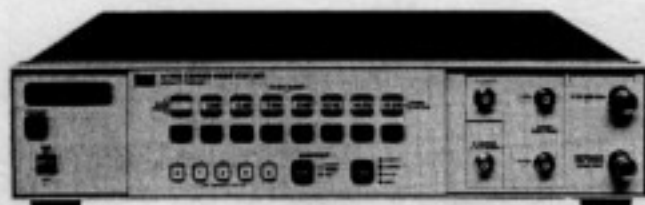




- 5 MHz to 18 GHz
- Phase noise and AM noise
- Low system noise floor



11729B

### 11729B Carrier Noise Test Set

#### Versatile Noise Measurements

Configured with an HP 8662A Synthesized Signal Generator and a spectrum analyzer, the 11729B allows versatile phase noise and AM noise characterization of microwave oscillators, 5 MHz to 18 GHz. With one convenient package, direct AM noise measurements and two methods of phase noise measurements can be made, at offsets of 1 Hz to 10 MHz from the carrier. These three methods allow a wide variety of sources, from low noise stabilized sources to free-running sources with high drift, to be measured. The 11729B may be ordered with either full frequency coverage, or in a number of dual band configurations to better match a given application.

#### Low Noise Performance

The 11729B offers a low system noise floor, allowing measurement of most state-of-the-art microwave oscillators. Typical system noise for a source at 10 GHz is less than  $-123$  dBc/Hz at a 10 kHz offset. This low noise performance is achieved with the 8662A providing the necessary driving signals.

#### Two Phase Noise Measurement Methods

A choice of two phase noise measurement methods optimizes the measurement to the type of oscillator being measured. The phase detector method is ideal for stabilized sources or close to the carrier analysis. The 11729B/8662A simplifies the phase detector method by providing all the necessary circuitry, including a low noise microwave reference source, variable bandwidth phase lock loop, and low noise amplifier.

The frequency discriminator method is best suited for sources with high level, low rate phase noise such as free-running sources. The 11729B/8662A removes many of the traditional complications of frequency discriminators by allowing the discriminator to operate at a frequency less than 1.3 GHz. The 11729B contains all necessary hardware except a user-supplied external discriminator, which can be delay line, bridge or cavity type.

#### Full Programmability for System Integration

The fully HP-IB programmable 11729B is easily configured into manual or automatic carrier noise measurement systems with available lab spectrum analyzers (such as the HP 8566A, 8568A, 3585A, or 3582A). The 11729B is also compatible with the HP 3047A Spectrum Analyzer System for a complete software/hardware noise measurement solution. (For more system information, refer to the 11729B Product Notes.)

#### Abbreviated 11729B Specifications

##### Overall Performance

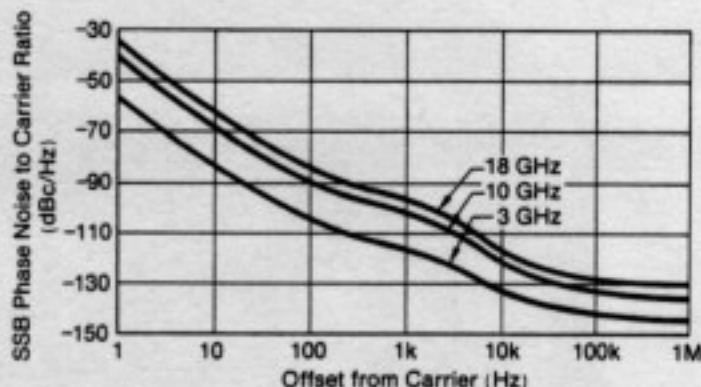
**Frequency range:** 5 MHz to 18 GHz

(typical overrange to 18.56 GHz)

**Residual noise:** (10 GHz input signal)

offset from carrier (Hz)	typical residual noise
10 Hz	-106 dBc/Hz
100 Hz	-117 dBc/Hz
1 kHz	-126 dBc/Hz
10 kHz	-132 dBc/Hz
100 kHz	-141 dBc/Hz
1 MHz	-143 dBc/Hz

- HP-IB programmable
- Phase detector method
- Frequency discriminator method



Typical System Sensitivity (when used with the 8662A)

#### Test Signal Requirements

**Amplitude:** +7 dBm minimum to +18 dBm maximum (typically useable to  $-15$  dBm with noise floor degradation).

#### RF Source Requirements

8662A or 8663A Option HO3 and Option H12.

#### 11729B Outputs

##### IF Output

**Bandwidth:** 5 to 1280 MHz

**Level:** +6 dBm minimum

##### Noise Spectrum Outputs

- 1) Auxiliary Noise Spectrum Output: dc coupled, 600  $\Omega$  nominal.
- 2) Noise Spectrum Output <1 MHz: dc coupled, 600  $\Omega$  nominal.
- 3) Noise Spectrum Output <10 MHz: 10 Hz to 10 MHz, 50  $\Omega$  nominal, nominal 40 dB of gain over <1 MHz output.

#### Phase Lock Loop Function

##### Frequency Control Outputs

To crystal oscillator:  $\pm 10$  V.

To dc FM:  $\pm 1$  V.

**Lock bandwidth factor:** nominal 1, 10, 100, 1k, 10k selectable.

**Loop characteristics:** dependent on method of phase lock chosen; typical loop bandwidths can range from 0.5 Hz to 50 kHz.

#### Remote Programming

All front panel functions are HP-IB programmable. In addition, the 11729B can output current settings and out-of-lock indication.

#### General

**Operating temperature range:** 0° to +55°C.

**Power:** 100, 120, 220, 240 V, +5%, -10%; 48 to 66 Hz; <75 VA max.

**Weight:** net 10.4 kg (23 lb). Shipping 13.2 kg (29 lb).

**Size:** 425 W x 99 H x 551 mm D (21.7 x 16.8 x 3.9 in.). 1 MW x 3 1/2 H x 20 D System II module.

#### Ordering Information

**11729B Carrier Noise Test Set (5 MHz to 18 GHz)**

Note: Each of options 003 to 027 (only one may be ordered) also includes 0.005 to 1.28 GHz coverage

**Option 003** (1.28 to 3.2 GHz)

**Option 007** (3.2 to 5.76 GHz)

**Option 011** (5.76 to 8.32 GHz)

**Option 015** (8.32 to 10.88 GHz)

**Option 019** (10.88 to 13.44 GHz)

**Option 023** (13.44 to 16.0 GHz)

**Option 027** (16.0 to 18.0 GHz)

**Option 130:** AM noise detection

**Option 140:** Rear panel connectors

**Option 907:** Front panel handle kit

**Option 908:** Rack mounting flange kit

**Option 909:** Front panel handle plus rack mounting flange kit

**Option 910:** Extra operating and service manual