INTRODUCTION

The performance of the Model 600-L1 can be summarized as follows:

- Very good sensitivity to right hand circularly polarized signals over a wide range of elevations and in all azimuth directions
- Excellent amplitude radiation pattern roll-off near the horizon, in effect eliminating multipath-generated replicas of the original line-of-sight (LOS) signal
- Very good axial ratio, thus ensuring that a high quality signal is received
- Common location and stable phase center (The phase center in the x and y-axis is located in the center of the antenna due to its inherent symmetry and co-centric type design.)

- Enhanced immunity against electromagnetic interference
- Better radiation “hardening” from lightening or EMP (electromagnetic pulse) effects
- High-speed transient voltage suppressor
- Operational temperature range from cold to hot extremes

DESCRIPTION

The Model 600-L1 GPSAntenna is an active antenna designed to operate at the GPS L1 frequency (1575.42 MHz). The slot array antenna element is coupled to a low-noise amplifier (LNA). The unit is optimized to receive right-hand-circularly-polarized signals, and its radiation pattern is shaped to reduce signals arriving at low elevation angles; these features decrease the errors associated with electromagnetic interference and multipath.

The Model 600-L1 GPSAntenna is intended for surveying and other kinematic positioning applications. The sealed radome allows the antenna to be used in severe weather, marine applications and hostile environments. The unit’s compact size and light weight ensure its portability.

Both the input DC power and the output RF signal flow over a single coaxial cable connected to the unit’s TNC female connector.

To mount the antenna, ensure that the adapter is screwed into the antenna base (finger tighten only). It is best to leave this adapter in at all times as it protects the plastic threads of the antenna itself. Screw the bottom of the adapter onto a range pole, tribrach, tripod or
other equivalent mount. Attach coaxial cable from the antenna connector to the antenna port on your receiver.

**Caution:** Over tightening the metal adaptor into the plastic baseplate will damage the baseplate.

The maximum directivity at 90° elevation angle (antenna boresight) is typically 8 Decibels (dBi). This is on average 5 dB more than a typical patch antenna. In addition the pattern roll-off from boresight to antenna horizon (0° elevation angle) is in the order of 15 dB. This roll-off compares well to a patch antenna roll-off mounted on a large choke ring ground plane. This antenna has a major advantage above the choke ring ground plane antenna – it is lighter by several pounds and much smaller.

The phase center in the x and y-axis is located in the center of the antenna due to its inherent symmetry and co-centric type design.

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**ELECTRICAL TECHNICAL SPECIFICATIONS**

- 3 dB pass band: L1: 1575 ± 8 MHz
- Out-of-band rejection:
  - $f_c ± 30$ MHz: 15 (typical)
  - $f_c ± 50$ MHz: 30 (typical)
  - $f_c ± 100$ MHz: 50 (typical)
- Antenna elev. pattern:
  - $\theta = 90^\circ$: 7.5 dBic (min.)
  - $20^\circ \leq \theta < 90^\circ$: -1.5 dBic (min.)
  - $5^\circ \leq \theta < 20^\circ$: -5.5 dBic (min.)
  - $0^\circ \leq \theta < 5^\circ$: -7.0 dBic (min.)
- LNA gain: 26 ± 3 dB
- Polarization: Right-hand circular
- Noise figure: $\leq 2.5$ dB (typical)
- Axial ratio: $0^\circ \leq \theta \leq 90^\circ$: 5 dB max.
- (90° = zenith)
- Nominal impedance: 50 $\Omega$
- VSWR: $\leq 2.0:1$
- Power requirements: $\leq 28$ mA @ +4 to +18 VDC, 25 mA (typical) @ 5 VDC
- Power handling: $\leq 0.125$ W (typical)

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**MECHANICAL & ENVIRONMENTAL SPECIFICATIONS**

- Finish: Weatherable polymer
- Weight: ≈ 730 g (25.75 oz)
- Altitude: 3000 m (9842.5 ft)
- Temperature: -55 °C to +85 °C (-67 °F to +185 °F)