

**ORDER FOR SUPPLIES OR SERVICES**

1. CONTRACT/PURCH. ORDER/ AGREEMENT NO. DASG60-02-D-0015	2. DELIVERY ORDER/ CALL NO. 000217	3. DATE OF ORDER/CALL 2002 Apr 24	4. REQ./ PURCH. REQUEST NO. TH2MSL1AAF-01	5. PRIORITY DX-A2
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6. ISSUED BY US ARMY SPACE & MISSILE DEFENSE COMMAND [REDACTED] PO BOX 1500 HUNTSVILLE AL 35807-3801	CODE W9113M	7. ADMINISTERED BY DCM LOCKHEED MARTIN DELAWARE VALLEY MAIL STOP AE 2-W 1 FEDERAL STREET CAMDEN NJ 08102-1013	CODE S3110A	8. DELIVERY FOB <input checked="" type="checkbox"/> DEST <input type="checkbox"/> OTHER  (See Schedule if other)
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9. CONTRACTOR L3 COMMUNICATIONS CORP L-3 SYSTEMS COMPANY 1 FEDERAL ST CAMDEN NJ 08103	CODE 1BRA6	FACILITY	10. DELIVER TO FOB POINT BY (Date) <b>SEE SCHEDULE</b>	11. MARK IF BUSINESS IS <input type="checkbox"/> SMALL <input type="checkbox"/> SMALL DISADVANTAGED <input type="checkbox"/> WOMEN-OWNED
			12. DISCOUNT TERMS	
13. MAIL INVOICES TO THE ADDRESS IN BLOCK See Item 15				

14. SHIP TO <b>SEE SCHEDULE</b>	CODE	15. PAYMENT WILL BE MADE BY DFAS-COLUMBUS CENTER NORTH ENTITLEMENT OPERATIONS PO BOX 182266 COLUMBUS OH 43218-2266	CODE HQ0337	<b>MARK ALL PACKAGES AND PAPERS WITH IDENTIFICATION NUMBERS IN BLOCKS 1 AND 2.</b>
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16. TYPE OF ORDER	DELIVERY/ CALL	<input checked="" type="checkbox"/>	This delivery order/call is issued on another Govt. agency or in accordance with and subject to terms and conditions of above numbered contract.
	PURCHASE		Reference your quote dated Furnish the following on terms specified herein. REF:

ACCEPTANCE. THE CONTRACTOR HEREBY ACCEPTS THE OFFER REPRESENTED BY THE NUMBERED PURCHASE ORDER AS IT MAY PREVIOUSLY HAVE BEEN OR IS NOW MODIFIED, SUBJECT TO ALL OF THE TERMS AND CONDITIONS SET FORTH, AND AGREES TO PERFORM THE SAME.

NAME OF CONTRACTOR \_\_\_\_\_ SIGNATURE \_\_\_\_\_ TYPED NAME AND TITLE \_\_\_\_\_ DATE SIGNED (YYYYMMDD) \_\_\_\_\_

If this box is marked, supplier must sign Acceptance and return the following number of copies:

17. ACCOUNTING AND APPROPRIATION DATA/ LOCAL USE  
**See Schedule**

18. ITEM NO.	19. SCHEDULE OF SUPPLIES/ SERVICES	20. QUANTITY ORDERED/ ACCEPTED*	21. UNIT	22. UNIT PRICE	23. AMOUNT
	<b>SEE SCHEDULE</b>				

\* If quantity accepted by the Government is same as quantity ordered, indicate by X. If different, enter actual quantity accepted below quantity ordered and encircle.

24. UNITED STATES OF AMERICA	25. TOTAL	\$3,314,474.00
CONTRACTING / ORDERING OFFICER	29. DIFFERENCES	

26. QUANTITY IN COLUMN 20 HAS BEEN <input type="checkbox"/> INSPECTED <input type="checkbox"/> RECEIVED <input type="checkbox"/> ACCEPTED, AND CONFORMS TO THE CONTRACT EXCEPT AS NOTED DATE _____ SIGNATURE OF AUTHORIZED GOVT. REP. _____	27. SHIP NO.	28. DO VOUCHER NO.	30. INITIALS
	<input type="checkbox"/> PARTIAL <input type="checkbox"/> FINAL	32. PAID BY	33. AMOUNT VERIFIED CORRECT FOR

36. I certify this account is correct and proper for payment. DATE _____ SIGNATURE AND TITLE OF CERTIFYING OFFICER _____	31. PAYMENT <input type="checkbox"/> COMPLETE <input type="checkbox"/> PARTIAL <input type="checkbox"/> FINAL	34. CHECK NUMBER	35. BILL OF LADING NO.
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37. RECEIVED AT	38. RECEIVED BY	39. DATE RECEIVED (YYYYMMDD)	40. TOTAL CONTAINERS	41. S/R ACCOUNT NO.	42. S/R VOUCHER NO.
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## Section B - Supplies or Services and Prices

ITEM NO	SUPPLIES/SERVICES	MAX QUANTITY	UNIT	UNIT PRICE	MAX AMOUNT
0001	SETAC - FP Labor COST	1	Lot	UNDEFINED	UNDEFINED
	Provide services outlined in the scope of work (SOW), as defined in a given task order (T/O), at the fixed prices/government labor category specified in Section B paragraph entitled, "GOVERNMENT LABOR CATEGORIES AND ASSOCIATED FIXED PRICES PER DPPH"				
	PURCHASE REQUEST NUMBER: TH2MSL1AAF-01				
				MAX COST	\$2,896,134.00

FOB: Destination

ITEM NO	SUPPLIES/SERVICES	MAX QUANTITY	UNIT	UNIT PRICE	MAX AMOUNT
0003	Consultants COST	1	Lot	UNDEFINED	UNDEFINED
	Provide services outlined in the scope of work (SOW) at the cost reimbursable amounts as approved on a task-order-by-task-order basis. Total Fee, including prime and subcontractor/consultant, shall not exceed 3% of the estimated costs. This CLIN is valid during the three-year base period as well as any/all award term extensions earned by the contractor.				
	PURCHASE REQUEST NUMBER: TH2MSL1AAF-01				
				MAX COST	\$0.00

FOB: Destination

ITEM NO	SUPPLIES/SERVICES	MAX QUANTITY	UNIT	UNIT PRICE	MAX AMOUNT
0004		1	Lot	UNDEFINED	UNDEFINED

Materials and STE

COST

Provide materials, special test equipment (STE), and associated services outlined in the individual task orders at the cost reimbursable amounts as approved by the T/OM and the Contracting Officer. NO FEE ON THIS CLIN. This CLIN is valid during the three-year base period as well as any/all award term extensions earned by the contractor.

PURCHASE REQUEST NUMBER: TH2MSL1AAF-01

MAX COST

\$0.00

FOB: Destination

ITEM NO	SUPPLIES/SERVICES	MAX QUANTITY	UNIT	UNIT PRICE	MAX AMOUNT
0005		1	Lot	UNDEFINED	UNDEFINED

Travel

COST

Travel as directed in the individual task orders. Travel must be completed within the cost reimbursable amounts allowed per the Joint Travel Regulations and the DCAA-approved Company-Implemented Policy and Procedures. NO FEE ON THIS CLIN. This CLIN is valid during the three-year base period as well as any/all award term extensions earned by the contractor.

PURCHASE REQUEST NUMBER: TH2MSL1AAF-01

MAX COST

\$418,340.00

FOB: Destination

BLOCK 17/BLOCK 18 CONTINUED

## BLOCK 17 (DD1155) CONTINUED:

TASK ORDER FUNDS REQUIRED \$3,314,474

TASK ORDER FUNDS AVAILABLE \$2,689,474

UNFUNDED BALANCE \$ 625,000

BLOCK 18 (DD1155) CONTINUED: In the performance of this Task Order (T/O), the contractor shall provide the total Direct Productive Person Hours (DPPHs), plus or minus 10 percent, as stated for fixed-price labor categories stated in Section B of the contract listed in Block 1 of the DD Form 1155. These DPPHs shall be billed at the fixed price stated in Exhibit V of the contract. The contractor shall not exceed the DPPHs, nor the total

dollars, stated for consultant below. The contractor is allowed to provide up to 10 percent less than the DPPHs stated for consultant and still expend the total dollars as stated in the T/O. Furthermore, under no circumstance shall the contractor exceed the dollars stated for Materials, Travel, or Total T/O.

