



Multi-Function Wideband Antenna System

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 customizable to suit a specific requirement. Mechanical integration of the system can be tailored to suit the platform.

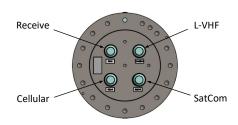


- Wide coverage; 30-3000MHz both Tx (selected bands) and Rx
- Highly customizable antenna configuration
- Multi mode; satisfies the need for LoS and Beyond-LoS communication
- Modular; constructed from proven antenna elements that can be exchanged if other needs arises
- Compact; high efficiency in a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

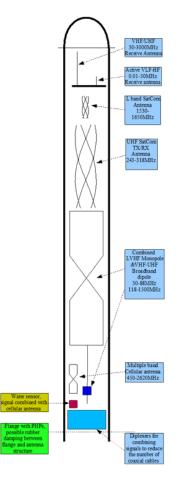
System Description

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 10kHz to 30MHz. There is one broadband receive antenna element covering 30-3000MHz. 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 customizable and the specification below is for the current version. Please contact Comrod to discuss your specific requirement.

The MFA currently has 4 connectors (Gisma series 51), giving the following specifications:

Cellular Signal type: RF: 450-2620MHz

Power: <20W

L-VHF & Broadband dipole Signal type: RF: 30-88MHz, RF: 118-3000MHz

Power: < 100W average, F<500MHz,

Derate to 50W at 1500MHz

<500W peak for IFF, low duty cycle

SatCom Signal type: RF: 243-318MHz & 360-380MHz, UHF

RF: 1600 - 1650MHz, L-band Power: < 100W @ UHF < 20W @ L-band

Receive Signal type: RF: 0.01-30, 30-3000MHz

DC: 39V @ 250mA DC supply to active antenna

System impedance is 50Ω

Dimensions
Complete Assembly - 4500mm long, Ø250mm (including radiating element)

Radiating Element - 3000mm long, Ø180mm

Antenna element specifications

Cellular Frequency range: 450-2620MHz,

VSWR: <3.5

Maximum power 20W for 30minutes

Radiation pattern

V: Like a thick dipole with similar dimensions

H: Omni directional with some distortion due interference from

cables

Gain: Nominal 1dBi Polarization: Vertical

Low VHF Frequency range: 30-88MHz

VSWR: <3.5, measured on the corner of a 3x3m ground plane

Maximum power 100W for 5minutes

Radiation pattern

V: Like a monopole, but depends slightly on the mast height

H: Omni directional. Gain: -20dBi..0dBi @ q=0° Polarization: Vertical

Broadband Dipole Frequency range: 118-1500MHz,

VSWR: <3,

Maximum power 100W for 30minutes, 500W peak for IFF

Radiation pattern

V: Like a dipole, but with some ripple

H: Omni directional.

Gain: -5..+2dBi @ q=0° for 118-430MHz,

Polarization: Vertical

V/UHF SatCom Frequency range: 243-318MHz & 360-380MHz

VSWR: <2

Maximum power 100W for 30 minutes

Radiation pattern Omni directional with maximum in q=90° (zenith).

Gain: >2dBic @ q=90°, >-4dBic @ q=0° Gain measured: -2..2 dBiC @ q=90°

Polarization: RHCP

L-band SatCom Frequency range: TX: 1600-1650MHz

VSWR: <2

Maximum power 20W for 30minutes

Radiation pattern Omni directional with maximum in q=90° (zenith).

Gain: >3dBic @ q=90°, >-4dBic @ q=0°

Polarization: RHCP

Active VLF-HF Rx antenna Frequency range: 0.01-30MHz

Connector: N-female

Antenna factor: 0.1, 0.01 with attenuator @ 2MHz

1dB comp. point input: 50V/m, ~ 500V/m with attenuator @ 2MHz

1dB comp. point out: 27dBm, approx.

VHF/UHF Rx antenna Power rating: RX

Antenna gain:

-31 .. -10dBi @ 30-88MHz -15 .. -1dBi @ 118-174MHz -6 .. +2dBi @ 225-430MHz

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