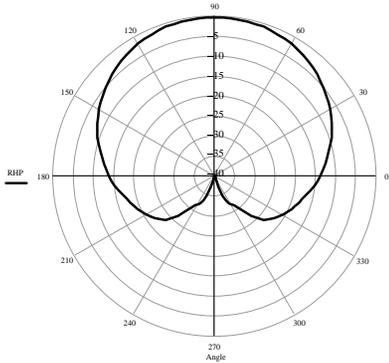
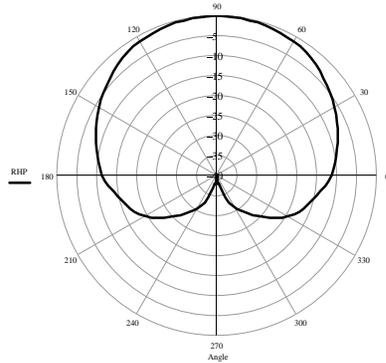


- ELEVATION GAIN PATTERNS -



**L1 channel**



**L2 channel**

**WARRANTY POLICY**

NovAtel Inc. warrants that its Global Positioning System (GPS) products are free from defects in materials and workmanship, subject to the conditions set forth below, for the following periods of time:

GPSAntenna™ Modules	One (1) Year
Cables and Accessories	Ninety (90) Days

Date of sale shall mean the date of the invoice to the original customer for the product. NovAtel's responsibility respecting this warranty is limited solely to product repair at an authorized NovAtel location only. Determination of repair will be made by NovAtel personnel or by technical personnel expressly authorized by NovAtel for this purpose.

THE FOREGOING WARRANTIES DO NOT EXTEND TO (I) NONCONFORMITIES, DEFECTS OR ERRORS IN THE PRODUCTS DUE TO ACCIDENT, ABUSE, MISUSE OR NEGLIGENT USE OF THE PRODUCTS OR USE IN OTHER THAN A NORMAL AND CUSTOMARY MANNER, ENVIRONMENTAL CONDITIONS NOT CONFORMING TO NOVATEL'S SPECIFICATIONS, OR FAILURE TO FOLLOW PRESCRIBED INSTALLATION, OPERATING AND MAINTENANCE PROCEDURES, (II) DEFECTS, ERRORS OR NONCONFORMITIES IN THE PRODUCTS DUE TO MODIFICATIONS, ALTERATIONS, ADDITIONS OR CHANGES NOT MADE IN ACCORDANCE WITH NOVATEL'S SPECIFICATIONS OR AUTHORIZED BY NOVATEL, (III) NORMAL WEAR AND TEAR, (IV) DAMAGE CAUSED BY FORCE OF NATURE OR ACT OF ANY THIRD PERSON, (V) SHIPPING DAMAGE; OR (VI) SERVICE OR REPAIR OF PRODUCT BY THE DEALER WITHOUT PRIOR WRITTEN CONSENT FROM NOVATEL.

IN ADDITION, THE FOREGOING WARRANTIES SHALL NOT APPLY TO PRODUCTS DESIGNATED BY NOVATEL AS BETA SITE TEST SAMPLES, EXPERIMENTAL, DEVELOPMENTAL, PREPRODUCTION, SAMPLE, INCOMPLETE OR OUT OF SPECIFICATION PRODUCTS OR TO RETURNED PRODUCTS IF THE ORIGINAL IDENTIFICATION MARKS HAVE BEEN REMOVED OR ALTERED.

THE WARRANTIES AND REMEDIES ARE EXCLUSIVE AND ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, WRITTEN OR ORAL, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE ARE EXCLUDED.

NOVATEL SHALL NOT BE LIABLE FOR ANY LOSS, DAMAGE OR EXPENSE ARISING DIRECTLY OR INDIRECTLY OUT OF THE PURCHASE, INSTALLATION, OPERATION, USE OR LICENSING OF PRODUCTS OR SERVICES. IN NO EVENT SHALL NOVATEL BE LIABLE FOR SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY KIND OR NATURE DUE TO ANY CAUSE.

There are no user-serviceable parts in the GPSAntenna and no maintenance is required. When the GPSCard status code indicates that the unit is faulty, replace with another unit and return the faulty unit to NovAtel Inc.

You must obtain a RETURN MATERIAL AUTHORIZATION (RMA) number by calling GPS Customer Service at 1-800-280-2242 (North America only) or 403-295-4900 before shipping any product to NovAtel or Dealer.

Once you have obtained an RMA number, you will be advised of proper shipping procedures to return any defective product. When returning any product to NovAtel, please return the defective product in the original packaging to avoid ESD and shipping damage.

© 2001 NovAtel Inc. All rights reserved.  
Unpublished rights reserved under International copyright laws.

Printed in Canada on recycled paper. Recyclable. ♻️ ♻️

November 2, 2001  
OM-2000069 Rev 1



NovAtel Inc.  
1120 - 68<sup>th</sup> Avenue N.E.  
Calgary, Alberta, Canada T2E 8S5  
<http://www.novatel.ca>

**NovAtel L1/L2 GPSAntenna™**  
**Model 600N**  
- User Information -



**INTRODUCTION**

The performance of the Model 600N 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
- Operates with an N-type connector for compatible equipment
- 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 for both L1 and L2 channels (The phase center in the x and y-axis is located in the center of the antenna for both channels 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

The Model 600N has a black rim, like the Model 600, that differentiates them from others in the 600 antenna series.

