

**INFORMATION TO OFFERORS OR QUOTERS  
SECTION A - COVER SHEET**

1. SOLICITATION NUMBER

2. (X one)

N00173-98-R-AS01

- |                                     |                     |
|-------------------------------------|---------------------|
| <input type="checkbox"/>            | a. SEALED BID       |
| <input checked="" type="checkbox"/> | b. NEGOTIATED (RFP) |
| <input type="checkbox"/>            | c. NEGOTIATED (RFQ) |

**INSTRUCTIONS**

NOTE THE AFFIRMATIVE ACTION REQUIREMENT OF THE EQUAL OPPORTUNITY CLAUSE WHICH MAY APPLY TO THE CONTRACT RESULTING FROM THIS SOLICITATION.

You are cautioned to note the "Certification of Non-Segregated Facilities" in the solicitation. Failure to agree to the certification will render your reply nonresponsive to the terms of solicitations involving awards of contracts exceeding \$25,000 which are not exempt from the provisions of the Equal Opportunity clause.

"Fill-ins" are provided on the face and reverse of Standard Form 18 and Parts I and IV of Standard Form 33, or other solicitation documents and Sections of Table of Contents in this solicitation and should be examined for applicability.

See the provision of this solicitation entitled either "Late Bids, Modifications of Bids or Withdrawal of Bids" or "Late Proposals, Modifications of Proposals and Withdrawals of Proposals."

When submitting your reply, the envelope used must be plainly marked with the Solicitation Number, as shown above and the date and local time set forth for bid opening or receipt of proposals in the solicitation document.

If NO RESPONSE is to be submitted, detach this sheet from the solicitation, complete the information requested on reverse, fold, affix postage, and mail. NO ENVELOPE IS NECESSARY.

Replies must set forth full, accurate, and complete information as required by this solicitation (including attachments). The penalty for making false statements is prescribed in 18 U.S.C. 1001.

3. ISSUING OFFICE (Complete mailing address, including ZIP Code)

PROCURING CONTRACTING OFFICE (CODE 3235.AS)  
NAVAL RESEARCH LABORATORY  
DEPARTMENT OF THE NAVY  
STENNIS SPACE CENTER, MS 39529-5004

4. ITEMS TO BE PURCHASED (Brief description)

DUAL BAND RECONNAISSANCE CAMERA

5. PROCUREMENT INFORMATION (X and complete as applicable)

- |                                     |  |
|-------------------------------------|--|
| <input checked="" type="checkbox"/> | a. THIS PROCUREMENT IS UNRESTRICTED  |
| <input type="checkbox"/>            | b. THIS PROCUREMENT IS A _____ % SET-ASIDE FOR ONE OF THE FOLLOWING (X one). (See Section I of the Table of Contents in this solicitation for details of the set-aside.) |
| <input type="checkbox"/>            | (1) Small Business   |
| <input type="checkbox"/>            | (2) Labor Surplus Area Concerns  |
| <input type="checkbox"/>            | (3) Combined Small Business/Labor Area Concerns  |

6. ADDITIONAL INFORMATION

THE NAVAL RESEARCH LABORATORY CONTRACTING DIVISION ISSUES SOLICITATIONS AND AMENDMENTS TO SOLICITATIONS ELECTRONICALLY VIA THE INTERNET AT THE FOLLOWING WEBSITE:

HTTP://HERON.NRL.NAVY.MIL/CONTRACTS/HOME.HTM.

ANY AMENDMENTS TO THIS SOLICITATION WILL BE POSTED AT THE WEBSITE. REFERENCED ABOVE. AMENDMENTS WILL NOT BE DISTRIBUTED BY ANY OTHER MEANS. IT IS THE RESPONSIBILITY OF POTENTIAL OFFERORS TO PERIODICALLY REVIEW THE WEBSITE FOR AMENDMENTS TO THIS SOLICITATION.

7. POINT OF CONTACT FOR INFORMATION

a. NAME (Last, First, Middle Initial)

Sharpe, Ann L.

b. ADDRESS (Include Zip Code)

PROCURING CONTRACTING OFFICE (CODE 3235)  
NAVAL RESEARCH LABORATORY  
STENNIS SPACE CENTER, MS 39529-5004

c. TELEPHONE NUMBER (Include Area Code and Extension) (NO COLLECT CALLS)

(228) 688-5403

<b>8. REASONS FOR NO RESPONSE (X all that apply)</b>			
<input type="checkbox"/>	<b>a. CANNOT COMPLY WITH SPECIFICATIONS</b>	<input type="checkbox"/>	<b>b. CANNOT MEET DELIVERY REQUIREMENT</b>
<input type="checkbox"/>	<b>c. UNABLE TO IDENTIFY THE ITEM(S)</b>	<input type="checkbox"/>	<b>d. DO NOT REGULARLY MANUFACTURE OR SELL THE TYPE OF ITEMS INVOLVED</b>
<input type="checkbox"/>	<b>e. OTHER (Specify)</b>		
<b>9. MAILING LIST INFORMATION (X one)</b>			
<input type="checkbox"/>	<b>YES</b>	<input type="checkbox"/>	<b>NO</b>
<b>WE DESIRE TO BE RETAINED ON THE MAILING LIST FOR FUTURE PROCUREMENT OF THE TYPE OF TIME(S) INVOLVED.</b>			
<b>10. RESPONDING FIRM</b>			
<b>a. COMPANY NAME</b>		<b>b. ADDRESS (Include Zip Code)</b>	
<b>c. ACTION OFFICER</b>			
<b>(1) Typed or Printed Name (Last, First, Middle Initial)</b>	<b>(2) Title</b>	<b>(3) Signature</b>	<b>(4) Date Signed (YYMMDD)</b>

DD FORM 1707 REVERSE, MAR 90

FOLD

FOLD

FOLD

FOLD

**FROM** Contracting Officer  
Code 3235.AS  
Naval Research Lab-SSC  
Stennis Space Ctr, MS 39529

**AFFIX  
STAMP  
HERE**

<b>SOLICITATION NUMBER</b>	
N00173-98-R-AS01	
<b>DATE (YYMMDD)</b>	<b>LOCAL TIME</b>
1999 JAN 11	3:00PM

**TO** PROCURING CONTRACTING OFFICE  
NAVAL RESEARCH LABORATORY  
CODE 3235.AS BLDG 1100 RM 107  
STENNIS SPACE CENTER, MS 39529-5004

<b>SOLICITATION, OFFER AND AWARD</b>		1. THIS CONTRACT IS A RATED ORDER UNDER DPAS (15 CFR 350) <span style="float: right;">▶</span>		RATING <b>DO-S10</b>	PAGE OF <b>1   30</b> PAGES
2. CONTRACT NO.	3. SOLICITATION NO. <b>N00173-98-R-AS01</b>	4. TYPE OF SOLICITATION <input type="checkbox"/> SEALED BID (IFB) <input checked="" type="checkbox"/> NEGOTIATED (RFP)		5. DATE ISSUED <b>11 DEC 1998</b>	6. REQUISITION/PURCHASE NO. <b>56-9374-98</b>
7. ISSUED BY <b>PROCURING CONTRACTING OFFICE NAVAL RESEARCH LABORATORY (NRL-SSC) CODE 3235 DEPARTMENT OF THE NAVY STENNIS SPACE CENTER, MS 39529-5004</b>		CODE <b>N68462</b>	8. ADDRESS OFFER TO (If other than Item 7)		

NOTE: In sealed bid solicitations "offer" and "offeror" mean "bid" and "bidder".

**SOLICITATION**

9. Sealed offers in original and SEE L11 copies for furnishing the supplies or services in the Schedule will be received at the place specified in Item 8, or if handcarried, in the depository located in BLDG 1100, RM 107 STENNIS SPACE CTR until 3:00 local time 11 JAN 1999  
(Hour) (Date)

CAUTION - LATE Submissions, Modifications, and Withdrawals: See Section I, Provision No. 52.214-7 or 52.215-10. All offers are subject to all terms and conditions contained in this solicitation.

10. FOR INFORMATION CALL: <span style="float: right;">▶</span>	A. NAME <b>Sharpe, Ann L.</b>	B. TELEPHONE NO. (Include area code) (NO COLLECT CALLS) <b>(228) 688-5403</b>
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<input checked="" type="checkbox"/>	B	SUPPLIES OR SERVICES AND PRICES/COSTS	2	PART III - LIST OF DOCUMENTS, EXHIBITS AND OTHER ATTACH.			
<input checked="" type="checkbox"/>	C	DESCRIPTION/SPECS./WORK STATEMENT	3	<input checked="" type="checkbox"/>	J	LIST OF ATTACHMENTS	17
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**OFFER (Must be fully completed by offeror)**

NOTE: Item 12 does not apply if the solicitation includes the provisions at 52.214-16, Minimum Bid Acceptance Period.

12. In compliance with the above, the undersigned agrees, if this offer is accepted within \_\_\_\_\_ calendar days (60 calendar days unless a different period is inserted by the offeror) from the date for receipt of offers specified above, to furnish any or all items upon which prices are offered at the price set opposite each item, delivered at the designated point(s), within the time specified in the schedule.

13. DISCOUNT FOR PROMPT PAYMENT (See Section I, Clause No. 52-232-8) <span style="float: right;">▶</span>	10 CALENDAR DAYS	20 CALENDAR DAYS	30 CALENDAR DAYS	CALENDAR DAYS
	%	%	%	%
14. ACKNOWLEDGMENT OF AMENDMENTS (The offeror acknowledges receipt of amendments to the SOLICITATION for offerors and related documents numbered and dated:	AMENDMENT NO.	DATE	AMENDMENT NO.	DATE

15A. NAME AND ADDRESS OF OFFEROR	CODE	FACILITY	16. NAME AND TITLE OF PERSON AUTHORIZED TO SIGN OFFER (Type or print)
15B. TELEPHONE NO. (Include area code)	15C. CHECK IF REMITTANCE ADDRESS IS DIFFERENT FROM ABOVE - ENTER SUCH ADDRESS IN SCHEDULE. <input type="checkbox"/>		17. SIGNATURE
<b>AWARD (To be completed by Government)</b>			18. OFFER DATE

19. ACCEPTED AS TO ITEMS NUMBERED	20. AMOUNT	21. ACCOUNTING AND APPROPRIATION	
22. AUTHORITY FOR USING OTHER THAN FULL AND OPEN COMPETITION: <input type="checkbox"/> 10 U.S.C. 2304(c) ( ) <input type="checkbox"/> 41 U.S.C. 253(c) ( )		23. SUBMIT INVOICES TO ADDRESS SHOWN IN (4 copies unless otherwise specified) <span style="float: right;">▶</span>	ITEM
24. ADMINISTERED BY (If other than Item 7) CODE		25. PAYMENT WILL BE MADE BY CODE	
26. NAME OF CONTRACTING OFFICER (Type or print)		27. UNITED STATES OF AMERICA  (Signature of Contracting Officer)	28. AWARD DATE

IMPORTANT - Award will be made on this Form, or on Standard Form 26, or by other authorized official written notice.

**PART I - THE SCHEDULE  
SECTION B  
SUPPLIES OR SERVICES AND PRICES/COSTS**

**B-1 SUPPLIES/SERVICES AND COSTS**

ITEM NO.	SUPPLIES OR SERVICES	ESTIMATED COST	FIXED FEE	TOTAL EST COST PLUS FIXED FEE
0001	The Contractor shall develop, fabricate, deliver, and support the testing of a Dual Band Reconnaissance Camera in accordance with Section C.	\$ _____	\$ _____	\$ _____
000101	Reports, Data, Software and Documentation as set forth in Exhibit A (DD 1423)	* NSP	* NSP	* NSP
<b>OPTION 1</b>				
0002	Integration, test support and data evaluation of the Camera in a F-18 pod in accordance with Section C.	\$ _____	\$ _____	\$ _____
000201	Reports, Data, Software and Documentation as set forth in Exhibit A (DD 1423)	* NSP	* NSP	* NSP
<b>OPTION 2</b>				
0003	Integration and test support of the Camera in a F-14 TARPS Pod in accordance with Section C.	\$ _____	\$ _____	\$ _____
000301	Reports, Data, Software and Documentation as set forth in Exhibit A (DD 1423)	* NSP	* NSP	* NSP
TOTAL ESTIMATED COST PLUS FIXED FEE:		\$ _____	\$ _____	\$ _____

\* Not Separately Priced

**SECTION C**  
**DESCRIPTION/SPECIFICATIONS/STATEMENT OF WORK**

**C-1 STATEMENT OF WORK**

The work and services to be performed hereunder shall be subject to the requirements and standards contained in Attachment (1), Statement of Work, with Exhibit A, Contract Data Requirements List, and all other Attachments cited in Section J, which are incorporated by reference into Section C. The work under optional CLIN 0002 shall be in accordance with Paragraph C.2.3 of Attachment (1), Statement of Work. The work under optional CLIN 0003 shall be in accordance with Paragraph C.2.4 of Attachment (1), Statement of Work.

**SECTION D**  
**PACKAGING AND MARKING**

**D-1 PACKAGING AND MARKING**

Preservation, packaging, packing and marking of all deliverable contract line items must conform to normal commercial packing standards to assure safe delivery at destination.

**SECTION E**  
**INSPECTION AND ACCEPTANCE**

**E-1 INSPECTION AND ACCEPTANCE CLAUSES INCORPORATED BY REFERENCE:**

**FAR CLAUSE    TITLE**

52.246-08    -    Inspection Of Research And Development - Cost Reimbursement (APR 1984)

**DFARS CLAUSE    TITLE**

252.246-7000    -    Material Inspection And Receiving Report (DEC 1991)

**E-2 INSPECTION AND ACCEPTANCE**

Inspection and acceptance of the final delivery will be accomplished by the Contracting Officer Representative (COR) designated in Section G of this contract . Inspection and acceptance will be performed at the Naval Research Laboratory, Washington, DC 20375-5320. Constructive acceptance, in accordance with FAR 32.905 (a)(1), shall be deemed to have occurred on the 30<sup>th</sup> day after each contractual performance or delivery.

**SECTION F  
DELIVERIES OR PERFORMANCE**

**F-1 DELIVERIES OR PERFORMANCE CLAUSES INCORPORATED BY REFERENCE:**

**FAR CLAUSE    TITLE**

52.242-15    -    Stop-Work Order (AUG 1989) - Alternate I (APR 1984)  
52.247-34    -    F.O.B. Destination (NOV 1991)

**F-2 PERIOD AND PLACE OF PERFORMANCE**

(a) The work under CLIN 0001 of this contract shall commence on the effective date of this contract and be completed as set forth in Sections C.5.0, 6.0 and 7.0 of Attachment (1), Statement of Work. Performance for each of the option periods is dependent upon available flight windows, and shall be coordinated with the Contracting Officer's Representative identified in Section G. Option 1 (CLIN 0002), if exercised, shall be for a period as set forth in Section C.8.0. Option 2 (CLIN 0003), if exercised, shall be for a period as set forth in Section C.9.0.

(b) The principal place of performance of CLIN 0001 of this contract shall be the contractor's facility located at \_\_\_\_\_.

