1

1240 LOGIC ANALYZER

START

MENU
CONFIG

TRIGGER

DATA

EDIT

UTILITY

OVERVIEW & POWER-UP

Specifications for the 1240, 1240D1, and 1240D2 are listed in Tables 8-5 through 8-9 in Section 8, *Reference Information.*

GENERAL INFORMATION

The TEKTRONIX 1240 Logic Analyzer is a portable, general-purpose digital design and troubleshooting tool. Two types of data acquisition cards can be combined in different configurations to meet your specific needs. The 1240D1 card supports high-speed hardware analysis with 9 acquisition channels at 100 MHz (10 ns) and 5 ns glitch detection. The 1240D2 has 18 acquisition channels at 50 MHz and includes a bus demultiplexing feature.

The 1240 is configurable with any combination of 1240D1 and 1240D2 acquisition cards up to a maximum of four cards. A 1240 configured with both card types is an effective tool for evaluating hardware-software integration. Total channel width varies from 9 channels (one 1240D1) to 72 channels (four 1240D2s).

The 1240 provides the following features:

- Acquisition with one or two timebases. Asynchronous or synchronous selections are available.

- Powerful triggering with two event recognizers that can be used independently or together. The global event recognizer triggers on a single event in one or two timebases. In addition to the trigger action, the global event recognizer provides storage qualification, trigger reset, and detailed counter/timer functions. The sequential event recognizer consists of up to 14 separate levels. Each level specifies its own event and a trigger, wait, jump, delay, or reset action. Storage qualification is also available at each level.

- Data display in state table or timing diagram formats. The display preserves the time relationship between events, including events acquired on separate timebases.

- Simple, menu-oriented user interface featuring a front-panel keyboard (see Figure 1-1) and a 7-inch (diagonal) CRT screen with touch-sensitive, on-screen soft keys. Soft keys help make the 1240 easy to use because only appropriate operations are available at any given time.

- Auto-acquisition mode, for repeated acquisitions without manually restarting the instrument.

- Expandable acquisition memory depth with the memory chaining feature.

- Data searching and comparison functions.

- Nonvolatile memory ensures that two instrument setups (the current setup and another setup of your choice) are not lost when power is turned off.

Specifications for the 1240, 1240D1, and 1240D2 are listed in Tables 8-5 through 8-9 in Section 8, *Reference Information*.

Operations are controlled by menus displayed on the screen. MENU keys on the front panel select general menu groups; individual menus are selected by on-screen soft keys. Each soft key is outlined on the screen and has a label describing its function. The keyboard layout illustrated in Figure 1-1 is described in *Keyboard Description* later in this section. *Menu Overview*, also in this section, summarizes all menus. Figure 1-2 lists the menus accessed by each MENU key on the front panel.

Optional equipment includes nonvolatile RAM packs for storing instrument setups and memories, COMMunication packs for customizing the 1240 for external interfaces, and ROM packs for special added features. See *Options and Accessories* in Section 8 for a complete list.
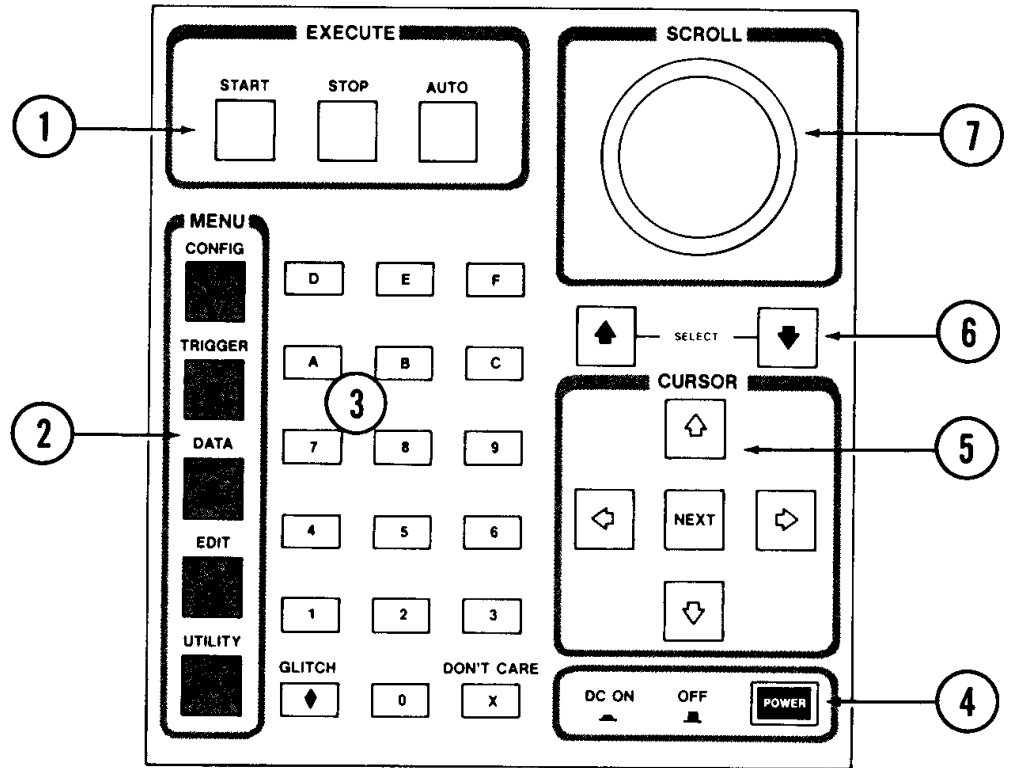
4340-1

Figure 1-1. 1240 keyboard layout.

KEYBOARD DESCRIPTION

The keyboard is divided into seven functional areas. These areas and their associated keys are described in the following paragraphs.

1 EXECUTE KEYS

START Starts data acquisition. When the trigger event specified in the Trigger Spec menu is found, the 1240 fills acquisition memory, then automatically stops and displays the acquired data in State Table or Timing Diagram format. While the 1240 is running, it displays information on the status of the trigger search.

STOP Stops data acquisition immediately (regardless of the status of the trigger search) and displays acquired data.

AUTO Starts a sequence of repeated data acquisitions based on the setups in the Trigger Spec and Auto-Run Spec menus. When the trigger event specified in the Trigger Spec menu is found, the conditions set up in Auto-Run Spec determine whether the 1240 stops, displays data, or continues to acquire.

2 MENU KEYS

These keys let you access groups of related menus. Each key has an LED in the center; the LED is lit when that menu group is in use.

For more menu information, refer to *Menu Overview* later in this section. The menus are discussed in detail in Sections 3 - 7.

CONFIG

Lets you access the Operation Level, Timebase, Memory Config(uration), and Channel Grouping menus. These menus work together to determine how the 1240 acquires and stores data.

TRIGGER

Lets you access the Trigger Spec(ification) and Auto-Run Spec(ification) menus. These menus define the trigger conditions.

DATA

Lets you access the State Table and Timing Diagram data display formats.

