

Antenna Pattern:

The antenna is a parabolic reflector with a 0.6 meter diameter and a mainbeam gain of 28 dBi.

The antenna pattern is determined based on the below equation:

$$g(\theta) = g_{max} \left(\frac{2J_1(x)}{x} \right)^2$$

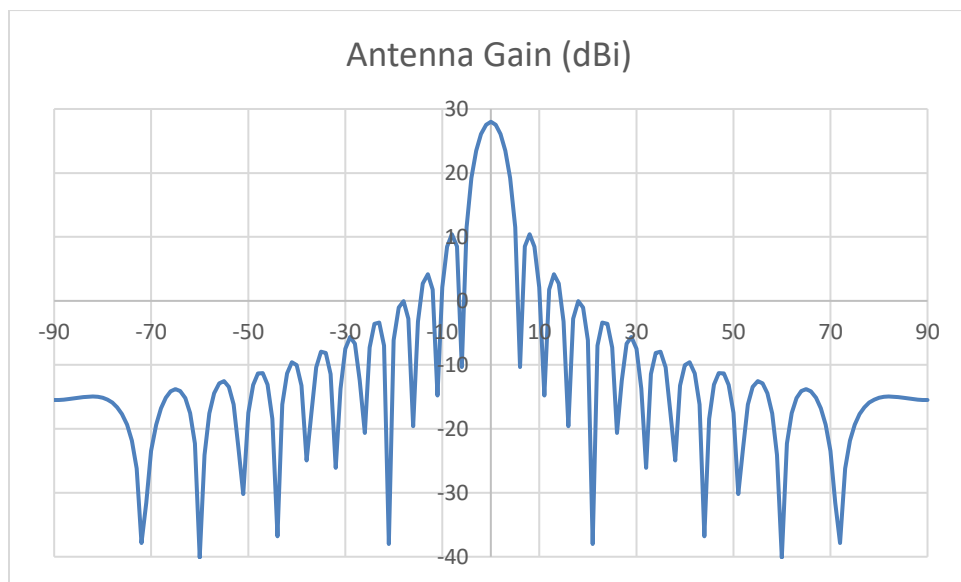
Where

$$x = \frac{\pi d}{\lambda} \sin \theta$$

θ = angle off boresight

J_1 = first order Bessel Function

Accordingly, the antenna pattern is shown graphically below.



The antenna pattern, combined with the spread spectrum nature of the transmitter will ensure that the station is always in compliance with the PFD levels required under Section 25.218 of the FCC Rules in order avoid interference to any adjacent two-degree-compliant space stations.

RF Exposure Determination:

In the mainbeam of the antenna, the EIRP will be $P_T + G = 30 \text{ dBm} + 28 \text{ dBi} = 58 \text{ dBm}$ (631 Watts).

The limit for General Population/Uncontrolled Exposure is 1 mW/cm^2 as given in Section 1.1310 of the FCC Rules.

The permitted power density is used as a threshold in order to determine the minimum safe distance using the equation below:

$$PD = \frac{Power}{4\pi d}$$
$$0.001 \text{ W/cm}^2 = \frac{631 \text{ W}}{4\pi d}$$
$$d = 224 \text{ cm}$$

Thus, Higher Ground will ensure that no person is within 2.24 meters of the antenna any time the experimental station is in operation.