

NovaRoam 900 RF Safety Considerations

The maximum permissible RF exposure [MPE] for the NovaRoam 900 is computed in accordance with §1.1307 (b) (1) of the FCC Rules. Two sets of limits are provided in §1.1310, one for occupational/controlled exposures and another for general population/uncontrolled exposures. Nova has selected the latter limits since they are the most restrictive. In this instance, the maximum power density equals $f/1500$ mW/cm², where f is the operating frequency in MHz. This results in a worst case power density limit of 0.601mW/cm² at the lower frequency limit of 902MHz.

The effective isotropic radiated power [EIRP] for the NovaRoam 900 is limited to +36dBm, or 3981mW, per §15.247 (b) (3) of the FCC Rules. Each of the NovaRoam 900 antenna/cable combinations has been selected to comply with this limit, as indicated in Table 1. The EIRP in Table 1 is referenced to +27.0dBm RF output from the NovaRoam 900 antenna port, which corresponds to the maximum value for any of its 7 operating modes. The power density at a given distance from a NovaRoam 900 antenna is computed by using the following equation:

$$P_d = \frac{EIRP}{4\pi r^2}$$

where

P_d	=	power density	0.601	mW/cm ²
EIRP	=	effective isotropic radiated power	3981	mW
r	=	separation from antenna	23.0	cm.

Inserting the maximum EIRP of +36dBm into this equation reveals that a power density of 0.601mW/cm² is obtained at a separation of $r=23.0\text{cm}=9.0''$ from the NovaRoam 900 antenna. This is the most restrictive limit since it corresponds to an EIRP level that exceeds the amount radiated by the NovaRoam 900 using any of the authorized antenna/cable combinations. Therefore a user that maintains a minimum separation of 9.0" from the NovaRoam 900 will be within the MPE guideline established by the FCC.

NovaRoam 900 EIRP Calculations					
Antenna		Antenna Gain	Antenna Cable	Cable Loss	EIRP
Collinear Whip	Antenex BB8965C	+7.2dBi	12' Teflex	1.7dB	+32.5dBm
Omni	Antenex FG9026	+8.2	25' LMR400	1.0	+34.2
Yagi	Antenex YB8966	+11.2	100' LMR400	3.9	+34.3

Nova Engineering cautions its users concerning the MPE limit by including a warning disclaimer in its User's Manual. A copy of this statement is provided below.

CAUTION

The NovaRoam™ 900 has been specifically designed to close the longest possible links. This goal has been accomplished in part by delivering the highest permissible RF output power to the antenna per the FCC Part 15 Rules. In August 1996, the FCC adopted RF exposure guidelines that established safety levels for various categories of wireless transceivers. Those limits are consistent with safety standards previously published by the National Council on Radiation Protection (NCRP) Report 86, §17.4.1, §17.4.1.1, §17.4.2, and §17.4.3 as well as the American National Standards Institute (ANSI) in §4.1 of "IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3kHz to 300GHz," ANSI/IEEE C95.1-1992. The NovaRoam™ 900 user can comply with this FCC guideline by maintaining a minimum separation from any NovaRoam™ 900 antenna of at least 9" (22.8cm). As a consequence, the user should disconnect the AC/DC input power source from the NovaRoam™ 900 whenever repositioning the antenna.