

<b>SOLICITATION/CONTRACT/ORDER FOR COMMERCIAL ITEMS</b> <i>OFFEROR TO COMPLETE BLOCKS 12, 17, 23, 24, AND 30</i>				1. REQUISITION NUMBER SEE SCHEDULE		PAGE 1 OF 16	
2. CONTRACT NO H92222-09-C-0025		3. AWARD/EFFECTIVE DATE 11-Mar-2009		4. ORDER NUMBER		5. SOLICITATION NUMBER	
7. FOR SOLICITATION INFORMATION CALL:		a. NAME				b. TELEPHONE NUMBER (No Collect Calls)	
9. ISSUED BY HQ USSOCOM SOAL-K ATTN: (b)(3) (10 USC §130(b), (b)(6)) 7701 TAMPA POINT BLVD MACDILL AFB FL 33621  TEL: (b)(6) FAX: (b)(6)		CODE H92222		10. THIS ACQUISITION IS <input checked="" type="checkbox"/> UNRESTRICTED SET ASIDE: % FOR <input type="checkbox"/> SB <input type="checkbox"/> HUBZONE SB <input type="checkbox"/> 8(A) <input type="checkbox"/> SVC-DISABLED VET-OWNED SB <input type="checkbox"/> EMERGING SB SIZE STD: NAICS: 333514		11. DELIVERY FOR FOB DESTINATION UNLESS BLOCK IS MARKED <input type="checkbox"/> SEE SCHEDULE <input checked="" type="checkbox"/> 13a. THIS CONTRACT IS A RATED ORDER UNDER DPAS (15 CFR 700) 13b. RATING DO-C9 14. METHOD OF SOLICITATION <input type="checkbox"/> RFQ <input type="checkbox"/> IFB <input type="checkbox"/> RFP	
15. DELIVER TO CRANE DIVISION NAVAL SURFACE WARFARE CEN (b)(6) (b)(2) High CRANE IN 47522		CODE N00164		16. ADMINISTERED BY DCMA VIRGINIA 10500 BATTLEVIEW PIKWAY, MANASSAS VA 20108-2342		CODE S2404A  SCD: B	
17a. CONTRACTOR/OFFEROR ITT CORPORATION (b)(6) 7635 PLANTATION RD ROANOKE VA 24019-3222  TEL. 540-563-0371 EXT.4367		CODE 13567		18a. PAYMENT WILL BE MADE BY DFAS COLUMBUS CENTER SOUTH ENTITLEMENT OPERATIONS P.O. BOX 182264 COLUMBUS OH 43218-2264		CODE HQ0338	
<input type="checkbox"/> 17b. CHECK IF REMITTANCE IS DIFFERENT AND PUT SUCH ADDRESS IN OFFER				<input checked="" type="checkbox"/> 18b. SUBMIT INVOICES TO ADDRESS SHOWN IN BLOCK 18a. UNLESS BLOCK BELOW IS CHECKED <input checked="" type="checkbox"/> SEE ADDENDUM			
19. ITEM NO.		20. SCHEDULE OF SUPPLIES/ SERVICES		21. QUANTITY		22. UNIT	
		CONFIRMING ORDER - DO NOT DUPLICATE SEE SCHEDULE				23. UNIT PRICE	
						24. AMOUNT	
25. ACCOUNTING AND APPROPRIATION DATA See Schedule						26. TOTAL AWARD AMOUNT (For Govt. Use Only) \$10,476,375.00	
<input type="checkbox"/> 27a. SOLICITATION INCORPORATES BY REFERENCE FAR 52.212-1, 52.212-4, FAR 52.212-3, 52.212-5 ARE ATTACHED. ADDENDA <input type="checkbox"/> ARE <input type="checkbox"/> ARE NOT ATTACHED							
<input type="checkbox"/> 27b. CONTRACT/PURCHASE ORDER INCORPORATES BY REFERENCE FAR 52.212-4, FAR 52.212-5 IS ATTACHED. ADDENDA <input type="checkbox"/> ARE <input type="checkbox"/> ARE NOT ATTACHED							
28. CONTRACTOR IS REQUIRED TO SIGN THIS DOCUMENT AND RETURN 1 COPIES <input checked="" type="checkbox"/> TO ISSUING OFFICE. CONTRACTOR AGREES TO FURNISH AND DELIVER ALL ITEMS SET FORTH OR OTHERWISE IDENTIFIED ABOVE AND ON ANY ADDITIONAL SHEETS SUBJECT TO THE TERMS AND CONDITIONS SPECIFIED HEREIN.				28. AWARD OF CONTRACT: REFERENCE <input type="checkbox"/> OFFER DATED . YOUR OFFER ON SOLICITATION (BLOCK 5), INCLUDING ANY ADDITIONS OR CHANGES WHICH ARE SET FORTH HEREIN, IS ACCEPTED AS TO ITEMS:			
30a. SIGNATURE OF OFFEROR/CONTRACTOR				31a. UNITED STATES OF AMERICA (SIGNATURE OF CONTRACTING OFFICER) (b)(6)		31c. DATE SIGNED 12-Mar-2009	
30b. NAME AND TITLE OF SIGNER (TYPE OR PRINT)		30c. DATE SIGNED		31b. NAME OF CONTRACTING OFFICER (TYPE OR PRINT) SUSAN M GRIFFIN / CONTRACTING OFFICER TEL: 813-826-7411 EMAIL: griffil@socom.mil			

SOLICITATION/CONTRACT/ORDER FOR COMMERCIAL ITEMS (CONTINUED)					PAGE 2 OF 16		
19. ITEM NO.	20. SCHEDULE OF SUPPLIES/ SERVICES			21. QUANTITY	22. UNIT	23. UNIT PRICE	24. AMOUNT
	(CONFIRMING ORDER - DO NOT DUPLICATE SEE SCHEDULE)						
32a. QUANTITY IN COLUMN 21 HAS BEEN <input type="checkbox"/> RECEIVED <input type="checkbox"/> INSPECTED <input type="checkbox"/> ACCEPTED, AND CONFORMS TO THE CONTRACT, EXCEPT AS NOTED: _____							
32b. SIGNATURE OF AUTHORIZED GOVERNMENT REPRESENTATIVE			32c. DATE	32d. PRINTED NAME AND TITLE OF AUTHORIZED GOVERNMENT REPRESENTATIVE			
32e. MAILING ADDRESS OF AUTHORIZED GOVERNMENT REPRESENTATIVE				32f. TELEPHONE NUMBER OF AUTHORIZED GOVERNMENT REPRESENTATIVE			
				32g. E-MAIL OF AUTHORIZED GOVERNMENT REPRESENTATIVE			
33. SHIP NUMBER	34. VOUCHER NUMBER	35. AMOUNT VERIFIED CORRECT FOR		36. PAYMENT		37. CHECK NUMBER	
<input type="checkbox"/> PARTIAL <input type="checkbox"/> FINAL				<input type="checkbox"/> COMPLETE <input type="checkbox"/> PARTIAL <input type="checkbox"/> FINAL			
38. S/R ACCOUNT NUMBER	39. S/R VOUCHER NUMBER	40. PAID BY					
41a. I CERTIFY THIS ACCOUNT IS CORRECT AND PROPER FOR PAYMENT				42a. RECEIVED BY ( <i>Print</i> )			
41b. SIGNATURE AND TITLE OF CERTIFYING OFFICER			41c. DATE	42b. RECEIVED AT ( <i>Location</i> )			
				42c. DATE REC'D ( <i>YY/MM/DD</i> )		42d. TOTAL CONTAINERS	

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## Section SF 1449 - CONTINUATION SHEET

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0001		4,355	Each	\$2,275.00	\$9,907,625.00

Image Intensifier Assembly  
FFP

Image Intensifier Assembly, 18MM Microchannel Wafer High Performance Tube MX-10160 GS, in accordance with Attachment 1, Performance Specification. ITT Part number 277137 (FY9800YG series). "A" Test Acceptance Test Procedures apply. CLIN 0001 will be warranted by ITT Corporation for a period of 12 months from the date of shipment in accordance with Attachment 3.

FOB: Destination

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NET AMT	\$9,907,625.00
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ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
000101					\$0.00

Funding for CLIN 0001  
FFP

FOB: Destination

PURCHASE REQUEST NUMBER: F2VUF09063A001

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NET AMT	\$0.00
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ACRN AA  
CIN: F2VUF09063A001

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	\$6,251,700.00
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ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
000102	Funding for CLIN 0001 FFP FOB: Destination PURCHASE REQUEST NUMBER: F2VUF09065A001				\$0.00
NET AMT					\$0.00
ACRN AB CIN: F2VUF09065A001					\$3,655,925.00

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0002	Image Intensifier Assembly FFP Image Intensifier Assembly, 18MM Microchannel Wafer High Performance Tube MX-10160 GS, in accordance with Attachment 1 Performance Specification. ITT Part number 277137 (FY9800YG series). "A" Test Acceptance Test Procedures apply. CLIN 0002 will be warranted by ITT Corporation for a period of 12 months from the date of shipment in accordance with Attachment 3. FOB: Destination PURCHASE REQUEST NUMBER: F2VUF09065A002	250	Each	\$2,275.00	\$568,750.00
NET AMT					\$568,750.00
ACRN AC CIN: F2VUF09065A002					\$568,750.00

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ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0003 OPTION	Image Intensifier Assembly FFP Image Intensifier Assembly, 18MM Microchannel Wafer High Performance Tube MX-10160 GS, in accordance with Attachment 1 Performance Specification. ITT Part number 277137 (FY9800YG series). "A" Test Acceptance Test Procedures apply. CLIN 0003 will be warranted by ITT Corporation for a period of 12 months from the date of shipment in accordance with Attachment 3. This option may be executed within 45 days after contract award. Note: this may not be unilaterally exercised if items are being procured under a foreign military sale (FMS) case. FOB: Destination PURCHASE REQUEST NUMBER: N0016409MP00058	416	Each	\$2,275.00	\$946,400.00

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NET AMT	\$946,400.00
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## INSPECTION AND ACCEPTANCE TERMS

Supplies/services will be inspected/accepted at:

CLIN	INSPECT AT	INSPECT BY	ACCEPT AT	ACCEPT BY
0001	Origin	Government	Origin	Government
0002	Origin	Government	Origin	Government
0003	Origin	Government	Origin	Government

## DELIVERY INFORMATION

CLIN	DELIVERY DATE	QUANTITY	SHIP TO ADDRESS	UIC
0001	04-FEB-2010	300	CRANE DIVISION NAVAL SURFACE WARFARE CEN (b)(6) (b)(2)High CRANE IN 47522 (b)(6) FOB: Destination	N00164
0001	10-MAR-2010	300	(SAME AS PREVIOUS LOCATION) FOB: Destination	N00164

0001	05-APR-2010	300	(SAME AS PREVIOUS LOCATION) FOB: Destination	N00164
0001	05-MAY-2010	300	(SAME AS PREVIOUS LOCATION) FOB: Destination	N00164
0001	04-JUN-2010	300	(SAME AS PREVIOUS LOCATION) FOB: Destination	N00164
0001	04-JUL-2010	300	(SAME AS PREVIOUS LOCATION) FOB: Destination	N00164
0001	03-AUG-2010	300	(SAME AS PREVIOUS LOCATION) FOB: Destination	N00164
0001	02-SEP-2010	300	(SAME AS PREVIOUS LOCATION) FOB: Destination	N00164
0001	02-OCT-2010	300	(SAME AS PREVIOUS LOCATION) FOB: Destination	N00164
0001	01-NOV-2010	300	(SAME AS PREVIOUS LOCATION) FOB: Destination	N00164
0001	01-DEC-2010	300	(SAME AS PREVIOUS LOCATION) FOB: Destination	N00164
0001	31-DEC-2010	300	(SAME AS PREVIOUS LOCATION) FOB: Destination	N00164
0001	30-JAN-2011	300	(SAME AS PREVIOUS LOCATION) FOB: Destination	N00164
0001	01-MAR-2011	300	(SAME AS PREVIOUS LOCATION) FOB: Destination	N00164
0001	31-MAR-2011	155	(SAME AS PREVIOUS LOCATION) FOB: Destination	N00164
0002	31-MAR-2011	145	CRANE DIVISION NAVAL SURFACE WAREHOUSE (b)(6) (b)(2) High CRANE IN 47522 (b)(6) FOB: Destination	N00164
0002	30-APR-2011	105	(SAME AS PREVIOUS LOCATION) FOB: Destination	N00164
0003	See FAR 52.217-6	416	(SAME AS PREVIOUS LOCATION) FOB: Destination	N00164

