

Table A1-1. 8505A Network Analyzer Specifications (1 of 3)

SOURCE

FREQUENCY CHARACTERISTICS

Frequency Range: 500 kHz to 1.3 GHz in three ranges; 500 kHz to 13 MHz, 500 kHz to 130 MHz and 500 kHz to 1.3 GHz.

Swept Frequency Accuracy: $\pm 1\%$ of range for linear sweep.

CW Frequency Accuracy: ± 2 counts \pm time-base accuracy.

Frequency Stability: better than $\pm 0.01\%$ of reading $\pm 0.01\%$ of frequency range over 10 minutes after warm up.

FREQUENCY COUNTER CHARACTERISTICS

Frequency counter measurements are made at any one of five continuously variable marker positions without interrupting the swept RF signal.

Accuracy:

Counter: ± 2 counts \pm time-base accuracy.

Marker Frequency: $\pm 0.002\%$ of scan width \pm counter accuracy.

Time Base Accuracy: ± 5 ppm ± 1 ppm/ $^{\circ}\text{C}$ ± 3 ppm/90 days

OUTPUT CHARACTERISTICS

Power:

Range: +10 dBm to -72 dBm.

Accuracy:

Attenuator: ± 1.5 dB over 70 dB range.

Vernier: ± 1 dB

Levelling: ± 0.5 dB from 500 kHz to 1.3 GHz.

✓ **Impedance:** 50Ω ; ≥ 16 dB return loss at -10 dBm output level (< 1.38 SWR).

✓ **Spectral Purity:**
Residual FM:

Frequency Range (MHz)	0.5 to 13	0.5 to 130	0.5 to 1300
Residual FM (Hz rms)	20 Hz	200 Hz	2 kHz
Measurement Bandwidth	20 Hz – 1 kHz	20 Hz – 1 kHz	20 Hz – 10 kHz

Harmonics: > 25 dB below main signal at +10 dBm output level. Typically > 40 dB below main signal at -12 dB setting of vernier.

Sub-harmonics and Spurious Signals: Below -50 dBm at +10 dBm output level.

RECEIVER

FREQUENCY RANGE

500 kHz to 1.3 GHz.

INPUT CHARACTERISTICS

Input Channels: Three channels (R, A, and B) with 100 dB dynamic range.

Maximum Input Level (Selectable): -10 dBm or -30 dBm input level.

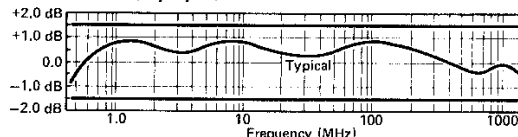
Noise (10 kHz BW): -110 dBm from 10 to 1300 MHz; -100 dBm from 2 to 10 MHz; -95 dBm from 0.5 to 2 MHz. Typically, -120 dBm using the -30 dBm input level position and 1 kHz BW.

✓ **Impedance:** 50Ω ; ≥ 20 dB return loss (< 1.22 SWR). Typically > 26 dB return loss (< 1.11 SWR).

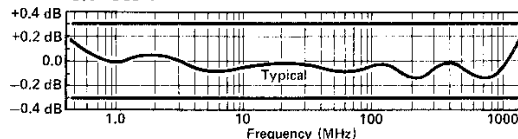
MAGNITUDE CHARACTERISTICS

Frequency Response:

Absolute (A, B, R): ± 1.5 dB.



Ratio (A/R, B/R): ± 0.3 dB from 0.5 MHz to 1.3 GHz.



Dynamic Accuracy:

± 0.01 dB/dB from -20 to -40 dBm.
 ± 0.2 dB from -10 to -50 dBm.
 ± 0.5 dB from -50 to -70 dBm.
 ± 1.0 dB from -70 to -90 dBm.
 ± 2.0 dB from -90 to -100 dBm.
 ± 4.0 dB from -100 to -110 dBm.

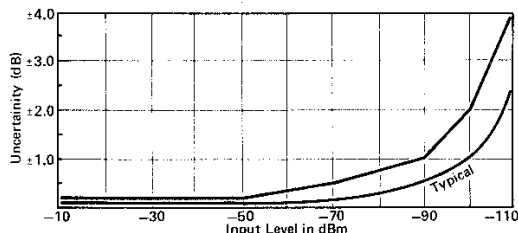
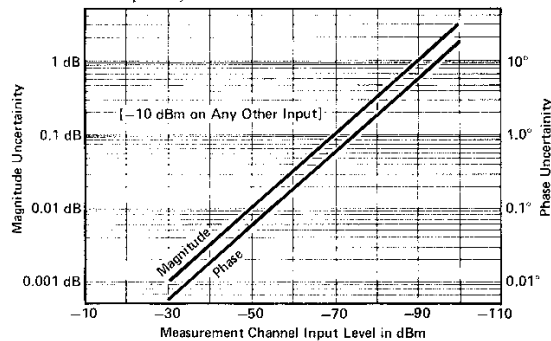


Table A1-1. 8505A Network Analyzer Specifications (2 of 3)

Crosstalk Error Limits: (≥ 100 dB isolation between inputs.)



Reference Offset:

Range: ± 199.9 dB.

Accuracy: ± 0.03 dB ± 0.003 dB/dB of offset.

Resolution:

Marker Measurement: 0.01 dB over any < 10 dB range; 0.1 dB for ≥ 10 dB range.

CRT Display: 0.1 dB to 20 dB/division in 1, 2, 5 sequence.

Crosstalk: See amplitude crosstalk specifications.

Reference Offset:

Range: ± 1700 degrees.

Accuracy: $\pm 0.3^\circ \pm 0.5\%$ of offset.

Resolution:

Marker Measurement: 0.1° over $< 100^\circ$ range and 1° for $\geq 100^\circ$ range.

CRT Display: 1° to 180° per division in 8 steps.

POLAR CHARACTERISTICS

Frequency Response, Dynamic Response, Reference Offset and Marker Measurement specifications are the same as magnitude and phase characteristics.

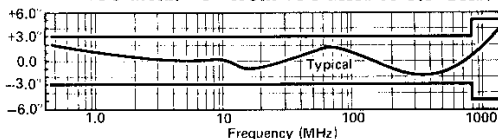
CRT Display Accuracy: Actual value is within less than a 3 mm circle of the displayed value.

