

TIME STAMP

USER'S MANUAL

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## OVERVIEW

### THIS MANUAL

This manual describes how the Time Stamp ROM Pack configures the 1240 Logic Analyzer for use with the Time Stamp Module to produce and display elapsed time information about synchronously acquired data samples.

### OTHER MANUALS

To use the Time Stamp ROM Pack and Module, you should be familiar with the operation of the 1240 Logic Analyzer. Refer to the "1240 Logic Analyzer Operator's Manual."

### TIME STAMP MODULE

The Time Stamp Module generates 18 bits of timing information which is stored with each synchronously acquired data sample.

### CONFIGURING THE TIME STAMP MODULE

The configuration of the Time Stamp Module is via a three-position toggle switch located on the front of the module case. Set this switch to match the value selected for TSMODE in the DATA menu STATE TABLE submenu. Table 1 contains the appropriate switch setting for each selected mode.

Table 1  
TIME STAMP MODULE CONFIGURATION

<u>TSMODE</u>	<u>SWITCH SETTING</u>	<u>TIME STAMP ACCURACY</u>
RELATIVE	20M	50 nsec
HIGH RES	20M	50 nsec
MED RES	200K	5 usec
LOW RES	2K	.5 Msec

## CONNECTIONS

### CONNECTING THE TIME STAMP MODULE TO THE 1240

Remove any data acquisition probes from the highest-numbered 1240D2 card of the 1240. The ribbon cables from the Time Stamp Module connect directly to the 1240D2 18-channel acquisition cards of the 1240; no data acquisition probes are required.

Both Time Stamp Module cables are connected to the highest numbered 1240D2 acquisition board installed in the 1240. Connect the connectors on the ribbon cables to the pods of the 1240 in accordance with the information in Table 2. Connectors are keyed so that they cannot be plugged in upside down.

Table 2  
TIME STAMP MODULE TO 1240 CONNECTIONS

Time Stamp Module Connector	1240 Pod I.D. Number for:		
	2 Acq Cards	3 Acq Cards	4 Acq Cards
Upper Connector	2	4	6
Lower Connector	3	5	7

CONNECTION OVERVIEW

Table 3 provides an overview of the connections between the 1240 Logic Analyzer equipped with a Time Stamp ROM Pack and the Time Stamp Module.

Table 3  
1240 TO TIME STAMP MODULE SIGNAL MAP

1240 SCREEN			CONNECTION	
GROUP	BIT	C/Q	POD*	CHAN
STMP	17		2	8
	16		2	7
	15		2	6
	14		2	5
	13		2	4
	12		2	3
	11		2	2
	10		2	1
	9		2	0
	8		3	8
	7		3	7
	6		3	6
	5		3	5
	4		3	4
	3		3	3
	2		3	2
	1		3	1
0		3	0	
(none)	-	P2	2	C/Q
(none)	-	P3	3	C/Q

\*Pod numbers are shown for a 1240 with a total of two 1240D2 acquisition cards installed. For each additional acquisition card installed, add 2 to the pod numbers given.

## ROM PACK INSTALLATION

### 1240 CONFIGURATION

In order to acquire data from a system under test using the Time Stamp support, you must have a 1240 Logic Analyzer equipped with at least two 1240D2 18-channel Data Acquisition Cards.

#### NOTE

The Time Stamp ROM Pack will not set up the 1240 or display time stamped data when it is installed in a 1240 with less than two 1240D2 acquisition cards.

### INSTALLING THE ROM PACK

#### CAUTION!

Static discharge can damage the semiconductor devices in a ROM Pack. Discharge static from a pack before installing it by momentarily laying the pack, label side up, on the top of the 1240.

To install the Time Stamp ROM pack in your 1240 Logic Analyzer, locate the slot on the right side of the instrument, beneath the probe connectors. Insert the connector end of the ROM Pack, with the label up, past the hinged slot cover and into the memory pack connector. (The mechanical design of the pack ensures that it cannot be installed incorrectly.)

#### NOTE

Power up the 1240 before powering up your system under test. Powering up your system first may result in a soft failure of your system.

Power up your 1240, then your system under test. The contents of the ROM Pack will be loaded automatically at power-up. If your 1240 is already on when the ROM Pack was installed, follow the next procedure, "Loading the ROM Pack Contents."

#### NOTE

The 1240 should use the same power source as the system under test. Otherwise, differences between system grounds may cause inconsistent acquisition.

