

520 MHz Signal Generators

- 100 Hz or 1 kHz Resolution
- Phase Locked Over Entire Range
- Complex Modulation: AM/FM, FM/FM, AM/AM
- Four Internal Modulation Frequencies
- GPIB Compatible

Versatility

Models 3003 through 3006 are rugged, solid state, synthesized signal generators which incorporate unique modulation capabilities, excellent accuracy and stability, and many standard and optional features. These instruments are identical with the exception of frequency range, resolution and option availability.

Model	Frequency Range	Resolution
3003	1 to 520 MHz	1 kHz (6 digits)
3004	1 kHz to 520 MHz	1 kHz (6 digits)
3005	1 to 520 MHz	100 Hz (7 digits)
3006	1 kHz to 520 MHz	100 Hz (7 digits)

Modulation Flexibility

Internal and external modulation capabilities provide unique complex, or simultaneous, modulation: FM on FM, AM on AM or AM on FM. This feature makes these Wavetek models ideal in tests of two-way radios, mobile telephones, paging receivers, and other systems that utilize techniques which superimpose subaudible tones or

tone coded signals on voice (or other) channels.

Easily operated front panel controls allow the selection of not just two modulation frequencies (as in most generators), but four: the two standard frequencies of 400 Hz and 1kHz, plus any other two, user-preset frequencies between 100 Hz and 10 kHz. Internal or external FM deviation (0 to 100 kHz) and percent AM modulation (0 to 90%) are easily set and read on the large, front panel meter. For increased readability and accuracy, two AM scales (30 or 100% full scale) and four FM scales (3, 10, 30, or 100 kHz full scale) are provided.

High Accuracy and Stability

Frequency of Models 3003 and 3004 is set via six front panel lever/indicator switches to a resolution of 1 kHz; Models 3005 and 3006 have seven lever/indicator switches and 100 Hz resolution. All models provide signal accuracy of 0.001%

(typically 0.0002%) over their entire frequency ranges. Standard stability is 0.2 ppm/hour. Option 05, External Reference, allows accuracy over the entire frequency range to equal the accuracy of an external standard. Option 06, High Stability Reference, used in conjunction with Option 05 provides typical overall accuracy of 0.2 ppm (0.00002%) and aging of 0.005 ppm/day.

Programmability

Frequency programmability through rear panel input connector using BCD coded TTL voltages or BCD coded contact closures is standard. Option 01A permits RF level programming. Models 3910 and 3911 provide for GPIB control of frequency and output level. Wavetek 3900 Series programmers provide control of frequency only. The programmability of Models 3003 through 3006 makes them ideal for automatic and semi-automatic test applications.



MODELS 3003, 3004, 3005 & 3006

SIGNAL GENERATORS

FREQUENCY

Range

Models 3003 and 3005: 1 to 520 MHz.
Models 3004 and 3006: 1 kHz to 520 MHz.

Readout

Lever/indicator switches.
Models 3003 and 3004: 6 digits.
Models 3005 and 3006: 7 digits.

Resolution

Models 3003 and 3004: 1 kHz.
Models 3005 and 3006: 100 Hz.

Accuracy

±0.001% in all modes.
(Typical: ±0.0002% after 2 hours.)

Stability

0.2 ppm/hr. 500 Hz/10 min when frequency vernier is not in CAL position.

Programmability

Frequency programmability through rear-panel input connector using BCD-coded TTL voltages or BCD-coded contact closures is standard. Option 01A permits RF level programming. GPIB converters (Models 3910 and 3911) for control of frequency and output level plus frequency programmers (3900 Series) are available.

RF OUTPUT

Power Level Range

+13 to -137 dBm (1V to 0.03 μV rms).

Level Control

Continuously adjustable in 10 dB steps with an 11 dB vernier. Output level is indicated on a front panel meter calibrated in volts and dBm.

Total Level Accuracy

+13 to -7 dBm: ±1.25 dB.
(Typical: ±0.75 dB.)
-7 to -77 dBm: ±1.95 dB.
(Typical: ±1.25 dB.)
-77 to -137 dBm: ±2.75 dB.
(Typical: ±1.5 dB.)

Accuracy Breakdown

Flatness (+13 to -7 dBm):
±0.75 dB (Typical: ±0.5 dB.)
Output Meter: ±0.5 dB.
Step Attenuator:
±0.5 to 70 dB (±0.2 dB cal. error);
±1.0 to 130 dB (±0.5 dB cal. error).

