Department of the Navy SBIR/STTR Transition Program

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NAVWAR HQCA-2023-A-163

Topic # N172-137
Advanced Cooling Technologies for Multifunctional Information Distribution System (MIDS) Terminals
Advanced Cooling Technologies, Inc.

WHO

SYSCOM: NAVWAR

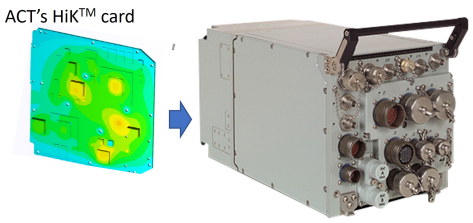
Sponsoring Program: PMA/PMW-101 (MIDS)

Transition Target: MIDS-JTRS

TPOC: (619) 524-1462

Other Transition Opportunities: General electronics thermal management for avionics and embedded computing

Notes:



WHAT

Operational Need and Improvement: Rapidly increasing capabilities of the Multifunctional Information Distribution System (MIDS) Joint Tactical Radio System (JTRS) leads to increasing amounts of waste heat that must be dissipated from the terminal. Improved thermal management is needed to maintain components within their prescribed operating temperatures.

Specifications Required: Substantial reduction in thermal resistance for heat dissipation from the MIDS terminal, without adverse impact on terminal performance.

Technology Developed: Embedded heat pipe (HiK™) and pulsating heat pipe (PHP) electronics conduction cards were developed. One HiK™ card was qualified and adopted by the MIDS primes. Additionally, the overall thermal resistance reduction from using ACT's Ice-Lok™ card retainers was further demonstrated.

Warfighter Value: Improved heat dissipation from the MIDS terminal due to reduced thermal resistance of the conduction cards and Ice-Lok™ card-locks reduces component temperatures, enabling higher reliability and longer mean time between failure (MTBF), as well as enabling higher power capabilities.

WHEN

Contract Number: N68335-19-C-0513 **Ending on:** Mar 08, 2021

Milestone	Risk Level	Measure of Success	Ending TRL	Date
MIDS thermal tech trade study	Low	Down-selected technologies for further development	3	3rd QTR FY18
Component design and analysis	Low	Solution sufficiently reduces component temperature	4	2nd QTR FY19
Detailed card design and prototype demonstration	Medium	PDR, CDR, and MRR with prime vendor	6	1st QTR FY21
Hardware qualification	Medium	Flight qualified by prime vendor	8	2nd QTR FY21
First hardware delivery	High	Successful delivery	9	2nd QTR FY22
Development of additional MIDS thermal management components	Low	Design and analysis of additional improvements	4	4th QTR FY23

HOW

Projected Business Model: ACT's business model is to manufacture its thermal management technologies, and market them to the defense primes. For improved thermal management of the MIDS terminal, ACT intends to market and sell to the MIDS manufacturers (ViaSat and Data Link Solutions).

Company Objectives: To commercialize ACT's HiK™, PHP, and Ice-Lok™ passive thermal management technologies, both in the MIDS-JTRS, as well as in other critical, high performance communications or computing applications. The technologies are applicable to both terrestrial and space thermal management applications.

Potential Commercial Applications: There are numerous high-power embedded and edge computing applications in which 3U or 6U electronics boards integrated with HiK™ or PHP heat spreaders can significantly improve the thermal performance and reliability of the electronics. The technologies are applicable to both terrestrial and space thermal management applications.

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