## ACCOUNTING AND APPROPRIATION DATA

AA: 9790300.56SF SD9 52SP 14704B 000000 00000 000000 667100 F67100ALD: AA FSR: 020871 PSR: 659133 DSR: 534514  
 AMOUNT: \$6,251,700.00  
 CIN F2VUF09063.A001: \$6,251,700.00

AB: 9780300.56SF SD8 52SP 14704B 000000 00000 000000 667100 F67100ALD: AA FSR: 006386 PSR: 193379 DSR: 650878  
 AMOUNT: \$3,655,925.00  
 CIN F2VUF09065.A001: \$3,655,925.00

AC: 9790100.56SF SC9 52SP 3GPVBM 010000 59200 017417 667100 F67100ALD: AA FSR: 023667 PSR: 193393 DSR: 652558  
 AMOUNT: \$568,750.00  
 CIN F2VUF09065.A002: \$568,750.00

## CLAUSES INCORPORATED BY REFERENCE

52.211-15	Defense Priority And Allocation Requirements	APR 2008
52.212-4	Contract Terms and Conditions--Commercial Items	OCT 2008

## CLAUSES INCORPORATED BY FULL TEXT

## 52.212-5 CONTRACT TERMS AND CONDITIONS REQUIRED TO IMPLEMENT STATUTES OR EXECUTIVE ORDERS--COMMERCIAL ITEMS (JAN 2009)

(a) The Contractor shall comply with the following Federal Acquisition Regulation (FAR) clauses, which are incorporated in this contract by reference, to implement provisions of law or Executive orders applicable to acquisitions of commercial items:

- (1) 52.233-3, Protest After Award (AUG 1996) (31 U.S.C. 3553).
- (2) 52.233-4, Applicable Law for Breach of Contract Claim (OCT 2004) (Pub. L. 108-77, 108-78).

(b) The Contractor shall comply with the FAR clauses in this paragraph (b) that the Contracting Officer has indicated as being incorporated in this contract by reference to implement provisions of law or Executive orders applicable to acquisitions of commercial items: (Contracting Officer check as appropriate.)

(1) 52.203-6, Restrictions on Subcontractor Sales to the Government (SEP 2006), with Alternate I (OCT 1995) (41 U.S.C. 253g and 10 U.S.C. 2402).

(2) 52.203-13, Contractor Code of Business Ethics and Conduct (DEC 2008)(Pub. L. 110-252, Title VI, Chapter 1 (41 U.S.C. 251 note)).

(3) 52.219-3, Notice of HUBZone Small Business Set-Aside (Jan 1999) (15 U.S.C. 657a).

(4) 52.219-4, Notice of Price Evaluation Preference for HUBZone Small Business Concerns (JUL 2005) (if the offeror elects to waive the preference, it shall so indicate in its offer) (15 U.S.C. 657a).

(5) [Removed].

(6)(i) 52.219-6, Notice of Total Small Business Set-Aside (JUNE 2003) (15 U.S.C. 644).

(ii) Alternate I (OCT 1995) of 52.219-6.

(iii) Alternate II (MAR 2004) of 52.219-6.

(7)(i) 52.219-7, Notice of Partial Small Business Set-Aside (JUNE 2003) (15 U.S.C. 644).

(ii) Alternate I (OCT 1995) of 52.219-7.

(iii) Alternate II (MAR 2004) of 52.219-7.

(8) 52.219-8, Utilization of Small Business Concerns (MAY 2004) (15 U.S.C. 637 (d)(2) and (3)).

(9)(i) 52.219-9, Small Business Subcontracting Plan (APR 2008) (15 U.S.C. 637(d)(4)).

(ii) Alternate I (OCT 2001) of 52.219-9

(iii) Alternate II (OCT 2001) of 52.219-9.

(10) 52.219-14, Limitations on Subcontracting (DEC 1996) (15 U.S.C. 637(a)(14)).

(11) 52.219-16, Liquidated Damages--Subcontracting Plan (JAN 1999) (15 U.S.C. 637(d)(4)(F)(i)).

(12)(i) 52.219-23, Notice of Price Evaluation Adjustment for Small Disadvantaged Business Concerns (OCT 2008) (10 U.S.C. 2323) (if the offeror elects to waive the adjustment, it shall so indicate in its offer).

(ii) Alternate I (JUNE 2003) of 52.219-23.

(13) 52.219-25, Small Disadvantaged Business Participation Program--Disadvantaged Status and Reporting (APR 2008) (Pub. L. 103-355, section 7102, and 10 U.S.C. 2323).

(14) 52.219-26, Small Disadvantaged Business Participation Program--Incentive Subcontracting (OCT 2000) (Pub. L. 103-355, section 7102, and 10 U.S.C. 2323).

(15) 52.219-27, Notice of Total Service-Disabled Veteran-Owned Small Business Set-Aside (MAY 2004) (U.S.C. 657 f).

(16) 52.219-28, Post Award Small Business Program Rerepresentation (JUNE 2007) (15 U.S.C. 632(a)(2)).

(17) 52.222-3, Convict Labor (JUNE 2003) (E.O. 11755).

(18) 52.222-19, Child Labor--Cooperation with Authorities and Remedies (FEB 2008) (E.O. 13126).

(19) 52.222-21, Prohibition of Segregated Facilities (FEB 1999).

(20) 52.222-26, Equal Opportunity (MAR 2007) (E.O. 11246).



(21) 52.222-35, Equal Opportunity for Special Disabled Veterans, Veterans of the Vietnam Era, and Other Eligible Veterans; (SEP 2006) (38 U.S.C. 4212).

(22) 52.222-36, Affirmative Action for Workers with Disabilities (JUN 1998) (29 U.S.C. 793).

(23) 52.222-37, Employment Reports on Special Disabled Veterans, Veterans of the Vietnam Era, and Other Eligible Veterans; (SEP 2006) (38 U.S.C. 4212).

(24) 52.222-39, Notification of Employee Rights Concerning Payment of Union Dues or Fees (DEC 2004) (E.O. 13201).

(25)(i) 52.222-50, Combating Trafficking in Persons (AUG 2007) (Applies to all contracts).

(ii) Alternate I (AUG 2007) of 52.222-50.

(26) 52.222-54, Employment Eligibility Verification (Jan 2009). (Executive Order 12989). (Not applicable to the acquisition of commercially available off-the-shelf items or certain other types of commercial items as prescribed in 22.1803.)

(27)(i) 52.223-9, Estimate of Percentage of Recovered Material Content for EPA-Designated Items (MAY 2008) (42 U.S.C. 6962(c)(3)(A)(ii)).

(ii) Alternate I (MAY 2008) of 52.223-9 (42 U.S.C. 6962(i)(2)(c)).

(28) 52.223-15, Energy Efficiency in Energy-Consuming Products (DEC 2007) (42 U.S.C. 8259b)

(29)(i) 52.223-16, IEEE 1680 Standard for the Environmental Assessment of Personal Computer Products (DEC 2007) (E.O. 13423).

(ii) Alternate I (DEC 2007) of 52.223-16.

(30) 52.225-1, Buy American Act--Supplies (JUNE 2003) (41 U.S.C. 10a-10d).

(31)(i) 52.225-3, Buy American Act--Free Trade Agreements--Israeli Trade Act (AUG 2007) (41 U.S.C. 10a-10d, 19 U.S.C. 2301 note, 19 U.S.C. 2112 note, Pub. L 108-77, 108-78, 108-286, 109-53 and 109-169).

(ii) Alternate I (JAN 2004) of 52.225-3.

(iii) Alternate II (JAN 2004) of 52.225-3.

(32) 52.225-5, Trade Agreements (Nov 2007) (19 U.S.C. 2501, et seq., 19 U.S.C. 3301 note).

(33) 52.225-13, Restrictions on Certain Foreign Purchases (JUN 2008) (E.O.'s, proclamations, and statutes administered by the Office of Foreign Assets Control of the Department of the Treasury).

(34) 52.225-4, Notice of Disaster or Emergency Area Set-Aside (Nov 2007) (42 U.S.C. 5150).

(35) 52.225-5, Restrictions on Subcontracting Outside Disaster or Emergency Area (Nov 2007) (42 U.S.C. 5150).

(36) 52.222-29, Terms for Financing of Purchases of Commercial Items (FEB 2002) (41 U.S.C. 255(f), 10 U.S.C. 2307(f)).

\_\_\_ (37) 52.232-30, Installment Payments for Commercial Items (OCT 1995) (41 U.S.C. 255(f), 10 U.S.C. 2307(f)).

X (38) 52.232-33, Payment by Electronic Funds Transfer--Central Contractor Registration (OCT 2003) (31 U.S.C. 3332).

\_\_\_ (39) 52.232-34, Payment by Electronic Funds Transfer--Other than Central Contractor Registration (MAY 1999) (31 U.S.C. 3332).

\_\_\_ (40) 52.232-36, Payment by Third Party (MAY 1999) (31 U.S.C. 3332).

\_\_\_ (41) 52.239-1, Privacy or Security Safeguards (AUG 1996) (5 U.S.C. 552a).

\_\_\_ (42)(i) 52.247-64, Preference for Privately Owned U.S.-Flag Commercial Vessels (FEB 2006) (46 U.S.C. Appx 1241(b) and 10 U.S.C. 2631).

\_\_\_ (ii) Alternate I (APR 2003) of 52.247-64.

(c) The Contractor shall comply with the FAR clauses in this paragraph (c), applicable to commercial services, that the Contracting Officer has indicated as being incorporated in this contract by reference to implement provisions of law or Executive orders applicable to acquisitions of commercial items: (Contracting Officer check as appropriate.)

\_\_\_ (1) 52.222-41, Service Contract Act of 1965 (Nov 2007) (41 U.S.C. 351, et seq.).

\_\_\_ (2) 52.222-42, Statement of Equivalent Rates for Federal Hires (MAY 1989) (29 U.S.C. 206 and 41 U.S.C. 351, et seq.).

\_\_\_ (3) 52.222-43, Fair Labor Standards Act and Service Contract Act--Price Adjustment (Multiple Year and Option Contracts) (NOV 2006) (29 U.S.C. 206 and 41 U.S.C. 351, et seq.).

\_\_\_ (4) 52.222-44, Fair Labor Standards Act and Service Contract Act--Price Adjustment (February 2002) (29 U.S.C. 206 and 41 U.S.C. 351, et seq.).

X (5) 52.222-51, Exemption from Application of the Service Contract Act to Contracts for Maintenance, Calibration, or Repair of Certain Equipment--Requirements (Nov 2007) (41 U.S.C. 351, et seq.).

X (6) 52.222-53, Exemption from Application of the Service Contract Act to Contracts for Certain Services--Requirements (Nov 2007) (41 U.S.C. 351, et seq.).

\_\_\_ (7) 52.237-11, Accepting and Dispensing of \$1 Coin (SEP 2008)(31 U.S.C. 5112(p)(1)).

