

RECORD REPRODUCTION COVER SHEET

The attached records are:

Releasable to the Public

Denied to the Public

Subject:

F33615-92-C-5805

FOIA Control Number:

03-089AB

Date Reproduced:

FREEDOM OF INFORMATION ACT (FOIA) RESPONSE AND INVOICE

REQUEST DATE <p style="text-align: center;">20021210</p>	REQUEST NUMBER <p style="text-align: center;">03-089AB</p>
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TO Azores Corp. Patricia Dilanni 260D Fordham Road Wilmington MA 01887	FROM 88 CG/SCCMF (FOIA Office) Building 676 Rm 150 2435 5th Street Area B Wright-Patterson AFB OH 45433
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1. REQUESTED RECORDS

<input checked="" type="checkbox"/> COMPLETELY RELEASED	<input type="checkbox"/> PARTIALLY RELEASABLE
<input checked="" type="checkbox"/> DOCUMENTS ARE ATTACHED	
DOCUMENTS WILL BE FORWARDED ON RECEIPT OF PAYMENT	
DOCUMENTS MAY BE VIEWED AT THIS LOCATION (Please call for an appointment)	
TIME EXTENSION IS REQUIRED BECAUSE	
ALL OR PART OF THE REQUESTED RECORDS ARE NOT AT THIS LOCATION	
VOLUMINOUS RECORDS MUST BE COLLECTED AND REVIEWED	
RECORDS ARE BEING REVIEWED BY ANOTHER AGENCY FOR POSSIBLE RELEASE	
WE HOPE TO PROVIDE A FINAL DECISION BY	

2. THE COSTS OF PROVIDING THESE DOCUMENTS ARE INDICATED BELOW

REQUEST ACTIONS	RATE	MATERIAL	TIME	COST
SEARCH (Hourly)				
REVIEW (Hourly)	\$44.00		0.50	\$22.00
COPY (Page)	\$0.15	118		\$17.70
COMPUTER MACHINE TIME (Hourly)				
COMPUTER OPERATOR TIME (Hourly)				
COMPUTER TAPES				
OTHER CD				
TOTAL AMOUNT DUE				\$39.70

3. Send your check or money order payable to "US DEPARTMENT OF TREASURY " with a copy of this invoice within 30 days. <i>(Future requests will not be processed until payment is received.)</i>	3A. MAIL TO 88 CG/SCCMF (FOIA Office) 2435 5th Street Area B Wright-Patterson AFB OH 45433
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4. THIS ACKNOWLEDGES RECEIPT OF YOUR CHECK OR MONEY ORDER FOR PAYMENT OF REQUESTED DOCUMENTS

NUMBER	DATE	AMOUNT

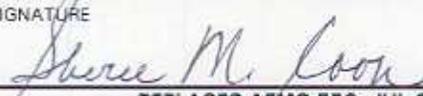
5. ALL OR PART OF THE INFORMATION YOU REQUESTED IS NOT AVAILABLE AT THIS INSTALLATION. WE HAVE FORWARDED YOUR REQUEST TO THE FOLLOWING LOCATION FOR ACTION WITH DIRECT RESPONSE TO YOU.

6. COMMENTS

Attached:
1 - Your FOIA Request
2 - Requested Records

Point of Contact (FOIA) is Abby Boggs at (937) 904-8203

7. FREEDOM OF INFORMATION ACT MANAGER

NAME AND PHONE Sheree M. Coon (937) 904-8207	SIGNATURE 	DATE 23/Dec 02
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Boggs Abby L Civ 88 CG/SCCM

From: pat@azorescorp.com
Sent: Tuesday, December 10, 2002 1:38 PM
To: WPAFB.FOIA@wpafb.af.mil
Subject: FOIA Request

Company Name: Azores Corp
Name: Patricia DiIanni
Address: 260D Fordham Road
City: Wilmington
State: MA
Zip: 01887
Phone: 978 657 8236
FAX: 978 658 6349
E-mail address: pat@azorescorp.com

Description:
Copy of Darpa Contract with MRS Technology #F33615-92-C-5805,
Prototype Development of a very large area, High Performance Microlithography
Tool. Azores Corp bought all of the assets, patents and technology out of
the MA Bankruptcy Courts and I would like this to complete our records and
documentation.

Yes, I am willing to pay fees assessed for this request;
however, please notify me if fees exceed: \$500.00.

O. P. R. AFRL/MLKT
CONTROL # 03-089AB
DUE DATE 09 Jan 02

AWARD/CONTRACT

1. PAGE 1 OF 34		
2. PROC INSTRUMENT ID NO. (PIIN) F33615-92-C-5805	3. EFFECTIVE DATE 92FEB21	4. REQUISITION/PURCHASE REQUEST/PROJECT NO. FY1133-92-05022
5. CERTIFIED FOR NATIONAL DEFENSE UNDER BDC DO-B9 REG 2/DMS REG 1 RATING		

6. ISSUED BY DEPARTMENT OF THE AIR FORCE AIR FORCE SYSTEMS COMMAND (ASD) WRIGHT LABORATORY (WL/MLKT) WRIGHT-PATTERSON AFB OH 45433-6503 CONTRACT NEGOTIATOR: MARK S. HILL PHONE: (513) 255-7143	CODE FQ8419	7. ADMINISTERED BY DCMAO BOSTON 495 SUMMER ST. BOSTON MA 02210-2138	CODE S2206A
PAS: NONE			

MAILING DATE

MAR 18 1992

8. CONTRACTOR NAME AND ADDRESS MRS TECHNOLOGY, INC. 10 ELIZABETH DRIVE CHELMSFORD MA 01824 PHONE: (508) 250-0450 COUNTY: MIDDLESEX	CODE OM5A8	9. SUBMIT INVOICES (4 copies unless otherwise specified) TO ADDRESS SHOWN IN
10. DISCOUNT FOR PROMPT PAYMENT		
IF "9" FOR MULTIPLE FACILITIES SEE SECT "G"		
11. AUTHORIZED RATE		
12. CONTRACT PERCENT FEE		
13. PAYMENT WILL BE MADE BY		
14. PURCHASE OFFICE POINT OF CONTACT		
15. SVC/AGENCY USE		
16. TYPE CONTRACTOR		
17. SECURITY A. CLAS		
B. DATE OF DD 254		
18. CONTRACT ADMINISTRATION DATA		
19. (RESERVED)		
20. DATE SIGNED		
21. SURV CRIT		
22. TOTAL AMOUNT		
23. AUTHORITY FOR USING OTHER THAN FULL AND OPEN COMPETITION		
24. TABLE OF CONTENTS		

DARPA

DFAS-COLUMBUS CENTER CODE SC1016
BUNKER HILL DIVISION
P. O. BOX 182077
COLUMBUS, OH 43218-2077

11. AUTHORIZED RATE A. PROGRESS PAY B. RECPOD	12. CONTRACT PERCENT FEE	13. PAYMENT WILL BE MADE BY
14. PURCHASE OFFICE POINT OF CONTACT L74/L74/L74	15. SVC/AGENCY USE	DFAS-COLUMBUS CENTER CODE SC1016 BUNKER HILL DIVISION P. O. BOX 182077 COLUMBUS, OH 43218-2077
16. TYPE CONTRACTOR B	17. SECURITY A. CLAS U	IF "9" FOR MULTIPLE DISBURSING OFFICES, SEE SECT "G"
18. CONTRACT ADMINISTRATION DATA A. FAST PAY (1) KIND (2) TYPE 2 U	B. CONTRACT C. ABSTRACT RECIP ADP POINT D. SPL CONT PROVISIONS FUNC LMT	E. CONT ADMIN F. DATE SIGNED G. SURV CRIT C
20. DATE SIGNED		22. TOTAL AMOUNT \$ 4,058,790.00
23. AUTHORITY FOR USING OTHER THAN FULL AND OPEN COMPETITION <input type="checkbox"/> PURSUANT TO 10 USC 2304(C) () : 41 USC 253(C) ()		

(X)	SEC	DESCRIPTION	PAGE(S)	(X)	SEC	DESCRIPTION	PAGE(S)
PART I - THE SCHEDULE				PART II - CONTRACT CLAUSES			
X	A	SOLICITATION/CONTRACT FORM	1	X	I	CONTRACT CLAUSES	22
X	B	SUPPLIES OR SERVICES AND PRICES/COSTS	2	PART III - LIST OF DOCUMENTS, EXHIBITS AND OTHER ATTACH			
X	C	DESCRIPTION/SPECS/WORK STATEMENT	3	X	J	LIST OF ATTACHMENTS	34
X	D	PACKAGING AND MARKING	10	PART IV - REPRESENTATIONS AND INSTRUCTIONS			
X	E	INSPECTION AND ACCEPTANCE	10	K	REPRESENTATIONS, CERTIFICATIONS AND OTHER STATEMENTS OF OFFERORS		
X	F	DELIVERIES OR PERFORMANCE	10	L	INSTRS., CONDS., AND NOTICES TO OFFER		
X	G	CONTRACT ADMINISTRATION DATA	12	M	EVALUATION FACTORS FOR AWARD		
X	H	SPECIAL CONTRACT REQUIREMENTS	14				

CONTRACTING OFFICER WILL COMPLETE BLOCK 25 OR 29, AS APPLICABLE

25. <input checked="" type="checkbox"/> CONTRACTOR'S NEGOTIATED AGREEMENT (Contractor is required to sign this document and return 1 copies to issuing office.) Contractor agrees to furnish and deliver all items or perform all the services set forth or otherwise identified herein for the consideration stated herein. The rights and obligations of the parties to this contract shall be subject to and governed by the following documents: (a) this award/contract, (b) the solicitation, if any, (c) such provisions, representations, certifications, and specifications, as are attached or incorporated by reference herein. (Attachments are listed herein.)	29. <input type="checkbox"/> AWARD (Contractor is not required to sign this document.) Your offer on Solicitation Number _____, including the additions or changes made by you which additions or changes are set forth in full above, is hereby accepted as to the items listed herein. This award consummates the contract which consists of the following documents (a) the Government's solicitation and your offer, and (b) this award/contract. No further contractual document is necessary.
26. CONTRACTOR BY: <u>J.L. Steele</u> (SIGNATURE OF PERSON AUTHORIZED TO SIGN)	30. UNITED STATES OF AMERICA BY: <u>Mark S. Hill</u> (SIGNATURE OF CONTRACTING OFFICER)
27. NAME AND TITLE OF SIGNER (TYPE OR PRINT) John L. Steele, Jr. Vice President	31. NAME OF CONTRACTING OFFICER (TYPE OR PRINT) MARK S. HILL
28. DATE SIGNED 92MAR12 YYMMDD	32. DATE SIGNED 92 Mar 17 YYMMDD

PREVIOUS EDITIONS ARE OBSOLETE.

AFSC Form 701, OCT 85

PART I SECTION B OF THE SCHEDULE
SUPPLIES LINE ITEM DATA

1. PROC INSTRUMENT ID NO. (PIIN) 2. SPIIN 3. PAGE 2 OF

F33615-92-C-5805

4. ITEM NO.	5. QUANTITY*	6. PURCH UNIT	7. UNIT PRICE	8. TOTAL ITEM AMOUNT*	13. CIRR
0001	1	LO	\$ N	\$ N	
9. SCTY10, ACRN CLAS	11. NSN	12. FSCM AND PART NUMBER		16. SVC/AGENCY USE	
U AA N					
14. SITE CODES A.PQA B.ACP C.FOB	15. NOUN	17. PR/MIPR DATA		21. ITEM/PROJ MGR	
D D D		RESEARCH AND DATA		FY1133	
22. 1ST DISCOUNT A. B.DAYS		23. 2ND DISCOUNT A. B.DAYS		24. 3RD DISCOUNT A. B.DAYS	
				25. NET DAYS	
				26. QUANTITY VARIANCE A. OVER B. UNDER	
				27. CONTRACT TYPE 28. OPR	
				29. DESCRIPTIVE DATA	

Conduct research entitled "PROTOTYPE DEVELOPMENT OF A VERY LARGE-AREA HIGH PERFORMANCE MICROLITHOGRAPHY TOOL" in accordance with Section C, Description/Specifications dated 92JAN17. Deliver data in accordance with Exhibit A, Contract Data Requirements List, DD Form 1423, dated 92JAN17.

Phase II, as set forth in paragraphs 4.2 thru 4.2.1.8 of Section C, may be obtained in accordance with the provisions of Section H-13 for Option 1.

Phase III, as set forth in paragraphs 4.3 thru 4.3.1.4 of Section C, may be obtained in accordance with the provisions of Section H-13 for Option 2.

Phase IV, as set forth in paragraph 4.4 through 4.4.1.2 of Section C, may be obtained in accordance with the provisions of Section H-13 for Option 3.

4. ITEM NO.	5. QUANTITY*	6. PURCH UNIT	7. UNIT PRICE	8. TOTAL ITEM AMOUNT*	13. CIRR
0002	1	LO	\$ N	\$ N	
9. SCTY10, ACRN CLAS	11. NSN	12. FSCM AND PART NUMBER		16. SVC/AGENCY USE	
U AA N					
14. SITE CODES A.PQA B.ACP C.FOB	15. NOUN	17. PR/MIPR DATA		21. ITEM/PROJ MGR	
S S D		LARGE AREA MICROLITHOGRAPHY TOOL		FY1456	
22. 1ST DISCOUNT A. B.DAYS		23. 2ND DISCOUNT A. B.DAYS		24. 3RD DISCOUNT A. B.DAYS	
				25. NET DAYS	
				26. QUANTITY VARIANCE A. OVER B. UNDER	
				27. CONTRACT TYPE 28. OPR	
				29. DESCRIPTIVE DATA	

Deliver the Large Area Microlithography Tool in accordance with Section C, Description/Specifications, paragraph 5.3, dated 92JAN17.

*REPRESENTS NET AMOUNT OF INCREASE/DECREASE WHEN MODIFYING EXISTING ITEM NO.
N = NOT APPLICABLE
U = UNDEFINITEZED
NSP = NOT SEPARATELY PRICED
E = ESTIMATED
- (IN QTY AND \$) = DECREASE
+ OR - (IN ITEM NO.) = ADDITION OR DELETION
CIRR: CONTROLLED ITEM RPT RQMT

S = SOURCE
D = DESTINATION
O = INTERMEDIATE
SITE CODES:

**PROTOTYPE DEVELOPMENT OF A VERY LARGE-AREA
HIGH PERFORMANCE MICROLITHOGRAPHY TOOL**

1.0 OBJECTIVE:

1.1 The primary objective of this program is to develop a new generation large-area microlithography tool suitable for imaging active matrix liquid crystal displays (AMLCD) substrates up to 750 mm square.

1.2 The specific objective of this program shall be the construction of a working full scale prototype of a large area microlithography tool capable of imaging glass substrates up to 750 mm square at approximately three-fold increase in imaging throughput rates as compared to any currently available large area microlithography tool.

2.0 SCOPE:

2.1 This is a four phase program with Phase I being the basic program and Phases II, III, and IV are options 1, 2, and 3, respectively. The entire program will develop and construct a working prototype, high speed, microlithography machine capable of imaging glass substrates up to 750 mm square at throughput rates significantly better than any currently available large area microlithography tool. This effort also includes the development of the following subsystem components which will be designed, constructed and integrated:

- 2.1.1 A 750 mm by 750 mm linear stepping motor based X-Y stage subsystem
- 2.1.2 A high-power illumination subsystem
- 2.1.3 A novel imaging subsystem capable of image scale adjustment of ≤ 100 ppm and image resolution of $\leq 3\mu\text{m}$
- 2.1.4 An automatic calibration metrology and control subsystem
- 2.1.5 An automatic, high-speed substrate alignment subsystem
- 2.1.6 An automatic reticle storage and handling subsystem
- 2.1.7 An automatic, high-speed, externally-interfaceable substrate handling system
- 2.1.8 An environmental control subsystem
- 2.1.9 Job setup and execution control software

2.2 The four (4) phases consist of system specification and architecture development, mainframe prototype development, additional subsystem development, and beta site partnering. Phases II, III, and IV are extensions of the mainframe prototype development in Phase I. Also, in Phases II, III, and IV, additional subsystems and control software shall be developed, all subsystems shall be integrated and the prototype system shall be tested at the contractor's facility..

3.0 **BACKGROUND:**

3.1 This program is one of several contracts that are being awarded as a result of the solicitation by the Defense Advanced Research Projects Agency (DARPA), Broad Agency Announcement (BAA) No. 91-06, titled "High Definition Systems".

3.2 The most critical problem in cockpits today is the lack of pilot/crew situation awareness. The present cockpit displays, namely cathode ray tubes (CRTs), have several disadvantages which limit the fusing of the data and presenting situation information to the pilot. Active matrix liquid crystal displays (AMLCDs) are the cockpit designer's choice for replacing CRTs since they are sunlight readable with full color capability. In addition, AMLCDs provide a large viewing area and are fail soft with small instrument depth.

3.3 The active matrix liquid crystal technology must be developed in the United States so that the displays required by the military are available from domestic sources. These programs, under DARPA/MANTECH auspices, will develop the manufacturing equipment necessary to establish the domestic manufacturing capability for large area active matrix liquid crystal displays. The Tri-Service needs for AMLCD cockpit displays are approximately 45,000 by the turn of the century. Most military display requirements are common with commercial aircraft and, in many instances, the critical component (AMLCD active glass) is common with commercial applications including portable computers, virtual reality workstations, and television receivers.

4.0 **TECHNICAL REQUIREMENTS/TASKS:**

4.1 **Phase I, Basic Effort**

4.1.1 **Task I-System Specification and Architecture Development** (CDRL #A008, #A009, #A016)

4.1.1.1 The contractor shall develop a system functional specification and detail the expectation of performance levels. This effort shall involve customer research activity to test the system requirements and shall include a detailed system error budget analysis in order to qualify the expected performance levels.

4.1.1.2 The contractor shall develop, with the assistance of one or more commercial photoresist vendors, optimized photoresists for use with the high-power exposure technique.

SECTION C

DATED: 92 JAN 17

4.1.1.3 The contractor shall develop the opto-mechanical architecture that supports the required specifications. The contractor shall address major conceptual issues such as base and camera bridging structure, camera size and mounting, reticle handling, and substrate transport.

4.1.1.4 The contractor shall develop the control electronics architecture to establish the computing structure and control system electronics modularity levels.

4.1.1.5 The contractor shall develop the control software architecture to establish the structure that shall contain the control applications software and software services needed to run the machine and analyze information produced by the machine.

4.1.2 **Task II-Mainframe Prototype Development** (CDRL #A008, #A009, #A016)

4.1.2.1 The contractor shall design and fabricate the X-Y motion subsystem including: the base and vibration isolation subsystem; stage motors and platen; stage mainframe structure; stage positioning metrology including the possible use of mirror replication; substrate transfer, banking, and chucking mechanics; electro-optic calibration sensor module; stage resident control electronics and access software; cable and hose connections to the fixed world; and the X-Y stage digital control servo.

4.1.2.2 The contractor shall design the high-power illumination subsystem including: illumination source evaluation and selection; beam transport and conditioning optics and mechanics; beam steering and aperaturing optics, mechanics, and controls; illumination triggering controls; and illumination safety system design. The contractor shall breadboard any high risk modules to determine operational feasibility.

4.1.2.3 The contractor shall design the imaging subsystem including: lens component design and fabrication; lens and optical column structural mechanics; optical column setup and alignment fixturing; optical column mounting structure; reticle positioning and alignment subsystem; automatic lens accuracy control subsystem; image scale adjustment control subsystem; and automatic focus control subsystem. The contractor shall breadboard any high risk modules to determine operational feasibility.

4.1.2.4 The contractor shall design the alignment metrology subsystem including: evaluating new sensor techniques, and developing hardware and sensor control software. The contractor shall breadboard any high risk modules to determine operational feasibility.

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4.1.2.5 The contractor shall design and fabricate the control system support electronics and software including: evaluating, selecting, and integrating system and subsystem control processors and operating systems; designing the overall system electronics packing and cabling.

4.1.2.6 The contractor shall design the application software including: hardware device driver development; software services development, e.g. calibration, database, communications, user interface; control application software development, e.g. job preparation, job execution control, calibration sequence control, and data visualization utilities. The contractor shall perform initial prototyping.

4.2 Phase II (Option 1)

4.2.1 Mainframe Prototype Development (CDRL #A008, #A009, #A016)

4.2.1.1 The contractor shall integrate and test the X-Y motion subsystem.

4.2.1.2 The contractor shall fabricate, integrate and test the high-power illumination subsystem.

4.2.1.3 The contractor shall fabricate, integrate, and test the imaging subsystem.

4.2.1.4 The contractor shall fabricate, integrate and test the alignment metrology subsystem.

4.2.1.5 The contractor shall develop the environmental control subsystem.

4.2.1.6 The contractor shall design the reticle handling and storage library subsystems.

4.2.1.7 The contractor shall integrate and test the control system support electronics and software.

4.2.1.8 The contractor shall develop and test the application software.

SECTION C

DATED: 92 JAN 17

4.3 Phase III (Option 2)

4.3.1 Mainframe Prototype Development (CDRL #A008, #A009, #A016)

4.3.1.1 The contractor shall procure the selected high-power source and related components for the illumination subsystem and shall integrate this with the system mainframe.

4.3.1.2 The contractor shall develop the in-system material transport subsystem.

4.3.1.3 The contractor shall fabricate, integrate and test the reticle storage and handling subsystem.

4.3.1.4 The contractor shall perform system integration, test, and characterization. This effort includes basic first layer imaging test & characterization and overlay imaging test and characterization. (CDRL #A009, #A014, #A016)

4.4 Phase IV (Option 3)

4.4.1 Task I - Mainframe Prototype Development (CDRL #A008, #A009, #A014, #A016)

4.4.1.1 The contractor shall perform system integration, test, and characterization. This effort includes reticle and substrate handling subsystems integration.

4.4.1.2 The contractor shall develop preliminary operation manuals, preliminary setup and calibration manuals, and preliminary acceptance test manuals.

4.4.2 Task II - Beta Site Partnering

4.4.2.1 The contractor shall interview, evaluate, and select one or more beta site partners. The contractor shall prepare draft beta site agreements for one or more partners. The contractor shall present recommendations for beta site partnering to the Government at a Quarterly Review. This task does not include execution of any beta site agreements.

4.5 Program Management/Planning: (Applicable to Phases I, II, III, and IV) The contractor shall conduct administrative and financial management functions during the course of this effort including: detailed scheduling of activities and milestones; defining work tasks, subtasks and all interrelationships; purchasing materials; defining skill levels required and allocating labor resources accordingly; defining and managing subcontractor activities (if any); budgeting, allocating, forecasting of funds and tracking status of funds; documenting all work problems, and progress toward the accomplishment of the overall tasks and the overall program objectives. The contractor shall notify and discuss the impact of key personnel changes with the Air Force prior to the effective date of change. (CDRL #A001, #A002, #A003, #A004, #A007, #A011, #A013, #A014)

5.0 DATA AND OTHER DELIVERABLES:

5.1 Data is listed on the DD Form 1423.

5.2 The contractor shall construct and deliver one (1) display board to describe the program. The size shall be 76 x 76 cm with 3.8 cm radius corners. It shall be of heavy construction to withstand repeated baggage handling, or, have a carrying case. The board shall be white with medium blue lettering of vinyl or silk screening. Color photographs and three-dimensional objects shall be securely attached. Velcro strips shall be permanently adhered to the back for mounting. Company logos are not permitted. Information displayed shall demonstrate by pictures and models, the program products (partially and/or fully completed or assembled)--the who, what, where, when, why, how, applications and projected savings--of the program. (CDRL A010)

5.3 One (1) large-area microlithography tool

6.0 SPECIAL CONSIDERATIONS:

6.1 Quarterly Reviews: The contractor shall conduct quarterly program status reviews to Government personnel. The purpose of the review is to provide a detailed account of the administrative, financial, and technical health of the program; to list accomplishments and problem areas; and to detail future program plans. (CDRL #A005, #A006, #A007)

6.1.1 Industry Workshops - The contractor shall conduct workshops, in conjunction with selected quarterly reviews. The purpose of these workshops shall be to transmit significant technical progress of this program, in a timely manner, to appropriate representatives of Government and industry. An invitation list will be developed by the contractor and the Air Force. The contractor shall invite the attendees, in addition to providing a meeting facility for approximately twenty-five (25) invited individuals. It is anticipated the frequency of these workshops will be semi-annually.

SECTION C

DATED: 92 JAN 17

6.2 End of the Contract Debriefing: The contractor shall conduct a debriefing subsequent to the completion of the technical effort and prior to approval of final report. The purpose of the debriefing shall be to transmit the results of this program, in a timely manner, to appropriate representatives of Government and industry. An invitation list will be supplied to the contractor by the Air Force. The contractor shall invite the attendees, in addition to providing a meeting facility for approximately one hundred (100) invited individuals.

6.2.1 An on-site review of the prototype microlithography tool shall be conducted for all End of the Contract Debriefing attendees.

6.3 Environmental Assessment: The contractor shall assess the environmental consequences of the technology established under this program from the standpoint of the program itself and from the standpoint of future scale-up to production quantities. If the technology is found to have adverse environmental consequences, the contractor shall provide suggestions for making the technology environmentally acceptable and indicate what economic impact the suggestions will have on the technology.

