

FUNCTION GENERATORS & FREQUENCY SYNTHESIZERS

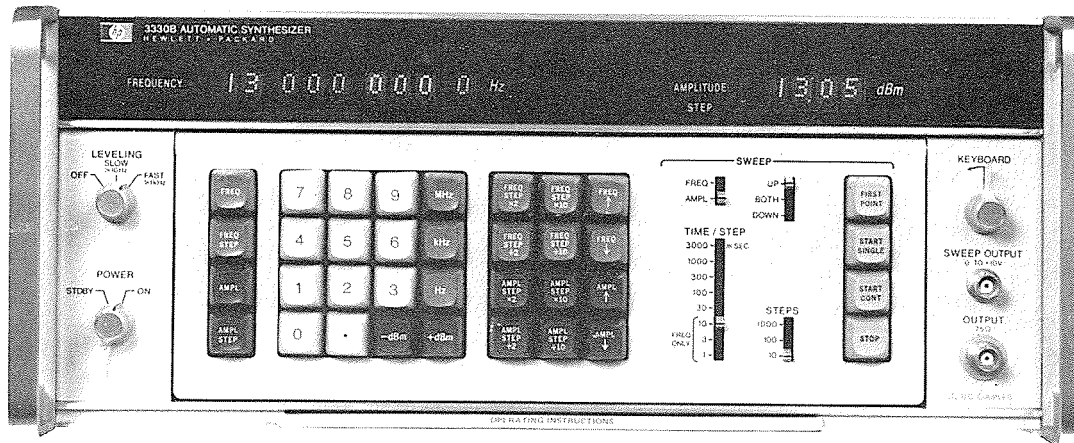
0.1 Hz to 13 MHz automatic synthesizer

Model 3330B

367



- Digital sweeping of frequency and amplitude



Abbreviated Specifications

(For complete specifications, refer to data sheet)

Frequency range: 0.1 Hz to 13,000,999.9 Hz.

Frequency resolution: 0.1 Hz (8 digits + overrange).

Frequency Stability

Long term: $\pm 1 \times 10^{-8}$ of frequency per day. $\pm 1 \times 10^{-7}$ of frequency per month.

Temperature: $\pm 1 \times 10^{-8}$ of frequency at $25^\circ\text{C} \pm 10^\circ\text{C}$. $\pm 1 \times 10^{-7}$ of frequency at 0°C to 55°C .

Signal to phase noise (Integrated): 50 dB down in a 30 kHz band, excluding ± 1 Hz, centered on carrier.

Harmonic distortion: with full output amplitude, any harmonically related signal will be less than the following specified levels.

5 Hz to 100 kHz: -60 dB.

100 kHz to 1 MHz: -50 dB.

1 MHz to 13 MHz: -40 dB.

Spurious

All nonharmonically related spurious signals will be greater than 70 dB below selected output level or ≤ 110 dBm/50 Ω , whichever is greater.

Auxiliary Outputs

20 - 33 MHz tracking output: > 100 mV rms/50 Ω .

1 MHz reference output: > 220 mV rms/50 Ω (0 dBm/50 Ω).

Synthesized search or tune: a frequency step (0.1 Hz min) may be entered. This step may be added to or subtracted from the synthesized output signal. Rate of search or tune is selected by the time per step control.

Digital sweeping of frequency: accomplished by entering and setting the center frequency, a frequency step, number of steps, time per step, and sweep direction.

Sweep width: the product of the step size and number of steps.

Step size: continuously adjustable in 0.1 Hz increments.

Step accuracy: $\pm 1 \times 10^{-8}$ per day for standard reference crystal.

Number of steps: 10, 100, or 1000.

Time per step: 1 ms, 3 ms, 10 ms, 30 ms, 100 ms, 300 ms, 1000 ms, and 3000 ms.

Direction of sweep: up, both, down.

Single sweep: initiated by momentary pushbutton.

Continuous sweep: initiated by momentary pushbutton.

Manual sweep: accomplished by holding down the freq \uparrow or freq \downarrow keys. Display will follow output.

Sweep output: stepped dc voltage proportional to sweep position, 0 to +10V.

Accuracy: $\pm 0.2\%$ of full scale.

Linearity: $\pm 0.1\%$ of full scale.

Amplitude Section

Amplitude: maximum 2.1 V rms into open circuit; maximum 1.05 V rms into 50 Ω .

Amplitude range: +13.44 dBm to -86.55 dBm into 50 Ω .

Amplitude resolution: 0.01 dB.

Output impedance: 50 Ω (75 Ω Opt 001).

Display: four digit readout in dBm with reference to 50 Ω .

Leveled frequency response: (10 kHz reference) 10 Hz-13 MHz.*

+13.44 dBm to -16.55 dBm: ± 0.05 dB.

-16.55 dBm to -36.55 dBm: ± 0.1 dB.

-36.55 dBm to -66.55 dBm: ± 0.2 dB.

-66.55 dBm to -86.55 dBm: ± 0.4 dB.

Amplitude attenuator accuracy: ± 0.02 dB/10 dB step (at 10 kHz) of attenuation down from maximum output.

Amplitude accuracy (absolute): ± 0.05 dB at 10 kHz and +13.44 dBm ($15^\circ\text{C} \pm 5^\circ\text{C}$). (For absolute accuracy at other frequencies and amplitudes, add 0.05 dB to the leveled frequency response specification, plus the attenuator accuracy specification.)

Amplitude modulation: requires external modulation source. Rear panel BNC. ALC switch must be in slow position.

Modulating signal: 100 Hz to 100 kHz.

Modulation depth: 0.95 V rms modulating signal for 95% modulation depth.

General

Operating temperature: 0°C to $+55^\circ\text{C}$.

Storage temperature: -40°C to $+70^\circ\text{C}$.

Turn on time: application of power to "On": 20 min to within $\pm 1 \times 10^{-7}$ of the final frequency.

"Standby" to "On": 15 s to full specifications.

Power requirements: 115 V or 230 V $\pm 10\%$, 48 Hz to 63 Hz, 20 W standby, 200 W on.

Weight: net, 22.6 kg (53 lb). Shipping, 26.8 kg (63 lb).

Size: 177 mm H \times 426 mm W \times 547 mm D (7" \times 16.8" \times 21.5").

Options

001: 75V-1 V output

002: High stability crystal oven

003: deletion of oven

005: 5 V-50 Ω output

3330B Automatic Synthesizer
(includes isolated HP-IB)