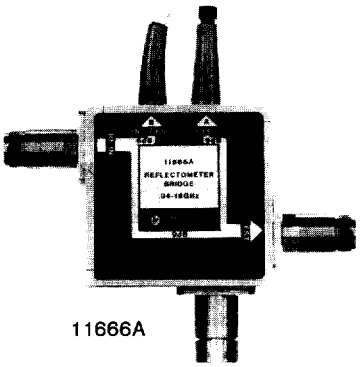
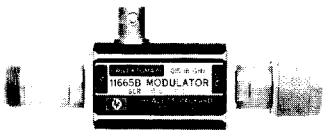
MICROWAVE TEST EQUIPMENT

8755 System Accessories

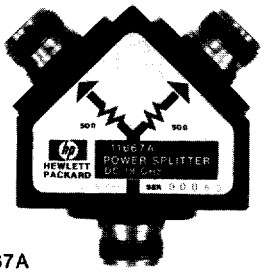
Models 11666A, 11667A, 11665B, 11678A, 11668A, 11679A/B



11666A



11665B



11667A

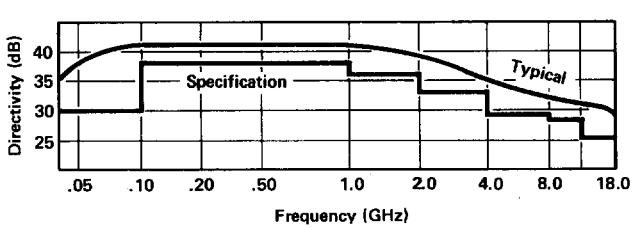
11666A Reflectometer Bridge

Reflection measurements covering from 40 MHz to 18 GHz with one directional device can be made with the Model 11666A Reflectometer Bridge. Operation of this type of directional device is based on principles of the resistive Wheatstone Bridge extended to microwave frequencies. When three bridge arms are 50Ω, the voltage across corners of the bridge is directly proportional to the reflection coefficient of the device connected in the fourth arm. Equivalent directivity is then a measure of how well the bridge circuit is balanced with a 50Ω termination connected. (Ideally this would create a voltage null representing infinite return loss.) The high equivalent directivity achievable over wide bandwidths makes the bridge configuration attractive.

The 11666A is completely dedicated to the 8755; two Schottky diode detectors (which sample the incident and reflected signals for ratioing by the 8755) are incorporated as an integral part of the bridge unit. The effective external leveling achieved by ratioing thus isolates the measurement port from source/bridge input mismatch. With the addition of an external 11664A Detector, two simultaneous ratio measurements of insertion and return loss can be made. Small size combined with its wide frequency range and high directivity make the 11666A ideal for production use.

Specifications 11666A (connected to the 8755C Analyzer)
Frequency Range: 40 MHz to 18 GHz.

Frequency Range	Equivalent Directivity	Equivalent Output SWR
40 to 100 MHz	30 dB	1.25
0.1 to 1 GHz	38 dB	1.25
1 to 2 Ghz	36 dB	1.25
2 to 4 GHz	33 dB	1.25
4 to 8 GHz	29 dB	1.25
8 to 12 GHz	27 dB	1.27
12 to 18 GHz	26 dB	1.52



Frequency tracking
(between incident and reflected arms): <3.2dB
(between incident and test port, including 1.1 dB from 11664A Detector). <4.3dB
Nominal coupling: 6-dB incident arm. 9-dB reflected arm. 9-dB transmission loss.
Input SWR: 1.92.
Maximum input power: +15 dBm.
Connectors: Type N-Female on input and output. APC-7 Optional.
Size: 69.9 mm H x 69.9 mm W x 46.4 mm D ($2^{3}/_{4}$" x $2^{3}/_{4}$" x $1^{27}/_{32}$"). Cable length, 1219 mm (48").
Weight: net, 0.7 kg (1.5 lb). Shipping, 2.26 kg (5.13 lb).
Accessories furnished: 11512A Short, Type N-Male (11565A short, APC-7 with Opt 002).

11667A Power Splitter

The 11667A Power Splitter is recommended when making wideband transmission measurements using the 8755 Test Set. This two-resistor type splitter provides excellent output SWR at the auxiliary arm when used for source leveling or ratio measurement applications. The 0.25 dB tracking between output arms over a frequency range from dc to 18 GHZ allows wideband measurements to be made with a minimum of uncertainty.
Frequency range: dc to 18 GHz.
Impedance: 50Ω.

	dc-4 GHz	dc-8 GHz	dc-18 GHz
Input SWR:	≤1.15	≤1.25	≤1.45
Equivalent output SWR: leveling or ratio	1.10	1.20	1.33
Output tracking: (between output arms)	<0.15 dB	<0.20 dB	<0.25 dB

Insertion loss: 6 dB nominal (input to either output).
Maximum input power: +27 dBm (0.5 watt).
Connectors: Type N female on all ports.
Size: 46 H x 50 W x 19 mm D ($1^{13}/_{16}$" x 2" x $^{3}/_{4}$").
Weight: net, 0.06 kg (2 oz). Shipping 0.22 kg (8 oz).