### LOADING THE ROM PACK CONTENTS

Enter the Storage Memory Manager menu. Then press the LOAD NEW PACK soft key. The ROM Pack is now loaded.

CAUTION!

Do not remove the ROM Pack while you are in any menu other than Storage Memory Manager. Removing it at any other time may cause complete disruption of the 1240's internal memory. To restore the 1240, turn it off and back on.

REMOVING THE ROM PACK

To unload the ROM Pack from the 1240, enter the Storage Memory Manager menu, pull the ROM Pack straight out of the 1240 (it is not necessary to power down) and press LOAD NEW PACK.

CAUTION!

After removing the ROM Pack, do not leave the Storage Memory Manager menu without pressing the LOAD NEW PACK soft key. Doing so may cause complete disruption of the 1240's internal memory. To restore the 1240, turn it off and back on.

## SETUP SUPPLIED BY THE ROM PACK

When the Time Stamp ROM Pack is loaded into a 1240 with two or more 1240D2 cards, several things happen:

- \* The 1240 enters Operation Level 2, ADVANCED STATE ANALYSIS. If you manually leave level 2 for levels 0 or 1, you will ruin the setup supplied by the ROM Pack. Using level 3 (after you load the pack) will not cause a problem.
- \* All 1240D2 chaining is turned off.
- \* The threshold is set to TTL on the pods used by this ROM pack.
- \* Both Time Stamp pods are clocked on T2.
- \* T2 is defined as sync with no clocks specified. See Timebase Definitions later in this manual.
- \* The display radix of the STMP group is set to OFF.

## MENU AND DATA DISPLAY DIFFERENCES

- \* Every menu that uses groups contains the STMP group set up by the ROM Pack. The display of this group has been turned off in the data menu, but may be turned on manually.
- \* If a 1200C01 RS232C or a 1200C11 Parallel Printer COMM Pack is installed, the COMM PORT CONTROL menu is replaced by the LINE PRINTER OUTPUT menu. Line printer operation is described later in this manual.
- \* The STATE TABLE soft key label changes to TIME STAMP STATE DISPLAY while you are in the state table menu.
- \* Also in the State Table display, GLITCHES ON/OFF is replaced by a TSMODE select field. This is where you choose a Time Stamp display mode. The choices are RELATIVE, HIGH RES, MED RES, LOW RES. The differences between these modes are discussed in detail later in this manual. You can still make the choice of GLITCHES ON or GLITCHES OFF in the Timing Diagram menu; the State Table display will reflect that choice.
- \* In the Timing Diagram display, the active cursor value at the bottom of the display is shown in RELATIVE, HIGH RES, MED RES, or LOW RES mode depending on the selection made in the State Table menu.

## TIMEBASE DEFINITIONS

The Time Stamp ROM Pack sets up the 1240 to use timebase 2 in the SYNC mode. No clock source is specified, as this will be determined by the system under test. Only SYNCHRONOUSLY acquired data on timebase T2 will be time stamped.

If you wish to time stamp data acquired from a 1240D1 acquisition card, you must manually assign the 1240D1 card to timebase T2.



An external clock signal supplied by the Time Stamp Module is available on the last two pods. The frequency of this clock signal corresponds to the frequency selected on the Time Stamp Module (200k, 2M, 20M). Care should be taken that this clock signal is not specified during normal time stamping operations.

#### WHAT YOU MAY CHANGE

Changing the setup provided by the Time Stamp ROM Pack may disrupt time stamping of data, but you can safely make the following modifications:

- \* You may change radices anywhere, and you may turn on the display of the STMP group if you wish.
- \* You may change anything related to timebase T1.
- \* You may change the contents or order of any group except STMP.

#### STORING AND USING A MODIFIED SETUP

When you have created and verified a modified setup for your 1240 that is compatible with Time Stamp operations, you can store it and retrieve it using the following procedures:

##### Storing a Modified Setup

- \* Go to the Storage Memory Manager menu (UTILITY key).
- \* Remove the Time Stamp ROM Pack.
- \* Install a RAM Pack, press LOAD NEW PACK, and store your setup (FILETYPE: SETUP, STORED IN: PACK).

##### Using a Modified Setup

- \* Go to the Storage Memory Manager menu (UTILITY key).
- \* Install your RAM Pack, press LOAD NEW PACK, and load the file containing the modified setup.
- \* Store the setup in the 1240's internal RAM (FILETYPE: SETUP, STORED IN: RAM).
- \* Remove the RAM Pack, install the Time Stamp ROM Pack, and press LOAD NEW PACK.
- \* Retrieve your modified setup from the 1240's internal RAM and proceed.

