

Direction Finding and Monitoring Antenna

20 – 3000 MHz

Product Code: DF-A0038

VERSION: 2.5

SPECIFICATIONS:



PRODUCT DESCRIPTION:

This direction finding antenna covers a frequency range of 20 MHz to 3 GHz. An integrated active monitoring antenna, working up to 3 GHz, gives a high sensitivity omni on the same axis as the DF antenna, without interference between them.

The full-size elements on all bands give excellent DF sensitivity. Ultimate angular resolution for strong signals is well under 1° for most of the frequency range. Dipole elements provide good cross-polarisation rejection, and fair performance for signals arriving from up to 15° above or below the horizon.

The integrated monitoring antenna is in two bands, mounted above the Band C DF antenna. These are amplified at the top of the cable, and passively combined to give continuous coverage over the frequency range 20 MHz to 3 GHz, with a single output connector. A 6 GHz option is available.

This DF antenna is designed to be used with a 2-channel phase-sensitive receiver, and correlative algorithm. Characterisation of the antenna can be performed on request.

Product codes:		
DF-A0038	DF with monitoring up to 3 GHz	
DF-A0038-01	DF with monitoring up to 6 GHz; Quick-disconnect centre break	
Electrical - DF:		
DF frequency range	Band 1: 20 – 300 MHz; Band 2: 300 – 1000 MHz; Band 3: 1000 – 3000 MHz	
Nominal input impedance	50 Ω	
Antenna type	5-element DF interferometer optimised for 2-channel receiver	
Polarisation	Vertical	
Output cables	RG 400 cables	
DF connectors	15 x TNC male	
Electrical - monitoring:		
	DF-A0038	DF-A0038-01
Frequency range	20 – 3000 MHz	20 – 6000 MHz
Nominal H-plane beamwidth	360°	360°
Nominal E-plane beamwidth	60°	60°
Typical VSWR	3:1	3:1
Polarisation	Vertical	Vertical
Connector type	N-type male	N-type male
Nominal impedance	50 Ω	50 Ω
Input voltage (via coax)	15 ± 1 V DC	15 ± 1 V DC
Input current	< 300 mA	< 150 mA
Power consumption	< 4.5 W	< 2.25 W
OP1dB (typ.)	> 17 dBm	> 11 dBm
OIP2 (typ.)	> 40 dBm	> 31 dBm
OIP3 (typ.)	> 23 dBm	> 21 dBm
Mechanical:		
Cross-sectional wind area	1.30 m ² (including antenna switch)	
Maximum wind speed	160 km/h (without ice load)	
Assembled height	3.4 m	
Assembled diameter (max)	2.7 m	
Shipping dimensions	1.55 m x 0.9 x 0.6 m	
Weight of antenna	55 kg	
including shipping container	126 kg	

ELECTRICAL FEATURES:

- Full-size DF
- Wideband DF
- 5-element interferometer
- Optimised for 2-channel receivers
- High sensitivity omni antenna integrated

MECHANICAL FEATURES:

- Designed for tower mounting
- Full quick-disassembly system allows antenna to be broken down into manageable parts without tools
- Assembly can be performed by one person in 15 minutes