EDIT

Lets you access the Search Pattern Entry and Reference Memory Editor menus. These menus provide tools for manipulating stored data.

UTILITY

Lets you access the Storage Memory Manager menu. If a COMM pack is installed, a COMM Port Control menu is also available. Another menu may be available if a ROM pack is installed (not all ROM packs provide menus).

NOTE

After you press a MENU key, one of the menus in that group is displayed on the screen. At the top of the screen is a row of rectangles with menu titles; the label for the menu currently on the screen is displayed in reverse video (dark characters on a light background). The rectangles are menu "soft keys", and they are touch-sensitive. To change menus, touch the desired menu's soft key. Refer to Menu Soft Keys later in this section for more information.

3 DATA ENTRY KEYS

0   F Used for numeric data entry. If the field requires a specific radix, some keys may not be legal.

DON'T CARE
X   Used to indicate that the value of a channel or character is not considered.
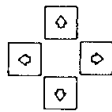
GLITCH
♦   Indicates that a glitch, rather than data, is the value to be tested for.

4 POWER SWITCH

POWER   Controls dc power from the power supply. This switch and the MAIN POWER SWITCH on the back panel (see Figure 1-3) must both be on for the 1240 to power up.

5   CURSOR CONTROL KEYS

These four keys move the blinking field cursor within menu fields and from one menu field to another. The cursor must reside in a field before you can make changes to that field.
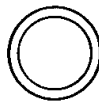
Advances the blinking field cursor to the next menu field to the right. If the cursor is positioned on the last field on a line, NEXT moves the cursor to the first field in the next line.

6   SELECT KEYS

These keys are used in some menu fields to choose from predetermined field values.

7   SCROLL KNOB

The knob's main function is to scroll through acquired data. It also serves as an alternative to the SELECT keys to choose from predetermined values for certain menu fields. A label describing the current function of the knob is displayed in the upper-right corner of the screen. If the knob cannot be used in a particular situation, no label appears.

				CONFIG
				TRIGGER
				DATA
				EDIT
				UTILITY

Touch-Sensitive Menu Soft Keys on the Screen
To change menus, touch the screen where the menu name is displayed.

Front Panel Menu Keys
Each key accesses a different group of menus.
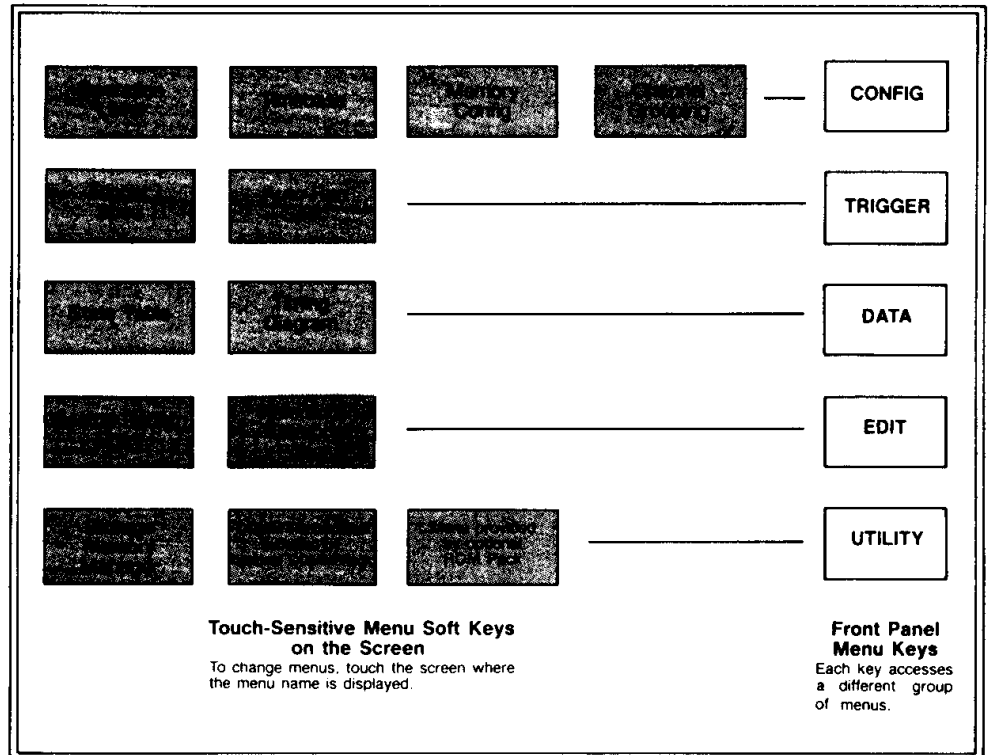
4340-2

Figure 1-2. Menu overview diagram, list of menus accessed by each MENU key.

MENU OVERVIEW

All 1240 operations are controlled by selections you enter into menus displayed on the screen. There are five groups of related menus; each group is accessed by a front panel MENU key (see previous *Keyboard Description*). Figure 1-2 shows which menus are accessed by each MENU key. A short description of each menu follows; detailed descriptions are in Sections 3 - 7.

When you press a MENU key, the menu displayed is the last menu accessed in that group. If this is the first time the group has been accessed since power-up, the 1240 defaults to the menu shown at the far left of each group in Figure 1-2.

MENU SOFT KEYS

At the top of the screen are touch-sensitive soft keys, one for each menu in the current menu group. The soft key in reverse video corresponds to the menu currently displayed. Change menus by touching the desired menu's soft key. The 1240 acknowledges the change with a short beep, displays the new menu, and changes the menu soft key to reverse video. Figure 1-2 lists the soft keys in each menu group.

Fingerprints accumulate on the screen with normal use of the soft keys. This does not affect the operation of the 1240, but the screen can be cleaned with a soft, lint-free cloth dampened with a 5% detergent solution.

MENU CHANGES

Many of the 1240's menus are interrelated; a change in one menu may affect selections available in other menus. Tables 8-1 through 8-4 in Section 8, *Reference Information*, list the effects on other menus of changes to Operation Level, Memory Config, Timebase, and Channel Grouping.

MENU DESCRIPTIONS

CONFIG Group. The menus in this group work together to determine how the 1240 acquires and stores data. Refer to Section 3 for complete details.

Operation Level — Displayed at power-up. Four operation levels customize the 1240 for different types of logic analysis tasks. The default level is Level 0 (Basic Operation), which supports most timing and state analyses. Levels 1 and 2 (Advanced Timing and State Analysis) have additional specialized features. All features are available in Level 3 (Full Operation).

Timebase — Specifies the number and type of timebases that can be used to control data acquisition.

Memory Config — Specifies the configuration of acquisition memory. Parameters involved are memory width vs. depth, acquisition card threshold, signal polarity, and pod-timebase assignments.

Channel Grouping — Collects channels into groups for data entry and display purposes. Specifies input and display radices for each group.

TRIGGER Group. These menus define the 1240's triggering characteristics. Refer to Section 4 for complete details.

