

VERSION: 1.1

Quick Deployment Active HF NVIS DF Element

1 – 30 MHz

Product Code: DF-A0172



PRODUCT FEATURES:

- Low visual profile
- Quick deployment
- Active operation with passive bypass option
- Integrated switching system
- Lightning/ESD protected
- Compact stowed form factor

APPLICATIONS:

- Tactical HF DF array element
- Linear or circular arrays
- SSL arrays

*CA Application 2,853,219; *EP Patent 2771943; *U.S. Patent No. 14/353,382; *ZA Patent No. 2014/02806

SPECIFICATIONS: **Electrical:** Frequency range 1 – 30 MHz < 2.0:1 (typical CP modes) VSWR 50 Ω Nominal impedance RF power handling Receive only Linear, vertical, LCP or RCP Polarisation Connector: RF N(f) 4-pin Amphenol Control 12 V Power supply OIP3 (Active mode) 38 dBm Switching cycles Designed for 100 Mc Mechanical: Total height < 2250/1200 mm (deployed/stowed) Total diameter < 1600/280 mm (excl. quadpod) (deployed /stowed) < 1900/280 mm (incl. guadpod) Total mass < 8.3 kg - Self-standing with quadpod - Bolt hole flange for semi-permanent Mounting mounting Colour Per request Environmental: designed to meet the following specifications Designed for storage: -30 °C to +70 °C Designed for operation -30 °C to +55 °C Temperature range Weatherproofing Designed for IP66 rain resistant Designed for MIL-STD 810E 516.4: Shock and vibration vibration category 8, shock 40 g 120 km/h without guy ropes Wind resistance

PRODUCT DESCRIPTION:

Exposed materials

The DF-A0172 antenna is a single site location (SSL) Active HF DF array element. Polarisation is selectable between linear vertical, RHCP and LHCP though the injecting of different DC voltages into the circular interface connector.

160 km/h when fitted with guy ropes

Painted aluminium and fibreglass

The antenna includes a low noise pre-amp that increases the antenna sensitivity, an integrated switching system and lightning and ESD protection. In passive bypass mode, there are no nonlinear active components in the chain to introduce unwanted distortion on the received signals.

It can be deployed as part of either a linear or circular array and is quickly and easily deployed and stowed. The product is unique in that it features a fully integrated quadpod for rapid deployment but can also be bolted to a plinth for semi-permanent installations. When stowed, the antenna collapses into a very small form factor for easy transportation and storage.

The design of the antenna element is such that it is able to switch between one of three modes: LHCP, RHCP and a VP omni mode. In LHCP and RHCP modes, the antenna element is capable of receiving waves of LHCP and RHCP polarisation respectively, incident from the upper half sphere, with a gain peak at $\theta = 0^{\circ}$ (directly upwards). In VP omni mode, the antenna operates similar to a monopole antenna, able to receive waves with vertical polarisation with a gain peak on the horison (or just above it) and a null at $\theta = 0^{\circ}$.

The antenna is intended for use in constructing DF interferometer arrays consisting of a number of DF-A0172 antennas.

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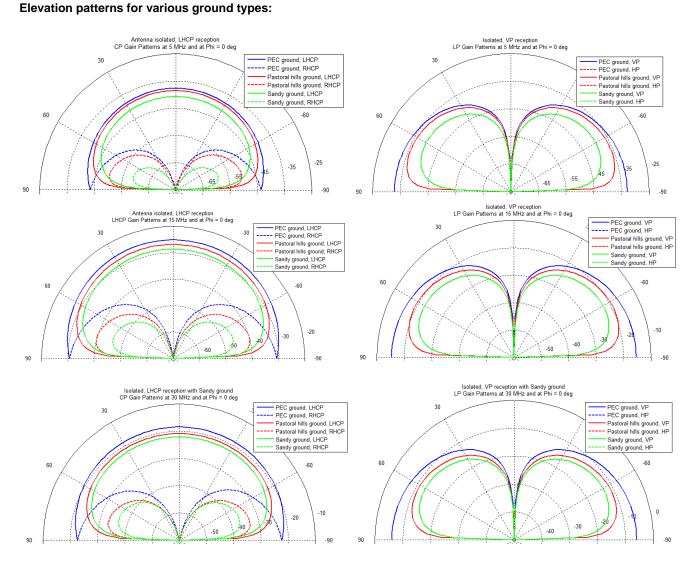
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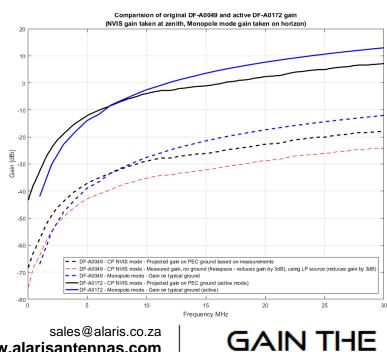
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Gain and pattern symmetry:

NB. Gain patterns are measured with the antenna in free space using a VP source and reference (coloured traces adjacent) for 4 elevation cuts at 45° to each other.

On this average, for these different elevation cuts, we can add 6 dB to predict the circular polarised gain that would be obtained on a good ground (like pastoral hills). Gain is for incidence from directly above (θ = 0°).



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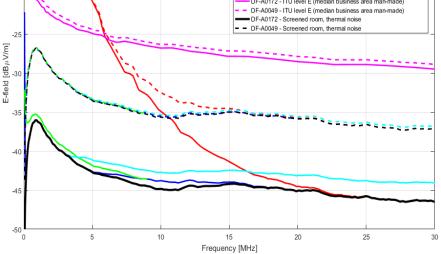
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E-field requirements:

Required E-field (less is better) for 0dB SNR in 1Hz with receiver noise figure = 6dB -10 DF-A0172 - ITU level A (atmospheric noise exceeded 0.5% of time) DF-A0049 - ITU level A (atmospheric noise exceeded 0.5% of time) - DF-A0172 - ITU level B (atmospheric noise exceeded 95% of time) DF-A0049 - ITU level B (atmospheric noise exceeded 95% of time) - DF-A0172 - ITU level C (man-made noise, quiet monitoring station) -15 DF-A0049 - ITU level C (man-made noise, quiet monitoring station) DF-X0049 - TTO level D (galatic noise) DF-X0172 - TTU level D (galatic noise) DF-X0049 - ITU level D (galatic noise) DF-X0172 - ITU level E (median business area man-made) DF-X0049 - ITU level E (median business area man-made) -20 DF-A0172 - Screened room, thermal noise DF-A0049 - Screened room, thermal noise -25 E-field [dB ///m] -30 -35 -40 -45 -50 10 20 30 0 5 15 25 Frequency [MHz] Required E-field (less is better) for 0dB SNR in 1Hz with receiver noise figure = 12dB -10 DF-A0172 - ITU level A (atmospheric noise exceeded 0.5% of time) DF-A0049 - ITU level A (atmospheric noise exceeded 0.5% of time) DF-A0172 - ITU level B (atmospheric noise exceeded 95% of time) DF-A0049 - ITU level B (atmospheric noise exceeded 95% of time) -15 DF-A0172 - ITU level C (man-made noise, guiet monitoring station) DF-A0049 - ITU level C (man-made noise, quiet monitoring station) DF-A0172 - ITU level D (galatic noise) DF-A0049 - ITU level D (galatic noise) - DF-A0172 - ITU level E (median business area man-made) -20 DF-A0049 - ITU level E (median business area man-made) DF-A0172 - Screened room, thermal noise



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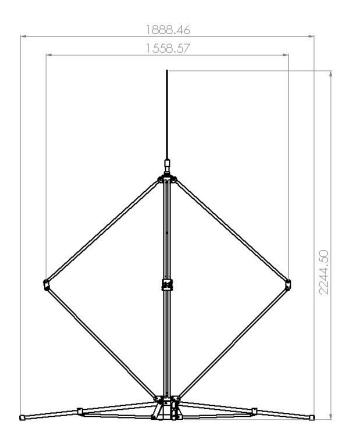
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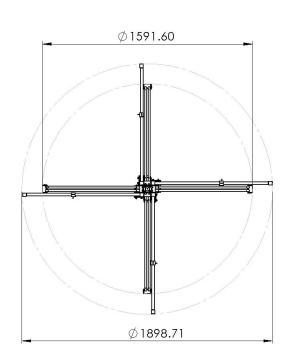
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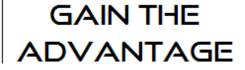
Outline dimension drawings:





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