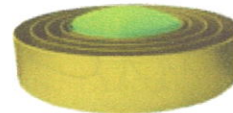




**ANNEX 1**  
**TECHNICAL DESCRIPTION OF THE OFFERED PERFORMANCE**

1.) JAVAD RingAnt-G3T – 2 pc  
(Choke ring + GrAnt-G3T)



2.) Receiver JAVAD DELTA-3N – 2 pc.

864 Universal Channels; GPS L1/L2/L5, GLONASS L1/L2, Galileo E1/E5A; RAIM; TriPad; High Speed RS232 Serial Port (up to 460,8 Kbps)

- WAAS/EGNOS
- Advanced Multipath Reduction
- Update Rate 10 Hz
- RTK Rate 10 Hz
- Data Storage 1GB
- Ethernet
- External Power Supply/Charger 90W C14/SAE
- AC Power Adapter 3c, C13 / CEE7/7, EURO



3.) GPS Antenna Cable TNC/TNC RA (RG-58) – 2 PC



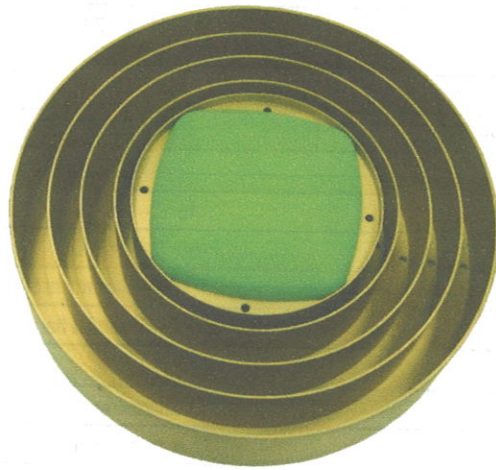
**ANNEX 2**  
**TECHNICAL SPECIFICATIONS**

- DATASHEET RINGANT-G3T
- DATASHEET DELTA-3N





## RINGANT-G3T



RingAnt-G3T is our GrAnt antenna mounted on our own choke ring. This makes our GrAnt antenna field upgradeable to choke ring type. The antenna cable can be connected via the standard TNC (N-type optional) connector on its side.

J-Shield is our filter that protects GPS L1, Galileo L1 and GLONASS L1 bands. It brings in all the useful signals intact and rejects out of band signals with the slope of about 12 dB/Mhz.

Similarly, it is our filter that protects GPS L2, GPS L5, GLONASS L2, GLONASS L3, and Galileo L5 and has slope of about 9 dB/Mhz.

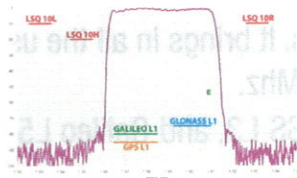
These filters have been extensively tested with five different innovative tests and prove that the filters also improve the performance of GNSS receivers.

RingAnt-G3T can track GPS, GLONASS, Galileo, BeiDou, WAAS, EGNOS, MSAS, GAGAN and QZSS signals.