DISPLAYING THE TIME STAMPED DATA

DISPLAY FORMATS

The Time Stamp information generated by the Time Stamp ROM Pack is available in the State Table display (accessed by pressing the DATA key). You have four different time stamp modes from which to choose.

RELATIVE. This mode displays a time value with each sample which is the cumulative elapsed time relative to the position of the active cursor. Samples occurring before the cursor position do not display a time stamp. Resolution of the time stamp is 50 nsec. Look at Figure 1.

A different start sample can be chosen by moving the active cursor to the desired sample and pressing the MARK START soft key.

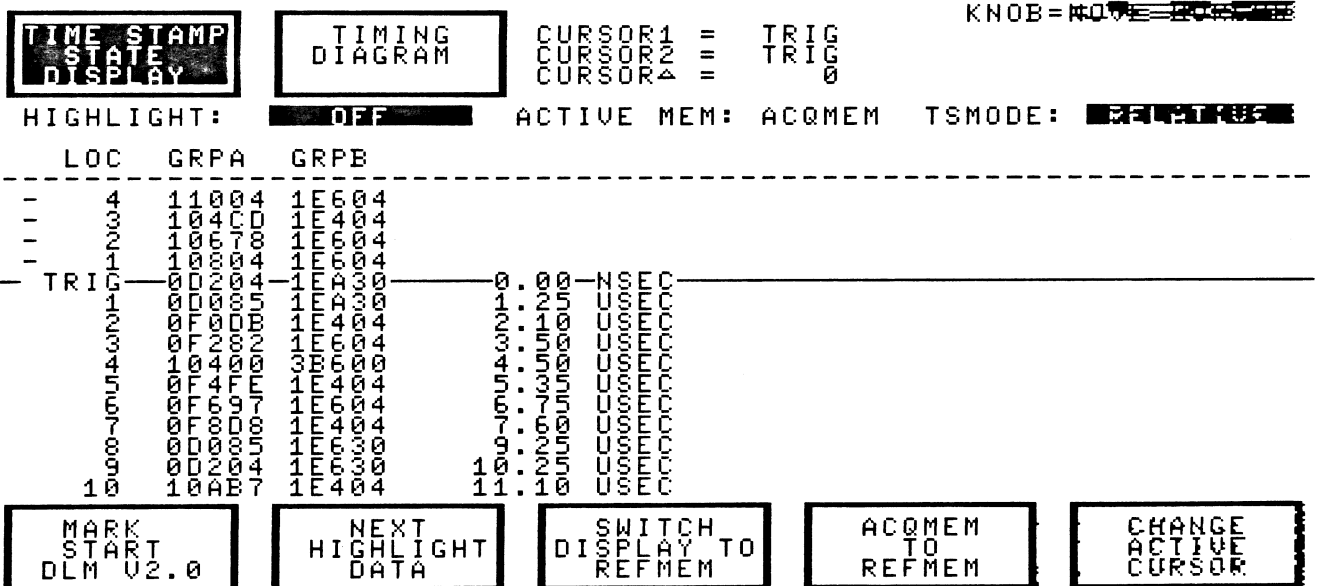


Figure 1. Relative display shows cumulative time from active cursor.

HIGH RES. High Res mode displays time values between successive samples with a resolution of 50 nsec. The Time Stamp Module switch MUST be set to "20M" for accurate display of the time stamp values. Look at Figure 2.

