# Provo Booster

## 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 0.6 kW. The antenna system consists of a cicularly polarized Jampro JCPD 2/1 Antenna. The antenna has a power gain of 4.9x. Therefore, an antenna input power of 0.122 watts is required to achieve 0.6 kW ERP.

To get the signal from the transmitter to the antenna, it must pass through a short Andrew HJ4-50 (1/2") jumper (0.18 dB loss), a Jampro RCCC.8 Balanced Combiner (0.8 dB loss), and 100 feet of Andrew HJ7-50 (1 5/8") transmission line (0.24 dB loss). Total insertion losses encountered between the transmitter and antenna are 1.22 dB yielding an efficiency of 75.53%. Therefore, a power of 162 watts is required at the transmitter output to achieve the authorized effective radiated power.

**TPO Calculations:**

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

$$\frac{0.6 \text{ kW}}{(4.9 * 75.53\%)} = \textbf{0.162 kW TPO}$$