Part 1.1310 - Exposure of humans to RF fields

As per FCC KDB 447498 D01 and Section 2.1091 radio frequency transmitters are required to be operated in a manner that ensures the public is not exposed to RF energy levels.

Calculations have been made using the General Public/Uncontrolled Exposure limits that are defined in Section 1.1310.

Minimum safe distances have been calculated below

- General Population /Uncontrolled exposure = 0.62 mW/cm^2 (f/1500 = 935 MHz/1500)

As Part 90 certification is being sought for the 935 - 940 MHz band this assessment has been carried out at 935 MHz which will give a worst case assessment.

Power Density = $E^2/3770 = 0.62$ mW/cm^2

Therefore:

$E = \sqrt{0.62*3770}$
$E = 48.3$ V/m

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:

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

The rated maximum transmitter power = 5 watts.

The transmitter would typically be operated using number of antennas.

The highest gain antenna is a yagi antenna with a gain of 11 dBi (12.6).

It has been assumed that the transmitter can be used with a duty cycle of 100%.

Therefore

$d = \sqrt{(30 * P * G*DC)} / E$
$d = \sqrt{(30.0 * 5.0 * 12.6 * 1.0)} / 48.3$
$d =$ 0.90 metres or 90 cm

Result: Transmitter will comply if the safe distance calculated above is applied.