SWEEP OSCILLATORS
Model 8620 Series: 10 MHz to 22 GHz
Model 8620 Series

- Broadband, straddle-band and single-band plug-ins
- External phase-lock capability
- High Output Power, >10 mW to 22 GHz
- Internal Leveling Standard

HP 8620C with HP 86222B, 86290B

HP 8620 Sweeper System

The HP 8620 solid-state sweeper system offers the flexibility of the HP 8620C mainframe in addition to a wide choice of broadband, straddle-band, and single-band plug-ins. The HP 8620 system also offers high output power with solid-state reliability; greater than 10 mW (leveled) to 22 GHz.

The fundamental oscillators used in the plug-ins are YIG-tuned-transistor or bulk-effect circuits. YIG tuning results in exceptional tuning linearity, low noise, and low spurious content. It also allows frequency modulation at high rates and wide deviations with low distortion.

Combining flexibility, powerful features, and reliability, the HP 8620 system is useful in network analysis, signal simulation, or local oscillator applications.

TYPICAL UNLEVELED POWER OUTPUT
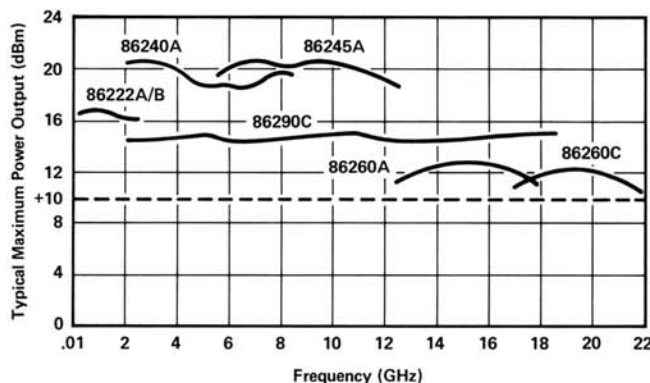
HP 8620C Sweeper Mainframe

The HP 8620C has many features highly useful in stringent applications. With convenient functionally-grouped controls and lighted pushbutton indicators, the mainframe offers ease of operation and flexibility. Additionally, it can be an HP-IB programmable source for automatic system and signal simulation applications.

HP 86222A/B and 86290B/C Broadband Plug-Ins

The 10 MHz to 18.6 GHz frequency range can be covered with just two plug-ins, the HP 86222A/B and 86290B/C. Besides their broad frequency ranges, these plug-ins offer many special features including unique crystal markers in the HP 86222B and better than ±30 MHz frequency accuracy in the HP 86290B/C.

HP 86240A/B/C and 86251A Straddle-Band Plug-Ins

Covering more than an octave of frequency, the HP 86240A/B span 2 to 8.4 GHz and the HP 86251A spans 7.5 to 18.6 GHz (covering the primary TWT amplifier frequencies) with major advances in power output and spectral purity. The HP 86240A offers more than 40 mW while the HP 86251A provides over 10 mW of leveled output power across their full bands. All three plug-ins deliver high-quality test signals of low harmonic content, with the HP 86240B providing harmonics less than −45 dBc. This can be very important when making multi-octave measurements.

HP 86200 Series Single-Band Plug-Ins

The HP 86200 series of plug-ins covers the frequency spectrum from 1.7 to 22 GHz with a choice of eight plug-ins.

Plug-In Compatibility with the HP 8350B Mainframe

The entire line of HP 86200 series plug-ins can be used in the HP 8350 Sweep Oscillator mainframe using the HP 11869A Adapter.
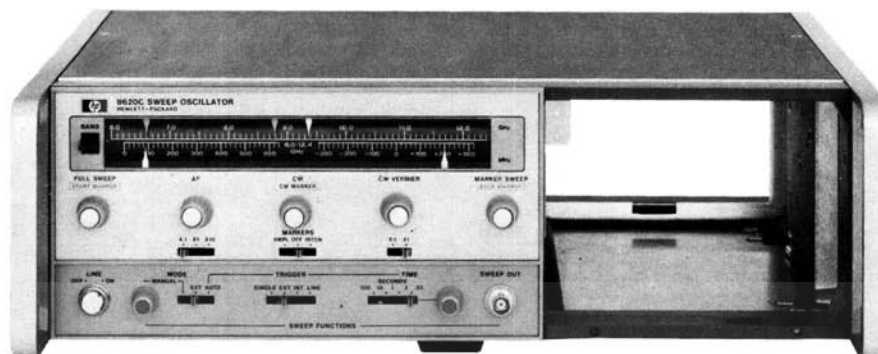
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- Optional BCD or HP-IB programming
- 3 markers

- 100% ΔF capability, fully calibrated

HP 8620C

The HP 8620C offers many features as standard equipment. For example, up to four separate bands and their respective frequency scales can be selected with a band-select lever to the left of the dial scale. Pushbuttons, concentrically located in the frequency control knobs, light when actuated to indicate the sweep function in use. Three frequency markers are available.

