Radio Frequency Hazard Information

As per Section 1.1310 and Section 2.1091 certification of this transmitter is sought using the Controlled / Occupational exposure limits as detailed in OST/OET Bulletin Number 65.

This transmitter is a fixed linked digital transmitter that uses two transmitters that transmit identical modulation with one transmitter transmitting using a horizontally polarised antenna and the other transmitter transmits using a vertically polarised antenna.

The client supplies a choice of two antennas they being a panel antenna and a circular polarised antenna.

Radio Frequency Hazard measurements and calculations were made using the circular polarised antenna as this antenna has the highest gain.

The Radio Frequency Hazard assessment has been carried out using a peak detector as this gave the worst case result.

The transmitters have a peak output power of 5 watts (+37 dBm) per transmitter and the client advises that the circular polarised yagi antenna has a gain of greater than 10 dBi.

This gives a theoretical radiated power that is greater than +47 dBm.

At a distance of 10 metres the EIRP power of the transmitters in both horizontal and vertical polarisations was measured to be +55 dBm or 316 watts

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

Minimum safe distances have been calculated below.

Power density, $mW/cm^2 = E^2/3770$

Occupational / Controlled Exposure limit: 1.55 mW/cm^2 (f/300 = 464 MHz/300)

General Population / Uncontrolled exposure limit: 0.31 mW/cm^2 (f/1500 = 464 MHz/1500)

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:

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

Controlled / Occupational	**Uncontrolled / General Public**
$E = 1.55\ mW/cm^2 = E^2/3770$	$E = 0.31\ mW/cm^2 = E^2/3770$
$E = \sqrt{1.55*3770}$	$E = \sqrt{0.31*3770}$
$E = 76.4\ V/m$	$E = 34.2\ V/m$

The maximum radiated transmitter power = 316 watts.

This figure takes into consideration the transmitter output power, antenna gain, coax losses and an assumption that a 100% duty cycle will be in used

Controlled / Occupational	**Uncontrolled / General Public**
$d = \sqrt{(30 * P * G*DC) / E}$	$d = \sqrt{(30 * P * G*DC) / E}$
$d = \sqrt{(30 *316) / 76.4}$	$d = \sqrt{(30 * 316) / 34.2}$
d = 1.27 metres	d = 2.85 metres

Result: Complies if the user is advised of the above safe distances in the appropriate documentation.