

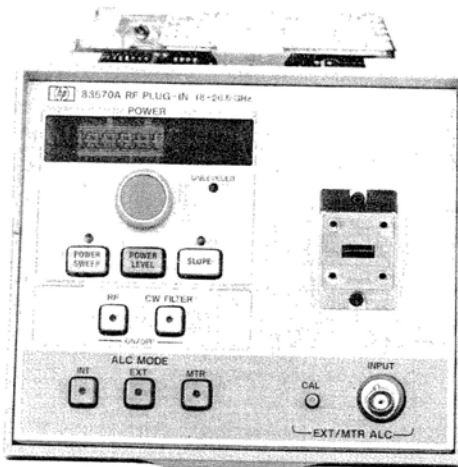
# SWEEP OSCILLATORS

## 8350 Series: RF Plug-ins (cont.)

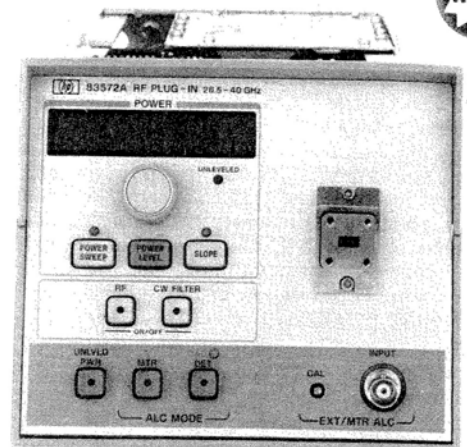
### Models 83570A, 83572A and 83572B

- 83572B offers 5 mW minimum unleveled 26.5-40 GHz output
- 83570A offers 10 mW internally leveled 18-26.5 GHz output
- 83570A offers low frequency auxiliary output for easy counting and phase-locking

- Calibrated output power with 0.1 dB resolution
- Power sweep
- Complete HP-IB programmability



83570A



83572A

### 83570A

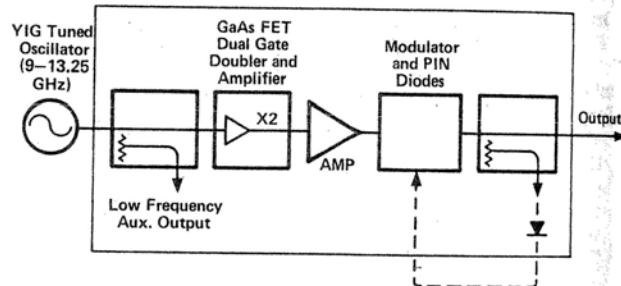
Now precision measurements to 26.5 GHz are possible with the solid state 83570 plug-in. The 83570 plug-in maintains a minimum leveled output power of 10 dBm which is comparable to the output power of Backward Wave Oscillators. Power is internally leveled to a flatness  $< \pm 1.4$  dB. At the output, power losses are minimized with a waveguide output connector (a coaxial output connector may be made using the HP K281C adapter). Full range coverage of the 83570 extends from 18 GHz to 26.5 GHz. This frequency range maintains a 30 MHz frequency accuracy and 0.1% linearity. With high frequency coverage, complete HP-IB programmability and outstanding leveled output power, the 83570 plug-in, combined with the many features of the 8350 mainframe adds a new dimension to microwave measurements above 18 GHz.

The output power has a calibrated range of 11 dB which can be extended with external attenuators such as the HP 8495K. The power level may be manually set to a 0.1 dB resolution, or the power level may be remotely HP-IB programmed to a 0.02 dB resolution. In addition to a single output power, the 83570 also has a power sweep function. This function sweeps the power from one level to another. Another important feature that the 83570 offers is slope compensation. This compensates for high frequency power losses in external tests by attenuating the power at lower frequencies.

Scalar measurements at high frequencies may be easily made since the 83570 provides internal 27.8 KHz modulation required to interface with the HP 8756A Scalar Network Analyzer. In addition to simplifying the interface circuitry, internal modulation reduces connection losses which are critical at high frequencies.

The high output power and HP-IB programmability also make the 83570A ideal for use with the 8410 Network Analyzer and K8747A Test Set when making vector network measurements from 18 to 26.5 GHz. The +10 dBm output power (unavailable on other solid state sources) is required for proper operation of K8747A mixers.

The 18-26.5 GHz signal is generated by doubling the output of a 9-13.25 GHz YIG oscillator. This half frequency is coupled off to an output which may be used for phase locking or counting. Key to the high power of the HP 83570 is a single doubler package. This package contains the frequency doubler, amplifier, modulator and the leveling coupler with detector. This single package configuration significantly reduces power losses. (See 83570A Block Diagram.)



83570A Block Diagram

### 83572A/B

The HP 83572A/B RF Plug-in extends the frequency coverage to 40.0 GHz. The plug-ins offer minimum unleveled output power of 7 dBm (83572B), and 3 dBm (83572A) for maximizing the dynamic range of passive device measurements. Option 001 provides 6 dBm (83572B), and 2 dBm (83572A) minimum calibrated externally leveled output power for regulated power control during swept and CW operations. At the output, power losses are minimized with a waveguide output connector. Full range coverage of the 83572 extends from 26.5 GHz to 40.0 GHz. This frequency range maintains a 100 MHz frequency accuracy and 0.2% linearity. With high frequency coverage, complete HP-IB programmability and outstanding leveled output power, the 83572 plug-ins extend the 8350 mainframe capabilities above 26.5 GHz.

