

AWARD/CONTRACT		1. THIS CONTRACT IS A RATED ORDER UNDER DPAS (15 CFR 350)		RATING	PAGE OF PAGES 1 33
2. CONTRACT (Proc. Inv. Mktg.) NO. HR0011-06-C-0144		3. EFFECTIVE DATE 27 Sep 2006		4. REQUISITION/PURCHASE REQUEST/PROJECT NO. W29401	
5. ISSUED BY DARPA C/MO ATTN: MICHAEL D. BLACKSTONE 3701 N. FAIRFAX DR. ARLINGTON VA 22203-1714		CODE HR0011	6. ADMINISTERED BY (If other than Item 5) DCMA NORTHROP GRUMMAN BALTIMORE 7323 AVIATION BLVD, WB 1235 BWI AIRPORT MD 21240-3000		CODE S2109A
7. NAME AND ADDRESS OF CONTRACTOR (No. street, city, county, state and zip code) NORTHROP GRUMMAN SYSTEMS CORPORATION 1580A NURSERY RD LINTHICUM HEIGHTS MD 21080-0000			8. DELIVERY [] FOB ORIGIN [X] OTHER (See below)		9. DISCOUNT FOR PROMPT PAYMENT Net 30 Days
10. SUBMIT INVOICES 1 (If other unless otherwise specified) TO THIS ADDRESS SHOWN IN:			ITEM Section G		
CODE 87942		FACILITY CODE			
11. SHIP TO/MARK FOR. CODE		12. PAYMENT WILL BE MADE BY DPAS COLUMBUS CENTER SOUTH BENTLEY OPERATIONS P.O. BOX 182294 COLUMBUS OH 43218-2294		CODE H0008	
See Schedule					
13. AUTHORITY FOR USING OTHER THAN FULL AND OPEN COMPETITION: [] 10 U.S.C. 2304(eX) [] 41 U.S.C. 253(eX)			14. ACCOUNTING AND APPROPRIATION DATA See Schedule		
15A. ITEM NO.	15B. SUPPLIES/ SERVICES	15C. QUANTITY	15D. UNIT	15E. UNIT PRICE	15F. AMOUNT
SEE SCHEDULE					
16. TABLE OF CONTENTS					15G. TOTAL AMOUNT OF CONTRACT \$10,000,000.00
NO. SEC.	DESCRIPTION	PAGE(S)	NO. SEC.	DESCRIPTION	PAGE(S)
PART I - THE SCHEDULE			PART II - CONTRACT CLAUSES		
X A	SOLICITATION/ CONTRACT FORM	1	X I	CONTRACT CLAUSES	19 - 32
X B	SUPPLIES OR SERVICES AND PRICES/ COSTS	2	PART III - LIST OF DOCUMENTS, EXHIBITS AND OTHER ATTACHMENTS		
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X E	INSPECTION AND ACCEPTANCE	6	K	REPRESENTATIONS, CERTIFICATIONS AND OTHER STATEMENTS OF OFFERORS	
X F	DELIVERIES OR PERFORMANCE	7 - 9		L	INSTR., CONDS. AND NOTICES TO OFFERORS
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X H	SPECIAL CONTRACT REQUIREMENTS	13 - 18			
CONTRACTING OFFICER WILL COMPLETE ITEM 17 OR 18 AS APPLICABLE					
17. [X] CONTRACTOR'S NEGOTIATED AGREEMENT (Contractor is required to sign this document and return copies to issuing office). Contractor agrees to furnish and follow all laws or perform all the services set forth or otherwise identified above and on any continuation sheets for the consideration stated herein. The rights and obligations of the parties to this contract shall be subject to and governed by the following documents: (a) this award/contract, (b) the solicitation, if any, and (c) such provisions, representations, certifications, and specifications, as are attached or incorporated by reference herein. (Attachments are listed below).			18. [] AWARD (Contractor is not required to sign this document.) Your offer on Solicitation Number _____ including the additions or changes made by you which additions or changes are set forth in full above, is hereby accepted as to the items listed above and on any continuation sheets. This award constitutes the contract which consists of the following documents: (a) the Government's solicitation and your offer, and (b) this award/contract. No further contractual document is necessary.		
19A. NAME AND TITLE OF SIGNER (Type or print) (b)(4)			19B. NAME AND TITLE OF CONTRACTING OFFICER CHAEL D. BLACKSTONE/PCO 571-218-4804 E-MAIL: michael.blackstone@darpa.mil		
19B. NAME OF CONTRACTOR Northrop Grumman Systems Corp. BY (b)(4)		19C. DATE SIGNED 28 Sept 2006	20B. UNITED STATES OF AMERICA (b)(6)		20C. DATE SIGNED 9/28/06

NSN 7540-01-132-8049

PREVIOUS EDITION UNUSABLE

28-107

GPO 1987 O - 406-794

STANDARD FORM 28 (REV. 4-85)
Prescribed by GSA
FAR (48 CFR) 53.214(f)

PO

Section B - Supplies or Services and Prices

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0001	VADER Phase 1 LTR - COST	1	Lot		
	<p>The contractor shall provide the personnel, facilities, and material necessary to conduct the research effort described in the Northrop Grumman "Vehicle and Dismount Exploitation Radar (VADER) Phase 1 Statement of Work, dated 22 September 2006, which is made part of this contract at Attachment (1). Data deliverable requirements shall be in accordance with Sections C and F, and Exhibit A, of the contract.</p> <p>FOB: Destination</p>				
				ESTIMATED COST	\$10,000,000.00

ITEM NO	AMOUNT
000101	
AO No. W295/00	
ACRN AA	\$10,000,000

Section C - Descriptions and Specifications

CLAUSES INCORPORATED BY FULL TEXT

C-1 Scope of Work

The Contractor shall furnish the necessary personnel, materials, facilities and other services as may be required to perform Contract Line Item Number (CLIN) 0001 in accordance with the Statement of Work, Attachment I hereto.

(end of clause)

C-2 Reports and Other Deliverables

(a) All technical reports delivered by the Contractor in the performance of the contract shall be considered "Technical Data" as defined in Section I contract clauses entitled "Rights in Technical Data - Noncommercial Items" and "Rights in Noncommercial Computer Software and Noncommercial Computer Software Documentation." The Government shall receive "unlimited rights" to this technical data, as defined in these clauses.

(b) In addition to those reports required by the Exhibit A, Contract Data Requirements List, the following report(s) must also be submitted as specified below:

1. FINAL REPORT

This report, prepared in accordance with DFARS 252.235-7011, shall document the results of the complete effort as set forth in the Statement of Work, Attachment I hereto. Title pages shall include a disclaimer worded substantially as follows:

"The views and conclusions contained in this document are those of the authors and should not be interpreted as representing the official policies, either expressly or implied, of the Defense Advanced Research Projects Agency or the U.S. Government."

(1) The Final Technical Report summary shall include:

- Task Objectives
- Technical Problems
- General Methodology (i.e., literature review, laboratory experiments, surveys, etc.)
- Technical Results
- Important Findings and Conclusions
- Significant Hardware Development
- Special Comments
- Implications for Further Research

(2) All papers and articles published as a result of DARPA sponsored research shall include a statement reflecting that sponsorship.

(3) Distribution Statement B applies as shown below:

"Distribution authorized to U.S. Government agencies only due to Critical/Classified Technology and to prevent Premature Dissemination of Information. Other requests for this document shall be referred to DARPA Technical Information Office via email at tio@darpa.mil."

2. ADDITIONAL MISC. DELIVERABLES

The Contractor shall also deliver those items listed in the Contract Attachment (1) - Statement of Work under the paragraph entitled "Deliverables", as applicable. The Contractor shall adhere to the schedule, as applicable, in the Statement of Work. Briefing materials (hard and softcopy) for all briefings given to the Government shall be provided in the Contractor's format.

(end of clause)

Section D - Packaging and Marking

CLAUSES INCORPORATED BY FULL TEXT

D-1 Packaging and Marking

- (a) All items shall be preserved, packaged, packed and marked in accordance with best commercial practices to meet the packing requirements of the carrier, and to ensure safe delivery at destination.
(end of clause)

Section E - Inspection and Acceptance

INSPECTION AND ACCEPTANCE TERMS

Supplies/services will be inspected/accepted at destination by the Contracting Officer's Representative (COR) identified at Section G herein.

(end of clause)

CLAUSES INCORPORATED BY REFERENCE

52.246-8	Inspection Of Research And Development Cost Reimbursement	MAY 2001
252.246-7000	Material Inspection And Receiving Report	MAR 2003

Section F - Deliveries or Performance

CLAUSES INCORPORATED BY REFERENCE

52.247-34 F.O.B. Destination NOV 1991
 52.247-55 F.O.B. Point For Delivery Of Government-Furnished Property JUN 2003

CLAUSES INCORPORATED BY FULL TEXT

F-1 Term of Contract

- (a) CLIN 0001 - The term of the contract commences on 1 October 2006 and continues through 1 April 2007.
- (b) Not applicable for UCA. The period of performance for Option 1, as set forth in CLIN TBD shall be from the effective date of the option exercise to and including (INSERT DATE).
 reserved
- (c) Not applicable for UCA. The period of performance for Option 2, as set forth in CLIN TBD shall be from the effective date of the option exercise to and including (INSERT DATE).

(end of clause)

F-2 Reports and Other Deliverables

- (a) Delivery of all reports and other deliverables shall be made to the addressee specified in F-3 entitled "Report Distribution" in accordance with the following:

Item No.	Description	Due Date (on or before)
0001	Interim Reports	See Exhibit A CDRL
0001	Final Report (Phase 1)	1 April 2007
0001	Additional Misc. Deliverables	See Section C-2

(end of clause)

F-3 Report Distribution

- I. For the Final Technical Report - The Contractor shall access the DARPA Extranet Reporting Page - <http://www.tfms.darpa.mil> and electronically submit all required reporting information as specified in Section C-2.

Additional distribution shall be made as follows:

- (a) Defense Technical Information Center
 - (1) Email: TR@dtic.mil
 (one electronic copy of the Final Technical Report, if unclassified)

(2) Attn: DTIC-BCS
8725 John J. Kingman Road, Suite 0944
Fort Belvoir, VA 22060-0944
(two hard copies of the Final Technical Report if unclassified)

(b) DARPA/Library
3701 North Fairfax Drive
Arlington, VA 22203-1714
Email: library@darpa.mil
(one copy of the Final Technical Report)

(c) DARPA/CMO
Attn: Mr. Michael D. Blackstone
3701 North Fairfax Drive
Arlington, VA 22203-1714
Email: Michael.Blackstone@darpa.mil
(one copy of the Final Technical Report - uploaded to TFIMS is acceptable)

(d) DARPA/IXO
Attn: Dr. Mark McClure
3701 North Fairfax Drive
Email: mark.mcclure@darpa.mil
(one copy of the Final Technical Report)

Note 1: (b) through (d) - submissions of unclassified materials only. Submission of classified material, if applicable, shall be coordinated through DARPA SID and/or the DARPA Program Manager in accordance with the attached DD254.

Note 2: For the Final Technical Report(s), the Contractor must also comply with the distribution requirements of DFARS 252-235-7011, as applicable.

2. All papers and articles published as a result of DARPA sponsored research shall include a statement reflecting the sponsorship. In addition, a bibliography of the titles and authors of all such papers are to be included in the Final Technical Report.

(a) The cover or title page of each of the above reports or publications prepared, will have the following citation:

Sponsored by
Defense Advanced Research Projects Agency
Information Exploitation Agency
Program: VADER
Issued by DARPA/CMO under Contract No. HR0011-06-C-0144

(b) The title page shall include a disclaimer worded substantially as follows:

"The views and conclusions contained in this document are those of the authors and should not be interpreted as representing the official policies, either expressly or implied, of the Defense Advanced Research Projects Agency or the U.S. Government."

(end of clause)

F-4 Notice Regarding Late Delivery

(a) In the event the Contractor anticipates difficulty in complying with the contract delivery schedule, the Contractor shall immediately notify the Contracting Officer in writing, giving pertinent details, including the date by which it expects to make delivery; PROVIDED, however, that this date shall be informational only in character and the receipt thereof shall not be construed as a waiver by the Government of any contract delivery schedule, or any rights or remedies provided by law or under this contract.
(end of clause)

Section G - Contract Administration Data

ACCOUNTING AND APPROPRIATION DATA

AA: 21 6 2040 0000 22 2010 633100ED100 255X RJS1 M1PR6JDRDJ9529 J9LERA W1YYAA S23185
 AMOUNT: \$10,000,000.00
 CIN 00000000000000000000000000000000: \$10,000,000.00

CLAUSES INCORPORATED BY REFERENCE

252.204-7006 Billing Instructions OCT 2005

CLAUSES INCORPORATED BY FULL TEXT

G-1 Procuring Office Representative

(a) The Procuring Office Representative is Michael D. Blackstone, DARPA/CMO, 3701 North Fairfax Drive, Arlington, VA 22203-1714, telephone: 571-218-4804, e-mail: Michael.Blackstone@darpa.mil.

(end of clause)

G-2 Electronic Submission of Payment Requests

(a) A Cost Voucher identified by contract number shall be submitted for payment directly by one of two means: (1) via EDI or (2) via the Internet to Wide Area Workflow Receipt and Acceptance at <https://wawf.eb.mil>

(b) Final cost vouchers shall be submitted for review and approval to DCAA:

DCAA
 Columbia Branch Office- 06311
 10025 Governor Warfield Parkway
 Suite 200
 Columbia, MD 21044
 DoDAAC: HAA719
 Phone No: 410-964-2060
 Fax No: 410-997-3237
 E-mail: dcaa-fao6311@dcaa.mil

(c) EDI voucher submissions: An softcopy of all vouchers submissions shall be emailed to the COR (for information purposes only - no preapprovals are required.)

(d) WAWF voucher submissions: The COR shall be notified via WAWF email notice of each voucher submission (for information purposes only - no preapprovals are required).

(end of clause)

G-3 Delegation of Authority for Contract Administration

(a) DCMA Northrop Grumman Baltimore is hereby designated as the Contracting Officer's authorized representative for administering this contract in accordance with current directives.
(end of clause)

G-4 Contracting Officer's Representative (COR)

(a) Performance of work under this contract shall be subject to the technical direction of Dr. Mark McClure, 3701 North Fairfax Drive, Arlington, VA 22203, 571-218-4982, e-mail: mark.mcclure@darpa.mil. Such technical direction includes those instructions to the Contractor necessary to accomplish the Statement of Work. The COR is not otherwise authorized to make any representations or commitments of any kind on behalf of the Contracting Officer or the Government. The COR does not have the authority to alter the Contractor's obligations or to change the specifications of the contract.

(b) Technical direction shall not include any direction which:

- (1) Constitutes additional work outside the scope of work;
- (2) Constitutes a change as defined in Section I contract clause entitled "Changes";
- (3) In any manner causes an increase or decrease in the total estimated cost or the time required for contract performance; or
- (4) Changes any of the stated terms, conditions, or specifications of the contract.

(end of clause)

G-5 Payment Instructions for Multiple Accounting Classification Citations

(a) Payments under contract line items funded by multiple accounting classification citations shall be made from the earliest available fiscal year funding sources. The earliest assigned ACRN must be fully disbursed before making disbursements from a succeeding ACRN. The CLIN/ACRN association stipulated at either Section B or G of the contract shall be strictly adhered to in making payments.
(end of clause)

G-6 Incremental Funding (N/A - Contract has been fully funded)

(a) This contract shall be subject to incremental funding with \$ [dollar amount] presently made available for performance under this contract. It is estimated that the funds presently available are sufficient to permit the Contractor's performance through [date]. Except in accordance with the Section I clause FAR 52.232-22, "Limitation of Funds," no legal liability of the part of the Government for payment of any money in excess of \$ [dollar amount] shall arise unless and until additional funds are made available by the Contracting Officer through a modification to this contract.
(end of clause)

G-7 Payment of Cost and Fee

(a) As consideration for the proper performance of work required under this contract, the Contractor shall be paid as follows:

(1) Costs, as provided for under Section I contract clause titled "Allowable Cost and Payment" not to exceed the amount set forth as "Total Estimated Cost" in Section B, and subject further to those Section I clauses entitled "Limitation of Cost" or "Limitation of Funds".

(2) A fixed fee in the amount set forth as "Fixed Fee" in Section B, in accordance with the Section I contract clause entitled "Fixed Fee". The Contractor may bill on each invoice the amount of the fixed fee bearing the same percentage to the total fixed fee as the amount of cost billed bears to the total estimated cost.

(end of clause)

Section H - Special Contract Requirements

CLAUSES INCORPORATED BY FULL TEXT

H-1 Contracting Officer

(a) Notwithstanding any other provision of this contract, the Contracting Officer is the only individual authorized to redirect the effort or in any way amend or modify any of the terms of this contract. If, as a result of technical discussions, it is desirable to alter contract obligations or statement of work, a modification must be issued in writing and signed by the Contracting Officer.
(end of clause)

H-2 Type of Contract

(a) This is a Cost-type Letter Contract (Undefinitized Contract Action).
(end of clause)

H-3 Public Release or Dissemination of Information

- (a) There shall be no dissemination or publication, except within and between the Contractor and any subcontractors, of information developed under this contract or contained in the reports to be furnished pursuant to this contract without prior written approval of the COR. All technical reports will be given proper review by appropriate authority to determine which Distribution Statement is to be applied prior to the initial distribution of these reports by the Contractor. Papers resulting from unclassified contracted fundamental research are exempt from prepublication controls and this review requirement, pursuant to DoD Instruction 5230.27 dated October 6, 1987.
- (b) When submitting material for clearance for open publication, the Contractor must furnish DARPA Technical Information Officer, 3701 North Fairfax Drive, Arlington VA 22203-1714, telephone (703) 526-4163 with five copies and allow four weeks for processing. Viewgraph presentations must be accompanied with a written text. Whenever a paper is to be presented at a meeting, the Contractor must indicate the exact dates of the meeting or the Contractor's date deadline for submitting the material.
- (c) Information and instructions on Public Release or Dissemination can be found at <http://www.darpa.mil/tio/>.
(end of clause)

H-4 Key Personnel

(a) The Contractor shall notify the Contracting Officer prior to making any change in key personnel. Key personnel are defined as follows:

(b)(4)

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(b) The Contractor must demonstrate that the qualifications of the prospective personnel are equal to or better than the qualifications of the personnel being replaced. Notwithstanding any of the foregoing provisions, key personnel shall be furnished unless the Contractor has demonstrated to the satisfaction of the COR that the qualifications of the proposed substitute personnel are equal to or better than the qualifications of the personnel being replaced.

(end of clause)

H-5 Restrictions on Printing

(a) Unless otherwise authorized in writing by the Contracting Officer, reports, data, or other written material produced using funds provided by this contract and submitted hereunder shall be reproduced only by duplicating processes and shall not exceed 5,000 single page reports or a total of 25,000 pages of a multiple-page report. These restrictions do not preclude the writing, editing, preparation of manuscript or reproducible copy of related illustrative materials if required as part of this contract, or incidental printing such as forms or materials necessary to be used by the Contractor to respond to the terms of the contract.

(end of clause)

H-6 Contractor Representations and Certifications

(a) The Contractor's Representations and Certifications (ORCA) for the period 16 March 2006 through 16 March 2007, and the supplemental Representations and Certifications dated 25 September 2006, are incorporated herein by reference.

(end of clause)

H-7 Insurance Schedule

(a) The Contractor shall maintain the types of insurance listed in FAR 28.307-2 (a), (b) and (c), with the minimum amounts of liability indicated therein. The types of insurance coverage listed in paragraphs (d) and (e) shall also be maintained when applicable.

(end of clause)

H-8 Travel

(a) Reimbursement for travel-related expenses shall be in accordance with the Contractor's approved travel policy. The Federal Travel Regulations, Joint Travel Regulations (JTR), and Standardized Regulations as stated in FAR 31.205-46 will be used as a guide in determining reasonableness of per diem costs. Costs for travel shall be allowable subject to the provisions of FAR 31.205-46.

(b) In connection with direct charge to the contract of travel-related expenses, the Contractor shall hold travel to the minimum required to meet the objectives of the contract, and substantial deviations from the amount of travel agreed to during contract negotiation shall not be made without the authorization of the Contracting Officer.

When applicable, the Contractor shall notify the COR of proposed travel of an employee beyond that agreed to during negotiations.

(c) Approval of the Contracting Officer shall be obtained in advance for attendance by personnel at training courses, seminars, and other meetings not directly related to contract performance if the costs for the courses, seminars, and other meetings are charged to the contract.

(d) All foreign travel shall be authorized and approved in advance, in writing, by the Contracting Officer. Request for such travel must be submitted to the Contracting Officer at least forty-five (45) days in advance of traveler's anticipated departure date, and shall include traveler's itinerary of United States Flag Air Carriers.
(end of clause)

H-9 Metric System

- (a) The Defense Advanced Research Projects Agency (DARPA) will consider the use of the metric system in all of its activities consistent with operational, economical, technical and safety requirements.
- (b) The metric system will be considered for use in all new designs. When it is deemed not to be in the best interest of the DoD to provide metric design, justification shall be provided.
- (c) Physical and operational interfaces between metric items and U.S. customary items will be designed to assure that interchangeability and interoperability will not be affected.
- (d) Existing designs dimensioned in U.S. customary units will be converted to metric units only if determined to be necessary or advantageous. Unnecessary retrofit of existing systems with new metric components will be avoided where both the new metric and existing units are interchangeable and interoperable. Normally, the system of measurement in which an item is originally designed will be retained for the life of the item.
- (e) During the metric transition phase hybrid metric and U.S. customary designs will be necessary and acceptable. Material components, parts, subassemblies, and semi-fabricated material, which are of adequate or when it is otherwise specifically determined to be in the best interest of the Department of Defense. Bulk materials will be specified and accepted in metric units when it is expedient or economical to do so.
- (f) Technical reports, studies, and position papers, (except those pertaining to items dimensioned in U.S. customary units) will include metric units of measurement in addition to or in lieu of U.S. customary units. With respect to existing contracts, this requirement applies only if such documentation can be obtained without an increase in contract costs.
- (g) Use of the dual dimensions (i.e., both-metric and U.S. customary dimensions) on drawings will be avoided unless it is determined in specific instances that such usage will be beneficial. However, the use of tables on the document to translate dimensions from one system of measurement to the other is acceptable.
(end of clause)

H-10 Consent to Subcontract

(a) Pursuant to the clause of the General Provisions entitled "Subcontracts (AUG 1998)," FAR 52.244-2, the Contracting Officer hereby consents to the placement of subcontract(s) with the following firm(s)/consultant(s) at the ceiling amounts specified:

NAME

TOTAL AMOUNT

NO SUBCONTRACTORS/CONSULTANTS IDENTIFIED AT TIME OF AWARD

(b) Approval must be obtained from the Administrative Contracting Officer to increase the use or number of subcontractors from the level established in subparagraph a.
(end of clause)

H-11 Proprietary Technical Data and Computer Software

(a) Any deliverable technical data or computer software developed or generated at private expense and considered to be proprietary by the Contractor or subcontractors shall be delivered in accordance with DFARS 252.227-7013 and 252.227-7014. A list of such data and/or software is incorporated into the contract as Attachment No. (To be negotiated during contract definitization).
(end of clause)

H-12 Small Business Subcontracting Plan and Goals

(a) The Contractor's Comprehensive Small Business Subcontracting Plan, dated 22 September 2005, is incorporated herein and made a part of this contract by reference.
(end of clause)

H-13 Government Furnished Property/Facilities and Services

(a) In accordance with the Section I contract clause entitled "Government Property (Cost Reimbursement, Time and Material, or Labor-Hour Contracts)", the following property, facilities and/or services shall be provided for use in the performance of this contract.

<u>Need Date</u>	<u>QTY</u>	<u>PROPERTY NOMENCLATURE</u>	<u>DELIVERY TO</u>
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NONE IDENTIFIED AT TIME OF CONTRACT AWARD

(end of clause)

H-14 Contractor-Acquired Property (Special Test Equipment)

(a) The Contractor is authorized to acquire the following items of special test equipment which are needed to accomplish this contract:

<u>Items To Be Acquired</u>	<u>Estimated Cost</u>
-----------------------------	-----------------------

TO BE NEGOTIATED AS PART OF CONTRACT DEFINITIZATION

Total

(b) The costs incurred by the Contractor in acquiring the special test equipment listed in paragraph (a) above shall be considered allowable costs under the contract provided that the total net amount of the special test equipment does not exceed \$0.00. The Contractor shall have no obligation to acquire special test equipment and the Government shall have no obligation to reimburse any amount for special test equipment in excess of the amount set forth above unless the contract is amended to increase this amount.

(c) The special test equipment listed above shall be considered Government Property and shall be subject to the provisions of FAR 52.245-05, incorporated by reference in Section I.

(d) The Contractor shall not use Contractor-acquired property listed above for work other than that performed pursuant to this contract unless so authorized in writing by the Contracting Officer.
(end of clause)

H-15 Contractor-Acquired Property (Special Tooling)

(a) The Contractor is authorized to acquire the following items of special tooling which are needed to accomplish this contract:

<u>Items To Be Acquired</u>	<u>Estimated Cost</u>
TO BE NEGOTIATED AS PART OF CONTRACT DEFINITIZATION	
Total	

(b) The costs incurred by the Contractor in acquiring the special tooling listed in paragraph (a) above shall be considered allowable costs under the contract provided that the total net amount of the special tooling does not exceed \$0.00. The Contractor shall have no obligation to acquire special tooling and the Government shall have no obligation to reimburse any amount for special tooling in excess of the amount set forth above unless the contract is amended to increase this amount.

(c) The special tooling listed above shall be considered Government Property and shall be subject to the provisions of FAR 52.245-05, incorporated by reference in Section I.

(d) The Contractor shall not use Contractor-acquired property listed above for work other than that performed pursuant to this contract unless so authorized in writing by the Contracting Officer.
(end of clause)

H-16 Contractor Acquired Property (IT)

(a) Performance of this contract will require use of the information technology (IT) resources listed below, acquisition of which (or equivalent) is hereby authorized:

ITEM	TOTAL AMOUNT
TO BE NEGOTIATED AS PART OF CONTRACT DEFINITIZATION	

(b) The costs incurred by the Contractor in acquiring the IT listed in paragraph (a) above shall be considered allowable costs under the contract provided that the total net amount of the IT does not exceed \$_____. The Contractor shall have no obligation to acquire IT and the Government shall have no obligation to reimburse any amount for IT in excess of the amount set forth above unless the contract is modified to increase this amount.

(c) The IT resources listed above shall be considered Government Property and shall be subject to the provisions of FAR 52.245-5, incorporated in Section I.

(d) The Contractor shall not use Contractor acquired property listed above for work other than that performed pursuant to this contract unless so authorized in writing by the Contracting Officer.

(e) This authorization is subject to the Contractor's compliance with the approvals and screening requirements set forth in DFARS Subpart 239.73 and DoD 7950.1-M, "Defense Automation Resources Management Manual."

(f) On-line screening for excess IT, regardless of cost, via remote terminal dial-up, is available to contractors through their Administrative Contracting Officers.

(end of clause)

Section 1 - Contract Clauses

CLAUSES INCORPORATED BY REFERENCE

52.202-1	Definitions	JUL 2004
52.203-3	Gratuities	APR 1984
52.203-5	Covenant Against Contingent Fees	APR 1984
52.203-6	Restrictions On Subcontractor Sales To The Government	JUL 1995
52.203-7	Anti-Kickback Procedures	JUL 1995
52.203-8	Cancellation, Rescission, and Recovery of Funds for Illegal or Improper Activity	JAN 1997
52.203-10	Price Or Fee Adjustment For Illegal Or Improper Activity	JAN 1997
52.203-12	Limitation On Payments To Influence Certain Federal Transactions	SEP 2005
52.204-4	Printed or Copied Double-Sided on Recycled Paper	AUG 2000
52.209-6	Protecting the Government's Interest When Subcontracting With Contractors Debarred, Suspended, or Proposed for Debarment	JAN 2005
52.215-10	Price Reduction for Defective Cost or Pricing Data	OCT 1997
52.215-12	Subcontractor Cost or Pricing Data	OCT 1997
52.215-15	Pension Adjustments and Asset Reversions	OCT 2004
52.215-18	Reversion or Adjustment of Plans for Postretirement Benefits (PRB) Other than Pensions	JUL 2005
52.216-7	Allowable Cost And Payment	DEC 2002
52.216-11	Cost Contract--No Fee	APR 1984
52.216-26	Payments Of Allowable Costs Before Definitization	DEC 2002
52.219-8	Utilization of Small Business Concerns	MAY 2004
52.222-3	Convict Labor	JUN 2003
52.222-21	Prohibition Of Segregated Facilities	FEB 1999
52.222-26	Equal Opportunity	APR 2002
52.222-35	Equal Opportunity For Special Disabled Veterans, Veterans of the Vietnam Era, and Other Eligible Veterans	DEC 2001
52.222-36	Affirmative Action For Workers With Disabilities	JUN 1998
52.222-37	Employment Reports On Special Disabled Veterans, Veterans Of The Vietnam Era, and Other Eligible Veterans	DEC 2001
52.222-39	Notification of Employee Rights Concerning Payment of Union Dues or Fees	DEC 2004
52.223-14	Toxic Chemical Release Reporting	AUG 2003
52.226-1	Utilization Of Indian Organizations And Indian-Owned Economic Enterprises	JUN 2000
52.227-2	Notice And Assistance Regarding Patent And Copyright Infringement	AUG 1996
52.228-7	Insurance--Liability To Third Persons	MAR 1996
52.232-9	Limitation On Withholding Of Payments	APR 1984
52.232-20	Limitation Of Cost	APR 1984
52.232-23 Alt I	Assignment of Claims (Jan 1986) - Alternate I	APR 1984
52.232-25	Prompt Payment	OCT 2003
52.232-33	Payment by Electronic Funds Transfer--Central Contractor Registration	OCT 2003
52.233-1	Disputes	JUL 2002
52.233-3 Alt I	Protest After Award (Aug 1996) - Alternate I	JUN 1985
52.242-1	Notice of Intent to Disallow Costs	APR 1984
52.242-3	Penalties for Unallowable Costs	MAY 2001

52.242-4	Certification of Final Indirect Costs	JAN 1997
52.243-2 Alt V	Changes--Cost-Reimbursement (Aug 1987) - Alternate V	APR 1984
52.244-6	Subcontracts for Commercial Items	FEB 2006
52.245-5 Dev	Government Property (Cost-Reimbursement, Time-and-Material, or Labor-Hour Contracts) Deviation	MAY 2004
52.245-9	Use And Charges	AUG 2005
52.249-6	Termination (Cost Reimbursement)	MAY 2004
52.249-14	Excusable Delays	APR 1984
52.252-6	Authorized Deviations In Clauses	APR 1984
52.253-1	Computer Generated Forms	JAN 1991
252.201-7000	Contracting Officer's Representative	DEC 1991
252.203-7001	Prohibition On Persons Convicted of Fraud or Other Defense-Contract-Related Felonies	DEC 2004
252.203-7002	Display Of DOD Hotline Poster	DEC 1991
252.204-7000	Disclosure Of Information	DEC 1991
252.204-7003	Control Of Government Personnel Work Product	APR 1992
252.204-7004 Alt A	Central Contractor Registration (52.204-7) Alternate A	NOV 2003
252.205-7000	Provision Of Information To Cooperative Agreement Holders	DEC 1991
252.209-7004	Subcontracting With Firms That Are Owned or Controlled By The Government of a Terrorist Country	MAR 1998
252.215-7000	Pricing Adjustments	DEC 1991
252.215-7002	Cost Estimating System Requirements	OCT 1998
252.219-7004	Small, Small Disadvantaged Women-Owned Business Subcontracting Plan (Test Program)	JUN 1997
252.225-7012	Preference For Certain Domestic Commodities	JUN 2004
252.227-7013	Rights in Technical Data--Noncommercial Items	NOV 1995
252.227-7014	Rights in Noncommercial Computer Software and Noncommercial Computer Software Documentation	JUN 1995
252.227-7015	Technical Data--Commercial Items	NOV 1995
252.227-7016	Rights in Bid or Proposal Information	JUN 1995
252.227-7019	Validation of Asserted Restrictions--Computer Software	JUN 1995
252.227-7027	Deferred Ordering Of Technical Data Or Computer Software	APR 1988
252.227-7037	Validation of Restrictive Markings on Technical Data	SEP 1999
252.231-7000	Supplemental Cost Principles	DEC 1991
252.232-7003	Electronic Submission of Payment Requests	MAY 2006
252.232-7010	Levies on Contract Payments	SEP 2005
252.235-7010	Acknowledgment of Support and Disclaimer	MAY 1995
252.235-7011	Final Scientific or Technical Report	NOV 2004
252.242-7004	Material Management And Accounting System	NOV 2005
252.243-7002	Requests for Equitable Adjustment	MAR 1998
252.244-7000	Subcontracts for Commercial Items and Commercial Components (DoD Contracts)	NOV 2005
252.247-7023	Transportation of Supplies by Sea	MAY 2002
252.247-7024	Notification Of Transportation Of Supplies By Sea	MAR 2000

CLAUSES INCORPORATED BY FULL TEXT

52.215-19 NOTIFICATION OF OWNERSHIP CHANGES (OCT 1997)

(a) The Contractor shall make the following notifications in writing:

(1) When the Contractor becomes aware that a change in its ownership has occurred, or is certain to occur, that could result in changes in the valuation of its capitalized assets in the accounting records, the Contractor shall notify the Administrative Contracting Officer (ACO) within 30 days.

(2) The Contractor shall also notify the ACO within 30 days whenever changes to asset valuations or any other cost changes have occurred or are certain to occur as a result of a change in ownership.

(b) The Contractor shall--

(1) Maintain current, accurate, and complete inventory records of assets and their costs;

(2) Provide the ACO or designated representative ready access to the records upon request;

(3) Ensure that all individual and grouped assets, their capitalized values, accumulated depreciation or amortization, and remaining useful lives are identified accurately before and after each of the Contractor's ownership changes; and

(4) Retain and continue to maintain depreciation and amortization schedules based on the asset records maintained before each Contractor ownership change.

The Contractor shall include the substance of this clause in all subcontracts under this contract that meet the applicability requirement of FAR 15.408(k).

(End of clause)

52.216-23 EXECUTION AND COMMENCEMENT OF WORK (APR 1984)

The Contractor shall indicate acceptance of this letter contract by signing three copies of the contract and returning them to the Contracting Officer not later than 28 September 2006. Upon acceptance by both parties, the Contractor shall proceed with performance of the work, including purchase of necessary materials.

(End of clause)

52.216-24 LIMITATION OF GOVERNMENT LIABILITY (APR 1984)

(a) In performing this contract, the Contractor is not authorized to make expenditures or incur obligations exceeding \$5,000,000 dollars.

(b) The maximum amount for which the Government shall be liable if this contract is terminated is \$5,000,000 dollars.