6.4 System Safety: A system safety program, including hazard analysis, shall be performed in accordance with MIL-STD-882B. The prime objective is to formalize an approach to eliminate hazards through engineering, design, education, management policy, and supervisory control, with constraints of operational effectiveness, time, and cost, throughout the equipment's life cycle. (CDRL #A015)

6.5 Program Highlights: The contractor shall ensure the documentation of this program by timely photographic coverage of significant events and milestones. (CDRL #A012)

SECTION D
PACKAGING AND MARKING

The Contractor shall provide preservation, packaging and packing which shall afford adequate protection against physical damage during shipment for all deliverable items in accordance with best commercial practices.

SECTION E
INSPECTION AND ACCEPTANCE

1. NOTICE: The following solicitation provisions and/or contract clauses pertinent to this section are hereby incorporated by reference:

I. FEDERAL ACQUISITION REGULATION CONTRACT CLAUSES

<u>PARAGRAPH</u>	<u>CLAUSE TITLE</u>	<u>DATE</u>
52.246-8	INSPECTION OF RESEARCH AND DEVELOPMENT - COST-REIMBURSEMENT	(APR 1984)

II. DOD FAR SUPPLEMENT CONTRACT CLAUSES

<u>PARAGRAPH</u>	<u>CLAUSE TITLE</u>	<u>DATE</u>
252.246-7000	MATERIAL INSPECTION AND RECEIVING REPORT	(DEC 1969)

SECTION F
DELIVERIES OR PERFORMANCE

1. NOTICE: The following solicitation provisions and/or contract clauses pertinent to this section are hereby incorporated by reference:

I. FEDERAL ACQUISITION REGULATION CONTRACT CLAUSES

<u>PARAGRAPH</u>	<u>CLAUSE TITLE</u>	<u>DATE</u>
52.212-13	STOP-WORK ORDER	(AUG 1989) - ALTERNATE I (APR 1984)
52.247-34	F.O.B. DESTINATION	(NOV 1991)

2. CONTRACT DELIVERIES

The terms "MAC" and "MARO", as used within this contract in conjunction with contract delivery requirements (including data deliveries), are hereby defined to mean "months after the effective date for award of the contractual action (as shown in block 3, Section A, AFSC Form 701)".

PART I SECTION F OF THE SCHEDULE
SUPPLIES SCHEDULE DATA

1. PROC INSTRUMENT ID NO. (PIIN)
F33615-92-C-5805

2. SPIIN
3. PAGE **11** OF

4. ITEM NO.	5. ACRN	6. TSP PRI	7. MILSTRIP DOC NO. AND SUFFIX	8. CON ITEM SERIAL NO.	9. ENDING SERIAL NO. (WHEN APPL)	10. CLIN IDENT EXHIBIT
0001	AA					
11. DEL SCHED DATE	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY*	14. SCTY	15. SHIP TO	16. MARK FOR	
A. 93JUL21	A.	A. 1	U ^{CLAS}	FY1133		
B.	B.	B.	D.	D.	D.	
C.	C.	C.	E.	E.	E.	

17. DESCRIPTIVE DATA
The scheduled delivery date, Block 11A, for the approved final technical report is 93JUL21. All data shall be delivered in accordance with Exhibit A, Contract Data Requirements List, DD Form 1423, dated 92JAN17. See Section H for FY1133 address. Technical effort must be completed no later than 93FEB22. If Option 1 is exercised, the date in Block 11A above will be changed to 94APR21 and completion of technical effort will be changed to 93NOV22. If Option 2 is exercised, the date in Block 11A above will be changed to 95JUN21 and completion of technical effort will be changed to 95JAN20.

4. ITEM NO.	5. ACRN	6. TSP PRI	7. MILSTRIP DOC NO. AND SUFFIX	8. CON ITEM SERIAL NO.	9. ENDING SERIAL NO. (WHEN APPL)	10. CLIN IDENT EXHIBIT
11. DEL SCHED DATE	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY*	14. SCTY	15. SHIP TO	16. MARK FOR	
A.	A.	A.	U ^{CLAS}			
B.	B.	B.	D.	D.	D.	
C.	C.	C.	E.	E.	E.	

17. DESCRIPTIVE DATA
If Option 3 is exercised, the date in Block 11A will be changed to 96FEB21 and completion of technical effort will be changed to 95SEP21.

4. ITEM NO.	5. ACRN	6. TSP PRI	7. MILSTRIP DOC NO. AND SUFFIX	8. CON ITEM SERIAL NO.	9. ENDING SERIAL NO. (WHEN APPL)	10. CLIN IDENT EXHIBIT
0002	AA					
11. DEL SCHED DATE	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY*	14. SCTY	15. SHIP TO	16. MARK FOR	
A. 93MAR22	A.	A. 1	U ^{CLAS}	FY1133		
B.	B.	B.	D.	D.	D.	
C.	C.	C.	E.	E.	E.	

17. DESCRIPTIVE DATA
The scheduled delivery date, Block 11A, for the Large Area Microlithography Tool Components is 93MAR22. Any Microlithography Tool Components shall remain in place at the contractor's facility. If Option 1 is exercised, the delivery date for the Microlithography Tool Components will be changed to 93DEC21. If Option 2 is exercised, the delivery date for the Microlithography Tool Components will be changed to 95FEB21. If Option 3 is exercised, the delivery date for the Microlithography Tool will be changed to 95OCT20.

*REPRESENTS A NET INCREASE/DECREASE WHEN NO + OR - APPEARS AFTER THE ITEM NO.
E = ESTIMATED
- (IN QTY) = DECREASE
+ OR - (IN ITEM NO.) = ADDITION OR DELETION

SECTION G
CONTRACT ADMINISTRATION DATA

1. ACO PROVISION

Contact the Administrative Contracting Officer (ACO), as designated in Block 7 of the cover page hereof, for information relating to contract administration.

2. INVENTION PROVISION

The contractor shall forward the invention reports called for by the Patent Rights clause through the Administrative Contracting Office addressed to Staff Judge Advocate, Patents Officer (Patent Counsel), AFCLC/JANP, Wright-Patterson AFB, Ohio 45433-5000.

3. PROJECT ENGINEER

Robert Cross
WL/MTEC
(513) 255-2461

4. BROAD AGENCY ANNOUNCEMENT

DARPA No. 91-06

5. CONTRACT NEGOTIATOR

Mark S. Hill
WL/MLKT
(513) 255-7143

PART I SECTION G OF THE SCHEDULE ACCOUNTING CLASSIFICATION DATA			1. PROC INSTRUMENT ID NO. (PIIN) F33615-92-C-5805	2. SPIIN	3. PAGE 13 OF
4. APPROPRIATION AND ACCOUNTING DATA A. SCTY CLAS B. ACRN C. APPROPRIATION U AA 9710400			D. LIMIT SUBHEAD 1302	E. SUPPLEMENTAL ACCTG CLASSIFICATION D11 47WL 1T1000 080820 00000 62708E 595600	
F. CPN RECIPIENT DODDAD F95600		G. OBLIGATION AMOUNT* S 4,058,790.00	H. NON-CLIN/CLIN	I. PR/MIPR DATA FY1133-92-05022	J. PAYING OFC CODE
6. DESCRIPTIVE DATA JON: DARK0251 CCC: 676500			COMPLETE		
ARPA ORDER NO. 8082, AMENDMENT NO. 4: PROGRAM CODE NO. 1T10, DATED 91SEP13.					
4. APPROPRIATION AND ACCOUNTING DATA A. SCTY CLAS B. ACRN C. APPROPRIATION			D. LIMIT SUBHEAD	E. SUPPLEMENTAL ACCTG CLASSIFICATION	
F. CPN RECIPIENT DODDAD		G. OBLIGATION AMOUNT* S	H. NON-CLIN/CLIN	I. PR/MIPR DATA	J. PAYING OFC CODE
6. DESCRIPTIVE DATA					
4. APPROPRIATION AND ACCOUNTING DATA A. SCTY CLAS B. ACRN C. APPROPRIATION			D. LIMIT SUBHEAD	E. SUPPLEMENTAL ACCTG CLASSIFICATION	
F. CPN RECIPIENT DODDAD		G. OBLIGATION AMOUNT* S	H. NON-CLIN/CLIN	I. PR/MIPR DATA	J. PAYING OFC CODE
6. DESCRIPTIVE DATA					
4. APPROPRIATION AND ACCOUNTING DATA A. SCTY CLAS B. ACRN C. APPROPRIATION			D. LIMIT SUBHEAD	E. SUPPLEMENTAL ACCTG CLASSIFICATION	
F. CPN RECIPIENT DODDAD		G. OBLIGATION AMOUNT* S	H. NON-CLIN/CLIN	I. PR/MIPR DATA	J. PAYING OFC CODE
6. DESCRIPTIVE DATA					
4. APPROPRIATION AND ACCOUNTING DATA A. SCTY CLAS B. ACRN C. APPROPRIATION			D. LIMIT SUBHEAD	E. SUPPLEMENTAL ACCTG CLASSIFICATION	
F. CPN RECIPIENT DODDAD		G. OBLIGATION AMOUNT* S	H. NON-CLIN/CLIN	I. PR/MIPR DATA	J. PAYING OFC CODE
6. DESCRIPTIVE DATA					

*REPRESENTS NET AMOUNT OF INCREASE DECREASE WHEN MODIFYING AN EXISTING ACRN.

+ OR IN ACRN = ADDITION OR DELETION IN \$ - DECREASE

NOTE TO CONTRACTOR: Submit invoices to paying office unless otherwise specified in the descriptive data item herein.

SECTION H
SPECIAL CONTRACT REQUIREMENTS

1. ACKNOWLEDGEMENT OF SPONSORSHIP

a. The Contractor agrees that in the release of information relating to this contract such release shall include a statement to the effect that the project or effort depicted was or is sponsored by the agency set forth below:

MANUFACTURING TECHNOLOGY DIRECTORATE
WRIGHT LABORATORY
AIR FORCE SYSTEMS COMMAND (ASD)
UNITED STATES AIR FORCE
WRIGHT-PATTERSON AFB OHIO 45433-6533

b. For the purpose of this clause, "information" includes but is not limited to, news releases, articles, manuscripts, brochures, advertisements, still and motion pictures, speeches, trade association meetings, symposia, etc.

c. Nothing in the foregoing shall affect compliance with the requirements of the clause (if applicable) of this contract entitled "Security Requirements."

d. The Contractor further agrees to include this clause in any subcontracts awarded as a result of this contract.

2. TYPE CONTRACT

This is a Cost Plus Fixed Fee (Completion) type contract.

3. CONTRACTING OFFICER AUTHORIZATION

The Contracting Officer shall be the only individual authorized to direct and/or redirect the effort or in any way amend any of the terms of this contract other than those instances specifically delegated to an Administrative Contracting Officer, or a Termination Contracting Officer by a Contract Clause of this contract, or in writing by the Contracting Officer. For purposes of this contract, "the Contracting Officer" is the individual located at the issuing office, and may be abbreviated as "CO".

4. COMSEC MONITORING

All communications with DOD organizations are subject to COMSEC review. Contractor personnel will be aware that telecommunications networks are continually subject to intercept by unfriendly intelligence organizations. The DOD has authorized the military departments to conduct COMSEC monitoring and recording of telephone calls originating from or terminating at DOD organizations. Therefore, civilian contractor personnel are advised that any time they place a call to or receive a call from a USAF organization, they are subject to COMSEC procedures. The contractor will assume the responsibility for ensuring wide and frequent dissemination of the above information to all employees dealing with official DOD information. (AFR 56-8)

5. ACCELERATED PERFORMANCE

If during the performance of this contract, the Government determines that an acceleration of performance hereunder may be in its best interest, the Contracting Officer will so advise the Contractor and secure its agreement by letter to accelerate a portion or all of the work required by this contract. If and when such an agreement to accelerate performance is consummated between the parties, the Contracting Officer will notify the Contractor by letter that the acceleration is approved. Should any additional incremental funding as contemplated by the clause of this contract entitled, "Limitation of Funds," or "Limitation of Cost," or "Limitation of Government's Obligation," be required, the funding amendment issued will cite the Contractor's letter agreement to accelerate and no other notification (letter) will be provided. Any agreed to acceleration shall not change the scope of this contract or any of its other terms and conditions. It is expressly understood by the parties hereto that any acceleration of performance pursuant to this provision shall be accomplished at no change in the contract fee.

6. DELIVERY OF REPORTS

All reports and correspondence submitted under this contract shall include the contract number and project number and be forwarded prepaid. A copy of the letters of transmittal, unless otherwise required by the Contract Data Requirements List, shall be delivered to the issuing office (CO) and the Administrative Office (ACO). The addresses are set forth on the Contract Award Cover Page, blocks 6 and 7, respectively. The complete address(es) and code(s) for the consignee(s) for the Contract Data Requirements List are as follows:

WL/MTEC (FY1133)	Manufacturing Technology Directorate Wright Laboratory Attn: WL/MTEC (Robert Cross) Contract Number: F33615-92-C-5805 Item Number: 0001, Seq. Number: Wright-Patterson AFB OH 45433-6533
WL/MTE (FY1133)	Manufacturing Technology Directorate Wright Laboratory Attn: WL/MTE Contract Number: F33615-92-C-5805 Item Number: 0001, Seq. Number: Wright-Patterson AFB OH 45433-6533
WL/MLCT (FY1457)	Materials Directorate Wright Laboratory Attn: WL/MLCT Contract Number: F33615-92-C-5805 Item Number: 0001, Seq. Number: Wright-Patterson AFB OH 45433-6533

WL/MTX (TTC) Manufacturing Technology Directorate
(FY1133) Wright Laboratory
Attn: WL/MTX (TTC)
Contract Number: F33615-92-C-5805
Item Number: 0001, Seq. Number:
Wright-Patterson AFB OH 45433-6533

WL/DOSM Wright Laboratory
(FY1456) Attn: WL/DOSM
Contract Number: F33615-92-C-5805
Item Number: 0001, Seq. Number:
Wright-Patterson AFB OH 45433-6523

ASD/RMV Aeronautical Systems Division
(FY7615) Attn: ASD/RMV
Contract Number: F33615-92-C-5805
Item Number: 0001, Seq. Number:
Wright-Patterson AFB OH 45433-6503

DARPA Defense Advanced Research Projects Agency (DARPA)
(HR0011) Electronics Systems Technology Office (ESTO)
Attn: Dr. Marko Slusarczyk
Contract Number: F33615-92-C-5805
Item Number: 0001, Seq. Number:
3701 N. FAIRFAX DR., ARLINGTON VA 22203-1714

7. PAYMENT OF FEE

The fixed fee shall be paid in monthly installments based upon the percentage of completion of work as determined by the Administrative Contracting Officer, subject to the withholding provisions of the Contract Clauses. (AFSC FAR Sup 52.216-9000).

8. MATERIAL INSPECTION & RECEIVING REPORT

Upon completion of all contract line items, the Contractor shall submit one Material Inspection and Receiving Report (DD Form 250) covering all contract line items and identify each contract line item thereon.

9. COST

Total estimated cost is \$3,838,099.00.

10. FEE

Total fixed fee is \$220,691.00.

11. INCORPORATION OF SECTION K BY REFERENCE

Pursuant to Federal Acquisition Regulation (FAR) 15.406-1(b), Section K of the solicitation is hereby incorporated herein by reference.

12. APPLICABILITY OF AFR 83-3

AFR 83-3 specifies certain distribution statements to be used on data subject to distribution. The required distribution statement code and corresponding distribution statement from AFR 83-3 will be set forth in Item 9 and Item 16, respectively, of the DD Form 1423. When the required distribution statement cannot immediately be determined, Item 9 will be marked "TBD" and the required distribution statement will then be furnished by the government technical office within 10 days after contract award.

13. OPTION

The Government is hereby granted the right to obtain the performance of the work described as Phase II (paragraph 4.2, Option 1), Phase III (paragraph 4.3, Option 2), and Phase IV (paragraph 4.4, Option 3), in Section C of the Schedule, and the Contracting Officer may require the Contractor to perform Phase II (Option 1), Phase III (Option 2), and Phase IV (Option 3) at the estimated cost and fixed fee set forth below by giving written contract modification to the Contractor on or before 92 DEC 21 for Phase II (Option 1) exercise, on or before 93 NOV 21 for Phase III (Option 2) exercise, and on or before 94 NOV 21 for Phase IV (Option 3) exercise. In the event that these options are exercised, block 11A of CLIN 0001, Section F, will be changed to reflect extended performance to 94 APR 21 for Phase II (Option 1), 95 JUN 21 for Phase III (Option 2), and 96 FEB 21 for Phase IV (Option 3). In the event that these options are exercised, block 11A of CLIN 0002, Section F, will be changed to reflect a delivery date of 93 DEC 21 for Phase II (Option 1), 95 FEB 21 for Phase III (Option 2), and 95 OCT 20 for Phase IV (Option 3).

OPTION 1, Phase II	Estimated Cost	\$4,158,756.00
	Fixed Fee	\$ 239,128.00
	Total	\$4,397,884.00
OPTION 2, Phase III	Estimated Cost	\$3,010,378.00
	Fixed Fee	\$ 173,097.00
	Total	\$3,183,475.00
OPTION 3, Phase IV	Estimated Cost	\$ 782,917.00
	Fixed Fee	\$ 45,018.00
	Total	\$ 827,935.00

14. GUARANTEED FINAL REPORT

In the event the contractor is unable to complete the entire work as specified in the contract because the cost of completion would be in excess of the funds allotted to the contract, the Contractor agrees, notwithstanding any other clauses or provisions of this contract, to furnish a final report as set forth in Item No. 0001, Sequence No. A008 of Exhibit A covering the work accomplished without any increase in the amount of funds allotted hereunder.

15. DEBRIEFING

The on-site debriefing shall be limited to such purpose as is defined in the Description/Specifications. The content of the debriefing shall be limited to the results of the contractor's effort under the contract and only those individuals directly involved in performance of the contract and essential to the on-site debriefing, shall present the debriefing. Only those costs incurred for materials, supplies and services which are essential to the debriefing, shall be reimbursable as allowable costs under this contract. As an example only, and not as a limitation of unallowable costs, cost of attendance by Government and industry attendees, including food, lodging and transportation, shall be considered unallowable.

16. RELEASE OF INFORMATION

The contractor shall not make public any information by news release, advertising copy, published professional papers, or presentation, covering all or any part of this contractual effort without prior approval of the Office of Public Affairs, ASD/PA, Wright-Patterson AFB, Ohio 45433-6503. Three (3) copies of any information to be released must be submitted to the Office of Public Affairs, for security review and clearance 45 days prior to release. Send one (1) copy to the cognizant CO at WL/MLKT and one copy to the Project Engineer at WL/MTEC. Papers/presentations co-authored with an Air Force author may be submitted by either author.

17. FOREIGN SOURCES

In the event that the contractor anticipates soliciting foreign sources for any work under this contract, the contractor shall notify the Contracting Officer (CO) 10 working days before either applying for an export license under International Traffic in Arms Regulation (ITAR), 22 CFR Sections 121-128, or before solicitation of the foreign sources, whichever shall occur first. This notification shall include detailed description of the Government data/equipment to be exported and a copy of the application for an export license, if such application has been made. This notification to the CO shall not be construed as an application for an export license, nor shall it in any way be interpreted to impede the contractor's right to apply for an export license. However, if the CO disagrees with the application, the contractor will be so notified.

(ASD FAR Sup 52.204-9201)

18. FOREIGN NATIONALS

For purposes of this clause, foreign nationals are all persons not citizens of, or immigrant aliens to, the United States. Nothing in this clause is intended to waive or modify any statutory requirement or any requirement imposed by any other U.S. Government agency with respect to employment of foreign nationals or export control.

The contractor acknowledges that equipment/technical data generated or delivered in performance of this contract is controlled by the International Traffic in Arms Regulation (ITAR) 22 CFR §§ 121-128, and may require an export license before assigning any foreign national to perform work under this contract or before granting access to foreign nationals to any equipment/technical data generated or delivered in performance of this contract (See 22 CFR § 125.03 in this regard). The contractor agrees to notify the Contracting Officer (CO) 10 working days prior to assigning or granting access to a foreign national to any work, equipment or technical data generated or delivered in performance of this contract. This notification will include the name and country of origin of the foreign national, the specific work, equipment or data to which the person will have access, and whether the foreign national is cleared to have access to technical data (Reference: Section 3 of DOD 5220.22-M, "Industrial Security Manual for Safeguarding Classified Information").

The contractor also agrees that, in addition to the procedures established by ITAR, the following legend shall be placed on all technical data generated or delivered in performance of this contract:

WARNING

This document contains technical data whose export is restricted by the Arms Export Control Act (Title 22, U.S.C., Sec 2751, et seq.) or the Export Administration Act of 1979, as amended, Title 50, U.S.C., App. 2401, et seq. Violations of these export laws are subject to severe criminal penalties. Disseminate in accordance with the provisions of AFR 80-34.

The above requirements shall not be construed as an application for an export license nor shall they in any way be interpreted to impede the contractor's right to apply for an export license. However, if the CO disagrees with the application, the contractor will be so notified.

19. LIST OF DATA TO BE PROVIDED WITH OTHER THAN UNLIMITED RIGHTS

a. With the exception of the technical data or computer software set out below, all technical data and computer software to be delivered under this contract shall be furnished with unlimited rights as defined in Section I clause DFARS 252.227-7013.

ITEMS, COMPONENTS, PROCESSES OR COMPUTER SOFTWARE	GOVERNMENT RIGHTS
User Interface System including such software as DiagKNOWS, PanelCAD, and printerVIEW	Limited
Substrate alignment process concept and design	Limited
Lens system, including scaling compensation process	Limited
Calibration process concept and design	Limited
Dust Detector system concept and design	Limited
Laser Triggering subsystem concept and design	Government Purpose License Rights (GPLR)
Grid calibration process concept and design	GPLR
Digital servos and controls concept and design	GPLR
Laser light transfer subsystem concept and design	GPLR
Reticle control subsystem concept and design	GPLR
High speed pattern changing concept and design	GPLR
Reticle storage library concept and design	GPLR
Precision X-Y motion subsystem concept and design (such as motor and platen)	GPLR

b. The technical data identified in paragraph a. above to be delivered with Limited Rights shall remain so for a period of five years from the date of delivery to the Government. After this five year period, the Government shall have Government Purpose License Rights in this data for five years.

c. The technical data identified in paragraph a. above to be delivered with Government Purpose License Rights shall remain so for a period of five years from the date of delivery to the Government. After this five year period, the Government shall have Unlimited Rights in this data for five years.

20. REPORTS OF WORK

a. The contractor shall submit reports making full disclosure of all work done and the results thereof, in the manner, at the times, and to the extent set forth in the Schedule; provided that, unless otherwise specified in the Schedule, the contractor shall submit such reports in triplicate from time to time as requested and upon completion (or earlier termination) of the work. Except as may be otherwise specified in the Schedule, or unless the contractor is otherwise instructed, the contractor shall, upon completion (or earlier termination) of the work, deliver any working drawings and specifications of any prototypes as may have been developed.

b. If the contractor becomes unable to complete the contract work and to deliver at the time specified in the Schedule because of technical difficulties, notwithstanding the exercise of good faith and diligent efforts in performance of the work, he/she shall give the Contracting Officer written notice of the anticipated delays with the reasons therefor not less than forty-five (45) days before the completion date specified in the Schedule or within such time as the Contracting Officer deems sufficient. When notice is so required, the Contracting Officer may, at his/her discretion, extend the time specified in the Schedule for such period as he/she deems advisable.

SECTION I
CONTRACT CLAUSES

1. NOTICE: The following solicitation provisions and/or contract clauses pertinent to this section are hereby incorporated by reference:

I. FEDERAL ACQUISITION REGULATION CONTRACT CLAUSES

<u>PARAGRAPH</u>	<u>CLAUSE TITLE</u>	<u>DATE</u>
52.202-1	DEFINITIONS (APR 1984)	
52.203-1	OFFICIALS NOT TO BENEFIT (APR 1984)	
52.203-3	GRATUITIES (APR 1984)	
52.203-5	COVENANT AGAINST CONTINGENT FEES (APR 1984)	
52.203-7	ANTI-KICKBACK PROCEDURES (OCT 1988)	
52.203-10	PRICE OR FEE ADJUSTMENT FOR ILLEGAL OR IMPROPER ACTIVITY (SEP 1990)	
52.203-12	LIMITATION ON PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS (JAN 1990)	
52.209-6	PROTECTING THE GOVERNMENT'S INTEREST WHEN SUBCONTRACTING WITH CONTRACTORS DEBARRED, SUSPENDED, OR PROPOSED FOR DEBARMENT (JUN 1991)	
52.212-8	DEFENSE PRIORITY AND ALLOCATION REQUIREMENTS (MAY 1986)	
52.215-1	EXAMINATION OF RECORDS BY COMPTROLLER GENERAL (APR 1984)	
52.215-2	AUDIT - NEGOTIATION (DEC 1989)	
52.215-22	PRICE REDUCTION FOR DEFECTIVE COST OR PRICING DATA (JAN 1991)	
52.215-27	TERMINATION OF DEFINED BENEFIT PENSION PLANS (SEP 1989)	
52.215-31	WAIVER OF FACILITIES CAPITAL COST OF MONEY (SEP 1987)	
52.215-39	REVERSION OR ADJUSTMENT OF PLANS FOR POSTRETIREMENT BENEFITS OTHER THAN PENSIONS (PRB) (JUL 1991)	
52.215-33	ORDER OF PRECEDENCE (JAN 1986)	
52.216-7	ALLOWABLE COST AND PAYMENT (JUL 1991)	
52.216-8	FIXED FEE (APR 1984)	
52.219-8	UTILIZATION OF SMALL BUSINESS CONCERNS AND SMALL DISADVANTAGED BUSINESS CONCERNS (FEB 1990)	
52.219-13	UTILIZATION OF WOMEN-OWNED SMALL BUSINESSES (AUG 1986)	
52.220-3	UTILIZATION OF LABOR SURPLUS AREA CONCERNS (APR 1984)	
52.220-4	LABOR SURPLUS AREA SUBCONTRACTING PROGRAM (APR 1984)	
52.222-1	NOTICE TO THE GOVERNMENT OF LABOR DISPUTES (APR 1984)	
52.222-2	PAYMENT FOR OVERTIME PREMIUMS (JUL 1990) Para (a), 'ZERO' is inserted. The inserted figure does not apply to the exceptions in subparagraph (a)(1) through (a)(4) of the clause.	
52.222-20	WALSH-HEALEY PUBLIC CONTRACTS ACT (APR 1984)	
52.222-26	EQUAL OPPORTUNITY (APR 1984)	
52.222-28	EQUAL OPPORTUNITY PREAWARD CLEARANCE OF SUBCONTRACTS (APR 1984)	
52.222-35	AFFIRMATIVE ACTION FOR SPECIAL DISABLED AND VIETNAM ERA VETERANS (APR 1984)	
52.222-36	AFFIRMATIVE ACTION FOR HANDICAPPED WORKERS (APR 1984)	
52.222-37	EMPLOYMENT REPORTS ON SPECIAL DISABLED VETERANS AND VETERANS OF THE VIETNAM ERA (JAN 1988)	
52.223-2	CLEAN AIR AND WATER (APR 1984)	
52.223-6	DRUG-FREE WORKPLACE (JUL 1990)	
52.223-7	NOTICE OF RADIOACTIVE MATERIALS (NOV 1991) paragraph (a), '30' is inserted.	

paragraph (a), '30' is inserted.

