Errata

Title & Document Type: 8757C/E Scalar Network Analyzer Operating Manual (Jul90)

Manual Part Number: 08757-90073

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HP References in this Manual

This manual may contain references to HP or Hewlett-Packard. Please note that Hewlett-Packard's former test and measurement, semiconductor products and chemical analysis businesses are now part of Agilent Technologies. We have made no changes to this manual copy. The HP XXXX referred to in this document is now the Agilent XXXX. For example, model number HP8648A is now model number Agilent 8648A.

About this Manual

We've added this manual to the Agilent website in an effort to help you support your product. This manual provides the best information we could find. It may be incomplete or contain dated information, and the scan quality may not be ideal. If we find a better copy in the future, we will add it to the Agilent website.

Support for Your Product

Agilent no longer sells or supports this product. You will find any other available product information on the Agilent Test & Measurement website:

www.tm.agilent.com

Search for the model number of this product, and the resulting product page will guide you to any available information. Our service centers may be able to perform calibration if no repair parts are needed, but no other support from Agilent is available.

Agilent Technologies

HP 8757C/E
SCALAR NETWORK ANALYZER
OPERATING MANUAL

SERIAL NUMBERS

This manual applies directly to any HP 8757C Scalar Network Analyzer having a serial number prefix 3026A and any HP 8757E Scalar Network Analyzer having a serial number prefix 3025A.

For instruments with lower serial number prefixes, see section 7, "Manual Backdating."

For additional information about serial numbers, see "Instruments Covered by Manual" in section 1.

1400 FOUNTAINGROVE PARKWAY, SANTA ROSA, CA 95403 U.S.A.

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HEWLETT PACKARD

HP 8757C/E Operating Manual
TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

SECTION 1. GENERAL INFORMATION

SECTION 2. INSTALLATION

SECTION 3. OPERATION

Local Operation

Operating Reference

Remote Operation

Introductory Programming Guide for the HP 8757C/E scalar network analyzer with the HP 9000 Series 200/300 Desktop Computer (BASIC)

Introductory Programming Guide for the HP 8757C/E scalar network analyzer with the HP Vectra Personal Computer using Microsoft® QuickBASIC 4.0

LIST OF TABLES

SAFETY CONSIDERATIONS

GENERAL

This product and related documentation must be reviewed for familiarization with safety markings and instructions before operation. This product has been designed and tested in accordance with international standards.

SAFETY SYMBOLS

Instruction manual symbol: the product will be marked with this symbol when it is necessary for the user to refer to the instruction manual (refer to Table of Contents).

Indicates hazardous voltages.

Indicates earth (ground) terminal.

WARNING

The WARNING sign denotes a hazard. It calls attention to a procedure, practice, or the like, which, if not correctly performed or adhered to, could result in personal injury. Do not proceed beyond a WARNING sign until the indicated conditions are fully understood and met.

CAUTION

The CAUTION sign denotes a hazard. It calls attention to an operating procedure, practice, or the like, which, if not correctly performed or adhered to, could result in damage to or destruction of part or all of the product. Do not proceed beyond a CAUTION sign until the indicated conditions are fully understood and met.

SAFETY EARTH GROUND

This is a Safety Class I product (provided with a protective earthing terminal). An uninterruptible safety earth ground must be provided from the main power source to the product input wiring terminals, power, cord, or supplied power cord set. Whenever it is likely that the protection has been impaired, the product must be made inoperative and secured against any unintended operation.

BEFORE APPLYING POWER

Verify that the product is configured to match the available main power source per the input power configuration instructions provided in this manual.

If this product is to be energized via an autotransformer make sure the common terminal is connected to the neutral (grounded side of the mains supply).

SERVICING

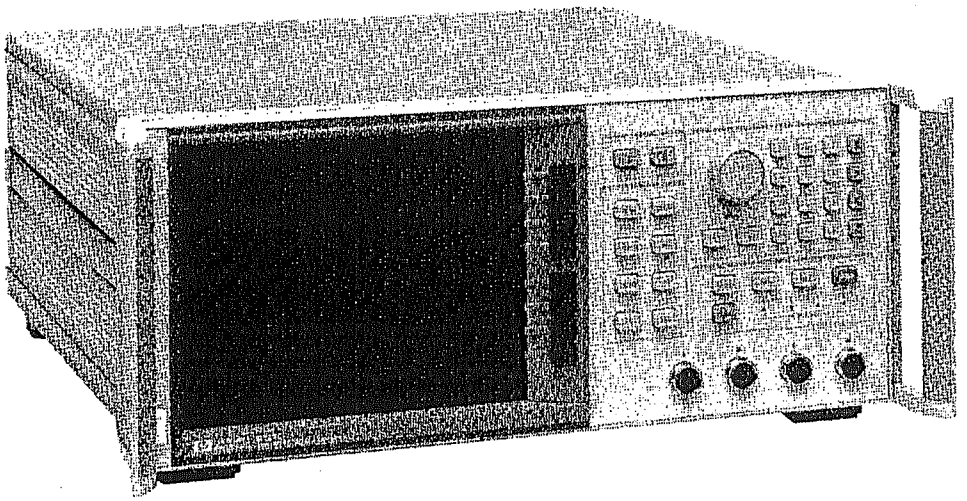
WARNING

Any servicing, adjustment, maintenance, or repair of this product must be performed only by qualified personnel.

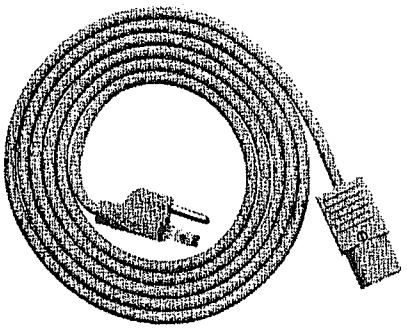
Adjustments described in this manual may be performed with power supplied to the product while protective covers are removed. Energy available at many points may, if contacted, result in personal injury.

Capacitors inside this product may still be charged even when disconnected from their power source.

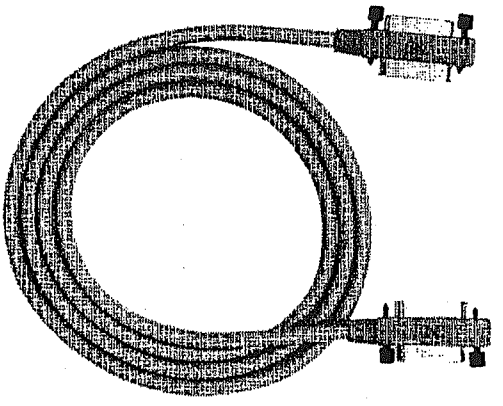
To avoid a fire hazard, only fuses with the required current rating and of the specified type (normal blow, time delay, etc.) are to be used for replacement.



HP 8757C OPTION 001 SCALAR NETWORK ANALYZER



POWER CABLE*



HP-IB INTERFACE CABLE

*Power cable/plug supplied depends on country of destination. Refer to Section 2 for part number information.

Figure 1-1. HP 8757C Option 001 Scalar Network Analyzer and Accessories Supplied

Section 1. General Information

CONTENTS

INTRODUCTION

This operating manual contains installation and operation information for the HP 8757C and HP 8757E Scalar Network Analyzers. This manual is part of a 2-manual set that also includes a service manual for performance tests, adjustments, and service. See "Replaceable Parts" in the service manual for part numbers to order additional manuals. The two manuals are available separately or as a set.

ANALYZER SIMILARITIES

The HP 8757E analyzer provides the critical elements of scalar network measurements: frequency coverage, measurement accuracy, and speed. The HP 8757C analyzer provides all the capabilities of the HP 8757E, plus additional features and enhancements. This manual set is written to apply to both the HP 8757C and HP 8757E analyzers.

(HP 8757C ONLY)

Text that applies *only* to the HP 8757C is enclosed with these symbols. In a table, text that is HP 8757C-only is referenced to a footnote.

MANUAL SET ORGANIZATION

The text in this manual is organized as follows:

a. Title page and warranty statement.

b. **Table of Contents:** This is a list of all primary and secondary headings. A list of illustrations and tables follows.

c. **Section 1. General Information:** This section includes a brief description of the instrument and available options, safety considerations, accessories supplied, and tables of specifications and supplemental performance characteristics.

d. **Section 2. Installation:** This section provides information for initial inspection, preparation for use, line voltage and fuse selection, connectors and cables, rack mounting, interconnections with sources and with external monitors, storage, and shipment.

e. **Section 3. Operation:** This section is divided into three subsections: Local Operation, Remote Operation, and In Case of Difficulty. Firmware revision history can also be found in this section.

   Local Operation contains feature descriptions of the analyzer, softkey menu structure maps, and instructions for typical measurements.

   Remote Operation provides information on remote operation of the analyzer with a controller. The programming notes identify programming commands and provide example programs to demonstrate remote control of the analyzer.

   In Case of Difficulty provides first-line problem identification and troubleshooting information.

f. **Connector Care:** This part of the manual contains a separately bound guide to care and cleaning of microwave connectors.

g. **Glossary and Index:** The "Glossary" contains definitions of terms that are unique to the manual or that require special understanding. The "Index" is an alphabetized subject guide to the manual.

The separate service manual is organized as follows:

a. Title page and warranty statement.

b. **Table of Contents:** This is a list of all primary and secondary headings. A list of illustrations and tables follows.

c. **Section 4. Performance Tests:** This section contains tests to verify that the instrument performance meets the specifications listed in table 1-1 in "General Information".

d. **Section 5. Adjustments:** This section provides information required to properly adjust and align the instrument after repair or replacement of an assembly.

e. **Section 6. Replaceable Parts:** This section provides lists and illustrations of all replaceable parts and assemblies in the instrument. Ordering information is provided.

f. **Section 7. Manual Backdating:** This section contains backdating information required to make this manual compatible with earlier shipment configurations of the instrument.

g. **Section 8. Service:** This section supplies information to troubleshoot and repair the instrument. An overall block diagram is provided, and each assembly is documented separately with a circuit description, schematic diagram, component locations diagram, and troubleshooting information.

h. **Index:** This is an alphabetized subject guide to the manual.

INSTRUMENTS COVERED BY MANUAL

This manual applies directly to any HP 8757C/E with a serial number prefix listed on the title page. The serial number plate, shown in Figure 1-2, is attached to the rear panel of the analyzer.

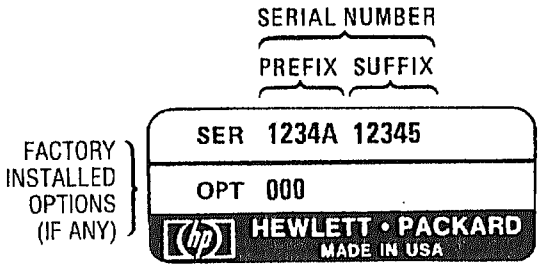


Figure 1-2. Typical Serial Number Plate

Other analyzers differ from those covered directly by this manual. Those differences are documented in the "Manual Backdating" section of this manual.

The title pages of both manuals show a microfiche part number. This number can be used to order 10-by 15-centimeter (4-by 6-inch) microfilm transparencies of the manual set.

SAFETY CONSIDERATIONS

This product has been manufactured and tested in accordance with international safety standards. Before operation, review this product and related documentation for familiarity with safety markings and instructions. A complete listing of safety considerations is provided at the end of this section and also in the service manual.

SPECIFICATIONS

Instrument specifications are listed in table 1-1. These specifications are the performance standards against which the analyzer is tested. Table 1-2 lists supplemental performance characteristics. These are *not* specifications but indicate typical, non-warranted performance parameters of the instrument.

ANALYZER DESCRIPTION

The HP 8757C/E is a microprocessor-based receiver capable of making scalar (magnitude only) reflection and transmission measurements. The frequency range is determined by the external detectors used. The raster display provides high resolution for viewing measurements.

HP 8757C ONLY

Eight CRT attributes, such as the grid, the measurement traces for each channel, and the labels, are shown in various factory-defined colors. The hue, saturation, and color intensity are adjustable for each of these CRT attributes.

The analyzer is capable of driving both the internal display and one external monitor simultaneously. Color or monochrome monitors can be used, provided that they are compatible with the analyzer's scan rate and video levels.

The analyzer can control external printers, plotters, and sources through the 8757 System Interface. A printer and plotter buffer speeds measurements by returning control to the analyzer while data is printing.

HP 8757C ONLY

Instrument states and calibration data can be stored to and recalled from external disks.

Four (two in the HP 8757E) independent but identical measurement channels, allow simultaneous measurement and viewing of measurement parameters. Three detector inputs (A, B, and R) accept AC or DC detected signals from detectors or bridges.

HP 8757C ONLY

The Option 001 has four detector inputs (A, B, C, and R) to process AC and DC detected signals.

The analyzer is locally operated by front panel controls and by menu selection using softkeys adjacent to the CRT. The analyzer is programmable over the Hewlett-Packard Interface Bus (HP-IB). (HP-IB is Hewlett-Packard's hardware, software, documentation and support for IEE-488 and IEC-625 worldwide standards for interfacing instruments.) On-screen graphics can be generated using a subset of Hewlett-Packard Graphics Language (HP-GL). See "Remote Operation" for a list of commands and an example program.

AC and DC Detection

The HP 8757C/E uses either AC or DC detection techniques in conjunction with its detectors. The AC detection mode provides very stable measurements, even with temperature variations and RF interference. Use DC detection for modulation-sensitive devices, such as nonlinear amplifiers and narrow-band filters; and for devices that cannot be modulated, such as oscillators.

In AC detection, an RF or microwave signal is amplitude modulated with a 27.778 kHz square wave, providing the stimulus to the device under test. The output signal from the device under test is then detected by a compatible detector, and the analyzer filters, digitizes, and displays the response on the CRT. A 27.778 kHz modulation signal is available from the rear panel of the analyzer to drive an external modulator for a source without internal amplitude modulation capability.

In DC detection, an unmodulated, continuous wave (CW) signal provides the stimulus to the device under test. This signal is rectified by the detector and then transformed into an AC detectable signal. The transformation is accomplished by the detector's chopping and sampling circuitry. The rectified signal is chopped at 27.778 kHz and made to resemble a square wave.

Hewlett-Packard Interface Bus

The HP 8757C/E is factory equipped with a remote programming interface using the Hewlett-Packard Interface Bus (HP-IB). Remote operation of the instrument allows you the same control of the instrument as with local operation, except for control of the power line switch and internal tests. Remote control is maintained by a controller that sends commands to and receives data from the analyzer using HP-IB. A tutorial description of HP-IB is available from Hewlett-Packard. See "Replaceable Parts", for ordering information. See also "Remote Operation", which describes the HP-IB capabilities of the analyzer.

8757 System Interface

The analyzer can control a plotter, printer, or source through the 8757 System Interface, in local and remote operation modes. A separate interface connector for the 8757 System Interface is located on the analyzer rear panel. It is a dedicated HP-IB port used exclusively by the analyzer. Do not connect a controller to this connector. Instruments are connected to the 8757 System Interface with HP-IB cables.

OPTIONS AVAILABLE

The following analyzer options are available:

HP 8757C ONLY

Option 001, Fourth Detector Input

The Option 001 is supplied with four front panel detector inputs (A, B, C, and R).

Option 802, HP-IB Disk Drive

The Option 802 adds one HP 9122C 3.5 inch Dual Disk Drive and one HP 10833A 1 m (3.3 ft) HP-IB cable.

Option W30, Extended Service

Option W30 adds two additional years of return to Hewlett-Packard hardware support following the first year of warranty. Option W30 can be ordered at the time of sale only. Instruments ordered with Option W30 are identified on the serial number plate.

Option 0D2, Factory Refurbished Demonstration Instrument

Option 0D2 instruments (designated by a yellow option tag on the serial number label) are instruments that have been used as demonstration units for less than 12 months, then returned to the factory for electrical and mechanical refurbishment. The standard warranty and specifications apply.

Option 908, Rack Mount Without Handles

The Option 908 analyzer is supplied with a rack mount kit containing a pair of flanges and the necessary hardware to mount the analyzer with handles detached in an equipment rack with 482.6 mm (19 in.) horizontal spacing. Section 2 of this manual gives installation instructions for this kit.

Option 913, Rack Mount With Handles

Option 913 is supplied with a kit containing a pair of flanges and the necessary hardware to mount the analyzer with handles attached in an equipment rack with 482.6 mm (19 in.) horizontal spacing. Section 2 of this manual gives installation instructions for this kit.

Option 910, Extra Operating and Service Manuals

The standard instrument is supplied with one manual set (one operating manual and one service manual). Option 910 provides an additional manual set. The manuals are available separately also. See "Replaceable Parts" in the service manual for ordering information.

ACCESSORIES SUPPLIED

Figure 1-1 shows the HP 8757C Option 001 Scalar Network Analyzer with its accessories. The HP 8757C/E analyzer is shipped with one HP-IB cable, a power cable, and a manual set (not shown). The power cable supplied depends on the country of destination. Section 2 of this manual gives further information about cables, connectors, and the part numbers for the different power cables.

Service Accessories

A service accessory kit, is available for servicing the analyzer. This kit consists of:

- One 15-pin printed circuit board extender. This board is provided for use in troubleshooting the log amplifier assemblies A7 through A10.
- One special purpose printed circuit board extender. This board is provided to aid in troubleshooting the A3 through A6 assemblies. Two +5 V test points and two digital ground test points are provided for powering digital troubleshooting devices (logic probe, logic pulser, current tracer).
- Extension cables to provide easier access while troubleshooting the A15 display and the A14 display interface.

EQUIPMENT REQUIRED BUT NOT SUPPLIED

A swept RF or microwave source and from one to three detectors or directional bridges are required to make measurements with your standard analyzer.

HP 8757C ONLY

Four detectors or bridges can be used with the Option 001.

For AC detection measurements, square wave modulation capability at 27.778 kHz is required (internally or through the use of an external modulator). The data sheet for the HP 8757C/E describes typical equipment setups and lists equipment available. For further information, contact your local Hewlett-Packard office.

Firmware Compatibility

The following lists the lowest firmware revisions of the sweepers for complete compatibility with the HP 8757C/E Scalar Network Analyzer Revisions 3.0 and above.

Sweeper	Firmware Revision
HP 8350B	Revision 6
HP 83522A	Revision 3
HP 83525A/B	Revision 3
HP 83540A/B	Revision 3
HP 83545A	Revision 3
HP 83550A	Revision 6
HP 83570A	Revision 3
HP 83572A/B	Revision 6
HP 83590A	Revision 6
HP 83592A/B/C	Revision 6
HP 83594A	Revision 6
HP 83595A	Revision 6
HP 83595C	All

RECOMMENDED TEST EQUIPMENT

Equipment required to test and service your analyzer is listed in table 4-1 of this manual. Other equipment may be substituted if it meets or exceeds the critical specifications listed in the table.

Table 1-1. Specifications and General Requirements (1 of 2)

HP 8757C/E SPECIFICATIONS

Specifications describe the instrument's warranted performance over the temperature range of 0°to +55°C (+32°to +131°F) except where noted.

Function: Four (two in the HP 8757E) independent display channels process signals from the HP 85025, 85026, or 11664 Detectors and the HP 85020/27 Bridges. The data is logarithmically displayed, in single input or ratio mode, with respect to frequency, on the internal CRT. Three detector inputs (A, B, and R) accept AC or DC detected signals from detectors or bridges.

The Option 001 has four detector inputs (A, B, C, and R).[1]

Modulator Drive: The modulator drive output of the analyzer provides the circuitry to drive the HP 8340 and 8341 Synthesized Sweepers and the HP 11665B Modulator. Modulator drive may be turned on and off via the front panel or HP-IB. In the OFF state the modulator drive signal turns the HP 11665B fully on for minimum insertion loss.

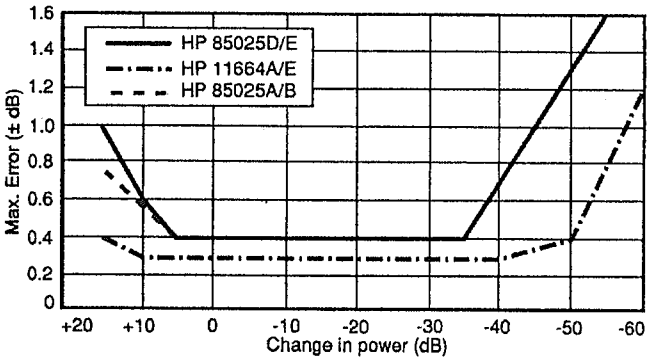
Frequency: 27.778 kHz ±12 Hz
Symmetry: 50% ±1%

Dynamic Range, Dynamic Power Accuracy, Absolute Power Accuracy: These are system specifications and depend on the detector being used. The following examples show frequently used Hewlett-Packard detectors.

Dynamic Range:

Detector	Dynamic Range
HP 11664A/E (AC mode):	+16 to −60 dBm
HP 85025-series (AC mode):	+16 to −55 dBm
(DC mode):	+16 to −50 dBm

Dynamic Power Accuracy (50 MHz, 25 ±5°C, 0 dBm reference):

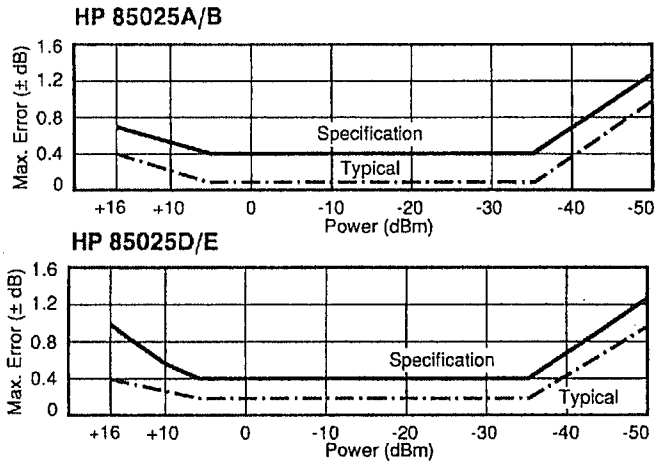


Note: For ≤20 dB change of power within +10 to −40 dBm the specification for the HP 8757C/E with the HP 11664A/E is ±(0.1 dB +0.01 dB/dB).

1. HP 8757C only.

Table 1-1. Specifications and General Requirements (2 of 2)

Absolute Power Accuracy (50 MHz, 25 ±5°C, DC mode):



GENERAL REQUIREMENTS

General requirements identify specifications required of the source in order for the analyzer to operate properly.

Sweep Time: Minimum sweep time and maximum number of displayed traces on the CRT depend on the horizontal resolution, (number of points):

Number of Points	Minimum Sweep Time (ms)			
	1 Trace	2 Traces	3 Traces[1]	4 Traces[1]
101	40	50	60	70
201	50	75	90	100
401	100	100	150	200
801[1]	200	250	NA	NA
1601[1]	400	NA	NA	NA

Modulation Requirements (for use with HP 11664 Detectors, HP 85025/26 Detectors, and HP 85020/27 Bridges in AC mode):

Square-wave amplitude modulation.
Frequency: 27.778 ±20 Hz.
≥30 dB on/off ratio.
45% to 55% symmetry.

Sweep Voltage Requirements (Sweep In): Horizontal sweep voltage, from 0 to 10 volts, provided by the source through the SWEEP IN 0-10V input on the rear panel of the analyzer. Other sweep voltages can also be accepted by using the non-standard sweep mode of the analyzer.

Marker and Blanking Requirements (Pos Z Blank): Blanking and marker signals are provided by the source through the POS Z BLANK input on the rear panel of the analyzer.

Voltage levels:	Blanked	+5V typical
	Unblanked	0V typical
	Marker	−4V typical
	Active Marker	−8V typical

1. HP 8757C only.

Table 1-2. Supplemental Performance Characteristics (1 of 3)

Values in this table are *not* specifications, but are intended to provide information useful in applying the instrument by giving typical but non-warranted performance parameters.

DISPLAY CHARACTERISTICS

Horizontal Resolution:

Number of Points
101
201
401
801[1]
1601[1]

Display Modes: All analyzer channels can display any one of the detector inputs or any ratio combination of detector inputs. Data can be displayed on the CRT in one of the following modes.

LOG MAGNITUDE:

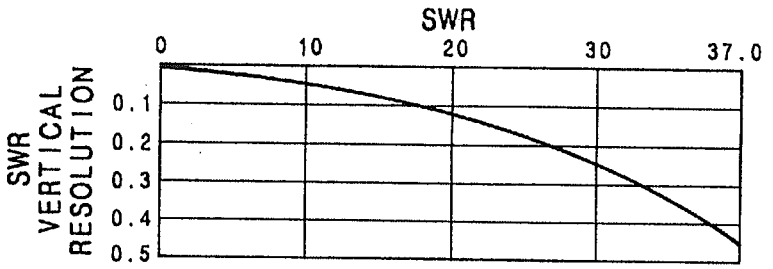
dBm: single channel power measurement.
dB: relative power measurement (ratio or relative to trace memory).

SWR: Relative measurements; channels 1 and 2 only; 401 points or fewer.

AUX: The rear panel BNC input ADC IN can be measured and displayed in volts (−10 to +10 volts). Typical maximum error is 60 mV.

Display Mode	Scale Resolution	Display Range	Vertical Resolution
dBm	0.1 to 20 dB/div (1/2/5 sequence)	−70 to +20 dBm	0.003 dB[2]
dB	0.1 to 20 dB/div (1/2/5 sequence)	−90 to +90 dB	0.006 dB[2]
SWR	0.02 to 10 units/div (1/2/4 sequence)	1.0 to 37.0	See figure below
AUX	0.025 to 5 V/div (1/2.5/5 sequence)	−10 to +10 V	0.001 V

SWR Resolution and Accuracy: Data is converted to SWR using an internally generated look-up table. The resolution in SWR mode varies with the SWR being measured as shown.



Averaging: 2, 4, 8, 16, 32, 64, 128, or 256 successive traces may be averaged.

Smoothing: Provides a linear moving average of adjacent data points. The smoothing aperture defines the trace width (number of data points) to be averaged, and ranges from 0.1% to 20% of the trace width.

Normalization: Traces are stored and normalized with the highest resolution, independent of display scale/division or offset. Calibration data can be saved and recalled with the instrument states.

Calibration data is interpolated when the frequency span is decreased with adaptive normalization engaged.[1]

1. HP 8757C only.
2. 0.01 dB for display cursor.

Table 1-2. Supplemental Performance Characteristics (2 of 3)

Graticules: 8 vertical x 10 horizontal divisions.
1 division = approximately 11 mm.

CRT AND GRAPHICS CHARACTERISTICS:

CRT Scan Rate: Raster scan with 60 Hz vertical refresh rate and 25.5 kHz horizontal scan rate.

Graphics Resolution: 1024 horizontal by 400 vertical pixels.

REAR PANEL CONNECTORS

Stop Sweep: Used with the HP 8350B Sweep Oscillator, and the HP 8340- or 8341-series Synthesized Sweeper when it is controlled by the 8757 system interface, to stop the sweep at band crossings and at end of sweep.

DAC Out: An output connector for use in troubleshooting.

ADC IN: An input connector for auxiliary voltage input in the −10 to +10 volt range. This voltage can be displayed (in volts) on any channel.

Video Output: Three BNC connectors used to drive external monitors with the following characteristics:[1]

R, G, B with sync on green.
75 ohm impedance.
1 V p-p (0.7 V = white; 0 V = black; −0.3 V = sync).

HP-IB CHARACTERISTICS

Interface: HP-IB operates according to IEEE 488-1978 and IEC-625 interface standards.

Interface Function Codes: SH1, AH1, T6, TE0, L4, LE0, SR1, RL1, PP0, DC1, DT0, C0, E1.

Transfer Formats: Data may be transferred either as ASCII characters or as 16-bit integers (most significant byte first). Readings may be taken at a single point, or an entire trace may be transferred at once.

Transfer Speed (includes command to initiate output):

ASCII format, 401 point trace:	500 ms typical
ASCII format, single point:	10 ms typical
Binary format, 401 point trace:	30 ms typical
Binary format, single point:	7 ms typical

Programmable Functions: All front panel functions, except power on/off, are programmable. The HP 8757C/E is compatible with all appropriate HP 8757A Scalar Network Analyzer programming codes.

User-Accessible Graphics: The user can generate on-screen graphics using a subset of HP-GL commands.

Interrupts: HP-IB service interrupts (SRQs) are generated for the following conditions:

Front panel key pressed	Numeric entry completed
Soft key only pressed	Limit test failed
Operation complete (sweep or plot)	Action requested not possible
Syntax error	Knob activity
Instrument self-test error	

1. HP 8757C only.

Table 1-2. Supplemental Performance Characteristics (3 of 3)

SYSTEM INTERFACE

Description: The 8757 System Interface is a dedicated HP-IB port used exclusively by the analyzer to control and extract information from a swept source, digital plotter, printer, or other devices.

GENERAL SPECIFICATIONS

Temperature Range:

OPERATING: 0°to +55°C (+32°to +131°F).
STORAGE: −40° to +70°C (−40° to +158°F).

Power Requirements: 48 to 66 Hz, 100/120/220/240V ±10%, typically 155 VA.

Dimensions: 178 × 425 × 445 mm (7.0 × 16.75 × 17.5 in.).

Weight: NET: 22 kg (48 lb).
SHIPPING: 28 kg (61.5 lb).

Section 2. Installation

CONTENTS

INTRODUCTION

This section provides installation instructions for your HP 8757C/E Scalar Network Analyzer and its accessories. This section also includes information about initial inspection, damage claims, preparation for using the analyzer, packaging, storage, and shipment.

HP 8757C ONLY

Text that applies *only* to the HP 8757C is enclosed with these symbols. In a table, text that is HP 8757C-only is referenced to a footnote.

INITIAL INSPECTION

Inspect the shipping container for damage. If the shipping container or cushioning material is damaged, keep it until this initial inspection is completed. Check the shipment contents for completeness. Figure 1-1 shows the HP 8757C Option 001 and its accessories. Inspect the analyzer for mechanical damage or defect. Follow the instructions in "Preparation For Use" and then check the analyzer's electrical performance. Use the performance tests in section 4, in the service manual.

