1GHz SIGNAL GENERATOR PSG1000

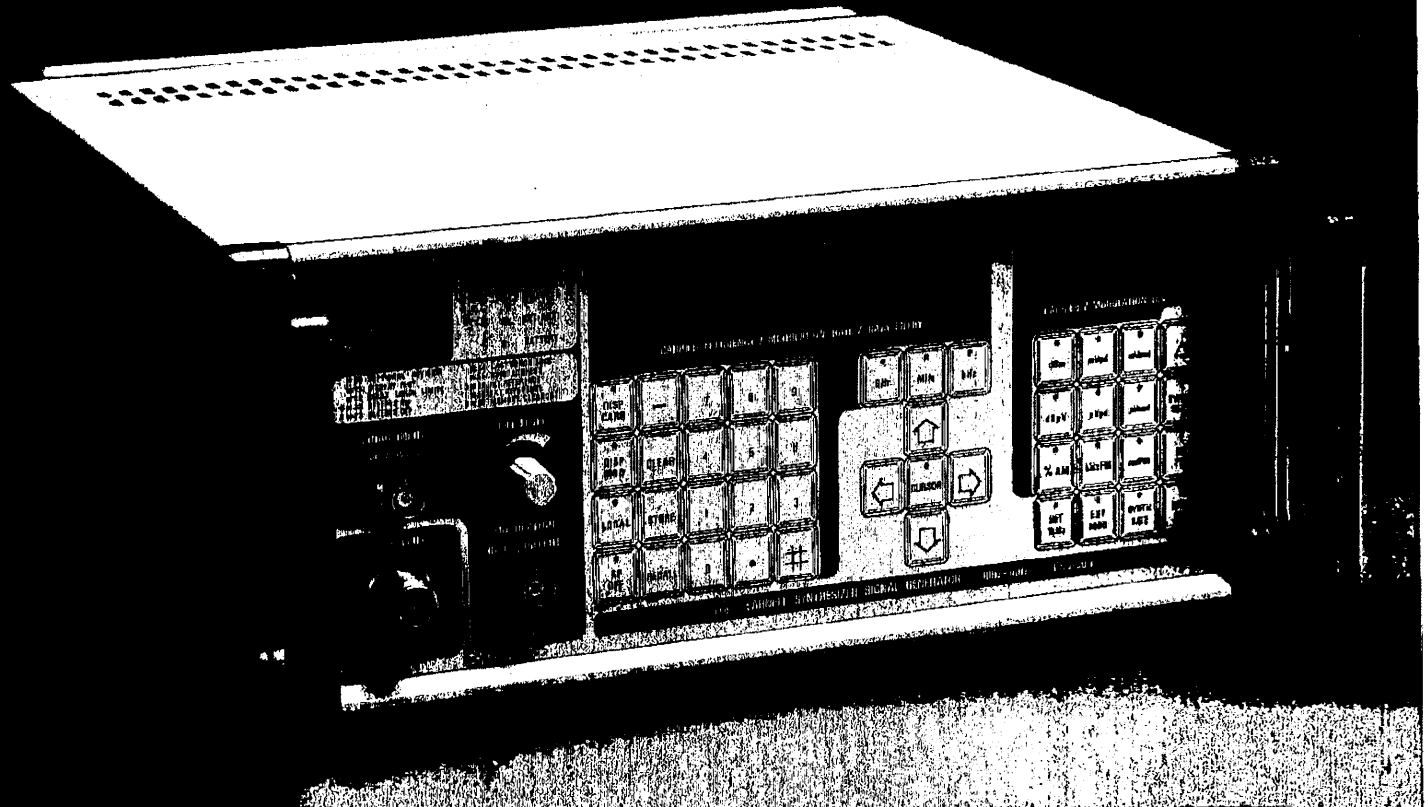
10kHz to 1GHz synthesized signal generator

