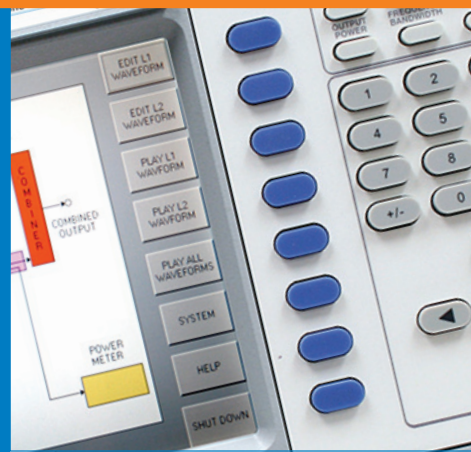# Noisecom

## GPS7500
## Noise & Interference Generator

**Count on the noise leader**

# GPS7500 Noise & Interference Generator

The Noise Com GPS7500 Noise & Interference Generator is capable of generating up to 40 MHz bandwidth of arbitrary waveforms for the test of susceptibility of GPS receivers to jamming, pulsed, CW, noise and any interference which we could imagine. A modular approach provides for expandability with additional independently programmable generators for L1, L2 or L5 bands. This unique combination allows for a single instrument to support today's as well as possible future GPS standards.

## Benefits

**Integrated Approach:** Contains one or optionally two independent arbitrary waveform generators. This allows for simultaneous testing of the L1 and L2 or L5 frequencies.

**Value:** Built-in GPS signal and interference combiner, Gaussian noise source and power meter for automatic high and low power level calibrations.

**Protected Investment:** As additional independent bands are needed the GPS7500 can be easily upgraded. Arbitrary waveform generator allows creation of any interference or jamming waveform which we could image.

**True "Standard" for GPS:** The GPS7500 was designed to support all of the current GPS tests of susceptibility to noise and interference of DO-229, DO-235 and DO-253.

**Ease of Use:** Access table of pre-stored GPS testing parameters made by pressing one button. Cursors automatically lead to GPS standard template, giving the operator a quick view of all necessary test criteria.

## Technical Features

- +21 dBm Output Power
- 1000 to 2000 MHz Synthesizer
- 40 MHz Arbitrary Waveform
- 164.5 dB On/Off Ratio
- +/-0.5 ppm over 0 to 50°C

## Applications

**GPS Receiver Test and Jamming to:**
- RTCA DO-229, DO-235 & DO-253
- Galileo
- GLONASS
- Automotive Standards
- Mobile Phone Location and E911 Service

Noise Com's GPS7500 Noise & Interference Generator was designed to support all the GPS testing requirements in an easy to use platform. Testing receiver susceptibility to interference, intentional or unintentional, has become a requirement and product differentiator in airborne, automotive, defense and mobile phone applications.

While the GPS7500 has been designed around the airborne GPS Standards, DO-253A, DO-235A and DO-229C with a federal agency as a lead customer, these standards are among the most commanding. Based on Noise Com's digital noise and arbitrary waveform technology, GPS7500 may generate any GPS interference waveform which we could imagine. It is therefore easily applicable to GPS receiver, chip set and system susceptibility testing in airborne, automotive, defense, mobile location and E911 services.

GPS7500 allows for user preset and user defined arbitrary interference and jamming waveforms. Automatic testing parameters for several known GPS requirements have been pre-stored and are available to the operator for ease of use. The higher bandwidth (>40 MHz) of the GPS7500 allows for interference generation over the entire band. With the twochannel option, measurements can be made simultaneously with independent waveforms at L1 and L2 or L5 over this higher bandwidth.
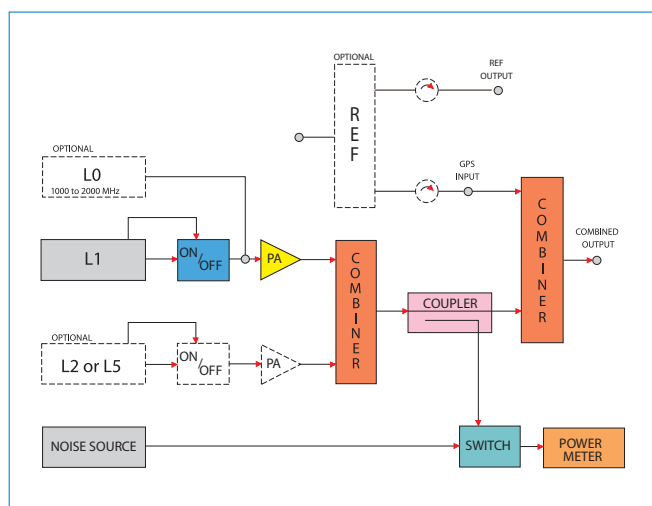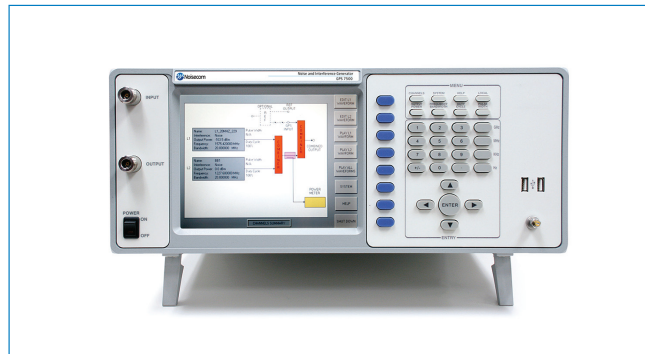