(End of clause)

52.222-2 PAYMENT FOR OVERTIME PREMIUMS (JUL 1990)

(a) The use of overtime is authorized under this contract if the overtime premium cost does not exceed zero (\$0.00) or the overtime premium is paid for work --

(1) Necessary to cope with emergencies such as those resulting from accidents, natural disasters, breakdowns of production equipment, or occasional production bottlenecks of a sporadic nature;

(2) By indirect-labor employees such as those performing duties in connection with administration, protection, transportation, maintenance, standby plant protection, operation of utilities, or accounting;

(3) To perform tests, industrial processes, laboratory procedures, loading or unloading of transportation conveyances, and operations in flight or afloat that are continuous in nature and cannot reasonably be interrupted or completed otherwise; or

(4) That will result in lower overall costs to the Government.

(b) Any request for estimated overtime premiums that exceeds the amount specified above shall include all estimated overtime for contract completion and shall--

(1) Identify the work unit; e.g., department or section in which the requested overtime will be used, together with present workload, staffing, and other data of the affected unit sufficient to permit the Contracting Officer to evaluate the necessity for the overtime;

(2) Demonstrate the effect that denial of the request will have on the contract delivery or performance schedule;

(3) Identify the extent to which approval of overtime would affect the performance or payments in connection with other Government contracts, together with identification of each affected contract; and

(4) Provide reasons why the required work cannot be performed by using multishift operations or by employing additional personnel.

* Insert either "zero" or the dollar amount agreed to during negotiations. The inserted figure does not apply to the exceptions in paragraph (a)(1) through (a)(4) of the clause.

(End of clause)

52.227-12 PATENT RIGHTS--RETENTION BY THE CONTRACTOR (LONG FORM) (JAN 1997)

(a) Definitions. "Invention" means any invention or discovery which is or may be patentable or otherwise protectable under title 35 of the United States Code or any novel variety of plant that is or may be protectable under the Plant Variety Protection Act (7 U.S.C. 2321, et seq.).

"Made" when used in relation to any invention means the conception or first actual reduction to practice of such invention.

"Nonprofit organization" means a domestic university or other institution of higher education or an organization of the type described in section 501(c)(3) of the Internal Revenue Code of 1954 (26 U.S.C. 501(c)) and exempt from taxation under section 501(a) of the Internal Revenue Code (26 U.S.C. 501(a)) or any nonprofit scientific or educational organization qualified under a state nonprofit organization statute.

"Practical application" means to manufacture in the case of a composition or product, to practice in the case of a process or method, or to operate in the case of a machine or system; and, in each case, under such conditions as to establish that the invention is being utilized and that its benefits are, to the extent permitted by law or Government regulations, available to the public on reasonable terms.

"Small business firm" means a small business concern as defined at section 2 of Pub. L. 85-536 (15 U.S.C. 632) and implementing regulations of the Administrator of the Small Business Administration. For the purpose of this clause, the size standards for small business concerns involved in Government procurement and subcontracting at 13 CFR 121.3-8 and 13 CFR 121.3-12, respectively, will be used.

"Subject invention" means any invention of the Contractor conceived or first actually reduced to practice in the performance of work under this contract; provided, that in the case of a variety of plant, the date of determination (as defined in section 41(d) of the Plant Variety Protection Act, 7 U.S.C. 2401(d)) must also occur during the period of contract performance.

(b) Allocation of principal rights. The Contractor may elect to retain the entire right, title, and interest throughout the world to each subject invention subject to the provisions of this clause and 35 U.S.C. 203. With respect to any subject invention in which the Contractor elects to retain title, the Federal Government shall have a nonexclusive, nontransferable, irrevocable, paid-up license to practice or have practiced for or on behalf of the United States the subject invention throughout the world.

(c) Invention disclosure, election of title, and filing of patent applications by Contractor. (1) The Contractor shall disclose each subject invention to the Contracting Officer within 2 months after the inventor discloses it in writing to Contractor personnel responsible for patent matters or within 6 months after the Contractor becomes aware that a subject invention has been made, whichever is earlier. The disclosure to the Contracting Officer shall be in the form of a written report and shall identify the contract under which the invention was made and the inventor(s). It shall be sufficiently complete in technical detail to convey a clear understanding, to the extent known at the time of the disclosure, of the nature, purpose, operation, and physical, chemical, biological, or electrical characteristics of the invention. The disclosure shall also identify any publication, on sale, or public use of the invention and whether a manuscript describing the invention has been submitted for publication and, if so, whether it has been accepted for publication at the time of disclosure. In addition, after disclosure to the Contracting Officer, the Contractor shall promptly notify the Contracting Officer of the acceptance of any manuscript describing the invention for publication or of any on sale or public use planned by the Contractor.

(2) The Contractor shall elect in writing whether or not to retain title to any such invention by notifying the Federal agency at the time of disclosure or within 8 months of disclosure, as to those countries (including the United States) in which the Contractor will retain title; provided, that in any case where publication, on sale, or public use has initiated the 1-year statutory period wherein valid patent protection can still be obtained in the United States, the period of election of title may be shortened by the agency to a date that is no more than 60 days prior to the end of the statutory period.

(3) The Contractor shall file its initial patent application on an elected invention within 1 year after election or, if earlier, prior to the end of any statutory period wherein valid patent protection can be obtained in the United States after a publication, on sale, or public use. The Contractor shall file patent applications in additional countries (including the European Patent Office and under the Patent Cooperation Treaty) within either 10 months of the corresponding initial patent application or 6 months from the date permission is granted by the Commissioner of Patents and Trademarks to file foreign patent applications where such filing has been prohibited by a Secrecy Order.

(4) Requests for extension of the time for disclosure to the Contracting Officer, election, and filing may, at the discretion of the funding Federal agency, be granted, and will normally be granted unless the Contracting Officer has reason to believe that a particular extension would prejudice the Government's interest.

(d) Conditions when the Government may obtain title. The Contractor shall convey to the Federal agency, upon written request, title to any subject invention--

(1) If the Contractor elects not to retain title to a subject invention;

(2) If the Contractor fails to disclose or elect the subject invention within the times specified in paragraph (c) above (the agency may only request title within 60 days after learning of the Contractor's failure to report or elect within the specified times);

(3) In those countries in which the Contractor fails to file patent applications within the time specified in paragraph (c) above; provided, however, that if the Contractor has filed a patent application in a country after the times specified in paragraph (c) above, but prior to its receipt of the written request of the Federal agency, the Contractor

shall continue to retain title in that country, or

(4) In any country in which the Contractor decides not to continue the prosecution of any application for, to pay the maintenance fees on, or defend in reexamination or opposition proceeding on, a patent on a subject invention.

(c) Minimum rights to Contractor. (1) The Contractor shall retain a nonexclusive, royalty-free license throughout the world in each subject invention to which the Government obtains title except if the Contractor fails to disclose the subject invention within the times specified in paragraph (c) above. The Contractor's license extends to its domestic subsidiaries and affiliates, if any, within the corporate structure of which the Contractor is a part and includes the right to grant sublicenses of the same scope to the extent the Contractor was legally obligated to do so at the time the contract was awarded. The license is transferable only with the approval of the funding Federal agency except when transferred to the successor of that part of the Contractor's business to which the invention pertains.

(2) The Contractor's domestic license may be revoked or modified by the funding Federal agency to the extent necessary to achieve expeditious practical application of the subject invention pursuant to an application for an exclusive license submitted in accordance with applicable provisions in the Federal Property Management Regulations and agency licensing regulations (if any). This license shall not be revoked in that field of use or the geographical areas in which the Contractor has achieved practical application and continues to make the benefits of the invention reasonably accessible to the public. The license in any foreign country may be revoked or modified at the discretion of the funding Federal agency to the extent the Contractor, its licensees, or its domestic subsidiaries or affiliates have failed to achieve practical application in that foreign country.

(3) Before revocation or modification of the license, the funding Federal agency shall furnish the Contractor a written notice of its intention to revoke or modify the license, and the Contractor shall be allowed 30 days (or such other time as may be authorized by the funding Federal agency for good cause shown by the Contractor) after the notice to show cause why the license should not be revoked or modified. The Contractor has the right to appeal, in accordance with applicable agency licensing regulations and 37 CFR 404 concerning the licensing of Government-owned inventions, any decision concerning the revocation or modification of its license.

(f) Contractor action to protect the Government's interest. (1) The Contractor agrees to execute or to have executed and promptly deliver to the Federal agency all instruments necessary to (i) establish or confirm the rights the Government has throughout the world in those subject inventions to which the Contractor elects to retain title, and (ii) convey title to the Federal agency when requested under paragraph (d) above and subparagraph (n)(2) below, and to enable the Government to obtain patent protection throughout the world in that subject invention.

(2) The Contractor agrees to require, by written agreement, its employees, other than clerical and nontechnical employees, to disclose promptly in writing to personnel identified as responsible for the administration of patent matters and in a format suggested by the Contractor each subject invention made under contract in order that the Contractor can comply with the disclosure provisions of paragraph (c) above, and to execute all papers necessary to file patent applications on subject inventions and to establish the Government's rights in the subject inventions. This disclosure format should require, as a minimum, the information required by subparagraph (c)(1) above. The Contractor shall instruct such employees through employee agreements or other suitable educational programs on the importance of reporting inventions in sufficient time to permit the filing of patent applications prior to U.S. or foreign statutory bars.

(3) The Contractor shall notify the Federal agency of any decision not to continue the prosecution of a patent application, pay maintenance fees, or defend in a reexamination or opposition proceeding on a patent, in any country, not less than 30 days before the expiration of the response period required by the relevant patent office.

(4) The Contractor agrees to include, within the specification of any United States patent application and any patent issuing thereon covering a subject invention, the following statement: "This invention was made with Government support under (identify the contract) awarded by (identify the Federal agency). The Government has certain rights in this invention."

(5) The Contractor shall establish and maintain active and effective procedures to assure that subject inventions are promptly identified and disclosed to Contractor personnel responsible for patent matters within 6 months of conception and/or first actual reduction to practice, whichever occurs first in performance of work under this contract. These procedures shall include the maintenance of laboratory notebooks or equivalent records and other records as are reasonably necessary to document the conception and/or the first actual reduction to practice of subject inventions, and records that show that the procedures for identifying and disclosing the inventions are followed. Upon request, the Contractor shall furnish the Contracting Officer a description of such procedures for evaluation and for determination as to their effectiveness.

(6) The Contractor agrees, when licensing a subject invention, to arrange to avoid royalty charges on acquisitions involving Government funds, including funds derived through Military Assistance Program of the Government or otherwise derived through the Government, to refund any amounts received as royalty charges on the subject invention in acquisitions for, or on behalf of, the Government, and to provide for such refund in any instrument transferring rights in the invention to any party.

(7) The Contractor shall furnish the Contracting Officer the following:

(i) Interim reports every 12 months (or such longer period as may be specified by the Contracting Officer) from the date of the contract, listing subject inventions during that period and stating that all subject inventions have been disclosed or that there are no such inventions.

(ii) A final report, within 3 months after completion of the contracted work, listing all subject inventions or stating that there were no such inventions, and listing all subcontracts at any tier containing a patent rights clause or stating that there were no such subcontracts.

(8) The Contractor shall promptly notify the Contracting Officer in writing upon the award of any subcontract at any tier containing a patent rights clause by identifying the subcontractor, the applicable patent rights clause, the work to be performed under the subcontract, and the dates of award and estimated completion. Upon request of the Contracting Officer, the Contractor shall furnish a copy of such subcontract, and no more frequently than annually, a listing of the subcontracts that have been awarded.

(9) In the event of a refusal by a prospective subcontractor to accept one of the clauses in subparagraph (g)(1) or (2) below, the Contractor (i) shall promptly submit a written notice to the Contracting Officer setting forth the subcontractor's reasons for such refusal and other pertinent information that may expedite disposition of the matter and (ii) shall not proceed with such subcontracting without the written authorization of the Contracting Officer.

(10) The Contractor shall provide, upon request, the filing date, serial number and title, a copy of the patent application (including an English-language version if filed in a language other than English), and patent number and issue date for any subject invention for which the Contractor has retained title.

(11) Upon request, the Contractor shall furnish the Government an irrevocable power to inspect and make copies of the patent application file.

(g) Subcontracts. (1) The Contractor shall include the clause at 52.227-11 of the Federal Acquisition Regulation (FAR), suitably modified to identify the parties, in all subcontracts, regardless of tier, for experimental, developmental, or research work to be performed by a small business firm or nonprofit organization. The subcontractor shall retain all rights provided for the Contractor in this clause, and the Contractor shall not, as part of the consideration for awarding the subcontract, obtain rights in the subcontractor's subject inventions.

(2) The Contractor shall include this clause (FAR 52.227-12) in all other subcontracts, regardless of tier, for experimental, developmental, or research work.

(3) In the case of subcontracts, at any tier, when the prime award with the Federal agency was a contract (but not a grant or cooperative agreement), the agency, subcontractor, and the Contractor agree that the mutual obligations of

the parties created by this clause constitute a contract between the subcontractor and the Federal agency with respect to those matters covered by this clause.

(h) Reporting utilization of subject inventions. The Contractor agrees to submit on request periodic reports no more frequently than annually on the utilization of a subject invention or on efforts at obtaining such utilization that are being made by the Contractor or its licensees or assignees. Such reports shall include information regarding the status of development, date of first commercial sale or use, gross royalties received by the Contractor, and such other data and information as the agency may reasonably specify. The Contractor also agrees to provide additional reports as may be requested by the agency in connection with any march-in proceedings undertaken by the agency in accordance with paragraph (j) of this clause. To the extent data or information supplied under this paragraph is considered by the Contractor, its licensee or assignee to be privileged and confidential and is so marked, the agency agrees that, to the extent permitted by law, it shall not disclose such information to persons outside the Government.

(i) Preference for United States industry. Notwithstanding any other provision of this clause, the Contractor agrees that neither it nor any assignee will grant to any person the exclusive right to use or sell any subject invention in the United States unless such person agrees that any products embodying the subject invention will be manufactured substantially in the United States. However, in individual cases, the requirement for such an agreement may be waived by the Federal agency upon a showing by the Contractor or its assignee that reasonable but unsuccessful efforts have been made to grant licenses on similar terms to potential licensees that would be likely to manufacture substantially in the United States or that under the circumstances domestic manufacture is not commercially feasible.

(j) March-in rights. The Contractor agrees that with respect to any subject invention in which it has acquired title, the Federal agency has the right in accordance with the procedures in FAR 27.304-1(g) to require the Contractor, an assignee, or exclusive licensee of a subject invention to grant a nonexclusive, partially exclusive, or exclusive license in any field of use to a responsible applicant or applicants, upon terms that are reasonable under the circumstances, and if the Contractor, assignee, or exclusive licensee refuses such a request, the Federal agency has the right to grant such a license itself if the Federal agency determines that--

(1) Such action is necessary because the Contractor or assignee has not taken, or is not expected to take within a reasonable time, effective steps to achieve practical application of the subject invention in such field of use;

(2) Such action is necessary to alleviate health or safety needs which are not reasonably satisfied by the Contractor, assignee, or their licensees;

(3) Such action is necessary to meet requirements for public use specified by Federal regulations and such requirements are not reasonably satisfied by the Contractor, assignee, or licensees; or

(4) Such action is necessary because the agreement required by paragraph (i) of this clause has not been obtained or waived or because a licensee of the exclusive right to use or sell any subject invention in the United States is in breach of such agreement.

(k) Special provisions for contracts with nonprofit organizations. [Reserved]

(l) Communications. All written notifications/reports required by this clause shall be submitted to the Administrative Contracting Officer (ACO). Upon written authorization by the Procuring Contracting Officer (PCO) or ACO, required reports shall be submitted using the i-Edison.gov reporting website (<https://s-edison.info.nih.gov/iEdison/>).

(m) Other inventions. Nothing contained in this clause shall be deemed to grant to the Government any rights with respect to any invention other than a subject invention.

(n) Examination of records relating to inventions. (1) The Contracting Officer or any authorized representative shall, until 3 years after final payment under this contract, have the right to examine any books (including laboratory notebooks), records, and documents of the Contractor relating to the conception or first reduction to practice of inventions in the same field of technology as the work under this contract to determine whether--

- (i) Any such inventions are subject inventions;
 - (ii) The Contractor has established and maintains the procedures required by subparagraphs (f)(2) and (f)(3) of this clause; and
 - (iii) The Contractor and its inventors have complied with the procedures.
- (2) If the Contracting Officer determines that an inventor has not disclosed a subject invention to the Contractor in accordance with the procedures required by subparagraph (f)(5) of this clause, the Contracting Officer may, within 60 days after the determination, request title in accordance with subparagraphs (d)(2) and (d)(3) of this clause. However, if the Contractor establishes that the failure to disclose did not result from the Contractor's fault or negligence, the Contracting Officer shall not request title.
- (3) If the Contracting Officer learns of an unreported Contractor invention which the Contracting Officer believes may be a subject invention, the Contractor may be required to disclose the invention to the agency for a determination of ownership rights.
- (4) Any examination of records under this paragraph shall be subject to appropriate conditions to protect the confidentiality of the information involved.
- (o) Withholding of payment (this paragraph does not apply to subcontracts). (1) Any time before final payment under this contract, the Contracting Officer may, in the Government's interest, withhold payment until a reserve not exceeding \$50,000 or 5 percent of the amount of the contract, whichever is less, shall have been set aside if, in the Contracting Officer's opinion, the Contractor fails to--
- (i) Establish, maintain, and follow effective procedures for identifying and disclosing subject inventions pursuant to subparagraph (f)(5) above;
 - (ii) Disclose any subject invention pursuant to subparagraph (c)(1) above;
 - (iii) Deliver acceptable interim reports pursuant to subdivision (f)(7)(i) above; or
 - (iv) Provide the information regarding subcontracts pursuant to subparagraph (f)(8) of this clause.
- (2) Such reserve or balance shall be withheld until the Contracting Officer has determined that the Contractor has rectified whatever deficiencies exist and has delivered all reports, disclosures, and other information required by this clause.
- (3) Final payment under this contract shall not be made before the Contractor delivers to the Contracting Officer all disclosures of subject inventions required by subparagraph (c)(1) above, an acceptable final report pursuant to subdivision (f)(7)(ii) above, and all past due confirmatory instruments.
- (4) The Contracting Officer may decrease or increase the sums withheld up to the maximum authorized above. No amount shall be withheld under this paragraph while the amount specified by this paragraph is being withheld under other provisions of the contract. The withholding of any amount or the subsequent payment thereof shall not be construed as a waiver of any Government right.
- (End of clause)

52.233-4 APPLICABLE LAW FOR BREACH OF CONTRACT CLAIM (OCT 2004)

United States law will apply to resolve any claim of breach of this contract.

(End of clause)

52.244-2 SUBCONTRACTS (AUG 1998)

(a) Definitions. As used in this clause--

Approved purchasing system means a Contractor's purchasing system that has been reviewed and approved in accordance with Part 44 of the Federal Acquisition Regulation (FAR).

Consent to subcontract means the Contracting Officer's written consent for the Contractor to enter into a particular subcontract.

Subcontract means any contract, as defined in FAR Subpart 2.1, entered into by a subcontractor to furnish supplies or services for performance of the prime contract or a subcontract. It includes, but is not limited to, purchase orders, and changes and modifications to purchase orders.

(b) This clause does not apply to subcontracts for special test equipment when the contract contains the clause at FAR 52.245-18, Special Test Equipment.

(c) When this clause is included in a fixed-price type contract, consent to subcontract is required only on unpriced contract actions (including unpriced modifications or unpriced delivery orders), and only if required in accordance with paragraph (d) or (e) of this clause.

(d) If the Contractor does not have an approved purchasing system, consent to subcontract is required for any subcontract that--

(1) Is of the cost-reimbursement, time-and-materials, or labor-hour type; or

(2) Is fixed-price and exceeds--

(i) For a contract awarded by the Department of Defense, the Coast Guard, or the National Aeronautics and Space Administration, the greater of the simplified acquisition threshold or 5 percent of the total estimated cost of the contract; or

(ii) For a contract awarded by a civilian agency other than the Coast Guard and the National Aeronautics and Space Administration, either the simplified acquisition threshold or 5 percent of the total estimated cost of the contract.

(e) If the Contractor has an approved purchasing system, the Contractor nevertheless shall obtain the Contracting Officer's written consent before placing the following subcontracts:

See Section H

(f)(1) The Contractor shall notify the Contracting Officer reasonably in advance of placing any subcontract or modification thereof for which consent is required under paragraph (c), (d), or (e) of this clause, including the following information:

(i) A description of the supplies or services to be subcontracted.

(ii) Identification of the type of subcontract to be used.

- (iii) Identification of the proposed subcontractor.
- (iv) The proposed subcontract price.
- (v) The subcontractor's current, complete, and accurate cost or pricing data and Certificate of Current Cost or Pricing Data, if required by other contract provisions.
- (vi) The subcontractor's Disclosure Statement or Certificate relating to Cost Accounting Standards when such data are required by other provisions of this contract.
- (vii) A negotiation memorandum reflecting--
 - (A) The principal elements of the subcontract price negotiations;
 - (B) The most significant considerations controlling establishment of initial or revised prices;
 - (C) The reason cost or pricing data were or were not required;
 - (D) The extent, if any, to which the Contractor did not rely on the subcontractor's cost or pricing data in determining the price objective and in negotiating the final price;
 - (E) The extent to which it was recognized in the negotiation that the subcontractor's cost or pricing data were not accurate, complete, or current; the action taken by the Contractor and the subcontractor; and the effect of any such defective data on the total price negotiated;
 - (F) The reasons for any significant difference between the Contractor's price objective and the price negotiated; and
 - (G) A complete explanation of the incentive fee or profit plan when incentives are used. The explanation shall identify each critical performance element, management decisions used to quantify each incentive element, reasons for the incentives, and a summary of all trade-off possibilities considered.
- (2) The Contractor is not required to notify the Contracting Officer in advance of entering into any subcontract for which consent is not required under paragraph (c), (d), or (e) of this clause.
 - (g) Unless the consent or approval specifically provides otherwise, neither consent by the Contracting Officer to any subcontract nor approval of the Contractor's purchasing system shall constitute a determination--
 - (1) Of the acceptability of any subcontract terms or conditions;
 - (2) Of the allowability of any cost under this contract; or
 - (3) To relieve the Contractor of any responsibility for performing this contract.
 - (h) No subcontract or modification thereof placed under this contract shall provide for payment on a cost-plus-a-percentage-of-cost basis, and any fee payable under cost-reimbursement type subcontracts shall not exceed the fee limitations in FAR 15.404-4(c)(4)(i).
 - (i) The Contractor shall give the Contracting Officer immediate written notice of any action or suit filed and prompt notice of any claim made against the Contractor by any subcontractor or vendor that, in the opinion of the Contractor, may result in litigation related in any way to this contract, with respect to which the Contractor may be entitled to reimbursement from the Government.
 - (j) The Government reserves the right to review the Contractor's purchasing system as set forth in FAR Subpart 44.3.

(k) Paragraphs (d) and (f) of this clause do not apply to the following subcontracts, which were evaluated during negotiations:

See Section H.

(End of clause)

52.252-2 CLAUSES INCORPORATED BY REFERENCE (FEB 1998)

This contract incorporates one or more clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. Also, the full text of a clause may be accessed electronically at this/these address(es):

<http://farsite.hill.af.mil/>

(End of clause)

252.217-7027 CONTRACT DEFINITIZATION (OCT 1998)

(a) A Cost-Plus-Fixed-Fee contract is contemplated. The Contractor agrees to begin promptly negotiating with the Contracting Officer the terms of a definitive contract that will include (1) all clauses required by the Federal Acquisition Regulation (FAR) on the date of execution of the undefinitized contract action, (2) all clauses required by law on the date of execution of the definitive contract action, and (3) any other mutually agreeable clauses, terms, and conditions. The Contractor agrees to submit a Cost-Plus-Fixed-Fee proposal and cost or pricing data supporting its proposal.

(b) The schedule for definitizing this contract is as follows (insert target date for definitization of the contract action and dates for submission of proposal, beginning of negotiations, and, if appropriate, submission of the make-or-buy and subcontracting plans and cost or pricing data).

- Submission of final qualifying cost proposal with buildup supporting Phases 1 - 3, vendor-quotes for all material/equipment with an estimated unit price of greater than \$5,000 (unless otherwise directed by the Procuring Contracting Officer (PCO) and/or appropriate supporting basis-of-estimate details, full unredacted subcontract proposals, subcontract proposal evaluation/analysis as required by FAR Part 15, and supporting basis-of-estimate details for all elements of cost proposed. Due on or before 31 October 2006
- Beginning of negotiations - on or before 9 November 2006
- Definitization negotiations completed - on or before 1 December 2006
- Execution of definitization modification - on or before 15 December 2006

(c) If agreement on a definitive contract action to supersede this undefinitized contract action is not reached by the target date in paragraph (b) of this clause, or within any extension of it granted by the Contracting Officer, the Contracting Officer may, with the approval of the head of the contracting activity, determine a reasonable price or fee in accordance with subpart 15.4 and part 31 of the FAR, subject to Contractor appeal as provided in the Disputes clause. In any event, the Contractor shall proceed with completion of the contract, subject only to the Limitation of Government Liability clause.

(1) After the Contracting Officer's determination of price or fee, the contract shall be governed by--

- (i) All clauses required by the FAR on the date of execution of this undefinitized contract action for either fixed-price or cost-reimbursement contracts, as determined by the Contracting Officer under this paragraph (c);
- (ii) All clauses required by law as of the date of the Contracting Officer's determination; and
- (iii) Any other clauses, terms, and conditions mutually agreed upon.

(2) To the extent consistent with paragraph (c)(1) of this clause, all clauses, terms, and conditions included in this undefinitized contract action shall continue in effect, except those that by their nature apply only to an undefinitized contract action.

(d) The definitive contract resulting from this undefinitized contract action will include a negotiated Cost-Plus-Fixed-Fee amount in no event to exceed \$10,000,000.

(End of clause)

252.223-7004 DRUG-FREE WORK FORCE (SEP 1988)

(a) Definitions.

(1) "Employee in a sensitive position," as used in this clause, means an employee who has been granted access to classified information; or employees in other positions that the Contractor determines involve national security; health or safety, or functions other than the foregoing requiring a high degree of trust and confidence.

(2) "Illegal drugs," as used in this clause, means controlled substances included in Schedules I and II, as defined by section 802(6) of title 21 of the United States Code, the possession of which is unlawful under chapter 13 of that Title. The term "illegal drugs" does not mean the use of a controlled substance pursuant to a valid prescription or other uses authorized by law.

(b) The Contractor agrees to institute and maintain a program for achieving the objective of a drug-free work force. While this clause defines criteria for such a program, contractors are encouraged to implement alternative approaches comparable to the criteria in paragraph (c) that are designed to achieve the objectives of this clause.

(c) Contractor programs shall include the following, or appropriate alternatives:

- (1) Employee assistance programs emphasizing high level direction, education, counseling, rehabilitation, and coordination with available community resources;
- (2) Supervisory training to assist in identifying and addressing illegal drug use by Contractor employees;
- (3) Provision for self-referrals as well as supervisory referrals to treatment with maximum respect for individual confidentiality consistent with safety and security issues;
- (4) Provision for identifying illegal drug users, including testing on a controlled and carefully monitored basis. Employee drug testing programs shall be established taking account of the following:

(i) The Contractor shall establish a program that provides for testing for the use of illegal drugs by employees in sensitive positions. The extent of and criteria for such testing shall be determined by the Contractor based on considerations that include the nature of the work being performed under the contract, the employee's duties, and efficient use of Contractor resources, and the risks to health, safety, or national security that could result from the failure of an employee adequately to discharge his or her position.

(ii) In addition, the Contractor may establish a program for employee drug testing--

(A) When there is a reasonable suspicion that an employee uses illegal drugs; or

(B) When an employees has been involved in an accident or unsafe practice;

(C) As part of or as a follow-up to counseling or rehabilitation for illegal drug use;

(D) As part of a voluntary employee drug testing program.

(iii) The Contractor may establish a program to test applicants for employment for illegal drug use.

(iv) For the purpose of administering this clause, testing for illegal drugs may be limited to those substances for which testing is prescribed by section 2.1 of subpart B of the "Mandatory Guidelines for Federal Workplace Drug Testing Programs" (53 FR 11980 (April 11, 1988), issued by the Department of Health and Human Services.

(d) Contractors shall adopt appropriate personnel procedures to deal with employees who are found to be using drugs illegally. Contractors shall not allow any employee to remain on duty or perform in a sensitive position who is found to use illegal drugs until such times as the Contractor, in accordance with procedures established by the Contractor, determines that the employee may perform in such a position.

(e) The provisions of this clause pertaining to drug testing program shall not apply to the extent that are inconsistent with state or local law, or with an existing collective bargaining agreement; provided that with respect to the latter, the Contractor agrees those issues that are in conflict will be a subject of negotiation at the next collective bargaining session.

(End of clause)

Section J - List of Documents, Exhibits and Other Attachments

Exhibit/Attachment Table of Contents

DOCUMENT TYPE	DESCRIPTION	PAGES	DATE
Exhibit A	CLIN 0001 Exhibit(s)	9	N/A
Attachment 1	Statement of Work	7	22 Sep 2006

CONTRACT NO. HR0011-06-C-0144

EXHIBIT A - CDRL A001

CONTRACT DATA REQUIREMENTS LIST
(1 Data Item)

Form Approved
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 110 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503. Please DO NOT RETURN your form to either of these addresses. Send completed form to the Government Issuing Contracting Officer for the Contract/PR No. listed in Block E.

A. CONTRACT LINE ITEM NO. 0001				B. EXHIBIT A		C. CATEGORY TDP TM- OTHER MISC				
D. SYSTEM/ITEM VADER - DMTI Phase 1				E. CONTRACT/PR NO. HR0011-06-C-0144		F. CONTRACTOR Northrop Grumman - ES				
1. DATA ITEM NO. A001		2. TITLE OF DATA ITEM RESEARCH AND DEVELOPMENT (R&D) PROJECT SUMMARY				3. SUBTITLE T-FIMS QUARTERLY AND MONTHLY REPORTING				
4. AUTHORITY (Data Acquisition Document No.) DI-MISC-81612A			5. CONTRACT REFERENCE C-2			6. REQUIRING OFFICE IXO				
7. DD250 REQ SEE BLOCK 16		9. DIST STATEMENT REQUIRED B (See H-3)	10. FREQUENCY SEE BLOCK 16		12. DATE OF FIRST SUBMISSION SEE BLOCK 16		14. DISTRIBUTION			
8. APP CODE N			11. AS OF DATE 0		13. DATE OF SUBSEQUENT SUBMISSION N/A		d. COPIES			
							e. ADDRESSEE		Final	
							Draft		Reg	
									Repro	
18. REMARKS REFERENCE BLOCK 2, RESEARCH AND DEVELOPMENT PROJECT SUMMARY, AND BLOCK 4, DI-MISC-81612A. FORMAT. <ul style="list-style-type: none"> GENERAL FORMAT INSTRUCTIONS: COMPLY WITH ALL INSTRUCTIONS DELINEATED ON THE DARPA T-FIMS WEB SITE (http://www.tfims.darpa.mil). SPECIAL INSTRUCTIONS: UPLOAD THE FOLLOWING ITEMS TO THE DARPA T-FIMS WEB SITE (http://www.tfims.darpa.mil). <ul style="list-style-type: none"> PUBLICATIONS THIS PERIOD (3.1.7) IN ADOBE ACROBAT (PDF) FILE FORMAT. UPDATED SCHEDULE AND MILESTONES (1.2.2.4) IN EITHER POWERPOINT (PPT), JPG, TIFF, OR PDF FILE FORMAT. QUAD-CHART (1.2.2.7) IN MICROSOFT POWERPOINT (PPT) FILE FORMAT. ELECTRONIC SUBMISSION. THE CONTRACTOR SHALL ACCESS THE DARPA T-FIMS WEB SITE (http://www.tfims.darpa.mil) AND ELECTRONICALLY SUBMIT ALL REQUIRED REPORTING INFORMATION FOLLOWING THE SPECIFICATIONS OUTLINED BELOW. POST-AWARD INITIAL SUBMISSION REQUIREMENT. <ul style="list-style-type: none"> SUBMIT THE PERFORMING ORGANIZATION CONTACTS (1.1.2) WITHIN FIVE (5) CALENDAR DAYS AFTER CONTRACT AWARD TO T-FIMS HELP BY E-MAIL (Tfims-Help@darpa.mil) FOR AWARDEE USER ACCOUNT ACTIVATION. 										
15. TOTAL										
G. PREPARED BY				H. DATE		I. APPROVED BY				J. DATE

CONTRACT DATA REQUIREMENTS LIST, DD FORM 1423 CONTINUATION SHEET

CLIN 0001

Exhibit A

HR0011-06-C-0144

PR No.

DATA ITEM No. A001

BLOCK 16, continued,

REPORTING TERMINOLOGY - QUARTERLY REPORTING PERIODS.

- JUL-SEP: COVERS PERFORMANCE FROM 1 JULY - 30 SEPTEMBER
- OCT-DEC: COVERS PERFORMANCE FROM 1 OCTOBER - 31 DECEMBER
- JAN-MAR: COVERS PERFORMANCE FROM 1 JANUARY - 31 MARCH
- APR-JUN: COVERS PERFORMANCE FROM 1 APRIL - 30 JUNE

QUARTERLY SUBMISSION REQUIREMENTS.

- FREQUENCY (BLOCK 10). INPUT FOUR (4) TIMES YEARLY, ONCE FOR EACH OF THE QUARTERLY REPORTING PERIODS CITED ABOVE, FOR THE DURATION OF THE CONTRACT.
- DATE OF FIRST SUBMISSION (BLOCK 12). SUBMIT WITHIN FIFTEEN (15) CALENDAR DAYS AFTER THE END OF MOST RECENT QUARTERLY REPORTING PERIOD
 - FOR REPORTING PERIOD JUL-SEP, DUE DATE IS OCTOBER 15
 - FOR REPORTING PERIOD OCT-DEC, DUE DATE IS JANUARY 15
 - FOR REPORTING PERIOD JAN-MAR, DUE DATE IS APRIL 15
 - FOR REPORTING PERIOD APR-JUN, DUE DATE IS JULY 15
- QUARTERLY CONTENT REQUIREMENTS.
 - MINIMAL INITIAL QUARTERLY SUBMISSION. IF THE AWARD OCCURS WITHIN THIRTY (30) CALENDAR DAYS PRIOR TO THE END OF THE QUARTERLY REPORTING PERIOD, SUBMIT PROJECT DESCRIPTION (1.2.2) ONLY.
 - FIRST QUARTERLY SUBMITTAL WILL CONTAIN RESPONSES TO ALL PROJECT INFORMATION (1), WITH THE EXCEPTION OF THE QUAD CHART (1.2.2.7); THE FUNDING REPORT (2), WITH THE EXCEPTION OF THE PROJECTED FUNDING INCREMENT (2.5); AND THE TECHNICAL REPORT (3).
 - FOR ALL OTHER QUARTERLY SUBMISSIONS, SUBMIT OR UPDATE THE ADMINISTRATIVE INFORMATION (1.1), INVOICES THIS PERIOD (2.2), PLANNED INCURRED EXPENSES (2.4), AND ALL THE INFORMATION UNDER THE TECHNICAL REPORT (3.)
 - IN ADDITION, SUBMIT THE FOLLOWING FOR THE APR-JUN QUARTERLY REPORTS.
 - QUAD CHART (1.2.2.7).
 - PROJECTED FUNDING INCREMENT (2.5).
 - IN ADDITION TO REPORTING THE PLANNED ACTIVITIES FOR THE NEXT MONTH (3.2.1.), INCLUDE A TOP-LEVEL BULLET LIST OF THE PLANNED ACTIVITIES FOR THE TIME PERIOD BEGINNING ON 1 AUGUST OF THE CURRENT YEAR AND ENDING ON 31 DECEMBER OF THE NEXT YEAR.

