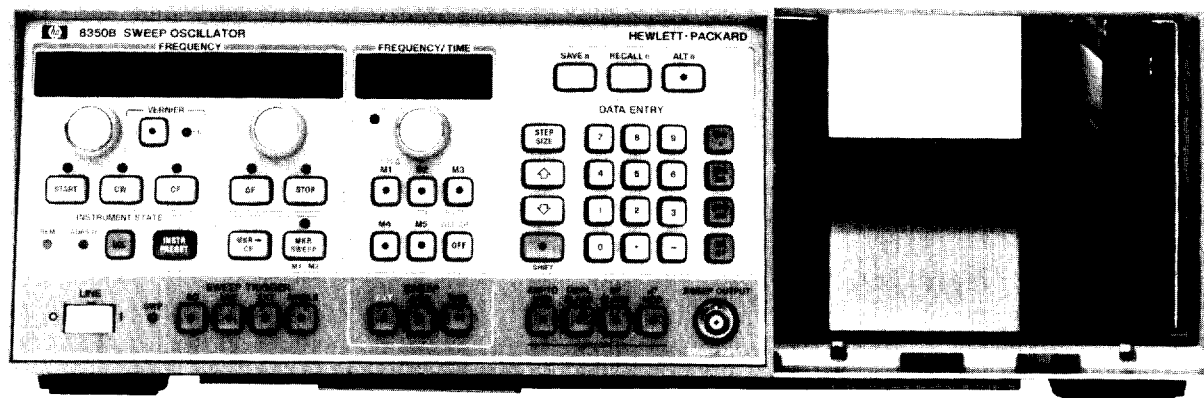


# SWEEP OSCILLATORS

Model 8350 Series: Mainframe

Model 8350B

- Accurate, high resolution, digital displays
- Five markers with marker  $\Delta$  and marker sweep
- Save/recall 9 complete front panel states
- Accepts all HP 83500 series plug-ins
- Total HP-IB programmability



HP 8350B



## HP 8350B Mainframe

Sweep Oscillator applications are greatly expanded by the features of the HP 8350B. Along with the traditional swept and CW frequency functions the HP 8350B adds five markers with extensive capabilities, versatile data entry and complete HP-IB programmability. The HP 8350B mainframe accepts the HP 86200 series plug-ins via the HP 11869A Adapter as well as the wideband HP 83500 series plug-ins. In order to aid system set ups, the HP 8350B is directly compatible with the HP 8510, HP 8410C, HP 8757A and HP 8756A network analyzers. The frequency accuracy is easily enhanced when the HP 5343A counter is used to count the START, STOP, or ACTIVE MARKER frequency. For even more frequency accuracy and stability the HP 5344S Source Synchronizer may be used to phase-lock the RF output.

The HP 8350B has three methods of changing function values: control knobs, keyboard entry, or step key entry.

Five markers are available with the HP 8350B. These markers combined with the high resolution digital readout make the accurate location of important frequency responses easy. A key marker feature, marker  $\Delta$ , computes the difference between any two markers. This feature is particularly useful for measurements such as the determination of the bandwidth between 3 dB points. With the extensive marker capabilities key frequency ranges may be marked and swept. The markers can modify the center frequency (marker  $\rightarrow$  CF) or the START/STOP frequency (Marker Sweep). These expanded marker capabilities simplify sophisticated measurements.

A necessity in making repetitive measurements or automatic tests is the Save/Recall feature. Once the HP 8350B controls have been set for a particular measurement, all of the front panel controls can be "Saved" in a memory location and later "Recalled" when the measurement is repeated. This feature supplies nine memory locations,

each storing a complete front panel set-up. Memory storage or access may be done randomly or sequentially. Nonvolatile memory is included so that all memories are retained even when line power is removed.

The HP 8350B makes "simultaneous" comparison of two separate frequency ranges or power levels easy via the alternate sweep mode. When the alternate sweep mode is activated, the HP 8350B alternates between the current front panel setting and any stored memory setting on successive sweeps. The output from this function may be processed through a network analyzer such as the HP 8756A or the HP 8757A and viewed on a two channel display.

All front panel controls (except the ac line power switch) may be programmed or controlled via the HP-IB. The HP 8350B may interact as a listener or as a talker on the HP-IB. As a talker the HP 8350B is capable of outputting the manually entered front panel information to a controller. The HP-IB capabilities of the HP 8350B are far more extensive than in other sweepers hence increasing its range of applications.

As a result of the HP 8350's internal microprocessor design, a self test is performed at turn on or whenever the instrument preset function is activated. This function verifies that the HP 8350B is functioning properly. If there is a problem, error codes are displayed on the front panel to help locate the problem quickly to the board and component level.

In the HP 8350B the frequency resolution is determined by the digital-to-analog converters that are used to produce the tuning voltage and marker pulses. The center frequency resolution is 0.00038% of the full band (262,144 points across the band). The  $\Delta F$  resolution is variable such that higher resolution is provided for narrow sweep widths. The  $\Delta F$  resolution is 0.1% of the full-band range for full-band sweeps and improves to 0.0015% of the full-band range for very narrowband sweeps.



## HP 8350B Specifications

### Instrument Control

**Control knobs, step keys and data entry keyboard:** all instrument parameters whether time, frequency or power may be set three ways: control knobs, keyboard entry, or step keys. The step size either can be entered by the user or the pre-programmed default values may be used. The SHIFT key is used to effect the functions written in blue.

### Frequency Control Functions

**Range:** determined by RF plug-in unit used.

**Linearity:** refer to RF unit specifications.

**START/STOP sweep:** sweeps up from the START frequency to the STOP frequency.

**CF/ΔF Sweep:** sweeps symmetrically upward, centered on CF.

ΔF: frequency width of sweep continuously adjustable from zero to 100% of frequency range.

