

## HC977 Triple-Band Helical Antenna + L-Band

Frequency Coverage: GNSS/QZSS-L1/L2/L5, GLONASS-G1/G2/G3, Galileo-E1/E5a/E5b, BeiDou-B1/B2/B2a, NavIC-L5  
+ L-Band correction services

The patented HC977 helical antenna is designed for precision positioning, covering the GPS/QZSS-L1/L2/L5, GLONASS-G1/G2/G3, Galileo-E1/E5a/E5b, BeiDou-B1/B2/B2a, and NavIC-L5 frequency bands, including the satellite-based augmentation system (SBAS) available in the region of operation [WAAS (North America), EGNOS (Europe), MSAS (Japan), or GAGAN (India)], as well as L-Band correction services.

Weighing only 42 g, the light and compact HC977 features a precision-tuned helix element that provides excellent axial ratios and operates without the requirement of a ground plane, making it ideal for a wide variety of applications, including unmanned aerial vehicles (UAVs).

The HC977 features an industry-leading low current, low-noise amplifier (LNA) that includes an integrated low-loss pre-filter to prevent harmonic interference from high-amplitude signals, such as 700 MHz band LTE and other nearby in-band cellular signals.

All Tallysman housed helical antenna elements are protected by a robust military-grade IP67-compliant plastic enclosure. The enclosure's base provides three threaded inserts for secure attachment, as well as a rubber O-ring around the outer edge to seal the antenna base and its integrated male SMA connector.

Tallysman's helical family has passed a rigorous 30-hour vibration test procedure, consisting of five cycles of 2-hour tests per axis (x, y, z):

- Cycle 1: 1.05 Grms;
- Cycle 2: 1.20 Grms;
- Cycle 3: 1.35 Grms;
- Cycle 4: 3.67 Grms;
- Cycle 5: 3.67 Grms.

For mounting instructions, visit:  
[https://www.tallysman.com/downloads/Helical\\_Mounting\\_Instruction.pdf](https://www.tallysman.com/downloads/Helical_Mounting_Instruction.pdf)

\*The HC977 replaces the HC975.



### Applications

- Autonomous unmanned aerial vehicles (UAVs)
- Precision GNSS positioning
- Precision land survey positioning
- Mission-critical GNSS timing
- Network timing and synchronization
- Sea and land container tracking
- Fleet management and asset tracking
- Marine and avionics systems
- Law enforcement and public safety

### Features

- Very low noise preamp (1.6 dB typ.)
- Axial ratio ( $\leq 0.5$  dB at zenith)
- LNA gain (28 dB typ. | 35 dB typ.)
- Low current (15 mA typ. | 21 mA typ.)
- ESD circuit protection (15 kV)
- Invariant performance from 2.2 to 16 VDC
- IP67, REACH, and RoHS compliant

### Benefits

- Extremely light (42 g)
- Ideal for RTK and PPP surveying systems
- Excellent RH circular polarized signal reception
- Great multipath rejection
- Increased system accuracy
- Excellent signal-to-noise ratio
- Industrial temperature range
- Rugged design, ideal for harsh environments

**About Tallysman:** With global headquarters and manufacturing in Ottawa, Canada, Tallysman is a leading manufacturer of high-precision antennas and components for Global Navigation Satellite System (GNSS) applications. Tallysman's mission is to support the needs of a new generation of positioning systems by delivering unprecedented antenna precision at competitive prices. Learn more at [www.tallysman.com](http://www.tallysman.com)

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+ L-Band correction services

