

Exposure of humans to RF fields

As per Section 1.1310 mobile transmitters are required to be operated in a manner that ensures the public is not exposed to RF energy levels in accordance with OST/OET Bulletin Number 65.

Calculations have been made using the General Public/Uncontrolled Exposure limits.

Minimum safe distances have been calculated below.

$$\text{Power density, mW/m}^2 = E^2/3770$$

The General Population / Uncontrolled exposure limit between 30-300 MHz is 0.2 mW/m²

The minimum distance from the antenna at which the MPE is met is calculated from the equation relating field strength in V/m, transmit power in watts, transmit antenna gain, transmitter duty cycle and separation distance in metres:

$$E, \text{ V/m} = (\sqrt{30 * P * G}) / d$$

Uncontrolled

$$E = 0.2 \text{ W/m}^2 = E^2/3770$$

$$E = \sqrt{0.2 * 3770}$$

$$E = 27.5 \text{ V/m}$$

The rated maximum transmitter power = 50 watts.

Transmitter is operated using a quarter wave whip antenna with a gain of 2.14 dBi (1.64).

A duty cycle of 100% as the transmitter is a base station could possibly be operated for long periods of time.

Uncontrolled

$$d = \sqrt{30 * P * G * DC} / E$$

$$d = \sqrt{30 * 50 * 1.64 * 1.0} / 27.5$$

$$d = 1.8 \text{ metres or } 180.0 \text{ cm}$$

Result: Complies if the safe distances defined for this environment is applied.