Impedance

50Ω (SWR <1.2 at RF output levels below 0.1V).

Leakage

<1 μV into a 2 turn, 1 in. diameter loop held 1 in from any surface.

SPECTRAL PURITY

Harmonic Output

1 to 10 MHz: >26 dBc.
10 to 520 MHz: >30 dBc.
1 kHz to 1 MHz (Models 3004 and 3006): >30 dBc.

Subharmonics

None detectable.

Nonharmonics

Fundamental Spurious Level

Models 3003 and 3005:
1 to 3 MHz >60 dBc in 1 to 3 MHz band

Models 3004 and 3006:
1 kHz to 3 MHz >60 dBc in 1 to 3 MHz band

Models 3003 thru 3006:
3 to 250 MHz >65 dBc in 3 to 250 MHz band

3 to 350 MHz >55 dBc in 3 to 350 MHz band

3 to 520 MHz >35 dBc in 3 to 1000 MHz band

Residual AM

>65 dB below carrier in a 50 Hz to 15 kHz post-detection bandwidth.

Residual FM

<100 Hz in 300 Hz to 3 kHz post-detection bandwidth. (Typical: <50 Hz.)

<200 Hz in a 50 Hz to 15 kHz post-detection bandwidth. (Typical: <100 Hz.)

AMPLITUDE MODULATION

Internal Frequency

400 Hz, 1000 Hz and two preset frequencies between 100 Hz and 10 kHz (accuracy: ±2%).

External Frequency

DC to 20 kHz (3 dB bandwidth). Input level required: 1V rms into 600Ω to provide full-scale adjustment with EXT MOD LEVEL control.

Range

0 to 90%.

Distortion

Measured at 1 kHz.
0 to 70% AM: <3%. (Typical, 0 to 30% AM: <1.5%.)
0 to 90% AM: <5%.

Meter

Scales of 30% AM and 100% AM. Accuracy: ±(2% of full-scale reading + 5% of meter reading) at 1 kHz modulation frequency.

FREQUENCY MODULATION

Internal Frequency

400 Hz, 1000 Hz and two preset frequencies between 100 Hz and 10 kHz (accuracy: ±2%).

External Frequency

50 Hz to 20 kHz (1 dB bandwidth) with frequency vernier in CAL. DC to 25 kHz (1 dB bandwidth) with frequency vernier not in CAL. Input level required: 1V rms into 600Ω to provide full-scale adjustment with EXT MOD LEVEL control.

Range

0 to 100 kHz deviation.

Distortion

Measured at 1 kHz.
10 kHz to max deviation: <2%.
3 kHz to 10 kHz deviation: <4%.

Meter

Scales of 3, 10, 30 and 100 kHz

deviation.

Accuracy: ±3% of full scale reading.

Measured with 1 kHz modulation.

GENERAL

Output Connector

Type N.

Dimensions

30.3 cm (12 in.) wide; 13.4 cm (5¼ in.) high; 34.9 cm (13¾ in.) deep.

Weight

13 kg (28.6 lb) net; 13.6 kg (30 lb) shipping.

Power

115 or 230V ±10%; 50 to 400 Hz; approximately 40 watts.

OPTIONS

NOTE: Not all options are available on all models. See page 110 for a model/option availability chart and a complete description of each option.

01A	\$650
RF Level Programming (0.1 dB steps)	
03	\$200
Reverse Power Protection	
04	\$180
Auxiliary RF Output	
05	\$210
External Reference (Required with Option 06)	
05A	\$295
External Reference/High Stability Reference (1 ppm accuracy).	
06	\$625
High Stability Reference (Requires Option 05)	
07	\$375
Low Level Leakage	

ACCESSORIES

NOTE: See page 111 for programming information and page 174 for rack mounting details.

Model K108	\$50
Rack Mount Adapter	
Model 2102	\$825
Precision Frequency Standard	
Model 3900	\$770
12 Channel Frequency Programmer	
Model 3900-1	\$450
12 Channel Frequency Programmer	
Model 3910	\$950
GPIB Converter	
Model 3911	\$1235
GPIB Converter (with integral LED readout of frequency and/or attenuation)	

PRICE (FOB Beech Grove)

Model 3003	\$4300
Model 3004	\$4750
Model 3005	\$4500
Model 3006	\$4950