(d) Comptroller General Examination of Record. The Contractor shall comply with the provisions of this paragraph (d) if this contract was awarded using other than sealed bid, is in excess of the simplified acquisition threshold, and does not contain the clause at 52.215-2, Audit and Records--Negotiation.

(1) The Comptroller General of the United States, or an authorized representative of the Comptroller General, shall have access to and right to examine any of the Contractor's directly pertinent records involving transactions related to this contract.

(2) The Contractor shall make available at its offices at all reasonable times the records, materials, and other evidence for examination, audit, or reproduction, until 3 years after final payment under this contract or for any shorter period specified in FAR Subpart 4.7, Contractor Records Retention, of the other clauses of this contract. If this contract is completely or partially terminated, the records relating to the work terminated shall be made available for 3 years after any resulting final termination settlement. Records relating to appeals under the disputes clause or to

litigation or the settlement of claims arising under or relating to this contract shall be made available until such appeals, litigation, or claims are finally resolved.

(3) As used in this clause, records include books, documents, accounting procedures and practices, and other data, regardless of type and regardless of form. This does not require the Contractor to create or maintain any record that the Contractor does not maintain in the ordinary course of business or pursuant to a provision of law.

(e) (1) Notwithstanding the requirements of the clauses in paragraphs (a), (b), (c), and (d) of this clause, the Contractor is not required to flow down any FAR clause, other than those in paragraphs (e)(1)(i) through (xi) of this paragraph in a subcontract for commercial items. Unless otherwise indicated below, the extent of the flow down shall be as required by the clause—

(i) 52.203-13, Contractor Code of Business Ethics and Conduct (DEC 2008) (Pub. L. 110-252, Title VI, Chapter 1 (41 U.S.C. 251 note).

(ii) 52.219-8, Utilization of Small Business Concerns (May 2004) (15 U.S.C. 637(d)(2) and (3)), in all subcontracts that offer further subcontracting opportunities. If the subcontract (except subcontracts to small business concerns) exceeds \$550,000 (\$1,000,000 for construction of any public facility), the subcontractor must include 52.219-8 in lower tier subcontracts that offer subcontracting opportunities.

(iii) 52.222-26, Equal Opportunity (MAR 2007) (E.O. 11246).

(iv) 52.222-35, Equal Opportunity for Special Disabled Veterans, Veterans of the Vietnam Era, and Other Eligible Veterans (SEP 2006) (38 U.S.C. 4212).

(v) 52.222-36, Affirmative Action for Workers with Disabilities (June 1998) (29 U.S.C. 793).

(vi) 52.222-39, Notification of Employee Rights Concerning Payment of Union Dues or Fees (DEC 2004) (E.O. 13201).

(vii) 52.222-41, Service Contract Act of 1965 (Nov 2007) (41 U.S.C. 351, et seq.).

(viii) 52.222-50, Combating Trafficking in Persons (AUG 2007) (22 U.S.C. 7104(g)). Flow down required in accordance with paragraph (f) of FAR clause 52.222-50.

(ix) 52.222-51, Exemption from Application of the Service Contract Act to Contracts for Maintenance, Calibration, or Repair of Certain Equipment--Requirements (Nov 2007) (41 U.S.C. 351, et seq.).

(x) 52.222-53, Exemption from Application of the Service Contract Act to Contracts for Certain Services--Requirements (Nov 2007) (41 U.S.C. 351, et seq.).

(xi) 52.222-54, Employment Eligibility Verification (Jan 2009).

(xii) 52.247-64, Preference for Privately Owned U.S.-Flag Commercial Vessels (FEB 2006) (46 U.S.C. Appx 1241(b) and 10 U.S.C. 2631). Flow down required in accordance with paragraph (d) of FAR clause 52.247-64.

(2) While not required, the contractor May include in its subcontracts for commercial items a minimal number of additional clauses necessary to satisfy its contractual obligations.

(End of clause)

## 52.217-6 OPTION FOR INCREASED QUANTITY (MAR 1989)

The Government may increase the quantity of supplies called for in the Schedule at the unit price specified. The Contracting Officer may exercise the option by written notice to the Contractor within 45 days from contract award. Delivery of the added items shall continue at the same rate as the like items called for under the contract, unless the parties otherwise agree.

(End of clause)

## 52.212-7001 CONTRACT TERMS AND CONDITIONS REQUIRED TO IMPLEMENT STATUTES OR EXECUTIVE ORDERS APPLICABLE TO DEFENSE ACQUISITIONS OF COMMERCIAL ITEMS (DEC 2008)

(a) The Contractor agrees to comply with the following Federal Acquisition Regulation (FAR) clause which, if checked, is included in this contract by reference to implement a provision of law applicable to acquisitions of commercial items or components.

52.203-3, Gratuities (APR 1984) (10 U.S.C. 2207).

(b) The Contractor agrees to comply with any clause that is checked on the following list of Defense FAR Supplement clauses which, if checked, is included in this contract by reference to implement provisions of law or Executive orders applicable to acquisitions of commercial items or components.

(1)  52.205-7000, Provision of Information to Cooperative Agreement Holders (DEC 1991) (10 U.S.C. 2416).

(2)  52.219-7003, Small Business Subcontracting Plan (DoD Contracts) (APR 2007) (15 U.S.C. 637).

(3)  52.219-7004, Small Business Subcontracting Plan (Test Program) (AUG 2008) (15 U.S.C. 637 note).

(4)  52.225-7001, Buy American Act and Balance of Payments Program (JUN 2005) (41 U.S.C. 10a-10d, E.O. 10582).

(5)  52.225-7012, Preference for Certain Domestic Commodities (DEC 2008) (10 U.S.C. 2533a).

(6)  52.225-7014, Preference for Domestic Specialty Metals (JUN 2005) (10 U.S.C. 2533a).

(7)  52.225-7015, Restriction on Acquisition of Hand or Measuring Tools (JUN 2005) (10 U.S.C. 2533a).

(8)  52.225-7016, Restriction on Acquisition of Ball and Roller Bearings (MAR 2006) (Section 8065 of Public Law 107-117 and the same restriction in subsequent DoD appropriations acts).

(9)  52.225-7021, Trade Agreements (NOV 2008) (19 U.S.C. 2501-2518 and 19 U.S.C. 3301 note).

(10)  52.225-7027, Restriction on Contingent Fees for Foreign Military Sales (APR 2003) (22 U.S.C. 2779).

(11)  52.225-7028, Exclusionary Policies and Practices of Foreign Governments (APR 2003) (22 U.S.C. 2755).

(12)(i) \_\_\_ 252.225-7036, Buy American Act--Free Trade Agreements--Balance of Payments Program (MAR 2007) (41 U.S.C. 10a-10d and 19 U.S.C. 3301 note).

(ii) \_\_\_ Alternate I (OCT 2006) of 252.225-7036.

(13) \_\_\_ 252.225-7038, Restriction on Acquisition of Air Circuit Breakers (JUN 2005) (10 U.S.C. 2534(a)(3)).

(14) X 252.226-7001, Utilization of Indian Organizations, Indian-Owned Economic Enterprises, and Native Hawaiian Small Business Concerns (SEP 2004) (Section 8021 of Pub. L. 107-248 and similar sections in subsequent DoD appropriations acts).

(15) \_\_\_ 252.227-7015, Technical Data--Commercial Items (NOV 1995) (10 U.S.C. 2320).

(16) \_\_\_ 252.227-7037, Validation of Restrictive Markings on Technical Data (SEP 1999) (10 U.S.C. 2321).

(17) X 252.232-7003, Electronic Submission of Payment Requests and Receiving Reports (MAR 2008) (10 U.S.C. 2227).

(18) \_\_\_ 252.227-7019, Training for Contractor Personnel Interacting with Detainees (SEP 2006) (Section 1092 of Public Law 108-375).

(19) X 252.243-7002, Requests for Equitable Adjustment (MAR 1998) (10 U.S.C. 2410).

(20)(i) X 252.247-7023, Transportation of Supplies by Sea (MAY 2002) (10 U.S.C. 2631).

(ii) \_\_\_ Alternate I (MAR 2000) of 252.247-7023.

(iii) \_\_\_ Alternate II (MAR 2000) of 252.247-7023.

(iv) \_\_\_ Alternate III (MAY 2002) of 252.247-7023.

(21) \_\_\_ 252.247-7024, Notification of Transportation of Supplies by Sea (MAR 2000) (10 U.S.C. 2631).

(c) In addition to the clauses listed in paragraph (e) of the Contract Terms and Conditions Required to Implement Statutes or Executive Orders--Commercial Items clause of this contract (FAR 52.212-5), the Contractor shall include the terms of the following clauses, if applicable, in subcontracts for commercial items or commercial components, awarded at any tier under this contract:

(1) 252.225-7014, Preference for Domestic Specialty Metals, Alternate I (APR 2003) (10 U.S.C. 2533a).

(2) 252.237-7019, Training for Contractor Personnel Interacting with Detainees (SEP 2006) (Section 1092 of Public Law 108-375).

(3) 252.247-7023, Transportation of Supplies by Sea (MAY 2002) (10 U.S.C. 2631).

(4) 252.247-7024, Notification of Transportation of Supplies by Sea (MAR 2000) (10 U.S.C. 2631).

(End of clause)

(End of clause)

#### 5652.201-9002 Authorized Changes Only by Contracting Officer (2005)

The Contractor shall not comply with any order, direction or request of Government personnel unless it is issued in writing and signed by the Contracting Officer, or is pursuant to specific authority otherwise included as part of this contract. Except as specified herein, no order, statement, or conduct of Government personnel who visit the contractor's facilities or in any other manner communicates with Contractor personnel during the performance of this contract shall constitute a change under the Changes clause in Section I. In the event the Contractor effects any change at the direction of any person other the Contracting Officer, the change will be considered to have been made without authority and no adjustment will be made in the contract price to cover any increase in cost incurred as a result thereof. The address and telephone number of the Contracting Officer is Susan M. Griffin, 813-826-7411 or [griff1@socom.mil](mailto:griff1@socom.mil).

(end of clause)

#### 5652.204-9002 Instructions for the Use of Electronic Contracts (2000)

In accordance with DoD policy, this solicitation and the resulting contract will be executed and documented through electronic means. As a result, the use of the terms "documented," "copy," "printed," "in writing," or "written" within this document shall refer to all electronically transmitted documents that will become part of the electronic contract file and an official government record. Any reference to official signatures and signed documents shall refer to electronic signatures. Whenever an electronic signature is used it shall have to full force and effect as a handwritten signature.

(end of clause)

#### 5652.204-9003 Disclosure of Unclassified Information (2007)

a. On September 21, 2001, the Department of Defense designated Headquarters US Special Operations Command (USSOCOM) a sensitive unit, as defined by Title 10 United States Code (USC) Section 130b (10 USC 130b). In keeping with this designation, unclassified information related to USSOCOM military technology acquisitions managed by USSOCOM or any of its component commands, will be designated Controlled Unclassified Information (CUI). As such, the contractor hereby unequivocally agrees that it shall not release to anyone outside the Contractor's organization any unclassified information, regardless of medium (e.g., film, tape, document, contractor's external website, newspaper, magazine, journal, corporate annual report, etc.), pertaining to any part of this contract or any program related to this contract, unless the Contracting Officer has given prior written approval. Furthermore, any release of information which associates USSOCOM, Special Operation Forces (SOF), or any component command with an acquisition program, contractor, or this contract is prohibited unless specifically authorized by USSOCOM.

b. Request for approval shall identify the specific information to be released, the medium to be used, and the purpose for the release. The contractor shall submit the request to the Contracting Officer at least 45 days before the propose date for release for approval. No release of any restricted information shall be made without specific written authorization by the Contracting Office.

c. The Contractor shall include a similar requirement in each subcontract under this contract. Subcontractors shall submit request for authorization to release through the prime contractor to the Contracting Officer.

d. The Contractor further understands that Title 18 USC Section 701 specifically prohibits the use of the USSOCOM emblem or logo in any medium (e.g., corporate website, marketing brochure, news paper, magazine, etc.) unless authorized in writing by USSOCOM. Forward any request to use the USSOCOM emblem or logo through the Contracting Officer.