Trigger Spec — Specifies the trigger event or sequence of events. Two event recognizers can be used individually or together to provide powerful, flexible triggering.

Auto-Run Spec — Specifies the conditions under which the 1240 makes repeated data acquisitions. The entries in this menu are only used if the data acquisition process is started with the AUTO key on the front panel. Auto-Run conditions do not specify trigger conditions; instead, they determine what action the 1240 takes when the trigger specified in the Trigger Spec menu occurs.

DATA Group. The first time after power-up that the 1240 displays acquired data, it uses the State Table format. As more acquisitions are taken, the 1240 displays data in either the State Table or Timing Diagram formats depending on which was last used.

The 1240 displays data in the order it occurred at the probe tip. The display shows if event A occurred before event B, even if the events were not sampled by the same timebase. This is the 1240's data correlation feature. Refer to Section 5 for more information.

State Table — Displays acquisition memory or reference memory in a tabular format. Operations are available that search for and highlight patterns of data. The channel arrangement, group label, and radix of displayed data are determined by the Channel Grouping menu.

Timing Diagram — Displays acquisition or reference memory in a logic-waveform format similar to the display of an oscilloscope. A maximum of 12 channels can be displayed at one time. Operations are available that search for and highlight patterns of data.

EDIT Group. These menus provide tools for manipulating data in memory. See Section 6 for details.

Search Pattern Entry — Specifies a pattern of data to be searched for in acquisition or reference memory. The search pattern specified by this menu is used by operations in the Timing Diagram and State Table menus.

Reference Memory Editor — Modifies the reference memory. You can change data in existing memory locations, and you can move the trigger to a different location.

1-6

| UTILITY | **Group.** The Storage Memory Manager menu is always available in this menu group. If a COMM pack is installed, a COMM Port Control menu is also available. Another menu may be available if a ROM pack is installed. Refer to Section 7 for details. |

Storage Memory Manager — Controls storage and retrieval of setups in nonvolatile memory and internal RAM; storage and retrieval of setups and memories in RAM packs; and retrieval of setups and memories from ROM packs.

COMM Port Control — Appears only when a COMM pack is installed. Configures the 1240's external interface to the specific interface supported by the pack. The format of this menu varies among COMM packs; refer to the COMM pack's Instruction Manual for a description.

ROM pack menu — Appears only when certain ROM packs are installed (not all ROM packs provide menus). Menu title and function vary between packs; refer to the ROM pack manual for a description.

TYPES OF VIDEO

The 1240 uses three types of video patterns to display information. Most information is displayed in regular video; reverse video and highlighting are used for special cases.

- Regular video—light characters on a dark background.

- Reverse video—dark characters on a light background. The changeable portions of menu fields are displayed in reverse video. *The blinking field cursor can only be positioned on reverse video menu fields; the cursor must be positioned on a field before changes can be made to that field.* Reverse video is also used to display a soft key when that function is in use. For example: the soft key for the menu currently in use is displayed in reverse video.

- Highlighted video—light characters on a shaded background. Highlighting emphasizes important information. For example: a label describing the current function of the SCROLL knob is displayed in highlighted video in the upper right corner of each menu. Another example: you can choose to highlight occurrences of the search pattern in a data display. Highlighting lets you quickly differentiate between data that matches the pattern and other data.

.

POWER-UP PROCEDURE

The 1240 is sent from the factory with all acquisition cards already installed. All you have to do is connect power and probes.

INITIAL INSPECTION

This instrument was inspected both mechanically and electrically before shipment. It should be free of mars or scratches and should meet or exceed all electrical specifications. To confirm this, inspect the instrument for physical damage incurred in transit and test the performance by following the *Operator's Checkout Procedure* later in this section. Verify performance requirements by referring a qualified service person to the *Verification and Adjustment Procedures* section of the *1240 Service Manual.* If there is damage or deficiency, contact the local Tektronix Field Office or representative.

REPACKING FOR SHIPMENT

If the instrument is to be shipped to a Tektronix Field Service Center for repair, attach a tag to the instrument showing the owner's name and address, the instrument's serial number, and a description of the service required. Return probes with the instrument so that the entire system can be tested.

Use the original packaging. If it is unavailable or not fit for use, contact your local Tektronix Field Office to obtain new packaging.

POWER REQUIREMENTS

Line Voltage Selector. The 1240 operates from a nominal 115 - 230 V, 48 - 440 Hz, single-phase power source. Before connecting the 1240 to a power source, verify that the line voltage selector on the back panel (see Figure 1-3) is showing the correct nominal voltage for the power source you are using.

$$\boxed{CAUTION}$$

If the line voltage selector shows the wrong voltage for the power source to be used, refer the 1240 to qualified service personnel for fuse replacement.

Power Cords. The 1240 has a 3-wire power cord with a 3-contact plug for connection to the power source and protective ground. The plug protective-ground contact connects to accessible metal parts of the 1240 through the power cord protective grounding conductor. For protection against electrical shock, insert this plug into a power source socket that has a securely grounded protective-ground contact.

$$\boxed{\textbf{WARNING}}$$

Hazardous voltages may be present on the exposed metal surfaces of the 1240 if the power source socket's protective-ground connection is not securely grounded.

The 1240 is shipped with a 115 V power cord unless otherwise ordered. Other power cords available are listed in Section 8 under *Options and Accessories.*

Power Switches. The 1240 has two power switches; both switches must be ON for the 1240 to operate. The MAIN POWER SWITCH on the back panel (see Figure 1-3) controls incoming ac power. The front-panel, push-button POWER switch controls dc power from the power supply. Use the front-panel switch to turn the 1240 off in normal operations; it is not necessary to turn off the MAIN POWER SWITCH also.

The contents of nonvolatile memory are not affected by these switches.