**DESCRIPTION**

The Model 600N GPSAntenna is an active antenna designed to operate at the GPS L1 and L2 frequencies, 1575.42 and 1227.60 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 600N GPSAntenna is intended for positioning applications and equipment with an N-type connector. 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 to 10 Decibels (dB). 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 to 20 dB. This roll-off compares well to a patch antenna roll-off mounted on a large choke ring ground plane antenna – it is lighter by several pounds and much smaller.

There is no difference in phase center location between the L1 and L2 channels. This is a very important feature of the antenna. Base stations with very long GPS baselines normally use a choke ring type antenna that has a physical vertical offset (z-axis) between the L1 and L2 channels in the order of 20 mm. The vertical phase center offset then has to be corrected because the choke ring antenna sees a different GPS satellite constellation. The GPS 600N then is very suitable for long baseline applications such as tectonic plate movement monitoring or telescope alignment. The phase center in the x and y-axis is located in the center of the antenna for both channels due to its inherent symmetry and co-centric type design.

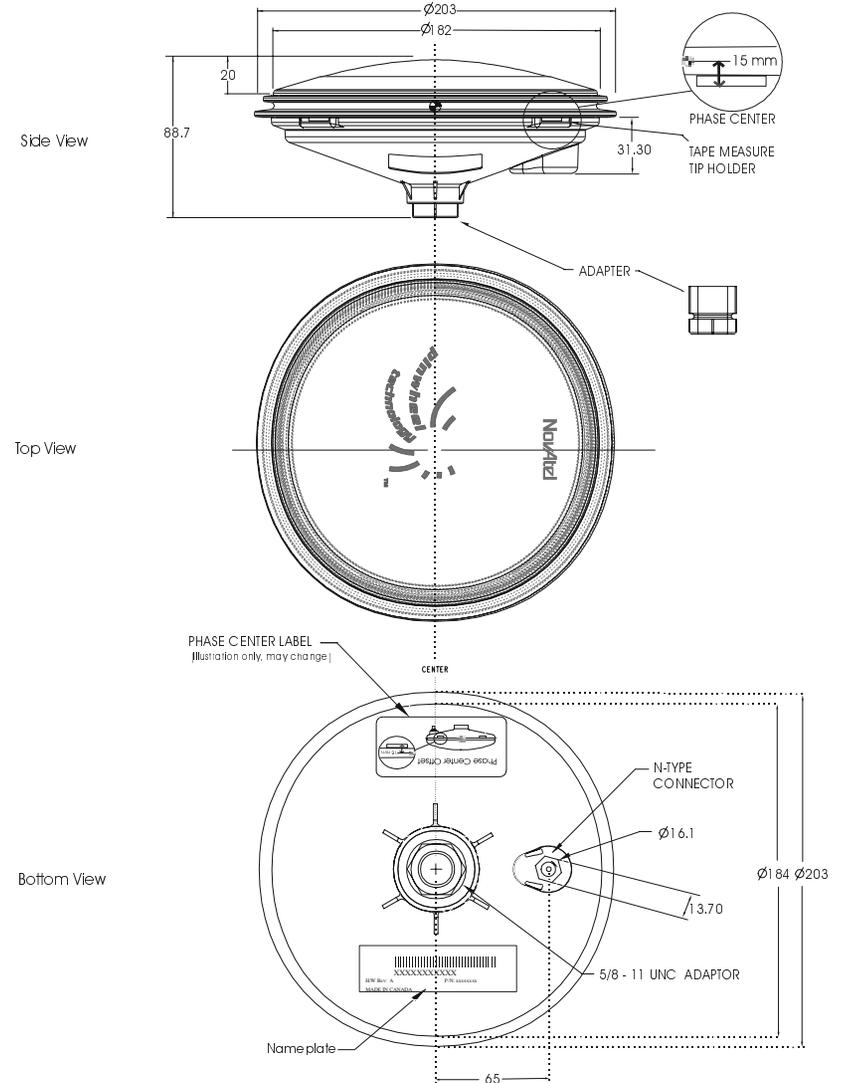
### – ELECTRICAL TECHNICAL SPECIFICATIONS –

3 dB pass band:	L1:	1575 ± 8 MHz
	L2:	1228 ± 10 MHz
Out-of-band rejection:	$f_c \pm 30$ MHz:	25 (min.)
	$f_c \pm 50$ MHz:	30 (min.)
	$f_c \pm 100$ MHz:	50 (min.)
Antenna elev. pattern: (90° = zenith)	$\theta = 90^\circ$ :	7.5 dBic (L1 min.), 6.5 dBic (L2 min.)
	$20^\circ \leq \theta < 90^\circ$ :	-1.5 dBic (L1 min.), -1.5 dBic (L2 min.)
	$5^\circ \leq \theta < 20^\circ$ :	-5.5 dBic (L1 min.), -3.5 dBic (L2 min.)
	$0^\circ \leq \theta < 5^\circ$ :	-7.0 dBic (L1 min.), -5.0 dBic (L2 min.)
LNA gain:	26 ± 3 dB (L1)	26 ± 3 dB (L2)
Polarization:	Right-hand circular	
Noise figure:	≤ 1.5 dB (typical)	
L1-L2 differential propagation delay:	1.5 nsec (typical)	
Axial ratio: (90° = zenith)	$0^\circ \leq \theta \leq 90^\circ$ : 5 dB max. (L1), 3 dB max. (L2)	
Nominal impedance:	50 Ω	
VSWR:	≤ 2.0:1	
Power requirements:	≤ 50 mA @ +4 to +18 VDC, 40 mA (typical) @ 5 VDC	
Power handling:	≤ 0.5 W	

### – 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)

### – MECHANICAL DRAWINGS –



All dimensions are in millimeters (mm)  
where 1 inch = 25.4 mm