

SIGNAL ANALYZERS

Harmonic Mixers, 18 to 110 GHz

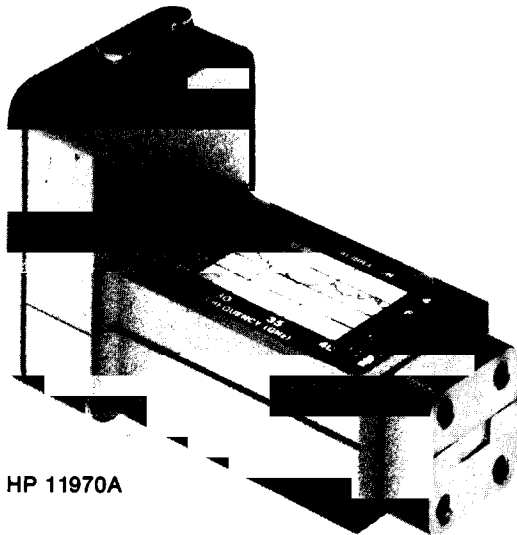
Models 11970 Series, 11971 Series & 11517A

693



- Low conversion loss
- Individually amplitude calibrated

- No bias or tuning adjustments
- High 100 mW safe input level



HP 11970A

HP 11970 and 11971: Exceptional Performance

The HP 11970 and 11971 series of waveguide Mixers are general purpose harmonic mixers employing state-of-the-art, dual diode design to achieve flat frequency response and low conversion loss. These mixers are available in six bands from 18 GHz through 110 GHz.

Easy to Use

The excellent frequency response and low conversion loss of the HP 11970 and 11971 series Harmonic Mixers are achieved without external dc bias or tuning stubs. Manual operation as well as computer controlled operation of hardware is simplified because no mixer adjustments are required.

HP 11517A Harmonic Mixer

This low-cost, wide-frequency-range harmonic mixer provides an economical solution for measurements not requiring amplitude calibration in the frequency range covering 12.4 to 40 GHz. Waveguide adapters are available to make measurements in more than one waveguide band.

The HP 11517A has an IF range of DC to 2 GHz and an LO range of 2 to 6 GHz, which makes this biased mixer compatible with a wide range of instruments.

Extends Spectrum Analysis Frequency

The HP 11970 and 11971 series Harmonic Mixers extend the frequency range of the HP 8566B, 8569B, and 71000 series microwave Spectrum Analyzers. The HP 11975A Amplifier provides the optimum LO power to the mixers when using the HP 8566B or 8569B Spectrum Analyzers. The HP 11517A external Harmonic Mixer extends the frequency range of the HP 8555A and 8565A Spectrum Analyzers.

Harmonic Mixer Selection Guide

HP Spectrum Analyzer	HP Compatible Mixer Series	HP LO Drive Amplifier
8566B	11970	11975A
71000	11970	70907A
8569B	11971	11975A
8569B Opt. 003	11971	internal ¹
8555A	11517A with adapters	11975A (optional)
8565A	11517A with adapters	11975A (optional)

HP 11970 and 11971 Series Specifications

IF range: DC to 1300 MHz
LO amplitude range: +14 to +18 dBm, +16 dBm optimum
Calibration accuracy: ±2.0dB with optimum LO amplitude
Typical RF input SWR: <2.2:1

Bias requirements: None

Typical odd order harmonic suppression: >20dB

Maximum CW RF input level: +20 dBm (100 mW)

Maximum peak pulse power: 24 dBm (250 mW) with <1 usec pulse (avg. Power: +20 dBm)

Environmental: Meets MIL-T-28800C, Type III, Class 3, Style C.

IF/LO connectors: SMA female

LO Range: HP 11970 Series, 3.0 to 6.1 GHz

HP 11971 Series, 2.0 to 4.5 GHz

HP Model	Frequency Range	LO Harm. Number	Conversion Loss (dB)	Noise Level (dB) 1kHz (RBW)	Freq. ¹ Response (dB)	Gain Compression (dBm)
11970K	18-26.5	6+	24	-110	±1.9	-3
11970A	26.5-40	8+	26	-108	±1.9	-5
11970Q	33-50	10+	28	-104	±1.9	-7
11970U	40-60	10+	28	-104	±1.9	-7
11970V	50-75	14+	40	-92	±2.1	-3
11970W	75-110	18+	46	-85	±3.0	-1
11971K	18-26.5	6+	24	-110	±2.1	-3
11971A	26.5-40	10+	28	-106	±2.1	-7
11971Q	33-50	16+	40	-92	±2.3	-3
11971U	40-60	16+	40	-92	±2.3	-3
11971V	50-75 ²	16+	42	-89	±2.5	-3

HP 11517A Characteristics

IF range: DC to 2 GHz

LO frequency range: 2.1 to 6.1 GHz

LO amplitude range: 0 to +10 dBm (+10 dBm optimum)³

Typical flatness: ±3 dB over a 1 GHz span with biased peaked

Typical DC bias range: 0 to 3.5mA

Maximum CW RF input level: +10 dBm

Typical 3 dBm gain compression: -15 dBm

Typical noise level: -85 dBm (using HP 8555A or 8565A with 1 kHz RBW)

12.4 to 18 GHz, -80 dBm 18 to 26.5 GHz, -70 dBm 26.5 to 40 GHz

Waveguide adapters:

12.4 to 18 GHz, HP 11518A; 18 to 26.5 GHz, HP 11519A; 26.5 to 40 GHz, HP 11520A

Ordering Information

HP 11970K 18 to 26.5 GHz Mixer	\$1500
HP 11970A 26.5 to 40 GHz Mixer	\$1550
HP 11970Q 33 to 50 GHz Mixer	\$1700
HP 11970U 40 to 60 GHz Mixer	\$1850
HP 11970V 50 to 75 GHz Mixer	\$2250
HP 11970W 75 to 110 GHz Mixer	\$2550
HP 11970T 18 to 40 GHz Mixers and Case	\$3100
Opt 001: Adds 40 to 60 GHz Mixer to 11970T	add \$1850
Opt 002: Adds 33 to 50 GHz Mixer to 11970T	add \$1700
HP 11971K 18 to 26.5 GHz	\$1350
HP 11971A 26.5 to 40 GHz	\$1400
HP 11971Q 33 to 50 GHz	\$1600
HP 11971U 40 to 60 GHz	\$1800
HP 11971V 50 to 75 GHz	\$2000
HP 11971T 18 to 40 GHz Mixer Set and Case	\$2700
Opt 009: Mixer Connection Set contains three 1 meter low-loss SMA cables, a wrench, and an allen driver for use with any of the mixers listed above. Space is provided in carrying case for cables and tools.	\$250

HP 11969A Carrying Case for one to five mixers, SMA cables and tools \$565

HP 11517A Harmonic Mixer (Waveguide Adapter required) \$500

HP 11518A 12.4 to 18 GHz Waveguide Adapter \$375

HP 11519A 18 to 26.5 GHz Waveguide Adapter \$375

HP 11520A 26.5 to 40 GHz Waveguide Adapter \$375

HP 11975A 2 to 8 GHz Amplifier \$4100

¹Frequency response of the mixers is reduced by 1 dB for LO range of 14 to 18 dBm.

²Operates to 71 GHz with the HP 8569B.

³The HP 11975A Amplifier can be used to provide sufficient LO power to the mixers.