Figure 1-3. 1240 back panel.
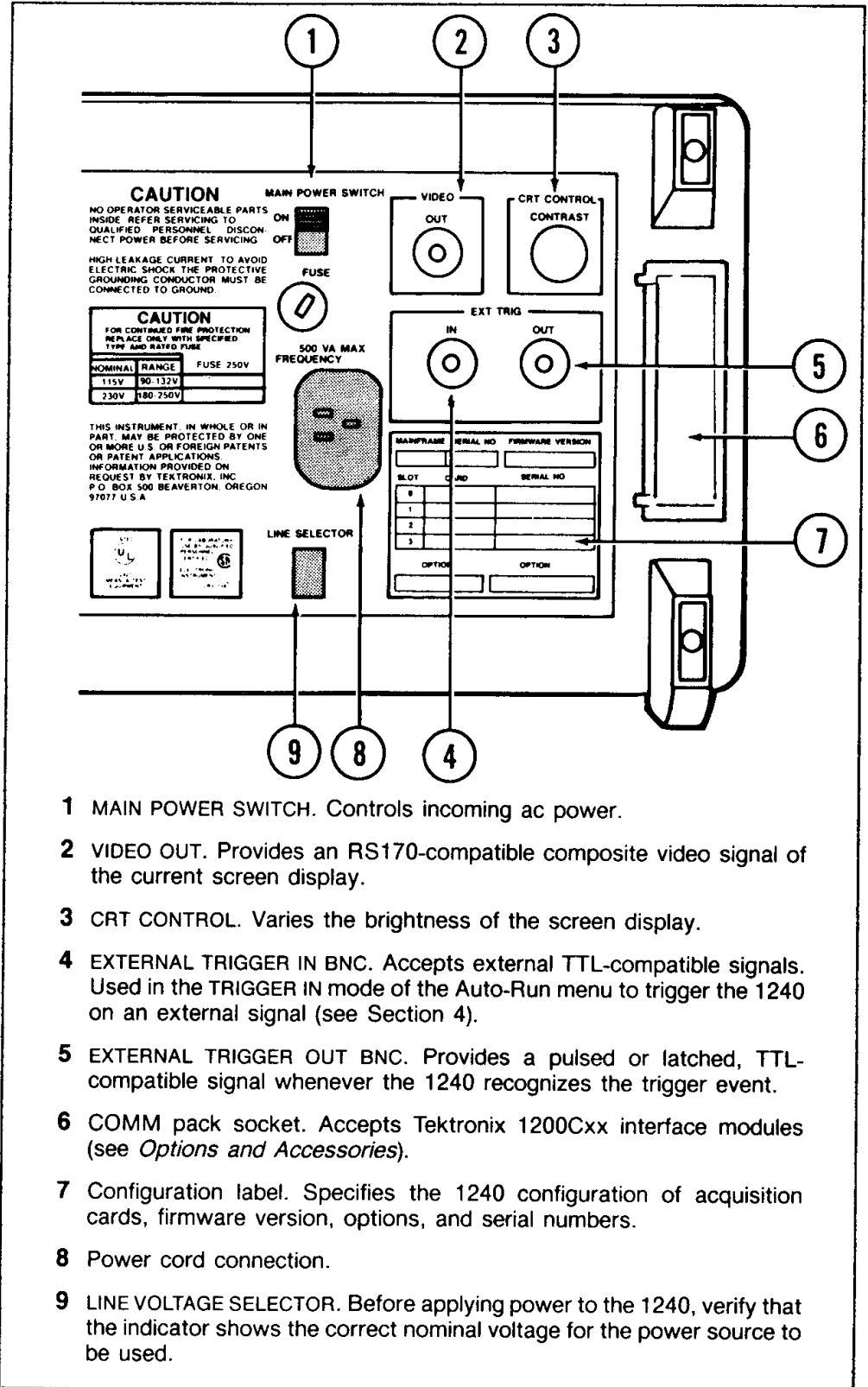
1 MAIN POWER SWITCH. Controls incoming ac power.

2 VIDEO OUT. Provides an RS170-compatible composite video signal of the current screen display.

3 CRT CONTROL. Varies the brightness of the screen display.

4 EXTERNAL TRIGGER IN BNC. Accepts external TTL-compatible signals. Used in the TRIGGER IN mode of the Auto-Run menu to trigger the 1240 on an external signal (see Section 4).

5 EXTERNAL TRIGGER OUT BNC. Provides a pulsed or latched, TTL-compatible signal whenever the 1240 recognizes the trigger event.

6 COMM pack socket. Accepts Tektronix 1200Cxx interface modules (see *Options and Accessories*).

7 Configuration label. Specifies the 1240 configuration of acquisition cards, firmware version, options, and serial numbers.

8 Power cord connection.

9 LINE VOLTAGE SELECTOR. Before applying power to the 1240, verify that the indicator shows the correct nominal voltage for the power source to be used.

POWER-UP DIAGNOSTICS

To power up the 1240, set the back-panel MAIN POWER SWITCH to ON, then push the front-panel POWER button.

The 1240 has internal diagnostic tests that run automatically at power-up. These tests check out major mainframe components and operating firmware. When power-up diagnostics are successfully completed, most of the instrument's functions are verified.

Power-up diagnostics take six to ten seconds depending on the instrument configuration. If all tests pass, the Operation Level menu (CONFIG menu group) is displayed. This menu is shown in Figure 3-1.

If diagnostics fail, the Main Diagnostics menu is displayed. The menu lists the functional modules tested and a PASS/FAIL message for each module (FAIL message shown in highlighted video). Figure 1-4 shows an example display.

Some error conditions only inhibit a portion of the 1240 functions. Table 1-1 describes the possible power-up error conditions.

Table 1-1
POWER-UP ERROR CONDITIONS

Error Conditions	Definition
Display is blank or full raster.	A failure occurred on either the display board or the CRT driver board. No operation is possible. Refer the 1240 to qualified service personnel.
Display is filled with random characters or zeros.	A failure occurred on either the I/O processor or the display board. No operation is possible. Refer the 1240 to qualified service personnel.
DIAGNOSTICS FAILURE IOP RAM XXXX XXXX *	One of the I/O processor RAMs failed. No operation is possible. Refer the 1240 to qualified service personnel.
DIAGNOSTICS FAILURE IOP ROM n XXXX XXXX	A failure occurred in I/O processor diagnostic ROM n. Limited operation may be possible. Refer to the *1240 Service Manual* for information.
IMPROPER ACQUISITION CARD SEQUENCE: RE-READ INSTALLATION INSTRUCTIONS OR CALL YOUR TEKTRONIX SERVICE REP.	Any 9-channel cards must be installed in lower-numbered slots than 18-channel cards. There can be no empty slots between acquisition cards. Refer to the *1240 Service Manual* for acquisition card installation instructions.
INTER-PROCESSOR COMMUNICATION FAILURE	The control and I/O processors are unable to communicate. No operation is possible. Refer the 1240 to qualified service personnel.
CONTROL PROCESSOR RAM FAILURE XXXX XX XX	A failure occurred in one of the control processor RAMs. No operation is possible. Refer the 1240 to qualified service personnel.
CONTROL PROCESSOR ROM FAILURE XXXX XXXX	A failure occurred in one of the control processor ROMs. No operation is possible. Refer the 1240 to qualified service personnel.

* X's indicate numeric codes used by the service technician to pinpoint the failure.

