

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. Contract ID Code
Cost Plus Fixed Fee

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2. Amendment/Modification No. 03	3. Effective Date 2013SEP24	4. Requisition/Purchase Req No. SEE SCHEDULE	5. Project No. (If applicable)
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6. Issued By U.S. ARMY CONTRACTING COMMAND ANDREW POMORSKI WARREN, MICHIGAN 48397-5000 HTTP://CONTRACTING.TACOM.ARMY.MIL EMAIL: ANDREW.G.POMORSKI@US.ARMY.MIL	Code W56HZV	7. Administered By (If other than Item 6) DCMA DETROIT 35803 MOUND ROAD STERLING HEIGHTS MI 48310	Code S2305A
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8. Name And Address Of Contractor (No., Street, City, County, State and Zip Code) WALTONEN ENGINEERING INC. WALTONEN ENGINEERING 31330 MOUND RD WARREN, MI 48092-1654	<input type="checkbox"/>	9A. Amendment Of Solicitation No.
	<input type="checkbox"/>	9B. Dated (See Item 11)
	<input checked="" type="checkbox"/>	10A. Modification Of Contract/Order No. W56HZV-09-D-0156/0006
	<input type="checkbox"/>	10B. Dated (See Item 13) 2012SEP24
Code 1WLX1	Facility Code	

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

The above numbered solicitation is amended as set forth in item 14. The hour and date specified for receipt of Offers

is extended, is not extended.

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended by one of the following methods: (a) By completing items 8 and 15, and returning _____ copies of the amendments; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. **FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER.** If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. Accounting And Appropriation Data (If required)

NO CHANGE TO OBLIGATION DATA

**13. THIS ITEM ONLY APPLIES TO MODIFICATIONS OF CONTRACTS/ORDERS
It Modifies The Contract/Order No. As Described In Item 14.**

<input type="checkbox"/>	A. This Change Order is Issued Pursuant To: The Contract/Order No. In Item 10A.	The Changes Set Forth In Item 14 Are Made In
<input checked="" type="checkbox"/>	B. The Above Numbered Contract/Order Is Modified To Reflect The Administrative Changes (such as changes in paying office, appropriation data, etc.) Set Forth In Item 14, Pursuant To The Authority of FAR 43.103(b).	
<input type="checkbox"/>	C. This Supplemental Agreement Is Entered Into Pursuant To Authority Of:	
<input type="checkbox"/>	D. Other (Specify type of modification and authority)	

E. IMPORTANT: Contractor is not, is required to sign this document and return _____ copies to the Issuing Office.

14. Description Of Amendment/Modification (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)

SEE SECOND PAGE FOR DESCRIPTION

Except as provided herein, all terms and conditions of the document referenced in item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. Name And Title Of Signer (Type or print)		16A. Name And Title Of Contracting Officer (Type or print) LYNN M. BYRNE LYNN.M.BYRNE@US.ARMY.MIL (586)282-6553	
15B. Contractor/Offendor (Signature of person authorized to sign)	15C. Date Signed	16B. United States Of America By _____ /SIGNED/ (Signature of Contracting Officer)	16C. Date Signed 2013OCT02

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Name of Offeror or Contractor: WALTONEN ENGINEERING INC.

SECTION A - SUPPLEMENTAL INFORMATION

Buyer Name: ANDREW POMORSKI
Buyer Office Symbol/Telephone Number: CCTA-ASG-C/(586)282-4465
Type of Contract: Cost Plus Fixed Fee
Kind of Contract: Research and Development Contracts
Type of Business: Other Small Business Performing in U.S.
Surveillance Criticality Designator: C
Weapon System: No Identified Army Weapons Systems

*** End of Narrative A0000 ***

PURPOSE OF MODIFICATION: Extend Performance Period.

PREVIOUS CONTRACT VALUE: \$1,794,164.18
AMOUNT OF THIS ACTION: \$ 0.00
TOTAL CONTRACT VALUE: \$1,794,164.18

1. This is a bilateral modification.
2. The purpose of Modification 03 is to extend the period of performance from 24 September 2013 to 27 November 2013.
3. As a result of this Modification 03 the following changes are hereby made to the contract:
 - a) Section B - The performance completion date for SubCLIN 0001AA and 0001AB is revised from 24 September 2013 to 27 November 2013.
 - b) Section C - Paragraph C.2.1 Delivery of Final T-HATS-CA HW/SW Designs & Documentation, NTE 27 November 2013
 - c) Section F - Paragraph F.1.2 are revised to extend the period of performance two (2) months to 27 November 2013.
4. Except as provided herein, all other terms and conditions remain unchanged and in full force and effect.

*** END OF NARRATIVE A0004 ***

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Name of Offeror or Contractor: WALTONEN ENGINEERING INC.

