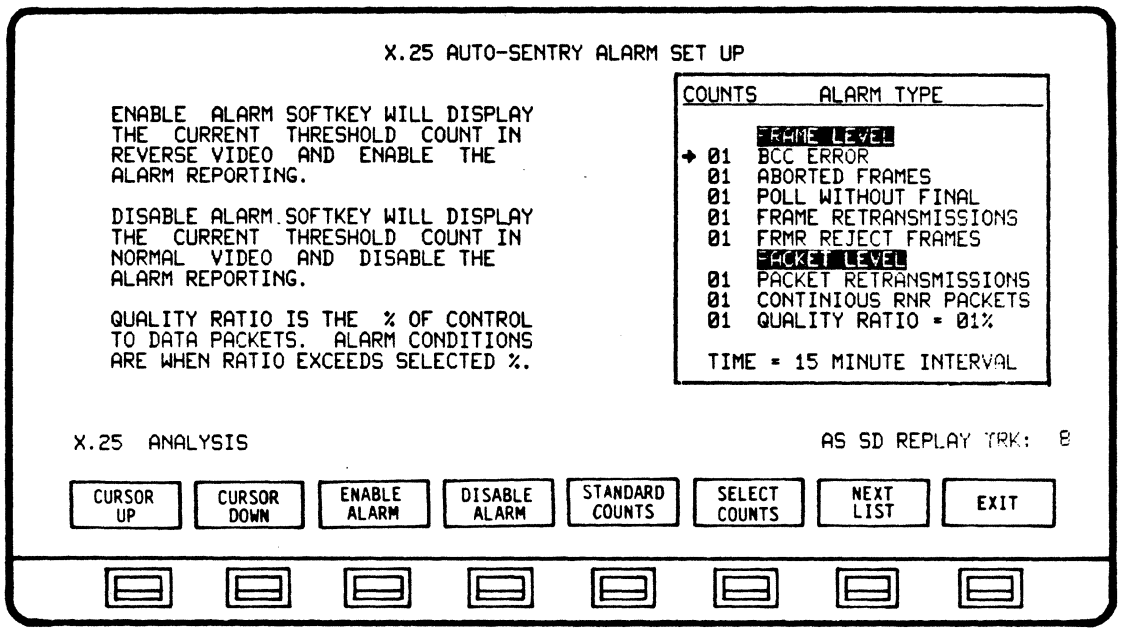
6.7 AUTO-SENTRY Alarms Set Up Softkey/Label Display Descriptions



6.7.1 GENERAL ALARMS Softkey/Label Display

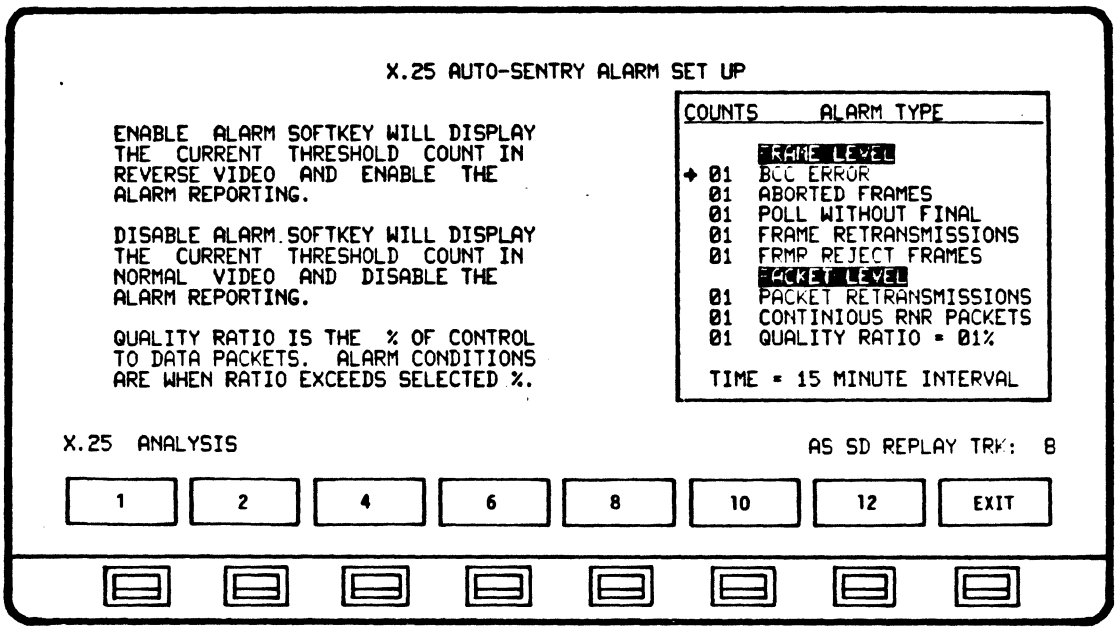
SOFTKEY/LABEL	FUNCTION
THRESHOLD ALARMS	Sets up softkey/label display to select Threshold Alarm parameters.
LEADSTATE ALARMS	Sets up softkey/label display to select Leadstate Alarm parameters.
	Not Used
	Not Used
	Not Used
	Not Used
	Not Used
EXIT	Return to previous softkey/label display. (GENERAL ALARMS - Ref 5.3.2)