Comprehensive modulation

Compact and lightweight for portable use

High performance for bench or systems use

Competitively priced



Buy the best in RF test... from

Farnell

PSG1000 HIGH PERFORMANCE SIGNAL GENERATOR

FEATURES

- 10kHz to 1GHz frequency range
- 10Hz resolution to 128MHz. 100Hz above
- Output -133dBm to +13dBm (0.05μV to 1Vrms pd)
- Comprehensive modulation facilities:
  AM/FM/ϕM
  Internal AF synthesizer 10Hz to 10kHz
  1kHz fixed tone
  Fixed plus AF tone
  CTCSS, CCIR, EEA, ZVEI-1/2, EIA, NATEL and SELCALL test tones easily generated
- Pulse modulation option
- External modulation may be DC coupled for both AM and FM
- Automatic SINAD meter
- 100 non-volatile memories for complete panel set ups, last sequence of tones, IEEE 488.1 address
- Mains or external DC operation
- Add-on rechargeable battery pack option
- 50W reverse power protection
- IEEE 488.1 programmable
- LabWindows driver
- Compact size
- Competitive price for so many features

The Farnell PSG1000 is a field portable synthesized signal generator covering the frequency range 10kHz to 1GHz with a full +13dBm to -133dBm output level range. These ranges are ideal for most radio services in the MF, HF, VHF and UHF bands.

Designed to operate from any standard AC supply or from 12VDC (24V option) this compact lightweight unit is perfect for field, bench or systems use.

An internal 1kHz distortion analyzer is a standard feature allowing SINAD sensitivity tests to be performed on mobile radios, thus enabling rapid and consistent alignment checks to be made. The SINAD signal to noise ratio is displayed on the front panel analogue meter which can also be used to monitor the external modulation input level or the battery state when DC power is applied.

Front panel control is by a tactile membrane switch assembly completely sealed against the ingress of moisture and dust and incorporating an RFI shield. High visibility LED displays are used to indicate carrier frequency, carrier level, modulation rate or modulation level.

The entire parameters of the last front panel settings and 100 user defined set ups are retained in non-volatile RAM following a power break. Individual memories are available for recall, store and protect, with an additional memory step function. Automatic conversion calculations are performed by the microprocessor enabling carrier level to be entered and displayed in the units of dB, dBμV, mV and μV pd.

A built-in fast locking modulation tone generator provides greater versatility than the usual spot frequencies and enables precise continuous tones to be set up for CTCSS systems, sequential tones to be programmed for SELCALL systems and modulation bandwidths to be accurately checked. Also included is a low distortion 1kHz spot frequency designed to be used for accurate modulation settings, SINAD measurements or mixed with the tone generator enabling two-tone tests to be made. External modulation sources may also be used independently or mixed with the internal tone generator.