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	SECTION B - SUPPLIES OR SERVICES AND PRICES/COSTS				
0001	ARCHITECTURE SOFTWARE				
0001AA	<p><u>HIT AVOIDANCE TECH- BASE EFFORT</u></p> <p>GENERIC NAME DESCRIPTION: ARCHITECTURE SOFTWARE CLIN CONTRACT TYPE: Cost Plus Fixed Fee PRON: R322C060R3 PRON AMD: 04 ACRN: AA AMS CD: 63300522100 PSC: AC41</p> <p><u>Inspection and Acceptance</u> INSPECTION: Destination ACCEPTANCE: Destination</p> <p><u>Deliveries or Performance</u> DLVR SCH PERF COMPL <u>REL CD QUANTITY DATE</u> 001 1 27-NOV-2013</p> <p style="text-align: right;">\$ 1,782,653.18</p>	1	LO		\$ 1,782,653.18
0001AB	<p><u>TRAVEL HIT AVOIDANCE TECH - BASE</u></p> <p>GENERIC NAME DESCRIPTION: ARCHITECTURE SOFTWARE CLIN CONTRACT TYPE: Cost Plus Fixed Fee PRON: R322C060R3 PRON AMD: 04 ACRN: AA AMS CD: 63300522100 PSC: AC41</p> <p><u>Inspection and Acceptance</u> INSPECTION: Destination ACCEPTANCE: Destination</p> <p><u>Deliveries or Performance</u> DLVR SCH PERF COMPL <u>REL CD QUANTITY DATE</u> 001 1 27-NOV-2013</p> <p style="text-align: right;">\$ 11,511.00</p>	1	LO		\$ 11,511.00

Name of Offeror or Contractor: WALTONEN ENGINEERING INC.

SECTION C - DESCRIPTION/SPECIFICATIONS/WORK STATEMENT

TARDEC HATS Common Architecture (CA) - SOWC.1 OBJECTIVE:

The U.S. Army TARDEC Ground Systems Survivability (GSS) desires to establish a common architecture framework to electronically and physically link all hit avoidance systems (i.e. passive and active sensors, hit avoidance signal processors, soft-kill electronic warfare (EW) counter-measures (CMs) and hard-kill or physical disrupt active protection (AP) CMs) with each other and to other host vehicle systems. This will permit future integration, hardware-in-the-loop testing, simulation lab evaluations, upgrading and tailoring the latest in Hit Avoidance Technology Systems (HATS) and components for different Army combat and tactical vehicles.

The contractor shall:

- 1.) Research, survey and gather available standards and networking protocols, including designs in use on advanced technology demo vehicles devised by HATS developers, to use and develop as the new TARDEC HATS-CA design. The contractor shall conform with Army fuse board vehicle integration requirements and recommendations. See Section J Attachments 0004 and 0006.
- 2.) Obtain and determine the maximum requirements for: HATS component communications and power needs, data output needs for host vehicle and man machine interfaces through the Army VICTORY (Vehicular Integration for C4ISR/EW Interoperability) system hardware. The VICTORY architecture provides a framework for integrating Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) and Electronic Warfare (EW) systems on military ground vehicles systems. See Section J Attachment 0009, VICTORY Architecture and Attachment 0010 VICTORY Standard Specifications.
- 3.) Devise and develop HATS common architecture designs, standards and Mil Specs for TARDEC to use as the basic interfacing standard and protocol for all future ARMY vehicle HATS component systems and for components developers in industry and the Government to use in devising HATS component upgrades. Consider adapting and modifying VICTORY designs.
- 4.) Deliver, in the BASE effort, the TARDEC HATS Common Architecture (T-HATS-CA) designs, standards, Interface Control Document (ICD), and Mil Specs for integrating all future HATS onto ARMY vehicles.

When one of the three options is awarded, the overall task order is extended for the additional length of that Option or the longest lasting activated option.

C.2 BASE effort Tasks:

C.2.1 Performance Schedule: The contractor shall devise/develop the T-HATS-CA design requirements according to the following schedule of major events and deliverables. Days after contract award (DAC) listed below are provided as the number of calendar days not to be exceeded (NTE) before the event or delivery is to occur. The actual updated dates will be event-based and will be dependent on the contractors Integrated Master Schedule (IMS).