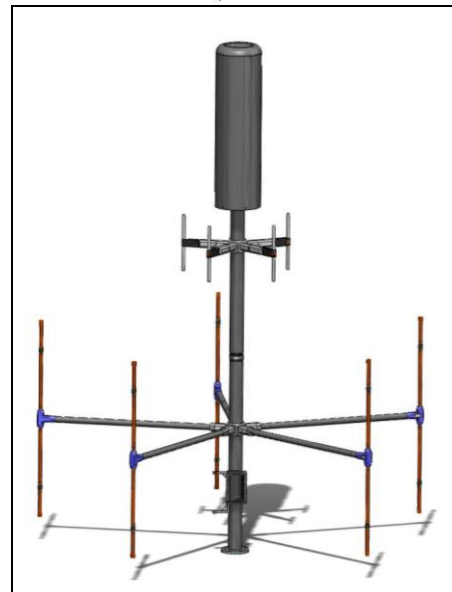
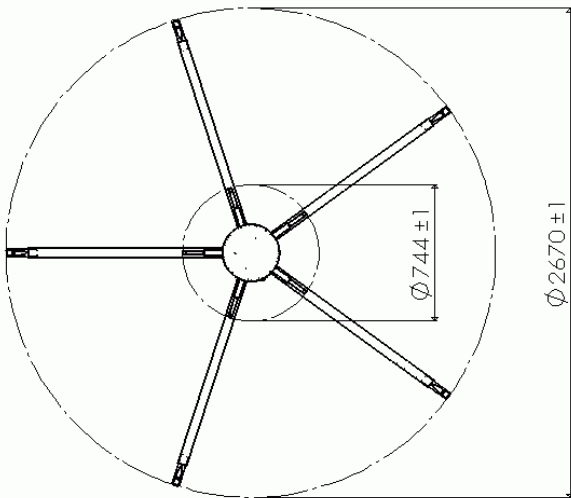
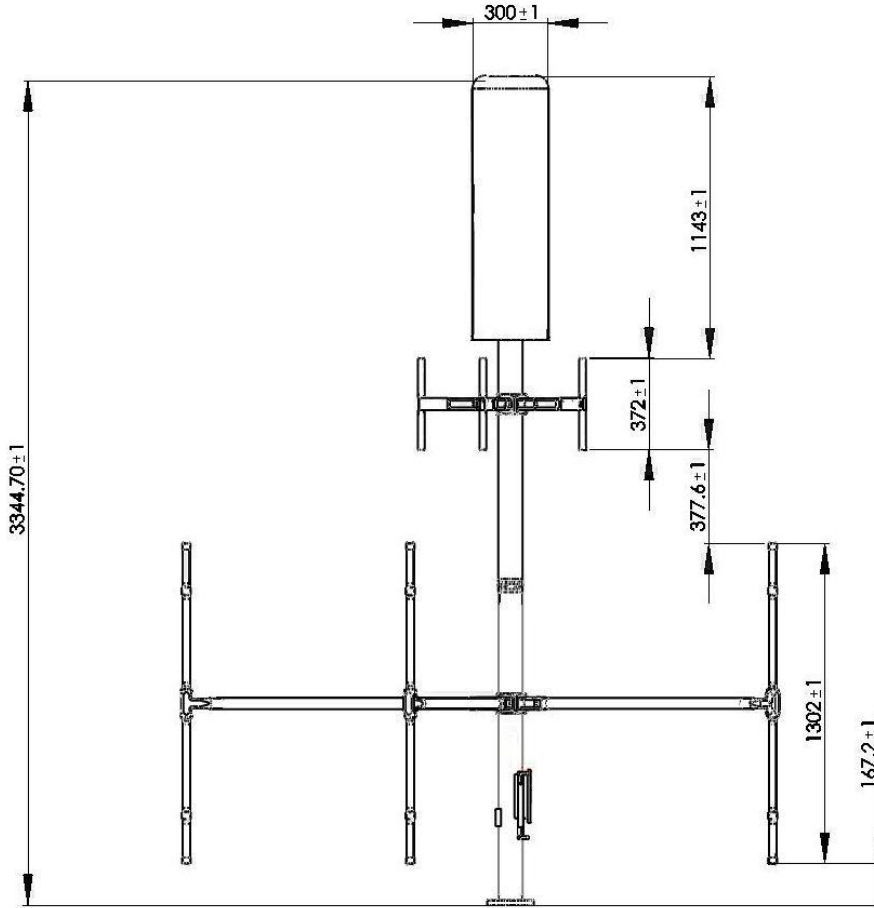
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DF ANTENNA DIMENSIONS