If the analyzer does not pass the performance tests, if the shipment contents are incomplete, or if there is mechanical damage or defect, notify the nearest Hewlett-Packard office. If the shipping container is damaged, or the cushioning material shows signs of stress, notify the carrier as well as Hewlett-Packard. Keep the shipping materials for the carrier's inspection. Hewlett-Packard will arrange for repair or replacement without waiting for a claim settlement.

PREPARATION FOR USE

Power Requirements

The analyzer requires a power source of 100, 120, 220, or 240 V AC, ±10%, 48 to 66 Hz, single-phase. Power consumption is approximately 155 volt-amps.

CAUTION

Make the correct line voltage and fuse selection before connecting line power to the instrument.

Line Voltage and Fuse Selection

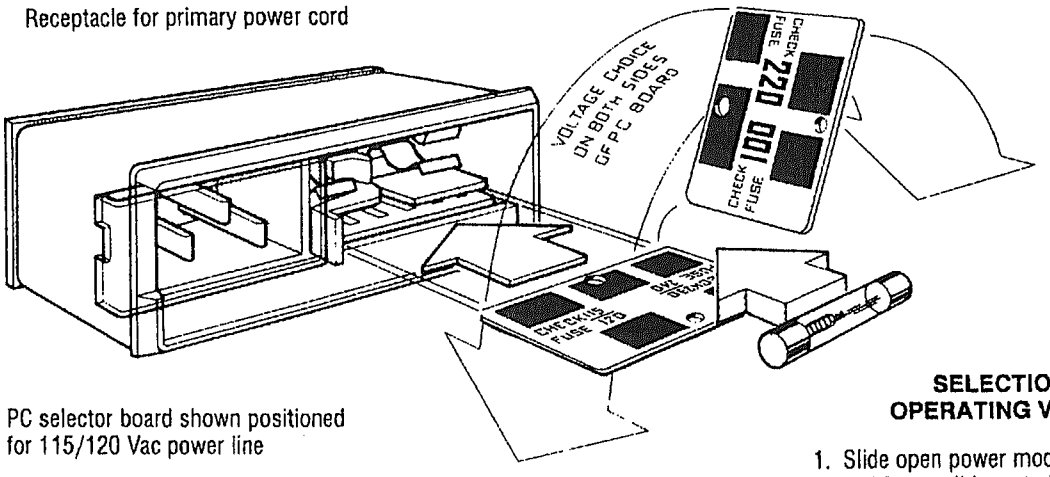
Figure 2-1 shows the line voltage selection card and fuse location in the power line module on the rear panel of the analyzer. Select the line voltage and fuse as follows:

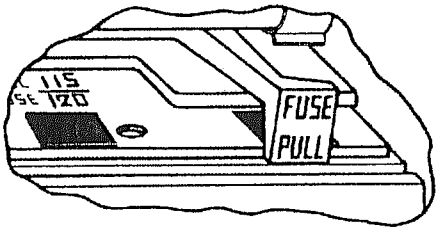
1. Measure the AC line voltage.
2. On the instrument rear panel power line module, select the line voltage (100, 120, 220, or 240 volts) closest to the voltage you measured in step 1. The available line voltage must be within ±10% of the line voltage selection as shown in table 2-1. If not, use an autotransformer between the power source and the analyzer.

Table 2-1. Line Voltage and Fuse Selection

Measured AC Line Voltage	PC Selector Board Position	Fuse
90 to 110 volts	100	2.5 A
108 to 132 volts	120	2.5 A
198 to 242 volts	220	1.5 A
216 to 264 volts	240	1.5 A

3. Install the correct fuse in the fuse holder. The required fuse rating for each line voltage is shown in table 2-1 and also below the power line module on the rear panel of the analyzer. Additional fuses are available from Hewlett-Packard. See "Replaceable Parts".





Operating voltage appears in module window

SELECTION OF OPERATING VOLTAGE

1. Slide open power module cover door and pull fuse-pull lever to left to remove fuse.
2. Pull out voltage-selector PC board. Position PC board so that voltage nearest actual line voltage level will appear in module window. Push board back into its slot.
3. Push fuse-pull lever into its normal right-hand position.
4. Check fuse to make sure it is of correct rating and type for input ac line voltage.
5. Insert correct fuse in fuseholder.

Figure 2-1. Power Line Module

Power Cable

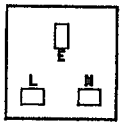
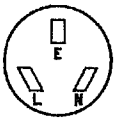
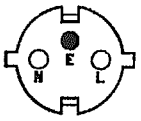
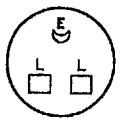
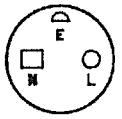
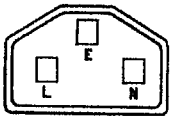
The analyzer is equipped with a three-wire power cable in accordance with international safety standards. When connected to an appropriate outlet, this cable grounds the instrument cabinet. Table 2-2 shows the styles of plugs available on power cables supplied with instruments. Each HP part number in column two refers to a complete power cable (including the plug illustrated in column one). The type of power cable shipped with the instrument depends on the country of destination.

WARNING

Before turning on line power to the analyzer, ensure that only the specified power cord is used. Insert the power cord only in a socket outlet provided with a protective earth contact.

The offset pin of the three-prong connector is the grounding pin. The analyzer can safely be operated from a two-contact outlet only when using a three-prong to two-prong adapter and connecting the green wire of the adapter to ground. Do not negate these protective features by using an extension cord without a protective ground conductor or by grounding one conductor of a two-conductor outlet.

Table 2-2. AC Power Cables Available

Plug Type[1]	Cable HP Part Number[2]	CD[3]	Plug Description[2]	Cable Length (inches)	Cable Color	For Use in Country
250V 	8120-1351 8120-1703	0 6	Straight BS1363A 90°	90 90	Mint Gray Mint Gray	United Kingdom, Cyprus, Nigeria, Zimbabwe, Singapore
250V 	8120-1369 8120-0696	0 4	Straight ZNSS198/ASC112 90°	79 87	Gray Gray	Australia, New Zealand
250V 	8120-1689 8120-1692	7 2	Straight CEE7-VII 90°	79 79	Mint Gray Mint Gray	East and West Europe, Saudi Arabia, Egypt, Republic of So. Africa, India (unpolarized in many nations)
125V 	8120-1348 8120-1398 8120-1754 8120-1378 8120-1521 8120-1676	5 5 7 1 6 2	Straight NEMA5-15P 90° Straight NEMA5-15P Straight NEMA5-15P 90° Straight NEMA5-15P	80 80 36 80 80 36	Black Black Black Jade Gray Jade Gray Jade Gray	United States, Canada, Japan (100V or 200V), Mexico, Philippines, Taiwan
250V 	8120-2104	3	Straight SEV1011.1959 24507,Type 12	79	Gray	Switzerland
250V 	8120-0698	6	Straight NEMA6-15P			United States, Canada
220V 	8120-1957 8120-2956	2 3	Straight DHCK 107 90°	79 79	Gray Gray	Denmark
250V 	8120-1860	6	Straight CEE22-VI (System Cabinet Use)			

1. E = Earth Ground; L = Line; N = Neutral
2. Part number shown for plug is industry identifier for plug only. Number shown for cable is HP Part Number for complete cable including plug.
3. The Check Digit (CD) is a coded digit that represents the specific combination of numbers used in the HP Part Number. It should be supplied with the HP Part Number when ordering any of the power assemblies listed above, to expedite speedy delivery.

RACK MOUNTING

CAUTION

Use only the specified screws to install the rack mount kit. Longer screws may damage internal components located behind the screw mounting holes.

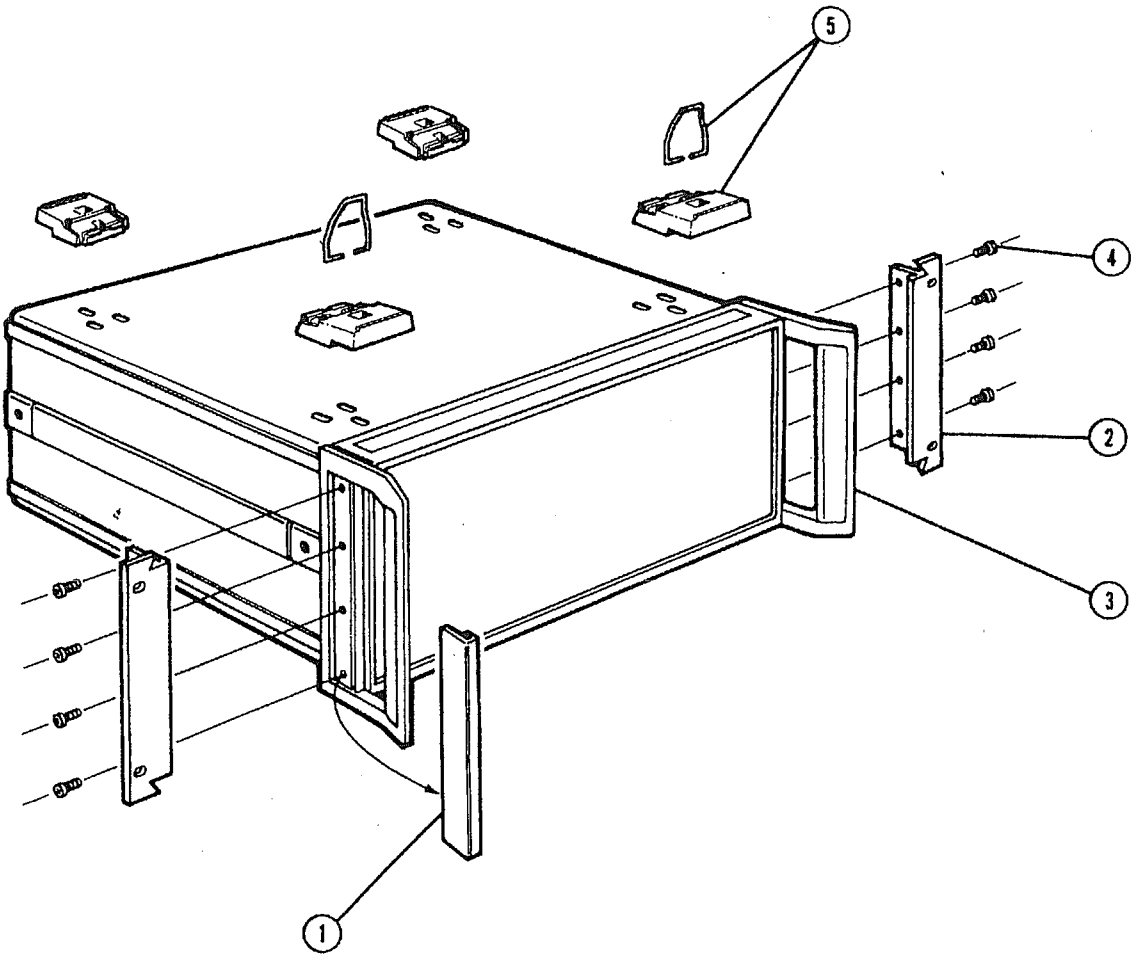
Rack Mounting without Front Handles (Option 908)

Instruments with Option 908 contain a Rack Mount Kit. This kit supplies the hardware and the installation instructions for preparing the instrument to mount on an equipment rack with 482.6 mm (19 in.) support spacing. Installation instructions are also given in figure 2-2. Additional Option 908 Rack Mount Kits may be ordered. See "Replaceable Parts" for ordering information.

Rack Mounting with Front Handles (Option 913)

Instruments with Option 913 contain a Rack Mount Kit. This kit supplies the hardware and the installation instructions for preparing the standard instrument, with handles attached, to mount on an equipment rack with 482.6 mm (19 in.) support spacing. Installation instructions are also given in figure 2-3. Additional Option 913 Rack Mount Kits may be ordered. See "Replaceable Parts" for ordering information.

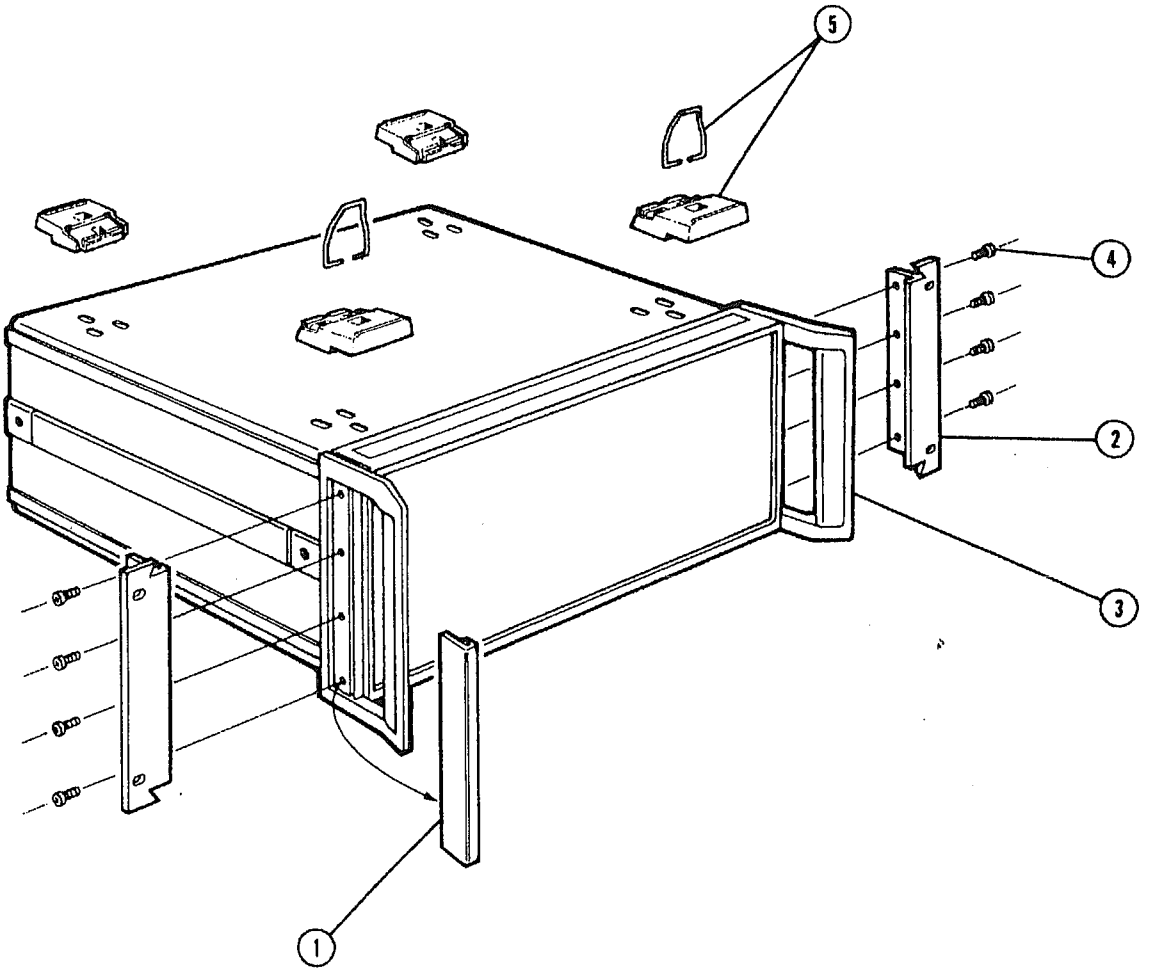
Option 908 Installation Instructions



1. Remove each front handle trim (1) by inserting tip of screwdriver between back edge of trim and front handle (3) and pulling forward.
2. Remove four screws (4) and one front handle assembly (3) per side.
3. Attach one rack mount flange (2) with four panhead screws (4) per side.
4. Remove feet and tilt stands (5) before rack mounting.
5. Save flathead screws and front handle assemblies for reuse when shipping.

Figure 2-2. Option 908 Rack Mounting without Front Handles

Option 913 Installation Instructions



1. Remove each front handle trim (1) by inserting tip of screwdriver between back edge of trim and front handle (3) and pulling forward.
2. Remove four flathead screws (4) and one front handle assembly (3) per side.
3. Attach one rack mount flange (2) and one front handle assembly (3) with four panhead screws (4) per side.
4. Remove feet and tilt stands (5) before rack mounting.
5. Save flathead screws for reuse when shipping.

Figure 2-3. Option 913 Rack Mounting with Front Handles

HP INTERFACE BUS AND 8757 SYSTEM INTERFACE CONNECTORS AND CABLES

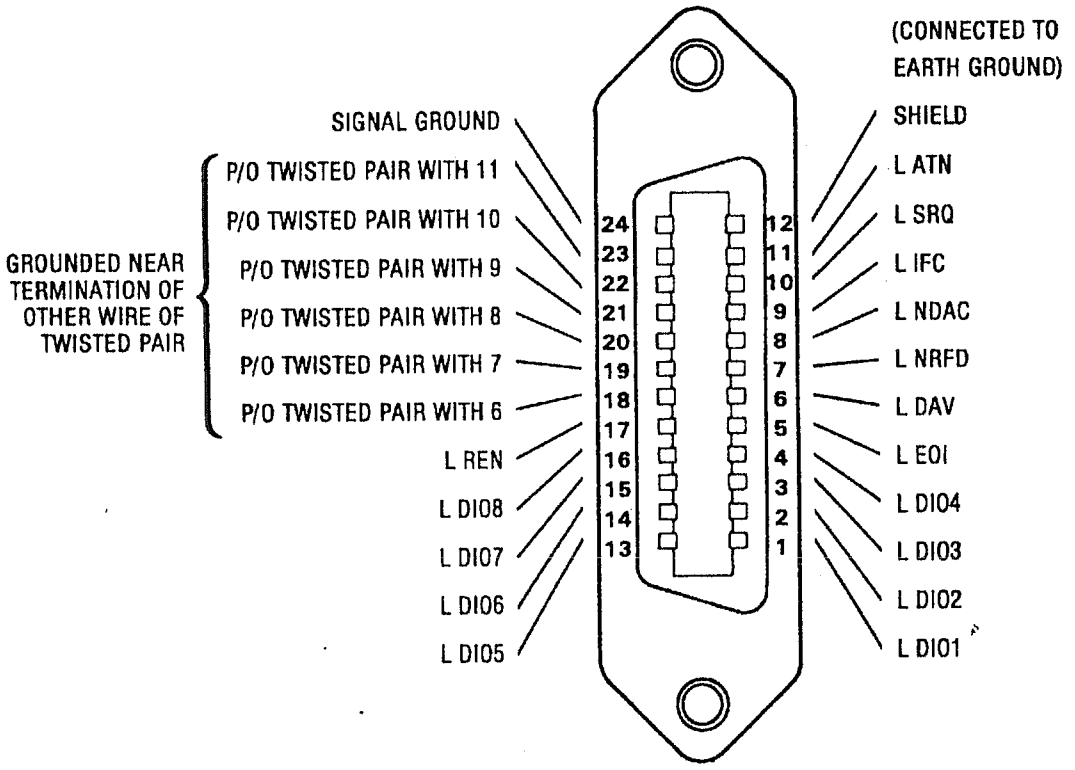
The HP INTERFACE BUS connector J2 is located on the rear panel of the analyzer. J2 allows the analyzer to be connected to a controller via HP-IB with or without additional instruments. An illustration of pin configuration and signals on the HP-IB connector is given in figure 2-4.

The 8757 SYSTEM INTERFACE connector J1 is located on the rear panel of the analyzer. The system interface connects the analyzer to the HP-IB connector of compatible instruments. The analyzer itself controls the system interface. Do not connect a controller to this connector. An illustration of J1 is given in figure 2-4.

All instruments on the HP-IB or the system interface are interconnected by HP-IB cables. HP-IB cables are available in lengths from 0.5 m (1.6 ft) to 4 m (13.2 ft). See "Replaceable Parts" for ordering information. As many as fifteen instruments may be connected in parallel on the HP-IB or the system interface. To achieve design performance on the bus, proper voltage levels and timing relationships must be maintained. If the system cable is too long or if the accumulated cable length between instruments is too long, the data and control lines cannot be driven properly and the system may fail to perform. Observe the following restrictions:

- 4 m (12 ft) is the maximum cable length with two instruments in a system.
- 2 m (6 ft) is the maximum cable length to each instrument when more than two instruments are connected on the bus.
- 20 m (65 ft) is the maximum total cable length between all units.

8757 System Interface Connector J1 and HP Interface Bus Connector J2 (as viewed from rear of instrument)



HP-IB Logic Levels:
True (low) State ≤ 0.8 VDC; (high) State $\geq +2.4$ VDC.

NOTE: Mnemonics on the wiring list for J1 and J2 are coded B and A to differentiate between the two. (L BDIO5 = 8757 System Interface; L ADIO5 = HP Interface Bus)

MNEMONICS TABLE

Mnemonic	Description
L ATN	LOW = Attention control line
L DAV	LOW = Data Valid control line
L DIO1 through 8	LOW = Data Input/Output lines
L EOI	LOW = End Or Identify control line
L IFC	LOW = Interface Clear control line
L NDAC	LOW = Data Not Accepted control line
L NRFD	LOW = Not Ready For Data control line
L REN	LOW = Remote Enable control line
L SRQ	LOW = Service Request control line

Figure 2-4. 8757 SYSTEM INTERFACE Connector and HP INTERFACE BUS Connector Signal and Pin Configuration

ANALYZER TO SOURCE INTERCONNECTIONS

An RF or microwave source is required for use with the analyzer. The HP 8350B Sweep Oscillator and the HP 8340- and 8341-series Synthesized Sweepers are commonly used sources. The following setups (figures 2-5 and 2-6) show the interconnections between these sources and the analyzer.

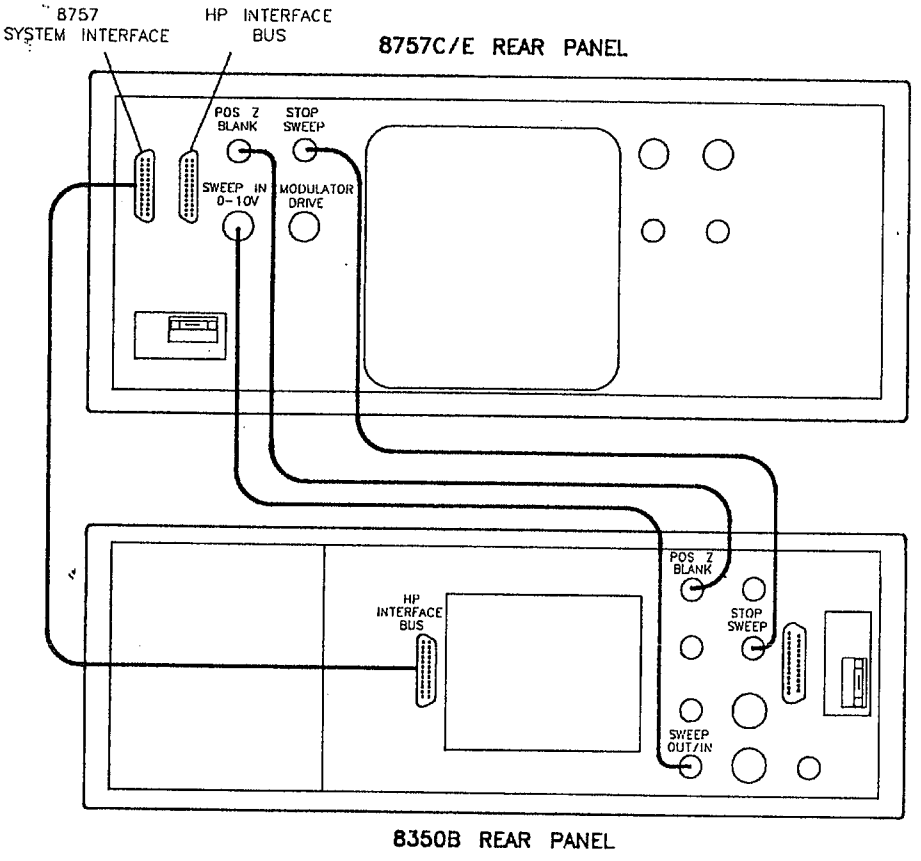


Figure 2-5. Analyzer to HP 8350B Sweep Oscillator Interconnections

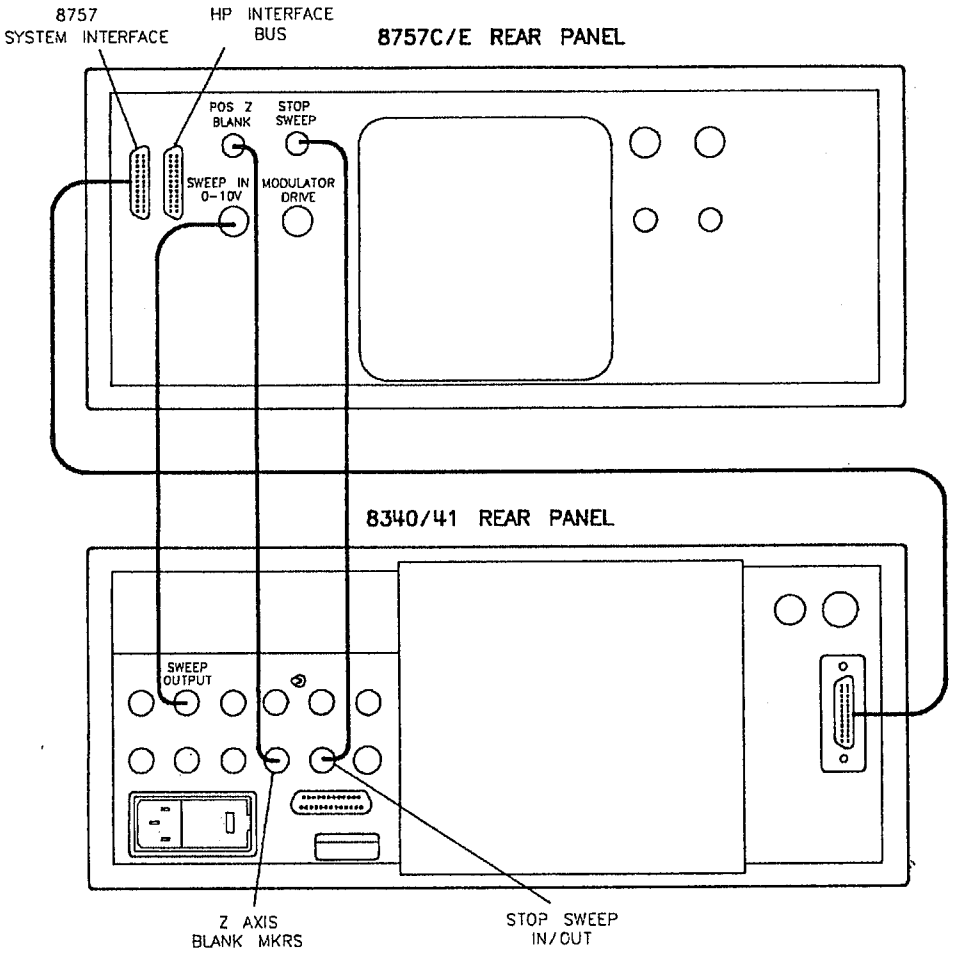


Figure 2-6. Analyzer to HP 8340- and 8341-series Synthesized Sweeper Interconnections

External Modulation

The HP 8340- and 8341-series Synthesized Sweepers do not provide an internal 27.778 kHz modulated signal for use in AC measurements. (The HP 8350B Sweep Oscillator does.) However, the analyzer's 27.778 kHz modulation signal can be used to externally modulate the synthesized sweeper. Connect the modulator drive of the analyzer to the source according to the instructions given in table 2-3. "CONNECTION/FUNCTION" indicates where to make the connection to the source front panel connector and which front panel key to press.

Table 2-3. External Modulation Connections

Source	Connection/Function (without System Interface connected)	Connection/Function (with System Interface connected)
HP 8340A (serial prefix <2302A)	Pulse Input/Pulse	Pulse Input/Pulse
HP 8340A (serial prefix ≥2320A)	AM Input/Shift Pulse	AM Input*
HP 8341A (all serials)	AM Input/Shift Pulse	AM Input*
HP 8340B (all serials)	Pulse Input/Pulse	Pulse Input*
HP 8341B (all serials)	Pulse Input/Pulse	Pulse Input*

*The correct function is programmed automatically.

Other Configurations

The analyzer can be operated with the sources already described without connecting the 8757 System Interface. In this configuration, make the connections to the analyzer's POS Z BLANK and SWEEP IN 0-10 V only. Use this configuration also with the HP 8620-series Sweep Oscillator and with non-Hewlett-Packard sources. Modulation is achieved by connecting the MODULATOR DRIVE to the source PULSE input or an external modulator can be used such as the HP 11665B.

HP 8757C ONLY

ANALYZER TO EXTERNAL MONITOR INTERCONNECTIONS

The analyzer is capable of driving both the internal display and one external monitor simultaneously. An external monitor may be connected to the analyzer using the three BNC connectors on the rear panel of the instrument. These three Red, Green, Blue, (RGB) connectors provide compatible video signals for an HP 35741A/B monitor. To use the external monitor, connect the three RGB BNC outputs from the rear panel of the analyzer to the corresponding RGB inputs of the monitor.

Other multisync monitors can be used if they are compatible with the analyzer's 25.5 kHz scan rate and video levels (1 V p-p, 0.7 V = white, 0 V = black, −0.3 V = sync on green). Use appropriate adapters to connect these monitors to the analyzer RGB connectors.

A monochrome monitor, such as the HP 35731A/B, may also be used if the analyzer is operated in monochrome mode. In this case, connect only the green (G) output to the monitor.

HP-IB ADDRESS SELECTION

The analyzer can be operated directly by the front panel controls or by remote control. In the remote control mode, the controller and the analyzer communicate through HP-IB. The controller identifies the analyzer by an HP-IB address. Each instrument on the bus must have a unique address code. Do *not* set the analyzer address to the same address as any other instrument connected to the 8757 System Interface.