(end of clause)

#### 5652.209-9003 Use of Contractor Support/Advisory Personnel as Contract Specialists (2005)

The contractor's attention is directed to the fact that contractor personnel may assist the Government in a contract administrator role for administration of this contract. Execution of this contract constitutes approval to release the contract and contractor's proposal to Government Support Contractors who have signed Non-Disclosure and Rules of Conduct/Conflict of Interest Statements.

(end of clause)

#### 5652.247-9000 Packaging & Marking - F.O.B. Destination (1998)

The shipping, address, contract number, device number, and any other "MARK FOR" information shall be clearly marked on the outside of all packages shipped under this contract. Information shall be easily identified without opening the package. This information shall also be included on the inside of all packages.

(end of clause)

#### Wide Area Workflow Routing Sheet:

1. In accordance with DFARS 232.7002, and SFARS 5652.232-90002, use of electronic payment requests is mandatory. WAWF will speed up payment processing time and allow you to monitor payment status online. There are no charges or fees associated with the use of WAWF. For more information on WAWF, go to <https://wawf.eb.mil>.

2. The accounts payable address can be found on page 1 of the Contract. You can easily access payment information using the DFAS web site at <http://www.dfas.mil>. Your contract number and order number (if applicable), or invoice will be required to inquire status of your payment. Go to DFAS on the web at <http://www.dfas.mil/money/vendor>.

3. The following codes will be required to route your receiving reports, invoices, and additional e-mail to correctly process through the WAWF system.

TYPE OF DOCUMENT:

Vendor/Contractor CAGE CODE:

ISSUING OFFICE DODAAC:

CONTRACT ADMIN DODAAC:

INSPECTION DODAAC/BPN:  PLUS SIX EXT:

ACCEPTOR / SHIP TO DODAAC/BPN:  PLUS SIX EXT:

PAY/DISBURSING OFFICE DODAAC:

E-MAIL POINT OF CONTACT LISTING (maximize use of group e-mail accounts):

INSPECTOR:

ACCEPTOR:

CONTRACT ADMINISTRATOR:

CONTRACTING OFFICER:

Exhibit/Attachment Table of Contents

DOCUMENT TYPE	DESCRIPTION	PAGES	DATE
Attachment 1	Performance Spec., MX-10160 G	18	04-APR-2008
Attachment 2	ITT Subcontracting Plan	8	18-JUN-2008
Attachment 3	Warranty Statement	1	OCT-2007



AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT			1. CONTRACT ID CODE: J	PAGE OF PAGES 1   4
2. AMENDMENT/MODIFICATION NO. P00001	3. EFFECTIVE DATE 06-Apr-2009	4. REQUISITION/PURCHASE REQ. NO. SEE SCHEDULE		5. PROJECT NO. (If applicable)
6. ISSUED BY HQ USSOCOM/SONL/K ATTN: (b)(3) (10 USC § 130b), (b)(6) 7701 TAMPA POINT BLVD MACDILL AFB FL 33621-5323	CODE H92222	7. ADMINISTERED BY (If other than item 6) DCMA VIRGINIA 10500 BATTLEVIEW PKWY. MANASSAS VA 20108-2342		CODE S2404A
8. NAME AND ADDRESS OF CONTRACTOR (No., Street, County, State and Zip Code) ITT CORPORATION (b)(6) 7635 PLANTATION RD ROANOKE VA 24019-3222			9A. AMENDMENT OF SOLICITATION NO.	
			9B. DATED (SEE ITEM 11)	
			X 10A. MOD. OF CONTRACT/ORDER NO. H92222-09-C-0025	
			X 10B. DATED (SEE ITEM 13) 11-Mar-2009	
CODE 13567	FACILITY CODE			
11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS				
<input type="checkbox"/> The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offer <input type="checkbox"/> is extended, <input type="checkbox"/> is not extended.				
<p>Offer must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended by one of the following methods:</p> <p>(a) By completing Items 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.</p>				
12. ACCOUNTING AND APPROPRIATION DATA (If required) See Schedule				
13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACT ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.				
A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.				
B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(B).				
X C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF: FAR 52.217-6 OPTION FOR INCREASED QUANTITY (MAR 1989)				
D. OTHER (Specify type of modification and authority)				
E. IMPORTANT: Contractor <input type="checkbox"/> is not, <input checked="" type="checkbox"/> is required to sign this document and return <u>1</u> copies to the issuing office.				
14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.) Modification Control Number: (b)(6)				
Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.				
15A. NAME AND TITLE OF SIGNER (Type or print)			16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) VERDETTA J WEAVER / CONTRACT SPECIALIST TEL: 813-826-5436 EMAIL: weaver@socom.mil	
15B. CONTRACTOR/OFFEROR  (Signature of person authorized to sign)	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA BY (b)(6)		16C. DATE SIGNED 08-Apr-2009 (Signature of Contracting Officer)

EXCEPTION TO SF 30  
APPROVED BY OTRM 11-84

30-105-04

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

H92222-09-C-0025

P00001

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## SECTION SF 30 BLOCK 14 CONTINUATION PAGE

## SUMMARY OF CHANGES

The purpose of this modification is to a) Increase total amount of contract by exercising option CLIN 0003; b) Exercise Option CLIN 0003; c) Add accounting and appropriation for CLIN 0003; and d) Revise the delivery schedule for CLIN 0003.

## SOLICITATION/CONTRACT FORM

a) Increase total amount of contract by exercising option CLIN 0003:

The total cost of this contract was increased from \$10,476,375.00 by \$946,400.00 to \$11,422,775.00.

## SUPPLIES OR SERVICES AND PRICES

b) Exercise Option CLIN 0003. CLIN 0003 is changed from:

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0003 OPTION	Image Intensifier Assembly FFP Image Intensifier Assembly, 18MM Microchannel Wafer High Performance Tube MX-10160 GS, in accordance with Attachment 1 Performance Specification. ITT Part number 277137 (FY9800YG series). "A" Test Acceptance Test Procedures Apply. CLIN 0003 will be warranted by ITT Corporation for a period of 12 months from the date of shipment in accordance with Attachment 3. This option may be executed within 45 days after contract award. Note: this may not be unilaterally exercised if items are being procured under a foreign military sale (FMS) case. FOB: Destination PURCHASE REQUEST NUMBER: N0016409MP00058	416	Each	\$2,275.00	\$946,400.00
				NET AMT	\$946,400.00

H92222-09-C-0025

P00001

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To Read:

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0003		416	Each	\$2,275.00	\$946,400.00
EXERCISED OPTION	Image Intensifier Assembly FFP Image Intensifier Assembly, 18MM Microchannel Wafer High Performance Tube MX-10160 GS, in accordance with Attachment 1 Performance Specification. ITT Part number 277137 ( FY9800YG series). "A" Test Acceptance Test Procedures Apply. CLIN 0003 will be warranted by ITT Corporation for a period of 12 months from the date of shipment in accordance with Attachment 3. This option may be executed within 45 days after contract award. Note: this may not be unilaterally exercised if items are being procured under a foreign military sale (FMS) case. FOB: Destination PURCHASE REQUEST NUMBER: F2VUF09093A001				

ACRN AD	NET AMT	\$946,400.00
CIN: F2VUF09093A001		

## ACCOUNTING AND APPROPRIATION

c) Add accounting and appropriation for CLIN 0003:

## Summary for the Payment Office

As a result of this modification, the total funded amount for this document was increased by \$946,400.00 from \$10,476,375.00 to \$11,422,775.00.

## CLIN 0003:

AD: 9770300.56SF SD7 52SP 547000 0AW200 00000 000000 667100 F67100 ALD:AA FSR:035792  
 PSR:263033 DS:528327 (CIN F2VUF09093A0010001) was increased by \$946,400.00 from \$0.00 to \$946,400.00  
 The contract ACRN AD has been added.  
 The CIN F2VUF09093A0010001 has been added.

d) Revise the delivery schedule for CLIN 0003 by changing it from:

**DELIVERIES AND PERFORMANCE**

The following Delivery Schedule item for CLIN 0003 has been changed from:

DELIVERY DATE	QUANTITY	SHIP TO ADDRESS	UTC
See FAR 52.217-6	416	CRANE DIVISION NAVAL SURFACE WARFARE CEN [REDACTED] (b)(6) (b)(2)High CRANE IN 47522 [REDACTED] (b)(6) FOB: Destination	N00164

To Read:

DELIVERY DATE	QUANTITY	SHIP TO ADDRESS	UTC
30-APR-2011	195	CRANE DIVISION NAVAL SURFACE WARFARE CEN [REDACTED] (b)(6) (b)(2)High CRANE IN 47522 [REDACTED] (b)(6) FOB: Destination	N00164
31-MAY-2011	221	(SAME AS PREVIOUS LOCATION) FOB: Destination	N00164

(End of Summary of Changes)

**PERFORMANCE SPECIFICATION**

**IMAGE INTENSIFIER ASSEMBLY, 18MM MICROCHANNEL WAFER  
HIGH PERFORMANCE TUBE  
MX-10160 GS**



**NIGHT VISION and ELECTRO-OPTICS DEPARTMENT  
MICROWAVE SYSTEMS DIRECTORATE  
NAVAL SURFACE WARFARE CENTER, CRANE DIVISION**

Naval Surface Warfare Center Crane Division Night Vision/Chemical and Biological Sensors (Code 805)  
Crane Division  
Crane, IN 47522-5001

Distribution Statement A. Approved for public release; distribution is unlimited.

**PERFORMANCE SPECIFICATION**

**IMAGE INTENSIFIER ASSEMBLY, 18MM MICROCHANNEL WAFER  
High Performance Tube**

**1. SCOPE**

1.1. Scope. This specification covers the Image Intensifier Assembly, 18mm Microchannel Wafer, High Performance Image Tube(see 5.1).

## 2. APPLICABLE DOCUMENTS

### 2.1. Government documents.

2.1.1. Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein.

#### SPECIFICATIONS

DEPARTMENT OF DEFENSE  
MIL-PRF-49425

Aviator's Night Vision Imaging System AN/AVS-6(V) ( )

#### STANDARDS

MIL-STD-810F

ENVIRONMENTAL ENGINEERING  
CONSIDERATIONS AND LABORATORY TESTS

2.1.2. Other Government documents, drawings and publications. The following other Government documents, drawings and publications form a part of this document to the extent specified herein. All military and government specifications/standards, excluding MIL-PRF-49425, cited in the following documents are for reference only and do not form a part of the requirements therein.

#### DRAWINGS

NVESD

A3256389

- Image Intensifier Tube, 18mm

2.2. Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

## 3. REQUIREMENTS

3.1. Description. The Image Intensifier Tube, 18mm Microchannel Wafer, High Performance Image Tube herein referred to as the Assembly, shall employ a group III-V compound, semi-transparent photocathode sealed to a glass faceplate forming the input window to the assembly. The assembly shall contain a fiber optic inverter screen. The assembly shall include an integral power supply and be encapsulated within a hard-surface insulating metallized envelope.

3.2. Thresholds/Objectives. Performance parameters and features in this specification are assigned numerical or verbal values. In some instances, objective (O) requirements that exceed the minimum requirements of this specification are identified in conjunction with the minimum or Threshold (T) requirements. In these instances, the threshold and objective parameters will be annotated as such. In the event no (T) or (O) value is assigned, the implied value will be a (T) parameter.

