

# Bullet™ and BulletII™

## GPS Antennas for Marine and Timing Applications

### Description

**Bullet:** The Bullet GPS antenna is designed specifically for marine and stationary timing applications and complements the SVEeSix line of GPS modules. Incorporating a proven epoxy seal, the Bullet is completely waterproof and designed to withstand the harsh marine environment. The threaded stainless-steel insert in the base of the antenna accepts a standard 1"-14 pole mount. The connector is located inside the threaded insert allowing the antenna cable to be routed through the pole mount, which protects the cable connection from the environment for added reliability. With a 35 dB pre-amp and dual band-pass filters, the Bullet supports 75' (22 m) cable runs and offers outstanding immunity to jamming sources, such as radar, Inmarsat and radio transmissions.

**BulletII:** Like the Bullet GPS antenna, the BulletII GPS antenna is designed for marine and stationary timing applications. It is an active GPS antenna with 35 dB of gain and a single band-pass filter. With only a single filter, the BulletII offers less jam immunity than the Bullet. The BulletII's enclosure is all plastic, including the threaded socket in the base of the antenna used for pole mounting. The plastic enclosure is a textured off-white color and is both weatherproof and waterproof. The threaded socket accepts either a 1"-14 straight thread (typical marine antenna mount) or a 3/4" pipe thread for stationary timing applications. Like the original Bullet antenna, the F-type antenna connector is located inside the threaded socket, which allows the antenna cable to be routed inside the pole and protects the cable connection. The BulletII uses the same RG-59 antenna cable as the original Bullet. It is compatible with the SVEeSix series of GPS receivers.

### Ordering Information

23339-00 Bullet antenna (order cable separately)  
25045-00 BulletII antenna (order cable separately)  
23420 50' (15 m) cable (RG-59 with F-type connectors)  
30135-00 User's Guide

### Environmental Specifications

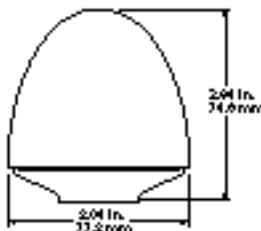
Operating temp: -40°C to +85°C  
Storage temp: -55°C to +100°C  
Vibration: 0.04g<sup>2</sup>/Hz 10 Hz to 500 Hz  
0.03g<sup>2</sup>/Hz 500 Hz to 850 Hz  
0.02g<sup>2</sup>/Hz 850 Hz to 1200 Hz  
Shock: 40g (11 m/sec Sawtooth)  
Humidity: 95% R.H. non-condensing  
Salt fog: Mil. Std. 202F, Method 101D Condition B  
Waterproof: Submersion to 1 meter

### Technical/Performance Specifications

Prime power: +5 Volts DC (±10%)  
Power consumption: 22 milli-amps, 0.11 watts (nominal)  
Output impedance: 50  
Frequency: L1 (1575 MHz)  
Polarization: Right-Hand Circular Polarization (RHCP)  
VSWR: 2:1  
Axial ratio: 2 dB @ zenith  
10 dB above 10° elevation  
Gain: 35 dB (nominal)  
Noise: 2.75 dB (nominal)  
Pass-band width: 50 MHz  
Filtering: -20 dBm @ 1626 MHz  
-10 dBm @ 1500 MHz  
Azimuth coverage: 360° (omni-directional)  
Elevation coverage: 0° to 90° elevation (hemispherical)

### Physical Characteristics

Dimensions: 3.04" Diameter x 2.94" Height  
(77.3 mm x 74.6 mm)  
Enclosure: Bullet: Glossy white plastic with stainless-steel threaded insert  
BulletII: Textured, off-white plastic  
Antenna weight: Bullet: 4.3 oz. (121.8 grams)  
BulletII: 3.5 oz. (100 grams)  
Connector: F-type  
Mounting: Bullet: 1"-14 thread  
BulletII: 1"-14 thread or 3/4" pipe thread



### Cable Specifications

Type: RG-59  
Impedance: 75  
Capacitance: 16.5 pF/foot (54.1 pF/meter)  
Vel. of propagation: 84%  
Shielding: Foil & Copper Braid (100% coverage)  
Connectors: Waterproof F-type  
Signal attenuation: <10 dB for cable and connectors

*Specifications subject to change without notice.*



# Bullet™ and BulletII™

*GPS Antennas for Marine and Timing Applications*

*Communication*

*Products*

## *Rugged GPS antennas for stressful marine and timing environments*

At high tide, the bridge abutment was 25 feet above the waterline. On the vessel, the Trimble GPS antenna was mounted 26 feet above the waterline. Both the bridge and the Trimble antenna survived the collision, but the pole mount did not fare so well.

Although the story above is an example of poor judgement, it also illustrates the rugged design of Trimble GPS antennas. The marine environment is characterized by high shock, excessive

vibration, extreme temperatures, continuous exposure to salt water, and relentless sunlight. In timing and synchronization applications, GPS antennas are often installed in hostile RF environments. This combination of conditions presents the toughest design challenge for a GPS antenna.

For over 10 years, Trimble has been producing GPS antennas renowned for their survivability in harsh environments. The Bullet offers the rugged, waterproof design and exceptional performance typical of Trimble antennas, but in a new, compact package.

The Bullet is an active antenna with

a 35 dB pre-amp and dual band-pass filters. The high-gain pre-amp allows the Bullet to be used with up to 75 feet of RG-59 cable. The band-pass filters improve immunity to jamming signals. The BulletII features 35 dB of gain and a single band-pass filter.

The Bullet and BulletII accept a pole mount. With the antenna cable routed through the mount, the connection is protected from the environment for added reliability.

In unforgiving environments, an antenna failure could be disastrous. Don't risk it. Select a proven, stress tested, GPS antenna—the Trimble Bullet.