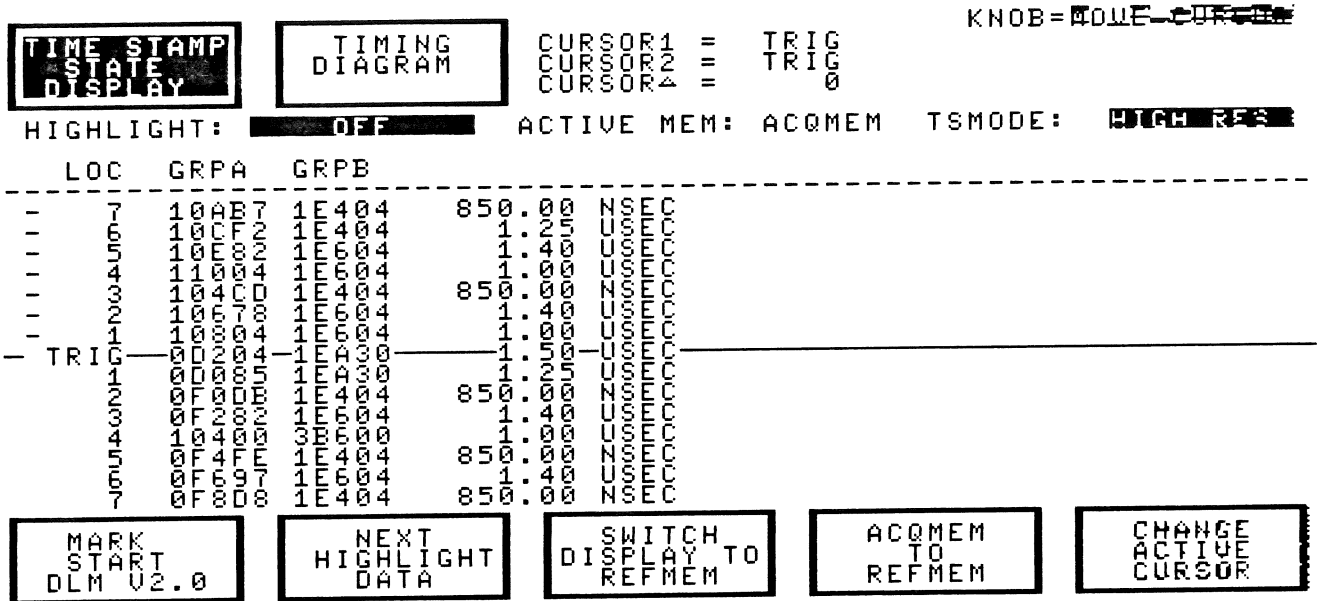


Figure 2. High Res mode shows time delta since last sample.





TIMING DISPLAYS

In the Timing Diagram Menu, the active cursor value readout at the bottom of the data display reflects the Time Stamp value from the STATE TABLE menu.

DUAL TIMEBASE DISPLAY

You may use T1 to acquire data asynchronously on non-timestamped channels. The T1 data is correlated with the T2 data and will appear as in Figure 5.

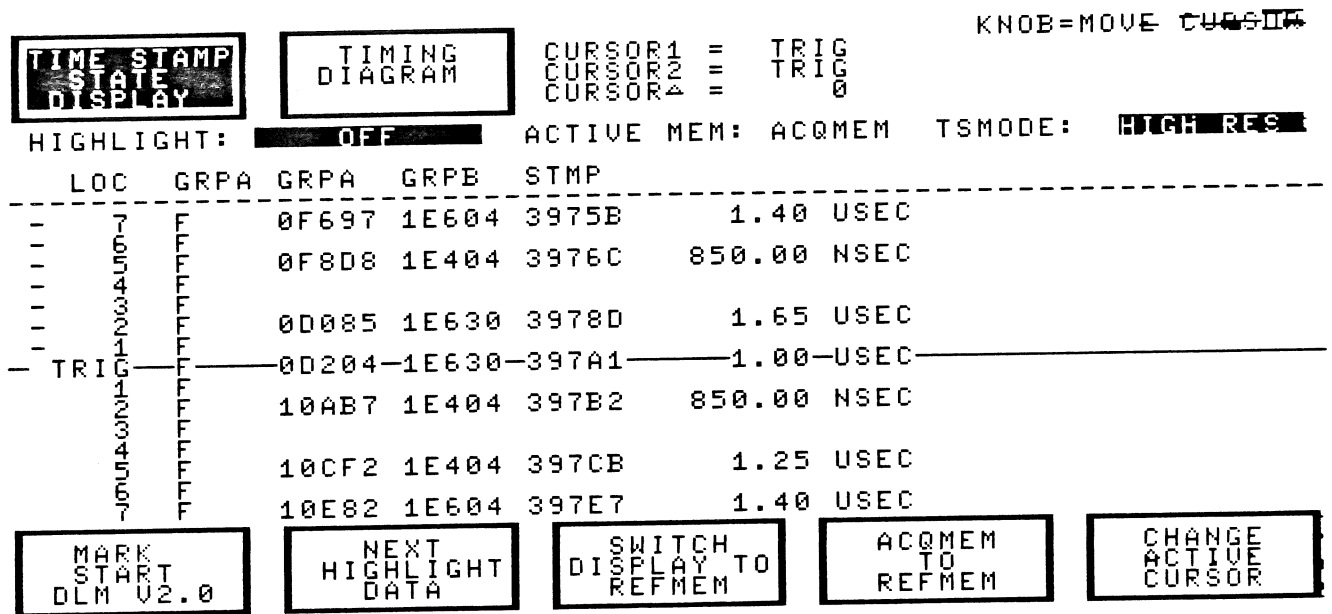


Figure 5. T1 data correlated with Time Stamped data.

