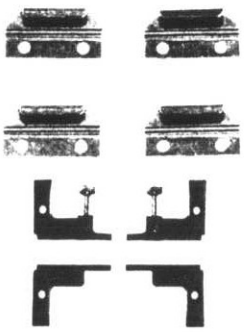
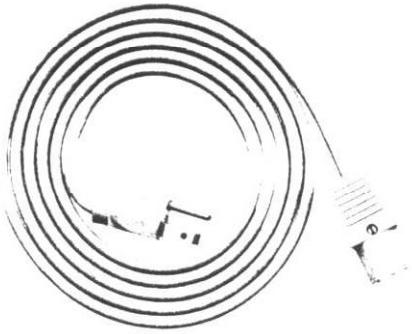
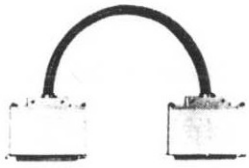
HP 8501A



LOCK FEET KIT
5061-0099

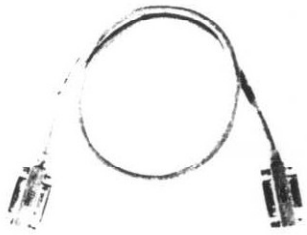


LINE POWER CABLE
(See Figure 2-5
for HP Part Number)



NORMALIZER/PROCESSOR
INTERCONNECT CABLE
08501-60067

LABELING INTERCONNECT
CABLE
08501-60068



HP-IB INTERCONNECT
CABLE
10631A

Figure 1-1. Model 8501A Storage-Normalizer with Accessories Supplied

SECTION I
GENERAL INFORMATION

1-1. INTRODUCTION

1-2. This Operating and Service Manual contains information required to install, operate, test, adjust, and service the Hewlett-Packard Model 8501A Storage-Normalizer. Figure 1-1 shows the instrument and accessories supplied. This section covers instrument identification, description, options, accessories, specifications, and other basic information.

1-3. Supplied with this manual is an Operating Information Supplement. The Supplement is a copy of the first three sections of the manual, and should be kept with the instrument for use by the operator. Additional copies of the Operating Information Supplement can be ordered separately through your nearest Hewlett-Packard office. The part number is listed on the title page.

1-4. OPERATING CHARACTERISTICS

1-5. Instrument operating characteristics are listed in Table 1-1. These operating characteristics are not specifications but are typical characteristics included as information for the user.

1-6. SAFETY CONSIDERATIONS

1-7. General

1-8. This is a Safety Class I instrument and has been manufactured and tested according to international safety standards.

1-9. Safety Symbols

⚠ Instruction manual symbol: The apparatus will be marked with this symbol when it is necessary for the user to refer to the instruction manual in order to protect the apparatus against damage.

Indicates dangerous voltages

Earth 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 injury or loss of life. 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 equipment. Do not proceed beyond a CAUTION sign until the indicated conditions are fully understood and met.

1-10. Operation

1-11. Before applying power, the following cautions should be observed:

CAUTION

BEFORE SWITCHING ON THIS INSTRUMENT, make sure instrument's ac input is set to the voltage of the ac power source (see Figure 2-1).

BEFORE SWITCHING ON THIS INSTRUMENT, make sure the ac line fuse is of the required current rating and type (normal-blow, time delay, etc.).

1-12. Service

1-13. Although this instrument has been manufactured in accordance with international safety standards, this manual contains information, cautions, and warnings which must be followed to insure safe operation. Service should be performed only by qualifed service personnel, and the following warnings should be observed.

WARNING

Any maintenance or repair of the opened instrument under voltage should be avoided as much as possible, and when unavoidable, should be carried out only by a skilled person who is aware of the hazard involved.

Capacitors inside the instrument may still be charged even if the instrument has been disconnected from its source of supply.

Make sure that only fuses with the required rated current and of the specified type (normal blow, time delay, etc.) are used for replacement. The use of repaired fuses and the short-circuiting of fuseholders must be avoided.

When it is likely that the earth ground protection has been interrupted, the instrument must be made inoperative and be secured against any unintended operation.

If this instrument is to be energized via an auto-transformer (for voltage reduction) make sure the common terminal is connected to the earthed pole of the power source.

BEFORE SWITCHING ON THE INSTRUMENT, the protective earth terminals of the instrument must be connected to the protective conductor of the mains power cord. The mains plug shall only be inserted in a socket outlet provided with a protective earth contact. The protective action must not be negated by the use of an extension cord (power cord) without a protective conductor (grounding). Grounding one conductor of a two conductor outlet is not sufficient protection.