MONTHLY SUBMISSION REQUIREMENTS.

- FREQUENCY (BLOCK 10). INPUT TWELVE (12) TIMES YEARLY (MONTHLY) FOR THE DURATION OF THE CONTRACT.
- DATE OF FIRST SUBMISSION (BLOCK 12). SUBMIT WITHIN FIFTEEN (15) CALENDAR DAYS AFTER THE END OF THE FIRST CALENDAR MONTH BUT NO SOONER THAN THIRTY (30) DAYS AFTER AWARD.
- MONTHLY CONTENT REQUIREMENT.
 - FOR THE DURATION OF THE CONTRACT SUBMIT INCURRED EXPENSES THIS PERIOD (2.1) AS A LUMP SUM TOTAL ONLY.
 - FOR THE DURATION OF THE CONTRACT SUBMIT INVOICES THIS PERIOD (2.2) AS INVOICES ARE SUBMITTED TO DFAS FOR PAYMENT.

CLASSIFICATION. THE ENTIRE REPORT SHALL BE UNCLASSIFIED.

PROCURING CONTRACTING OFFICER (PCO), REFERENCE SF 26, BLOCK 5.

ADMINISTRATIVE CONTRACTING OFFICER (ACO) REFERENCE SF 26, BLOCK 6.

DD FORM 250 SHALL BE SUBMITTED WITH THE FINAL TECHNICAL REPORT

DATA ITEM DESCRIPTION

Title: RESEARCH AND DEVELOPMENT (R&D) PROJECT SUMMARY

Number: DI-MISC-81612A

Approval Date: 20031215

AMSC Number: D7517

Limitation:

DTIC Applicable: N/A

GIDEP Applicable: N/A

Preparing Activity: OSD-SO (FOR DARPA/IXO)

Applicable Forms: N/A

Use, Relationships:

The R&D Project Summary reports key project administrative, programmatic, technical and financial data. The R&D Project Summary includes administrative and funding information, research objectives, innovative approaches, accomplishments, plans, technology transitions, technology transfers, and issues. The technical and financial information contained in the R&D Project Summary enables comprehensive assessment of project goals, progress and status. This Data Item Description (DID) contains format and content preparation instructions for the data product generated by specific and discrete task requirements as delineated in the contract statement of work (SOW).

Requirements:

1. Project Information.

1.1. Administrative Information.

1.1.1. Subcontractors. Verify each subcontractor.

1.1.2. Performing Organization Contacts.

1.1.2.1. Principal Investigator(s) Contact. Verify the name, organization, business address, business phone, business fax, and e-mail address of each principal investigator.

1.1.2.2. Administrative Contact. Verify the name, organization, business address, business phone, business fax, and e-mail address of the administrative point of contact.

1.1.2.3. Financial Data Contact. Verify the name, organization, business address, business phone, business fax, and e-mail address of the contact for financial data.

1.1.2.4. Programmatic/Technical Reporter Contact. If the Principal Investigator is not the reporter of the programmatic/technical data verify the name, organization, business address, business phone, business fax, and e-mail address of the programmatic/technical reporter point of contact.

1.2. Programmatic Information.

1.2.1. Project Uniform Resource Locator (URL). Provide the project URL.

1.2.2. Project Description.

1.2.2.1. Research Objectives.

1.2.2.2. Problem Description. Provide a concise description of the problem area addressed by this research project.

1.2.2.2.1. Research Goals. Identify specific research goals of this project. Identify and quantify expected performance improvements from this research. Identify new capabilities enabled by this research. Identify and discuss salient features and capabilities of developmental hardware and software prototypes.

1.2.2.2.2. Expected Impact. Describe the expected impact of the research project, if successful, to the problem area.

1.2.2.3. Technical Approach.

1.2.2.3.1. Detailed Description of Technical Approach. Provide a detailed description of the technical approach that will be used in this project to achieve the research goals. Specifically identify and discuss innovative aspects of the technical approach.

1.2.2.3.2. Comparison with Current Technology. Describe state-of-the-art approaches and the limitations within the context of the problem area addressed by this research.

1.2.2.4. Schedule and Milestones.

1.2.2.4.1. Schedule Graphic. Provide a graphic representation of the project schedule including detail down to the individual task effort level. Show all project milestones. Use absolute time designations for all dates.

1.2.2.4.2. Detailed Individual Task Descriptions. Provide detailed task descriptions for each individual task in the schedule graphic.

- 1.2.2.5. Deliverables Description. List and provide a detailed description for each planned deliverable. Specify receiving organization(s) and expected delivery dates for each deliverable.
- 1.2.2.6. Technology Transition and Technology Transfer Targets and Plans. Discuss plans for technology transition and transfer. Identify specific military and commercial organizations for technology transition or transfer. Specify anticipated dates for transition or transfer.
- 1.2.2.7. Quad Chart. Provide a Quad Chart as one (1) landscape-oriented page divided into four (4) quadrants and suitable for use in briefings using the following format:

Project Title	
GRAPHIC:	NEW IDEAS:
A visually compelling graphic that conveys the key technological idea(s) or the expected impact of the research.	List at least 3 new technical ideas embodied by the research.
IMPACT:	SCHEDULE:
At least 3 quantitative statements discussing how this research can revolutionize an area of importance to the Department of Defense.	At least 2 scheduled events or project milestones per year, depicted on a horizontal timeline with at least Quarter resolution (3 month increments) starting with the Quarter that contains the project start and ending with the Quarter that contains the scheduled project end. Quarters begin on 1 October, 1 January, 1 April, and 1 July. Use absolute time designations for all dates.

2. Funding Report.

- 2.1. Incurred Expenses this Period. Specify the expenses incurred during this reporting period (direct and indirect costs on the awardee's accounting system including labor, overhead, G&A, equipment purchases, travel, material, and any subcontract charges known by the prime).
- 2.2. Invoices this Period. Specify the invoice date, number, and amount of each invoice submitted during this reporting.
- 2.3. Date Incurred Expenses will equal Obligated Funding. Specify the anticipated dates that incurred expenses will equal 75% and 100% of the obligated funding, respectively.

- 2.4. Planned Incurred Expenses. Specify the total expenses planned to be incurred for each of the next three (3) quarters.
- 2.5. Projected Funding Increment. Specify the funding increment required for the period beginning with "Date Incurred Expenses will equal 100% of Obligated Funding" and ending with 31 December of the next calendar year. If contract ends prior to 31 December of the next calendar year, specify the funding increment required up to the contract end date. Obligated funding increments are additions to currently available funds, not additions to the total contract value.
- 2.6. Issues or Concerns. Summarize any funding, technical, programmatic and other issues or concerns as well as recommended actions for Government consideration. Indicate if an anticipated funding increment has not been received.

3. Technical Report.

3.1. Project Progress.

- 3.1.1. Progress Against Planned Objectives. Update the status of the specific objectives identified in the last reporting period as "Specific Objectives for Next Period". For each objective, indicate if the objective was or was not accomplished. For each objective not accomplished, detail the current status of the objective.
- 3.1.2. Technical Accomplishments this Period. Describe the technical accomplishments made during this reporting period.
- 3.1.3. Improvements to Prototypes this Period. Provide a detailed, quantitative description of significant new features, capabilities and performance enhancements to hardware and software prototypes made during this period.
- 3.1.4. Significant Changes to Technical Approach to Date. Identify and provide a detailed description of and rationale for significant changes to the technical approach since the start of the research project.
- 3.1.5. Deliverables this Period. Report the deliverables (excluding Technology Transition and Transfer covered under 3.1.6.) submitted during this reporting period. List the Deliverable Name, Type of Deliverable (e.g. hardware or software item, demonstration, milestone, design study or other documentation), and Date of Submission. List the Contract Line or Data Item Number (CLIN or DIN), when applicable. Specify the name, organization, business phone, fax number, and e-mail address of a point of contact for the organization(s) that received the deliverable.

3.1.6. Technology Transition and Transfer this Period.

3.1.6.1. Technology Transition and Transfer Description. List and describe the features and performance capabilities for each technology transitioned or transferred this period.

3.1.6.2. Technology Transition and Transfer List. For each technology transitioned or transferred this period, identify the specific military, commercial, or other transition or transfer organization(s) and the application context.

3.1.6.3. Technology Transition and Transfer Contacts. For each technology transitioned or transferred this period, specify the name, organization, business address, business phone, business fax, and e-mail address of a cognizant point of contact for the organization(s) that received the transitioned or transferred technology.

3.1.7. Publications this Period. Provide an electronic copy of each publication sponsored fully or in part by this contract during the reporting period. For each publication, specify the:

- (1) Title
- (2) Author(s)
- (3) Publication date
- (4) Publication venue (e.g. journal, conference or magazine name)
- (5) Publication keywords

3.1.8. Meetings and Presentations this Period. List all meetings (conferences, workshops, demonstrations, and other coordination meetings) participated in during the reporting period that were sponsored fully or in part by this contract. For each meeting, specify the:

- (1) Meeting Name
- (2) Meeting Purpose
- (3) Meeting Start and End Dates
- (4) Meeting Location (place and name of facility)
- (5) Meeting Attendees from this project
- (6) Presentations Made

3.1.9. Issues or Concerns. Summarize any funding, technical, programmatic, or other issues or concerns as well as recommended actions for Government consideration. Indicate if an anticipated funding increment has not been received.

3.2. Project Plans.

3.2.1. Planned Activities. Describe the planned activities for the next reporting period. Discuss the risks and payoffs corresponding to the planned activities. Include a discussion of planned experiments, demonstrations, presentations, and technical papers.

3.2.2. Specific Objectives for Next Period. Report the significant technical and programmatic objectives planned to be completed during the next reporting period. These are dynamic objectives driven by the progress of the project and not necessarily long-term milestones. Report specific and measurable objectives, rather than simple declarations of continued or sustained effort. For each objective, provide:

- (1) Objective Name
- (2) Objective Type.
- (3) Objective Description. Provide a description of the objective in terms of a specific performance capability to be achieved and in relation to project milestones.
- (4) Impact. State the significance to this project or related projects if the objective is or is not met.

END OF DI-MISC-81612A

**Statement of Work For
Vehicle And Dismount Exploitation Radar (VADER)
Development and Demonstration Program**

Phase 1

Period of Performance:

October 1, 2006 through April 1, 2007

Northrop Grumman Systems Corporation
Electronic Systems
1580A W. Nursery Road, MS A340
Linthicum, Maryland 21090

(b)(4)



22 September 2006

(b)(4)



Figure 1. Phases Delineations for the Top-level VADER Program Schedule

1. Scope

This Statement of Work (SOW) includes the tasks to support the Phase I efforts of the development and demonstration of a SAR/GMTI/DMTI Ku-band (b)(4) Radar (VADER). Phase I is the period of performance for the first 6 months from the date of contract start, which is expected to be October 1, 2006 through April 1, 2007 (*please refer to figure 1 for Program Phase delineations*).

The VADER Radar will be used to carry out demonstrations related to detection of dismounts and vehicles and for the collection of data for potential use in data exploitation. The work will be conducted at Northrop Grumman facilities in Linthicum, MD, and Norwalk, CT.

Included in this six month effort are the design efforts and materials procurement of an (b)(4) Ku-band Antenna subsystem, and the development and fabrication of the (b)(4) (b)(4) subsystem to be used on an NGC test aircraft, the Britten-Norman Islander. Software development efforts to support (b)(4) and Ground Station development efforts are also included in this SOW.

1.1 Ground Rules

1. The VADER Radar development and demonstration program will produce a prototype radar system and demonstrate it on an NGC-owned test aircraft, (b)(4) and a GFE (b)(4) aircraft as an option.
2. Hardware and software from on-going NGC development and production programs will be leveraged to the maximum extent possible in the conduct of the DMTI research effort. Additionally, to the extent necessary, existing NGC development and production hardware and software will be modified in accordance with specifications/functionality described at Appendix B of NG VADAR Technical Proposal No. SDQ-2157 (4 Aug 2006), as amended by NG's "Responses to Questions to Proposal - BAA05-45" dated 29 August 2006, and as updated through Preliminary Design Review (PDR) and Critical Design Review (CDR).
3. Deliverables, in terms of hardware, software, and data and documentation, will be as specified in this SOW.

2. Applicable Documents

NGES VADER System Performance Specification (Appendix B to NGC DMTI Technical Proposal No. SDQ-2157 (4 Aug 2006) - as amended by NG's "Responses to Questions to Proposal - BAA05-45" dtd 29 August 2006. This document is made a part of this Contract Statement of Work by reference.

3. Task Requirements

Northrop Grumman Electronics Systems (NGES) shall provide all labor and administrative services necessary to support, perform and document the work to develop a prototype (b)(4) Ku-band (b)(4) radar system in accordance with the Phase I tasks delineated below. The system shall be configured for real time control, real time status/data quality checks, data acquisition, and real time system operation for (b)(4). The VADER Radar system requirements are specified in the NGES VADER System Performance Specification.

3.1. System Engineering

3.1.1. Requirements Definition and Documentation Management.

Throughout Phase I of this program, NGES shall develop the system requirements and manage the radar system-level documentation in contractor format. Requirements will be presented and discussed at the customer reviews.

3.1.2. Algorithm Definition.

NGES shall provide systems engineering support to specify the real time signal and data processing, radar scheduling, control, calibration and communications software requirements throughout Phase I of this program.

3.1.3. Test Planning.

NGES shall develop a preliminary Integration and Test approach that includes Subsystem Integration and Test, System Integration Laboratory Integration and Test, and Flight Testing. [CDRL A002]

3.1.4. Performance Analysis.

NGES shall analyze and update expected radar system performance throughout Phase I of this program. Analysis results shall be presented at the customer reviews.

3.1.5. Systems Engineering Support.

NGES shall provide overall systems engineering support throughout the design and development of the VADER Radar during Phase I of this program.

3.2. Hardware Design and Development.

3.2.1. Antenna (b)(4) Ku-band (b)(4) Subsystem.

NGES shall perform design and development of the antenna subsystem. The effort shall include the necessary design, analysis, drafting and materials procurement required to complete the array hardware tasks in support of Phase I of this program.

3.2.1.1. *Antenna structure (pod) and cooling* – NGES shall design and develop the support (pod) structure to (b)(4) NGES also shall design and develop the support structure for the LRMs on the array as well as the support structure need to mount to the (b)(4) NGES shall design and develop the cooling mechanization of the array and other elements within the antenna subsystem to include (b)(4) within the antenna structure (pod) in support of Phase I of this program.

3.2.1.2. *Array power and logic distribution.* – NGES shall design the power and logic distribution needed to supply electrical power and control to the (b)(4) in support of Phase I of this program.

3.2.1.3. (b)(4) – NGES shall design and develop (b)(4) (b)(4) to support the (b)(4) in support of Phase I of this program. The (b)(4)

3.2.1.4. (b)(4) – NGES shall support the initial fabrication of (b)(4) (b)(4)

3.2.1.5. *Aperture* (b)(4) – NGES shall design and develop (b)(4) (b)(4)

3.2.1.6. (b)(4) – NGES shall specify the (b)(4) requirements for (b)(4) of the array within the antenna subsystem. (b)(4)

3.2.1.7. (b)(4) – NGES shall design and develop (b)(4) within the antenna subsystem in support of Phase I of this program.

3.2.1.8. (b)(4) – NGES shall design and develop (b)(4) to accommodate the VADER Radar array form factor in support of Phase I of this program.

3.2.1.9. (b)(4) – NGES shall design and develop the (b)(4)

3.2.1.10. *Radome* – NGES shall specify the radome requirements for the antenna subsystem. NGES shall begin source control documents for vendor sourcing of the VADER Radar radome in support of Phase I of this program.

3.2.1.11. (b)(4) – NGES shall specify the (b)(4) for the antenna subsystem. NGES (b)(4) in support of Phase I of this program.

3.2.1.12. *Antenna Integrated Product Team (IPT)* – In support of Phase I of this program, NGES shall provide antenna design and development oversight and analysis necessary to ensure the antenna design will meet its required performance. The IPT shall also maintain project cost and schedule visibility and control throughout Phase I of this program.

3.2.2. (b)(4)

3.2.2.1. (b)(4)

3.2.2.2.

(b)(4)

3.2.2.3.

(b)(4)

3.3. Hardware Build and Test

3.3.1. Material Procurement.

3.3.1.1. *Antenna Subsystem* – NGES shall procure antenna subsystem parts and materials, (b)(4)

3.3.1.2. (b)(4)

3.3.1.3. *Datalink and Ground Station* - NGES shall procure datalink and ground station subsystem parts and materials in support of Phase I of this program.

3.3.2. Subsystem Build and Test.

3.3.2.1. *Antenna Subsystem* – NGES shall start the initial planning and build, test, and assembly of the antenna subsystem array components.

3.3.2.2. (b)(4) – NGES shall:

1. Begin the build and test of the (b)(4) modules.

3.3.2.3. *Datalink and Ground Station* – NGES shall begin the assembly and test of the datalink and ground station subsystem

3.4. Software Design and Test

NGES shall manage, design, document, code, and test all software required for the VADER Radar in accordance with NGES internal processes and procedures for software development in support of Phase I of this program.

3.4.1. Radar Manager Software

NGES shall manage, design, document, code and test the radar manager software which controls the operation of the radar system to include provisions for control interfaces in support of Phase I of this program.

3.4.2. GMTI/DMTI Software

NGES shall manage, design, document, code and test the software to perform GMTI and DMTI functions in support of Phase I of this program.

3.4.3. SAR Software

NGES shall manage, design, document, code and test the software to perform (b)(4) (b)(4) Functions in support of Phase I of this program.

3.4.4. Datalink and Ground Station Software

NGES shall manage, design, document, code and test the software for the Datalink and Ground Station operation in support of Phase I of this program.

3.5. Radar System Integration and Test.

3.5.1. Systems Integration Laboratory (SIL) Integration Testing.

NGES shall initiate plans for integration of all aspects of the VADER Radar system in the NGES SIL.

3.5.2. (b)(4)

(b)(4)

3.5.3. (b)(4)

NGES shall perform an initial Safety of Flight (SOF) analysis for the VADER Radar prototype system in support of Phase I of this program.

3.6. Program Office

3.6.1. Program Management.

NGES shall establish and maintain Program Management practices to support Phase I of the VADER Radar project to include planning, oversight, and reporting of the cost, schedule, and technical progress, subcontracts/vendor management, internal design reviews, customer technical interchange meetings/design reviews, customer interface, as well as providing NGES management visibility to program cost schedule, and technical status. [CDRL A001, A003 - A005]

3.6.2. Conferences / Formal Reviews.

NGES shall host and conduct the following reviews during Phase I of the program as technical interchange meetings (TIMs) [CDRL A004, A005]:

1. Post-award Conference / Kickoff Meeting at 30 days ARO
2. Preliminary Design Review (PDR) at 2 months ARO
3. Critical Design Review (CDR) at 5 months ARO

3.6.3. Documentation.

NGES shall prepare and submit data and documentation in accordance with the Contract Data Requirements List (CDRL) in table 1. All deliverable documentation shall be prepared in accordance with NGES contractor format and/or other commercial format and shall be delivered in Microsoft Office 2000-compatible office products. Documentation shall be delivered in soft-copy on CD ROM and/or electronically. All data items shall be delivered via an NGES contracts letter of transmittal.

Table 1. VADER Radar Demonstration Contract Data Requirements List (CDRL)

Data Item No.	Title of Data Item	SOW Reference	Frequency
A001	R&D Project Summary	Exhibit A	As Req'd
A002	Preliminary Integration & Test Approach	3.1.3	One time
A003	Program Plan	3.6.1.	One time
A004	Conference Agenda	3.6.2.	As required
A005	Conference Minutes	3.6.2.	As required

4. Deliverables

NGES shall provide the following deliverables as described in this SOW, unless otherwise directed by the Government:

1. NGES shall deliver CDRL Items as specified in 3.6.3 of this SOW.

Enclosure (1)
P00001

Attachment (2)
Contract No. HR0011-06-C-0144

DD254

HR0011-06-C-0144

DD FORM 254

Four pages denied in full pursuant to 5 U.S.C. § 552 (b)(7)(E) and (b)(7)(F).

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT			1. CONTRACT ID CODE	PAGE OF PAGES	
			S	1	2
2. AMENDMENT/MODIFICATION NO. P00001	3. EFFECTIVE DATE 18-Oct-2006	4. REQUISITION/PURCHASE REQ. NO. W29860	5. PROJECT NO.(if applicable)		
6. ISSUED BY DARPA CMC ATTN: MICHAEL D. BLACKSTONE 3701 N. FAIRFAX DR. ARLINGTON VA 22203-1714	CODE HR0011	7. ADMINISTERED BY (If other than item 6) DCMA NORTHROP GRUMMAN BALTIMORE 7322 AVIATION BLVD, MS 1288 BWI AIRPORT MD 21240-2003	CODE	S2103A	
8. NAME AND ADDRESS OF CONTRACTOR (No., Street, County, State and Zip Code) NORTHROP GRUMMAN SYSTEMS CORPORATION 1562A HUNSBURY RD LINTHOLM HEIGHTS MD 21090-0009			9A. AMENDMENT OF SOLICITATION NO.		
			9B. DATED (SEE ITEM 11)		
			X 10A. MOD. OF CONTRACT/ORDER NO. HR0011-06-C-0144		
			X 10B. DATED (SEE ITEM 13) 27-Sep-2006		
CODE 97942	FACILITY CODE				
11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS					
<input type="checkbox"/> The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offer <input type="checkbox"/> is extended, <input type="checkbox"/> is not extended. Offer 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 1 and 15, and returning _____ copies of the amendment; (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)					
13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.					
A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.					
B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(B).					
X C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF: By Mutual Agreement of the Parties.					
D. OTHER (Specify type of modification and authority)					
E. IMPORTANT: Contractor <input type="checkbox"/> is not, <input checked="" type="checkbox"/> is required to sign this document and return <u>2</u> copies to the issuing office.					
14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible) Modification Control Number: kgrigari0730 The purpose of this modification is to incorporate Attachment (2) "Department of Defense Contract Security Classification Specification (DD254)" to the contract. The DD254 is Enclosure (1) to this modification. See page 2.					
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) (b)(4)			16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) Michael Blackstone, PCO TEL: 571-218-4804 EMAIL: Michael.Blackstone@darpa.mil		
15B. CONTRACTING OFFICER (b)(4)		15C. DATE SIGNED 01 NOV 06	15D. SIGNATURE (b)(6)	16C. DATE SIGNED 11/1/2006	
(Signature of person authorized to sign)					

EXCEPTION TO SF 30
APPROVED BY OIRM 11-84

30-105-04

STANDARD FORM 30 (Rev. 10-83)
Prescribed by GSA
FAR (48 CFR) 53.243

PD

SECTION SF 30 BLOCK 14 CONTINUATION PAGE

SUMMARY OF CHANGES

1. SECTION J - LIST OF DOCUMENTS, EXHIBITS AND OTHER ATTACHMENTS

The following has been modified as highlighted below:

FROM:

Exhibit/Attachment Table of Contents

DOCUMENT TYPE	DESCRIPTION	PAGES	DATE
Exhibit A	CLIN 0001 Exhibit(s)	9	N/A
Attachment 1	Statement of Work	7	22 Sep 2006

TO:

Exhibit/Attachment Table of Contents

DOCUMENT TYPE	DESCRIPTION	PAGES	DATE
Exhibit A	CLIN 0001 Exhibit(s)	9	N/A
Attachment 1	Statement of Work	7	22 Sep 2006
Attachment 2	DD Form 254 "Department of Defense Contract Security Classification Specification"	4	22 Sep 2006

2. Except as modified above, the terms and conditions of Contract No. HR0011-06-C-0144 shall remain unchanged and in full force and effect.

(End of Summary of Changes)

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT				1. CONTRACT ID CODE	PAGE OF PAGES
				S	1 7
2. AMENDMENT/MODIFICATION NO. P00002	3. EFFECTIVE DATE 24-Jan-2007	4. REQUISITION/PURCHASE REQ. NO. W2000	5. PROJECT NO. (if applicable)		
6. ISSUED BY DARPA CDAO ATTN: MICHAEL D. BLACKSTONE 3701 N. FAIRFAX DR. ARLINGTON VA 22203-1714	CODE HPO011	7. ADMINISTERED BY (if other than item 6) DCHA NORTHROP GRUMMAN BALTIMORE 733 AVIATION BLVD. 1425 1200 BWI AIRPORT MD 21040-2020	CODE	S2103A	
8. NAME AND ADDRESS OF CONTRACTOR (No., Street, County, State and Zip Code) NORTHROP GRUMMAN SYSTEMS CORPORATION 1525A NURSERY RD LINTHICUM HEIGHTS MD 21080-0000			9A. AMENDMENT OF SOLICITATION NO.		
			9B. DATED (SEE ITEM 11)		
			X 10A. MOD. OF CONTRACT/ORDER NO. HPO011-06-C-0144		
			X 10B. DATED (SEE ITEM 13) 27-Sep-2006		
CODE 87942		FACILITY CODE			
11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS					
<input type="checkbox"/> The above numbered solicitation is amended as set forth in Item 4. The hour and date specified for receipt of offer <input type="checkbox"/> is extended, <input type="checkbox"/> is not extended.					
Offer was to 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 Item 8 and 15, and returning _____ copies of the amendment; (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. (By virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided such 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) See Schedule					
13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACT ORDERS IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.					
A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.					
B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as change in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(B).					
X C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF: FAR 252.217-7027 "Contract Definition."					
D. OTHER (Specify type of modification and authority)					
E. IMPORTANT: Contractor <input type="checkbox"/> is not, <input checked="" type="checkbox"/> is required to sign this document and return <u>2</u> copies to the issuing office.					
14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible) Modification Control Number: kgriger07291 The purpose of this modification is to deinitize CLIN 0001, Vader Phase 1, at a Total Estimated Cost-Plus-Fixed-Fee of \$9,970,999 and to incorporate Phase I, Option 1, of the program as CLIN 0002. Additionally, funding in the amount of \$29,001 is deobligated from this contract. See page 2.					
Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as hereto be changed, remain unchanged and in full force and effect.					
15A. NAME AND TITLE OF SIGNER (Type or print) (b)(4)			16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) Michael D. Blackstone/PCO TEL: 571-201-4304 EMAIL: michael.blackstone@arpa.mil		
15B. CONTRACTOR/OFFEROR (b)(4)		15C. DATE SIGNED 25 JAN 07		16B. UNITED STATES OF AMERICA BY (b)(6)	
(Signature of person authorized to sign)				16C. DATE SIGNED 1/25/07 (Signature of Contracting Officer)	

EXCEPTION TO SF 30
APPROVED BY OIRM 11-84

30-105-04

STANDARD FORM 30 (Rev. 10-83)
Prescribed by GSA
FAR (48 CFR) 53.243

PD

SECTION SF 30 BLOCK 14 CONTINUATION PAGE

SUMMARY OF CHANGES

1. SECTION A - SOLICITATION/CONTRACT FORM

The total cost of this contract was decreased by \$29,001.00 from \$10,000,000.00 to \$9,970,999.00.

2. SECTION B - SUPPLIES OR SERVICES AND PRICES

Global Changes

a. CLIN 0001 -- SUBCLIN 000101
 The contract type has changed from COST to CPFF.

b. CLIN 0001

(b)(4)

The unit of issue Lot has been deleted.
 The cost constraint NTE has been deleted.
 The total cost of this line item has decreased by \$29,001.00 from \$10,000,000.00 to \$9,970,999.00.

ITEM NO	SUPPLIES/SERVICES	ESTIMATED COST	FIXED FEE	TOTAL EST. COST PLUS FIXED FEE
0001	VADER Phase 1	(b)(4)		\$9,970,999.00

The contractor shall provide the personnel, facilities, and material necessary to conduct the research effort described in the Northrop Grumman "Vehicle and Dismount Exploitation Radar (VADER) Phase 1 Statement of Work, dated 22 September 2006, which is made part of this contract at Attachment (1). Data deliverable requirements shall be in accordance with Sections C and F, and Exhibit A, of the contract.

SUBCLIN 000101

ITEM NO	AMOUNT
000101	
AO No. W295/00	
ACRN AA	\$9,970,999.00

c. CLIN 0002 is added as follows:

ITEM NO	SUPPLIES/SERVICES	ESTIMATED COST	FIXED FEE	TOTAL EST. COST PLUS FIXED FEE
0002	Vader Phase II (Opt 1)	(b)(4)		\$9,999,932.00

The contractor shall provide the personnel, facilities, and material necessary to conduct the research effort described in the Northrop Grumman "Vehicle and Dismount Exploitation Radar (VADER) Phase II Statement of Work, dated 14 December 2006, which is made part of this contract at Attachment (3). Data deliverable requirements shall be in accordance with Sections C and F, and Exhibit A, of the contract.

3. SECTION F - DELIVERIES OR PERFORMANCE

The following have been modified as highlighted in bold:

F-1 Term of Contract

(a) CLIN 0001 - The term of the contract commences on 1 October 2006 and continues through 1 April 2007.

(b) The period of performance for Option 1, as set forth in CLIN 0002, shall be from the effective date of the option exercise to and including **twelve (12) months**.

(c) **Deleted/Reserved.**

(end of clause)

4. SECTION G - CONTRACT ADMINISTRATION DATA

Accounting and Appropriation

a. Summary for the Payment Office

As a result of this modification, the total funded amount for this document was decreased by \$29,001.00 from \$10,000,000.00 to \$9,970,999.00.

b. SUBCLIN 000101:

AA: 21 6 2040 0000 22 2010 633100ED100 255X RJS1 MIPR6JDRDJ9529 J9LERA W1YYAA S23185 (CIN 00000000000000000000000000000000) was decreased by \$29,001.00 from \$10,000,000.00 to \$9,970,999.00

5. SECTION H - SPECIAL CONTRACT REQUIREMENTS

The following have been modified as highlighted in bold:

a. H-2 Type of Contract

(a) This is a **Cost-Plus-Fixed-Fee (CPFF) completion** contract.
(end of clause)

b. H-11 Proprietary Technical Data and Computer Software

(a) Any deliverable technical data or computer software developed or generated at private expense and considered to be proprietary by the Contractor or subcontractors shall be delivered in accordance with DFARS 252.227-7013 and 252.227-7014. A list of such data and/or software is incorporated into the contract as Attachment No. See Attachment (4) for list of Intellectual Property.
(end of clause)

c. H-13 Government Furnished Property/Facilities and Services

(a) In accordance with the Section I contract clause entitled "Government Property (Cost Reimbursement, Time and Material, or Labor-Hour Contracts)", the following property, facilities and/or services shall be provided for use in the performance of this contract.

<u>Need Date</u>	<u>QTY</u>	<u>PROPERTY NOMENCLATURE</u>	<u>DELIVERY TO</u>
------------------	------------	------------------------------	--------------------

NONE IDENTIFIED AT DEFINITIZATION
(end of clause)

d. H-14 Contractor-Acquired Property (Special Test Equipment)

(a) The Contractor is authorized to acquire the following items of special test equipment which are needed to accomplish this contract:

<u>Items To Be Acquired</u>	<u>Estimated Cost</u>
-----------------------------	-----------------------

NONE IDENTIFIED AT DEFINITIZATION

(b) The costs incurred by the Contractor in acquiring the special test equipment listed in paragraph (a) above shall be considered allowable costs under the contract provided that the total net amount of the special test equipment does not exceed \$0.00. The Contractor shall have no obligation to acquire special test equipment and the Government shall have no obligation to reimburse any amount for special test equipment in excess of the amount set forth above unless the contract is amended to increase this amount.

(c) The special test equipment listed above shall be considered Government Property and shall be subject to the provisions of FAR 52.245-05, incorporated by reference in Section I.

(d) The Contractor shall not use Contractor-acquired property listed above for work other than that performed pursuant to this contract unless so authorized in writing by the Contracting Officer.
(end of clause)

e. H-15 Contractor-Acquired Property (Special Tooling)

(a) The Contractor is authorized to acquire the following items of special tooling which are needed to accomplish this contract:

<u>Items To Be Acquired</u>	<u>Estimated Cost</u>
-----------------------------	-----------------------

NONE IDENTIFIED AT DEFINITIZATION

(b) The costs incurred by the Contractor in acquiring the special tooling listed in paragraph (a) above shall be considered allowable costs under the contract provided that the total net amount of the special tooling does not exceed \$0.00. The Contractor shall have no obligation to acquire special tooling and the Government shall have no obligation to reimburse any amount for special tooling in excess of the amount set forth above unless the contract is amended to increase this amount.

(c) The special tooling listed above shall be considered Government Property and shall be subject to the provisions of FAR 52.245-05, incorporated by reference in Section I.

(d) The Contractor shall not use Contractor-acquired property listed above for work other than that performed pursuant to this contract unless so authorized in writing by the Contracting Officer.
(end of clause)

f. H-16 Contractor Acquired Property (IT)

(a) Performance of this contract will require use of the information technology (IT) resources listed below, acquisition of which (or equivalent) is hereby authorized:

ITEM	TOTAL AMOUNT
------	--------------

NONE IDENTIFIED AT DEFINITIZATION

(b) The costs incurred by the Contractor in acquiring the IT listed in paragraph (a) above shall be considered allowable costs under the contract provided that the total net amount of the IT does not exceed \$_____. The Contractor shall have no obligation to acquire IT and the Government shall have no obligation to reimburse any amount for IT in excess of the amount set forth above unless the contract is modified to increase this amount.

(c) The IT resources listed above shall be considered Government Property and shall be subject to the provisions of FAR 52.245-5, incorporated in Section I.

(d) The Contractor shall not use Contractor acquired property listed above for work other than that performed pursuant to this contract unless so authorized in writing by the Contracting Officer.

(e) This authorization is subject to the Contractor's compliance with the approvals and screening requirements set forth in DFARS Subpart 239.73 and DoD 7950.1-M, "Defense Automation Resources Management Manual."

(f) On-line screening for excess IT, regardless of cost, via remote terminal dial-up, is available to contractors through their Administrative Contracting Officers.
(end of clause)

6. SECTION I - CONTRACT CLAUSES

a. The following have been added by reference:

52.216-8 Fixed Fee MAR 1997

b. The following have been added by full text:

52.217-9 OPTION TO EXTEND THE TERM OF THE CONTRACT (MAR 2000)

(a) The Government may extend the term of this contract by written notice to the Contractor within 6 months (insert the period of time within which the Contracting Officer may exercise the option); provided that the Government gives the Contractor a preliminary written notice of its intent to extend at least 60 days (60 days unless a different number of days is inserted) before the contract expires. The preliminary notice does not commit the Government to an extension.