52.225-11 RESTRICTIONS ON CERTAIN FOREIGN PURCHASES (APR 1991)
52.225-13 RESTRICTIONS ON CONTRACTING WITH SANCTIONED PERSONS (APR 1991)
52.227-1 AUTHORIZATION AND CONSENT (APR 1984) - ALTERNATE I (APR 1984)
52.227-2 NOTICE AND ASSISTANCE REGARDING PATENT AND COPYRIGHT INFRINGEMENT
(APR 1984)
52.227-11 PATENT RIGHTS - RETENTION BY THE CONTRACTOR (SHORT FORM) (JUN 1989)
52.228-7 INSURANCE - LIABILITY TO THIRD PERSONS (APR 1984)
52.232-9 LIMITATION ON WITHHOLDING OF PAYMENTS (APR 1984)
52.232-17 INTEREST (JAN 1991)
52.232-20 LIMITATION OF COST (APR 1984)
52.232-23 ASSIGNMENT OF CLAIMS (JAN 1986) - ALTERNATE I (APR 1984)
52.232-25 PROMPT PAYMENT (APR 1989)
52.233-1 DISPUTES (APR 1984)
52.233-3 PROTEST AFTER AWARD (AUG 1989) - ALTERNATE I (JUN 1985)
52.242-1 NOTICE OF INTENT TO DISALLOW COSTS (APR 1984)
52.242-13 BANKRUPTCY (APR 1991)
52.243-2 CHANGES - COST-REIMBURSEMENT (AUG 1987) - ALTERNATE V (APR 1984)
52.243-6 CHANGE ORDER ACCOUNTING (APR 1984)
52.244-2 SUBCONTRACTS (COST-REIMBURSEMENT AND LETTER CONTRACTS) (JUL 1985)
- ALTERNATE I (APR 1985)
52.244-5 COMPETITION IN SUBCONTRACTING (APR 1984)
52.245-5 GOVERNMENT PROPERTY (COST-REIMBURSEMENT, TIME-AND-MATERIAL, OR
LABOR-HOUR CONTRACTS) (JAN 1986)
52.246-23 LIMITATION OF LIABILITY (APR 1984)
52.247-1 COMMERCIAL BILL OF LADING NOTATIONS (APR 1984)
52.249-6 TERMINATION (COST-REIMBURSEMENT) (MAY 1986)
52.249-14 EXCUSABLE DELAYS (APR 1984)
52.253-1 COMPUTER GENERATED FORMS (JAN 1991)

II. DOD FAR SUPPLEMENT CONTRACT CLAUSES

<u>PARAGRAPH</u>	<u>CLAUSE TITLE</u>	<u>DATE</u>
252.203-7001	SPECIAL PROHIBITION ON EMPLOYMENT	(FEB 1991)
252.203-7002	STATUTORY COMPENSATION PROHIBITIONS AND REPORTING REQUIREMENTS RELATING TO CERTAIN FORMER DEPARTMENT OF DEFENSE(DOD) EMPLOYEES (FEB 1991)	
252.203-7003	DISPLAY OF DOD HOTLINE POSTER	(OCT 1987)
252.204-7005	OVERSEAS DISTRIBUTION OF DEFENSE SUBCONTRACTS	(AUG 1988)
252.205-7000	RELEASE OF INFORMATION TO COOPERATIVE AGREEMENT HOLDERS	(FEB 1989)
252.209-7001	ACQUISITIONS FROM SUBCONTRACTORS SUBJECT TO ON-SITE INSPECTION UNDER THE INTERMEDIATE - RANGE NUCLEAR FORCES (INF) TREATY	(JAN 1990)
252.215-7000	AGGREGATE PRICING ADJUSTMENT	(APR 1985)
252.215-7003	COST ESTIMATING SYSTEM REQUIREMENTS	(JAN 1990)
252.225-7008	DUTY-FREE ENTRY--QUALIFYING COUNTRY END PRODUCTS AND SUPPLIES	(DEC 1990)
252.227-7013	RIGHTS IN TECHNICAL DATA AND COMPUTER SOFTWARE	(OCT 1988)
252.227-7018	RESTRICTIVE MARKINGS ON TECHNICAL DATA	(OCT 1988)
252.227-7029	IDENTIFICATION OF TECHNICAL DATA	(APR 1988)
252.227-7030	TECHNICAL DATA--WITHHOLDING OF PAYMENT	(OCT 1988)
252.227-7031	DATA REQUIREMENTS	(OCT 1988)
252.227-7034	PATENTS - SUBCONTRACTS	(APR 1984)

- 252.227-7036 CERTIFICATION OF TECHNICAL DATA CONFORMITY (MAY 1987)
The term 'delivered' means accompanied by a DD Form 250
Material Inspection and Receiving Report.
- 252.227-7037 VALIDATION OF RESTRICTIVE MARKINGS ON TECHNICAL DATA (APR 1988)
- 252.227-7039 PATENT RIGHTS--REPORTING OF SUBJECT INVENTIONS (APR 1990)
- 252.231-7000 SUPPLEMENTAL COST PRINCIPLES (APR 1991)
- 252.231-7001 PENALTIES FOR UNALLOWABLE COSTS (APR 1988)
- 252.233-7000 CERTIFICATION OF REQUESTS FOR ADJUSTMENT OR RELIEF EXCEEDING \$100,000
(APR 1990)
- 252.242-7000 SUBMISSION OF COMMERCIAL FREIGHT BILLS TO THE GENERAL SERVICES
ADMINISTRATION FOR AUDIT (AUG 1985)
- 252.242-7001 MATERIAL MANAGEMENT AND ACCOUNTING SYSTEM REQUIREMENTS AND STANDARDS
(MAY 1989)
- 252.242-7003 CERTIFICATION OF INDIRECT COSTS (APR 1986)
- 252.271-7001 RECOVERY OF NONRECURRING COSTS ON COMMERCIAL SALES OF DEFENSE PRODUCTS
AND TECHNOLOGY AND OF ROYALTY FEES FOR USE OF DOD TECHNICAL DATA
(FEB 1989)

2. CLAUSES INCORPORATED BY REFERENCE (JUN 1988)

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.

(FAR 52.252-2)

3. SCIENTIFIC/TECHNICAL INFORMATION (STINFO) (SEP 1985)

If not already registered, the Contractor shall register for Defense Technical Information Center (DTIC) service by contacting the following:

Defense Technical Information Center
ATTN: Registration Section (DTIC-DDR-B)
BLDG. 5, Cameron Station
Alexandria, VA 22304-6145
(202) 274-6871

To avoid duplication of effort and conserve scientific and technical resources the Contractor shall search existing sources in DTIC to determine the current state-of-the-art concepts, studies, etc.

(AF FAR Supplement 52.235-9000)

4. NOT-TO-EXCEED COST AGREEMENT (OCT 1990)

(a) Prior to the issuance of an undefinitized contractual action under this contract, the contracting officer may solicit from the contractor written agreement as to (1) the monetary adjustment (maximum increase or minimum decrease) to be made to the contract or (2) adjustment in the delivery schedule (or time of performance) by reason of the action. The contracting officer may also solicit a definitization schedule for the action and limitations to the adjustments of any other provisions of the contract which may be subject to definitization. Any written agreement shall be cited in the undefinitized contractual action and shall be a binding part of the contract. In no event shall the definitive price exceed the established limitations.

(b) The agreement contemplated by the clause shall be evidenced by a written offer by the contractor which is irrevocable for 60 days unless a different time period is otherwise agreed to by the contract parties. This applies to changes proposed by the contractor and also by the government. The dollar amount specified in the offer will constitute the maximum upward equitable adjustment in contract price for the change.

(AFSC FAR Sup 52.243-9001)

5. TRANSPORTATION OF SUPPLIES BY SEA (APR 1990)

(a) As used in this clause:

(1) "Armed services" means the Army, Navy, Air Force, Marine Corps, and Defense Agencies.

(2) "Components" means articles, materials, and supplies incorporated directly into end products at any level of manufacture, fabrication or assembly by the Contractor or any subcontractor.

(3) "Foreign flag vessel" means any vessel that is not a U.S.-flag vessel.

(4) "Ocean transportation" means any transportation aboard a ship, vessel, boat, barge, or ferry through international waters.

(5) "Subcontractor" means a supplier, materialman, distributor or vendor at any level below the prime contractor whose contractual obligation to perform results from, or is conditioned upon, award of the prime contract and who is performing any part of the work or other requirement of the prime contract.

(6) "Supplies" means all property, except land and interests in land, that is clearly identifiable for eventual use by the armed services, or owned by the armed services, at the time of transportation by sea. It includes (but is not limited to) public works, building and facilities, ships, floating equipment and vessels of every character, type, and description, together with parts, subassemblies, accessories, and equipment; machine tools, material, equipment, and stores of all kinds; end items, construction materials and the component of the foregoing. An item is clearly identifiable for eventual use by the armed services if, for example, the contract documentation contains a reference to a DoD contract number or a military destination.

(7) "U.S.-flag vessel" means a vessel of the United States or belonging to the United States, including any vessel registered or having national status under the laws of the United States.

(b) The Contractor shall employ United States-flag vessels, and no others, in the transportation by sea of any supplies to be furnished in the performance of its contractual obligations.

(c) If the Contractor or subcontractor believes that (1) U.S.-flag vessels are not available for timely shipment; (2) the freight charges are excessive or unreasonable; or (3) freight charges are higher than charges to private persons for transportation of like goods, the Prime Contractor, including subcontractors through the Prime Contractor, may request from the Contracting Officer, in accordance with paragraph (d) below, authorization to ship in foreign-flag vessels or designation of available U.S.-flag vessels. If the Prime Contractor's request to ship supplies in foreign-flag vessels, whether on its own account or on account of a subcontractor, is granted in writing by the Contracting Officer, the supplies may be shipped on foreign-flag vessels in accordance with the approval. The Contracting Officer may condition approval to ship on a foreign-flag vessel on a equitable adjustment of the contract.

(d) The request for use of other than U.S.-flag vessels because of matters concerning freight charges or matters concerning vessel availability must be

submitted in writing by or through the Prime Contractor to the Contracting Officer at least forty-five (45) days prior to the sailing date for the shipper to meet its delivery schedules. Request submitted after such date(s) will be processed as expeditiously as possible, but the failure of the appropriate official to grant approval to meet the shipper's sailing date will not of itself constitute a compensable delay under this or any other clause of this contract. The request shall contain at a minimum:

- (1) Type, weight, and cube of cargo.
- (2) Required shipping date.
- (3) Special handling and discharge requirements.
- (4) Loading and discharge points.
- (5) Name of shipper and consignee.
- (6) Prime contract number.

(7) A documented description of efforts made to secure U.S.-flag vessels, including points of contact with at least two (2) U.S.-flag carriers contacted by name and telephone number. Copies of telephone notes, telegraphic and facsimile messages or letters will be sufficient for this purpose.

(e) The Contractor shall, within thirty (30) days after each shipment covered by this clause, provide the Contracting Officer and the Division of National Cargo, Office of Market Development, Maritime Administration, U.S. Department of Transportation, Washington, DC 20590, one copy of the rated on board vessel operating carrier's ocean-bill-of-lading, which shall contain the following information:

- (1) Applicable Government prime contract number;
- (2) Name of vessel;
- (3) Vessel flag of registry;
- (4) Date of loading;
- (5) Port of loading;
- (6) Port of final discharge;
- (7) Description of commodity;
- (8) Gross weight in pounds and cubic feet if available;
- (9) Total ocean freight in U.S. dollars.
- (10) Name of the steamship company.

(f) Along with the submission of its final invoice under this contract the Contractor agrees to provide a representation that to the best of its knowledge and belief:

- (1) No ocean transportation was used in the performance of this contract;
- (2) Ocean transportation was used and only United States-flag vessels were used for all ocean shipments under the contract. Legible copies of shipping documents have been submitted to the Contracting Officer and to the Maritime Administration in accordance with paragraph (e) of this clause;
- (3) Ocean transportation was used, and to the extent any non-U.S.-flag vessels were used, the Contractor had the written consent of the Contracting Officer for all non-U.S.-flag ocean transportation; or

(4) Ocean transportation was used and some or all of the shipments were made on non-U.S.-flag vessels without the written consent of the Contracting Officer. These shipments were as follows:

<u>ITEM DESCRIPTION</u>	<u>CONTRACT LINE ITEMS</u>	<u>QUANTITY</u>
TOTAL		

(g) If the final invoice does not include the required representation it will be rejected and returned to the Contractor as an improper invoice for the purposes of the clause of the contract entitled "Prompt Payment". In the event there has been unauthorized use of non-U.S.-flag vessels in the performance of this contract, the Contracting Officer is entitled to equitably adjust the contract, based on the unauthorized use.

(h) The Contractor shall include this clause, including this paragraph (h), revised as necessary to reflect the relationship of the contracting parties, in all subcontracts hereunder. Subcontractor bills of lading shall be submitted through the prime contractor to the parties and with the information specified in paragraph (e) of this clause.

(DFARS 252.247-7203)

6. NOTIFICATION OF TRANSPORTATION OF SUPPLIES BY SEA (APR 1990)

(a) The Contractor has indicated by the response to the solicitation provision at 252.247-7202, Representation of Extent of Transportation of Supplies by Sea, that it did not anticipate transporting by sea any supplies, as defined in the clause at 252.247-7203, Transportation of Supplies by Sea, in the performance of this contract. If, however, after the award of this contract, the Contractor should learn that supplies will be transported by sea, the Contractor shall notify the Contracting Officer of the fact that transportation by sea will be used and hereby agrees to comply with all the terms and conditions of the clause at 252.247-7203, entitled "Transportation of Supplies by Sea", contained in this contract.

(b) The Contractor shall include this clause, including this paragraph (b), revised as necessary to reflect the relationship of the contracting parties, in all subcontracts hereunder.

(DFARS 252.247-7204)

7. EQUAL OPPORTUNITY PREAWARD CLEARANCE OF SUBCONTRACTS (JUN 1990)

The prime contractor shall request its preaward clearances through the contracting officer at least 30 calendar days before the proposed award date, unless the cognizant Department of Labor compliance office agrees to a shorter time.

(AFSC FAR Supplement 52.222-9000)

8. AUTHORIZED DEVIATIONS IN CLAUSES (APR 1984)

(a) The use in this solicitation or contract of any Federal Acquisition Regulation (48 CFR Chapter 1) clause with an authorized deviation is indicated by the addition of "(DEVIATION)" after the date of the clause.

(b) The use in this solicitation or contract of any DOD FAR Supplement (48 CFR Chapter 2) clause with an authorized deviation is indicated by the addition of "(DEVIATION)" after the name of the regulation.

(FAR 52.252-6)

9. REQUIREMENT FOR CERTIFICATE OF PROCUREMENT INTEGRITY-MODIFICATION (NOV 1990)

(a) Definitions. The definitions set forth in FAR 3.104-4 are hereby incorporated in this clause.

(b) The Contractor agrees that it will execute the certification set forth in paragraph (c) of this clause when requested by the Contracting Officer in connection with the execution of any modification of this contract.

(c) Certification. As required in paragraph (b) of this clause, the officer or employee responsible for the modification proposal shall execute the following certification:

CERTIFICATE OF PROCUREMENT INTEGRITY MODIFICATION (NOV 1990)

(1) I, [Name of certifier] am the officer or employee responsible for the preparation of this modification proposal and hereby certify that, to the best of my knowledge and belief, with the exception of any information described in this certification, I have no information concerning a violation or possible violation of subsection 27(a), (b), (d) or (f) of the Office of Federal Procurement Policy Act, as amended* (41 U.S.C. 423), (hereinafter referred to as "the Act"), as implemented in the FAR, occurring during the conduct of this procurement (contract and modification number).

(2) As required by subsection 27(e)(1)(B) of the Act, I further certify that to the best of my knowledge and belief, each officer, employee, agent, representative, and consultant of [Name of Offeror] who participated personally and substantially in the preparation or submission of this proposal has certified that he or she is familiar with, and will comply with, the requirements of subsection 27(a) of the Act, as implemented in the FAR, and will report immediately to me any information concerning a violation or possible violation of subsections 27(a), (b), (d) or (f) of the Act, as implemented in the FAR, pertaining to this procurement.

(3) Violations or possible violations: (Continue on plain bond paper if necessary and label Certificate of Procurement Integrity-Modification (Continuation Sheet), ENTER "NONE" IF NONE EXISTS) _____

_____ [Signature of the officer or employee responsible]
for the modification proposal and date _____]

[Typed name of the officer or employee responsible]
for the modification proposal _____]

* Subsections 27(a), (b), and (d) are effective on December 1, 1990. Subsection 27(f) is effective on June 1, 1991.

THIS CERTIFICATION CONCERNS A MATTER WITHIN THE JURISDICTION OF AN AGENCY OF THE UNITED STATES AND THE MAKING OF A FALSE, FICTITIOUS, OR FRAUDULENT CERTIFICATION MAY RENDER THE MAKER SUBJECT TO PROSECUTION UNDER TITLE 18, UNITED STATES CODE, SECTION 1001.

(End of certification)

(d) In making the certification in paragraph (2) of the certificate, the officer or employee of the competing Contractor responsible for the offer or bid, may rely upon a one-time certification from each individual required to submit a certification to the competing Contractor, supplemented by periodic training. These certifications shall be obtained at the earliest possible date after an individual required to certify begins employment or association with the contractor. If the contractor decides to rely on a certification executed prior to the suspension of section 27 (i.e., prior to December 1, 1989), the Contractor shall ensure that an individual who has so certified is notified that section 27 has been reinstated. These certifications shall be maintained by the Contractor for a period of 6 years from the date a certifying employee's employment with the company ends or, for an agency, representative, or consultant, 6 years from the date such individual ceases to act on behalf of the contractor.

(e) The certification required by paragraph (c) of this clause is a material representation of fact upon which reliance will be placed in executing this modification.

(FAR 52.203-9)

10. SUBCONTRACTOR COST OR PRICING DATA (DEVIATION) (DEC 1990)

(a) Before any subcontract expected to exceed \$500,000 when entered into, or before pricing any subcontract modification involving a pricing adjustment expected to exceed \$500,000, the Contractor shall require the subcontractor to submit cost or pricing data (actually or by specific identification in writing), unless the price is --

(1) Based on adequate price competition;

(2) Based on established catalog or market prices of commercial items sold in substantial quantities to the general public; or

(3) Set by law or regulation.

(b) The Contractor shall require the subcontractor to certify in substantially the form prescribed in subsection 15.804-4 of the Federal Acquisition Regulation (FAR) that, to the best of its knowledge and belief, the data submitted under paragraph (a) above were accurate, complete, and current as of the date of agreement on the negotiated price of the subcontract or subcontract modification.

(c) In each subcontract that exceeds \$500,000 when entered into, the Contractor shall insert either --

(1) The substance of this clause, including this paragraph (c), if paragraph (a) above requires submission of cost or pricing data for the subcontract; or

(2) The substance of the clause at FAR 52.215-25, Subcontractor Cost or Pricing Data--Modifications.

(d) The \$500,000 threshold shall revert to \$100,000 after December 31, 1995. Therefore, all subcontracts awarded after December 31, 1995, and/or all changes or modifications made after December 31, 1995, shall be subject to the \$100,000 threshold.

(FAR 52.215-24)

11. PROHIBITION AGAINST RETALIATORY PERSONNEL ACTIONS (APR 1991)

(a) Definitions. As used in this clause,

"Appropriate Government official" means --

(1) An officer or employee of the Department of Defense responsible for command, direct staff assistance to a commander, contract administration, program management, audit, inspection, investigation, or enforcement of any law or regulation relating to Government procurement or the subject matter of the contract;

(2) A member of Congress or an officer or employee of Congress, the General Accounting Office, the Congressional Budget Office, or the Office of Technology Assessment; and

(3) Any other officer or employee of the United States whose duties include the investigation or enforcement of any law, rule, or regulation relating to Government procurement or the subject matter of the contract.

"Information concerning a contract" means information about cost, price, compliance with specifications, meeting the user's requirements, user safety, use or disposition of services, real property or personal property acquired under the contract, the procurement process (including competition, negotiation, award and administration), and relationship with Government personnel, competitors, or subcontractors.

(b) Prohibition.

In accordance with 10 U.S.C. 2409a, the Contractor shall not discharge or otherwise discriminate against any employee with respect to the employee's compensation or terms and conditions of employment because the employee (or any person acting pursuant to a request of the employee) discloses to a Government official information concerning a defense contract, which information the employee reasonable believes evidences a violation of any Federal law or regulation relating to defense procurement or the subject matter of this contract.

(c) The Government will notify the Contractor upon receipt of any complaint filed under the provisions of this clause and Subpart 203.71 of the Defense FAR Supplement. The Contractor agrees to cooperate with the Government during its investigation of any such complaint.

(d) The Contractor shall inform all employees of --

- (1) The prohibitions of this clause;
- (2) Employees right under 10 U.S.C. 2409a; and
- (3) Availability of procedures implementing the statute.

(DFARS 252.203-7004)

12. NOTIFICATION OF SUBSTANTIAL IMPACT ON EMPLOYMENT (MAY 1991)

(a) Definitions.

(1) "Major defense contract or subcontract" means --

- (i) All prime contracts of \$5 million or more; and
- (ii) All subcontracts, awarded under the prime, of \$500,000 or more.

(2) "Substantial impact on employment" means --

(i) A reduction of --

(A) 2,500 or more employee positions, in the case of a Metropolitan Statistical Area (MSA) or similar area. MSA are identified in FIPS Publication 8-5, Metropolitan Statistical Areas, which is available from the U.S.

Department of Commerce, National Technical Information Service, Springfield, VA 22161, tel (703) 487-4650. Telephone inquiries concerning MSAs may also be directed to the Bureau of the Census, Population Division, Population Distribution Branch, Washington, DC, tel (301) 763-5158;

(B) 1,000 or more employee positions, in the case of a labor market area outside an MSA, or

area; or (C) 1 percent of the total number of civilian jobs in that

(ii) A reduction, or the threat of a reduction of --

(A) 25 percent or more in sales or production of the contractor or subcontractor; or

(B) 80 percent or more of the work force of the contractor or subcontractor in any division of such contractor or such subcontractor or at any plant or facility of such contractor or subcontractor; or

(iii) Any group of 100 or more workers at a defense facility who are, or who are threatened to become, eligible to participate in the Defense Conversion Adjustment Program under section 325 of the Job Training Partnership Act (29 U.S.C. 1662-1662c, as amended).

(b) This clause applies only if a modification or termination of a major defense contract or subcontract will have a substantial impact on employment.

(c) The Contractor shall promptly notify the Contracting Officer if the proposed modification or termination of this contract or major defense subcontract under this contract will have a substantial impact on employment.

(d) The Contractor shall include the substance of this clause in all subcontracts of \$500,000 or more under this contract.