6.7.2 THRESHOLD ALARMS Softkey/Label Display



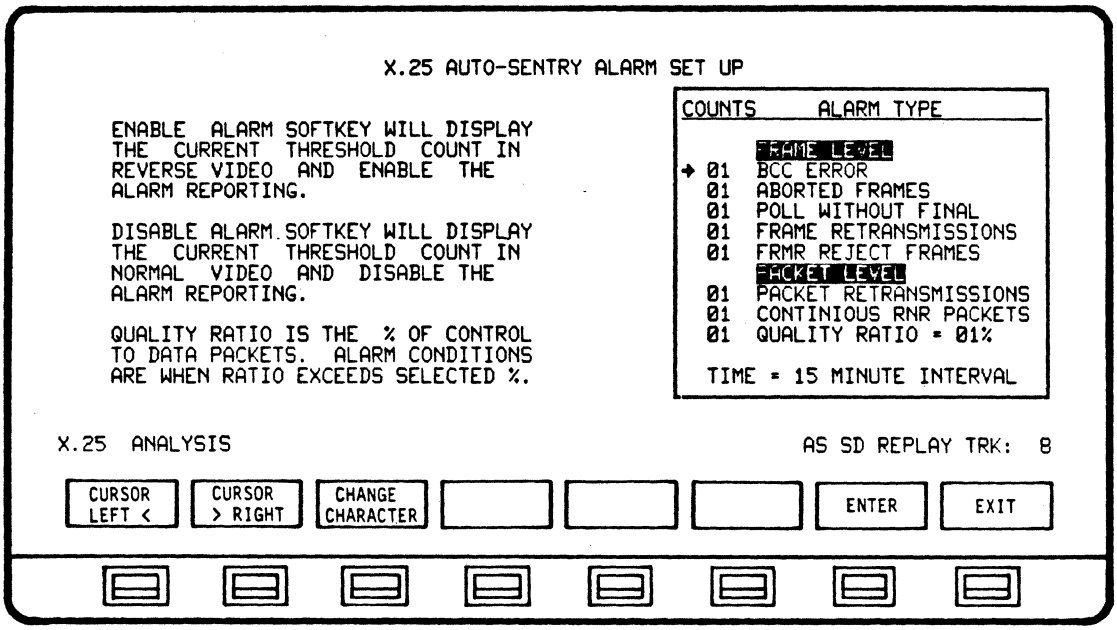
SOFTKEY/LABEL	FUNCTION
CURSOR UP	Moves Arrow Cursor one(1) line up to select alarm counts and type
CURSOR DOWN	Moves Arrow Cursor one(1) line down to select alarm counts and type
ENABLE ALARM	Initiates Alarm reporting
DISABLE ALARM	Disables Alarm reporting
STANDARD COUNTS	Sets up softkey/label display 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