(b) If the Government exercises this option, the extended contract shall be considered to include this option clause.

(c) The total duration of this contract, including the exercise of any options under this clause, shall not exceed 18 months.
(End of clause)

The following have been deleted:

52.216-11	Cost Contract--No Fee	APR 1984
52.216-24	Limitation Of Government Liability	APR 1984
52.216-26	Payments Of Allowable Costs Before Definitization	DEC 2002
252.217-7027	Contract Definitization	OCT 1998

7. SECTION J - LIST OF DOCUMENTS, EXHIBITS AND OTHER ATTACHMENTS

The Table of Contents has changed as highlighted in bold

FROM:
Exhibit/Attachment Table of Contents

DOCUMENT TYPE	DESCRIPTION	PAGES	DATE
Exhibit A	CLIN 0001 Exhibit(s)	9	N/A
Attachment I	Statement of Work	7	22 Sep 2006

Attachment 2	DD Form 254 "Department of Defense Contract Security Classification Specification"	4	22 Sep 2006
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TO:
Exhibit/Attachment Table of Contents

DOCUMENT TYPE	DESCRIPTION	PAGES	DATE
Exhibit A	CLIN 0001 Exhibit(s)	9	N/A
Attachment 1	Statement of Work Phase I*	7	22 Sep 2006
Attachment 2	DD Form 254 "Department of Defense Contract Security Classification Specification"	4	22 Sep 2006
Attachment 3	Statement of Work Phase II	7	14 Dec 2006
Attachment 4	Intellectual Property Assertions	1	15 Nov 2006

*Changes have been made to the Phase I Statement of Work as noted with the change bars in the left hand margin.

8. Except as modified above, the terms and conditions of Contract No. HR0011-06-C-0144 shall remain unchanged and in full force and effect.

(End of Summary of Changes)

**Statement of Work For
Vehicle And Dismount Exploitation Radar (VADER)
Development and Demonstration Program**

Phase 1

Period of Performance:

October 1, 2006 through April 1, 2007

Northrop Grumman Systems Corporation
Electronic Systems
1580A W. Nursery Road, MS A340
Linthicum, Maryland 21090

(b)(4)

A rectangular grey box redacting information, likely a contact name or phone number, located below the address.

22 September 2006

1. Scope

This Statement of Work (SOW) includes the tasks to support the Phase I efforts of the development and demonstration of a SAR/(b)(4) Ku-band (b)(4) Radar (VADER). Phase I is the period of performance for the first 6 months from the date of contract start, which is expected to be October 1, 2006 through April 1, 2007 (please refer to figure 1 for Program Phase delineations).

The VADER Radar will be used to carry out demonstrations related to detection of dismounts and vehicles and for the collection of data for potential use in data exploitation. The work will be conducted at Northrop Grumman facilities in (b)(4)

Included in this six month effort are the design efforts and materials procurement of an (b)(4) Ku-band Antenna subsystem, and the development and fabrication of the (b)(4) (b)(4) subsystem to be used on an (b)(4) Software development efforts to support (b)(4) and Ground Station development efforts are also included in this SOW.

1.1 Ground Rules

1. The VADER Radar development and demonstration program will produce a prototype radar system and demonstrate it on an NGC-owned test aircraft, (b)(4) and a GFE (b)(4) aircraft as an option.
2. Hardware and software from on-going NGC development and production programs will be leveraged to the maximum extent possible in the conduct of the (b)(4) research effort. Additionally, to the extent necessary, existing NGC development and production hardware and software will be modified in accordance with specifications/functionality described at Appendix B of NG VADAR Technical Proposal No. SDQ-2157 (4 Aug 2006), as amended by NG's "Responses to Questions to Proposal - BAA05-45" dated 29 August 2006, and as updated through Preliminary Design Review (PDR) and Critical Design Review (CDR).
3. Deliverables, in terms of hardware, software, and data and documentation, will be as specified in this SOW.

2. Applicable Documents

NGES VADER System Performance Specification (Appendix B to NGC DMTI Technical Proposal No. SDQ-2157 (4 Aug 2006) - as amended by NG's "Responses to Questions to Proposal - BAA05-45" dtd 29 August 2006. This document is made a part of this Contract Statement of Work by reference.

3. Task Requirements

Northrop Grumman Electronics Systems (NGES) shall provide all labor and administrative services necessary to support, perform and document the work to develop a prototype SAR/GMTI/DMTI Ku-band (b)(4) radar system in accordance with the Phase I tasks delineated below. The system shall be configured for real time control, real time status/data quality checks, data acquisition, and real time system operation for (b)(4). The VADER Radar system requirements are specified in the NGES VADER System Performance Specification.

3.1. System Engineering

3.1.1. Requirements Definition and Documentation Management.

Throughout Phase I of this program, NGES shall develop the system requirements and manage the radar system-level documentation in contractor format. Requirements will be presented and discussed at the customer reviews.

3.1.2. Algorithm Definition.

NGES shall provide systems engineering support to specify the real time signal and data processing, radar scheduling, control, calibration and communications software requirements throughout Phase I of this program.

3.1.3. Test Planning.

NGES shall develop a preliminary Integration and Test approach that includes Subsystem Integration and Test, System Integration Laboratory Integration and Test, and Flight Testing. [CDRL A002]

3.1.4. Performance Analysis.

NGES shall analyze and update expected radar system performance throughout Phase I of this program. Analysis results shall be presented at the customer reviews.

3.1.5. Systems Engineering Support.

NGES shall provide overall systems engineering support throughout the design and development of the VADER Radar during Phase I of this program.

3.2. Hardware Design and Development.

3.2.1. Antenna (b) Ku-band (b)(4) Subsystem.

NGES shall perform design and development of the antenna subsystem. The effort shall include the necessary design, analysis, drafting and materials procurement required to complete the array hardware tasks in support of Phase I of this program.

3.2.1.1. *Antenna structure (pod) and cooling* – NGES shall design and develop the support (pod) structure to (b)(4) NGES also shall design and develop the support structure for the LRMs on the array as well as the support structure need to mount to the (b)(4) NGES shall design and develop the cooling mechanization of the array and other elements within the antenna subsystem to include (b)(4) within the (b)(4) (pod) in support of Phase I of this program.

3.2.1.2. *Array power and logic distribution.* – NGES shall design the power and logic distribution needed to supply electrical power and control to the (b)(4) in support of Phase I of this program.

3.2.1.3. (b)(4) – NGES shall design and develop (b)(4) (b)(4) to support the (b)(4) in support of Phase I of this program. The task also includes (b)(4)

3.2.1.4. (b)(4) – NGES shall support the initial fabrication of (b)(4) (b)(4) in support of Phase I of this program.

3.2.1.5. *Aperture* (b)(4) – NGES shall design and develop (b)(4) (b)(4) in support of Phase I of this program. (b)(4) (b)(4)

3.2.1.6. (b)(4) - NGES shall specify (b)(4) requirements (b)(4) of the array within the antenna subsystem. NGES shall (b)(4) in support of Phase I of this program.

3.2.1.7. (b)(4) - NGES shall design and develop (b)(4) within the antenna subsystem in support of Phase I of this program.

3.2.1.8. (b)(4) - NGES shall design and develop (b)(4) to accommodate the VADER Radar array form factor in support of Phase I of this program.

3.2.1.9. (b)(4) - NGES shall design and develop the (b)(4) in support of Phase I of this program.

3.2.1.10. Radome - NGES shall specify the radome requirements for the antenna subsystem. NGES shall begin source control documents for vendor sourcing of the VADER Radar radome in support of Phase I of this program.

3.2.1.11. (b)(4) - NGES shall specify the (b)(4) for the antenna subsystem. NGES (b)(4) in support of Phase I of this program.

3.2.1.12. Antenna Integrated Product Team (IPT) - In support of Phase I of this program, NGES shall provide antenna design and development oversight and analysis necessary to ensure the antenna design will meet its required performance. The IPT shall also maintain project cost and schedule visibility and control throughout Phase I of this program.

3.2.2. (b)(4)

3.2.2.1. (b)(4)

3.2.2.2.

(b)(4)

3.2.2.3.

(b)(4)

3.3. Hardware Build and Test

3.3.1. Material Procurement.

3.3.1.1. Antenna Subsystem - NGES shall procure antenna subsystem parts and materials, (b)(4)

3.3.1.2. (b)(4)

3.3.1.3. *Datalink and Ground Station* - NGES shall procure datalink and ground station subsystem parts and materials in support of Phase I of this program.

3.3.2. Subsystem Build and Test.

3.3.2.1. *Antenna Subsystem* - NGES shall start the initial planning and build, test, and assembly of the antenna subsystem array components.

3.3.2.2. (b)(4) - NGES shall:

1. Begin the build and test of the (b)(4) modules.

3.3.2.3. *Datalink and Ground Station* - NGES shall begin the assembly and test of the datalink and ground station subsystem

3.4. Software Design and Test

NGES shall manage, design, document, code, and test all software required for the VADER Radar in accordance with NGES internal processes and procedures for software development in support of Phase I of this program.

3.4.1. Radar Manager Software

NGES shall manage, design, document, code and test the radar manager software which controls the operation of the radar system to include provisions for control interfaces in support of Phase I of this program.

3.4.2. (b)(4) Software

NGES shall manage, design, document, code and test the software to perform (b)(4) functions in support of Phase I of this program.

3.4.3. SAR Software

NGES shall manage, design, document, code and test the software to perform (b)(4) (b)(4) Functions in support of Phase I of this program.

3.4.4. Datalink and Ground Station Software

NGES shall manage, design, document, code and test the software for the Datalink and Ground Station operation in support of Phase I of this program.

3.5. Radar System Integration and Test.

3.5.1. Systems Integration Laboratory (SIL) Integration Testing.

NGES shall initiate plans for integration of all aspects of the VADER Radar system in the NGES SIL.

3.5.2. (b)(4)

(b)(4)

3.5.3. (b)(4)

NGES shall perform an initial Safety of Flight (SOF) analysis for the VADER Radar prototype system in support of Phase I of this program.

3.6. Program Office**3.6.1. Program Management.**

NGES shall establish and maintain Program Management practices to support Phase I of the VADER Radar project to include planning, oversight, and reporting of the cost, schedule, and technical progress, subcontracts/vendor management, internal design reviews, customer technical interchange meetings/design reviews, customer interface, as well as providing NGES management visibility to program cost schedule, and technical status. [CDRL A001, A003 - A005]

3.6.2. Conferences / Formal Reviews.

NGES shall host and conduct the following reviews during Phase I of the program as technical interchange meetings (TIMs) [CDRL A004, A005]:

1. Post-award Conference / Kickoff Meeting at 30 days ARO
2. Preliminary Design Review (PDR) at 2 months ARO
3. Critical Design Review (CDR) at 5 months ARO

3.6.3. Documentation.

NGES shall prepare and submit data and documentation in accordance with the Contract Data Requirements List (CDRL) in table 1. All deliverable documentation shall be prepared in accordance with NGES contractor format and/or other commercial format and shall be delivered in Microsoft Office 2000-compatible office products. Documentation shall be delivered in soft-copy on CD ROM and/or electronically. All data items shall be delivered via an NGES contracts letter of transmittal.

Table 1. VADER Radar Demonstration Contract Data Requirements List (CDRL)

Data Item No.	Title of Data Item	SOW Reference	Frequency
A001	R&D Project Summary	Exhibit A	As Req'd
A002	Preliminary Integration & Test Approach	3.1.3	One time
A003	Program Plan	3.6.1.	One time
A004	Conference Agenda	3.6.2.	As required
A005	Conference Minutes	3.6.2.	As required
A006	System Design Report	3.6.2	1 Time (CDR)
A007	Production Cost Estimate	3.6.2	1 Time (CDR)

4. Deliverables

NGES shall provide the following deliverables as described in this SOW, unless otherwise directed by the Government:

1. NGES shall deliver CDRL Items as specified in 3.6.3 of this SOW.

(b)(4)



Figure 1. Phases Delineations for the Top-level VADER Program Schedule

Contract No. HR0011-06-C-0144

Attachment (3)

**Statement of Work For
Vehicle And Dismount Exploitation Radar (VADER)
Development and Demonstration Program**

Phase II

Period of Performance:

April 1, 2007 through April 1, 2008

Modification P00002

Enclosure (2)

1. Scope

This Statement of Work (SOW) includes the tasks to support the Phase II efforts of the development and demonstration of a (b)(4) SAR Ku-band (b)(4) Radar (VADER). Phase II is a 12 month period of performance beginning April 1, 2007 through to April 1, 2008 (*please refer to figure 1 for Program Phase delineations*).

The VADER Radar will be used to carry out demonstrations related to detection of dismounts and vehicles and for the collection of data for potential use in data exploitation. The work will be conducted at Northrop Grumman facilities in (b)(4).

Included in this twelve month effort are the completion of design efforts, materials procurement, fabrication, integration and test of an (b)(4) Ku-band Antenna subsystem and the (b)(4) to be used on an (b)(4) (b)(4) Software development efforts, integration and testing to support 3 modes: SAR (b)(4) (b)(4) and Ground Station development efforts are also included in this SOW. The effort also includes integration of test of the VADER system, including flight testing on (b)(4) (b)(4).

1.1 Ground Rules

1. The VADER Radar development and demonstration program will produce a prototype radar system and demonstrate it on an NGC-owned test aircraft, (b)(4) and a GFE (b)(4) aircraft as an option.
2. Hardware and software designs (b)(4) (b)(4)
3. Deliverables, in terms of hardware, software, and data and documentation, will be as specified in this SOW.

1.2 Period of Performance and Program Milestones

The period of performance for the incrementally-funded tasking and deliverables associated with this SOW begins 6 months from the date of contract start and continues through an additional 12 months (from April 1, 2007 through April 1, 2008).

2. Applicable Documents

NGES VADER System Performance Specification

3. Task Requirements

Northrop Grumman Electronics Systems (NGES) shall provide all labor and administrative services necessary to support, perform and document the work to develop, build and demonstrate a prototype GMTI/DMTI/SAR Ku-band (b)(4) radar system for Phase II, which begins 6 months from the date of contract start and continues through for 12 months. The system shall be configured for real time control, real time status/data quality checks, data acquisition, and real time system operation for (b)(4)

(b)(4) The VADER Radar system requirements are specified in the NGES VADER System Performance Specification. [CDRL A001]

3.1. System Engineering

3.1.1. Requirements Definition and Documentation Management.

Throughout Phase II of this program, NGES shall continue to develop the system requirements and manage the radar system-level documentation in contractor format. Requirements will continue to be presented and discussed at the customer reviews.

3.1.2. Algorithm Definition.

NGES shall provide systems engineering support to specify the real time signal and data processing, radar scheduling, control, calibration and communications software requirements throughout Phase II of this program.

3.1.3. Test Planning.

NGES shall continue to refine the Integration and Test approach that includes Subsystem Integration and Test, System Integration Laboratory Integration and Test, and Flight Testing. [CDRL A002]

3.1.4. Performance Analysis.

NGES shall analyze and update expected radar system performance throughout Phase II of this program. Analysis results shall be presented at the customer reviews. NGES shall also analyze the flight test data and support flight testing activities.

3.1.5. Systems Engineering Support.

NGES shall provide overall systems engineering support throughout the development, integration and testing of the VADER Radar during Phase II of this program. Systems engineering shall participate in Integration and Flight Testing of the radar system on the Islander during this phase.

3.2. Hardware Design and Development.

3.2.1. Antenna (b)(4) Ku-band (b)(4) Subsystem.

NGES shall perform design and development of the antenna subsystem. The effort shall include the necessary design, analysis, drafting and materials procurement required to complete the array hardware tasks in support of a demonstration flight test with the prototype hardware during Phase II of this program.

3.2.1.1. *Antenna structure (pod) and cooling* – NGES shall develop the support (pod) structure to (b)(4) NGES also shall develop the support structure for the LRMs on the array as well as the support structure need to mount to the (b)(4) (b)(4) NGES shall develop the cooling mechanization of the array and other elements within the antenna subsystem to include (b)(4) within the antenna structure (pod) in support of Phase II of this program.

3.2.1.2. *Array power and logic distribution.* – NGES shall develop the power and logic distribution needed to supply electrical power and control to the (b)(4) in support of Phase II of this program.

3.2.1.3. (b)(4) – NGES shall develop (b)(4) (b)(4) needed to support the (b)(4) in support of Phase II of this program. The task also includes (b)(4)

3.2.1.4. (b)(4) – NGES shall support the fabrication of (b)(4) (b)(4) in support of Phase II of this program.

3.2.1.5. *Aperture* (b)(4) – NGES shall develop (b)(4) (b)(4) in support of Phase II of this program. (b)(4) (b)(4)

3.2.1.6. (b)(4) – NGES shall complete (b)(4) (b)(4)

3.2.1.7. (b)(4) – NGES shall develop (b)(4) (b)(4) within the antenna subsystem in support of Phase II of this program.

3.2.1.8. (b)(4) – NGES shall develop (b)(4) (b)(4) the VADER Radar array form factor in support of Phase II of this program.

3.2.1.9. (b)(4) – NGES shall (b)(4) (b)(4) in support of Phase II of this program.

3.2.1.10. *Radome* –NGES shall complete the source control documents for vendor sourcing of the VADER Radar radome in support of Phase II of this program.

3.2.1.11. (b)(4) – NGES shall complete the documentation for (b)(4) (b)(4) in support of Phase II of this program.

3.2.1.12. *Antenna Integrated Product Team (IPT)* – In support of Phase I of this program, NGES shall provide antenna design and development oversight and analysis necessary to ensure the antenna design will meet its required performance. The IPT shall also maintain project cost and schedule visibility and control throughout Phase II of this program.

3.2.2. (b)(4)

3.2.2.1. (b)(4) (b)(4)

3.2.2.2. (b)(4)

3.2.2.3. (b)(4)

3.3. Hardware Build and Test

3.3.1. Material Procurement.

3.3.1.1. Antenna Subsystem – NGES shall continue the procurement of all remaining antenna subsystem parts and materials, including spares, for the T/R modules, radiators, gimbal subsystem, circulators, array driver, BSC, up converter, down converter, structure, housing, radome, power supply, and GPS/INS in support of Phase II of this program.

3.3.1.2. (b)(4)

(b)(4)

3.3.1.3. Datalink and Ground Station - NGES shall continue the procurement of all remaining datalink and ground station subsystem parts and materials in support of Phase II of this program.

3.3.2. Subsystem Build and Test.

3.3.2.1. Antenna Subsystem – NGES shall:

1. Build, test, and assemble the antenna subsystem array components.
2. Characterize and test the assembled array.
3. Integrate the array with (b)(4) and other components of the antenna (pod) subsystem.
4. Characterize and test the antenna (pod) subsystem.

3.3.2.2. (b)(4) Subsystem – NGES shall:

1. Complete the build and test of (b)(4) subsystem modules.
2. Assemble (b)(4)
3. Characterize and test the assembled (b)(4)

3.3.2.3. Datalink and Ground Station – NGES shall complete the assembly and test of the datalink and ground station subsystem

3.4. Software Design and Test

NGES shall manage, design, document, code, and test all software required for the VADER Radar in accordance with NGES internal processes and procedures for software development in support of Phase II of this program.

3.4.1. Radar Manager Software

NGES shall manage, design, document, code and test the radar manager software which controls the operation of the radar system to include provisions for control interfaces in support of Phase II of this program.

3.4.2. GMTI/DMTI Software

NGES shall manage, design, document, code and test the software to perform GMTI and DMTI functions in support of Phase II of this program.

3.4.3. SAR Software

NGES shall manage, design, document, code and test the software to perform (b)(4) (b)(4) in support of Phase II of this program.

3.4.4. Datalink and Ground Station Software

NGES shall manage, design, document, code and test the software for the Datalink and Ground Station operation in support of Phase II of this program.

3.5. Radar System Integration and Test.

3.5.1. (b)(4) Integration Testing.

NGES shall integrate all aspects of the VADER Radar system in the NGES (b)(4)

3.5.2. (b)(4) Flight Integration.

(b)(4)

NGES shall integrate the antenna subsystem (pod) and (b)(4) onto the (b)(4) aircraft. This effort shall include technical and mechanical support.

NGES shall prepare the appropriate documentation of the installation, such as inspection records, complete FAA package with DER signoff and SOF flight test plan and report.

3.5.3. (b)(4) Flight Testing.

NGES shall perform flight testing of the VADER Radar on the Islander aircraft.

NGES shall perform a Safety of Flight (SOF) analysis for the VADER Radar prototype system prior to initiating flight testing. NGES shall prepare a flight test plan prior to each flight test which will be coordinated with the Government (COR) for review and comment. At the conclusion of flight testing, NGES shall prepare a flight test report which shall include analysis of system performance and, as requested by the Government (COR), copies of the (b)(4) from each of the flight tests.

3.6. Program Office

3.6.1. Program Management.

NGES shall establish and maintain Program Management practices to support Phase II of the VADER Radar project to include planning, oversight, and reporting of the cost, schedule, and technical progress, subcontracts/vendor management, internal design reviews, customer technical interchange meetings/design reviews, customer interface, as well as providing NGES management visibility to program cost schedule, and technical status. [CDRL A003, A004, A005]

3.6.2. Conferences / Formal Reviews.

NGES shall host and conduct the following reviews during Phase II of the program as technical interchange meetings (TIMs) [CDRL A006, A007]:

1. Post-award Conference / Kickoff Meeting at 30 days ARO
2. Preliminary Design Review (PDR) at 2 months ARO

3. Critical Design Review (CDR) at 5 months ARO

3.6.3. Documentation.

NGES shall prepare and submit data and documentation in accordance with the Contract Data Requirements List (CDRL) in table 1 during Phase II. All deliverable documentation shall be prepared in accordance with NGES contractor format and/or other commercial format and shall be delivered in Microsoft Office 2000-compatible office products. Documentation shall be delivered in soft-copy on CD ROM and/or electronically. All data items shall be delivered via an NGES contracts letter of transmittal.

Table 1. VADER Radar Demonstration Contract Data Requirements List (CDRL)

Data Item No.	Title of Data Item	SOW Reference	Frequency
A004	Monthly Progress Report	3.6.1.	Monthly
A005	Funds Expenditure Report	3.6.1.	Monthly
A006	Conference Agenda	3.6.2.	As required
A007	Conference Minutes	3.6.2.	As required
A008	Radar Raw Phase History & Processed Data From Each Flight Test	3.5.3	As required
A009	Test Plan Prior to Each Flight Test	3.5.3	As required
A010	Flight Test Report Including Analyses of System Performance	3.5.3	As required

4. Deliverables

NGES shall provide the following deliverables as described in this SOW, unless otherwise directed by the Government:

1. NGES shall deliver in place, at the end of the period of performance, all radar hardware developed or procured under this contract..
2. NGES shall deliver in place, at the end of the period of performance, the final Operational Flight Program (OFP) software developed under this contract.
3. NGES shall delivery in place, at the end of the period of performance, the ground station hardware and software developed under this contract.
4. NGES shall deliver in place, at the end of the period of performance, the NGES shall deliver CDRL Items as specified in 3.6.3 of this SOW.

(b)(4)



Technical Data or Computer Software to be Furnished with Restrictions	Basis of Assertion	Asserted Rights Category	Name of Person Asserting Restrictions	Will All IP Be Physically Delivered To The Government In Performance of The Contract	Provide a Short Description of Each Item and It's Role In Accomplishing the SOW Requirements	Rationale for Claim of R&D Project Charge Number	Data From
(b)(4)							

*All IP items asserted under this contract were previously developed exclusively at NGES private expense and will not be further developed under the VADER program using Government dollars.

(b)(4)



*All IP items asserted under this contract were previously developed exclusively at NGES private expense and will not be further developed under the VADER program using Government dollars.

Modification P00002

Enclosure (3)

Contract No. HR0011-06-C-0144

Attachment (4)

(b)(4)



***All IP items asserted under this contract were previously developed exclusively at NGES private expense and will not be further developed under the VADER program using Government dollars.**

Modification P00002

Enclosure (3)

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT			1. CONTRACT ID CODE U	PAGE OF PAGES 1 2	
2. AMENDMENT/MODIFICATION NO. P00003	3. EFFECTIVE DATE 23-Mar-2007	4. REQUISITION/PURCHASE REQ. NO. W096/00	5. PROJECT NO. (if applicable)		
6. ISSUED BY DARPA CNO ATTN: MICHAEL D. BLACKSTONE 3701 N. FAIRFAX DR. ARLINGTON VA 22203-1714	CODE HR0011	7. ADMINISTERED BY (if other than item 6) DCMA NORTHROP GRUMMAN BALTIMORE 7323 AVIATION BLVD. SUITE 1285 BWI AIRPORT MD 21240-2000		CODE S2103A	
8. NAME AND ADDRESS OF CONTRACTOR (Nn., Street, County, State and Zip Code) NORTHROP GRUMMAN SYSTEMS CORPORATION 1580A NURSERY RD LINTHICUM HEIGHTS MD 21090-0000			9A. AMENDMENT OF SOLICITATION NO.		
			9B. DATED (SEE ITEM 11)		
			X	10A. MOD. OF CONTRACT/ORDER NO. HR0011-06-C-0144	
			X	10B. DATED (SEE ITEM 13) 27-Sep-2006	
CODE 97842	FACILITY CODE				
11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS					
<input type="checkbox"/> The above numbered solicitation is amended as set forth in item 14. The hour and date specified for receipt of Offer <input type="checkbox"/> is extended, <input type="checkbox"/> is not extended. Offer 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 amendment; (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 such 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)					
13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.					
A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.					
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).					
X C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF: By Mutual Agreement of Both Parties					
D. OTHER (Specify type of modification and authority)					
E. IMPORTANT: Contractor <input type="checkbox"/> is not, <input checked="" type="checkbox"/> is required to sign this document and return <u>2</u> copies to the issuing office.					
14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.) Modification Control Number: kpaterso07546 The purpose of this modification is to extend the period of performance through 30 April 2007, at no cost to the Government, and to update key personnel, Section H-4.					
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) MITCHELL J. DZULEBAK CONTRACTS REPRESENTATIVE		16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) MICHAEL D. BLACKSTONE/PCO TEL: 571-278-4504 EMAIL: michael.blackstone@dcm.mil			
15B. CONTRACTOR/OFFEROR (b)(4) (Signature of person authorized to sign)	15C. DATE SIGNED 3-27-07	16B. FEDERAL STATE OF AMERICA (b)(6) E1	16C. DATE SIGNED 3/28/07		



HR0011-06-C-0144

Page 2 of 2

SECTION SF 30 BLOCK 14 CONTINUATION PAGE

SUMMARY OF CHANGES

The following has been modified as highlighted in bold:

1) SECTION F - DELIVERIES OR PERFORMANCE

a. F-1 Term of Contract

(a) CLIN 0001 - The term of the contract commences on 1 October 2006 and continues through 30 April 2007.

(end of clause)

b. F-2 Reports and Other Deliverables

(a) Delivery of all reports and other deliverables shall be made to the addressee specified in F-3 entitled "Report Distribution" in accordance with the following:

Item No.	Description	Due Date (on or before)
0001	Interim Reports	See Exhibit A CDRL
0001	Final Report (Phase 1)	30 April 2007
0001	Additional Misc. Deliverables	See Section C-2

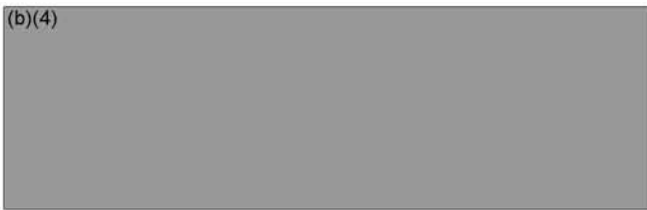
(end of clause)

2) SECTION H - SPECIAL CONTRACT REQUIREMENTS

a. H-4 Key Personnel

(a) The Contractor shall notify the Contracting Officer prior to making any change in key personnel. Key personnel are defined as follows:

(b)(4)



(end of clause)

3) Except as modified above, the terms and conditions of Contract No. HR0011-06-C-0144 shall remain unchanged and in full force and effect.

(End of Summary of Changes)

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT			1. CONTRACT ID CODE U	PAGE OF PAGES 1 9
2. AMENDMENT/MODIFICATION NO. P00004	3. EFFECTIVE DATE 18-Apr-2007	4. REQUISITION/PURCHASE REQ. NO. SEE SCHEDULE		5. PROJECT NO. (if applicable)
6. ISSUED BY DARPA CMO ATTN: MICHAEL D. BLACKSTONE 3701 N. FAIRFAX DR. ARLINGTON VA 22203-1714	CODE HRO011	7. ADMINISTERED BY (If other than item 6) DCMA NORTHROP GRUMMAN BALTIMORE 7329 AVIATION BLVD, W8 1285 BWI AIRPORT MD 21240-2003		CODE S2103A
8. NAME AND ADDRESS OF CONTRACTOR (No., Street, County, State and Zip Code) NORTHROP GRUMMAN SYSTEMS CORPORATION 1580A NURSERY RD LINTHICUM HEIGHTS MD 21080-0000			9A. AMENDMENT OF SOLICITATION NO.	
			9B. DATED (SEE ITEM 11)	
			X 10A. MOD. OF CONTRACT/ORDER NO. HRO011-06-C-0144	
			X 10B. DATED (SEE ITEM 13) 27-Sep-2006	
CODE 97942			FACILITY CODE	
11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS				
<input type="checkbox"/> The above numbered solicitation is amended as set forth in item 14. The hour and date specified for receipt of Offer <input type="checkbox"/> is extended. <input type="checkbox"/> is not extended. Offer 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 amendment; (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) See Schedule				
13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.				
A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.				
B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(B).				
X C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF: By Mutual Agreement of the Parties.				
D. OTHER (Specify type of modification and authority)				
E. IMPORTANT: Contractor <input type="checkbox"/> is not, <input checked="" type="checkbox"/> is required to sign this document and return <u>1</u> copies to the issuing office.				
14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.) Modification Control Number: kgrigen07682 The purpose of this modification is to exercise Option I (Phase II) and to provide \$4,500,000 (AO No. W295/01) of incremental funding. See page 2.				
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) MITCHELL J. DZURENKU CONTRACTS REPRESENTATIVE		16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) Michael D. Blackstone, PCO TEL: 571-278-4804 EMAIL: Michael.Blackstone@darpa.mil		
15B. CONTRACTOR/ORDER NO. (b)(4)	15C. DATE SIGNED 4-16-07	16B. UNITED STATES OF AMERICA (b)(6)	16C. DATE SIGNED 4/16/07	
(Signature of person authorized to sign)		(Signature of Contracting Officer)		

SECTION SF 30 BLOCK 14 CONTINUATION PAGE

SUMMARY OF CHANGES

1. SECTION A - SOLICITATION/CONTRACT FORM

The total cost of this contract was increased by \$9,999,932.00 from \$9,970,999.00 to \$19,970,931.00.

2. SECTION B - SUPPLIES OR SERVICES AND PRICES

- a. CLIN 0002
The option status has changed from Option to Option Exercised.
- b. SUBCLIN 000201 is added as follows:

ITEM NO		AMOUNT
000201	Funding for Phase II	
	AO No. W295/01	
	ACRN AB	\$4,500,000.00

3. SECTION F - DELIVERIES OR PERFORMANCE

The following have been modified as highlighted in bold:

- a. F-1 Term of Contract
- (a) CLIN 0001 - The term of the contract commences on 1 October 2006 and continues through 30 April 2007.
- (b) The period of performance for Option 1, as set forth in CLIN 0002, **commences on 17 April 2007 and continues through 16 April 2008.**
eserved
- (c) Deleted/Reserved.

(end of clause)

b. F-2 Reports and Other Deliverables

(a) Delivery of all reports and other deliverables shall be made to the addressee specified in F-3 entitled "Report Distribution" in accordance with the following:

Item No.	Description	Due Date (on or before)
0001, 0002	Interim Reports	See Exhibit A CDRL
0001	Final Report (Phase 1)	30 April 2007
0001, 0002	Additional Misc. Deliverables	See Section C-2

0002
(end of clause)

Final Report (Phase 2)

9 April 2008

4. SECTION G - CONTRACT ADMINISTRATION DATA

Accounting and Appropriation

a. Summary for the Payment Office

As a result of this modification, the total funded amount for this document was increased by \$4,500,000.00 from \$9,970,999.00 to \$14,470,999.00.

b. SUBCLIN 000201: Funding on SUBCLIN 000201 is initiated as follows:

ACRN: AB

CIN: 00000000000000000000000000000000

Acting Data: 9770400 1320 W295 P7P30 2525 DPAC 7 5222 S12136 63767E

Increase: \$4,500,000.00

Total: \$4,500,000.00

c. The following have been modified as highlighted in bold:

G-6 Incremental Funding

(a) This contract shall be subject to incremental funding with **\$14,470,999** presently made available for performance under this contract. It is estimated that the funds presently available are sufficient to permit the Contractor's performance through **13 October 2007**. Except in accordance with the Section I clause FAR 52.232-22, "Limitation of Funds," no legal liability of the part of the Government for payment of any money in excess of **\$14,470,999** shall arise unless and until additional funds are made available by the Contracting Officer through a modification to this contract.

(b) Incremental funding has been provided as follows:

- a. CLIN 0001, Phase 1 - **\$9,970,999** through **30 April 2007***
- b. CLIN 0002, Phase 2 - **\$4,500,000** through **13 October 2007***

*** Funding provided may not be used to support any activity subject to the Common Rule and/or associated Human Subject Testing Regulations, as defined by 32 CFR 219, which is implemented by DoD Directive 3216.2. No such human subject testing may take place on this contract as DARPA CMO is not authorized to issue such contracts.**

(end of clause)

5. Except as modified above, the terms and conditions of Contract No. HR0011-06-C-0144 shall remain unchanged and in full force and effect.