3.3. Certification. Unless otherwise specified by the contract, image intensifier assemblies furnished under this specification shall be products approved as compliant products (see 3.6.23).

3.3.1. Initial Production (IPT). The supplier shall furnish and test assemblies in accordance with requirements identified in 4.2. If the production assemblies are currently qualified on another DoD contract then IPT can be waived as the assemblies may be qualified by similarity.

3.4. Construction. The Image Intensifier Assembly shall be constructed in accordance with the contract or purchase order, Drawing A3256389 and all the requirements of this specification.

3.4.1. Weight. The weight of the assembly shall not exceed 85 grams.

3.4.2. Parts and Materials. Parts and materials shall be as specified and as defined by the applicable drawing (see 3.4). The contractor shall select parts and materials which shall be capable of meeting all of the operational and environmental requirements specified. Any change of a part or material after certification requires notification of the procuring activity and submittal of proposed re-certification. Recovered materials shall be used to the maximum extent possible.

3.4.3. Phosphor screen. The phosphor screen shall be type P-43.

3.4.4. Components. The following requirements shall be met by each assembly delivered without damage (see 3.5.9) nor degradation of performance (see 3.5.31) to the assembly.

3.4.4.1. Power supply. The integral power supply shall meet all of the operational characteristics when powered by one "AA" alkaline battery, or one BA-5567/U lithium battery or an equivalent 1.5 to 3.0 volts direct current (Vdc) power source.

3.4.4.2. Fiber optic inverter. The fiber optic inverter shall exhibit the following characteristics:

3.4.4.2.1. Shear distortion. Shear distortion (see 3.6.3.1) shall not exceed 25 micrometers over the display area.

3.4.4.2.2. Gross distortion. Gross distortion (see 3.6.3.2) shall cause no point on the image of a straight line, through any axis, to be displaced more than  $\pm 30$  microns relative to the best-fit straight line (see 3.6.3.3). Displacement measurements shall be rounded to the nearest whole micron. The maximum slope of the straight line image shall be less than 15 microns per millimeter across the line image and less than 25 microns per any two millimeters from the best-fit straight line. Distortion shall be measured along 4 axes, which are 45 degrees apart. Distortion measurements shall be initiated from an identifiable reference point located on the fiber optic inverter. The line image cannot have more than two slope reversals. Slope reversals less than  $\pm 5$  microns shall not be considered as a change in slope.

3.4.4.2.3. Image inversion. The fiber optic inverter shall rotate a straight line image  $180 \pm 1$  degree in a clockwise direction when viewed from the display side relative to the end points of the best-fit straight line (see 3.6.3.3). Image inversion measurements shall be rounded off to the nearest tenth of a degree.

3.4.4.2.4. Chicken wire. When the fiber optic is uniformly illuminated and viewed under 10-power magnification perpendicular to the plane surface, the fiber optic shall meet the chicken wire (see 3.6.4) limits specified in Table I.

TABLE I. Fiber optic allowable chicken wire.

Number of allowable incidences	Minimum length (inches)	Maximum length (inches)
Chicken wire (zone 1) 0 Disregard lengths which are not greater than 0.003 inches.	>0.003	---
Chicken wire (zone 2) 0 3	0.030 0.015	>0.030 <0.030

18 each spaced $\geq 0.035$ inches apart. Disregard lengths which are not greater than 0.003 inches.	$>0.003$	$<0.015$
Chicken wire (zone 3)		
0	0.045	$>0.045$
6	0.030	$<0.045$
12	$>0.019$	$<0.039$
Disregard lengths which are not greater than 0.019 inch.		

Zone 1 - 0.295 inch diameter circle in center of optic.

Zone 2 - 0.295 to 0.580 inch annulus concentric with Zone 1.

Zone 3 - 0.580 to 0.710 inch annulus concentric with Zone 2.

#### 3.4.4.3. Microchannel plate.

3.4.4.3.1. Ion barrier film quality (if necessary). There shall be no more than 10 type-B holes over the total useful area of the output screen. There shall be no more holes present with an effective diameter greater than 125 micrometers.

3.4.4.4. Input faceplate. The input faceplate shall be of optical quality with a minimum of a 60/40 (scratches/digs) finish and flat within 10 fringes using the sodium D light.

3.4.5. Chrome. There shall be no visible chrome present between the cathode and the black glass of the input faceplate.

3.4.6. System interface. When inserted into a certified ANVIS binocular assembly, the assembly shall operate and allow the objective lens to be focused from 28cm through infinity, and allow the eyepiece lens to be focused from +2 to -6 diopters. There shall be no flashing, flickering, or intermittent operation of the binocular.

3.4.7. Identification and marking. Each assembly shall be marked in accordance with drawing A3256389 as specified by customer.

3.4.8. Workmanship. The image intensifier assembly shall be free from burrs, chips, dirt, or any embedded or surface foreign material. Optical surfaces shall be free from imperfections that adversely affect the prescribed performance. Optical element surface quality shall be consistent with the best commercial practices.

3.5. Operational performance requirements. Unless otherwise specified herein, all operational performance requirements shall be complied without damage (see 3.5.9) nor degradation of performance (see 3.5.31).

- a. The radiation source used for evaluation of photocathode sensitivity, EBI, luminance gain, signal-to-noise, output brightness uniformity, chrome, and reliability shall be a tungsten filament lamp operated at a color temperature of  $2856 \pm 50$  Kelvin (K).
- b. The radiation source used for evaluation of ion barrier film quality (if necessary), burn-in/ESS, temperature cycling, temperature extremes, environmentals, halo, bright source protection, fixed pattern noise, image alignment, resolution, MTF, useful cathode diameter, screen quality, luminance persistence, and EMI shall be a tungsten filament lamp operated at a color temperature of 2700K to 2900K.
- c. The photometer used for screen brightness measurements shall be calibrated against a standard source as specified below:



- (1) Tungsten filament lamp operated in conjunction with an opal glass or integrating sphere such that the color temperature of the radiation emitted from the opal glass or integrating sphere is  $2856 \pm 50\text{K}$ .
  - (2) Opal glass or integrating sphere to produce a uniform, Lambertian distribution.
  - (3) Corning spectral filters, nos. 3-71 and 4-67, or equivalent.
  - (4) Output brightness of 0.1 to 1.0 foot-lamberts (fl) uniformly distributed over the output aperture.
- d. Tolerances on radiation levels shall be  $\pm 20$  percent.
  - e. Meters used for monitoring lamp current and voltage shall have an accuracy of  $\pm 0.25$  percent.
  - f. Tests unless otherwise specified shall be performed at room temperature (see 3.6.7).
  - g. Neutral density filters used in test equipment shall have transmission characteristics with 10 percent of the nominal filter transmission from 0.35 to 1.0 micrometer.
  - h. Input voltage on the assembly shall be  $3.0 \pm 0.05$  Vdc.
  - i. All gain and environmental tests except humidity shall be performed in a grounded housing.
  - j. Environmental test chambers shall maintain the temperature within  $\pm 2^\circ\text{C}$  of the specified test temperature.
  - k. All measurements of time shall be with a calibrated device capable of indicating a time variance one-half of the smallest increment required or smaller (i.e., requirement 1 second, indicator 0.5 second) and be calibrated to  $\pm .010$  of the required increment.

3.5.1. Photocathode sensitivity. Over a 16mm useful diameter circle with 0.001 lumen of radiation, the luminous transmission sensitivity shall be not less than 1,800 (T), 2,200 (O), micro-amperes per lumen ( $\mu\text{A/lm}$ ) with a voltage of not greater than 1200 Vdc applied to the photocathode. Over a 16mm useful diameter circle with filtered radiation between  $1 \times 10^{-6}$  to  $5 \times 10^{-6}$  watt, the radiant sensitivity shall be not less than 190 (T), 220 (O) milliamperes/watt at  $0.830 \pm 0.001$  micrometer and 80 (T), 110 (O) milliamperes/watt at  $0.880, \pm 0.001$  micrometer with a voltage not greater than 1200 Vdc applied to the photocathode.

3.5.2. Equivalent background input (EBI). The equivalent background input at room temperature shall not exceed  $3.0 \times 10^{-11}$  (T),  $2.5 \times 10^{-11}$  (O) phot (lumens/square centimeter) when tested at  $23^\circ\text{C} +0^\circ/-2^\circ\text{C}$ .

3.5.3. Luminance gain. The assembly shall exhibit a room temperature luminance gain and high light level saturation characteristics per Table II.

TABLE II. Saturation requirements for luminance gain.

Nominal Light input (fc)	Minimum Allowable Gain	Minimum allowable output (fl)	Maximum allowable gain	Maximum allowable output (fl)	Maximum Allowable input current (mA)
--------------------------	------------------------	-------------------------------	------------------------	-------------------------------	--------------------------------------

	(T/O)				
$2 \times 10^{-6}$	40K/50K	NA	80K	NA	45
$2 \times 10^{-4}$	10K/12.5K	NA	21K	NA	45
1.0	NA	2.5	NA	4.2	NA
20.0	NA	2.5	NA	4.2	NA

3.5.4. Halo. The halo (see 3.6.8) produced by projecting light through an aperture and the AN/AVS-6(V)3 objective lens onto the input of the assembly, such that a  $0.350 \pm 0.02$ mm diameter spot is produced on the photocathode, shall be no greater than 1.0 (T), .8 (O) mm in diameter. The illumination in the spot shall be not less than  $5 \times 10^{-4}$  foot-candle (fc). The illumination incident on the photocathode in the region outside the 0.350mm spot shall not exceed  $5 \times 10^{-7}$  fc.

3.5.5. Bright source protection. With operating potential applied, the assembly shall not be damaged (see 3.6.9) when subjected to an input illumination of not less than 50 milli-lumens concentrated on the photocathode within an area no greater than one square millimeter for a time interval not less than one minute. There shall be no discernible damage (see 3.6.9) after a non-operating period of not more than 24 hours.

3.5.6. Signal-to-noise ratio. The signal-to-noise (S/N) ratio (see 3.6.30) shall be a minimum of 25.0 (T), 28.0 (O).

3.5.7. Fixed pattern noise.

3.5.7.1. Multi-to-multi pattern variation. With the operating potential applied to the assembly and the entire photocathode uniformly illuminated at a level of 1 to  $2 \times 10^{-4}$  fc, multi-to-multi brightness deviations from the mean value shall not exceed  $\pm 10$  percent.

3.5.7.2. Multi-boundary pattern noise. With the operating potential applied to the assembly and the entire photocathode uniformly illuminated at a level of 1 to  $2 \times 10^{-4}$  fc, the average value of the brightness deviations of the multi-boundary intensities shall not deviate from the mean value of the adjacent multi intensities by more than  $\pm 10$  percent. The mean value shall be established from the three adjacent multies containing the above multi-boundaries.

3.5.8. Output brightness uniformity. When the photocathode is uniformly illuminated with between  $5 \times 10^{-6}$  and  $1 \times 10^{-5}$  fc of light, the output brightness uniformity shall be such that the ratio of the maximum to minimum brightness variation over the useful screen area shall not exceed 3:1. For input illumination of 1 to  $3 \times 10^{-10}$  watt of radiation of wavelength  $0.830 \pm 0.001$  micrometer, the ratio shall not exceed 3:1. Under the same conditions, when the screen is viewed with a 10-power magnifier, the background shading shall be uniformly graded with no distinct lines of demarcation between the light and dark areas.

3.5.9. Image alignment. With the operating potential applied and the photocathode illuminated to provide best contrast, a test reticle projected on the photocathode of the assembly concentric with the optical axis shall produce an image on the screen of the assembly such that the center of the reticle's image shall fall within a circle 0.006 inch in diameter concentric with the optical axis of the assembly.