Any interruption of the protective (grounding) conductor (inside or outside the instrument or disconnecting the protective earth terminal is likely to make this instrument dangerous.

1-14. INSTRUMENTS COVERED BY MANUAL

1-15. Attached to the instrument is a serial number plate (Figure 1-2). The serial number is in two parts. The first four digits and the letter are the serial number prefix; the last five digits are the suffix. The prefix is the same for all identical instruments; it changes only when a change is made to the instrument. The suffix, however, is assigned sequentially and is different for each instrument. The contents of this manual apply to instruments with the serial number prefix(es) listed under SERIAL NUMBERS on the title page.

Figure 1-2. Typical Serial Number Plate

1-16. An instrument manufactured after the printing of this manual may have a serial number prefix that is not listed on the title page. This unlisted serial number prefix indicates the instrument is different from those described in this manual. The manual for this newer instrument is accompanied by a yellow Manual Changes supplement. This supplement contains "change information" that explains how to adapt the manual to the newer instrument.

1-17. DESCRIPTION

1-18. HP Model 8501A Storage Normalizer is an accessory that increases the measurement capability of the HP 8505A Network Analyzer by offering the following features: (a) Digital Storage; (b) CRT Labeling; (c) Normalization, and (d) Averaging. Digital storage for a flicker free display and CRT labeling of the major control settings provide easy documentation of a measurement. Normaliza-

Table 1-1. Model 8501A Storage-Normalizer Operating Characteristics

RECTANGULAR DISPLAY:	
Horizontal Display Resolution:	500 points displayed full scale (0.2% or full scale) plus 100% overrange. May vary from 500 points above and zero below to zero above and 500 below.
Vertical Display Resolution:	
POLAR DISPLAY:	
Display Resolution:	Two display channels, 250 points per polar display (0.2% of full scale).
HORIZONTAL INPUT SWEEP RATE:	100 sec max/10 ms min
CONVERSION TIME:	10 ms max for 500 ±2 data points
DISPLAY REFRESH TIME:	Approximately 20 ms to 60 ms, depending upon information displayed.
DISPLAY TRACKING:	Visual offsets between direct 8505A and stored displays are approximately ±½ CRT minor division (±1 mm).
CHANNEL 1 AND 2 INPUTS:	−2.5 to +2.5V nominal for full scale.
INPUT SWEEP VOLTAGE	0 to 13V nominal.
EXTERNAL TRIGGER:	High to low transition (standard TTL levels) initiates data processing
XYZ DISPLAY OUTPUTS:	X – 1V full screen, 83 mV/div (12 div). Y – 1V full screen, 100 mV/div (10 div). Z – – 1 volt blanks display, +2 volts unblanks display. (Signal compatible with HP CRT displays).
HP-IB INTERFACE CAPABILITIES	
Input Data:	Data for graphics or other purposes can be sent to the 8501A at a rate of: ASCII mode, 600 points per second. Binary mode, 10000 points per second.
Output Data:	Data can be read from the 8501A at a rate of: ASCII mode, 800 points per second. Binary mode, 9000 points per second.
POWER REQUIREMENT:	Selection of 100, 120, 220, or 240V +5% – 10%. 50 to 60 Hz and <140 VA (<140 watts).
DIMENSIONS:	426 mm wide, 90 mm high, 534 mm deep (16¾ in. x 3½ in. x 21 in.)
WEIGHT:	Net, 12.25 kg (27 lb). Shipping, 14 kg (31 lb).

tion is useful in removing frequency response error from the CRT display. The 8501A can digitally average signals to improve the signal-to-noise ratio and magnify the display for greater resolution. With a desk-top computer, such as the 9830A/B or 9825A, graphics capability is added to the 8505A for displaying corrected data, operator messages, or computer programs.

1-19. HEWLETT-PACKARD INTERFACE BUS (HP-IB)

1-20. The HP 8501A is factory equipped with a remote programming interface using the Hewlett-Packard Interface Bus (HP-IB). This provides a remote operator with the same control of the instrument available to a manual (local) operator. Remote control is maintained by a system controller (desk-top computer, computer, etc.) that sends commands or instructions to and receives data from the 8501A using the HP-IB. The HP-IB is Hewlett-Packard's implementation of the IEEE Standard 488-1975. A complete general description of the HP-IB is provided in the manual entitled "Condensed Description of the Hewlett-Packard Interface Bus", HP Part No. 59401-90030.