(End of Summary of Changes)

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT			1. CONTRACT ID CODE U	PAGE OF PAGES 1 3
2. AMENDMENT/MODIFICATION NO. F00005	3. EFFECTIVE DATE 01-May-2007	4. REQUISITION/PURCHASE REQ. NO. SEE SCHEDULE		5. PROJECT NO. (if applicable)
6. ISSUED BY DARPA CAND ATTN: MICHAEL D. BLACKSTONE 3701 N. FAIRFAX DR. ARLINGTON VA 22203-1714	CODE HR0011	7. ADMINISTERED BY (if other than item 6) DCMA NORTHROP GRUMMAN BALTIMORE 7325 AVIATION BLVD, MS 1265 9901 AIRPORT MD 21240-2003		CODE S2103A
8. NAME AND ADDRESS OF CONTRACTOR (No., Street, County, State and Zip Code) NORTHROP GRUMMAN SYSTEMS CORPORATION 1580A NURSERY RD LINTHICUM HEIGHTS MD 21090-0000			9A. AMENDMENT OF SOLICITATION NO.	
			9B. DATED (SEE ITEM 11)	
			X	10A. MOD. OF CONTRACT/ORDER NO. HR0011-06-C-0144
			X	10B. DATED (SEE ITEM 13) 27-Sep-2006
CODE 97942			FACILITY CODE	
11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS				
<input type="checkbox"/> The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offer <input type="checkbox"/> is extended. <input type="checkbox"/> is not extended. Offer 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 amendment; (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) See Schedule				
13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.				
A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.				
B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(B).				
X C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF: By Mutual Agreement of the Parties.				
D. OTHER (Specify type of modification and authority)				
E. IMPORTANT: Contractor <input type="checkbox"/> is not, <input checked="" type="checkbox"/> is required to sign this document and return <u>1</u> copies to the issuing office.				
14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCP section headings, including solicitation/contract subject matter, where feasible) Modification Control Number: Hgrpm07879 The purpose of this modification is to revise the CLIN structure of the effort. CLIN 0001 has been revised to include both the Phase I (currently CLIN 0001) and Phase II (currently CLIN 0002) efforts. CLIN 0002 is hereby deleted in its entirety, and the scope and estimated cost-plus-fixed-fee amount moved to CLIN 0001. The current Statement of Work, Attachment 1, is hereby deleted in its entirety and replaced with a revised Statement of Work (Phase 1&2), dated 27 April 2007. See page 2.				
Except as provided herein, all terms and conditions of the documents referenced in Item 9A or 10A, as heretofore changed, remain unchanged and in full force and effect.				
15A. NAME AND TITLE OF SIGNER (Type or print) DONALD W. CROCKER CONTRACTS SUPERVISOR		16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) MICHAEL D. BLACKSTONE; PCO TELE 571-218-4504 EMAIL: Michael.Blackstone@darpa.mil		
(b)(4)		15C. DATE SIGNED: 07 MAY 07	16B. DATE SIGNED: (b)(6)	16C. DATE SIGNED: 5/7/07
(Signature of person authorized to sign)				

EXCEPTION TO SF 308
APPROVED BY OIRM-11-84

30-105-04

STANDARD FORM 30 (Rev. 03/01)
Prescribed by GSA
FAR (48 CFR) 53.243



SECTION SF 30 BLOCK 14 CONTINUATION PAGE

SUMMARY OF CHANGES

The following has been modified as highlighted in bold:

1. SECTION B - SUPPLIES OR SERVICES AND PRICES

a. CLIN 0001

The contractor shall provide the personnel, facilities, and material necessary to conduct the research effort described in the Northrop Grumman "Vehicle and Dismount Exploitation Radar (VADER) Phase 1/2 Statement of Work, dated 27 April 2007, which is made part of this contract at Attachment (1). Data deliverable requirements shall be in accordance with Sections C and F, and Exhibit A, of the contract.

The estimated/max cost has increased by (b)(4)
The fixed fee has increased by (b)(4)
The total cost of this line item has increased by \$9,999,932.00 from \$9,970,999.00 to \$19,970,931.00.

b. SUBCLIN 000102 is added as follows:

ITEM NO	AMOUNT
000102	
ACRN AB	\$4,500,000.00

c. CLIN 0002

The estimated/max cost has decreased by \$9,283,013.00 from \$9,283,013.00 to \$0.00.
The fixed fee has decreased by \$716,919.00 from \$716,919.00 to \$0.00.
The total cost of this line item has decreased by \$9,999,932.00 from \$9,999,932.00 to \$0.00.

d. SUBCLIN 000201

The CLIN description Funding for Phase II has been deleted.

2. SECTION G - CONTRACT ADMINISTRATION DATA

Accounting and Appropriation

a. Summary for the Payment Office

SUBCLIN 000102:

Funding on SUBCLIN 000102 is initiated as follows:

ACRN: AB

CIN: 00000000000000000000000000000000

Acctng Data: 9770400 1320 W295 P7P30 2525 DPAC 7 5222 S12136 63767E

Increase: \$4,500,000.00

Total: \$4,500,000.00

SUBCLIN 000201:

AB: 9770400 1320 W295 P7P30 2525 DPAC 7 5222 S12136 63767E (CIN
00000000000000000000000000000000) was decreased by \$4,500,000.00 from \$4,500,000.00 to \$0.00

b. The following have been modified as highlighted in bold:

G-6 Incremental Funding

(a) This contract shall be subject to incremental funding with \$14,470,999 presently made available for performance under this contract. It is estimated that the funds presently available are sufficient to permit the Contractor's performance through 13 October 2007. Except in accordance with the Section I clause FAR 52.232-22, "Limitation of Funds," no legal liability of the part of the Government for payment of any money in excess of \$14,470,999 shall arise unless and until additional funds are made available by the Contracting Officer through a modification to this contract.

(b) Incremental funding has been provided as follows:

- a. CLIN 0001, Phase 1 - \$9,970,999 through 13 April 2007 (ACRN AA)*
- b. CLIN 0001, Phase 2 - \$4,500,000 through 13 October 2007 (ACRN AB)*

***The contractor shall only invoice Phase I work activities against ACRN AA and Phase II work activities against ACRN AB.**

(end of clause)

3. Per FAR 52.227-17, subparagraph (I) "Communications," the contractor shall from the effective date of this modification utilize the i-edison website for patent/invention disclosures and reports.

4. The contract CLIN format has been revised to combine the Phase I and Phase II efforts on CLIN 0001 only. All references to CLIN 0002 have been deleted from the contract. A conform copy of the contract is attached as Enclosure (1) to this modification that incorporates the above changes and all other changes to the contract as a result of the moving CLIN 0002 scope and CPFF amount to CLIN 0001.

5. Except as modified above, the terms and conditions of Contract No. HR0011-06-C-0144 shall remain unchanged and in full force and effect.

Vehicle and Dismount Exploitation Radar (VADER)

Statement of Work

Revision : A

Revision Date: April 27, 2007

Contract Number: HR0011-06-C-0144

01 October 2006 – 16 April 2008

Distribution Statement B: Distribution authorized to U.S. Government agencies only due to Critical/Classified Technology and to prevent Premature Dissemination of Information. Other Request for this document shall be referred to DARPA Technical Information Office via email at tio@darpa.mil.

Attachment (1)

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Attachment (1)

1 Scope

This Statement of Work (SOW) includes the tasks to support the efforts to develop and demonstrate a (b)(4) Ku-band (b)(4) Radar (VADER). The overall program is planned for an 18 month period of performance. *(please refer to figure 1 for general Program Phase delineations).*

Phase I activities encompass the initial design and ordering of long lead material from contract award through DARPA Go/No Go review and includes subsequent manufacturing of long lead parts and receipt of long lead material. Specifically, this includes the design efforts and materials procurement of an (b)(4) Ku-band Antenna subsystem, and the development and fabrication of the (b)(4) subsystem to be used on an NGC test aircraft, the (b)(4) (b)(4) Software design efforts support 3 modes: (b)(4) (both Spot and Strip maps), (b)(4) Ground Station design efforts are also included in this SOW.

Phase 2 activities begin subsequent to DARPA Go/No Go milestone authorization and include the completion of design efforts, materials procurement, fabrication, and integration and test of an (b)(4) Ku-band Antenna subsystem and the (b)(4) subsystem to be used on an NGC test aircraft, the (b)(4) Software development efforts, integration and testing to support 3 modes: (b)(4) (both Spot and Strip maps), (b)(4) and Ground Station development efforts are also included in this SOW. The effort also includes integration of test of the VADER system, including flight testing on the (b)(4)

The VADER Radar will be used to carry out demonstrations related to detection of dismounts and vehicles and for the collection of data for potential use in data exploitation. The work will be conducted at Northrop Grumman facilities in (b)(4)

1.1 Ground Rules

1. The VADER Radar development and demonstration program will produce a prototype radar system and demonstrate it on an NGC-owned test aircraft, the Islander, and a GFE ERMP/Warrior aircraft as an option.
2. Hardware and software from on-going development and productions programs will be leveraged with little or no modifications for much of the design and software development effort.
3. Deliverables, in terms of hardware, software, and data and documentation, will be as specified in this SOW.

2 Applicable Documents

NGES VADER System Performance Specification

3 Task Requirements

Specific task requirements for each program phase are captured in Attachment A for Phase 1 and Attachment B for Phase 2.

Attachment (1)

(b)(4)



Figure 1. Phases Delineations for the Top-level VADER Program Schedule

Attachment A

Statement of Work For Vehicle And Dismount Exploitation Radar (VADER) Development and Demonstration Program

Phase 1: Design and Long Lead Material Order

Attachment (1)

A1 Scope

This Statement of Work (SOW) includes the tasks to support the Phase I efforts of the development and demonstration of a SAR/GMTI/DMTI Ku-band (b)(4) Radar (VADER) and includes subsequent manufacturing of long lead parts and receipt of long lead material.

A2 Applicable Documents

NGES VADER System Performance Specification

A3 Task Requirements

Northrop Grumman Electronics Systems (NGES) shall provide all labor and administrative services necessary to support, perform and document the work to develop a prototype (b)(4) Ku-band (b)(4) radar system from contract start through DARPA Go / No Go milestone approval. The system shall be configured for real time control, real time status/data quality checks, data acquisition, and real time system operation for (b)(4). The VADER Radar system requirements are specified in the NGES VADER System Performance Specification. [CDRL A001]

A3.1 System Engineering

A3.1.1 Requirements Definition and Documentation Management.

Throughout Phase I of this program, NGES shall develop the system requirements and manage the radar system-level documentation in contractor format. Requirements will be presented and discussed at the customer reviews.

A3.1.1 Algorithm Definition.

NGES shall provide systems engineering support to specify the real time signal and data processing, radar scheduling, control, calibration and communications software requirements throughout Phase I of this program.

A3.1.3 Test Planning.

NGES shall develop a preliminary Integration and Test approach that includes Subsystem Integration and Test, System Integration Laboratory Integration and Test, and Flight Testing. [CDRL A002]

A3.1.4 Performance Analysis.

NGES shall analyze and update expected radar system performance throughout Phase I of this program. Analysis results shall be presented at the customer reviews.

Use or disclosure of data contained on this sheet is subject to the restriction on the title page of this proposal or quotation.

Attachment (1)

A3.1.5 Systems Engineering Support.

NGES shall provide overall systems engineering support throughout the design and development of the VADER Radar during Phase I of this program.

A3.2 Hardware Design and Development.

A3.2.1 Antenna (b)(4) Ku-band (b)(4) Subsystem.

NGES shall perform design and development of the antenna subsystem. The effort shall include the necessary design, analysis, drafting and materials procurement required to complete the array hardware tasks in support of Phase I of this program.

A3.2.1.1 Antenna structure (pod) and cooling – NGES shall design and develop the support (pod) structure to (b)(4) NGES also shall design and develop the support structure for the LRMs on the array as well as the support structure needed to mount to the (b)(4) NGES shall design and develop the cooling mechanization of the array and other elements within the antenna subsystem to include (b)(4) within the antenna structure (pod) in support of Phase I of this program.

A3.2.1.2 Array power and logic distribution. – NGES shall design the power and logic distribution needed to supply electrical power and control to the (b)(4) support of Phase I of this program.

A3.2.1.3 (b)(4) – NGES shall design and develop (b)(4) (b)(4) to support the (b)(4) in support of Phase I of this program. The (b)(4)

A3.2.1.4 (b)(4) – NGES shall support the initial fabrication of (b)(4) (b)(4)

A3.2.1.5 Aperture (b)(4) – NGES shall design and develop (b)(4) (b)(4) in support of Phase I of this program. (b)(4) (b)(4)

A3.2.1.6 (b)(4) – NGES shall specify the (b)(4) requirements for (b)(4) (b)(4) of the array within the antenna subsystem. (b)(4) (b)(4)

A3.2.1.7 (b)(4) – NGES shall design and develop (b)(4) (b)(4) within the antenna subsystem in support of Phase I of this program.

A3.2.1.8 (b)(4) – NGES shall design and develop (b)(4) (b)(4) the VADER Radar array form factor in support of Phase I of this program.

A3.2.1.9 (b)(4) – NGES shall design and develop the (b)(4) (b)(4)

Use or disclosure of data contained on this sheet is subject to the restriction on the title page of this proposal or quotation.

Attachment (1)

A3.2.1.10 Radome – NGES shall specify the radome requirements for the antenna subsystem. NGES shall begin source control documents for vendor sourcing of the VADER Radar radome in support of Phase I of this program.

A3.2.1.11 (b)(4) – NGES shall specify the (b)(4) for the antenna subsystem. NGES (b)(4) in support of Phase I of this program.

A3.2.1.12 Antenna Integrated Product Team (IPT) – In support of Phase I of this program, NGES shall provide antenna design and development oversight and analysis necessary to ensure the antenna design will meet its required performance. The IPT shall also maintain project cost and schedule visibility and control throughout Phase I of this program.

A3.2.2 (b)(4) Subsystem.

A3.2.2.1 (b)(4)

A3.2.2.2

A3.2.2.3

A3.3 Hardware Build and Test

A3.3.1 Material Procurement.

A3.3.1.1 Antenna Subsystem – NGES shall procure antenna subsystem parts and materials, (b)(4)

A3.3.1.2 (b)(4)

A3.3.1.3 Datalink and Ground Station - NGES shall procure datalink and ground station subsystem parts and materials in support of Phase I of this program.

A3.3.2 Subsystem Build and Test.

A3.3.2.1 Antenna Subsystem – NGES shall start the initial planning and build, test, and assembly of the antenna subsystem array components.

Use or disclosure of data contained on this sheet is subject to the restriction on the title page of this proposal or quotation.

Attachment (1)

A3.3.2.2 (b)(4) – NGES shall:

1. Begin the build and test of the (b)(4) modules.

A3.3.2.3 *Datalink and Ground Station* – NGES shall begin the assembly and test of the datalink and ground station subsystem

A3.4 Software Design and Test

NGES shall manage, design, document, code, and test all software required for the VADER Radar in accordance with NGES internal processes and procedures for software development in support of Phase I of this program.

A3.4.1 Radar Manager Software

NGES shall manage, design, document, code and test the radar manager software which controls the operation of the radar system to include provisions for control interfaces in support of Phase I of this program.

A3.4.2 GMTI/DMTI Software

NGES shall manage, design, document, code and test the software to perform (b)(4) functions in support of Phase I of this program.

A3.4.3 SAR Software

NGES shall manage, design, document, code and test the software to perform Spot (b)(4) (b)(4) Functions in support of Phase I of this program.

A3.4.4 Datalink and Ground Station Software

NGES shall manage, design, document, code and test the software for the Datalink and Ground Station operation in support of Phase I of this program.

A3.5 Radar System Integration and Test.

A3.5.1 Systems Integration Laboratory (SIL) Integration Testing.

NGES shall initiate plans for integration of all aspects of the VADER Radar system in the NGES SIL.

A3.5.2 (b)(4) Integration.

(b)(4)

A3.5.3 (b)(4) Testing.

NGES shall perform an initial Safety of Flight (SOF) analysis for the VADER Radar prototype system in support of Phase I of this program.

Use or disclosure of data contained on this sheet is subject to the restriction on the title page of this proposal or quotation.

Attachment (1)

A3.6 Program Office

A3.6.1 Program Management.

NGES shall establish and maintain Program Management practices to support Phase I of the VADER Radar project to include planning, oversight, and reporting of the cost, schedule, and technical progress, subcontracts/vendor management, internal design reviews, customer technical interchange meetings/design reviews, customer interface, as well as providing NGES management visibility to program cost schedule, and technical status. [CDRL A003, A004, A005]

A3.6.2 Conferences / Formal Reviews.

NGES shall host and conduct the following reviews during Phase I of the program as technical interchange meetings (TIMs) [CDRL A006, A007]:

1. Post-award Conference / Kickoff Meeting at 30 days ARO
2. Preliminary Design Review (PDR) at 2 months ARO
3. Critical Design Review (CDR) at 5 months ARO

A3.6.3 Documentation.

NGES shall prepare and submit data and documentation in accordance with the Contract Data Requirements List (CDRL) in table 1. All deliverable documentation shall be prepared in accordance with NGES contractor format and/or other commercial format and shall be delivered in Microsoft Office 2000-compatible office products. Documentation shall be delivered in soft-copy on CD ROM and/or electronically. All data items shall be delivered via an NGES contracts letter of transmittal.

Table 1. VADER Radar Demonstration Contract Data Requirements List (CDRL)

Data Item No.	Title of Data Item	SOW Reference	Frequency
A003	Program Plan	3.6.1.	One time
A004	Monthly Progress Report	3.6.1.	Monthly
A005	Funds Expenditure Report	3.6.1.	Monthly
A006	Conference Agenda	3.6.2.	As required
A007	Conference Minutes	3.6.2.	As required

A4 Deliverables

NGES shall provide the following deliverables as described in this SOW, unless otherwise directed by the Government:

1. NGES shall deliver CDRL Items as specified in 3.6.3 of this SOW.

Use or disclosure of data contained on this sheet is subject to the restriction on the title page of this proposal or quotation.

Attachment B

Statement of Work For Vehicle And Dismount Exploitation Radar (VADER) Development and Demonstration Program

Phase 2: Build and Test Activities

Attachment (1)

B1 Scope

This Statement of Work (SOW) includes the tasks to support the Phase II efforts of the development and demonstration of a (b)(4) Ku-band (b)(4) Radar (VADER). Phase 2 activities begin subsequent to DARPA Go/No Go milestone authorization and include the completion of design efforts, materials procurement, fabrication, integration and test of an (b)(4) Ku-band Antenna subsystem and the (b)(4) subsystem to be used on an NGC test aircraft, the (b)(4)

B2 Applicable Documents

NGES VADER System Performance Specification

B3 Task Requirements

Northrop Grumman Electronics Systems (NGES) shall provide all labor and administrative services necessary to support, perform and document the work to develop, build and demonstrate a prototype (b)(4) Ku-band (b)(4) radar system for Phase 2. Phase 2 begins subsequent to DARPA Go/No Go milestone authorization and includes the completion of design efforts, materials procurement, fabrication, integration and test on an NGC test aircraft. The system shall be configured for real time control, real time status/data quality checks, data acquisition, and real time system operation for Spot (b)(4) Strip (b)(4). The VADER Radar system requirements are specified in the NGES VADER System Performance Specification. [CDRL A001]

B3.1 System Engineering

B3.1.1 Requirements Definition and Documentation Management.

Throughout Phase II of this program, NGES shall continue to develop the system requirements and manage the radar system-level documentation in contractor format. Requirements will continue to be presented and discussed at the customer reviews.

B3.1.2 Algorithm Definition.

NGES shall provide systems engineering support to specify the real time signal and data processing, radar scheduling, control, calibration and communications software requirements throughout Phase II of this program.

B3.1.3 Test Planning.

NGES shall continue to refine the Integration and Test approach that includes Subsystem Integration and Test, System Integration Laboratory Integration and Test, and Flight Testing. [CDRL A002]

Use or disclosure of data contained on this sheet is subject to the restriction on the title page of this proposal or quotation.

Attachment (1)

B3.1.4 Performance Analysis.

NGES shall analyze and update expected radar system performance throughout Phase II of this program. Analysis results shall be presented at the customer reviews. NGES shall also analyze the flight test data and support flight testing activities.

B3.1.5 Systems Engineering Support.

NGES shall provide overall systems engineering support throughout the development, integration and testing of the VADER Radar during Phase II of this program. Systems engineering shall participate in Integration and Flight Testing of the radar system on the (b)(4) during this phase.

B3.2 Hardware Design and Development.

B3.2.1 Antenna (b)(4) Ku-band (b)(4) Subsystem.

NGES shall perform design and development of the antenna subsystem. The effort shall include the necessary design, analysis, drafting and materials procurement required to complete the array hardware tasks in support of a demonstration flight test with the prototype hardware during Phase II of this program.

B3.2.1.1 Antenna structure (pod) and cooling – NGES shall develop the support (pod) structure to house the TR modules, the RF manifold, and the patch radiators. NGES also shall develop the support structure for the LRMs on the array as well as the support structure need to mount to the (b)(4) assembly. NGES shall develop the (b)(4) and other elements within the antenna subsystem to include air distribution within the antenna structure (pod) in support of Phase II of this program.

B3.2.1.2 Array power and logic distribution. – NGES shall develop the power and logic distribution needed to supply electrical power and control to the TR modules, the support LRMs, and the (b)(4) in support of Phase II of this program.

B3.2.1.3 (b)(4) – NGES shall develop (b)(4) (b)(4) in support of Phase II of this program. The task also includes development of any (b)(4)

B3.2.1.4 (b)(4) – NGES shall support the fabrication of (b)(4) (b)(4) in support of Phase II of this program.

B3.2.1.5 Aperture (b)(4) – NGES shall develop (b)(4) (b)(4) in support of Phase II of this program. (b)(4) (b)(4)

B3.2.1.6 (b)(4) – NGES shall complete the source control document for vendor sourcing of the VADER Radar (b)(4) in support of Phase II of this program per the NGES specified (b)(4) requirements for roll positioning of the array within the antenna subsystem.

B3.2.1.7 (b)(4) – NGES shall develop (b)(4) (b)(4) within the antenna subsystem in support of Phase II of this program.

Use or disclosure of data contained on this sheet is subject to the restriction on the title page of this proposal or quotation.

Attachment (1)

B3.2.1.8 (b)(4) – NGES shall develop modifications to existing package designs for the up/down converters to accommodate the VADER Radar array form factor in support of Phase II of this program.

B3.2.1.9 (b)(4) – NGES shall develop the (b)(4) support of Phase II of this program.

B3.2.1.10 Radome – NGES shall complete (b)(4) VADER Radar radome in support of Phase II of this program.

B3.2.1.11 (b)(4) – NGES shall complete the documentation for (b)(4) (b)(4) in support of Phase II of this program.

B3.2.1.12 Antenna Integrated Product Team (IPT) – In support of Phase I of this program, NGES shall provide antenna design and development oversight and analysis necessary to ensure the antenna design will meet its required performance. (b)(4)

B3.2.2 (b)(4)

B3.2.2.1 (b)(4) – NGES shall (b)(4) if and as necessary, to existing designs for the (b)(4) during Phase II of this program. The NGES (b)(4) utilized for the VADER (b)(4)

(b)(4)
B3.2.2.2 (b)(4) – NGES shall develop the (b)(4) and (b)(4). The effort shall include the necessary design, analysis, and drafting required to complete tasks in support of a demonstration flight test with prototype hardware during Phase II of this program.

B3.2.2.3 (b)(4) *Integrated Product Team (IPT)* – NGES shall provide (b)(4) design and development oversight and analysis necessary to ensure the (b)(4) design meets its required performance. The IPT shall also maintain project cost and schedule visibility and control throughout Phase II of this program.

B3.3 Hardware Build and Test

B3.3.1 Material Procurement.

B3.3.1.1 Antenna Subsystem – NGES shall continue the procurement of all remaining antenna subsystem parts and materials, including (b)(4)

B3.3.1.2 (b)(4) – NGES shall continue the procurement of all remaining receiver/exciter/ processor subsystem parts and materials, including (b)(4)

B3.3.1.3 Datalink and Ground Station – NGES shall continue the procurement of all remaining datalink and ground station subsystem parts and materials in support of Phase II of this program.

Use or disclosure of data contained on this sheet is subject to the restriction on the title page of this proposal or quotation.

Attachment (1)

B3.3.2 Subsystem Build and Test.

B3.3.2.1 Antenna Subsystem – NGES shall:

1. Build, test, and assemble the antenna subsystem array components.
2. Characterize and test the assembled array.
3. Integrate the array with the (b)(4) and other components of the antenna (pod) subsystem.
4. Characterize and test the antenna (pod) subsystem.

B3.3.2.2 (b)(4) – NGES shall:

2. Complete the build and test of the (b)(4) subsystem modules.
3. Assemble the (b)(4)
4. Characterize and test the assembled (b)(4)

B3.3.2.3 Datalink and Ground Station – NGES shall complete the assembly and test of the datalink and ground station subsystem

B3.4 Software Design and Test

NGES shall manage, design, document, code, and test all software required for the VADER Radar in accordance with NGES internal processes and procedures for software development in support of Phase II of this program.

B3.4.1 Radar Manager Software

NGES shall manage, design, document, code and test the radar manager software (b)(4) (b)(4) in support of Phase II of this program.

B3.4.2 (b)(4) Software

NGES shall manage, design, document, code and test the software to perform (b)(4) functions in support of Phase II of this program.

B3.4.3 (b)(4) Software

NGES shall manage, design, document, code and test the software to perform Spot (b)(4) and Strip (b)(4) Functions in support of Phase II of this program.

B3.4.4 Datalink and Ground Station Software

NGES shall manage, design, document, code and test the software for the Datalink and Ground Station operation in support of Phase II of this program.

Use or disclosure of data contained on this sheet is subject to the restriction on the title page of this proposal or quotation.

Attachment (1)

B3.5 Radar System Integration and Test.

B3.5.1 (b)(4) Integration Testing.

NGES shall integrate all aspects of the VADER Radar system in the NGES (b)(4)

B3.5.2 (b)(4) Integration.

NGES shall perform structural and aerodynamic analyses and provide the structural components necessary to modify the (b)(4) to accept the VADER Radar system.

NGES shall integrate the antenna subsystem (pod) and (b)(4) onto the Islander aircraft. This effort shall include technical and mechanical support.

NGES shall prepare the appropriate documentation of the installation, such as inspection records, complete FAA package with DER signoff and SOF flight test plan and report.

B3.5.3 (b)(4) Flight Testing.

NGES shall perform a Safety of Flight (SOF) analysis for the VADER Radar prototype system.

NGES shall perform flight testing of the VADER Radar on the (b)(4) aircraft.

B3.6 Program Office

B3.6.1 Program Management.

NGES shall establish and maintain Program Management practices to support Phase II of the VADER Radar project to include planning, oversight, and reporting of the cost, schedule, and technical progress, subcontracts/vendor management, internal design reviews, customer technical interchange meetings/design reviews, customer interface, as well as providing NGES management visibility to program cost schedule, and technical status. [CDRL A003, A004, A005]

B3.6.2 Conferences / Formal Reviews.

NGES shall host and conduct the following reviews during Phase II of the program as technical interchange meetings (TIMs) [CDRL A006, A007]:

- 1 Post-award Conference / Kickoff Meeting at 30 days ARO
- 2 Preliminary Design Review (PDR) at 2 months ARO
- 3 Critical Design Review (CDR) at 5 months ARO

B3.6.3 Documentation.

NGES shall prepare and submit data and documentation in accordance with the Contract Data Requirements List (CDRL) in table 1 during Phase II. All deliverable documentation shall be prepared in accordance with NGES contractor format and/or other commercial format and shall be delivered in Microsoft Office 2000-compatible office products. Documentation shall be delivered

Use or disclosure of data contained on this sheet is subject to the restriction on the title page of this proposal or quotation.

Attachment (1)

in soft-copy on CD ROM and/or electronically. All data items shall be delivered via an NGES contracts letter of transmittal.

Table 1. VADER Radar Demonstration Contract Data Requirements List (CDRL)

Data Item No.	Title of Data Item	SOW Reference	Frequency
A004	Monthly Progress Report	3.6.1.	Monthly
A005	Funds Expenditure Report	3.6.1.	Monthly
A006	Conference Agenda	3.6.2.	As required
A007	Conference Minutes	3.6.2.	As required
A008	Radar Raw Phase History & Processed Data From Each Flight Test	3.5.3	As required
A009	Test Plan Prior to Each Flight Test	3.5.3	As required
A010	Flight Test Report Including Analyses of System Performance	3.5.3	As required

B4 Deliverables

NGES shall provide the CDRL Items as specified in 3.6.3 of this SOW, unless otherwise directed by the Government.

NGES shall provide the following deliverables as described in this SOW, unless otherwise directed by the Government:

1. NGES shall deliver in place, at the end of the period of performance, all radar hardware developed or procured under this contract.
2. NGES shall deliver in place, at the end of the period of performance, the final Operational Fight Program (OFF) software developed under this contract.
3. NGES shall deliver in place, at the end of the period of performance, the ground station hardware and software developed under this contract.
4. NGES shall deliver CDRL items as specified in 3.6.3 of this SOW.

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT				I. CONTRACT ID CODE	PAGE OF PAGES
				U	1 3
2. AMENDMENT/MODIFICATION NO. F00006	3. EFFECTIVE DATE 01-Jun-2007	4. REQUISITION/PURCHASE REQ. NO. SEE SCHEDULE	5. PROJECT NO. (If applicable)		
6. ISSUED BY DARPA CMO ATTN: MICHAEL D. BLACKSTONE 3701 N. FAIRFAX DR. ARLINGTON VA 22203-1714	CODE HR0011	7. ADMINISTERED BY (If other than item 6) DCMA NORTHROP GRUMMAN BALTIMORE 7323 AVIATION BLVD, WFS 1285 BWI AIRPORT MD 21240-2003		CODE	S2103A
8. NAME AND ADDRESS OF CONTRACTOR (No., Street, County, State and Zip Code) NORTHROP GRUMMAN SYSTEMS CORPORATION 1580A NURSERY RD LINTHICUM HEIGHTS MD 21090-0000				9A. AMENDMENT OF SOLICITATION NO.	
				9B. DATED (SEE ITEM 11)	
				X	10A. MOD. OF CONTRACT/ORDER NO. HR0011-06-C-0144
				X	10B. DATED (SEE ITEM 13) 27-Sep-2006
CODE 97942	FACILITY CODE				
11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS					
<input type="checkbox"/> The above numbered solicitation is amended as set forth in item 14. The hour and date specified for receipt of offer <input type="checkbox"/> is extended. <input type="checkbox"/> is not extended.					
<p>Offer 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:</p> <p>(a) By completing items 8 and 15, and returning _____ copies of the amendment; (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.</p>					
12. ACCOUNTING AND APPROPRIATION DATA (If required)					
See Schedule					
13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACT ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.					
A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.					
B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(B).					
C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:					
X D. OTHER (Specify type of modification and authority) Unilateral FAR 52-232-22 "Limitation of Funds"					
E. IMPORTANT: Contractor <input checked="" type="checkbox"/> is not, <input type="checkbox"/> 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.) Modification Control Number: kgriger107767 The purpose of this modification is to provide \$3,500,000 (AO No. W295/02) of incremental funding to the contract. This funding, and all previous funding provided, is hereby authorized for both Phase I and Phase II efforts. See page 2.					
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) CHRIS GUSTA/ TEL: 571-216-4405 EMAIL: christopher.gusta@arpa.mil		
15B. CONTRACTOR/OFFEROR (Signature of person authorized to sign)		15C. DATE SIGNED	16B. UNITED STATES OF AMERICA By _____ (b)(6) (Signature of Contracting Officer)		16C. DATE SIGNED 01-Jun-2007

SECTION SF 30 BLOCK 14 CONTINUATION PAGE

SUMMARY OF CHANGES

1. SECTION B - SUPPLIES OR SERVICES AND PRICES

SUBCLIN 000103 is added as follows:

ITEM NO	AMOUNT
000103	
AO No. W295/02	
ACRN AC	\$3,500,000.00

2. SECTION G - CONTRACT ADMINISTRATION DATA

Accounting and Appropriation

a. Summary for the Payment Office

As a result of this modification, the total funded amount for this document was increased by \$3,500,000.00 from \$14,470,999.00 to \$17,970,999.00.

b. SUBCLIN 000103:

Funding on SUBCLIN 000103 is initiated as follows:

ACRN: AC

CIN: 00000000000000000000000000000000

Acctng Data: 9760400 1320 W295 P6P30 2525 DPAC 6 5530 S12136 63767E

Increase: \$3,500,000.00

Total: \$3,500,000.00

c. The following have been modified as highlighted in bold:

G-6 Incremental Funding

(a) This contract shall be subject to incremental funding with **\$17,970,999** presently made available for performance under this contract. It is estimated that the funds presently available are sufficient to permit the Contractor's performance through **13 November 2007**. Except in accordance with the Section I clause FAR 52.232-22, "Limitation of Funds," no legal liability of the part of the Government for payment of any money in excess of **\$17,970,999** shall arise unless and until additional funds are made available by the Contracting Officer through a modification to this contract.

(a) Incremental funding has been provided as follows:

- a. CLIN 0001, Phase 1 - \$9,970,999 through 13 April 2007 *
- b. CLIN 0001, Phase 2 - \$8,000,000 through 13 November 2007 *

***All funding is authorized for both Phase I and II efforts.**

(end of clause)

3. Except as modified above, the terms and conditions of Contract No. HR0011-06-C-0144 shall remain unchanged and in full force and effect.

(End of Summary of Changes)

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT				1. CONTRACT ID CODE	PAGE OF PAGES
				U	1 3
2. AMENDMENT/MODIFICATION NO. P00007	3. EFFECTIVE DATE 10-Jul-2007	4. REQUISITION/PURCHASE RBQ. NO. SEE SCHEDULE		5. PROJECT NO. (If applicable)	
6. ISSUED BY DARPA CMO ATTN: MICHAEL D. BLACKSTONE 3701 N. FAIRFAX DR. ARLINGTON VA 22203-1714	CODE HR0011	7. ADMINISTERED BY (If other than item 6) DCMA NORTHROP GRUMMAN BALTIMORE 7323 AVIATION BLVD, M/S 1285 BM AIRPORT MD 21240-2003		CODE S2103A	
8. NAME AND ADDRESS OF CONTRACTOR (No., Street, County, State and Zip Code) NORTHROP GRUMMAN SYSTEMS CORPORATION 1580A NURSERY RD LINTHICUM HEIGHTS MD 21080-0000				9A. AMENDMENT OF SOLICITATION NO.	
				9B. DATED (SEE ITEM 11)	
				X 10A. MOD. OF CONTRACT/ORDER NO. HR0011-06-C-0144	
				X 10B. DATED (SEE ITEM 13) 27-Sep-2006	
CODE 97942		FACILITY CODE			
11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS					
<input type="checkbox"/> The above numbered solicitation is amended as set forth in item 14. The hour and date specified for receipt of offer <input type="checkbox"/> is extended, <input type="checkbox"/> is not extended.					
<p>Offer 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:</p> <p>(a) By completing items 8 and 15, and returning _____ copies of the amendment; (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.</p>					
12. ACCOUNTING AND APPROPRIATION DATA (If required)					
13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.					
X A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A. FAR 52-243-2 AIR V					
B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(B).					
C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:					
D. OTHER (Specify type of modification and authority)					
E. IMPORTANT: Contractor <input checked="" type="checkbox"/> is not, <input type="checkbox"/> 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.) Modification Control Number: kgrigeri07875 The purpose of this modification is to issue a unilateral change to CLIN 0001 of the contract. The unilateral change is issued in accordance with FAR 52.243-2 Alt V (Aug 87). See page 2.					
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) STEVE DAVIS / CONTRACTING OFFICER TEL: 571-218-4040 EMAIL: Steve.Davis@darpa.mil		
15B. CONTRACTOR/OFFEROR (Signature of person authorized to sign)	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA (b)(6) BY _____ (Signature of Contracting Officer)		16C. DATE SIGNED 10-Jul-2007	

SECTION SF 30 BLOCK 14 CONTINUATION PAGE

SUMMARY OF CHANGES

All property listed below in H-13 was originally proposed by Northrop Grumman. This equipment is no longer to be acquired by Northrop Grumman, but rather to be provided by the Government as GFP. The budget made available (from the removal of the equipment purchases) allows for tasks to be added as delineated in the Revised SOW included as Enclosure (1) to this modification.