(c) The Camera System to be delivered under this Contract shall be shipped FOB Destination and consigned to the following:

Contracting Officer's Representative: \_\_\_\_\_ \*  
Naval Research Laboratory  
Contract Number: \_\_\_\_\_ \*  
Building: \_\_\_\_\_ \*; Code: \_\_\_\_\_ \*  
4555 Overlook Ave., S.W.  
Washington, DC 20375-5326  
(\* To be filled in at time of award)

**F-3 DISTRIBUTION**

(a) Item No. 000101 of Section B (and 000201 and 000301 if Options are exercised) shall be delivered within the time period stated in Exhibit A, F.O.B. Destination.

(b) Distribution, consignment and marking instructions for Line Item 000101 (and 000201 and 000301, as applicable) shall be in accordance with the following:

Shipped F.O.B. Destination to the locations set forth in Exhibit A,  
Marked for: Contract Number \_\_\_\_\_ \* (\* To be filled in at time of award).

**SECTION G**  
**CONTRACT ADMINISTRATION DATA**

**G-1** PROCURING OFFICE REPRESENTATIVE

In order to expedite administration of this contract, the Administrative Contracting Officer (ACO) will direct inquiries to the appropriate office listed below. Please do not direct routine inquiries to the person listed in Item 20A on Standard Form 26.

Contract Matters- L. Ann Sharpe , Code 3235 , (228) 688-5784,  
DSN 485-5784-, or Telecopier (228) 688-6055

Security Matters- Mr. Charles Rogers, Code 1221, (202) 767-2240, DSN 297-2240

Safety Matters- Mr. Kirk J. King, Code 1240, (202) 767-2232, DSN 297 2232

Patent Matters- Mr. Thomas McDonnell, Code 3008.2, (202) 767-3427, DSN 297-3427

Release of Data- Mr. Richard L. Thompson, Code 1230 (202) 767-2541, DSN 297-2541

The ACO will forward invention disclosures and reports directly to the Associate Counsel for Patents, Code 3008.2, Naval Research Laboratory, Washington, DC 20375-5320. The Associate Counsel for Patents will return the reports along with a recommendation to the Administrative Contracting Officer. The Associate Counsel for Patents will represent the Contracting Officer with regard to invention reporting matters arising under this contract.

**G-2** CONTRACTING OFFICER'S REPRESENTATIVE (COR) - FUNCTIONS AND LIMITATIONS

\* \_\_\_\_\_ is hereby designated the cognizant COR who will represent the Contracting Officer in the administration of technical details within the scope of this contract and inspection and acceptance. 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 change the specifications in the contract. If, as a result of technical discussions, it is desirable to alter contract obligations or statements of work, a modification must be issued in writing and signed by the Contracting Officer. The COR is responsible for reviewing the bills and charges submitted by the Contractor and informing the ACO of areas where exceptions are to be taken.

*( \* To be filled in at time of award)*

**G-3** SUBCONTRACTORS/CONSULTANTS

(a) Advance notification or requests for consent pursuant to the contract clause entitled "Subcontracts" (FAR 52.244-2) shall be directed to the cognizant administrative contracting officer (ACO).

(b) The following subcontractors/consultants have been identified in the Contractor's proposal as necessary for performance of this contract:

Subcontractor/Consultant Name	Estimated Cost
-------------------------------	----------------

*(Paragraph (b) will be included and filled in at time of award if subcontractors/consultants are proposed by the successful offeror)*

**G-4 NAPS 5252.232-9001 - SUBMISSION OF INVOICES (COST-REIMBURSEMENT, TIME-AND-MATERIALS, LABOR-HOUR, OR FIXED PRICE INCENTIVE (JUL 1992)**

(a) "Invoice" as used in this clause includes contractor requests for interim payments using public vouchers (SF 1034) but does not include contractor requests for progress payments under fixed price incentive contracts.

(b) The Contractor shall submit invoices and any necessary supporting documentation, in an original and 4 copies, to the contract auditor at the following address:

\_\_\_\_\_ \* \_\_\_\_\_ (\* To be filled in at time of award)

unless delivery orders are applicable, in which case invoices will be segregated by individual order and submitted to the address specified in the order. In addition, an information copy shall be submitted to [See Section G for designated COR]. Following verification, the contract auditor will forward the invoice to the designated payment office for payment in the amount determined to be owing, in accordance with the applicable payment (and fee) clause(s) of this contract.

(c) Invoices requesting interim payments shall be submitted no more than once every two weeks, unless another time period is specified in the Payments clause of this contract. For indefinite delivery type contracts, interim payment invoices shall be submitted no more than once every two weeks for each delivery orders. There shall be a lapse of no more than 30 calendar days between performance and submission of an interim payment invoice.

(d) In addition to the information identified in the Prompt Payment clause herein, each invoice shall contain the following information, as applicable:

- (1) Contract line item number (CLIN)
- (2) Subline item number (SLIN)
- (3) Accounting Classification Reference Number(ACRN)
- (4) Payment terms
- (5) Procuring activity
- (6) Date supplies provided or services performed
- (7) Costs incurred and allowable under the contract
- (8) Vessel (e.g., ship, submarine or other craft) or system for which supply/service is provided

(e) A DD Form 250, "Material Inspection and Receiving Report",

X is required with indicated in EXHIBIT A.

\_\_\_ is required only with the final invoice.

\_\_\_ is not required.

- (f) A Certificate of Performance  
 \_\_\_ shall be provided with each invoice submittal.  
X is not required.
- (g) The Contractor's final invoice shall be identified as such, and shall list all other invoices (if any) previously tendered under this contract.
- (h) Cost of performance shall be segregated, accumulated and invoiced to the appropriate ACRN categories to the extent possible. When such segregation of costs by ACRN is not possible for invoices submitted with CLIN/SLINS with more than one ACRN, an allocation ratio shall be established in the same ratio as the obligations cited in the accounting data so that costs are allocated on a proportional basis.

#### **G-5 PAYMENT OF FIXED FEE (COMPLETION FORM)**

The fixed fee set forth in Section B of this contract shall be payable on completion of the work and services required under each CLIN of this contract and their acceptance on behalf of the Government. However the contractor may bill on each voucher the amount of the fixed fee bearing the same percentage to the amount of cost billed as the total fixed fee bears to the total estimated cost set forth in Section B, subject to the contract clause entitled "Fixed Fee" (FAR 52.216-8). If the fixed fee is reduced pursuant to any clause or requirement of this contract and the reduced fee is less than the sum of all fee payments made to the contractor under this contract, the contractor shall repay the difference to the Government. The total fee paid the contractor shall not exceed the fixed fee set forth in Section B.

#### **G-6 INCREMENTAL FUNDING**

This contract is incrementally funded pursuant to the Limitation of Funds clause, FAR 52.232-22. Funds are allotted to the contract in the amount of \$ \_\_\_\_\_\*\_\_\_\_\_ and it is estimated that they are sufficient for contract performance through \_\_\_\_\_\*\_\_\_\_\_.

(\* To be filled in at time of award)

#### **G-7 PAYMENT INSTRUCTIONS FOR MULTIPLE ACCOUNTING CLASSIFICATION CITATIONS (COST-REIMBURSEMENT)**

The purpose of these instructions is to permit the paying office to charge the accounting classification citations in the contract in a manner that reflects the performance of the contract. These instructions do not create any obligation on the part of the Government or the contractor nor do they in any way alter any obligation created by any other provision of the contract. Invoices should be paid from available ACRNs in the following order:

- (a) ACRNs cited on the contractor's invoice.
- (b) On a proportional basis from any ACRNs assigned to funds which will cancel at the end of the current fiscal year.
- (c) The ACRN assigned to the following line of accounting:  
 97X4930.NH4A 000 77777 0 000173 2F 000000 N00173Z45000.
- (d) If funds appropriated in more than one fiscal year are allotted to the contract, the ACRN assigned to the oldest allotment of funds.

(e) On a proportional basis from all ACRNs assigned to allotments of funds appropriated in a single fiscal year.

**G-8** ACCOUNTING AND APPROPRIATION DATA

*(To be provided at time of award)*

**SECTION H  
SPECIAL CONTRACT REQUIREMENTS**

**H-1 TYPE OF CONTRACT**

*(To be filled in at the time of award)*

**H-2 ONR 5252.237-9705 - KEY PERSONNEL (DEC 88)**

(a) The Contractor agrees to assign to the contract tasks those persons identified herein as "key personnel". No substitutions may be made except in accordance with this clause.

(b) The Contractor understands that during the first ninety (90) days of the contract performance period, no personnel substitutions will be permitted unless these substitutions are unavoidable because of the incumbent's sudden illness, death or termination of employment. In any of these events, the Contractor shall promptly notify the Contracting Officer and provide the information described in paragraph (c) below. After the initial ninety (90) day period the Contractor must submit to the Contracting Officer all proposed substitutions, in writing, at least fifteen (15) days in advance (thirty (30) days if security clearance must be obtained) of any proposed substitution and provide the information required by paragraph (c) below.

(c) Any request for substitution must include a detailed explanation of the circumstances necessitating the proposed substitution, a resume for the proposed substitute, and any other information requested by the Contracting Officer. Any proposed substitute must have qualifications equal to or superior to the qualifications of the incumbent. The Contracting Officer or his/her authorized representative will evaluate such requests and promptly notify the Contractor of his/her approval or disapproval thereof.

(d) In the event that any of the identified key personnel cease to perform under the contract and the substitute is disapproved, the contract may be immediately terminated in accordance with the Termination clause of the contract.

The following are identified as key personnel:

Program Manager: \_\_\_\_\_

Program Manager Alternate(s): \_\_\_\_\_

Chief Engineer (or equivalent): \_\_\_\_\_

**H-3 CONTRACTOR'S PROGRAM MANAGER**

(a) The Contractor's Program Manager identified above is the contractor's authorized supervisor for technical and administrative performance of all work hereunder. The Program Manager shall provide the single point of contact between the Contractor and the Government's Contracting Officer's Representative (COR). All administrative support of technical personnel required to fulfill the work stated in the contract shall be the responsibility of the contractor.

(b) The Program manager shall receive and execute, on behalf of the Contractor, such technical directions as the Government's COR may issue within the terms and conditions of the Contract.

**H-4 ONR 5252.242-9718 TECHNICAL DIRECTION (DEC 88)**

(a) Performance of the work hereunder is subject to the technical direction of the COR designated in this contract or his duly authorized representative. For the purposes of this clause, technical direction includes the following:

- (1) Direction to the Contractor which shifts work emphasis between work areas or tasks, requires pursuit of certain lines of inquiry, fills in details or otherwise serves to accomplish the objectives described in the statement of work;
- (2) Guidelines to the Contractor which assist in the interpretation of drawings, specifications or technical portions of work description.

(b) Technical direction must be within the general scope of work stated in the contract.

Technical instructions may not be used to:

- (1) Assign additional work under the contract
- (2) Direct a change as defined in the contract clause entitled "Changes";
- (3) Increase or decrease the estimated contract cost, the fixed fee, or the time required for contract performance; or
- (4) Change any of the terms, conditions or specifications of the contract.

(c) The only individual authorized to in any way amend or modify any of the terms of this contract shall be the Contracting Officer. When, in the opinion of the Contractor, any technical instruction calls for effort outside the scope of the contract or inconsistent with this special provision, the Contractor shall notify the Contracting Officer in writing within ten working days after its receipt. The Contractor shall not proceed with the work affected by the technical direction until the Contractor is notified by the Contracting Officer that the technical direction is within the scope of the contract.

(d) Nothing in the foregoing paragraphs may be construed to excuse the Contractor from performing that portion of the work statement which is not affected by the disputed technical instruction.

**H-5 ONR 252.235-9714 - REPORT PREPARATION (FEB 97)**

Scientific or technical reports prepared by the Contractor and deliverable under the terms of this contract will be prepared in accordance with format requirements contained in ANSI/NISO Z39.18-1995, "Scientific and Technical Reports: Elements, Organization, and Design." [NOTE: ANSI Z39.18 may be obtained from NISO Press Fulfillment Center, P. O. Box 338, Oxon Hill, MD. 20750-0338. Telephone 1-800-282-6476]

**H-6 OPTION(S)**

The Government may require performance of the numbered line items identified in the Schedule as optional items at the price stated in the Schedule. The Contracting Officer's may unilaterally exercise the option by written notice to the Contractor anytime prior to the current completion date of the contract.

**H-7 REPRESENTATIONS AND CERTIFICATIONS**

The Contractor's completed Representations, Certifications, and Other Statements of Offerors or Respondents are incorporated herein by reference.

**PART II - CONTRACT CLAUSES**  
**SECTION I**  
**CONTRACT CLAUSES**

**I-1 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://www.arnet.gov/far>  
<http://heron.nrl.navy.mil/contracts/home.htm>

**a. FEDERAL ACQUISITION REGULATION CLAUSES**

**FAR CLAUSE    TITLE**

- 52.202-1    -    Definitions (OCT 1995)
- 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 (JUN 1997)
- 52.204-4    -    Printing/Copying Double-Sided On Recycled Paper (JUN 1996)
- 52.209-6    -    Protecting The Government's Interest When Subcontracting With Contractors Debarred, Suspended, Or Proposed For Debarment (JUL 1995)
- 52.211-15    -    Defense Priority and Allocation Requirements (SEP 1990)
- 52.215-2    -    Audit And Records-Negotiation (AUG 1996)
- 52.215-8    -    Order of Precedence - Uniform Contract Format (OCT 1997)
- 52.215-11    -    Price Reduction for Defective Cost or Pricing Data - Modifications (OCT 1997)
- 52.215-13    -    Subcontractor Cost or Pricing Data Modifications (OCT 1997)
- 52.215-14    -    Integrity of Unit Prices (OCT 1997)
- 52.215-15    -    Termination of Defined Benefit Pension Plans (OCT 1997)
- 52.215-17    -    Waiver of Facilities Capital Cost of Money (OCT 1997)[*Will be included if the successful offeror does not propose facilities capital cost of money.*]
- 52.215-18    -    Reversion or Adjustment of Plans for Post-retirement Benefits (PRB) Other than Pensions (OCT 1997)
- 52.215-19    -    Notification of Ownership Changes (OCT 1997)
- 52.215-21    -    Requirements for Cost or Pricing Data or Information Other Than Cost or Pricing Data--Modifications (OCT 1997)
- 52.216-7    -    Allowable Cost And Payment (APR 1998)
- 52.216-8    -    Fixed-Fee (MAR 1997)
- 52.219-8    -    Utilization Of Small, Small Disadvantaged And Women-Owned Small Business Concerns (JUN 1997)

- 52.219-9 - Small, Small Disadvantaged and Women-Owned Small Business Subcontracting Plan (AUG 1998) - Alternate II (MAR 1996)
- 52.219-16 - Liquidated Damages-Subcontracting Plan (AUG 1998)
- 52.219-23 - Notice of Price Evaluation Adjustment For Small Disadvantaged Business Concerns (OCT 1998) with Alternate I (OCT 1998) Offers will be evaluated by adding a factor of 10%. \_\_\_\_\_ Offeror elects to waive the adjustment.
- 52.222-1 - Notice To The Government Of Labor Disputes (FEB 1997)
- 52.222-2 - Payment For Overtime Premiums (JUL 1990) -The Use Of Overtime Is Authorized Under This Contract If The Overtime Premium Does Not Exceed "0"
- 52.222-20 - Walsh-Healey Public Contracts Act (DEC 1996)
- 52.222-21 - Prohibition of Segregated Facilities (APR 1984) (DEVIATION)
- 52.222-26 - Equal Opportunity (APR 1984)(DEVIATION)
- 52.222-35 - Affirmative Action For Disabled Veterans And Veterans Of The Vietnam Era (APR 1998)
- 52.222-36 - Affirmative Action For Workers With Disabilities (JUN 1998)
- 52.222-37 - Employment Reports On Disabled Veterans And Veterans Of The Vietnam Era (APR 1998)
- 52.223-2 - Clean Air And Water (APR 1984)
- 52.223-6 - Drug-Free Workplace (JAN 1997)
- 52.223-14 - Toxic Chemical Release Reporting (OCT 1996)
- 52.225-11 - Restrictions On Certain Foreign Purchases (AUG 1998)
- 52.226-1 - Utilization Of Indian Organizations And Indian-Owned Economic Enterprises (SEP 1996)
- 52.227-1 - Authorization And Consent (JUL 1995)- Alternate I (APR 1984)
- 52.227-2 - Notice And Assistance Regarding Patent And Copyright Infringement (AUG 1996)
- 52.227-10 - Filing of Patent Application- Classified Subject Matter (APR 1984)
- 52.227-11 - Patent Rights - Retention By The Contractor (Short Form) (JUN 1997)[*Will be included if the successful offeror is a small business or a non-profit organization.*]
- 52.227-12 - Patent Rights - Retention By The Contractor (Long Form) (JAN 1997)[*Will be included if the successful offeror is not a small business or a non-profit organization.*]
- 52.228-7 - Insurance - Liability To Third Persons (MAR 1996)
- 52.230-2 - Cost Accounting Standards (APR 1998)
- 52.230-3 - Disclosure And Consistency Of Cost Accounting Practices (APR 1998)
- 52.230-6 - Administration Of Cost Accounting Standards (APR 1996)
- 52.232-9 - Limitation On Withholding Of Payments (APR 1984)
- 52.232-17 - Interest (JUN 1996)
- 52.232-18 - Availability Of Funds (APR 1984)
- 52.232-20 - Limitation Of Cost (APR 1984) (Applicable when the contract is fully funded)
- 52.232-22 - Limitation Of Funds (APR 1984) (Applicable when the contract is not fully funded)
- 52.232-23 - Assignment Of Claims (JAN 1986) Alternate I (APR 1984)
- 52.232-25 - Prompt Payment (JUN 1997)
- 52.233-1 - Disputes (OCT 1995)
- 52.233-3 - 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 (OCT 1995)
- 52.242-4 - Certification of Final Indirect Costs (JAN 1997)
- 52.242-13 - Bankruptcy (JUL 1995)
- 52.243-2 - Changes - Cost-Reimbursement (AUG 1987) - Alternate V (APR 1984)
- 52.243-7 - Notification Of Changes (APR 1984)fill in 30
- 52.244-2 - Subcontracts (AUG 1998) - Alternate I (AUG 1998)
- 52.244-5 - Competition In Subcontracting (DEC 1996)
- 52.244-6 - Subcontracts for Commercial Items and Commercial Components (OCT 1998)
- 52.245-5 - Government Property (Cost-Reimbursement, Time-And-Material, Or Labor-Hour Contracts) (JAN 1986) (DEVIATION)
- 52.245-9 - Use And Charges (APR 1984) (DEVIATION)
- 52.245-18 - Special Test Equipment (FEB 1993)
- 52.245-19 - Government Property Furnished "As-Is" (APR 1984)
- 52.246-23 - Limitation Of Liability (FEB 1997)
- 52.247-1 - Commercial Bill Of Lading Notations (APR 1984)
- 52.247-63 - Preference For U. S. Flag Carriers (JAN 1997)
- 52.249-6 - Termination (Cost-Reimbursement) (SEP 1996)
- 52.249-14 - Excusable Delays (APR 1984)
- 52.251-1 - Government Supply Sources (APR 1984)
- 52.252-6 - Authorized Deviations in Clauses (APR 1984)( fill in Defense Federal Acquisition Regulation Supplement (48 CFR Chapter 2))
- 52.253-1 - Computer Generated Forms (JAN 1991)

**b. DEPARTMENT OF DEFENSE FEDERAL ACQUISITION REGULATION CLAUSES**

**DFARS CLAUSE    TITLE**

- 252.201-7000 - Contracting Officer's Representative (DEC 1991)
- 252.203-7001 - Special Prohibition On Employment (JUN 1997)
- 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 - Required Central Contractor Registration (MAR 1998)
- 252.205-7000 - Provision Of Information To Cooperative Agreement Holders (DEC 1991)
- 252.209-7000 - Acquisition From Subcontractors Subject To On-Site Inspection Under The Intermediate-Range Nuclear Forces (INF) Treaty (NOV 1995)
- 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)
- 252.219-7003 - Small Business And Small Disadvantaged Business Subcontracting Plan (DoD Contracts) (APR 1996)
- 252.219-7005 - Incentive For Subcontracting With Small Businesses, Small Disadvantaged Businesses, Historically Black Colleges And Universities And Minority Institutions (OCT 1998) If the Contractor exceeds the small disadvantaged business, historically black college and university, minority institution goal of its subcontracting plan, at completion of contract performance, the Contractor will receive 1 percent of the excess.

- 252.223-7001 - Hazard Warning Labels (DEC 1991)
- 252.225-7001 - Buy American Act And Balance Of Payments Program (MAR 1998)
- 252.225-7002 - Qualifying Country Sources As Subcontractors (DEC 1991)
- 252.225-7009 - Duty Free Entry- Qualifying Country Supplies (End Products and Components) (MAR 1998)
- 252.225-7010 - Duty Free Entry - Additional Provisions (MAR 1998)
- 252.225-7012 - Preference For Certain Domestic Commodities (SEP 1997)
- 252.225-7016 - Restriction On Acquisition Of Ball And Roller Bearings (AUG 1998)
- 252.225-7026 - Reporting Of Contract Performance Outside The United States (MAR 1998)
- 252.225-7031 - Secondary Arab Boycott Of Israel (JUN 1992)
- 252.227-7000 - Non Estoppel (OCT 1966)
- 252.227-7001 - Release Of Past Infringement (AUG 1984)
- 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)
- 252.227-7016 - Rights In Bids or Proposal Information (JUN 1995)
- 252.227-7019 - Validation Of Asserted Restrictions--Computer Software (JUN 1995)
- 252.227-7025 - Limitations On The Use Or Disclosure Of Government-Furnished Information Marked With Restrictive Legends (JUN 1995)
- 252.227-7026 - Deferred Delivery Of Technical Data Or Computer Software (APR 1988)
- 252.227-7027 - Deferred Ordering Of Technical Data Or Computer Software (APR 1988)
- 252.227-7030 - Technical Data--Withholding Of Payment (OCT 1988)
- 252.227-7034 - Patents--Subcontracts (APR 1984)
- 252.227-7036 - Declaration Of Technical Data Conformity (JAN 1997)
- 252.227-7037 - Validation Of Restrictive Markings On Technical Data (NOV 1995)
- 252.227-7039 - Patents--Reporting of Subject Inventions (APR 1990)
- 252.231-7000 - Supplemental Cost Principles (DEC 1991)
- 252.232-7009 - Payment By Electronic Funds Transfer (CCR) (JUN 1998)
- 252.235-7010 - Acknowledgment of Support and Disclaimer (MAY 1995)
- 252.235-7011 - Final Scientific Or Technical Report (MAY 1995)
- 252.242-7000 - Post Award Conference (DEC 1991)
- 252.242-7004 - Material Management And Accounting System (SEP 1996)
- 252.243-7002 - Requests for Equitable Adjustment (MAR 1998)
- 252.245-7001 - Reports of Government Property (MAY 1994)
- 252.246-7001 - Warranty Of Data (DEC 1991)
- 252.247-7023 - Transportation Of Supplies By Sea (NOV 1995)
- 252.247-7024 - Notification Of Transportation Of Supplies By Sea (NOV 1995)[*Will be included if the successful offeror made a negative response to the inquiry at DFARS 252.247-7022.*]
- 252.251-7000 - Ordering From Government Supply Sources (MAY 1995)

**I-2 FAR 52.223-11 - OZONE-DEPLETING SUBSTANCES (JUN 1996)**

(a) Definitions.

“Ozone-depleting substance”, as used in this clause, means any substance designated as Class I by the Environmental Protection Agency (EPA) (40 CFR Part 82), including but not limited to chlorofluorocarbons, halons, carbon tetrachloride, and methyl chloroform; or any substance designated as Class II by EPA (40 CFR Part 82), including but not limited to hydrochlorofluorocarbons.

(b) The Contractor shall label products which contain or are manufactured with ozone-depleting substances in the manner and to the extent required by 42 U.S.C. 7671j (b), (c), and (d) and 40 CFR Part 82, Subpart E, as follows:

"WARNING: Contains (or manufactured with, if applicable) \_\_\_\_\_\*, a substance(s) which harm(s) public health and environment by destroying ozone in the upper atmosphere."

\* The Contractor shall insert the name of the substance(s).

**PART III - LIST OF DOCUMENTS, EXHIBITS, AND OTHER ATTACHMENTS**  
**SECTION J**  
**LIST OF ATTACHMENTS**

- J-1** Attachment (1) - Statement Of Work (19 pages) with EXHIBIT A - Contract Data Requirements (DD Form 1423) (7 pages) and Enclosure (1) - Contract Data Requirements List Instructions For Distribution (1 page) and Enclosure (2) - User's Operation and Maintenance Manual Specifications (2 pages).

**PART IV - REPRESENTATIONS AND INSTRUCTIONS**  
**SECTION - K**  
**REPRESENTATIONS, CERTIFICATIONS**  
**AND OTHER STATEMENTS OF OFFERORS OR RESPONDENTS**

**K-1** EACH OFFEROR MUST SUBMIT A COMPLETED REPRESENTATIONS, CERTIFICATIONS, AND OTHER STATEMENTS OF OFFERORS OR RESPONDENTS WITH THEIR PROPOSAL. "Representation, Certifications and Other Statements of Offerors or Respondents" is available in full text electronically at this address:

<http://heron.nrl.navy.mil/contracts/rep&certs.htm>

**K-2** DFARS 252.225-7018 is not applicable to this solicitation and need not be completed by offerors.

**K-3** The fill-in information for FAR 52.219-1 - SMALL BUSINESS PROGRAM REPRESENTATIONS (OCT 1998) is as follows:

The standard industrial classification (SIC) code for this acquisition is 8731.

The small business size standard is 500.

**K-4** COMMERCIAL AND GOVERNMENT ENTITY (CAGE) CODE REPORTING

The Offeror's CAGE Code is {fill-in}\_\_\_\_\_.

[See DFARS 252.204-7001 in Section L for procedures on requesting a CAGE Code.]

**SECTION L  
INSTRUCTIONS CONDITIONS AND NOTICES  
TO OFFERORS OR RESPONDENTS**

**L-1 52.252-1 SOLICITATION PROVISIONS INCORPORATED BY REFERENCE (FEB 1998)**

This solicitation incorporates one or more solicitation provisions 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. The offeror is cautioned that the listed provisions may include blocks that must be completed by the offeror and submitted with its quotation or offer. In lieu of submitting the full text of those provisions, the offeror may identify the provision by paragraph identifier and provide the appropriate information with its quotation or offer. Also, the full text of a solicitation provision may be accessed electronically at this/these address(es):

<http://www.arnet.gov/far>

<http://heron.nrl.navy.mil/contracts/home.htm>

**FAR CLAUSE    TITLE**

52.204-6	-	Data Universal Numbering System (DUNS) Number (APR 1998)
52.211-2	-	Availability of Specifications Listed in the DOD Index of Specifications and Standards (DODISS) and Descriptions Listed in the Acquisition Management Systems and Data Requirements Control List, DOD 5010.12-L (AUG 1998)
52.214-34	-	Submission Of Offers In The English Language (APR 1991)
52.214-35	-	Submission Of Offers In U.S. Currency (APR 1991)
52.215-1	-	Instructions to Offerors--Competitive Acquisition (OCT 1997)
52.215-16	-	Facilities Capital Cost Of Money (OCT 1997)
52.252-5	-	Authorized Deviations in Provisions (APR 1984)

**L-2 FAR 52.211-14 - NOTICE OF PRIORITY RATING FOR NATIONAL DEFENSE USE (SEP 1990)**

Any contract awarded as a result of this solicitation will be a  DX rated order;  DO rated order certified for national use under the Defense Priorities and Allocations system (DPAS) (15 CFR 700), and the Contractor will be required to follow all of the requirements of this regulation.

**L-3 FAR 52.215-20 REQUIREMENTS FOR COST OR PRICING DATA OR INFORMATION OTHER THAN COST OR PRICING DATA (OCT 1997) ALTERNATE IV (OCT 1997)**

- (a) Submission of cost or pricing data is not required.
- (b) Provide information described below:

See SECTION L-11(c) VOLUME II - Cost Proposal

**L-4 FAR 52.216-1 - TYPE OF CONTRACT (APR 1984)**

The Government contemplates award of a Cost Plus Fixed Fee (Completion form) type contract resulting from this solicitation.

**L-5 FAR 52.233-2 - SERVICE OF PROTEST (AUG 1996)**

(a) Protests, as defined in Section 33.101 of the Federal Acquisition Regulation, that are filed directly with an agency, and copies of any protests that are filed with the General Accounting Office (GAO) shall be served on the Contracting Officer (addressed as follows) by obtaining written and dated acknowledgment of receipt from the Control Desk, Code 3200, Bldg. 222, Rm. 115, Naval Research Laboratory, 4555 Overlook Ave., S.W., Washington DC 20375-5326.

(b) The copy of any protest shall be received in the office designated above within one day of filing a protest with the GAO.

**L-6 DFARS 252.204-7001 - COMMERCIAL AND GOVERNMENT ENTITY (CAGE) CODE REPORTING (DEC 1991)**

- (a) The Offeror is requested to enter its CAGE code on its offer in the block with its name and address. The CAGE code entered must be for that name and address. Enter CAGE Before the number.
- (b) If the Offeror does not have a CAGE code, it may ask the Contracting Officer to request one from the Defense Logistics Services Center (DLSC). The Contracting Officer will--
  - (1) Ask the Contractor to complete section B of a DD Form 2051, Request for Assignment of the Commercial and Government Entity (CAGE) Code;
  - (2) Complete section A and forward the form to DLSC; and
  - (3) Notify the Contractor of its assigned CAGE code.
- (c) Do not delay submission of the offer pending receipt of a CAGE code.

