

1 to 1040 MHz Signal Generator

- 1 MHz to 1040 MHz Frequency Range
- GPIB Programmability
- 32 Complete Front-Panel Stored Settings
- Nonvolatile Memory
- Programmable Internal Modulation Source
- 50 Watt Reverse Power Protection

Model 3510B, a microprocessor-controlled Signal Generator, covers the frequency spectrum of 1 to 1040 MHz. Standard features include a programmable internal audio source for AM and FM modulation, a nonvolatile memory and full GPIB programmability.

+ 13 dBm Output;

0.001% Frequency Accuracy

RF output power range is +13 dBm to -137 dBm with flatness to ± 1 dB (+13 to -6.9 dBm). Frequency resolution is 100 Hz and accuracy is 0.001% (typically 0.0002%). The standard stability of 0.2 ppm/hr may be improved by using the optional External Reference input, the optional Internal/

External Reference and/or the optional High Stability Internal Reference.

Modulation Flexibility

The internal modulation signal can be at any 10 Hz increment between 80 Hz and 10 kHz. This internal source may be combined with an external source to create complex or simultaneous modulation such as AM on FM, FM on FM or AM on AM.

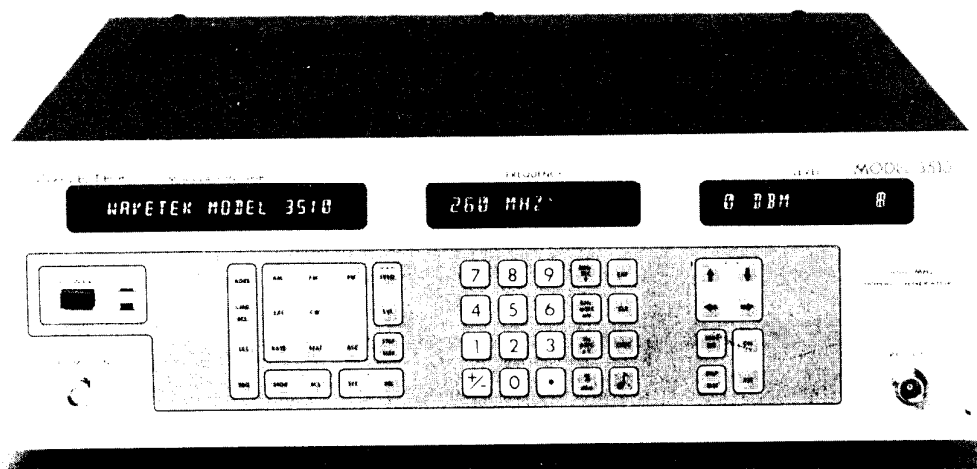
Simple Operation

Manual control is via a 48-key touch pad front panel. A "beeper" indicates a button has been pressed. All settings are displayed. Output levels are conveniently read out in dBm or

volts. Up to 32 complete front-panel settings may be stored in a non-volatile memory and recalled to the front panel on command.

A unique cursor system has selectable increment sizes. A reference mode allows frequency or level references to be set; subsequent display values are relative to the reference value.

All functions are GPIB programmable except power on/off. Programming is "free format," and multiple function changes can be executed simultaneously. Frequency switching and settling time over the bus is typically 75 ms.



MODEL 3510B

SIGNAL GENERATORS

FREQUENCY

Range

1 to 1040 MHz. (1 kHz to 1040 MHz optional.)

Resolution

100 Hz.

Accuracy

± 0.001% in all modes with ALC on;
± (0.001% + 10 kHz) in all modes with ALC off.

Stability

(After 2 hr warmup)
1 to 520.9999 MHz: 0.2 ppm/hr with ALC on, 500 Hz/10 min with ALC off.
521 to 1000 MHz: 0.4 ppm/hr with ALC on, 1 kHz/10 min with ALC off.

Switching Speed

Typically <200 ms.
(<40 ms for steps >1 MHz).

RF OUTPUT

Impedance

50Ω (SWR less than 1.3 at RF levels less than 0.1 Vrms)

Output Connector

Type N.

Power Level Range

1 to 1000 MHz: +13 to -137 dBm (1 volt to 0.0316 μVrms).

RF Level Control

Adjustable in 0.1 dB steps in dBm mode. Three significant digits in voltage mode.

Total Level Accuracy (1 to 1000 MHz)

+13 to -36.9 dBm: ± 1.3 dB below -36.9 dBm: ± (1.3 dB + 1% of step attenuation).

Accuracy Traits (1 to 1000 MHz)

Flatness (+13 to -6.9 dBm): ± 1 dB, 1 to 1000 MHz.

Step Attenuator: ± 0.3 dB or 1% of attenuation, whichever is greater.