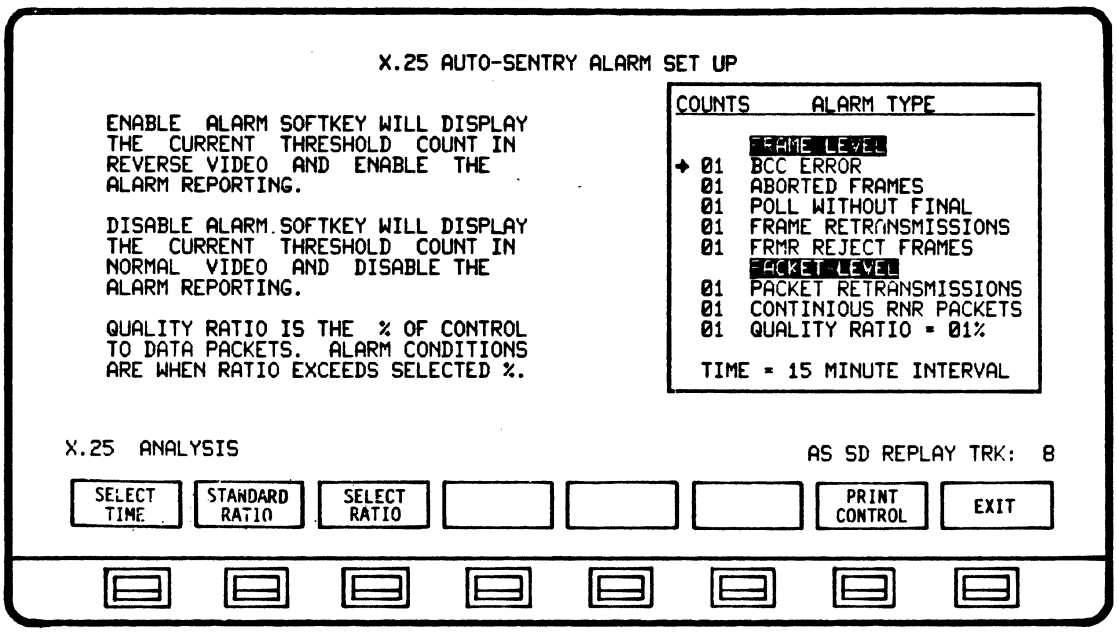
SOFTKEY/LABEL	FUNCTION
1	Selects 1 as the standard count.
2	Selects 2 as the standard count.
4	Selects 4 as the standard count.
6	Selects 6 as the standard count.
8	Selects 8 as the standard count.
10	Selects 10 as the standard count.
12	Selects 12 as the standard count.
EXIT	Return to previous softkey/label display. (STANDARD COUNTS - Ref 6.7.2)

6.7.2.2 SELECT COUNTS Softkey/Label Display



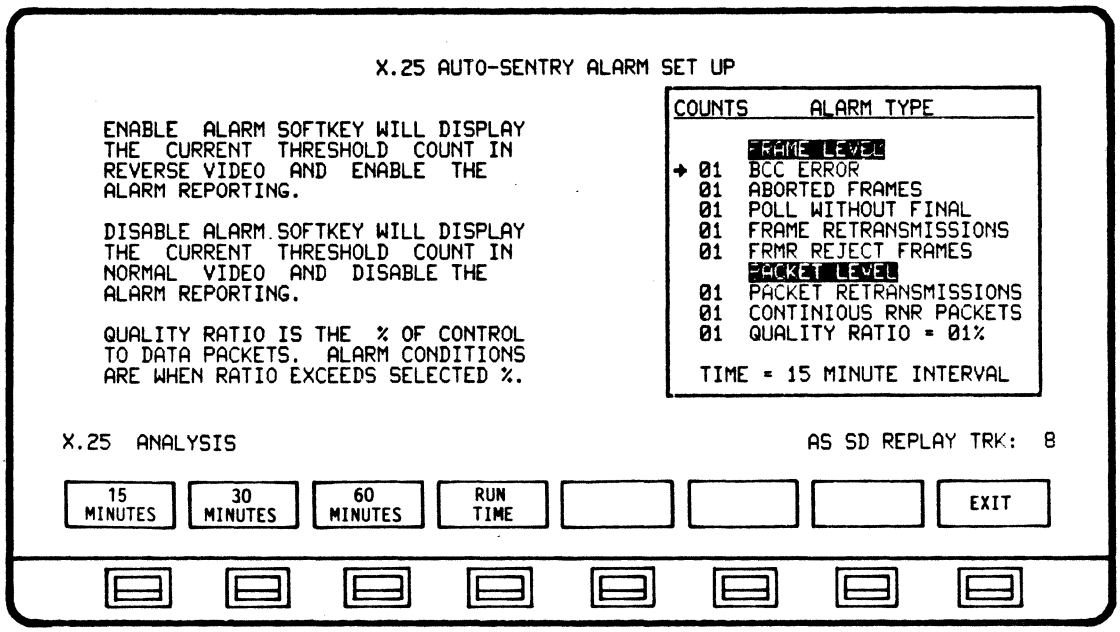
SOFTKEY/LABEL	FUNCTION
CURSOR LEFT <	Moves cursor one(1) character position left in parameter line to be changed.
CURSOR > RIGHT	Moves cursor one(1) character position right in parameter line to be changed.
CHANGE CHARACTER	Changes character in cursor location. Characters will cycle sequentially when softkey is depressed. (Decimal - 0 to 9)
	Not Used
	Not Used
	Not Used
ENTER	Enters new 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)
EXIT	Return to previous softkey/label display. (SELECT COUNTS - Ref 6.7.2)

