



# GPS-301

## USER GUIDE

GM-14915156

Rev 2

March 2018

The GPS-301 antenna is designed for airborne use, but it will operate in any mobile application.

The GPS-301 is an active GPS antenna, 89.6 mm (3.53") in diameter, and designed to operate at the GPS L1 frequency of 1575.42 MHz. Its mechanical configuration is a spherical radius molded radome which provides enhanced protection against rain and ice. This antenna includes the following:

- internal 26 dB low noise amplifier
- bias voltage from 3.8 to 8.0 VDC for operation
- band pass filtering
- DC bias provided through the coaxial connector

NovAtel offers optional coaxial cables of various lengths and models for interconnecting between the antenna and NovAtel GNSS receivers.

This guide provides the basic information you need to install and begin using your new antenna.

### ADDITIONAL EQUIPMENT REQUIRED

- A device with an antenna input port that both receives the RF signal and provides 3.8 to 8.0 VDC to the antenna is required to set up the GPS-301. (NovAtel GNSS receivers provide the necessary power through their antenna RF connectors.)
- Coaxial cable with a male TNC connector

### INSTALLING THE ANTENNA



The integrator of this antenna is responsible for ensuring antenna installation meets all the overall integrated system requirements.



Refer to Section 307 of [www.faa.gov/documentLibrary/media/Advisory\\_Circular/AC%2043.13-2B.pdf](http://www.faa.gov/documentLibrary/media/Advisory_Circular/AC%2043.13-2B.pdf) for information about antenna bonding in aircraft applications.

Both the input DC power and the output RF signal flow over a single coaxial cable that is connected to the antenna's TNC female connector.

The antenna can be attached to a surface by means of a square, 4 bolt, 1.9 inch space mounting pattern as shown in the *Mechanical Drawings* section of this guide.

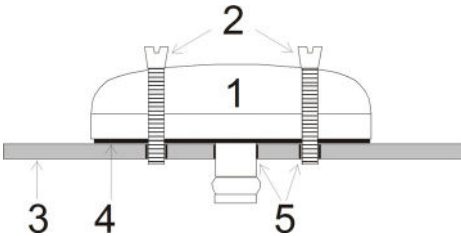


Contact NavtechGPS for product details. [www.NavtechGPS.com](http://www.NavtechGPS.com)  
+1-703-256-8900 • 800-628-0885 • [info@navtechgps.com](mailto:info@navtechgps.com)

Four screws pass through the housing of the antenna.

Install the antenna as follows:

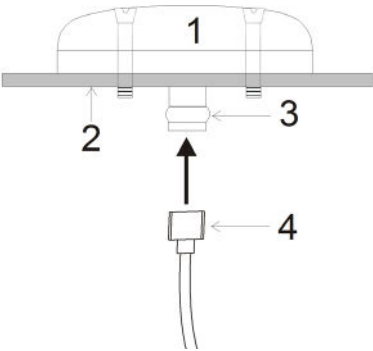
1. The antenna is supplied with an o-ring. Place it in the o-ring groove of the antenna base. A user-supplied o-ring grease can be used to hold the o-ring in the groove during installation.
2. Pre-drill and tap the mounting holes and drill the connector clearance hole on the surface, see the *Mechanical Drawings* section of this guide for details on the mounting pattern.
3. Attach the antenna to the surface using the four mounting screws supplied (use of user-supplied thread-locking material is recommended). The o-ring compresses and creates a seal between the surface and the antenna.



**Ref. # Description**

- |   |                            |
|---|----------------------------|
| 1 | Antenna                    |
| 2 | Countersink screws         |
| 3 | Mounting surface           |
| 4 | O-ring                     |
| 5 | Pre-drilled mounting holes |

