

## 5.6. RF EXPOSURE REQUIREMENTS [§§ 1.1310 & 2.1091]

### 5.6.1. Limits

§ 1.1310: The criteria listed in the following table shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in 1.1307(b).

#### LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm <sup>2</sup> )	Average Time (minutes)
<b>(A) Limits for Occupational/Control Exposures</b>				
30-300	61.4	0.163	1.0	6
300-1500	--	--	f/300	6
<b>(B) Limits for General Population/Uncontrolled Exposure</b>				
30-300	27.5	0.073	0.2	30
300-1500	--	--	f/1500	30

**Note:** f is frequency in MHz

### 5.6.2. Method of Measurements

#### Calculation Method of RF Safety Distance:

$$S = \frac{PG}{4\pi \cdot r^2} = \frac{EIRP}{4\pi \cdot r^2}$$

Where,  
 P: power input to the antenna in mW  
 EIRP: Equivalent (effective) isotropic radiated power.  
 S: power density mW/cm<sup>2</sup>  
 G: numeric gain of antenna relative to isotropic radiator  
 r: distance to centre of radiation in cm

$$r = \sqrt{\frac{PG}{4\pi \cdot S}} = \sqrt{\frac{EIRP}{4\pi \cdot S}}$$

### 5.6.3. Evaluation of RF Exposure Compliance Requirements

Maximum RF Power conducted,  $P_{\text{conducted}}[\text{dBm}] = 47.04$  (rated power)

Maximum Antenna Gain,  $G[\text{dBi}] = 0$

Maximum EIRP,  $P_{\text{EIRP}}[\text{dBm}] = 47.04$

User-based time-average for PTT = 50%, So EIRP for Calculation = 25291 mW

MPE Limit for Occupational/Controlled Exposure,  $S_{\text{controlled}}[\text{mW/cm}^2] = 450.1/300 = 1.50$

MPE Limit for General Population/Uncontrolled Exposure,  $S_{\text{uncontrolled}}[\text{mW/cm}^2] = 450.1/1500 = 0.30$

Calculated RF Safety Distance for Occupational/Controlled Exposure,  $r_{\text{safety\_controlled}}[\text{cm}] = 36.63$

Calculated RF Safety Distance for General Population/Uncontrolled Exposure,  $r_{\text{safety\_uncontrolled}}[\text{cm}] = 81.90$

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## SAFETY TRAINING INFORMATION



**Your Icom radio generates RF electromagnetic energy during transmit mode. This radio is designed for and classified as “Occupational Use Only”, meaning it must be used only during the course of employment by individuals aware of the hazards, and the ways to minimize such hazards. This radio is NOT intended for use by the “General Population” in an uncontrolled environment.**

- For compliance with FCC and Industry Canada RF Exposure Requirements, the transmitter antenna installation shall comply with the following two conditions:

1. The transmitter antenna gain shall not exceed 0 dBi.
2. IC-F5121D:

The antenna is required to be located outside of a vehicle and kept at a distance of 45 centimeters or more between the transmitting antenna of this device and any persons during operation. For small vehicle as worst case, the antenna shall be located on the roof top at any place on the centre line along the vehicle in order to achieve 45 centimeters separation distance. In order to ensure this distance is met, the installation of the antenna must be mounted at least 45 centimeters away from the nearest edge of the vehicle in order to protect against exposure to bystanders.

2. IC-F6121D:

The antenna is required to be located outside of a vehicle and kept at a distance of 37 centimeters or more between the transmitting antenna of this device and any persons during operation. For small vehicle as worst case, the antenna shall be located on the roof top at any place on the centre line along the vehicle in order to achieve 37 centimeters separation distance. In order to ensure this distance is met, the installation of the antenna must be mounted at least 37 centimeters away from the nearest edge of the vehicle in order to protect against exposure to bystanders.

3. IC-F5121D:

Transmit only when people outside the vehicle are at least the recommended minimum distance of 100 centimeters away from the properly installed antenna. This separation distance will ensure that there is sufficient distance from a properly installed externally-mounted antenna to satisfy the RF exposure requirements in the applicable RF exposure compliance standards.

3. IC-F6121D:

Transmit only when people outside the vehicle are at least the recommended minimum distance of 82 centimeters away from the properly installed antenna. This separation distance will ensure that there is sufficient distance from a properly installed externally-mounted antenna to satisfy the RF exposure requirements in the applicable RF exposure compliance standards.

**CAUTION**

To ensure that your exposure to RF electromagnetic energy is within the FCC allowable limits for occupational use, always adhere to the following guidelines:

- **DO NOT** operate the radio without a proper antenna attached, as this may damage the radio and may also cause you to exceed FCC RF exposure limits. A proper antenna is the antenna supplied with this radio by the manufacturer or an antenna specifically authorized by the manufacturer for use with this radio.
- **DO NOT** transmit for more than 50% of total radio use time (“50% duty cycle”). Transmitting more than 50% of the time can cause FCC RF exposure compliance requirements to be exceeded. The radio is transmitting when the “transmit indicator” appears on the LCD. You can cause the radio to transmit by pressing the “PTT” switch.

### **Electromagnetic Interference/Compatibility**

During transmissions, your Icom radio generates RF energy that can possibly cause interference with other devices or systems. To avoid such interference, turn OFF the radio in areas where signs are posted to do so. **DO NOT** operate the transmitter in areas that are sensitive to electromagnetic radiation such as hospitals, aircraft, and blasting sites.