Tracking Between dB Offset Controls and Polar Full switch positions: ≤ 0.2 dB.

CRT Display Resolution: Magnitude graticules at 20% of full scale spacing; phase graticules at 10° increments around unit circle.

PHASE CHARACTERISTICS

Frequency Response: $\pm 3^\circ$ from 500 kHz to 750 MHz. $\pm 5^\circ$ from 750 MHz to 1.3 GHz.



Range: $\pm 180^\circ$.

Accuracy: $\pm 0.01^\circ/\text{degree}$ for $\pm 170^\circ$
 $\pm 0.01^\circ/\text{degree} \pm 0.5^\circ$ for $\pm 180^\circ$

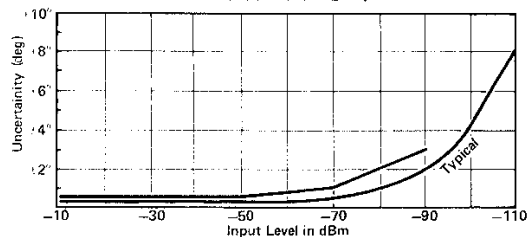
Dynamic Accuracy (in 10 kHz Bandwidth):

$\pm 0.02^\circ/\text{dB}$ from -20 to -40 dBm.

$\pm 0.5^\circ$ from -10 to -50 dBm.

$\pm 1^\circ$ from -50 to -70 dBm.

$\pm 3^\circ$ from -70 to -90 dBm.



DELAY CHARACTERISTICS

Frequency Response: ± 1 ns from 500 kHz to 1.3 GHz

Delay Accuracy³: $\pm 3\%$ of reading ± 3 units.

(Units = 1 nsec for 0.5 to 1300 MHz range, 10 nsec for 0.5 to 130 MHz range, and 100 nsec for 0.5 to 13 MHz range.)

Range, Resolution and Aperture²

Frequency Range (MHz)	0.5 to 13	0.5 to 130	0.5 to 1300
Range	0 to 80 μs	0 to 8 μs	0 to 800 ns
Resolution			
CRT:	100 ns	10 ns	1 ns
Marker:	100 ns	10 ns	1 ns
Marker over limited Range:	10 ns ($< 1 \mu\text{s}$)	1 ns (≤ 100 ns)	0.1 ns (≤ 10 ns)
Aperture ²	7 kHz	20 kHz	200 kHz

Reference Offset:

Range: ± 1999 units.

Accuracy: ± 0.3 units $\pm 0.3\%$ of offset.

Table A1-1. 8505A Network Analyzer Specifications (3 of 3)

ELECTRICAL LENGTH/REF. PLANE EXTENSION CHARACTERISTICS				Accuracy: $\pm 3\%$ of reading $\pm 1\%$ of range.
Calibrated Electrical Length: Range and Resolution: ³				Resolution: 10°
Frequency Range (MHz)	0.5 to 13	0.5 to 130	0.5 to 1300	Vernier Range: Continuously variable over $>10^\circ$ range.
Range	x1	± 19.9 m	± 1.99 m	Accuracy: $\pm 3\%$ of reading $\pm 10^\circ/\text{scan}$.
	x10	± 100 m	± 10 m	
Resolution	x1	10 cm	1 cm	Phase Compensation Linearity: $< \pm 0.2\%$ of phase slope inserted.
	x10	1 m	10 cm	
				Dimensions: 426 mm wide, 279 mm high, 553 mm deep (16-3/4 in. x 11 in. x 21-3/4 in.).
				Weight:
				Net, 36 kg (86 lb)
				Shipping, 48 kg (106 lb)

¹ +3 Units may be calibrated out.

² Typical measurement Aperture using linear FM modulation technique.

³ Vernier provides continuous adjustment of electrical length.

Table A1-2. Typical Operating Characteristics (1 of 2)

SOURCE				Typical CW Noise (SSB in 1 Hz BW):			
Swept Frequency Resolution: (Verniers provide continuous frequency adjustment.)				Frequency Range (MHz)	0.5 to 13	0.5 to 130	0.5 to 1300
Frequency Range (MHz)	0.5 to 13	0.5 to 130	0.5 to 1300	dB below carrier	70	85	100
Start/Stop	10 kHz	100 kHz	1 MHz	Frequency offset from carrier	1 kHz	10 kHz	150 kHz
CW $\pm \Delta F$	10 kHz 1 kHz	100 kHz 10 kHz	1 MHz 100 kHz				
CW	100 Hz	1 kHz	10 kHz				
Frequency Counter Resolution: (Least Significant digit)				SOURCE General Characteristics:			
Frequency Range (MHz)	0.5 to 13	0.5 to 130	0.5 to 1300	Sweep Modes: Linear Full, Log Full, Start/Stop 1, Start/Stop 2, Alternate, CW $\pm \Delta F$, and CW.			
10 ms Sweep Time	10 kHz	100 kHz	1 MHz	Sweep Times: 10 ms to 100 seconds in decade ranges with vernier adjustment or manual sweep using vernier.			
100 ms Sweep Time	1 kHz	10 kHz	100 kHz	Trigger Modes: Auto, line sync., single scan or external sync. up to 50 kHz rate with ≥ 2 Vpp and ≥ 1 μ s trigger signal.			
>1 second Sweep Time	100 Hz	1 kHz	10 kHz	RF Output Connector: Type N Female.			