Built-in calibration and an onboard power meter ensure that measurements will always be accurate. A true Gaussian noise source provides a fixed low level reference to which the output power of the arbitrary waveform can be calibrated. A built-in power meter assists in this calibration as well as in the setting of high output power levels up to +21 dBm. The GPS7500 has three main modes:

• Continuous Wave (CW) Synthesized
• Arbitrary Interference including Broadband Gaussian Noise
• Pulse Mode

Any arbitrary interference waveform which we could imagine may be generated in the Arbitrary Interference Mode. These waveforms, which may include sine waves, noise, AM etc., can then be pulsed at any duty cycle between 0 and 100% at 6.67 nanoseconds resolution. The pulse on/off ratio of 164.5 dB is obtained in a proprietary switch design also includes circuitry for the reduction of frequency splatter.

The embedded PC allows for user defined waveforms as well as custom programming. The Ethernet port supports connection to a LAN and a TCP/IP command set for remote control.

Modular design allows for a number of options, including dual channels (L1, L2 or L5) and built-in low phase noise synthesizer. An optional GPS signal splitter with dual outputs for both an isolated clean reference output and an interference plus GPS combined output is also available.



GPS7500 Block Diagram

# Examples of RTCA Test Cases Supported by the GPS7500

| Test Case | Frequency(MHz) | Noise Bandwidth | Power(dBm) | Pulse Width | Duty Cycle | Notes |
|---|---|---|---|---|---|---|
| Broadband Interference | 1575.42 | 100 kHz | -110.5 | N/A | 100% | |
| | 1575.42 | 20 MHz | -97.5 | N/A | 100% | |
| Continuous Wave Interference (CWI) | 1525.0 | CW | -12.0 | N/A | 100% | |
| | 1555.42 | CW | -89.5 | N/A | 100% | |
| | 1575.41998 | CW | -120.5 | N/A | 100% | |
| | 1595.42 | CW | -89.5 | N/A | 100% | |
| | 1610.00 | CW | -30.0 | N/A | 100% | |
| | 1618.00 | CW | -12.0 | N/A | 100% | |
| | 1626.00 | CW | +8.0 | N/A | 100% | Only aircraft with SATCOM |
| GPS at Maximum Power Level | 1575.42 | 100 kHz | -110.5 | N/A | 100% | At maximum GPS RF pwr |
| | 1575.42 | 20 MHz | -97.5 | N/A | 100% | At maximum GPS RF pwr |
| Pulse Interference | 1575.42 | 100 kHz | +20 | 1 ms | 10% | |
| | 1575.42 | 100kHz | +20 | 125.0 us | 10% | Only GPS & WAAS Combo |
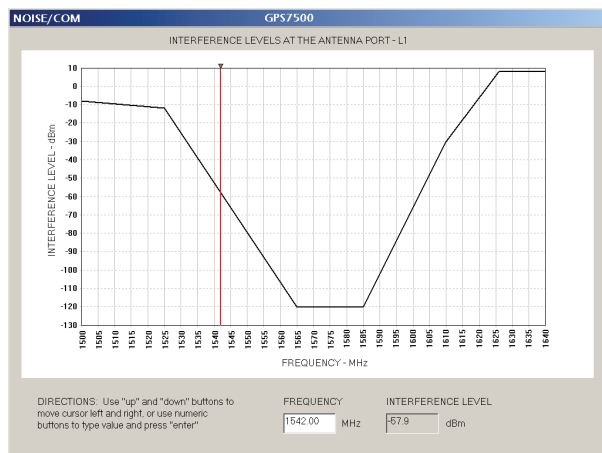