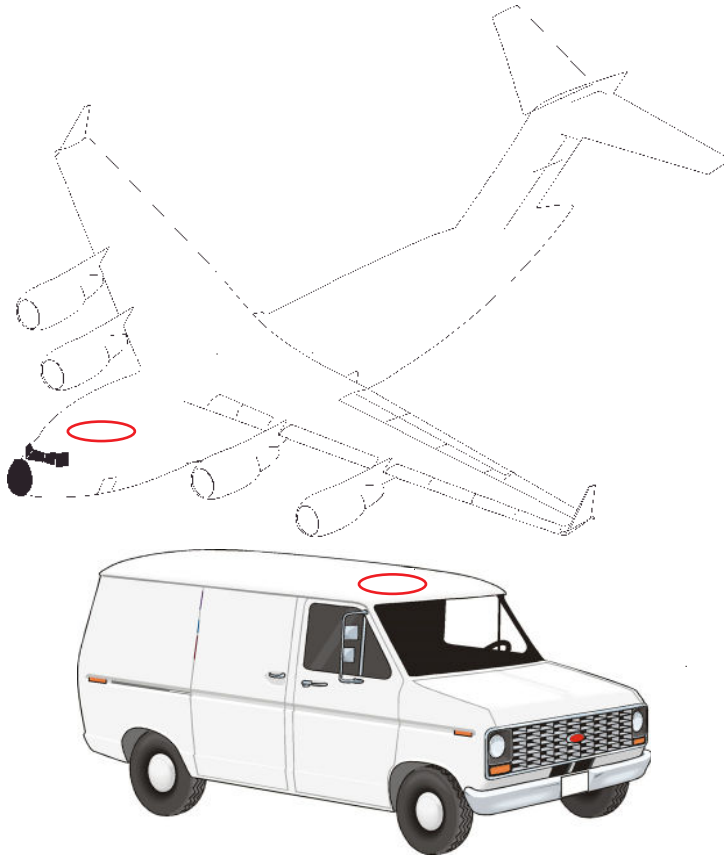
4. Remove the dust cap from the antenna's TNC connector.
5. Attach the male TNC connector of the coaxial cable to the antenna's TNC connector:



**Ref. # Description**

- |   |                            |
|---|----------------------------|
| 1 | Antenna screwed into place |
| 2 | Surface                    |
| 3 | TNC connector              |
| 4 | Coaxial cable              |

6. Attach the other end of the coaxial cable to the antenna input port of the receiving device, which must provide power as detailed in the *SPECIFICATIONS* section of this guide. All NovAtel GNSS receivers provide the necessary power through their antenna RF connectors.



The graphics above show examples of where the antenna may be placed on an aircraft or vehicle (not to scale).

## ANTENNA CARE

The GPS-301 is designed to withstand the elements, including rain, snow and dust. However, to ensure your antenna performs optimally, keep the radome clean and brush off any ice and snow. In addition, ensure the TNC connector remains clean and dry and replace the dust cap when a cable is not connected.



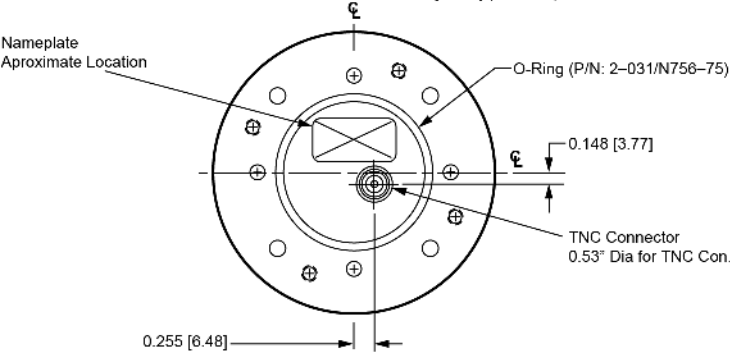
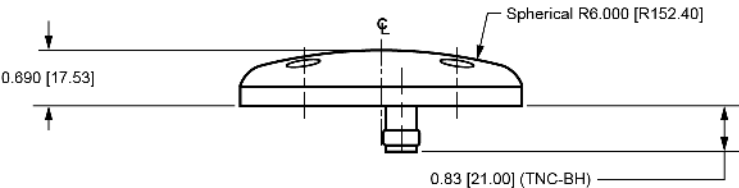
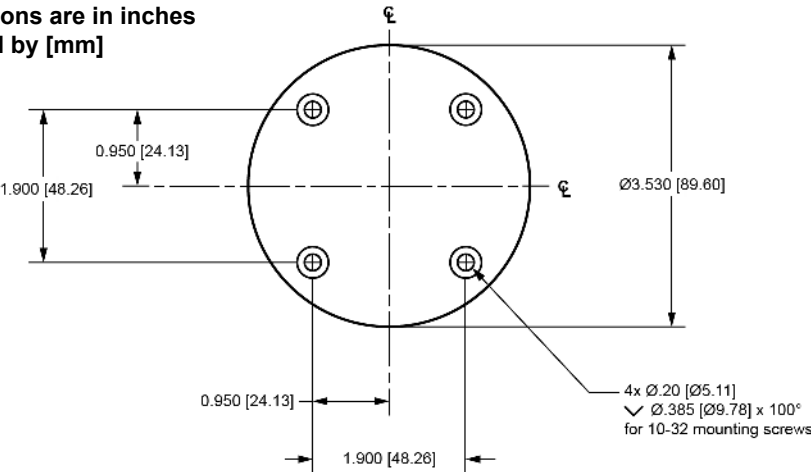
Contact NavtechGPS for product details. [www.NavtechGPS.com](http://www.NavtechGPS.com)  
+1-703-256-8900 • 800-628-0885 • [info@navtechgps.com](mailto:info@navtechgps.com)