Thirty different address codes are available (0 through 29). The analyzer is shipped from the factory preset to address 16. In all standard analyzers the HP-IB address is read at first power on by the central processing unit (CPU) from firmware and stored in memory. The analyzer HP-IB address will not change until the value in memory is changed through the front panel functions, or when firmware is changed in the analyzer. With a firmware change, the HP-IB address again defaults to 16. Read the analyzer HP-IB address on the CRT by pressing:

[LOCAL] —front panel key
[8757] —softkey

To change the HP-IB address at this point, enter the new address number using the entry keys on the front panel. When the correct numbers have been entered, press **[ENT]**. The CRT will now show the new HP-IB address. This address is stored in memory and is not changed by turning the LINE switch off, or when the analyzer is preset.

HP-IB address labels (shown in figure 2-7) are available for recording instrument HP-IB addresses. See "Replaceable Parts", in the service manual, for ordering information.

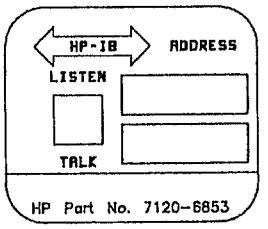


Figure 2-7. HP-IB Address Label

OPERATING ENVIRONMENT

To ensure that no damage to the analyzer occurs, operate the analyzer only under the following conditions. Analyzer specifications are warranted for these conditions except where noted in table 1-1, "Specifications and General Requirements".

Temperature: 0° to +55° C (+32° to +131° F).

Relative Humidity: 15% to 95% at +25° to +40° C (+77° to +104° F).

Protect the analyzer from temperature extremes that could cause condensation within the instrument.

Altitude: Up to 4,572 m (15,000 ft).

Cooling: Clearance for ventilation should be at least 10 cm (4 in.) at the rear of the cabinet and 7.6 cm (3 in.) at the sides. The clearances provided by the plastic feet in bench stacking, and filler strips in rack mounting, are adequate for the top and bottom cabinet surfaces. The fan, mounted in the rear of the analyzer, moves air into the instrument and out through the sides. Ensure that the air intake and exhaust clearances are met and that the fan filter is cleaned regularly.

STORAGE AND SHIPMENT ENVIRONMENT

The analyzer can be stored or shipped in environments within the following limits:

Temperature: −40° to +70° C (−40° to +167° F).

Relative Humidity: 90% at +65° C (+149° F).

Protect the instrument from temperature extremes that could cause condensation in the instrument.

Altitude: Up to 15,240 m (50,000 ft).

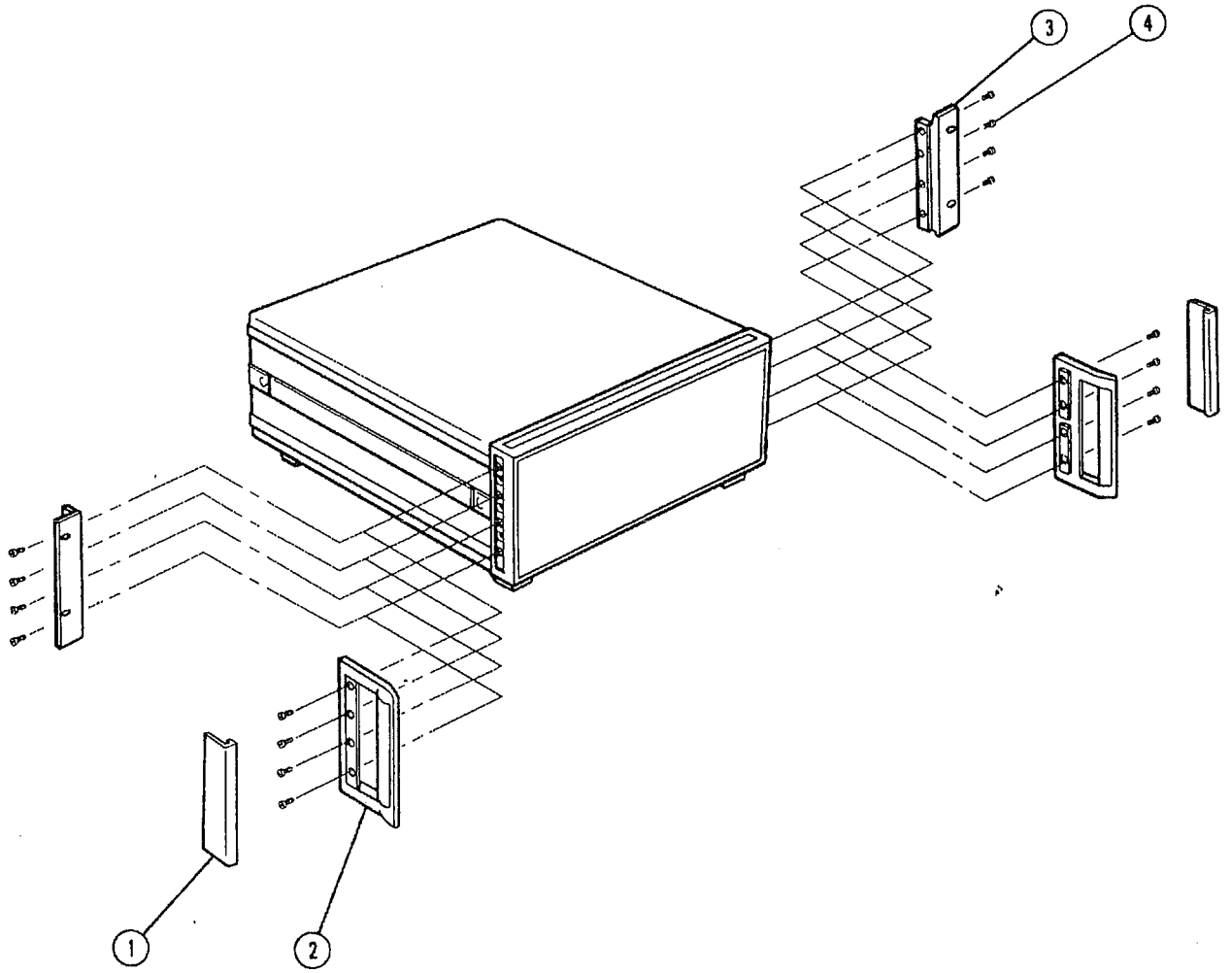
PACKAGING

Containers and materials identical to those used in factory packaging are available through Hewlett-Packard offices. A complete diagram of packaging materials used for the analyzer is shown in figure 2-9. See "Replaceable Parts" for part numbers and ordering information. If the analyzer is being returned to Hewlett-Packard for servicing, complete a blue service tag (located at the end of this section) and attach it to the analyzer. Mark the container *FRAGILE* to ensure careful handling. In any correspondence, refer to the analyzer by model number and full serial number.

Use these instructions to repackage the analyzer with commercially available packaging materials:

1. If the instrument has rack-mount flanges, remove them as shown in figure 2-8.
2. Attach a completed blue service tag (located at the end of this section) if returning the analyzer to Hewlett-Packard for service.
3. Enclose the analyzer in anti-static material.
4. Use a strong shipping container. Pack enough shock-absorbing material around all sides of the analyzer to provide a firm cushion and to prevent movement inside the container. Protect the control panel with cardboard.
5. Seal the shipping container securely.
6. Mark the shipping container *FRAGILE* to ensure careful handling.
7. In any correspondence, refer to the instrument by model number and full serial number.

Shipment Preparation Instructions



1. If standard analyzer with handles only, ship.
2. If option 913 (with rack mount flanges), remove four panhead screws and one rack mount flange per side.
3. Reinstall one front handle assembly (3) with four flathead screws per side and ship.
4. If the analyzer lacks handles, perform step 3.

Figure 2-8. Preparation of Instrument for Shipment

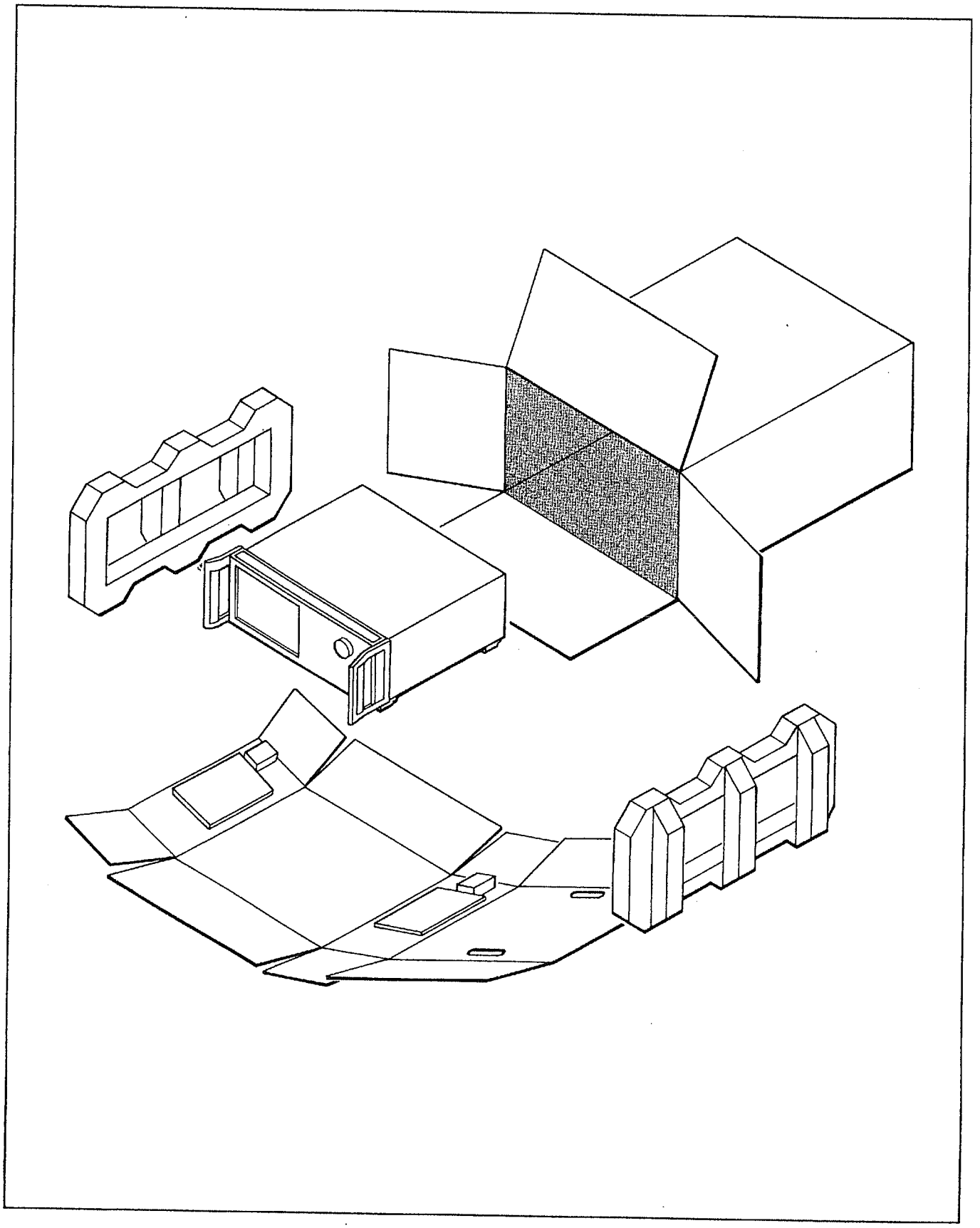


Figure 2-9. Packaging for Shipment Using Factory Packaging Materials

Section 3. Operation

CONTENTS

INTRODUCTION

This section contains operating information organized as follows:

The "Local Operation" subsection contains the *Operating Reference* and the *User's Guide*. The *Operating Reference* explains the analyzer's front and rear panel operating features and front panel key and softkey functions. It also contains the Operator's Check, which is used to verify that your analyzer is functioning properly. The *User's Guide* contains typical measurement setups and example transmission and reflection measurements.

The "Remote Operation" subsection contains programming guides with example programs and a listing of commands that are compatible with the analyzer.

"In Case of Difficulty" explains what to do when a problem is encountered with the analyzer. It gives suggestions for minor problems that do not involve defects in the internal circuitry. If a problem is encountered that is not solved using any of these suggestions, go to section 8 of the service manual for troubleshooting information.

HP 8757C FIRMWARE REVISION HISTORY

This section describes HP 8757C firmware revisions which includes a brief description of the additional features. This is only a summary. For more complete information, refer to the HP 8757C/E Scalar Network Analyzer Operating Manual and Operating Reference.

Revision 3.0

Initial shipment release.

Revision 3.1

- New softkey ***[CSR FMT SWR dB]*** has been added to the ***[CURSOR]*** key menu. Corresponding remote commands are FR0 for log magnitude and FR1 for SWR. This function allows convenient readout of cursor data in SWR (standing wave ratio) when measuring device match in dB (return loss). (This function is similar in operation to the HP 8757A feature.)
- New softkey ***[PLT BUF ON OFF]*** has been added to the ***[SYSTEM]*** key menu. The corresponding remote command is BFm. This function enables and disables the internal plotter buffer of the analyzer.
- New softkey ***[ALL HOLD]*** has been added to the ***[RECALL]*** key menu. The corresponding remote command is LFH. This function loads the files listed in the ***[ALL]*** function in addition to holding the measurement display.
- New softkey ***[MEAS-MEM]*** has been added to the ***[SAVE]*** key menu. The corresponding remote command is SFN. This function stores normalized trace data to disk that can later be analyzed with a computer.
- New softkey ***[STEP SW ON OFF]*** has been added to the ***[SYSTEM]*** key menu. The corresponding remote command is FSm. This function enables the step-sweep mode when using an HP 8340 or HP 8360 and connected to the 8757 SYSTEM INTERFACE.
- New system-interface compatibility with HP 8360s including master/slave source configurations.

HP 8757E FIRMWARE REVISION HISTORY

This section describes HP 8757E firmware revisions which includes a brief description of the additional features. This is only a summary. For more complete information, refer to the HP 8757C/E Scalar Network Analyzer Operating Manual and Operating Reference.

Revision 4.0

Initial shipment release.

Revision 4.1

- New softkey ***[CSR FMT SWR dB]*** has been added to the ***[CURSOR]*** key menu. Corresponding remote commands are FR0 for log magnitude and FR1 for SWR. This function allows convenient readout of cursor data in SWR (standing wave ratio) when measuring device match in dB (return loss). (This function is similar in operation to the HP 8757A feature.)
- New softkey ***[PLT BUF ON OFF]*** has been added to the ***[SYSTEM]*** key menu. The corresponding remote command is BFm. This function enables and disables the internal plotter buffer of the analyzer.
- New softkey ***[STEP SW ON OFF]*** has been added to the ***[SYSTEM]*** key menu. The corresponding remote command is FSm. This function enables the step-sweep mode when using an HP 8340 or HP 8360 and connected to the 8757 SYSTEM INTERFACE.
- New system-interface compatibility with HP 8360s including master/slave source configurations.

OPERATING REFERENCE

HP 8757C/E SCALAR NETWORK ANALYZER

HEWLETT PACKARD

CONTENTS

WHAT IS IN THIS REFERENCE

This reference describes the operating features of the HP 8757C/E Scalar Network Analyzer:

- Front and rear panel features.
- Front panel key operation.
- Softkey operation.
- Softkey menu structure maps.

The "Operator's Check" is located at the end of this reference to help you verify the functionality of the analyzer.

This document is intended to guide you through manual use of the analyzer. Further instruction is contained in the *User's Guide* which is included in this subsection (*Local Operation*). The *User's Guide* describes general measurement setups and includes typical measurement examples.

See section 1, "General Information" for an overall description of the analyzer's capabilities.

(HP 8757C ONLY)

Text that applies *only* to the HP 8757C is enclosed with these symbols. In a table, text that is HP 8757C-only is referenced to a footnote.

HOW TO USE THIS REFERENCE

- Figure 1 shows the analyzer's front panel. Call-outs identify the features, which are described in the text below the figure.
- Figure 2 is the CRT. It identifies each of the information areas on the CRT.

To Find a Front Panel Key Description

The front panel keys are divided into functional groups (CHANNEL, FUNCTION, ENTRY, and INSTRUMENT STATE). These functional groups are labeled on the analyzer front panel. Look on your analyzer's front panel or figure 1. To find a front panel key description in this reference:

1. Look for that key under its functional group label in "Contents" on the front page of this section.
2. Turn to the page number listed for the description.

To Find a Softkey Description

When pressed, most of the front panel keys present one or more softkey menus. These softkeys expand the analyzer's capabilities without adding additional front panel key complexity. To find a softkey description:

1. Locate the associated front panel key in "Contents" on the front page of this section.
2. Turn to the page number listed. The softkey menu descriptions are included with each front panel key description. The softkeys are described in the order in which they appear on the CRT from the top to the bottom.

If You Can't Find a Softkey

If you are looking for a softkey function and don't know which front panel key presents the softkey menu containing this function:

1. Find the page number for the softkey menu structure maps for your analyzer (HP 8757C *or* HP 8757E —*remember, they are different*) in "Contents" on the front page of this section. The softkey menu structure maps show all of the front panel keys and their softkey menus together.
2. Locate the softkey on the map; then note which front panel key presents the softkey menu containing this softkey.
3. Locate the associated front panel key in "Contents" on the front page of this section.
4. Turn to the page number listed.

FRONT PANEL FEATURES

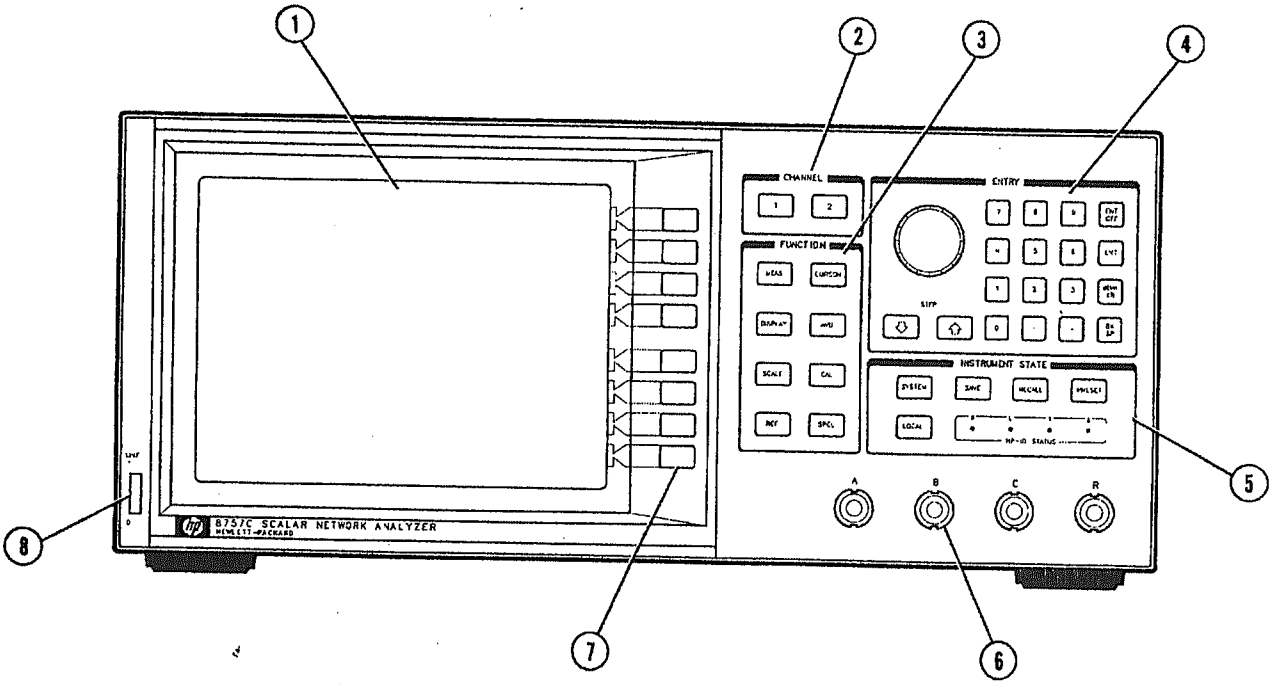


Figure 1. The HP 8757C Option 001 Front Panel

1. CRT: This screen shows measurement annotation, soft key labels, data traces, and other information. See figure 2 for CRT details.
2. CHANNEL: These keys select the active channel.
3. FUNCTION: These keys engage functions such as calibration and averaging. They present softkey menus that generally apply to the active channel only.
4. ENTRY: The entry area includes the knob, the STEP keys, and the numeric keypad. These are used for entering data.
5. INSTRUMENT STATE: These keys are used to control system functions, such as plotting and defining titles, that apply to the entire instrument state, not just to a single channel.
6. DETECTOR INPUTS: These connectors are used for connection of compatible detectors and directional bridges.
7. SOFTKEYS: The softkeys are used to present functions in the menus and for instrument status information. To engage a softkey function, press the key to the immediate right of the softkey label on the CRT.
8. LINE: This switch controls AC power to the analyzer.

CRT DESCRIPTION

The analyzer CRT is divided into several information areas. See figure 2.

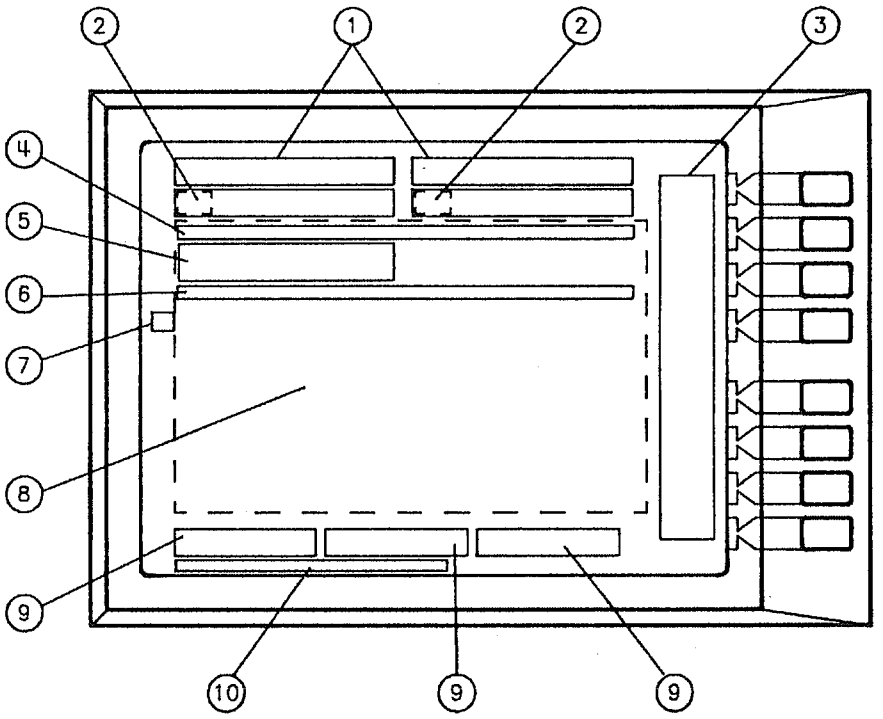


Figure 2. The Analyzer CRT

1. MODE LABELS: For each channel that is turned on, this area shows the measurement mode (single input or ratio), status symbols (indicating activated functions), cursor amplitude (or HP 8350B or 8340/8341-series active marker amplitude), scale per division, and reference level value. Figure 3 shows each part of the mode labels area.

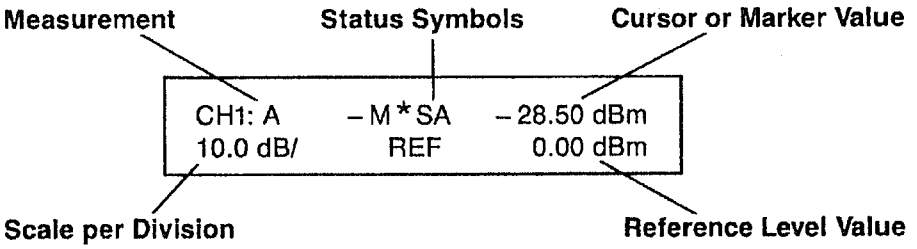


Figure 3. Mode Labels Description

Status Symbols: These symbols identify engaged functions. See table 1 for a list of these symbols. Read about the functions they represent in "Front Panel Operation". The associated FUNCTION or INSTRUMENT STATE key will help you locate each function.

Table 1. Status Symbol Identification

Status Symbol	Activated Feature	Function Key/ Instrument State Key
−M	MEASUREMENT-MINUS-MEMORY	[DISPLAY]
MEM	MEMORY	[DISPLAY]
A	AVERAGING ON	[AVG]
S	SMOOTHING ON	[SPCL]
*[1]	ADAPTIVE NORMALIZATION ON	[SYSTEM]
U[1]	ADAPTIVE NORMALIZATION ON (uncalibrated)	[SYSTEM]

1. HP 8757C only.

Mode labels are shown for each channel in the following locations:

LEFT SIDE OF CRT	RIGHT SIDE OF CRT
Channel 1	Channel 2
Channel 3[1]	Channel 4[1]

The active channel mode labels are enclosed in a highlighted box.

HP 8757C ONLY

2. PASS/FAIL INDICATORS: These labels show the pass/fail status based on the limit lines entered for channel 1 or 2. The pass/fail indicators can be shown only with both channels 3 and 4 off.

3. SOFTKEY LABELS: The softkey labels define the functions of the softkeys for the menu shown. Labels for functions engaged for the active channel are shown with greater intensity and underlining.

4. TITLE LINE: This line shows the title, which you can enter using the SYSTEM menu.

5. ACTIVE ENTRY AREA: The last entry or HP-IB command function selected is shown here. Exceptions are **[PRESET]**, **[MEAS]**, and **[DISPLAY]**.

6. MESSAGE LINE: This line shows messages and warnings to the operator.

7. REFERENCE LINE POSITIONS: The reference position for each channel is identified by the number of the channel and a ">" symbol in the left margin of the graticule grid. Reference lines can only be positioned on major graticule lines.

8. DATA DISPLAY AREA: The measurement data traces are shown in this area simultaneously for all channels that are turned on.

9. FREQUENCY LABELS: The start, stop, and cursor (or source active marker) frequencies are shown in this area when a source is connected to the 8757 system interface bus. The cursor frequency takes precedence over the active marker frequency. Alternate sweep frequencies are also shown when that function is engaged.

10. STATUS LINE: This line, illustrated in figure 4, shows the current status of the analyzer. When entries do not apply to the current status they are left blank.

AC	401	DETOFS ABCR	CW MAN SS NON	UNCAL ABCR	SYSINTF OFF
1	2	3	4	5	6

Figure 4. Status Line Description

1. AC or DC detection mode.
2. Number of trace points:
   101
   201
   401
   801[1]
   1601[1]
3. Non-zero detector offset for each detector indicated.
4. Sweep mode other than standard swept mode:

   MAN – manual sweep mode
   CW – continuous wave (CW) sweep mode
   SS – step sweep mode
   NON – nonstandard sweep mode

5. Uncalibrated condition for each detector connected.

   This message occurs only when *[AUTOCAL OFF]* is engaged in the CAL menu and an input has drifted out of calibration. See "HP 8757C/E Self-Calibration", in this section, for more information.

6. 8757 system interface is off.

1. HP 8757C only.

FRONT PANEL OPERATION

CHANNEL Keys

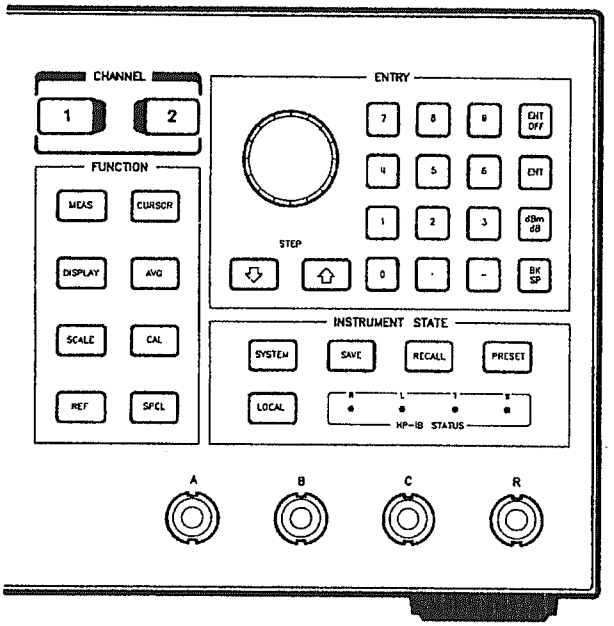


Figure 5. CHANNEL Keys

The CHANNEL keys are shown in figure 5. The channel is used to take the data received from the detector inputs and show it on the CRT in a format designated by preset conditions or front panel key entry. CHANNEL key operation is described in the following text.

CHANNEL [1] CHANNEL [2] —CHANNEL MENU

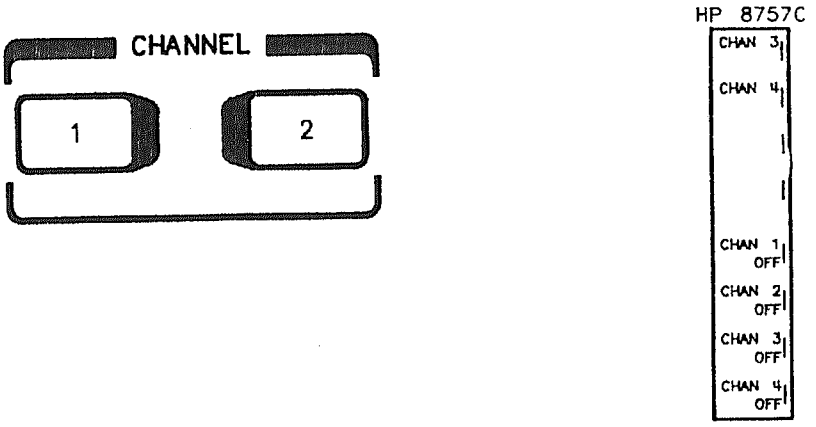


Figure 6. CHANNEL Keys and Channel Menu

Pressing either CHANNEL **[1]** or CHANNEL **[2]** turns on and activates that channel. Only one channel is active at a time, although all channels can be turned on for simultaneous viewing. The active channel mode labels are enclosed in a highlighted box. Any functions entered apply *only* to the active channel. Measurement data, however, is updated to all channels simultaneously. Channel 1 and 2 are turned on at preset, and channel 1 is the active channel; otherwise the channel number pressed is active.