## Antenna

Technology Triple-frequency, RHCP quadrifilar helix

		Gain	Axial Ratio
		dBic typ. at Zenith	dB at Zenith
<b>GNSS</b>			
GPS / QZSS	L1	2.5	$\leq 0.5$
	L2	2.0	$\leq 0.5$
	L5	1.0	$\leq 0.5$
GLONASS	G1	1.5	$\leq 0.5$
	G2	1.1	$\leq 0.5$
	G3	2.6	$\leq 0.5$
Galileo	E1	2.5	$\leq 0.5$
	E5a	1.1	$\leq 0.5$
	E5b	2.2	$\leq 0.5$
	E6	-	-
BeiDou	B1	2.5	$\leq 0.5$
	B2	2.7	$\leq 0.5$
	B2a	1.0	$\leq 0.5$
	B3	-	-
IRNSS / NavIC	L5	1.0	$\leq 0.5$
QZSS	L6	-	-
L-band correction services		1.5	$\leq 0.5$
<b>Satellite Communications</b>			
Iridium		-	-
		-	-
<b>Phase Centre</b>			
Phase Centre Variation (PCV)		$\pm 3.0$ mm (all freq.)	
Phase Centre Offset (PCO)		32 mm @ L1   37 mm @ L2/L5	

## Mechanicals

Mechanical Size 44.2 mm (dia.) x 62.4 mm (h.)  
Weight 42 g  
Available Connectors SMA (male)  
Radome / Enclosure Radome and Base: EXL9330  
Mount 3x M2.5 screws

## Environmental

Operating Temperature -40 °C to + 85 °C  
Storage Temperature -50 °C to + 95 °C  
Random Vibration MIL-STD-810E - Test method 514.5  
4 hours per axis (x, y, z) at 3.674 Grms  
Shock and Drop -  
Salt Fog -  
IP Rating (housing) IP67  
Compliance IPC-A-610, FCC, RED / CE Mark, RoHS, REACH

## Warranty:

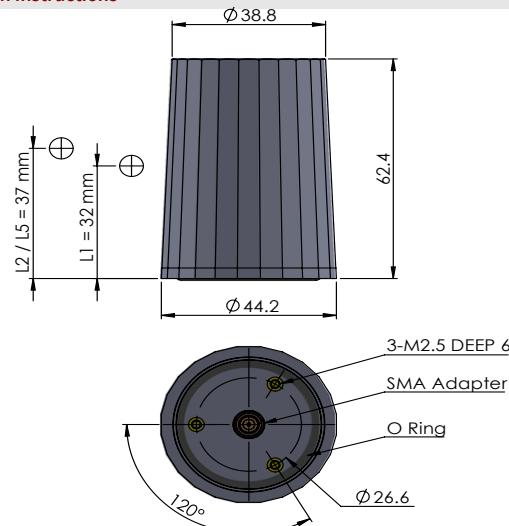
Parts and Labour 3-year standard warranty

## Low Noise Amplifier (LNA) - Measured at 3.0 VDC and 25°C

Frequency Bandwidth		Out-of-Band Rejection
Lower Band	1160 - 1255 MHz	> 63 dB @ < 1000 MHz > 38 dB @ < 1100 MHz > 57 dB @ < 1325 MHz
L-band corrections services	1539 - 1559 MHz	
Upper Band	1559 - 1606 MHz	> 36 dB @ < 1400 MHz > 44 dB @ < 1450 MHz > 28 dB @ > 1700 MHz

Architecture Pre-filter → LNA  
Gain 28 dB typ. | 35 dB typ.  
Noise Figure 1.6 dB typ.  
VSWR < 1.5:1 typ. | 1.8:1 max.  
Supply Voltage Range 2.2 to 16 VDC  
Supply Current 15 mA typ. (28 dB) | 21 mA typ. (35 dB)  
ESD Circuit Protection 15 kV air discharge  
P 1dB Output 22.7 dBm @ L1 | 25.1 dBm @ L2/L5  
Group Delay Variation 2 ns @ L1 | 5 ns @ L2

## Installation Instructions



## Ordering Information

Part Number **33-HC977-xx**

where xx = gain (28 or 35 dB)

Please refer to our **Ordering Guide** to review available radomes and connectors at:  
<https://www.tallysman.com/resource/tallysman-ordering-guide/>