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PCLA450B USER'S MANUAL

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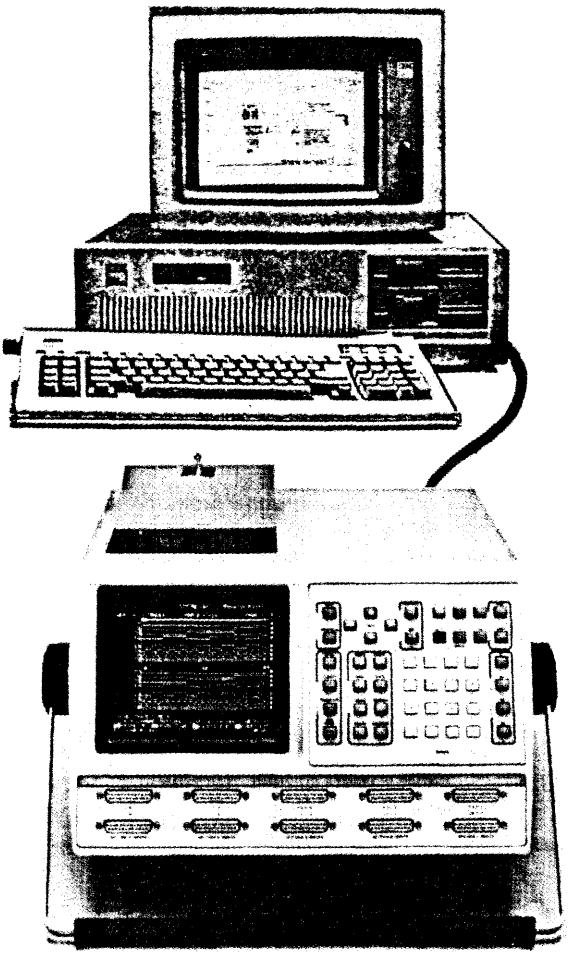
PREFACE

This manual describes operation of the BIOMATION PCLA450B system. PCLA450B is installed as a software package in an IBM Personal Computer (PC, XT or AT) or compatible system which serves as the host.

The BIOMATION K450B Logic Analyzer operates with the PC as a peripheral unit, driven by PCLA450B to collect selected input data and display the results on the PC screen. The K450B Logic Analyzer operation is controlled remotely by commands entered at the P.C. keyboard.

Information in this manual reflects the Control Software level valid on February 4, 1988, and is up-to-date at the time of publication, but is subject to change without prior notice.

Copies of this manual and other BIOMATION publications may be obtained from the BIOMATION sales office or distributor, serving your locality.



K450B Logic Analyzer and Personal Computer System

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ILLUSTRATIONS

Chapter 1

GENERAL DESCRIPTION

INTRODUCTION

This manual describes operation of the BIOMATION PCLA450B software which permits the logic analyzer to be controlled remotely by a personal computer. PCLA450B is installed as a software package in the IBM Personal Computer (PC, XT or AT) or compatible system. The BIOMATION K450B Logic Analyzer operates with the PC as a peripheral unit.

The PCLA450B program simulates the K450B Logic Analyzer setup and data display screens on the PC video display. It communicates with the K450B to provide a remote Logic Analyzer display and control facility. GPIB (IEEE-488) and RS-232 communication interfaces are supported.

The K450B Logic Analyzer is controlled remotely by PCLA450B commands entered at the PC keyboard. PCLA450B collects selected input data, and displays the results on the PC screen. PCLA450B also allows the PC to read from, write to, and display contents of diskettes used on a stand-alone K450B Logic Analyzer.

The PCLA450B kit has one diskette labeled PCLA450B and a User's Manual. A National Instruments GPIB board and interface cable is available as an option.

PC SYSTEM REQUIREMENTS

The PC minimum system requirements are:

The Personal Computer is an IBM PC/XT/AT or compatible system.

The PC should have a minimum of 512K of RAM and one floppy disk drive.

Either a CGA Display Adapter or a EGA/VGA Display Adapter running in CGA mode is required to display waveforms of the Timing Screen.

A monochrome monitor and IBM MDA Display Adapter, or Hercules Monochrome Display Adapter, may be used but will not display waveforms of the Timing Screen.

The operating system is DOS 2.0 or higher.

The Extended Screen and Keyboard Control driver (ANSI.SYS file) is installed.

EQUIPMENT CONNECTIONS

Hardware installation (Figure 1-1) consists of connecting the K450B Logic Analyzer to the PC via the RS-232-C or optional GPIB interface as described in subsequent paragraphs.

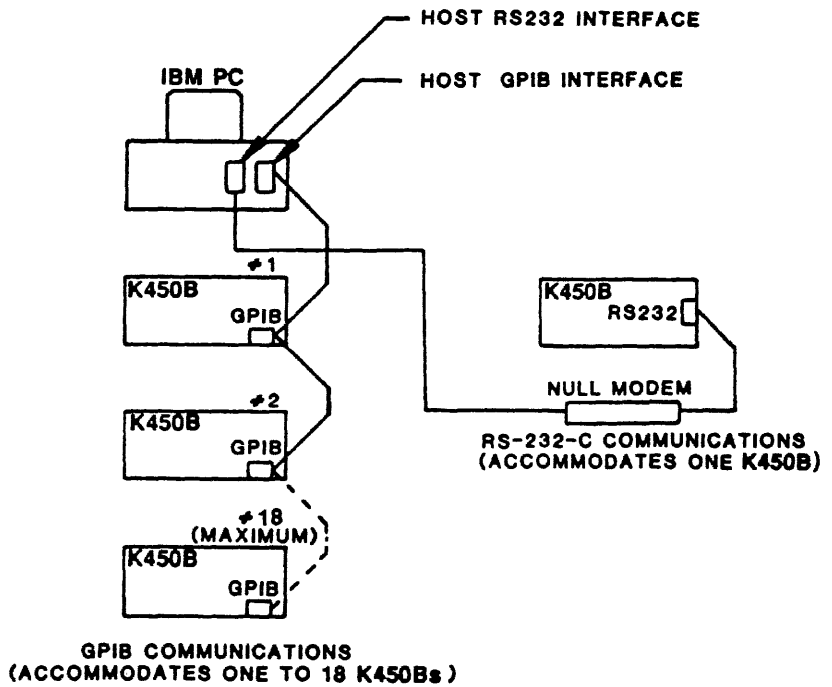

Figure 1-1. PC Equipment Connections

RS-232-C Interface

A single K450B Logic Analyzer unit may be connected to the PC via the RS-232 interface. The RS-232 port at K450B Logic Analyzer is configured as Data Terminal Equipment (DTE) and requires a Null Modem for Operation as described in the Logic Analyzer User's Manual.

The RS-232 communications protocol must be set the same for both the PC and K450B. The ***PCLA Configuration*** screen must be accessed to set the RS-232-C protocol for the PC as described in Chapter 3 of this manual. (See description of ***PCLA Configuration*** Screen.)

The K450B ***I/O*** screen must be accessed to set the RS-232-C protocol at the Logic Analyzer as described in the Logic Analyzer User's Manual. (See description of RS-232-C Interface.)

Select the following conditions for RS-232-C interface at both the PC and Logic Analyzer:

I/O PORT =	RS-232
BAUD RATE =	9600 Max. (User defined)
WORD LENGTH =	8 Bits
STOP BITS =	1
PARITY =	NONE
RECORD LENGTH =	unlimited
PROTOCOL =	XON/OFF

Optional GPIB Interface

Up to 18 K450B Logic Analyzer units may be connected to the PC via the optional GPIB (IEEE-488) interface. The GPIB interface allows the PC to select and control remote operation for only one Logic Analyzer at a time. However, PCLA can monitor the activity of all Logic Analyzers connected in the GPIB network.

The handshake interaction for GPIB communications must be the same for both the PC and K450B. The ***PCLA Configuration*** screen must be accessed to set the GPIB handshake control as described in Chapter 3 of this manual. (See description of ***PCLA Configuration*** Screen.)

The K450B ***I/O*** screen must be accessed to set the GPIB handshake control as described in the Logic Analyzer User's Manual. (See description of GPIB interface.)

Select the following conditions for GBIP interface at both the PC and Logic Analyzer:

GPIB MODE =	Talk/Listen
TERMINATOR =	CR
EOI OUTPUT =	ON (set with last transmission byte)
I/O PORT =	GPIB
RECORD LENGTH =	Unlimited

Chapter 2

SOFTWARE INSTALLATION

INTRODUCTION

This chapter describes the software installation and execution of PCLA450B with the PC. These procedures assume the user is familiar with DOS. The syntax used in these procedures is identical to the DOS syntax found in the DOS Reference Manual. If an error is made before installing a DOS file, press the **Ctrl/C** keys and re-enter the command.

Procedures are provided for installing and invoking PCLA450B on a hard disk or a floppy disk system. Procedures are also included for startup using the PCLA450B Setup File.

PCLA450B HARD DISK INSTALLATION

This procedure assumes that DOS is installed on the PC hard disk. This procedure also assumes that the user is familiar with DOS. The syntax used in these procedures is identical to the DOS syntax found in the DOS Reference Manual. To manually install PCLA450B on a hard disk, perform the following:

NOTE: If the files already exist for CONFIG.SYS and AUTOEXEC.BAT, simply add the information contained in steps 3 and 6 to the respective file using any word processor.

1. Turn on the power at the PC disk drive and monitor. The prompt should be C:\> and should be in the root directory.

2. Begin installing (if it does not already exist) the CONFIG.SYS file by entering COPY CON: CONFIG.SYS. The PC prompt changes to a - (dash).

3. Enter DEVICE=[d:][path]ANSI.SYS

   It is also recommended to set the following values:

   Enter BUFFERS=20
   Enter FILES=20

4. Press the **Ctrl/ Z** and then the **RETURN** keys. This creates the CONFIG.SYS file.

5. Begin installing the AUTOEXEC.BAT file by entering COPY CON: AUTOEXEC.BAT.

6. Enter SET GPIB=GPIB0, if a GPIB board is installed.

7. Press the **Ctrl/ Z** and then the **RETURN** keys. This creates the AUTOEXEC.BAT file.

8. Press the **Ctrl/Alt** and **Delete** keys to reboot the host computer with the new DOS files.

9. Enter MD \PCLA450B (or any other sub-directory name)to create the PCLA450B sub-directory.

10. Change the prompt to A:

11. Insert the PCLA450B disk into the PC disk drive A.

12. Enter COPY *.* C:\PCLA450B (or sub-directory path name selected).

13. Change the prompt to C:.

14. Start PCLA450B by logging onto the PCLA450B subdirectory by entering CD \PCLA450B (or sub-directory path name selected).

15. To start PCLA450B, enter PCLA450B

(OR)

16. Enter PCLA450B @setup

17. Set the GPIB or RS-232-C values in the ***PCLA Configuration*** screen. See Chapter 3 of this manual for more information on this screen.

18. Set the GPIB or RS-232-C values in the ***I/O*** screen in the Logic Analyzer. This requires a K450B User's Manual. See Chapter 4 of this manual for reference documents.

19. Each screen may be displayed and parameters modified. If a Logic Analyzer is connected, recordings may be taken.

20. Press the **HOME** key to return to the ***PCLA450B Top Menu*** screen from most other screens.

21. Press the **Ctrl/C** keys to exit PCLA450B.

PCLA450B FLOPPY DISK INSTALLATION PROCEDURE

The syntax used in these procedures is identical to the DOS syntax found in the DOS Reference Manual. To manually install PCLA450B on a floppy disk system, perform the following:

NOTE: If the files already exist for CONFIG.SYS and AUTOEXEC.BAT, simply add the information contained in steps 4 and 7 to the respective file using any word processor.