Other Signal Separation Devices

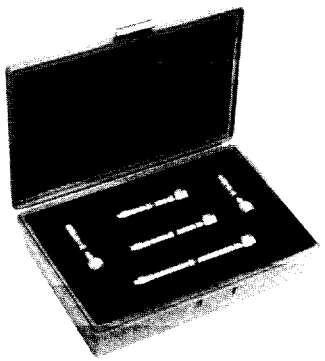
Many other signal separation devices are available from HP for use with the 8755. Coaxial couplers from 0.1 to 18 GHz are available with the 770 series, the 790 series, and the 11692. Higher directivity 752 series waveguide couplers can also be used with the 8755S with the addition of appropriate 281 series waveguide to coax adaptors.

11665B Modulator

Function: absorbtive on-off modulator designed for and powered by the 8755C plug-in.

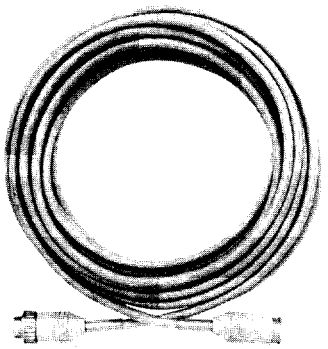
Frequency Range	Return Loss On and Off	Insertion Loss On	Insertion Loss Off
15–40 MHz	≥10 dB	≤7.0 dB	≥35 dB
40 MHz–4 GHz	≥15 dB	≤3.2 dB	≥35 dB
4–8 GHz	≥12 dB	≤3.8 dB	≥40 dB
8–12.4 GHz	≥8 dB	≤4.3 dB	≥45 dB
12.4–18 GHz	≥8 dB	≤5.0 dB	≥45 dB

Modulator drive feedthrough: ≤8 mV (peak) at 27.8 kHz at either port when powered by the 8755C. Reduced to ≤ 1mV (peak) using the 11668A. (See 11668A High Pass Filter).
Drive current: nominally +50 mA in ON condition, −50 mA Off condition.
Weight: net, 0.17 kg (6 oz). Shipping, 0.9 kg (2 lb).



11678A

11668A



11679A

11678A Low Pass Filter Kit

The 11678A Low Pass Filter Kit contains five filters conveniently matched to HP 8620 sweeper bands. These filters have <1.1 dB insertion loss at 0.95 fc with > 40 dB rejection at 1.25 fc. Filter use is recommended to reduce undesirable harmonics causing errors in broadband detector measurements.

Frequency range: low pass filters, cutoff frequency fc: 11688A, 2.8 GHz: 11689A, 4.4 GHz, 11684A, 6.8 GHz, 11685A, 9.5 GHz, 11686A, 13.0 GHz.

Connectors: N-Male, N-Female.

Weight: net 0.44 kg (1 lb). Shipping 1.2 kg (2.9 lb).

11668A High Pass Filter

The 11668A High Pass Filter accessory is recommended when making measurements on active devices which have gain below 50 MHz. Use of the 11668A, placed after the 11665B, reduces the modulator drive feedthrough from 8 mV to 1 mV and prevents possible amplifier saturation. Use of the 11668A filter is not necessary for passive measurements since the feedthrough from the 11665B is −65 dBm and causes no degradation in system performance.

Frequency range: 50 MHz to 18 GHz.

	Insertion Loss	Return Loss
50–100 MHz	≤2.5 dB	≥12 dB
100 MHz–8 GHz	≤1.0 dB	≥16 dB
8–12 GHz	≤1.0 dB	≥14 dB
12–18 GHz	≤1.5 dB	≥14 dB

Maximum input: +27 dBm.

Connectors: N-female, N-male

Weight: 0.13 kg (5 oz). Shipping 0.28 kg (10 oz).

11679A/B Extension Cables

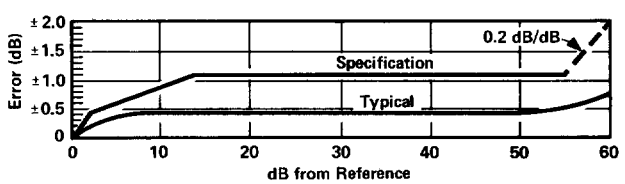
11679A 25-foot Extension Cable and 11679B 200-foot Extension Cable fit directly between 11664A Detector and display. Remote detector operation is permitted without performance degradation.

Common System Specifications

Power Measurement Range:

Single channel: +10 dBm to −50 dBm (noise level).