Table 1-1 (cont.)
POWER-UP ERROR CONDITIONS

Error Conditions	Definition
I/O FAIL	A failure occurred in the specified area of the I/O processor. Limited operation may be possible. Refer to the *1240 Service Manual* for more information.
FRONTPANEL FAIL	A failure occurred in the specified area of the front panel. Limited operation may be possible. Refer to the *1240 Service Manual* for more information.
DISPLAY FAIL	A failure occurred in the specified area of the display. Limited operation may be possible. Refer to the *1240 Service Manual* for more information.
COMMPACK FAIL	The specified area of the COMM pack failed. The pack will not operate properly, but the rest of the 1240 is not affected. Power down and remove the pack.
COMMPACK ROM FAIL XXXX XXXX	The specified area of the COMM pack failed. The pack will not operate properly, but the rest of the 1240 is not affected. Power down and remove the pack.
CONTROL FAIL	A failure occurred in the specified area of the control processor. Limited operation may be possible. Refer to the *1240 Service Manual* for more information.
TRIGGER FAIL	A failure occurred in the specified area of the trigger board. Limited operation may be possible. Refer to the *1240 Service Manual* for more information.
9 CH ACQn FAIL	A failure occurred in the specified area of the 9-channel card in acquisition card position n. This card will not operate properly, and may affect other cards if it is left in the system. Refer the 1240 to qualified service personnel for card removal.
18 CH ACQn FAIL	A failure occurred in the specified area of the 18-channel card in acquisition card position n. This card will not operate properly, and may affect other cards if it is left in the system. Refer the 1240 to qualified service personnel for card removal.
RAMPACK FAIL	This message can be displayed for two reasons. 1. A failure occurred in the specified area of the pack. 2. The pack is not initialized. First, try to initialize the pack: touch the ENTER NORMAL OPERATION soft key, then press the UTILITY key on the front panel. In the Storage Memory Manager menu, touch the LOAD NEW PACK soft key (runs pack initialization routines). Next, turn the 1240 off, then on again. If the error message persists, the pack has failed; it will not operate properly, but the rest of the 1240 is not affected. Power down and remove the pack.
ROMPACK FAIL	A failure occurred in the specified area of the ROM pack. The pack will not operate properly, but the rest of the 1240 is not affected. Power down and remove the pack.
ROMPACK ROM FAIL XXXX XXXX	The specified area of the ROM pack failed. The pack will not operate properly, but the rest of the 1240 is not affected. Power down and remove the pack.
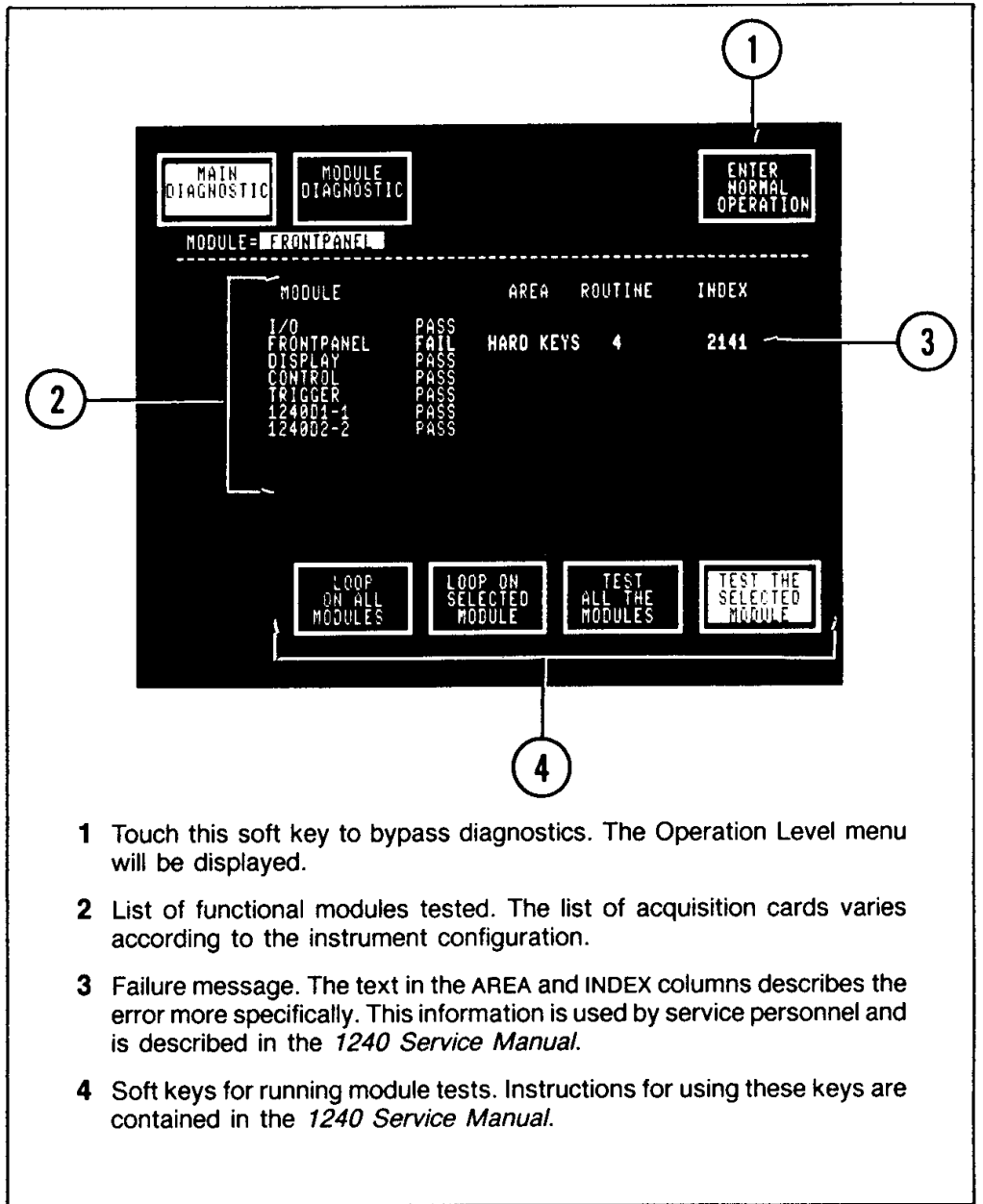
1 Touch this soft key to bypass diagnostics. The Operation Level menu will be displayed.

2 List of functional modules tested. The list of acquisition cards varies according to the instrument configuration.

3 Failure message. The text in the AREA and INDEX columns describes the error more specifically. This information is used by service personnel and is described in the *1240 Service Manual.*

4 Soft keys for running module tests. Instructions for using these keys are contained in the *1240 Service Manual.*

4340—4

Figure 1-4. Example display generated when a failure is detected by the power-up diagnostics. Refer to Table 1-1 to see how the failure affects operation. Touch the ENTER NORMAL OPERATION soft key to bypass diagnostics. You can force this display by holding down any front-panel key during power-up.

PROBE CONNECTIONS

The 1240 can be used with the P6460 Data Acquisition Probe or the P6462 Fixed Threshold TTL Acquisition Probe. Nine-channel cards use one probe; 18-channel cards use two.

Each probe has nine data lines (numbered 0-8) and one clock/qualifier (C/Q) line. Electrical, environmental, and physical specifications are listed in the instructions accompanying the probe.

Probes connect to acquisition cards through openings in the right side-panel of the 1240. Figure 1-5 shows how to connect a probe to an acquisition card. Be sure the raised tab on the probe connector is aligned with the guides in the side panel and in the edge connector.