## LINE PRINTER OUTPUT

When the time stamp ROM Pack is installed in a 1240 that also has a 1200C01 RS232C or 1200C11 Parallel Printer COMM Pack installed, the UTILITY menu presents a soft key labeled LINE PRINTER OUTPUT replacing the COMM PORT CONTROL key. The menu accessed by this key allows you to send your state data displays to a line printer in the current format. Refer to Figures 6 and 7.

STORAGE MEMORY MANAGER      LINE PRINTER OUTPUT      KNOB=

PRINTER INTERFACE PARAMETERS:

NEW LINE CHARACTERS (IN HEX)    00 0A XX XX

LINES PER PAGE    50  
NEW PAGE CHARACTERS (IN HEX)    00 XX XX XX

ACTIVE MEM: ACQMEM

PRINT LIMITS ARE:      FIXED  
LIMITS:      255  
              255

PRINT DATA

Figure 6. LINE PRINTER OUTPUT menu when 1200C11 is installed.

**NEW LINE CHARACTERS:** Use these hexadecimal fields to define a string of from one to four characters that will be appended to each line. The first field must have an entry, but the last three fields can be filled with Xs (don't cares).

**LINES PER PAGE:** Use this decimal field to specify the number of lines that will be printed on each page. Valid values range from 1 to 99.

**NEW PAGE CHARACTERS:** Use these hexadecimal fields to define a string of from one to four characters that will follow the end of every page. The first field must have an entry, but the last three fields can be filled with Xs (don't cares).

**ACTIVE MEM:** This field is for information only. Change the active memory in the State Table or Timing Diagram menus.

PRINT LIMITS ARE: Use this field to indicate whether the area of active memory to be printed will be defined by FIXED LIMITS or BETWEEN CURSORS. When BETWEEN CURSORS is selected, the area of the active memory that will be printed is defined by the data cursors (inclusive).

LIMITS: This field becomes active when FIXED LIMITS is selected in the PRINT LIMITS ARE field. Entries here specify the first and last line of memory to be printed. When PRINT LIMITS ARE: BETWEEN CURSORS, this field displays the locations of the cursors.

PRINT DATA: Touch this soft key to start the transmission of data. It will remain lighted during the transfer. Use the STOP key to interrupt the transmission if necessary.

NOTE

Do not attempt to control the 1240 remotely using an RS232C COMM Pack while this ROM Pack is installed.

