

MFA303000S-K

VHF/UHF, multifunction wideband submarine antenna system,
30-3000 MHz

Naval Antennas and Systems: Submarine



Description

The MFA303000S-K is a multi-function wideband antenna system designed for submarine applications. The system comprises multiple antennas combined in a single radome controlled by an Antenna Control System (ACS). The system is highly customisable to suit a specific requirement. Mechanical integration of the system can be tailored to suit the platform.

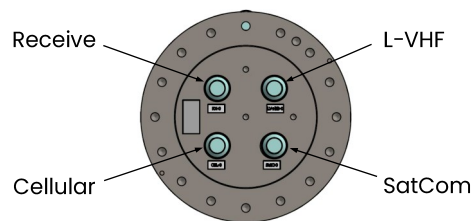


- Wide coverage; 30-3000 MHz both Tx (selected bands) and Rx
- Highly customisable antenna configuration
- Multi mode; satisfies the need for LoS and Beyond-LoS communication
- Modular; constructed from proven antenna elements that can be exchanged if other needs arises
- Compact; high efficiency in a small form factor, given the number of functions/bands

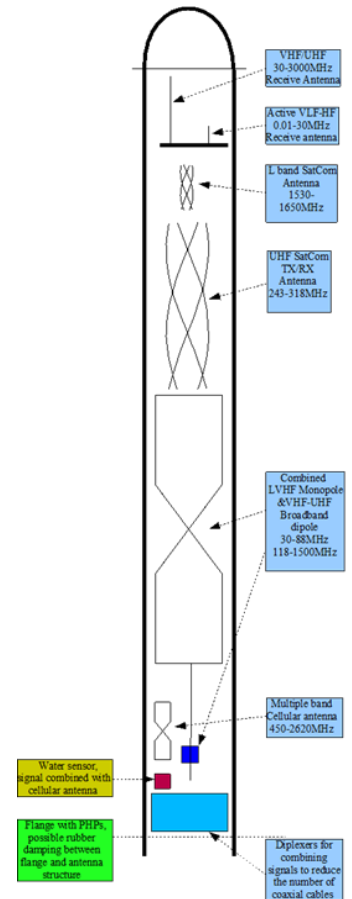
System Description

To achieve the best possible performance with many parallel communication channels, the different frequency bands (antennas) are separated as much as possible within the radome. This separation is achieved both physically and with the use of common modules. The antenna shown contains 6+1 different antenna elements. One of these is active, the receive antenna covering 10 kHz to 30 MHz. There is one broadband receive antenna element covering 30–3000 MHz. The other passive antennas can be used for both transmit and receive. The elements are placed for optimum performance within the required frequency bands. Positioning of the elements is critical to the overall performance of the system. For example, the GSM antenna is located very low to get sufficient distance from the L-band transmit antennas. The L-VHF element is formed by the entire MFA structure in order to make it as efficient as possible despite the small size.

Together with the Comrod V/UHF Antenna Control System (ACS) this Multi Function Antenna (MFA) forms a very efficient part of a submarine communication system.



Typical connector configuration
(customisable)



Technical Data

The Multifunctional antenna is highly customisable and the specification below is for the current version. Please contact Eylex to discuss your specific requirement.

The MFA currently has 4 connectors, giving the following specifications:

- Cellular
Signal type: RF : 450–2620 MHz
Power: <20W
- L-VHF and Broadband dipole
Signal type: RF : 30–88 MHz, RF : 118–3000 MHz
Power: < 100 W average, F<500 MHz,
Derate to 50 W at 1500 MHz
<500 W peak for IFF, low duty cycle
- SatCom
Signal type: RF : 243–318 MHz and 360–380 MHz, UHF
RF : 1600 – 1650 MHz, L-band
Power: < 100 W @ UHF
< 20W @ L-band
- Receive
Signal type: RF : 0.01–30, 30–3000 MHz
DC: 39V @ 250mA DC supply to active antenna
- System impedance is 50Ω
- Connectors are Gisma series 51

Antenna Element Specifications

- Cellular

Frequency Range: 450–2620 MHz
 VSWR: < 3.5
 Maximum Power 20 W for 30 minutes
 Radiation Pattern
 V: Like a thick dipole with similar dimensions
 H: Omnidirectional with some distortion due interference from cables
 Gain: Nominal 1 dBi
 Polarisation: Vertical
- Low VHF

Frequency Range: 30–88 MHz
 VSWR: < 3.5, measured on the corner of a 3x3 m ground plane
 Maximum power 100 W for 5 minutes
 Radiation Pattern
 V: Like a monopole, but depends slightly on the mast height
 H: Omnidirectional.
 Gain: – 20 dBi..0 dBi @ $q=0^\circ$
 Polarisation: Vertical
- Broadband Dipole

Frequency Range: 118–1500 MHz
 VSWR: < 3
 Maximum Power 100 W for 30 minutes, 500 W peak for IFF
 Radiation Pattern
 V: Like a dipole, but with some ripple
 H: Omnidirectional.
 Gain: – 5..+ 2 dBi @ $q=0^\circ$ for 118–430 MHz
 Polarisation: Vertical
- V/UHF SatCom

Frequency Range: 243–318 MHz and 360–380 MHz
 VSWR: < 2
 Maximum Power 100 W for 30 minutes
 Radiation Pattern Omnidirectional with maximum in $q=90^\circ$ (zenith)
 Gain: > 2 dBic @ $q=90^\circ$, > – 4 dBic @ $q=0^\circ$
 Gain Measured: –2..2 dBic @ $q=90^\circ$
 Polarisation: RHCP
- L-band SatCom

Frequency Range: TX: 1600–1650 MHz
 VSWR: < 2
 Maximum Power 20 W for 30 minutes
 Radiation Pattern Omnidirectional with maximum in $q=90^\circ$ (zenith)
 Gain: >3 dBic @ $q=90^\circ$, > –4 dBic @ $q=0^\circ$
 Polarisation: RHCP
- Active VLF–HF Rx antenna

Frequency Range: 0.01–30 MHz
 Connector: N–female
 Antenna Factor: 0.1, 0.01 with attenuator @ 2 MHz
 1 dB comp. point input: 50 V/m, ~ 500 V/m with attenuator @ 2 MHz
 1 dB comp. point out: 27 dBm, approx.
- VHF/UHF Rx antenna

Power Rating: RX
 Antenna gain:
 –31 .. – 10 dBi @ 30–88 MHz
 –15 .. – 1 dBi @ 118–174 MHz
 –6 .. + 2 dBi @ 225–430 MHz



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All specifications are subject to change without notice
The information contained herein is for reference only and does not constitute a warranty of performance

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