HP 8757E users can turn off a channel by pressing that CHANNEL key twice. The first press activates the channel; the second press turns it off. Press the CHANNEL key again to turn the channel back on.

HP 8757C ONLY

Either CHANNEL key also presents the channel menu of softkeys shown in figure 6.

[CHAN 3] and ***[CHAN 4]*** allow you to turn on and activate those channels.

Any channel can be turned off when the channel menu is accessed. For example, when ***[CHAN 1 OFF]*** is pressed, the channel 1 trace is removed from the CRT, in addition to all other information relating to channel 1.

The channel menu can be turned off. Instructions for this function are explained under "[SYSTEM]-SYSTEM MENUS".

FUNCTION Keys

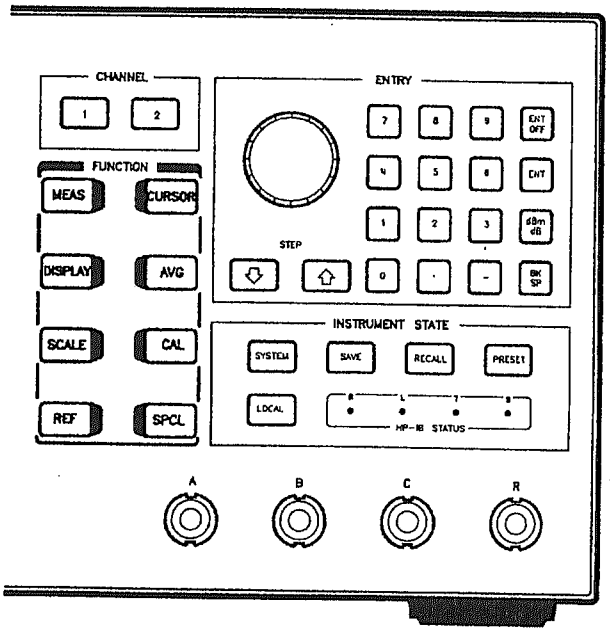


Figure 7. FUNCTION Keys

The FUNCTION keys are shown in figure 7. The eight FUNCTION keys are used to engage functions and present softkey menus that generally apply to the active channel only. These functions include measurement modes, display formats, scale factors, reference levels and positions, cursor positioning, averaging, calibration, and special functions. These functions are described in the following pages.

[MEAS] – MEASUREMENT MENUS

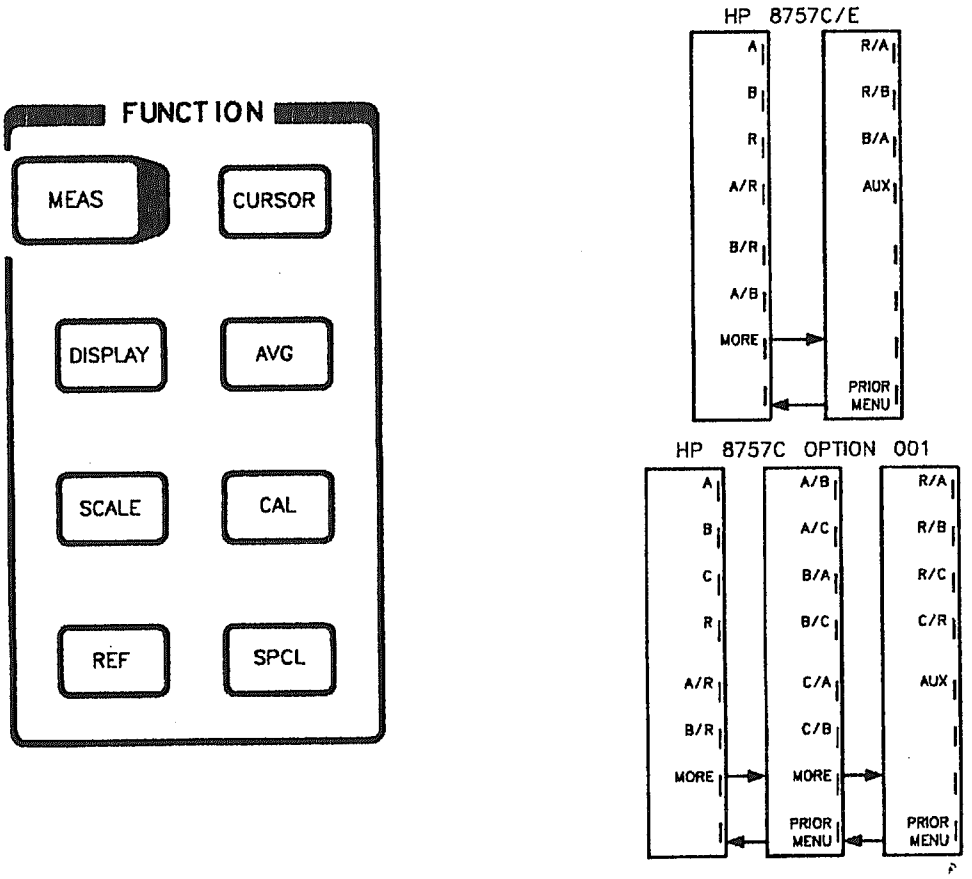


Figure 8. [MEAS] Key and Measurement Menus

The **[MEAS]** key presents the measurement menus. Figure 8 shows the measurement menus for the analyzer. Either a single input or a ratio of inputs can be measured. For example, if ***[A]*** is pressed, the displayed data is the measured value at input A in dBm. If ***[A/R]*** is pressed, the displayed data is the measured value at input A in dBm minus the measured value at input R in dBm. (Since the values are in dBm, a logarithmic subtraction is equal to the linear division A/R.) The softkey function engaged applies only to the active channel.

The measurement parameter chosen is shown in the mode labels area next to the channel number. Pressing [PRESET] (the green INSTRUMENT STATE key) presets channel 1 to measure input A, and channel 2 to measure input B. In the mode labels area an "A" is shown next to "CH1:" and a "B" next to "CH2:".

The measurement menus are layered. Pressing ***[MORE]*** accesses the next menu. ***[PRIOR MENU]*** returns the previous menu.

[AUX] selects a voltage input from the rear panel ADC IN (+10 to −10 V) connector. This voltage is shown on the active channel (instead of data from a single or ratioed detector input.) This function can be used to observe the control voltage input to a voltage controlled device.

[DISPLAY] — DISPLAY MENUS

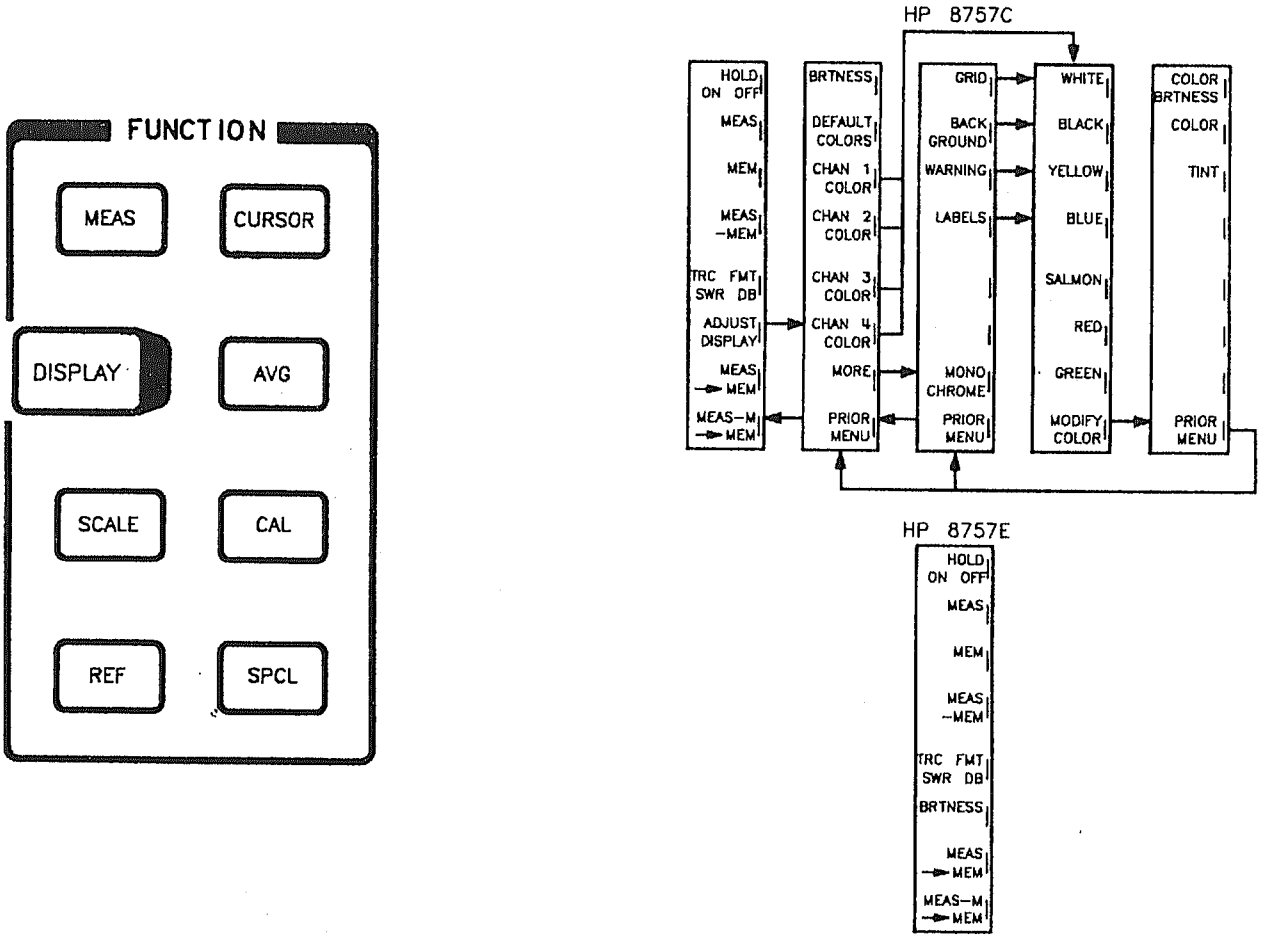


Figure 9. [DISPLAY] Key and Display Menus

The **[DISPLAY]** key presents the display menu (figure 9), which lets you control how the measurement data is processed and shown on the CRT. This menu lets you show the measurement, the data in memory of the active channel, or the difference between the two. It also lets you enter the measurement, or the measurement-minus-memory, into memory. Remember that selection of any of these softkeys engages that function for the active channel only.

HP 8757C ONLY

This menu also lets you define the colors used on the CRT attributes such as the grid, the channel measurement traces, and the labels. At the end of the [DISPLAY] key and menu description is additional information about color definitions and adjustments.

[HOLD ON OFF] freezes the active channel measurement data on the CRT.

[MEAS] shows the measurement data of the selected input (or ratio of inputs).

[MEM] shows the measurement data that had previously been stored in the memory of that channel. When this function is engaged, "MEM" appears in the status symbols section of the mode labels area for that channel.

[MEAS-MEM] is used to subtract the data previously stored in memory from the current measurement data. This is commonly used during calibration to produce a normalized trace. When engaged, "−M" appears in the status symbols section of the mode labels area for that channel.

[TRC FMT SWR dB] provides a choice of data formats for reflection data as standing wave ratio (SWR) or as return loss (dB). The data is formatted as return loss at preset.

HP 8757C ONLY

The SWR selection is available only for ratioed or normalized measurements on channels 1 and 2 with 401, or fewer, points. Channels 3 and 4 must be turned off to engage SWR format on channels 1 and 2.

SWR is calculated using a lookup table that is generated when SWR format is selected. This initial calculation takes a few moments, but the data is shown in "real time" thereafter.

[BRTNESS] allows you to change the brightness (intensity) of the display. When pressed, BRTNESS:DISPLAY appears in the active entry area of the CRT along with the value last entered. 100% is the specified brightness level. 100% is equivalent to 100 nits (units of luminance) at shipment. Use the front panel knob or numeric keypad to enter a new value. Terminate the entry with the [ENT] key. You can adjust the brightness value down or up (although the display quality is not specified above 100%.) The maximum value depends upon the individual display. The brightness level is not changed at preset unless the level has been set below a defined minimum. This minimum brightness level can be changed. Instructions are in the service manual.

HP 8757C ONLY

The brightness adjustment softkey is accessed by first pressing [ADJUST DISPLAY]. "Adjusting Color" explains all of the [ADJUST DISPLAY] softkeys.

[MEAS→MEM] stores the current measurement data into memory. The data is stored in dB/dBm format (even when you are viewing the data in SWR format). Voltage data (ADC IN) can also be stored into memory.

[MEAS-M→MEM] stores the measurement-minus-memory (normalized trace) into memory. This function can be used for ratio measurements only.

Horizontal Display Data Resolution: The horizontal display resolution of the analyzer depends on the number of points selected and the number of measurement traces as shown in table 2. To change the number of trace points, use the [#TRACE POINTS] softkey in the system menu.

Table 2. Minimum Sweep Time Versus Number of Points

Number of Points	Minimum Sweep Time (ms)			
	1 Trace	2 Traces	3 Traces[1]	4 Traces[1]
101	40	50	60	70
201	50	75	90	100
401	100	100	150	200
801[1]	200	250	N/A	N/A
1601[1]	400	N/A	N/A	N/A

1. HP 8757C only.

Vertical Display Data Resolution: Memory data is always stored at the highest resolution regardless of the displayed resolution, scale per division, or reference level. Viewing normalized dB data will reduce resolution by one-half.

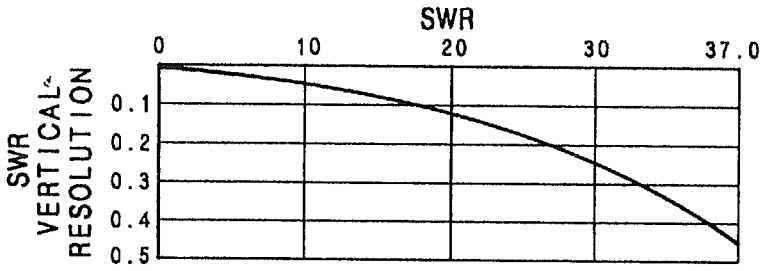
Vertical display resolution and display range for the various display modes are shown in table 3.

Table 3. Display Ranges and Vertical Resolution

Display Mode	Display Range	Vertical Display Resolution
dBm	−70 to +20 dBm	0.003 dB[1]
dB	−90 to +90 dBm	0.006 dB[1]
SWR	1.0 to 37.0	See graph below
AUX	−10 to +10 V[2]	

1. 0.01 dB for display cursor.
2. −20 to +20 V for normalized AUX.

SWR is calculated from dB data. SWR resolution varies with the SWR being measured:



HP 8757C ONLY

ADJUSTING COLOR

This procedure explains how to adjust the colors on your CRT. The default colors in this instrument have been scientifically chosen to maximize your ability to discern the difference between the colors, and to comfortably and effectively view the colors. These colors are recommended for normal use because they will accommodate most color deficient vision, and they provide a suitable contrast that is easy to view for long periods of time.

You may choose to change the default colors to suit environmental needs, individual preferences, or to accommodate color deficient vision. The easiest way to change a color on the CRT is to choose a color from the color list. The color list is a selection of 7 factory-defined colors. You can use any of these colors for any of the 8 CRT attributes. The following is a list, by softkey, of these CRT attributes:

[CHAN 1 COLOR]
[CHAN 2 COLOR] Channel 1 (2, 3, or 4) measurement trace, mode labels,
[CHAN 3 COLOR] limit lines, and reference level marker.
[CHAN 4 COLOR]
[GRID] —CRT grid.
[BACKGROUND] —CRT background.
[WARNING] —Warning messages.
[LABELS] —Softkey labels, status line, frequency labels, and title.

NOTE: Although you have the option to adjust the colors of all the CRT attributes, it is possible to adjust the colors such that you cannot discern an attribute against the background such as red warning labels against a red background. The softkey labels, however, will always be visible.

Figure 10 shows the color adjustment softkeys in the display menus.

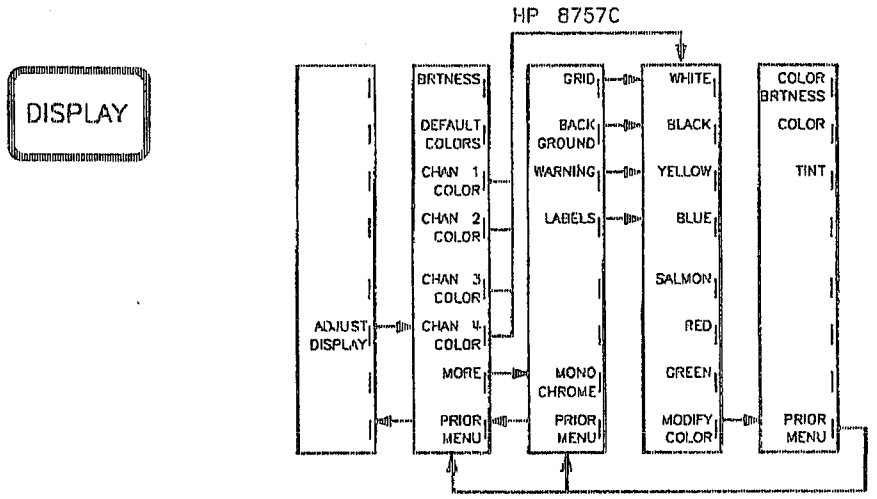


Figure 10. Color Adjustment Softkeys from Display Menus

Setting Default Colors

To set all the CRT attributes to the factory-defined default colors, press:

[DISPLAY] *[ADJUST DISPLAY] [DEFAULT COLORS].*

HP 8757C ONLY

Changing CRT Attribute Colors

To change the color of a CRT attribute, press the softkey for that attribute (such as ***[CHAN 1 COLOR]*** or ***[GRID]***). The menu containing the color list is presented. The current color for the attribute is highlighted and underlined. Choose one of the seven available colors by pressing the desired color. Selection of the color returns you to the menu from which you came. If you don't wish to choose one of these colors, press any front panel key (except for ENTRY keys) to exit this menu.

Setting Monochrome

To set your CRT to green monochrome, press:

[DISPLAY] ***[ADJUST DISPLAY] [MORE] [MONOCHROME]***.

All of the CRT attributes are now green. A highlighted box surrounds the active mode labels, and all attributes associated with the active channel are highlighted.

Adjusting Colors

If the default colors or the color list will not accommodate special circumstances, such as color deficient vision, additional adjustments can be made. The most frequently occurring color deficiency is the inability to distinguish red, yellow, and green from one another. Confusion between these colors can usually be eliminated by increasing the brightness between the colors. If additional adjustment is needed, vary the degree of whiteness of the color. Usually, only minor changes are needed.

Color is composed of three parameters:

Color Brightness —A measure of the brightness of the color.

Color —The degree of whiteness of the color. A scale from white to pure color.

Tint —The continuum of hues on the color wheel, ranging from red, through green and blue, and back to red.

Three softkeys allow you to adjust the color brightness, color, and tint of any CRT attribute. Press the softkey for the attribute. Now press ***[MODIFY COLOR]*** and choose any of the adjustments.

> ***[COLOR BRTNESS]*** changes the attribute's color brightness. Press this softkey and the existing value set for the attribute is shown on the CRT. Use the front panel knob or numeric keypad to enter a new value for color brightness. Observe the attribute on the CRT. It changes as you change values. Terminate your keypad entry with the [ENT] key when your adjustment is complete.
>
> ***[COLOR]*** changes the degree of whiteness of the color of the attribute. This parameter is adjusted the same way as [COLOR BRTNESS].
>
> ***[TINT]*** changes the attribute's hue. This parameter is adjusted the same way as [COLOR BRTNESS].

Color changes and adjustments remain in effect until changed again in these menus. Preset and power on/off do not affect color selection. To return to a previously defined color, write down the numeric value of the color brightness, color, and tint and enter those values for each of the parameters.

[SCALE] – SCALE MENUS

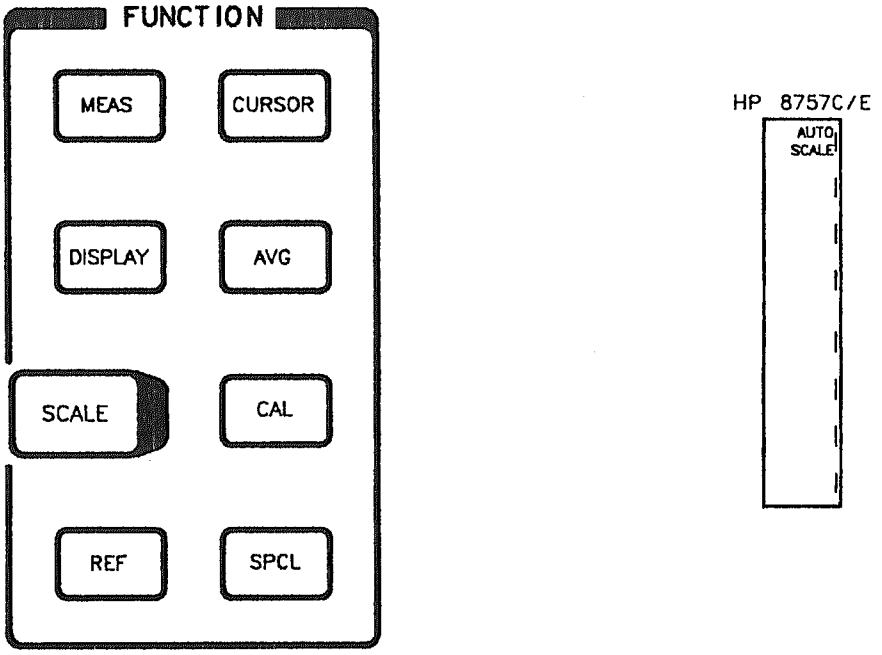


Figure 11. [SCALE] Key and Scale Menus

The **[SCALE]** key engages the SCALE FACTOR function. SCALE FACTOR lets you select the scale per division for viewing measurement data. The possible choices for each of the display modes are shown in table 4. You can change the scale factor with the knob, the STEP keys, or the numeric keypad. If the keypad is used to enter the scale factor, the entry must be terminated with the [dBm/dB] or [ENT] key.

The [SCALE] key also presents the scale menu. The only label in the scale menu is ***[AUTOSCALE]***. Pressing [AUTOSCALE] automatically adjusts the scale and reference level of the active trace so that it best fits within the graticule.

Table 4. Scale Per Division for Display Modes

Display Mode	Available Scales Per Division
dB/dBm	20, 10, 5, 1, 0.5, 0.2, and 0.1 per division
SWR	10, 4, 2, 1, 0.4, 0.2, 0.1, 0.04, and 0.02 SWR units per division
AUX (ADC IN)	5, 2.5, 1, 0.5, 0.25, 0.1, 0.05, and 0.025 volts per division

[REF] — REFERENCE MENUS

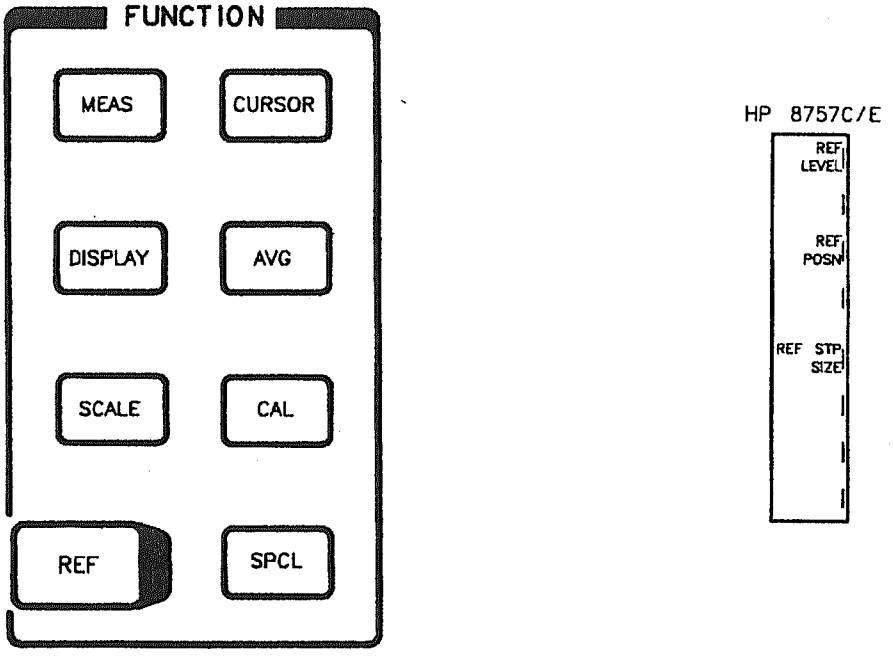


Figure 12. [REF] Key and Reference Menus

The **[REF]** key engages the REF LEVEL function, and presents the reference menu.

[REF LEVEL] lets you set the value of the reference level line. This is the horizontal line indicated by the reference position indicator on the left side of the CRT. Varying the value of this line and the scale per division allows easy measurement of any data point and viewing of the measurement data relative to the reference level line value. Use the knob, STEP keys, or numeric keypad to enter the reference level. Terminate your entry with the [dBm/dB] or [ENT] key.

[REF POSN] sets the position of the reference level line to any of the major graticules, using the knob or the step keys. The channel number and a ">" symbol show the current position of each channel's reference level line.

[REF STP SIZE] sets the size of the steps used to increment or decrement the reference level value. The reference step size can be set with the numeric keypad only. Terminate your entry with the [dBm/dB] or [ENT] key.

[CURSOR] – CURSOR MENUS

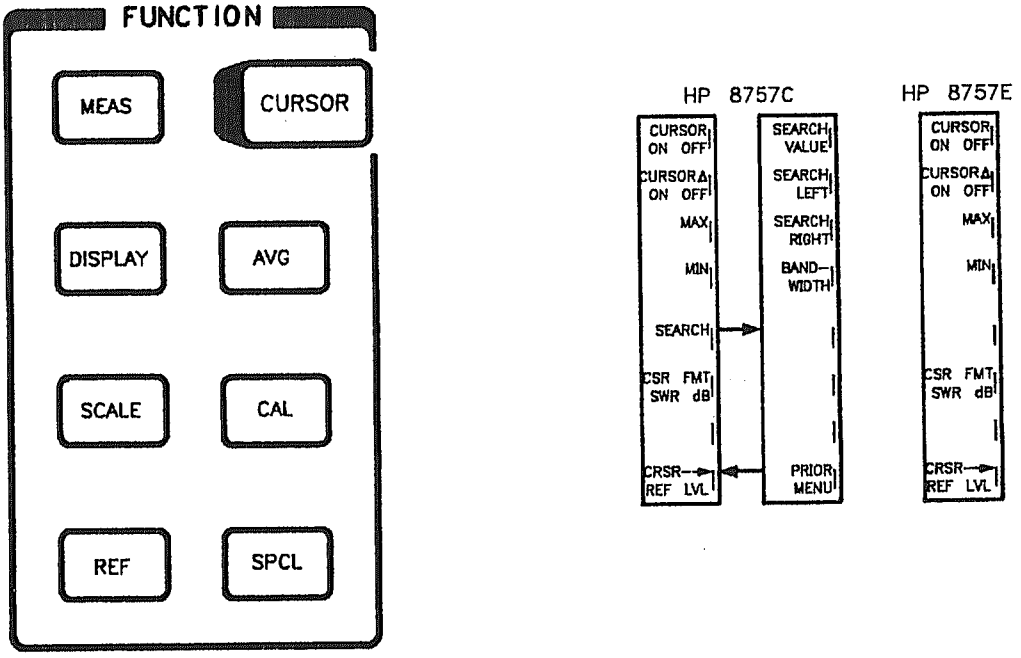


Figure 13. CURSOR Key and Cursor Menus

The **[CURSOR]** key presents the cursor menu and engages the cursor "∇" on all channels. The cursor is used for quickly reading the measured value of any data point. Use the knob to move the cursor across the data.

When [CURSOR] is pressed, the amplitude of the data point at the active channel cursor position is shown in the CRT active entry area. The cursor value for each channel is also shown in the mode labels area. The cursor units correspond to the measurement and display mode selected, such as dB or SWR. The cursor value is always resolved to 0.01 dB, 0.001 SWR, or 0.001 V.

If either the HP 8350B Sweep Oscillator or the HP 8340- or 8341-series Synthesized Sweeper is connected to the 8757 system interface bus, the cursor frequency for the active channel is shown in the frequency labels area, and also in the active entry area. (If the cursor is off, and source markers are on, the marker frequency is shown in the frequency labels area.) When alternate sweep is engaged, the cursor frequencies for both sweeps are shown in the frequency labels area.

[CURSOR ON OFF] toggles the cursor on or off.

[CURSOR Δ ON OFF] toggles the cursor delta function on and off. When it is on, the Δ marks the last set position of the cursor. When this function is engaged, the CURSOR function is automatically toggled on (if not already turned on). The cursor Δ function makes it possible to obtain an instant reading of the difference in magnitude (and frequency, if an appropriate HP-IB source is used) between two points on the trace, marked by the ∇ and the Δ. This magnitude (and frequency) difference value for the active channel is shown in the active entry area. (The frequency difference value is also shown in the frequency labels area.) When alternate sweep is engaged, the cursor Δ frequencies for both sweeps are shown in the frequency labels area.

[MAX] positions the cursor to the maximum value point on the active channel trace for the current sweep. The cursor is not continuously positioned to the maximum point. When the measurement data is updated on the next sweep, press [MAX] again to relocate the cursor to the maximum point.

[MIN] positions the cursor to the minimum value point on the active channel trace.

HP 8757C ONLY

[SEARCH] presents the search menu and lets you search for a specific value in dB or dBm on the active channel. Use this function with [CURSOR Δ ON] to find a power difference in dB. Search functions cannot be used with SWR or AUX modes.

When [SEARCH] is pressed, the search menu is presented and the active entry area shows the last set search value. Change this value using the knob, the STEP keys, or the numeric keypad. Terminate the entry with the [dBm/dB] or [ENT] key. Then use the [SEARCH LEFT] and [SEARCH RIGHT] softkeys to locate the entered value.

[SEARCH VALUE] allows you to change the search value (as when [SEARCH] is pressed.)

[SEARCH LEFT] causes the cursor to move to the first left position where the search value exists. The analyzer will interpolate the point between two existing values and calculate the corresponding frequency when needed. If the value cannot be found, the message `WARNING: Cursor Value not found. Trace HOLD` appears on the CRT. In a normalized measurement, the search function finds the n-dB point from the 0 dB reference line. In cursor Δ mode, search values are found for the n-dB points from the Δ marker.

[SEARCH RIGHT] works the same as the [SEARCH LEFT] function except that the cursor moves to the right.

[BANDWIDTH] determines the trace bandwidth at a specified value down from the maximum trace value. The n-dB value for the bandwidth can be set with the STEP keys or the numeric keypad. Terminate the entry with the [dBm/dB] or [ENT] key. The analyzer searches automatically for the maximum trace amplitude, then finds the n-dB down points on both sides and shows the bandwidth in the active entry area. [BANDWIDTH] effectively performs the following series of functions: [CURSOR], [MAX] or [MIN], [CURSOR Δ ON], [SEARCH], set search value, [SEARCH LEFT], write down the frequency = f1, [SEARCH RIGHT] write down the frequency = f2, calculate f2-f1. This function produces results *only* when an HP-IB compatible sweep oscillator or synthesized sweeper is used.

[PRIOR MENU] returns the first cursor menu.

[CSR FMT SWR DB] allows convenient readout of cursor data in SWR (standing wave ratio) when measuring device match in dB (return loss), if preferred. The cursor format is independent of the display format, which determines the format of the entire trace.

[CURSOR→REF LVL] changes the reference level value to be equal to the cursor reading. The reference position is not changed, so the trace moves to the reference level. This makes it possible to expand the trace about the cursor for detailed viewing.

[AVG] – AVERAGE MENUS

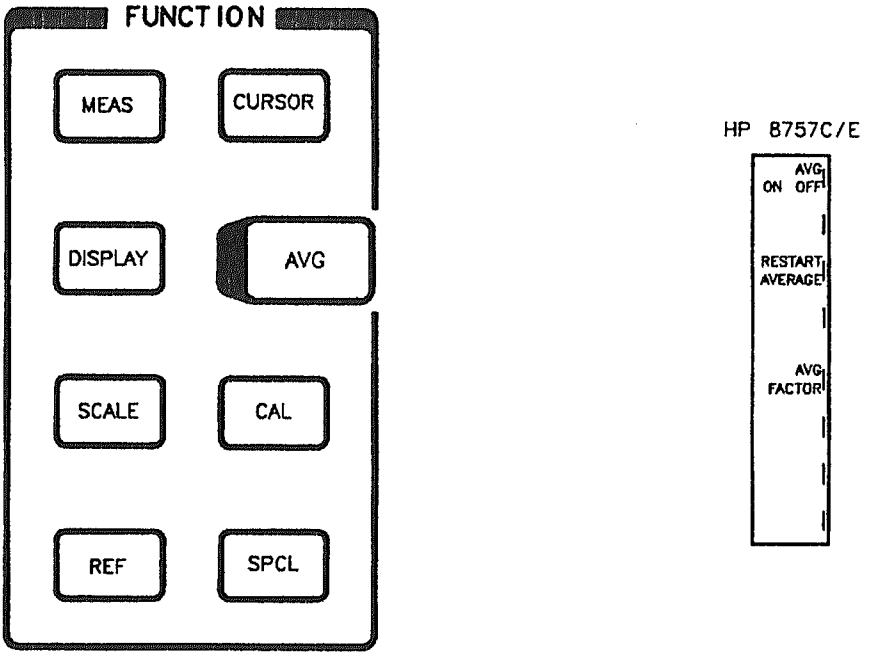


Figure 14. [AVG] Key and Average Menus

The ***[AVG]*** function averages a programmable number of sweeps. Averaging computes each data point based on the average value during a specified number of sweeps. The number of sweeps over which the trace is averaged is called the averaging factor. The averaging technique is called "stable averaging". When averaging first begins, the first sweep is averaged using an averaging factor =1, the second is averaged using an averaging factor =2, the third and fourth are averaged using an averaging factor =4, and increasing powers of 2 until the desired averaging factor is reached. This technique improves accuracy and resolution in calibration or measurement traces. Averaging is always performed on logarithmic data. When SWR format is engaged, the SWR conversion is performed on the averaged data.

The average menu is used to turn averaging on or off, to set the average factor, and to restart the averaging process after it is turned on.

[AVG ON OFF] toggles on and off the averaging function for the active channel. The averaging factor is shown in the active entry area. The status symbol "A" is shown in the mode labels area for any channel that has averaging turned on.

[RESTART AVERAGE] starts the averaging process from the beginning.

[AVG FACTOR] lets you set the averaging factor. The averaging factor is shown in the active entry area. The analyzer defaults to an averaging factor of 8 at preset and power on. You can set the averaging factor to 1, 2, 4, 8, 16, 32, 64, 128, or 256. (If you try to set the averaging factor to any other value, the analyzer automatically changes it to the first allowed value that is lower than your entry.) Use the knob, STEP keys, or numeric keypad. Terminate the entry with the [ENT] key.

[CAL] — CALIBRATION MENUS

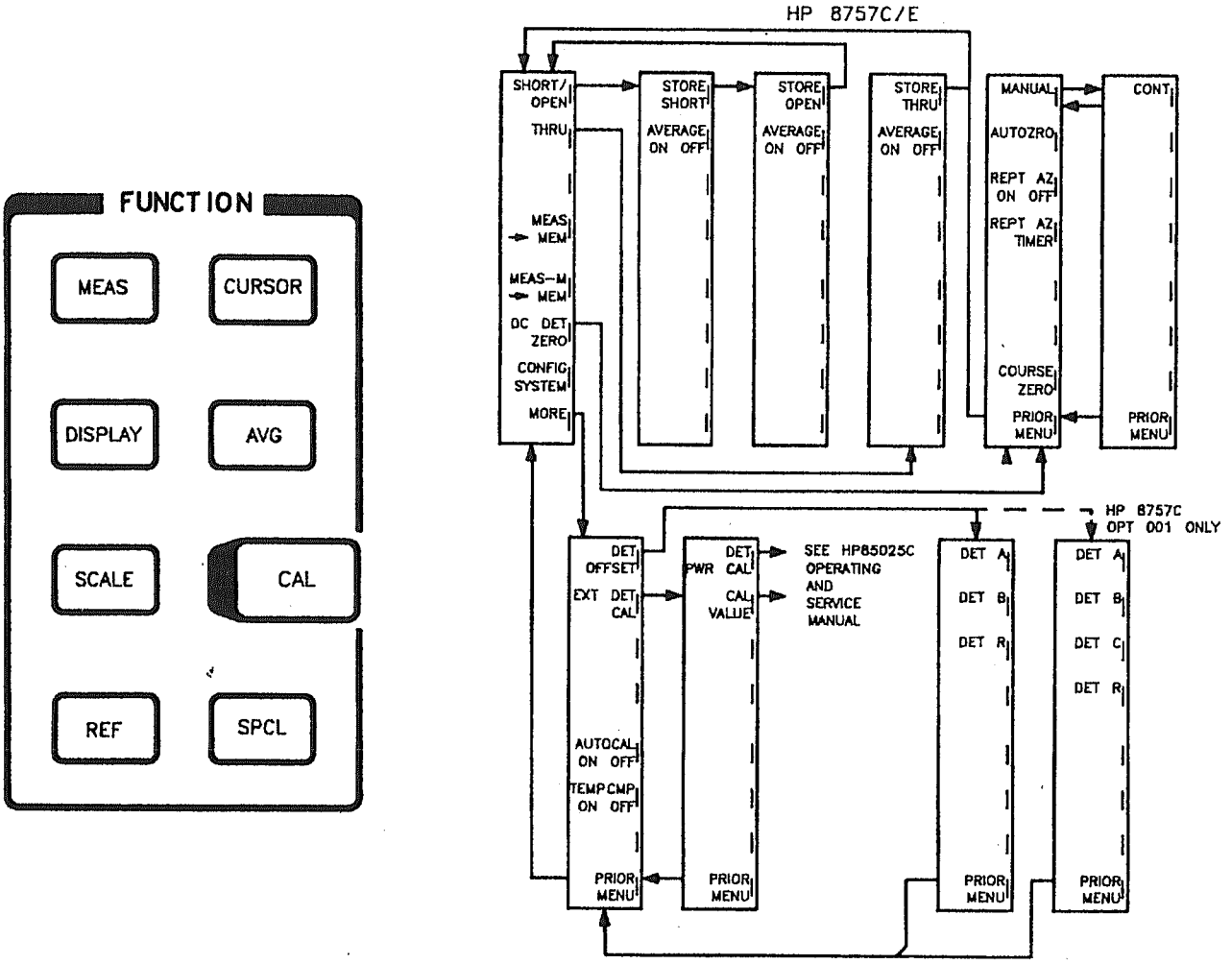


Figure 15. [CAL] Key and Calibration Menus

The **[CAL]** key presents the calibration menus. These softkeys allow you to perform and store calibrations. Use these softkeys, also, to perform detector zero calibrations, to set detector offsets, and to turn on automatic internal calibration.

You can perform a calibration without changing the analyzer's display mode. The analyzer automatically measures the calibration standards, stores the data at the highest resolution, and returns the display mode you had previously set.

[SHORT/OPEN] prompts you through a short/open calibration. This calibration is automatically stored in memory in dB/dBm format. When the [SHORT/OPEN] softkey is pressed, the prompt `CONNECT SHORT...STORE WHEN READY` appears on the CRT, and a second menu layer is presented.

[AVERAGE ON OFF] toggles averaging on and off. This is the same averaging function that is engaged by pressing [AVG ON OFF] in the averaging menu. If you had previously turned averaging on, it will automatically be toggled off when [SHORT/OPEN] is pressed. Pressing [AVERAGE ON OFF] toggles averaging on *only* for the measurement of the short. The averaging factor does not change from the last value set in the averaging menu. You must return to the averaging menu if you wish to change the averaging factor.

[STORE SHORT] measures the short circuit response. Connect the short to the test port of the bridge or detector being used, and press [STORE SHORT]. The message `CONNECT OPEN...STORE WHEN READY` appears on the CRT, and a third menu layer is presented.

[AVERAGE ON OFF] toggles averaging on and off. If you used averaging when measuring the short, you should use averaging to measure the open. Averaging has automatically been turned off again. Use this softkey to turn it on.

[STORE OPEN] measures the open circuit response. Connect the open circuit to the bridge or detector test port, and press [STORE OPEN]. The message `SHORT/OPEN CAL SAVED IN CH1 MEM` appears on the CRT. (The channel indicated depends on which channel is active.) The open and short calibration data has been averaged, and is stored in the active channel memory. The first calibration menu is automatically presented.

Now the message `For Normalized Meas...select [DISPLAY][MEAS-MEM].` appears on the CRT, if you were not already in [MEAS-MEM] mode. Press these keys to normalize the measurement.

[THRU] prompts you through a thru calibration. This calibration is automatically stored in memory in dB/dBm format. When the [THRU] softkey is pressed, the prompt `CONNECT THRU...STORE WHEN READY` appears on the CRT, and a second menu layer is presented.

[AVERAGE ON OFF] toggles averaging on and off. This is the same averaging function that is engaged by pressing [AVG ON OFF] in the averaging menu. If you had previously turned averaging on, it will automatically be toggled off when [THRU] is pressed. Pressing [AVERAGE ON OFF] toggles averaging on *only* for the measurement of the thru. The averaging factor does not change from the last value set in the averaging menu. You must return to the averaging menu if you wish to change the averaging factor.

[STORE THRU] measures the thru response. Connect the thru between the two points between which the device under test will be connected, and press [STORE THRU]. The message `THRU SAVED IN CH1 MEM` appears on the CRT. The first calibration menu is automatically presented.

Now the message `For Normalized Meas...select [DISPLAY][MEAS-MEM].` appears on the CRT, if you were not already in [MEAS-MEM] mode. Press these keys to normalize the measurement.

[MEAS→MEM] stores the current measured data into memory. The data is stored in dB/dBm format (even when you are viewing the data in SWR format). This softkey is also part of the [DISPLAY] menu.

[MEAS-M→MEM] stores the measurement-minus-memory (normalized trace) into memory. This function can be used for ratio measurements only. This softkey is also part of the [DISPLAY] menu.

[DC DET ZERO] appears in the calibration menu only when AC/DC detectors or bridges are connected to the detector inputs. Pressing [DC DET ZERO] presents the DC detector zero menu. Use these softkeys to zero DC detectors. Zeroing eliminates small DC voltages present in the detectors, and establishes the noise floor with no RF signal applied. Periodic zeroing also compensates for the effects of DC drift.

Zero your DC detectors when you first connect them to the analyzer, before calibration, and whenever significant temperature changes occur.

[MANUAL] is used when you must manually remove the RF signal from the detectors. Use this method of zeroing with sources *not* connected to the analyzer through the 8757 system interface bus, or when a small RF signal is present in the device under test (such as amplifiers, mixers, and oscillators). When the [MANUAL] softkey is pressed, the message REMOVE RF FROM DC DETECTORS appears on the CRT, and a second menu layer is presented. Disconnect the DC detector from any RF signal.

[CONT] is used to alert the analyzer to measure any signal now present at the detector input. The analyzer then subtracts this amount from any measurements made. The previous menu is automatically presented.

[AUTOZRO] is presented in this menu only when a compatible source is connected to the analyzer through the 8757 system interface. When [AUTOZRO] is pressed, the analyzer turns off the RF signal from the source and automatically performs the DC detector zero. While the autozero is in progress, the message AUTO ZERO IN PROGRESS . . . appears on the CRT. When completed, AUTO ZERO COMPLETED appears on the CRT. An autozero can be performed at any time, even with the repeat autozero function engaged.

[REPT AZ ON OFF] toggles on and off periodic autozero repeats. The analyzer is factory-set to an interval of 5 minutes.

[REPT AZ TIMER] lets you change the interval between autozero repeats. Set intervals from 1 to 60 minutes using the numeric keypad. Terminate the entry with the [ENT] key. The interval does not change at preset or power on; it remains the same until changed with this softkey.

[COARSE ZERO] is presented in this menu only if an HP 85025C Detector Adapter is connected to the analyzer. See the *HP 85025C Detector Adapter Operating and Service Manual* for instructions on this procedure. This procedure is written to apply to the HP 8757A, but is also compatible with the HP 8757C/E.

[PRIOR MENU] returns the first calibration menu.

[CONFIG SYSTEM] forces the computation of the internal calibration tables for all detector inputs shown on the CRT. See "HP 8757C/E Self-Calibration," in this section, for more information.

[MORE] presents a second layer of the calibration menu.

[DET OFFSET] lets you set an offset value in dB for each detector. You might use this to enter an offset that is the difference between the power reading of an analyzer input and the power reading of a power meter. You might also use an offset to represent the value of attenuation used with a detector. Pressing [DET OFFSET] presents another menu.

Select the detector for which you will set an offset value. For example, *[DET A]*. The current offset value for that detector is shown in the active entry area. Change the offset value using the step keys, knob, or numeric keypad. Terminate the entry with the [dBm/dB] or [ENT] key. The range of allowable entry values is +60 to −60 dBm. However, if the offset value procedure produces results outside the +20 to −70 dBm range for non-ratio measurements, or +90 to −90 dB for ratio measurements, the analyzer will not be able to correctly show the data on the CRT.

Detector offsets *are* valid during calibration as well as during measurement. Detector offsets remain in effect until they are changed. Power on and off or preset will not change an offset. Offsets affect a detector input, not a detector. The offset always applies to a measurement made on that input, regardless of which channel selects the measurement, or if a register is recalled.

[PRIOR MENU] returns the previous menu.

[EXT DET CAL] appears only if an HP 85025C Detector Adapter is connected to the analyzer. Use this function to calibrate the analyzer to a detector connected to the detector adapter. Pressing this softkey presents another menu layer.

[DET PWR CAL] is a calibration sequence that consists of providing the analyzer with two known power levels. Once you perform a calibration with a detector, the analyzer identifies that detector by its calibration value ([CAL VALUE]). You can use the detector and enter its calibration value on any analyzer input. See the *HP 85025C Detector Adapter Operating and Service Manual* for instructions on this procedure. It is written to apply to the HP 8757A, but is also compatible with the HP 8757C/E.

[PRIOR MENU] returns you to the previous menu.

[AUTOCAL ON OFF] gives you control over the automatic regeneration of the internal calibration tables for the detector inputs. Pressing this softkey toggles autocalibration on and off. See "HP 8757C/E Self-Calibration," in this section, for more details.

[TEMPCMP ON OFF] gives you control over the analyzer's continuous temperature compensation. Pressing this softkey toggles temperature compensation on and off. See "HP 8757C/E Self-Calibration," in this section, for more details.

[PRIOR MENU] returns the first calibration menu.

HP 8757C/E Self-Calibration

The calibration menu softkeys *[CONFIG SYSTEM]*, *[AUTOCAL ON OFF]*, and *[TEMPCMP ON OFF]* all relate to the analyzer's internal calibration. With *[AUTOCAL ON]* and *[TEMPCMP ON]*, all internal calibration is done automatically, and is transparent to the user. The analyzer automatically maintains absolute and dynamic power accuracy for each detector input using two independent digital correction processes:

Autocalibration — A regeneration of the internal calibration tables whenever:

- The accessory configuration is changed.
- A significant change in temperature occurs (approximately 5°C).

Temperature Compensation —A continuous compensation for small changes in temperature.

Both of these correction processes can be controlled in the second calibration menu. At preset or power-on, both autocalibration and temperature compensation are on, and all internal calibration is performed automatically.

AUTOCALIBRATION

With *[AUTOCAL ON]*, the internal calibration tables are updated automatically. *[AUTOCAL ON]* is recommended for most applications. The analyzer may update its internal calibrations tables under any of the following conditions:

[AUTOCAL ON] or *[AUTOCAL OFF]*:

- At instrument preset, power-on, or recall instrument state.
- *[CONFIG SYSTEM]* softkey selected.

Only if *[AUTOCAL ON]*:

- Detector or bridge configuration changed.
- Large temperature change.
- At a fixed 5-minute interval.

To regenerate the calibration tables, the analyzer determines the following for each detector input:

- Detector or bridge type (AC only or AC/DC).
- Detector or bridge power versus voltage characteristics.
- Temperature of the detector (AC/DC accessories only) and the log amplifier.

Using these readings, the analyzer automatically computes the internal calibration tables. Depending on the configuration, this table regeneration process can last a few seconds. When completed, the message `CONFIG SYSTEM COMPLETED` appears on the CRT.

If the analyzer is in a thermally stable environment (temperature drift less than 5°C), thermal drift in the log amplifiers is minimal. The detectors, however, may be exposed to significant changes in temperature. ***[AUTOCAL ON]*** automatically compensates for significant temperature changes.

TEMPERATURE COMPENSATION

With ***[TEMPCMP ON]***, continuous temperature compensation to the data is performed. This corrects the measurement data for small drifts in temperature without the need to recompute the calibration tables.

Always use temperature compensation when making measurements with the analyzer. This function is on at preset and power-on. Turn off temperature compensation only when diagnosing a possible problem with the analyzer or its detectors.

[SPCL] – SPECIAL MENUS

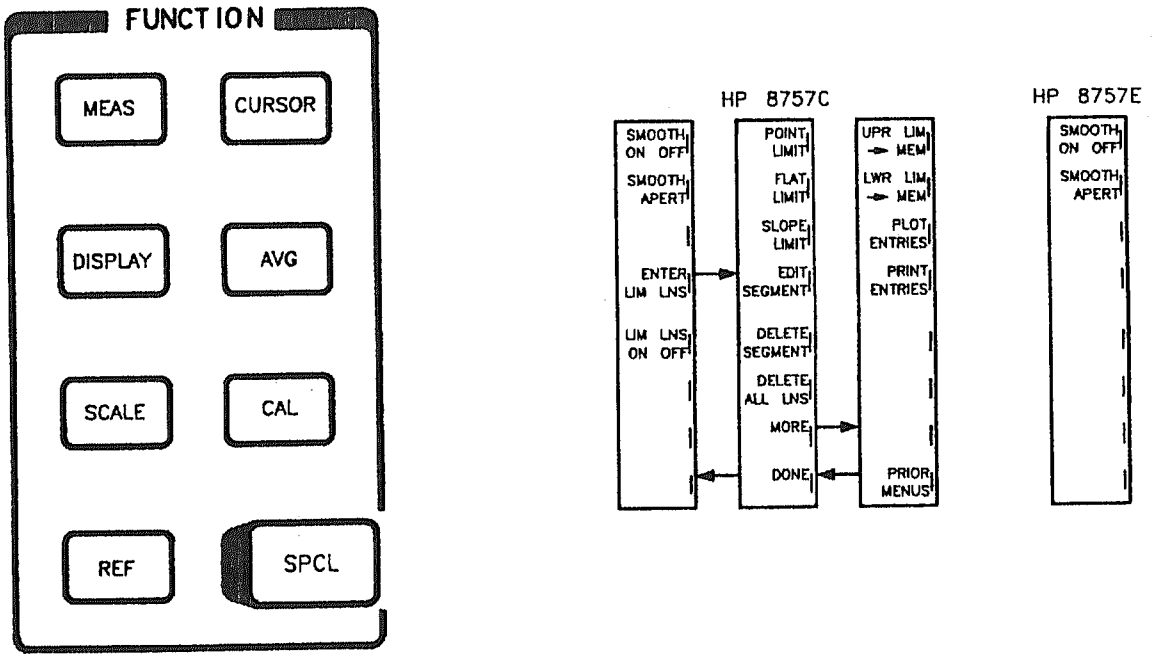


Figure 16. [SPCL] Key and Special Menus

The **[SPCL]** key presents the special functions menu.

[SMOOTH ON OFF] toggles the smoothing function on and off. Smoothing (video filtering) calculates a moving average of the active channel data. The aperture of the moving average is a percent of the sweep span, not greater than 20%.

Smoothing is different from averaging. Averaging computes each data point based on the average value of each point during several sweeps. Smoothing computes each data point based on *one* sweep, on the average of data points on both sides of that data point in the current sweep. An "S" is shown in the status symbols area of the mode labels for any channel that has smoothing activated. Smoothing is off for all channels at preset.

[SMOOTH APERT] lets you change the value of the smoothing aperture. The aperture defaults to 5% at preset. Use the knob, STEP keys, or numeric keypad to change the smoothing aperture value. Enter any value from 0.1% through 20%.

HP 8757C ONLY

[ENTER LIM LNS] presents the first of two limit lines menus. Using these softkeys, you can define limit lines for channel 1 and for channel 2. The limit lines consist of upper and lower limits for a frequency or a band of frequencies. You can also choose just the upper or the lower limit. Turn on the limit lines and they are shown on the CRT, and the measurement data is compared to the limit lines. An out-of-limit condition is shown with a F A I L message on the CRT below the mode labels area.

Three types of limit lines are available: point, flat line, and sloped line. One limit line can contain up to 12 segments. Each segment can be any one of the three types. Segments are numbered sequentially when they are entered from the front panel. If entered through HP-IB, segments can be entered in random order. The CRT prompts you for frequency, and upper and lower limits. Use the numeric keypad to enter the frequency and terminate the entry with the softkey which represents the units: ***[x1]***, ***[Hz]***, ***[kHz]***, ***[MHz]***, ***[GHz]***. Use the numeric keypad also to enter the upper and lower limits, and terminate the entry with the [dBm/dB] or [ENT] key. If you do *not* want either the upper or the lower limit, press the [dBm/dB] or the [ENT] key immediately after the prompt. Limit lines can be stored only in save/recall registers 1 through 4. Limit lines are restricted to traces with 401 points or fewer. Limit entries can be made in dB, dBm, or SWR, depending on the display format. In SWR mode, however, the limits cannot be saved in trace memory.

Limit entries can also be made in volts in the AUX mode.

[POINT LIMIT] lets you define a limit for a single frequency point.

[FLAT LIMIT] lets you define a flat limit that is a constant value between two frequency points.

[SLOPE LIMIT] lets you define a sloped limit between two frequency points that is linear with frequency.

[EDIT SEGMENT] lets you redefine an existing limit line segment. When you press this softkey, the CRT prompts you for the number of the segment you wish to change. Use the numeric keypad to enter the number of the segment to be changed, then press [ENT]. The entire segment will be deleted. Re-enter the segment. First choose the limit type from the softkeys. The CRT will then prompt you to enter frequencies and limit values.

[DELETE SEGMENT] lets you delete an entire segment. Press the key and the CRT prompts you for the segment number to be deleted. Use the numeric keypad to enter the number of the segment to be deleted and terminate the entry with the [ENT] key.

[DELETE ALL LNS] lets you delete all existing limit lines for that channel.

[MORE] presents a second limits menu.

[UPR LIM→MEM] places the upper limit line into memory and ***[LWR LIM→MEM]*** places the lower limit line into memory. Whenever either of the limit line to memory keys is pressed, the memory for the active channel is initialized with a 0 dB (or 0 dBm) reference level. The appropriate limits are then updated into memory in the order in which the segments were entered. (For overlapping limits, the last entry will overwrite any overlap of the previous entry, and points with no limit data will be entered as 0 dB or 0 dBm.) The limit-line-to-memory functions cannot be used with SWR display mode.

[PLOT ENTRIES] sends the limit line frequency and amplitude values to the plotter, in tabular format.

HP 8757C ONLY

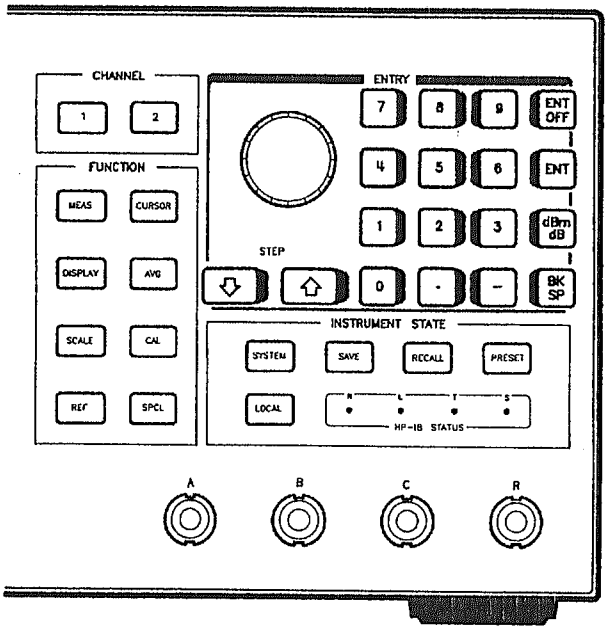
[PRINT ENTRIES] sends the limit line frequency and amplitude values to the printer in tabular form.

[PRIOR MENU] returns the previous limits menu.

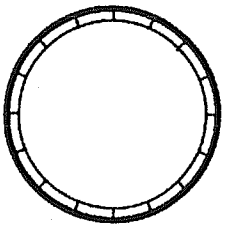
[DONE] is used to terminate limit line data entry for the active channel. It also returns the previous menu (special functions).

[LIM LINS ON OFF] is the last softkey in the special functions menu. It toggles the limit lines on and off for the active channel. When limit lines are turned on, each limit line segment becomes visible on the CRT as it is entered. You *can* turn limit lines on, even when no limit lines have been entered. If you do, the CRT will show a PASS condition for any measurement data.

ENTRY Area



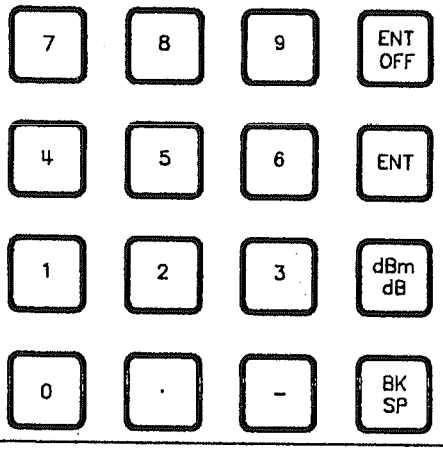
The ENTRY area consists of the knob, the STEP keys, and the numeric keypad.



The knob is used to change current values for various functions such as [SCALE] and [REF LEVEL]. Counterclockwise rotation decrements the value; clockwise rotation increments the value.

STEP

The STEP keys are used to increment or decrement the numerical value of a function to the next allowed value.



The numeric keypad is used to select digits, decimal points, and minus signs for numerical entries. A terminator ([ENT] or [dBm/dB]) is required except for [SAVE] and [RECALL] entries.

[ENT OFF] clears the active entry area on the CRT.

[ENT] terminates unitless entries.

[dBm/dB] terminates numeric keypad entries for functions such as [SCALE] and [REF LEVEL].

[BK SP] deletes the last digit entered.