(DFARS 252.249-7001)

SECTION J
LIST OF DOCUMENTS, EXHIBITS, AND OTHER ATTACHMENTS

LIST OF EXHIBITS:

<u>IDENTIFIER</u>	<u>DATE</u>	<u>TITLE</u>	<u>NO. OF PAGES</u>
Exhibit A	92 JAN 17	Contract Data Requirements List (DD Form 1423) Addendum No. 1 to A014	16 8

CONTRACT DATA REQUIREMENTS LIST

(1 Data Item)

For Approved
OMB No. 0704-0188

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

A. CONTRACT LINE ITEM NO. 0001		B. EXHIBIT A	C. CATEGORY: TDP: _____ TM: _____ OTHER: _____		Ref: DoD 5010.12-L AMSDL			
D. SYSTEM/ITEM DARK0251		E. CONTRACT F33615-92-C-5805		F. CONTRACTOR MRS Technology				
1. DATA ITEM NO. A004	2. TITLE OF DATA ITEM CONTRACT FUNDS STATUS REPORT (CFSR)			3. SUBTITLE				
4. AUTHORITY (Data Acquisition Document No.) DI-F-6004B/T		5. CONTRACT REFERENCE Section C, Para. 4.5		6. REQUIRING OFFICE WL/MTE				
7. DD 250 REQ LT	9. DIST STATEMENT REQUIRED E	10. FREQUENCY QRTL	12. DATE OF FIRST SUBMISSION **	14. DISTRIBUTION				
8. APP CODE	11. AS OF DATE *	13. DATE OF SUBSEQUENT SUBMISSION **	a. ADDRESSEE					
16. REMARKS			b. COPIES					
			Draft		FINAL Reg Repro			
<p>Tailored so that the report shall contain forecasts by month for the next six months, by quarter for the remaining fiscal year, and by year for the remaining fiscal years. CFSR data shall be reconciled to the Government's fiscal year end at 30 September if the contractor's fiscal year does not coincide with the Government's fiscal year.</p> <p>* The last day of the contractor's monthly accounting period nearest the end of the calendar quarter.</p> <p>** 25 calendar days after Block 11 time</p> <p>Applicable for Options I, II, and III if exercised.</p>			WL/MTE					
			CO			3		
			ACO			1		
			WL/MLCT			1		
			DARPA			1		
						15. TOTAL →		7

17. PRICE GROUP
18. ESTIMATED TOTAL PRICE

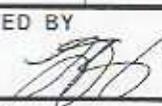
G. PREPARED BY Robert Cross, Project Engineer, WL/MTEC 52461	H. DATE 17 Jan 92	I. APPROVED BY 	J. DATE 17 Jan 92
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CONTRACT DATA REQUIREMENTS LIST

(1 Data Item)

For Approved
OMB No. 0704-0188

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A. CONTRACT LINE ITEM NO. 0001		B. EXHIBIT A		C. CATEGORY: TDP _____ TM _____ OTHER _____		Ref: DoD 5010.12-L AMSDL	
D. SYSTEM/ITEM DARK0251			E. CONTRACT F33615-92-C-5805		F. CONTRACTOR MRS Technology		
1. DATA ITEM NO. A006		2. TITLE OF DATA ITEM CONFERENCE MINUTES			3. SUBTITLE QUARTERLY TECHNICAL REVIEW		
4. AUTHORITY (Data Acquisition Document No.) DI-A-7089/T			5. CONTRACT REFERENCE SOW para. 6.1		6. REQUIRING OFFICE WL/MTEC		
7. DD 250 REQ LT	8. DIST STATEMENT REQUIRED B	9. FREQUENCY QRTLY	10. DATE OF FIRST SUBMISSION **		14. DISTRIBUTION		
8. APP CODE	11. AS OF DATE .	12. DATE OF SUBSEQUENT SUBMISSION **		a. ADDRESSEE WL/MTE	b. COPIES		
16. REMARKS Tailored to contractor's format * At the conclusion of each quarterly review. ** Conference minutes for each review shall be submitted to WL/MTEC, no later than two calendar weeks after each quarterly review. Applicable for Options I, II, and III if exercised.					Draft	FINAL	
					Reg	Repro	
				15. TOTAL →	5		
G. PREPARED BY Robert Cross, Project Engineer, WL/MTEC 52461			H. DATE 17 Jan 92	I. APPROVED BY 		J. DATE 17 Jan 92	

17. PRICE GROUP
18. ESTIMATED TOTAL PRICE

CONTRACT DATA REQUISITEMENTS LIST

(1 Data Item)

For approved
OML No. 0704-0188

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

A. CONTRACT LINE ITEM NO. 0001	B. EXHIBIT A	C. CATEGORY: TDP _____ TM _____ OTHER _____	Ref: DoD 5010.12-L AMSDL
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D. SYSTEM/ITEM DARK0251	E. CONTRACT F33615-92-C-5805	F. CONTRACTOR MRS Technology
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1. DATA ITEM NO. A008	2. TITLE OF DATA ITEM SCIENTIFIC and TECHNICAL REPORTS	3. SUBTITLE FINAL REPORT
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4. AUTHORITY (Data Acquisition Document No.) DI-MISC-80711/T	5. CONTRACT REFERENCE Section C, Para. 4.1 - 4.4	6. REQUIRING OFFICE WLMTEC
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7. DD 250 REQ XX	9. DIST STATEMENT REQUIRED B	10. FREQUENCY One/R	12. DATE OF FIRST SUBMISSION *93MAR22	14. DISTRIBUTION			
8. APP CODE A		11. AS OF DATE *93FEB22	13. DATE OF SUBSEQUENT SUBMISSION *93JUL21				a. ADDRESSEE WLMTE
					Draft	FINAL	
						Reg	Repro
					2	5	1

16. REMARKS
Tailored to require the official WL and DARPA emblems to be placed in the upper right hand corner of the front cover with the affected entries adjusted as required (WL will supply copies of the emblems); Block 10, para. 10.3 is clarified so that distribution to DTIC will be through Air Force distribution channels.

Approval/disapproval by letter from the Air Force within ninety (90) days after receipt.

Disapproval requires correction/resubmission within thirty (30) days after receipt of Air Force comments.

Draft report shall be unbound, double-spaced and in standard size type.

The reproducible copy shall be CAMERA READY (the original typed master), unbound, and shall incorporate all changes made in the corrected draft. All photos used in this report shall be glossy finished. Submit the reproducible copy with the Final corrected version only.

All Limited Rights and Government Purpose License Rights (GPLR) data shall be submitted in a separate Addendum to this report.

Block 11, 12 and 13 will change as each option is exercised, as follows:

	Block 11	Block 12	Block 13
Option 1	93NOV22	93DEC21	94APR21
Option 2	95JAN20	95FEB21	95JUN21
Option 3	95SEP21	95OCT20	96FEB21

15. TOTAL →	2	5	1
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G. PREPARED BY Robert Cross, Project Engineer, WL/MTEC 52451	H. DATE 17 Jan 92	I. APPROVED BY 	J. DATE 17 Jan 92
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17. PRICE GROUP
18. ESTIMATED TOTAL PRICE

CONTRACT DATA REQUIREMENTS LIST

(1 Data Item)

For *Approved*
OML No. 0704-0188

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

A. CONTRACT LINE ITEM NO. **0001** B. EXHIBIT **A** C. CATEGORY: **Ref: DoD 5010.12-L AMSDL**
TDP _____ TM _____ OTHER _____

D. SYSTEM/ITEM **DARK0251** E. CONTRACT **F33615-92-C-5805** F. CONTRACTOR **MRS Technology**

1. DATA ITEM NO: **A009** 2. TITLE OF DATA ITEM **TECHNICAL OPERATING REPORT (TOR)** 3. SUBTITLE **END OF PHASE REPORT**

4. AUTHORITY (Data Acquisition Document No.) **DI-S-30559/T** 5. CONTRACT REFERENCE **Section C, Para. 4.1 - 4.4** 6. REQUIRING OFFICE **WL/MTE**

7. DD 250 REQ LT	8. APP CODE A	9. DIST STATEMENT REQUIRED B	10. FREQUENCY THREE/R	11. AS OF DATE *	12. DATE OF FIRST SUBMISSION **	13. DATE OF SUBSEQUENT SUBMISSION ** ***	14. DISTRIBUTION		
								a. ADDRESSEE	
								b. COPIES	
								Draft	FINAL
									Reg
									Repro

16. REMARKS

Tailored to contractor's format.

*At the completion of phases I, II and III of the contract.

Approval/disapproval by letter from the Air Force within thirty (30) days after receipt.

**30 days after Block 11 time.

***Disapproval requires correction/resubmission within 10 days after receipt of Air Force comments.

All Limited Rights and Government Purpose License Rights (GPLR) data shall be submitted in a separate addendum to this report.

15. TOTAL	5	5
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17. PRICE GROUP
18. ESTIMATED TOTAL PRICE

G. PREPARED BY: **Robert Cross, Project Engineer, WL/MTEC 52461** H. DATE: **17 Jan 92** I. APPROVED BY: *[Signature]* J. DATE: **17 Jan 92**

CONTRACT DATA REQUIREMENTS LIST

(1 Data Item)

For Approved
OML No. 0704-0188

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

A. CONTRACT LINE ITEM NO. 0001	B. EXHIBIT A	C. CATEGORY: TDP _____ TM _____ OTHER _____	Ref: DoD 5010.12-L AMSDL
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D. SYSTEM/ITEM DARK0251	E. CONTRACT F33615-92-C-5805	F. CONTRACTOR MRS Technology
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1. DATA ITEM NO. A010	2. TITLE OF DATA ITEM PRESENTATION MATERIAL	3. SUBTITLE LAYOUT FOR DISPLAY BOARD
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4. AUTHORITY (Data Acquisition Document No.) DI-A-3024A/T	5. CONTRACT REFERENCE Section C, Para. 5.2	6. REQUIRING OFFICE WL/MTE
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7. DD 250 REQ LT	9. DIST STATEMENT REQUIRED A	10. FREQUENCY ONE/R	12. DATE OF FIRST SUBMISSION **	14. DISTRIBUTION											
8. APP CODE A	11. AS OF DATE *	13. DATE OF SUBSEQUENT SUBMISSION ***	<table border="1"> <tr> <th rowspan="2">a. ADDRESSEE</th> <th colspan="3">b. COPIES</th> </tr> <tr> <th>Draft</th> <th>Reg</th> <th>Repro</th> </tr> <tr> <td>WL/MTE</td> <td>1</td> <td>1</td> <td></td> </tr> </table>		a. ADDRESSEE	b. COPIES			Draft	Reg	Repro	WL/MTE	1	1	
a. ADDRESSEE	b. COPIES														
	Draft	Reg	Repro												
WL/MTE	1	1													

16. REMARKS

Tailored to require only a pictorial or graphical layout of the display board results of work effort.

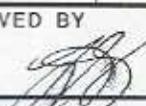
* Close of technical effort

** Submit a draft with the draft of the final report Data Item #A008.

Approval/Disapproval by letter from the Air Force within 30 days after receipt.

***Disapproval requires correction/resubmission within 30 days after receipt of Air Force comments.

15. TOTAL	1	1
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G. PREPARED BY Robert Cross, Project Engineer, WL/MTEC 52461	H. DATE 17 Jan 92	I. APPROVED BY 	J. DATE 17 Jan 92
---	----------------------	---	----------------------

17. PRICE GROUP
18. ESTIMATED TOTAL PRICE

CONTRACT DATA REQUIREMENTS LIST
(1 Data Item)

Fo. Approved
OMB No. 0704-0188

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

A. CONTRACT LINE ITEM NO. 0001 B. EXHIBIT A C. CATEGORY: TDP _____ TM _____ OTHER _____ Ref: DoD 5010.12-L AMSDL

D. SYSTEM/ITEM DARK0251 E. CONTRACT F33615-92-C-5805 F. CONTRACTOR MRS Technology

1. DATA ITEM NO. A014 2. TITLE OF DATA ITEM SCIENTIFIC AND TECHNICAL REPORTS 3. SUBTITLE EXECUTIVE SUMMARY

4. AUTHORITY (Data Acquisition Document No.) DI-MISC-80711/T 5. CONTRACT REFERENCE Section C, Para. 4.4 6. REQUIRING OFFICE WL/MTE

7. DD 250 REQ LT 8. APP CODE A 9. DIST STATEMENT REQUIRED A 10. FREQUENCY ONE/R 11. AS OF DATE * 12. DATE OF FIRST SUBMISSION * 13. DATE OF SUBSEQUENT SUBMISSION ** 14. DISTRIBUTION a. ADDRESSEE WL/MTE b. COPIES Draft 1 FINAL Reg 1 Report 1

16. REMARKS
Tailored to be prepared as a printer's reproducible layout in the attached format. See Addendum No. 1 to Data Item A014 for format.

The summary shall be 8 1/2" x 11" when folded and stapled on the left side, and shall contain a minimum of 8 pages (4 sheets, both sides).

Approval/disapproval by letter from the Air Force within thirty (30) days after receipt.

*Submit with Final Report CDRL #A008

**Disapproval requires correction/resubmission within thirty (30) days after receipt of Air Force comments.

UNDER NO CIRCUMSTANCES SHALL THE CONTRACTOR MAKE A PRINTING PLATE OF THE DATA OR SUMMARY, NOR SHALL THE CONTRACTOR PRINT ANY COPIES OF THIS INFORMATION.

15. TOTAL → 1 1

G. PREPARED BY Robert Cross, Project Engineer, WLMTEC 52461 H. DATE 17 Jan 92 I. APPROVED BY [Signature] J. DATE 17 Jan 92

17. PRICE GROUP
18. ESTIMATED TOTAL PRICE

CONTRACT DATA REQUIREMENTS LIST
(1 Data Item)

For approval
OMB No. 0704-0188

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

A. CONTRACT LINE ITEM NO. 0001 B. EXHIBIT A C. CATEGORY: TDP _____ TM _____ OTHER _____ Ref: DoD 5010.12-L AMSDL

D. SYSTEM ITEM DARK0251 E. CONTRACT F33615-92-C-5805 F. CONTRACTOR MRS Technology

1. DATA ITEM NO. A016 2. TITLE OF DATA ITEM SYSTEM/SEGMENT SPECIFICATION 3. SUBTITLE

4. AUTHORITY (Data Acquisition Document No.) DI-CMAN-80008A/T 5. CONTRACT REFERENCE Section C, Para. 4.1 - 4.4 6. REQUIRING OFFICE WL/MTE

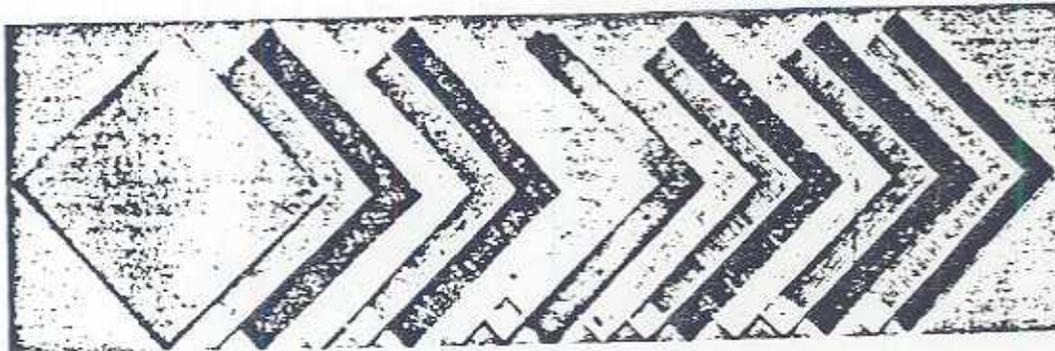
7. DD 250 REQ LT 8. APP CODE A 9. DIST STATEMENT REQUIRED D 10. FREQUENCY ONE/R 11. AS OF DATE 92 APR 21 12. DATE OF FIRST SUBMISSION 92 MAY 21 13. DATE OF SUBSEQUENT SUBMISSION 92 JUL 21 14. DISTRIBUTION

15. TOTAL → 2 2

17. PRICE GROUP
18. ESTIMATED TOTAL PRICE

16. REMARKS
Tailored to allow contractor's format.
Deliver unbound on 8 1/2" x 11" bond paper.
Approval/disapproval by letter from the Air Force within 30 days after receipt.
Disapproval requires correction/resubmission within 30 days after receipt of Air Force comments.

G. PREPARED BY Robert Cross, Project Engineer, WL/MTEC 52461 H. DATE 17 Jan 92 I. APPROVED BY [Signature] J. DATE 17 Jan 92



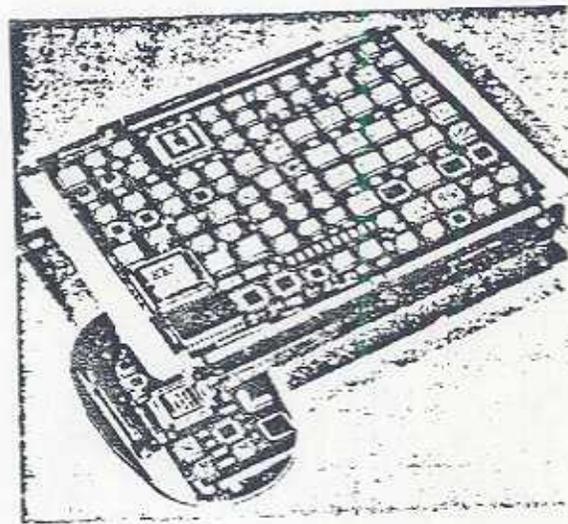
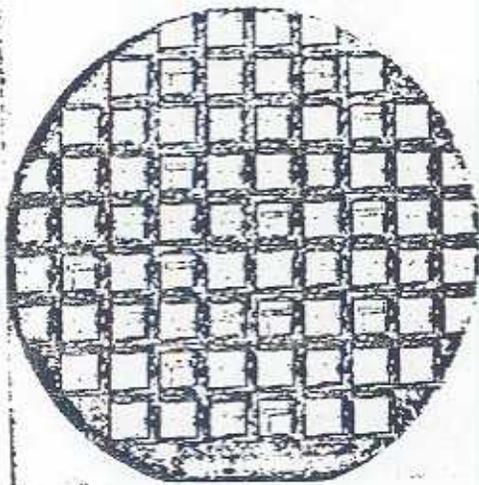
Program Sponsor
Manufacturing Technology Directorate
Wright Research Development Center
Wright-Patterson AFB, Ohio

Prime Contractor
Martin Marietta Missile Systems

Prime Team Members
GE Aerospace
Westinghouse Electric Corporation
9 Real-Time Technology Transfer Team
Members (RT4)
14 Technical Advisory Board Members
50 Material and Process Development
Subcontractors

Contract Number
F33615-85-C-5065

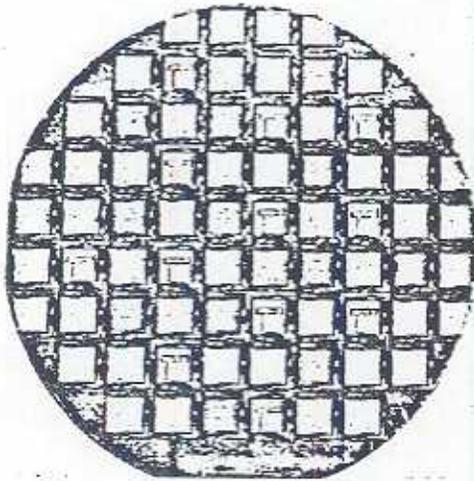
Manufacturing Technology for Advanced Data/Signal Processing



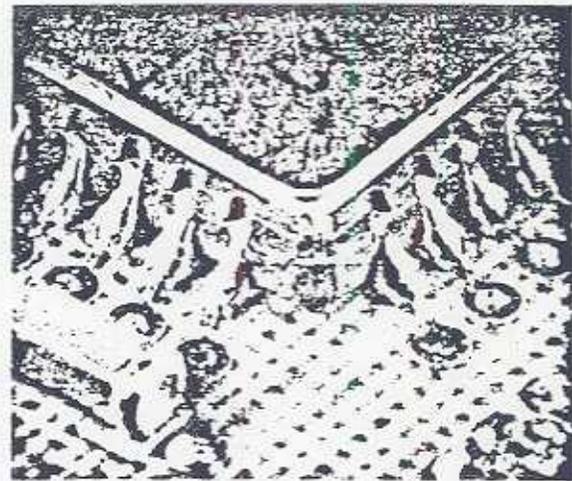
GE Aerospace

 **Westinghouse**

MARTIN MARIETTA

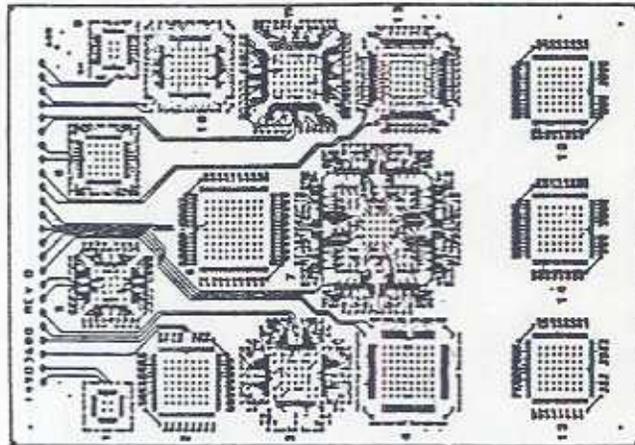


1.25μ VHSIC Wafer



Solder Fillet Geometry

*Top Layer Layout
of Task III Phase II
Test Board*



The primary objective of this manufacturing technology (ManTech) program was to establish manufacturing techniques, processes, and controls that reproducibly and economically produce high-speed digital electronic assemblies capable of surviving the extreme environments to which advanced systems are subjected.

The five tasks of this program included:

Task I – Screening and inspecting (at the wafer level) very-high-speed devices during fabrication to effectively double their yield

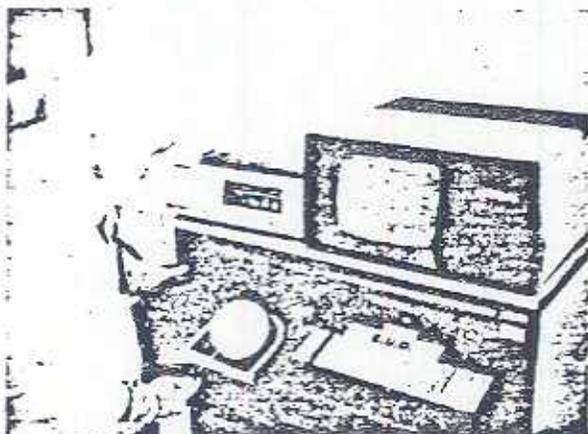
Task II – Design and select materials and processes for PWBs that are functional at speeds up to 40 MHz

Task III – Investigate soldering processes and controls that would reliably attach high-density surface-mounted packages for these devices to the PWB

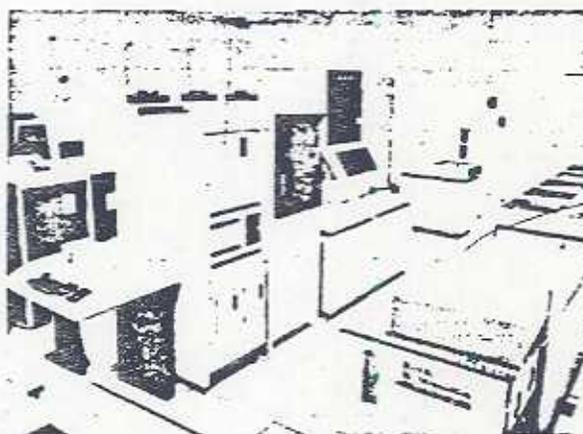
Task IV – Demonstrate the integration of these technologies into fully functional high-performance, highly reliable PWB assemblies that can be produced at multiple facilities

Task V – Demonstrate the insertion of high-speed electronic assemblies having been fabricated using the new enabling technology into existing or soon to exist DoD programs. As shown herein, this ManTech program was able to successfully meet and exceed all the goals set for it.