LABOR CATEGORIES: Labor categories are as listed in the contract, Section B, paragraph entitled "GOVERNMENT LABOR CATEGORIES AND ASSOCIATED FIXED PRICES PER DPPH"

	DPPHs ORDERED	NTE AMOUNT
FIXED-PRICE LABOR TOTAL	 DPPHs	\$2,896,134
*CONSULTANT TOTAL	 DPPHs	\$ 0
T/O TOTAL LABOR	 DPPHs	\$2,896,134
MATERIAL	NTE	\$ 0
TRAVEL	NTE	\$ 418,340
T/O TOTAL		\$3,314,474

\*\*Consultant requirements must have prior written approval of the Administrative Contracting Officer (ACO) (via subcontract consent package) before any costs are incurred under the consultant CLIN.

Section C - Descriptions and Specifications

DISTRIBUTION

TASK ORDER MONITOR (Para 1.0 of SOW): [REDACTED]  
[REDACTED]

TASK ORDER MONITOR (Para 1.1 and 1.2 of SOW): [REDACTED]  
[REDACTED]

TASK ORDER MONITOR (Para 1.3 of SOW): [REDACTED]  
[REDACTED]

TASK ORDER MONITOR (Para 1.4 of SOW): [REDACTED]  
[REDACTED]

TASK ORDER MONITOR (Para 1.5 and 1.6 of SOW): [REDACTED]  
[REDACTED]

TASK ORDER MONITOR (Para 1.7 of SOW): [REDACTED]  
[REDACTED]

MAILING ADDRESS: [REDACTED]  
[REDACTED]

PROGRAM MANAGEMENT POC: [REDACTED]  
[REDACTED]

MAILING ADDRESS: [REDACTED]  
[REDACTED]

PROGRAM ANALYST POC: [REDACTED]  
[REDACTED]

MAILING ADDRESS: [REDACTED]  
[REDACTED]

KEY PERSONNEL

KEY PERSONNEL: [REDACTED]

SPECIAL INSTRUCTIONS

SPECIAL INSTRUCTIONS:

Cost data shall be segregated/reported/vouchered/paid at the ACRN level.

The "Limitation of Funds" is applicable at the ACRN level.

The effort described in the Task Order Statement of Work, which is anticipated to be performed in FY02-FY05, is subject to the Clause at FAR 52.232-18, Availability of Funds.

All of the terms and conditions of the contract listed in Block 1 above are applicable to this T/O.

All of the provisions and clauses of the contract listed in Block 1 above are applicable to this T/O.

The following Government Furnished Property or Test Facilities are available for use in performance of this Task Order:

For "THAAD Booster and TVA Support" Statement of Work, the government will furnish all code development tools such as Visual Basic – latest code development and tools development editions. The government will furnish Classified data processing machine and state-of-the art rocket motor design analyses software tools on as needed basis. The government will furnish latest edition of MATLAB software for TVA Model performance predictions development.

For "THAAD Missile Hardware Design and Integrate Product Team (IPT) Support" Statement of Work, Paragraphs 1.1 and 1.2, the Government will provide access to and use of the THAAD Missile Propulsion Products Classified Processing Center (including software) located within Building 7120 of the Propulsion & Structures Directorate – U.S. Army Aviation and Missile Command (AMCOM) on Redstone Arsenal.

It is incumbent upon the contractor and/or subcontractor to ensure that appropriate Technical Assistance Agreements (TAAs) and/or applicable export licenses are in place before conducting any activity under the SOW which requires such approval and documentation.

Modification 0002-06 incorporated L3's T/ORP 0004 proposal dated 10 Jan 03 (\$2,348,171/23,865 DPPH).

#### MATERIALS

ESTIMATED COST FOR MATERIALS AND/OR SPECIAL TEST EQUIPMENT: The contractor has no authority to incur material costs without the explicit prior written approval of the contracting officer. Prior to forwarding requests to the contracting officer, the contractor shall obtain the Task Order Monitor's concurrence. Electronic Mail (email) shall be utilized for both steps in this process. Under no circumstance shall the contractor incur materials costs in excess of the NTE amount stated herein. NTE: \$ 0

#### TRAVEL

ESTIMATED TRAVEL: Except for the locations listed below, the contractor has no authority to incur travel costs without explicit written approval (Email is acceptable) of the Task Order Monitor. The contractor is not authorized to travel outside the United States without the explicit written approval (email acceptable) of the Contracting Officer. Under no circumstances shall the contractor incur travel costs in excess of the NTE amount stated herein. NTE: \$418,340

Sunnyvale, CA (LMSSC/M&SO)  
 Rockford, ILL. (Pratt & Whitney/HSC)  
 Washington, DC  
 Riverside, CA  
 Boston, MA (Sanders)  
 Joplin, MO (Eagle Picher)  
 Redmond, WA (PRIMEX Aerospace Co)  
 San Diego, CA (Hitco)  
 WSMR, NM

San Jose, CA (Pratt & Whitney/CSD)  
 St. Petersburg/Clearwater, FLA. (Enser Battery Corp.)  
 Baltimore, MD  
 Santa Rosa, CA  
 Tampa, FL (Clearwater)  
 Canoga Park, CA (Boeing/Rocketdyne)  
 Chicago, IL (Hamilton Sunstrand)  
 Phoenix, AZ  
 Troy, AL

Camden, AR

Dallas, TX

DELIVERABLES

## DELIVERABLES:

Item/Title	CDRL#	# Copies	Delivery Date
Task Order Management Plan	A001	1 *	Per CDRL
FMER	A003	1 *	Per CDRL
Interim Technical Reports/ Briefings	A004	1	As Required
Codes/User's Manuals	A004	1 *	23 APR 05
Final Technical Report	A005	1 *	31 DEC 05
Conference Minutes	A006	1	Per CDRL
Data Accession List	A007	1	Per CDRL

\* Plus Electronic Version.

STATEMENT OF WORK

“THAAD Booster Motor and TVA Support” Statement of Work (Deleted in its entirety - Modification 0002-06)

“THAAD Missile Hardware Design and Integrate Product Team (IPT) Support” Statement of Work (Added - Modification 0002-06)

1.0 The contractor shall support the THAAD Project Office (TPO) Missile Directorate in its development of the Missile hardware and its interface with the Prime Contractor within the IPT structure.

#### 1.1 THAAD Boost Motor Performance Data Analyses Support

The Contractor shall support the government by developing a user friendly Graphical User Interface (GUI) code using Visual Basic.Net program language to reduce THAAD Boost Motor ballistic performance data and provide performance predictions prior to motor static test firings as well as for future design changes. Additionally, a user-friendly GUI code shall be written to reduce and analyze the kinematics of the various THAAD Thrust Vector Actuation (TVA) System performance Generation (GEN) tests such as GEN-1, GEN-2 & GEN-3. Additional database code development may be needed in order to perform statistical analyses from various Boost Motor and TVA tests. Structural and thermal analyses of both the TVA and Boost Motor shall be performed on an as needed basis. This effort may require design evaluation of future THAAD propulsion technologies. The contractor shall support of all Boost Motor and TVA Integrated Product Team (IPT), Component Product Team (CPT), Missile Technical Round Table (TRT) meetings as well as technical meetings such as Component Design Reviews (CDR's).

## 1.2 THAAD Missile Propulsion Support

The contractor shall support the government by analyzing and evaluating Missile kinematics and structural performance based on results from task 1.1 above as well as Missile Structures data generated on the THAAD program against Missile performance requirements. This task shall also require developing programs using FORTRAN, Visual Basic.Net and potentially C++. Propulsion performance data shall be used to evaluate THAAD Missile performance using the latest THAADSIMA Missile Simulation Codes as well as other simulation/analytical predictive tools. This effort may require design evaluation of future THAAD propulsion technologies. The contractor shall support of all Boost Motor and TVA Integrated Product Team (IPT), Component Product Team (CPT), Missile Technical Round Table (TRT) meetings as well as technical meetings such as Component Design Reviews (CDR's).

## 1.3 THAAD Divert and Attitude Control System (DACS) Support:

The contractor shall support the Government DACS lead by analyzing and evaluating DACS thruster and system level thermal performance. The contractor shall use thermal models to verify that the DACS hot fire performance is compliant to specifications requirements. The contractor shall perform independent thermal analyses and validated those analyses based on thermal profiles obtained during hot fire testing to support design verification. The contractor shall use models developed based on the BLIMP-J (Boundary Layer Integral Method Program - JANNAF) coupled with the EXITS (Explicit Interactive Thermal Structures) one-dimensional thermal analyzer code. The contractor shall review and analyze models used for thermal conditioning and vacuum systems at the Air Force Research Laboratory (AFRL), Edwards Air Force Base, CA to verify test facility can provide the environmental and altitude requirements required. The contractor shall perform independent thermal analyses and vacuum system modeling to support any necessary facility modifications to achieve requirements. The contractor shall use the VACTRN vacuum system analysis code to determine system losses and identify potential modifications to reduce flow losses. The contractor shall perform thermal analysis to support Insensitive Munitions requirements and design testing for the DACS Composite Overwrapped Pressure Vessel (COPV) Tanks. The contractor shall provide support in identifying potential failure modes within the COPV during the fast cook testing and the slow cook off testing. The contractor shall perform analyses on the nozzle thermal barrier designs to determine if the designs meet specification requirements.

## 1.4 THAAD Missile Avionics and Sensors Processor Support

The Contractor shall support Government personnel responsible for development of complex electrical and electronic assemblies utilized within the THAAD Missile. The contractor shall participate in conducting Critical Design Reviews for these assemblies by reviewing design requirements, drawings, and performance analysis. The contractor shall conduct reviews and analysis independent from the Prime Contractor and Subcontractors as required to provide assessment of designs and suitability of those designs to meet program performance and cost goals. The contractor shall support engineering development and initial fabrication of brass board and flight hardware at the Prime Contractor and Subcontractor facilities and provide independent evaluation of Flight Qualification Testing and Acceptance Testing of hardware to support the Flight Test Program. The contractor shall maintain essential records of technical interchange meeting minutes, design drawings, and assembly requirements that support hardware development decisions.

## 1.5 THAAD Missile Structures Products Support

The contractor shall provide technical services support to the THAAD Missile Structures Products IPT. The contractor shall perform technical assessments and preparation of technical reports of the Prime contractors and Subcontractors developments derived from the Missile Round specifications to the CIDS. The contractor shall monitor and prepare audits and analysis for submittal to the government of all

recurring and non-recurring resources required to develop, manufacture, test and integrate the Structures Products. The structures products IPT responsible for the following products: Missile forebody, Missile mid-body, Missile interstage & Booster integration, Aft skirt & Flare and Canister and Missile round assembly. The contractor shall conduct studies, and provide concept system definition and related documentation to support the study results; provide independent analyses, simulations and technological assessments; and perform related tasks in missile systems structures products design, definition, experiments, and demonstration. The contractor shall analyze, critique and assess the adequacy, timeliness, and cost effectiveness of work performed by other contractors. The contractor shall identify issues, formulate, and provide alternative for issue resolution of their areas of assigned. The contractor shall attend Technical Interchange Meetings at the prime contractor facilities as directed by the government, and/or dates mutually agreed.

#### 1.6 THAAD Missile Canister Support

The Contractor shall support the government in the development of the THAAD Missile Canister. The contractor shall perform analysis and review of all missile canister data, related analysis or other analysis studies as that will validate the canister subcontractor data for a successfully canister CDR.. Since the canister analysis data are tightly coupled to certain measures of missile system performance, it is anticipated that these analysis tasks and the results will be closely coordinated and communicated with THAAD Project Office, the Prime Contractor, the canister Subcontractor, and other structures analysis contractor personnel. The main task area is Missile Canister stress allowable and fly-out analysis (including transportation and safety drop shock (snubber support and rails carts); axial loads, and missile tip-off/fly-outs, uncertainty analysis and reduction). The contractor shall support the Canister CPT's with alternative solution paths in order to maintain both EMD cost and schedule as well as control program risk down to a low and manageable level. The contractor shall offer design solutions to TPO as requested. Also, perform other thermal related phenomena (e.g., canister blow-by, canister egress, adjacent pressure, and missile canister thermal resistance analysis) as needed.