3.5.10. Resolution.

3.5.10.1. Center resolution. The limiting resolution (see 3.6.16) of the assembly at the optical axis (see 3.5.15), referenced to the photocathode, shall not be less than 64 line pairs per millimeter (lp/mm) (T), 72 line pairs per millimeter (lp/mm) (O).

3.5.10.2. Peripheral resolution. The limiting resolution (see 3.6.16) of the assembly at points along a 14mm diameter circle concentric with the optical axis (see 3.5.15), referenced to the photocathode, shall not be less than 57 lp/mm.

3.5.10.3. High light level center resolution. With the entire photocathode of the assembly illuminated with not less than 20 fc, the minimum center resolution shall be 36 lp/mm.

3.5.11. Modulation transfer function. With an input illumination of not greater than  $8 \times 10^{-4}$  fc, the minimum assembly modulation transfer function (MTF) (see 3.6.12) shall be as follows:

- a. 61 percent MTF at 15.0 lp/mm
- b. 38 percent MTF at 25.0 lp/mm

Measurement at the following two points shall be taken for information only:

- c. MTF at 2.5 lp/mm
- d. MTF at 7.5 lp/mm

3.5.12. Useful cathode diameter. The useful cathode diameter shall be not less than 17.5mm.

3.5.13. Screen quality. With no light input to the assembly, observe and locate bright spots or discernible field emissions (see 3.6.13) on the screen when viewed with a 10-power magnifier. With  $2 \times 10^{-6}$  fc incident on the photocathode, there shall be no bright spots or discernible field emissions (see 3.6.13) brighter or larger than the background scintillations (see 3.6.14) on the screen when viewed with a 10-power magnifier. With the radiation level on the photocathode adjusted to obtain the best contrast, there shall be no bright spots visible on the screen when viewed with a 10-power magnifier except those identified as type B holes per 3.3.3.3.1. The dark spots which exceed a contrast (see 3.6.22) of 30 percent of their surrounding areas shall not exceed the sizes and quantities specified in Table III. If the spot is non-circular, the diameter of the circular spot of an equal area shall be used. When the distance between two spots is less than the maximum dimension of either spot, the two spots shall be considered as one circular spot whose diameter is equal to the sum of the maximum dimensions of the two spots plus the amount of separation between them. Graininess caused by grainy or "peppery" phosphor screen, channel-to-channel gain variations, or photocathode irregularities (see 3.6.20) shall not be discernible over the useful diameter to the degree that it detracts from normal operation, when viewed with a 10-power magnifier and with the photocathode uniformly illuminated. Screen quality shall also include any dirt, lint, hair, or red spots, which indicates phosphor contamination. No dirt, lint, hair, or red spots shall be visible on the screen when viewed with a 10-power magnifier.

TABLE III. Tube assembly dark spots.

Size of spots (inches)	Number of Spots within 0.22 inch diameter circle	Number of spots within annulus bounded by 2 circles 0.22 and 0.58 inch diameter	Number of spots within annulus bounded by circles 0.58 inch diameter and total screen diameter
0.009 or larger	0	0	0
0.006 to 0.009	0	1	1
0.003 to 0.006	0	2	2

NOTE: The 0.22 and 0.58 inch circles on the image screen shall be concentric with the optical axis of the assembly and the total number of spots in all zones shall not exceed four.

3.5.14. Luminance persistence. When an illumination of  $4 \times 10^{-3}$  fc is gated OFF, output brightness of the assembly shall fall to not greater than 0.15 percent within 300 milliseconds.

3.5.15. Veiling glare off-axis. The off-axis veiling glare (see 3.6.24) exhibited by the assembly in the AN/AVS-6 system shall not exceed the limits of Table IV when a point light source illuminates the objective's entrance pupil at a level of  $2.0 \pm .5 \times 10^{-4}$  fc. The point source shall subtend less than 0.7 milliradians. The average tube (phosphor) background brightness shall be less than or equal to  $1.5 \times 10^{-3}$  fl.

The off-axis veiling glare requirement shall be from 2° to 70° beyond the field-of-view (FOV) of the objective lens.

TABLE IV. Off-axis veiling glare.

Point Source Angle (Degrees off Optical Axis)	Maximum Intensity of Veiling Glare Image (foot-lamberts)
2°	0.25
3°	0.15
4°	0.10
5°	0.08
6° - 70°	0.06

3.5.16. Environmental Characteristics. The assembly shall not be damaged (see 3.6.9) nor suffer degradation of performance (see 3.6.31) and shall meet the performance requirements specified herein when subjected to the following environmental conditions:

3.5.16.1. Environmental stress screening (ESS). Each assembly shall be subjected to an appropriate ESS for the purpose of elimination of workmanship/infant mortality type failures (see 3.6.9).

3.5.16.2. Vibration. The assembly, with no operating voltage applied, shall not be damaged nor suffer degradation of performance after being subjected to resonance search (see 3.6.21), resonance dwell, and cycling with vibrations of the frequency and amplitude represented in Figure 2 applied both parallel to and perpendicular to the optical axis of the assembly for not less than one (1) hour in each axis.

3.5.16.3. Shock. With no radiation incident on the photo-cathode, the operating assembly shall not be damaged nor suffer degradation of performance when subjected to 6 shock impacts parallel to the optical axis and 6 shock impacts perpendicular to the optical axis with no more than 2 flashes in each axis. Impacts shall be half-sine wave with a minimum peak amplitude of 75g's (see 3.6.5) and a duration of  $6 \pm 2$  milliseconds measured at the 10 percent amplitude points.

3.5.16.4. Temperature extremes. The assembly shall meet the requirements specified in 3.5.16.1 and shall not be damaged nor suffer degradation of performance by continuous operation from +52°C to -37°C or operation after storage from +85°C to -37°C. The assembly shall not be damaged nor suffer degradation of performance by sudden temperature changes from +23°C to +85°C, +85°C to +23°C and from +23°C to -37°C, -37°C to +23°C each transition occurring within five (5) minutes. Room temperature pre-test and room temperature post-test values shall be taken. Soak time at each temperature extreme shall be sufficient to attain temperature stabilization.

3.5.16.4.1. Operating requirements for +52°C and -37°C.

- a. Input current - not greater than 57 mA at +52°C and 46 mA at -37°C.
- b. Gain at  $2 \times 10^6$  fc - between 25,000 and 110,000 at both temperatures.
- c. Gain at  $2 \times 10^4$  fc - between 10,000 and 24,000 at both temperatures.
- d. Operational stability at > 1 FL tube output:

(1) For a period of 2 minutes after an initial operating time of 2 seconds, the output brightness shall not fluctuate more than +/- 10 percent from steady state and shall not drift more than +/- 15 percent from steady state. All fluctuations shall be random after the initial 2 seconds. There shall be no flickering, flashing, or blinking visible to the naked eye.

(2) Rise time (see 3.6.6) shall not be greater than 7 seconds and overshoot (see 3.6.17) shall not be greater than 40 percent of steady-state output brightness.

- e. Gain and EBI: The variation between the beginning of temperature testing room temperature pre-test gain, and the completion of temperature testing room temperature post-test gain shall not be greater than  $\pm 20$  percent. Post-test EBI shall be as specified in 3.6.2.

3.5.16.5. Humidity. The unprotected tube assembly shall not be damaged nor suffer degradation of performance when subjected to not less than 90 percent relative humidity at temperatures varying between 21°C and 65°C for a period of not less than 240 hours. The gain and input current shall not vary more than  $\pm 20$  percent, the equivalent background input (EBI) shall not exceed  $3.0 \times 10^{-11}$  lm/cm<sup>2</sup>, and all parameters must remain within specified limits.

3.5.17. Electromagnetic interference (EMI). The assembly, when properly incorporated within a certified AN/AVS-9 system shall be qualified by similarity with MIL-PRF-A3279454 (NVI) 03 May 2002.

3.5.18. Reliability. The assembly shall have a minimum mean time to failure of not less than 7,500 hours (1,500 hours accelerated) (T), 10,000 hours (2,500 hours accelerated) (O) when operated under the environmental and operational conditions specified in 4.2.1. The reliability test sample size and acceptance criteria shall be as specified in the Government approved Quality Validation Plan (QVP). Note that the QVP will require the supplier conduct reliability testing on all production lots unless otherwise authorized by the Government. Following and during reliability testing, the assembly shall exhibit neither damage (see 3.6.9) nor degradation (see 3.6.31) of performance and shall comply with the requirements specified in Table V. Failures of the power supply shall be considered relevant.

TABLE V. Reliability acceptance levels.

Requirement	Acceptance level
Luminance Gain at $2 \times 10^{-6}$ fc	35,000 to 95,000
EBI	$3.0 \times 10^{-11}$ fc maximum
Signal-to-noise	21.0:1 (T), 23.0:1 (O) minimum
Center resolution	64 lp/mm
High-light level center resolution	36 lp/mm
Useful cathode diameter	17.5 mm minimum
Output brightness uniformity	per 3.5.8
Screen quality	per 3.5.13

3.5.19. Storage life. The assembly shall exhibit neither damage (see 3.6.9) nor degradation of performance (see 3.6.31) during a storage period of not less than 60 days at room temperature (see 3.5.7) preceded by an exposure to 12 continuous temperature cycles of +85°C to -37°C. During cycling, the assembly shall remain at each temperature extreme until the assembly is thermally stabilized, and the chamber temperature rate of change shall be not less than 3°C per minute during transitions. As a minimum, conformance to the luminance gain, input current, signal-to-noise ratio, output brightness uniformity, screen quality, and useful cathode diameter requirements shall be verified upon completion of the 60 day storage period.

3.6. Technical interpretations. The following technical interpretations shall be, when referenced in section 3 mandatory for this specification.

3.6.1. Photocathode. The glass input window with a gallium arsenide substrate bonded to it is referred to as the photocathode:

3.6.2. Phosphor. The phosphor shall be type P-43 as defined commercially.

3.6.3. Distortion. The two types of distortion are shear distortion and gross distortion.

3.6.3.1. Shear distortion. Causes the image of a straight line to have a discrete, localized lateral displacement (break). Shear distortion is due to localized misalignment errors in the assembly of fibers or multifibers. Shear distortion in fiber bundles is sometimes referred to as incoherences.

3.6.3.2. Gross distortion. Causes the image of a straight line to curve. Gross distortion is caused by a long-range deformation of flow of fibers during fabrication.

3.6.3.3. Best-fit straight line. A straight line intersecting the +8 and -8 millimeter points of the input straight-line image. The +8 and -8 millimeter measurements are relative to the projected pattern center point.

3.6.4. Chicken wire. Defined as a predominant pattern of dead fibers, which has a diameter not greater than 0.0009 inch (2 single fibers) whose light transmission is so degraded that with light projected through the optic, single fibers in the area in question cannot be distinguished or identified as single fibers with the use of 50-power magnification.

3.6.5. "g". A "g" is defined as a unit of gravitational force (on earth) to which an object is subjected.

3.6.6. Rise time and decay time. The rise time required for the assembly to achieve 50 percent of its steady-state performance after the voltage source is applied to the assembly. The decay time is the time required for the assembly to achieve the screen brightness not greater than  $1 \times 10^{-3}$  fl after the voltage source is disconnected.

3.6.7. Room temperature. Room temperature is defined as  $+23^{\circ}\text{C} +10/-2^{\circ}\text{C}$ .

3.6.8. Halo. Halo is defined as a circular area of bright-ness evidenced on the assembly output imaging screen occurring as a result of a small bright source input and concentric with the input.

3.6.9. Damage. Damage is defined as:

- a. Electrical failure or malfunctioning, intermittent or continuous, including arcing, corona, flashing, bright spots, flickering, blinking, or a change in input current greater than  $\pm 1.0$  mA and more than  $\pm 20$  percent during or subsequent to completion of ESS testing and during the humidity testing.
- b. Cracks, breakage, deformation, burrs, corrosion, or deterioration of any part or finish, and missing or loose components.
- c. Imperfections in or on optical components that adversely affect optical performance.

3.6.10. Multi-to-multi pattern variation. Discernible spatial gain variation between individual multi-patterns or groups of multi-patterns.

3.6.11. Multi-boundary pattern noise. Discernible spatial gain variation between peripheral and interior channels or groups of channels in a multi-pattern.

3.6.12. Modulation transfer function (MTF). Modulation transfer function is a measure of the degradation of an image as it appears at the output screen of the assembly as correlated to the input pattern which is normalized to 100 percent contrast at a spatial frequency equal to or less than 0.2 lines per millimeter.

3.6.13. Field emission. Discernible field emission is voltage-dependent extraneous emission, which appears as bright spots or a pattern that may flicker or appear intermittently on the image screen in one general area. Field emission is voltage dependent and is best observed with a low level of radiation incident on the photocathode.

- 3.6.14. Scintillations. Bright spots, which occur on the image screen randomly in space and time.
- 3.6.15. Optical axis. The optical axis of the assembly is defined as the mean centerline of that cylindrical portion of the assembly used to align the assembly in the system housing.
- 3.6.16. Limiting resolution. Limiting resolution is defined as the smallest resolution pattern for which the observer can see and distinguish between the black lines and the clear area between the black lines in both the vertical and horizontal test patterns.
- 3.6.17. Overshoot. The percent amplitude of output brightness above a steady-state condition at turn-on.
- 3.6.18. Type-B hole defect. When the photocathode of a packaged tube is illuminated with not less than  $1 \times 10^{-1}$  fc, a type-B hole is a hole in the ion barrier which exists over a series of channels having an area equal to a circle with effective diameter not greater than 125 micrometers.
- 3.6.19. Useful area. The useful photocathode and phosphor screen area shall comprise a circle of diameter not less than 17.5 millimeters centered on the assembly optical axis.
- 3.6.20. Photocathode irregularities. Imperfections in the photocathode, which lead to significantly, degraded image quality. A photocathode grown on a host crystal cut more than 0.5 degree off the proper crystallographic axis, which leads to a terraced crystal surface; and hillocks or craters due to foreign inclusions in the crystal growth.
- 3.6.21. Resonant frequency. A resonant frequency is defined as any frequency where the response amplitude is greater than or equal to two times the input vibration amplitude at that frequency.
- 3.6.22. Contrast. Contrast is defined as  $\frac{B1 - B2}{B1 + B2}$ .
- B1 is the brightness surrounding the dark spot.  
B2 is the brightness of the dark spot.
- 3.6.23. Compliant Product. For the purposes of this specification, a compliant product is a product that has successfully met all of the requirements of an IPT which verifies all requirements of this specification have been met. Should the supplier at any time make substantial changes in the process used to produce a compliant product for the Federal Government, the Government will determine what testing is necessary to verify continued compliance to specification requirements for all characteristics of the product affected by the changes.
- 3.6.24. Veiling glare. Veiling glare shall be defined as ghost images, crescents or other geometrically shaped images appearing in the system's field-of-view, when a bright point source is outside the field-of-view and illuminating the entrance pupil of the objective lens.
- 3.6.25. Dirty window. A cosmetic defect in the gallium arsenide photocathode that reduces or impairs the image definition of the tube assembly.
- 3.6.26. Luminance transmission sensitivity. The photo current (in microamperes), corrected for leakage and dark current, divided by the actual input (in lumens).
- 3.6.27. Radiant sensitivity. Total tube current (minus photocathode leakage and dark current) divided by the actual input radiation (in watts).
- 3.6.28. EBI. EBI is defined as  $[R_1/(R_2-R_1)] \times$  actual input illumination where R1 is defined as the stabilized screen brightness (in fl) with no radiation incident on the photocathode and R2 is the screen brightness (in foot-lamberts) when the photocathode is illuminated by  $3.5$  to  $7 \times 10^{-11}$  phot (lumens/square cm) uniformly

distributed over the full useful diameter centered on the photocathode faceplate. The angle of incident flux shall not be greater than 2 degrees from perpendicular such that the acceptance angle covers the full 17mm.

3.6.29. Luminance gain. When the photocathode of the operational tube assembly is illuminated with input light uniformly distributed over the full useful diameter of the faceplate, the luminance gain is defined as the screen luminance (in fl) divided by the actual input illumination (in fc) where screen luminance is measured such that the acceptance angle (of the measuring instrument) subtends a 17mm diameter area centered on the phosphor screen.

3.6.30. Signal-to-noise. Signal-to-noise is a measure of the image intensifier tube's average output brightness (signal) divided by the standard deviation of output brightness (noise) per the following equation:

$$S/N = (S_0 - S_{bkd}) / K(N_0^2 - N_{bkd}^2)^{0.5}$$

where,

S	=	dc signal
N	=	rms noise
S <sub>0</sub>	=	average signal output from the S/N test set
S <sub>bkd</sub>	=	average background signal from S/N test set with light input off
N <sub>0</sub>	=	noise output from S/N test set rms meter
N <sub>bkd</sub>	=	background noise from S/N test set rms meter with light input off

K = correlation factor to obtain a S/N ratio over an equivalent bandwidth of 10 Hz independent of assembly frequency response. K = 1.15 for a P-43 phosphor.

These statistics are measured with a specified input spot of light of 0.2-millimeter diameter placed within a 1-millimeter radius from the assembly optical axis, and at a light level of  $1 \times 10^{-5}$  fc of  $2856 \pm 50K$  black body irradiance. The standard deviation of brightness is measured over a 10-Hertz noise equivalent bandwidth.

3.6.31. Degradation of performance. Degradation of performance is defined as a cumulative change in measurable characteristics, which can result in failure of the assembly to meet specified requirements.

#### 4. VERIFICATION

4.1 Applicability. For the purposes of confirming reliability and environmental compliance, the Government will accept existing qualifications issued under active U.S. Government contracts for image tubes built on the same production line in lieu of forming a unique test lot specific to this contract.

4.2. Classification of inspections. The inspection requirements specified herein are classified as follows:

- a. Initial production testing (IPT)
- b. Conformance inspection (CI)

4.3. Reliability test conditions.

4.3.1. Environmental conditions. Samples selected for reliability verification shall first demonstrate compliance to the requirements of shock (see 3.4.16.3), temperature extremes (see 3.4.16.4), and humidity (see 3.4.16.5). Reliability verification shall be conducted at a temperature not less than 40°C.



4.3.2. Operational conditions. The assemblies shall be continuously cycled for 11 minutes of ON time followed by 1 minute OFF. Input voltage to the assembly shall be 2.7 to 3.0 Vdc. Each assembly shall be continuously illuminated with not less than  $5 \times 10^{-5}$  fc. Once during each 11 minute period the illumination shall be increased to  $5 \times 10^{-4}$  fc for 5 seconds, reduced to  $5 \times 10^{-5}$  fc for not less than 5 minutes, and then increased to 5 fc for not less than 3 seconds. Sufficient instrumentation shall be provided to ensure immediate recognition of a catastrophic failure as well as a change in output brightness. The assemblies shall remain on test until each assembly has completed 1,500 (T), 2,000 (O) hours of operation; assemblies shall be removed from test conditions for not more than 15 hours at any given time for measurement of assembly parameters. Failed assemblies, which have been removed from test, shall not be replaced.

## 5. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory).

5.2. Intended use. The assembly is intended for use in the following systems: AN/PVS-18 and AN/PVS-15 Night Vision Imaging Systems, electro-optical viewing devices capable of intensifying low light levels such that a visible image is presented for viewing purposes.

5.3. Certification requirements. With respect to products requiring certification, unless otherwise specified by the contract or purchase order, if a product is not certified at time of award, the contract shall require certification prior to first delivery. For the purposes of this specification, the activity responsible for approving certified products is the Night Vision and Electro-Optics Department, Microwave Systems Directorate, Naval Surface Warfare Center, Crane Division.

## 5.4. Subject term (key word) listing.

ANVIS  
Tubes

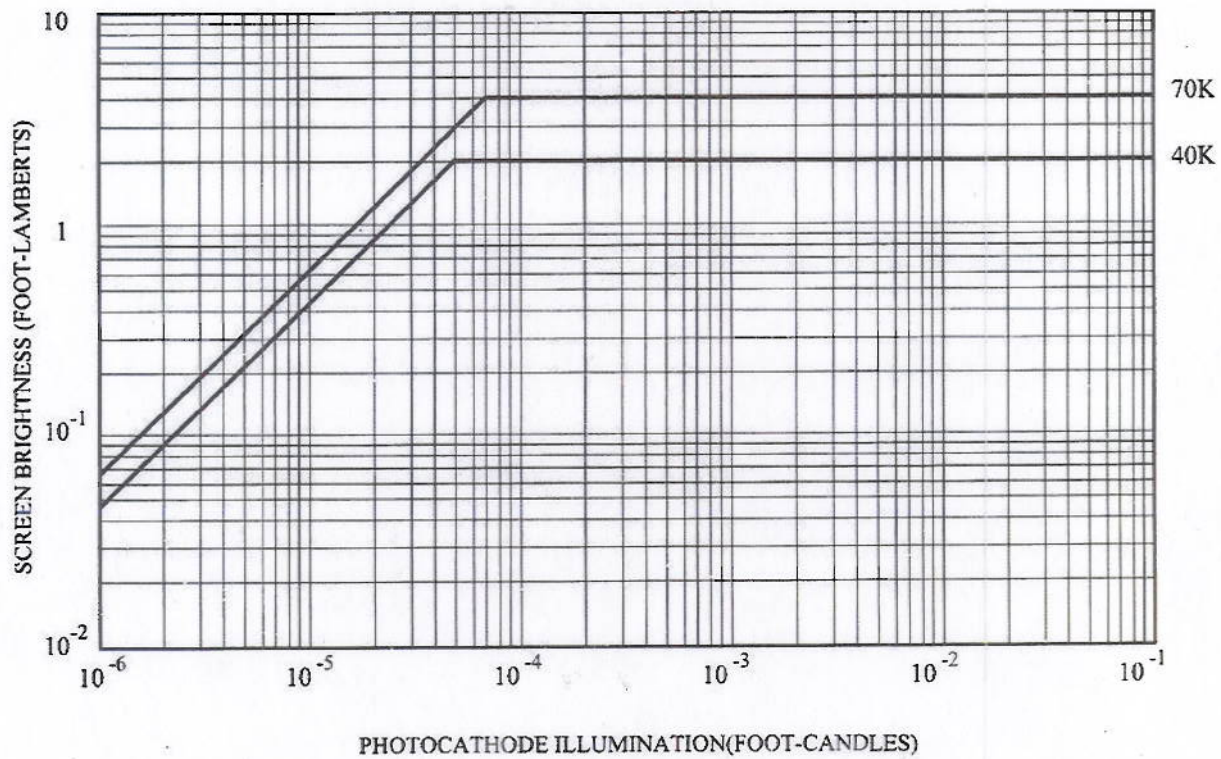


FIGURE 1. Gain/saturation requirement.



