KRPXTransmission System

Transmitter Power Output Calculations

This exhibit has been included to explain the basis for the transmitter power output utilized to achieve the authorized effective radiated power of 6 kW. The antenna system consists of a circularly polarized Jampro JMPC-3 antenna. The antenna has a peak power gain of 1.5. Therefore, an antenna input power of 4000 watts is required to achieve 6 kW.

To get the signal from the transmitter to the antenna, it must pass through a 110 foot section of Andrew HJ7-50A transmission line (.25 dB loss) yielding an efficiency of 94.35%. Therefore, a power of 4240 watts is required at the transmitter output to achieve the authorized effective radiated power.

Feed System Efficiency:

In calculating the Feed System Efficiency, the following values were used based on the insertion loss data provided by each manufacturer.

Andrew HJ7-50A Heliax (110 feet)
Insertion Loss = 0.25 dB (at 95.3 MHz)

Total Losses = .25 dB (94.35% efficiency)

Antenna Gain:

In calculating the Antenna Gain, the following value was used based on data provided by the manufacturer:
Jampro JMPC-3
Power Gain: 1.5 (Circularly Polarized)

TPO Calculations:

$$\frac{\text{Effective Radiated Power}}{(\text{Antenna Power Gain} * \text{Feed System Efficiency})} = \text{TPO}$$

$$\frac{6\text{ kW}}{(1.5 * 94.35\%)} = \textbf{4.24 kW TPO}$$