Task I - VHSIC Wafer Yield Improvement

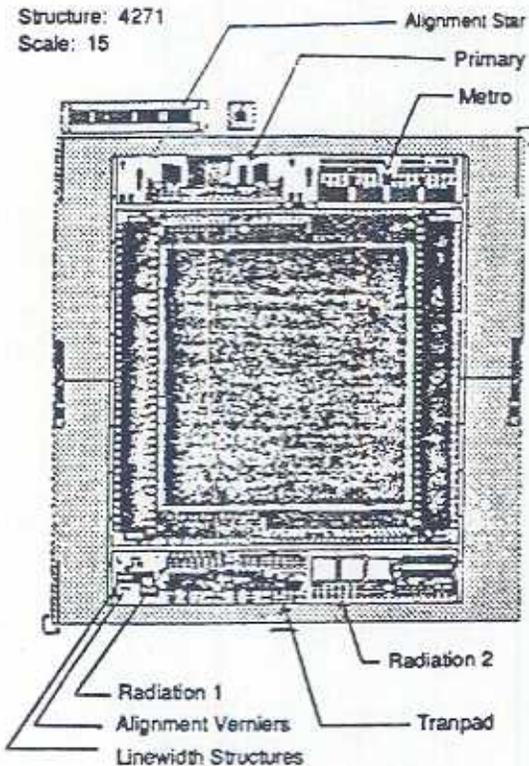


Wafer Material Screening

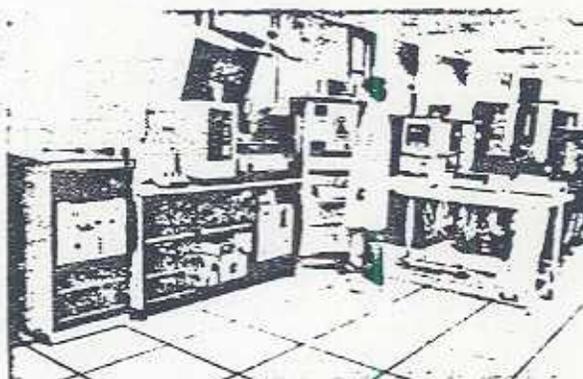


**Automatic Data Collection,
Analysis, and Feedback**

Structure: 4271
Scale: 15



Device Test Structure

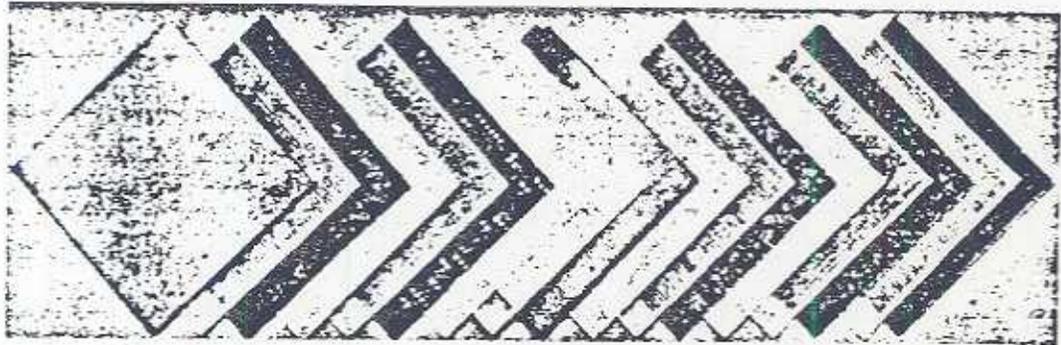


Radiation Hardness Wafer Test

Payoff

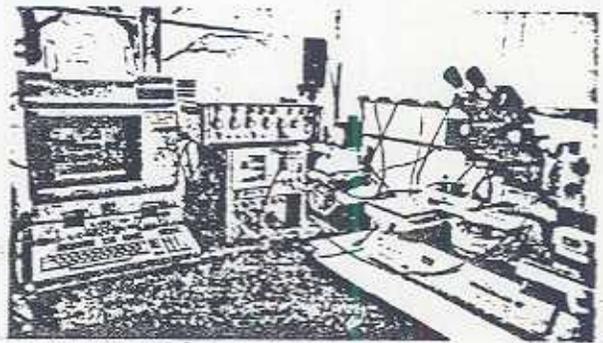
- Yield increased 4 times (2 to 8 percent)
- 40 percent improved fabrication cycle time (101 to 63 days)
- 66 percent reduction in test time (60 to 20 minutes/wafer)
- Methods transferred to industry through RT⁴

Task II – PWB Process Improvements

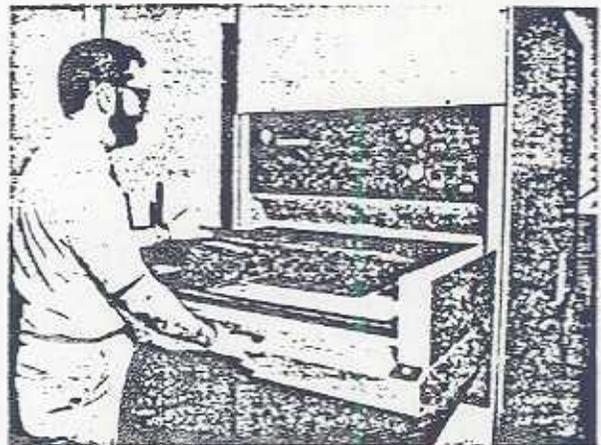


Materials Characterization

- Downselected VHSIC PWB materials
 - Quatrex™/Quartz 525
 - Quatrex™/Kevlar® 120
 - Polyimide/E-glass
- PWBs electrically, mechanically, and physically compatible with VHSIC 1.25 micrometer devices
- Yield is now greater than 80 percent, up from a baseline of less than 50 percent
- Survived greater than 1000 thermal stress cycles at -55 to +125°C
- Established critical element matrix – relates performance, reliability, and cost to design, materials, and processes



Electrical Testing



Processing Optimization

Task III – Solder Interconnection Reliability

The program determined which factors influence solder interconnection reliability by using analytical computer-modeling and empirical testing.

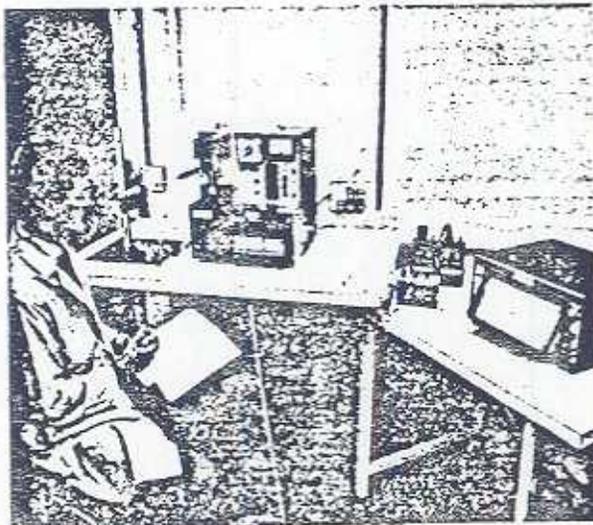
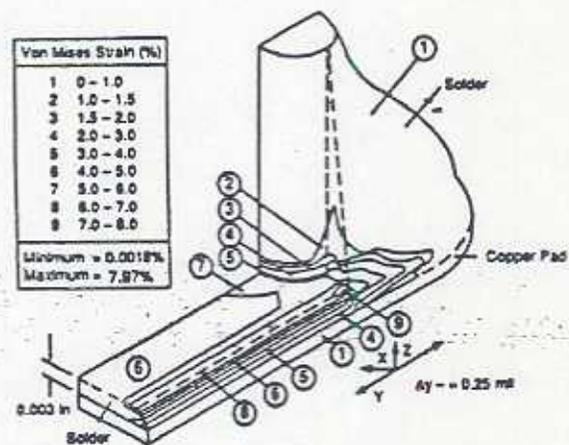
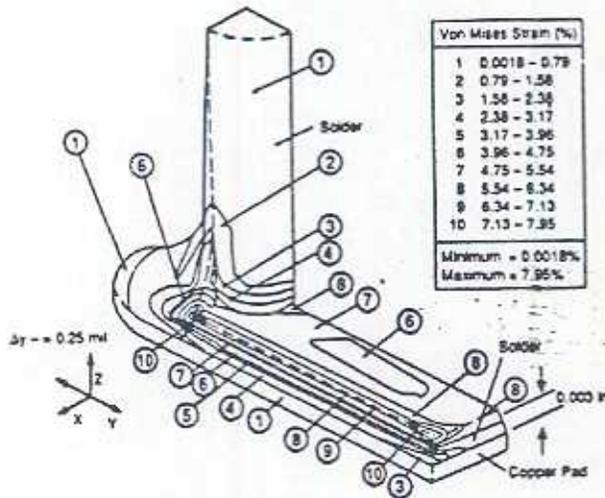
Significant solder joint characteristics for high reliability include:

- Joint-to-joint uniformity
- Bulbous fillet
- Component registration

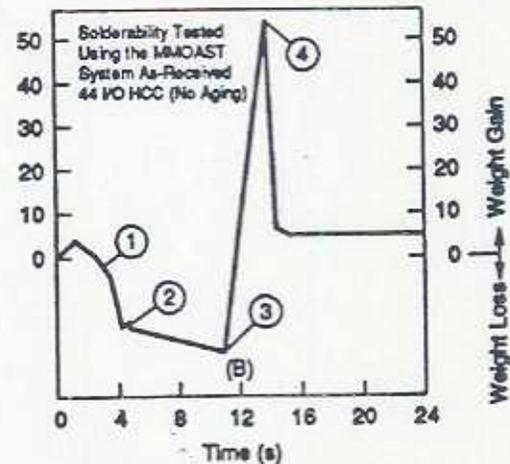
- 7 to 10 mil standoff ratio
- Vertical, parallel edges at bottom of package

Component solderability is critical to ensure good first-pass product yields and life-cycle reliability.

The AD/SP program developed, demonstrated, and used new quantitative test methods to ensure good solderability.



Wetting Balance Test Setup



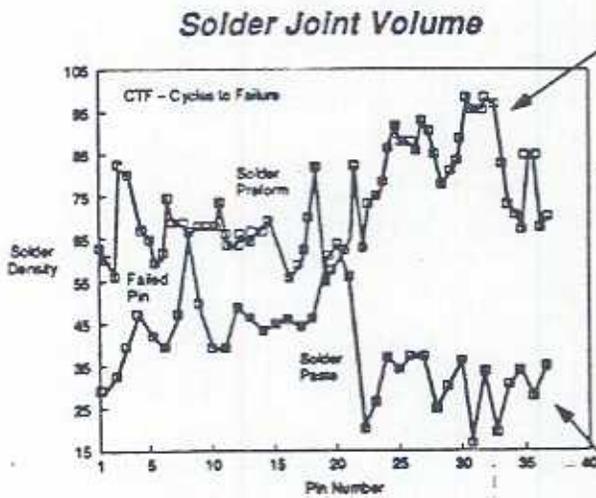
- | | |
|---|--|
| 1 | Initial Contact with Solder |
| 2 | Immersion Stops - Dwell Starts |
| 3 | Beginning Withdrawal from Solder |
| 4 | Rupture Point of Solder Drawn Up from Pot by Wetted Termination(s) |

Task III – Solder Process Implementation

New assembly methods were developed to produce more reliable, large, uniform solder joints.

VHSIC high-density electronic packaging. Industry representatives credit the technology transferred from this program with having prevented specific field failures.

The AD/SP program demonstrated the solder interconnection reliability necessary to use



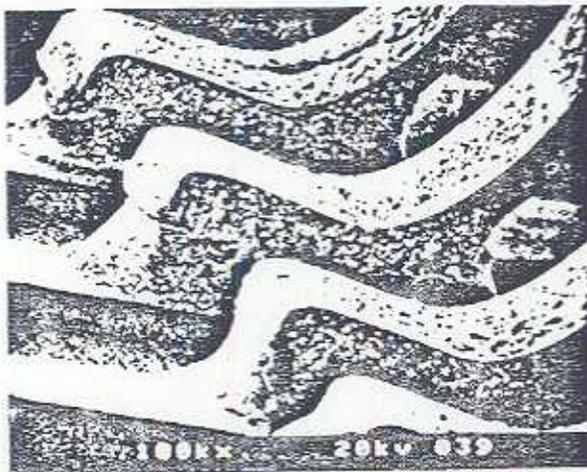
Solder Paste/Solder Preforms Assembly Process Comparison



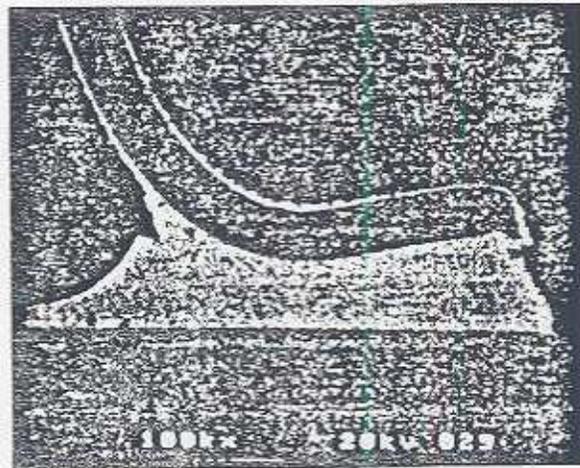
Solder Joints Produced Using Solder Preforms



Solder Joints Produced Using Conventional Stencil/Print Reflow Process



124 VO 20-Mil Package Solder Joints After 1,000 Cycles, -40°C to 90°C, Worst Case Surface Deformation, 100X

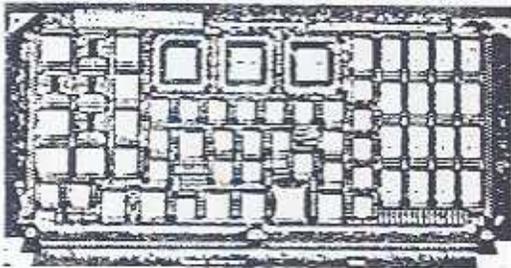


Cross Section of Solder Joint; Surface Cracking Does Not Affect Entire Foot Area Joint Integrity, 100X

Tasks IV/V – Assembly Implementation Demonstration

One objective of the program was to demonstrate the integration of technologies from Tasks I, II, and III into demonstration units during Task IV that could be inserted into active DoD systems (Task V).

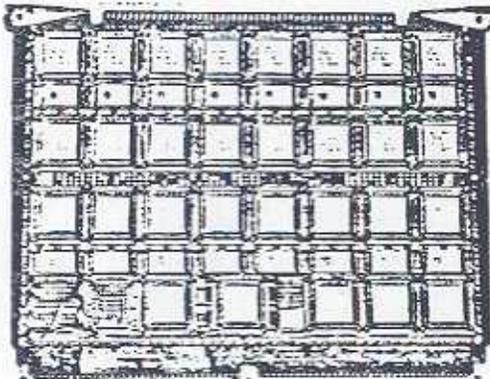
Each module was tested and passed the program's criteria. The GE Aerospace YF-120 CPU module is planned to be integrated into the ATF program.



1750A Processor



Martin Marietta → F-15 LANTIRN

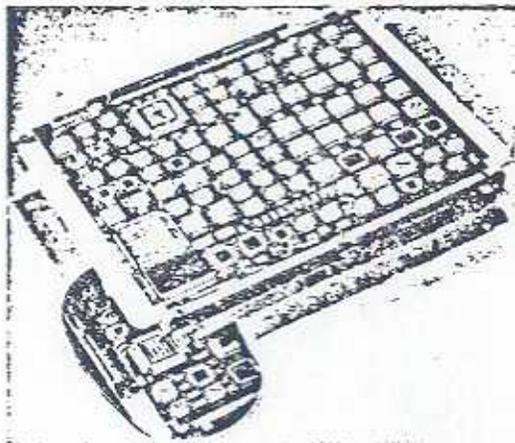


VPSP

Westinghouse →



F-16 Radar



YF-120

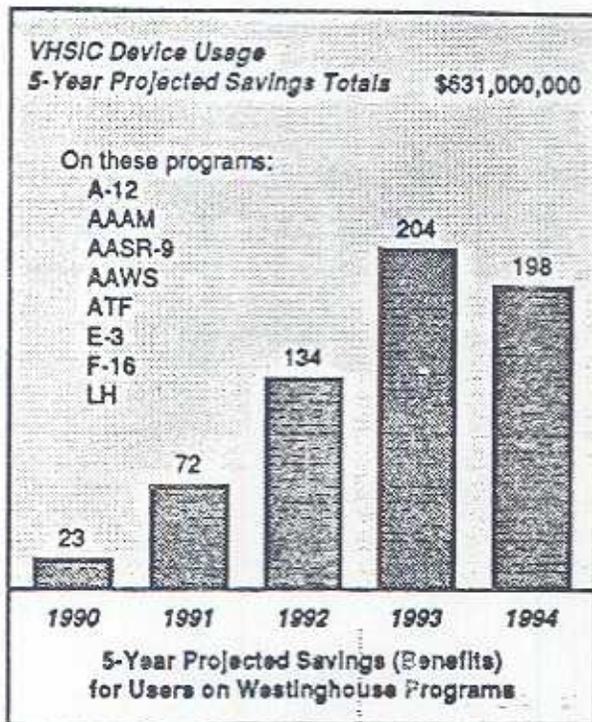
GE Aerospace →



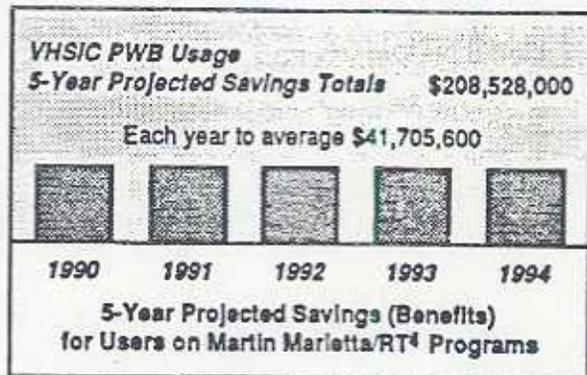
ATF

AD/SP Program

Benefits



VHSIC chips, VHSIC PWBs, and assembly processes successfully enable 1000+ cycles of thermal stress. Component failure usually begins before solder joints. Leaded devices are reliable with all materials if compliant leads are used.



For additional information about this program, call:

Edward J. Morrissey
Project Chief
Materials & Device Processes Branch
(513) 255-8589

2. AMENDMENT/MODIFICATION NO. A00001
 3. EFFECTIVE DATE SEE BLOCK 16C
 4. REQUISITION/PURCHASE REQ. NO. See Schedule
 5. PROJECT NO. (If applicable)

6. ISSUED BY CODE S2206A
 7. ADMINISTERED BY (If other than Item 6) CODE

DCMC BOSTON
 495 SUMMER ST
 BOSTON MA 02210-2138
 Susan King/ / (617) 753-4133

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code)
 MRS TECHNOLOGY INC
 10 ELIZABETH DR
 CHELMSFORD MA 01824

9A. AMENDMENT OF SOLICITATION NO.
 9B. DATED (SEE ITEM 11)
 10A. MODIFICATION OF CONTRACT/ORDER NO. F33615-92-C-5805
 10B. DATED (SEE ITEM 13) 1992 FEB 21

CODE 0M5A8 FACILITY CODE

MAKING DATE
 SEP 09 1998

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers is extended, is not extended.
 Offer must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods:
 (a) By completing Items 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGEMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. Accounting and Appropriation Data (if required)
 SEE BLOCK 14

13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS, IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.
 B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc). SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
 C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
 D. OTHER (Specify type of modification and authority)
 AFRL/MLKT authorization dated 2 Sep 98 and DCMC Boston-GFTE letter dated 21 Aug 98

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

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)
 Accounting and Appropriations Data.
 AF: DECREASE (\$5,691.82)
 AG: DECREASE (\$94,872.18)

a. This modification is issued to decrease the excess funding of this contract.

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)
 SUSAN A. LAPLANTE
 Administrative Contracting Officer

15B. CONTRACTOR/OFFEROR
 15C. DATE SIGNED
 16B. UNITED STATES OF AMERICA
 BY *Susan Laplante*
 (Signature of Contracting Officer)

16C. DATE SIGNED
 19980902

CONTINUATION SHEET

REFERENCE NO. OF DOCUMENT BEING CONTINUED

PAGE OF PAGES

F33615-92-C-5805

A00001

2

2

b. As a result of this modification, the contract obligation is hereby decreased by \$100,564.00 from \$19,288,691.00 to \$19,188,127.00.

END OF MODIFICATION

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

PAGE 1 OF 3

1. PROC INSTRUMENT ID NO. (PIIN) F33615-92-C-5805	2. SPIIN P00012	4. EFFECTIVE DATE MAIL DATE	5. REQUISITION/PURCHASE REQUEST PROJECT NO. GWLMLFT-96-05111	6. SOC/DMS RATING
--	--------------------	--------------------------------	---	-------------------

7. ISSUED BY DEPARTMENT OF THE AIR FORCE AIR FORCE MATERIEL COMMAND (ASC) WRIGHT LABORATORY (WL/MLKT) WRIGHT-PATTERSON AFB, OH 45433-7607 NEGOTIATOR: JIMMIE L. GARRARD II PHONE: (513) 255-7143	CODE FA8650	8. ADMINISTERED BY (IF OTHER THAN BLOCK 7) DCMC BOSTON 495 SUMMER STREET BOSTON MA 02210-2138	CODE S2206A
--	-------------	--	-------------

9. CONTRACTOR NAME AND ADDRESS MRS TECHNOLOGY INC. 10 ELIZABETH DRIVE CHELMSFORD MA 01824 COUNTY: MIDDLESEX	CODE UM5A8	FACILITY CODE	IF "9" FOR MULTIPLE FACILITIES SEE SECT "K"	10. SECURITY CLAS U																				
<p style="text-align: center;">MAILING DATE SEP 30 1996</p>				11. DISCOUNT FOR PROMPT PAYMENT																				
				<table border="1"> <tr> <td>1</td> <td>%</td> <td>DAYS</td> <td>NET</td> </tr> <tr> <td>ST</td> <td></td> <td></td> <td>DAY</td> </tr> <tr> <td>2</td> <td>%</td> <td>DAYS</td> <td>OTHER</td> </tr> <tr> <td>ND</td> <td></td> <td></td> <td>IF</td> </tr> <tr> <td>3</td> <td>%</td> <td>DAYS</td> <td>SEE</td> </tr> <tr> <td>RD</td> <td></td> <td></td> <td>SECT "E"</td> </tr> </table>	1	%	DAYS	NET	ST			DAY	2	%	DAYS	OTHER	ND			IF	3	%	DAYS	SEE
1	%	DAYS	NET																					
ST			DAY																					
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ND			IF																					
3	%	DAYS	SEE																					
RD			SECT "E"																					
				12. PURCHASE OFFICE POINT OF CONTACT LGA/L56/LGA																				

13. THIS BLOCK APPLIES ONLY TO AMENDMENTS OF SOLICITATIONS

The above numbered solicitation is amended as set forth in block 17. The hour and date specified for receipt of Offers is extended is not extended

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation, or as amended by one of the following methods:

(a) By signing and returning _____ copies of this 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 ISSUING OFFICE PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER if by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter provided such telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

14. THIS BLOCK APPLIES ONLY TO MODIFICATIONS OF CONTRACTS

THIS CHANGE IS ISSUED PURSUANT TO _____ THE CHANGES SET FORTH HEREIN ARE MADE TO THE ABOVE NUMBERED CONTRACT/ORDER.

THE ABOVE NUMBERED CONTRACT IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (SUCH AS CHANGES IN PAYING OFFICE, APPROPRIATION DATA, ETC.) SET FORTH HEREIN.

THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF _____ INVOLVED.

THIS MODIFICATION IS ISSUED PURSUANT TO _____

MUTUAL CONSENT OF ALL PARTIES INVOLVED.

15. CONTRACT ADMINISTRATION DATA

A. KIND OF MOD	B. MOD ASST RECIPIENT ADR PT	C. DATE OF SIGNATURE MODIFICATION	D. CHANGE IN CONTRACT AMOUNT (INCREASE (+) DECREASE (-))	E. LOSING PO/CAD ON TRANSFER	F. GAINING PO/CAD ON TRANSFER	G. SVC/AGENCY USE
C			\$ 429,043.00+			

16. ENTER ANY APPLICABLE CHANGES

A. PAY CODE	B. EFFECTIVE DATE OF AWARD	C. CONTRACT (1)TYPE (2)KIND	D. TYPE CONTR	E. SURV CRIT	F. SPL CONTR PROVISIONS	G. PAYING OFC CODE	H. DATE SIGNED	I. SECURITY (1)CLAS (2) DATE OF DD 254
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17. REMARKS (Except as provided herein, all terms and conditions of the contract, as heretofore changed, remain unchanged and in full force and effect)

SUBJECT: INTERIM RECOGNITION OF PENDING OVERRUN

PROJECT ENGINEER: ROBERT CROSS, WL/MTMC, (513) 255-2461

FINANCE OFFICE: DFAS-CO/BUNKER HILL, P.O. BOX 182077, COLUMBUS OH 43218-2077 (CODE: SC1016)

18. CONTRACTOR/OFFEROR IS NOT REQUIRED TO SIGN THIS DOCUMENT CONTRACTOR/OFFEROR IS REQUIRED TO SIGN THIS DOCUMENT AND RETURN COPIES TO ISSUING OFFICE

19. CONTRACTOR/OFFEROR (Signature for person authorized to sign) By <i>J.L. Steele</i>	22. UNITED STATES OF AMERICA (Signature of Contracting Officer) By <i>Timothy L. Jones</i>		
20. NAME AND TITLE OF SIGNER (Type or print) John L. Steele, Jr.	21. DATE SIGNED 9/27/96	23. NAME OF CONTRACTING OFFICER (Type or print) TIMOTHY L. JONES	24. DATE SIGNED 30 Sep 96

SCHEDULE

FIRST: Section A, AFSC Form 701 (67X), dated 18 Mar 92, Block 22, is increased from \$19,245,787.00 by \$429,043.00 to \$19,674,830.00.

SECOND: Section G, Accounting and Classification Data, AFSC Form 703 (69K) is amended as shown herein.

THIRD: Section H, Special Contract Requirements, is amended as follows:

a. Paragraph 9, COST, is amended to read \$18,969,088.00 an increase of \$429,043.00 which covers all contractual items through 30 September 1996 (per MRS Technology Cost to Complete proposal dated 8 July 1996).

FOURTH: The \$429,043.00 in overrun costs being recognized in the interim is broken out as follows per Section H, Special Contract Requirements, Paragraph 21, "Cost Share of Overrun" Provision.

Government Share	\$ 42,904.00	(10%)
Contractor Share	\$386,139.00	(90%)
Total	\$429,043.00	

FIFTH: The above provisions include interim recognition of overrun costs to be incurred by the contractor. The parties hereto agree that this interim recognition and funding of the anticipated overrun will not effect the rights of either party to negotiate an adjustment in total cost of this contract as a result of contemplated negotiation between the parties.

SIXTH: It is also recognized by the parties hereto that this action does not in any way involve a determination of allowability or allocability of any charges incurred under this contract and does not authorize any specific expenditure made in connection with this overrun.

SEVENTH: The government is not obligated to reimburse the contractor for costs incurred in excess of the total amount of \$19,288,691.00 allotted by the government to this contract, and the contractor is not obligated to continue performance under this contract or otherwise incur costs in excess of the \$19,674,830.00.