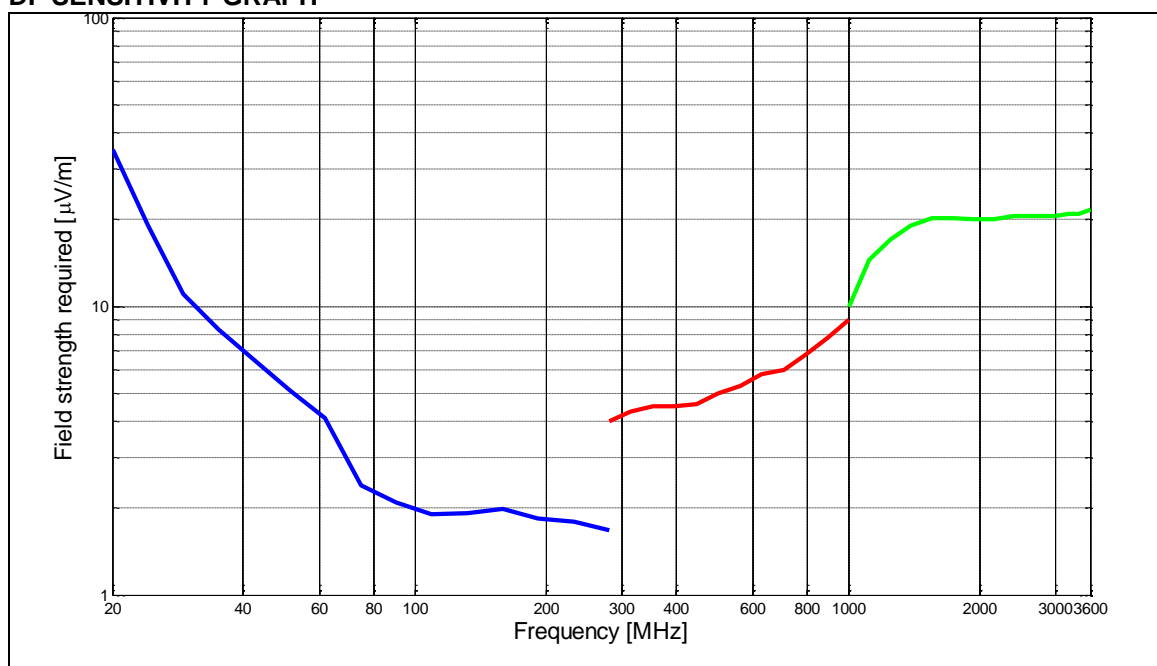
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DF SENSITIVITY GRAPH



The graph illustrates the direction finding sensitivity of a typical system. The sensitivity is measured using an IF bandwidth of 1.25 kHz and without averaging.

The graph shows the minimum signal required to obtain a bearing fluctuation of less than 1.5° for the frequency range 20 to 280 MHz and less than 1° for the frequency range 280 to 3000 MHz.

The DF sensitivity of the full system is highly dependent on the receivers, processing and algorithm used, and the characterisation table density. The graph above assumes a 5-channel, low noise receiver and correlative algorithm. The sensitivity will be slightly lower with a 2-channel receiver system.

ENVIRONMENTAL SPECIFICATIONS AND TESTS:

Vibration	MIL-STD-810E method 516.4, category 8
Mechanical shock	MIL-STD-810E method 516.4 (40 g)
Low temperature storage	MIL-STD-810E method 502.3 (-30 °C)
High temperature storage	MIL-STD-810E method 501.3 (+70 °C)
Rain	MIL-STD-810E 506.3 procedure I (95% RH)
Artificial weathering (UV stability) total duration 500 h	BS 3900: Part F16, method A. lamps: UV-B (313) Product exceeds requirements set out by the British Standard
Temperature and humidity	MIL-STD-810E method 507.3
Salt / fog	MIL-STD-810E 509.3 procedure I
Dust	MIL-STD-810E 510.3 procedure II

TWO-CHANNEL DF RECEIVERS:

The 1 to 3 GHz band of this antenna is designed for efficient operation with a commutated 2-channel receiver. Special attention has been paid to the nulls which usually occur in this band due to the large diameter mast. Receiver systems with two channels, commutated to measure five antennas, are sensitive to nulls in the element patterns. Depending on the receiver and algorithm, reducing the null depth leads to a more reliable system.

The graph above is for a five-channel receiver, a two-channel receiver will be between 1 and 10 dB less sensitive.



