



Success Story

PROPULSION DIRECTORATE DEVELOPS MORE EFFICIENT ECU FOR DEPLOYABLE TENTS



A new Environmental Control Unit (ECU), a field-deployable tent cooler that heats or cools military tents in the most extreme temperatures, promises a 28% boost in performance while reducing weight and volume by 56%. The ECU improves reliability and maintainability in a deployed environment, reduces generator requirements, saves fuel and will cut the total power consumption at deployed airbases.



Air Force Research Laboratory
Wright-Patterson AFB OH

Accomplishment

A Cooperative Research and Development Agreement between the Propulsion Directorate and Mainstream Engineering Corp. resulted in the building and testing of a more lightweight and efficient ECU for deployable tents. The directorate and Mainstream Engineering Corporation developed the new ECU to provide comfort for US troops and to keep vital operational equipment running smoothly under the most extreme conditions. During Operation IRAQI FREEDOM the US troops used less efficient and bulkier tent coolers for relief from the 125°F heat of the Iraqi desert, and to protect military equipment stored in tents from harsh weather conditions that could degrade performance.

The current design features improved maintainability, performance, and cost, while the training required to maintain and operate the unit was simplified. The unit also uses standard commercial parts, and there are no exotic components or materials.

The Department of Defense deems the new tent cooler environmentally friendly with no ozone-depletion potential since the unit uses Puron (R-410A) refrigerant. The existing “-39” version ECU operates at a low power factor, is bulky, and uses an ozone-depleting refrigerant (R-22).

Background

The directorate recently tested the new unit at Fort Drum, New York during Patriot Exercise 2003. The directorate designed the second-generation prototype to operate in Nuclear, Biological, or Chemical (NBC) mode or non-NBC mode.

The ECU can act as either a heater or an air conditioner and can be operated with a remote control. Compared to previous models that took up to 10% of the airbase deployment weight, the current ECU would reduce that by more than half.

Additional information

To receive more information about this or other activities in the Air Force Research Laboratory, contact TECH CONNECT, AFRL/XPTC, (800) 203-6451 and you will be directed to the appropriate laboratory expert. (03-PR-26)

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