1-21. OPTIONS

1-22. Option 907 Front Handle Kit

1-23. Option 907, HP Part Number 5061-0088, contains front handles and necessary hardware for attaching the handles. See Figure 2-4 for installation procedure.

1-24. Option 908 Rack Flange Kit

1-25. Option 908, HP Part Number 5061-0076, contains flanges and hardware required to mount the 8501A in an equipment rack with 482.6 mm (19 inches) horizontal spacing. See Figure 2-4 for installation procedure.

1-26. Option 909 Rack Flange/Front Handle Kit

1-27. Option 909, HP Part Number 5061-0082, consists of one Option 907 Front Handle Kit and one Option 908 Rack Flange Kit (see descriptions above.) See Figure 2-4 for installation procedure.

1-28. Option 910 Additional Operating and Service Manuals

1-29. Option 910 provides additional Operating and Service manual(s). The number of additional manuals depends on quantity of Option 910's ordered. To obtain additional Operating and Service manuals after initial shipment, order by manual part number (refer to title page or rear cover of manual).

1-30. ACCESSORIES SUPPLIED

1-31. Figure 1-1 shows the HP Model 8501A Storage-Normalizer, line power cable, normalizer interconnect cable, and the HP-IB interconnect cable. The lock feet kit shown may be used to lock the 8501A on top of the 8505A.

1-32. EQUIPMENT REQUIRED BUT NOT SUPPLIED

1-33. To use the HP-IB capabilities, a computing controller such as the HP Model 9825A or 9830A/B is needed. An 8505A Network Analyzer without the Model 11864A 8501A/8505A Labeling Interface Kit installed will operate with the 8501A; however, to obtain 8505A CRT annotation, the kit must be installed.

1-34. EQUIPMENT AVAILABLE

1-35. Extender Board 08501-60031

1-36. The extender board (HP Part Number 08501-60031) has jumper pins on each trace so that traces may be opened as an aid in servicing.

1-37. Large Screen and Auxiliary CRT Displays

1-38. The use of an external CRT Display, such as HP Models 1304A, 1310A or 1332A, allows the operator to make adjustments on test devices without removing a camera from the 8505A CRT display.

1-39. RECOMMENDED TEST EQUIPMENT

1-40. Equipment required for incoming inspection, performance testing and troubleshooting of the Hewlett-Packard Model 8501A Storage-Normalizer is listed in Table 1-2. Other equipment may be substituted if it meets or exceeds the critical specifications listed in the table.

Table 1-2. Recommended Test Equipment

Instrument	Critical Specifications	Recommended Model	Use*
Oscilloscope with Dual Channel Plug-In 10:1 Probe (3 required)	Vertical Bandwidth: dc to 100 MHz Trigger: Internal or External	HP 180C/1801A/1821A	P, A, T
200 MHz Bandpass Filter	Center Frequency =200 MHz Bandwidth =10 MHz (NOTE: Other frequency units may be used; however, 8505A START-STOP frequencies must be set to include passband.)	Telonic Model TBA200-10-4EF1	P
Desk top Computer	HP 9825A: 23K bytes memory, 98210A String-Advanced Programming, 98214A Plotter-General I/O - Extended I/O, 98034A HP-IB Interface, or HP 9830A/B: 8K words memory, I/O ROM String Variable ROM, 59405A-H02-H30 HP-IB interface, or other HP models with proper programming, memory, and interface.	HP 9825A or 9830A/B	P, A, T
Digital Multimeter	Range: DC to 300 volts Accuracy: ±0.4% of reading	HP 3465A	T
Normalizer Interconnect Cable	No substitutes. Supplied with 8501A.	HP 08501-60067	P, A, T
Labeling Interconnect Cable	No substitutes. Supplied with 8501A.	HP 08501-60068	P, A, T
HP-IB Cable (3 required)	No substitutes	HP 10631A	P, A, T
Extender Board	Supplied with 8501A	08501-60021	T
Extender Board	Jumper pins on each trace	08501-60031	T
Network Analyzer	No substitutes	HP 8505A	P, A, T
Signature Analyzer	No substitutes	HP 5004A	T
Logic Pulser	No substitutes	HP 546A	T
Logic Probe	No substitutes	HP 545A	T

*P =Performance; T =Troubleshooting; A =Adjustment.