Figure 17. Knob, STEP Keys and Numeric Keypad

INSTRUMENT STATE Keys

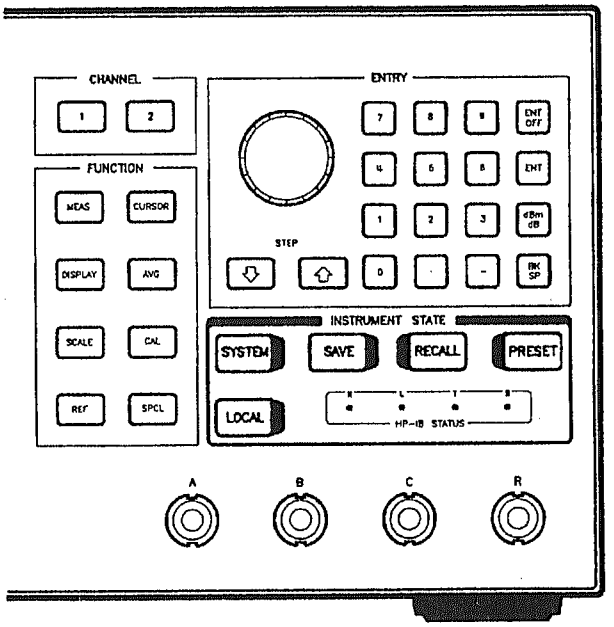
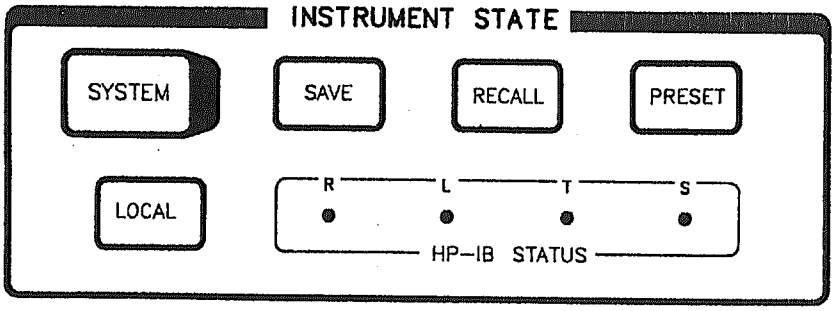


Figure 18. INSTRUMENT STATE Keys

Figure 18 shows the INSTRUMENT STATE keys. The keys in the INSTRUMENT STATE area of the front panel are used to control system functions that are not channel specific but apply to the entire instrument state.

[SYSTEM] – SYSTEM MENUS



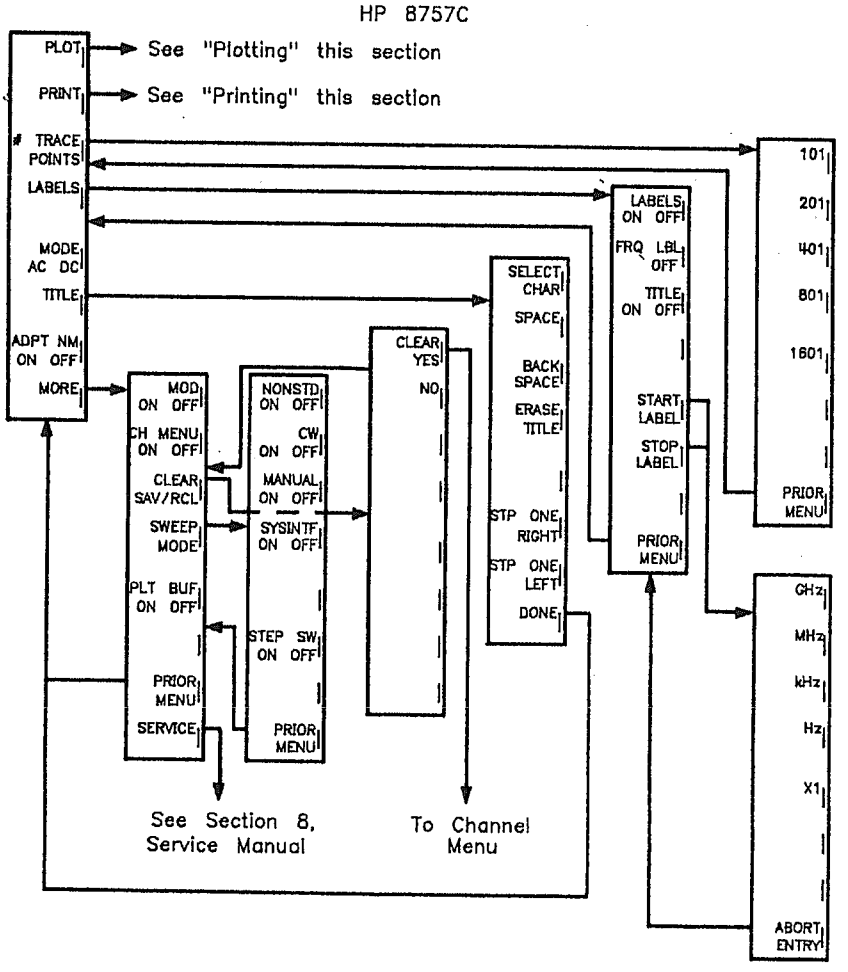


Figure 19. [SYSTEM] Key and System Menus (1 of 2)

[SYSTEM] – SYSTEM MENUS (cont'd)

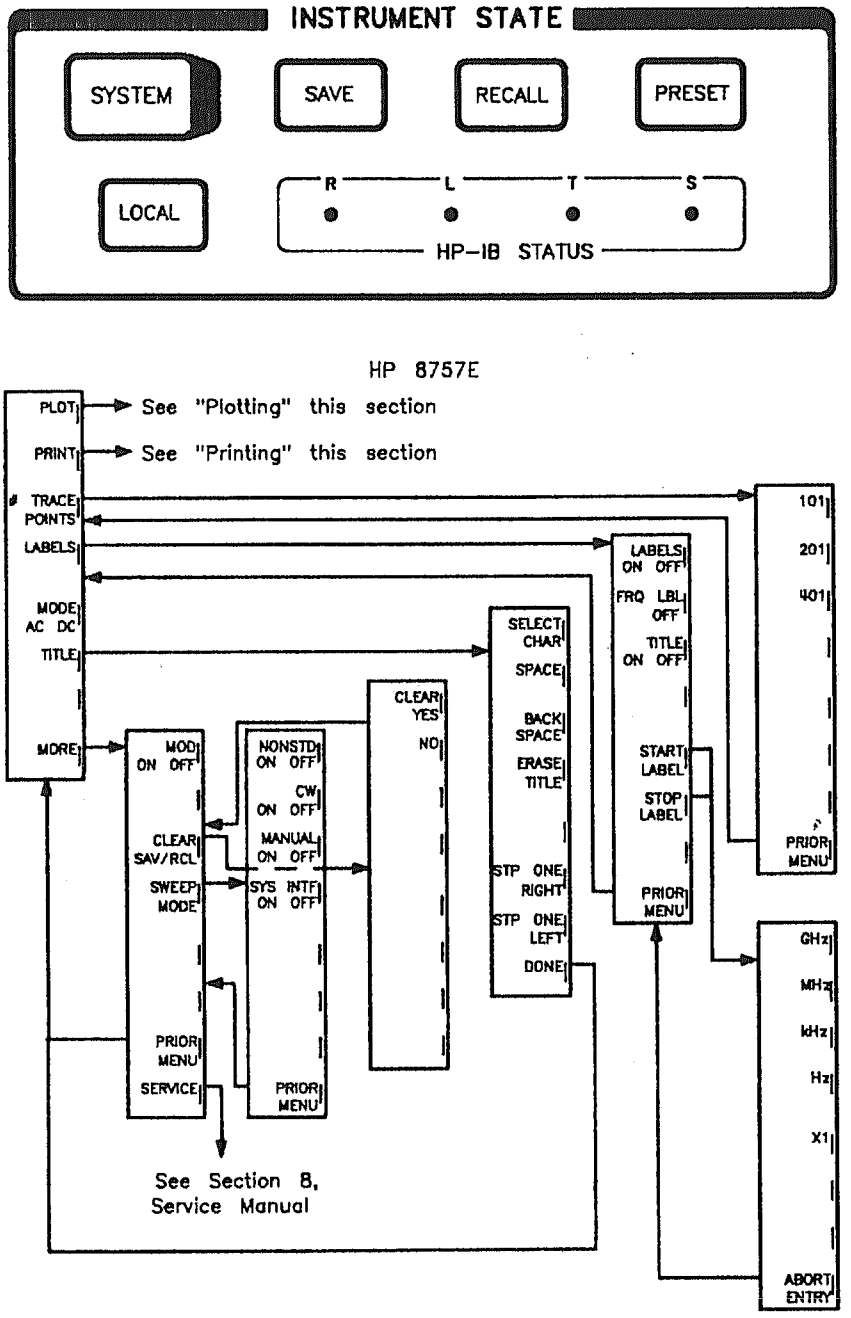


Figure 19. [SYSTEM] Key and System Menus (2 of 2)

The **[SYSTEM]** key presents the system menus, which allow access to a variety of miscellaneous soft key functions. These functions apply to the entire instrument state, such as plotting, printing, AC and DC detection mode, number of trace points, and service. The [SERVICE] softkey allows access to a series of menus that are described in section 8 of the service manual.

Plotting

SYSTEM

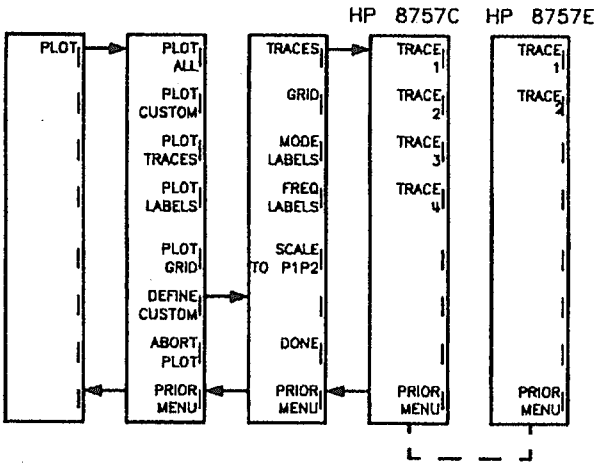


Figure 20. Plot Menus

[PLOT] presents the first plot menu. The plot menus are shown in figure 20. These menus let you custom-define and initiate plots on a plotter on the 8757 system interface. The analyzer is designed to be compatible with the HP 7440A, 7550A, and 7475A Plotters. Other Hewlett-Packard plotters not listed here may also be compatible.

The analyzer expects to find the plotter at an HP-IB address of 5, unless you have set a different address using the analyzer's [LOCAL] key. Check the plotter to ensure that its address is correctly set.

When one of the plot softkeys is pressed, the analyzer freezes the measurement data and then transfers this information to the plotter buffer. Upon completion of the data transfer, the analyzer is free to continue measurements while the data is plotting. To speed up the process of plotting, set ***[PLT BUF ON OFF]*** to OFF. This function disables all analyzer functions, except for plotting, until completion of the plot.

If the plotter is incorrectly addressed, or not connected to the 8757 SYSTEM INTERFACE, the message PLOTTER NOT AVAIL appears on the CRT. Once the problem has been corrected, press the plot softkey again to begin plotting.

If the plotter is properly connected to the 8757 SYSTEM INTERFACE, but has no paper loaded or is otherwise not ready to plot, the message PLOTTER NOT READY appears on the CRT. Once the problem has been corrected, press the plot softkey again to begin plotting.

HP 8757C ONLY

Limit lines and PASS/FAIL indicators are included in the [PLOT ALL] and [PLOT TRACES] plots when turned on.

[PLOT ALL] causes the plotter to draw the grid, labels, trace data, cursor, markers, and title. Plots do not include status line information. If a message is shown in the active entry area, it will also be plotted. If the message is not desired on the plot, press [ENT OFF] (in the ENTRY area) before plotting.

[PLOT CUSTOM] causes the plotter to draw a plot using only the attributes specified with the [DEFINE CUSTOM] softkey in this menu.

[PLOT TRACES] draws the data traces for all channels that are turned on. It includes cursors, cursor deltas, and markers.

[PLOT LABELS] draws the mode labels, reference line position labels, frequency labels (when turned on), and status line information.

[PLOT GRID] draws the horizontal and vertical graticule lines.

[DEFINE CUSTOM] presents the custom plot menu, and the message DEFINE CUSTOM PLOT appears on the CRT. This menu lets you specify which plot attribute or combination of attributes will be included in a custom-defined plot format. The format you define is plotted when [PLOT CUSTOM] is pressed. This is convenient for plotting repetitions of the same plot format. The softkey labels for the attributes you select to plot are highlighted on the CRT.

[TRACES] presents the traces menu. This menu lets you specify the trace or traces to be drawn on the plot. Each of the trace softkeys such as *[TRACE 1]* toggles on and off. Only traces of channels that are turned on can be plotted.

[PRIOR MENU] returns the custom plot menu.

[GRID] includes the horizontal and vertical graticule lines in the custom plot format.

[MODE LABELS] includes the mode labels in the custom plot format.

[FREQ LABELS] includes the frequency labels in the custom plot format (unless they are turned off with [FRQ LBL OFF]).

[SCALE TO P1P2] expands the plot so that the lower left corner of the grid is at the P1 position of the plotter and the upper right corner of the grid is at the P2 position of the plotter. Mode labels and frequency labels are plotted outside of the grid (unlike the HP 8757A).

[DONE] terminates the definition of the custom plot format. When pressed, this softkey returns the plot menu.

[PRIOR MENU] also terminates the definition of the custom plot format and returns the plot menu.

[ABORT PLOT] terminates plotting of a plot currently in progress. Plotting does not stop immediately; it stops after the buffer empties.

[PRIOR MENU] returns the previous menu (system menu).

SYSTEM

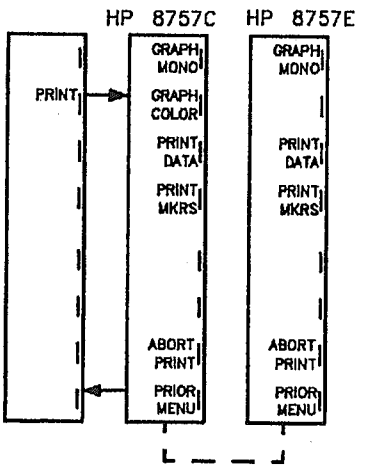


Figure 21. Print Menus

[PRINT] presents the print menus. The print menus are shown in figure 21. [PRINT] allows you to print data to a printer capable of generating a graphics plot or tabular listings. The analyzer is designed to be compatible with the HP 2255A ThinkJet, the HP 3630A PaintJet, and the HP 2227B QuietJet Plus. Other Hewlett-Packard printers not listed here may also be compatible with the analyzer. Pressing the [PRINT] softkey presents the print menu.

When one of the print softkeys is pressed, the analyzer freezes the data to be printed on the CRT and sends it to the printer through a buffer. Once the data is transferred to the buffer, the analyzer is free to continue measurements while the data is printing.

If the printer is incorrectly addressed, or not connected to the 8757 SYSTEM INTERFACE, the message NO PRINTER AVAIL appears on the CRT. Once the problem has been corrected, press the print softkey again to begin printing.

If the printer is properly connected to the 8757 SYSTEM INTERFACE, but has no paper loaded or is otherwise not ready to print, the message PRINTER NOT READY appears on the CRT. Once the problem has been corrected, press the print softkey again to begin printing.

[GRAPH MONO] causes the printer to draw the grid, labels, trace data, cursors, markers, and title. Messages in the active entry area and most softkeys are not included. Use this command to print in black and white mode only.

HP 8757C ONLY

[GRAPH COLOR] causes the printer to draw the grid, labels, trace data, cursors, markers, and title. Messages in the active entry area are not included. Use this command to print in color only (PaintJet Printer). The printer will print with a default set of colors which approximate the default colors of the analyzer with white and black reversed. The printer default colors are fixed and cannot be altered.

Limit lines and PASS/FAIL indicators are included in both mono and color prints.

Graphics written to the CRT through HP-IB are not drawn to the printer. The printer can be accessed with passthrough commands which are described in "Remote Operation."

[PRINT DATA] causes the printer to list all data in tabular form. An example of a printout is shown in figure 22a. The number of data points listed is the number selected by [#TRACE POINTS] in the system menu.

[PRINT MKRS] causes the printer to list the data at the frequencies of the source markers that are turned on. The markers are indicated by their number, except for the active marker, which is labeled "act." If the cursor is on, the cursor amplitude value and frequency are also printed. An example of a marker printout is shown in figure 22b.

No.	Frequency (Hz)	Chan. 1 (dBm)	Chan. 2 (dBm)
0	1E+07	- 3.391	- 57.017
1	2.4975E+07	- 3.187	- 55.555
2	3.995E+07	- 3.127	- 53.998
3	5.492501E+07	- 3.141	- 59.741
4	6.99E+07	- 3.176	- 56.984
5	8.487501E+07	- 3.215	- 54.775
6	9.985003E+07	- 3.248	- 59.370
7	1.14825E+08	- 3.248	- 54.759
8	1.298E+08	- 3.196	- 55.099
9	1.44775E+08	- 3.122	- 57.909
10	1.5975E+08	- 3.058	- 58.939
11	1.74725E+08	- 2.998	- 54.855
12	1.897E+08	- 2.970	- 53.866
13	2.046751E+08	- 3.006	- 55.844
14	2.1965E+08	- 3.039	- 59.211

(a)

Markers

No.	Frequency (Hz)	Chan. 1 (dBm)	Chan. 2 (dBm)
1	2.930125E+09	- 12.122	+ 2.570
2	3.798676E+09	- 12.207	+ 1.894
act	2.211325E+09	- 14.600	+ 2.886

Cursors

1	1.971725E+09	- 14.548	+ 2.701
d	2.06655E+09	+ 4.370	+ .514

(b)

Figure 22. Example Printout for (a) [PRINT DATA] and (b) [PRINT MKRS]

HP 8757C ONLY

If alternate sweep is on, the printouts will include only the channel pair with the active channel (channels 1 and 3 *or* channels 2 and 4). To print the other pair, activate one of the channels in that pair and print again.

[ABORT PRINT] terminates printing of a printout currently in progress. Printing does not stop immediately; it stops after the buffer empties.

[PRIOR MENU] returns the previous menu (system menu).

Other [SYSTEM] functions

[#TRACE POINTS] presents a menu to choose the number of data points to be used by the analyzer for processing and showing the data on the CRT. Selecting fewer points means lower resolution, but lets you use faster sweep times.

HP 8757C ONLY

The maximum number of trace points available for each of four traces (turned on simultaneously) is 401. The maximum for two traces is 801 points. The maximum for one trace is 1601 points, using channel 1 only.

The analyzer presets to 401 trace points. Pressing a softkey (such as [201]) in the number of trace points menu lets you change the number of trace points to that value. The value set will not be changed at power on, but will preset to 401 points.

[PRIOR MENU] returns the previous menu (system menu).

[LABELS] presents the labels menu. This menu lets you show or blank one or more of the labels.

[LABELS ON OFF] toggles on and off the mode labels, the frequency labels, and the display status line on the CRT.

HP 8757C ONLY

If limit lines are engaged, the PASS/FAIL indicator will not be blanked until limit lines are disabled.

Secure Frequency Mode

[FRQ LBL OFF] turns off the frequency labels. If the frequency labels are off, the source frequency readout is also blanked. The frequency labels will not be plotted or printed when turned off. Once off, the frequency labels *cannot* be restored except by an instrument preset. Preset turns the frequency labels on, but also resets frequency information to preset conditions. Power off and on does not affect the status of the frequency labels.

The source instrument state is still completely saved to the save/recall registers even when the frequency labels are turned off. However, when the instrument state is recalled, the frequency labels will be turned off, as they were when the instrument state was saved. See "[CLEAR SAV/ RCL]" for additional information.

HP 8757C ONLY

The source instrument state is still completely stored to disk when the frequency labels are turned off. However, when the instrument state is loaded from disk, the frequency labels will be turned off, and the source frequency readout blanked as they were when the instrument state was stored.

HP-IB programming commands also allow you to turn the frequency labels off and operate in the secure frequency mode. See "Secure Frequency Mode" in any of the *Remote Operation* documents.

[TITLE ON OFF] toggles the titles on and off without erasing the title.

[START LABEL] is used to specify the start value of the left graticule. This function can only be engaged with the system interface off. After pressing this softkey, enter the start frequency with the numeric keypad and terminate the entry with the appropriate units softkey (such as ***[GHz]*** or ***[MHz]***). Termination of the entry presents the labels menu.

[STOP LABEL] is used to specify the stop value of the right graticule. This function can only be engaged with the system interface off. This function is engaged the same way as [START LABEL].

[PRIOR MENU] returns the system menu.

[MODE AC DC] toggles between AC and DC detection modes. If a compatible source is connected to the system interface, the source modulation is controlled automatically (normally on for AC and off for DC.) This function also controls the [MOD ON OFF] function. When AC is engaged, the analyzer modulation output is on. In DC, the modulation is off. Both features can be manually overridden.

[TITLE] presents the title menu, which is used to define a title that is shown on the CRT and plotted with the data. The title is composed of characters selected from the CRT in the active entry area. The letters of the alphabet, the digits 0 through 9, a decimal point, and the mathematical symbols ( ) + − / =: are shown on the CRT with the message `POINT WITH WITH KNOB, SOFTKEYS, THEN PRESS SELECT CHAR`.

[SELECT CHAR] enters your character in the title. Turn the knob or repeatedly press the [STP ONE RIGHT] or [STP ONE LEFT] softkey until the arrow points to the character you desire. Press [SELECT CHAR] and the character appears in the title.

[SPACE] inserts a blank space in the title next to the last character entered.

[BACK SPACE] deletes the last character entered.

[ERASE TITLE] deletes the entire title.

[STP ONE RIGHT] moves the arrow pointer to the next character to the right.

[STP ONE LEFT] moves the arrow pointer to the next character to the left.

[DONE] terminates entry of the title and returns the system menu.

HP 8757C ONLY

[ADPT NM ON OFF] toggles adaptive normalization on and off. Adaptive normalization adjusts the calibration data stored in memory when the frequency range is changed. This makes it possible to narrow in on part of the calibrated frequency range without recalibrating. The resolution of the narrower range viewed is not changed as the trace is expanded, and the calibration data is interpolated between the available points. Adaptive normalization should not be used if the calibration trace varies rapidly with frequency. An asterisk is shown in the status symbols area of the model labels area for any channel that has adaptive normalization engaged and is in [MEM] or [MEAS-MEM] display mode. If the trace is expanded beyond the frequency range of calibration, the calibration data outside that frequency range is extrapolated as a straight line from the calibration data at the start and stop frequencies. In this case, a U is shown in the status symbols area.

[MORE] presents a second system menu.

[MOD ON OFF] toggles on and off the 27.778 kHz modulation drive output on the rear panel of the analyzer.

HP 8757C ONLY

[CH MENU ON OFF] toggles on and off the channel menu accessed from the channel keys. In this state, pressing a CHANNEL key activates the channel but the existing menu presented on the CRT does not change. This is a convenient mode in which to define the measurement parameters for both channel 1 and channel 2 because it saves keystrokes.

To turn off a channel when the channel menu is off, press the channel key twice. The first press activates the channel; the second press turns it off. Pressing the CHANNEL key again turns on the channel and activates it.

To return the channel menu, press [SYSTEM] [MORE] [CH MENU ON].

[CLEAR SAV/RCL] clears all of the save/recall registers and presets the analyzer. If a compatible source is connected to the 8757 system interface, it is also preset, and its save/recall registers are cleared. When this softkey is pressed, the message `IF YOU WANT TO CLEAR ALL REGISTERS, PRESS YES` appears on the CRT and another menu is presented.

[CLEAR YES] clears all save/recall registers and returns the channel menu in the preset instrument state.

[NO] returns the previous system menu with all save/recall registers intact.

NOTE: For high security environments, the analyzer can be configured to clear *all* save/recall registers each time the instrument is powered down. This eliminates the possibility of confidential information remaining in the registers. To enable this function, follow these steps:

- Remove the battery (A3BT1) from the A3 CPU board. This will prevent storage of any register data. The internal self test now indicates a battery failure upon power up.
- Install a wire jumper (A3W2) on the A3 CPU board, just below U2. This jumper will signal the CPU to skip the battery self test and normal operation resumes. A warning message, `SAVE/RECALL registers defaulted` will briefly appear upon each power up cycle.

Removing the battery does not affect the internal calibration of the analyzer; only the save/recall registers.

[SWEEP MODE] presents the sweep mode menu. This menu is used to specify the type of sweep supplied by a source not compatible with the 8757 system interface or to toggle on and off the 8757 system interface.

[NONSTD ON OFF] enables the analyzer to track a sweep ramp other than the expected 0-10 volt sweep ramp. The nonstandard sweep must be within the 0-10 volt range. See Product Note 8757-5 for a more detailed description of this mode. If a sweep in excess of 10 volts is used, the A4 ADC assembly must be modified to accept it. See section 8 of the service manual for instructions. To use nonstandard sweep mode, disconnect the POS Z BLANK, the STOP SWEEP, and the 8757 SYSTEM INTERFACE connections to the source. Only the SWEEP IN should be connected. The number of trace points selected using the [#TRACE POINTS] function is still active for nonstandard sweep mode.

[CW ON OFF] is used with a source that is not compatible with the 8757 system interface. This function allows the display to be continuously updated when the non-compatible source is in CW mode with no sweep ramp applied to the analyzer. With [CW ON], the analyzer provides its own continuous internal horizontal display update, so that any stable input will be shown as a straight line. [CW ON] is also used if the source is 8757 system interface compatible. This function is selected automatically when the source is in CW mode (or toggling to [CW ON] will engage the source CW mode).

[MANUAL ON OFF] toggles on and off manual sweep control. If the source is connected to the 8757 system interface, [MANUAL ON] is selected automatically when the source is in manual mode (or toggling to [MANUAL ON] will engage the source manual sweep mode). This function also allows manual sweep control by a source not compatible with the 8757 system interface using a sweep input signal. With [MANUAL ON] and the source in manual mode, the analyzer provides a cursor whose vertical position represents amplitude and whose horizontal position can be manually swept from the source.

[SYSINTF ON OFF] toggles the analyzer's control of the 8757 system interface on and off. When the analyzer is not the system controller, another instrument on the 8757 system interface can control the instruments connected to the system interface. The setting of this function is not changed at preset. When off, SYS INTF OFF is shown in the status line on the CRT.

[STEP SW ON OFF] toggles on and off step-sweep mode. Step-sweep mode requires that the 8757 SYSTEM INTERFACE be connected and the *[SYSINTF ON OFF]* softkey be set to ON.

NOTE: The *[STEP SW ON OFF]* softkey is only available with an HP 8340 or 8360.

[PRIOR MENU] returns the previous menu.

[PLT BUF ON OFF] turns the plotter buffer on and off. When the buffer is on and a plot softkey is pressed, the analyzer is free to continue measurements while the data in the buffer is plotting. Not all active functions are available during a plot, and the entire process of plotting is slowed down when the buffer is on. When the buffer is off, all active functions are disabled and the plot is processed until finished.

NOTE: The *[PLT BUF ON OFF]* softkey is preset at the factory in the ON position. In order to speed up the plotting process, turn this function off.

[PRIOR MENU] returns the previous menu.

[SERVICE] presents the service menu, which provides a series of automated tests of the functional blocks of the analyzer. These tests are described in section 8 of the service manual.

[LOCAL] — LOCAL MENU

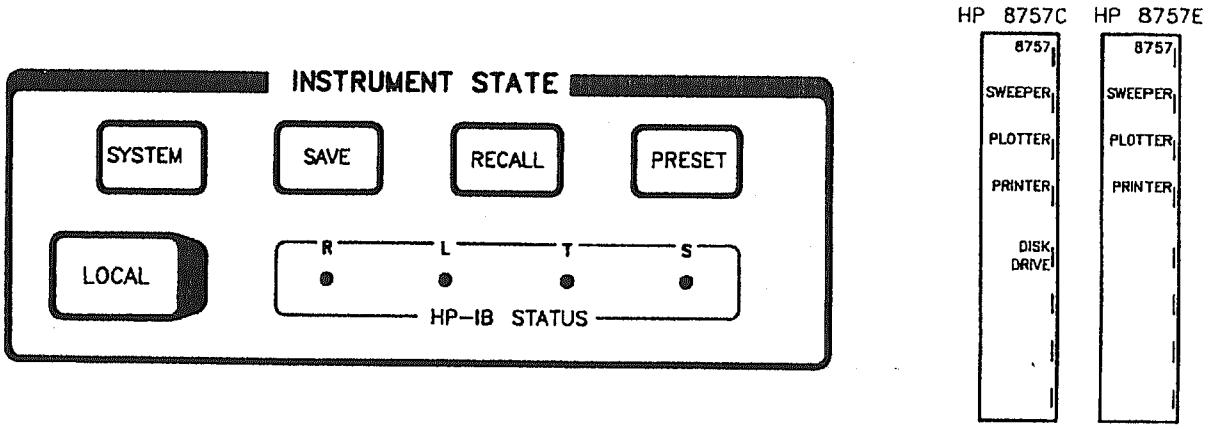


Figure 23. [LOCAL] Key and Local Menus

The **[LOCAL]** key returns the analyzer to local operation from the remote operation state unless a LOCAL LOCKOUT command has been received over HP-IB. Pressing [LOCAL] also presents the local menu. The local menu allows you to set HP-IB addresses for the analyzer and other instruments connected to the 8757 system interface. The default addresses for these instruments are shown in table 5.

Table 5. HP-IB Default Addresses

Instrument	HP-IB Address
8757	16
Sweeper	19
Plotter	05
Printer	01
Disk Drive[1]	00

1. HP 8757C only.

Change the default addresses of these instruments by pressing the softkey for the instrument you wish to change. For example, press ***[8757]***. The current HP-IB address is displayed in the active entry area of the CRT. Now enter a new address. Allowable values are 0 through 29. Enter the new value with the numeric keypad and terminate the entry with the [ENT] key. (Do *not* set two instruments to the same HP-IB address.) The CRT shows the new HP-IB address. This address is stored in memory and is not changed by turning the LINE switch off, or when the analyzer is preset.

Be sure that the address set for each instrument matches the address physically set on the instrument.