1. Turn on the power at the PC disk drive and monitor.

2. Insert and load the DOS disk into the PC disk drive.

3. Begin installing the CONFIG.SYS file by entering COPY CON: CONFIG.SYS.

4. Enter DEVICE=[d:]ANSI.SYS

   It is also recommended to set the following values:

   Enter BUFFERS=20
   Enter FILES=20

5. Press the **Ctrl/ Z** and **RETURN** keys. This creates the CONFIG.SYS file.

6. Begin installing the AUTOEXEC.BAT file by entering COPY CON: AUTOEXEC.BAT.

7. Enter SET GPIB=GPIB0, if a GPIB board is installed.

8. Press the **Ctrl/ Z** and then the **RETURN** keys. This creates the AUTOEXEC.BAT file.

9. Press the **Ctrl/Alt** and **Delete** keys to reboot the PC with the new DOS files.

10. Remove the DOS disk from the PC disk drive A.

11. Insert the PCLA450B disk into the PC disk drive A.

12. To start PCLA450B with a user supplied display type, enter PCLA450B

(OR)

13. Enter PCLA450B @setup.

14. Set the GPIB or RS-232-C values in the ***PCLA Configuration*** screen. See Chapter 3 of this manual for more information on this screen.

15. Set the GPIB or RS-232-C values in the ***I/O*** screen in the Logic Analyzer. This requires a K450B User's Manual. See Chapter 4 of this manual for reference documents.

16. Each screen may be displayed and parameters modified. If a Logic Analyzer is connected, recordings may be taken.

17. Press the **HOME** key to return to the ***PCLA450B TOP Menu*** screen from most other screens.

18. Press the **Ctrl/C** keys to exit PCLA450B.

PCLA450B SETUP FILE

Startup Command

The startup of PCLA450B using the Setup file is invoked by entering the program name followed by a Setup filename. The command is entered as Follows:

```
C:\> pcla450B @setup
```

The @ preceding the setup filename is mandatory. The setup filename must follow PC-DOS filename format.

Information Contained In Setup File

The Setup file is a free-form ASCII file containing default information for PCLA450B. The following list of commands presents valid command entries and associated formats.

COMMAND DESCRIPTION

comx (or) mcomx	PC LOCAL serial port number PC MODEM serial port number
	This command selects a PC LOCAL serial port or MODEM serial port to be used by PCLA450B. The X is replaced by 1 or 2, corresponding to PC ports COM1: and COM2. There is no default value for these commands.
mono (or) color (or) ansi	IBM Monographics card IBM Color/ Graphics card ANSI standard terminal

Syntax:

(remote) (name) (width) (comm) [baud] [addr] (phone)

Examples:

```
remote SFO 32 rs232 1200 (408) 988-6800
remote SFO 32 gpib 07
```

This command loads a remote K450B unit configuration into the PCLA450B database. As many as 18 units may be specified. The parameters following the remote command are as follows:

-name
Up to three characters, the name for each unit must be unique, and must match the name specified in directory entry 0 of the K450B TeleDiagnostics phone directory.

-width
Remote unit input width - 16, 32 or 48

-comm
Communications mode RS232 or GPIB

-baud
Must follow selection of RS232 as comm-
110, 150, 300, 600, 1200, 2400, 4800, 9600

-addr
Must follow selection of GPIB as comm - two digit value in the range 01 - 30.

-phone
Phone number for modem controlled units. If a phone number is specified, the unit is assumed to be controlled via a modem. Do not enter for GPIB Mode.

phone — This command sets the local phone number, i.e. the phone that is attached to PC. Hayes Modem standard format is used. This number is sent to remote units when the AUTO CALLBACK option is selected during ARM.

swap — This command causes PCLA to act as a virtual Logic Analyzer. As each unit is selected on the ***Top Menu*** screen, the complete database describing that unit is loaded either from disk (if diskswap) or by querying the remote unit. Additionally, a complete data transfer will be requested when a remote unit calls in to PCLA. Note that PCLA will ALWAYS request a Memory A transfer from the remote unit when it receives a data call from the remote. Default is no swap.

diskswap — This command tells PCLA to maintain a disk image of each remote unit and to load the appropriate setup and data information from disk when a remote unit is selected from the ***Top Menu*** screen and the swap command is in effect. If no data file exists for the selected unit, PCLA will query the remote unit. If a disk image is present for unit 00 at initialization time, it will be loaded. Note that this option requires approximately 110K of disk space per remote unit file. Default is no diskswap.

Note: Selecting a new unit while in the ***PCLA Configuration*** screen does not cause either swap operation, regardless of the command setting.

dospath c: \pclados

This command sets the pcdos directory that PCLA450B uses for saving and recalling setup and data files. Default is the current directory.

helppath c: \pclados

This command sets the pcdos directory that PCLA450B uses when searching for help files. Default searches PC-DOS directories in the PATH statement for PCLA help files.

Entries may be made in any order. When entries are duplicated, only the last occurrence will be accepted. PCLA450B ignores blank lines and any text on a line following a semicolon (;).

IBM PC KEYBOARD

The Standard Function keys are:

Key	Description
Home	Returns the user from the current screen to the ***Top Menu*** screen.
PgUp (NEXT)	Changes the field to the next selection.
PgDn (PREVIOUS)	Changes the field to the previous selection.
End	Toggles Edit on/off in various screens.
Ins	Inserts data into the display.
Del	Deletes data from the display.
?	Selects ***Help*** screen (On-Line User's Guide for screen being displayed).
Return	All data is entered and processing begins.
ARROWs	Moves the active field within the display

The standard ASCII keys used for PCLA are as follows:

Key	Description
0-9	Enters numerals.
0-9, A-F, a-f	Enters hex values.
X, x,*	Enters Don't Care values.
Alpha-numeric	Enters text messages

The Special Function keys common to all screens are:

Key	Description
F8	Transfers memory A to memory B.
F9	Toggles memory A and B as follows: where: M toggles to A A toggles to B B toggles to A
F10	Toggles the Arm cycle on and off.
Ctrl/A	Manually advances to the next trace level while taking a recording in the Arm mode.

USER ASSISTANCE

On-Line User's Guide

Press the **?** key to read the PCLA 450B On-Line User's Guide on the PC for more information about a specific screen.

Error Messages

PCLA error messages are presented in the list which follows. The messages are categorized according to type of function and type of screen present when message is displayed.

List of Error Messages

General Messages

Illegal key, press '?' for more information
Warning: Split timing selected

Communications Related Messages

PC DOS error
No MODEM port installed (selected)
No Serial board installed (selected)
No GPIB board installed (selected)
Phone hung up.
Remote unit has hung up
Remote unit did NOT hang up, try again

Warning: Invalid Record Received
NAK Sent
Urecoverable communications error
NAK received
Use F10 from TOP MENU to Establish Modem Link

GPIB Related Messages

PC DOS error
Function requires PC to be Controller-in-Charge
Write detected no listeners
Interface board not addressed correctly
Invalid argument to function call
Function requires PC to be System Active Controller
I/O operation aborted
Non-existent interface board
GPIB Err 8
GPIB Err 9
I/O operation started before previous completed
No capability for operation
GPIB Err 12
GPIB Err 13
Command error during device call
Serial Poll status byte lost
SRQ remains asserted

Trace Control Screen Messages

Illegal DELAY: values are 1 - 65535
No room for pattern/command line
Simplified Trace Control no longer valid
Can't change memory A or B
No room for pattern/command line
Pattern not found, add to definition list? (Y/N)
Cannot delete, pattern referenced in command line

Format Screen Messages

User Specified Format loaded
Cannot set User Specified from User Specified!
Can't change memory A or B

Histogram Screen Messages

Memory A only
Insufficient PC memory for requested function

PC DOS and K450B DOS Utilities Messages

Illegal command
Illegal option
Illegal filename
Working drive must be specified
Disk read error
File not found
Invalid directory
File locked
Duplicate filename
Insufficient disk space
Disk write error
Insufficient directory space
File type mismatch
Not enough memory
Checksum error
Help command argument error
Unable to open file
MS-DOS error

Data Swap Function Messages

Unable to perform disk swap
Swapping remote unit databases
Disk error during swap

Acquisition Parameters Screen Messages

Illegal value, press PgDn (PREV) to clear
Unknown error in Acquisition Parameter Screen

Timing Screen Messages

Incomplete channel selection: must enter key 0 -F
Insufficient PC memory for requested function
Can't send while remote unit is armed

Data Screen Messages

Illegal cursor value
Illegal value for C or R - Maximum value is <xxxx>

Clock Screen Messages

Illegal clock: legal values 20 nS to 100 mS
Can't change memory A or B

User Utilities Messages

Bad file or filename
insufficient PC memory for requested function

Simplified Trace Control Screen Messages

Only one OR condition may be used at a time
No room for pattern/command line
Illegal value, press PgDn (PREV) to clear
Can't change memory A or B
Can't change screens while editing

Arm Mode Screen Messages

Insufficient PC memory for requested function
Illegal value, press PgDn (PREV) to clear
Can't change memory A or B

Configuration Screen Messages

Can't open setup files: 'filename'
Error in reading setup file: 'filename'
Setup file syntax error, line <#>
COMM and MCOM cannot be equal
Unknown or illegal display type
Must specify PHONE with MCOM
Unknown setup file error
Illegal value: valid addresses are 01 - 30

Chapter 3

OPERATION

INTRODUCTION

This chapter describes the operation of PCLA450B with the P.C. The PCLA450B organization of displays is shown in Figure 3-1.

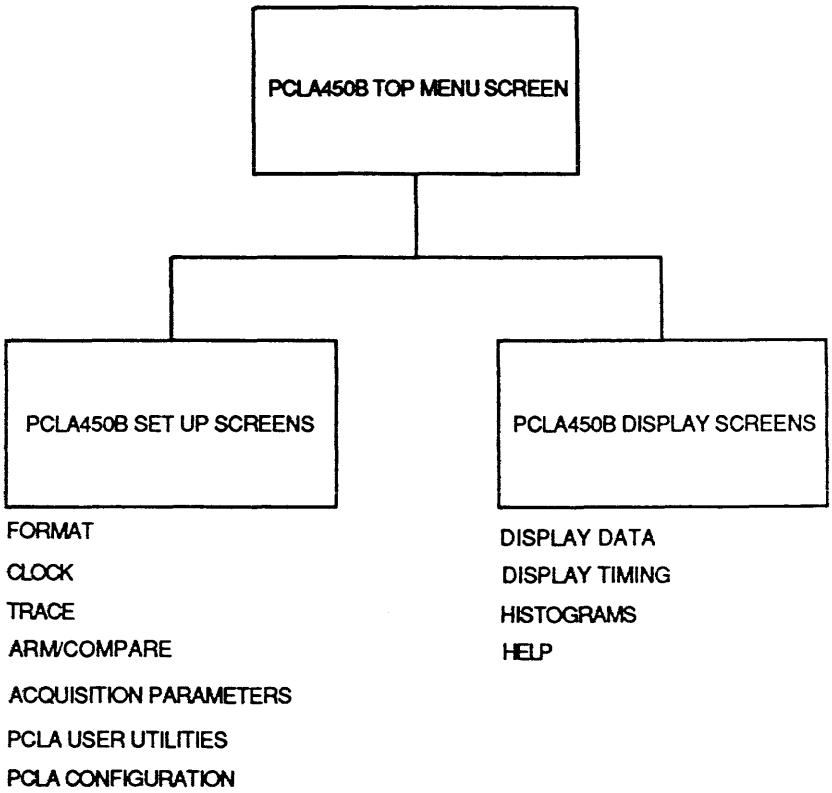

Figure 3-1. PCLA450B Organization Of Displays

PCLA450 TOP MENU SCREEN

The ***PCLA450B Top Menu*** screen (Figure 3-2) is displayed when PCLA450B is initialized.