Table A1-2. Typical Operating Characteristics (2 of 2)

RECEIVER	
Input Damage Level: +20 dBm or ≥ 50 Vdc.	General Characteristics (Cont'd)
Full Scale Polar Magnitude Range: 1 to 0.01 in a 1, 0.5, 0.2 sequence.	Display Bandwidth: Selectable IF bandwidths of 10 kHz and 1 kHz. A video filter position is also provided.
Electrical Length Linearity: $\Delta\phi = 0.5\% \times 1.2f$ (MHz) \times 1 (meters)	CRT Background Illumination: Illumination control provided for CRT photography.
Linear Phase Substitution (degrees/scan):	CRT Overlays: Smith Charts (3.16, 1, 0.5, 0.2, 0.1 full scale), Log Charts (10 MHz, 100 MHz and 1000 MHz). HP Part No. 08505-60154.
Range: $\pm 1700^\circ$ per scan with 0° offset. $\frac{\pm 1.4 \text{ km}}{\text{scan width (MHz)}} \text{ or } \frac{\pm 4.7 \text{ } \mu\text{sec}}{\text{scan width (MHz)}}$	CRT Camera Adaptor: Hewlett-Packard 197A Option 006 camera is a direct fit. Camera bezel adaptor model 10375A is required to convert the standard 197A camera to fit the 8505A display.
Magnitude Offset	Auxiliary Outputs:
Typical Maximum Offset between -10 and -30 dBm Input Level Position: ± 0.2 dB (excluding dynamic accuracy).	Channel 1 and 2 Outputs: 0.25 V/display division with 2 k Ω source impedance.
Typical Maximum Offset between 10 kHz and 1 kHz BW Positions: ± 0.2 dB (excluding dynamic accuracy).	Sweep Output: 0.25 V/display division with 2 k Ω source impedance.
Phase Offset	Pen Lift: DC coupled, 200 mA current sink.
Typical Maximum Offset between -10V and -30 dBm Input Level Position: $\leq \pm 2.0^\circ$ (excluding dynamic accuracy).	Power Requirements: 100, 120, 220, or 240 Vac $\pm 5\%$ -10%, 50 to 60 Hz, approximately 275 watts. (Total for Signal Processor and Source/Converter-Frequency Control units.)
Typical Maximum Offset between 10 kHz and 1 kHz BW Position: $\leq \pm 5^\circ$ (excluding dynamic accuracy).	
General Characteristics:	
RF Input Connectors: Type N Female.	
CRT Reference Position: Reference lines for Channel 1, Channel 2, and beam center (in Polar) may be independently set to any position on the CRT Display.	

A1-42. TEST SETS AND ACCESSORIES AVAILABLE

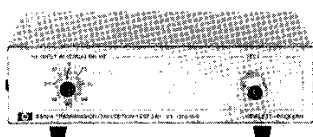
A1-43. Test sets and accessories available for use with the 8505A are listed with their specifications in Table A1-3.

A1-8

A1-44. RECOMMENDED TEST EQUIPMENT

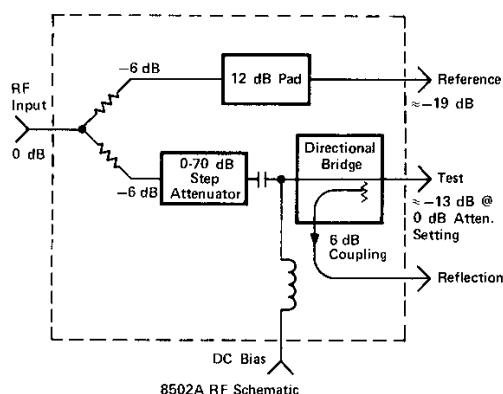
A1-45. Equipment recommended for testing and troubleshooting the 8505A Network Analyzer is listed in Table A1-4. Other equipment may be substituted for the equipment listed, providing it meets or exceeds the critical specifications indicated in the table.

Table A1-3. Test Sets and Accessories (1 of 7)



8502A
50 Ω TRANSMISSION/REFLECTION TEST SET

8502B
75 Ω TRANSMISSION/REFLECTION TEST SET¹



Frequency Range: 500 kHz to 1.3 GHz.

Impedance: 8502A, 50 Ω ; 8502B, 75 Ω .

Directivity: ≥ 40 dB.

Frequency Response²:

Transmission: $\leq \pm 0.8$ dB Magnitude and $\leq \pm 8^\circ$ Phase.

Reflection: $\leq \pm 1.5$ dB Magnitude and $\leq \pm 15^\circ$ Phase from 0.5 to 1300 MHz; $\leq \pm 10^\circ$ Phase from 2 to 1300 MHz.

Port Match:

Test Port: ≥ 26 dB Return Loss from 2 to 1300 MHz (≤ 1.12 SWR); ≥ 20 dB Return Loss from 0.5 to 2 MHz (1.22 SWR).

Test Port Open/Short Ratio: ± 0.75 dB Magnitude and $\pm 6^\circ$ Phase from 2 to 1000 MHz; ± 0.9 dB Magnitude and $\pm 7^\circ$ Phase from 1000 to 1300 MHz; ± 1.25 dB Magnitude and $\pm 10^\circ$ Phase from 0.5 to 2 MHz.

Reference and Reflection Port²: ≥ 25 dB Return Loss from 2 to 1000 MHz (≤ 1.12 SWR); ≥ 23 dB Return Loss 0.5 to 1300 MHz (≤ 1.15 SWR).

Input Port³: ≥ 23 dB Return Loss (≤ 1.15 SWR).

Insertion Loss:

Input to Test Port: 13 dB.

Input to Reference Port: 19 dB.

Input to Reflection Port: 19 dB.

Maximum Operating Level: $\leq +20$ dBm.

Damage Level: > 1 watt CW.

RF Attenuator Range: 0 to 70 dB in 10-dB steps.

DC Bias Input Range: ± 30 V dc, ± 200 mA, some degradation of RF specification 0.5 to 100 MHz; 500 mA maximum.

RF Connectors: 8502A, 50 Ω Type N Female; 8502B Test Port 75 Ω Type N Female, all other RF connectors 50 Ω Type N Female.

DC Bias Input Connector: BNC Female.

Includes: 8502B includes a 50 Ω to 75 Ω minimum loss pad (11852A).

Recommended Accessory: 11851A Cable Kit:

11853A 50 Ω N Accessory Kit for 8502A.

11855A 75 Ω N Accessory Kit for 8502B.

Dimensions: 101 mm wide, 61.5 mm high, 204 mm deep (7½ in. x 2-7/16 in. x 8 in.).

Weight:

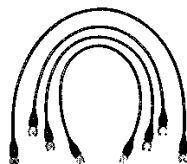
Net, 1.7 kg (3-3/4 lb).