Pod ID. Any time the 1240 refers to a probe in a menu or screen message, it uses a number called the Pod ID. ("Pod" is used throughout this manual to mean "probe;" they are equivalent terms.) A probe's Pod ID is determined by the type of acquisition card the probe is connected to and what position, or slot, the card occupies in the 1240.

The 1240 has four acquisition card slots, numbered 0-3. All possible Pod ID numbers (two per slot, see Figure 1-5) are molded into the side panel above the slots. An 18-channel card accepts probes at both Pod ID slot locations. A 9-channel card accepts a probe only at an even-numbered Pod ID location. For example: The sample menu displays for this manual are based on a 1240 equipped with two 9-channel and two 18-channel cards. Since 9-channel cards must be installed in lower-numbered slots than 18-channel cards, the 9-channel cards have probes attached at Pod IDs 0 and 2, and the 18-channel cards have probes attached at IDs 4,5 and 6,7. Pod IDs 1 and 3 are not used. Pod ID 1 is only used when no 9-channel cards are installed.

A Pod ID button is located on the back edge of the probe (see Figure 1-6). Press this button to get a screen readout of the probe's Pod ID.

NOTE

Press the Pod ID button located on the back edge of probe to get a display on the top line of the screen of the probe's Pod ID.

⚠ **Lead Sets.** A ten-inch lead set is supplied with each P6460. This lead set can be used to clock frequencies up to 25 MHz. Above 25 MHz, one of the optional five-inch lead sets may be required to meet all specifications. Refer to the documentation accompanying the P6460 for the part numbers of these lead sets.

Two ground leads are also provided with each P6460. Below 25 MHz, only one ground lead is required with the ten-inch lead set. Between 25 MHz and 50 MHz, use both ground leads. For frequencies above 50 MHz or in environments with lots of electrical noise, use a five-inch lead set and both ground leads with alligator clips.

A ten-inch lead set and one ground lead are supplied with each P6462. For clock operating frequencies up to 25 MHz, use the 10-inch lead set. For clock frequencies over 25 MHz, use the optional 5-inch lead set. One ground lead is sufficient.

Figure 1-6 shows how to install lead sets and ground leads. It also shows the location of the Pod ID button.
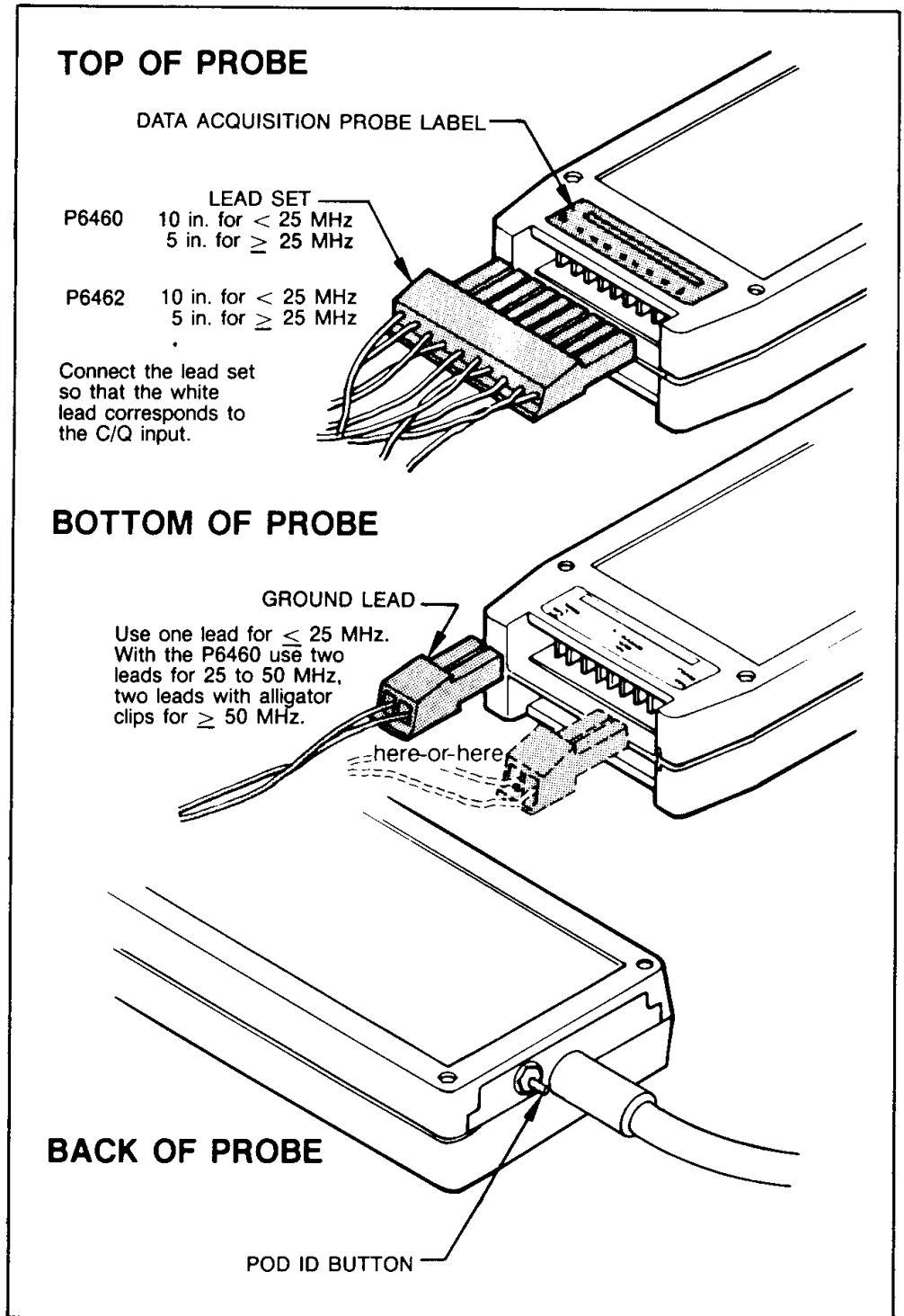
> *CAUTION*