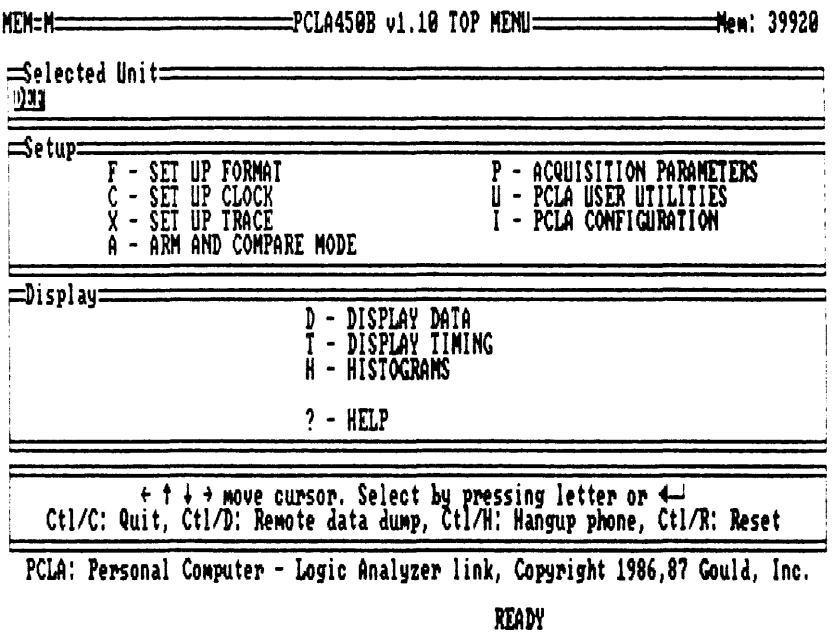

Figure 3-2. PCLA450B Top Menu Screen

The ***PCLA450B Top Menu*** screen lists all screens used to set and display the test results at the P.C. To select a screen, press the **ARROW** key to move the cursor to the desired screen and press the **RETURN** key. The user can also select and press the letter displayed next to each screen. This is called the QUICK key.

The ***PCLA450B Top Menu*** screen displays the names of the K450B remote units and allows the user to change the active remote unit. The top display box shows the first three characters of the remote unit ID names. The active remote unit is highlighted. Remote units requesting service are displayed in reverse video, with a red backround if a color monitor is used.

If the remote unit has a phone number, PCLA450B attempts to establish a phone connection when the **F10** key is pressed. The phone number is displayed and the user can press the **F1** key to call, or press the **F2** key to cancel. The active remote unit executes a data dump when the **Ctrl/D** keys are pressed.

The top line of data on all screens is the Memory Status. The Memory Status indicates the type of memory displayed. Set Up memory M displays the parameters selected for the next acquisition cycle. Set Up memory A displays the parameters selected for the acquisition cycle just completed. Set Up memory B is used for storage of Set Up memory A data for future reference and comparison.

The Data memories are used with certain Display screens. Data memory A stores the data acquired during the last acquisition cycle. Data memory B stores the data of memory A for future reference or comparisons. Data memories A and B are seen by the user.

TESTING PROCEDURE

This is a procedure for connecting the Logic Analyzer to a signal generator. The user should generate a recording of an input signal. Refer to the installation procedure of chapter 1 for specific instructions on connecting a Logic Analyzer to the P.C.

The user should have a signal generator, that provides an output timing signal with a TTL logic level and a square wave or pulse train frequency between 10 KHz and1 MHz. Perform the following steps:

1. **Connect The Probe Cable To The Logic Analyzer**

   Plug a Probe Cable assembly to the Logic Analyzer front panel input socket labeled A, CLK J, K, 7-0. Connect the flying leads to the Probe Cables.

2. **Connect The Probe Cable to The User's Equipment**

   Connect the Logic Analyzer probe tip (brown wire) labeled GND to the ground of the signal generator. Connect the Logic Analyzer probe tip (orange wire) labeled 3 to the signal output of the signal generator.

3. **Install PCLA450B At The Host Computer**

   Follow the installation procedures in Chapter 2. After PCLA450B is installed and running, select the ***PCLA Configuration*** screen. Select the appropriate remote unit. See the section on the ***PCLA Configuration*** screen in Chapter 3.

4. **Take A Recording Of The Input Signal**

   Press the **F10** key to take a recording.

5. **Display The Results of Recorded Data**

   Press the **HOME** key to return to the ***PCLA450B Top Menu*** screen.Press the **D** key. Verify on the ***Display Data*** screen that the input signal trace appears.

6. Take Another Recording of The Input Signal

Press the **F10** key to rearm the Logic Analyzer.

7. To Exit PCLA450B

Press the **Ctrl/C** keys on the host computer. Exit PCLA450B by answering Y to the prompt.

SET UP FORMAT SCREEN

The ***Set Up Format*** screen (Figure 3-3) specifies the format for displaying data samples.

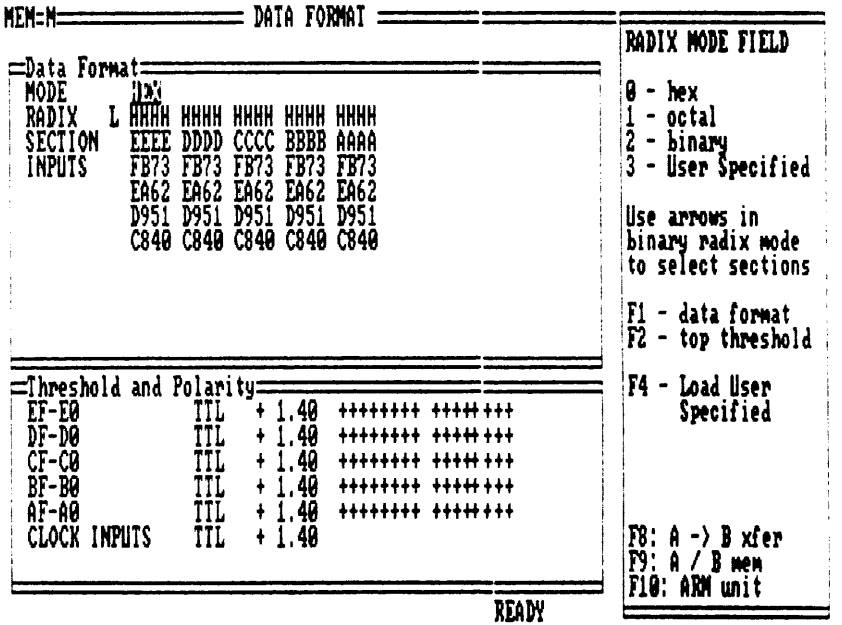

Figure 3-3. Set Up Format Screen

This screen also has a section for selecting probe data input thresholds and polarities. The format determines how data samples are shown on the ***Display Data, Set Up Trace*** and ***Histograms*** screens.

Perform the following steps:

1. Press the **HOME** key to access the ***PCLA450B Top Menu*** screen and select the ***Setup Format*** screen.

2. Press the **PgUp** or **PgDn** keys.

   Selects the data format by scrolling through the logical next or previous choices. Enter a value. The options for Radix Mode field are displayed on the far right of the screen.

3. Press the **DOWN ARROW** key.

   Selects the Section and Inputs fields if the User Specified data format is specified. Enter a value, or go to step five.

4. Press the **INSERT** or **DELETE** keys.

   Adds or deletes data. Cannot restore data after it is deleted.

5. Press the **F2** key.

   Selects the Threshold values for each data input. Enter a value . The options are displayed in the far right of the screen.

6. Press the **ARROW** and **PgUp/PgDn** keys.

   Enters the next or previous value for the Threshold field.

7. Press the **RIGHT ARROW** key.

   Moves the cursor to the Polarity field. Selects the polarity for each threshold. Enter a value The options are displayed in the far right of the screen.

8. Press the **HOME** key.

   Returns the user to the ***PCLA450B Top Menu*** screen.

SET UP CLOCK SCREEN

The ***Set Up Clock*** screen (Figure 3-4) determines the Logic Analyzer clocks and inputs. The ***Set Up Clock*** screen displays the memory M set up condition used on the next recording during the Arm cycle. The user may also view the A and B Clock screens.

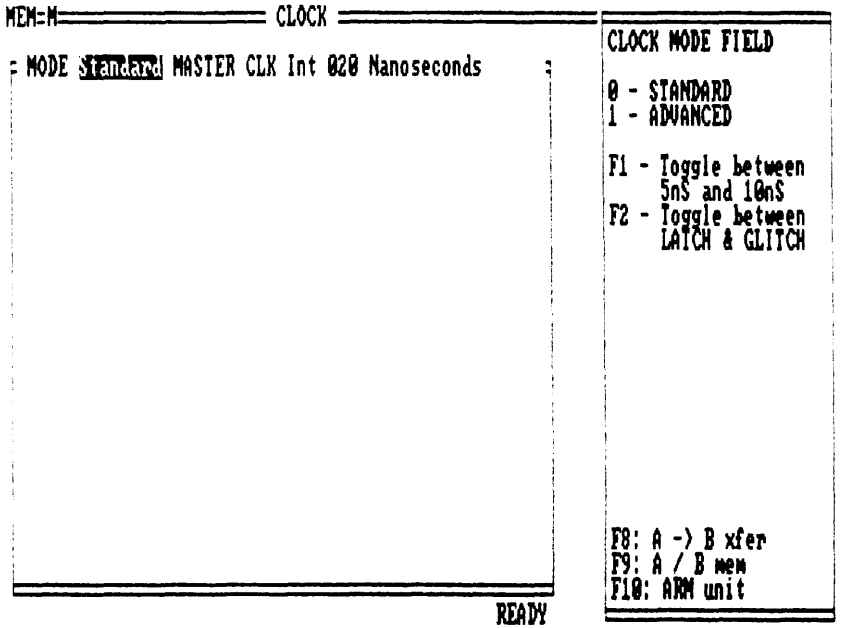

Figure 3-4. Set Up Clock Screen

The ***Set Up Clocks*** screen special function keys are:

Key	Description
F 1	Forces the unit into the Advanced mode and 100/200 MHz timing for all sections.
F 2	Pressing this key in the Standard mode forces the unit into the Advanced mode. This key also selects Glitch or Demux for all inputs and samples all sections at the Master Clock rate.

Perform the following steps:

Standard Internal Clock Mode

1. Press the **C** key .

   Selects the ***Set Up Clocks*** screen from the ***PCLA450B Top Menu*** screen.

2. Press the **0** key.

   Selects the Standard Clock mode. The Standard Clock mode controls clocking for all three input sections with a single clock expression (Internal/External).

   Input data is sampled, stored or discarded and Trace Control decisions are made at the Master Clock rate on all sections.

3. Press the **DOWN ARROW** Key.

   Moves the cursor to the Master Clock field. Enter a value from the Clock Interval field. The options are presented at the right of the screen. Legal values are 20 ns to 100 ms.

4. Press the **0** key.

   Selects the Internal Master Clock field.

5. Press the **RIGHT ARROW** key.

   Selects the Clock Interval field. Values are displayed at the right of the screen.

6. Press the **RIGHT ARROW** key.

   Selects the Clock Decade field. Values are displayed at the right of the screen.

7. Press the **HOME** key.

   Returns the user to the ***PCLA450B Top Menu*** screen.

Standard External Clock Mode

1. Press the **C** key .

   Selects the ***Set Up Clocks*** screen from the ***PCLA450B Top Menu*** screen.

2. Press the **0** key.

   Selects the Standard Clock mode. The Standard Clock mode controls clocking for all three input sections with a single clock expression (Internal/External).

   Input data is sampled, stored or discarded and Trace Control decisions are made at the Master Clock rate on all sections.

   Any J or K clock input can be inverted, not inverted or not monitored. The monitored J clocks are ANDED together, while the monitored K clocks are ORED and the J's are ORED to the K's.

3. Press the **DOWN ARROW** key.

   Moves the cursor to the Master Clock field.

4. Press the **1** key.

   Selects the External Master Clock field.