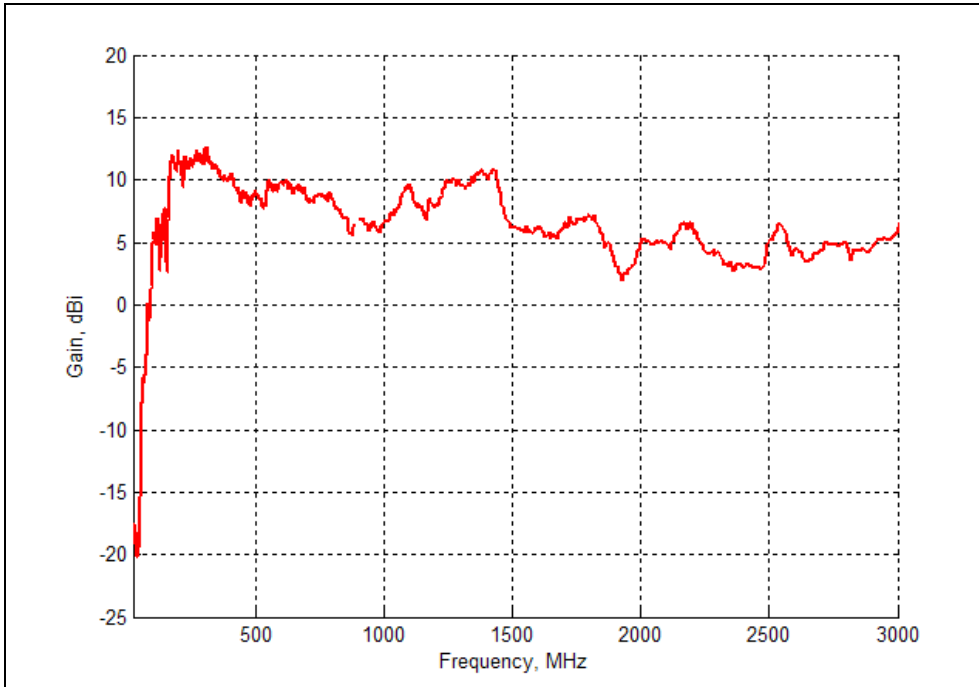
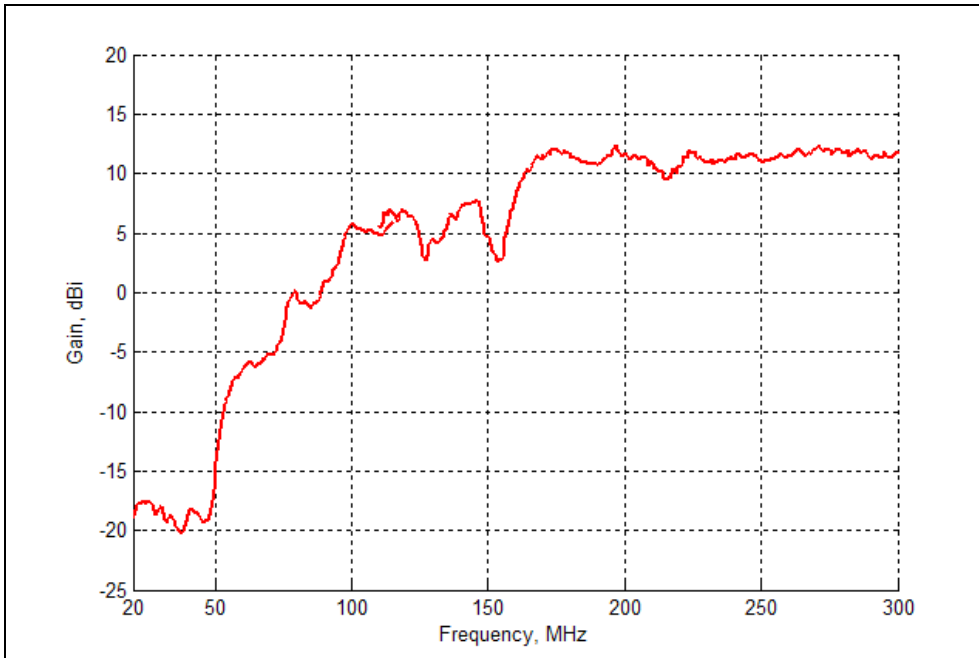
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GAIN OF OMNI ANTENNA



The monitoring output of the DF-A0038 3 GHz version has been plotted twice, to show the full band, and also show detail at the lower frequencies.