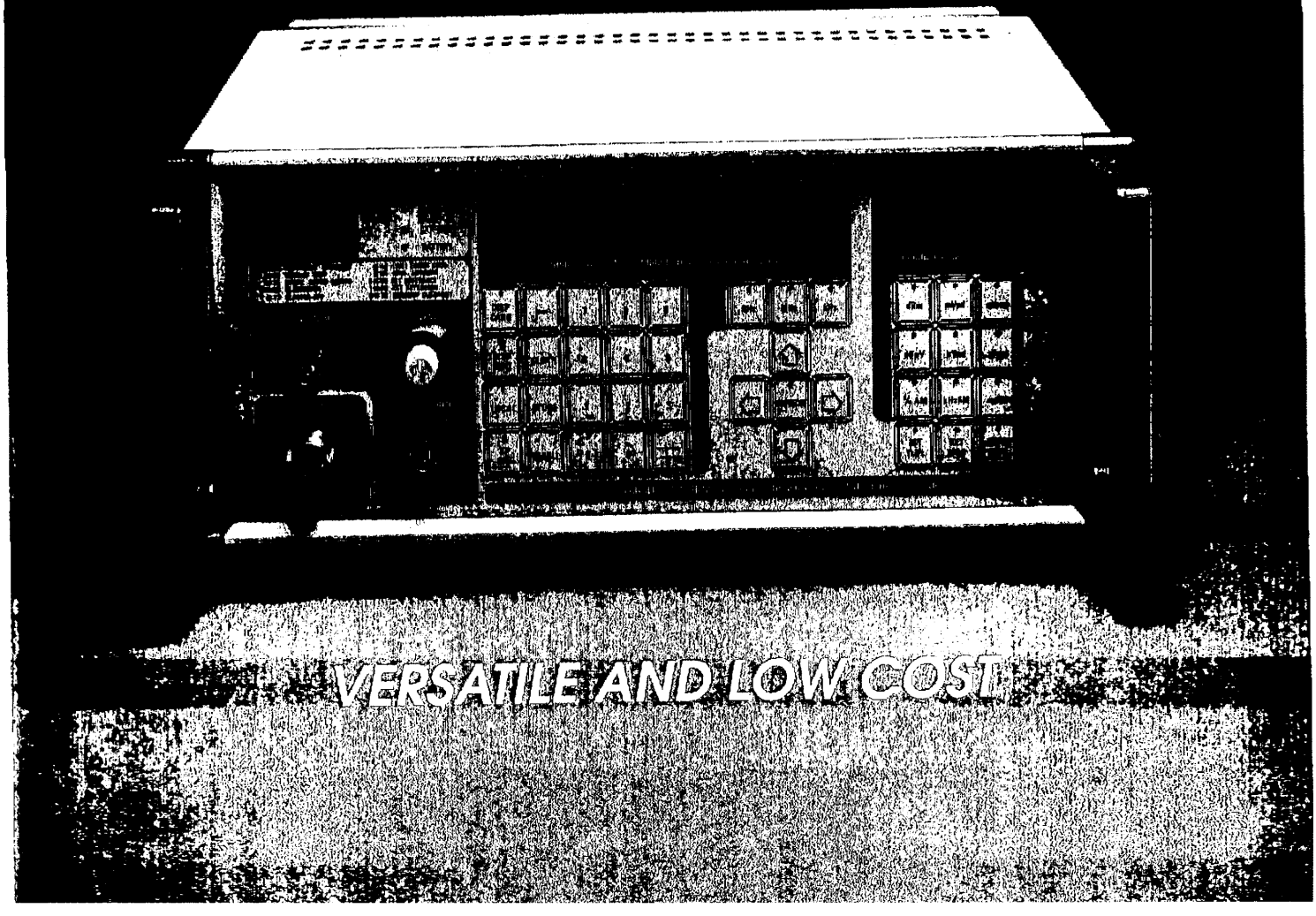
The wide external modulation bandwidth extends down to DC to cater for low rate data streams. A front panel potentiometer is provided to adjust the external input.

In addition to amplitude and frequency modulation, phase modulation is available as standard.

Extra features include a secondary function key for access to special facilities, and digital sweep of displayed data with the ability to set start, stop points and the total sweep time. Other standard features include IEEE 488.1 programming and reverse power protection.

The instrument's low power consumption allows field operation from an optional 12V re-chargeable add-on battery pack.

Other options include a high stability crystal reference and pulse modulation.



SPECIFICATION

FREQUENCY

Range
10kHz to 1000MHz

Resolution
10Hz (carrier <128MHz)
100Hz (carrier ≥128MHz)

Lock speed (to 100Hz)
<500ms

Stability
Standard: ±1E⁻⁶ (0 to 55°C)
±2E⁻⁷ per month
Option O: ±2E⁻⁷ (0 to 40°C)
±8E⁻⁸ per month during first year
±4E⁻⁸ per month after first year

RF OUTPUT

Range
-133·0dBm to +13dBm
(0·05µV to 1V rms pd)