5. Press the **RIGHT ARROW** key.

   Moves the cursor to the Clock Input Expression field.

6. Press the **PgUp** or **PgDn** keys.

   Changes the active field to the next or previous legal selection.

7. Press the **HOME** key.

   Returns the user to the ***PCLA450B Top Menu*** screen.

Advanced Internal Clock Mode

1. Press the **C** key .

   Selects the ***Set Up Clocks*** screen from the ***PCLA450B Top Menu*** screen.

2. Press the **1** key.

   Selects the ***Advanced Clock screen*** (Figure 3-5) and field.The Advanced Clock mode allows Glitch detection, Multiplexing and 100/200 MHz sampling for one or more sections.

   The Advanced Clock mode samples data at different rates for each section. Trace Control decisions are still made at the Master Clock rate. Glitch detection, Demux and Latch modes are selected independently.

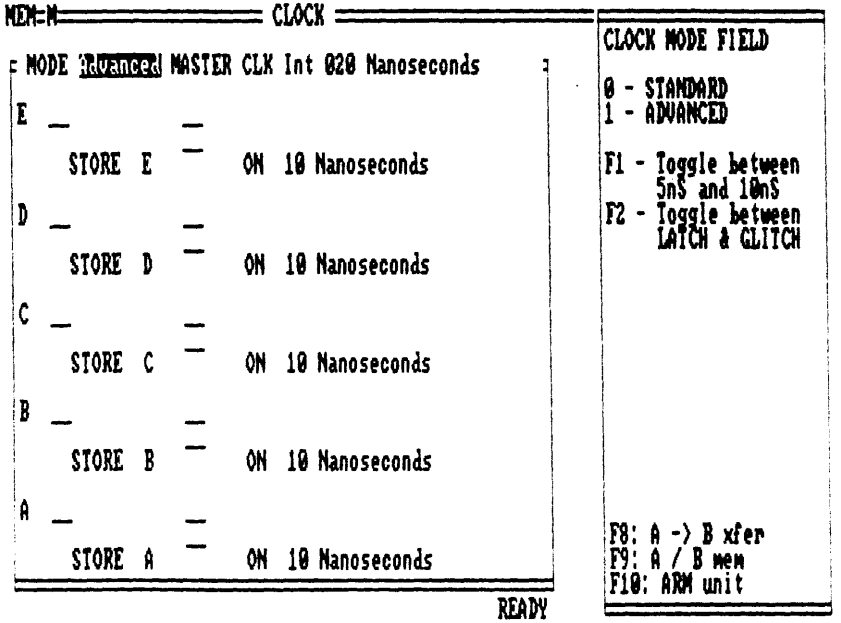

Figure 3-5. Advanced Clock Screen

3. Press the **DOWN ARROW** key.

   Moves the cursor to the Master Clock field.

4. Press the **0** key.

   Selects the Internal Master Clock field.

5. Press the **RIGHT ARROW** key.

   Selects the Clock Interval field. Values are displayed at the right of the screen.

6. Press the **RIGHT ARROW** key.

   Selects the Clock Decade field. Values are displayed at the right of the screen.

7. Press the **DOWN ARROW** key.

   Selects Latch and Glitch modes.

   The Latch mode holds data from one or both halves of the input section until the Sample and Store clock is active.

   The Glitch mode detects input pluses of 250 mV, or higher at 5 ns and stores them at the next sample clock, as the opposite of the input data state at that time.

8. Press the **LEFT ARROW** key.

   Selects the Demux option. If the Demux option is selected, section 8-F data inputs are inoperative, while the clock inputs remain functional. Section 8-F samples data through the section 0-7 input, but is latched by the clock selected for the section.

9. Press the **DOWN ARROW** key.

   Moves the cursor to the Section Clock field. Select a value from the top right of the screen.

10. Press the **LEFT ARROW** key.

    Moves the cursor to the Sample and Store field. The Sample and Store field selects the rate data is stored in memory. Sample mode stores data at the Master Clock rate. Store mode holds data at the section clock rate.

11. Press the **HOME** key.

    Returns the user to the ***PCLA450B Top Menu*** screen.

Advanced External Clock Mode

1. Press the **C** key .

   Selects the ***Set Up Clocks*** screen from the ***PCLA450B Top Menu*** screen.

2. Press the **1** key.

   Selects the Advanced Clock mode.The Advanced Clock mode allows Glitch detection, Multiplexing and 200 MHz sampling for one or more sections.

   The Advanced Clock mode samples data at different rates for each section. Trace Control decisions are still made at the Master Clock rate. Glitch detection, Demux and Latch modes are selected independently.

3. Press the **DOWN ARROW** key.

   Moves the cursor to the Master Clock field.

4. Press the **1** key.

   Selects the External Master Clock field.

5. Press the **RIGHT ARROW** key.

   Selects the Clock Input Expression field.

6. Press the **PgUp/PgDn** keys.

   Selects the next or previous legal choices.

7. Press **DOWN ARROW** key.

   Selects Latch and Glitch modes. The Latch mode holds data from one or both halves of the input section until the Sample and Store clock is active. The Glitch mode detects input pluses of 250 mV, or higher at 5 ns and stores them at the next sample clock, as the opposite of the input data state at that time.

8. Press the **LEFT ARROW** key.

   Selects the Demux option. If the Demux option is selected, section 8-F data inputs are inoperative, while the clock inputs remain functional. Section 8-F samples data through the section 0-7 input, but is latched by the clock selected for the section.

9. Press the **DOWN ARROW** key.

   Moves the cursor to the Section Clock field. Select a value from the top right of the screen.

10. Press the **LEFT ARROW** key.

    Moves the cursor to the Sample and Store field. The Sample and Store field selects the rate data is stored in memory. Sample mode stores data at the Master Clock rate. Store mode holds data at the section clock rate.

11. Press the **HOME** key.

    Returns the user to the ***PCLA450B Top Menu*** screen.

SET UP TRACE SCREEN

The ***Set Up Trace*** screen is displayed in Figure 3-6.

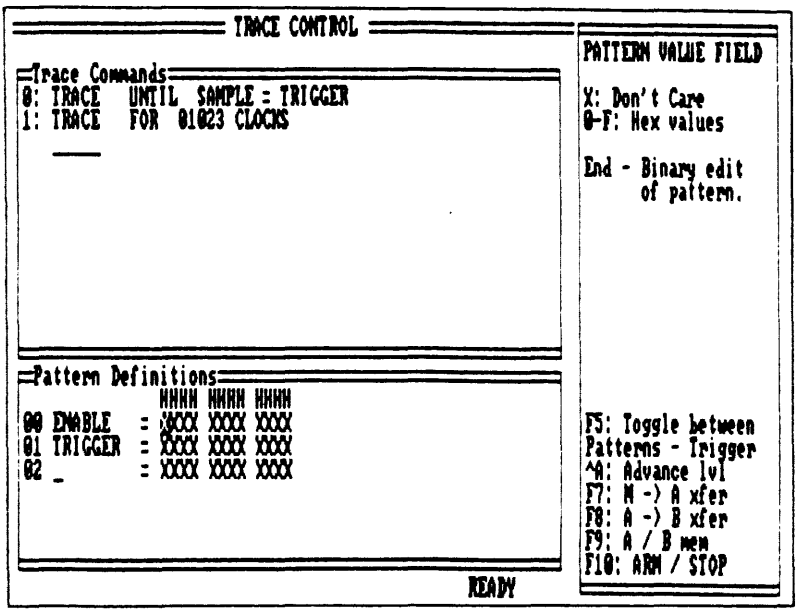

Figure 3-6. Set Up Trace Screen

Trace Control Commands And Conditions

The ***Set Up Trace*** screen commands are based on specific conditions. The conditions determine if and when any given command is executed. Up to sixteen trace levels can be specified. Each trace level uses up to five commands.

The Trace Control primary commands are:

Command	Description
GOTO	If the command is present, the Logic Analyzer jumps to any level. An example is JUMPing from level 1 to level 3. JUMPing from level 4 to level 4 resets the clock or event count programmed for that level.
TRACE	Records data into memory M if specified conditions are satisified.
STOP	Ends recording cycle if conditions are satisfied.
WAIT	Data is not saved. ADVANCEs to the next level.
ADVANCE	Advances to the next level.

The Trace Control secondary commands are:

Command	Description
ADVANCE IF	Advances to the next level If the command or pattern is present or detected.
OR UNTIL	Advances to the next level if the condition is met.
OR GOTO IF	Jumps to a specified level if the condition is met. This has priority over ADVANCE IF.
OR STOP IF	Stops the Arm cycle if the condition is met. Has priority over all other commands in the statement.

The Trace Control secondary commands contain conditions. The ***Set Up Trace*** screen conditions are:

Sample	Sample = Word Sample ≠ Word Up to fifty words may be defined. Example: TRACE if Sample = Break 3 (where Break 3 is a user defined word.)
Delay	Count = ___ clocks or patterns ≠ > < ≥ ≤ On each of the eight levels, a unique delay may be defined using the set delay function. The delay count is set to zero every time the level is entered (see ADVANCE or JUMP commands). Each master clock increments the delay count. If delay by patterns is selected, then the specified pattern increments the delay count. Examples: TRACE until count = 35 clocks. Set delay to 48 counts of sample = FREEZE TRACE until count = 48. (Where FREEZE is a user-defined pattern.)
Compound Conditions	Sample and Delay conditions are logically ANDed and both must be true. Example: Set delay to 21 clocks. TRACE if SAMPLE = PITCH 1 and COUNT ≥21.

Standard and Simplified Trace Control

Perform the following steps:

Standard Trace Control

1. Press the **X** key.

   Selects the ***Set Up Trace*** screen from the ***PCLA450B Top Menu*** screen.

2. Press the **PgUp** or **PgDn** keys.

   Selects the next or previous Trace Control Command Sequence. Enter a command. Options are displayed to the right of the screen.

3. Press the **DOWN ARROW** key.

   Moves the cursor to the Pattern Value field.

4. Press the **PgUp** or **PgDn** keys.

   Selects the next or previous Pattern Value field options from the far right column on the screen. Enter aPattern Values for zero to forty-nine fields. Can also use the **0-9** and **x** keys.

5. Press the **LEFT ARROW** key.

   Moves the cursor to the Pattern Name field. Enter a value. Use any printable symbol to form a pattern name from zero to forty-nine fields.

6. Press the **HOME** key.

   Returns the user to the ***PCLA450B Top Menu*** screen.

Simplified Trace Control

1. Press the **X** key.

   Selects the ***Set Up Trace*** screen from the ***PCLA450B Top Menu*** screen.

2. Press the **F5** key.

Selects the ***Simplified Trace Control*** screen (Figure 3-7). The cursor is moved to the Pattern Value field.

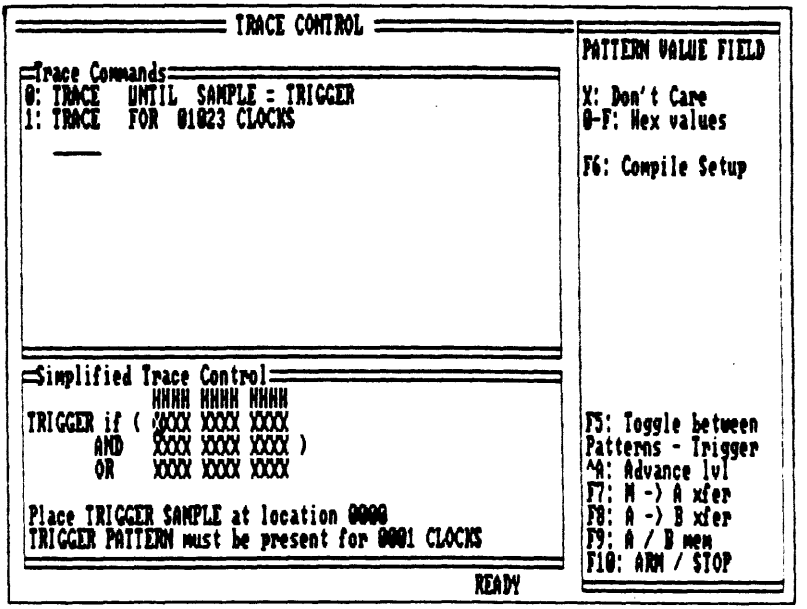

Figure 3-7. Simplified Trace Control Screen

3. Press the **PgUp/PgDn** keys.

   Selects the next or previous legal values.