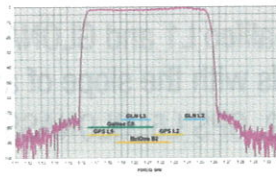


# RINGANT-G3T

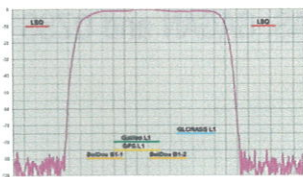
	G3T	G3T-JS	G3T+
<b>Signal</b>			
Capability	GPS L1/L2/L2C/L5 GLONASS L1/L2/L3 GALILEO E1/E2/E5ab BEIDOU B1/B2 WAAS L1/L5, EGNOS, MSAS, GAGAN QZSS L1/L2/L2C/L5	GPS L1/L2/L2C/L5 GLONASS L1/L2/L3 GALILEO E1/E5ab WAAS L1/L5, EGNOS, MSAS, GAGAN QZSS L1/L2/L2C/L5	GPS L1/L2/L5 GLONASS L1/L2/L3 GALILEO E1/E5ab BEIDOU B1/B2 WAAS L1/L5, EGNOS, MSAS, GAGAN QZSS L1/L2/L5
Frequency	1555~1610MHz 1164~1253 MHz	1565~1610MHz 1164 ~1253 MH	1555~1610 MHz 1164 ~1253 MHz
<b>Electrical</b>			
Antenna Gain	1555~1610MHz – 6.0 dB typ. 1164~1253 MHz – 5.0 dB typ	1565~1610MHz – 6.0 dB typ. 1164~1253 MHz – 5.0 dB typ	1555~1610 MHz – 6.0 dB typ. 1164~1253 MHz – 5.0 dB typ.
Axial Ratio	3.0 dB max.		
Output Impedance	50 Ohm		
LNA gain	32±2 dB 40±2 dB (optional)	1565~1610 MHz - 33±3 dB 1164~1253 MHz - 33±3 dB	1555~1610 MHz - 33±3 dB 1164~1253 MHz - 33±3 dB
Noise Figure	1555~1610MHz – 1.7 dB typ. 1164~1253 MHz – 1.7 dB typ.	1565~1610 MHz – 2.8 dB typ. 1164~1253 MHz – 2.8 dB typ.	1555~1610 MHz – 2.8 dB typ. 1164~1253 MHz – 2.8 dB typ.
DC voltage	3.0~15.0VDC 45mA@5.0V typ.	4.5~15.0VDC 90mA@5.0V typ.	
Power consumption	0.25 Watt (max)	0.5 Watt (max)	
<b>Environmental</b>			
Operating Temperature	-45°C ~ +85°C		
Storage Temperature	-50°C ~ +85°C		
Humidity	Waterproof, 100% non-condensing, IP68		
Shock	Survives a 0.5 m drop onto a hard surface		
<b>Mechanical</b>			
Antenna type	Microstrip		
Connector	TNC; N-type (optional)		
Weight	2.7 kg		
Dimensions	Ø326 mm; h=88 mm		
Enclosure	Radome: ABS; Base: Aluminum		
Mounting	5/8-11 inches mount		



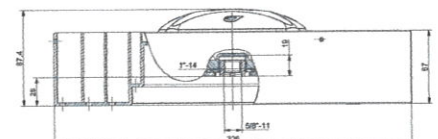
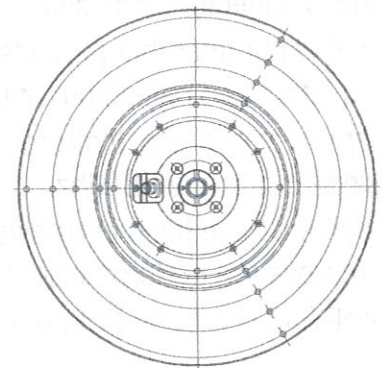
Frequency response of J-Shield filter for GPS L1, Galileo E1, and GLONASS L1 bands.



Frequency response of J-Shield and RingAnt-G3T+ filter for GPS L2, GPS L5, GLONASS L2, GLONASS L3, and Galileo E5.



Frequency response of RingAnt-G3T+ filter for GPS L1, Galileo E1, and GLONASS L1 bands.



\* All dimensions are in mm

Specifications are subject to change without notice



**JAVAD GNSS**  
www.javad.com

Rev.2.3 October 3, 2016





# DELTA-3N

FOR TRE-3N

GPS L1/L2/L2C/L5, GALILEO E1/E5A/E5B/ALBoc  
GLONASS L1/L2/L3, BeiDou B1/B2



864 GNSS channels of DELTA-3N allow tracking all current and future satellite signals.

The DELTA-3N is a powerful and reliable receiver for high-precision navigation systems, including high dynamics systems, for machine and traffic control, as well as for high-precision surveying and geodynamics and aerogeophysics applications.

DELTA-3N can operate as a receiver for post-processing, as a Continuously Operating Reference Station (CORS) or portable base station for Real-time Kinematic (RTK) applications, and as a scientific station collecting information for special studies, such as ionosphere monitoring and the like.