Resolution 0·1dB

Units dBm, dBµV, mV, µV, pd, emf

Absolute level accuracy
±1dB for carrier levels of 0dBm to +13dBm
For carrier levels of -127 to 0dBm:
±1·5dB (carrier <500MHz)
±2·5dB (carrier ≥500MHz)
For carrier levels <-127dBm:
±3dB, typical

Source impedance 50Ω

VSWR <1·5:1 (carrier <-3dBm)

Reverse power protection
50W maximum (from 50Ω source)
DC to 1GHz

Trip level
100mW typical. User reset

SPECTRAL PURITY

Harmonics <-25dBc (carrier <+7dBm)

Sub harmonics and non-harmonic spurious
<-60dBc at carrier offsets ≥3kHz

Residual FM
<48Hz rms at 1GHz (CCITT P53A weighting) improving 6dB/octave to <1·5Hz rms at 16MHz
<6Hz rms below 16MHz

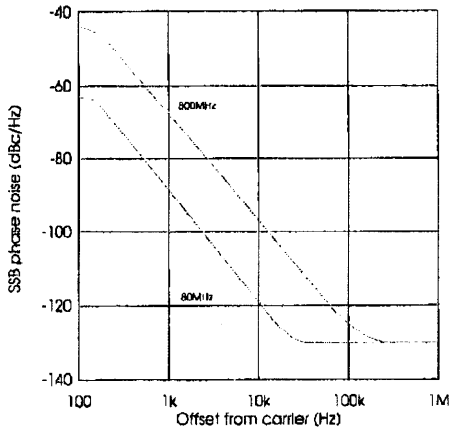
Residual AM
<0·1% rms (50Hz to 15kHz bandwidth)

Noise floor <-130dBc/Hz

AM on 20kHz FM
<0,5% at 1kHz rate, 50Hz to 15kHz bandwidth

FM on 30% AM
<200Hz at 1kHz rate, 50Hz to 15kHz bandwidth

SSB noise
Typical characteristics shown below for carrier frequencies of 80 and 800MHz



Carrier leakage
<0·5µV (2 turn 25mm loop, 25mm away)

AMPLITUDE MODULATION

Depth
0 to 99·9% (<500MHz <+7dBm)
0 to 50% (≥500MHz <+7dBm)

Resolution 0·1%

Accuracy
±5% of reading at 1kHz rate, up to 90% depth

Bandwidth (1dB) DC/10Hz to 25kHz

Distortion (THD)
<2% up to 50% depth, 1kHz rate, 50Hz to 15kHz bandwidth
<5% up to 80% depth, up to 25kHz rate, 50Hz to 75kHz bandwidth

FREQUENCY MODULATION

Maximum peak deviation

10kHz	to	<16MHz: 100kHz
16MHz	to	<32MHz: 25kHz
32MHz	to	<64MHz: 50kHz
64MHz	to	<128MHz: 100kHz
128MHz	to	<256MHz: 200kHz
256MHz	to	<512MHz: 400kHz
512MHz	to	1000MHz: 800kHz

Resolution
Carrier frequency ≥64MHz:
10Hz (<10kHz peak)
100Hz (10 to <100kHz peak)
200Hz (100 to <200kHz peak)
400Hz (200 to <400kHz peak)
800Hz (400 to 800kHz peak)
carrier frequency <64MHz:
10Hz (<10% max. peak deviation)
100Hz (≥10% max. peak deviation)

Accuracy
±5% of reading at 1kHz rate excluding residual FM

Bandwidth (1dB) DC/50Hz to 25kHz

Distortion (THD)
1kHz rate, 50Hz to 15kHz bandwidth:
<1% up to 10kHz peak deviation
Up to 25kHz rate, 50Hz to 75kHz bandwidth:
<5% <100kHz peak deviation

