

# Department of the Navy SBIR/STTR Transition Program

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MCSC-PRR-2430

Topic # N151-001

Improved Softwall Shelter Heating System

Altex Technologies Corporation

## WHO

**SYSCOM:** MARCOR

**Sponsoring Program:** MCSC PM Supply & Maintenance Systems (SMS)

**Transition Target:** MCSC PM Supply & Maintenance Systems (SMS), PM Combat Support Systems (CSS), PdM Combat Support Equipment (CSE),

**TPOC:**

[sbir.admin@usmc.mil](mailto:sbir.admin@usmc.mil)

**Other transition opportunities:** Army with cooperation of JOCOTAS (Joint Committee on Tactical Shelters), Army Armament Research, Development and Engineering Center (ARDEC) and Natick Soldier Systems Center (NSSC).

**Notes:** Altex Technologies Corporation (Altex) will transition the technology through its manufacturing partner, HDT Global, the current manufacturer of the SHC60 that the new heater will replace. The new heater is multi-fuel capable (DF1, DF2, DFA, JP5, and JP8) with the capability of augmenting the logistic fuels with field available organic plant based fuel sources and military waste, resulting in a 50% fuel savings and a less than one year payback value. The new heater improves the warfighter's comfort, fuel flexibility, logistic burden, combat effectiveness and mobility. The current SBIR contract provides support for simulated field testing consistent with MIL-STD-810. The team is seeking support to produce five units for field testing along with a procurement commitment contingent on successful field testing.

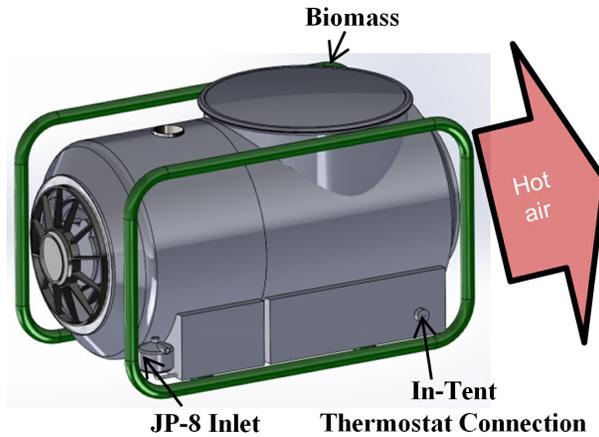


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## WHAT

**Operational Need and Improvement:** Reduction of heater's fossil fuel consumption by using field available materials such as wood, wood pellets, and other readily available plant based organics, and base wastes. Thermostatic control to enable automatic adjustment and heater turn down for shelter occupant's comfort.

**Specifications Required:** Specs include: Heat shelters up to 600 sq ft; Multi-fuel capability (DF1, DF2, DFA, JP5, and JP8); Augment logistic fuels with field available biomass and military waste (mixed wastes; MRE's), 50% fossil fuel savings; Thermostat control, Good turn-down of 45,000 to 10,000 Btu/hr; Capable of 75 degree F temperature increase of 450 CFM air; Smaller and lighter than current SHC60; Clean exhaust with Bacharach smoke scale <4, and pass MIL-STD 810F/G applicable tests.

**Technology Developed:** Altex, a leading combustion and gasifier company, has teamed up with HDT Global, a manufacturer of a vast array of military equipment including shelters and heaters, and has developed a multi-fuel self-powered heater for shelters and other markets. The heater has been proven to save 50% JP-8 by operating on wood pellets, wood chunks, tree branches and other readily available plant based organics, and base wastes. The heater uses the current HDT Global SHC heater as a platform, and it is light and compact. An Alpha unit has been fabricated and is being tested under a Phase II Base project, leading to a Beta system for simulated field testing by HDT Global under a Phase II Option. The team is seeking support to produce five units for field testing, along with a procurement commitment contingent on successful field testing.

**Warfighter Value:** Clean Multi-Fuel Soft Wall Shelter Heater System (CMF-HEAT) uses the current SCH60 self-powered heater as a platform and improves it for warfighter comfort, fuel flexibility, reduced logistic and enhanced combat effectiveness and mobility. CMF-HEAT will have thermostat control with 4.5 to 1 turn-down, thus overcoming the current SCH 60 turn-down limitation. CMF-HEAT will be lighter and more compact than SCH60 and yet it augments the liquid fuels with field available wood, branches, and other readily available plant based organics and warfighter wastes to save 50% fuel and reduce the fuel logistics burden and cost. The heater can be set up with no more than two personnel in less than 20 minutes. It is self-powered and operates quietly and cleanly. The system is storable and operable in temperatures down to -40 °F to allow use in an arctic environment.

## WHEN

**Contract Number:** M67854-17-C-6502 **Ending on:** December 18, 2018

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Phase I	Med	Gasifier developed and proved 50% fuel savings	TRL4	1st QTR FY16
Phase I Option	Med	Improved self-powered range for wider turndown and shelter occupant's comfort	TRL4	1st QTR FY17
Phase II Base, Alpha unit	Med	Meet specs	TRL 5	1st QTR FY19
Phase II Option, Beta Unit	Med	Successful simulated field testing	TRL 6	4th QTR FY19
TRL upgrade and five units fabrication and field testing	Med	Successful field testing and warfighter's acceptance	TRL7	3rd QTR FY21
Manufacturing and transition	High	Transition	TRL9	4th QTR FY22

## HOW

**Projected Business Model:** Altex Technologies Corporation has teamed up with HDT Global, a manufacturer of a vast array of military equipment including shelter and heaters, to develop this multi-fuel self-powered heater for shelters and other markets. The Clean Multi-Fuel Soft Wall Shelter Heater System (CMF-HEAT) operates on JP-8/Diesel and readily available biomass and wastes and saves 50% fuel, paying for itself in less than one year. The heater uses the current HDT Global SHC heater as a platform and it is light and compact. A teaming agreement is in place between Altex and HDT Global for developing and manufacturing the heater. After development, the CMF-HEAT will become an HDT Global product line that will be manufactured, delivered, supported and maintained by HDT Global.

**Company Objectives:** Altex was founded in 1985, to pursue the development of novel fuels processing, combustion, thermal management and power systems technologies, including fuel cells, gas turbines, biomass conversion, burners and heat exchanger components and systems. During the mid 90s, the company focused on the transition of fundamental knowledge to benefit power, energy and environmental products. This transition of knowledge to innovative products has been applied to all our development activities. For example, Altex developed, manufactured and qualified a high performance thermal management system for military vehicles that is now in production. Altex has fabricated an Alpha CMF-HEAT unit that is currently in testing; leading to a Beta system for simulated field testing that will be led by HDT Global. The team is seeking support to produce five units for field testing along with a procurement commitment contingent on successful field testing.

**Potential Commercial Applications:** The potential for commercial application and dual use is high because the heater will pay for itself in less than one year. The CMF-HEAT softwall shelter heater can be used in commercial and civilian shelters where liquid fuels are not available or in short supply. Additionally, it can be used in soft walled shelters employed by emergency management, disaster aid and humanitarian aid agencies as well as by municipal public safety organizations.

**Contact:** Mehdi Namazian, Vice President  
[mehdi@altextech.com](mailto:mehdi@altextech.com) 408-328-8303