

Support Documentation for Fixed Antenna

Necessary bandwidth of transmit signal:

Modulation format in use: Binary FSK and Gaussian binary FSK.

Baud rate: 2400, 4800, 9600 bits per second.

3dB bandwidth of Gaussian filter normalized to baud rate: 0.3, 0.5.

Modulation index : 0.5, 0.7

Necessary bandwidth that contains 99% of transmitted RF power that covers all the above cases of application is 15.6Khz. This bandwidth is calculated based on necessary bandwidth formula for binary FSK in annex J of 'Manual of Regulations and Procedures for Federal radio Frequency Management' published by National Telecommunications and Information Administration(Rev. 9/2009).

The formula for binary FSK from annex J of NTIA is $B_n = 3.86 * D + 0.27 * R$ where B_n is necessary bandwidth, D peak frequency deviation, and R baud rate.

RF spectrum measurement of transmitting radio's RF output also confirms that 15Khz is a necessary bandwidth for all modulation parameters of interests in our application.

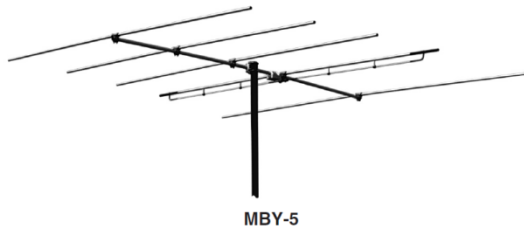
Fixed Station Antenna information

METEOR BURST ANTENNAS

4 to 7.5 dBd gain

40–50 MHz

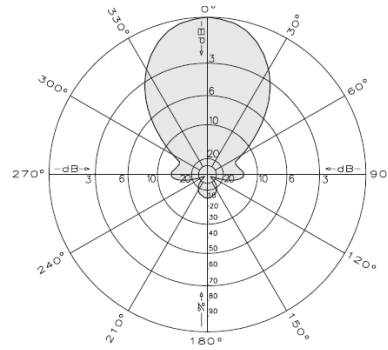
Horizontally polarized



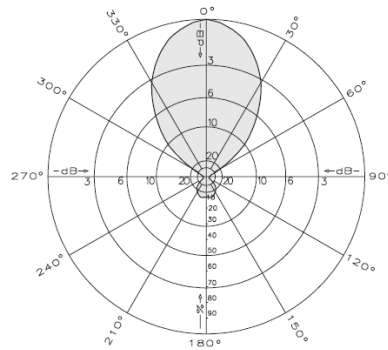
Master Station Antenna – Kathrein Scala Division MBY-5

Master station antenna pattern (see figure below):

E-plane beamwidth 58 degrees, H-plane beamwidth 68 degrees at 49.8MHz.



H-plane
 Horizontal pattern – V-polarization



E-plane
 Vertical pattern – V-polarization

MBY-5 Specifications

Frequency range: 40–50 MHz

Gain: 7 dBd at 49.8MHz

Impedance: 50 ohms at 49.8MHz

VSWR : <1.5:1

Polarization: Horizontal or vertical

Front-to-back ratio: >16 dB at 49.8MHz

Maximum input power: 500 watts (at 50°C)

H-plane beamwidth: 68 degrees (half-power) at 49.8MHz

E-plane beamwidth: 58 degrees (half-power) at 49.8MHz

Connector: N female

Weight: 30 lb (13.6 kg)

Dimensions : 156.5 x 127.6 inches (maximum) (3975 x 3242 mm)

Equivalent flat plate area: 4.21 ft² (0.391 m²) (maximum)

Wind survival rating: 80 mph (130 kph) 100 mph (160 kph) with no radial ice