4. Press the **DOWN ARROW** key.

   Moves the cursor to the Trigger Position field.

5. Press the **PgUp/PgDn** keys.

   Selects the value for the Trigger Position Sample location.

6. Press the **DOWN ARROW** key.

   Moves the cursor to the Trigger Filter field.

7. Press the **PgUp/PgDn** keys.

   Selects the next or previous value for the Trigger Filter field.

8. Press the **F6** key.

   Compiles the Simplified Trace Control set up.

9. Press the **HOME** key.

   Returns the user to the ***PCLA450B Top Menu*** screen.

ARM AND COMPARE MODE SCREEN

The ***Arm and Compare Mode*** screen (Figure 3-8) controls the operation of the Logic Analyzer when recordings are taken. This includes single and multiple recordings. The ***Arm and Compare Mode*** screen specifies the following:

Type of arm mode.

Conditions when a recording series is terminated.

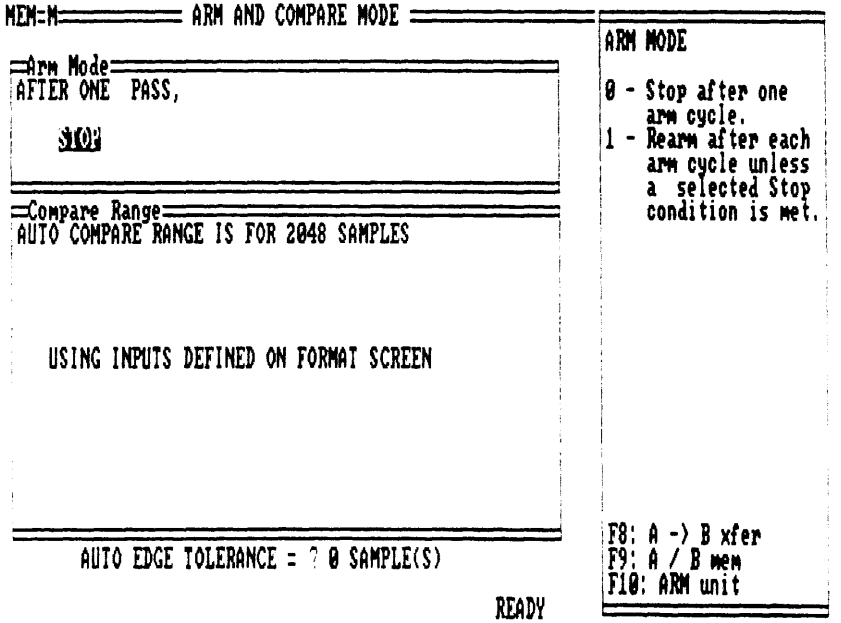

Figure 3-8. Arm and Compare Mode Screen

Perform the following steps:

Manual Arm Mode

1. Press the **A** key.

   Selects the ***Arm and Compare Mode*** screen from the ***PCLA450B Top Menu*** screen.

2. Press the **0** key.

   Selects the Arm Mode field. The Manual Arm mode STOPs the Logic Analyzer after one recording cycle.

3. Press the **DOWN ARROW** key.

   Moves the cursor to the Compare Sample Range field. The Compare Sample Range field specifies data examined during comparison. The depth and width of the compare range is set by modifying the Compare statement.

4. Press the **PgUp/PgDn** keys.

   Selects the next or previous legal options.

5. Press the **DOWN ARROW** key.

   Moves the cursor to the Compare Input Mode field.

6. Press the **PgUp/PgDn** keys.

   Select the next or previous values using the inputs selected below the field or inputs defined on the ***Set Up Format*** screen.

7. Press the **DOWN ARROW** key.

   Selects the edge tolerance feature. Enter a value. Edge tolerance compares the data in memory A with memory B. PCLA stores don't care samples in memory B. These samples are not compared with their counterparts in memory A. This places tolerances around the rising and falling edges in memory B. The ***Arm and Compare Mode*** screen determines the tolerances around each edge in the memory B buffer.

8. Press the **F4** key.

   Executes the edge tolerance feature.

9. Press the **F10** key.

Executes the Arm cycle. Set up parameters are sent from the host computer to the Logic Analyzer.

Samples are transferred from memory M to memory A when the data acquisition is complete. The data is transferred to the host computer for display. The Logic Analyzer is not armed during the data transfer.

10. Press the **HOME** key.

Returns the user to the ***PLCA450B TOP Menu*** screen.

Auto Arm Mode

1. Press the **A** key.

Selects the ***Arm and Compare Mode*** screen from the ***PLCA450B TOP Menu*** screen.

2. Press the **1** key.

Selects the Auto Arm field. The Auto Arm field re-arms the Logic Analyzer after the first recording cycle and continues to re-arm indefinitely unless modified by the pass counter or STOP condition.

3. Press the **UP ARROW** key.

Selects the Comparison Count field. Executes automatic comparison of memory A and memory B. Auto re-arm STOPs when the relationship between memory A and memory B is true. The re-arm continues and counts the number of times it is true.

STOP on memory comparison has priority over STOP on limit.

4. Press the **DOWN ARROW** key twice.

   Moves the cursor to the Autosave Mode field.

5. Press the **PgUp/PgDn** keys.

   Selects the next or previous legal option.

6. Press the **DOWN ARROW** key.

   Moves the cursor to the Compare Sample Range field. The Compare Sample Range field specifies data examined during comparison for incrementing the comparison counter. The depth and width of the compare range is set by modifying the Compare statement.

7. Press the **PgUp/PgDn** keys.

   Selects the next or previous legal option.

8. Press the **DOWN ARROW** key.

   Moves the cursor to the Compare Input Mode field.

9. Press the **PgUp/PgDn** keys.

   Select the next or previous values using the inputs selected below the field or inputs defined on the ***Set Up Format*** screen.

10. Press the **DOWN ARROW** key.

    Selects the edge tolerance feature. Enter a value. Edge tolerance compares the data in memory A with memory B. PCLA 450B stores don't care samples in memory B. These samples are not compared with their counterparts in memory A. This places tolerances around the rising and falling edges in memory B. The ***Arm and Compare Mode*** screen determines the tolerances around each edge in the memory B buffer.

11. Press the **F4** key.

    Executes the edge tolerance feature.

12. Press the **F10** key.

    Executes the Arm cycle. Set up parameters are sent from the P.C.to the Logic Analyzer.

    Samples are transferred from memory M to memory A when the data acquisition is complete. The data is transferred to the host computer for display. The Logic Analyzer is not armed during the data transfer.

13. Press the **HOME** key.

    Returns the user to the ***PCLA450B Top Menu*** screen.

ACQUISITION PARAMETERS SCREEN

The ***Acquisition Parameters*** screen (Figure 3-9) controls the amount of data transferred to and from the remote unit during acquisitions. If it is not necessary to send or receive all set up and memory data during each Arm cycle of the Logic Analyzer, transfer time may be reduced by de-selecting the unnecessary information.

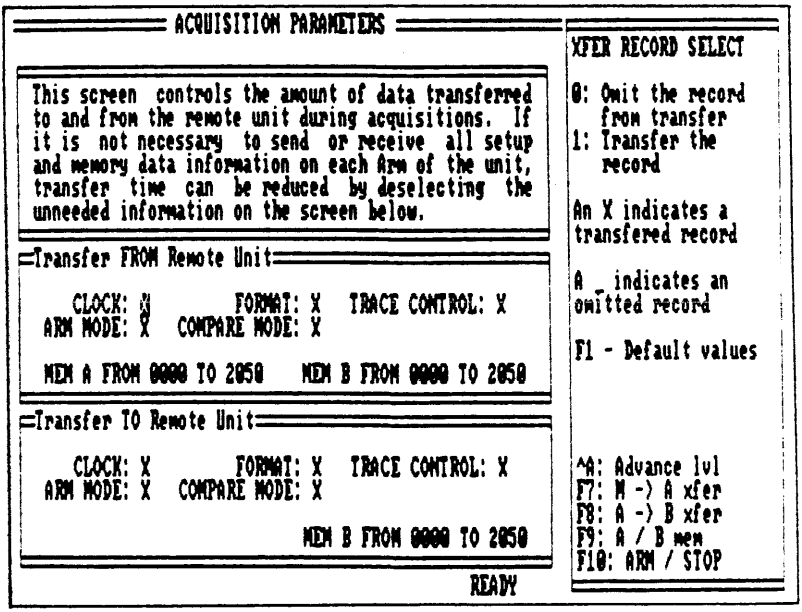

Figure 3-9. Acquisition Parameters Screen

Perform the following steps:

1. Press the **P** key.

   Selects the ***Acquisition Parameters*** screen from the ***PCLA450B TOP Menu*** screen.

2. Press the **0** key.

   De-selects unnecessary transfer information from the remote unit.

3. Press the **DOWN ARROW** key.

   Moves the cursor to the Transfer Sample Select field.

4. Press the **PgUp/PgDn** keys.

   Selects the next or previous legal values.

5. Press the **DOWN ARROW** and then the **0** keys.

   De-selects unnecessary transfer information to the remote unit.

6. Press the **HOME** key.

   Returns the user to the ***PCLA450B TOP Menu*** screen.

PCLA USER UTILITIES SCREEN

The ***PCLA User Utilities Menu*** screen (Figure 3-10) provides several tools for the user.

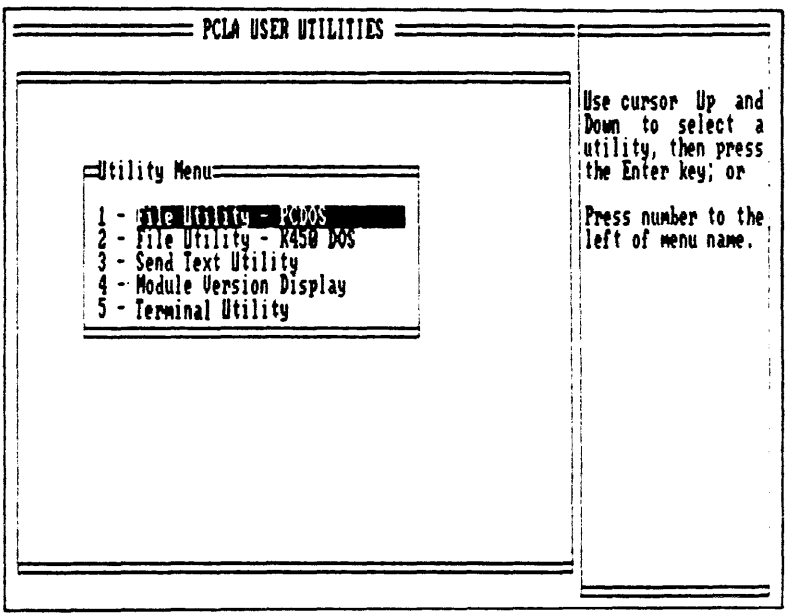

Figure 3-10. PCLA User Utilities Menu Screen

Perform the following steps:

1. Press the **U** key.

   Selects the ***PCLA User Utilities Menu*** screen from the ***PCLA450B Top Menu*** screen.

2. Press the **1** key.

Selects the ***File Utility PC DOS*** screen (Figure 3-11). This screen allows the user to save and restore Logic Analyzer data in the DOS format on the P.C.