**L-7 DFARS 252.227-7017 - IDENTIFICATION AND ASSERTION OF USE, RELEASE, OR DISCLOSURE RESTRICTIONS (JUN 1995)**

- (a) The terms used in this provision are defined in following clause or clauses contained in this solicitation--
  - (1) If a successful offeror will be required to deliver technical data, the Rights in Technical Data--Noncommercial Items clause, or, if this solicitation contemplates a contract under the Small Business Innovative Research Program, the Rights in Noncommercial Technical Data and Computer Software--Small Business Innovative Research (SBIR) Program clause.
  - (2) If a successful offeror will not be required to deliver technical data, the Rights in Noncommercial Computer Software and Noncommercial Computer Software Documentation clause, or, if this solicitation contemplates a contract under the Small Business Innovative Research Program, the Rights in Noncommercial Technical Data

and Computer Software--Small Business Innovative Research (SBIR) Program clause.

- (b) The identification and assertion requirements in this provision apply only to technical data, including computer software documents, or computer software to be delivered with other than unlimited rights. For contracts to be awarded under the Small Business Innovative Research Program, the notification requirements do not apply to technical data or computer software that will be generated under the resulting contract. Notification and identification is not required for restrictions based solely on copyright.
- (c) Offers submitted in response to this solicitation shall identify, to the extent known at the time an offer is submitted to the Government, the technical data or computer software that the Offeror, its subcontractors or suppliers, or potential subcontractors or suppliers, assert should be furnished to the Government with restrictions on use, release, or disclosure.
- (d) The Offeror's assertions, including the assertions of its subcontractors or suppliers or potential subcontractors or suppliers shall be submitted as an attachment to its offer in the following format, dated and signed by an official authorized to contractually obligate the Offeror:

Identification and Assertion of Restrictions on the Government's Use, Release, or Disclosure of Technical Data or Computer Software.

The Offeror asserts for itself, or the persons identified below, that the Government's rights to use, release, or disclose the following technical data or computer software should be restricted:

Technical Data or Computer Software to be Furnished With Restrictions*	Basis for Assertion**	Asserted Rights Category***	Name of Person Asserting Restrictions****
(LIST)*****.	(LIST)	(LIST)	(LIST)

\* For technical data (other than computer software documentation) pertaining to items, components, or processes developed at private expense, identify both the deliverable technical data and each such items, component, or process. For computer software or computer software documentation identify the software or documentation.

\*\* Generally, development at private expense, either exclusively or partially, is the only basis for asserting restrictions. For technical data, other than computer software documentation, development refers to development of the item, component, or process to which the data pertain. The Government's rights in computer software documentation generally may not be restricted. For computer software, development refers to the software. Indicate whether development was accomplished exclusively or partially at private expense. If development was not accomplished at private expense, or for computer software documentation, enter the specific basis for asserting restrictions.

\*\*\* Enter asserted rights category (e.g., government purpose license rights from a prior contract, rights in SBIR data generated under another contract, limited, restricted, or government purpose rights under this or a prior contract, or specially negotiated licenses).

\*\*\*\* Corporation, individual, or other person, as appropriate.

\*\*\*\*\* Enter "none" when all data or software will be submitted without restrictions.

Date \_\_\_\_\_

Printed Name and Title \_\_\_\_\_

Signature \_\_\_\_\_

(End of identification and assertion)

- (e) An offeror's failure to submit, complete, or sign the notification and identification required by paragraph (d) of this provision with its offer may render the offer ineligible for award.
- (f) If the Offeror is awarded a contract, the assertions identified in paragraph (d) of this provision shall be listed in an attachment to that contract. Upon request by the Contracting Officer, the Offeror shall provide sufficient information to enable the Contracting Officer to evaluate any listed assertion.

**L-8 DFARS 252.227-7028 - TECHNICAL DATA OR COMPUTER SOFTWARE PREVIOUSLY DELIVERED TO THE GOVERNMENT (JUN 1995)**

The Offeror shall attach to its offer an identification of all documents or other media incorporating technical data or computer software it intends to deliver under this contract with other than unlimited rights that are identical or substantially similar to documents or other media that the Offeror has produced for, delivered to, or is obligated to deliver to the Government under any contract or subcontract. The attachment shall identify - -

- (a) The contract number under which the data or software were produced;
- (b) The contract number under which, and the name and address of the organization to whom, the data or software were most recently delivered or will be delivered; and
- (c) Any limitations on the Government's rights to use or disclose the data or software, including, when applicable, identification of the earliest date the limitations expire.

**L-9 GOVERNMENT-FURNISHED PROPERTY**

No material, labor, or facilities will be furnished by the Government unless provided for in the solicitation.

**L-10 INQUIRIES CONCERNING THE RFP**

Any questions concerning the RFP must be submitted in writing to the Contracting Officer at the location noted in blocks 7 and 9 of the Standard Form 33, "Solicitation, Offer and Award," no less than fifteen (15) days before closing. The Government will not consider questions received after this date. Offerors are cautioned against directing any questions concerning this RFP to technical personnel at the Naval Research Laboratory.

**L-11 INSTRUCTIONS FOR SUBMISSION AND INFORMATION REQUIRED TO EVALUATE PROPOSALS****(a) GENERAL INSTRUCTIONS**

- (1) Information for the technical and management proposal shall be placed in Volume I and be completely separate from the cost proposal (Volume II).
- (2) Offerors shall submit their proposals in the following quantities:
  - (i) Seven (7) copies of the technical proposal (Volume I)
  - (ii) Three (3) copies of the cost proposal (Volume II), one of which must bear original signature(s)
  - (iii) One (1) completed copy of this solicitation document, which must bear an original signature.
- (3) Proposal Identification/Mailing - The proposal should be packaged for delivery so as to permit safe and timely arrival at destination. The proposal package should be sent to the address shown in Block 7 of the RFP face page and marked:

**Solicitation No. N00173-98-R-AS01**

**Closing Date: (As specified in Block 9, RFP face page)**

**Attn: Code 3235**

**Stennis Space Center, MS 39529-5004**

- (4) Proposal Format and Length - No attempt is made to restrict the proposal format and style. However, the proposal should be written and organized so as to be compatible with the RFP, the Statement of Work, company's organization and accounting structure, and proposed cost estimate. Offerors are encouraged to use recycled paper and maximize the use of double sided copying when preparing responses to solicitations.
- (5) Offerors are required to propose on Option 1 (CLIN 0002). Offerors are not required to propose on Option 2 (CLIN 0003).
- (6) Electronic submission of proposals are NOT authorized under this RFP.
- (7) The following information is required for evaluation of your technical/management and cost proposal. Any additional information may be provided.

**(b) VOLUME I - TECHNICAL/MANAGEMENT PROPOSAL REQUIREMENTS****(1) General**

- (i) Your technical proposal describing how the Statement of Work (SOW) requirements will be achieved should be prepared as a separate or readily detachable part of the total proposal package. Specific cost or pricing details must be omitted from the technical proposal.
- (ii) You are advised to closely read the evaluation criteria set forth in this RFP, Section M, EVALUATION FACTORS FOR AWARD, prior to preparation of a technical proposal. Your technical proposal will be rated solely against these criteria - hence, they merit your closest attention.
- (iii) Stating that you "understand and will comply with the SOW," or paraphrasing the

SOW or parts thereof is considered inadequate. Stock phrases such as "standard procedures will be employed," "will comply," and "well known techniques will be used," are insufficient and may significantly impact the proposal evaluation. It is recognized that all of the technical factors cannot be detailed in advance; however, the technical proposal shall express how you propose to comply with the SOW, with a full explanation of the techniques and procedures you propose to follow. Data previously submitted and incorporated into the technical proposal by reference will not be considered.

(iv) The technical proposal shall include information/documentation in sufficient detail to clearly identify the offeror's overall qualifications, be subdivided into the following sections in the order listed, and should contain the following elements which are discussed more fully in subsequent sections:

- (A) Technical Approach
- (B) Expected Performance of Camera
- (C) Corporate Experience & Resources
- (D) Personnel Quality & Experience
- (E) Past Performance

(2) Technical Approach

The proposal will be graded according to completeness and responsiveness to the requirements set forth in the Section C, and according to its clarity in technical explanations. The proposal should clearly demonstrate the offeror's technical approach for completing on schedule and within cost the design and fabrication of the camera described in the Statement of Work. The offeror's proposal should contain a credible risk assessment of both individual required technologies, hardware, and integration and performance issues for the camera operating in a pod environment. The proposal should include data from similar pan scan or step-stare cameras indicating that the imagery from the proposed camera will be free of artifacts that affect compression, mensuration, and targeting. The offeror's proposal should include measured data showing the performance of the visible focal plane array and the infrared focal plane array proposed for the camera or on an array of similar dimensionality, architecture, pixel size, and other parameters. The measured data should include Noise Equivalent Temperature Difference (NETD) or MRT for a similar camera, temporal noise, camera signal to noise ratios for different background temperature and illumination levels, and fixed pattern noise before and after correction. The proposal should discuss risk for the electronic exposure control, anti-blooming control, stabilization, and motion compensation. The proposal should also discuss any potential for growth to focal plane arrays with performance better than the proposed array with an assessment of the fabrication risks and schedule. The proposal should show clearly that the dewar for the infrared detector array includes electrical interconnects providing low noise and includes a cold shield for controlling stray radiation. The proposal should include descriptions of suitable camera hardware and software which can be adapted from the offeror's capabilities with other reconnaissance cameras.

References to technical journal publications may be cited if they relate directly to issues being described in the proposal. References to non-published reports, such as from prior contractual efforts or results of IR&D or proprietary efforts, may be cited only if two copies of such supporting documents are included for Government use with the proposal submission.

(3) Expected Performance of the Camera

The proposal should include a detailed description of the performance of the offeror's camera in relation to the SOW. The proposal should include image performance measures such as large area coverage with resolution and sensitivity (contrast and MRT). The offeror's proposal should show how the performance of the proposed dual band camera follows from the demonstrated performance of offeror's single band cameras. The proposal should discuss camera performance during aircraft maneuvers. The proposal should discuss user measures such as flight worthiness, platform integration, camera capabilities in the tactical pod, camera environmental restrictions, and aircraft maneuver restrictions. The proposal should indicate, if possible, the areas in which the proposed camera exceeds the requirements in Section C by having higher resolution with greater coverage, less degradation from aircraft maneuvers and forward motion, better sensitivity, etc.

(4) Corporate Experience & Corporate Resources

A. Experience Proposals should provide a narrative description of corporate experience on projects with tasks similar to those required in Section C and its Statement of Work. This description should clearly show the relationship between the offeror's experience and the tasks required. The experience to be addressed include, but not limited to: large-scale visible and midwave infrared focal plane array technology, optical design, image motion compensation, camera integration, ruggedization of cameras for airborne use, reconnaissance system needs, digital recording of imagery, camera control technology, pan camera technology, and evaluation of moving test imagery. The offeror should indicate past experience on relevant funded and IR&D efforts of both the offeror and relevant subcontractors.

B. Resources The offeror shall provide complete details of corporate resources available to this project. For example: computer resources, describe facilities (size, etc.) and equipment to be used for fabrication, calibration, testing, machining of components, assembly of sections, and electrical, mechanical, and software systems development, installation, and checks. This information shall indicate clearly whether such resources will be available from in-house or through sub-contracting arrangements. In the latter case, complete details regarding such sub-contracting arrangements shall be provided.

(5) Personnel Quality & Experience

(i) Identify by name the key personnel you propose to use for each labor category necessary to perform the work required. Key personnel, Program Manager, and Program Manager Alternate(s) shall be designated. Resumes of proposed personnel should be included in this section. Offerors must certify that all personnel proposed are currently employed by them or attach committal letter with resume.

(ii) Consultants/Subcontracts - Identify by names along with the portion(s) of work they are to perform and extent of involvement in performance under the contract shall be provided.

(iii) Of particular importance will be the demonstrated experience, knowledge, skills, and capabilities offered to perform the work set forth in the Statement of Work (Attachment No. 1). Describe the adequacy of personnel experience on applicable projects as evidenced by a narrative description of the experience. This experience should clearly show the relationship to this SOW, and provide details such as a project description and identify the sponsoring institution.

The prime contractor and major subcontractors must identify key personnel with adequate experience as well as list personnel with specific experience in various technical fields such as: reconnaissance system requirements, optics, quality assurance, data recording, contrast/noise and resolution evaluation, sensor integration, pod integration, air-worthiness, and large scale visible and infrared focal plane arrays. The proposal should include publications, patents, and relevant projects of these personnel.

(iv) Include a matrix indicating proposed labor hours by skill category required to perform the statement of work. This matrix shall not contain labor rates or any other indication of price.

(6) Past Performance

(a) Offerors shall submit the following information as part of their proposal. (Offerors are encouraged to submit the information prior to other parts of the proposal to assist the government in reducing the length of the evaluation period.) List the last two contracts or subcontracts completed during the past three years for services similar in nature to this requirement. Include in the two any current contracts or subcontracts for similar services that were awarded at least one year prior to the date of this solicitation. Offerors that have no similar previous or current contracts should provide the requested information for proposed subcontractors that will perform major or critical aspects of the requirement or for the proposed project manager or key personnel responsible for major or critical aspects of the requirement.

1. Name of contracting organization.
2. Contract number
3. Contract type
4. Total contract value
5. Description of the contract work
6. Contracting officer and telephone number
7. Contracting officer's representative, program manager, or similar official and telephone number

(b) Offerors shall contact the contracting organizations identified pursuant to paragraph (a) as soon as possible and request them to send past performance information on the identified contracts to the address in Block 7 of the face page of this solicitation. The past performance report which is available at <http://heron.nrl.navy.mil/contracts/home.htm> is to be provided to the contracting organization for this purpose. If the contracting organization has already collected past performance information on the contract pursuant to FAR Subpart 42.15, the format used to collect the information may be used instead of the past performance report.

(c) Offerors may include in their proposals specific information relating to problems encountered in performing the identified contracts and any corrective actions by the offeror. Offerors should not provide general information on their performance on the identified contracts as this will be obtained from the contracting organizations

(c) **VOLUME II - COST PROPOSAL**

(1) The offeror shall submit a cost proposal that includes all backup information to establish that proposed costs are reasonable, allocable, appropriate, and allowable in accordance with both Part 31 of the Federal Acquisition Regulations (FAR) and Part 231 of the Defense Federal Acquisition Regulations Supplement (DFARS). Proposed costs for each CLIN in Section B shall be broken out and priced separately.

- (2) The cost proposal shall include the following information, as applicable:
- (i) Labor, to include categories of labor, hours per category, and rate per category
  - (ii) Indirect or Overhead Rate(s)
    - On Contractor's Site rate(s)
    - Off Contractor's Site rate(s)
  - (iii) G&A Rate
  - (iv) Facilities Capital Cost of Money
  - (v) Any other applicable rate(s) per offeror
  - (vi) Other supporting cost(s)
  - (vii) Fee

(3) Should rates be used in the proposal that are not DCAA reviewed and/or approved, the offeror shall provide complete documentation and the rationale for their use at time of proposal submission.

(4) If the Contracting Officer deems necessary, the offeror shall provide additional information supporting the proposed costs.

(5) Costs such as subcontracts, per diem rates, and other costs pertaining to travel, material, etc., shall be broken out as separately identifiable items. In addition, offerors should submit any information reasonably required to explain the offeror's estimating process.

(6) Consultants/Subcontractors:

(i) All requirements for the prime contractor cost proposal shall be met by any proposed subcontractor as well. Subcontracts, regardless of dollar value, shall be documented to facilitate a determination of cost reasonableness.

