MRC565 PACKET DATA RADIO TRANSCEIVER

EXPOSURE TO RF RADIATION

The FCC guidelines limit the maximum permitted exposure to RF radiation for Occupational/ Controlled Exposure to 1 mw/sq. cm for frequency ranges of 30-300 MHz. This limit and the following equation for calculating field strength (obtained from OET Bulletin 65) is used to calculate the minimum separation between humans and the transmit antenna based on MPE:

S= P*G* DC/(4*π*R*R) =>

R=(P*G*DC/(4*π*S))^0.5 as rearranged to solve for separation distance, R

P = Transmit power in milliwatts = 100,000

G = Antenna gain referenced to an isotropic radiator

= 1.68 (2.2 dBi) mobile quarter wave dipole mounted to fender/roof of automobile

= 10.0 (10.0 dBi) fixed 5 element Yagi mounted to top of fixed antenna tower

= 3.3 (5.2 dBi) fixed half wave dipole mounted to fixed antenna tower leg

R = separation required cm

DC = Maximum duty cycle of transmitter = 10 %

S = Power density = 1 milliwatt/square cm

This equation is accurate for the far field of an antenna, but will over-predict power density in the near field. Thus, the near field MPE distances calculated here are "worst case" or conservative.

Antenna separation for mobile applications:

The typical antenna used in mobile application has a maximum antenna gain of less than 2.2 dBi (¼ wave dipole or ½ wave dipole). To insure safe operation the antenna must be mounted such that the separation between the antenna and any human occupants of the vehicle exceeds .36 meters (14"). The best location for antenna mounting is the center of the vehicle roof. This will provide additional RF shielding between the antenna and the human occupants that reduces the RF exposure to levels well below that specified in FCC OET Bulletin 65.

When working on the antenna and or co-ax cable always disable the transmitter by turning its power off.

Antenna separation for fixed applications:

For fixed applications, antenna gains and mounting techniques can vary depending on the application. For Yagi antennas whose gain does not exceed 10 dBi, that antenna must be mounted a minimum of .90 meters from any humans occupants. Lower gain antennas, such as side mount dipoles, exhibit lower gain (5.2 dBi) allow closer separations (.52 meters for 5.2 dBi antennas). This will provide RF shielding between the antenna and the human occupants that reduce the RF exposure to levels below that specified in FCC OET Bulletin 65.

When working on the antenna and or co-ax cable always disable the transmitter by turning its power off.