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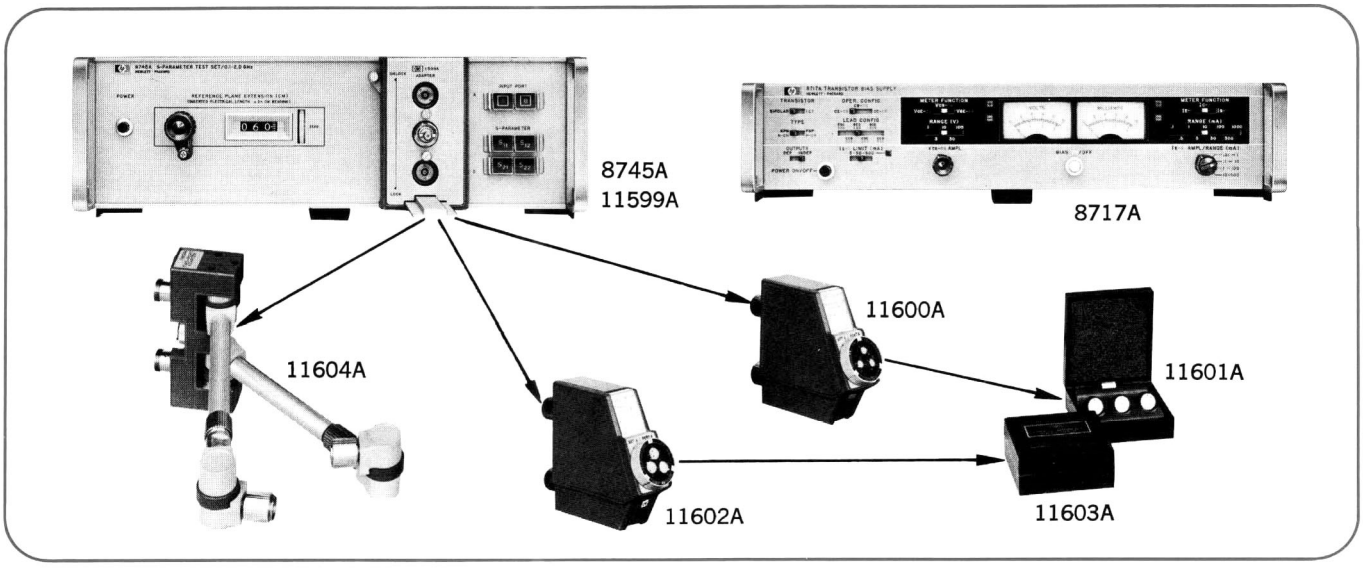
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S-PARAMETER MEASUREMENT

Two-port reflection and transmission, 0.1-2 GHz

Model 8745A



8745A S-Parameter Test Set

The 8745A is used with the network analyzer or vector voltmeter to measure two-port reflection and transmission coefficients. The major components of the 8745A are two broadband directional couplers, a precision 30-cm line stretcher, and five coax switches. When an s-parameter button is pressed, the switches establish the measuring circuit and direct the proper coupler outputs to the network analyzer or vector voltmeter. The network analyzer or vector voltmeter reads the magnitude and phase of that parameter. Simply adjust the line stretcher and the 8745A is calibrated from 100 MHz to 2 GHz for all four s parameters. The 8745A is completely programmable and can be used for automatic testing. A rear panel connector provides for remotely selecting s-parameters and biasing transistors through a built-in biasing network.

11600A and 11602A Transistor Fixtures

The 11600A and 11602A Transistor Fixtures accept TO-18/TO-72, and TO-5/TO-12 device configurations and will accept diodes, tunnel diodes, and other devices. The fixtures mount on the front of the 8745A and provide common emitter-base-collector and common source-gate-drain connections for bipolar and field-effect transistors. Each fixture is usable from dc to 2 GHz and accepts leads up to 1½ inches long.

11604A Universal Extension

The 11604A Universal Extension mounts on the front of the 8745A and is used for measuring microwave components. Since it is composed of rotary joints and rotary air lines, its APC-7 connectors will connect to almost any two-port geometry. The 11604A provides the flexibility of cable yet retains the accuracy of rigid air line.

11599A Quick-Connect Adapter

The 11599A Quick-Connect Adapter quickly connects the 11604A Universal Extension or the 11600A/11602A Transistor Fixtures to the 8745A by merely throwing a lever. Because connectors do not have to be screwed together, the accessory is ideal for production-line testing and prolongs the life of the APC-7 connectors.