(ii) Subcontractors should be identified as well as the portion of the work to be subcontracted. Documents establishing a subcontracting relationship should be submitted with the cost proposal. Offerors may arrange for proposed subcontractors to submit supporting data directly to the Government. Paragraph (3) of the solicitation provision entitled, "Instructions to Offerors--Competitive Acquisition" will be applicable to data so submitted. Any such submission shall not be deemed to establish privity of contract between the Government and the proposed subcontractor.

(7) Offerors should take into consideration the total cost to fully cover all requirements of this RFP, including EXHIBITs and ATTACHMENTs of SECTION J.

(8) In determining a cost realism position for each offeror, the Government will use any and all available information.

**L-12 COST CONTRACT (NO FEE) AND COST-SHARING PROPOSALS**

(a) If a cost-reimbursement contract without fee is proposed by the offeror and accepted by the Government, the following changes will be made in the contractual award document:

- (1) Section B will be revised to delete the columns "Fixed Fee" and "Total Est Cost

Plus Fixed Fee."

(2) Section G will be revised to delete the provision, "Payment of Fixed Fee (Completion Form)."

(3) Section I will be revised to substitute the clause FAR 52.216-11, Cost Contract--No Fee (Apr 1984), for the clause FAR 52.216-8, Fixed Fee (Mar 1997).

(b) If a cost-sharing contract is proposed by the offeror and accepted by the Government, the following changes will be made in the contractual award document:

(1) Section B will be revised to delete the columns "Estimated Cost," "Fixed Fee" and "Total Est Cost Plus Fixed Fee" and insert in lieu thereof columns entitled "Estimated Allowable Cost" and "Estimated Cost to the Government."

(2) Section G will be revised to delete the provision, "Payment of Fixed Fee (Completion Form)."

(3) Section H will be revised to include the following provision:

#### **COST SHARING**

Both the estimated allowable cost of performing each CLIN and the estimated cost to the Government of each CLIN are set forth in Section B of this contract. The difference between these amounts represents the contractor's share of the estimated allowable cost of the CLIN. In order to accomplish this sharing by the parties, the Contractor shall be reimbursed by the Government for incurred allowable costs of performing each CLIN in the same proportion as the total estimated cost to the Government of the CLIN is to the total estimated allowable cost of the CLIN.

(4) Section I will be revised to substitute the clause FAR 52.216-12, Cost Sharing Contract--No Fee (Apr 1984), for the clause FAR 52.216-8, Fixed Fee (Mar 1997).

#### **L-13 BACKGROUND INFORMATION: RELATIONSHIP TO OTHER ACQUISITIONS**

Any information gathered during the performance of any contract resulting from this solicitation may be utilized or relied upon to establish technical specifications or to support evaluations for any future Navy tactical reconnaissance camera acquisition.

## SECTION M EVALUATION FACTORS FOR AWARD

### M-1 EVALUATION AND AWARD

Award will be made to that offeror whose proposal is determined to be the best value to the Government, proposed cost and other factors considered. Although technical considerations are more important than cost, the closer the technical scores of the various proposals are to one another, the more important cost considerations become. The Government reserves the right to reject any or all proposals. The Government also reserves the right to award to other than the lowest offeror. The Government may make multiple awards from this solicitation if determined to be in the best interest of the Government.

### M-2 EVALUATION FACTORS FOR AWARD

Proposals will be evaluated in accordance with the following criteria. The factors in the Technical Category are substantially more important than those in the Cost Category and the factors in the Cost Category are substantially more important than those in the Business Category.

#### M-2-1 Technical Category

(a) Within the Technical Category, Technical Approach is weighted greater than Expected Performance of the Camera - which is weighted greater than Corporate Experience & Resources - which is weighted greater than either Personnel Quality & Experience and Past Performance - which are both weighted the same.

(b) The Technical Approach evaluation will consider the Offeror's overall capability to adequately perform, and the understanding of the technical requirements as they apply to Section L.11(b)(2).

(c) Expected Performance of the Camera will be evaluated in accordance with Section L.11(b)(3).

(d) Corporate Experience & Resources will be evaluated in accordance with Section L.11(b)(4) in regards to the offeror's demonstrable ability to perform the work required, and the relevance of the offeror's proposed corporate resources in supporting the SOW.

(e) Personnel Quality & Experience - evaluation will be conducted in accordance with Section L.11(b)(5).

(f) Past Performance evaluation will be on the basis of quality of work performed, timeliness of performance, cost control, and business relations. The evaluation will be based on the information provided in accordance with Section L.11(b)(6) and other sources, if available.

Offerors who have no relevant performance history, or for which past performance information is not available, will not be evaluated favorably or unfavorably on past performance.

The Government may begin proposal evaluation prior to receipt of past performance information. If, after completion of proposal evaluation except evaluation of past performance, the Contracting Officer determines that evaluation of past performance will not affect the outcome of competitive selection, the Contracting Officer may waive its evaluation in accordance with FAR 15.304(c)(3)(iii).

**M-2-2**      Cost Category

(a) COST TO THE GOVERNMENT

Proposed estimated cost to the Government.

The Government may adjust the proposed cost for purposes of evaluation based upon an evaluation of cost realism. Cost Realism means that the costs in an offeror's proposal are realistic for the work to be performed; reflect a clear understanding of the requirements; and are consistent with the various elements of the offeror's technical proposal. The cost realism evaluation includes an analysis of the adequacy of the hours, labor mix, and other direct costs to perform the work as proposed in the technical proposal as well as the proposed labor and indirect rates. It also includes evaluation of the likelihood that the risks inherent in the offeror's technical approach will result in higher actual costs than anticipated.

**M-2-3**      Business Category

(a) COMMITMENT TO SMALL BUSINESS, SMALL DISADVANTAGED BUSINESS, HISTORICALLY BLACK COLLEGE AND UNIVERSITY AND/OR MINORITY INSTITUTION PARTICIPATION IN PERFORMANCE OF THE CONTRACT

Evaluation will be based on the extent to which such firms are specifically identified in proposals, the extent of their participation in terms of the value of the total acquisition, and the complexity and variety of the work such firms are to perform. Small business concerns that are not required by FAR 52.219-9 to submit a subcontracting plan should indicate the extent to which proposed subcontracts are with large businesses, small disadvantaged businesses or historically black colleges and universities / minority institutions.

**M-3**      FAR 52.217-5 - EVALUATION OF OPTIONS (JUL 1990)

Except when it is determined in accordance with FAR 17.206(b) not to be in the Government's best interests, the Government will evaluate offers for award purposes by adding the total price for all options to the total price for the basic requirement. Evaluation of options will not obligate the Government to exercise the option(s).

**STATEMENT OF WORK  
for  
DUAL BAND RECONNAISSANCE CAMERA**

**C.1.0 BACKGROUND**

(a) In manned tactical reconnaissance missions, the first objective is aircraft survivability. This is maximized by flying either high with long standoff range or by flying low to minimize detectability. Current reconnaissance missions using 4.5 inch and 9-inch visible film in the F-14 TARPS pod fly either "high" near 10,000 feet looking sideways with long focal length, or flying "low" near 200 feet with the camera forward oblique or pointed downward with a very wide field of view. Future missions desire longer standoff ranges of 15 to 45 nautical miles. A second objective is to insure image capture of the intended ground targets so that the aircraft does not have to return to the hostile environment. But target locations are often not well known, so images need to cover large areas. The third objective is to achieve imagery with useful photo-interpretability, which involves recognition and identification of small, slightly extended targets, not detection of point targets. Highly desirable are ground resolution pixels at least as small as 1.5 feet on a side free of motion blur and a footprint one-half or one-quarter of this.

(b) Photoreconnaissance interpreters refer to this 1.5-foot footprint as a line-pair ground resolvable distance of  $GRD = 3$  feet, or a national imagery interpretability rating scale (NIIRS) of  $NIIRS = 5$ . NIIRS 5 facilitates recognition of radio and radar facilities, but only detection of vehicles, rockets and artillery. With NIIRS 6 imagery, the former can begin to be identified and the later can begin to be recognized. NIIRS 7 imagery yields identification of most military targets. All National Imagery Interpretability Rating Scale (NIIRS) resolution requirements shall be computed, for the purpose of defining sensor parameters, as being that spatial resolution at the midpoint of each NIIRS scale level. This results in the following ground resolved distance (GRD) values for the purpose of this SOW:

NIIRS 3 = 11.5 ft/cy  
NIIRS 4 = 6.0 ft/cy  
NIIRS 5 = 3.3 ft/cy  
NIIRS 6 = 2.0 ft/cy  
NIIRS 7 = 0.8 ft/cy

The GRD for each pixel's ground subtense (as results from pan scanning or step-stare) shall be defined in this SOW as the square root of the sum of the squares of the distance on the surface parallel and perpendicular to the flight direction.

(c) The use of film in reconnaissance is a mature technology giving high-resolution, large-format imagery over extended regions of the ground and with expansive data storage. Film, however, must rely on slow, non-real-time methods for processing and data handling. A fourth objective is generation of imagery for near-real-time transmission and exploitation. Visible-band cameras using very large, one and two-dimensional arrays and infrared band cameras using scanning TDI and staring arrays have been demonstrated.

(d) A final reconnaissance objective is day/night capability using compact lightweight cameras. Significant advantages are gained from combining multiple operating wavelengths in a single camera.

## **C.2.0 SCOPE**

C.2.1 This Statement of Work (SOW) addresses the development and testing of a tactical airborne reconnaissance camera that outputs digital images in two spectral bands. This day/night capable dual band reconnaissance camera shall have the following features:

- (a) simultaneous capture of visible and mid-wave infrared imagery from aircraft at medium and low altitude
- (b) operable in a pod on carrier based F-18, and in the P-3 aircraft, (Operation in a TARPS pod on F-14 is desired but not required)
- (c) compensation for aircraft motion
- (d) pan operation using either a scanning or step-stare mode allowing collection of contiguous imagery covering a swath greater than the lens/FPA field of view;
- (e) field-of-regard equal to wingtip-to-wingtip through NADIR
- (f) overflight resolution of NIIRS 6 in visible and NIIRS 5 in IR ;
- (g) operation for stereo imagery at medium altitudes; and
- (h) digital imagery free of distortions that may affect image compression consistent with JPEG 2000 standards, mensuration to pixel level, and targeting.

The minimum ground speed shall be 300 knots with 200 knots desired. The maximum ground speed shall be 550 knots with 600 knots being desired. The camera shall operate at medium/low altitudes from 2,500 feet to 20,000 feet with altitudes from 2,000 to 25,000 feet desired.

C.2.2 The Contractor shall provide for testing of the camera in a P-3 aircraft. The camera will initially be flown in the bomb bay equipment platform (BEP) of a P-3 aircraft flying at about 330 feet per second and V/H up to 0.4 /sec

C.2.3 Option 1: The Contractor shall provide options for demonstrating camera operation in a government supplied pod on F-18, in accordance with the following:

- (a) The Contractor shall provide for the camera to operate and interface in a pod.
- (b) The Contractor shall provide support for two weeks testing of the camera in pod:
  - (1) The camera will be evaluated in the pod flying at 200 to 600 knots.
  - (2) Aircraft altitude will be chosen to achieve a desired ground resolution.
  - (3) The camera shall operate in a pan mode centered either directly downward or at a selected oblique angle such that the outer edge of its field of view is as far as 90 degrees from aircraft vertical.

C.2.4 Option 2: [*This option is desired but not required.*] The Contractor shall provide options for demonstrating camera operation in a F-14 TARPS Pod (If the camera can fit), in accordance with the following:

(a) The Contractor shall provide for the camera to operate and interface in an F-14 TARPS pod.

(b) The Contractor shall provide support for about two weeks testing of the camera in a F-14 TARPS Pod:

(1) The camera will be evaluated in bay 2 of the F-14 TARPS Pod flying at 200 to 600 knots.

(2) Aircraft altitude will be chosen to achieve a desired ground resolution within the 2,000 to 25,000 altitude.

(3) The camera shall operate in a pan mode centered either directly downward or at a selected oblique angle such that the outer edge of its field of view is as far as 90 degrees from aircraft vertical.

### **C.3.0 APPLICABLE DOCUMENTS**

The Contractor shall comply with the following documents, specifications, and standards as they apply to the work described herein.

#### **C.3.1 LA-610 TARPS Reconnaissance Pod Drawing Package**

Available for on-site review at Naval Research Laboratory, Washington, D.C.  
Contact Contract Specialist identified in Section G.

#### **C.3.2 MIL-E-5400T Military Specification, Electronic Equipment, Aerospace General Specification For. 15 June 1992**

#### **C.3.3 MIL-STD-704E Military Standard, Aircraft Electrical Power**

#### **C3.4 Mil Standard 2500B National Imagery Transmission Format Standard 2.1 with change Number 1 Aug 22, 1997.**

#### **C.3.5 MIL-STD-1760A Military Standard, Aircraft/Store Electrical Interconnection System, 3 Sep 1985**

#### **C.3.6 MIL-E-6051D(1) Electromagnetic Compatibility Requirements, Systems**

#### **C.3.7 MIL-STD 810C, Shock and vibration**

#### **C.3.8 MIL-STD 210B Climatic Information to Determine Design and Test Requirements for Military Equipment**

### **C.4.0 REQUIREMENTS**

The Contractor shall design, develop and deliver a camera that meets or exceeds the following Government's minimum requirements.

#### **C.4.1 Camera Performance**

C.4.1.1 The Contractor shall furnish a dual band camera system with the following characteristics:

a. A common entrance aperture(s) supporting simultaneous day/night imaging in the visible and mid-wave infrared. The day capability shall operate within the visible waveband from 0.4 to 0.9 microns. The night capability shall operate within the midwave infrared band from 3 to 5 microns. Camera day performance shall be attainable for sun angles not less than ten degrees. Night performance shall be attainable from one hour after to one hour before the thermal crossover points. Graceful degradation is required outside these limits.

b. A medium/low altitude, overflight and standoff, capability shall be provided, capable of achieving the desired NIIRS in a clear atmosphere. Clear atmosphere is that mass of air between target and camera which is free of imaging obscurants such as rain, fog, smoke, clouds, blowing sand, and similar.

c. The camera shall be capable of operating in the bomb bay of the P-3, and in a pod on F-18, (Desired to fly in the TARPS pod on F-14). The camera shall operate with ground speeds between 300 and 550 knots with ground speeds between 200 and 600 knots desirable. The camera shall operate at medium/low altitudes between 2,000 and 25,000 feet with 200 feet to 45,000 feet desired.

d. Specific resolution requirements are given in Table 1.