Shipping, 3.1 kg (7 lb).

¹ Tentative specification for 8502B.

² \pm degrees specified as deviation from linear phase.

³ Other ports terminated in their characteristic impedance.



11851A
RF CABLE KIT

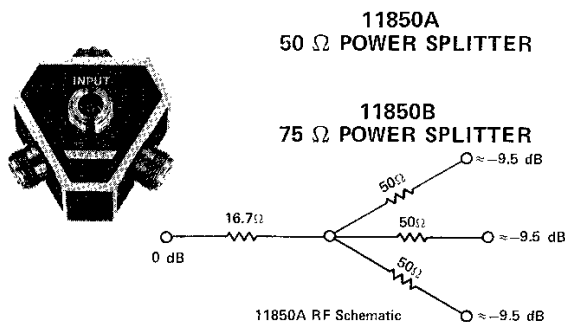
Function: Provides the necessary RF interconnections and RF shielding required for 8505A Network Analyzer measurements when using the 8502A, 8502B Transmission Reflection Test Sets or the 11850A, 11850B Power Splitters.

Kit Includes: Three 61 cm (24 in.) 50 Ω cables, phase matched to 4° at 1.3 GHz and one 86 cm (34 in.).

Connectors: 50 Ω Type N Male.

Weight: Net 0.91 kg (2 lb). Shipping, 1.36 kg (3 lb).

Table A1-3. Test Sets and Accessories (2 of 7)



Frequency Range: 500 kHz to 1.3 GHz.

Frequency Response (Absolute): Input to Output $\leq \pm 0.2$ dB.

Nominal Insertion Loss: 9.54 dB for 11850A; 7.78 dB for 11850B.

Impedance: 11850A, 50 Ω ; 11850B, 75 Ω .

Tracking Between Any Two Output Ports: ≤ 0.1 dB Magnitude and $\leq 1.5^\circ$ Phase.

Port Match:

Output Ports: ≥ 32 dB Return Loss (≤ 1.05 SWR).

Input Port: ≥ 20 dB Return Loss (≤ 1.2 SWR).

Maximum Operating Level: $\leq +20$ dBm input.

Burn-out Level: ≥ 1 watt CW.

RF Connectors: 11850A, 50 Ω Type N Female; 11850B Test Ports (3) 75 Ω Type N Female, RF input 50 Ω Type N Female.

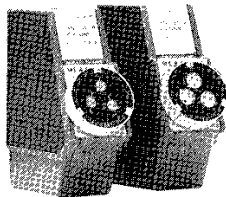
Recommended Accessory: 11851A Cable Kit.

Includes: 11850B includes three 50 Ω to 75 Ω minimum loss pads (11852A).

Dimensions: 67 mm wide, 46 mm high, 67 mm deep (2-5/8 in. x 1-7/8 in. x 2-5/8 in.).

Weight: Net, 1.8 kg (4 lb).
Shipping, 3.1 kg (7 lb)

¹ Tentative specification for 11850B.



**11600B/11602B
TRANSISTOR
FIXTURES**

Function: These units allow RF measurements to be made on leaded transistors. Either fixture provides common emitter, base, and collector for bipolar, and common source, gate, and drain for FET's. Other devices also fit the fixtures (tunnel diodes, diodes, etc.).

Transistor Base Patterns:

Model 11600B: Accepts TO-18/TO-72 packages. Will also accept any 3 or 4 lead packages with leads that lie on a 0.1-inch circle and whose diameters are 0.016 to 0.019 inch.

Model 11602B: Accepts TO-5/TO-12 packages. Will also accept any 3 or 4 lead package with leads that lie on a 0.2-inch circle and whose diameters are 0.016 to 0.019 inch.

Calibration References: Included for calibration of the transistor fixtures are two calibration references; a short circuit termination and a 50 Ω through-section.

Lead Lengths: Up to 1.5 inches long.

Frequency Ranges: DC to 2 GHz.

Impedance: 50 Ω nominal.

Return Loss: > 26 dB, 100 MHz to 1.0 GHz; > 21 dB from 1 to 2 GHz.

Connectors: Hybrid APC-7 precision connections.

Option 001: Type N Female connectors.

Recommended Accessory: The 11858A Rigid RF cable Interconnect Adapter is recommended for measurements using the 8503A S-parameter Test Set.

Option 003: Includes 11858A Rigid Interconnect Adapter for use with 8503A.

Maximum Power: 10W including RF signals.

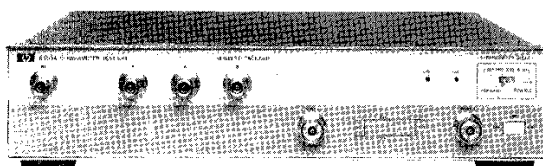
Weight:

Net, 1.1 kg (2-3/8 lb).
Shipping, 1.8 kg (4 lb).

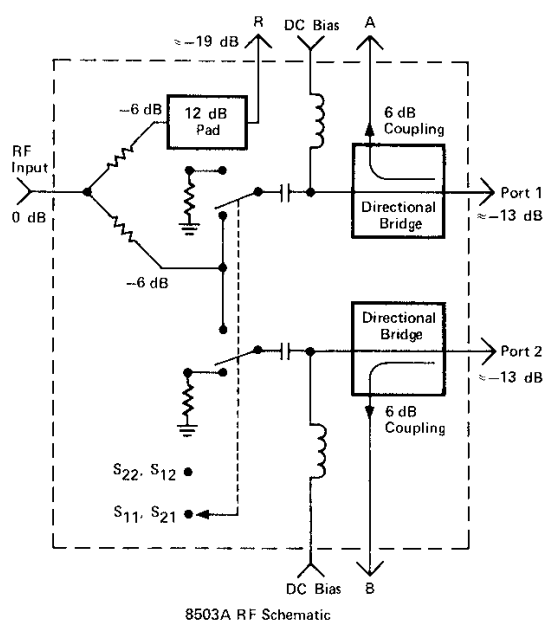
Dimensions:

44 mm wide, 152 mm high, 229 mm deep (1-3/4 in. x 6 in. x 9 in.).