Start of Work (SOW) Meeting, NTE 14 DAC
System Functional Review (SFR), NTE 150 DAC
Interim Progress Review (IPR) #1, NTE 230 DAC
System Preliminary Design Review (PDR), NTE 280 DAC
Draft Technical Manual and ICD, at PDR
Delivery of Initial T-HATS-CA HW/SW Designs to TARDEC HA SIL, at PDR
Interim Progress Review (IPR) #2, NTE 330 DAC
Critical Design Review (CDR), NTE 360 DAC
***Delivery of Final T-HATS-CA HW/SW Designs & Documentation, NTE 27 November 2013

**Revised per modification 02 for Task Order 0006

*** Revised per modificaiton 03 for Task Order 0006

C.2.2 BASE effort Development Requirements:

C.2.2.1 The contractor shall review and research available industry and military systems and major component systems communications standards, networking protocols and military specs applicable to adapt for use as the standard for all future U. S. Army HATS and major sensor and countermeasure subsystems. This includes COTS/GOTS (commercially-off-the-shelf/government-off-the shelf) systems. The contractor shall review and accommodate Army fuse board requirements, recommendations, and guidelines (See Section J Attachments 0004 and 0006). The contractor shall review the Army VICTORY Architecture and Standard Specifications (See Section J Attachments 0009 and 0010).

C.2.2.2 The contractor shall determine the maximum number and types of communication(s) and power lines that are required between major HATS component systems by surveying HAT system/component developers (including; Sensor or Detection systems, the number of data lines, data rates, data/signal processor systems and counter-measure (CM) systems). The contractor shall also determine the communications requirements needed to exchange information with other vehicle systems on the host HATS protected vehicle (such as the man machine interface systems), via the Army VICTORY open architecture hardware system.

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C.2.2.3 The contractor shall devise and develop a common architecture design for TARDEC to use as the basic interfacing data bus structure, input/output standards and protocols, interface software and hardware, for all future vehicle HATS systems and for HATS components developers, in industry and the Government to use when devising upgrades. The contractor shall consider use of the Army VICTORY design (See Section J Attachments 0009 and 0010) with needed adjustments, as the framework for the T-HATS-CA system design.

C.2.2.3.1 The contractor shall develop the T-HATS-CA system design and all its interfacing protocol requirements to meet the operating requirements listed below:

C.2.2.3.1.1- The T-HATS-CA system design shall be an Open Architecture system (a type of software/computer architecture that allows adding, upgrading and swapping components) as described in Section J Attachment 0008.

C.2.2.3.1.2- The T-HATS-CA system design shall accept and handle new or upgraded HATS sensor, countermeasure and processing components.

C.2.2.3.1.3- The T-HATS-CA system design shall handle the information and data rate requirements for sensing, processing and reacting with HATS counter-measures to as many combat vehicle threat projectile classes of munitions as possible (RPGs, Recoilless Rifle munitions, ATGMs and tank-fired CE and KE rounds)

C.2.2.3.1.4- The T-HATS-CA system design shall output HATS status information to the host vehicles ARMY VICTORY system (See Section J Attachment 0009 and 0010), including vehicle user interface displays

C.2.2.3.1.5- The T-HATS-CA system design shall interface with TARDECs developing Hit Avoidance - Simulation Integration Lab (TARDEC HA-SIL)

C.2.2.3.1.6- The T-HATS-CA system design shall conform to and adopt all Army fuse board requirements and recommendations, See Section J Attachments 0004 and 0010.

C.2.2.3.1.7- The T-HATS-CA system design hardware and software shall operate HATS components, meeting Attachment 0003 requirements as found in Section J, while mounted on Army vehicles.

C.2.2.3.2 The contractor shall internally conduct reviews, adapt and/or modify any existing available Common Architecture system designs and protocols, testing and analysis determined necessary, via Government and contractor phone discussions, to devise the T-HATS-CA system design. This design shall include: all HATS data and power cables and connectors, bus structure, interface protocols, processor, software and ICD requirements. The Government shall have the right to attend any or all Contractor internal efforts throughout the period of performance. The contractor shall hold one (1) Start of Work/System Functional Review (SOW/SFR), one (1) Preliminary Design Review (PDR) and two (2) Interim Progress Reviews (IPR) showing development progress throughout the period of performance. All reviews shall be event-based dependent on the system modification and development events as defined in the contractors Integrated Master Schedule (IMS) In Accordance With (IAW) Contract Data Requirement List (CDRL) A002. The reviews shall be focused on the component-level, as defined in the contractors Work Breakdown Structure IAW CDRL A002, as well as component integration to meet system level requirements, as detailed in Section J Attachment 0003, as found in Section J. The contractor shall hold the Critical Design Review (CDR) to present to the Government the final designs and the data showing compliance to requirements, as detailed in Section J Attachment 0003. The Government will grant/award follow-up options based on the cumulative information and documentation provided by the contractor at the various reviews and CDR demonstrating the system meets the requirements.

C.2.2.4 The contractor shall fully document Base effort and deliver the Base effort version of the TARDEC HATS Common Architecture (T-HATS-CA) design with hardware and software mil spec interface requirements ICD for all future HATS developers to use, IAW CDRL A006. TARDEC will publish this T-HATS-CA ICD documentation as the standard for all HATS component hardware on U. S. Army vehicles.

