18 RF EXPOSURE CALCULATIONS FOR HIGH GAIN ANTENNAS

From FCC 1.1310 table 1A, the maximum permissible RF exposure for an uncontrolled environment is $1mW/cm^{2.}$ The Electric field generated for a $1mW/cm^2$ exposure (S) is calculated as follows:

$S = E^2/Z$

where:
S = Power density
E = Electric field
Z = Impedance.

$E = \sqrt{S \times Z}$

$1mW/cm^2 = 10\ W/m^2$

The impedance of free space is 337 ohms, where E and H fields are perpendicular.

Thus:

$E = \sqrt{10 \times 377} = 61.4$ V/m which is equivalent to $1mW/cm^2$

Using the relationship between Electric field E, Power in watts P, and distance in meters d, the corresponding Antenna numeric gain G and the transmitter output power and solving for d,

$$d = \sqrt{\frac{P_{eak} \times 30 \times G}{E}}$$

The Numeric gain G of antenna with a gain specified in dB is determined by: $G = \text{Log}^{-1}$ (dB gain/10).
The table below identifies the distances where the $1mW/cm^2$ exposure limits may be exceeded during continuous transmission using the proposed fixed antennas

Manufacturer	Type	Model	Gain (dBi)	Numeric gain	Channel	Peak Power (mW)	Calculated Distance (m)	Minimum RF Exposure Separation Distance (m)
Gabriel	Dish	SSSP2 52	29.0	794.3	3	239.9	1.2	2
Gabriel	Flat panel	MT-20004	28.0	631.0	3	239.9	1.1	2
MTI	Flat panel	DFPD1-52	23.9	245.5	3	239.9	0.7	2

WARNING: It is the responsibility of the professional installer to ensure that when using the outdoor antenna kits in the United States (or where FCC rules apply), only these antenna configurations shown in the table in section 18 are used. The use of any antenna other than those listed is expressly forbidden in accordance to FCC rules CFR47 part 15.204.

Notice:

FCC Radiation Exposure Statement

i) This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment when installed as directed. This equipment should be installed and operated with fix-mounted antennas that are installed with a minimum of 2 meters of separation distance between the antenna and all persons body during normal operation and the antennas as shown below: