

On the Horizon: Reducing Power Consumption at SeaSonde Locations

Why does the CODAR set industry records only to break them shortly after? Because innovation is the key to expanding utility! **CODAR engineers are working to lower the entire radar site power requirement by as much as 40-90% of present needs. In this latest development effort CODAR engineers are reducing the power requirement to an average of 150 watts for the SeaSonde radar AND cooling system.** This ultra-low power system is ideally suited for remote areas where renewable power sources or operation from generators is only viable option. Read on to learn about this exciting work...

Development Impetus

When calculating the total power required at any radar site, you need to factor in the consumption of the radar plus that of any associated infrastructure at that location. Temperature and humidity control for the electronics enclosure is the potential biggest power draw at the radar site. In mild climates, keeping the electronics within optimal temperature ranges can often be achieved with a simple heat exchange fan that draws only 25 watts power. In contrast, cooling the electronics in warmer climates or stagnant air becomes more complicated; simple low-power heat exchangers are not adequate for the task and in those cases use of a closed-loop air conditioning system is required. Though power for a SeaSonde radar is only 350-450 watts, air conditioners can sometimes require up to 1.5 kilowatts of power— over 4 times that of the SeaSonde itself. This poses a problem when power must be derived solely from renewable sources (e.g. solar or wind), presenting logistical challenge and high cost

REDUCING POWER WITH NEW DESIGN FEATURES



Prototype Class-E transmit amplifier shown here.

Highly Efficient Transmit Amplifier

The conventional SeaSonde transmit amplifier efficiency is 30%, which is standard for Class-AB amplifiers designed for use at HF. CODAR engineers have developed and will be utilizing a breakthrough design Class-E transmit amplifier having an TX efficiency over 80%. This not only reduces the amount of required power input to transmit amplifier but also the amount of heat generated that would otherwise need dissipation.

Electronics Packaging & Built-In Cooling System

A key consideration to maximizing system efficiency is heat management. The entire electronics layout is being revamped to optimize heat dissipation inside the system. The transmit and receive electronics are stripped from the traditional two 19" electronics chassis and assembled together into one small package, roughly 0.75m height x 0.5m width x 0.5m depth. This sealed case is weather resistant and suitable for both indoor/outdoor use. A cooling system is built into casing with a temperature sensor inside electronics allowing for intelligent auto on/off.

System Requirement

With an average draw of 150 watts, the power requirement will vary throughout normal operations from 130 watts - 200 watts, based on the local temperatures (and hence internal air cooling requirement). Any power generation system should be engineered to at least 150 watts under any expected local weather conditions.

Consult CODAR for additional information.