PART I SECTION G OF THE SCHEDULE ACCOUNTING CLASSIFICATION DATA		1. PROC INSTRUMENT ID NO. (PIIN) F33615-92-C-5805	2. SPIIN P00012	3. PAGE 3 OF 3
4. APPROPRIATION AND ACCOUNTING DATA A. SCTY CLAS B. ACRN C. APPROPRIATION U AH+ 9760400		D. LIMIT SUBHEAD 1302	E. SUPPLEMENTAL ACCTG CLASSIFICATION D16 47WL 6T1000 0A9890 00000 62708E 503000	
F. CPN RECIPIENT 000000 F03000	G. OBLIGATION AMOUNT* 42,904.00	H. NON-CLIN/CLIN	I. PR/MIPR DATA GWLMLFT-96-05111	J. PAYING OFC CODE
6. DESCRIPTIVE DATA JON: A9890003 CCC: 676500 REF: ARPA ORDER #A989-23 DISBURSEMENT IS TO BE MADE FROM OLDEST YEAR FUNDS FIRST COMPLETE				

4. APPROPRIATION AND ACCOUNTING DATA A. SCTY CLAS B. ACRN C. APPROPRIATION		D. LIMIT SUBHEAD	E. SUPPLEMENTAL ACCTG CLASSIFICATION	
F. CPN RECIPIENT 000000	G. OBLIGATION AMOUNT*	H. NON-CLIN/CLIN	I. PR/MIPR DATA	J. PAYING OFC CODE
6. DESCRIPTIVE DATA				

4. APPROPRIATION AND ACCOUNTING DATA A. SCTY CLAS B. ACRN C. APPROPRIATION		D. LIMIT SUBHEAD	E. SUPPLEMENTAL ACCTG CLASSIFICATION	
F. CPN RECIPIENT 000000	G. OBLIGATION AMOUNT*	H. NON-CLIN/CLIN	I. PR/MIPR DATA	J. PAYING OFC CODE
6. DESCRIPTIVE DATA				

4. APPROPRIATION AND ACCOUNTING DATA A. SCTY CLAS B. ACRN C. APPROPRIATION		D. LIMIT SUBHEAD	E. SUPPLEMENTAL ACCTG CLASSIFICATION	
F. CPN RECIPIENT 000000	G. OBLIGATION AMOUNT*	H. NON-CLIN/CLIN	I. PR/MIPR DATA	J. PAYING OFC CODE
6. DESCRIPTIVE DATA				

4. APPROPRIATION AND ACCOUNTING DATA A. SCTY CLAS B. ACRN C. APPROPRIATION		D. LIMIT SUBHEAD	E. SUPPLEMENTAL ACCTG CLASSIFICATION	
F. CPN RECIPIENT 000000	G. OBLIGATION AMOUNT*	H. NON-CLIN/CLIN	I. PR/MIPR DATA	J. PAYING OFC CODE
6. DESCRIPTIVE DATA				

* REPRESENTS NET AMOUNT OF INCREASE DECREASE WHEN MODIFYING AN EXISTING ACRN.

+ OR IN ACRN = ADDITION OR DELETION IN S - DECREASE

NOTE TO CONTRACTOR: Submit invoices to paying office unless otherwise specified in the descriptive data item hereon.

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT					PAGE 1 OF 2	
2. PROC INSTRUMENT ID NO. (PIIN)	3. SPIIN	4. EFFECTIVE DATE	5. REQUISITION/PURCHASE REQUEST PROJECT NO.	6. BDC/DMS RATING		
F33615-92-C-5805	P00011		GWLMLFT-96-05043			
7. ISSUED BY		MAIL DATE		8. ADMINISTERED BY (IF OTHER THAN BLOCK 7)		
DEPARTMENT OF THE AIR FORCE AIR FORCE MATERIEL COMMAND (ASC) WRIGHT LABORATORY (WL/MLKT) WRIGHT-PATTERSON AFB, OH 45433-7607 NEGOTIATOR: CAPT MARK SALANSKY PHONE: (513) 255-7143		DCMAO BOSTON 495 SUMMER STREET BOSTON MA 02210-2138		CODE S2206A		
9. CONTRACTOR NAME AND ADDRESS		CODE	FACILITY CODE	10. SECURITY CLAS		
MRS TECHNOLOGY INC. 10 ELIZABETH DRIVE CHELMSFORD MA 01824		OM5A8		U		
COUNTY: MIDDLESEX		IF "9" FOR MULTIPLE FACILITIES SEE SECT "K"		11. DISCOUNT FOR PROMPT PAYMENT		
		MAILING DATE JAN 24 1996		NET DAYS		
				OTHER IF "9" SEE SECT "E"		
				12. PURCHASE OFFICE POINT OF CONTACT		
				T.S.L./L.56/T.S.L.		
13. THIS BLOCK APPLIES ONLY TO AMENDMENTS OF SOLICITATIONS						
<input type="checkbox"/> The above numbered solicitation is amended as set forth in block 17.						
The hour and date specified for receipt of offers: <input type="checkbox"/> is extended <input type="checkbox"/> is not extended						
Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation, or as amended by one of the following methods:						
(a) By signing and returning _____ copies of this 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 ISSUING OFFICE PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER IF by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter provided such telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.						
14. THIS BLOCK APPLIES ONLY TO MODIFICATIONS OF CONTRACTS						
<input checked="" type="checkbox"/> THIS CHANGE IS ISSUED PURSUANT TO <u>THE CONTRACT CLAUSE ENTITLED "LIMITATION OF FUNDS"</u>						
THE CHANGES SET FORTH HEREIN ARE MADE TO THE ABOVE NUMBERED CONTRACT/ORDER.						
<input type="checkbox"/> THE ABOVE NUMBERED CONTRACT IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (SUCH AS CHANGES IN PAYING OFFICE, APPROPRIATION DATA, ETC.) SET FORTH HEREIN.						
<input type="checkbox"/> THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF _____ IT MODIFIES THE ABOVE NUMBERED CONTRACT AS SET FORTH HEREIN.						
<input type="checkbox"/> THIS MODIFICATION IS ISSUED PURSUANT TO _____						
15. CONTRACT ADMINISTRATION DATA						
A. KIND OF MOD	B. MOD ARSY RECIPIENT ADP PT	C. DATE OF SIGNATURE MODIFICATION	D. CHANGE IN CONTRACT AMOUNT INCREASE (+) DECREASE (-)	E. LOSING PO/CAO ON TRANSFER	F. GAINING PO/CAO ON TRANSFER	G. BYC/AGENCY USE
B			5			
16. ENTER ANY APPLICABLE CHANGES						
A. PAY CODE	B. EFFECTIVE DATE OF AWARD	C. CONTRACT (1)TYPE (2)KIND	D. TYPE CONTR	E. SURV CRIT	F. SPL CONTR PROVISIONS	G. PAYING OFC CODE
17. REMARKS (Except as provided herein, all items and conditions of the contract, as heretofore changed, remain unchanged and in full force and effect.)						
SUBJECT: COMPLETION OF FUNDING						
PROJECT ENGINEER: ROBERT CROSS, WL/MTEC, (513) 255-2461						
FINANCE OFFICE: DFAS CO-JNB/BUNKER HILL, P.O. BOX 182077, COLUMBUS OH 43218-2077 (CODE: SC1016)						
18. <input checked="" type="checkbox"/> CONTRACTOR/OFFEROR IS NOT REQUIRED TO SIGN THIS DOCUMENT						
<input type="checkbox"/> CONTRACTOR/OFFEROR IS REQUIRED TO SIGN THIS DOCUMENT AND RETURN COPIES TO ISSUING OFFICE						
19. CONTRACTOR/OFFEROR (Signature of person authorized to sign)				22. UNITED STATES OF AMERICA (Signature of Contracting Officer)		
By _____				By <i>Timothy L. Jones</i>		
20. NAME AND TITLE OF SIGNER (Type or print)		21. DATE SIGNED		23. NAME OF CONTRACTING OFFICER (Type or print)		24. DATE SIGNED
				TIMOTHY L. JONES		23 Jan 96

PART I SECTION G OF THE SCHEDULE ACCOUNTING CLASSIFICATION DATA			1. PROC INSTRUMENT ID NO. (PIIN) F33615-92-C-5805	2. SPIIN P00011	3. PAGE 2 OF 2
4. APPROPRIATION AND ACCOUNTING DATA A. SCTY CLAS B. ACRN C. APPROPRIATION U AGP 9760400		D. LIMIT SUBHEAD 1302	E. SUPPLEMENTAL ACCTS CLASSIFICATION D16 47WL 6T1000 080820 00000 62708E 503000		
F. CPN RECIPIENT P03000	G. OBLIGATION AMOUNT \$ 670,251.00	H. NON-CLIN/CLIN	I. PR/MIPR DATA GWLMLFT-96-05043 COMPLETE	J. PAYING OFC CODE	
8. DESCRIPTIVE DATA JON: DARK0251 CCC: 676500 REF: ARPA ORDER #A8082-82 DISBURSEMENT IS TO BE MADE FROM OLDEST YEAR FUNDS FIRST					

4. APPROPRIATION AND ACCOUNTING DATA A. SCTY CLAS B. ACRN C. APPROPRIATION			D. LIMIT SUBHEAD	E. SUPPLEMENTAL ACCTS CLASSIFICATION	
F. CPN RECIPIENT 000A0D	G. OBLIGATION AMOUNT \$	H. NON-CLIN/CLIN	I. PR/MIPR DATA	J. PAYING OFC CODE	
8. DESCRIPTIVE DATA AS CONTEMPLATED BY THE CLAUSE OF THE CONTRACT ENTITLED "LIMITATION OF FUNDS", THE AMOUNT ALLOTTED TO THIS CONTRACT IS \$670,251.00 THEREBY MAKING A REVISED AMOUNT ALLOTTED OF \$19,245,787.00, WHICH COVERS ALL CONTRACTUAL ITEMS THROUGH COMPLETION.					

4. APPROPRIATION AND ACCOUNTING DATA A. SCTY CLAS B. ACRN C. APPROPRIATION			D. LIMIT SUBHEAD	E. SUPPLEMENTAL ACCTS CLASSIFICATION	
F. CPN RECIPIENT 000A0D	G. OBLIGATION AMOUNT \$	H. NON-CLIN/CLIN	I. PR/MIPR DATA	J. PAYING OFC CODE	
8. DESCRIPTIVE DATA					

4. APPROPRIATION AND ACCOUNTING DATA A. SCTY CLAS B. ACRN C. APPROPRIATION			D. LIMIT SUBHEAD	E. SUPPLEMENTAL ACCTS CLASSIFICATION	
F. CPN RECIPIENT 000A0D	G. OBLIGATION AMOUNT \$	H. NON-CLIN/CLIN	I. PR/MIPR DATA	J. PAYING OFC CODE	
8. DESCRIPTIVE DATA					

4. APPROPRIATION AND ACCOUNTING DATA A. SCTY CLAS B. ACRN C. APPROPRIATION			D. LIMIT SUBHEAD	E. SUPPLEMENTAL ACCTS CLASSIFICATION	
F. CPN RECIPIENT 000A0D	G. OBLIGATION AMOUNT \$	H. NON-CLIN/CLIN	I. PR/MIPR DATA	J. PAYING OFC CODE	
8. DESCRIPTIVE DATA					

* REPRESENTS NET AMOUNT OF INCREASE DECREASE WHEN MODIFYING AN EXISTING ACRN.
+ OR IN ACRN = ADDITION OR DELETION IN \$ - DECREASE NOTE TO CONTRACTOR: Submit Invoices to paying office unless otherwise specified in the descriptive data item hereon.

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT						1. PAGE 1 OF 2
2. PROC INSTRUMENT ID NO. (PIIN) F33615-92-C-5805	3. SPIIN P00010	4. EFFECTIVE DATE MAIL DATE	5. REQUISITION/PURCHASE REQUEST PROJECT NO. FY1133-95-05172	6. BOC/DMS RATING		
7. ISSUED BY DEPARTMENT OF THE AIR FORCE AIR FORCE MATERIEL COMMAND (ASC) WRIGHT LABORATORY (WL/MLKT) WRIGHT-PATTERSON AFB, OH 45433-7607 NEGOTIATOR: CAPT MARK SALANSKY PHONE: (513) 255-7143			8. ADMINISTERED BY (IF OTHER THAN BLOCK 7) DCMAO BOSTON 495 SUMMER STREET BOSTON MA 02210-2138			
9. CONTRACTOR NAME AND ADDRESS MRS TECHNOLOGY INC. 10 ELIZABETH DRIVE CHELMSFORD MA 01824 COUNTY: MIDDLESEX		CODE FA8650	FACILITY CODE IF "9" FOR MULTIPLE FACILITIES SEE SECT "K"	10. SECURITY CLAS U		
			11. DISCOUNT FOR PROMPT PAYMENT			
			1 ST	%	DAYS	NET DAYS
			2 ND	%	DAYS	OTHER IF "9" SEE SECT "E"
			3 RD	%	DAYS	
			12. PURCHASE OFFICE POINT OF CONTACT LSL/L76/LSL			
13. THIS BLOCK APPLIES ONLY TO AMENDMENTS OF SOLICITATIONS						
<input type="checkbox"/> The above numbered solicitation is amended as set forth in block 17. The hour and date specified for receipt of offers <input type="checkbox"/> is extended <input type="checkbox"/> is not extended.						
Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation, or as amended by one of the following methods:						
(a) By signing and returning _____ copies of this 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 ISSUING OFFICE PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter provided such telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.						
14. THIS BLOCK APPLIES ONLY TO MODIFICATIONS OF CONTRACTS						
<input checked="" type="checkbox"/> THIS CHANGE IS ISSUED PURSUANT TO THE CONTRACT CLAUSE ENTITLED "LIMITATION OF FUNDS" THE CHANGES SET FORTH HEREIN ARE MADE TO THE ABOVE NUMBERED CONTRACT/ORDER.						
<input type="checkbox"/> THE ABOVE NUMBERED CONTRACT IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (SUCH AS CHANGES IN PAYING OFFICE, APPROPRIATION DATA, ETC.) SET FORTH HEREIN.						
<input type="checkbox"/> THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF _____ IT MODIFIES THE ABOVE NUMBERED CONTRACT AS SET FORTH HEREIN.						
<input type="checkbox"/> THIS MODIFICATION IS ISSUED PURSUANT TO _____						
15. CONTRACT ADMINISTRATION DATA						
A. KIND OF MOD	B. MOD ABST RECIPIENT ADDR	C. DATE OF SIGNATURE MODIFICATION	D. CHANGE IN CONTRACT AMOUNT INCREASE (+) DECREASE (-)	E. LOSING PD/CAO ON TRANSFER	F. GAINING PD/CAO ON TRANSFER	G. SVC/AGENCY USE
B			S			
16. ENTER ANY APPLICABLE CHANGES						
A. PAY CODE	B. EFFECTIVE DATE OF AWARD	C. CONTRACT (1)TYPE (2)KIND	D. TYPE CONTR	E. SURV CRIT	F. SPL CONTR PROVISIONS	G. PAYING OFF CODE
17. REMARKS (Except as provided herein, all items and conditions of the contract, as heretofore changed, remain unchanged and in full force and effect.)						
SUBJECT: INCREMENTAL FUNDING						
PROJECT ENGINEER: ROBERT CROSS, WL/MTEC, (513) 255-2461						
FINANCE OFFICE: DFAS CO-EB/BUNKER HILL, P.O. BOX 182077, COLUMBUS OH 43218-2077 (CODE: SC1016)						
18. CONTRACTOR/OFFEROR IS NOT REQUIRED TO SIGN THIS DOCUMENT <input checked="" type="checkbox"/> CONTRACTOR/OFFEROR IS REQUIRED TO SIGN THIS DOCUMENT AND RETURN COPIES TO ISSUING OFFICE <input type="checkbox"/>						
19. CONTRACTOR/OFFEROR (Signature of person authorized to sign)				22. UNITED STATES OF AMERICA (Signature of Contracting Officer)		
BY				BY <i>Douglas E. Harris</i>		
20. NAME AND TITLE OF SIGNER (Type or print)		21. DATE SIGNED		23. NAME OF CONTRACTING OFFICER (Type or print)		24. DATE SIGNED
				DOUGLAS E. HARRIS		95 Sep 12

PART I SECTION G OF THE SCHEDULE ACCOUNTING CLASSIFICATION DATA			1. PROC INSTRUMENT ID NO. (PIIN)	2. SPIIN	3.
4. APPROPRIATION AND ACCOUNTING DATA A. SCTY CLAS B. ACRN C. APPROPRIATION			F33615-92-C-5805	P00010	PAGE 2 OF 2
D. LIMIT SUBHEAD			1302	E. SUPPLEMENTAL ACCTG CLASSIFICATION	
F. CPN RECIPIENT DODAAD			G. OBLIGATION AMOUNT*	H. NON-CLIN/CLIN	I. PR/MIPR DATA
U AF+ 9750400			1302	D15 47WL 5T1000 080820 00000 62708E	595600
F95600 \$ 900,000.00				FY1133-95-05172	
8. DESCRIPTIVE DATA			COMPLETE		
JON: DARK0251					
CCC: 676500					
REF: ARPA ORDER #8082-77					
DISBURSEMENT IS TO BE MADE FROM OLDEST YEAR FUNDS FIRST					
4. APPROPRIATION AND ACCOUNTING DATA A. SCTY CLAS B. ACRN C. APPROPRIATION			D. LIMIT SUBHEAD	E. SUPPLEMENTAL ACCTG CLASSIFICATION	
F. CPN RECIPIENT DODAAD			G. OBLIGATION AMOUNT*	H. NON-CLIN/CLIN	I. PR/MIPR DATA
S					J. PAYING OFC CODE
8. DESCRIPTIVE DATA			AS CONTEMPLATED BY THE CLAUSE OF THE CONTRACT ENTITLED "LIMITATION OF FUNDS", THE AMOUNT ALLOTTED TO THIS CONTRACT IS \$900,000.00 THEREBY MAKING A REVISED AMOUNT ALLOTTED OF \$18,575,536.00, WHICH COVERS ALL CONTRACTUAL ITEMS THROUGH 96JAN31. THE AMOUNT ALLOTTED AND TIME SPECIFIED ARE IN ACCORDANCE WITH THE CONTRACTOR'S LETTER DATED 95SEP11.		
4. APPROPRIATION AND ACCOUNTING DATA A. SCTY CLAS B. ACRN C. APPROPRIATION			D. LIMIT SUBHEAD	E. SUPPLEMENTAL ACCTG CLASSIFICATION	
F. CPN RECIPIENT DODAAD			G. OBLIGATION AMOUNT*	H. NON-CLIN/CLIN	I. PR/MIPR DATA
S					J. PAYING OFC CODE
8. DESCRIPTIVE DATA			INCORPOATED HEREIN BY REFERENCE.		
4. APPROPRIATION AND ACCOUNTING DATA A. SCTY CLAS B. ACRN C. APPROPRIATION			D. LIMIT SUBHEAD	E. SUPPLEMENTAL ACCTG CLASSIFICATION	
F. CPN RECIPIENT DODAAD			G. OBLIGATION AMOUNT*	H. NON-CLIN/CLIN	I. PR/MIPR DATA
S					J. PAYING OFC CODE
8. DESCRIPTIVE DATA					
4. APPROPRIATION AND ACCOUNTING DATA A. SCTY CLAS B. ACRN C. APPROPRIATION			D. LIMIT SUBHEAD	E. SUPPLEMENTAL ACCTG CLASSIFICATION	
F. CPN RECIPIENT DODAAD			G. OBLIGATION AMOUNT*	H. NON-CLIN/CLIN	I. PR/MIPR DATA
S					J. PAYING OFC CODE
8. DESCRIPTIVE DATA					

* REPRESENTS NET AMOUNT OF INCREASE DECREASE WHEN MODIFYING AN EXISTING AN ACRN.

+ OR IN ACRN = ADDITION OR DELETION

IN \$ - DECREASE

NOTE TO CONTRACTOR: Submit invoices to paying office unless otherwise specified in the descriptive data item hereon.

(jls) AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

PAGE 1 OF 10

2. PROC INSTRUMENT ID NO. (PIIN) F33615-92-C-5805	3. SPIIN P00009	4. EFFECTIVE DATE	5. REQUISITION/PURCHASE REQUEST PROJECT NO.	6. BDC/DMS RATING
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7. ISSUED BY DEPARTMENT OF THE AIR FORCE AIR FORCE MATERIEL COMMAND (ASC) WRIGHT LABORATORY (WL/MLKT) WRIGHT-PATTERSON AFB, OH 45433-7607 NEGOTIATOR: CAPT MARK SALANSKY PHONE: (513) 255-7143	CODE FA8650	MAIL DATE SEP 08 1995	ADMINISTERED BY (IF OTHER THAN BLOCK 7) DCMAO BOSTON 495 SUMMER STREET BOSTON MA 02210-2138	CODE S2206A
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9. CONTRACTOR NAME AND ADDRESS MRS TECHNOLOGY INC. 10 ELIZABETH DRIVE CHELMSFORD MA 01824 COUNTY: MIDDLESEX	CODE OM5A8	FACILITY CODE IF "9" FOR MULTIPLE FACILITIES SEE SECT "K"	10. SECURITY CLAS U
11. DISCOUNT FOR PROMPT PAYMENT			NET DAYS
1 1ST % DAYS			OTHER IF "9" SEE SECT "E"
2 2ND % DAYS			
3 3RD % DAYS			
12. PURCHASE OFFICE POINT OF CONTACT LSL/L56/LSL			

MAILING DATE SEP 08 1995

13. THIS BLOCK APPLIES ONLY TO AMENDMENTS OF SOLICITATIONS

The above numbered solicitation is amended as set forth in Block 17. The hour and date specified for receipt of Offers is extended is not extended

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation, or as amended by one of the following methods:

(a) By signing and returning _____ copies of this 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 ISSUING OFFICE PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER if by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter provided such telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

14. THIS BLOCK APPLIES ONLY TO MODIFICATIONS OF CONTRACTS

THIS CHANGE IS ISSUED PURSUANT TO _____ THE CHANGES SET FORTH HEREIN ARE MADE TO THE ABOVE NUMBERED CONTRACT/ORDER.

THE ABOVE NUMBERED CONTRACT IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (SUCH AS CHANGES IN PAYING OFFICE, APPROPRIATION DATA, ETC.) SET FORTH HEREIN.

THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF "LIMITATION OF FUNDS" & "CHANGES" CLAUSES

THIS MODIFICATION IS ISSUED PURSUANT TO _____

15. CONTRACT ADMINISTRATION DATA

A. KIND OF MOD	B. MOD ABST RECIPIENT ADP PT	C. DATE OF SIGNATURE MODIFICATION	D. CHANGE IN CONTRACT AMOUNT INCREASE (+) DECREASE (-)	E. LOSING PO/CAO ON TRANSFER	F. GAINING PO/CAO ON TRANSFER	G. SVC/AGENCY USE
C			\$1,570,251.00+			

16. ENTER ANY APPLICABLE CHANGES

A. PAY CODE	B. EFFECTIVE DATE OF AWARD	C. CONTRACT TYPE (1)TYPE (2)KIND	D. TYPE CONTR	E. SURV CRIT	F. SPL CONTR PROVISIONS	G. PAYING OFC CODE	H. DATE SIGNED	I. SECURITY (1)CLAS (2) DATE OF DD 254
-------------	----------------------------	----------------------------------	---------------	--------------	-------------------------	--------------------	----------------	--

17. REMARKS (Except as provided herein, all items and conditions of the contract, as heretofore changed, remain unchanged and in full force and effect.)

SUBJECT: SETTLEMENT OF OVERRUN
PROJECT ENGINEER: ROBERT CROSS, WL/MTEC, (513) 255-2461
FINANCE OFFICE: DFAS CO-EB/BUNKER HILL, P.O. BOX 182077, COLUMBUS OH 43218-2077 (CODE: SC1016)

18. CONTRACTOR/OFFEROR IS NOT REQUIRED TO SIGN THIS DOCUMENT CONTRACTOR/OFFEROR IS REQUIRED TO SIGN THIS DOCUMENT AND RETURN COPIES TO ISSUING OFFICE

19. CONTRACTOR/OFFEROR (Signature of person authorized to sign)
BY *W.C. Schneider*

20. NAME AND TITLE OF SIGNER (Type or print)
William C. Schneider
Vice President

21. DATE SIGNED
8/30/95

22. UNITED STATES OF AMERICA (Signature of Contracting Officer)
BY *Timothy D. Jones*

23. NAME OF CONTRACTING OFFICER (Type or print)
TIMOTHY D. JONES

24. DATE SIGNED
95 Sep 7

Schedule of Changes

- First: Section A, AFSC Form 701 (67X), dated 18 Mar 92, Block 22, is increased from \$17,675,536.00 by \$1,570,251.00 to \$19,245,787.00.
- Second: Section C, Descriptions and Specifications, is amended to delete the Statement of Work dated 9 Sep 93 in its entirety and replace it with the Statement of Work dated 18 Aug 95
- Third: Section F, AFMC Form 706 (70H), Supplies Schedule Data, is amended as set forth herein.
- Fourth: Section H, Special Contract Requirements, is amended as follows:
- a. Paragraph 9, "*COST*", is amended to read \$18,540,045.00 an increase of, \$1,617,585.00, which covers all contractual items through completion of the effort.
 - b. Paragraph 10, "*FEE*", is amended to read "\$705,742.00", a decrease in \$47,334.00.
 - c. Paragraph 21, "*Cost Share of Over-Run*" is added and reads as follows:

"Any costs in excess of 18,540,045.00 will be shared using the following ratio:

<i>Government Share:</i>	<i>10%</i>
<i>Contractor Share:</i>	<i>90%</i>
- Fifth: Section J, DD Form 1423, Contract Data Requirements List, is modified as follows:

For Data Item A008:

	<u>FROM</u>	<u>TO</u>
<u>Block 11</u>	22 Dec 95	30 Oct 96
<u>Block 12</u>	22 Jan 96	30 Nov 96
<u>Block 13</u>	21 May 96	30 Jan 97

For Data Item A012:

	<u>FROM</u>	<u>TO</u>
<u>Block 11</u>	36 MAC	20 Nov 96
<u>Block 12</u>	36 MAC + 15 Days	5 Dec 96
<u>Block 13</u>	38 MAC / R	20 Jan 97 / R

Sixth: It is also recognized by the parties hereto that this action does not in any way involve a determination of allowability or allocability of any charges incurred under this contract and does not authorize any specific expenditure made in connection with this overrun.