The HP 8620C is fully calibrated for any ΔF sweep width. When in CW/ΔF or CW modes, the CW vernier knob allows excellent frequency resolution by increasing the effective length of the dial scale to 7.5 metres (300 inches).

Another powerful feature is the capability to program the sweeper. The standard HP 8620C includes inputs for band selection, sweep function selection, and analog frequency control. Additionally, more flexible digital frequency programming is available to control the HP 8620C via HP-IB (Option 011).

Frequency markers: three constant-width markers are fully calibrated and independently adjustable over the entire range in FULL SWEEP function, controlled by START MARKER, STOP MARKER, and CW MARKER controls. In ΔF sweep START and STOP MARKERS are available, and in MARKER SWEEP the CW MARKER is available. Amplitude or intensity markers available.

Marker output: rectangular pulse, typically −5 volts peak, available from Z-axis BNC connector on rear panel.

Sweep and Trigger Modes
Internal: sweep recurs automatically.
Line: sweep triggered by ac power line frequency.
External trigger: sweep actuated by external signal.
Single: selects mode and triggers a single sweep.
Sweep time: continuously adjustable from 10 ms to 100 seconds.
Sweep output: direct-coupled sawtooth, zero to approximately +10 volts, concurrent with swept RF output.

HP 8620C Specifications
Frequency, output level, and modulation capablities depend on the RF plug-in installed; these specifications are summarized on the following page.

Remote Control: band can be selected remotely by three binary contact closure lines available at rear panel connector.

HP-IB Frequency Programming, Option 011
Functions
Band: manual enable or remote control of up to four bands.
Modes: seven modes are selectable, including digital control in three modes with a resolution of 10,000 points.
HP-IB interface functions
SH0, AH1, T0, L2, SR0, RL2, PP0, DC0, DT0, C0, E1.
Size: 132.6 mm H x 425 mm W x 337 mm D (5.29″ x 16.75″ x 13.25″).

Sweep Functions
FULL SWEEP: sweeps the full band as determined by the plug-in and the band select lever.
MARKER SWEEP: sweeps from START MARKER to STOP MARKER frequency settings, up to the full plug-in range, *either up or down in frequency.*
ΔF sweep: sweeps upward in frequency, centered on CW setting. CW vernier can be activated for fine control of center frequency.
Width: continuously adjustable and calibrated from zero to 1%, 10%, or 100% of frequency band.
CW operations: single-frequency RF output controlled by CW MARKER knob, selected by depressing pushbutton in CW MARKER control.
CW vernier: calibrated directly in MHz about CW setting. CW vernier activated by depressing pushbutton in CW VERNIER control.

Ordering Information
	Price
HP 8620C Sweep Oscillator Mainframe	$4,000
Opt 011: HP-IB Frequency Programming	add $955
Opt 007: Rear Sweep Out	add $75
Opt 820: 8410C Interface Cable	add $50
Opt W30: Two Years Extended Service	add $100

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392 SWEEP OSCILLATORS
Model 8620 Series: Mainframe (cont'd)
Model 8620C

