

Utilicom LR2050  
2.4 GHz Direct Sequence Spread Spectrum Radio

FCC ID: LFO-LR2050

The following section will be added to the user manual:

### **5.3 Antenna Installation Instructions: FCC RF Exposure Limits**

Antennas used for these transmitters shall be professionally installed on permanent structures for outdoor operations. The installer is responsible for ensuring that the systems using high gain directional antennas are used exclusively for fixed, point-to-point operations.

The installer shall mount all transmit antennas so as to comply with the limits for human exposure to radio frequency (RF) fields per paragraph 1.1307 of the Federal Communications Commission (FCC) Regulations. The FCC requirements incorporate limits for Maximum Permissible Exposure (MPE) in terms of electric field strength, magnetic field strength, and power density.

Antenna installations shall be engineered so that MPE is limited to  $1 \text{ mW/cm}^2$ , the more stringent limit for "uncontrolled environments". Table 2 below specifies the **minimum** distance that must be maintained between the antenna and any areas where persons may have access, including rooftop walkways, sidewalks, as well as through windows and other RF-transparent areas behind which persons may be located.

**Table 2 Antenna Radiation Hazard**

**Exposure,  $\text{mW/cm}^2$ :** 1.00

Max RF Power P, dBm	TX Antenna G, dBi	MPE Safe Distance, cm
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24.0	24.0	70.9
27.0	15.0	35.5
28.0	8.0	20*

**Basis of Calculations:**

$$E^2/3770 = S, \text{ mW/cm}^2$$

$$E, \text{ V/m} = (P_{\text{watts}} * G_{\text{gain}} * 30)^{0.5} / d, \text{ meters}$$

$$d = ((P_{\text{watts}} * G * 30) / 3770 * S)^{0.5}$$

$$P_{\text{watts}} * G_{\text{gain}} = 10^{(P_{\text{dBm}} - 30 + G_{\text{dBi}}) / 10}$$

**\*NOTE: For mobile or fixed location transmitters, minimum separation distance is 20 cm, even if calculations indicate MPE distance is less**