Specifications

Model 8745A S-Parameter Test Set

Function: the 8745A S-Parameter Test Set supplies the circuitry necessary to measure two-port s parameters with the 8405A Vector Voltmeter or the 8410A Network Analyzer.

Frequency range: 100 MHz to 2 GHz.

Impedance: 50Ω nominal.

Load match: 110 to 200 MHz, <1.22; 200 MHz-2 GHz, <1.13.

Source match: <1.06 at 110 MHz; <1.12 at 2 GHz.

Maximum RF power: 2 W.

Insertion loss: from RF input to test ports, 4 dB nominal. From test ports to 8405A or 8410A outputs, 20 dB nominal, increases 6 dB/octave below 120 MHz.

Tracking or frequency response

Magnitude: ±0.35 dB.
Phase: ±5°.

Reference plane extension: maximum length 30 cm, 0.01 cm precision. Extends reference plane 0 to 15 cm beyond an 11600A or 11602A Transistor Fixture or 11604A Universal Extension.

Connectors

RF input: Type N female.
Test ports: APC-7 precision connectors.
Outputs to 8405A or 8410A: mates with APC-7 precision connectors.

Microwave coax switches: maximum switching time, 50 ms. Estimated switch lifetime >1 million cycles.

Remote programming: remote s parameter selection by closing 2 contacts of 36-pin rear panel connector to ground pin. Contact is at 12 volts and short to ground will draw 12 mA.

Transistor biasing: accomplished through 36-pin rear panel connector. Bias and bias sensing connections are made to biasing networks built into the 8745A.

Power: 115 or 230 V ±10%, 50 to 400 Hz, 40 watts.

Weight: net, 35 lb (15,9 kg).

Dimensions: 5½" x 16¾" x 25¾" (139 x 423 x 650 mm).

Price: HP 8745A, $3,000.

Models 11600A and 11602A Transistor Fixtures

Function: used with or without the 8745A to measure transistors and other semiconductor devices. Mount directly on the 8745A and provide common emitter-base-collector and common source-gate-drain connections. Require 11601A or 11603A Calibration Kits.

Model 11600A: for TO-18/TO-72 or similar transistor packages. Has four snap-on dials, two for bipolars and two for FET's.

Model 11602A: for TO-5/TO-12 or similar transistor packages. It has two snap-on dials for bipolars.

Frequency: dc to 2 GHz.
Lead lengths: accepts leads up to 1.5 inches long.
Lead diameters: 0.016 to 0.019 inch.
Impedance: 50Ω ±2Ω.
Connectors: APC-7* precision connectors for input and output.
Option 01: precision type N connectors for input and output.
Maximum power: 10 W including RF signals.
Dimensions: 4⅝" x 6" x 1½" (119 x 152 x 38 mm).
Weight: 38 oz (1,1 kg).
Price: 11600A, $425; 11602A, $425.

Models 11601A and 11603A Calibration Kits

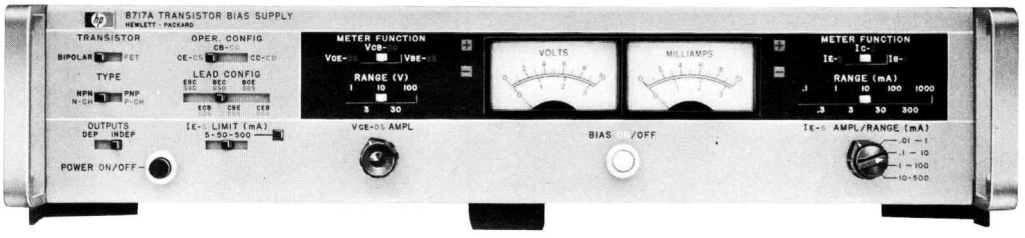
Function: Model 11601A used to calibrate the 11600A, and Model 11603A used to calibrate the 11602A Transistor Fixture. Three calibration references: a short termination, a 50Ω termination, and a 50Ω through section are contained in a protective case.
Case dimensions: 2¾" x 2¾" x 1⅛" (70 x 70 x 29 mm).
Weight: 3 oz (84 g) including case.
Price: 11601A, $75; 11603A, $75.

Model 11604A Universal Extension

Function: used with the 8745A to test microwave components. Mounts on the front of the 8745A and connects to almost any two-port geometry.
Frequency range: dc to 2 GHz.
Connectors: APC-7 precision connectors.
Test port VSWR: 1.07:1.
Price: HP 11604A, $800.