1. SECTION H - SPECIAL CONTRACT REQUIREMENTS

The following have been modified as highlighted in bold:

H-13 Government Furnished Property/Facilities and Services

(a) In accordance with the Section I contract clause entitled "Government Property (Cost Reimbursement, Time and Material, or Labor-Hour Contracts)", the following property, facilities and/or services shall be provided for use in the performance of this contract.

<u>Need Date</u>	<u>QTY</u>	<u>PROPERTY NOMENCLATURE</u>	<u>DELIVERY TO</u>
11/1/07	1	L3 Airborne Mini-T Modem, 15W RFE and Omni antenna	Northrop Grumman*
11/1/07	1	L3 Ground Terminal	Northrop Grumman*
2/1/08	1	L3 15W directional airborne antenna	Northrop Grumman*

*L-3 will provide setup, intialization and tuning support for this GFE, on the Government's behalf.

(end of clause)

2. SECTION J - LIST OF DOCUMENTS, EXHIBITS AND OTHER ATTACHMENTS

a. The Table of Contents has changed as highlighted in bold:

FROM:

Exhibit/Attachment Table of Contents

DOCUMENT TYPE	DESCRIPTION	PAGES	DATE
Exhibit A	CLIN 0001 Exhibit(s)	9	N/A
Attachment 1	Statement of Work (Phase I/II)	18	27 April 2007
Attachment 2	DD Form 254 "Department of Defense Contract Security Classification Specification"	4	22 Sep 2006
Attachment 3	DELETED/RESERVED		
Attachment 4	Intellectual Property Assertions	1	15 Nov 2006

TO:
Exhibit/Attachment Table of Contents

DOCUMENT TYPE	DESCRIPTION	PAGES	DATE
Exhibit A	CLIN 0001 Exhibit(s)	9	N/A
Attachment 1	Statement of Work (Phase I/II)	19	15 May 2007
Attachment 2	DD Form 254 "Department of Defense Contract Security Classification Specification"	4	22 Sep 2006
Attachment 3	DELETED/RESERVED		
Attachment 4	Intellectual Property Assertions	1	15 Nov 2006

b. The Attachment 1 Statement of Work, dated 27 April 2007, is hereby deleted in its entirety and replaced with the revised Statement of Work, dated 15 May 2007 (Rev B), provided as Enclosure 1 to this modification. Sections of the SOW that have changed are shown with change bars on the left and right margins and are the subject of the change proposal requested at paragraph 3(c) below.

c. The contractor shall provide a cost (change) proposal reflecting the associated increase or decrease (equitable adjustment) to the total CLIN 0001 estimated cost-plus-fixed-fee, if applicable, by no later than 10 August 2007.

3. The estimated cost-plus-fixed-fee amount of CLIN 0001 has not been changed as a result of this modification.

4. Except for as modified above, the terms and conditions of Contract No. HR0011-06-C-0144 shall remain unchanged and in full force and effect.

(End of Summary of Changes)

Contract No. HR0011-06-C-0144
Attachment (1)

Modification P00007
Enclosure (1)

Vehicle and Dismount Exploitation Radar (VADER)

Statement of Work

Revision : B

Revision Date: May 15, 2007

Contract Number: HR0011-06-C-0144

01 October 2006 – 16 April 2008

Distribution Statement B: Distribution authorized to U.S. Government agencies only due to Critical/Classified Technology and to prevent Premature Dissemination of Information. Other Request for this document shall be referred to DARPA Technical Information Office via email at tio@darpa.mil.

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 B3 Task Requirements..... B2
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1 Scope

This Statement of Work (SOW) includes the tasks to support the efforts to develop and demonstrate a (b)(4) Ku-band (b)(4) Radar (VADER). The overall program is planned for an 18 month period of performance. *(please refer to figure 1 for general Program Phase delineations).*

Phase I activities encompass the initial design and ordering of long lead material from contract award through DARPA Go/No Go review and includes subsequent manufacturing of long lead parts and receipt of long lead material. Specifically, this includes the design efforts and materials procurement of an (b)(4) Ku-band Antenna subsystem, and the development and fabrication of the (b)(4) subsystem to be used on an NGC test aircraft, the (b)(4) (b)(4) Software design efforts support 3 modes: (b)(4) (both Spot and Strip maps), (b)(4) Ground Station design efforts are also included in this SOW.

Phase 2 activities begin subsequent to DARPA Go/No Go milestone authorization and include the completion of design efforts, materials procurement, fabrication, and integration and test of an (b)(4) Ku-band Antenna subsystem and the (b)(4) subsystem to be used on an NGC test aircraft, the (b)(4) Software development efforts, integration and testing to support 3 modes: (b)(4) (both Spot and Strip maps), (b)(4) and Ground Station development efforts are also included in this SOW. The effort also includes integration of test of the VADER system, including flight testing on the (b)(4)

The VADER Radar will be used to carry out demonstrations related to detection of dismounts and vehicles and for the collection of data for potential use in data exploitation. The work will be conducted at Northrop Grumman facilities in (b)(4)

1.1 Ground Rules

1. The VADER Radar development and demonstration program will produce a prototype radar system and demonstrate it on an NGC-owned test aircraft, the (b)(4) and a GFE (b)(4) aircraft as an option.
2. Hardware and software from on-going development and productions programs will be leveraged with little or no modifications for much of the design and software development effort.
3. Deliverables, in terms of hardware, software, and data and documentation, will be as specified in this SOW.

2 Applicable Documents

NGES VADER System Performance Specification

3 Task Requirements

Specific task requirements for each program phase are captured in Attachment A for Phase 1 and Attachment B for Phase 2.

(b)(4)



Figure 1. Phases Delineations for the Top-level VADER Program Schedule

Attachment A

Statement of Work For Vehicle And Dismount Exploitation Radar (VADER) Development and Demonstration Program

Phase 1: Design and Long Lead Material Order

Use or disclosure of data contained on this sheet is subject to the restriction on the title page of this proposal or quotation.

A1 Scope

This Statement of Work (SOW) includes the tasks to support the Phase I efforts of the development and demonstration of a (b)(4) Ku-band (b)(4) Radar (VADER) and includes subsequent manufacturing of long lead parts and receipt of long lead material.

A2 Applicable Documents

NGES VADER System Performance Specification

A3 Task Requirements

Northrop Grumman Electronics Systems (NGES) shall provide all labor and administrative services necessary to support, perform and document the work to develop a prototype (b)(4) Ku-band (b)(4) radar system from contract start through DARPA Go / No Go milestone approval. The system shall be configured for real time control, real time status/data quality checks, data acquisition, and real time system operation for Spot (b)(4) Strip (b)(4). The VADER Radar system requirements are specified in the NGES VADER System Performance Specification. [CDRL A001]

A3.1 System Engineering

A3.1.1 Requirements Definition and Documentation Management.

Throughout Phase I of this program, NGES shall develop the system requirements and manage the radar system-level documentation in contractor format. Requirements will be presented and discussed at the customer reviews.

A3.1.1 Algorithm Definition.

NGES shall provide systems engineering support to specify the real time signal and data processing, radar scheduling, control, calibration and communications software requirements throughout Phase I of this program.

A3.1.3 Test Planning.

NGES shall develop a preliminary Integration and Test approach that includes Subsystem Integration and Test, System Integration Laboratory Integration and Test, and Flight Testing. [CDRL A002]

A3.1.4 Performance Analysis.

NGES shall analyze and update expected radar system performance throughout Phase I of this program. Analysis results shall be presented at the customer reviews.

Use or disclosure of data contained on this sheet is subject to the restriction on the title page of this proposal or quotation.

A3.1.5 Systems Engineering Support.

NGES shall provide overall systems engineering support throughout the design and development of the VADER Radar during Phase I of this program.

A3.2 Hardware Design and Development.

A3.2.1 Antenna (b)(4) Ku-band (b)(4) Subsystem.

NGES shall perform design and development of the antenna subsystem. The effort shall include the necessary design, analysis, drafting and materials procurement required to complete the array hardware tasks in support of Phase I of this program.

A3.2.1.1 Antenna structure (pod) and cooling – NGES shall design and develop the support (pod) structure to (b)(4) NGES also shall design and develop the support structure for the LRMs on the array as well as the support structure needed to mount to the gimbal assembly. NGES shall design and develop the cooling mechanization of the array and other elements within the antenna subsystem to include (b)(4) within the antenna structure (pod) in support of Phase I of this program.

A3.2.1.2 Array power and logic distribution. – NGES shall design the power and logic distribution needed to supply electrical power and control to the (b)(4) (b)(4)

A3.2.1.3 (b)(4) – NGES shall design and develop (b)(4) (b)(4) to support the (b)(4) in support of Phase I of this program. The task also includes (b)(4)

A3.2.1.4 (b)(4) – NGES shall support the initial fabrication of (b)(4) (b)(4) in support of Phase I of this program.

A3.2.1.5 Aperture (b)(4) – NGES shall design and develop (b)(4) (b)(4) in support of Phase I of this program. (b)(4) (b)(4)

A3.2.1.6 (b)(4) – NGES shall specify the (b)(4) requirements (b)(4) (b)(4) of the array within the antenna subsystem. NGES shall (b)(4) (b)(4) in support of Phase I of this program.

A3.2.1.7 (b)(4) – NGES shall design and develop (b)(4) (b)(4) control devices within the antenna subsystem in support of Phase I of this program.

A3.2.1.8 (b)(4) – NGES shall design and develop (b)(4) (b)(4) the VADER Radar array form factor in support of Phase I of this program.

A3.2.1.9 (b)(4) – NGES shall design and develop the (b)(4) (b)(4) in support of Phase I of this program.

A3.2.1.10 Radome – NGES shall specify the radome requirements for the antenna subsystem. NGES shall begin source control documents for vendor sourcing of the VADER Radar radome in support of Phase I of this program.

A3.2.1.11 (b)(4) – NGES shall specify the (b)(4) for the antenna subsystem. NGES (b)(4) in support of Phase I of this program.

A3.2.1.12 Antenna Integrated Product Team (IPT) – In support of Phase I of this program, NGES shall provide antenna design and development oversight and analysis necessary to ensure the antenna design will meet its required performance. The IPT shall also maintain project cost and schedule visibility and control throughout Phase I of this program.

A3.2.2 (b)(4)

A3.2.2.1 (b)(4)

A3.2.2.2 (b)(4)

A3.2.2.3 (b)(4) *Integrated Product Team (IPT)* – (b)(4)

throughout Phase I of this program.

A3.3 Hardware Build and Test

A3.3.1 Material Procurement.

A3.3.1.1 Antenna Subsystem – NGES shall procure antenna subsystem parts and materials, (b)(4)

(b)(4) Phase I of this program.

A3.3.1.2 (b)(4) – NGES shall procure (b)(4)

subsystem parts and materials, including (b)(4) support of Phase I of this program.

A3.3.1.3 Datalink and Ground Station - NGES shall procure datalink and ground station subsystem parts and materials in support of Phase I of this program.

A3.3.2 Subsystem Build and Test.

A3.3.2.1 Antenna Subsystem – NGES shall start the initial planning and build, test, and assembly of the antenna subsystem array components.

Use or disclosure of data contained on this sheet is subject to the restriction on the title page of this proposal or quotation.

A3.3.2.2 (b)(4) – NGES shall:

1. Begin the build and test of the (b)(4) subsystem modules.

A3.3.2.3 *Datalink and Ground Station* – NGES shall begin the assembly and test of the datalink and ground station subsystem

A3.4 Software Design and Test

NGES shall manage, design, document, code, and test all software required for the VADER Radar in accordance with NGES internal processes and procedures for software development in support of Phase I of this program.

A3.4.1 Radar Manager Software

NGES shall manage, design, document, code and test the radar manager software which controls the operation of the radar system to include provisions for control interfaces in support of Phase I of this program.

A3.4.2 (b)(4) Software

NGES shall manage, design, document, code and test the software to perform (b)(4) functions in support of Phase I of this program.

A3.4.3 SAR Software

NGES shall manage, design, document, code and test the software to perform Spot (b)(4) and Strip (b)(4) Functions in support of Phase I of this program.

A3.4.4 Datalink and Ground Station Software

NGES shall manage, design, document, code and test the software for the Datalink and Ground Station operation in support of Phase I of this program.

A3.5 Radar System Integration and Test.

A3.5.1 Systems Integration Laboratory (SIL) Integration Testing.

NGES shall initiate plans for integration of all aspects of the VADER Radar system in the NGES SIL.

A3.5.2 (b)(4) Integration.

NGES shall perform the initial (b)(4)
NGES (b)(4) aircraft to accept the VADER Radar system.

A3.5.3 (b)(4) Testing.

NGES shall perform an initial Safety of Flight (SOF) analysis for the VADER Radar prototype system in support of Phase I of this program.

Use or disclosure of data contained on this sheet is subject to the restriction on the title page of this proposal or quotation.

A3.6 Program Office

A3.6.1 Program Management.

NGES shall establish and maintain Program Management practices to support Phase I of the VADER Radar project to include planning, oversight, and reporting of the cost, schedule, and technical progress, subcontracts/vendor management, internal design reviews, customer technical interchange meetings/design reviews, customer interface, as well as providing NGES management visibility to program cost schedule, and technical status. [CDRL A003, A004, A005]

A3.6.2 Conferences / Formal Reviews.

NGES shall host and conduct the following reviews during Phase I of the program as technical interchange meetings (TIMs) [CDRL A006, A007]:

1. Post-award Conference / Kickoff Meeting at 30 days ARO
2. Preliminary Design Review (PDR) at 2 months ARO
3. Critical Design Review (CDR) at 5 months ARO

A3.6.3 Documentation.

NGES shall prepare and submit data and documentation in accordance with the Contract Data Requirements List (CDRL) in table 1. All deliverable documentation shall be prepared in accordance with NGES contractor format and/or other commercial format and shall be delivered in Microsoft Office 2000-compatible office products. Documentation shall be delivered in soft-copy on CD ROM and/or electronically. All data items shall be delivered via an NGES contracts letter of transmittal.

Table 1. VADER Radar Demonstration Contract Data Requirements List (CDRL)

Data Item No.	Title of Data Item	SOW Reference	Frequency
A003	Program Plan	3.6.1.	One time
A004	Monthly Progress Report	3.6.1.	Monthly
A005	Funds Expenditure Report	3.6.1.	Monthly
A006	Conference Agenda	3.6.2.	As required
A007	Conference Minutes	3.6.2.	As required

A4 Deliverables

NGES shall provide the following deliverables as described in this SOW, unless otherwise directed by the Government:

1. NGES shall deliver CDRL Items as specified in 3.6.3 of this SOW.

Use or disclosure of data contained on this sheet is subject to the restriction on the title page of this proposal or quotation.

Attachment B

Statement of Work For Vehicle And Dismount Exploitation Radar (VADER) Development and Demonstration Program

Phase 2: Build and Test Activities

B1 Scope

This Statement of Work (SOW) includes the tasks to support the Phase II efforts of the development and demonstration of a (b)(4) Ku-band (b)(4) Radar (VADER). Phase 2 activities begin subsequent to DARPA Go/No Go milestone authorization and include the completion of design efforts, materials procurement, fabrication, integration and test of an (b)(4) Ku-band Antenna subsystem and the (b)(4) subsystem to be used on an NGC test aircraft, the (b)(4)

B2 Applicable Documents

NGES VADER System Performance Specification

B3 Task Requirements

Northrop Grumman Electronics Systems (NGES) shall provide all labor and administrative services necessary to support, perform and document the work to develop, build and demonstrate a prototype (b)(4) Ku-band (b)(4) radar system for Phase 2. Phase 2 begins subsequent to DARPA Go/No Go milestone authorization and includes the completion of design efforts, materials procurement, fabrication, integration and test on an NGC test aircraft. The system shall be configured for real time control, real time status/data quality checks, data acquisition, and real time system operation for Spot (b)(4) Strip (b)(4) Quick (b)(4). The HRR capability within (b)(4) shall be capable of executing multiple HRR dwells within a WAGMT interrupt, outputting either full Doppler width or limited Doppler width HRRs, optionally outputting one dimensional HRRs (range profiles), optionally outputting data without STAP processing, and optionally outputting data without Keystone processing. The (b)(4) capability shall also be capable of covering two or more areas on a bar-to-bar basis to accomplish "simultaneous" coverage. The VADER Radar system requirements are specified in the NGES VADER System Performance Specification. [CDRL A001]

B3.1 System Engineering**B3.1.1 Requirements Definition and Documentation Management.**

Throughout Phase II of this program, NGES shall continue to develop the system requirements and manage the radar system-level documentation in contractor format. Requirements will continue to be presented and discussed at the customer reviews.

B3.1.2 Algorithm Definition.

NGES shall provide systems engineering support to specify the real time signal and data processing, radar scheduling, control, calibration and communications software requirements throughout Phase II of this program.

B3.1.3 Test Planning.

Use or disclosure of data contained on this sheet is subject to the restriction on the title page of this proposal or quotation.

NGES shall continue to refine the Integration and Test approach that includes Subsystem Integration and Test, System Integration Laboratory Integration and Test, and Flight Testing. [CDRL A002]

B3.1.4 Performance Analysis.

NGES shall analyze and update expected radar system performance throughout Phase II of this program. Analysis results shall be presented at the customer reviews. NGES shall also analyze the flight test data and support flight testing activities.

B3.1.5 Systems Engineering Support.

NGES shall provide overall systems engineering support throughout the development, integration and testing of the VADER Radar during Phase II of this program. Systems engineering shall participate in Integration and Flight Testing of the radar system on the (b)(4) during this phase.

B3.2 Hardware Design and Development.

B3.2.1 Antenna (b)(4) Ku-band (b)(4) Subsystem.

NGES shall perform design and development of the antenna subsystem. The effort shall include the necessary design, analysis, drafting and materials procurement required to complete the array hardware tasks in support of a demonstration flight test with the prototype hardware during Phase II of this program.

B3.2.1.1 Antenna structure (pod) and cooling – NGES shall develop the support (pod) structure to house the TR modules, the RF manifold, and the patch radiators. NGES also shall develop the support structure for the LRMs on the array as well as the support structure need to mount to the (b)(4) assembly. NGES shall develop the (b)(4) and other elements within the antenna subsystem to include air distribution within the antenna structure (pod) in support of Phase II of this program.

B3.2.1.2 Array power and logic distribution. – NGES shall develop the power and logic distribution needed to supply electrical power and control to the (b)(4) and the (b)(4) in support of Phase II of this program.

B3.2.1.3 (b)(4) – NGES shall develop (b)(4) in support of Phase II of this program. The task also includes development of any (b)(4)

B3.2.1.4 (b)(4) – NGES shall support the fabrication of (b)(4) in support of Phase II of this program.

B3.2.1.5 Aperture (b)(4) – NGES shall develop (b)(4) in support of Phase II of this program. (b)(4)

B3.2.1.6 (b)(4) – NGES shall complete (b)(4) in support of Phase II of this program per the

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NGES specified gimbal subsystem requirements for roll positioning of the array within the antenna subsystem.

B3.2.1.7 (b)(4) – NGES shall develop (b)(4) within the antenna subsystem in support of Phase II of this program.

B3.2.1.8 (b)(4) – NGES shall develop (b)(4) the VADER Radar array form factor in support of Phase II of this program.

B3.2.1.9 (b)(4) – NGES shall (b)(4) support of Phase II of this program.

B3.2.1.10 Radome –NGES shall complete the source control documents for vendor sourcing of the VADER Radar radome in support of Phase II of this program.

B3.2.1.11 (b)(4) – NGES shall complete the documentation for (b)(4) in support of Phase II of this program.

B3.2.1.12 Antenna Integrated Product Team (IPT) – In support of Phase I of this program, NGES shall provide antenna design and development oversight and analysis necessary to ensure the antenna design will meet its required performance. (b)(4)

B3.2.2 (b)(4) Subsystem.

B3.2.2.1 (b)(4)

B3.2.2.2 (b)(4)

B3.2.2.3 (b)(4) Integrated Product Team (IPT) – (b)(4)

throughout Phase II of this program.

B3.3 Hardware Build and Test

B3.3.1 Material Procurement.

B3.3.1.1 Antenna Subsystem – NGES shall continue the procurement of all remaining antenna subsystem parts and materials, including spares, for the T/R modules, radiators, gimbal subsystem, circulators, array driver, BSC, up converter, down converter, structure, housing, radome, power supply, and GPS/INS in support of Phase II of this program.

B3.3.1.2 (b)(4)

Use or disclosure of data contained on this sheet is subject to the restriction on the title page of this proposal or quotation.

(b)(4)

(b)(4)

Phase II of this program.

B3.3.1.3 Datalink and Ground Station - NGES shall continue the procurement of all remaining ground station subsystem parts and materials in support of Phase II of this program. Datalink shall be provided as Government Furnished Equipment (GFE).

B3.3.2 Subsystem Build and Test.

B3.3.2.1 Antenna Subsystem – NGES shall:

1. Build, test, and assemble the antenna subsystem array components.
2. Characterize and test the assembled array.
3. Integrate the array with the (b)(4) and other components of the antenna (pod) subsystem.
4. Characterize and test the antenna (pod) subsystem.

B3.3.2.2 (b)(4) Subsystem – NGES shall:

2. Complete the build and test of the (b)(4) subsystem modules.
3. Assemble the (b)(4)
4. Characterize and test the assembled (b)(4)

B3.3.2.3 Datalink and Ground Station – NGES shall complete the integration of the GFE datalink and ground station subsystem. Integration support for the datalink is be GFE.

B3.4 Software Design and Test

NGES shall manage, design, document, code, and test all software required for the VADER Radar in accordance with NGES internal processes and procedures for software development in support of Phase II of this program.

B3.4.1 Radar Manager Software

NGES shall manage, design, document, code and test the radar manager software which controls the operation of the radar system to include provisions for control interfaces in support of Phase II of this program.

B3.4.2 (b)(4) Software

NGES shall manage, design, document, code and test the software to perform (b)(4) functions in support of Phase II of this program.

B3.4.3 (b)(4) Software

NGES shall manage, design, document, code and test the software to perform Spot (b)(4) and Strip (b)(4) Functions in support of Phase II of this program.

Use or disclosure of data contained on this sheet is subject to the restriction on the title page of this proposal or quotation.

B3.4.4 Datalink and Ground Station Software

NGES shall manage, design, document, code and test the software for the Datalink interface and Ground Station operation in support of Phase II of this program.

B3.5 Radar System Integration and Test.**B3.5.1 (b)(4) Integration Testing.**

NGES shall integrate all aspects of the VADER Radar system in the NGES SIL.

B3.5.2 Islander Flight Integration.

NGES shall perform structural and aerodynamic analyses and provide the structural components necessary to modify the (b)(4) to accept the VADER Radar system.

NGES shall integrate the antenna subsystem (pod) and (b)(4) onto the (b)(4) aircraft. This effort shall include technical and mechanical support.

NGES shall prepare the appropriate documentation of the installation, such as inspection records, complete FAA package with DER signoff and SOF flight test plan and report.

B3.5.3 (b)(4) Testing.

NGES shall perform a Safety of Flight (SOF) analysis for the VADER Radar prototype system.

NGES shall perform flight testing of the VADER Radar on the (b)(4) aircraft.

B3.6 Program Office**B3.6.1 Program Management.**

NGES shall establish and maintain Program Management practices to support Phase II of the VADER Radar project to include planning, oversight, and reporting of the cost, schedule, and technical progress, subcontracts/vendor management, internal design reviews, customer technical interchange meetings/design reviews, customer interface, as well as providing NGES management visibility to program cost schedule, and technical status. [CDRL A003, A004, A005]

B3.6.2 Conferences / Formal Reviews.

NGES shall host and conduct the following reviews during Phase II of the program as technical interchange meetings (TIMs) [CDRL A006, A007]:

- 1 Post-award Conference / Kickoff Meeting at 30 days ARO
2. Preliminary Design Review (PDR) at 2 months ARO

Use or disclosure of data contained on this sheet is subject to the restriction on the title page of this proposal or quotation.

3 Critical Design Review (CDR) at 5 months ARO

B3.6.3 Documentation.

NGES shall prepare and submit data and documentation in accordance with the Contract Data Requirements List (CDRL) in table 1 during Phase II. All deliverable documentation shall be prepared in accordance with NGES contractor format and/or other commercial format and shall be delivered in Microsoft Office 2000-compatible office products. Documentation shall be delivered in soft-copy on CD ROM and/or electronically. All data items shall be delivered via an NGES contracts letter of transmittal.

Table 1. VADER Radar Demonstration Contract Data Requirements List (CDRL)

Data Item No.	Title of Data Item	SOW Reference	Frequency
A004	Monthly Progress Report	3.6.1.	Monthly
A005	Funds Expenditure Report	3.6.1.	Monthly
A006	Conference Agenda	3.6.2.	As required
A007	Conference Minutes	3.6.2.	As required
A008	Radar Raw Phase History & Processed Data From Each Flight Test	3.5.3	As required
A009	Test Plan Prior to Each Flight Test	3.5.3	As required
A010	Flight Test Report Including Analyses of System Performance	3.5.3	As required

B3.7 Exploitation Software Integration and Analysis**B3.7.1 Exploitation Software**

NGES shall support integration of external third party exploitation capability with the VADER ground station. NGES shall analyze performance of VADER radar and ground station to support exploitation efforts by third parties, as necessary. NGES will attend meetings with third parties involved in the development of data exploitation systems. NGES will provide details of data interfaces (beyond ICDs) to those third parties (e.g. data latencies). NGES will make minor modifications to data interfaces to support exploitation needs.

B3.7.2 VADER Analysis and Costing

NGES shall support VADER analysis and costing of performance improvements and next phase capabilities at the request of the Government.

B4 Deliverables

NGES shall provide the CDRL Items as specified in 3.6.3 of this SOW, unless otherwise directed by the Government.

NGES shall provide the following deliverables as described in this SOW, unless otherwise directed by the Government:

1. NGES shall deliver in place, at the end of the period of performance, all radar hardware developed or procured under this contract.
2. NGES shall deliver in place, at the end of the period of performance, the final Operational Fight Program (OFP) software developed under this contract.
3. NGES shall deliver in place, at the end of the period of performance, the ground station hardware and software developed under this contract.
4. NGES shall deliver CDRL items as specified in 3.6.3 of this SOW.

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT				1. CONTRACT ID CODE	PAGE OF PAGES	
				U	1	3
2. AMENDMENT/MODIFICATION NO. FD0008		3. EFFECTIVE DATE 31-Jul-2007	4. REQUISITION/PURCHASE REQ. NO. SEE SCHEDULE		5. PROJECT NO. (If applicable)	
6. ISSUED BY DARPA CMO ATTN: MICHAEL D. BLACKSTONE 3701 N. FAIRFAX DR. ARLINGTON VA 22203-1714		CODE HR0011	7. ADMINISTERED BY (If other than item 6) DCMA NORTHROP GRUMMAN BALTIMORE 7323 AVIATION BLVD, M/S 1285 BWI AIRPORT MD 21240-2035		CODE S2103A	
8. NAME AND ADDRESS OF CONTRACTOR (No., Street, County, State and Zip Code) NORTHROP GRUMMAN SYSTEMS CORPORATION 1580A NURSERY RD LINTHICUM HEIGHTS MD 21080-0000				9A. AMENDMENT OF SOLICITATION NO.		
				9B. DATED (SEE ITEM 11)		
				X 10A. MOD. OF CONTRACT/ORDER NO. HR0011-06-C-0144		
				X 10B. DATED (SEE ITEM 13) 27-Sep-2006		
CODE 97942		FACILITY CODE				
11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS						
<input type="checkbox"/> The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offer <input type="checkbox"/> is extended, <input type="checkbox"/> is not extended. Offer 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 amendment; (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) See Schedule						
13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.						
A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.						
B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(B).						
C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:						
X D. OTHER (Specify type of modification and authority) Unilateral FAR 52.232-22 "Limitation of Funds"						
E. IMPORTANT: Contractor <input checked="" type="checkbox"/> is not, <input type="checkbox"/> 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.) Modification Control Number: kgrigeri07943 The purpose of this modification is to apply incremental funding in the amount of \$225,000 (AO No. W295/05). See page 2.						
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)		
				MICHAEL D. BLACKSTONE / PCO TEL: (571) 218-4804 EMAIL: michael.blackstone@darpa.mil		
15B. CONTRACTOR/OFFEROR		15C. DATE SIGNED		16B. UNITED STATES OF AMERICA (b)(6)		16C. DATE SIGNED
(Signature of person authorized to sign)				BY _____		31-Jul-2007
				(Signature of Contracting Officer)		

SECTION SF 30 BLOCK 14 CONTINUATION PAGE

SUMMARY OF CHANGES

1. SECTION B - SUPPLIES OR SERVICES AND PRICES

SUBCLIN 000104 is added as follows:

ITEM NO	AMOUNT
000104	
AO No. W295/05	
ACRN AC	\$225,000.00

2. SECTION G - CONTRACT ADMINISTRATION DATA

Accounting and Appropriation

a. Summary for the Payment Office

As a result of this modification, the total funded amount for this document was increased by \$225,000.00 from \$17,970,999.00 to \$18,195,999.00.

b. SUBCLIN 000104:
Funding on SUBCLIN 000104 is initiated as follows:

ACRN: AC

CIN: 00000000000000000000000000000000

Acctng Data: 9760400 1320 W295 P6P30 2525 DPAC 6 5530 S12136 63767E

Increase: \$225,000.00

Total: \$225,000.00

c. The following have been modified as highlighted in bold:

G-6 Incremental Funding

- (a) This contract shall be subject to incremental funding with **\$18,195,999** presently made available for performance under this contract. It is estimated that the funds presently available are sufficient to permit the Contractor's performance through **13 December 2007**. Except in accordance with the Section I clause FAR 52.232-22, "Limitation of Funds," no legal liability of the part of the Government for payment of any money in excess of **\$18,195,999** shall arise unless and until additional funds are made available by the Contracting Officer through a modification to this contract.

(a) Incremental funding has been provided as follows:

- a. CLIN 0001, Phase 1 - \$9,970,999 through 13 April 2007 *
- b. CLIN 0001, Phase 2 - \$8,225,000 through 13 December 2007 *

*All funding is authorized for both Phase I and II efforts.

(end of clause)

3. Except as modified above, the terms and conditions of Contract No. HR0011-06-C-0144 shall remain unchanged and in full force and effect.

(End of Summary of Changes)

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT			1. CONTRACT ID CODE	PAGE OF PAGES
			U	1 4
2. AMENDMENT/MODIFICATION NO. P00009	3. EFFECTIVE DATE 23-Aug-2007	4. REQUISITION/PURCHASE REQ. NO. SEE SCHEDULE		5. PROJECT NO. (If applicable)
6. ISSUED BY DARPA CMO ATTN: STEPHEN C DAVIS 3701 N. FAIRFAX DR. ARLINGTON VA 22203-1714	CODE HR0011	7. ADMINISTERED BY (If other than item 6) DCMA NORTHROP GRUMMAN BALTIMORE 7323 AVIATION BLVD, M/S 1285 BM AIRPORT MD 21240-2003		CODE S2103A
8. NAME AND ADDRESS OF CONTRACTOR (No., Street, County, State and Zip Code) NORTHROP GRUMMAN SYSTEMS CORPORATION 1550A NURSERY RD LINTHICUM HEIGHTS MD 21080-0000			9A. AMENDMENT OF SOLICITATION NO.	
			9B. DATED (SEE ITEM 11)	
			X 10A. MOD. OF CONTRACT/ORDER NO. HR0011-06-C-0144	
			X 10B. DATED (SEE ITEM 13) 27-Sep-2006	
CODE 97942	FACILITY CODE			
11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS				
<input type="checkbox"/> The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of offer <input type="checkbox"/> is extended, <input type="checkbox"/> is not extended. Offer 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 amendment; (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) See Schedule				
13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACT ORDERS IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.				
A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.				
B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(B).				
C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:				
X D. OTHER (Specify type of modification and authority) Unilateral: FAR 52.232-22 "Limitation of Funds"				
E. IMPORTANT: Contractor <input checked="" type="checkbox"/> is not, <input type="checkbox"/> 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.) Modification Control Number: bfa1asca071023 The purpose of this modification is to provide incremental funding in the amount of \$1,774,932 (AO W295/04 AO and W295/07) to the Contract, as well as to change the PCO to Stephen C. Davis. See page 2-4.				
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) STEVE DAVIS / CONTRACTING OFFICER TEL: 571-216-4949 EMAIL: Stephen.C.Davis@darpa.mil		
15B. CONTRACTOR/OFFEROR	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA BY (b)(6)	16C. DATE SIGNED 23-Aug-2007	
(Signature of person authorized to sign)		(Signature of Contracting Officer)		

SECTION SF 30 BLOCK 14 CONTINUATION PAGE

SUMMARY OF CHANGES

1. SECTION B - SUPPLIES OR SERVICES AND PRICES

SUBCLIN 000105 is added as follows:

ITEM NO		AMOUNT
000105	Funding for CLIN0001	
	AO No. W295/04	
	ACRN AA	\$29,001.00

SUBCLIN 000106 is added as follows:

ITEM NO		AMOUNT
000106	Funding for CLIN0001	
	AO No. W295/07	
	ACRN AD	\$1,745,931.00

2. SECTION F - DELIVERIES OR PERFORMANCE

The following have been modified as highlighted in bold:

F-3 Report Distribution

1. For the Final Technical Report - The Contractor shall access the DARPA Extranet Reporting Page - <http://www.tfims.darpa.mil> and electronically submit all required reporting information as specified in Section C-2.

Additional distribution shall be made as follows:

(a) Defense Technical Information Center

(1) Email: TR@dtic.mil
(one electronic copy of the Final Technical Report, if unclassified)

(2) Attn: DTIC-BCS
8725 John J. Kingman Road, Suite 0944
Fort Belvoir, VA 22060-0944
(two hard copies of the Final Technical Report if unclassified)

(b) DARPA/Library
3701 North Fairfax Drive

Arlington, VA 22203-1714
Email: library@darpa.mil
(one copy of the Final Technical Report)

(c) DARPA/CMO
Attn: Mr. Stephen C. Davis
3701 North Fairfax Drive
Arlington, VA 22203-1714
Email: Stephen.C.Davis@darpa.mil
(one copy of the Final Technical Report - uploaded to TFIMS is acceptable)

(d) DARPA/IXO
Attn: Dr. Mark McClure
3701 North Fairfax Drive
Email: mark.mcclure@darpa.mil
(one copy of the Final Technical Report)

Note 1: (b) through (d) - submissions of unclassified materials only. Submission of classified material, if applicable, shall be coordinated through DARPA SID and/or the DARPA Program Manager in accordance with the attached DD254.