Table A1-3. Test Sets and Accessories (3 of 7)



8503A
50 Ω S-PARAMETER TEST SET
8503B
75 Ω S-PARAMETER TEST SET



Frequency Range: 500 kHz to 1.3 GHz.

Impedance: 50 Ω .

Directivity: ≥ 40 dB.

Frequency Response:

Transmission¹ (S21, S12): ± 1 dB, $\pm 12^\circ$ from 0.5 to 1300 MHz.

Reflection¹ (S11, S22): ± 2 dB, $\pm 20^\circ$ from 0.5 to 1300 MHz, $\pm 15^\circ$ from 2 to 1300 MHz.

Port Match²:

8503A, Test Port 1 and 2: ≥ 28 dB Return Loss from 2 to 1000 MHz; ≥ 26 dB Return Loss from 1000 to 1300 MHz (≤ 1.11 SWR); ≥ 20 dB Return Loss from 0.5 to 2 MHz (≤ 1.22 SWR).

8503B, Test Port 1 and 2: ≥ 24 dB Return Loss from 2 to 1300 MHz; ≥ 18 dB Return Loss from 0.5 to 2 MHz.

8503A, Test Port 1 and 2 Open/Short Ratio: $\leq \pm 0.75$ dB Magnitude and $\pm 6^\circ$ from 2 to 1000 MHz; ≤ 0.9 dB Magnitude and $\pm 7.5^\circ$ from 1000 MHz to 1300 MHz; ± 1.25 dB Magnitude, $\pm 10^\circ$ Phase from 0.5 to 2 MHz.

8503B, Test Port 1 and 2 Open/Short Ratio: $\leq \pm 0.9$ dB Magnitude and $\pm 7.5^\circ$ from 2 to 1300 MHz; $\leq \pm 1.25$ dB Magnitude and $\pm 10^\circ$ from 0.5 to 2 MHz.

Reference and Return Ports: ≥ 23 dB Return Loss from 2 to 1000 MHz (≤ 1.15 SWR); ≥ 20 dB Return Loss from 0.5 to 2 MHz and 1000 to 1300 MHz (≤ 1.22 SWR).

RF Input Port: ≥ 20 dB Return Loss from 0.5 to 1300 MHz (≤ 1.22 SWR).

Tracking Between Reference and Test Port 1 and 2: **Transmission¹ (S21, S12):** $\leq \pm 0.5$ dB Magnitude and $\leq \pm 4^\circ$ Phase.

Reflection¹ (S11, S22): $\leq \pm 0.75$ dB Magnitude and $\leq \pm 6^\circ$ Phase.

RF Input to Test Port 1 or 2: $\leq \pm 1.5$ dB.

Insertion Loss:

Input to Port 1 and 2:
 13 dB Nominal

Input to Port A, B, or R:
 19 dB Nominal

Maximum Operating Level: +20 dBm

Damage Level: 1 watt CW

Connectors:

Test Ports: APC-7.

All Other RF Ports: 50 Ω Type N Female.

DC Bias Inputs: BNC Female.

DC Bias Input Range: ± 30 Vdc, ± 200 mA, some degradation of RF specifications 0.5 to 100 MHz; 500 mA maximum.

Includes: Four 19 cm (7½ in.) cables with Type N Male connectors for connection to 8505A.

Recommended Accessory: 11857A Test Port Extension Cables.

Power: Selection of 100, 120, 220, or 240V +5%–10%, 50 or 60 Hz., approximately 10 watts.

Dimensions: 432 mm wide, 90 mm high, 495 mm deep (17 in. x 3½ in. x 19½ in.).

Weight: Net, 9.1 kg (20 lb). Shipping, 11.3 kg (25 lb).

¹ \pm Degrees, specified as deviation from Linear Phase.

² Effective Port match for ratio measurement.

Table A1-3. Test Sets and Accessories (4 of 7)

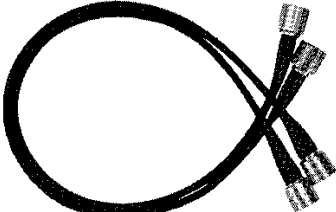
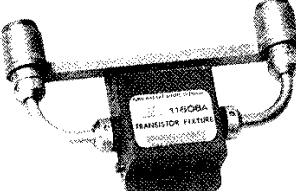

<p>11857A/B/C¹ TEST PORT EXTENSION CABLES</p>  <p>¹11857A is 50 ohm cable with APC-7 connectors. 11857B is 75 ohm cable with Type-N 75 ohm male connectors on one end and Type-N 75 ohm female connectors on the other end. 11857C is 75 ohm cable with Type-N 75 ohm male connectors on one end and GR-900 75 ohm connectors on the other end.</p>	<p>Function: Two precision cables extend the 8503A test ports for convenient measurement of devices having any two-port geometry.</p> <p>Kit Includes: Two 61 cm (24 in.) cables, phase matched to 2° at 1.3 GHz</p> <p>Connectors: APC-7.</p> <p>Weight: Net, 0.91 kg (2 lb). Shipping, 1.36 kg (3 lb).</p>
 <p>11608A TRANSISTOR FIXTURE</p> <p>Function: Provides the capability of completely characterizing stripline transistors in either the TO-51 or HPAC-200 package styles. For special package styles, a through-line microstrip and bolt-in grounding structure machinable by customer is available.</p> <p>Frequency Range: DC to 12.4 GHz.</p> <p>Impedance: 50 Ω nominal.</p> <p>Return Loss: >26 dB dc to 4 GHz; >23 dB 4.0 to 8.0 GHz; >19 dB to 12.4 GHz.</p> <p>Microstrip Material: 0.031 in. polyphenylene oxide (P.P.O.); 0.080 in. wide 50 Ω stripline.</p>	<p>Package Styles: Option 001: Through-line microstrip (P.P.O. plastic) and bolt-in grounding structure machinable by customer for special package styles.</p> <p>Option 002: TO-51 (0.250 in. dia.).</p> <p>Option 003: HPAC-200 (0.205 in. dia.).</p> <p>Calibration References: Options 002 and 003 are supplied with two calibration references; a short circuit termination and a 50 Ω through-section.</p> <p>Connectors: APC-7 Hybrid connectors. Mates with 8503A and 8746B S-parameter Test Units. Option 100: Type N Female connectors.</p> <p>Maximum Power: 10 W including RF signals.</p> <p>Weight: Net, 0.9 kg (2 lb). Shipping, 1.4 kg (3 lb).</p> <p>Dimensions: 143 mm wide, 25 mm high, 89 mm deep (5-5/8 in. x 1 in. x 3 1/2 in.).</p>
 <p>1121A AC PROBE</p> <p>Function: For making signal measurements without disturbing circuitry and for measuring voltage transfer functions in impedance systems radically different from 50 Ω. Furnished with 10:1 and 100:1 divider and BNC adapter.</p> <p>Bandwidth (3 dB): 1 kHz to >500 MHz.</p> <p>Gain: 0 dB \pm 1 dB.</p> <p>Frequency Response: 1 kHz to 100 MHz, \pm0.5 dB, \pm2°.</p>	<p>Input Impedance: 100 kΩ, shunt capacitance 3 pF at 100 MHz. With 10:1 or 100:1 divider, 1 MΩ shunt capacitance 1 pF at 100 MHz.</p> <p>Output Impedance: 50 Ω nominal.</p> <p>Maximum Input: 300 mV rms, \pm100 V dc. With 10:1 divider, 3 V rms, \pm350 V dc. With 100:1 divider, 30 V rms, \pm350 V dc.</p> <p>Power: Supplied by 8505A through PROBE PWR jacks. Warning: The output of the 1121A is direct coupled and has an output voltage of approximately -2 to -4 V. The output must not be dc coupled or the probe may be permanently damaged. If using the 1121A with instruments other than the 8505A, or if an attenuator pad is to be used at the probe output, be sure a blocking capacitor is provided. Model 10240B or equivalent can be used.</p> <p>Weight: Net, 0.7 kg (1.5 lb). Shipping 1.2 kg (2.5 lb).</p>

Table A1-3. Test Sets and Accessories (5 of 7)

<p align="center">11852A 50 Ω to 75 Ω Minimum Loss Pad</p> <p>Function: A low SWR impedance conversion is required for accurate transmission measurements of 75 Ω devices using the 8505A Receiver (50 Ω). The Minimum Loss Pad provides a matched impedance in both directions, 50 Ω to the 8505A and 75 Ω to the device under test.</p> <p>Frequency Range: DC to 1.3 GHz. Insertion Loss: 5.7 dB Return Loss: ≥ 30 dB (≤ 1.06 SWR). Maximum Input Power: 250 mW (+24 dBm). Connectors: 50 Ω Type N Female to 75 Ω Type N Female Dimensions: Diameter 14 mm, length 70 mm (9/16 in. x 2-3/4 in.). Weight: Net 0.11 kg (4 oz). Shipping, 0.26 kg (9 oz).</p>	<p align="center">11855A 75 Ω Type N Accessory Kit</p> <p>Function: Provides the RF connecting hardware generally required for 75 Ω Type N component measurements using the 8502B Reflection/Transmission Test Set.</p> <p>Kit Includes:</p> <table border="1"> <thead> <tr> <th>Qty.</th><th>Description</th></tr> </thead> <tbody> <tr> <td>2</td><td>75 Ω Type N Male barrel.</td></tr> <tr> <td>2</td><td>75 Ω Type N Female barrel.</td></tr> <tr> <td>1</td><td>75 Ω Type N Male short circuit</td></tr> <tr> <td>1</td><td>75 Ω Type N Female short circuit</td></tr> <tr> <td>1</td><td>Storage Case</td></tr> </tbody> </table> <p>Dimensions: 254 mm wide, 64 mm high, 191 mm deep (10 in. x 2 1/2 in. x 7 1/2 in.). Weight: Net 0.91 kg (2 lb). Shipping, 1.36 kg (3 lb).</p>	Qty.	Description	2	75 Ω Type N Male barrel.	2	75 Ω Type N Female barrel.	1	75 Ω Type N Male short circuit	1	75 Ω Type N Female short circuit	1	Storage Case																