[SAVE] – SAVE MENUS

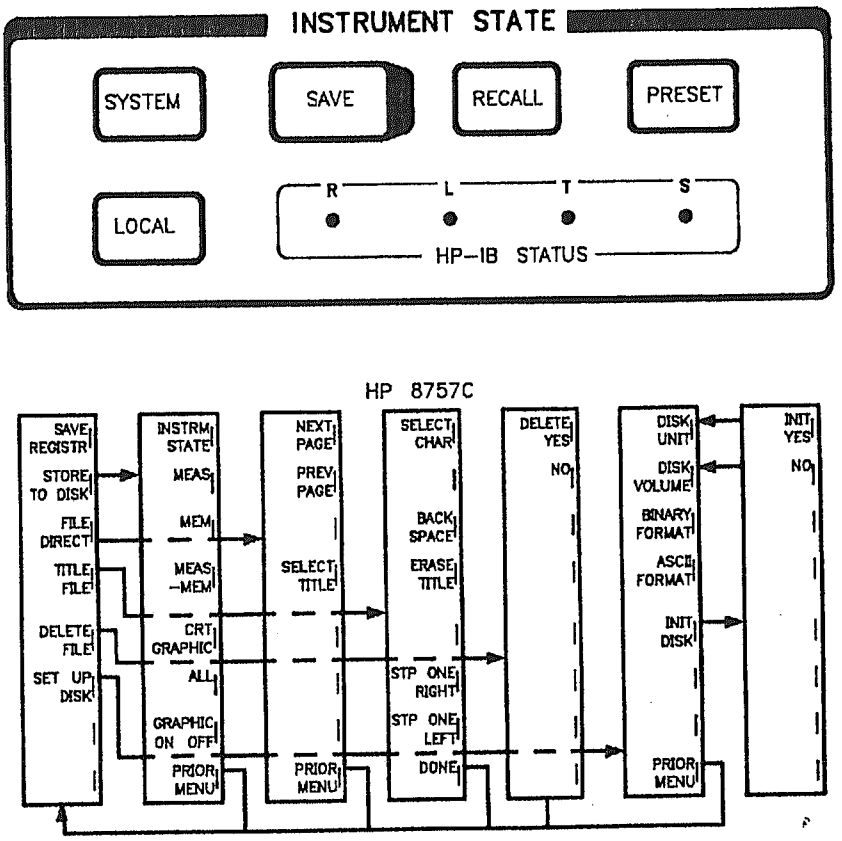


Figure 24. [SAVE] Key and Save Menus

The **[SAVE]** key allows you to save the current instrument state in save/recall registers in the analyzer. The information is stored in non-volatile memory and will be available, even if power is interrupted, until the registers are written over or cleared with the [CLEAR SAV/RCL] softkey.

To save the current instrument state in a register, press [SAVE]. SAVE REG appears in the active entry area. Enter the register number, using the numeric keypad, where you wish to store the current instrument state. No terminating key is needed. 9 different settings can be stored in registers 1 through 9 of the analyzer.

After you enter the register number (1 through 9), the analyzer saves the current instrument state in the appropriate register. This takes only a moment, then COMPLETE appears in the active entry area.

The information saved includes the current front panel settings of the analyzer and source, trace memory, and titles. The memory trace is saved at 401 points regardless of the number of points selected for the measurement.

HP 8757C ONLY

Limit lines can be saved in registers 1 through 4 only.

The [SAVE] key also presents the save menus which allow you to store data to disk. You can store the instrument states, measurement data, data in memory, and CRT graphics to a disk on a drive connected to the system interface. The instrument state information includes front panel settings for the analyzer and source, label information ([LABELS ON/OFF], [FRQ LBL OFF], [TITLE ON/OFF]), limit lines, and color selection.

If you load the instrument states for an analyzer and source combination into an analyzer with a different source, the original source instrument state will be applied to the new source. The new source will clamp frequency and power at its extreme limits, if needed. Table 6 is a list of the source settings that are saved on disk.

Before you store anything to a new disk, you must initialize the disk. You must also identify the disk unit where the disk resides, and the disk volume number of a hard disk drive. See [SET UP DISK] to accomplish these tasks.

[SAVE REGISTR] provides the same save-to-analyzer-register function that is engaged by pressing the [SAVE] key. See the [SAVE] key description for details.

[STORE TO DISK] presents a menu which allows you to store your instrument state, trace data, and CRT graphics to disk. The information will be stored under the active file title which is shown in the title area on the CRT. If there is no active file title, the information is stored under a default file title (FILE1). If you want to store the information under a different file title, enter the desired file title using [TITLE FILE] before pressing [STORE TO DISK].

NOTE: Instrument-state information of an HP 8360 Series Synthesized Sweeper can only be saved or recalled on disk with firmware Revision 3.1.

NOTE: Alternate state information cannot be saved on disk.

NOTE: User flatness data for an HP 8360 Series Synthesized Sweeper is not stored to disk.

When pressed, [STORE TO DISK] presents another menu.

[INSTRM STATE] stores the analyzer and source front panel settings to disk. These are stored under the active file title. If there is already instrument state data stored under this file title, the new data will write over the old.

[MEAS] stores the trace measurement data to disk. This information is stored under the active file title.

[MEM] stores the trace memory data to disk. This information is stored under the active file title.

[MEAS−MEM] stores normalized trace data to disk that can later be analyzed with a computer. This information is stored under the active file title.

[CRT GRAPHIC] stores current CRT graphics to disk. This information is stored under the active file title.

[ALL] stores the instrument state, trace measurement and memory, normalized trace data (only if the current display function is MEAS−MEM), and CRT graphics to disk in one operation. This information is stored in separate files under the active file title.

HP 8757C ONLY

[GRAPHIC ON OFF] allows you to turn on or off graphics that have been recalled from disk or placed in graphics memory by computer. *[GRAPHIC ON]* shows graphics and softkey menus only and blanks all instrument state and measurement data. The current softkey menu remains active on the CRT and all other softkey menus can be accessed. A useful application for this function might be an instrument connection diagram which a user can access at any time during the measurement process. *[GRAPHIC OFF]* turns off graphics and returns the instrument state and measurement data.

[PRIOR MENU] returns the previous menu.

[TITLE FILE] lets you create a new file title. The current active file title is displayed in the title area on the CRT. To create a new file title, first erase the active file title. Then enter up to eight characters. The new title is shown in the title area as you create it.

[SELECT CHAR] enters your character selection. Turn the analyzer knob until the arrow points to the character you desire. Press [SELECT CHAR] and the character appears in the title area.

[BACKSPACE] deletes the last character entered in the title.

[ERASE TITLE] deletes the entire title.

[STP ONE RIGHT] moves the arrow pointer to the next character to the right.

[STP ONE LEFT] moves the arrow pointer to the next character to the left.

[DONE] terminates entry of the title and returns the previous menu.

[FILE DIRECT] shows you the directory of files on the specified disk. The directory holds 382 files, with 16 files to a page.

[NEXT PAGE] shows you successive pages of the directory.

[PREV PAGE] shows you previous pages of the directory.

[SELECT TITLE] lets you select a file title to be the active file title. The current active file title is shown at the top of the CRT. Use the analyzer knob to move the arrow to the file title you wish to be the active file title. Press [SELECT TITLE].

[PRIOR MENU] returns the previous menu.

[DELETE FILE] deletes files from the directory. Pressing [DELETE FILE] shows you the active file title. Make sure that the files you wish to delete are active. You have two options:

[DELETE YES] deletes all files in the directory with the active file title. If you *do* wish to delete the files with the active file titles, press [DELETE YES].

[NO] exits the delete file menu *without* deleting any files. If you want to delete files other than the current active file, use [SELECT TITLE] or the file directory to change the active file title.

[SET UP DISK] presents another menu that lets you set disk unit and volume numbers, initialize disks, and to define the format in which to save the data.

[DISK UNIT] shows the unit of the disk drive where the analyzer expects to find your disk. When pressed, DISK UNIT appears in the active entry area of the CRT, along with the unit number of the drive. To change the unit number, use the numeric keypad to enter the new unit number and terminate the entry with the [ENT] key.

HP 8757C ONLY

[DISK VOLUME] shows you which volume of the disk drive the analyzer will access to save and recall data. When pressed, DISK VOLUME appears in the active entry area of the CRT along with the volume number of the drive. The correct volume number is critical when using a hard disk. To change the volume number, use the numeric keypad to enter the new volume number and terminate the entry with the [ENT] key.

[BINARY FORMAT] sets the measurement and memory data format to binary. Binary format provides the fastest transfer speed of data, and uses the smallest storage space of the two formats available (binary and ASCII). The format chosen is highlighted and underlined. The analyzer presets to binary format.

[ASCII FORMAT] sets the measurement and memory data format to ASCII. ASCII format makes the stored data compatible with other computers.

[INIT DISK] lets you initialize a disk. The analyzer will initialize the disk identified by [DISK UNIT] and [DISK VOLUME]. Be certain these are correctly set before continuing.

[INIT YES] begins the initialization. The message WAITING FOR DISK appears on the CRT. When this message is removed and the disk drive light turns out, initialization is complete.

NOTE: Initialization of hard disks can take up to 30 minutes to complete.

NOTE: If your disk is write-protected, the message WARNING: DISK IS WRITE PROTECTED appears on the CRT and the initialization is aborted. If you still wish to initialize the disk, remove the write protection and press [INIT DISK] [INIT YES].

[NO] returns the previous menu without running the initialization. It will *not* abort an initialization already in progress.

[PRIOR MENU] returns the previous menu.

Table 6. Source Settings Saved on Disk

- Markers 1 through 5.
- Marker Delta.
- Marker Sweep.
- Sweep Trigger (Internal, Line, External).
- Sweep Type (Manual, External, Continuous).
- Sweep Mode (Start/Stop, CF/ΔF, CW, Swept CW).
- Start/Stop Frequencies.
- CF/ΔF Frequencies.
- CW Frequency.
- ALC Mode (Internal, External, Power Meter).
- Power Sweep.
- Power Slope.
- RF Power (On/Off, Value).
- Display Offset (HP 8350B only).
- Display Multiplier.
- Display Update On/Off.
- Square Wave Modulation On/Off (HP 8350B only) or Shift Pulse Modulation On/Off (HP 8340/41).
- Sweep Time.

[RECALL] – RECALL MENUS

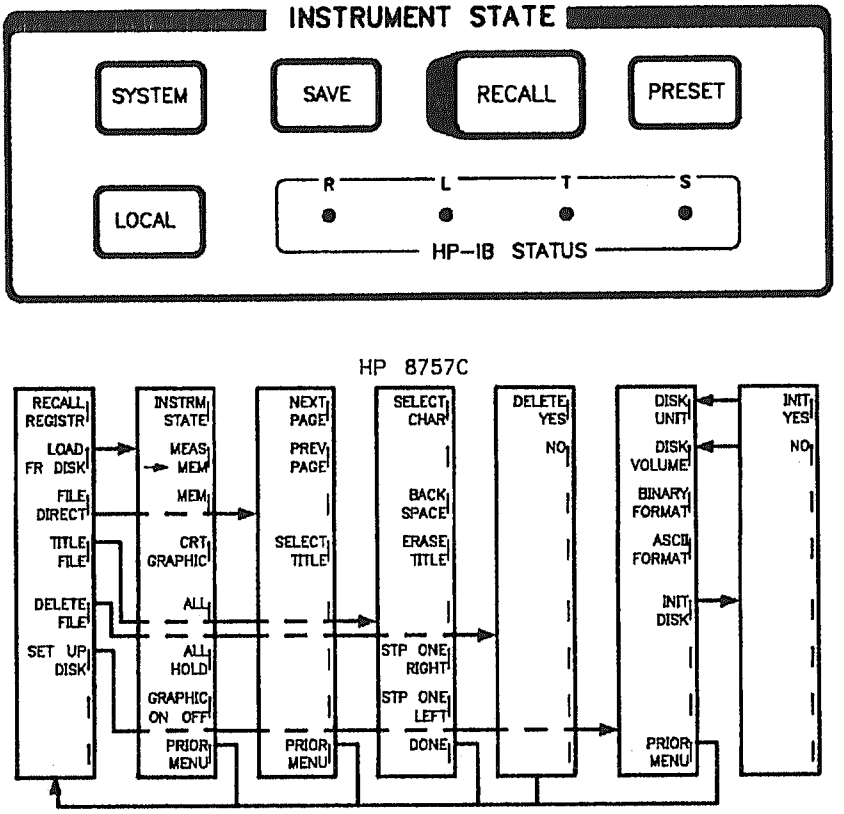


Figure 25. [RECALL] Key and Recall Menus

[RECALL] allows you to recall information previously saved in the analyzer registers. When you press [RECALL], the message RECALL REG appears in the active entry area on the CRT. Enter the register number containing the information you wish to recall using the numeric keypad. No terminator is required. The analyzer retrieves the information saved in that register. This takes only a moment, then COMPLETE appears in the active entry area.

HP 8757C ONLY

The [RECALL] key presents a menu which allows you to recall data previously stored to disk.

[RECALL REGISTR] provides the same recall-from-analyzer-register function as pressing the [RECALL] key. See the [RECALL] key description for details.

[LOAD FR DISK] presents a menu which lets you load the instrument state, trace data, and CRT graphics from disk. The active file title, in the title area on the CRT, identifies the file to be loaded. If you want to load information from a different file, enter the desired file title using the [TITLE FILE] softkey (or select the file title in the file directory). If no file exists on disk with the current active file title, the message WARNING: NO FILE FOUND ON DISK appears on the CRT. Return to the previous menu and use the file directory to verify that you have the correct file title and the correct disk.

NOTE: Alternate state information cannot be saved on disk, therefore, it cannot be recalled.

HP 8757C ONLY

When pressed, [LOAD FR DISK] presents another menu.

[INSTRM STATE] loads instrument front panel settings from disk. This information must have been previously stored under the current active file title.

[MEAS→MEM] loads trace measurement data from disk into the analyzer trace memory. This information must have been previously stored under the current active file title.

[MEM] loads trace memory data from disk. This information must have been previously stored under the current active file title.

[CRT GRAPHIC] loads CRT graphics from disk. This information must have been previously stored under the current active file title.

[ALL] loads the instrument state, trace measurement and memory, and CRT graphics from disk in one operation. This information must have been previously stored under the current active file title.

[ALL HOLD] loads the files listed in the [ALL] function above in addition to holding the measurement display. This allows archived data to be viewed and plotted. The following display functions are also allowed, manually or via HP-IB: scaling, cursor/cursor search, smoothing, data plotting/printing, channels on/off, or SWR display (when data is stored as SWR). All other recall functions remain the same.

NOTE: Smoothing will be turned off if the stored file has smoothed data.

[GRAPHIC ON OFF] allows you to turn on or off graphics that have been recalled from disk or placed in graphics memory by computer. *[GRAPHIC ON]* shows graphics and softkey menus only and blanks all instrument state and measurement data. The current softkey menu remains active on the CRT and all other softkey menus can be accessed. A useful application for this function might be an instrument connection diagram which a user can access at any time during the measurement process. *[GRAPHIC OFF]* turns off graphics and returns the instrument state and measurement data.

[PRIOR MENU] returns the previous menu.

[FILE DIRECT] shows you the directory of files on the specified disk. The directory holds 382 files, with 16 files to a page.

[NEXT PAGE] shows you successive pages of the directory.

[PREV PAGE] shows you previous pages of the directory.

[SELECT TITLE] lets you select a file title to be the active file title. The current active file title is shown at the top of the CRT. Use the analyzer knob to move the arrow to the file title you wish to be the active file title. Press [SELECT TITLE].

[PRIOR MENU] returns the previous menu.

[TITLE FILE] allows you define a new file title. The current active file title is displayed in the title area on the CRT. To create a new file title, first erase the active file title. Then enter up to eight characters. The new title is shown in the title area as you create it.

[SELECT CHAR] enters your character selection in the title. Turn the analyzer knob or repeatedly press the [STP ONE RIGHT] or [STP ONE LEFT] softkey until the arrow points to the character you desire. Press [SELECT CHAR] and the character appears in the title.

HP 8757C ONLY

[BACKSPACE] deletes the last character entered in the title.

[ERASE TITLE] deletes the entire title.

[STP ONE RIGHT] moves the arrow pointer to the next character to the right.

[STP ONE LEFT] moves the arrow pointer to the next character to the left.

[DONE] terminates entry of the title and returns the previous menu.

[DELETE FILE] deletes files from the directory. Pressing [DELETE FILE] shows you the active file title. Make sure that the files you wish to delete are active. You have two options:

[DELETE YES] deletes all files in the directory with the active file title. If you *do* wish to delete the files with the active file titles, press [DELETE YES].

[NO] exits the delete file menu *without* deleting any files. If you want to delete files other than the current active file, use [SELECT TITLE] or the file directory to change the active file title.

[SET UP DISK] presents another menu that lets you set disk unit and volume numbers, initialize disks, and define the format in which to save the data.

[DISK UNIT] shows you the unit of the disk drive where the analyzer expects to find your disk. When pressed, DISK UNIT appears in the active entry area of the CRT, along with the unit number of the drive. To change the unit number, use the numeric keypad to enter the new unit number and terminate the entry with the [ENT] key.

[DISK VOLUME] shows you which volume of the disk drive the analyzer will access to save and recall data. When pressed, DISK VOLUME appears in the active entry area of the CRT along with the volume number of the drive. To change the volume number, use the numeric keypad to enter the new volume number and terminate the entry with the [ENT] key.

[BINARY FORMAT] sets the measurement and memory data format to binary. Binary format provides the fastest transfer speed of data, and uses the smallest storage space of the two formats available (binary and ASCII). The format chosen is highlighted and underlined. The analyzer presets to binary format.

[ASCII FORMAT] sets the measurement and memory data format to ASCII. ASCII format makes the stored data compatible with other computers.

[INIT DISK] lets you initialize a disk. The analyzer will initialize the disk identified by [DISK UNIT] and [DISK VOLUME]. Be certain these are correctly set before continuing.

[INIT YES] begins the initialization. The message WAITING FOR DISK appears on the CRT. When this message is removed and the disk drive light turns out, initialization is complete.

NOTE: If your disk is write-protected, the message WARNING: DISK IS WRITE PROTECTED appears on the CRT and the initialization is aborted. If you still wish to initialize the disk, remove the write protection and press [INIT DISK] [INIT YES].

[NO] returns the previous menu without running the initialization. It will *not* abort an initialization already in progress.

[PRIOR MENU] returns the previous menu.

[PRESET] — PRESET KEY

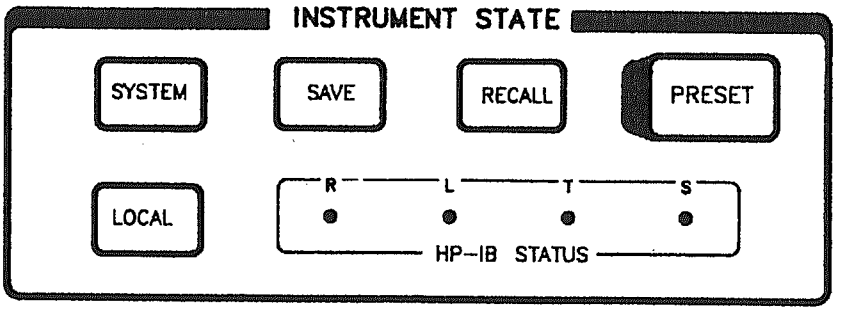


Figure 26. [PRESET] Key

When the **[PRESET]** key is pressed, or when the IP command is received from a system controller, a self-test is performed. This is followed by presetting of the analyzer and the instruments connected to the 8757 system interface. All functions are turned off, then the following instrument states are set:

ANALYZER

The channel menu appears in the softkey label area of the CRT.[1]

- Measure power A on channel 1 (on).
- Measure power B on channel 2 (on).
- Measure power C (or B) on channel 3 (off).[1]
- Measure power R on channel 4 (off).[1]
- Display measurement data in log magnitude format.
- Scale =20 dB/div.
- Reference level 0 dBm for all channels.
- Reference level step size =20 dB.
- Averaging off.
- Averaging factor =8.
- Cursor off.
- All labels on.
- Channel menu on.
- Channel 1 as the active channel.
- Modulation drive on.
- Number of trace points =401.
- Detector mode set for AC detection.
- Smoothing aperture set for 5.0% of span (off).
- Cursor format =log magnitude.
- Search value =−3 dB.
- Adaptive normalization off.[1]
- Temperature compensation on.
- Repeat autozero off.

1. HP 8757C only.

SOURCE

- Instrument preset.
- Sweep time 200 ms.
- HP 8350B square wave modulation on.
- HP 8340/8341 SHIFT PULSE on; RF output on.

PLOTTER

- Abort plot, if in progress.
- P1 and P2 scaling points unchanged.
- Selection of plotter pens unchanged.

PRINTER

- Abort plot or print, if in progress.

DISK DRIVE[1]

- Aborts any data transfer in progress.
- Unit number unchanged.
- Volume number unchanged.
- ASCII or binary mode unchanged.

The following analyzer conditions are not changed during a [PRESET] or IP command execution:

- Reference position.
- Trace memory.
- Save/recall registers.
- HP-IB addresses.
- Request mask.
- Limit lines.[1]
- Title.
- Detector offset.
- User-defined plot.
- 8757 system interface private bus control on/off.
- Repeat autozero timer.
- Display intensity.
- Display colors.[1]

1. HP 8757C only.

HP-IB STATUS

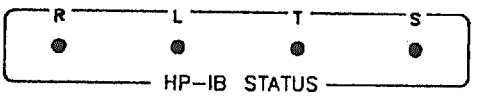


Figure 27. HP-IB STATUS Indicators

The HP-IB STATUS indicators (figure 27) show the current status of the analyzer. When the indicator is lit, the analyzer is in the status represented by the indicator.

Indicator	Analyzer Status
R	Remote operation
L	Listen mode
T	Talk mode
S	Service request (SRQ) asserted

The indicators are not updated continuously. It is possible for several complete HP-IB operations to take place without any change in status.

Detector Inputs

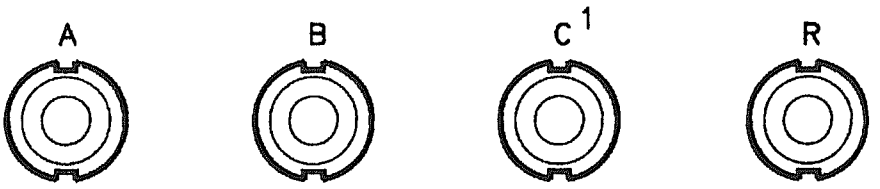


Figure 28. Detector Inputs

Figure 28 shows the analyzer's detector inputs. Each input has identical characteristics and allows connection of compatible detectors and bridges. Input A is typically used for the connection of a directional bridge for reflection measurements. Input B is typically used for the connection of a detector for transmission measurements.

HP 8757C ONLY

Input C (Option 001 only) is an optional channel used to measure a fourth parameter (for example, where a device under test has more than one output).

Input R is typically used for the reference detector input for ratio measurements.

1. HP 8757C Option 001 only.

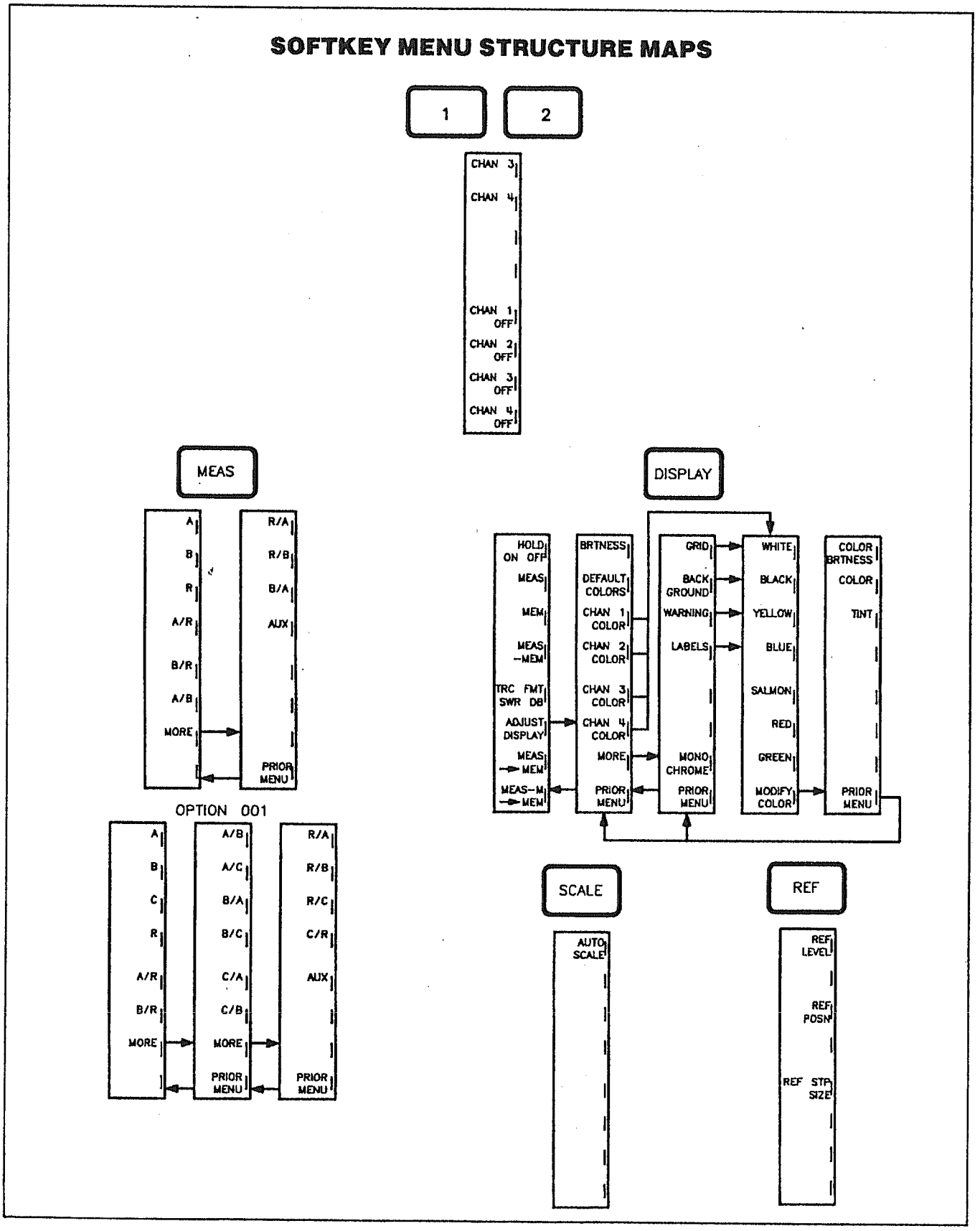


Figure 29. The HP 8757C Softkey Menu Structure Map (1 of 4)

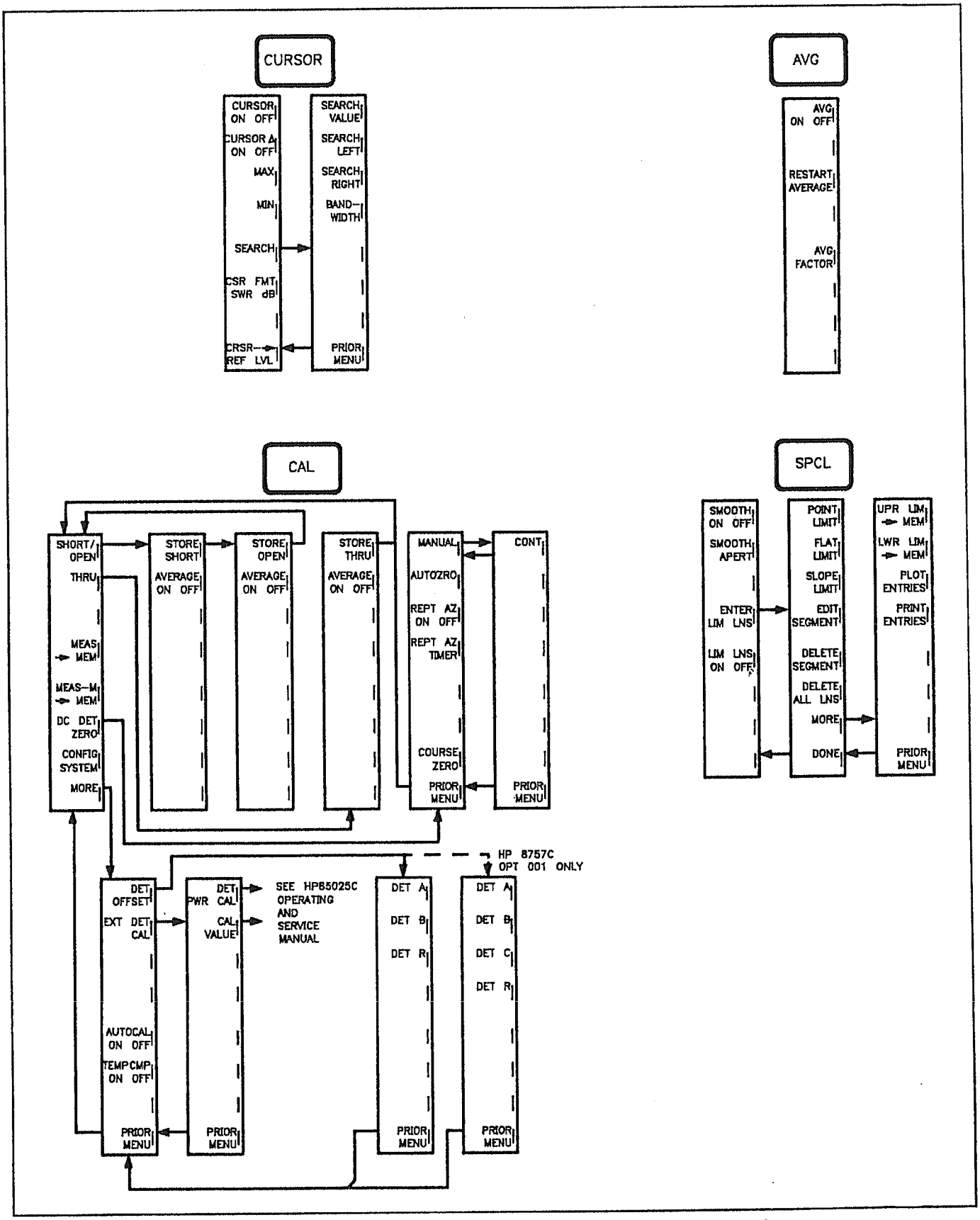


Figure 29. The HP 8757C Softkey Menu Structure Map (2 of 4)