Note 2: For the Final Technical Report(s), the Contractor must also comply with the distribution requirements of DFARS 252-235-7011, as applicable.

2. All papers and articles published as a result of DARPA sponsored research shall include a statement reflecting the sponsorship. In addition, a bibliography of the titles and authors of all such papers are to be included in the Final Technical Report.

(a) The cover or title page of each of the above reports or publications prepared, will have the following citation:

Sponsored by
Defense Advanced Research Projects Agency
Information Exploitation Agency
Program: VADER
Issued by DARPA/CMO under Contract No. HR0011-06-C-0144

(b) The title page shall include a disclaimer worded substantially as follows:

"The views and conclusions contained in this document are those of the authors and should not be interpreted as representing the official policies, either expressly or implied, of the Defense Advanced Research Projects Agency or the U.S. Government."

(end of clause)

3. SECTION G - CONTRACT ADMINISTRATION DATA

Accounting and Appropriation

Summary for the Payment Office

As a result of this modification, the total funded amount for this document was increased by \$1,774,932.00 from \$18,195,999.00 to \$19,970,931.00.

SUBCLIN 000105:

Funding on SUBCLIN 000105 is initiated as follows:

ACRN: AA
CIN: 00000000000000000000000000000000
Acctng Data: 21 6 2040 0000 22 2010 633100ED100 255X RJS1 MIPR6JDRDJ9529 J9LERA W1YYAA
S23185
Increase: \$29,001.00
AO: W295/04
Total: \$29,001.00

SUBCLIN 000106:

Funding on SUBCLIN 000106 is initiated as follows:

ACRN: AD
CIN: 00000000000000000000000000000000
Acctng Data: 21 7 2093 0000 5U-5U01 121000.00000 2512 JDJT MIPR7J077X7383 J7ZF S12193 RL81
Increase: \$1,745,931.00
AO: W295/07
Total: \$1,745,931.00

The following have been modified as highlighted in bold:

G-1 Procuring Office Representative

(a) The Procuring Office Representative is **Stephen C. Davis, DARPA/CMO, 3701 North Fairfax Drive, Arlington, VA 22203-1714, telephone: 571-218-4949, e-mail: Stephen.C.Davis@darpa.mil.**

(end of clause)

G-6 Incremental Funding

(a) This contract shall be subject to incremental funding with **\$19,970,931** presently made available for performance under this contract. It is estimated that the funds presently available are sufficient to permit the Contractor's performance through 13 December 2007. Except in accordance with the Section I clause FAR 52.232-22, "Limitation of Funds," no legal liability of the part of the Government for payment of any money in excess of **\$19,970,931** shall arise unless and until additional funds are made available by the Contracting Officer through a modification to this contract. **CLIN0001 is henceforth fully funded.**

*All funding is authorized for both Phase I and II efforts.

(end of clause)

4. Except as modified above, the terms and conditions of Contract No. HR0011-06-C-0144 shall remain unchanged and in full force and effect.

(End of Summary of Changes)

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT				1. CONTRACT ID CODE: U	PAGE OF PAGES 1 3
2. AMENDMENT/MODIFICATION NO.: 700016	3. EFFECTIVE DATE: 13-Sep-2007	4. REQUISITION/PURCHASE REQ. NO. SEE SCHEDULE	5. PROJECT NO. (if applicable)		
6. ISSUED BY: DARPA CMO ATTN: STEPHEN C DAVIS 3701 N. FAIRFAX DR. ARLINGTON VA 22209-1714	CODE: HFR0011	7. ADMINISTERED BY (if other than item 6): DOMA NORTHROP GRUMMAN BALTIMORE 7329 AVIATION BLVD, N/B 1285 BWI AIRPORT MD 21240-2000		CODE: S2103A	
8. NAME AND ADDRESS OF CONTRACTOR (No., Street, County, State and Zip Code) NORTHROP GRUMMAN SYSTEMS CORPORATION 1890A NURSERY RD LINTHICUM HEIGHTS MD 21086-0000				9A. AMENDMENT OF SOLICITATION NO.	
				9B. DATED (SEE ITEM 11)	
				X 10A. MOD. OF CONTRACT/ORDER NO. HFR0011-08-C-0144	
				X 10B. DATED (SEE ITEM 13) 27-Sep-2008	
CODE: 97842	FACILITY CODE:				
11. THIS ITEM APPLIES ONLY TO AMENDMENTS OF SOLICITATIONS					
<input type="checkbox"/> The above numbered solicitation is amended as set forth in item 14. The hour and date specified for receipt of Offer <input type="checkbox"/> is extended, <input type="checkbox"/> is not extended. Offer 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 13, and returning _____ copies of the amendment; (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) See Schedule					
13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.					
A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.					
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).					
X C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF the "Changes" clause.					
D. OTHER (Specify type of modification and authority)					
E. IMPORTANT: Contractor <input type="checkbox"/> is not, <input checked="" type="checkbox"/> is required to sign this document and return 1 copies to the issuing office.					
14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCP section headings, including solicitation/contract subject matter where feasible.) Modification Control Number: bfa1a50a071076 The purpose of this modification is to increase the value of the contract due to a cost growth, as well as provide funding in the amount of \$3,680,740 (AO W295/07). See pages 2-3.					
Except as provided herein, all terms and conditions of the document referenced in item 9A or 10A, as heretofore changed, remain unchanged and in full force and effect.					
15A. NAME AND TITLE OF SIGNER (Type or print) (b)(4)			16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) Stephen C. Davis, PCO TEL: 571-218-4949 EMAIL: Stephen.C.Davis@darpa.mil		
15B. DATE SIGNED (b)(4)			16C. DATE SIGNED (b)(6)		
12 SEPT 07			13 SEP 07		

EXCEPTION TO SF 30
APPROVED BY OIRM 11-84

30-10

STANDARD FORM 30 (Rev. 10-83)
Prescribed by GSA
FAR (48 CFR) 53.243

SECTION SF 30 BLOCK 14 CONTINUATION PAGE

SUMMARY OF CHANGES

1. SECTION A - SOLICITATION/CONTRACT FORM

The total cost of this contract was increased by \$3,660,740.00 from \$19,970,931.00 to \$23,631,671.00.

2. SECTION B - SUPPLIES OR SERVICES AND PRICES

CLIN 0001

The estimated/max cost has increased by \$3,660,740.00 from \$18,540,715.00 to \$22,201,455.00.

The total cost of this line item has increased by \$3,660,740.00 from \$19,970,931.00 to \$23,631,671.00.

SUBCLIN 000107 is added as follows:

ITEM NO		AMOUNT
000107	Funding for CLIN 0001	
	AO No. W295/07	
	ACRN AD	\$3,660,740.00

3. SECTION G - CONTRACT ADMINISTRATION DATA

a. Accounting and Appropriation

Summary for the Payment Office

As a result of this modification, the total funded amount for this document was increased by \$3,660,740.00 from \$19,970,931.00 to \$23,631,671.00.

b. SUBCLIN 000107:

Funding on SUBCLIN 000107 is initiated as follows:

ACRN: AD

CTN: 00000000000000000000000000000000

Acctng Data: 21 7 2093 0000 SU-5U01 121000.00000 2512 JDJT MIPR7J077X7383 J7ZF S12193 RI.81

Increase: \$3,660,740.00

Total: \$3,660,740.00

c. The following have been modified as highlighted in bold:

G-6 Incremental Funding

- (a) This contract shall be subject to incremental funding with \$23,631,671 presently made available for performance under this contract. It is estimated that the funds presently available are sufficient to permit the Contractor's performance through completion. Except in accordance with the Section I clause FAR 52.232-22, "Limitation of Funds," no legal liability of the part of the Government for payment of any money in excess of \$23,631,671 shall arise unless and until additional funds are made available by the Contracting Officer through a modification to this contract. CLIN0001 is henceforth fully funded.

*All funding is authorized for both Phase I and II efforts.

(end of clause)

4. Except as modified above, the terms and conditions of Contract No. HR0011-06-C-0144 shall remain unchanged and in full force and effect.

(End of Summary of Changes)

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT			1. CONTRACT ID CODE U	PAGE OF PAGES 1 4
2. AMENDMENT/MODIFICATION NO. P00011	3. EFFECTIVE DATE 14-Sep-2007	4. REQUISITION/PURCHASE REQ. NO. SEE SCHEDULE		5. PROJECT NO. (if applicable)
6. ISSUED BY DARPA CND ATTN: STEPHEN C DAVIS 3701 N. FAIRFAX DR. ARLINGTON VA 22208-1714	CODE HR0011	7. ADMINISTERED BY (if other than item 6) DOMA NORTHROP GRUMMAN BALTIMORE 7323 AVIATION BLVD, W/S 12B5 BWI AIRPORT MD 21240-2003		CODE S2103A
8. NAME AND ADDRESS OF CONTRACTOR (No., Street, County, State and Zip Code) NORTHROP GRUMMAN SYSTEMS CORPORATION 1280A NURSERY RD LINTHICUM HEIGHTS MD 21090-0000			9A. AMENDMENT OF SOLICITATION NO.	
			9B. DATED (SEE ITEM 11)	
			X 10A. MOD. OF CONTRACT/ORDER NO. HR0011-06-C-0144	
			X 10B. DATED (SEE ITEM 13) 27-Sep-2006	
CODE 97942			FACILITY CODE	
11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS				
<input type="checkbox"/> The above numbered solicitation is amended as set forth in item 14. The hour and date specified for receipt of Offer <input type="checkbox"/> is extended, <input type="checkbox"/> is not extended. Offer 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 amendment; (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) See Schedule				
13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.				
A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.				
B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(B).				
X C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF: the "Changes" clause.				
D. OTHER (Specify type of modification and authority)				
E. IMPORTANT: Contractor <input type="checkbox"/> is not, <input checked="" type="checkbox"/> is required to sign this document and return <u>1</u> copies to the issuing office.				
14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.) Modification Control Number: bfalesca071095 The purpose of this modification is to incorporate an additional task into the program, as well as extend the period of performance. This modification increases the value of the contract and provides funding in the amount of \$1,304,005 (AO W295/06). The Statement of Work for this additional task is hereby attached as Attachment (5), dated 11 September 2007. See pages 2-4.				
Except as provided herein, all terms and conditions of the document referenced in item 9A or 10A, as heretofore changed, remains unchanged and is full force and effect.				
15A. NAME AND TITLE OF SIGNER (Type or print) (b)(4)			16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) Stephen C. Davis, PCO TEL: 571-218-4949 EMAIL: Stephen.C.Davis@darpa.mil	
15B. CONTRACTOR OFFEROR (b)(4) (Signature of person authorized to sign)			15C. DATE SIGNED 9/14/07	
EXCEPTION TO SF 30 APPROVED BY OIRM 11-84			15D. DATE SIGNED 14 SEP 07	

EXCEPTION TO SF 30 APPROVED BY OIRM 11-84

30-10

SECTION SF 30 BLOCK 14 CONTINUATION PAGE

SUMMARY OF CHANGES

1. SECTION A - SOLICITATION/CONTRACT FORM

The total cost of this contract was increased by \$1,304,005.00 from \$23,631,671.00 to \$24,935,676.00.

2. SECTION B - SUPPLIES OR SERVICES AND PRICES

CLIN 0001

The estimated/max cost has increased by (b)(4)
 The fixed fee has increased by (b)(4)
 The total cost of this line item has increased by \$1,304,005.00 from \$23,631,671.00 to \$24,935,676.00.

SUBCLIN 000108 is added as follows:

ITEM NO		AMOUNT
000108	Funding for CLIN0001 (Exploitation)	
	AO No. W295/08	
	ACRN AD	\$1,304,005.00

3. SECTION C - DESCRIPTIONS AND SPECIFICATIONS

The following have been modified as highlighted in bold:

C-1 Scope of Work

The Contractor shall furnish the necessary personnel, materials, facilities and other services as may be required to perform Contract Line Item Number (CLIN) 0001 in accordance with the Statements of Work, Attachment 1 and Attachment 5 hereto.

(end of clause)

4. SECTION F - DELIVERIES OR PERFORMANCE

The following have been modified as highlighted in bold:

F-1 Term of Contract

(a) CLIN 0001 - The term of the contract commences on 1 October 2006 and continues through 1 August 2008.

(end of clause)

F-2 Reports and Other Deliverables

(a) Delivery of all reports and other deliverables shall be made to the addressee specified in F-3 entitled "Report Distribution" in accordance with the following:

Item No.	Description	Due Date (on or before)
0001	Interim Reports	See Exhibit A CDRL
0001	Additional Misc. Deliverables	See Section C-2
0001	Final Report (Phase 2)	25 July 2008

(end of clause)

5. SECTION G - CONTRACT ADMINISTRATION DATA

a. Accounting and Appropriation

Summary for the Payment Office

As a result of this modification, the total funded amount for this document was increased by \$1,304,005.00 from \$23,631,671.00 to \$24,935,676.00.

b. SUBCLIN 000108:

Funding on SUBCLIN 000108 is initiated as follows:

ACRN: AD

CIN: 00000000000000000000000000000000

Acctg Data: 21 7 2093 0000 5U-5U01 121000.00000 2512 JDJT MIPR7J077X7383 J7ZF S12193 RL81

Increase: \$1,304,005.00

Total: \$1,304,005.00

c. The following have been modified as highlighted in bold:

G-6 Incremental Funding

(a) This contract shall be subject to incremental funding with **\$24,935,676** presently made available for performance under this contract. It is estimated that the funds presently available are sufficient to permit the Contractor's performance through completion. Except in accordance with the Section I clause FAR 52.232-22, "Limitation of Funds," no legal liability of the part of the Government for payment of any money in excess of **\$24,935,676** shall arise unless and until additional funds are made available by the Contracting Officer through a modification to this contract. CLIN0001 is henceforth fully funded.

*All funding is authorized for both Phase I and II efforts.

(end of clause)

6. SECTION J - LIST OF DOCUMENTS, EXHIBITS AND OTHER ATTACHMENTS

The following have been modified as highlighted in bold:

DOCUMENT TYPE	DESCRIPTION	PAGES	DATE
Exhibit A	CLIN 0001 Exhibit(s)	9	N/A

Attachment 1	Statement of Work (Phase I/II)	19	15 May 2007
Attachment 2	DD Form 254 "Department of Defense Contract Security Classification Specification"	4	22 Sep 2006
Attachment 3	DELETED/RESERVED		
Attachment 4	Intellectual Property Assertions	1	15 Nov 2006
Attachment 5	Statement of Work for VADER Exploitation Support	3	11 Sep 2007

7. Except as modified above, the terms and conditions of Contract No. HR0011-06-C-0144 shall remain unchanged and in full force and effect.

(End of Summary of Changes)

Statement of Work
For
VADER Exploitation Support

September 11, 2007

Revision: B

Prepared For:

DARPA
3710 N. Fairfax Drive
Arlington, VA 22203-1714
Attn: Michael J. Blackstone, Contracting Officer 571-218-4804

Submitted By:

Northrop Grumman Systems Corporation
Electronics Systems
P.O. Box 1693
Baltimore, Maryland
CAGE Code: 15055, DUNS No.: 80-013-1955

Use and Disclosure of Data

This proposal includes data that shall not be disclosed outside the Government and shall not be duplicated, used, or disclosed—in whole or in part—for any purpose other than to evaluate this proposal. However, if a contract is awarded to this offeror as a result of—or in connection with—the submission of these data, the Government shall have the right to duplicate, use, or disclose the data to the extent provided in the resulting contract. This restriction does not limit the Government's right to use information contained in these data if they are obtained from another source without restriction.

The data subject to this restriction are contained on all pages.

1. Scope

This Statement of Work (SOW) includes the tasks to support the interface definition and establishment of data exchange and communication between the VADER system and an external exploitation system being developed by DARPA.

1.1 Assumptions

1. Flight test plans will be sufficiently detailed and accurate to allow flight planning as well as to support valid radar capabilities and modes.
2. Data will be unclassified and handled in the same manner as dedicated VADER test data
3. Exploitation contractors will utilize similar working space and facilities as Northrop Grumman personnel
4. Exploitation contractors will provide their own PCs and data storage media
5. Testing will not require any changes to the (b)(4) different from dedicated VADER testing
6. Reflects support only for BAE and MIT/LL activities. Assumes no impact to VADER for MTIX integration or additional support required to integrate MTIX.
7. NGES will provide aircraft, VADER and access to collected data (and operation of radar and aircraft). Exploitation contractors will provide all required targets, confusers and personnel associated with testing in the AOI for their dedicated tests.
8. There are no material costs to keeping the radar functional over that time period and no miscellaneous material is required to support the program.

2. Applicable Documents

All documentation for this project will be provided by Northrop Grumman Electronic Systems (NGES) in contractor format. Documents include the VADER External Interface ICD and the VADER Integration Environment. Third party supplied detailed flight test plans for flight tests.

3. Task Requirements

Northrop Grumman Electronics Systems (NGES) shall provide labor and material associated with the following tasks.

3.1. VADER / External Exploitation Interface Support

NGES shall provide personnel to support the creation and maintenance of a VADER Interface Control Document (ICD) specifying how external exploitation users will exchange data and radar tasking information with the VADER system. This support will also include systems analysis supporting interface data requirements and definition of interface and system requirements necessary to properly utilize input and output data, onsite support to contractors in the NGES integration laboratory and at/during flight test events. Furthermore, this task will support the VADER software modifications required to successfully integrate the VADER system with the 3rd party Exploitation system. Initial coding of the basic data exchange software is not included here as it is part of the base VADER

contract. Task will also support interface and control testing for short periods of time during dedicated VADER flight testing.

3.2. Tracker / Exploitation Flight Test Support

NGES will provide the (b)(4) pilot, ground crew and all necessary flight support dedicated Exploitation / Tracker flight test of the VADER system. These flight tests will be conducted according to the exploitation contractor's flight test plans to demonstrate exploitation system performance using VADER data. NGES shall provide the aircraft for 6 flights. Each flight is estimated to be require 3 hours of flight time. Data collection is assumed to be performed at Georgetown airport on the Eastern Shore of Maryland. Additionally, NGES will perform radar data analysis and verification of collected data to ensure no corruption of data was experienced during the testing. This team will support troubleshooting and performance analysis associated with collected data as well as software revisions required by VADER system faults identified during these exploitation tests. Finally, NGES will support data analysis and briefing preparation for final DARPA KPP briefing to DARPA and transition sponsors.

3.3. Dismount Exploitation Flight Test Support

NGES will provide the (b)(4) pilot, ground crew and all necessary flight support dedicated Dismount Exploitation flight test of the VADER system. These flight tests will be conducted according to the exploitation contractor's flight test plans and to demonstrate exploitation system performance using VADER data. NGES shall provide the aircraft for 3 flights. Each flight is estimated to be require 3 hours of flight time. Data collection is assumed to be performed at Georgetown airport on the Eastern Shore of Maryland. Additionally, NGES will perform radar data analysis and verification of collected data to ensure no corruption of data was experienced during the testing. This team will support troubleshooting and performance analysis associated with collected data as well as software revisions required by VADER system faults identified during these exploitation tests. Finally, NGES will support data analysis and briefing preparation for final DARPA KPP briefing to DARPA and transition sponsors.

4. Schedule

Work is expected to be initiated August 15, 2007 and complete 9 weeks after the completion of VADER Phase 2 (nominally mid June 2008).

Tracker flight tests are expected to be grouped, two flights in a week, with a week for analysis before the next pair of flights. Dismount exploitation flights will be conducted during Tracker analysis periods, one flight in a given week. Final analysis and briefing preparation will be conducted at the end of this week period of flight tests.

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT			1. CONTRACT ID CODE	PAGE OF PAGES
			U	1 7
2. AMENDMENT/MODIFICATION NO. P00012	3. EFFECTIVE DATE 19-Nov-2007	4. REQUISITION/PURCHASE REQ. NO. SEE SCHEDULE	5. PROJECT NO. (If applicable)	
6. ISSUED BY DARPA OMO ATTN: STEPHEN C DAVIS 3701 N. FAIRFAX DR. ARLINGTON VA 22203-1714	CODE HFD011	7. ADMINISTERED BY (If other than item 6) OCMA/NORTHROP GRUMMAN/BALTIMORE 7325 AVIATION BLVD, 475 1366 BWI AIRPORT MD 21040-8035		CODE S2109A
8. NAME AND ADDRESS OF CONTRACTOR (No., Street, County, State and Zip Code) NORTHROP GRUMMAN SYSTEMS CORPORATION 1380A HURSBERY RD LINTHICUM HEIGHTS MD 21080-0000			9A. AMENDMENT OF SOLICITATION NO.	
			9B. DATED (SEE ITEM 11)	
			X 10A. MOD. OF CONTRACT/ORDER NO. HFD011-06-C-0144	
			X 10B. DATED (SEE ITEM 13) 27-Sep-2006	
CODE 97942			FACILITY CODE	
11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS				
<input type="checkbox"/> The above numbered solicitation is amended as set forth in item 14. The hour and date specified for receipt of offer <input type="checkbox"/> is extended, <input type="checkbox"/> is not extended. Offer was: 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 boxes 8 and 15, and returning _____ copies of the amendment; (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 number. 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 such 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) See Schedule				
13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACT ORDERS IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.				
A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.				
B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(B).				
X C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF: the "Changes" Clause				
D. OTHER (Specify type of modification and authority)				
E. IMPORTANT: Contractor <input type="checkbox"/> is not, <input checked="" type="checkbox"/> is required to sign this document and return <u>1</u> copies to the issuing office.				
14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.) Modification Control Number: b/alsca06111 The purpose of this modification is to incorporate an additional task into the program, as well as extend the period of performance. This modification increases the value of the contract and provides funding in the amount of \$5,831,839 (AO W295/10). The Statement of Work for this additional task is hereby attached as Attachment (6), dated 22 October 2007. See Pages 2-7.				
Except as provided herein, all terms and conditions of the document referenced in items 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.				
15A. NAME AND TITLE OF SORNER (Type or print) (b)(4)		16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) STEPHEN C. DAVIS Contracting Officer		
15B. CONTRACTOR ADDRESS (b)(4)		15C. DATE SIGNED 26 NOV 2007	16B. DATE SIGNED 27 NOV 07	
(Signature of person authorized to sign)				

SECTION SF 30 BLOCK 14 CONTINUATION PAGE

SUMMARY OF CHANGES

1. SECTION A - SOLICITATION/CONTRACT FORM

The total cost of this contract was increased by \$5,331,939.00 from \$24,935,676.00 to \$30,267,615.00.

2. SECTION B - SUPPLIES OR SERVICES AND PRICES

CLIN 0003 is added as follows:

ITEM NO	SUPPLIES/SERVICES	ESTIMATED COST	FIXED FEE	TOTAL EST. COST PLUS FIXED FEE
0003	Second System (Base)	(b)(4)		\$5,331,939.00

The contractor shall provide the personnel, facilities, and material necessary to conduct the base of the research effort described in the Northrop Grumman "VADER System #2" Statement of Work, dated 22 October 2007, which is made part of this contract at Attachment (6). Data deliverable requirements shall be in accordance with Sections C and F, and Exhibit A, of the contract.

SUBCLIN 000301 is added as follows:

ITEM NO		AMOUNT
000301	Funding for CLIN 0003	
	AO No. W295/10	
	ACRN AD	\$5,331,939.00

CLIN 0004 is added as follows:

ITEM NO	SUPPLIES/SERVICES	ESTIMATED COST	FIXED FEE	TOTAL EST. COST PLUS FIXED FEE
0004	Second System (Option 1 - SFCO)	(b)(4)		\$287,162.00

The contractor shall provide the personnel, facilities, and material necessary to conduct the first Option of the research effort described in the Northrop Grumman "VADER System #2" Statement of Work, dated 22 October 2007, which is made part of this contract at Attachment (6). Data deliverable requirements shall be in accordance with Sections C and F, and Exhibit A, of the contract.

CLIN 0005 is added as follows:

ITEM NO	SUPPLIES/SERVICES	ESTIMATED COST	FIXED FEE	TOTAL EST. COST PLUS FIXED FEE
0005	Second System (Option 2-Ground Station)	(b)(4)		\$85,392.00

The contractor shall provide the personnel, facilities, and material necessary to conduct the second Option of the research effort described in the Northrop Grumman "VADER System #2" Statement of Work, dated 22 October 2007, which is made part of this contract at Attachment (6). Data deliverable requirements shall be in accordance with Sections C and F, and Exhibit A, of the contract.

3. SECTION C - DESCRIPTIONS AND SPECIFICATIONS

The following have been modified as highlighted in bold:

C-1 Scope of Work

The Contractor shall furnish the necessary personnel, materials, facilities and other services as may be required to perform Contract Line Item Numbers (CLIN) 0001 and 0003, as well as those CLINs corresponding to any exercise Option (CLINs 0004 and 0005, as applicable), in accordance with the Statements of Work, Attachment 1, Attachment 5 and Attachment 6 hereto.

(b) In the event of an inconsistency between the provisions of this contract and the Contractor's proposal, the inconsistency shall be resolved by giving precedence in the following order: (1) the contract, (2) the attachments to the contract, and then (3) the Contractor's proposal.

(end of clause)

C-2 Reports and Other Deliverables

(a) All technical reports delivered by the Contractor in the performance of the contract shall be considered "Technical Data" as defined in Section I contract clauses entitled "Rights in Technical Data - Noncommercial Items" and "Rights in Noncommercial Computer Software and Noncommercial Computer Software Documentation." The Government shall receive "unlimited rights" to this technical data, as defined in these clauses.

(b) In addition to those reports required by the Exhibit A, Contract Data Requirements List, the following report(s) must also be submitted as specified below:

1. FINAL REPORT

This report, prepared in accordance with DFARS 252.235-7011, shall document the results of the complete effort as set forth in the Statement of Work, Attachment 1 hereto. Title pages shall include a disclaimer worded substantially as follows:

"The views and conclusions contained in this document are those of the authors and should not be interpreted as representing the official policies, either expressly or implied, of the Defense Advanced Research Projects Agency or the U.S. Government."

(1) The Final Technical Report summary shall include:

- Task Objectives
- Technical Problems
- General Methodology (i.e., literature review, laboratory experiments, surveys, etc.)
- Technical Results
- Important Findings and Conclusions
- Significant Hardware Development
- Special Comments
- Implications for Further Research

(2) All papers and articles published as a result of DARPA sponsored research shall include a statement reflecting that sponsorship.

(3) Distribution Statement B applies as shown below:

"Distribution authorized to U.S. Government agencies only due to Critical/Classified Technology and to prevent Premature Dissemination of Information. Other requests for this document shall be referred to DARPA Technical Information Office via email at tio@darpa.mil."

2. ADDITIONAL MISC. DELIVERABLES

The Contractor shall also deliver those items listed in the Contract Attachments (1) and (6) - Statements of Work under the paragraph entitled "Deliverables", as applicable. The Contractor shall adhere to the schedule, as applicable, in the Statements of Work. Briefing materials (hard and softcopy) for all briefings given to the Government shall be provided in the Contractor's format.

(end of clause)

4. SECTION F - DELIVERIES OR PERFORMANCE

The following have been modified as highlighted in bold:

F-1 Term of Contract

(a) CLIN 0001 - The term of this CLIN commences on 1 October 2006 and continues through 1 August 2008.

(b) **CLIN 0003 - The term of this CLIN commences on 19 November 2007 and continues through 20 April 2009.**

(end of clause)

F-2 Reports and Other Deliverables

(a) Delivery of all reports and other deliverables shall be made to the addressee specified in F-3 entitled "Report Distribution" in accordance with the following:

Item No.	Description	Due Date (on or before)
0001	Interim Reports	See Exhibit A CDRL
0001	Additional Misc. Deliverables	See Section C-2
0001	Final Report (Phase 2)	25 July 2008
0003	Interim Reports	See Exhibit A CDRL
0003	Additional Misc. Deliverables	See Section C-2
0003	Final Report (Second System)	20 April 2009
0004*	Interim Reports	See Exhibit A CDRL
0004*	Additional Misc. Deliverables	See Section C-2
0004*	Final Report (Second System)	20 April 2009
0005*	Interim Reports	See Exhibit A CDRL
0005*	Additional Misc. Deliverables	See Section C-2
0005*	Final Report (Second System)	20 April 2009

***If option is exercised**

(end of clause)

5. SECTION G - CONTRACT ADMINISTRATION DATA

Accounting and Appropriation

a. Summary for the Payment Office

As a result of this modification, the total funded amount for this document was increased by \$5,331,939.00 from \$24,935,676.00 to \$30,267,615.00.

b. SUBCLIN 000301:

Funding on SUBCLIN 000301 is initiated as follows:

ACRN: AD

Attachment 6 Statement of Work for VADER 4
System #2

22 October 2007

8. Except as modified above, the terms and conditions of Contract No. HR0011-06-C-0144 shall remain unchanged and in full force and effect.

(End of Summary of Changes)

Statement of Work
For
VADER System #2

October 22, 2007
RPI #2500005809

Prepared For:

DARPA
3710 N. Fairfax Drive
Arlington, VA 22203-1714
Attn: Brian Falasca, Contracting Officer 571-218-4815

Submitted By:

Northrop Grumman Systems Corporation
Electronics Systems
P.O. Box 1693
Baltimore, Maryland
CAGE Code: 15055, DUNS No.: 80-013-1955

Use and Disclosure of Data

This proposal includes data that shall not be disclosed outside the Government and shall not be duplicated, used, or disclosed—in whole or in part—for any purpose other than to evaluate this proposal. However, if a contract is awarded to this offeror as a result of—or in connection with—the submission of these data, the Government shall have the right to duplicate, use, or disclose the data to the extent provided in the resulting contract. This restriction does not limit the Government's right to use information contained in these data if they are obtained from another source without restriction. The data subject to this restriction are contained on all pages.

1. Scope

This Statement of Work (SOW) includes the tasks to build and bench test a second VADER pod and (b)(4). In order to keep cost down, the scope does not include a second ground station or any TCDL hardware as these will already be available. It also does not include flight testing the hardware to verify full performance but relies on bench testing instead, which should prove system functionality but not full performance. These latter two items are included as options with costing, should the government wish to include them in the effort.

2. Applicable Documents

There are no applicable documents.

3. Task Requirements

Northrop Grumman Electronics Systems (NGES) shall provide all labor, material, and administrative services necessary to build and test a second VADER Antenna / Pod and (b)(4). This equipment will be furnished with an installation kit for the transition aircraft. Options for a second ground station and for flight testing the system are also included, should they be desired.

3.1 Antenna / Pod Hardware

Northrop Grumman Electronics Systems (NGES) will procure, build, assemble and bench test a VADER Pod, including all hardware specified by drawing (b)(4). This pod will be built in exactly the same rapid prototyping manner as the initial pod and will serve as a second antenna should the first unit be damaged or experience component failures. Top level assembly drawings will be created to ensure the second system is built in a similar manner to the first system. Drawing Revision Notes (RNs) created during the build of the first system will not be incorporated into the drawings, but will be referenced to ensure the materials are identical. The pod will be tested with the (b)(4) on the system bench to ensure the system is correctly assembled and functioning. Basic tests such as SAR circle tests, MTI delay line tests and hardware actuation will be conducted to verify function.

3.2 (b)(4)

Northrop Grumman Electronics Systems (NGES) has built a VADER (b)(4) on company funds to reduce risk during system integration and test. This unit, part number (b)(4) is built to the same drawings and standards as the contracted (b)(4) and is fully flight capable. This task includes transferring this corporate asset to the government as part of this build. This approach has several advantages for the government described herein. The corporate (b)(4) eliminates any DMS hardware concerns as it is already built. The corporate (b)(4) offers reduced cost due to the improved test efficiency experienced with this unit since it will be tested immediately following the completion of the first unit. And finally, the corporate (b)(4) reduces the software / integration effort since this unit will be used as a second system bench throughout the testing of the first VADER system all software and utilities will be loaded and tested with the first system.

3.3 Installation Kit

Northrop Grumman Electronics Systems (NGES) will procure and provide an installation kit for the second VADER system. This kit includes the following equipment necessary to install the VADER system onto an aircraft: aircraft power and signal cables for the (b)(4) and Pod; interconnection cables between the (b)(4) and Pod; Buffer box to boost RF signals between the (b)(4) and Pod; GPS antenna and NAVCOM Starfire GPS receiver.

3.4 Optional Ground Station

The procurement of a second VADER ground station is offered as an optional effort. The ground station effort includes the purchase, integration and test of the groundstation workstation, RAID, routers and UPS'. This option does not include the TCDL hardware (airborne or ground components) as they have been GFE.

3.5 Optional Flight Testing

Flight testing is offered as an optional effort. Flight testing comprises integration of the system on the (b)(4) test aircraft, four flights to demonstrate system function and performance, associated aircraft / crew costs, and data analysis required to verify system function and performance. This flight testing serves to demonstrate with certainty that the system is functioning to the specification.

4 Assumptions

Assumptions related to this scope of work, hardware and operations are presented below. These assumptions define the scope of effort for this work and changes may result in added cost to produce and operate the second system.

4.1 Dependence on aircraft configuration

This effort further assumes that the transition vehicle configuration and layout does not require the cable length between the (b)(4) and the Pod to exceed the thirty (30) feet in the baseline design.

4.2 No Diminishing Material Sources (DMS) issues

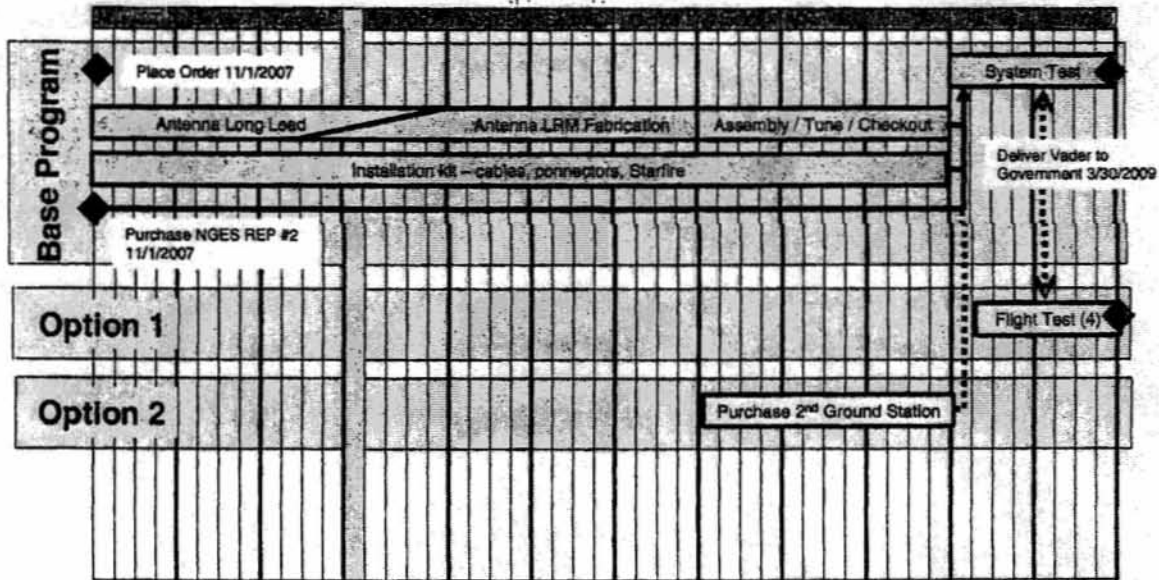
This effort assumes that no significant additional costs will be incurred due to material obsolescence. The second system contains a large number of Commercial Off The Shelf components which are subject to obsolescence at any time due to market pressures. No significant obsolescence issues are known at this time, but redesign work to accommodate new parts is not included in this effort.