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2	75 Ω Type N Female barrel.																												
1	75 Ω Type N Male short circuit																												
1	75 Ω Type N Female short circuit																												
1	Storage Case																												
<p align="center">11853A 50 Ω Type N Accessory Kit</p> <p>Function: The 11853A furnishes the RF components generally required when using the 8502A, 11850A, and 8503A (8503A requires 85032A also) when measuring devices having 50 Ω Type N connectors. The characteristics of the components in this kit insure high quality RF measurements for those devices having 50 Ω Type N connectors.</p> <p>Kit Includes:</p> <table border="1"> <thead> <tr> <th>Qty.</th><th>Description</th></tr> </thead> <tbody> <tr> <td>1</td><td>Type N Female short circuit</td></tr> <tr> <td>1</td><td>Type N Male short circuit</td></tr> <tr> <td>2</td><td>Type N Male Barrel</td></tr> <tr> <td>2</td><td>Type N Female Barrel</td></tr> <tr> <td>1</td><td>Storage Case</td></tr> </tbody> </table> <p>Dimensions: 254 mm wide, 64 mm high, 191 mm deep (10 in. x 2 1/2 in. x 7 1/2 in.). Weight: Net 0.91 kg (2 lb). Shipping, 1.36 kg (3 lb).</p>	Qty.	Description	1	Type N Female short circuit	1	Type N Male short circuit	2	Type N Male Barrel	2	Type N Female Barrel	1	Storage Case	<p align="center">11856A 75 Ω BNC Accessory Kit</p> <p>Function: Provides the BNC connecting hardware required for test setups using the HP 8502B Transmission/Reflection Test Set, the HP 8503B S-Parameter Test Set, or the HP 11850B Power Splitter (75-ohm) to make measurements on devices with 75 Ω BNC connectors.</p> <p>Kit Includes:</p> <table border="1"> <thead> <tr> <th>Qty.</th><th>Description</th></tr> </thead> <tbody> <tr> <td>2</td><td>75 Ω Type N Male to BNC Female adapter</td></tr> <tr> <td>2</td><td>75 Ω Type N Male to BNC Male adapter</td></tr> <tr> <td>2</td><td>75 Ω Type N Female to BNC Male adapter</td></tr> <tr> <td>2</td><td>75 Ω Type N Female to BNC Female adapter</td></tr> <tr> <td>1</td><td>75 Ω BNC Male short circuit</td></tr> <tr> <td>1</td><td>BNC Male 75 Ω termination</td></tr> <tr> <td>1</td><td>Storage Case</td></tr> </tbody> </table> <p>Dimensions: 168 mm wide, 114 mm deep, 51 mm high (6-5/8 in. x 4-1/2 in. x 2 in.). Weight: Net: 0.91 kg (2 lb). Shipping: 1.36 kg (3 lb).</p>	Qty.	Description	2	75 Ω Type N Male to BNC Female adapter	2	75 Ω Type N Male to BNC Male adapter	2	75 Ω Type N Female to BNC Male adapter	2	75 Ω Type N Female to BNC Female adapter	1	75 Ω BNC Male short circuit	1	BNC Male 75 Ω termination	1	Storage Case
Qty.	Description																												
1	Type N Female short circuit																												
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2	Type N Male Barrel																												
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1	BNC Male 75 Ω termination																												
1	Storage Case																												
<p align="center">11854A 50 Ω BNC Accessory Kit</p> <p>Function: The 11854A furnishes the RF components generally required when using the 8502A, 11850A, and 8503A (8503A requires the 85032A also) when measuring devices having 50 Ω BNC connectors. The characteristics of the components in this kit insure high quality RF measurements for those devices having 50 Ω BNC connectors.</p> <p>Kit Includes:</p> <table border="1"> <thead> <tr> <th>Qty.</th><th>Description</th></tr> </thead> <tbody> <tr> <td>2</td><td>Type N Male to BNC Female adapter</td></tr> <tr> <td>2</td><td>Type N Male to BNC Male adapter</td></tr> <tr> <td>2</td><td>Type N Female to BNC Male adapter</td></tr> <tr> <td>2</td><td>Type N Female to BNC Female adapter</td></tr> <tr> <td>1</td><td>BNC Male short circuit</td></tr> <tr> <td>1</td><td>Storage Case</td></tr> </tbody> </table> <p>Dimensions: 254 mm wide, 64 mm high, 191 mm deep (10 in. x 2 1/2 in. x 7 1/2 in.). Weight: Net 1.13 kg (2 1/2 lb). Shipping, 1.59 kg (3 1/2 lb).</p>	Qty.	Description	2	Type N Male to BNC Female adapter	2	Type N Male to BNC Male adapter	2	Type N Female to BNC Male adapter	2	Type N Female to BNC Female adapter	1	BNC Male short circuit	1	Storage Case	<p align="center">11858A Rigid Interconnect Adapter</p> <p>Function: Provides a rigid RF cable interconnection (horizontal to vertical test port orientation) between the 8503A S-parameter Test Set and the 11600B/11602B Transistor Fixtures and 11604A Universal Extension (11604A information provided in 8410S data sheet).</p> <p>Connectors: APC-7</p> <p>Dimensions: 254 mm wide, 64 mm high, 191 mm deep (10 in. x 2 1/2 in. x 7 1/2 in.). Weight: Net 0.91 kg (2 lb). Shipping 1.36 kg (3 lb).</p>														
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1	Storage Case																												