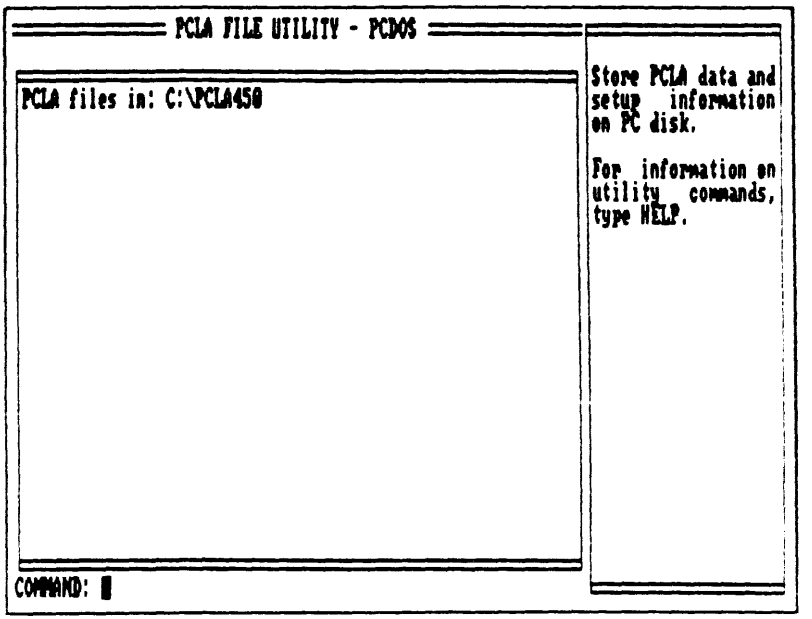

Figure 3-11 File Utility PC DOS Screen

The K450B Logic Analyzer filename format is:

A: RESULT-01.SM

Where:

A	Drive
RESULT	Filename up to six digits. No embedded spaces.
01	File version (00-99)
.SM	File type.

The file types are:

Type	Description
.SM	Memory M Set Up Information.
.SA	Memory A Set Up Information.
.SB	Memory B Set Up Information.
.MA	Memory A Data.
.MB	Memory B Data.
.BA	Memory A Set Up Data/Information
.BB	Memory B Set Up Data /Information.

The translated DOS filename format is:

A:01RESULT.T0

Where:

A	Drive
01	File Version.
RESULT	File name.
.T0	DOS File Type.

The Logic Analyzer file type and DOS code is:

K450B	DOS
.SM	.T0
.SA	.T1
.SB	.T2
.MA	.T3
.MB	.T4
.BA	.T5
.BB	.T6

Enter any of the following commands:

Command	Description
DIR	Views the diskdirectory. Example: Dir
SAVE	Saves set up/memory data . Example: SAVE SETUP-01.SM SAVE DATA-01.MA
RECALL	Recalls set up/memory data. Example: RECALL/A FILE 01.SM RECALL DATA-20.MA
DELETE	Erases unlocked files. Example: DELETE FILE-*.* DELETE DATA-02.MB
HELP	Displays DOS commands.

3. Press the **ESC** key.

   Returns the user to the ***PCLA User Utility Menu*** screen.

4. Press the **HOME** key.

   Returns the user to the ***PCLA450B TOP Menu*** screen.

File Utility K450B DOS

2. Press the **2** key.

   Selects the ***File Utility K450B DOS*** screen (Figure 3-12). Insert a blank or formatted K450B disk in drive A or B of the P.C.

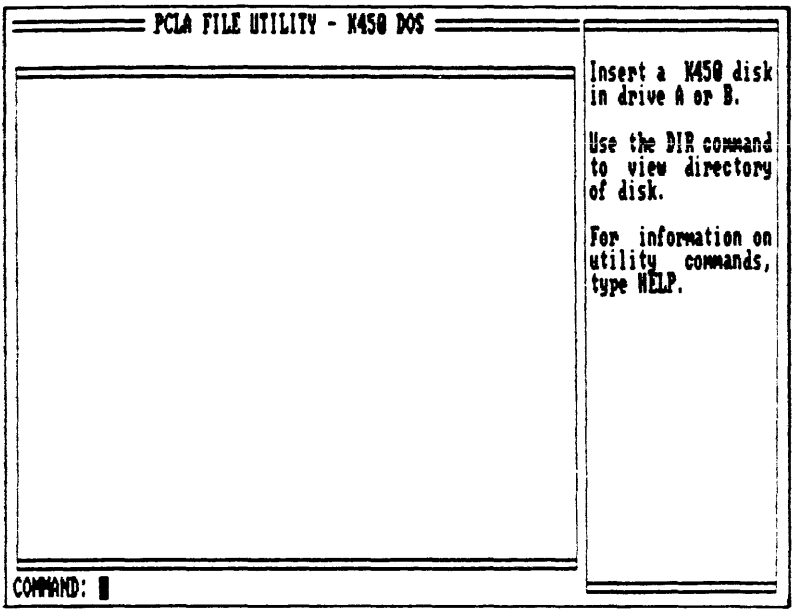

Figure 3-12. File Utility K450 DOS Screen

2. Enter any of the following commands:

Command	Description
DIR	Views the diskdirectory. Example: Dir A:
SAVE	Saves set up/memory data . Example: SAVE SETUP-01.SM SAVE B:DATA-01.MA
RECALL	Recalls set up/memory data. Example: RECALL/A FILE 01.SM RECALL DATA-20.MA

DELETE	Erases unlocked files. Example: DELETE A:FILE-*.* DELETE DATA-02.MB
LOCK	Applies a software write protect to the filename.
UNLOCK	Removes the software write protect from the filename.
HELP	Displays DOS commands.

3. Press the **ESC** key.

   Returns the user to the ***PCLA User Utility Menu*** screen.

4. Press the **HOME** key.

   Returns the user to the ***PCLA450B TOP Menu*** screen.

Send Text Utility

2. Press the **3** key.

   Selects the ***Send Text Utility*** screen (Figure 3-13). Enter text at the bottom of the screen.

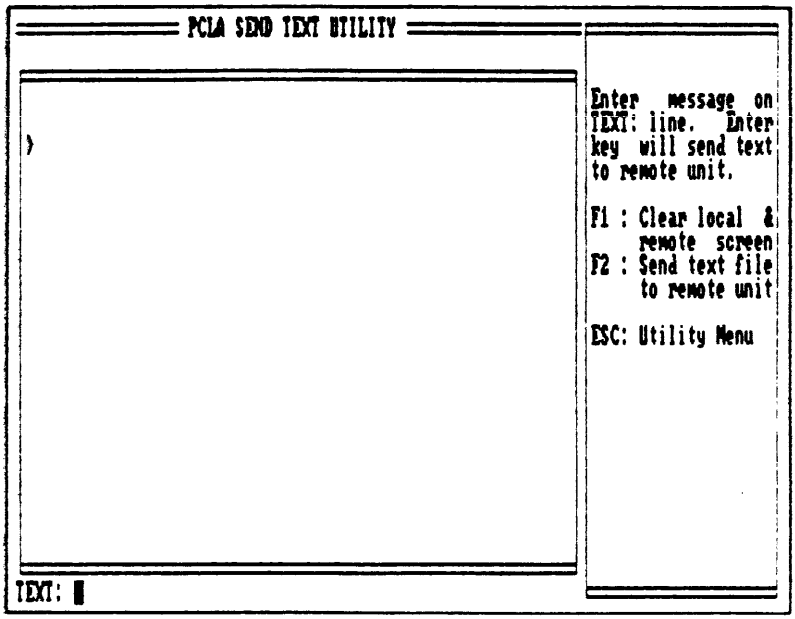

Figure 3-13. Send Text Utility Screen

3. Press the **RETURN** key.

   Sends the text line to the Logic Analyzer.

4. Press the **F1** key.

   Clears the Logic Analyzer message and display.

5. Press the **ESC** key.

   Returns the user to the ***PCLA User Utility Menu*** screen.

6. Press the **HOME** key.

   Returns the user to the ***PCLA450B Top Menu*** screen.

Module Version Display

1. Press the **4** key.

   Displays the ***Module Version Display*** screen (Figure 3-14). This screen displays the version numbers of the major Logic Analyzer software modules.

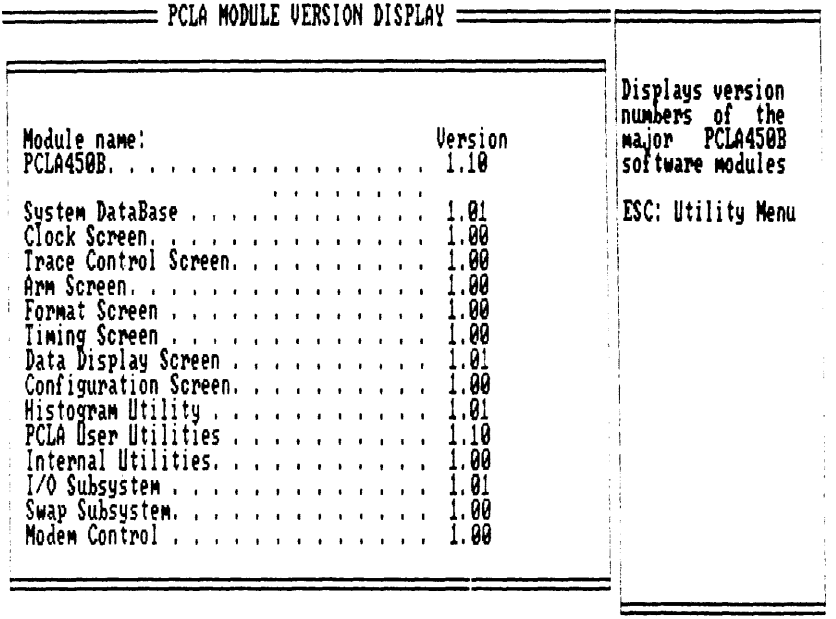

Figure 3-14. Module Version Display Screen

2. Press the **ESC** key.

   Returns the user to the ***PCLA User Utilities Menu*** screen.

1. Press the **5** key.

   Selects the ***Terminal Utility*** (Figure 3-15) screen. This screen is a simple terminal emulator attached to the currently active COM: port of the host computer. The user may talk directly to the Logic Analyzer or a modem attached to the COM: port.

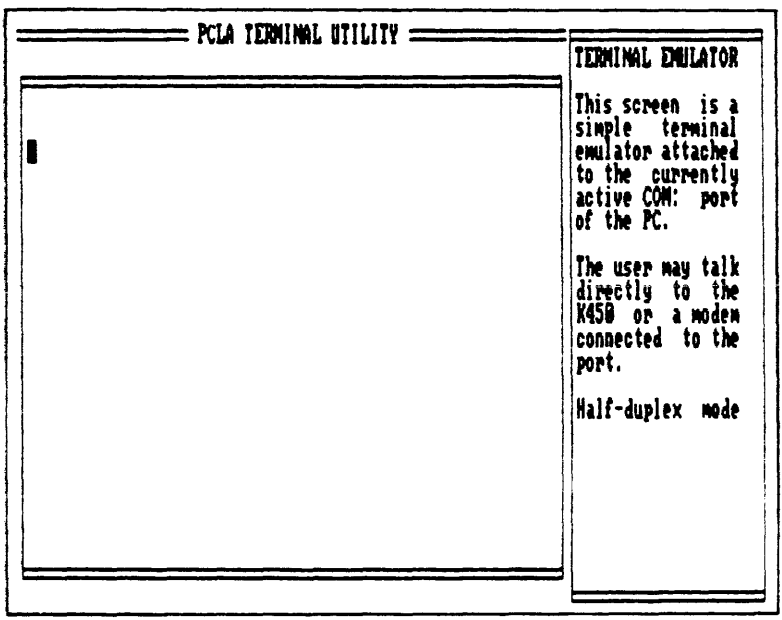

Figure 3-15. Terminal Utility Screen

2. Connect a Hayes Smartmodem II or compatible modem.

3. Set the baud rate at 300 or 1200 bps.

4. Set to internal or external.

5. Select a modem communications port.

6. Enter `mcom 1` in the PCLA450B set up file.

7. Press the **ESC** key.

   Returns the user to the ***PCLA User Utilities Menu*** screen.