Refer to the specifications in the probe instructions for the maximum non-destructive input voltage range. If the probe is connected to a voltage greater than this range, its circuitry may be damaged.
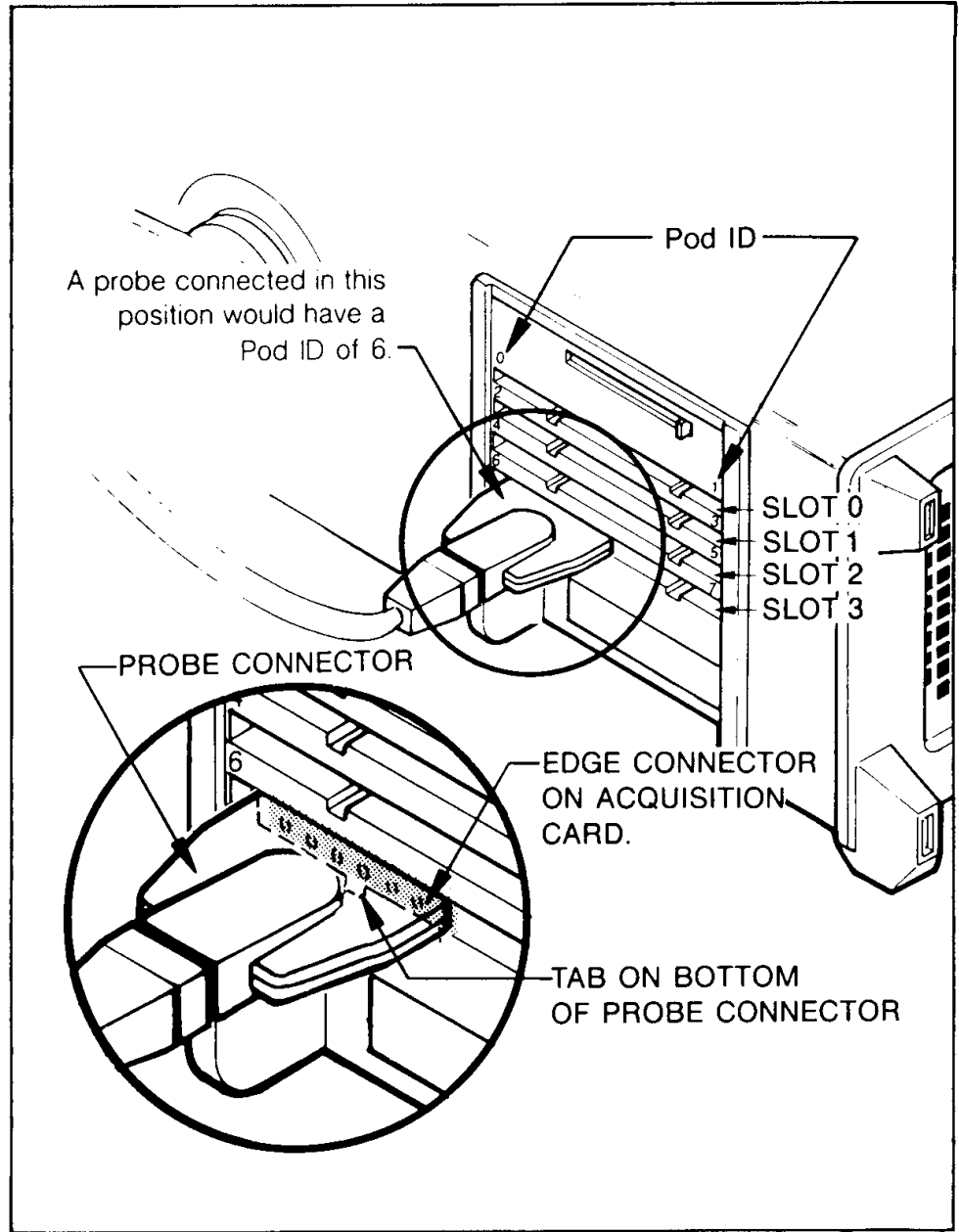
4340—5

Figure 1-5. Connecting probes to the 1240. Align the raised tab on the probe connector with the guides in the side panel and in the edge connector on the acquisition card.

TOP OF PROBE

DATA ACQUISITION PROBE LABEL

LEAD SET

P6460   10 in. for $<$ 25 MHz
5 in. for $\geq$ 25 MHz

P6462   10 in. for $<$ 25 MHz
5 in. for $\geq$ 25 MHz

Connect the lead set
so that the white
lead corresponds to
the C/Q input.

BOTTOM OF PROBE

GROUND LEAD

Use one lead for $\leq$ 25 MHz.
With the P6460 use two
leads for 25 to 50 MHz,
two leads with alligator
clips for $\geq$ 50 MHz.

here-or-here

BACK OF PROBE

POD ID BUTTON

4340-6

Figure 1-6. Connecting lead sets and ground leads to data acquisition probes.

ROM/RAM AND COMM PACK CONNECTIONS

ROM and RAM packs are installed in the slot directly beneath the probe connections on the right side-panel (see Figure 1-7). ROM and RAM packs can be installed or removed while power is on or off. If power is on, the Storage Memory Manager menu (UTILITY menu group) must be displayed on the screen, and you must press the LOAD NEW PACK soft key immediately after installing or removing the pack.

To install a pack, slide the pack (label side up) past the hinged slot cover and push it slowly and firmly into the connector. Two guides on the top cover of the pack ensure that the pack will be installed correctly. To remove a ROM or RAM pack, simply pull it straight out.

Refer to the description of the Storage Memory Manager menu in Section 7 for information on how to access ROM or RAM pack information.

```
CAUTION
```

Static discharge can damage the semiconductor devices in a ROM or RAM pack.

