12-5001

CHELTON

V/UHF Tuneable Antenna

High performance military aircraft need to maintain continuity for broadband, frequency hopping V/UHF secure communication waveforms. Antennas for this application need to be compact and have high reliability and resilience whilst offering the maximum gain over this wide frequency band. For existing platforms being modernized, there is a need to provide compatibility whilst achieving the best performance improvement and future capability.

The **12-5001 V/UHF Tuneable Antenna** meets the stringent requirements of our military customers and provides unrivalled RF, mechanical and environmental performance.

The **12-5001** is a compact high efficiency PIN diode tuned antenna operating over the frequency range 30 MHz to 941 MHz, intended for general airborne applications up to MACH 1.

The **12-5001** is designed to be used with the **Type 7-5001 Logic Converter Unit (LCU)**.

The **12-5001** and **7-5001 LCU** represent the state-of-the-art in high reliability, high gain tuneable airborne blade antenna systems.

The antenna consists of a VHF element and two UHF elements.

The VHF element is configured as an electrically short monopole, the capacitance between the element and the baseplate is tuned out by a series of binary related PIN diode switched inductances to achieve

a matched connection over the 30 MHz to 174 MHz frequency range.

The UHF elements use essentially lossless matching techniques and incorporate decoupling circuitry to optimise the gain, while maintaining a suitable match response over the broad band frequency range.

The **12-5001** comprises a moulded composite blade of aerofoil section which supports a top loading element and houses the impedance matching network. The blade is enclosed by an aluminium alloy baseplate that supports the two RF connectors and one dc multiway connector.

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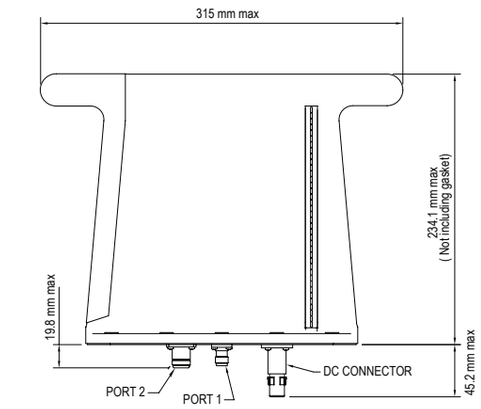
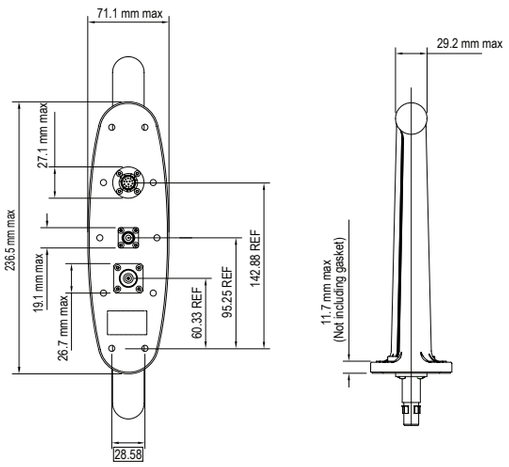
ELECTRICAL

Frequency	30 MHz - 511.995 MHz (VHF) Port 1 512 MHz - 941.000 MHz (UHF) Port 2		
Impedance	50 Ohms nominal		
Return Loss	Frequency (MHz)	Return Loss (dB)	VSWR
	30 - 87.995	> 7.36	< 2.5:1
	118 - 173.995	> 7.36	< 2.5:1
	225 - 299.995	> 8.1	< 2.3:1
	300 - 511.995	> 9.54	< 2.0:1
	512 - 941	> 9.54	< 2.0:1
RF Power	25 Watts maximum		
Gain	dBi	MHz	
	≥ -12.5	30	
	≥ -3.5	88	
	≥ -1 average	108 - 173	
	≥ +1 average	225 - 511.995	
	≥ 0 average	512 - 941	
Polarisation	Predominantly vertical		





ENVIRONMENTAL

Altitude	MIL-STD-810F, Method 500.4, Procedures I and II 70,000 feet, storage and operational	
High Temperature	MIL-STD-810F, Method 501.4, Procedures I and II, Diurnal	
	Storage:	95°C
	Operational:	71°C
Low Temperature	MIL-STD-810F, Method 501.4, Procedures I and II	
	Storage:	-62°C
	Operational:	-54°C
Shock	MIL-STD-810F, Method 516.5, Procedures I and IV	
	Functional	20 g, 11 ms, sawtoothCrash
	Hazard	40 g, 11 ms, sawtooth
Lightning	EUROCAE ED-14F / RTCA DO-160F, Section 23, Zone 1B Antenna functions after exposure to the defined waveforms and will not import more than 500 V	
Vibration	MIL-STD-810F, Method 514.5, Procedure I	
Sine	Frequency (Hz)	Displacement double amplitude (inches)
	5 - 20	≥@ 0.1 inspk-pk
	20 - 33	≥@ 2 g
	33 - 52	≥@ 0.036 inspk-pk
	52 - 2000	≥@ 5 g
Random Vibration 1: Endurance	Frequency (Hz)	Acceleration Power Density
	15 - 133	≥@ 0.04 g²/Hz
	133 - 300	≥@ +4 dB/Octave
	300 - 1000	≥@ 0.12 g²/Hz
	1000 - 2000	≥@ -6 dB/Octave
Random Vibration 2: Endurance	Random vibration endurance test profile shown in Figure 1 (overleaf)	

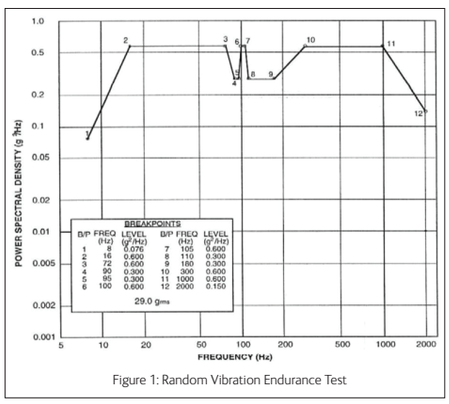


Figure 1: Random Vibration Endurance Test

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