	Broadband			Straddle-Band				Single-Band						
HP 86200 Series Plug-Ins: Specifications Summary	HP 86222B[1]	HP 86290B[2]	HP 86240A	HP 86240B	HP 86240C	HP 86251A	HP 86235A	HP 86241A	HP 86242D	HP 86245A	HP 86250D	HP 86260B	HP 86260A	HP 86260C
Frequency Characteristics														
Range (GHz)	0.01-2.4	2.0-18.6	2.0-8.4	2.0-8.4	3.6-8.6	7.5-18.6	1.7-4.3	3.2-6.5	5.9-9.0	5.9-12.4	8.0-12.4	10.0-15.5	12.4-18.0	17.0-22.0
Accuracy (MHz, 25°C)														
CW Mode	±10	±30	±25	±25	±25	±60	±20	±30	±35	±40	±40	±50	±50	±50
Remote Programming, typical	±1.5	±2.5	±3.5	±3.5	±3.5	±20	±2.5	±10.5	±5.0	±20	±20	±25	±25	±25
All Sweep Modes (sweep time >100 ms)	±15	±40	±40	±50	±35	±60	±30	±33	±40	±50	±50	±70	±70	±70
Residual FM (kHz peak, 20 Hz-15 kHz bandwidth)	<5	<25	<25	<25	<15	<15	<15	<7	<7	<30	<9	<9	<9	<20
Output Characteristics														
Maximum Leveled Power (mW, 25°C)	>20	>10	>40	>20	>40	>10	>40	>5	>10	>50	>10	>10	>10	>10
Power Variation (dB, at max specified power)														
Internally Leveled	±0.25	±0.7	±2	±2	±2	±0.8	±2	±0.8	±0.5	±0.6	±0.5	±0.7	±0.7	±0.7
Externally Leveled (excluding coupler and detector variations)	±0.1	±0.15	±0.1	±0.1	±0.1	±0.15	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1
Spurious Signals (dBc, at max specified power)														
Harmonically Related	<-25	<-25	<-16	<-45	<-16	<-35	<-20	<-16	<-30	<-17	<-30	<-25	<-25	<-25
Non-harmonics	<-25	<-50	<-60	<-60	<-60	<-50	<-60	<-60	<-60	<-60	<-60	<-50	<-50	<-50
Source SWR (50 ohms nominal, internally leveled)	<1.5	<1.9	<1.6	<1.6	<1.6	<1.9	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6
Modulation Characteristics														
External Pulse														
Rise/Fall Time, typical (ns)	n/a	n/a	20	20	20	n/a	20	n/a	n/a	n/a	n/a	n/a	n/a	n/a
On/Off Ratio (dB)			40	40	40		40							
For Input (volts)			+6	+6	+6		+6							
External FM[3]														
Maximum Deviation (MHz)														
DC to 100 Hz Rates	±75	±75	±75	±75	±75	±75	±75	±25	±150	±150	±150			
100 Hz to 1 MHz Rates	±5	±5	±5	±5	MLA[3]	±5	±5		±15	±15	±15			
1 MHz to 2MHz Rates	±2	±5	±2	±2		±5	±2		±5	±5	±5			
DC to 200 Hz Rates												±75	±75	±75
200 Hz to 200 kHz Rates												±5	±5	±5
Sensitivity, nominal (MHz/volt)	−20/−6	−20/−6	−20/−6	−20/−6	−20/−6	−20/−6	−20/−6	−6	−20/−6	−20/−6	−20/−6	−20/−6	−20/−6	−20/−6
External AM														
Linear Mode														
Frequency Response, Typical (kHz)	150	300	50	50	50	300	50	30	30	30	30	300	300	300
Attenuation (dB), typical	>30	>30	>30	>30	>30	>30	>30	>25	>20	>20	>20	>25	>25	>25
For Input (volts)	+6	+5	+5	+5	+5	+5	+5	−10	+6	+6	+6	−10	−10	−10
Square Wave Mode														
On/Off Ratio (dB)	n/a	>30	n/a	n/a	n/a	>30	n/a	n/a	>40	>40	>40	n/a	n/a	n/a
For Input (volts)		+6				+6			+6	+6	+6			
Compatible with HP 8757/8756 Mod Drive signal	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	No	No	No
Internal AM														
1 kHz Square Wave On/Off Ratio (dB)	>30	>25	>40	>40	>40	>25	>40	>25	>40	>40	>40	>25	>25	>25
Prices														
Plug-in	$7,000 (86222A: $6,000)	$15,600 (86290C: $20,000)	$6,600	$7,800	$7,600	$11,000	$5,400	$4,700	$5,600	$8,100	$5,500	$6,700	$6,500	$9,500
With Opt 002 (70 dB Attenuator)	+ $750	n/a	+ $905	+ $905	+ $905	n/a	+ $850	n/a	n/a	n/a	n/a	n/a	n/a	n/a
With Opt 004 (Rear Panel RF Output)	+ $200	+ $200	+ $200	+ $200	+ $200	+ $200	+ $200	+ $200	+ $200	+ $200	+ $200	+ $200	+ $200	+ $200

[1] HP 86222A specifications identical to HP 86222B, except that the HP 86222B has 1, 10, and 50 MHz crystal markers which allow enhancement of frequency accuracy to better than ±200 kHz.
[2] HP 86290C specifications identical to HP 86290B, except that the HP 86290C has maximum leveled power >20 mW. HP 86290B specifications listed apply to frequencies 6 to 12.4 GHz.
[3] Many HP 86200 series plug-ins have optional Microwave Link Analyzer (MLA) compatibility capabilities, see page 487 for details.

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