

Subscriber Communicator (SC) Radiation Hazard Assessment

The effective isotropic radiated power (EIRP) of the Subscriber Communicator (SC) is derived in Table 1. Derived EIRP is used because the manufacturing process introduces slight variations in losses from the final stage amplifier to the antenna port, actual output power may vary slightly, cables loss and antenna gain can vary.

Peak Antenna Gain @ 150 MHz (Typical 1/2? whip)	-0.5	dBi	
Losses, Amplifier to Antenna	-0.2	dB	
SC Transmit Power	+7.4	dBW (5.5 Watts)	
Nominal EIRP	+6.7	dBW (4.7 Watts)	

Table 1. Calculation of Transmit EIRP

The calculations in Table 2 show that the transmit power of the SC is below the limitation imposed by ANSI C95.1-2002, 27.5 V/m for Electric Field Strength in an Uncontrolled Environment.

It should be noted that the vast majority of ORBCOMM applications are commercial and industrial in nature and proximity to the human body is not common. That being said, applications that have used the ORBCOMM System for personal messaging have included a keyboard entry method and display. The use of the terminal for these applications results in the antenna being pointed away from the body.

Transmit Power	+7.0	dBW	
Area of an Isotrope @ 150 MHz	-4.98	dB-m ²	
	Total	+2.02	dBW/m ²
Convert to Watts	+1.59	W/ m ²	
Convert to Field Strength	+24.50	V/m	
Duty Cycle Limitation per FCC, 1% in 15 minutes	+0.25	V/m	

Table 2. Calculation of Time Average Field Strength Transmitted by the SC

The duty cycle limitations are overly conservative given the additional FCC constraint of no transmission shall be longer than 450 milliseconds. This constraint is the result of FCC rules on non-voice, non-geostationary (NVNG) mobile satellite systems and the radiation hazard requirements set forth in IEEE C95.1-2002, "Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz".

This radiation hazard analysis demonstrates that no public hazard will be created by the operation of these subscriber communicators.