C.2.2.5 Software Development: The contractor shall develop all software/firmware in accordance with project software development processes that are compliant with or at least equivalent to Level III of the Software Engineering Institute (SEI) Capability Maturity Model/Capability Maturity Model Integration-Development (CMM-Software /CMMI-DEV). The contractor shall show the proposed software development process is equal to or greater than CMM/CMMI level three and shall be validated by the Government or a mutually agreeable third party. All software that is safety critical (software that implements safety requirements, software that provides data or functions to software that implements safety requirements, or software that is not partitioned from software that implements safety requirements) shall be implemented in compliance with CMMI development process and standards.

C.2.2.6 The Government shall have those data rights to the system and components (hardware and software) per applicable laws and regulations. The contractor shall inform the Government of Restrictions, Pre-Award: As required by DFARS 252.227-7017, Post Award: As required by DFARS sub-sections (e) of -7013, -7014, -7018.

C.2.2.7 System Integration Lab (SIL) Hardware and Software design deliveries: Within 210 days of BASE award, the contractor shall deliver to TARDEC initial T-HATS-CA system designs for component level hardware, emulators, and software IAW CDRL A008. The hardware plan shall include emulators of sensor, signal processor and inert counter-measure components. The hardware plan shall use Light Emitting Diodes (LEDs) to provide a visible means of indicating sensor, processor and counter-measure status. The plan shall include the use of an on and off switch to control the ability for any real sensor(s) to emit. This design plan will be used for TARDEC's hardware-in-the-loop SIL evaluations to verify performance capabilities. This delivery shall also include the necessary documentation

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and tools to design, compile, modify, build, test, and load software for the system.

C.2.2.8 T-HATS-CA Developmental Technical Data Package (DTDP) The Contractor shall prepare a DTDP. The DTDP shall include a system Interface Control Document (ICD) IAW CDRL A006 defining the electrical signal types, interface circuitry for each type, and the mechanical interface requirements of the TARDEC HATS CA. At the BASE effort PDR meeting, the contractor shall deliver a T-HATS-CA DTDP with details of all hardware and software interfaces required for integrating a hit avoidance system or component system upgrade(s) on a tactical and combat vehicle(s). The ICD shall include drawings that define the physical hardware that mounting provisions have to be designed to interface with and drawings that define all the required hardware for integrating on an Army tactical and/or combat vehicle. The ICD shall include details required for data, power cabling, and integrating HATS components. The DTDP shall also include system and software documents including SDP, SSDD, SRS and STR as described in sections C.2.4.9, and C.2.4.11 thru C.2.4.13. The software source code shall be presented IAW DI-IPSC-81488. The documents shall specify the networking protocols interfacing each of the systems components and provide summaries and parameters for all data messages that can be passed between the major components. This should include data such as byte position, type (int, etc.), unit (sec, m, etc.), range, bits (message length) and description. The source code shall include documentation for compiling and running information sufficient for the Government to alter the software to permit installation and interfacing with different vehicle configurations. A draft DTDP and ICD shall be presented at the PDR. Updates shall be presented at IPR#1 and IPR#2. The final DTDP and ICD shall be presented at the CDR and submitted in accordance with CDRL A006 and CDRL A008.

C.2.2.9 Base Effort Final Report: The contractor shall fully document all BASE tasks, including all C.2.2 tasks efforts. The contractor shall deliver, at the Base CDR, a draft Base effort final report, per CDRL A005.

C.2.3 BASE effort Meetings:

C.2.3.1 SOW/SFR Meeting: The Contractor shall conduct and host a joint SOW/SFR meeting at its facility within fourteen (14) days of task order award. The date of the meeting and agenda shall be coordinated between the Field Technical Representative (FTR) and the Contractor via email. The Contractor shall present an overview of its entire contractual effort to include: a draft Work Breakdown Structure (WBS) and a draft Integrated Master Schedule (IMS), per CDRL\~A002. The contractor shall also present the following:

- a.) T-HATS-CA system design status against the requirements and work effort left to meet requirements (e.g. reviews, tests, analysis, modeling),
- b.) T-HATS-CA system concept of operation describing how the system will be operated and illustrate how the system will meet TARDECs needs in adapting/evaluating and updating HATS systems and/or component systems and for HATS component developers in industry or within GOV agencies. The concept of operation shall also define the T-HATS-CA system architecture and include a timeline analysis for the system identifying the minimum or maximum times required between each action of each component during system operation.
- c.) Identify initial T-HATS-CA system architecture hardware, software and ICD requirements.

The read-ahead presentation and meeting minutes shall be submitted IAW CDRL A001.

C.2.3.2 Preliminary Design Review (PDR): The contractor shall hold a PDR at its facility to review the status of the T-HATS-CA system hardware and software designs for meeting the requirements. The date of the meeting and agenda shall be coordinated between the FTR and the contractor via email. The PDR shall be held no later than 90 days after Task Order award and shall be scheduled as an event-based meeting dependent on the system modification and development events as defined in the contractors IMS. At the PDR, the contractor shall present the T-HATS-CA system design, the system design options and different pros and cons. The contractor shall present an updated IMS IAW CDRL A002, updated requirements listing and funding spent per task to date against the plan and spending for the remaining development tasks IAW CDRL A004. The contractor shall present the T-HATS-CA ICD, with details of all hardware software designs. The contractor shall present an updated concept of operations, system and component cost estimates. The read-ahead presentation and meeting minutes shall be submitted IAW CDRL A001.

C.2.3.3 Interim Progress Reviews (IPR): The contractor shall hold two (2) IPRs in between the PDR and Critical Design Review (CDR) to review the status of the T-HATS-CA system design effort to meet requirements. The IPRs shall be event-based per the contractors IMS, with no more than 90 days in between each IPR. The specific dates of the IPRs and agenda shall be coordinated between the FTR and the contractor via email. At each IPR, the contractor shall present, in contractor format, the latest status T-HATS-CA systems designs and hardware/software developments. The contractor shall submit updated IMS IAW CDRL A002, updated requirements, funding spent per task to date against plan and spending plan for remaining development tasks IAW CDRL A004. The contractor shall also present an updated concept of operations and any software architecture changes made from the prior review. The read-ahead presentation and meeting minutes shall be submitted IAW CDRL A001.

C.2.3.4 Critical Design Review (CDR): The contractor shall hold an event-based CDR dependent on the T-HATS-CA system development activities defined in the contractor IMS. At the CDR, the contractor shall present the final T-HATS-CA system design to the Government. The contractor shall present test and analysis data to show that the complete system meets the requirements in Section J Attachment 0003. The contractor shall present the final funds spent on each task IAW CDRL A004. The contractor shall present the final concept of operations, system and component cost estimates. The Government must approve the T-HATS-CA system to the contractor beginning work on any of the Options tasks. The Government will identify which if any of the Options shall be awarded. The read-ahead presentation and meeting minutes shall be submitted IAW CDRL A001.

C.2.3.5 Army Fuse Safety Review Board Preliminary Design Review: The contractor shall attend an Army Fuse Safety Review Board (AFSRB) Preliminary Design Review (PDR). This meeting is separate and distinct from the BASE Effort PDR. The date will be set by the AFSRB approximately 60 days prior to the AFSRB PDR; the contractor shall be notified via email of the date. The target date for the AFSRB PDR will be after the BASE CDR, but is dependent on the AFSRB quarterly review schedule. The contractor is responsible for preparing all presentation materials for the AFSRB PDR and for presenting the material at the AFSRB PDR. The presentation material and meeting

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minutes shall be delivered IAW CDRL A001.

C.2.4 Deliverables:

C.2.4.1 Meeting Read-ahead Presentations and Minutes: The contractor shall provide meeting agenda and read-ahead presentation material three (3) days before the SOW/SFR meeting, PDR, IPRs, and CDR IAW CDRL A001. The contractor shall record and provide meeting minutes for the SOW/SFR meeting and all reviews IAW CDRL A001.

C.2.4.2 RESERVED.

C.2.4.3 Work Breakdown Structure (WBS): The contractor shall provide its contract WBS to indenture level 3 (at a minimum) at the SOW/SFR meeting in accordance with CDRL~A002. The FTR shall provide approval of the WBS electronically, within ten (10) working days.

C.2.4.4 Program Integrated Master Schedule (IMS): The contractor shall provide an IMS to indenture level 3 (at a minimum) at the SOW/SFR meeting. The FTR must provide approval for the IMS prior to the contractor base-lining the schedule. The contractor shall present the updated IMS at each PDR, IPR, and CDR and deliver the updated IMS to the FTR every second Friday after the SOW/SFR meeting through the period of performance. The contractor shall submit the IMS in accordance with CDRL A002.

C.2.4.5 Weekly Situation Reports: The Contractor shall provide weekly situation reports (SITREPs) on the technical and programmatic status of the contract to the FTR. The SITREP shall be submitted IAW CDRL A003.

C.2.4.6 Cost Performance Reports: The contractor shall present and deliver an Earned Value Management Performance Measurement Baseline (PMB) at the SOW/SFR meeting. The FTR shall approve the PMB. After PMB approval by the FTR, the contractor shall provide monthly cost performance reports the last Friday of every month, IAW CDRL~A004.

C.2.4.7 Final Report: The contractor shall provide a Final Report, IAW CDRL A005. The report shall describe the T-HATS-CA system and individual component/parts designs, any associated tests or analysis to demonstrate that the system and individual components meet the requirements. The report shall also fully document all tasks efforts performed by the contractor from initial award.

C.2.4.8 Technical Manual: The contractor shall provide a draft technical manual for T-HATS-CA system operation, handling and storage of the components, communication protocols, description of powered system modes, and system setup instructions. The technical manual shall also include component maintenance requirements and intervals, maintenance procedures, and maintenance tools list. High level tasks in the technical manual shall be described and presented at the PDR, IPRs, and CDR, and an updated technical manual shall be IAW CDRL A007.

C.2.4.9 System Development Plan (SDP). The contractor shall present a draft T-HATS-CA SDP at the SOW/SFR meeting and final SDP at BASE effort PDR. The SDP shall include a hardware development plan IAW CDRL A008 and a software development plan. The plans shall include an overview of all development tasks, the planned development methods that shall be used, a description of tests that shall be implemented, and a configuration management plan. For the software plan, bi-directional traceability shall be provided for the flow from system requirements through software work products, as applicable to each phase of the development activity. The SDP shall be written IAW per CDRL A008.

C.2.4.10 RESERVED

C.2.4.11 System/Subsystem Design Description (SSDD): The contractor shall develop and submit a SSDD IAW CDRL A008. The SSDD shall describe the system and/or subsystem-wide design and the architectural design of a system or subsystem. The SSDD shall trace to the SRS (section C.2.4.12 below) with flags for the implementation of any safety critical software, meeting Army fuse board requirements. The SSDD shall also describe software design decisions, the architectural design and detailed design (defined as the lowest software components that make up the Computer Software Configuration Items (CSCI) needed to implement the software). Interfaces shall be identified and defined, including operating system, hardware, software and graphical-user interfaces and networking protocols. The SSDD may be supplemented by an Interface Design Description (IDDs) IAW DI-IPSC-81436 and a Software Design Description (SDD) IAW DI-IPSC-81435A if necessary, by the government in IPRs.

C.2.4.12 Software Requirements Specification (SRS): The contractor shall develop and submit an SRS, IAW CDRL A008. The SRS shall specify the requirements the software performs and the methods to be used to ensure that each requirement has been met, IAW DI-IPSC-81433A. Each safety related requirement shall be individually flagged. The SRS shall distinguish all software safety requirements from the other software requirements. An SRS is required for each CSCI to be integrated into the platform and each platform CSCI modified for the integration. The design requirements shall be directly traceable to higher-level system performance requirements.

C.2.4.13 Software Test Plan (STP) and Software Test Report (STR): The contractor shall develop and submit a STP and STR, IAW CDRL A008, for every system or major component level software test or demonstrations performed at contractor facilities. The STP shall describe plans for testing of the software, IAW DI-IPSC-81438A. It shall also describe the software test environment to be used for the testing, identify the test to be performed, and provide schedules for test activities. The STP shall address the method(s) that will be used to perform software testing, if required (TBD by the GOV FTR, at IPR), for the safety requirements identified in the SRS. An STP and STR are required for each CSCI to be integrated into the platform, and each platform CSCI that was modified for the integration. The STR shall include the test preparations, test cases, and test procedures to be used to perform testing of the software IAW DI-IPSC-81440A. The STR shall be a record of the software tests performed. The STR shall include the result of each test, the procedures used for the test, and the personnel that witnessed the test. The STP and STR may be supplemented by a Software Test Description (STD) IAW DI-IPSC-

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81439A if necessary, (TBD by Govt FTR at IPR).

C.2.5 Contractor Manpower Reporting (CMR): CMR shall be completed for the BASE (Sec C.2) effort and for all Option (Sec C.3 to Sec C.5) efforts that the Government exercises.

C.2.5.1 The Office of the Assistant Secretary of the Army (Manpower & Reserve Affairs) operates and maintains a secure Army data collection site where the contractor will report ALL contractor manpower (including subcontractor manpower) required for performance of this contract. The contractor is required to completely fill in all the information in the format using the following web address: [://contractormanpower.army.pentagon.mil](http://contractormanpower.army.pentagon.mil). The required information includes:

C.2.5.1.1 Contracting Office, Contracting Officer, Contracting Officer's Technical Representative;

C.2.5.1.2 Contract number, including task and delivery order number;

C.2.5.1.3 Beginning and ending dates covered by reporting period;

C.2.5.1.4 Contractor name, address, phone number, e-mail address, identity of contractor employee entering data;

C.2.5.1.5 Estimated direct labor hours (including sub-contractors);

C.2.5.1.6 Estimated direct labor dollars paid this reporting period (including sub- contractors);

C.2.5.1.7 Total payments (including sub-contractors);

