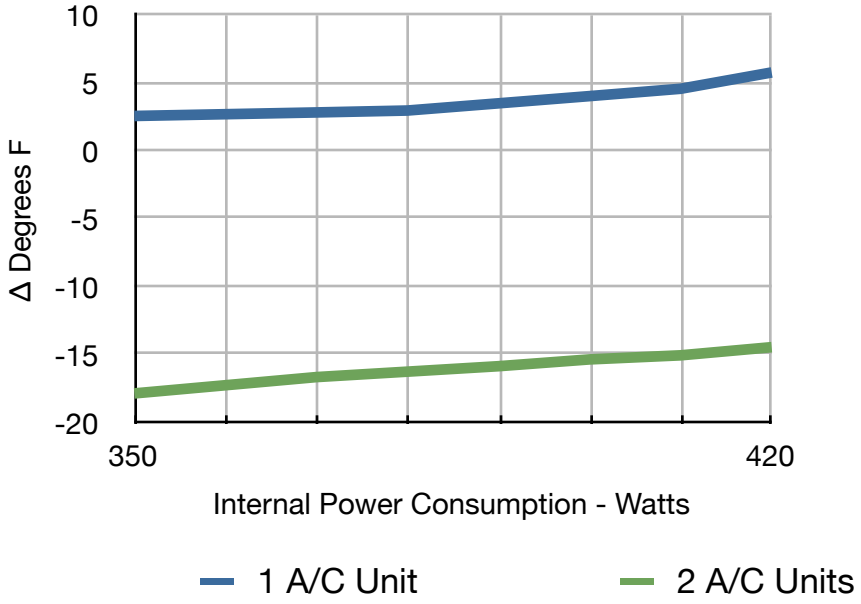
CODAR Ocean Sensors

Thermal Evaluation of the COS EIC Enclosure

An EIC brand enclosure was tested to determine the effectiveness of the air-conditioners that are used for cooling the electronics. The EIC enclosure model under test is made out of Stainless Steel with a white powder coated paint finish to reduce solar heat contributions. The approximate size is 24"(.61)W X 36"(.91)H X 34"(.86)D. The cooling units used were two EIC brand model #s AAC-145-4XT-E. Each with a rated cooling capacity of 1500 Btu. Each conditioner has it's own thermostat. A 300 Watt light bulb along with a resistive load on a DC power supply were used to introduce heat into the enclosure. Testing was done in our warehouse where ambient temperatures ranged between 87° - 93° F. Internal heat was generated at levels between 300 - 370 Watts/hr which corresponds to 1024-1262 Btus. In the plots I adjusted the power levels up by 50 Watts to accommodate for the radiated energy escaping through the transmit antenna. Internal enclosure measurements were made a 30 minutes minimum after heat source changes to allow the internal temperature to stabilize. Repeat measurements were done and the results averaged.

Cooling Effectiveness of Peltier Air-conditioner on a SeaSonde Radar



To use the the curves determine the SeaSonde Wattage, 350 for a baseline SeaSonde. Next pick the ambient temperature you expect the SeaSonde to be exposed to and if you will be operating with one or both AC units. Where the vertical Watts line and the horizontal **Δ°** intersect determine what temperature you add to the ambient.

Example for 2 A/C units:

Expected ambient - 95° F

Load - SeaSonde with peripheral electronics - 370 Watts

At the point a 370 Watt vertical line intersects the green curve go left to get the **Δ** value. Add this value to get the internal temperature of 79° F at 95° ambient.