Interference Level vs. Frequency
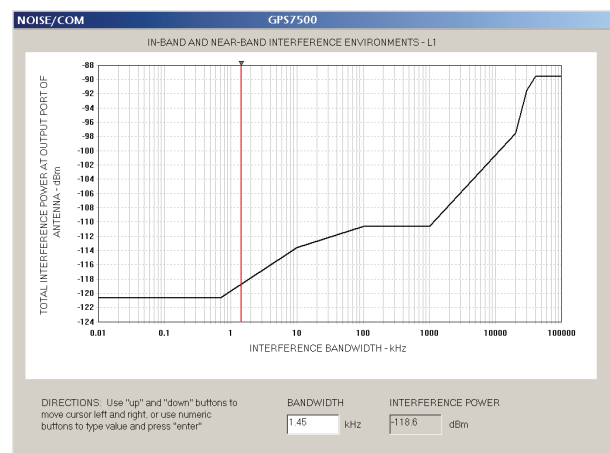


Interference Level vs. Interference Bandwidth

# Specifications

| Description | Specification | Notes |
| --- | --- | --- |
| CW Operating Frequency Range | 1000 MHz to 2000 MHz | Internal Synthesizer |
| Noise and Pulse Interference Center Frequences | 1575.42 MHz (L1) and optionally 1227.60 MHz (L2) or 1176.45 MHz (L5) | Tunable over +/-20MHz for each Band |
| Arbitrary Signal (AM, Noise, Pulse) 3dB Bandwidth | 0 to 40 MHz | |
| Frequency Stability | +/- 0.5 ppm | Over 0 to 55 degrees C |
| Minimum Frequency Resolution | 20 kHz | |
| Phase Noise | -46 dBc/Hz at +/- 20 kHz Offset | Maximum All Modes |
| | -122 dBc/Hz at +/- 100 kHz Offset | Typical CW Mode |
| Typical Spurious Output | -52 dBc at <+/- 21.5 MHz Offset | All Modes |
| | -80 dBc at >+/- 21.5 MHz Offset | CW Mode |
| Maximum Spurious Output in CW Mode | -122.5 dBc between 1564.42 MHz and 1586.42 MHz | For CW signal at < 1525 MHz or > 1610 MHz |
| Available Output Power | +10 dBm at 1000 to 2000 MHz | After internal GPS plus Interference |
| | +21 dBm at 1555 to 1595 MHz Combiner | |
| Lowest Output Power | -126.5 dBm | All Modes |
| | -170.5 dBm/Hz | Noise Mode |
| Output Power Resolution | 0.1 dB | |
| Interference/Signal Ratios | Up to 155 dB | Relative to -134.5 dBm GPS Signal |
| Minimum Pulse On/Off Ratio | 164.5 dB | In Pulse Mode, 1575 to 1595 MHz, > +20 dBm. |
| Pulse Duty Cycle | 0 to 100% | |
| Pulse Width Resolution | 6.67 ns | |
| Pulse Repetition Rates | 5 Hz to 75 MHz | |
| Maximum CW, Noise or Pulse Power at GPS Input | -41.25 dBm/MHz | Isolation to GPS Input |

## General

| | | |
| --- | --- | --- |
| Processor | Pentium | |
| Operating System | XP | |
| Display | 8.4'' TFT-LCD Color | |
| Remote Interface | Ethernet | GPIB Optional |
| External Reference Input | 10 MHz | Internal/External Reference is software selectable |

## Ordering Information

| Part Number | Description |
| --- | --- |
| GPS7500 | Noise & Interference Generator for GPS Testing at L1 Band, 1575.42 MHz +/- 20 MHz |
| GPSoptL2 | Additional independently programmable Noise and Interference Generator for L2 band, 1226.20 MHz +/- 20 MHz |
| GPSoptL5 | Additional independently programmable Noise and Interference Generator for L5 band, 1176.45 MHz +/- 20 MHz |
| GPSoptREF | GPS Signal Splitter with Isolated GPS Output for Reference Receiver |

Wireless Telecom Group
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