ΔF Accuracy: refer to RF unit specifications.

CF Accuracy: refer to RF unit specifications.

CF Resolution: 0.00038% (262,144 points across band).

ΔF Resolution: 0.1% of full band (1024 points across band)  
0.012% of band for 1/8 of band or less  
0.0015% of band for 1/64 of band or less.

**Display resolution:** 5 digits.

**CW operation:** single frequency RF output.

**CW accuracy:** refer to RF unit specifications.

**CW resolution:** same as CF.

**Vernier:** adjusts CW frequency or swept center frequency up to 0.05% of RF plug-in band being swept.

**Vernier resolution:** 4 ppm (64 points between each CW point; 262,144 points across band).

**Offset:** allows the CW frequency or center frequency to be offset by any amount up to the full range of the plug-in.

**Resolution:** same as CF.

**Accuracy:** refer to RF unit specifications.

**Frequency markers:** five frequency markers are independently adjustable and fully calibrated over the entire sweep range. Amplitude or intensity markers available.

**Resolution:** 0.4% of selected sweep width (256 points/sweep).

**Accuracy:** refer to frequency accuracy.

**Marker output:** rectangular pulse, typically -5 volts peak available from the POS Z BLANK connector on rear panel.

**Marker sweep:** RF output is swept between Marker 1 and Marker 2.

**Marker→CF:** causes the CW or the swept center frequency to equal the frequency of the active marker.

### Sweep and Trigger Modes

**Internal:** sweep recurs automatically.

**Line:** sweep triggered by ac power line frequency.

**External trigger:** sweep is actuated by external trigger signal.

**Single:** selects mode and triggers a single sweep.

**Sweep time:** continuously adjustable from 10 ms to 100 seconds.

**Manual sweep:** front panel controls provide continuous manual adjustment of frequency between end frequencies.

**External sweep:** sweep is controlled by external signal applied to front or rear panel SWP OUTPUT/SWP INPUT connector.

**Sweep output:** direct-coupled sawtooth, zero to approximately ±10 volts, at front or rear panel concurrent with swept RF output.

### Instrument State Storage

**Save n/recall n:** up to 9 different front panel settings can be stored in the HP 8350B via the Save n (n = 1 through 9) function. Settings can be recalled randomly or in sequence.

**Alt n:** causes the RF output to alternate on successive sweeps between the current front panel setting and a setting stored in memory.

### Instrument State

**Instrument preset:** sets the front panel of the HP 8350B into a pre-determined state. It also causes an internal analog and digital self-test to occur. If internal errors or failures are detected they are indicated via error codes.

**Local operation:** this key is used to return the HP 8350B to local control from the remotely controlled state. The REM lamp indicates remote control. The ADRS'D lamp indicates transmitted or received data over the HP-IB.

### Modulation

**External AM:** refer to RF unit specifications.

**Internal AM:** square wave modulation available at all sweep speeds. Factory preset to 27.8 kHz although selectable to 1000 Hz or 27.8 kHz. On/off ratio, refer to RF unit specifications.

**External FM:** refer to RF unit specifications.

**Phase-lock:** refer to RF unit specifications.

### Remote Programming (HP-IB)

The HP 8350B has both input and output capability. The HP-IB address can be displayed on the front panel and is selectable (any number from 0 to 31).

**Input mode functions:** all front panel controls except the ac line power switch are programmable. Numerical values typically have Lgreater entry resolution than is displayed.

**Frequency resolution:** same as CF/ΔF plus vernier.

**Power resolution:** see HP 83500 Series Plug-ins.

**Output mode functions:** the HP 8350B can output to a controller an instrument state message that describes the present instrument status.

**HP-IB interface functions:** SH1, AH1, T6, L4, SR1, RL1, PPO, DC1, DT1, CO, E1.

### General Specifications

**Nonvolatile memory:** continuous memory that retains the contents of all instrument state storage registers, the HP-IB address, and current instrument state when ac line power is off.

#### Blanking

**RF:** when enabled, RF turns off during retrace and remains off until next sweep.

**Display:** POS Z BLANK; direct-coupled rectangular pulse approximately +5.0 volts during retrace and bandswitch points of sweep. LNEG Z BLANK; direct-coupled rectangular pulse approximately -5.0 volts coincident in time with RF blanking.

**Pen Lift:** output to control the pen lift function of XY recorder at end point of sweep.

**Counter trigger (CNTR TRIG):** output for controlling the external trigger input of the HP 5343A Frequency Counter.

**Stop sweep:** input for stopping the progress of a forward sweep, used with HP 5343A Frequency Counter.

**Program connector:** additional control of and information on the HP 8350B instrument state is provided via a 25 pin rear panel connector.

**HP 8410C interface cable:** permits multi-octave operation of HP HP 8410C Network Analyzer with HP 8350B.

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

**Power:** 100, 120, 220 or 240 volts ±10%, 50 to 60 Hz (Option 400, 60 to 400 Hz). Approximately 270 volt-amperes including RF unit.

**Weight (not including RF unit):** Net 16.5 kg (36.4 lb). Shipping 22.7 kg (50 lb).

**Dimensions:** 425 mm wide, 133.3 mm high, 422 mm deep (16.75" x 5.25" x 16.6").

### Ordering Information

#### HP 8350B Sweep Oscillator Mainframe<sup>1</sup>

##### Options

	Price
400: 400 Hz Power Line Frequency Operation	add \$200
803: HP 5343A Interface Cables	add \$60
850: HP 8410C Source Control Cable	add \$100
908: Rack Mounting Kit	add \$32.50
910: Extra Manual	add \$80
913: Rack Flange Kit for Instruments with Front Handles	add \$35

<sup>1</sup>For transit cases see page 688