PROTOTYPE DEVELOPMENT OF A VERY LARGE-AREA
HIGH PERFORMANCE MICROLITHOGRAPHY TOOL

1.0 OBJECTIVE:

1.1 The primary objective of this program is to develop a new generation high throughput large-area microlithography tool suitable for imaging active matrix liquid crystal displays (AMLCD) substrates up to 600 mm x 500 mm in size.

1.2 The specific objective of this program shall be the construction of a working full scale prototype of a large area microlithography tool capable of imaging glass substrates up to 600 mm x 500 mm in size at approximately a two-to three-fold increase in imaging throughput rates as compared to any currently available large area microlithography tool.

2.0 SCOPE:

2.1 This is a four phase program with Phase I being the basic program and Phases II, III, and IV are options 1, 2, and 3, respectively. The entire program will develop and construct a working prototype, high speed, microlithography machine capable of imaging glass substrates up to 600 mm x 500 mm in size at throughput rates significantly better than any currently available large area microlithography tool. This effort includes the development of the following subsystem components which will be designed, constructed and integrated:

- 2.1.1 A dual X-Y stage subsystem based on linear stepping motor technology
- 2.1.2 A high-power illumination subsystem
- 2.1.3 A novel imaging subsystem capable of image scale adjustment of ≤ 100 ppm and image resolution of $\leq 3\mu\text{m}$
- 2.1.4 An automatic calibration metrology and control subsystem
- 2.1.5 An automatic, high-speed substrate alignment subsystem
- 2.1.6 An environmental control subsystem
- 2.1.7 Job setup and execution control software

2.2 The four (4) phases consist of system specification and architecture development, mainframe prototype development, additional subsystem development, and beta site partnering. Phases II, III, and IV are extensions of the mainframe prototype development in Phase I. Also, in Phases II, III, and IV, additional subsystems and control software shall be developed, all subsystems shall be integrated and the prototype system shall be tested at the contractor's facility.

3.0 BACKGROUND:

3.1 This program is one of several contracts that are being awarded as a result of the solicitation by the Defense Advanced Research Projects Agency (DARPA), Broad Agency Announcement (BAA) No. 91-06, entitled "High Definition Systems".

3.2 The most critical problem in cockpits today is the lack of pilot/crew situation awareness. The present cockpit displays, namely cathode ray tubes (CRTs), have several disadvantages which limit the fusing of the data and presenting situation information to the pilot. Active matrix liquid crystal displays (AMLCDS) are the cockpit designer's choice for replacing CRTs since they are sunlight readable with full color capability. In addition, AMLCDs provide a large viewing area and are fail soft with small instrument depth.

3.3 The active matrix liquid crystal technology must be developed in the United States so that the displays required by the military are available from domestic sources. These programs, under DARPA/MANTECH auspices, will develop the manufacturing equipment necessary to establish the domestic manufacturing capability for large area active matrix liquid crystal displays. The TriService needs for AMLCD cockpit displays are approximately 45,000 by the turn of the century. Most military display requirements are common with commercial aircraft and, in many instances, the critical component (AMLCD active glass) is common with commercial applications including portable computers, virtual reality workstations, and television receivers.

4.0 TECHNICAL REQUIREMENTS/TASKS:

4.1 Phase 1. Basic Effort

4.1.1 Task I-System Specification and Architecture Development: (CDRL #AOO8, #AOO9, #AO16)

4.1.1.1 The contractor shall develop a system functional specification and detail the expectation of performance levels. This effort shall involve customer research activity to test the system requirements and shall include a detailed system error budget analysis in order to qualify the expected performance levels.

4.1.1.2 The contractor shall develop, with the assistance of one or more commercial photoresist vendors, optimized photoresists for use with the high-power exposure technique.

4.1.1.3 The contractor shall develop the opto-mechanical architecture that supports the required specifications. The contractor shall address major conceptual issues such as base and camera bridging structure and camera size and mounting.

4.1.1.4 The contractor shall develop the control electronics architecture to establish the computing structure and control system electronics modularity levels.

4.1.1.5 The contractor shall develop the control software architecture to establish the structure that shall contain the control applications software and software services needed to run the machine and analyze information produced by the machine.

4.1.2 Task II-Mainframe Prototype Development (CDRL #AOO8,#AOO9, #AO16)

4.1.2.1 The contractor shall design the X-Y motion subsystem including: the base and vibration isolation subsystem; stage motors and platen; stage mainframe structure; stage positioning metrology including the possible use of mirror replication; substrate transfer, banking, and chucking mechanics; electro-optic calibration sensor module; stage resident control electronics and access software; cable and hose connections to the fixed world; and the X-Y stage digital control servo.

4.1.2.2 The contractor shall design the high-power illumination subsystem including: illumination source evaluation and selection; illumination light conditioning optics and mechanics; aperaturing optics, mechanics, and controls; illumination triggering controls; and illumination safety system design. The contractor shall breadboard any high risk modules to determine operational feasibility.

4.1.2.3 The contractor shall design the imaging subsystem including: developing the detailed performance specifications of the lens system, evaluate and select a subcontractor to perform the detailed design and fabrication; and optical column setup and alignment fixturing; optical column mounting structure; reticle positioning and alignment subsystem; automatic lens accuracy control subsystem; image scale adjustment control subsystem; and automatic focus control subsystem. The contractor shall breadboard any high risk modules to determine operational feasibility.

4.1.2.4 The contractor shall design the alignment metrology subsystem including: evaluating new sensor techniques, and developing hardware and sensor control software. The contractor shall breadboard any high risk modules to determine operational feasibility.

4.1.2.5 The contractor shall design and fabricate the control system support electronics and software including: evaluating, selecting, and integrating system and subsystem control processors and operating systems; designing the overall system electronics packing and cabling.

4.1.2.6 The contractor shall design the application software including: hardware device driver development; software services development, e.g. calibration, database, communications, user interface; control application software development, e.g. job preparation, job execution control, calibration sequence control, and data visualization utilities. The contractor shall perform initial prototyping.

4.2 Phase II (Option 1)

4.2.1 Mainframe Prototype Development (CDRL #AOO8, #AOO9, #AO 16)

4.2.1.1 The contractor shall fabricate, integrate and test the X-Y motion subsystem.

4.2.1.2 The contractor shall fabricate, integrate and test the highpower illumination subsystem.

4.2.1.3 The contractor shall fabricate, integrate, and test the imaging subsystem.

4.2.1.4 The contractor shall fabricate, integrate and test the alignment metrology subsystem.

4.2.1.5 The contractor shall specify and procure a low cost, temporary the environmental control subsystem.

4.2.1.6 The contractor shall integrate and test the control system support electronics and software.

4.2.1.7 The contractor shall develop and test the application software.

4.3 Phase III (Option 2)

4.3.1 Mainframe Prototype Development (CDRL #AOOB, #AOO9, #AO16)

4.3.1.1 The contractor shall specify the reticle storage and handling system design.

4.3.1.2 The contractor shall develop an in-system material transport system conceptual design and architecture.

4.3.1.3 The contractor shall perform system integration, test, and characterization. This effort includes basic first layer imaging test & characterization and overlay imaging test and characterization.

4.3.1.4 The contractor shall define the detailed design requirements for the final environmental control system, evaluate and select a vendor, and procure the final chamber.

4.4 Phase IV (Option III)

4.4.1 Task I -Mainframe Prototype Development (CDRL #AOO8, #AOO9 #AO14, #AO16)

4.4.1.1 The contractor shall perform system integration, test, and characterization. This effort includes the final environmental control system integration.

4.4.1.2 The contractor shall develop preliminary operation manuals, preliminary setup and calibration manuals, and preliminary acceptance test manuals.

4.4.2 Task II - Beta Site Partnering

4.4.2.1 The contractor shall interview, evaluate, and select one or more beta site partners. The contractor shall prepare draft beta site agreements for one or more partners. The contractor shall present recommendations for beta site partnering to the Government at a Quarterly Review. This task does not include execution of any beta site agreements.

4.5 Program Management/Planing. (Applicable to Phases I, II, III, and IV) The contractor shall conduct administrative and financial management functions during the course of this effort including: detailed scheduling of activities and milestones; defining work tasks, subtasks and all interrelationships; purchasing materials; defining skill levels required and allocating labor resources accordingly; defining and managing subcontractor activities (if any); budgeting, allocating, forecasting of funds and tracking status of funds; documenting all work problems, and progress toward the accomplishment of the overall tasks and the overall program objectives. The contractor shall notify and discuss the impact of key personnel changes with the Air Force prior to the effective date of change. (CDRL #AOO1, #AOO2, #AOO3, #AOO4, #AOO7, #AO11, #AO13, #AO14)

5.0 DATA AND OTHER DELIVERABLES:

5.1 Data is listed on the DD Form 1423.

5.2 The contractor shall construct and deliver one (1) display board to describe the program. The size shall be 76 x 76 cm with 3.8 cm radius corners. It shall be of heavy construction to withstand repeated baggage handling, or, have a carrying case. The board shall be white with medium blue lettering of vinyl or silk screening. Color photographs and three-dimensional objects shall be securely attached. Velcro strips shall be permanently adhered to the back for mounting. Company logos are not permitted. Information displayed shall demonstrate by pictures and models, the program products (partially and/or fully completed or assembled)--the who, what, where, when, why, how, applications and projected savings--of the program. (CDRL A010)

5.3 One (1) large-area microlithography tool

6.0 Special Considerations:

6.1 Quarterly Reviews: The contractor shall conduct quarterly program status reviews to Government personnel. The purpose of the review is to provide a detailed account of the administrative, financial, and technical health of the program; to list accomplishments and problem areas; and to detail future program plans. (CDRL #AOO5, #AOO6, #AOO7)

6.1.1 Industry Workshops - The contractor shall conduct workshops, in conjunction with selected quarterly reviews. The purpose of these workshops shall be to transmit significant technical progress of this program, in a timely manner, to appropriate representatives of Government and industry. An invitation list will be developed by the contractor and the Air Force. The contractor shall invite the attendees, in addition to providing a meeting facility for approximately twenty-five (25) invited individuals. It is anticipated the frequency of these workshops will be semi-annually.

6.2 End of the Contract Debriefing: The contractor shall conduct a debriefing subsequent to the completion of the technical effort and prior to approval of final report. The purpose of the debriefing shall be to transmit the results of this program, in a timely manner, to appropriate representatives of Government and industry. An invitation list will be supplied to the contractor by the Air Force. The contractor shall invite the attendees, in addition to providing a meeting facility for approximately one hundred (100) invited individuals.

6.2.1 An on-site review of the prototype microlithography tool shall be conducted for all End of the Contract Debriefing attendees.

6.3 Environmental Assessment- The contractor shall assess the environmental consequences of the technology established under this program from the standpoint of the program itself and from the standpoint of future scale-Up to production quantities. If the technology is found to have adverse environmental consequences, the contractor shall provide suggestions for making the technology environmentally acceptable and indicate what economic impact the suggestions will have on the technology.

6.4 System Safety: A system safety program, including hazard analysis, shall be performed in accordance with SEMI Standard S2-93. The prime objective is to formalize an approach to eliminate hazards through engineering, design, education, management policy, and supervisory control, with constraints of operational effectiveness, time, and cost, throughout the equipment's life cycle. (CDRL #AO15)

6.5 Program Highlights: The contractor shall ensure the documentation of this program by timely photographic coverage of significant events and milestones. (CDRL #AO12)

PART I SECTION F OF THE SCHEDULE SUPPLIES SCHEDULE DATA			1. PROC INSTRUMENT ID NO. (PIIN)	2. SPIIN	3.	
4. ITEM NO.	5. ACRN	6. TSP PRI	7. MILSTRIP DOC NO. AND SUFFIX	8. CON ITEM SERIAL NO.	9. ENDING SERIAL NO. (WHEN APPL)	10. CLIN IDENT EXHIBIT
11. DEL SCHED DATE	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY*	14. SCTY CLAS	15. SHIP TO	16. MARK FOR	
A. 97JAN30	A. XA	A. 1		U U		
B.	B.	B.		D.	D.	D.
C.	C.	C.		E.	E.	E.
17. DESCRIPTIVE DATA						
THE SCHEDULED DELIVERY DATE, BLOCK 11A, FOR THE APPROVED FINAL TECHNICAL REPORT IS 97JAN30.						
ALL DATA SHALL BE DELIVERED IN ACCORDANCE WITH EXHIBIT A, CONTRACT DATA REQUIREMENTS LIST, DD FORM 1423, DATED 92JAN17.						
TECHNICAL EFFORT MUST BE COMPLETED NO LATER THAN 96SEP20.						
4. ITEM NO.	5. ACRN	6. TSP PRI	7. MILSTRIP DOC NO. AND SUFFIX	8. CON ITEM SERIAL NO.	9. ENDING SERIAL NO. (WHEN APPL)	10. CLIN IDENT EXHIBIT
11. DEL SCHED DATE	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY*	14. SCTY CLAS	15. SHIP TO	16. MARK FOR	
A. 96SEP20	A. XA	A. 1		U U		
B.	B.	B.		D.	D.	D.
C.	C.	C.		E.	E.	E.
17. DESCRIPTIVE DATA						
THE SCHEDULED DELIVERY DATE, BLOCK 11A, FOR THE LARGE AREA MICROLITHOGRAPHY TOOL COMPONENTS IS 96SEP20.						
ANY MICROLITHOGRAPHY TOOL COMPONENTS SHALL REMAIN IN PLACE AT THE CONTRACTOR'S FACILITY.						
4. ITEM NO.	5. ACRN	6. TSP PRI	7. MILSTRIP DOC NO. AND SUFFIX	8. CON ITEM SERIAL NO.	9. ENDING SERIAL NO. (WHEN APPL)	10. CLIN IDENT EXHIBIT
11. DEL SCHED DATE	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY*	14. SCTY CLAS	15. SHIP TO	16. MARK FOR	
A.	A.	A.				
B.	B.	B.		D.	D.	C.
C.	C.	C.		E.	E.	E.
17. DESCRIPTIVE DATA						

* REPRESENTS A NET INCREASE/DECREASE WHEN NO + OR - APPEARS AFTER THE ITEM NO.

E = ESTIMATED

- (IN QTY) = DECREASE

+ OR - (IN ITEM NO.) = ADDITION OR DELETION

(rjh)
AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. PAGE 1 OF 3
6. BOC/DMS RATING 3

2. PROC INSTRUMENT ID NO. (PIIN) F33615-92-C-5805
3. SPIIN P00008
4. EFFECTIVE DATE
5. REQUISITION/PURCHASE REQUEST PROJECT NO. FY1133-95-05128

7. ISSUED BY DEPARTMENT OF THE AIR FORCE
AIR FORCE MATERIEL COMMAND (ASC)
WRIGHT LABORATORY (WL/MLKT)
WRIGHT-PATTERSON AFB, OH 45433-6503
NEGOTIATOR: SUSAN PALMER
PHONE: (513) 255-7143
CODE FA8650
MAIL REGISTERED BY (IF OTHER THAN BLOCK 7) DCM AO BOSTON
495 SUMMER STREET
BOSTON MA 02210-2138
CODE S2206A

9. CONTRACTOR NAME AND ADDRESS MRS TECHNOLOGY, INC.
10 ELIZABETH DRIVE
CHELMSFORD MA 01824
CODE OM5A8
FACILITY CODE
IF "9" FOR MULTIPLE FACILITIES SEE SECT "K"

MAILING DATE
APR 26 1995

10. SECURITY CLAS U
11. DISCOUNT FOR PROMPT PAYMENT
1 ST % DAYS NET 0 A Y S
2 ND % DAYS OTHER IF '9'
3 RD % DAYS SEE SECT "E"

COUNTY: MIDDLESEX
MAILING DATE
APR 26 1995

12. PURCHASE OFFICE POINT OF CONTACT
LBK/L76/LBK

13. THIS BLOCK APPLIES ONLY TO AMENDMENTS OF SOLICITATIONS
 The above numbered solicitation is amended as set forth in Block 17.
The hour and date specified for receipt of Offers is extended is not extended
Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation, or as amended by one of the following methods:
(a) By signing and returning _____ copies of this 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 ISSUING OFFICE PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If written of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter provided such telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

14. THIS BLOCK APPLIES ONLY TO MODIFICATIONS OF CONTRACTS
 THIS CHANGE IS ISSUED PURSUANT TO _____
THE CHANGES SET FORTH HEREIN ARE MADE TO THE ABOVE NUMBERED CONTRACT/ORDER.
 THE ABOVE NUMBERED CONTRACT IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (SUCH AS CHANGES IN PAYING OFFICE, APPROPRIATION DATA, ETC.) SET FORTH HEREIN.
 THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF MUTUAL CONSENT OF ALL PARTIES INVOLVED.
 THIS MODIFICATION IS ISSUED PURSUANT TO _____

15. CONTRACT ADMINISTRATION DATA
A. KIND OF MOD C. DATE OF SIGNATURE MODIFICATION
B. MOD ABST RECIPIENT ADP PT
D. CHANGE IN CONTRACT AMOUNT INCREASE (+) DECREASE (-)
E. LOSING PO/CAO ON TRANSFER
F. GAINING PO/CAO ON TRANSFER
G. SVC/AGENCY USE
\$ 2,300,000.00+

16. ENTER ANY APPLICABLE CHANGES
A. PAY CODE
B. EFFECTIVE DATE OF AWARD
C. CONTRACT TYPE (1) TYPE (2) KIND
D. TYPE CONTR
E. SURV CRIT
F. SPL CONTR PROVISIONS
G. PAYING OFC CODE
H. DATE SIGNED
I. SECURITY CLASS (1) DATE OF DD 254

17. REMARKS (Except as provided herein, all items and conditions of the contract, as heretofore changed, remain unchanged and in full force and effect.)
SUBJECT: INTERIM RECOGNITION OF PENDING OVERRUN
PROJECT ENGINEER: ROBERT CROSS, WL/MTEC, (513) 255-2461
FINANCE OFFICE: (SC1016) DFAS-CO-EB/BUNKER HILL
P.O. BOX 182077, COLUMBUS OH 43218-2077

18. CONTRACTOR/OFFEROR IS NOT REQUIRED TO SIGN THIS DOCUMENT CONTRACTOR/OFFEROR IS REQUIRED TO SIGN THIS DOCUMENT AND RETURN COPIES TO ISSUING OFFICE

19. CONTRACTOR/OFFEROR (Signature of person authorized to sign) By *Michael C. Rive*
20. NAME AND TITLE OF SIGNER (Type or print) MICHAEL C. RIVE, VICE PRESIDENT TECHNOLOGY
21. DATE SIGNED 4/20/95
22. UNITED STATES OF AMERICA (Signature of Contracting Officer) By *Douglas E. Harris*
23. NAME OF CONTRACTING OFFICER (Type or print) DOUGLAS E. HARRIS
24. DATE SIGNED 95 APR 25

Schedule of Changes

- First:** Section A, AFSC Form 701 (67X), dated 18 Mar 92, Block 22, is increased from \$15,375,536.00 by \$2,300,000.00 to \$17,675,536.00.
- Second:** Section G, Accounting and Classification Data, AFSC Form 703 (69K) is amended as shown herein.
- Third:** Section H, Special Contract Requirements, is amended as follows:
- a. Paragraph 9, "*COST*", is amended to read \$16,922,560.00 an increase of \$2,300,000.00 which covers all contractual items through 30 September 1995 (per MRS Technology letter dated 7 April 94).
- Fourth:** The above provisions include interim recognition of overrun costs to be incurred by the contractor. The parties hereto agree that this interim recognition and funding of the anticipated overrun will not effect the rights of either party to negotiate an adjustment in total cost of this contract as a result of contemplated negotiation between the parties.
- Fifth:** It is also recognized by the parties hereto that this action does not in any way involve a determination of allowability or allocability of any charges incurred under this contract and does not authorize any specific expenditure made in connection with this overrun.
- Sixth:** The government is not obligated to reimburse the contractor for costs incurred in excess of the total amount of \$17,675,536.00 allotted by the government to this contract, and the contractor is not obligated to continue performance under this contract or otherwise incur costs in excess of the \$17,675,536.00.

PART I SECTION G OF THE SCHEDULE ACCOUNTING CLASSIFICATION DATA			1. PROC INSTRUMENT ID NO. (PIIN)	2. SPIIN	3. PAGE 3 OF 3
4. APPROPRIATION AND ACCOUNTING DATA A. SCTY CLAS B. ACRN C. APPROPRIATION			D. LIMIT SUBHEAD	E. SUPPLEMENTAL ACCTS CLASSIFICATION	
U AE 9750400			1302	D15 47WL 005T10 080820 00000 62708E 595600	
F. CPN RECIPIENT DDDAAD			G. OBLIGATION AMOUNT*	H. NON-CLIN/CLIN	I. PR/MIPR DATA
F95600			\$ 2,300,000.00+		
8. DESCRIPTIVE DATA			FY1133-95-05128+ COMPLETE		
JON: DARK0251					
CCC: 676500					
4. APPROPRIATION AND ACCOUNTING DATA A. SCTY CLAS B. ACRN C. APPROPRIATION			D. LIMIT SUBHEAD	E. SUPPLEMENTAL ACCTS CLASSIFICATION	
F. CPN RECIPIENT DDDAAD			G. OBLIGATION AMOUNT*	H. NON-CLIN/CLIN	I. PR/MIPR DATA
S					
8. DESCRIPTIVE DATA					
4. APPROPRIATION AND ACCOUNTING DATA A. SCTY CLAS B. ACRN C. APPROPRIATION			D. LIMIT SUBHEAD	E. SUPPLEMENTAL ACCTS CLASSIFICATION	
F. CPN RECIPIENT DDDAAD			G. OBLIGATION AMOUNT*	H. NON-CLIN/CLIN	I. PR/MIPR DATA
S					
8. DESCRIPTIVE DATA					
4. APPROPRIATION AND ACCOUNTING DATA A. SCTY CLAS B. ACRN C. APPROPRIATION			D. LIMIT SUBHEAD	E. SUPPLEMENTAL ACCTS CLASSIFICATION	
F. CPN RECIPIENT DDDAAD			G. OBLIGATION AMOUNT*	H. NON-CLIN/CLIN	I. PR/MIPR DATA
S					
8. DESCRIPTIVE DATA					
4. APPROPRIATION AND ACCOUNTING DATA A. SCTY CLAS B. ACRN C. APPROPRIATION			D. LIMIT SUBHEAD	E. SUPPLEMENTAL ACCTS CLASSIFICATION	
F. CPN RECIPIENT DDDAAD			G. OBLIGATION AMOUNT*	H. NON-CLIN/CLIN	I. PR/MIPR DATA
S					
8. DESCRIPTIVE DATA					

* REPRESENTS NET AMOUNT OF INCREASE DECREASE WHEN MODIFYING AN EXISTING ACRN.
 + OR IN ACRN : ADDITION OR DELETION IN \$ - DECREASE
 NOTE TO CONTRACTOR: Submit invoices to paying office unless otherwise specified in the descriptive data item hereon.

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

PAGE 1 OF 3

2. PROC INSTRUMENT ID NO. (PIRN) F33615-92-C-5805	3. SPIN P00007	4. EFFECTIVE DATE MAIL DATE	5. REQUISITION/PURCHASE REQUEST FY1133-95-05062	6. BDC/DMS RATING
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7. ISSUED BY DEPARTMENT OF THE AIR FORCE AIR FORCE MATERIEL COMMAND (ASC) WRIGHT LABORATORY (WL/MLKT) WRIGHT-PATTERSON AFB, OH 45433-6503 NEGOTIATOR: CAPT MARK SALANSKY PHONE: (513) 255-3506	8. ADMINISTERED BY IF OTHER THAN BLOCK 7: DCMAO BOSTON 495 SUMMER STREET BOSTON, MA 02210-2138	CODE S2206A
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9. CONTRACTOR NAME AND ADDRESS MRS TECHNOLOGY, INC. 10 ELIZABETH DRIVE CHELMSFORD, MA 01824 (MIDDLESEX)	CODE OM5A8	FACILITY CODE	10. SECURITY CLAS U
IF "9" FOR MULTIPLE FACILITIES SEE SECT "K"			11. DISCOUNT FOR PROMPT PAYMENT
MAILING DATE JAN 04 1995			1 1 DAY NET 0
			2 1 DAY OTHER IF '9'
			3 1 DAY SEE SECT "E"
			12. PURCHASE OFFICE POINT OF CONTACT LSL/L76/LSL

13. THIS BLOCK APPLIES ONLY TO AMENDMENTS OF SOLICITATIONS

The above numbered solicitation is amended as set forth in block 17.