The output power has calibrated range of 7 dB. The power level may be manually set to a 0.1 dB resolution, or the power level may be remotely HP-IB programmed to a 0.01 dB resolution. The 83572 also features Power Sweep which allows real time power response measurements of active devices. Another important feature is slope compensation which compensates for system/cable losses at high frequencies.

Scalar measurements at high frequencies may be easily made since the 83572 provides internal 27.8 kHz modulation (Option 006) required to interface with the HP 8756A Scalar Network Analyzer. In addition to amplifying the interface circuitry, internal modulation reduces connection losses which are critical at high frequencies.

The high output power and HP-IB programmability also make the 83572 ideal for use with the 8410 Network Analyzer and R8747B Test Unit when making vector network measurements from 26.5 to 40.0 GHz.

## 8350 Series Broadband RF Plug-Ins: Models 83570A, 83572A and 83572B Specifications

FREQUENCY CHARACTERISTICS		
	83570A	83572A/B
Range	18-26.5 GHz	26.5-40 GHz
Accuracy (25°C ± 5°C)		
CW Mode	± 30 MHz	± 100 MHz
Typical	± 20 MHz	± 20 MHz
All Sweep Modes	± 55 MHz	± 150 MHz
Residual FM (in 20 Hz-15 kHz bandwidth, CW mode)	< 30 kHz	< 60 kHz
OUTPUT CHARACTERISTICS		
Maximum Leveled Power (25°C ± 5°C)	> 10 mΩ	
Minimum Unleveled Power (25°C ± 5°C)		> 2 mΩ (5 mΩ) <sup>1</sup>
Opt. 001 (at output of external leveling coupler)		1.0 dB less
Opt. 006 (at waveguide output of plug-in)		1.5 dB less
Power Level Accuracy: Typical		
Internally Leveled	± 1.8 dB	
Externally Leveled (Opt. 001)		± 1.5 dB
Resolution (displayed)	0.1 dB	0.1 dB
Remote Programming (settable)	± 0.01 dB	± 0.01 dB
Power Variation (at max. rated power)		
Internally Leveled	< ± 1.4 dB	
Unleveled: Typically	< ± 2 dB	< ± 3 dB
Externally Leveled (Excluding coupler/detector variation)		
Crystal Detector or Power Meter	< ± 0.1 dB	< ± 0.2 dB
Spurious Signals		

Harmonically Related	< -25 dBc	< -20 dBc
Non-Harmonics	< -50 dBc	< -50 dBc
Source VSWR: 50 $\Omega$ nominal impedance		
Internally leveled	< 2.5	
Externally Leveled		< 1.5
<b>MODULATION CHARACTERISTICS</b>		
External FM		
Maximum Deviations for Modulation Frequencies		
DC to 100 Hz	$\pm 75$ MHz	$\pm 150$ MHz
100 Hz to 200 kHz		$\pm 3.5$ MHz
100 Hz to 1 MHz	$\pm 7$ MHz	
1 MHz to 2 MHz	$\pm 5$ MHz	
2 MHz to 10 MHz	$\pm 1.0$ MHz	
Sensitivity: Nominal		
FM Mode	-20 MHz/V	-20 MHz/V
Phase-Lock Mode	-6 MHz/V	-6 MHz/V
External AM		
Frequency Response: Typically	100 kHz	10 kHz
Range: Typically	11 dB	-
Option 001	-	7 dB (11 dB) <sup>1</sup>
Unleveled	-	30 dB
Sensitivity	1 dB/V	1 dB/V (Opt. 001)
External Pulse Modulation <sup>2</sup>		
Rise/Fall Time	20 ns	300/50 ns
Minimum RF Pulse Width (Typically)		

<b>Internally Leveled</b>	1 us	-
<b>Unleveled</b>	100 ns	500 ns
<b>Modulation Rate</b>	-	0.5 kHz-1 MHz
<b>On/Off Ratio</b>	> 25 dB	> 20 dB
<b>Internal AM: Selectable to 1 kHz or 27.8 kHz square wave</b>		
<b>On/Off Ratio</b>	> 25 dB	> 20 dB
<sup>1</sup> HP 83572B only.		
<sup>2</sup> HP 83572A/B, Option 006, unleveled output		
<b>External Leveling: Option 001</b>	Calibrated crystal detector (option 001): approximately -10 to -200 mV for specified leveling at rated output; for use with negative polarity detectors such as HP 422 Series Crystal detectors. SHIFT DET switch selects internal calibration for an external coupler, a crystal detector, and a BNC cable, all included in Option 001 of HP 83572.	
<b>GENERAL SPECIFICATIONS</b>		
<b>Sweep Time (minimum over full band)</b>	10 ms	
<b>RF Output Connector</b>	HP 83570A type WR42 waveguide. HP 83572A/B type WR28 waveguide.	
<b>Auxiliary Output</b>	(HP 83570A) real panel 9-13.25 GHz fundamental oscillator output, nominally 0 dBm.	
<b>Weight</b>	net 5.4 kg (12 lbs). Shipping 8.7 kg (19 lbs).	