4.3 Use of (b)(4) for Integration Support of System #1

This effort assumes that the (b)(4) will be available to support integration and testing of the VADER #1. This unit is critical to maintaining the delivery schedule of the first system and must be available for integration and software development throughout the entire duration of the Phase 2 contract.

5 Schedule

The schedule of work is shown in Figure 1 below. Northrop Grumman expects to be awarded a contract to build the second VADER system on November 1, 2007 and will deliver the system March 30, 2009. The longer schedule is due to the fact that the 1st VADER antenna leveraged many parts that were in inventory from other programs. Many of these parts are no longer available and must be procured from vendors with very long lead times.



6 Deliverables

NGES shall provide the following deliverables as described in this SOW, unless otherwise directed by the Government:

1. NGES shall deliver in place, at the end of the period of performance, the second VADER system hardware developed or procured under this contract. This shall include a VADER pod, a VADER (b)(4) and a VADER installation kit.
2. NGES shall deliver in place, at the end of the period of performance, the Operational Flight Program (OFP) software for the system hardware.
3. NGES shall deliver in place, at the end of the period of performance, the second VADER ground station hardware and software developed under this contract. [if option is exercised]
4. NGES shall deliver a flight test report in contractor format showing the results of flight testing performed. [if option is exercised]

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT			1. CONTRACT ID CODE U	PAGE OF PAGES 1 3
1. AMENDMENT/MODIFICATION NO. P0013	3. EFFECTIVE DATE 30-Nov-2007	4. REQUISITION/PURCHASE REQ. NO. SEE SCHEDULE	5. PROJECT NO. (if applicable)	
6. ISSUED BY DARPA CWO ATTN: STEPHEN C DAVIS 3701 N. FAIRFAX DR. ARLINGTON VA 22205-1714	CODE HR0011	7. ADMINISTERED BY (If other than item 6) DOMA NORTHROP GRUMMAN BALTIMORE 7320 AVIATION BLVD, NWS 1285 BWI AIRPORT MD 21280-2000	CODE	S2103A
8. NAME AND ADDRESS OF CONTRACTOR (No., Street, County, State and Zip Code) NORTHROP GRUMMAN SYSTEMS CORPORATION 1580A NURSERY RD LINTHICUM HEIGHTS MD 21080-0000		9A. AMENDMENT OF SOLICITATION NO.		
		9B. DATED (SEE ITEM 11)		
		X 10A. MOD. OF CONTRACT/ORDER NO. HR0011-06-C-0144		
		10B. DATED (SEE ITEM 13)		
CODE 97942		FACILITY CODE		
11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS				
<input type="checkbox"/> The above numbered solicitation is amended as set forth in item 4. The hour and date specified for receipt of offer <input type="checkbox"/> is extended, <input type="checkbox"/> is not extended.				
Offer 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 amendment; (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) See Schedule				
13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACT ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.				
A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.				
B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(B).				
X C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF: the "Changes" Clause.				
D. OTHER (Specify type of modification and authority)				
E. IMPORTANT: Contractor <input type="checkbox"/> is not, <input checked="" type="checkbox"/> is required to sign this document and return <u>1</u> copies to the issuing office.				
14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by DCF section headings, including solicitation/contract subject matter where feasible.) Modification Control Number: bfaasca08150 The purpose of this modification is to incorporate an additional task to the program. This modification increases the value of the contract and provides funding in the amount of \$43,890 (AO W295/11). The Statement of Work for this additional task is hereby attached as Attachment (7), dated 1 August 2007. See Pages 2-3.				
Except as provided herein, all terms and conditions of the document referenced in item 9A or 10A, as heretofore changed, remain unchanged and in full force and effect.				
15A. NAME AND TITLE OF SIGNER (Type or print) DANIEL W. CROCKETT NORTHROP GRUMMAN AND ELECTRONIC SYSTEMS CONTRACTS REPRESENTATIVE		16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) STEPHEN C. DAVIS Contracting Officer		
(b)(4)		15C. DATE SIGNED 30 NOV 2007	(b)(6)	16C. DATE SIGNED 11-30-07
(Signature of person authorized to sign)				

SECTION SF 30 BLOCK 14 CONTINUATION PAGE

SUMMARY OF CHANGES

1. SECTION A - SOLICITATION/CONTRACT FORM

The total cost of this contract was increased by \$43,890.00 from \$30,267,615.00 to \$30,311,505.00.

2. SECTION B - SUPPLIES OR SERVICES AND PRICES

CLIN 0001

The estimated/max cost has increased by (b)(4)

The fixed fee has increased by (b)(4)

The total cost of this line item has increased by \$43,890.00 from \$24,935,676.00 to \$24,979,566.00.

SUBCLIN 000109 is added as follows:

ITEM NO		AMOUNT
000109	Funding for CLIN 0001 (Field Support)	
	AO No. W295/11	
	ACRN AD	\$43,890.00

3. SECTION C - DESCRIPTIONS AND SPECIFICATIONS

The following have been modified as highlighted in bold:

C-1 Scope of Work

The Contractor shall furnish the necessary personnel, materials, facilities and other services as may be required to perform Contract Line Item Numbers (CLIN) 0001 and 0003, as well as those CLINs corresponding to any exercise Option (CLINs 0004 and 0005, as applicable), in accordance with the Statements of Work, Attachment 1, Attachment 5, Attachment 6 **and Attachment 7** hereto.

(b) In the event of an inconsistency between the provisions of this contract and the Contractor's proposal, the inconsistency shall be resolved by giving precedence in the following order: (1) the contract, (2) the attachments to the contract, and then (3) the Contractor's proposal.

(end of clause)

4. SECTION G - CONTRACT ADMINISTRATION DATA

Accounting and Appropriation

a. Summary for the Payment Office

As a result of this modification, the total funded amount for this document was increased by \$43,890.00 from \$30,267,615.00 to \$30,311,505.00.

b. SUBCLIN 000109:

Funding on SUBCLIN 000109 is initiated as follows:

ACRN: AD

CIN: 00000000000000000000000000000000

Acctng Data: 21 7 2093 0000 5U-5U01 121000.00000 2512 JDJT MIPR7J077X7383 J7ZF S12193 RL81

Increase: \$43,890.00

Total: \$43,890.00

5. SECTION J - LIST OF DOCUMENTS, EXHIBITS AND OTHER ATTACHMENTS

The following have been added as highlighted in bold:

Exhibit/Attachment Table of Contents

DOCUMENT TYPE	DESCRIPTION	PAGES	DATE
Exhibit A	CLIN 0001 Exhibit(s)	9	N/A
Attachment 1	Statement of Work (Phase I/II)	19	15 May 2007
Attachment 2	DD Form 254 "Department of Defense Contract Security Classification Specification"	4	22 Sep 2006
Attachment 3	DELETED/RESERVED		
Attachment 4	Intellectual Property Assertions	1	15 Nov 2006
Attachment 5	Statement of Work for VADER Exploitation Support	3	11 Sep 2007
Attachment 6	Statement of Work for VADER System #2	4	22 October 2007
Attachment 7	Statement of Work for VADER Field Support Familiarization	1	1 August 2007

6. Except as modified above, the terms and conditions of Contract No. HR0011-06-C-0144 shall remain unchanged and in full force and effect.

(End of Summary of Changes)

1 August 2007

Page 1 of 1

1. Scope

This Statement of Work (SOW) includes the tasks to familiarize a field support engineer to prepare for the deployment of VADER to a remote location under austere conditions

2. Applicable Documents

All documentation for this project will be provided by Northrop Grumman Electronic Systems (NGES) in contractor format.

3. Task Requirements

Northrop Grumman Electronics Systems (NGES) shall provide all labor and administrative services necessary to all a field support engineer to become intimately familiar with VADER system operation, testing and maintenance.

Task supports development of a preliminary Integration and Test approach that includes Subsystem Integration and Test, System Integration Laboratory Integration and Test, and Flight Testing. Logistics Services will insert one engineer into this process 6 months prior to deployment. This will allow NGES to bring one senior level Field Engineer completely up to speed on all aspects of VADER's operational and maintenance requirements. This engineering will then train additional additional Field Engineers prior to deployment. Additional engineers will be inserted into the VADER integration and test team for Warrior integration or testing on a service aircraft 3 months before deployment to a hostile region.

4. Schedule

Task is anticipated to start in December 2007 and complete at the end of May 2008.

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT		1. CONTRACT ID CODE	PAGE OF PAGES
		U	1 5
2. AMENDMENT/MODIFICATION NO. R00014	3. EFFECTIVE DATE 21-Dec-2007	4. REQUISITION/PURCHASE REQ. NO. SEE SCHEDULE	5. PROJECT NO.(if applicable)
6. ISSUED BY DARPA CNO ATTN: STEPHEN C DAVIS 3701 N. FAIRFAX DR. ARLINGTON VA 22203-1714	CODE HR0011	7. ADMINISTERED BY (If other than item 6) DCMA NORTHROP GRUMMAN BALTIMORE 7323 AVIATION BLVD, M/S 1285 BWI AIRPORT MD 21240-8003	CODE S2103A
8. NAME AND ADDRESS OF CONTRACTOR (No., Street, County, State and Zip Code) NORTHROP GRUMMAN SYSTEMS CORPORATION 1580A NURSERY RD LINTHICUM HEIGHTS MD 21090-0000		9A. AMENDMENT OF SOLICITATION NO.	
		9B. DATED (SEE ITEM 11)	
		X 10A. MOD. OF CONTRACT/ORDER NO. HR0011-06-C-0144	
		X 10B. DATED (SEE ITEM 13) 27-Sep-2006	
CODE 97942	FACILITY CODE		
11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS			
<input type="checkbox"/> The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offer <input type="checkbox"/> is extended, <input type="checkbox"/> is not extended. Offer 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 amendment); (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) See Schedule			
13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.			
A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.			
B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(B).			
X C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF: the "Changes" Clause.			
D. OTHER (Specify type of modification and authority)			
E. IMPORTANT: Contractor <input type="checkbox"/> is not, <input checked="" type="checkbox"/> is required to sign this document and return <u>1</u> copies to the issuing office.			
14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.) Modification Control Number: bfa/asca06236 The purpose of this modification is to incorporate an additional task to the program. This modification increases the value of the contract and provides funding in the amount of \$1,248,876 (ACs W295/10 and W295/12), as well as extends the period of performance of CLIN 0001. The Statement of Work for this additional task is hereby attached as Attachment (8), dated 18 November 2007. See Pages 2-5.			
Except as provided herein, all terms and conditions of the document referenced in item 9A or 10A, as heretofore changed, remain unchanged and in full force and effect.			
15A. NAME AND TITLE OF SIGNER (b)(4)		16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) Stephen C. Davis, PCO TEL: 571-218-4949 EMAIL: Stephen.C.Davis@darpa.mil	
15B. CONTRACTOR/ORDER NO. (b)(4)		15C. DATE SIGNED (b)(6) 21 DEC 2007	
(Signature of person authorized to sign)		16C. DATE SIGNED 21 DEC 07	

EXCEPTION TO SF 30
APPROVED BY OIRM 11-84

30-105-04

STANDARD FORM 30 (Rev. 10-83)
Prescribed by GSA
FAR (48 CFR) 53.243

SECTION SF 30 BLOCK 14 CONTINUATION PAGE

SUMMARY OF CHANGES

1. SECTION A - SOLICITATION/CONTRACT FORM

The total cost of this contract was increased by \$1,248,876.00 from \$30,311,505.00 to \$31,560,381.00.

2. SECTION B - SUPPLIES OR SERVICES AND PRICES

CLIN 0001

The estimated/max cost has increased by (b)(4)

The fixed fee has increased by (b)(4)

The total cost of this line item has increased by \$1,248,876.00 from \$24,979,566.00 to \$26,228,442.00.

SUBCLIN 000110 is added as follows:

ITEM NO		AMOUNT
000110	Funding for CLIN 0001 (Field Spares)	
	AO No. W295/10 AND W295/12	
	ACRN AD	\$1,248,876.00

3. SECTION C - DESCRIPTIONS AND SPECIFICATIONS

The following have been modified as highlighted in bold:

C-1 Scope of Work

The Contractor shall furnish the necessary personnel, materials, facilities and other services as may be required to perform Contract Line Item Numbers (CLIN) 0001 and 0003, as well as those CLINs corresponding to any exercise Option (CLINs 0004 and 0005, as applicable), in accordance with the Statements of Work, Attachment 1, Attachment 5, Attachment 6, Attachment 7 **and Attachment 8** hereto.

(b) In the event of an inconsistency between the provisions of this contract and the Contractor's proposal, the inconsistency shall be resolved by giving precedence in the following order: (1) the contract, (2) the attachments to the contract, and then (3) the Contractor's proposal.

(end of clause)

C-2 Reports and Other Deliverables

(a) All technical reports delivered by the Contractor in the performance of the contract shall be considered "Technical Data" as defined in Section I contract clauses entitled "Rights in Technical Data - Noncommercial Items" and "Rights in Noncommercial Computer Software and Noncommercial Computer Software Documentation." The Government shall receive "unlimited rights" to this technical data, as defined in these clauses.

(b) In addition to those reports required by the Exhibit A, Contract Data Requirements List, the following report(s) must also be submitted as specified below:

1. FINAL REPORT

This report, prepared in accordance with DFARS 252.235-7011, shall document the results of the complete effort as set forth in the Statement of Work, Attachment 1 hereto. Title pages shall include a disclaimer worded substantially as follows:

"The views and conclusions contained in this document are those of the authors and should not be interpreted as representing the official policies, either expressly or implied, of the Defense Advanced Research Projects Agency or the U.S. Government."

(1) The Final Technical Report summary shall include:

Task Objectives
Technical Problems
General Methodology (i.e., literature review, laboratory experiments, surveys, etc.)
Technical Results
Important Findings and Conclusions
Significant Hardware Development
Special Comments
Implications for Further Research

(2) All papers and articles published as a result of DARPA sponsored research shall include a statement reflecting that sponsorship.

(3) Distribution Statement B applies as shown below:

"Distribution authorized to U.S. Government agencies only due to Critical/Classified Technology and to prevent Premature Dissemination of Information. Other requests for this document shall be referred to DARPA Technical Information Office via email at tjo@darpa.mil."

2. ADDITIONAL MISC. DELIVERABLES

The Contractor shall also deliver those items listed in the Contract Attachments (1), (6) and (8) - Statements of Work under the paragraph entitled "Deliverables", as applicable. The Contractor shall adhere to the schedule, as applicable, in the Statements of Work. Briefing materials (hard and softcopy) for all briefings given to the Government shall be provided in the Contractor's format.

(end of clause)

4. SECTION F - DELIVERIES OR PERFORMANCE

The following have been modified as highlighted in bold:

F-1 Term of Contract

(a) CLIN 0001 - The term of this CLIN commences on 1 October 2006 and continues through **28 February 2009**.

(b) CLIN 0003 - The term of this CLIN commences on 19 November 2007 and continues through **20 April 2009**.

(end of clause)

F-2 Reports and Other Deliverables

(a) Delivery of all reports and other deliverables shall be made to the addressee specified in F-3 entitled "Report Distribution" in accordance with the following:

Item No.	Description	Due Date (on or before)
0001	Interim Reports	See Exhibit A CDRL
0001	Additional Misc. Deliverables	See Section C-2
0001	Final Report (Phase 2)	25 February 2009
0003	Interim Reports	See Exhibit A CDRL
0003	Additional Misc. Deliverables	See Section C-2
0003	Final Report (Second System)	20 April 2009
0004*	Interim Reports	See Exhibit A CDRL
0004*	Additional Misc. Deliverables	See Section C-2
0004*	Final Report (Second System)	20 April 2009
0005*	Interim Reports	See Exhibit A CDRL
0005*	Additional Misc. Deliverables	See Section C-2
0005*	Final Report (Second System)	20 April 2009

*If option is exercised
(end of clause)

5. SECTION G - CONTRACT ADMINISTRATION DATA

Accounting and Appropriation

a.) Summary for the Payment Office

As a result of this modification, the total funded amount for this document was increased by \$1,248,876.00 from \$30,311,505.00 to \$31,560,381.00.

b.) SUBCLIN 000110:

Funding on SUBCLIN 000110 is initiated as follows:

ACRN: AD

CIN: 00000000000000000000000000000000

Acctng Data: 21 7 2093 0000 5U-5U01 121000.00000 2512 JDJT MIPR7J077X7383 J7ZF S12193 RL81

Increase: \$1,248,876.00

Total: \$1,248,876.00

6. SECTION J - LIST OF DOCUMENTS, EXHIBITS AND OTHER ATTACHMENTS

The following have been added as highlighted in bold:

Exhibit/Attachment Table of Contents

DOCUMENT TYPE	DESCRIPTION	PAGES	DATE
Exhibit A	CLIN 0001 Exhibit(s)	9	N/A
Attachment 1	Statement of Work (Phase I/II)	19	15 May 2007
Attachment 2	DD Form 254 "Department of Defense Contract Security Classification Specification"	4	22 Sep 2006
Attachment 3	DELETED/RESERVED		
Attachment 4	Intellectual Property Assertions	1	15 Nov 2006
Attachment 5	Statement of Work for VADER Exploitation Support	3	11 Sep 2007
Attachment 6	Statement of Work for VADER System #2	4	22 October 2007
Attachment 7	Statement of Work for VADER Field Support Familiarization	1	1 August 2007
Attachment 8	Statement of Work for VADER Field Spares	1	16 November 2007

7. Except as modified above, the terms and conditions of Contract No. HR0011-06-C-0144 shall remain unchanged and in full force and effect.

(End of Summary of Changes)

**Attachment 8 – Statement of Work for VADER
Field Spares**

HR0011-06-C-0144 P00014

16 November 2007

Page 1 of 1

1. Scope

This Statement of Work (SOW) includes the tasks to procure spares for the VADER system.

1.1 Assumptions

1. Engineering judgment was used to identify the critical spares for the VADER system that would require long lead parts order new. It is assumed that one spare of critical components would allow the system to be operated while existing parts are repaired or new ordered. No reliability analysis study was conducted.

2. Applicable Documents

There are no applicable documents

3. Task Requirements

Northrop Grumman Electronics Systems (NGES) shall provide all labor and administrative services necessary to support, perform and document the work to procure the parts identified in Table 1.

Table 1 VADER Field Spares List

(b)(4)



4. Deliverables

NGES shall provide the parts identified in Table 1.

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT			1. CONTRACT ID CODE	PAGE OF PAGES	
			U	1	3
2. AMENDMENT/MODIFICATION NO. P00015	3. EFFECTIVE DATE 30-Jan-2008	4. REQUISITION/PURCHASE REQ. NO. SEE SCHEDULE		5. PROJECT NO. (if applicable)	
6. ISSUED BY DARPA CMO ATTN: STEPHEN C DAVIS 3701 N FAIRFAX DR. ARLINGTON VA 22203-1714	CODE HR0011	7. ADMINISTERED BY (If other than Item 6) DOMA NORTHROP GRUMMAN BALTIMORE 7323 AVIATION BLVD, M/B 1285 BWI AIRPORT MD 21240-2003		CODE S2103A	
8. NAME AND ADDRESS OF CONTRACTOR (No., Street, County, State and Zip Code) NORTHROP GRUMMAN SYSTEMS CORPORATION 1960A NURSERY RD LINTHICUM HEIGHTS MD 21080-0000			9A. AMENDMENT OF SOLICITATION NO.		
			9B. DATED (SEE ITEM 11)		
			X 10A. MOD. OF CONTRACT/ORDER NO. HR0011-06-C-0144		
			X 10B. DATED (SEE ITEM 13) 27-Sep-2006		
CODE 87942	FACILITY CODE				
11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS					
<input type="checkbox"/> The above numbered solicitation is amended as set forth in Item 4. The hour and date specified for receipt of offer <input type="checkbox"/> is extended. <input type="checkbox"/> is not extended. Offer 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 amendment; (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)					
13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.					
A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.					
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).					
X C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF the "Changes" Clause.					
D. OTHER (Specify type of modification and authority)					
E. IMPORTANT: Contractor <input type="checkbox"/> is not. <input checked="" type="checkbox"/> is required to sign this document and return <u>1</u> copies to the issuing office.					
14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCP section headings, including solicitation/contract subject matter where feasible.) Modification Control Number: <i>brinsca08946</i> The purpose of this modification is to amend Attachment (4) - Intellectual Property Assertions, per emails dated 29 March 2007 and 24 January 2008. See Pages 2-3.					
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 CONTRACTOR (b)(4)			16A. NAME AND TITLE OF CONTRACTOR (Type or print) STEPHEN C DAVIS Contracting Officer		
15B. CONTRACTOR/ORDER NO. (b)(4)			15C. DATE SIGNED 31 JAN 08		16(b)(6)
(Signature of person authorized to sign)			16C. DATE SIGNED JAN 31 2008		

EXCEPTION TO SF 30
APPROVED BY OIRM 11-84

30-105-

SECTION SF 30 BLOCK 14 CONTINUATION PAGE

SUMMARY OF CHANGES

I. SECTION J - LIST OF DOCUMENTS, EXHIBITS AND OTHER ATTACHMENTS

The Table of Contents has changed, as highlighted in bold, from:

Exhibit/Attachment Table of Contents

DOCUMENT TYPE	DESCRIPTION	PAGES	DATE
Exhibit A	CLIN 0001 Exhibit(s)	9	N/A
Attachment 1	Statement of Work (Phase I/II)	19	15 May 2007
Attachment 2	DD Form 254 "Department of Defense Contract Security Classification Specification"	4	22 Sep 2006
Attachment 3	DELETED/RESERVED		
Attachment 4	Intellectual Property Assertions	1	15 Nov 2006
Attachment 5	Statement of Work for VADER Exploitation Support	3	11 Sep 2007
Attachment 6	Statement of Work for VADER System #2	4	22 October 2007
Attachment 7	Statement of Work for VADER Field Support Familiarization	1	1 August 2007
Attachment 8	Statement of Work for VADER Field Spares	1	16 November 2007

to:

DOCUMENT TYPE	DESCRIPTION	PAGES	DATE
Exhibit A	CLIN 0001 Exhibit(s)	9	N/A
Attachment 1	Statement of Work (Phase I/II)	19	15 May 2007
Attachment 2	DD Form 254 "Department of Defense Contract Security Classification Specification"	4	22 Sep 2006
Attachment 3	DELETED/RESERVED		
Attachment 4	Intellectual Property Assertions	3	29 January 2008
Attachment 5	Statement of Work for VADER	3	11 Sep 2007

Exploitation Support			
Attachment 6	Statement of Work for VADER System #2	4	22 October 2007
Attachment 7	Statement of Work for VADER Field Support Familiarization	1	1 August 2007
Attachment 8	Statement of Work for VADER Field Spares	1	16 November 2007

2. Except as modified above, the terms and conditions of Contract No. HR0011-06-C-0144 shall remain unchanged and in full force and effect.

(End of Summary of Changes)

Technical Data or Computer Software to be Furnished with Restrictions ²	Basis of Assertion ³	Asserted Rights Category ^{4,5,6}	Name of Person Asserting Restrictions ^{7,8,9}	Will All IP Be Physically Delivered To The Government In Performance of The Contract	Provide a Short Description of Each Item and It's Role In Accomplishing the SOW Requirements	Rationale for Claim or IR&D Project Charge Number	Data From
--	---------------------------------	---	--	--	--	---	-----------

(b)(4)

*All IP items asserted under this contract were previously developed exclusively at NGES private expense and will not be further developed under the VADER program using Government dollars.

Modification P00015

Enclosure (1)

(b)(4)



*All IP items asserted under this contract were previously developed exclusively at NGES private expense and will not be further developed under the VADER program using Government dollars.

Modification P00015

Enclosure (1)

(b)(4)



*All IP items asserted under this contract were previously developed exclusively at NGES private expense and will not be further developed under the VADER program using Government dollars.

Modification P00015

Enclosure (1)

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT			1. CONTRACT TO CODE U	PAGE OF PAGES 1 5
2. AMENDMENT/MODIFICATION NO. P00016	3. EFFECTIVE DATE 12-May-2008	4. REQUISITION/PURCHASE REQ. NO. SEE SCHEDULE		5. PROJECT NO. (if applicable)
6. ISSUED BY DARPA CMO ATTN: STEPHEN C DAVIS 3701 N. FAIRFAX DR. ARLINGTON VA 22203-1714	CODE HR0011	7. ADMINISTERED BY (if other than item 6) DCMA NORTHROP GRUMMAN BALTIMORE 7323 AVIATION BLVD, MS 1282 BWI AIRPORT MD 21240-2003		CODE S2103A
8. NAME AND ADDRESS OF CONTRACTOR (No., Street, County, State and Zip Code) NORTHROP GRUMMAN SYSTEMS CORPORATION 15804 NURSERY RD LANTHORN HEIGHTS MD 21090-0900			9A. AMENDMENT OF SOLICITATION NO.	
			9B. DATED (SEE ITEM 11)	
			X 10A. MOD. OF CONTRACT/ORDER NO. HR0011-06-C-0144	
			X 10B. DATED (SEE ITEM 13) 27-Sep-2006	
CODE 97942	FACILITY CODE			
11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS				
<input type="checkbox"/> The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offer <input type="checkbox"/> is extended. <input type="checkbox"/> is not extended. Offer 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 13, and returning _____ copies of the amendment; (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) See Schedule				
13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.				
A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.				
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).				
X C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF: the "Changes" Clause.				
D. OTHER (Specify type of modification and authority)				
E. IMPORTANT: Contractor <input type="checkbox"/> is not, <input checked="" type="checkbox"/> is required to sign this document, and return 1 copies to the issuing office.				
14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.) Modification Control Number: bfa1aacc06676 The purpose of this modification is to incorporate an additional effort to the contract, as well as funding in the amount of \$199,002 (AO X575/00). See Pages 2-5.				
Except as provided herein, all terms and conditions of the documents referenced in Item 9A or 10A, as heretofore changed, remain unchanged and in full force and effect.				
15A. NAME AND TITLE OF SIGNER (Type or print) (b)(4)		16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) Stephen C. Davis, PCO TEL: 571-218-4949 EMAIL: Stephen.C.Davis@darpa.mil		
15B. CONTRACTING OFFICER (b)(4)		15C. DATE SIGNED 16 May 08		16C. DATE SIGNED 16 May 08

EXCEPTION TO SF 30
APPROVED BY OIRM 11-84

30-105-

FORM 30 (Rev. 10-83)

Prescribed by GSA
FAR (48 CFR) 53.243

SECTION SF 30 BLOCK 14 CONTINUATION PAGE

SUMMARY OF CHANGES

1. SECTION A - SOLICITATION/CONTRACT FORM

The total cost of this contract was increased by \$199,002.00 from \$31,560,381.00 to \$31,759,383.00.

2. SECTION B - SUPPLIES OR SERVICES AND PRICES

CLIN 0006 is added as follows:

ITEM NO	SUPPLIES/SERVICES	ESTIMATED COST	FIXED FEE	TOTAL EST. COST PLUS FIXED FEE
0006	T3 Study	(b)(4)		\$199,002.00
	The Contractor shall accomplish the tasks associated with Phase I in accordance with the Attachment (9) Statement of Work. Data deliverables/reports will be provided in accordance with Sections C and F.			\$199,002.00

SUBCLIN 000601 is added as follows:

ITEM NO		AMOUNT
000601	Funding for CLIN 0006	
	AO No. X575/00	
	ACRN AE	\$199,002.00

3. SECTION C - DESCRIPTIONS AND SPECIFICATIONS

The following paragraphs have been modified as highlighted in bold:

C-1 Scope of Work

(a) The Contractor shall furnish the necessary personnel, materials, facilities and other services as may be required to perform **Contract Line Item Numbers (CLIN) 0001, 0003, and 0006**, as well as those CLINs corresponding to any exercise Option (CLINs 0004 and 0005, as applicable), in accordance with the **Statements of Work, Attachment 1, Attachment 5, Attachment 6, Attachment 7, Attachment 8, and Attachment 9** hereto.

(end of clause)

C-2 Reports and Other Deliverables

2. ADDITIONAL MISC. DELIVERABLES

The Contractor shall also deliver those items listed in the **Contract Attachments (1), (6), (8), and (9) - Statements of Work** under the paragraph entitled "Deliverables", as applicable. The Contractor shall adhere to the schedule, as applicable, in the Statements of Work. Briefing materials (hard and softcopy) for all briefings given to the Government shall be provided in the Contractor's format.

(end of clause)

4. SECTION F - DELIVERIES OR PERFORMANCE

The following have been added as highlighted in bold:

F-1 Term of Contract

(a) CLIN 0001 - The term of this CLIN commences on 1 October 2006 and continues through 28 February 2009.

(b) CLIN 0003 - The term of this CLIN commences on 19 November 2007 and continues through 20 April 2009.

(c) CLIN 0006 - The term of this CLIN commences 12 May 2008 and continues through 12 August 2008.

(end of clause)

F-2 Reports and Other Deliverables

(a) Delivery of all reports and other deliverables shall be made to the addressee specified in F-3 entitled "Report Distribution" in accordance with the following:

Item No.	Description	Due Date (on or before)
0001	Interim Reports	See Exhibit A CDRL
0001	Additional Misc. Deliverables	See Section C-2
0001	Final Report (Phase 2)	25 February 2009
0003	Interim Reports	See Exhibit A CDRL
0003	Additional Misc. Deliverables	See Section C-2
0003	Final Report (Second System)	20 April 2009
0004*	Interim Reports	See Exhibit A CDRL
0004*	Additional Misc. Deliverables	See Section C-2
0004*	Final Report (Second System)	20 April 2009
0005*	Interim Reports	See Exhibit A CDRL
0005*	Additional Misc. Deliverables	See Section C-2
0005*	Final Report (Second System)	20 April 2009
0006	Interim Reports	See Exhibit A CDRL
0006	Additional Misc. Deliverables	12 August 2008
0006	Final Report (T3 Study)	12 August 2008

*If option is exercised
(end of clause)

5. SECTION G - CONTRACT ADMINISTRATION DATA

Accounting and Appropriation

a) Summary for the Payment Office

As a result of this modification, the total funded amount for this document was increased by \$199,002.00 from \$31,560,381.00 to \$31,759,383.00.

b) SUBCLIN 000601:

Funding on SUBCLIN 000601 is initiated as follows:

ACRN: AE

CIN: 00000000000000000000000000000000

Acctng Data: 9770400 1320 X575 P7C40 2525 DPAC 7 5489 S12136 63286E

Increase: \$199,002.00

Total: \$199,002.00

6. SECTION J - LIST OF DOCUMENTS, EXHIBITS AND OTHER ATTACHMENTS

The following has been added as highlighted in bold:

Exhibit/Attachment Table of Contents

DOCUMENT TYPE	DESCRIPTION	PAGES	DATE
Exhibit A	CLIN 0001 Exhibit(s)	9	N/A
Attachment 1	Statement of Work (Phase I/II)	19	15 May 2007
Attachment 2	DD Form 254 "Department of Defense Contract Security Classification Specification"	4	22 Sep 2006
Attachment 3	DELETED/RESERVED		
Attachment 4	Intellectual Property Assertions	3	12 May 2008
Attachment 5	Statement of Work for VADER Exploitation Support	3	11 Sep 2007
Attachment 6	Statement of Work for VADER System #2	4	22 October 2007
Attachment 7	Statement of Work for VADER Field Support Familiarization	1	1 August 2007

Attachment 8 **Statement of Work for VADER** **1** **16 November 2007**
 Field Spares

Attachment 9 **Statement of Work for T3 Study** **1** **12 March 2008**

7. Except as modified above, the terms and conditions of Contract No. HR0011-06-C-0144 shall remain unchanged and in full force and effect.

(End of Summary of Changes)

Technical Data or Computer Software to be Furnished with Restrictions*	Basis of Assertion**	Asserted Rights Category***	Name of Person Asserting Restrictions****	Will All IP Be Physically Delivered To The Government In Performance of The Contract	Provide a Short Description of Each Item and It's Role In Accomplishing the SOW Requirements	Rationale for Claim or BKD Project Charge Number	Data From
(b)(4)							

*All IP items asserted under this contract were previously developed exclusively at NGES private expense and will not be further developed under the VADER program using Government dollars.

Modification P00016

Enclosure (1)

(b)(4)



*All IP items asserted under this contract were previously developed exclusively at NGES private expense and will not be further developed under the VADER program using Government dollars.

Modification P00016

Enclosure (1)

(b)(4)



*All IP items asserted under this contract were previously developed exclusively at NGES private expense and will not be further developed under the VADER program using Government dollars.

Modification P00016

Enclosure (1)

12 March 2008

Page 1 of 1

1. Scope

The Advanced Mission Computing (AMC) task will provide analysis results and platform independent architecture that can be employed by the VADER program. This study effort is within the scope of the VADER program because it studies the effectiveness of incorporating AMC environment and developing an initial AMC architecture that would apply to automating and improving VADER performance in the following areas: optimizing selection of selection of VADER modes (operating modes (SAR (both (b)(4) maps), GMTI, and DMTI); coordinating and optimizing the operations and sensor modes of multiple VADER equipped UAVs on a common mission; and automate and optimize VADER sensor activity with ground station exploitation and data collection.

2. General

Missile and sensor analysis assessing performance against approved operational threats using the SEAS multi-agent battlespace system effectiveness simulation. The analysis will show the benefits of injecting autonomous collective behaviors, revolving around CAS principles, into the core system mission computer, particularly in regard to self-organization and healing, real time reconfiguration, adaptive mission reach and dynamic systems coupling.

3. Tasks

Tasks for this study are as follows:

1. Define and integrate the benchmark battlespace threat behaviors and T3 missile mission computing behaviors into the USAF Systems Effectiveness Analysis Simulation (SEAS). This will include the definition of the T3 configuration, engagement parameter set and measures of performance being used for battlespace effectiveness.
2. Objectively benchmark the battlespace value of traditional mission computing integration trends using SEAS.
3. Objectively benchmark the battlespace value of an open adaptive advanced missile or sensor mission computer using SEAS
4. Program management: Develop program plan and schedule; monitor program execution, technical performance, and cost.

4. Deliverables

There are three distinct deliverables that will be provided at the end of the study period:

- (1) A SEAS simulation analysis and value assessment of the advanced mission computers behavioural traits within the battlespace as compared to a traditional benchmark
- (2) An architectural description, with background documentation, of the proposed next generation mission computer
- (3) A reference implementation of the Complexity Managers architectural description