

NASA SBIR/STTR Technologies

A2.01-9150 - A Turbo-Brayton Cryocooler for Aircraft Superconducting Systems



PI: Anthony Dietz
Creare, Inc. - Hanover, NH

Identification and Significance of Innovation

Identification and Significance of Innovation:

Creare's Cryoflight cryocooler is an enabling technology for hybrid turboelectric aircraft

- * Decoupling power production from propulsion allows radical new designs
- * Large reductions in emissions, fuel burn, and noise possible with this approach
- * Weight targets only achievable with superconducting generators and motors cooled by compact, lightweight cryocoolers

Advantages of the Cryoflight Cryocooler:

- * High-performance turbo-Brayton cryocooler
- * Efficiency exceeds others available
- * Weight is five times lighter than others

Proposed Cryoflight Recuperator:

- * Lightweight, compact, high performance

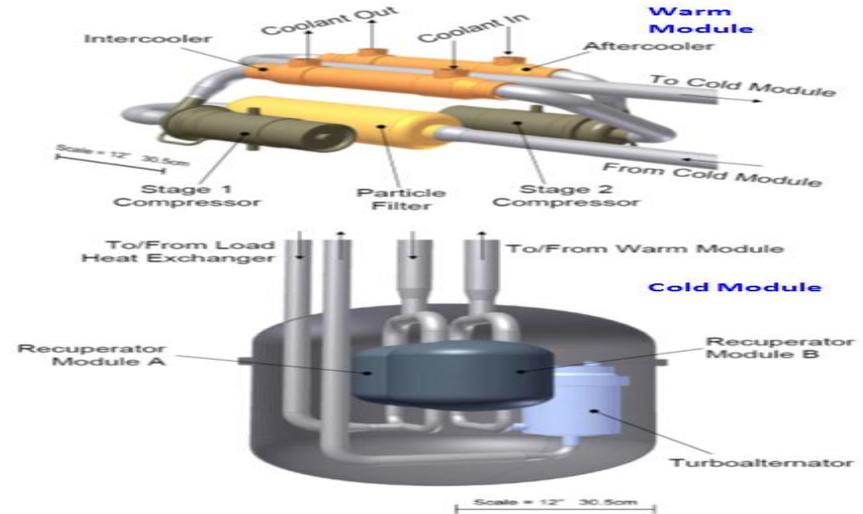
Estimated TRL at beginning and end of contract: (Begin: 3 End: 4)

Technical Objectives and Work Plan

Technical Objectives: Develop and demonstrate a compact, lightweight recuperator optimized for a turbo-Brayton cryocooler for hybrid turboelectric aircraft.

Work Plan:

- Phase I: Demonstrate feasibility of recuperator concept through risk reduction tests
- Phase II: Design fabricate and test a prototype recuperator
- Phase III: Integrate with cryocooler
- Build and test engineering model cryocooler
- Transition to production



NASA Applications

Cooler for superconducting aircraft technology demonstrators.
Cooling for cryogen liquefaction and storage for space missions and at spaceports on earth.

Non-NASA Applications

Cooler for production superconducting aircraft.
Cooling for superconducting machines in power generation (wind turbines).
Cooling for superconducting power transmission systems (data centers).

Firm Contacts

Anthony Dietz
Creare, Inc.
P.O. Box 71
Hanover, NH, 03755-3116
PHONE: (603) 643-3800
FAX: (603) 643-4657

NON-PROPRIETARY DATA