6.7.2.3 NEXT LIST Softkey/Label Display



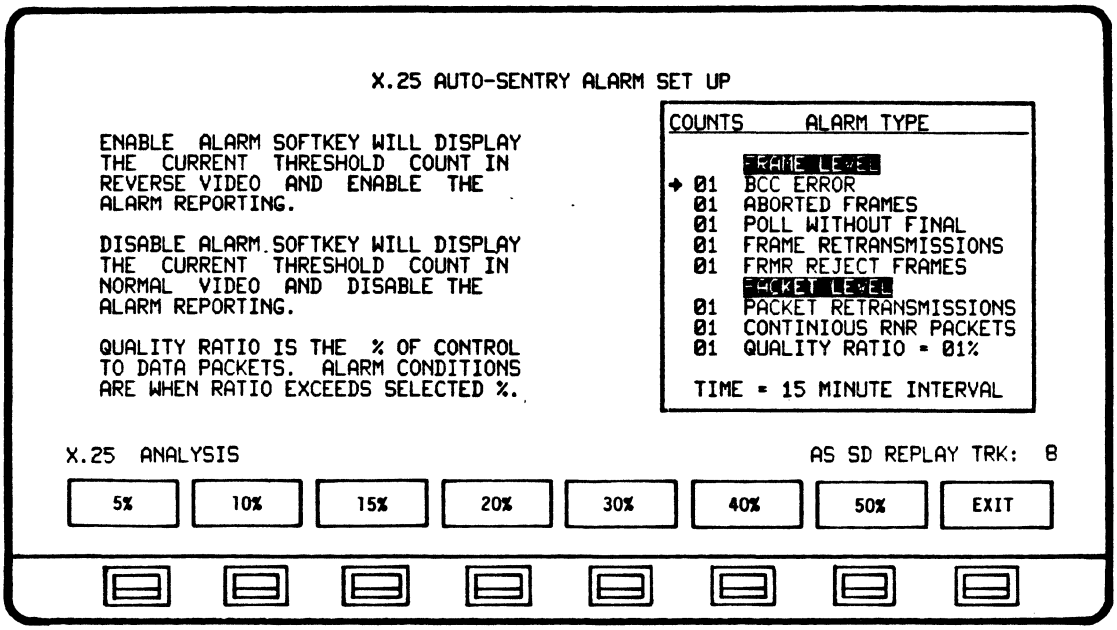
SOFTKEY/LABEL	FUNCTION
SELECT TIME	Sets up softkey/label display to select alarm time parameters. (Ref 6.7.2.4)
STANDARD RATIO	Sets up softkey/label display to select a standard quality ratio. (Ref 6.7.2.5)
SELECT RATIO	Sets up softkey/label display to create a custom ratio. (Ref 6.7.2.6)
	Not Used
	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