Table A1-3. Test Sets and Accessories (6 of 7)

<p align="center">85010A/B 8507A/B—8501A Application PAC</p> <p>Function: Provides a cassette program that supplements the 85030A/B Application PAC. It provides faster data transfer and incorporates the normalization and averaging features of the 8501A.</p> <p>Includes: Cassette and Operating/Programming Manual.</p>	<p align="center">85032A 50 Ω Type N Calibration Kit</p> <p>Function: This kit is recommended for use with the 8503A S-parameter Test Set or 8507A Automatic Network Analyzer for measurement of devices having Type N RF connectors.</p> <p>Kit Includes:</p> <table border="1"> <thead> <tr> <th>Qty.</th><th>Description</th></tr> </thead> <tbody> <tr> <td>2</td><td>APC-7 to Type N Female adapter</td></tr> <tr> <td>2</td><td>APC-7 to Type N Male adapter</td></tr> <tr> <td>1</td><td>50 Ω Type N Female termination with <1.005 SWR at 2 GHz</td></tr> <tr> <td>1</td><td>50 Ω Type N Male termination with <1.005 SWR at 2 GHz</td></tr> <tr> <td>1</td><td>Type N Female short circuit</td></tr> <tr> <td>1</td><td>Type N Male short circuit</td></tr> <tr> <td>1</td><td>Storage Case</td></tr> </tbody> </table> <p>Dimensions: 254 mm wide, 64 mm high, 191 mm deep (10 in. x 2½ in. x 7½ in.).</p> <p>Weight: Net 1.13 kg (2½ lb). Shipping 1.59 kg (3½ lb).</p>	Qty.	Description	2	APC-7 to Type N Female adapter	2	APC-7 to Type N Male adapter	1	50 Ω Type N Female termination with <1.005 SWR at 2 GHz	1	50 Ω Type N Male termination with <1.005 SWR at 2 GHz	1	Type N Female short circuit	1	Type N Male short circuit	1	Storage Case												
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1	Type N Male short circuit																												
1	Storage Case																												
<p align="center">85030A 8507A/9830A Application PAC 85030B 8507B/9825A Application PAC</p> <p>Function: Provides three cassette programs. The Accuracy Enhancement Program (AIM-30 or AIM-25) improves measurement accuracy by removing mismatch, directivity and frequency tracking errors for both one-and two-port devices. The Verification Program operationally checks calculator/network analyzer interfaces. The Basic Measurements Program makes the features of Learn Mode and data printing, plotting (with 9862A Plotter), and normalization available to the non-programmer.</p> <p>Includes: Cassettes and Operating/Programmers Manual</p> <p>Weight: Net 0.91 kg (2 lb). Shipping 1.36 kg (3 lb).</p>	<p align="center">85033A SMA Calibration Kit</p> <p>Function: This kit is recommended for use with the 8503A S-parameter Test Set or 8507A Automatic Network Analyzer for measurement of devices having SMA RF connectors.</p> <p>Kit Includes:</p> <table border="1"> <thead> <tr> <th>Qty.</th><th>Description</th></tr> </thead> <tbody> <tr> <td>2</td><td>APC-7 to SMA Male adapter</td></tr> <tr> <td>2</td><td>APC-7 to SMA Female adapter</td></tr> <tr> <td>1</td><td>50 Ω SMA Female termination</td></tr> <tr> <td>1</td><td>50 Ω SMA Male termination</td></tr> <tr> <td>1</td><td>SMA Female short circuit</td></tr> <tr> <td>1</td><td>SMA Male short circuit</td></tr> <tr> <td>1</td><td>Storage Case</td></tr> </tbody> </table> <p>Dimensions: 254 mm wide, 64 mm high, 191 mm deep (10 in. x 2½ in. x 7½ in.).</p> <p>Weight: Net 1.13 kg (2½ lb). Shipping, 1.59 kg (3½ lb).</p>	Qty.	Description	2	APC-7 to SMA Male adapter	2	APC-7 to SMA Female adapter	1	50 Ω SMA Female termination	1	50 Ω SMA Male termination	1	SMA Female short circuit	1	SMA Male short circuit	1	Storage Case												
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1	SMA Female short circuit																												
1	SMA Male short circuit																												
1	Storage Case																												
<p align="center">85031A Verification and APC-7 Calibration Kit</p> <p>Function: This kit is furnished with the 8507A Automatic Network Analyzer and is used for verification of measurement system performance. 3 dB and 50 dB Pads are included for use with the 8507A's verification program which functionally checks all parts of the 8507A system. Test data on the pads is also provided.</p> <p>Kit Includes:</p> <table border="1"> <thead> <tr> <th>Qty.</th><th>Description</th></tr> </thead> <tbody> <tr> <td>1</td><td>APC-7 50 Ω Termination <1.005 SWR at 2 GHz</td></tr> <tr> <td>1</td><td>APC-7 Short Circuit</td></tr> <tr> <td>1</td><td>APC-7 3 dB Pad with Test Data</td></tr> <tr> <td>1</td><td>APC-7 50 dB Pad with Test Data</td></tr> <tr> <td>1</td><td>Storage Case</td></tr> </tbody> </table> <p>Dimensions: 254 mm wide, 64.0 mm high, 19 mm deep (10 in. x 2½ in. x 7½ in.).</p> <p>Weight: Net 0.91 kg (2 lb). Shipping, 1.36 kg (3 lb).</p>	Qty.	Description	1	APC-7 50 Ω Termination <1.005 SWR at 2 GHz	1	APC-7 Short Circuit	1	APC-7 3 dB Pad with Test Data	1	APC-7 50 dB Pad with Test Data	1	Storage Case	<p align="center">85036A 75Ω Type N Calibration Kit</p> <p>Function: This calibration kit contains 75Ω Type N connector adapters, short circuits, and terminations. This hardware is required for making error-corrected measurements in accuracy enhancement program (AIM) test setups that use equipment with 75Ω Type N connectors.</p> <p>Kit Includes:</p> <table border="1"> <thead> <tr> <th>Qty.</th><th>Description</th></tr> </thead> <tbody> <tr> <td>1</td><td>75Ω Type N Male to Type N Male adapter</td></tr> <tr> <td>1</td><td>75Ω Type N Female to Type N Female adapter</td></tr> <tr> <td>1</td><td>75Ω Type N Male short circuit</td></tr> <tr> <td>1</td><td>75Ω Type N Female short circuit</td></tr> <tr> <td>1</td><td>Type N Male 75Ω termination</td></tr> <tr> <td>1</td><td>Type N Female 75Ω termination</td></tr> <tr> <td>1</td><td>Storage Case</td></tr> </tbody> </table> <p>Dimensions: 168 mm wide, 114 mm deep, 51 mm high (6-5/8 in. x 4-1/2 in. x 2 in.).</p> <p>Weight: Net: 0.91 kg (2 lb). Shipping: 1.36 kg (3 lb).</p>	Qty.	Description	1	75 Ω Type N Male to Type N Male adapter	1	75 Ω Type N Female to Type N Female adapter	1	75 Ω Type N Male short circuit	1	75 Ω Type N Female short circuit	1	Type N Male 75 Ω termination	1	Type N Female 75 Ω termination	1	Storage Case
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Table A1-3. Test Sets and Accessories (7 of 7)

8505A TEST SET AND ACCESSORY RECOMMENDATIONS

 Can be ordered as 11600B/11602B Option 003

 Three 50 to 75 Ω Minimum Loss Pads provided with 11852A, one Minimum Loss Pad provided with 8502B.

	TRANSISTOR S-PARAMETERS TO-18/TO-72 TO-S/TO-12 TO-51 HPAC-200				S-PARAMETERS APC-7 (50 Ω) Type N (50 Ω) BNC (50 Ω)				TRANSMISSION/ REFLECTION MEASUREMENTS Type N (50 Ω) BNC (50 Ω) Type N (75 Ω)				TRANSMISSION MEASUREMENTS Only Type N (50 Ω) BNC (50 Ω) Type N (75 Ω)			
8505A Network Analyzer																
8502A 50 Ω Transmission/ Reflection Test Set																
8502B 75 Ω Transmission/ Reflection Test Set																
11850A 50 Ω Power Splitter																
11850B 75 Ω Power Splitter																
8503A 50 Ω S-Parameter Test Set																
11600B Transistor Fixture																
11602B Transistor Fixture																
11608A Option 002 Stripline Transistor Fixture																
11608A Option 003 Stripline Transistor Fixture																
11851A RF Cable Kit																
11852A 50 Ω to 75 Ω Minimum Loss Pad																
11853A 50 Ω Type N Accessory Kit																
11854A 50 Ω BNC Accessory Kit																
11855A 75 Ω Type N Accessory Kit																
11857A Test Port Extension Cables																
11858A Rigid Interconnect Adapter																
85032A 50 Ω Type N Calibration Kit																