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Green chillies: a practical thermoacoustic refrigerator in day-to-day use since February 2007

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CFIC, Inc. recently designed and built a thermoacoustic food refrigerator for the U.S. Army's Combat Feeding program (based at the Natick Soldier Center in Natick, MA). The Army wants a more combat-hardy alternative to standard vapor-compression devices, which have many leak-prone braze joints. However, the thermoacoustic "Army Fridge" has generated increasing commercial and public interest as the search for environmentally benign alternatives to conventional refrigeration has intensified. The Army fridge uses helium as its working fluid, and it has no pumps or cirulating fluids, only heat pipes and fans for heat exchange with the air. Unlike all other thermoacoustic prototypes known to us, this device is expressly designed like a product, with all the thermoacoustic hardware and controls confined to a relatively small enclosure on top of a large (17 cubic foot) cabinet, and operation accomplished by a single power switch and a thermostat. In early 2007 the Army fridge went into long-term testing at CFIC, Inc. as our auxiliary refrigerator. By March 2007 it will have surpassed 1 year (8760 hours) of continuous running. We will present details of construction, performance history, and recommendations for higher efficiency and lower cost.