

We are upgrading the Sahara radar system's software and hardware for our Air Force customer, which includes testing the system by radiating at and collecting data off of calibration sphere's and overhead targets. The system will be radiating infrequently for less than 5 minutes at a time for a maximum of 4 hours a week. The system is ground based and we would like to be able to take it to open fields in the surrounding area to collect calibration data from targets ~300m away without significant obstructions or clutter.

The radar will operate in 2 modes.

Mode a) 60kHz PRF with 890uSec pulses (which corresponds to a 5.35% transmit duty cycle). 70ns turn on and turn off times will reduce the effective mean power to approximately 4.9% of peak.

Mode b) 6kHz with 7.1 uSec pulses (which corresponds to 4.25% duty cycle). This mode has a lower mean radiated power than mode a.

The peak radiated power will be approximately 80W. So the highest mean radiated power will be approximately 3.94W

The peak antenna gain is 34dBi. So the mean EIRP will be $3.94W * 10^{3.4} = 9.9kW$