Leakage

<1 μV into a two-turn, 1 inch diameter loop held 1 inch from any surface.

SPECTRAL PURITY

Harmonic Output

1 MHz to 10 MHz: < -26 dBc;

10 MHz to 1 GHz: < -30 dBc.

Sub-Harmonics

1 to 520.9999 MHz: none detectable;

521 to 1000 MHz: < -30 dBc.

Non-Harmonics

Fundamental	Spurious Level
1 to 3 MHz	< -60 dBc in 1 to 3 MHz band
3.0001 to 250 MHz	< -65 dBc in 3 to 250 MHz band
3.0001 to 350 MHz	< -55 dBc in 3 to 350 MHz band
3.0001 to 500 MHz	< -35 dBc in 3 to 500 MHz band
3.0001 to 1000 MHz	< -30 dBc in 3 to 2000 MHz band

Phase Noise

1 to 520.9999 MHz: < -93 dBc typical (offset 20 kHz from carrier with 1 Hz bandwidth);

1 to 520.9999 MHz: < -120 dBc typical (offset 500 kHz from carrier with 1 Hz bandwidth);

521 to 1000 MHz: < -87 dBc typical (offset 20 kHz from carrier with 1 Hz bandwidth);

521 to 1000 MHz: < -114 dBc typical (offset 500 kHz from carrier with 1 Hz bandwidth);

Residual AM

< -60 dBc in a 50 Hz to 15 kHz post-detection bandwidth.

Residual FM

In 50 Hz to 15 kHz Post-Detection Bandwidth:

1 to 520.9999 MHz: <200 Hz (typically <100 Hz).

521 to 1000 MHz: <400 Hz (typically <200 Hz).

MODULATION

Internal Frequency Source

Internal modulation source settable in 10 Hz increments between 80 Hz and 10 kHz (accuracy ± 6% + 2% of reading).

External Frequency Source

AM: DC to 30 kHz (3 dB bandwidth) with ALC off; 100 Hz to 30 kHz with ALC on.

FM: DC to 60 kHz (1 dB bandwidth) with ALC off; 100 Hz to 60 kHz with ALC on.

Input Level Required to Provide Calibrated Display:

ALC On: 0.1V to 1 Vp-p into 600Ω;

ALC Off: 10 Vp-p into 600Ω.

Modulation Depth Resolution

0.1%.

Modulation Depth Indicator Accuracy

0 to 90%: ± (2% + 4% of reading) at 1 kHz rate.

Modulation Range

0.1 to 90% (over range to 100%).

Modulation Distortion

(Measured at 1 kHz.)

0 to 30% AM: <1.5%.

30 to 70% AM: <3%.

70 to 90% AM: <5%.

Deviation Resolution

100 Hz for deviations <10 kHz.

1 kHz for deviations ≥10 kHz.

Deviation Indicator Accuracy

± (500 Hz + 5% of reading) at 1 kHz rate.

Deviation Range

0.1 to 100 kHz deviation.

Distortion

(Measured at 1 kHz.)

10 to 100 kHz deviation: <2%.

3 to 10 kHz deviation: <4%.

GPIB REMOTE PROGRAMMING

Conforms to IEEE-488 standards.
Controls all functions except power On/Off.

Function

Listens and talks, gives error status and instrument status. Implements: SH1, AH1, T6, TE0, L4, LE0, SR1, RL1, PP0, DC1, DT1, C0, E2.

GENERAL

Readout

Alpha numeric vacuum-fluorescent display.

Front Panel Control

Soft touch membrane switches.

Reverse Power Protection

(No protection below 1 MHz).

Trip Time: <2ms.

RF Trip Level: Approx 0.7W.

RF: 50W.

DC Blocking Voltage: 50V.

Environment:

Specifications Apply: 25° ± 5°C.

Slight Degradation of Specifications: 25° ± 15°C.

Dimensions

43.2 cm (17 in.) wide × 14.6 cm (5¾ in.) high × 40.6 cm (16 in.) deep.

Weight

14.5 kg (32 lb).

Power

90 to 110, 110 to 130, 180 to 220, or 220 to 240 VAC; 50 to 400 Hz; approximately 75 watts.

OPTIONS

NOTE: Option combinations are restricted as shown on model/option availability chart (page 124). Options are described on this page also.

02A	External Pulse Modulation.	\$550
05	External Reference. Required with Option 06.	\$275
05A	External Reference/High Stability Reference.	\$350
06	High Stability Reference.	\$720
08	Low Frequency Extension (1 kHz to 1040 MHz).	\$700
09	Rear Panel RF Out and Mod In.	\$250

ACCESSORIES

K234	Rack Mount Kit (P/N1019-00-0234) See page 172 for details.	\$75
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FACTORY/FOB

Beech Grove, IN

PRICE

Model 3510B \$5600