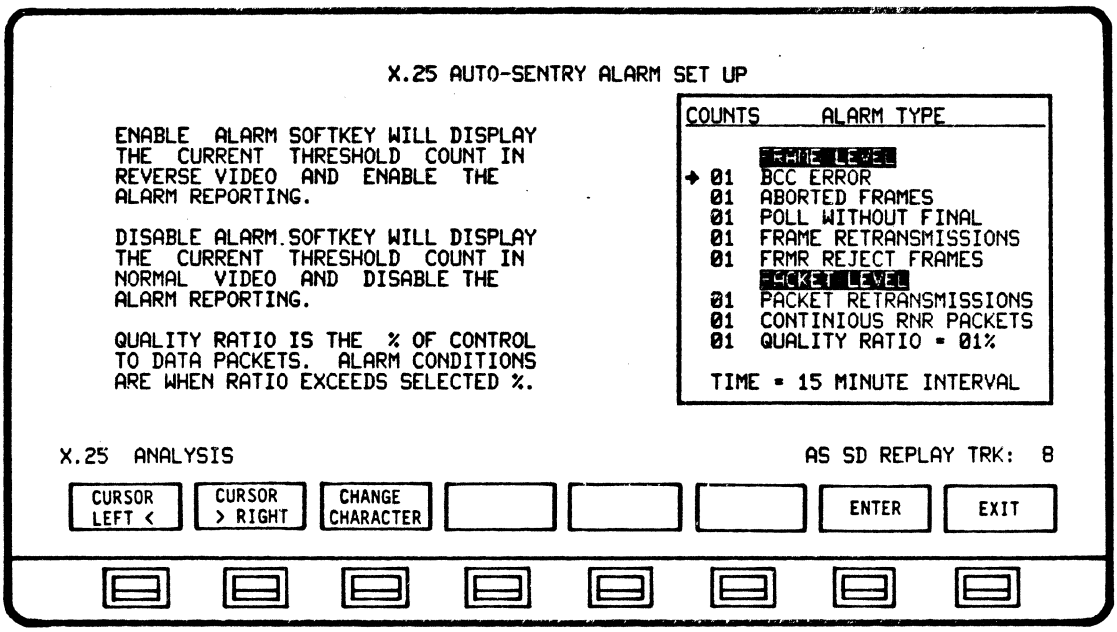
SOFTKEY/LABEL	FUNCTION
15 MINUTES	Selects 15 minutes as time interval.
30 MINUTES	Selects 30 minutes as time interval.
60 MINUTES	Selects 60 minutes as time interval.
RUN TIME	Selects RUN TIME as the time interval.
	Not Used
	Not Used
	Not Used
EXIT	Return to previous softkey/label display. (SELECT TIME - Ref 6.7.2.3)

6.7.2.5 STANDARD RATIO Softkey/Label Display



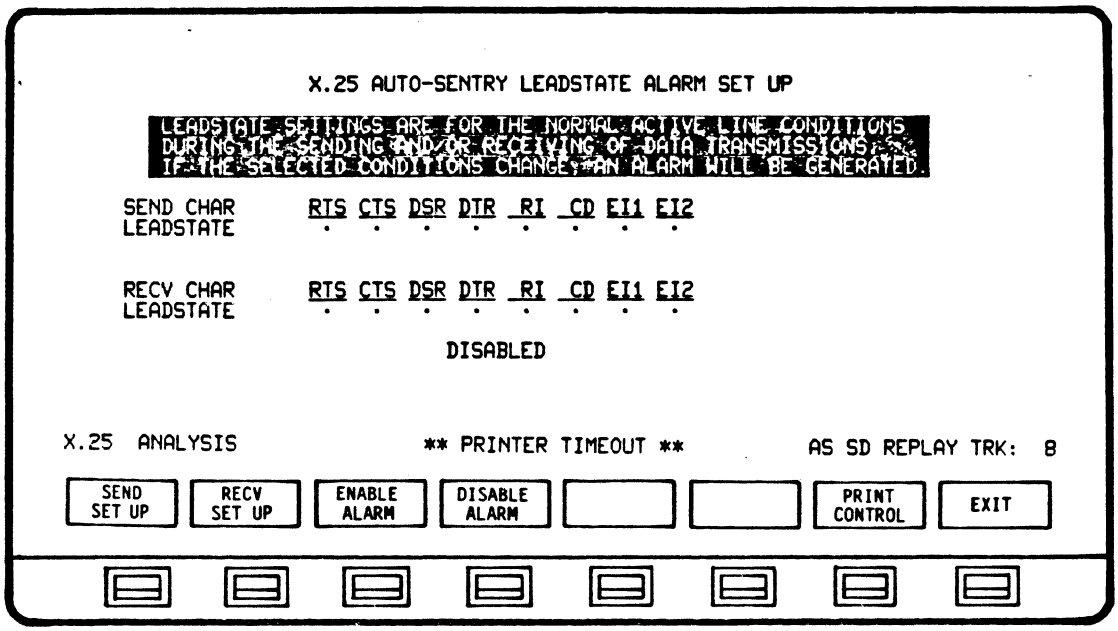
SOFTKEY/LABEL	FUNCTION
5%	Selects 5% as the standard quality ratio.
10%	Selects 10% as the standard quality ratio.
15%	Selects 15% as the standard quality ratio.
20%	Selects 20% as the standard quality ratio.
30%	Selects 30% as the standard quality ratio.
40%	Selects 40% as the standard quality ratio.
50%	Selects 50% as the standard quality ratio.
EXIT	Return to previous softkey/label display. (STANDARD RATIO - Ref 6.7.2.3)