Table 1

<b>Requirement</b>	<b>Threshold</b>	<b>Objective</b>
Minimum ground speed (all missions)	300 knots	200 knots
Maximum ground speed (all missions)	550 knots	600 knots
Medium Alt, Overflight/Standoff, Day/Night, min alt	2,500 ft	2,000 ft
Medium Alt, Overflight/Standoff, Day/Night, max alt	20,000 ft	25,000 ft
Medium Alt standoff, day, maximum slant range [Most distant pixel along optical centerline] (nautical miles)	15	20
Medium Alt standoff, night, maximum slant range [Most distant pixel along optical centerline] (nautical miles)	10	20
Resolution <sup>1</sup> , overflight, day	NIIRS 6	NIIRS 7
Resolution <sup>1</sup> , overflight, night	NIIRS 5	NIIRS 6
Med Alt Resolution <sup>2</sup> , medium alt standoff, day	NIIRS 4	NIIRS 5
Med Alt Resolution <sup>2</sup> , medium alt standoff, night	NIIRS 3	NIIRS 4
Field of view <sup>3</sup> , Med Alt overflight, day/night	20 deg	30 deg
Field of regard, medium altitude, day/night (wingtip to wingtip through nadir)	180 deg	
<sup>1</sup> Resolution requirement applies throughout the complete altitude and speed ranges.		
<sup>2</sup> Resolution requirements apply at the maximum standoff ranges.		
<sup>3</sup> All field of view requirements are cross line of flight.		

The following high altitude performance stated in Table 1A is desired but not required.

Table 1A

<b>Requirement</b>	<b>Threshold</b>	<b>Objective</b>
High Alt standoff, day/night, minimum altitude	20,000 ft	15,000 ft
High Alt standoff, day/night, maximum altitude	45,000 ft	50,000 ft
High Altitude, Standoff – Day, max slant range	45nm	50nm
High Altitude, Standoff –Night, max slant range	25nm	30nm
Resolution <sup>2</sup> , High Alt standoff, day	NIIRS 5	NIIRS 6
Resolution <sup>2</sup> , High Alt standoff, night	NIIRS 4	NIIRS 5
Field of view <sup>3</sup> , High Alt standoff, day/night	3 deg	5 deg
Field of regard, High Alt standoff, day/night	Horizon to 45 deg depressed left and right sides	180 deg
<sup>2</sup> Resolution requirements apply at the maximum standoff ranges.		
<sup>3</sup> All field of view requirements are cross line of flight.		

e. Potential image blurring due to aircraft forward motion shall be compensated over all camera-operating conditions.

f. Image blurring due to roll, pitch and yaw shall be kept to a minimum to meet the resolution requirements. Image stabilization techniques shall be incorporated, as necessary, to correct for roll displacements up to 30° and pitch and yaw displacements up to 10°.

g. The contribution of the camera to uncertainty above that of the pod inertial information in the pointing accuracy of the center of the image shall be better than 0.1 degrees.

h. Full resolution imagery of a point target using the medium altitude overflight/standoff capability shall be acquired in accelerated symmetrical maneuvering environments with up to four “G’s”. Degraded performance is allowable for rates above these values. All other sensor capabilities (e.g., area targets and long range standoff) shall remain stabilized during mild maneuvering within the stabilization limits of paragraph f.

i. The camera shall operate in a pan mode providing contiguous stereo capable imaging at medium altitudes.

j. The field-of-regard shall be wingtip-to-wingtip through NADIR.

k. construction to insure performance in operating environments of pods, and

l. built-in calibration sources if required to meet performance.

C.4.1.2 The Contractor shall design the camera so that it can be hard mounted and remotely operated in the Bomb bay Equipment Pallet (BEP) of a P-3 airplane or in an F-18 pod and optionally if possible in Bay 2 of a F-14 airplane TARPS pod. Control electronics and digital recorder may be placed in the cabin of the P-3. This packaging design shall include specifications for achievable window design on the P-3 BEP.

C.4.1.3 The camera shall be designed to control the array integration and readout during flight testing using information as velocity divided by altitude (V/H), INS, and camera look angle as supplied by the Government interface. In a laboratory setting, the operator interface implemented on a PC computer shall supply the simulated platform information.

C.4.1.4 The Contractor shall provide the camera with controls and interfacing which shall allow transfer of imagery in NITFS 2.1 including Support Data Extensions (SDE) to the Government-owned interface or digital recorder. This SDE shall contain information supplied to the camera such as operator settings and presets, recording status, time, date and aircraft Inertial Navigation System (INS) data, and information generated by the camera describing the image formation. The image packet shall contain available information needed for mensuration and targeting applications. This format of the data will be finalized at PDR.

C.4.1.5 Potential blurring shall be controlled:

a. The residual component of image blurring during an image capture integration period that arises from steady platform motion alone shall be controlled to be no more than  $S_{det}$  when the speed of image motion at the center of the focal plan is as high as  $0.7 S_{det}/msec$ . Where  $S_{det}$  is the size of the detector in the flight direction.

b. Potential burring from aircraft roll and yaw shall be controlled to meet the NIIRs requirements.

C.4.1.6 The camera shall have built-in exposure control.

#### C.4.2 Visible Focal Plane Arrays

C.4.2.1 The camera shall use a silicon focal plane that is able to meet the performance requirements in table 1.

C.4.2.2 The spectral bandpass shall be optimized to generate high resolution imagery of scenes. The spectral bandpass chosen by the vendor shall be stated and justified in the proposal.

C.4.2.3 Spatial non-uniformities in gain and offset shall be sufficiently small after correction to achieve the sensitivity which bottoms out on the focal plane temporal noise or the scene fluctuations rather than the non-uniformity. The vendor may choose any method of correction, including combinations of calibrations and scene-based processing within the constraints of system operation in the aircraft pod or bomb bay during image acquisition. The non-uniformity correction shall be demonstrated as a part of the factory functional test.

C.4.2.4 The quality of the detector array shall be as follows:

C.4.2.4.1 The total number of inoperable detectors in any array used in this reconnaissance camera shall be such that less than 0.2% of the total number of pixels in a large image are inoperable, and such that there is no inoperable row or column.

C.4.2.4.2 Further, there shall be no more than two clusters of more than 25, no more than two clusters of 12 to 25, and no more than 400 clusters of 3 to 11 adjacent

inoperable detectors, where "adjacent" shall include both sideways and diagonal neighbors.

C.4.2.4.4 The term "inoperable" shall mean not only pixels derived from detectors unresponsive to radiation, but also those with noise standard deviation greater than five times that of the average of all others in the array after non-uniformity correction.

C.4.2.5 Detector temperature cooling or stabilization, if necessary, shall be by means of thermoelectric cooler.

### C.4.3 Infrared Focal Plane Array and Cryogenic Dewar

C.4.3.1 The Contractor shall use a large mid-wave infrared focal plane array that is able to meet the performance requirements in table 1.

C.4.3.2 The Contractor shall select the spectral bandpass of the camera to optimize thermal imagery of moonless night scenes with mean temperature of 65 degrees Fahrenheit.

C.4.3.3 The focal plane shall be able to operate with the integration times necessary to accommodate mean scene temperatures from 20 degrees Fahrenheit to at least 110 degrees Fahrenheit, including daytime solar radiation. The integration time of the camera shall be controlled automatically by the camera electronics.

C.4.3.4 Spatial non-uniformities in gain, offset, and non-linearity shall be sufficiently small after correction to achieve the required MRT performance at the required scene mean temperature and temperature variation. The residual noise due to non-uniformity shall be less than or comparable to the temporal noise. The contractor shall choose any procedure for correction of non-uniformity, including combinations of black-body source calibrations and scene-based processing within the constraints of system operation in the aircraft pod or bomb bay during the procedure.

C.4.3.5 The quality of the IR array provided in the camera shall be as follows:

C.4.3.5.1 The array shall have no more than two inoperable rows or columns.

C.4.3.5.2 The number of inoperable detectors shall be less than 2% of the total.

C.4.3.5.3 The image shall have no more than one cluster having more than 25, no more than two clusters of 12 to 25, and no more than 400 clusters of 3 to 11 adjacent inoperable pixels. The term "adjacent" shall include both sideways and diagonal neighbors.

C.4.3.5.4 The term "inoperable" shall mean not only pixels derived from detectors unresponsive to radiation, but also those with noise standard deviation greater than five times that of the average of all others in the array after non-uniformity correction.

C.4.3.6 A closed cycle refrigeration system for detector cooling shall be included. The detector array operating temperature shall be no lower than what life-cycle data shows the cryogenic system to be capable of maintaining after 1000 hours of operation.

C.4.3.7 A dewar shall be provided for the detector array, having low noise electrical interconnects and a cold shield for controlling stray radiation. The dewar shall maintain vacuum integrity throughout the camera test flight period.

C.4.4 Infrared Sensitivity

C.4.4.1 Minimum Resolvable Temperature

C.4.4.1.1 The MRT (minimum resolvable temperature) of the medium standoff camera shall be less than 0.5 degrees centigrade at all good-pixel locations across the array when measured on a four-bar thermal pattern with spatial frequency 0.9 Nyquist and when this bar pattern moves at different speeds at different locations of the array with a test scene mean temperature of 75 degrees Fahrenheit. Better MRT is desired.

C.4.4.1.2 MRT at a given location, is here defined as the Root Mean Square (RMS) average of two measurements, one with the bar pattern parallel and one with the bar pattern perpendicular to the scene motion direction.

C.4.4.1.3 The non-uniformity correction in the camera shall adequate to reduce fixed pattern non-uniformity to below the sensor temporal noise at all required operational backgrounds.

C.4.4.2 For uniform image speed across the image, the MRT requirement shall be achievable for any effective motion rates from 0 to 4.0 pixels/msec.

C.4.4.3 The media for quantitative viewing and evaluation of sensor output bar patterns to establish MRT shall be the computer display of digital image files first recorded onto and then played back from a digital recorder.

C.4.4.4 The following limitations to any electronic processing techniques, including modulation transfer function compensation, used to enhance high-spatial frequency response for meeting the above sensitivity specifications shall be adhered to:

C.4.4.4.1 The Contractor shall not use either matched spatial filtering to 0.9 Nyquist or multi-frame processing.

C.4.4.4.2 Acceptable forms of MTF compensation that may be applied to the camera include lowering of intermediate spatial frequencies to flatten MRT response to match the pre-lens scene distribution and/or attenuation of low spatial frequencies below 1/5 Nyquist to improve high frequency contrast.

C.4.4.4.3 If electronic MTF compensation is used in the design, MRT response at other intermediate spatial frequencies down to 1/5 Nyquist shall not be adversely affected. In addition, a means shall be provided for bypassing the non-zero-frequency part of this MTF compensation so that imagery that has been only non-uniformity corrected with dc pedestal removed can be recorded and evaluated.

C.4.4.5 The ratio of system MTF (modulation transfer function) at 1.1 Nyquist to that at 0.9 Nyquist shall be no larger than 0.5. The Contractor shall design to control aliasing for reconnaissance targets, such as vehicles or bunkers that are 5 to 10 pixels in size.

## C.4.5 Camera Electrical Interfaces

C.4.5.1 Digital Image Interface. The camera shall supply uncompressed digital imagery for digital storage, compression, or display.

C.4.5.1.1 The full resolution xy image format shall be NITFS 2.1 with  $512 < x, y < 12,300$ . Larger format images in this range may be required to meet the interface speed limitations. The minimum size of each full resolution visible image must be greater than 3000 and for the infrared greater than 1500. A reduced resolution digital image comparable to the RS-170 image shall accompany each full resolution image.

C.4.5.1.2 A required voltage interface format is the 32 bit parallel, ECL, differential, up to 50 MHz interface used on the "clip-on" for the DCRSi recorder. Other outputs such as ANSI FibreChannel Level \_ will be considered with final selection made at PDR.

C.4.5.1.3 The visible image shall be eight bits and the IR image shall be twelve bits.

C.4.5.1.4 The data extensions shall include INS data, and camera characteristics in accordance with NITFS 2.1, and BIT data.

C.4.5.2 Analog Image Interface. The camera shall supply reduced resolution imagery which is downsampled from the full image into RS-170 format for monitor display.

C.4.5.3 Camera Control Interface. Camera control shall be achieved using a MIL STD 1553 interface.

C.4.5.3.1 Camera control commands shall include at a minimum: status, operate mode, coverage mode, spectral mode, and INS information input.

C.4.5.3.2 The status command shall at a minimum include off, standby, operate.

C.4.5.3.3 The operate mode shall at a minimum include left, right, and vertical at specified depression angles.

C.4.5.3.4 The spectral modes shall include EO, IR, and Dual EO/IR.

C.4.5.4 Camera BIT Interface. Camera Built-In-Test (BIT) capability shall include as a minimum Power-on BIT (PBIT) and Operator Initiated BIT (IBIT) through the Management Controller port, and Diagnostic BIT (DBIT) through the diagnostic port.

C.4.5.4.1 Camera PBIT and IBIT shall be achieved using the 1553 interface used for camera control with final selection being made at PDR.

C.4.5.4.2 PBIT shall characterize camera performance as pass/fail with the PBIT function exercised at power application.

C.4.5.4.3 IBIT shall be exercised upon command to characterize camera performance as pass/fail.

C.4.5.4.4 DBIT shall characterize camera performance in detail with some indication of failure mode when the DBIT function is commanded through the diagnostic port.

C.4.5.4.5 Camera Diagnostic Interface. Camera diagnostics shall be achieved using an Ethernet or 1553 interface with final selection being made at PDR. Camera diagnostic software in C++ shall be supplied on a PC computer.

C.4.5.5 Reliability. As a goal, the camera shall have a mean time between failures of greater than 60 flight hours with a 50% use factor. The camera shall be capable of operating for 100 flight hours without maintenance other than random failure repairs. The operating life shall be 6000 flight hours and the nonoperating life shall be more than ten years.

#### C.4.6 Camera Size, Weight and Power

C.4.6.1 The camera shall be configured to consist of no more than four and preferably two units: the imaging unit, and the camera electronics unit.

C.4.6.2 The size, weight, and power of the camera shall be designed to allow use in a reconnaissance pod and as a goal shall be as small as possible.

C.4.6.3 The size of the imaging unit shall be sufficiently small to allow full integration and operation in a cylindrical space less than 51 inches in length and 24.5 inches diameter. The size of the camera processing units and the size of the power supply unit shall be compatible with usage in a pod whose outer envelope does not exceed a 330-gallon fuel tank. The electronics shall be in ATR enclosures that shall provide thermal and mechanical environment to allow circuit assemblies to operate throughout flight envelope.

C.4.6.4 The weight of the imaging unit shall be less than 300 pounds. The weight of the all camera units shall be less than 370 pounds.

C.4.6.5 The average consumed power shall be less than 800 Watts and the peak power shall be no more than 30% higher than the average. The power supplied to the unit shall be 120V, 400 Hz, 3 phase and 28 volt DC in accordance with MIL-STD-704E and MIL-STD-1760A for the Aircraft/Store Electrical Interconnection System.

#### C.4.7 Electrical Protection

The camera shall prevent equipment damage whenever an electrical power condition exists with the abnormal power limits of MIL-STD-704. A short circuit to ground of any electrical input or output shall not cause any permanent damage to the equipment.

#### C.4.8 Electromagnetic Compatibility

The camera, as installed in the F/A-18 pod, shall comply with the system EMC requirements of MIL-E-6051D(1).

#### C.4.9. Environmental

The camera shall operate within the range of the Environmental Control System (ECS) in the P-3 pallet and in F/A-18 SHARP pod system. The camera shall have the capability of operating within the internal temperature, pressure and humidity within the pod during all phases of flight throughout the flight envelope, ground operation, and taxi and maintenance conditions. The camera shall survive as per MIL-STD 810C.