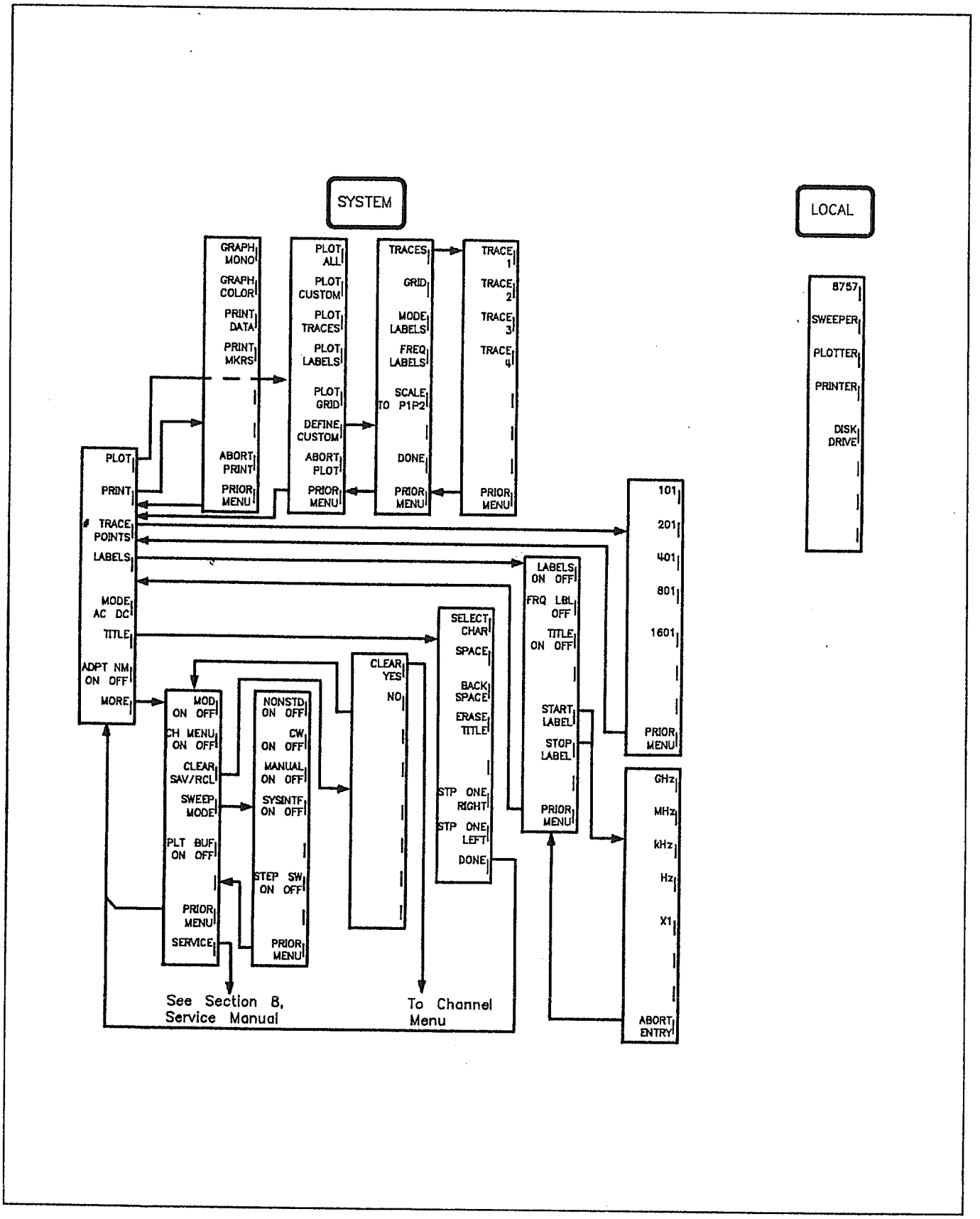


Figure 29. The HP 8757C Softkey Menu Structure Map (3 of 4)

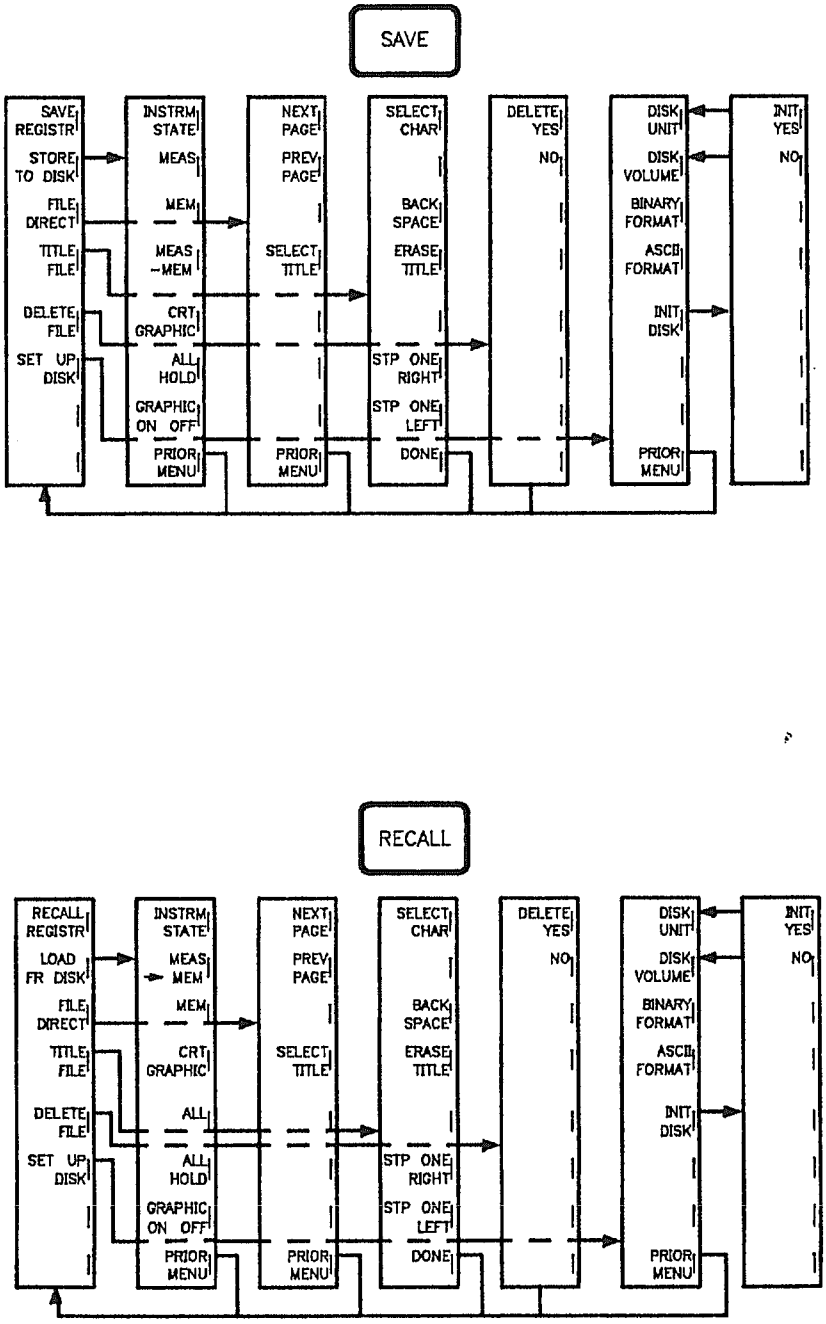


Figure 29. The HP 8757C Softkey Menu Structure Map (4 of 4)

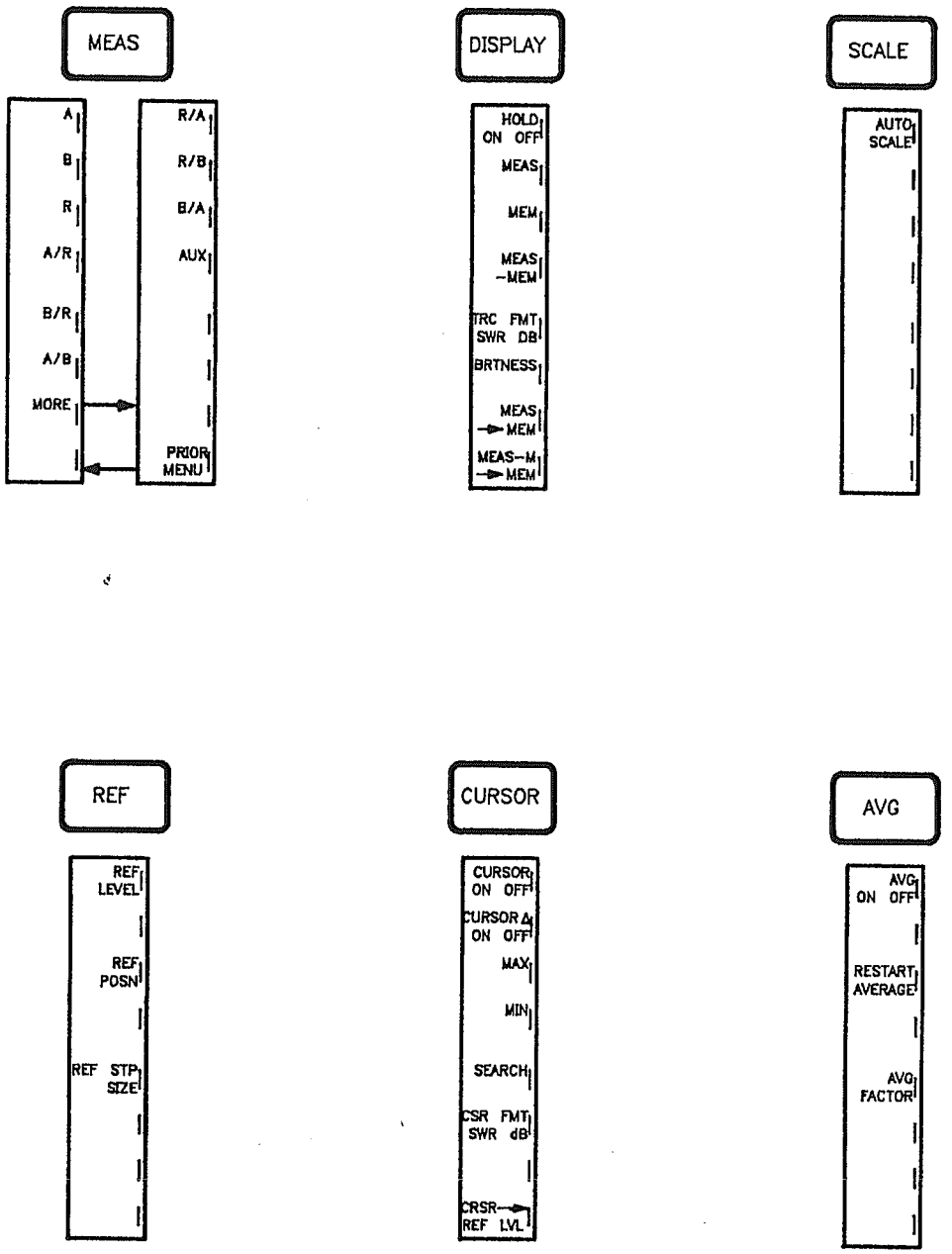


Figure 30. The HP 8757E Softkey Menu Structure Map (1 of 3)

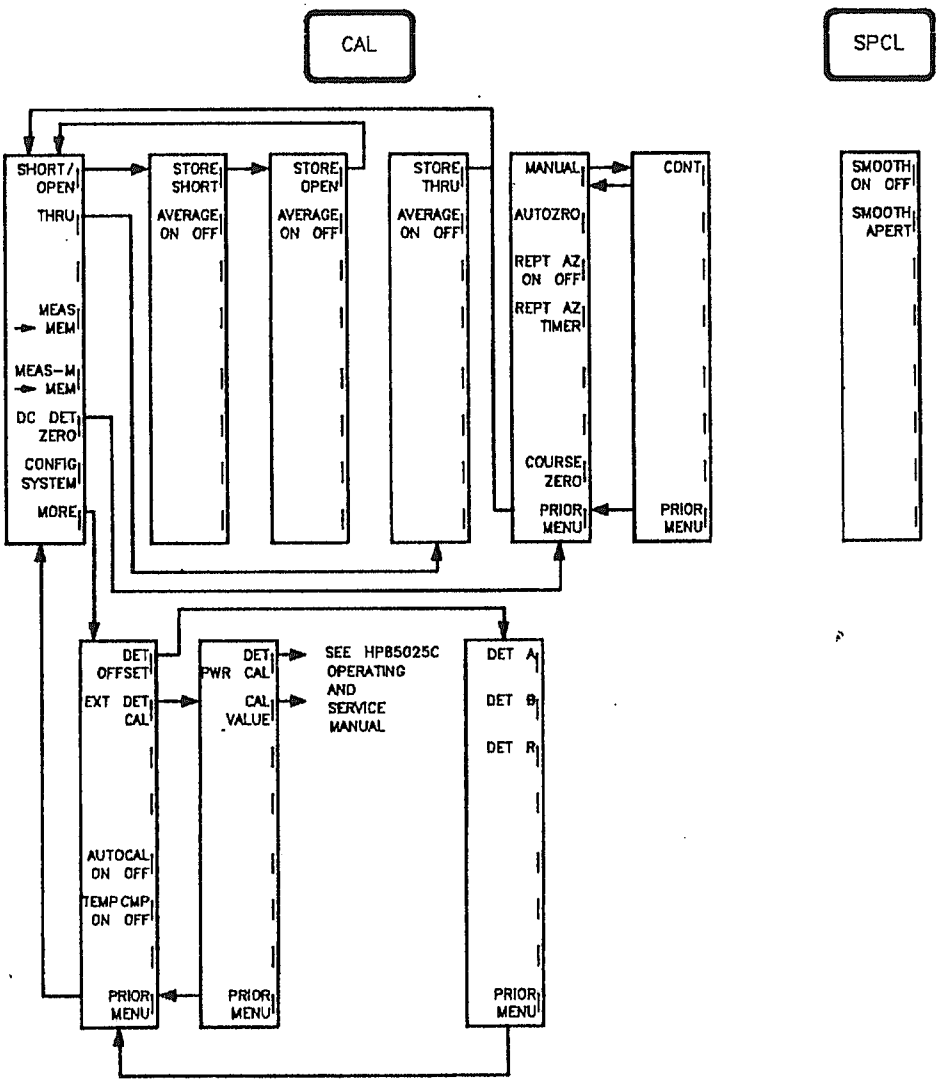


Figure 30. The HP 8757E Softkey Menu Structure Map (2 of 3)

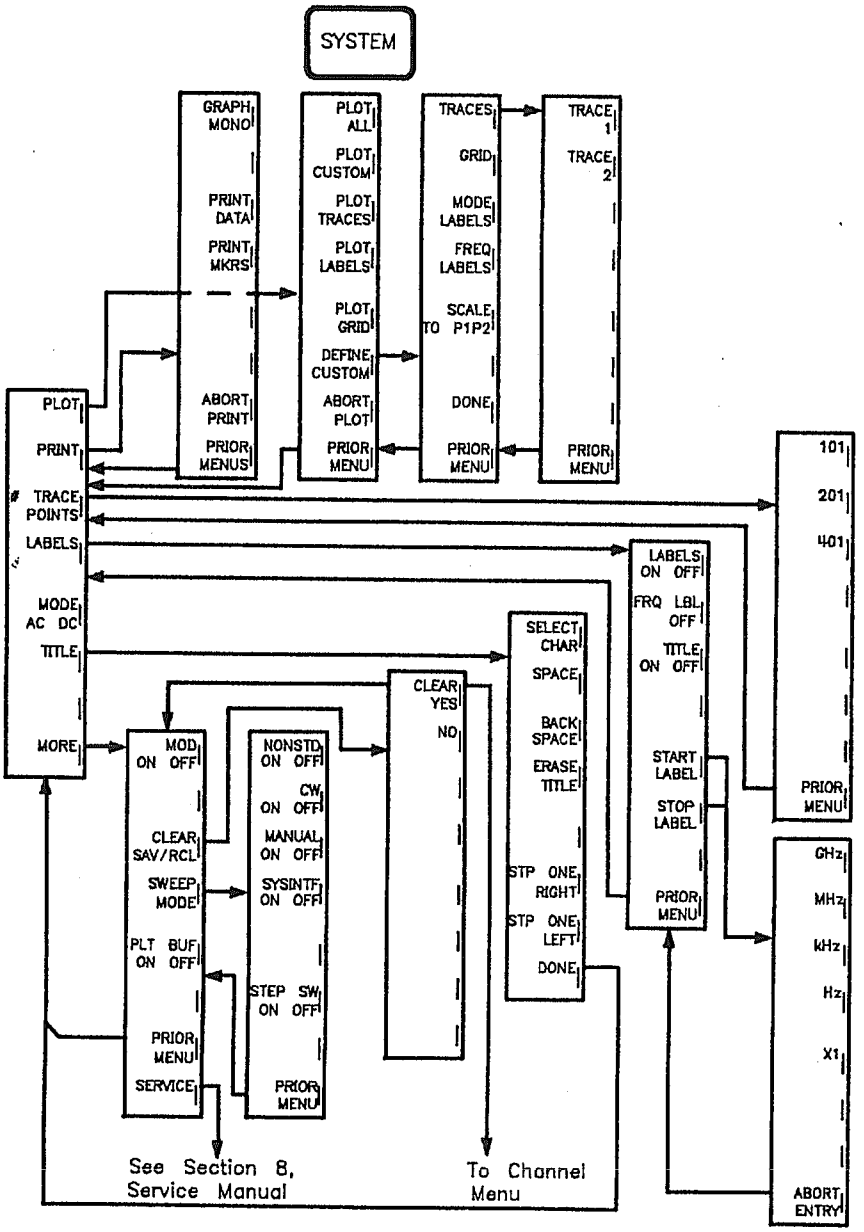


Figure 30. The HP 8757E Softkey Menu Structure Map (3 of 3)

REAR PANEL FEATURES

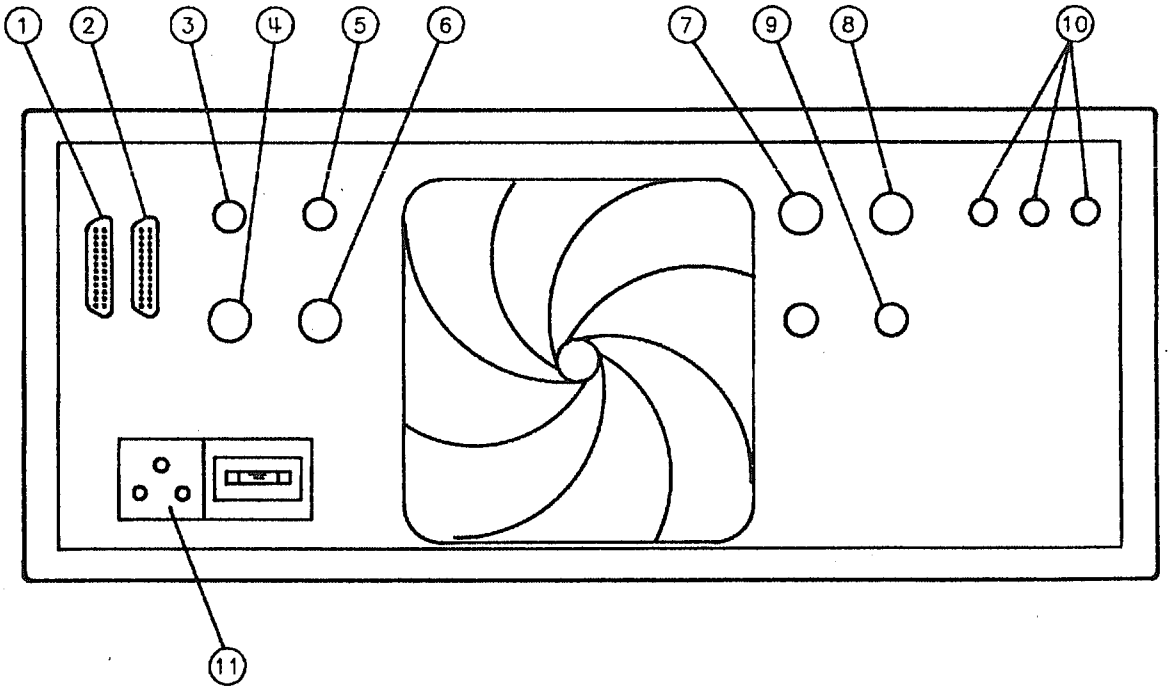


Figure 31. The HP 8757C Rear Panel

1. The 8757 SYSTEM INTERFACE connector is used to connect the private bus that lets the analyzer control peripherals such as the source, plotter, and printer. Since the analyzer itself controls the 8757 system interface bus, other controllers must not be attached to this connector, unless the ***[SYSINTF OFF]*** function is engaged.

   The 8757 system interface control of the HP 8350B Sweep Oscillator or HP 8340- or 8341-series Synthesized Sweeper provides frequency annotation shown in the frequency labels area of the CRT. In addition, the **[SAVE]**, **[RECALL]**, and **[PRESET]** keys of either the source or the analyzer control these functions in both instruments. Alternate sweep capability is also available in both instruments.

2. The HP INTERFACE BUS input/output connector allows interfacing with a computer controller and other HP-IB instruments.

3. The POS Z BLANK input connector accepts positive retrace and bandswitch blanking and negative intensity marker (z-axis modulation) signals. The signal levels sensed on this input are +5 V for blanking, 0 V for display, −4 V for markers, and −8 V for the active marker.

4. The SWEEP IN 0-10V input connector accepts a 0 V to +10 V sweep signal from a source. Using the non-standard sweep mode, it can also accept a different sweep ramp within the 0 to +10 V range. The A4 ADC assembly can be modified to allow sweep ramps greater than +10 V.

5. The STOP SWEEP connector provides the interface signal to stop the sweep of the HP 8350B or 8340/41 when it is controlled over the private bus. The analyzer also uses this connector to sense when the source has stopped the sweep.

NOTE: Connection of a sweep signal to the SWEEP IN 0-10V connector is the minimum requirement for use of the analyzer as a receiver. The POS Z BLANK must be connected to provide marker information on the screen. If the source is connected to the analyzer through the 8757 system interface, the STOP SWEEP must also be connected.

6. The MODULATOR DRIVE connector provides a 27.778 kHz square wave signal, nominally ±6 V open circuit, for driving an external modulator or the external amplitude or pulse modulation input of the HP 8350B Sweep Oscillator or the HP 8340- or 8341-series Synthesized Sweeper.

7. The DAC OUT 0-10V connector is provided for future enhancements with later revisions of firmware. It can also be used for troubleshooting purposes.

8. The ADC IN connector is used to show an external voltage on the analyzer CRT using **[MEAS]** ***[AUX]***. The connector is also referred to as AUX input. It can also be used for troubleshooting purposes.

9. The CONTROL 1 and CONTROL 2 connectors provide digital output signals (TTL open-collector) as a convenience for driving other peripheral equipment in an HP-IB controlled system. The CONTROL 1 signal is used as an oscilloscope trigger source when continuous loop service-related tests are performed.

HP 8757C ONLY

10. The R, G, and B VIDEO OUTPUT connectors provide analog red, green, and blue video signals, which can be used to drive an external color monitor such as the HP 3571A/B or monochrome monitor such as the HP 35731A/B. Other analog multisync monitors can be used if they are compatible with the analyzer's 25.5 kHz scan rate and video levels (1 V p-p, 0.7 V =white, 0 V =black, −0.3 V =sync, sync on green).

11. The LINE V ±10% input connector accepts primary line voltage to power the analyzer. The line voltage of 100 V, 120 V, 220 V, or 240 V is selected by correctly inserting the printed circuit selector board. Information on line voltage and fuse selection is in section 2, "Installation."

OPERATOR'S CHECK

DESCRIPTION

The operator's check verifies that the analyzer is functioning properly. It does not verify all specifications, but is an appropriate test for daily instrument verification, incoming inspection, or verification after repair or replacement of digital circuits.

This check consists of analyzer HP-IB and 8757 system interface checks, and self-tests, followed by an insertion loss measurement of a standard device. Save the insertion loss data as a reference for comparison with future operator's checks. Keep the standard device exclusively for these operator's checks to minimize device variation.

You can modify this test to use other microwave devices and test specific frequency ranges, but if you use a different RF plug-in that cannot output +16 dBm, you will not be testing the analyzer's full dynamic range.

EQUIPMENT

HP-IB Cable	HP 10833A/B/C/D
Sweep Oscillator Mainframe	HP 8350B
RF Plug-In	HP 83592B
Detector	HP 11664A/E
50 MHz Bandpass Filter	HP Part Number 08757-80027
Graphics Plotter	HP 7440A

PROCEDURE

1. To verify the instrument self-tests, HP-IB, and 8757 system interface private bus, perform the "HP Interface Bus and 8757 System Interface" performance test in section 4 of the service manual.

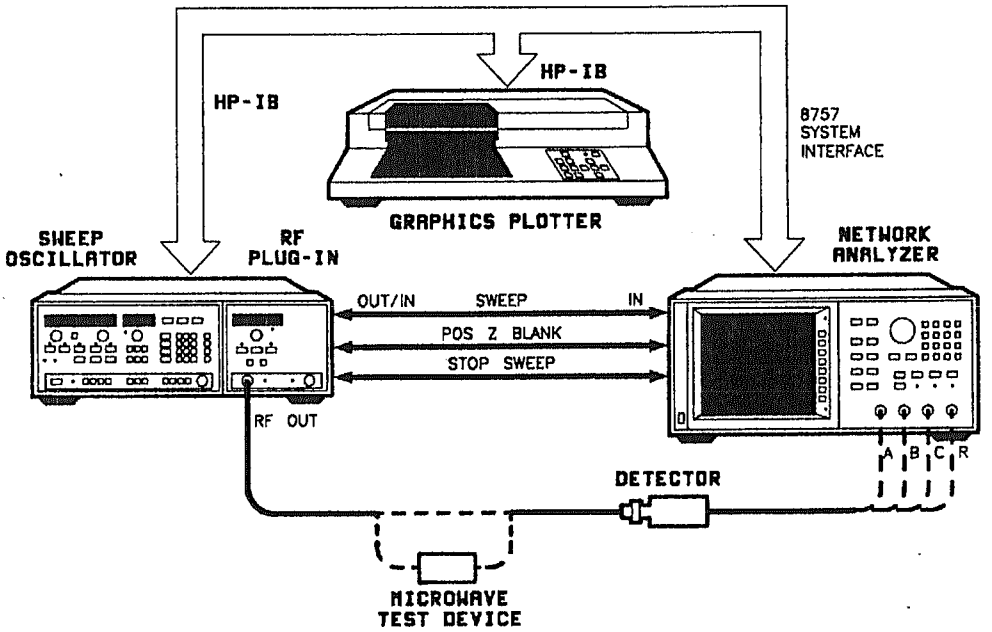


Figure 32. Equipment Set-up for Operator's Check

2. Set up the equipment as shown in figure 32, with the detector connected to input A of the analyzer. Connect the detector's RF input to the RF output of the source for a "thru" (0 dB insertion loss) connection. Turn on the instruments and allow 30 minutes warm-up time.

   If the 8757 system interface is *not* engaged (SYS INTF OFF appears in the status line of the CRT), turn it on by pressing **[SYSTEM]** ***[MORE] [SWEEP MODE] [SYSINTF ON]***.

3. On the analyzer, press **[PRESET]** to preset both the analyzer and the source. At preset, the analyzer channel 1 is active and measures input A.

4. Adjust the start and stop frequencies of the source to include the frequency range of the microwave test device. These frequencies will be plotted with the data for a permanent record.

5. Turn off the analyzer's channel 2.

HP 8757C ONLY

Press CHANNEL **[2]** ***[CHAN 2 OFF]***.

For the HP 8757E, press CHANNEL **[2]** twice.

6. On the analyzer, press **[CURSOR]** ***[MAX]*** to place the cursor at the maximum value of the trace. The CRSR value is displayed in the active entry area of the CRT. Adjust the output power of the RF plug-in until the cursor value on the CRT reads +16 dBm. This value is the upper limit of the dynamic range of the analyzer.

7. Press **[DISPLAY]** ***[MEAS→MEM]*** to store the trace in memory. The message CHAN 1 MEAS TO MEMORY will be shown on the message line of the CRT.

8. Disconnect the detector from the RF output of the source. Press **[AVG]** ***[AVG ON OFF]*** to turn on averaging with the default average factor of 8. Wait a few seconds to allow the trace to settle.

9. Press **[CURSOR]** ***[MAX]***. A cursor value of −60 dBm or lower should be displayed in the active entry area. This is the noise floor power level.

10. Insert the microwave test device between the RF output of the source and the detector. On the analyzer, press **[DISPLAY]** ***[MEAS-MEM]***. Wait a few seconds to allow the trace to settle.

11. Press **[CURSOR]** ***[MAX]*** to find the trace maximum. The CRSR value displayed in the active entry area now represents the minimum insertion loss of the microwave test device. This value will be plotted with the data trace.

12. Press **[SYSTEM]** ***[PLOT] [PLOT ALL]*** to generate a hard copy plot. Keep this plot for comparison with future operator's checks.

13. Disconnect the detector from the A input and connect it to the B input. Remove the microwave test device from the circuit and connect the input of the detector to the RF output of the source. Press **[DISPLAY]** ***[MEAS]*** **[MEAS]** ***[B]*** **[AVG]** ***[AVG OFF]***. Repeat steps 6 through 12.

14. Repeat step 13 for the remaining detector inputs, pressing **[MEAS]** and the softkey corresponding to the detector input connected.