6.7.2.6 SELECT RATIO Softkey/Label Display



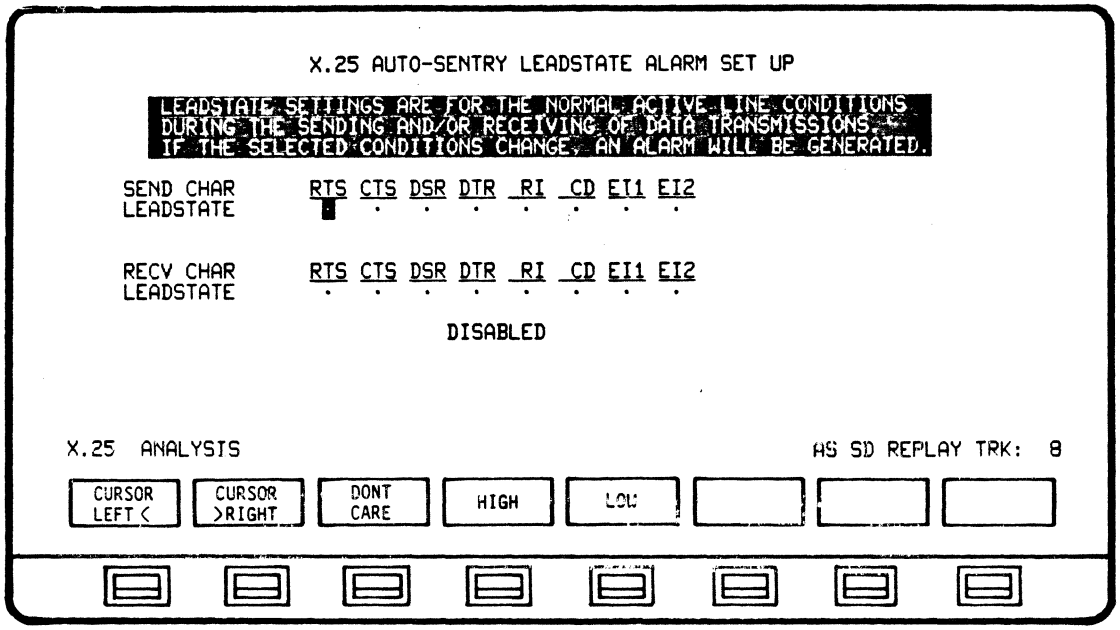
SOFTKEY/LABEL	FUNCTION
CURSOR LEFT <	Moves cursor one(1) character position left in parameter line to be changed.
CURSOR > RIGHT	Moves cursor one(1) character position right in parameter line to be changed.
CHANGE CHARACTER	Changes character in cursor location. Characters will cycle sequentially when softkey is depressed. (Decimal - 0 to 9)
	Not Used
	Not Used
	Not Used
ENTER	Enters new 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