PHASE MODULATION

Deviation
0 to 3 rads

Resolution
0.01 rad

Accuracy
±20% of reading at 1kHz rate excluding residual PM

Bandwidth (1dB)
100Hz to 10kHz

Distortion (THD)
<2% at 1kHz rate, 300Hz to 3kHz bandwidth

PULSE MODULATION OPTION

Frequency range
25MHz to 1000MHz

Carrier on/off ratio
≥60dB at 70MHz
≥45dB at 500MHz
≥40dB at 800MHz

Pulse rise time 2µs nominal

Pulse fall time 1µs nominal

Minimum pulse width 4µs

Modulator insertion loss <4.5dB

TTL logic drive (maximum 5V peak)
TTL high = carrier ON
TTL low = carrier OFF

Carrier leakage
<0.5µV (2-turn 25mm loop 25mm away)
Carrier level <-3dBm

INTERNAL MODULATION SOURCES

Spot frequency 1kHz

Accuracy ±2E⁻⁵

Distortion (THD)
<0.2% (50Hz to 15kHz bandwidth)

Tone generator
10.0Hz to 9.999kHz

Resolution
0.1Hz <1kHz
1Hz ≥1kHz

Accuracy
±2E⁻⁵

SPECIFICATION (contd.)

Lock speed
<5ms

Distortion (THD)
<2% up to 5kHz (50Hz to 15kHz bandwidth)

Simultaneous tones
Ratio fixed tone to variable tone 5: 1

SEQUENTIAL TONES

Systems covered
CCIR, EEA, ZVEI, DZVEI, EIA, NATEL

EXTERNAL MODULATION

Impedance
≥50kΩ

Level
1V rms for fsd. Front panel potentiometer for adjustment of higher levels

Indication
Analogue meter (scaled 0 to 1 with 'CAL' marker)

Simultaneous tones
The external input may be mixed with the internal tone generator, with a fixed amplitude ratio of 5:1

SINAD

Input frequency
1kHz

Input level
30mV to 3V rms

Indication
Analogue meter, scale range 30dB to 6dB (true rms detection)

Impedance
≥5kΩ

Bandwidth
60Hz to 6kHz

SWEEP

Functions
Carrier frequency, carrier level, modulation rate, modulation level

Range (start, stop)
Any within setting range

Total sweep time
2 to 200 seconds

GENERAL

Programmability
GPIB (IEEE 488.1)

Memory (non-volatile)
100 complete front panel set ups.
Last front panel set up.
IEEE 488.1 address

Internal crystal reference
TCXO, 10MHz

Internal reference output
3V pk-pk (load impedance >10kΩ)

External reference frequency
10MHz

External reference level
1V rms

POWER REQUIREMENT

AC input
100, 120, 220, 240V ±10%
45 to 440Hz

DC input
Standard: 11.5 to 15V
Option A: 23 to 30V

Consumption
30VA maximum

ENVIRONMENT

Operating ambient temperature range
0 to 55°C

Storage temperature range
-40 to +70°C

Relative humidity
95% to +40°C non-condensing

Vibration
5 to 150Hz at 2G sinusoidal
15 minutes in each of 3 orthogonal planes

Shock
10 off 25mm drops on each of 6 faces

Safety
Designed to meet the requirements of IEC publication 348 (BS 4743)

EMC
Designed to meet European Standards
EN 50 081-1 (generic emission)
EN 50 082-1 (generic immunity)

MECHANICAL

Height 145mm (including feet)
Width 330mm
Depth 405mm
Weight 8.6kg

ORDER CODES, OPTIONS AND ACCESSORIES

17PSG1000	PSG1000 Signal Generator
	Factory fitted options (add suffix to order code):
/A	With option A (23 to 30VDC)
/F	With option F (RF output changed to rear)
/M	With option M (pulse modulation)
/O	With option O (high stability frequency reference)
	Accessories:
15S10100	Rechargeable 12V 4Ah add-on battery pack
	For use with standard 11.5 to 15VDC input only
15A20100	Rack mounting kit
15A20110	Protective carry case

Represented by:

Design developments may result in specification changes

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