Model 11599A Quick Connect Adapter

Function: quickly connects the 8745A and the 11600A, 11602A, or the 11604A.
Dimensions: 3" x 5" x 4¼" (76 x 127 x 108 mm).
Weight: 12 oz (21 g).
Price: HP 11599A, $75.



8717A

8717A Transistor Bias Supply

The 8717A is a companion unit to the 11600A/11602A Transistor Fixtures. It is an accurate, stable, manual and/or digitally programmable transistor bias supply. It features switching for convenience in test set-ups and provides metering for accurate voltage/current settings and readings. Front panel switches on the 8717A quickly establish stable bias conditions for all transistor configurations used in the 11600A/11602A transistor fixtures. This eliminates the need for external wiring changes for each new configuration, i.e., common emitter-base-collector or common source-gate-drain. The transistor under test is biased in a feedback circuit which maintains a highly accurate collector-emitter voltage and emitter current every time a different transistor is biased, when a common lead configuration is changed, or when temperature changes. Two meters independently measure one of the voltages and one of the currents on any of the three leads of the transistor under test. Transistors are protected by an emitter current limit shutdown circuit which removes biasing when the preset limit is exceeded.

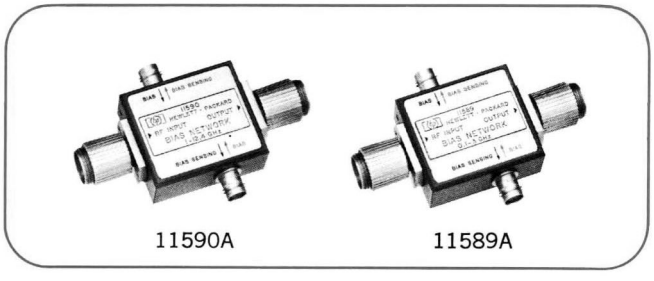
The 8717A is digitally programmed through an optional D/A converter plug-in with which the two internal supplies can be switched into an independent constant voltage supply and an independent constant current supply. All the features otherwise remain the same as above.

Ripple: V_{CE} (V_{DS}) <5 mV, I_E(I_S) <100 μA.
Option 01: digital/analog converter for remote programming capability.
Power: 115 or 230 V ±10%, 50 to 400 Hz, 65 watts.
Dimensions: 16¾" x 3⅜" x 13½" (425 x 86 x 336 mm).
Weight: 17.75 lb (8,0 kg).
Price: HP 8717A, $1295.
Option 01: programmable A-D Converter, $500.

Specifications, 8717A

Outputs:		Manual control	Programmed control
Normal Mode	V_{CE}(V_{DS}): 0–31.75 V	continuously variable	min. step size: 0.25 V
	I_E(I_S): 0–500mA	continuously variable (4 ranges) 0.01–1; 0.1–10; 1–100; 10–1000 mA	min. step size: 3.2% of full range
Independent Mode	Voltage supply: 0 to ±31.75/V @ 0.5 A	continuously variable	min. step size: 0.25 V
	Current supply: 0 to 100 mA @ ±10 V	continuously variable (3 ranges) 0.01–1; 0.1–10; 1–100 mA	min. step size: 3.2% of full range
Normal or Independent	Voltage accuracy	4% of meter full scale	0.2 V+2% of normal
	Current accuracy	4% of meter full scale	2% of programmed value

Meters:	Volts	Milliamps
Meter functions	V_{CE}, V_{BE}, V_{CB} or V_{DS}, V_{DG}, V_{GS}	I_E, I_C, I_B or I_S, I_G, I_D
Full scale ranges	1, 3, 10, 30, 100 V	0.1, 0.3, 1, 3, 10, 30, 100, 300, 1000 mA



11589A and 11590A Bias Networks

Function: provides dc bias and bias sensing on 50Ω systems. Compatible with bias supplies using sensing like the 8717A, but can be used with or without bias sensing.

Specifications, 11589A, 11590A

	11589A	11590A
Frequency range:	100 MHz–3 GHz	1 GHz–12.4 GHz
VSWR	<1.2	<1.2
Insertion loss	<0.5dB	<0.5dB
Max bias voltage	100 V	100 V
Max bias current	1 A	0.5 A
RF Connectors	APC-7	APC-7
Price	Available on request	Available on request

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