

HOW WE TESTED

A Chilling Task: Measuring Efficiency

For this test, *Practical Sailor* constructed an 8-cubic-foot box in which each of the three units were tested. The efficiency, or lack there of, of the box, was meant to replicate an average, not-very-well-insulated ice box found aboard many production boats, new or old. These confines are often designed to maximize space at the expense of insulation efficiency. It would have been easy to construct a much more efficient box, but the data would have been less realistic.

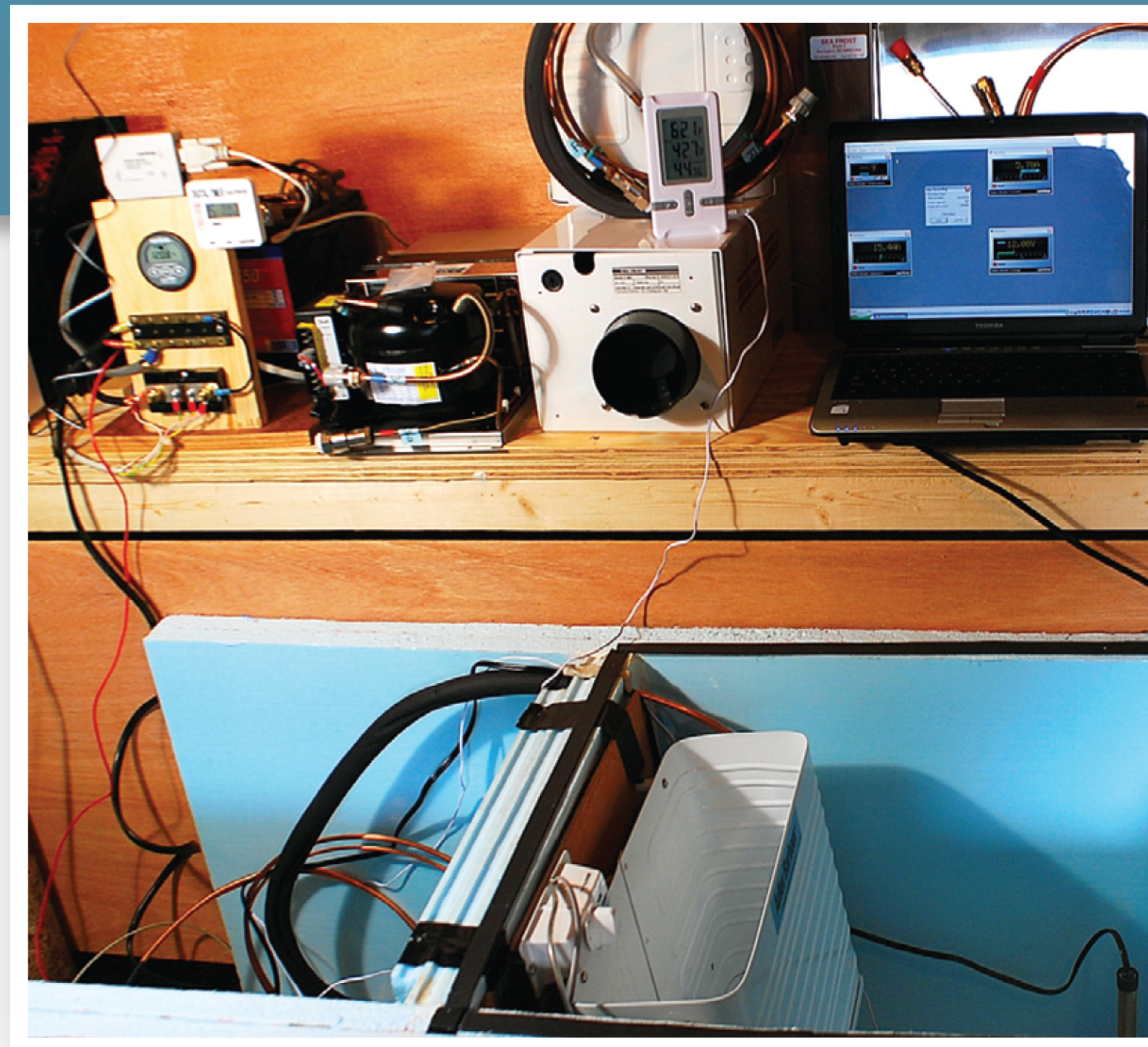
We also controlled the power available to each system, mimicking a 200 amp-hour 12-volt DC battery bank that was fully charged prior to each test cycle. Volts, amps, and amp-hours were continually tracked through the use of a Link Pro battery monitor supplied by Xantrex. Using data sensors, a laptop, and data-logging software, we tracked the ambient temperature of the shop, and the temperature at the center of the box and in the machinery compartment where the compressor was housed. Run times were tracked, and physical conditions such as plate icing and the cut out/cut in times were monitored.

Ambient conditions at the compressor/condenser were controlled using a portable heater, and another small heater inside the box controlled temperature as well. Multiple sen-

sors inside the box allowed for an average mid-box reading.

The ability to control and track the impact of heat inside the box and at the compressor kept the playing field even and allowed testers a chance to closely compare performance in the three.

The first performance test measured the amount of time and amp-hours required to cool a 60-degree box down to 40 degrees. The second test measured the amount of energy required to maintain the box at 40 degrees for 12 hours, with ambient temperatures at 60 degrees. Cooling capacity was tested by cooling a 90-degree gallon jug of water down to 42 degrees, tracking both time and energy consumed in amp-hours.



Temperature sensors fed into data-logging software on a laptop to chart cooling efficiency.

