Response to FCC Form 312, Question 28
RADIATION HAZARD ANALYSIS

RF SAFETY

The Globalstar™ "PTracker" Mobile Earth Station (MES) terminal is designed to comply with Specific Absorption Rates (SAR) limits for distances within 20 cm of the transmitting elements of the MES, and with general public uncontrolled environment Maximum Permissible Exposure (MPE) limits at distances greater than 20 cm from the transmitting elements of the MES, as required by Sections 1.1307 through 1.1310, 2.1091 and 2.1093 of the 47 C.F.R. (1996). The unit also complies with the MPE requirements from ANSI/IEEE C95.1-1992 and the NCRP Report No. 86, on which the FCC RF safety limits are based.

SAR tests for the production "PTracker" terminal (SPOT) indicate hazard levels significantly below the previously-authorized Globalstar™ "Handheld 1" (Qualcomm GSP-1600) and "Handheld 2" (Qualcomm GSP-1700) MESs, which met all SAR limits by a large margin, since the new "PTracker" MES operates at a lower peak EIRP than either of the previously-authorized "Handheld" units.

The "Telemetry" Globalstar™ MESs are designed to comply general public uncontrolled environment Maximum Permissible Exposure (MPE) limits at distances greater than 30 cm from the transmitting elements of the MES, as required by Sections 1.1307 through 1.1310, 2.1091 and 2.1093 of the 47 C.F.R. (1996). The units also comply with the MPE requirements from ANSI/IEEE C95.1-1992 and the NCRP Report No. 86, on which the FCC RF safety limits are based.

For distances greater than 20 cm, The Office of Engineering and Technology (OET) Bulletin 65 specifies a maximum permissible exposure (MPE) limit for the general population, i.e. uncontrolled exposure, at an average power level of 1 mW/cm2 over a 30-minute period. OET Bulletin 65 (Edition 97-01), Supplement C (Edition 01-01), permits RF radiation hazard compliance evaluation through field strength or power density calculations. The following analysis, prepared by Globalstar USA, follows the OET Bulletin 65 guidelines and shows that harmful levels of radiation above the maximum allowable exposure level of 1 mW/cm2 will not exist in areas normally occupied by anyone, even when utilizing "worst case" over-predictions for the near field and for antenna positioning with respect to any user or subjects in the vicinity of a user.

To estimate the radiation hazard that could potentially exist in the vicinity of a 1.6 GHz transmit "PTracker" MES, the following equation is generally accurate in the far-field of an antenna but will over-predict the radiation hazard in the near-field, representing a "worst case" or conservative prediction. The maximum power density is defined by the equation $S = P*G/(4*\pi*R^2)$, where P is the maximum power at the antenna input flange which is 0.4 watts, G is the peak gain of the antenna in the direction of interest relative to an isotropic radiator which is 5.0 dBi, and R is the distance to the center of radiation of the antenna which is at least 20 centimeters away from any subjects.

$$S = 400\text{mW}*10^{0.5}/(4*\pi*(20\text{cm})^2) = \mathbf{0.25\ mW/cm^2},$$

which meets the maximum allowable exposure level of 1 mW/cm^2

As stated in technical exhibit for Question 43, typical peak EIRP will be limited to that authorized by current blanket license with radiation level of 0.1 mW/cm^2, much lower than that stated above as "worst case" or conservative prediction due to the use of peak power and peak antenna gain.

To estimate the radiation hazard that could potentially exist in the vicinity of a 1.6 GHz transmit "Telemetry" mobile earth station using the SRT antenna, the following equation is generally accurate in the far-field of an antenna but will over-predict the radiation hazard in the near-field, representing a "worst case" or conservative prediction. The maximum power density is defined by the equation $S = P*G/(4*\pi*R^2)$, where P is the maximum power at the antenna input flange which is 0.4 watts, G is the peak gain of the antenna in the direction of interest relative to an isotropic radiator which is 5.0 dBi, and R is the distance to the center of radiation of the antenna which is at least 30 centimeters away from any subjects, an overly conservative estimate for locating a fixed antenna at an elevated position for an unobstructed horizon.

$$S = 400mW*10^{0.5}/(4*\pi*(30cm)^2) = \mathbf{0.11\ mW/cm^2},$$

which meets the maximum allowable exposure level of 1 mW/cm^2.

As stated in technical exhibit for Question 43, typical peak EIRP will be limited to that authorized by current blanket license with radiation level of 0.09 mW/cm^2, much lower than that stated above as "worst case" or conservative prediction due to the use of peak power and peak antenna gain.

The installation and operating manuals for the Telemetry devices will advise the user to maintain a minimum 30 cm separation distance between any person, including the user, and the earth station antenna while operating the terminal in order to avoid excessive RF hazard.