System accuracy (Ratio Measurements):



Accuracy curve shows system uncertainty for a relative measurement with +10 dBm incident at the test detector when the 0-dB reference is set. Accuracy when calibration levels below +10 dBm are used remains the same, except the additional 0.2 dB/dB uncertainty should be added for measurements below −45 dBm. This curve includes system noise, offset uncertainty, and crosstalk, and assumes the reference detector power remains fixed between calibration and test. Refer to detector, coupler, or bridge specifications to determine system frequency response.

Absolute Measurements:

Absolute power incident on a detector is displayed with respect to the 0 dBm POSITION line when the OFFSET CAL switch is turned OFF. Accuracy at any power level is typically ±0.5 dB not including detector frequency response or mismatch errors. For applications requiring more precision, increased accuracy can be obtained if the 8755 display is calibrated at a specific power level using a power meter. The stability of the 8755 then permits accurate power measurements repeatable to hundredths of dBs.

General

Resolution: Independent for each channel in steps of 10, 5, 1, 0.25, or 0.1 dB per division. Combinations of steps can be engaged, e.g. 10 dB/div. and 5 dB/div. to achieve 15 dB/div.

Offset: Independent for each channel. ±59.9 dB in 0.1 dB increments.

Graticule: 8755S, 1 Div. ≃1.29 cm. 8755S Option 001, 1 Div. ≃1 cm.

Temperature range: Operation, 0 to 55°C; storage, −40°C to 75°C.

Power: 48 to 440 Hz, 115/230 V ±10%, typically 100 watts.

8755S Specifications

Consists of:
- 8755C Swept Amplitude Analyzer
- 182T Display
- 11664A Detectors (3 each)
- 8750A Storage-Normalizer

Frequency range: 10 MHz to 18 GHz (determined by the 11664A Detectors)

8755S Option 001 Specifications

Consists of:
- 8755C Swept Amplitude Analyzer
- 180TR Display
- 11664A Detectors (3 each)
- 8750A Storage-Normalizer

8755S Option 002 Specifications

Consists of:
- 8755C Swept Amplitude Analyzer
- 182T Display
- 11664A Detector (1 each)
- 11666A Reflectometer Bridge
- 8750A Storage-Normalizer

Frequency range: 40 MHz to 18 GHz (determined by the 11666A Bridge).

8755S Option 003 Specifications

Adds 11665B External Modulator.

Frequency range: 15 MHz to 18 GHz (determined by the 11665B Modulator).

8755S Option 004 Specifications

Deletes the 8750A Storage-Normalizer.

8755S Option 005 Specifications

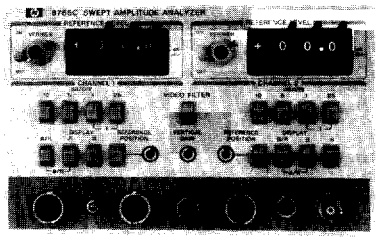
Consists of:
- 8755C Swept Amplitude Analyzer
- 182T Display
- 11664B Detectors (3 each)
- 8750A Storage-Normalizer

Frequency range: 10 MHz to 26.5 GHz (determined by the 11664B Detectors).

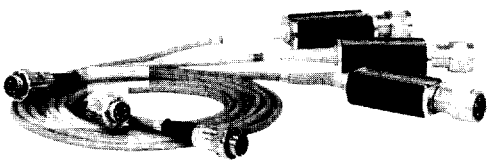
MICROWAVE TEST EQUIPMENT

8755 System

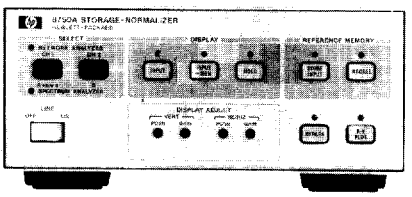
Models 8755C, 11664A/B/C, 8750A Components



8755C



11664A



8750A

Individual Instrument Specifications

8755C Plug-in

Function: The 8755C plug-in processes demodulated 27.8 kHz signals from the 11664 Detectors (R,A,B) for logarithmic display on 180 series oscilloscopes.

Resolution: Independent for each channel in steps of 10, 5, 1, 0.25, or 0.1 dB per division.

Offset: Independent for each channel. ±59.9 dB in 0.1 dB increments.

Display Units

180 "T" series displays are recommended for use with the 8755C. They provide zero offset recorder outputs, and both positive and negative 5-volt retrace blanking inputs.

Large screen (Model 182T): This display unit is contained in the 8755S standard configuration. It has an 8 × 10 division internal graticule with 1 div=1.29 cm. and medium persistence P39 phosphor.

Rack mount (Model 180TR). This display unit is contained in the 8755S Option 001 system configuration. It has an 8 × 10 division internal graticule with 1 div = 1 cm. and medium persistence P39 phosphor.