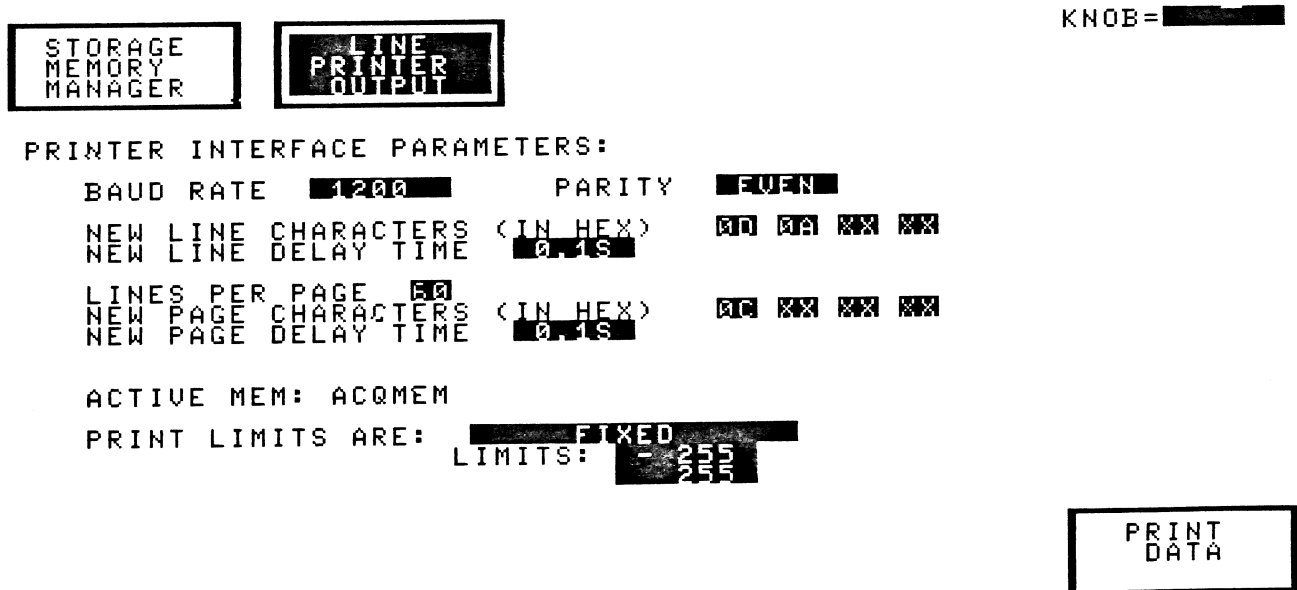


Figure 7. LINE PRINTER OUTPUT menu when 1200C01 is installed. Refer to Figure 6 for a description of those fields that are the same in both menus. Refer to the RS232C COMM Pack 1200C01 Operator's Manual for information on handshaking protocols and the use of null modems.



**BAUD RATE:** Use this field to specify the baud rate at which the 1240 will supply data to the printer. The available choices are: 110, 134.5, 150, 300, 600, 1200, 2400, 4800, and 9600.

**PARITY:** Use this field to make parity choices of ODD, EVEN, and NONE. If your printer uses the 8th (parity) bit for something other than parity, set this field to NONE.

**NEW LINE DELAY TIME:** Use this field to specify the minimum time delay between the transmission of successive lines by the 1240. The choices range from NONE to 9.9 SEC in 100 ms steps.

**NEW PAGE DELAY TIME:** Use this field to specify the minimum amount of time delay between the transmission of the last line of one page and the first line of the next page. The choices range from NONE TO 9.9 SEC in 100 ms steps.

**PRINT DATA:** Touch this soft key to start the transmission of data. Use the STOP key to interrupt the transmission, if necessary. This key places the 1240 ONLINE when the 1200C01 RS232C COMM Pack is installed. If the device being transmitted to is capable of transmitting back, spurious remote commands can affect the operation of the 1240. Also, during a PRINT DATA operation, the 1200C01 parameters are modified. Therefore, do not attempt to control the 1240 remotely while this ROM Pack is installed.

## ERROR MESSAGES

When used with a Time Stamp ROM Pack, the 1240 Logic Analyzer uses some error messages that are different from those it normally displays. Also, some of the normal error messages have additional meanings when they are used with this ROM Pack.

"?" --- A question mark displayed in front of the time stamp location on any sample indicates that there is some question as to the validity of the time stamp data for that sample. Another acquisition should be taken to verify that sample. All unmarked samples are incorrect.

APPLYING SEARCH PATTERN - PLEASE WAIT --- This message occurs briefly twice during a data acquisition with the Time Stamp ROM Pack installed, unless PATTERN SEARCH DISABLED is selected.

CONFIG ERROR --- This message always appears in the State Table display after power-up with a Time Stamp ROM Pack installed. It indicates that the setup used to acquire the current acquisition memory and the current setup from the Time Stamp ROM Pack are inconsistent. Acquiring new data should make this message go away. (Refer to the Reference Information section of the 1240 Logic Analyzer Operator's Manual for a complete discussion of this message.) This message also appears in the LINE PRINTER OUTPUT menu if the current configuration does not permit a PRINT DATA operation to be performed.

INSUFFICIENT 1240D2 CARDS TO SUPPORT DISASSEMBLY --- This message indicates that your instrument does not have enough 18-channel cards to support the use of the Time Stamp ROM Pack.

MARK START KEY VALID IN RELATIVE MODE ONLY --- This message occurs when the MARK START softkey is pressed in any mode other than RELATIVE mode.

MEMORY TIMEBASE ASSIGNMENTS WILL NOT SUPPORT DISASSEMBLY --- The memory being displayed cannot be time stamped because it was acquired with a setup that does not support time stamping. Go to the Storage Memory Manager menu and press LOAD NEW PACK to get a setup that will support time stamping. Then select an appropriate synchronous clock source and acquire new data using that setup.

NO VALID DATA ACQUIRED --- This message indicates that no T2 data was acquired.

PRESS "STOP" TO TERMINATE OPERATION --- This message tells you the correct way to stop a PRINT DATA operation. Since letting the printing operation finish or stopping it are your only choices once a printout is in progress, the 1240 assumes that you want to stop printing if you touch any key.