C.2.5.1.8 Predominant Federal Service Code (FSC) reflecting services provided by contractor (and separate predominant FSC for each sub-contractor if different);

C.2.5.1.9 Estimated data collection cost;

C.2.5.1.10 Organizational title associated with the Unit Identification Code (UIC) for the Army Requiring Activity (the Army Requiring Activity is responsible for providing the contractor with its UIC for the purposes of reporting this information);

C.2.5.1.11 Locations where contractor and sub-contractors perform the work (specified by zip code in the United States and nearest city, country, when in an overseas location, using standardized nomenclature provided on website);

C.2.5.1.12 Presence of deployment or contingency contract language; and

C.2.5.1.13 Number of contractor, and sub-contractor employees deployed in theater this reporting period (by country).

C.2.5.2 As part of its submission, the contractor will also provide the estimated total cost (if any) incurred to comply with this reporting requirement. Reporting period will be the period of performance not to exceed twelve (12) months ending 30 September of each government fiscal year and must be reported by 31 October of each calendar year. Contractors may use a direct XML data transfer to the database server or fill in the fields on the website. The XML direct transfer is a format for transferring files from a contractor's systems to the secure web site without the need for separate data entries for each required data element at the web site. The specific formats for the XML direct transfer may be downloaded from the web site.

C.3 Option 1 Tasks Efforts:

C.3.1 HATS-CA test-bed Hardware and Software: The contractor shall further develop the HATS-CA design and deliver to TARDEC one Technical Readiness Level (TRL) 4 (as defined in Section J Attachment 0005) HATS-CA system component hardware and software test bed, within nine (9) months after award of Option 1. This test-bed shall include needed processors, peripherals (i.e. sensor and counter-measure (CM) emulators) and common data bus and power lines, with multi Software (SW) drops. For video recording purposes, Emulators may simulate inert counter-measure activation, which are electronically equivalent to normal counter-measures, with LEDs. Emulators shall have a visible means of indicating sensor, processor, and counter-measure status. The ability for any real sensor(s) to emit shall be controlled with an on and off switch. The TRL 4 level HATS-CA test bed hardware and software shall be delivered IAW CDRL A009.

C.3.2 Test-Bed Test and Evaluation Support: After initial T-HATS-CA simulation hardware is delivered to TARDEC, the components will undergo TARDEC hit avoidance simulation integration lab (HA-SIL) testing and evaluation. The contractors TARDEC HA-SIL evaluation test support shall consist of one (1) engineer on site at TARDEC for up to two (2) one (1) week trips. The test-bed support shall include setup, inspection, and operation to ensure compliance to its designed capabilities. The support shall also include performing software or hardware updates when significant changes to either hardware or software (i.e. new software versions) are presented at the Option-1 Start of Work, PDR or following IPR meetings. The onsite engineer shall have experience performing the above technical support.

C.3.3 Operators and Tech Manual: The contractor shall devise, develop and deliver, along with the test-bed, T-HATS-CA Operators and

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Technical Manual, per CDRL A007, with hardware and software parts and source lists.

C.3.4 Updated BASE and Option 1 Documentation: The contractor shall provide updates to BASE deliverables and reports. The contractor shall fully document all BASE and Option 1 tasks efforts. The contractor shall deliver, at the Option 1 CDR, a draft contract final report, per CDRL A005.

C.3.5 Option 1 Meetings, Deliverables and Contractor Manpower Reporting (CMR): The contractor shall continue support of the scheduling and sequencing of SOW, PDR, IPR and CDR program review meetings, weekly inputs, deliverables and CMR reporting, initially established during the BASE effort. This Options SOW, PDR, IPRs and CDR shall follow the same pattern, every 3 months sequence, as established in the BASE effort. This Options reviews may be inserted or added into an already scheduled program review (every 3 months) for another option. The Government FTR, with inputs and recommendations from the contractors lead program manager, shall determine the exact dates for all Options program review meeting.

C.4 Option 2 Tasks Efforts:

C.4.1 TRL 5 Level HATS-CA test-bed: The contractor shall further develop the HATS-CA design and deliver to TARDEC one TRL 5 (as defined in Section J Attachment 0005) level HATS-CA system component test bed, within twelve (12) months of Option 2 award. This TRL 5 test-bed shall include upgraded processors, peripherals (i.e. sensor and counter-measure (CM) emulators), available (Government provided or contractor acquired) real sensors and real CMs components (with inert CM munitions) and common data bus and power lines. CM emulators may simulate inert counter-measure activation, with LEDs. Sensor emulators shall have a visible means of indicating sensor, processor, and counter-measure status. The ability for any real sensor(s) to emit shall be controlled with an on and off switch. The TRL 5 level HATS-CA test bed hardware and software shall be delivered IAW CDRL A009.