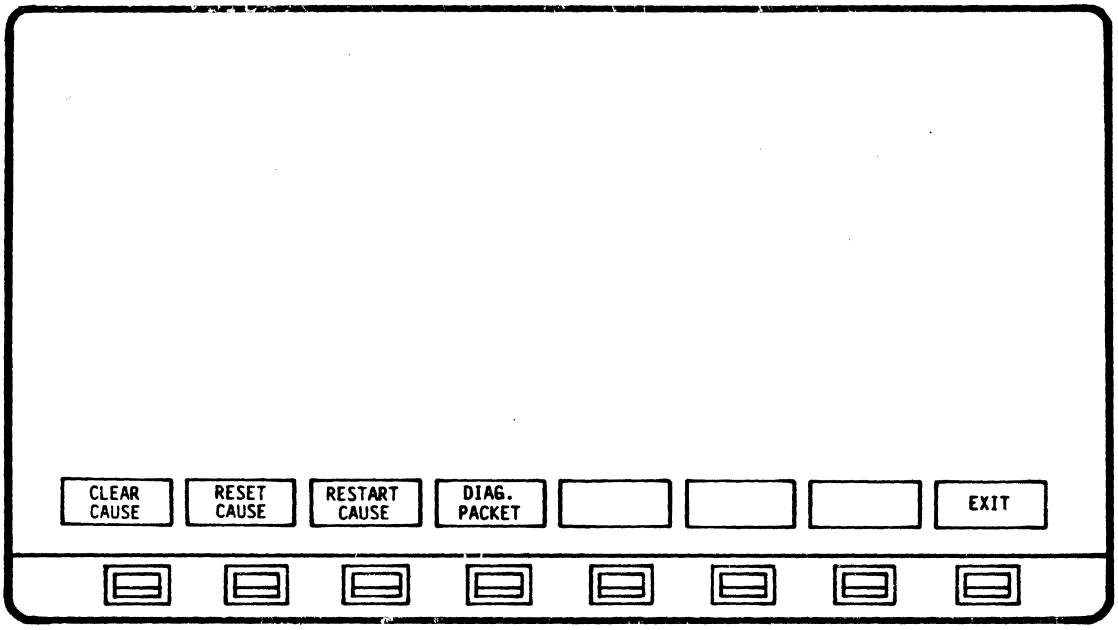
SOFTKEY/LABEL	FUNCTION
SEND SET UP	Sets up softkey/label display to select send leadstate parameters. (Ref 6.7.3.1)
RECV SET UP	Sets up softkey/label display to select receive leadstate parameters. (Ref 6.7.3.1)
ENABLE ALARM	Initiates alarm reporting.
DISABLE ALARM	Disables alarm reporting.
	Not Used
	Not Used
PRINT CONTROL	Initiates Print Control softkey/label display. (Ref 6.5.6)
EXIT	Return to previous softkey/label display. (LEADSTATE ALARM - Ref 6.7.1)

6.7.3.1 SEND SET UP/RECV SET UP Softkey/Label Display



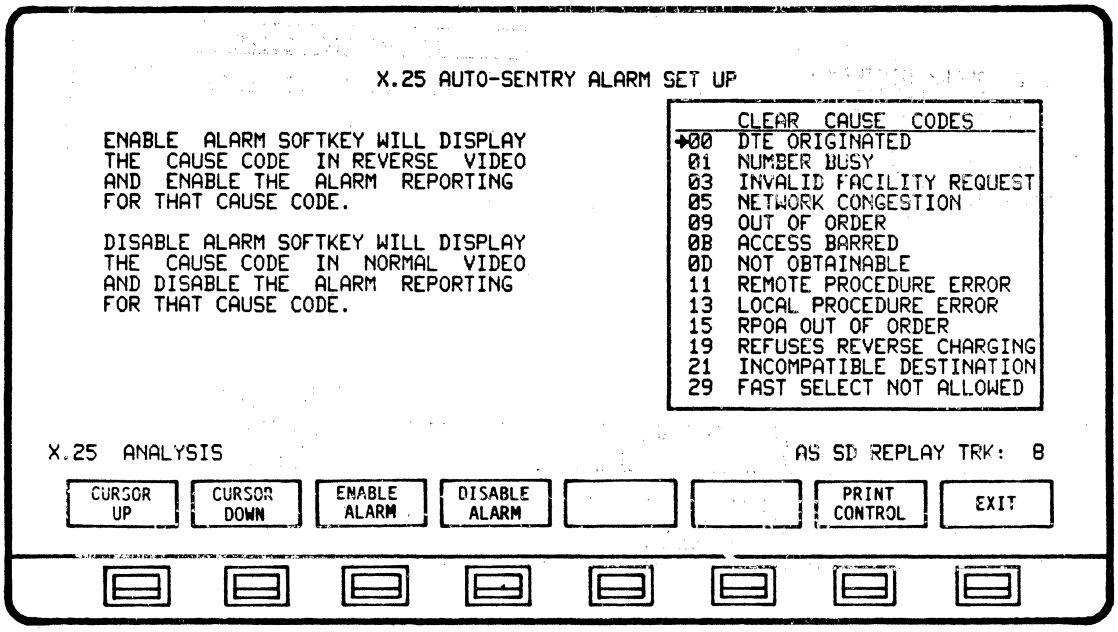
SOFTKEY/LABEL	FUNCTION
CURSOR LEFT <	Moves cursor left one(1) leadstate position
CURSOR >RIGHT	Moves cursor right one(1) leadstate position.
DONT CARE	Selects DONT CARE as the alarm parameter for the leadstate.
HIGH	Selects the leadstate signal HIGH as the alarm parameter.
LOW	Selects the leadstate signal LOW as the alarm parameter.
	Not Used
	Not Used
EXIT	Return to previous softkey/label display. (SEND SET UP - Ref 6.7.3) (RECV SET UP - Ref 6.7.3)