ITT

**SUBMITTED IN ACCORDANCE WITH PUBLIC LAW 95-507  
UTILIZATION OF SMALL, SMALL DISADVANTAGED, WOMEN-OWNED,  
HISTORICALLY UNDERUTILIZED BUSINESSES (HUBZONE) VETERAN OWNED  
AND SERVICE-DISABLED VETERAN OWNED SMALL BUSINESS CONCERNS**

1. Request For Proposal: H92222-08-R-0040  
S.O. #634066  
F9800YG, IMAGE INTENSIFIER  
PN277137

HQ USSOCOM SOAL-K (H92222)  
ATTN: (b)(3) (10USC §130(b), (b)(6))  
7701 TAMPA POINT BLVD  
MACDILL AFB, FL 33621

2. Contractor Name: ITT NIGHT VISION  
7635 Plantation Road  
Roanoke, Virginia 24019

3. Name of individual completing this plan:  
(b)(6)

4. Subcontracting Goals:

	<u>Contract Value</u>	<u>Material Costs</u>	<u>Subcontracted Material Dollars Based On Material Costs</u>	<u>Subcontracted Material Percentages Based On Material Costs</u>
	\$(b)(4)	\$(b)(4)		
<u>(Based on 1,000 units)</u>				
<u>Large Business</u>			\$	
<u>Small Business</u>			\$	
<u>Small Disadvantaged Business</u>			\$	
<u>Woman Owned Small Business</u>			\$	(b)(4)
<u>Underutilized (HUB Zone) Business</u>			\$	(b)(4)
<u>Veteran-Owned Small Business</u>			\$	
<u>Service Disabled Veteran-Owned Small Business</u>			\$	



- 4a. The following percentage goals (expressed in terms of a percentage of total planned subcontracting dollars) are applicable to the requirements cited above or to the contract awarded under Request For Proposal # H92222-08-R-0040.
- (i) **Small Business Concerns:**  
Percentage of total planned subcontracting goals under this contract will go to subcontractors who are small business concerns. Subcontracts estimated for Small Business concerns is \$ (b)(4). Small Disadvantaged, Women-Owned, HUB Zone, Veteran-Owned and Service Disabled Veteran Owned Small Business dollars are included in the total amount awarded to Small Business concerns.
  - (ii) **Small Disadvantaged (Certified) Business Concerns:**  
Percentage of total planned subcontracting goals under this contract will be awarded to subcontractors who are small business concerns owned and controlled by socially and economically disadvantaged individuals, whom has received certification through the Small Business Administration. Subcontracts estimated for Small Disadvantaged Business concerns is \$ (b)(4).
  - (iii) **Women-Owned Business Concerns:**  
Percentage of total planned subcontracting goals under this contract will be awarded to subcontractors who are Women-Owned business concerns. Subcontracts estimated for Women-Owned business concerns is \$ (b)(4).
  - (iv) **Underutilized (HUB Zone) Business:**  
Percentage of total planned subcontracting goals under this contract will be awarded to subcontractors who are located in Underutilized (HUB Zone) business areas. Subcontracts estimated for Underutilized (HUB Zone) business concerns is \$ (b)(4).
  - (v) **Veteran-Owned Small Business:**  
Percentage of total planned subcontracting dollars under this contract will be awarded to subcontractors who are Veteran-Owned Small business concerns. Subcontracts estimated for Veteran-Owned Small Business concerns is \$ (b)(4).
  - (vi) **Service Disabled Veteran-Owned Small Business:**  
Percentage of total planned subcontracting goals under this contract will be awarded to subcontractors who are Service Disabled Veteran-Owned Small Business concerns. Subcontracts estimated for Service Disabled Veteran-Owned Small Business concerns is \$ (b)(4).
  - (vii) **Large Business:**



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Percentage of total planned subcontracting dollars under this contract will be awarded to subcontractors who are Large business concerns. Subcontracts estimated for Large business concerns is \$ (b)(4).

- (viii) The total estimated goals of planned subcontracting (to all types of business concerns) for this solicitation, is \$ (b)(4).
- 4b. The following principal products and/or services will be subcontracted under this contract, and the distributed among Small, Small Disadvantaged, Women-Owned, HUB Zone, Veteran-Owned and Service Disabled-Veteran Owned Small business concerns:
- 4c. (b)(4) or Historically Black Colleges/Universities /Minority Institution (HBCU/MI) programs into any business classifications listed in this Subcontracting Plan.

SEE THE FOLLOWING TABLE



<u>Small Business Business Commodities</u>	<u>Small Business Suppliers</u>	<u>Certified Small Disadvantaged Business (SDB) Commodities</u>	<u>Certified SDB Suppliers</u>
(b)(4)	(b)(4)	(b)(4)	(b)(4)
		<u>Large Business Commodities</u>	<u>Large Business Suppliers</u>
		(b)(4)	(b)(4)
		<u>HUBZONE Commodities</u>	<u>HUBZONE Suppliers</u>
		(b)(4)	(b)(4)
<u>Women Owned Business (WOB) Commodities</u>	<u>Women Owned Business Suppliers</u>	<u>Veteran Owned Small Business Commodities</u>	<u>Veteran Owned Small Business Suppliers</u>
(b)(4)	(b)(4)	(b)(4)	(b)(4)
		<u>Service Disabled Veteran Owned Business Commodities</u>	<u>Service Disabled Veteran Owned Business Suppliers</u>
(b)(4)	(b)(4)	(b)(4)	(b)(4)



5. ITT will continue to aggressively, identify sources and award procurements to qualified Small Disadvantaged, Veterans, Women Owned, HubZone and Service Disabled Veteran-Owned Small Business concerns.

6. ITT subcontracting goals (b)(4) ITT (b)(4)  
(b)(4)

7. ITT will continue to review subcontracting opportunities to obtain major items through Small Business concerns and enforce these requirements on our Subcontractors.

8. ITT has taken a position to aggressively seek out and develop Small Business concerns. The SBLO will continue to identify components or subassemblies for Small Business concerns.

9. Methodology used to develop Small Business Subcontracting goals:

- (b)(4)
- (b)(4)
- (b)(4)
- (b)(4)
- (b)(4)
- (b)(4)



• [Redacted] (b)(4)

• [Redacted] (b)(4)

10. The designated individual employed by ITT who will administer the subcontracting program is:

Name: [Redacted]  
Title: [Redacted]  
Address: [Redacted] (b)(6)  
Telephone: [Redacted]

[Redacted] (b)(4)

11. Describe the efforts that will be taken to assure that Small Business concerns will have an equitable opportunity to compete for subcontracts as they pertain to this procurement.

[Redacted] (b)(4)

ITT will continue to maintain an "open door policy" when approached by Small Business concerns, soliciting for business. Interviews will be granted promptly by all levels of procurement personnel.





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12. The following is a recitation of the types of records ITT will maintain to demonstrate procedures which have been adopted to comply with the requirements and goals set forth in this Plan, including the establishment of source lists of Small Business concerns and efforts to identify and award subcontracts to such Small Business concerns as they pertain to this procurement:
- a) Access SBA (CCR) Central Contractor Registration for certified suppliers.
  - b) Regional Minority Purchasing Council lists.
  - c) "Try Us" National Directory of Minority Businesses.
  - d) SBA Regional Office facilities and lists.
  - e) Exchange of Information with ITT component suppliers regarding Small Business sources.
  - f) Attending seminars sponsored by congressional delegates for Small Business.
  - g) Records on each subcontract solicitation resulting in an award of more than \$10,000 indicating if small business concerns were solicited.
  - h) Records of outreach efforts to contact 1). Trade Associations, 2). Business Development Organizations, 3). Conferences and Trade Fairs to locate Small Businesses.
  - i) Records of internal guidance and encouragement provided to buyers through workshops, seminars, training, and monitoring performance to evaluate compliance with the program's requirements.
  - j) ITT will request SF295 or SF294 reports from major subcontractors to monitor their subcontracting goals.
  - k) ITT will ensure FAR Clause 52.219-8 Utilization of Small Business Concerns is included in all subcontracts.
13. ITT maintains records of procurements which defines by category the following types of supplier classifications:
- a) Small Business
  - b) Large Business



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- c) Women Owned Business
  - d) Small Business – Hub Zone Area
  - e) Large Business – Hub Zone Area
  - f) Small Disadvantaged Business – Hub Zone Area
  - f) Women Owned Business – Hub Zone Area
  - g) Minority/Women Owned – Hub Zone Area
  - i) Certified Small Disadvantaged Business
  - j) Veteran Owned Small Business
  - k) Service Disabled Veteran Owned Small Business
  - l) Foreign (Offshore) Business
14. ITT will continue to review subcontracting opportunities to obtain major items through Small Businesses and enforce these requirements on our Subcontractors.
15. I the undersigned Director of Operations, do hereby assure that ITT will include FAR Clause 52.219-8 Utilization of Small Business Concerns and FAR 52.219-9, Small Business Subcontracting Plan in this solicitation and in all Subcontracts which offer further subcontracting opportunities. ITT as the prime contractor, will require all subcontractors (except Small Business concerns) who receive subcontracts in excess of \$1,000,000 in the case of a contract for construction of any public facility, or in excess of \$550,000 in the case of all other contracts, to adopt a similar plan. ITT will submit such periodic reports and cooperate in any studies or surveys as may be required by the Contracting Federal Agency of the Small Business Administration in order to determine the compliance of this plan.

(b)(6)

### Warranty Statement

- (a) Subject to the conditions hereinafter stated, Seller warrants that at time of delivery to the carrier, all ITEMS will be free from defects in material and workmanship.
- (b) Seller's obligation under this warranty shall be limited to (1) repairing, or (2) replacing at its factory or (3) allowing an equitable credit for any ITEM, which upon inspection and in the judgment of Seller, is defective in material or in workmanship, provided that Seller is notified of any such defect or nonconformance **within twelve (12) months of the date of shipment of the affected ITEM.**
- (c) No ITEM will be accepted for repair, replacement or credit adjustment without the written returned goods authorization of ITT. Upon such authorization, and in accordance with instructions of Seller, ITEMS for which adjustment is requested shall be returned to Seller for examination with all shipping charges prepaid by the Purchaser. Such ITEMS shall be packed in the original shipping container or in a manner substantially equal to the original packing used by Seller. If such ITEMS, after examination by Seller, are found to be defective, then credit will be allowed for the shipping charges paid by the Purchaser.
- (d) In the event that, pursuant to paragraph B above, ITT elects not to repair or replace any such defective ITEM, then Seller will refund the purchase price (inclusive of any documented shipping charges paid by Purchaser) and Seller shall have no further obligation hereunder with respect to the defective ITEM.
- (e) **IN THE EVENT THAT THE ITEM APPEARS TO HAVE BEEN DAMAGED IN TRANSIT, THE PURCHASER MUST IMMEDIATELY FILE A CLAIM AGAINST THE CARRIER.**
- (f) This warranty does not extend to any ITEM which has been subject to misuse, neglect, accident, operation outside of the ITEM'S maximum/minimum ratings, incorrect wiring, improper application or installation, use in violation of instructions furnished by Seller, or has had its serial number or any part thereof altered, defaced or removed. Returned ITEMS, which are found by Seller to be within specifications, will be subject to a handling charge of 10% of the original purchase price billable to the Purchaser.
- (g) Seller will be permitted upon request to observe Purchaser's incoming inspection testing procedures at anytime that is mutually acceptable.
- (h) Except as to title, Seller's liability arising out of the supplying or use of these ITEMS, whether or not within warranty, shall not in any case exceed the limitations herein stated nor shall Seller be liable for any general, special or consequential damages for any loss, damage or expense directly or indirectly arising from the use or inability to use the ITEMS, or any inability to use them either separately or in combination with any other equipment, or from any other cause. **THE WARRANTY HEREIN PROVIDED FOR SHALL BE PURCHASERS EXCLUSIVE REMEDY AND IS EXPRESSLY IN LIEU OF AND EXCLUDES ALL OTHER WARRANTIES EXPRESSED OR IMPLIED INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR USE.**