# DELTA-3N



## Tracking Features\*

- Total 864 channels: all-in-view
- GPS: C/A, L1C (P+D), P1, P2, L2C (L+M), L5(I+Q)
- GLONASS: C/A, L2C, P1, P2, L3 (I+Q)
- Galileo: E1 (B+C), E5A (I+Q), E5B (I+Q), AltBoc
- BeiDou: B1, B1-2, B1C(P+D), B5A (I+Q), B2, B5B (I+Q)
- QZSS: C/A, L1C (P+D), L2C (L+M), L5 (I+Q), SAIF
- SBAS\*\* L1, L5
- IRNSS L5
- In-Band Interference Rejection
- Advanced Multipath Reduction
- Fast acquisition channels
- High accuracy velocity measurement

## Performance Specifications

- Autonomous: <2 m
- Static, Fast Static Accuracy:  
Horizontal:  $0.3 \text{ cm} + 0.1 \text{ ppm} * \text{base\_line\_length}^{***}$   
Vertical:  $0.35 \text{ cm} + 0.4 \text{ ppm} * \text{base\_line\_length}$
- Kinematic Accuracy:  
Horizontal:  $1 \text{ cm} + 1 \text{ ppm} * \text{base\_line\_length}$   
Vertical:  $1.5 \text{ cm} + 1 \text{ ppm} * \text{base\_line\_length}$
- RTK (OTF) Accuracy:  
Horizontal:  $1 \text{ cm} + 1 \text{ ppm} * \text{base\_line\_length}$   
Vertical:  $1.5 \text{ cm} + 1 \text{ ppm} * \text{base\_line\_length}$
- DGPS Accuracy:  
< 0.25 m post processing; < 0.5 m real-time
- Real-time heading accuracy:  
~ 0.004/L [rad] RMS, where L is the antenna separation in [m]
- Cold/Warm Start/ Reacquisition:  
<35 seconds / <5 seconds / <1 second

## Data Features

- Up to 100 Hz update rate for real time position and raw data (code and carrier)
- 10 cm code phase and 1 mm carrier phase precision
- IEEE 1588 protocol support
- Hardware Viterbi decoder
- RTCM SC104 versions 2.x and 3.x Input/Output

- NMEA 0183 versions 2.x and 3.0 Output
- BINEX Output
- Code Differential Rover
- Code Differential Base
- Geoid and Magnetic Variation models
- RAIM
- Different DATUMs support
- Output of grid coordinates

## Data Storage

- Up to 16 GB of onboard non-removable memory for data storage

## Input/Output

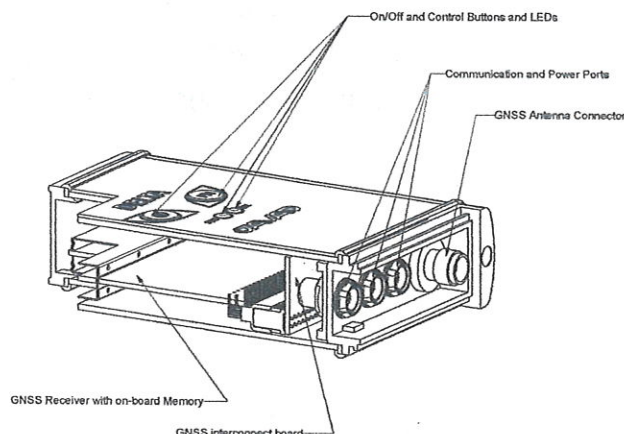
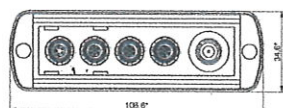
- Two serial RS232 ports (up to 460.8 kbps)
- Two high-speed RS232/RS422 serial ports (up to 460.8 Kbps)
- High-speed USB 2.0 device port (480 Mbps)
- Full-duplex 10BASE-T/100BASE-TX Ethernet port
- CAN 2.0
- Two 1 PPS
- Two Event Markers
- IRIG A134, A137, B124, B137
- External Reference Frequency Input/Output
- Two LEDs, two function keys (TriPad)

## Power Specification

- External power input
- Power consumption: 4.5 Watt
- Input voltage: +4.5 to +35 Volts

## Environmental and Physical

- Operating Temperature: -40°C to +70°C
- Storage Temperature: -45°C to +85°C
- Humidity: 95%
- High shock and vibration resistance
- Dimensions: 4.3x1.4x5.6/max 6.3 inches (109x35x141/max 160 mm) with connectors
- Weight: 0.92 lbs (0.42 kg)



\* For the full list of standard and optional features see [www.javad.com](http://www.javad.com)  
\*\* US WAAS, European EGNOS, Russian SDGM, Indian GAGAN, Japanese MSAS, and similar future satellite systems  
\*\*\* For good observation conditions and proper length of observation session

Specifications are subject to change without notice



**JAVAD GNSS**  
[www.javad.com](http://www.javad.com)

Rev.1.2 January 12, 2018