8. Press the **HOME** key.

   Returns the user to the ***PCLA450B TOP Menu*** screen.

PCLA CONFIGURATION SCREEN

The ***PCLA Configuration*** screen (Figure 3-16) defines and enables communication between the Logic Analyzer and PC. PCLA450B communicates with only one Logic Analyzer at a time, but can keep track of up to eighteen remote units in a GPIB network. The active unit is identified by an arrow pointing to the unit number on the ***PCLA Configuration*** screen.

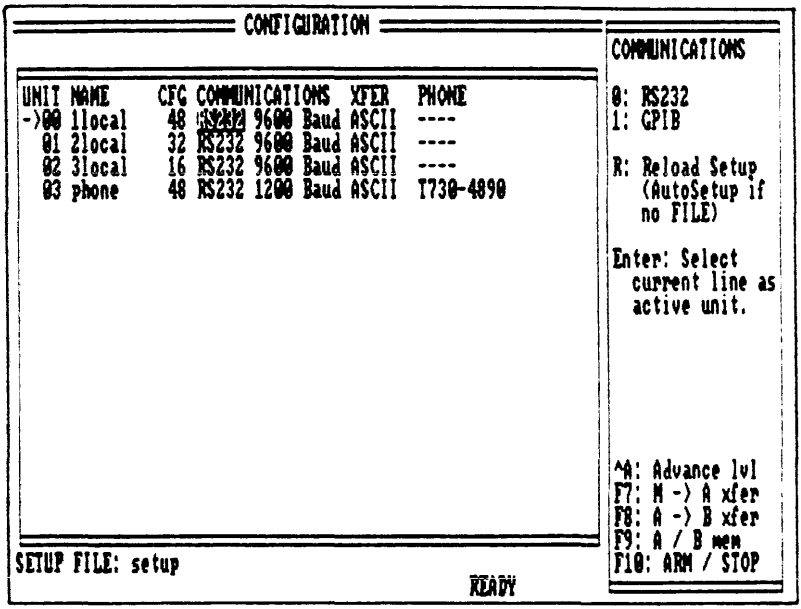

Figure 3-16. PCLA Configuration Screen

Perform the following steps:

1. Press the **I** key.

   Selects the ***PCLA Configuration*** screen from the ***PCLA450B Top Menu*** screen.

RS-232-C

2. Press the **0** key.

   Selects the RS-232-C mode. Conditions for RS-232-C linkage are:

   Baud Rate: 9600 Max. (User Defined)

   Word Length: 8 Bits

   Stop Bit (s): 1

   Parity: None

   Protocol: XON/XOFF

   Record Length: Unlimited

   The Logic Analyzer should be set to the same values.

3. Press the **RIGHT ARROW** key.

   Moves the cursor to the RS-232-C Baud Rate field.

4. Press the **PgUp/PgDn** keys.

   Selects the next or previous baud rate in the RS-232-C Baud Rate field.

5. Press the **RIGHT ARROW** key.

   Moves the cursor to the Transfer Mode field.

6. Press the **PgUp/PgDn** keys.

   Selects the next or previous legal values.

7. Press the **R** key.

   Reconfigures the communications channels. Reloads the configuration data. If a set up file was used, it is displayed at the bottom of the ***PCLA Configuration*** screen.

8. Press the **DOWN ARROW** key.

   Moves the cursor to the Setup Filename field. Enter the filename in the space provided.

9. Press the **HOME** key.

   Returns the user to the ***PCLA450B Top Menu*** screen.

GPIB

1. Press the **1** key.

   Selects the GPIB option. GPIB interface conditions are:

EOI:	On (Set with last byte of transmission.)
CR:	As Terminator
GPIB MODE:	Talk/Listen
Record Length:	Unlimited

   The Logic Analyzer should be set to the same values.

2. Press the **RIGHT ARROW** key.

   Moves the cursor to the GPIB Address field.

3. Press the **PgUp/PgDn** keys.

   Selects the next or previous legal values.

4. Press the **R** key.

   Reconfigures the communications channels. Reloads the configuration data. If a set up file was used, it is displayed at the bottom of the ***PCLA Configuration*** screen.

5. Press the **RIGHT ARROW** key.

   Moves the cursor to the Setup Filename field. Enter the filename in the space provided.

6. Press the **HOME** key

   Returns the user to the ***PCLA450B Top Menu*** screen.

DISPLAY DATA SCREEN

The ***Display Data*** screen (Figure 3-17) shows the data recorded by the Logic Analyzer in the format specified in the ***Set Up Format*** screen as numeric or ASCII values. The last sample stored in memory is located in 2047/4095.

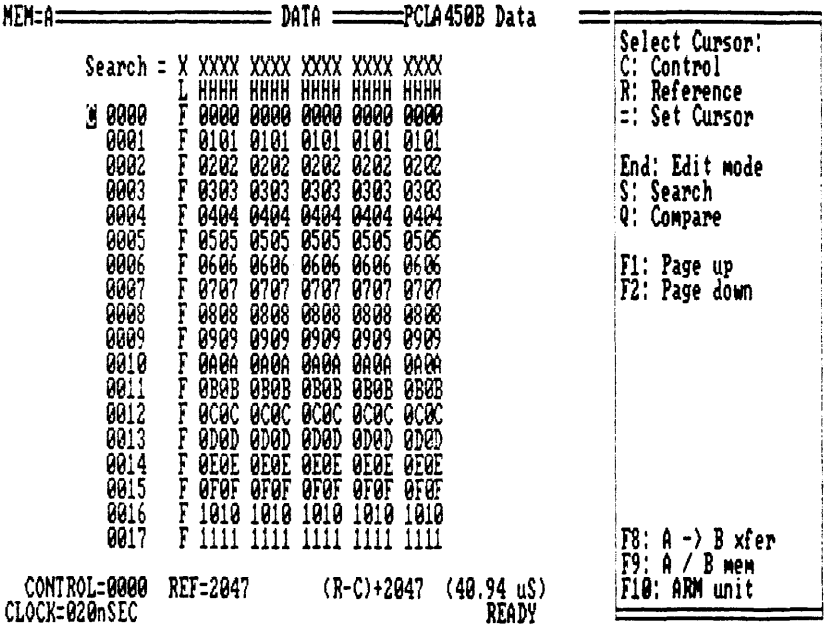

Figure 3-17. Display Data Screen

Perform the following steps:

1. Press the **D** key.

   Selects the ***Display Data*** screen from the ***PCLA450B Top Menu*** screen.

2. Press the **DOWN ARROW** or **PgUp/PgDn** or **F1/F2** keys.

   Moves the Control cursor by line or by screen through the memory sample lines 0000 to 2047/4095.

3. Press the **C** key.

   Selects the Control cursor as the active cursor.

4. Press the **PgUp** or **PgDn** keys or directly enter a number.

   Enters the memory sample lines. Directly enter a number with the equal (=) sign.

6. Press the **R** key.

   Selects the Reference cursor as the active cursor.

7. Press the **PgUp** or **PgDn** keys or directly enter a number.

   Enters the next or previous memory reference sample lines. Directly enter a number with the equal (=) sign.

8. Press the **END** key.

   Selects the Edit search word.

9. Press the **END** key.

   Exits the Edit mode.

10. Press the **S** key.

    Selects the Search function. The Search function instructs the PCLA450B to examine all stored data samples in memory A or memory B and report the number of times a specified word was located. Each occurrence of the Search Word is marked with an asterisk. If using a color monitor, the matched samples are displayed as yellow characters on a red background.

11. Press the **Q** key.

    Selects the Compare function.The Compare parameters in the memory M controls the memory A to B comparison. Differences between the stored recordings are indicated by a #. The number of miscompares is shown as well as their locations. If using a color monitor, the miscompare samples are displayed as yellow characters on a red background.

12. Press the **PgUp** or **PgDn** keys.

    JUMPs to the next or previous occurrence of the Search Word or miscompare. JUMPs to the Next/Previous level if Search/Compare is not selected.

13. Press the **F1** or **F2** keys.

    Scrolls through the screen.

14. Press the **HOME** key.

    Returns the user to the ***PCLA450B Top Menu*** screen.

DISPLAY TIMING SCREEN

The ***Display Timing*** screen (Figure 3-18), shows each sample input line of data as a reconstructed waveform when using CGA mode. (See PC System Requirements in Chapter 1 which describe the use of CGA mode to ***Display Timing*** screen Waveforms.) The Timing Screen indicates whether the line is at a logic High or Low, independent of the polarity selected. The combined sample points of all the data input sections are one trace sample. Data search and compare functions are also supported.

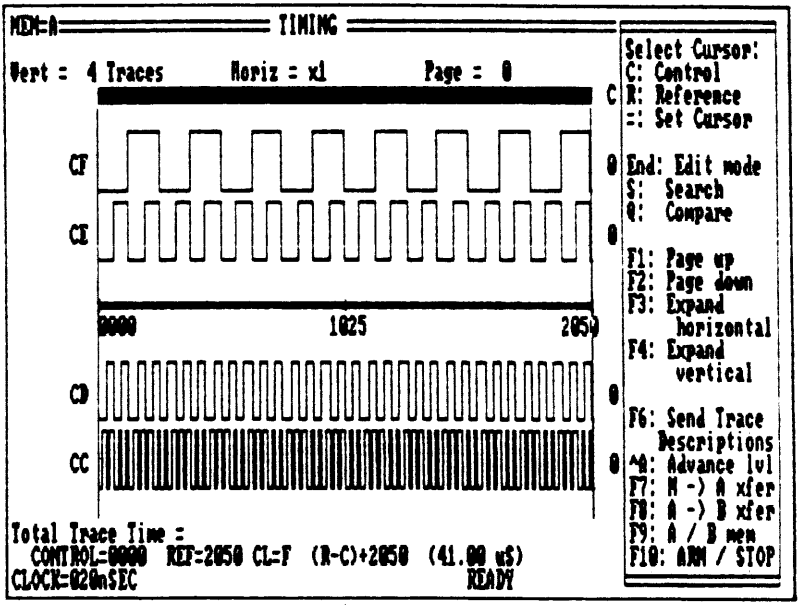

Figure 3-18. Display Timing Screen

Perform the following steps:

1. Press the **T** key.

   Selects the ***Display Timing*** screen from the ***PCLA450B B Top Menu*** screen.

2. Press the **C** key.

   Selects the Control cursor as active. The Control field is located near the bottom of the screen. The Control and Reference fields indicate the value of the memory location under the Control cursor. Enter a value.

   The Control and Reference fields on the ***Display Data*** screen and the vertical cursor and reference lines on the ***Display Timing*** screen are interdependent. A change made on one screen results in an equal change to its counterpart on the other screen.

3. Press the **R** key.

   Selects the Reference cursor as active. The Reference field is located near the bottom of the screen. Enter a value.

4. Press the **F3** key.

   Expands the horizontal ***Display Timing*** screen in increments of X1, X10, X20 and X40.

7. Press the **F4** key.

   Expands the vertical ***Display Timing*** screen by increments of 8, 4 and 16 traces.

8. Press the **END** key.

   Selects the Edit Mode in the left of the screen that assigns labels and identifiers. Enter a value.

9. Press the **PgUp** or **PgDn** keys.

   Changes inputs by moving the active cursor to next or previous input ID fields for entering new numbers. Sets input labels by moving the active cursor to the desired column.

10. Press the **UP, DOWN, LEFT, RIGHT ARROW** keys.

    Selects the option that alters data in memory B. Enter a value.The cursor may be moved to the trace area and used as an editing cursor.

11. Press the **END** key.

    Exits the Edit mode.