Discharge static from a pack before installing it by momentarily laying the pack (label side up) on top of the 1240.
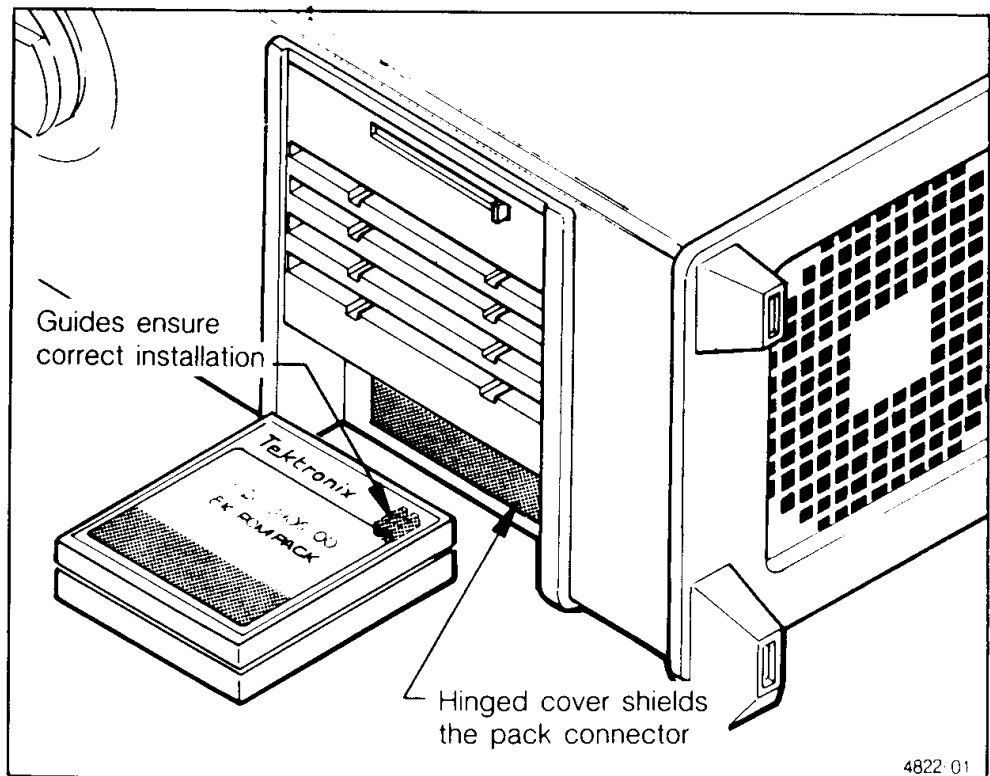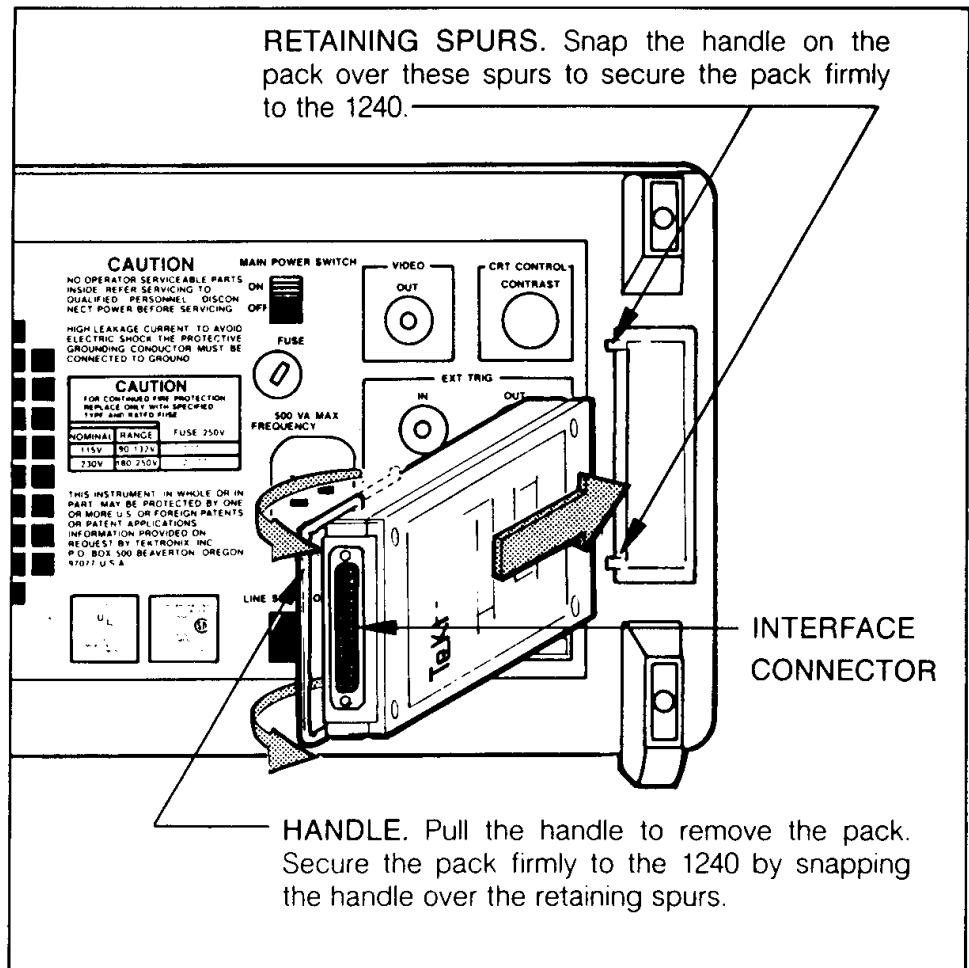

Guides ensure correct installation

Hinged cover shields the pack connector

4822-01

Figure 1-7. **Installing a ROM or RAM pack.** ROM or RAM packs can be installed or removed while power is on or off. If power is on, the Storage Memory Manager menu (UTILITY menu group) must be displayed on the screen, and you must press the LOAD NEW PACK soft key immediately after installing or removing the pack.

REV JAN 1984

COMM packs are installed at the back panel; see Figure 1-8. With **power off**, slide the pack past the hinged cover, label to the right as you face the back panel. The pack connector is located about four inches past the hinged cover. You can anchor the pack firmly to the 1240 by snapping the handle over the two small retaining spurs to the left of the slot (see Figure 1-8).

To remove a COMM pack from the 1240, first turn dc power off, then pull on the handle on the back of the pack.

{ *CAUTION* }

Do not install or remove a COMM pack while dc power is on; the COMM pack may be damaged.

RETAINING SPURS. Snap the handle on the pack over these spurs to secure the pack firmly to the 1240.

INTERFACE CONNECTOR

HANDLE. Pull the handle to remove the pack. Secure the pack firmly to the 1240 by snapping the handle over the retaining spurs.

4340–8

Figure 1-8. Installing a COMM pack. Do not install or remove a COMM pack while dc power is on.

1-17

OPERATOR'S CHECKOUT PROCEDURE

This procedure consists of diagnostic tests the operator can perform as an incoming inspection. The tests provide a basic check of 1240 operational status. Complete operational tests are described in the *Verification and Adjustment Procedures* in the *1240 Service Manual;* these procedures should be performed only by a qualified service technician.

1. With power off, plug in any COMM pack and any ROM or RAM pack you want to test.

2. Connect probes to the acquisition card you want to test. Connect one probe to a 9-channel card or two probes to an 18-channel card. Figure 1-5 shows how to connect probes to acquisition cards.

3. Connect a diagnostic lead set to each probe. Two diagnostic lead sets are standard accessories with each 1240.

4. If you are testing a 9-channel card, connect the diagnostic lead set to the *left* TPG output connector.

   If you are testing an 18-channel card, connect the diagnostic lead set of the left probe to the left TPG output and the other lead set to the right TPG output.

   Figure 2-1 in the next section shows how to connect a diagnostic lead set to a TPG output connector. *Be sure to connect the white wire to the lower-left pin.*

5. Hold down any front-panel key and power up the 1240. The Main Diagnostic menu is displayed (see Figure 1-4). The menu will indicate a keyboard failure because of the power-up method.

NOTE

If the 1240 displays RAMPACK FAIL when you power-up with a RAM pack installed, the pack may not be initialized. Follow the initialization instructions described under this message in Table 1-1.

6. Touch the TEST ALL MODULES soft key, then press the START key on the front panel to begin the tests. When the tests are completed, a PASS or FAIL status message is displayed for each module. FAIL messages are displayed in highlighted video.

7. Connect the TPG to an untested acquisition card, then select that card in the MODULE field. Touch the TEST THE SELECTED MODULE soft key, then press START. When the test is complete, a PASS or FAIL message is displayed for the tested card. Repeat this procedure until all cards are tested.

If a failure occurs, re-run the test to ensure that the failure is valid. A module that previously failed but now passes will indicate the failure history with a highlighted PASS message. Refer failed acquisition cards and the attached probe(s) to a qualified service technician for repair.