C.4.9.1 Environmental conditions: The camera shall be designed to operate during and after exposure to maintenance, transport, and the operating environment conditions specified herein and in accordance with MIL-STD-210.

C.4.9.2 Maneuvering environments: The camera shall survive and perform after the accelerations of Table 2 are applied for a duration necessary to achieve the angular velocities of Table 2. The environments in Table 3 are defined at the pod/aircraft mount structure interface.

TABLE 2.  
MANEUVERING ENVIRONMENTS

Environment		Angular Limits (deg) <sup>(1)</sup>	Angular Velocities (deg/sec)	Angular Accelerations <sup>(2)</sup> (deg/sec <sup>2</sup> )
Non-operating	Roll Pitch Yaw		LBA LBA LBA	LBA LBA LBA
Operating (3) (without damage)	Roll Pitch Yaw	360 ±90 360	270 50 50	859 172 115
Full performance	Roll Pitch Yaw	±30 ±10 ±10	30 20 20	60 30 10
Notes: 1. Reduced by any platform line-of-sight obstructions. 2. At 0 degrees roll angle. 3. LBA" Limits basic aircraft				

C.4.9.3 Installed Environments: For the service life and specified design usage, the camera shall perform after exposure to any combination of anticipated environmental conditions as listed in tables 3 and 4 when provided the Environmental Control System (ECS) cooling specified in ICD. The environments in Table 3 and 4 are measured at the camera to aircraft/pod structure interface.

TABLE 3.  
INSTALLED ENVIRONMENTS

ENVIRONMENT		Standby		NON OPERATING (ENDURANCE)
Temperature (Bay temp)	High Low Shock	Sensor 32° C -40 C 0.25 C/sec	Electronics 55° C -55° C 0.25 C/sec	85° C -51° C 0.5 C/sec
Altitude	High Low Rate	1.7 psi (50,000 ft) 15.7 psi (sea level) 0.25 psi/sec		0.82 psi (65,000 ft) 15.7 psi (sea level) 0.25 psi/sec
Linear Acceleration along any axis		3 g's		15 g's
Shock (1) Crash safety (1) (4)		20 g's in 9 ms 40 g's		20 g's in 9 ms 40 g's
Acoustic		150 dB		150 dB
Humidity (2)	Relative Absolute	<70 percent 11 grams/meter <sup>3</sup>		100 percent 16 grams/meter <sup>3</sup>

NOTES:

- (1) 11 ms sawtooth or equivalent, any direction
- (2) Degraded performance under conditions where moisture condenses or ice forms on surfaces.
- (3) 24° to 31° C with relative humidity greater than 70 percent.
- (4) ) WRA mounting points may yield, but the WRA shall not break loose. Operating performance during or after the crash safety environment is not required.

TABLE 4  
INSTALLED VIBRATION ENVIRONMENTS

ENVIRONMENT	OPERATING	NON OPERATING (ENDURANCE)
Vertical Random(1)  * = actual frequencies where slope intercepts power level	TBDg rms Freq (Hz)            g <sup>2</sup> /Hz	TBD g rms Freq (Hz)            g <sup>2</sup> /Hz
Lateral/ Random(1) Longitudinal  * = actual frequencies where slope intercepts power level	TBD g rms  Freq (Hz)            g <sup>2</sup> /Hz	TBD g rms  Freq (Hz)            g <sup>2</sup> /Hz
<b>NOTE:</b> (1) Installation shock mounts/vibration isolators in place if applicable		

C.4.9.4        Explosive atmosphere: Camera operation shall not cause ignition of an ambient-explosive-gaseous mixture with air as specified in MIL-STD-810C, method 511.

C.4.9.5        Chemical-biological: Camera shall be designed to operate in a chemical/biological environment and maintain full operational functionality during and after exposure to chemical/biological agents. The equipment shall be resistant to damage using standard decontamination procedures, including cleaning agents such as soap or detergent and water solution, or R113 solvent in accordance with BB-F-1421.

C.4.9.6        Transportability: Camera equipment shall be air and surface transportable using standard government inventory handling/transportation equipment. There shall be no shelf life expirations/restrictions or refrigeration requirements for storage. Camera shall be capable of full performance after exposure to flight line maintenance, ground handling, transportation, storage, and repair. It shall withstand exposure to the logistics environment defined herein.

C.4.10        Shipping containers shall be provided.

## **C.5.0 DESIGN AND FABRICATION TASKS**

The following is a schedule for contract management and Government-Contractor interactions.

**C.5.1 Monthly Reports.** The Contractor shall submit monthly reports summarizing costs and technical progress (EXHIBIT A, CDRL's A001 and A002).

**C.5.2 Ad Hoc Meetings.** Technical interchange working meetings shall be scheduled when required. It is anticipated that approximately 2 such meetings shall take place, one of them at Naval Research laboratory or in the Washington DC area and one at the Contractor's site. The Contractor shall supply four good copies of viewgraphs presented at the meetings (EXHIBIT A, CDRL A003).

**C.5.3 Preliminary Design Review (45 days).** The Contractor shall provide a 1-day review of preliminary design at the Contractor's facilities within 45 days after contract award. The COR shall be given two weeks prior notice of date and time. The Contractor shall provide the projected performance of the camera for tactical reconnaissance, an update of the technical proposal, an analysis of the cost spending schedule, and an overall plan for personnel commitments. Differences, if any, from the Statement of Work proposal, or negotiated contract are to be clarified and justified subject to government acceptance. The Contractor shall include in the review overall design diagrams, design trades, current schedule, and status for all long-lead and major components and hardware to be purchased. The Contractor shall also address preliminary form and fit, external interfaces, and updated "Action Item List." Only those items that have been paid for with contractor or subcontractor IR&D shall be labeled as "Proprietary." Plans are also to be given for any items for which fabrication needs to begin before the critical design review (EXHIBIT A, CDRL A004).

**C.5.4 Critical Design Review (120 days).** A 1 - 2 day review of final design shall be given at the Contractor's facilities within 120 days after contract award. The COR shall be given two weeks prior notice of date and time. The Contractor shall deliver copies of all materials to NRL (see Section F) within 30 days after the critical design review (EXHIBIT A, CDRL A005). The Contractor shall include in the review and in the delivered materials the following topics:

**C.5.4.1** Final Design of the camera and its interfaces. Only those items that have been paid for with Contractor or subcontractor IR&D shall be labeled as "Proprietary."

**C.5.4.2** Firm fabrication and spending schedules, and the status for all long-lead and major components and hardware.

**C.5.4.3** Interface and control specifications. The Contractor shall provide detailed form, fit and size of the camera and an estimated drawing count. The Contractor shall provide the camera interfaces, data header formats, controls and cabling for operations in the P-3 BEP, and the laboratory environment.

C.5.4.4 Action Item List. The Contractor shall provide at the critical design review a complete description of what the Government needs to be or supply in order to support camera integration and testing.

C.5.4.5 An analysis in support of the predicted MTBF in ground and flight operations, and a list of any critical components likely to be needed for 200 hours of post-acceptance testing.

**C.5.5 Progress Review (10 months).** A meeting shall be held within 10 months after contract award to review the status of fabrication and plan for aircraft integration and for flight testing. . The COR shall be given two weeks prior notice of location, date and time. The final camera-quality array should be installed into the camera at this time, and its performance data presented. The Contractor shall present an initial version plan of the functional demonstration at this meeting. Four copies of the Progress Review materials shall be provided to the COR (EXHIBIT A, CDRL A006).

## **C.6.0 FACTORY FUNCTIONAL DEMONSTRATION AND DELIVERY**

### **C.6.1 User's Guide.**

In accordance with EXHIBIT A, CDRL A007, and its Enclosure, the Contractor shall provide a User's Operational, Maintenance, and Processing Manual for the camera required under this Contract. A draft format shall be provided within 11.5 months after contract award. Three copies of the final manual shall be delivered within 15 days after the COR has review the draft and returned it to the Contractor for final revision. The User's manual shall be in accordance with Enclosure 1 to CDRL A007 and the following: The Manual shall explain camera operation, the recording and playback of imagery, airborne installation and expected performance. It shall include an annotated glossary of commonly used symbols and abbreviations, ample pictures and diagrams for simple comprehension, and an appendix listing the controller source code with self-contained comments for readability. The User's Manual, less appendix shall be under 100 pages in length (EXHIBIT A, CDRL A007).

### **C.6.2 Functional Demonstration (11.5 months).**

The Contractor shall demonstrate camera functionality at the factor within 11.5 months after contract award. The COR shall be given two weeks prior notice of location, date and time. Features to be demonstrated shall include, but not be limited to, operator controls, interfacing, and display and evaluation of recorded imagery. A summary of results, including sample recorded imagery, shall be provided to the COR at the time of delivery of the camera (EXHIBIT A, CDRL A008).

### **C.6.3 Delivery (12 months).**

In accordance with Section F, the Contractor shall deliver the camera no later than 12 months after award of the Contract.

## **C.7.0 P-3 TEST SUPPORT**

The Contractor shall provide personnel and material to support the camera during field tests and to evaluate the test data.

**C.7.1 Field Test Support.** The Contractor shall provide personnel and support for installing and maintaining the Camera on a Navy P-3 aircraft for data collection over a period of two weeks.

C.7.1.1 The Contractor shall provide support for data collection for as much as 24 flight hours in a two-week flight window. The Contractor shall provide support for test flights which include imaging of resolution charts and targets of opportunity with prearranged laydowns during daytime, dawn, dusk, and nighttime operations, low altitude versus high altitude operations, and also conditions of low versus high maneuver.

C.7.1.2 During this two-week flight window, the Contractor shall provide support for pre-flight camera integration and performance verification, installation, operator instruction, and deinstallation. The Contractor shall have on hand any critical long-lead spare parts deemed necessary in anticipation of 200 hours of operation, and shall perform maintenance and repair of the camera as necessary. The Contractor shall supply display system, and the Government will supply a PC based control unit and a digital recorder.

C.7.1.3 Data Evaluation: The Contractor shall provide a report within 30 days after the completion of the flight window. The contractor shall include in the report a summary of test results including a minimum of ten high quality photographic reproductions of recorded and/or transmitted images taken with the camera, analysis of the imagery, lessons learned, and recommendations concerning use of the camera (EXHIBIT A, CDRL A008).

## **C.8.0 Option 1 F-18 pod INTEGRATION AND FLIGHT TEST SUPPORT**

The Contractor shall prepare the camera so that it can be hard mounted and remotely operated in a government supplied F-18 pod. Control electronics may be placed in adjacent locations that will also contain the recorder. The Contractor shall provide test support.

C.8.1 Pod Integration. The Contractor shall deliver the reconnaissance camera in any contractor-supplied housing configured to fit the F-18 pod. Camera control electronics shall fit in identified remaining space in pod.

C.8.1.1 In-Pod Mounts. The Contractor shall supply information needed to obtain NAVAIR flight approval for any proposed changes to the camera mounts.

C.8.1.2 Pod Camera Survivability. The Contractor's camera shall be designed to not be degraded by normal land-based takeoffs and landings in the pod, and to be able to survive in a stowed or standby mode for the full F-18 maneuver. The camera, support electronics, cabling, and any other components shall be designed to survive full carrier shock testing. The Contractor shall provide all information necessary to obtain NAVAIR flight certification of the camera for the pod test flights. Although the camera shall be designed for full carrier based operation.

C.8.2 Demonstration and Test Support: The Contractor shall provide personnel and material to support the camera during F-18 field tests and to evaluate the test data.

C.8.2.1 Field Test Support. The Contractor shall provide personnel and support for installing and maintaining the Camera on Navy aircraft for data collections as described below over a period of six months following the camera's delivery to NRL.

C.8.2.2 The Contractor shall provide support for data collection during two flight windows for a duration of two-weeks each. The Contractor shall provide support for as much as 12 flight hours in each two-week flight window. Each two week flight window will be at least one month apart from the next window. The Contractor shall provide support for test flights which include imaging of resolution charts and targets of opportunity with prearranged laydowns during daytime, dawn, dusk and nighttime operations, low speed versus high speed operations, low altitude versus high altitude operations, and also conditions of low versus high maneuver.

C.8.2.3 During each two-week flight window, the Contractor shall provide support for pre-flight camera integration and performance verification, installation, operator instruction, and deinstallation. The Contractor shall have on hand any critical long-lead spare parts deemed necessary in anticipation of 200 hours of operation, and shall perform maintenance and repair of the camera as necessary.

C.8.2.4 Data Evaluation. The Contractor shall provide personnel and support for the purpose of evaluating the flight data of the camera. The Contractor shall provide an analysis that includes evaluation of recorded imagery against the system specifications of this Statement of Work and against the performance of other digital cameras and/or film cameras. The contractor shall provide a final report within 30 days after the second test sequence or six months after demonstration and test support is initiated. The contractor shall include in the report a summary of test results, including a minimum of 10 high quality photographic reproductions of recorded and/or transmitted images taken with the camera, analysis of the imagery, lessons learned, and recommendations concerning use of the camera. (EXHIBIT A, CDRL B001)

#### **C.9.0 Option 2 *[Desired but not required]*: F-14 TARPS INTEGRATION AND FLIGHT TEST SUPPORT**

The Contractor shall prepare the camera so that it can be hard mounted and remotely operated in bay 2 of the F-14 TARPS pod. Control electronics may be placed in adjacent locations with the recorder. This packaging design shall include specifications for achievable window modification for the F-14 TARPS pod. The Contractor shall provide test support.

C.9.1 TARPS Pod Integration. The Contractor shall deliver the reconnaissance camera in any contractor-supplied housing configured to fit in bay 2 of the F-14 TARPS pod using a modified window and the existing flight-certified mount. Camera control electronics shall fit in any remaining space in bays 2 or 3. (The sizes of bay 2 and 3 are approximately 51 inches long by 31-inches in diameter. Bay 4 tapers to a smaller diameter, is only some 25-inches long, and is about 1/3 filled with other essential components. Temperatures in closed sections of the pod are maintained within 90 to 105 degrees Fahrenheit.)

C.9.1.1 Pod Window. The Contractor shall provide a dual band window design for the bay 2 door. The design is subject to COR approval at the preliminary design review. (The standard door of bay 2 contains a set of visible-band flat windows that provide both vertical and side-viewing capabilities.)

C.9.1.2 In-Pod Mounts. The Contractor shall supply information needed to obtain NAVAIR flight approval for any proposed changes to the camera mounts. (The bay 2 mount is designed to support the KS-153 film camera from both the front and rear using a swivel that allows cant mounting of the optical line of sight out to angles where station obscuration begins to occur. The mechanical mounting for the dual band Camera housing shall be an exact form fit replacement into one of the existing mounts unless a NAVAIR approved alternate mount is supplied with the camera.

C.9.1.3 Pod Camera Survivability. The Contractor's camera shall be designed to not be degraded by normal land-based takeoffs and landings in the TARPS pod, and to be able to survive in a stowed or standby mode for the full F-14 maneuver capabilities of 6.5 g and near-instantaneous 180 degree rolls. The camera, support electronics, cabling, and any other components shall be designed to survive with enough mechanical integrity so as not to disassemble and cause damage to the pod if it were subjected to full carrier shock testing. The Contractor shall provide all information necessary to obtain NAVAIR flight certification of the camera for the TARPS and P-3 test flights. Although the camera shall be designed for full carrier based operation, carrier flight clearance is not part of the current effort.