The 182T and 180TR are directly compatible with the 8750A Storage-Normalizer. As a result of the 8750A compatibility, the 182T and 180TR cannot be used with time domain plug-ins.

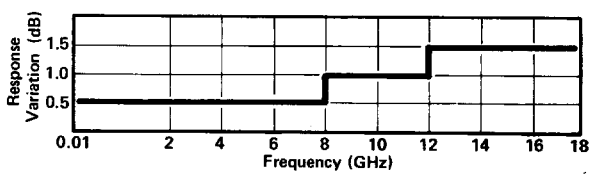
Variable persistence/storage (Model 181T, Cabinet Model 181TR, Rack Mount): These displays can be ordered individually for use with the 8755C. Because they offer CRT storage, they have not been made compatible with the 8750A Storage-Normalizer. They have an 8 × 10 division internal graticule with 1 div = 0.95 cm. and offer variable persistence phosphor for storing single or multiple traces.

11664A Detectors

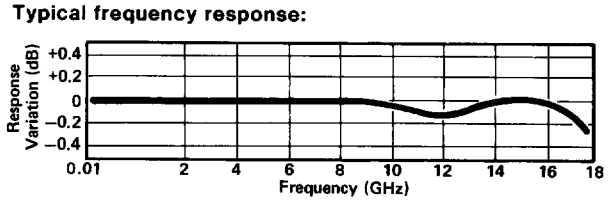
Function: Designed specifically for use with the 8755C Swept Amplitude Analyzer, the 11664A detects the envelope of the 27.8 kHz modulated microwave signal. It uses a biased Schottky diode to achieve −50 dBm sensitivity.

Frequency range: 10 MHz to 26.5 GHz.

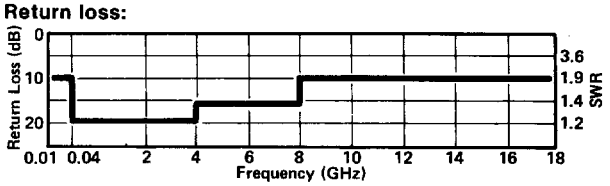
Tracking between two 11664A Detectors:



Typical frequency response:



Return loss:



Impedance: 50 ohms nominal

Connector: N-Male.

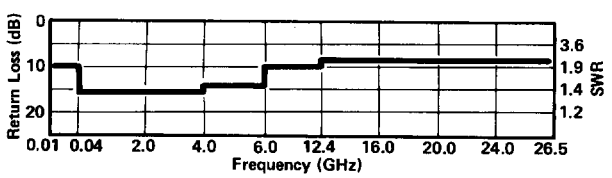
11664B Detectors

(All specifications are the same as the 11664A with the following differences):

Frequency range: 10 MHz to 26.5 GHz.

Tracking between two 11664B Detectors: Tracking between two detectors at the same power level is typically <2 dB from 10 MHz to 26.5 GHz.

Return Loss:



Connector: APC 3.5 Male.

11664C Detector Adapter

Function: Allows the 8755 to be used with many available diode detectors. Two adjustments allow the detector to be mated with the 8755 to provide absolute power as well as ratio with a frequency range that is determined by the diode detector used.

Connector: BNC male

8750A Storage-Normalizer

Function: Provides digital storage display and digital normalization for both channels of the 8755. The 8750A connects directly to the 8755/182T via a single cable.

Ordering Information

The 8755S system and its options are configured of separate instruments and components solely for ordering convenience. If a different display or optional connectors are desired, each part of the system should be listed separately.

	Price
8755S Complete Test Set	$9,025
Opt 001: Rack mount version	$175
Opt 002: deletes (2) 11664 Detectors, adds 11666A Reflectometer Bridge	add $2,150
Opt 003: adds 11665B Modulator	add $950
Opt 004: deletes 8750A Storage-Normalizer	less $2,150
Opt 005: Replaces (3) 11664A with (3) 11664B	add $750
8755C Test Set Plug-in only	$2,600
11665B 15 MHz 18 GHz Modulator	$950
11664A 10 MHz 18 GHz Detector	$425
Opt 001: APC-7 Connector	add $25
11664B APC 3.5 10 MHz to 26.5 GHz Detector	$675
11664C Detector Adapter	$250
182T Large Screen Cabinet Scope Display	$3,000
180TR Standard Screen Rack Display	$3,175
181T Storage, Cabinet Display	$4,100
181TR Storage, Rack Display	$4,425
11666A Reflectometer Bridge	$3,000
11679A 7.6 m (25 ft) Detector Extension Cable	$85
11679B 61 m (200 ft) Detector Extension Cable	$300
11668A 50 MHz High Pass Filter	$525
11667A DC to 18 GHz Power Splitter	$925
11678A Low Pass Filter Kit	$1,250
Individual filters: specify model number	$250