## SPECIFICATIONS

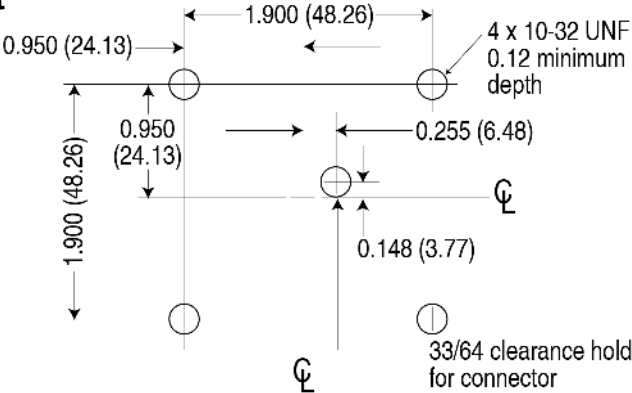
RF			
Operational Band (typical)	L1 (1575.42 ±10 MHz)		
Antenna Gain (dBic)	Free Space	16 inch Ground Plane	4 foot Ground Plane
90° zenith	+5.4	+2.2	+4.6
10° elevation	-1.3	-2.4	-1.0
20° elevation	+0.4	-0.3	+1.4
30° elevation	+1.8	+1.7	+1.5
60°–90° elevation	>4.5	+4.6/+2.2	>2.7
LNA gain (typical)	26 dB		
Polarization	Right-hand circular		
Noise figure (typical)	3.5 dB		
Nominal impedance	50 Ω		
VSWR (typical)	< 1.5 : 1		
POWER			
Input voltage	3.8 – 8.0 VDC		
Current (typical)	< 35 mA		
PHYSICAL			
Radome Diameter x Height	8.96 cm (3.53”) x 1.75 cm (0.690”)		
Weight	184.3 g (6.5 oz.)		
ENVIRONMENTAL			
Maximum altitude	21336 m (70000 ft.)		
Operating temperature	-40°C to +85°C (-40°F to +185°F)		
Storage temperature	-55°C to +85°C (-67°F to +185°F)		
Vibration	>30 G		
Designed to meet these standards	DO-160D, MIL-C-5541, MIL-E-5400, MIL-I-45208A and MIL-STD-810		

MECHANICAL DRAWINGS


Dimensions are in inches  
followed by [mm]



Square Bolt



**WEEE**

If you purchased a GPS-301 antenna in Europe, return it to your dealer or supplier at the end of its life. The objectives of the European Community's environment policy are, in particular, to preserve, protect and improve the quality of the environment, protect human health and utilise natural resources prudently and rationally. Sustainable development advocates the reduction of wasteful consumption of natural resources and the prevention of pollution. Waste electrical and electronic equipment (WEEE) is a regulated area. Where the generation of waste cannot be avoided, it should be reused or recovered for its material or energy. WEEE products may be recognized by their wheeled bin label ().

See [www.novatel.com/products/compliance/environmental-compliance/](http://www.novatel.com/products/compliance/environmental-compliance/) for more information.

**ROHS**

The GPS-301 is compliant with the European Union (EU) Restriction of Hazardous Substances (RoHS) Directive 2011/65/EU.

**WARRANTY POLICY**

NovAtel Inc. warrants that its Global Navigation Satellite System (GNSS) products are free from defects in materials and workmanship, subject to the conditions set forth on our web site:  
[www.novatel.com/products/warranty](http://www.novatel.com/products/warranty).

GNSS Antenna™ Modules:	One (1) Year
Cables and Accessories:	Ninety (90) Days

**RETURN INSTRUCTIONS**

To return products, refer to the instructions found under the Return Policy Tab on the warranty page:  
[www.novatel.com/products/warranty](http://www.novatel.com/products/warranty).

## QUESTIONS OR COMMENTS

If you have any questions or comments, please log a support request with NovAtel Customer Support using one of the following methods:

### Log a Case and Search Knowledge:

Website: [www.novatel.com/support](http://www.novatel.com/support)

### Log a Case, Search Knowledge and View Your Case History: (login access required)

Web Portal: <https://novatelsupport.force.com/community/login>

### E-mail:

[support@novatel.com](mailto:support@novatel.com)

### Telephone:

U.S. and Canada: 1-800-NOVATEL (1-800-668-2835)

International: +1-403-295-4900



Contact NavtechGPS for product details. [www.NavtechGPS.com](http://www.NavtechGPS.com)  
+1-703-256-8900 • 800-628-0885 • [info@navtechgps.com](mailto:info@navtechgps.com)



© Copyright 2018 NovAtel Inc. All rights reserved.  
Unpublished rights reserved under international copyright laws.