12. Press the **S** key.

    Selects the Search function. The search function asks the Logic Analyzer to examine all stored samples and report the number of times a specified word was located.

13. Press the **Q** key.

    Selects the compare function. Differences between the two stored recordings are indicated by dotted traces. The number and locations of miscompares is shown at the bottom of the screen.

14. Press the **PgUp** or **PgDn** keys.

    JUMPS to the next or previous occurrence of the search word or miscompare.

15. Press the **HOME** key.

    Returns the user to the ***PCLA450B Top Menu*** screen.

HISTOGRAM SCREENS

The ***Histogram Menu*** screen (Figure 3-19) selects the ***Link*** or ***Range Definition*** or the ***Range*** or ***Link Histogram*** screens. A range is the relationship between two numbers, typically an address. A link exists when a specified bit pattern is followed by another specified bit pattern.

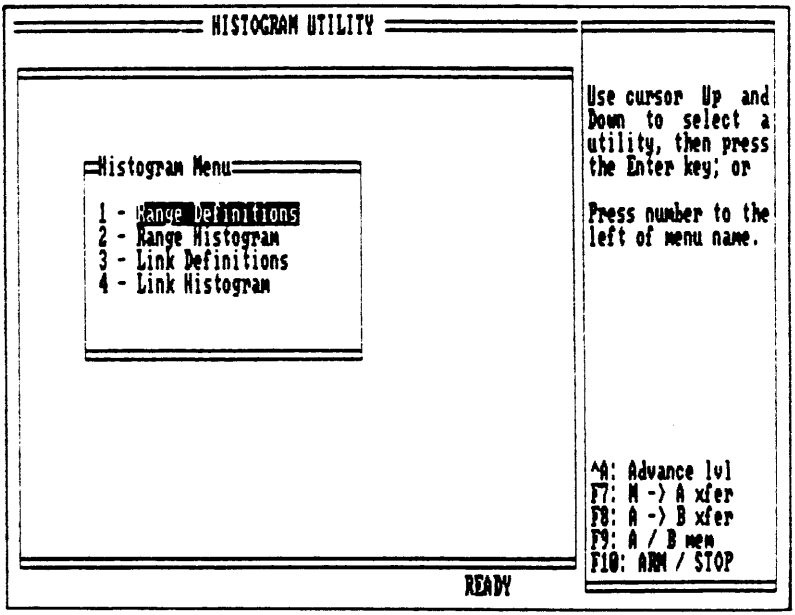

Figure 3-19. Histogram Utility Menu Screen

Perform the following steps:

1. Press the **H** key.

   Selects the ***Histogram Utility Menu*** screen from the ***PCLA450B Top Menu*** screen.

Range Definition and Range Histogram

2. Press the **1** key.

   The ***Range Definition*** screen (Figure 3-20) defines the beginning and end of up to sixteen ranges. A range is the difference between the least and greatest values of a variable. The variable may be data or an address.

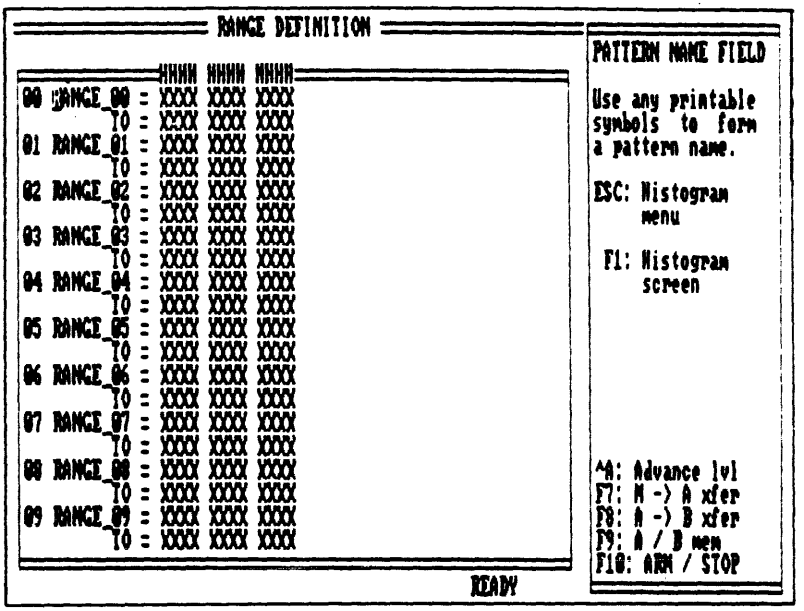

Figure 3-20. Range Definition Screen

3. Press the **UP** or **DOWN ARROW** keys.

   Moves the cursor in the Pattern Name field from range 00 to 15.

4. Press the **LEFT** or **RIGHT ARROW** keys.

   Moves the cursor to the Pattern Value field.

5. Press the **PgUp** or **PgDn** keys.

   Selects the values of the Pattern Value field. X sets don't cares and 0 to F sets the Hex values.

6. Press the **F1** key.

   Selects the ***Range Histogram*** screen (Figure 3-21).

   The ***Range Histogram*** screen displays the number of samples falling within each defined range as a percent of the total number of samples.

   The data is represented in three different ways:

   Next to each range is a bar with a length related to the percent values on the x axis of the graph.

   At the end of the bar is the percentage.

   The actual number of samples falling within that range.

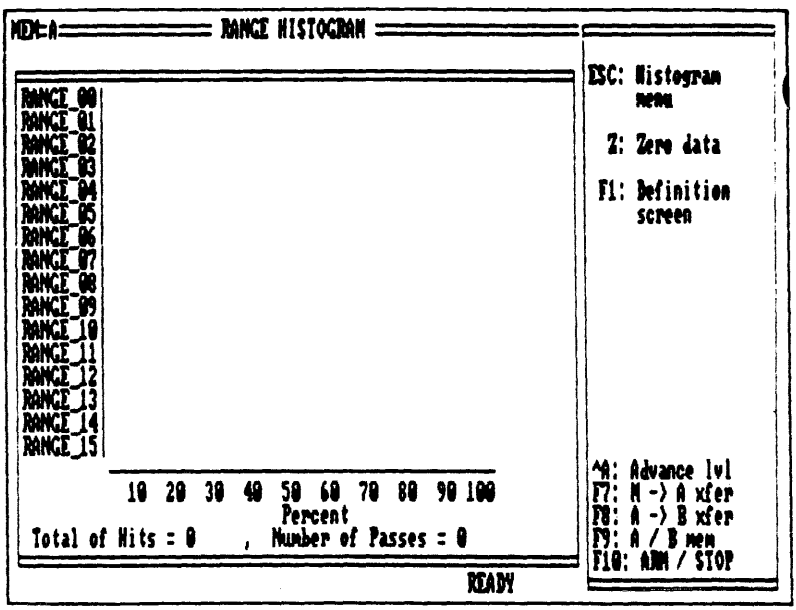

Figure 3-21. Range Histogram Screen

7. Press the **F10** key.

Arms the Logic Analyzer and generates the trace recording. The following is displayed on the ***Range Histogram*** screen:

A percentage value is indicated for the specified range selected in step six.

The count value is present for the total number of Hits that occured in the specified range.

The pass count is indicated at the bottom of the ***Range Histogram*** screen to show the number of times memory A is analyzed and graphed.

8. Press the **F10** key.

Re-Arms the Logic Analyzer and generates another trace recording. The count value is incremented for the total number of Hits in all ranges.The pass count is incremented with each Arm cycle.

Link Definitions and Link Histogram

2. Press the **3** key.

Selects the ***Link Definitions*** screen (Figure 3-22). A link exists when a specified bit pattern is followed by another specified bit pattern. Since don't care patterns may be used, the Link is a good analysis tool to find the area of memory from which a specified sub-routine entry point is called.

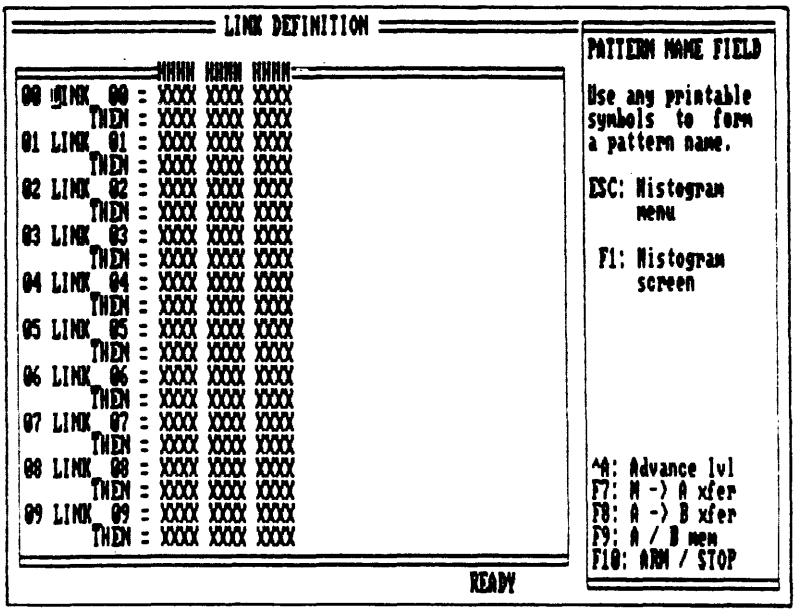

Figure 3-22. Link Definitions Screen

3. Press the **F1** key.

The ***Link Histogram*** screen (Figure 3-23) displays a sequence of two patterns the user has defined as constituting a link. Each character or bit in a predefined sample is set to a value or don't care. Each link is assigned a user-supplied name. By default, each link is assigned LINK_XX.

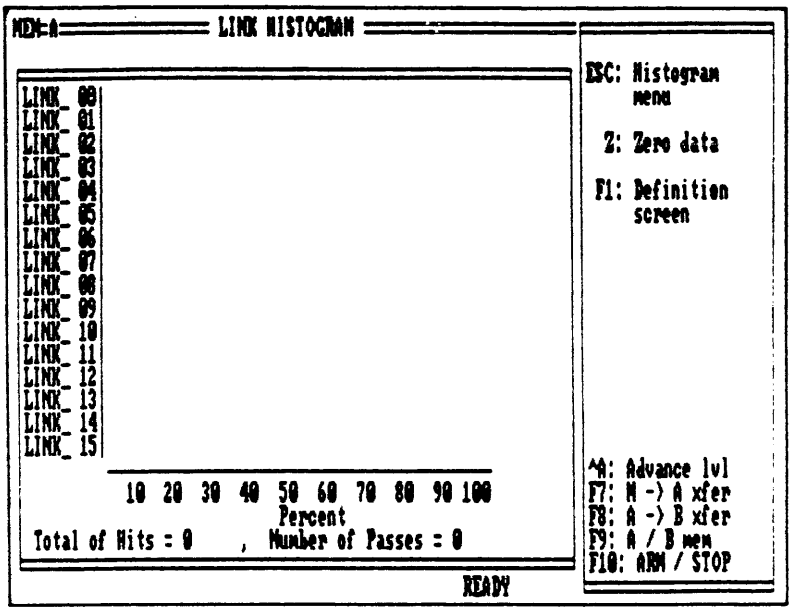

Figure 3-23. Link Histogram Screen

3. Press the **ESC** key.

   Returns the user to the ***Histogram Menu*** screen.

4. Press the **HOME** key.

   Returns the user to the ***PCLA450B Top Menu*** screen.

Chapter 4

REFERENCE INFORMATION

INTRODUCTION

This chapter provides customer service and reference information.

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REFERENCE DOCUMENTS

The following documents are used with this manual:

K450B User's Manual, 0121-0460-10

This document describes the setup and operation of the stand-alone K450B Logic Analyzer.

GPIB-PC User Reference Manual, 320014-01

This document describes how to install and configure the National Instruments GPIB-PC card and cable with the PC.

Reader Comments

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