#### 1.7 THAAD Missile Assembly and Test and Development Test Operations Support

The contractor shall support the responsible Government personnel in its interface with the Prime Contractor's Vehicle Assembly and Test IPT. Activities focus on Integration, Assembly, and Test Operations; Facility Management; and Production Test Equipment. The contractor shall review and assess Missile Integration, Assembly, and Test (IA&T) Procedures as they are developed. The contractor shall assess the proofing of Missile IA&T Procedures by the THAAD Prime Contractor. The contractor shall review and assess the implementation of Missile IA&T procedures as they are implemented at the THAAD Prime Contractor IA&T Operations and as they are transitioned to the initial production facility. The contractor shall support the government in monitoring requirement definition, design, planning and construction of the THAAD Missile Production Facility. The contractor shall support TPO in monitoring the Assembly and Test of Engineering Development Unit, Ground Test Unit, IM/HC, Production Qualification Test, and Flight Test Missiles/Missile Rounds by the THAAD Prime

Contractor. The contractor shall review and assess THAAD Prime Contractor development of Production Test Equipment and evaluate its relationship to the system peculiar support equipment. The contractor shall review and assess development of the test strategy and specific test program sets for Missile IA&T. The contractor shall participate in the Vehicle Assembly and Test IPT and its sub-tier teams as required.

The Contractor shall support the THAAD Project Office in its interface with the Prime Contractor's Development Test Engineering Team. The contractor shall review test plans, procedures, and results of development tests conducted by the THAAD Prime Contractor or other entities as required. The contractor shall provide technical oversight to Missile Segment development tests and design verification tests conducted by the THAAD Prime Contractor. The Contractor shall witness and assess operations of the THAAD Prime Contractor in the Missile System Integration Laboratory as required.

#### 1.8 Interface With Other THAAD Contractors

The contractor shall interface, as required, with the THAAD prime contractor, Lockheed Martin Space Systems Company, Sunnyvale, CA; The Simulation/Independent Verification and Validation contractor, COLSA Corporation, Huntsville, AL; the Hardware-in-the-Loop contractor, Tech Masters, Inc.; and other SETA contractors, in performance of this task order

#### PERIOD OF PERFORMANCE

PERIOD OF PERFORMANCE: 24 APR 02 - 31 JAN 03 (THAAD Booster Motor and TVA SOW)  
30 JAN 03 - 31 DEC 05 (THAAD Missile Hardware Design and Integrate  
Product Team SOW)

## Section G - Contract Administration Data

## ACCOUNTING AND APPROPRIATION DATA

AA: 9720400.2501 BM-THAD 50604861C00.2012 255Y TH2MSL1AAF S01021 TH2MSL1AAF/2THEMD/TH  
COST 000000000000  
CODE:  
AMOUNT: \$127,869.00

AB: 9730400.2501 BM-THAD 50604861C00.2011 255Y TH3MSL1AA8 S01021 TH3MSL1AA8/3THEMD/TH  
COST 000000000000  
CODE:  
AMOUNT: \$32,000.00

AC: 9730400.2501 BM-THAD 50604861C00.2011 255Y TH3MSL1BA1 S01021 TH3MSL1BA1/3THEMD/TH  
AMOUNT: \$793,605.00

AD: 9740400.2501 BM-THAD 40603881C00.0707 255Y TH4MSL1BA1 S01021 TH4MSL1BA1/4THEMD/TH0000  
AMOUNT: \$1,111,000.00

AE: 9750400.2501 BM-THAD 40603881C00.0707 255Y TH5MSL1BA1 S01021 TH5MSL1BA1/5THEMD/TH0000  
AMOUNT: \$625,000.00