6.7.4 LCN ALARMS Softkey/Label Display



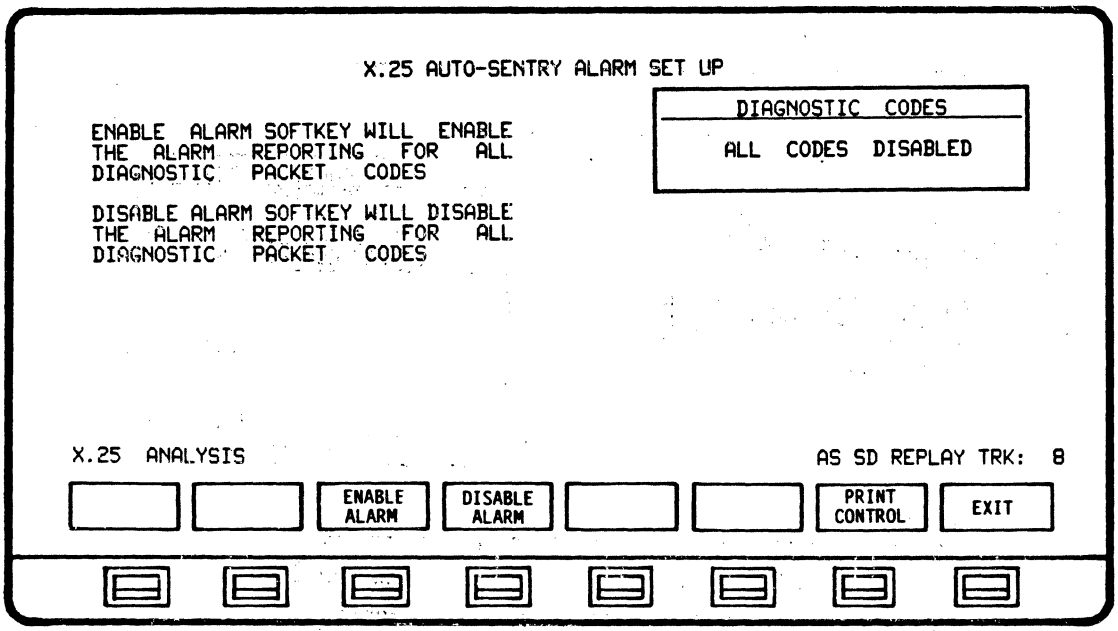
SOFTKEY/LABEL	FUNCTION
CLEAR CAUSE	Sets up softkey/label display to select Clear Cause alarm parameters. (Ref 6.7.4.1)
RESET CAUSE	Sets up softkey/label display to select Reset Cause alarm parameters. (Ref 6.7.4.1)
RESTART CAUSE	Sets up softkey/label display to select Restart Cause alarm parameters. (Ref 6.7.4.1)
DIAG. PACKET	Sets up softkey/label display to select enable or disable alarm parameter. (Ref 6.7.4.2)
	Not Used
	Not Used
	Not Used
EXIT	Return to previous softkey/label display. (LCN ALARMS - Ref 6.7.1)

6.7.4.1 CLEAR CAUSE / RESET CAUSE / RESTART CAUSE Softkey/Label Display



SOFTKEY/LABEL	FUNCTION
CURSOR UP	Moves Arrow Cursor one(1) line up to select alarm code.
CURSOR DOWN	Moves Arrow Cursor one(1) line down to select alarm code.
ENABLE ALARM	Initiates Alarm reporting.
DISABLE ALARM	Disables Alarm reporting.
	Not Used
	Not Used
PRINT CONTROL	Initiates Print Control softkey/label display. (Ref 6.5.6)
EXIT	Return to previous softkey/label display. (CLEAR CAUSE - Ref 6.7.4) (RESET CAUSE - Ref 6.7.4) (RESTART CAUSE - Ref 6.7.4)

6.7.4.2 DIAGNOSTIC PACKET Softkey/Label Display



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