C.9.2 F-14 Camera Controls. The standard TARPS rear-seat cockpit control switches shall be the only human interface needed for operation of this dual band reconnaissance camera. When mounted in the TARPS pod, neither the hardware nor the cabling in or to the F-14 cockpit is to be altered. The Contractor may make changes between pod pays. After pre-flight setting, there shall be no required pilot manipulation of camera internal parameters, such as integration time, mean offset or gain, choice of scene dynamic range, non-uniformity calibrations, refrigerator power setting, or recorder controls. The required control by the camera operator shall be limited to settings such as sensor on/off, recorder on/off and record/playback, unless the operator choose to override a camera setting as discussed above.

C.9.3 Demonstration and Test Support: The Contractor shall provide personnel and material to support the camera during F-14 field tests and to evaluate the test data.

C.9.3.1 Field Test Support: The Contractor shall provide personnel and support for installing and maintaining the Camera on Navy aircraft for data collections occurring during a period of six months following the camera's delivery to NRL.

C.9.3.2 The Contractor shall provide support for data collection during two flight windows for a duration of two-weeks each. These flight windows shall be devoted to flying the camera in the F-14 aircraft using the TARPS pod. The Contractor shall provide support for as much as 12 flight hours in each two-week flight window. Each two week flight window will be at least one month apart from the next window. The Contractor shall provide support for test flights which include imaging of resolution charts and targets of opportunity with prearranged laydowns during daytime, dawn, dusk and nighttime operations, low speed versus high speed operations, low altitude versus high altitude operations, and also conditions of low versus high maneuver.

C.9.3.3 During each two-week flight window, the Contractor shall provide support for pre-flight camera integration and performance verification, installation, operator instruction, and deinstallation. The Contractor shall have on hand any critical long-lead spare parts deemed necessary in anticipation of 200 hours of operation, and shall perform maintenance and repair of the camera as necessary.

C.9.3.4 Data Evaluation: The Contractor shall provide personnel and support for the purpose of evaluating the flight data of the camera. The Contractor shall provide an analysis that includes evaluation of recorded imagery against the system specifications of this Statement of Work and against the performance of other digital cameras and/or film cameras in side-by-side flight tests. The contractor shall provide a final report within 30 days after the second test sequence or six months after demonstration and test support is initiated. The contractor shall include in the report a summary of test results, including a minimum of 10 high quality photographic reproductions of recorded and/or transmitted images taken with the camera, analysis of the imagery, lessons learned, and recommendations concerning use of the camera. (EXHIBIT A, CDRL C001)







# CONTRACT DATA REQUIREMENTS LIST

(2 Data Items)

*Form Approved*  
*OMB No. 0704-0188*

Public reporting burden for this collection of information is estimated to average 220 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.

<b>A. CONTRACT LINE ITEM NO.</b> 000101	<b>B. EXHIBIT</b> A	<b>C. CATEGORY:</b> TOP _____ TM _____ OTHER _____
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<b>D. SYSTEM / ITEM</b> Dual-Band Reconnaissance Camera	<b>E. CONTRACT / PR NO.</b> RFP N00173-98-R-AS01	<b>F. CONTRACTOR</b> TBD
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<b>1. DATA ITEM NO.</b> A007	<b>2. TITLE OF DATA ITEM</b> User's Operation & Maintenance Manual for the Dual Band Reconnaissance Camera	<b>3. SUBTITLE</b>
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<b>4. AUTHORITY (Data Acquisition Document No.)</b> Enclosure No. 2	<b>5. CONTRACT REFERENCE</b> Sec. B, Sec. C, & Para. C.6.0 of SOW, and Enclosure 2	<b>6. REQUIRING OFFICE</b> COR
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<b>7. DD 250 REQ</b> DD**	<b>8. DIST STATEMENT REQUIRED</b>	<b>10. FREQUENCY</b> ONE/R	<b>12. DATE OF FIRST SUBMISSION</b> *See #16	<b>14. DISTRIBUTION</b>		
<b>9. APP CODE</b> N/A	<b>11. AS OF DATE</b> N/A	<b>13. DATE OF SUBSEQUENT SUBMISSION</b> *See #16	<b>a. ADDRESSEE</b>			

<b>10. REMARKS</b> * Draft: 11-1/5 months After Contract Award * Final Version: 12 months After Contract Award/or 15 days after the COR has reviewed the draft and returned it to the Contractor for Final Version.  Dual Band Framing Reconnaissance Camera User's Operation & Maintenance Manual shall be provided in accordance with Para. C.6.1 of the SOW and with Enclosure No. 2.  **DD 250 required only for acceptance of the Final Version by the COR designated in Section G.	<b>15. TOTAL</b> → 2 1 3
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<b>1. DATA ITEM NO.</b> A008	<b>2. TITLE OF DATA ITEM</b> Functional test Data: Dual Band Reconnaissance Camera	<b>3. SUBTITLE</b> N/A
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<b>4. AUTHORITY (Data Acquisition Document No.)</b>	<b>5. CONTRACT REFERENCE</b> Sec. B, Sec. C, & Para. C.6.2 of the SOW (Attach. No. 1)	<b>6. REQUIRING OFFICE</b> COR
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<b>7. DD 250 REQ</b> DD**	<b>8. DIST STATEMENT REQUIRED</b>	<b>10. FREQUENCY</b> Once	<b>12. DATE OF FIRST SUBMISSION</b> 11.5 Months ARO	<b>14. DISTRIBUTION</b>		
<b>9. APP CODE</b> N/A	<b>11. AS OF DATE</b> N/A	<b>13. DATE OF SUBSEQUENT SUBMISSION</b> See #12	<b>a. ADDRESSEE</b>			

<b>10. REMARKS</b> The Contractor shall functionally demonstrate, as required in Para. C.6.2 of the SOW, at the factory, starting 11.5 months after contract award. Four copies of the performance results shall be provided with the delivery of the Camera.  **DD 250 required only for acceptance by the COR designated in Section G.	<b>15. TOTAL</b> → 1 4
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<b>G. PREPARED BY</b> Dr. Melvin R. Krueger	<b>H. DATE</b> 1 DEC 98	<b>I. APPROVED BY</b> Code 3235:AS	<b>J. DATE</b> 3 DEC 98
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<b>17. PRICE GROUP</b>
<b>18. ESTIMATED</b>

<b>17. PRICE GROUP</b>
<b>18. ESTIMATED</b>

# CONTRACT DATA REQUIREMENTS LIST

(2 Data Items)

*Form Approved*  
**OMB No. 0704-0188**

Public reporting burden for this collection of information is estimated to average 220 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.

<b>A. CONTRACT LINE ITEM NO.</b> 000101				<b>B. EXHIBIT</b> A		<b>C. CATEGORY:</b> TDP _____ TM _____ OTHER _____			
<b>D. SYSTEM / ITEM</b> Dual-Band Reconnaissance Camera				<b>E. CONTRACT / PR NO.</b> RFP N00173-98-R-AS01		<b>F. CONTRACTOR</b> TBD			
<b>1. DATA ITEM NO.</b> A009		<b>2. TITLE OF DATA ITEM</b> Report on Camera P-3 Demonstration				<b>3. SUBTITLE</b>			
<b>4. AUTHORITY (Data Acquisition Document No.)</b>			<b>5. CONTRACT REFERENCE</b> Sec. B, Sec. C, & Para. C.7.0 of the SOW (Attach. 1)			<b>6. REQUIRING OFFICE</b> COR			
<b>7. DD ZSR REQ</b> LT	<b>8. DIST STATEMENT REQUIRED</b>	<b>10. FREQUENCY</b> Once		<b>12. DATE OF FIRST SUBMISSION</b> *		<b>14. DISTRIBUTION</b>			
<b>8. APP CODE</b> N/A	<b>9. DIST STATEMENT REQUIRED</b> N/A	<b>11. AS OF DATE</b> *		<b>13. DATE OF SUBSEQUENT SUBMISSION</b> *		<b>a. ADDRESSEE</b>		<b>b. COPIES</b>	
								Draft	Final
<b>16. REMARKS</b> * 30 days after final flight window in accordance with C.7.1.3, to be coordinated with the COR.  Final report of camera imagery shall be delivered 30 days after completion of flight windows. The Contractor's analysis shall include evaluation of recorded imagery against the system specifications of this SOW & against the performance of other digital cameras and/or film cameras in side-by-side flight tests. The Contractor shall provide a final report containing a summary of results, including a minimum of 10 high quality photographic reproductions of recorded and/or transmitted images taken with the camera, a digital copy of these images, analysis of the imagery, lessons learned, recommendations concerning use of the camera, and as required by Sec. C.7.0 of the SOW.						COR (See Encl 1)			1
						NRL Code 5630			1
						ACO (See Encl 1)			1
						(Trx Doc. Only)			
						<b>15. TOTAL</b> →		1	8

<b>17. PRICE GROUP</b>
<b>18. ESTIMATED TOTAL PRICE</b>

<b>17. PRICE GROUP</b>
<b>18. ESTIMATED TOTAL PRICE</b>





**ENCLOSURE NUMBER 1**  
TO DD FORM 1423 (EXHIBIT A)  
CONTRACT DATA REQUIREMENTS LIST  
INSTRUCTIONS FOR REPORT DISTRIBUTION

DISTRIBUTION OF TECHNICAL REPORTS AND FINAL REPORT:

The minimum distribution of technical reports and the final report submitted in connection with this contract is as follows:

<u>ADDRESSEE</u>	<u>DODAAD CODE</u>	<u>NUMBER OF COPIES</u>	
		<u>UNCLASSIFIED/ UNLIMITED</u>	<u>UNCLASSIFIED/LIMITED AND CLASSIFIED</u>
Contracting Officer's Representative (COR) Naval Research Laboratory Code * 4555 Overlook Ave., S.W. Washington, DC 20375-5320 ATTN: *	N00173	1	1
Administrative Contracting Officer (ACO) (Blk 6, SF 26)	*	1	1
Director, Naval Research Laboratory, ATTN: Code 5227 4555 Overlook Ave., S.W. Washington, DC 203775-5320	N00173	1	1
Defense Technical Information Center (DTIC) 8725 John J. Kingman Road Suite #0944 Fort Belvoir, VA 22060-6218	S47031	4	2

If the Contracting Officer directs, the Contractor shall make additional distribution of technical reports in accordance with a supplemental distribution list provided by the Contracting Officer.

DISTRIBUTION OF REPORTS WHICH ARE NOT TECHNICAL REPORTS:

<u>ADDRESSEE</u>	<u>DODAAD CODE</u>	<u>NUMBER OF COPIES</u>	
		<u>UNCLASSIFIED/ UNLIMITED</u>	<u>UNCLASSIFIED/LIMITED AND CLASSIFIED</u>
COR	N00173	1	1
ACO	*	1	1

\* To be inserted at award.

**1. TITLE: USERS OPERATION AND MAINTENANCE MANUAL SPECIFICATIONS**

**2. DESCRIPTION/PURPOSE:** Technical manual for use by the end user for operation, maintenance and logistic support of a Dual-Band Reconnaissance Camera.

**3. GENERAL:**

The manual shall be contractor format, but may reference manufacturer's manuals for commercial components. The referenced manufacturer's manuals, if any, shall also be provided.

The manual shall contain the procedures necessary to properly operate, maintain and support the System.

**4. CONTENTS:**

**4.1 Description.** This chapter shall include:

- a. A full page composite illustration of the equipment.
- b. An illustration calling out the major assemblies with their nomenclature.
- c. A basic description of the type of equipment and its purpose.
- d. A functional block diagram.
- e. Tables listing equipment supplied and equipment required, but not supplied.
- f. Tables of technical, environmental and physical characteristics.
- g. A description of the software for the equipment that will include the purpose, routines and functions of the software program.

**4.2 Installation.** This chapter shall include:

- a. Information on unpacking, proper location of units, interconnections and initial pre-operational procedures.
- b. Details of cables and grounding requirements and cable fabrications, if applicable.
- c. Illustrations of interconnections and their respective functions.
- d. Power requirements.

**4.3 Operation.** This chapter shall include:

- a. Step-by-step procedures for turning on, operating and turning off the equipment.
- b. Calibration readings and/or results expected from properly adjusted and operating equipment.
- c. Tables and illustrations calling out all operational controls and indicators, and their functions. All references to switches, controls and indicators in the manual shall follow designations on the panels and name plates.
- d. Maintenance procedures which may normally be performed by the operator.

**4.4 Principles of operation.** This chapter shall include:

- a. A complete function description of the equipment based on a block diagram.
- b. A complete explanation of the mechanical features using block diagrams or cutaway drawings.
- c. Major assemblies broken into individual circuits, accompanied by complete circuit analysis keyed to a simplified schematic.
- d. Brief descriptions of complex and unusual circuits.
- e. Voltage waveforms at significant points in the circuits, if appropriate.
- f. Memory maps and a description of microprocessor function, if appropriate.
- g. Any other data and instructions needed for the proper operation and maintenance of the System.

4.5 Preventive/corrective maintenance. This chapter shall include:

- a. A schedule of detailed maintenance and adjustment checks, if appropriate.
- b. List of recommended test equipment, if appropriate.
- c. Troubleshooting information to enable a technician to locate trouble and to make repairs or adjustments to the equipment, if appropriate.
- d. An outline of disassembly and reassembly procedures.
- e. Details for special test procedures and expected results, where appropriate.
- f. Complete adjustment and maintenance information for electromechanical devices, where appropriate.
- g. Oscilloscope waveforms illustrated with peak voltage, duration, repetition rate and control positions, where appropriate.
- h. A complete listing of diagnostic programs and where to use.
- i. A flowchart and listing of diagnostics.
- j. Complete identifying numbers for all firmware and software.

4.6 Parts list. This section shall contain a tabulation of all electrical/mechanical components and repairable/replaceable commercial or vendor components in the equipment. All parts shall be sufficiently described to reorder/replace. The parts list shall contain:

- a. Reference designation to include circuit symbols, as appearing on supporting and referenced engineering drawings.
- b. Nomenclature and complete description of the part (including hardware, firmware and software).
- c. Original equipment manufacturer (OEM), complete with company name, address and telephone number.
- d. OEM part numbers.
- e. Quantity per item listed.
- f. Vendor part number.

4.7 Drawings. All drawings and lettering in the manual shall be legible, uncluttered and capable of being read without magnification. All lettering shall be a minimum of .06 inches (1.5mm) in height. The drawings shall include, as applicable:

- a. Schematic diagrams of individual major assemblies, printed wiring boards, and the complete equipment.
- b. Logic diagrams.
- c. Interconnection diagrams.
- d. Cabling diagrams.
- e. Wiring diagrams.
- f. Illustrations that identify and call out circuit components on printed circuit cards and chassis.
- g. Schematics of chips used on printed circuit cards (programmable read-only memory (PROM), erasable PROM (EPROM), Buffers, etc.).

4.8 Software. This section shall contain:

- a. A description of all firmware/software supplied.
- b. Instructions for using the routines and programs.
- c. Source codes and object codes of the programs/routines.
- d. Details of the software, routines and subroutines.