2.4GHz Telepath MPE Calculation

The following calculation is provided to determine the minimum distance that a person can be from the antenna so as not to exceed the Maximum Permissible Exposure (MPE) regulation of FCC 1.1310.

Table 1(B) - General Population/Uncontrolled Exposure gives the MPE limit in the 2.4GHz MHz ISM band as follows:

MPE = 1.0 where MPE is in units of [mW/cm^2] regardless of frequency (1)

The power output of our radio device was measured and found to be always less than 100 mW. (2)

Antenna gain is 8 dBi. (3)

The antenna gain (3) can be applied to the maximum output power (2) to yield an effective isotropic radiated output power as follows:

$Piso = 100\ mW * 10^{(8/10)}$ (4)

$Piso = 631mW$ (5)

The minimum distance permissible can be computed based on the surface area of the isotropic sphere:

$Aiso = 4 * pi * r^2$ where Aiso is the area [cm^2] and r is the radius of the sphere [cm] (6)

$MPE * Aiso = Piso$ (7)

$r = (Piso / (MPE * 4 * pi))^{(1/2)}$ (8)

$r = (631\ [mW] / (1.0\ [mW/cm^2] * 4 * pi))^{(1/2)}$ (9)

r = 7 cm or 2 -3/4 in (10)

The following statement is included in the Installation Manual:

"To comply with FCC requirements for RF exposure, antennas must be installed such that no persons will be closer than 20cm (8") from any part of the antenna while operational."

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