

# 19-450

# CHELTON

## UHF and GPS SatCOM Antenna

The 19-450 UHF and GPS SatCOM Antenna is a combined UHF satellite communications and Global Positioning System (GPS) antenna. The antenna is low profile in construction and intended for airborne applications.

The UHF section provides essentially hemispherical satellite communications coverage. The GPS section provides nominal hemispherical coverage in the GPS L1 and L2 frequency bands to allow reception of microwave signals from a number of satellites.

A variant of the 19-450, the 19-450N, offers alternative types of connector.

The UHF section comprises two independent elements:

- A circularly polarized turnstile antenna comprising a pair of quadrature connected broadband horizontal crossed dipoles, fed via a pair of Roberts baluns. The antenna is polarized Right Hand Circular (RHCP) according to IEEE definition.
- A vertically polarized, reactively matched, broadband, folded monopole.

Low angle ( $0^{\circ}$  to  $35^{\circ}$  nominal) coverage is provided by the vertical element, and high angle ( $35^{\circ}$  to  $90^{\circ}$  nominal) coverage is provided by the circularly polarized element. In this way, essentially full



hemispheric coverage is achieved for satellite communications. Both elements are dc grounded to provide a degree of lightning protection.

The GPS section is a stacked patch arrangement giving right-hand circularly polarised radiation.

The 19-450 utilizes a one-piece vertical shell moulded under heat and pressure for high strength and resistance to moisture ingress.

The horizontal element is contained within a circular fibreglass moulding, which is securely and permanently fitted to the vertical shell.

An aluminium alloy base plate provides for fixing the antenna to the airframe. Careful design of internal ribs and base-to-shell load transfer ensures very high side loading acceptance.

The GPS element is mounted rigidly on the top face of the antenna.



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### ELECTRICAL

<b>Frequency</b>	240 MHz - 400 MHz		
<b>Gain</b>	Low Angle: Average within 2 dB of a quarter wave stub High Angle: +4.5 dBiC minimum (average full band) at zenith		
<b>Polarisation</b>	Low Angle: Essentially vertical when mounted vertically High Angle: Predominantly RHCP at zenith		
<b>Power Rating</b>	200 W max		
<b>Impedance</b>	50 ohm nominal		
<b>VSWR</b>	Low Angle: 2.5:1 max High Angle: 2.0:1 max		
<b>Isolation</b>	≥ 15	dBBetween Low and High Angle	
	≥ 30	dBBetween Low Angle and GPS	
	≥ 30	dBBetween High Angle and GPS	
<b>Connectors</b>	Type	Low Angle	High Angle
	19-450	TNC Type Female	N Type Female
	19-450N	N Type Female	N Type Female

### MECHANICAL

<b>Dimensions</b>	H 228.60 mm, W 403.86 mm		
<b>Weight</b>	4 kg		
<b>Mounting</b>	8 holes fixed location		

### ENVIRONMENTAL

<b>High Temperature</b>	MIL-STD-810D, Method 501.2, Procedures I and II Operational: +71°C Storage: +85°C
<b>Low Temperature</b>	MIL-STD-810D, Method 501.2, Procedures I and II Operational: -51°C Storage: -62°C
<b>Altitude and Rate of Change</b>	MIL-STD-810D, Method 500.2, Procedure II 30,000 ft and 2,000 ft/minute
<b>Shock</b>	MIL-STD-810C, Method 516.2, Procedure I 15 g, 11 ms, sine
<b>Vibration</b>	MIL-STD-810E, Method 514.4, Procedure I, Category 6
<b>Humidity</b>	MIL-STD-810D, Method 507.2, Procedure III 95% RH, 60°C - 30°C, 10 cycles
<b>Salt Fog</b>	MIL-STD-810D, Method 509.2, Procedure I

### GPS SatCOM

<b>Frequency</b>	L1 band:1565 MHz - 1586 MHz L2 band:1217 MHz - 1238 MHz
<b>Gain</b>	+4 dBiC typical at zenith
<b>Polarisation</b>	Predominantly RHCP at zenith
<b>Impedance</b>	50 ohm nominal
<b>VSWR</b>	2.0:1 max
<b>Connectors</b>	TNC Type Female