C.4.2 TRL 5 level Test-Bed Test and Evaluation Support: After TRL 5 T-HATS-CA hardware is delivered TARDEC will perform hit avoidance simulation integration lab (HA-SIL) tests and evaluations. The contractor shall support the TARDEC TRL 5 T-HATS-CA Test-Bed HA-SIL testing and evaluations with one (1) engineer on site at TARDEC for up to two (2) two (2) week trips. The test-bed support shall include setup, inspection, and operation to ensure compliance to its designed capabilities. The support shall also include performing software or hardware updates when significant changes to either hardware or software (i.e. new software versions) are presented at the Option-2 Start of Work, PDR or following IPR meetings. The onsite engineer shall have experience performing the above technical support.

C.4.3 Operators and Tech Manual: The contractor shall devise, develop and deliver, along with the test-bed, T-HATS-CA Operators and Technical Manual, IAW CDRL A007, with hardware and software parts and source lists.

C.4.4 Updated Documentation: The contractor shall provide updates to BASE and Option 1 deliverables, ICD and reports at Option 2 program reviews. The contractor shall fully document all BASE tasks, Option 1 and Option 2 tasks efforts. The contractor shall deliver, at the Option 2 CDR, a draft contract final report, per CDRL A005.

C.4.5 Option 2 Meetings, Deliverables and Contractor Manpower Reporting (CMR): The contractor shall continue support of the scheduling and sequencing of SOW, PDR, IPR and CDR program review meetings, weekly inputs, deliverables and CMR reporting, initially established during the BASE effort. This Options SOW, PDR, IPRs and CDR shall follow the same pattern, every 3 months sequence, as already established in the BASE effort. This Options reviews may be inserted or added into an already scheduled program review (every 3 months) for another option. The Government FTR, with inputs and recommendations from the contractors lead program manager, shall determine the exact dates for all Options program review meeting.

C.5 Option 3 Tasks Efforts:

C.5.1 T-HATS-CA Production Technical Data Package (TDP): At the Option 3 effort PDR meeting, the contractor shall deliver a draft T-HATS-CA TDP with details of all hardware and software interfaces required for integrating a hit avoidance system or component system upgrades on a tactical and combat vehicle. The TDP shall include drawings that define the physical hardware that mounting provisions have to be designed to interface with and drawings that define all the required hardware for integrating on an Army combat vehicle. The TDP shall include details required for data and power cabling, for integrating HATS components. The TDP shall also include the communication protocols interfacing each of the system components. The software interface information shall include the source codes of system and component interface software, used between top level component sections and for interfacing other vehicle systems. The software TDP shall provide summaries and parameters for all data messages that can be passed between the major components. This should include data such as byte position, type (int,.), unit (sec, m, range, bits (message length) and description. The source code shall include documentation for compiling and running information sufficient for the Government to alter the software to permit installation and interfacing with different vehicle configurations. A draft TDP shall be presented at the Option 3 effort PDR. Updates to the TDP shall be presented at following program reviews. The final TDP shall be presented at the Option 3 CDR and submitted as part of the Option 3 Final Report, IAW CDRL A005, A008 and A009.

C.5.2 Hardware (HW) and Software (SW) Sources: The contractor shall establish, maintain and provide updated lists of sources and costs (as a technical manual) for acquiring T-HATS-CA HW and SW component parts, at program reviews, IAW CDRL A007.

C.5.3 Option 3 Meetings, Deliverables and Contractor Manpower Reporting (CMR): The contractor shall continue support of the scheduling

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and sequencing of SOW, PDR, IPR and CDR program review meetings, weekly inputs, deliverables and CMR reporting, initially established during the BASE effort. This Options SOW, PDR, IPRs and CDR shall follow the same pattern, every 3 months sequence, as already established in the BASE effort. This Options reviews may be inserted or added into an already scheduled program review (every 3 months) for another option. The Government FTR, with inputs and recommendations from the contractors lead program manager, shall determine the exact dates for all Options program review meeting.

C.5.4 Contract Final Report: The contractor shall fully document all BASE tasks, Option 1, Option 2 and Option 3 tasks efforts. The contractor shall deliver, at the Option 3 CDR, a draft contract final report, per CDRL A005.

** Revised per Modification 02 for Task Order 0006

*** END OF NARRATIVE C0001 ***

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SECTION F - DELIVERIES OR PERFORMANCE

F.1 PERIOD OF PERFORMANCE

F.1.1 The base period of performance for Task Order 0006 will be fourteen (14) months after the Task Order award date, period of performance ending on 27 November 2013.*

F.1.2 Task Order 0006 will have three (3) options, each with a period of performance of twelve (12) months, if exercised.

* Revised per modification P03

*** END OF NARRATIVE F0001 ***