The hour and date specified for receipt of offers: is extended is not extended

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation, or as amended by one of the following methods:

(1) By signing and returning copies of this amendment. (2) By acknowledging receipt of this amendment on each copy of the offer submitted or (3) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE ISSUING OFFICE PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER if by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter provided such telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

14. THIS BLOCK APPLIES ONLY TO MODIFICATIONS OF CONTRACTS

THIS CHANGE IS ISSUED PURSUANT TO THE CHANGES SET FORTH HEREIN ARE MADE TO THE ABOVE NUMBERED CONTRACT/ORDER.

THE ABOVE NUMBERED CONTRACT IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (SUCH AS CHANGES IN PAYING OFFICE, APPROPRIATION DATA, ETC.) SET FORTH HEREIN.

THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF IT MODIFIES THE ABOVE NUMBERED CONTRACT AS SET FORTH HEREIN. MUTUAL CONSENT OF ALL PARTIES INVOLVED.

THIS MODIFICATION IS ISSUED PURSUANT TO

15. CONTRACT ADMINISTRATION DATA

A. KIND OF MOD	B. MOD ABBY RECIPIENT ADP #	C. DATE OF SIGNATURE MODIFICATION	D. CHANGE IN CONTRACT AMOUNT INCREASE (+) DECREASE (-)	E. LOSING PO/CAO ON TRANSFER	F. GAINING PO/CAO ON TRANSFER	G. SVC/AGENCY USE
C			\$ 1,525,506.00+			

16. ENTER ANY APPLICABLE CHANGES

A. PAY CODE	B. EFFECTIVE DATE OF AWARD	C. CONTRACT TYPE (1) TYPE (2) KIND	D. TYPE CONTR	E. SURV CR	F. SPL CONTR PROVISIONS	G. PAYING OFC CODE	H. DATE SIGNED	I. SECURITY CLASS (2) DATE OF DD 254
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17. REMARKS (Except as provided herein, all items and conditions of the contract, as heretofore changed, remain unchanged and in full force and effect)

SUBJECT: INTERIM RECOGNITION OF PENDING OVERRUN
PROJECT ENGINEER: ROBERT CROSS, WL/MTEC, (513) 255-2461
FINANCE OFFICE: (SC1016) DFAS-CO-EB/BUNKER HILL
P.O. BOX 182077
COLUMBUS, OH 43218-2077

18. CONTRACTOR/OFFEROR IS NOT REQUIRED TO SIGN THIS DOCUMENT. CONTRACTOR/OFFEROR IS REQUIRED TO SIGN THIS DOCUMENT AND RETURN 1 COPIES TO ISSUING OFFICE.

19. CONTRACTOR/OFFEROR (Signature of person authorized to sign) BY: <i>Michael C. King</i>	22. UNITED STATES OF AMERICA (Signature of Contracting Officer) BY: <i>Douglas E. Harris</i>
20. NAME AND TITLE OF SIGNER (Type or print) Michael C. King, V.P.	23. NAME OF CONTRACTING OFFICER (Type or print) DOUGLAS E. HARRIS
21. DATE SIGNED 12/29/94	24. DATE SIGNED 94 Dec 30

Schedule of Changes

- First:** Section A, AFSC Form 701 (67X), dated 18 Mar 92, Block 22, is increased from \$13,850,030.00 by \$1,525,506.00 to \$15,375,536.00.
- Second:** Section G, Accounting and Classification Data, AFSC Form 703 (69K) is amended as shown herein.
- Third:** Section H, Special Contract Requirements, is amended as follows:
- a. Paragraph 9, COST, is amended to read \$15,375,536.00 in lieu of \$13,850,030.00 which covers all contractual items through 6 Jan 95 (per MRS Technology letter dated 21 Dec 94).
- Fourth:** The above provisions include interim recognition of overrun costs to be incurred by the contractor. The parties hereto agree that this interim recognition and funding of the anticipated overrun will not effect the rights of either party to negotiate an adjustment in total cost of this contract as a result of contemplated negotiation between the parties.
- Fifth:** It is also recognized by the parties hereto that this action does not in any way involve a determination of allowability or allocability of any charges incurred under this contract and does not authorize any specific expenditure made in connection with this overrun.
- Sixth:** The government is not obligated to reimburse the contractor for costs incurred in excess of the total amount of \$15,375,536.00 allotted by the government to this contract, and the contractor is not obligated to continue performance under this contract or otherwise incur costs in excess of the \$15,375,536.00.

PART I SECTION G OF THE SCHEDULE ACCOUNTING CLASSIFICATION DATA			1. PROC INSTRUMENT ID NO. (PIIN) F33615-92-C-5805	2. SPIIN P00007	3. PAGE 3 of 3
4. APPROPRIATION AND ACCOUNTING DATA A. SCTY CLAS B. ACRN C. APPROPRIATION		D. LIMIT SUBHEAD 1302	E. SUPPLEMENTAL ACCTG CLASSIFICATION D15 47WL 005T10 080820 00000 62708E 595600		
F. CPN RECIPIENT DDDAAD U AE+ F95600 \$		G. OBLIGATION AMOUNT* 9750400 \$1,525,506.00	H. NON-CLIN/ELIN	I. PR/MIPR DATA FY1133-95-05062 COMPLETE	J. PAYING OFC CODE
8. DESCRIPTIVE DATA JON: DARK0251 CCC: 676500 ARPA-ORDER NO. 74+75 EXPIRE 15 SEP 95.					
4. APPROPRIATION AND ACCOUNTING DATA A. SCTY CLAS B. ACRN C. APPROPRIATION		D. LIMIT SUBHEAD	E. SUPPLEMENTAL ACCTG CLASSIFICATION		
F. CPN RECIPIENT DDDAAD \$		G. OBLIGATION AMOUNT*	H. NON-CLIN/ELIN	I. PR/MIPR DATA	J. PAYING OFC CODE
8. DESCRIPTIVE DATA DISBURSEMENT IS TO MADE FROM OLDEST YEAR FUNDS FIRST.					
4. APPROPRIATION AND ACCOUNTING DATA A. SCTY CLAS B. ACRN C. APPROPRIATION		D. LIMIT SUBHEAD	E. SUPPLEMENTAL ACCTG CLASSIFICATION		
F. CPN RECIPIENT DDDAAD \$		G. OBLIGATION AMOUNT*	H. NON-CLIN/ELIN	I. PR/MIPR DATA	J. PAYING OFC CODE
8. DESCRIPTIVE DATA					
4. APPROPRIATION AND ACCOUNTING DATA A. SCTY CLAS B. ACRN C. APPROPRIATION		D. LIMIT SUBHEAD	E. SUPPLEMENTAL ACCTG CLASSIFICATION		
F. CPN RECIPIENT DDDAAD \$		G. OBLIGATION AMOUNT*	H. NON-CLIN/ELIN	I. PR/MIPR DATA	J. PAYING OFC CODE
8. DESCRIPTIVE DATA					
4. APPROPRIATION AND ACCOUNTING DATA A. SCTY CLAS B. ACRN C. APPROPRIATION		D. LIMIT SUBHEAD	E. SUPPLEMENTAL ACCTG CLASSIFICATION		
F. CPN RECIPIENT DDDAAD \$		G. OBLIGATION AMOUNT*	H. NON-CLIN/ELIN	I. PR/MIPR DATA	J. PAYING OFC CODE
8. DESCRIPTIVE DATA					

* REPRESENTS NET AMOUNT OF INCREASE DECREASE WHEN MODIFYING AN EXISTING ACRN

+ OR - IN ACRN : ADDITION OR DELETION IN \$ - DECREASE

NOTE TO CONTRACTOR: Submit invoices to paying office unless otherwise specified in the descriptive data item hereon.

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT						1. PAGE 1 OF 4
2. PROC INSTRUMENT ID NO. (PIIN) F33615-92-C-5805	3. SPIIN P00006	4. EFFECTIVE DATE	5. REQUISITION/PURCHASE REQUEST PROJECT NO. FY1133-94-05151	6. BDC/DMS RATING		
7. ISSUED BY DEPARTMENT OF THE AIR FORCE AIR FORCE MATERIEL COMMAND (ASC) WRIGHT LABORATORY (WL/MLKT) WRIGHT-PATTERSON AFB, OH 45433-6503 NEGOTIATOR: MARK GARST, Capt, USAF PHONE: (513) 255-7143		MAIL DATE ADMINISTERED BY (IF OTHER THAN BLOCK 7) DCMAO BOSTON 495 SUMMER STREET BOSTON MA 02210-2138		CODE FA8650 S2206A		
9. CONTRACTOR NAME AND ADDRESS MRS TECHNOLOGY INC. 10 ELIZABETH DRIVE CHELMSFORD MA 01824 COUNTY: MIDDLESEX PHONE: (508) 250-0450		CODE OM5A8	FACILITY CODE IF "9" FOR MULTIPLE FACILITIES SEE SECT "K"	10. SECURITY CLASS U		
		MAILING DATE JUL 19 1994		11. DISCOUNT FOR PROMPT PAYMENT NET DAY S 1 ST N % DAYS 2 ND % DAYS IF "9" 3 RD % DAYS SEE SECT "E"		
				12. PURCHASE OFFICE POINT OF CONTACT LMG/L56/LMG		
13. THIS BLOCK APPLIES ONLY TO AMENDMENTS OF SOLICITATIONS <input type="checkbox"/> The above numbered solicitation is amended as set forth in block 17. The hour and date specified for receipt of offers <input type="checkbox"/> is extended <input type="checkbox"/> is not extended. Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation, or as amended by one of the following methods: (a) By signing and returning _____ copies of this 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 ISSUING OFFICE PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter provided such telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.						
14. THIS BLOCK APPLIES ONLY TO MODIFICATIONS OF CONTRACTS <input checked="" type="checkbox"/> THIS CHANGE IS ISSUED PURSUANT TO <u>SPECIAL CONTRACT REQUIREMENT H-13, "OPTION"</u> THE CHANGES SET FORTH HEREIN ARE MADE TO THE ABOVE NUMBERED CONTRACT/ORDER. <input type="checkbox"/> THE ABOVE NUMBERED CONTRACT IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (SUCH AS CHANGES IN PAYING OFFICE, APPROPRIATION DATA, ETC.) SET FORTH HEREIN. <input type="checkbox"/> THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF _____ IT MODIFIES THE ABOVE NUMBERED CONTRACT AS SET FORTH HEREIN. <input type="checkbox"/> THIS MODIFICATION IS ISSUED PURSUANT TO _____						
15. CONTRACT ADMINISTRATION DATA A. KIND OF MOD. B. MOD ABST RECIPIENT ADP PY C. DATE OF SIGNATURE MODIFICATION D. CHANGE IN CONTRACT AMOUNT INCREASE (+) DECREASE (-) E. LOSING PD/CAO ON TRANSFER F. GAINING PD/CAO ON TRANSFER G. SVC/AGENCY USE B \$827,935.00+						
16. ENTER ANY APPLICABLE CHANGES A. PAY CODE B. EFFECTIVE DATE OF AWARD C. CONTRACT (1) TYPE (2) KIND D. TYPE CONTR E. SURV CRIT F. SPL CONTR PROVISIONS G. PAYING OFC CODE H. DATE SIGNED I. SECURITY (1) CLASS (2) DATE OF DD 254						
17. REMARKS (Except as provided herein, all items and conditions of the contract, as heretofore changed, remain unchanged and in full force and effect.) SUBJECT: EXERCISE OF OPTION 3 (PHASE IV) PROJECT ENGINEER: ROBERT CROSS, WL/MTEC, (513) 255-2461 FINANCE OFFICE: DFAS-CO/BUNKER HILL, P.O. BOX 182077, COLUMBUS OH 43218-2077						
18. <input checked="" type="checkbox"/> CONTRACTOR/OFFEROR IS NOT REQUIRED TO SIGN THIS DOCUMENT <input type="checkbox"/> CONTRACTOR/OFFEROR IS REQUIRED TO SIGN THIS DOCUMENT AND RETURN COPIES TO ISSUING OFFICE						
19. CONTRACTOR/OFFEROR (Signature of person authorized to sign) BY			22. UNITED STATES OF AMERICA (Signature of Contracting Officer) BY <i>Timothy L. Jones</i>			
20. NAME AND TITLE OF SIGNER (Type or print)		21. DATE SIGNED		23. NAME OF CONTRACTING OFFICER (Type or print) TIMOTHY L. JONES		
				24. DATE SIGNED 94 JUL 15		

SCHEDULE

The purpose of this modification is to exercise Option 3 (Phase IV) of this contract, as specified by Special Contract Requirement H-13.

- FIRST: Section A, AFSC Form 706, Block 22, is hereby increased by \$827,935.00 for a new total contract amount of \$13,850,030.00.
- SECOND: Section F, Supplies Schedule Data, is amended as shown on page 3 herein.
- THIRD: Section G, Accounting Classification Data, AFSC Form 703, is amended as shown on page 4 herein.
- FOURTH: Section H, Special Contract Requirements, is amended as follows:
- a. Paragraph 9, COST, is amended to read \$13,096,954.00 in lieu of \$12,314,037.00.
 - b. Paragraph 10, FEE, is amended to read \$753,076.00 in lieu of \$708,058.00.
- FIFTH: All other terms and conditions remain unchanged.

PART I SECTION F OF THE SCHEDULE
SUPPLIES SCHEDULE DATA

1. PROC INSTRUMENT ID NO. (PIIN)
F33615-92-C-5805

2. SPIIN
P00006

3. PAGE 3 OF 4

4. ITEM NO.	5. ACRN	6. TSP PRI	7. MILSTRIP DOC NO. AND SUFFIX	8. CON ITEM SERIAL NO.	9. ENDING SERIAL NO. (WHEN APPL)	10. CLIN IDENT EXHIBIT
0001	XA					
11. DEL SCHED DATE	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY*	14. SCTY	15. SHIP TO	16. MARK FOR	
A. 96MAY21	A.	A. 1	A. GLAS	A. U		
B.	B.	B.	D.	D.	D.	
C.	C.	C.	E.	E.	E.	

17. DESCRIPTIVE DATA
 THE SCHEDULED DELIVERY DATE, BLOCK 11A, FOR THE APPROVED FINAL TECHNICAL REPORT IS 96MAY21.
 ALL DATA SHALL BE DELIVERED IN ACCORDANCE WITH EXHIBIT A, CONTRACT DATA REQUIREMENTS LIST, DD FORM 1423, DATED 92JAN17.
 TECHNICAL EFFORT MUST BE COMPLETED NO LATER THAN 95DEC22.

4. ITEM NO.	5. ACRN	6. TSP PRI	7. MILSTRIP DOC NO. AND SUFFIX	8. CON ITEM SERIAL NO.	9. ENDING SERIAL NO. (WHEN APPL)	10. CLIN IDENT EXHIBIT
0002	XA					
11. DEL SCHED DATE	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY*	14. SCTY	15. SHIP TO	16. MARK FOR	
A. 95DEC20	A.	A. 1	A. GLAS	A. U		
B.	B.	B.	D.	D.	D.	
C.	C.	C.	E.	E.	E.	

17. DESCRIPTIVE DATA
 THE SCHEDULED DELIVERY DATE, BLOCK 11A, FOR THE LARGE AREA MICROLITHOGRAPHY TOOL COMPONENTS IS 95DEC20.
 ANY MICROLITHOGRAPHY TOOL COMPONENTS SHALL REMAIN IN PLACE AT THE CONTRACTOR'S FACILITY.

4. ITEM NO.	5. ACRN	6. TSP PRI	7. MILSTRIP DOC NO. AND SUFFIX	8. CON ITEM SERIAL NO.	9. ENDING SERIAL NO. (WHEN APPL)	10. CLIN IDENT EXHIBIT
11. DEL SCHED DATE	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY*	14. SCTY	15. SHIP TO	16. MARK FOR	
A.	A.	A.	A. CLAS			
B.	B.	B.	D.	D.	C.	
C.	C.	C.	E.	E.	E.	

17. DESCRIPTIVE DATA

* REPRESENTS A NET INCREASE/DECREASE WHEN NO + OR - APPEARS AFTER THE ITEM NO.
 E = ESTIMATED
 - (IN QTY) = DECREASE
 + OR - (IN ITEM NO.) = ADDITION OR DELETION

PART I SECTION G OF THE SCHEDULE
ACCOUNTING CLASSIFICATION DATA

4. APPROPRIATION AND ACCOUNTING DATA A. SCTY CLAS B. ACRN C. APPROPRIATION		D. LIMIT SUBHEAD	E. SUPPLEMENTAL ACCTS CLASSIFICATION	
F. CPN RECIPIENT DDDAAD		G. OBLIGATION AMOUNT*	H. NON-CLIN/CLIN	I. PR/MIPR DATA
8. DESCRIPTIVE DATA				J. PAYING OFC CODE

1. PROC INSTRUMENT ID NO. (PIIN) F33615 92 C 5805

2. SPIIN P00006

3. PAGE 4 OF 4

U AD 9740400 1302 D14 47WL 4T1000 080820 00000 62708E.59560Q

F95600 \$ 827,935.00+ FY1133-94-05151+ COMPLETE

JON: DARK0251
 CCC: 676500
 ARPA ORDER NO. 8082-70 DATED 94MAY05
 EXPIRES 94SEP15

4. APPROPRIATION AND ACCOUNTING DATA A. SCTY CLAS B. ACRN C. APPROPRIATION		D. LIMIT SUBHEAD	E. SUPPLEMENTAL ACCTS CLASSIFICATION	
F. CPN RECIPIENT DDDAAD		G. OBLIGATION AMOUNT*	H. NON-CLIN/CLIN	I. PR/MIPR DATA
8. DESCRIPTIVE DATA				J. PAYING OFC CODE

DISBURSEMENT IS TO BE MADE FROM OLDEST YEAR FUNDS FIRST.

4. APPROPRIATION AND ACCOUNTING DATA A. SCTY CLAS B. ACRN C. APPROPRIATION		D. LIMIT SUBHEAD	E. SUPPLEMENTAL ACCTS CLASSIFICATION	
F. CPN RECIPIENT DDDAAD		G. OBLIGATION AMOUNT*	H. NON-CLIN/CLIN	I. PR/MIPR DATA
8. DESCRIPTIVE DATA				J. PAYING OFC CODE

4. APPROPRIATION AND ACCOUNTING DATA A. SCTY CLAS B. ACRN C. APPROPRIATION		D. LIMIT SUBHEAD	E. SUPPLEMENTAL ACCTS CLASSIFICATION	
F. CPN RECIPIENT DDDAAD		G. OBLIGATION AMOUNT*	H. NON-CLIN/CLIN	I. PR/MIPR DATA
8. DESCRIPTIVE DATA				J. PAYING OFC CODE

4. APPROPRIATION AND ACCOUNTING DATA A. SCTY CLAS B. ACRN C. APPROPRIATION		D. LIMIT SUBHEAD	E. SUPPLEMENTAL ACCTS CLASSIFICATION	
F. CPN RECIPIENT DDDAAD		G. OBLIGATION AMOUNT*	H. NON-CLIN/CLIN	I. PR/MIPR DATA
8. DESCRIPTIVE DATA				J. PAYING OFC CODE

* REPRESENTS NET AMOUNT OF INCREASE DECREASE WHEN MODIFYING AN EXISTING ACRN.
 + OR IN ACRN = ADDITION OR DELETION IN \$ - DECREASE
 NOTE TO CONTRACTOR: Submit Invoices to paying office unless otherwise specified in the descriptive data item hereon.

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT						1. PAGE 1 OF 2
2. PROC INSTRUMENT ID NO. (PIIN) F33615-92-C-5805	3. SPIIN P00005	4. EFFECTIVE DATE MAIL DATE	5. REQUISITION/PURCHASE REQUEST PROJECT NO.	6. BDC/DMS RATING		
7. ISSUED BY DEPARTMENT OF THE AIR FORCE AIR FORCE MATERIEL COMMAND (ASC) WRIGHT LABORATORY (WL/MLKT) WRIGHT-PATTERSON AFB, OH 45433-6503 NEGOTIATOR: CAPT MARK GARST PHONE: (513) 255-7143			8. ADMINISTERED BY (IF OTHER THAN BLOCK 7) DCMAO BOSTON 495 SUMMER STREET BOSTON MA 02210-2138			
9. CONTRACTOR NAME AND ADDRESS MRS TECHNOLOGY INC. 10 ELIZABETH DR. CHELMSFORD MA 01824 COUNTY: MIDDLESEX PHONE: (508) 250-0450		CODE 0M5A8	FACILITY CODE	10. SECURITY CLAS. U		
IF "9" FOR MULTIPLE FACILITIES SEE SECT "K"				11. DISCOUNT FOR PROMPT PAYMENT		
				1. NET D A Y S ST N % DAYS	2. OTHER IF "9" SEE SECT "E" NO % DAYS	3. RD % DAYS
12. PURCHASE OFFICE POINT OF CONTACT LMG/L35/LMG				13. THIS BLOCK APPLIES ONLY TO AMENDMENTS OF SOLICITATIONS		
<input type="checkbox"/> The above numbered solicitation is amended as set forth in block 17. The hour and date specified for receipt of Offers <input type="checkbox"/> is extended <input type="checkbox"/> is not extended.						
Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation, or as amended by one of the following methods:						
(a) By signing and referring _____ copies of this 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 ISSUING OFFICE 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 CHANGES MAY BE MADE BY TELEGRAM OR LETTER PROVIDED SUCH TELEGRAM OR LETTER MAKES REFERENCE TO THE SOLICITATION AND THIS AMENDMENT, AND IS RECEIVED PRIOR TO THE OPENING HOUR AND DATE SPECIFIED.						
14. THIS BLOCK APPLIES ONLY TO MODIFICATIONS OF CONTRACTS						
<input type="checkbox"/> THIS CHANGE IS ISSUED PURSUANT TO _____ THE CHANGES SET FORTH HEREIN ARE MADE TO THE ABOVE NUMBERED CONTRACT/ORDER.						
<input checked="" type="checkbox"/> THE ABOVE NUMBERED CONTRACT IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (SUCH AS CHANGES IN PAYING OFFICE, APPROPRIATION DATA, ETC.) SET FORTH HEREIN.						
<input type="checkbox"/> THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF _____ IT MODIFIES THE ABOVE NUMBERED CONTRACT AS SET FORTH HEREIN.						
<input type="checkbox"/> THIS MODIFICATION IS ISSUED PURSUANT TO _____						
15. CONTRACT ADMINISTRATION DATA						
A. KIND OF MOD	B. MOD ASST RECIPIENT ADR PT	C. DATE OF SIGNATURE MODIFICATION	D. CHANGE IN CONTRACT AMOUNT INCREASE (+) DECREASE (-)	E. LOSING PD/CAO ON TRANSFER	F. GAINING PD/CAO ON TRANSFER	G. SVC/AGENCY USE
B			5			
16. ENTER ANY APPLICABLE CHANGES						
A. PAY CODE	B. EFFECTIVE DATE OF AWARD	C. CONTRACT (1) TYPE (2) KIND	D. TYPE CONTR	E. SURV CRIT	F. SPL CONTR PROVISIONS	G. PAYING OFC CODE
17. REMARKS (Except as provided herein, all items and conditions of the contract, as heretofore changed, remain unchanged and in full force and effect)						
SUBJECT: ADMINISTRATIVE CHANGE PROJECT ENGINEER: ROBERT CROSS, WL/MTEC, (513) 255-2461 FINANCE OFFICE: DFAS-CO/BUNKER HILL, P.O. BOX 182077 COLUMBUS OH 43218-2077						
18. CONTRACTOR/OFFEROR IS NOT REQUIRED TO SIGN THIS DOCUMENT <input checked="" type="checkbox"/> CONTRACTOR/OFFEROR IS REQUIRED TO SIGN THIS DOCUMENT AND RETURN COPIES TO ISSUING OFFICE <input type="checkbox"/>						
19. CONTRACTOR/OFFEROR (Signature of person authorized to sign)			22. UNITED STATES OF AMERICA (Signature of Contracting Officer)			
BY			By <i>Mark D. Bennington</i>			
20. NAME AND TITLE OF SIGNER (Type or print)		21. DATE SIGNED	23. NAME OF CONTRACTING OFFICER (Type or print)		24. DATE SIGNED	
			MARK D. BENNINGTON		94 Feb-02	

SCHEDULE OF CHANGES

FIRST: Amend Section I, Contract Clauses, Paragraph 1, to remove the following clause:

52.245-17 SPECIAL TOOLING (Dec 1989)

This clause was inadvertently added as a part of P00002.

SECOND: This change is administrative in nature and does not relinquish any substantive rights of the Government.

58X

(nfl)

68X

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT						1. PAGE 1 OF 4
2. PROC INSTRUMENT ID NO. (PIIN) F33615-92-C-5805	3. SPIIN P00004	4. EFFECTIVE DATE MAIL DATE	5. REQUISITION/PURCHASE REQUEST FY13-94-05060	6. BDC/DMS RATING		
7. ISSUED BY DEPARTMENT OF THE AIR FORCE AIR FORCE MATERIEL COMMAND (ASC) WRIGHT LABORATORY (WL/MLKT) WRIGHT-PATTERSON AFB, OH 45433-7607 NEGOTIATOR: CAPT MARK GARST PHONE: (513) 255-7143			8. ADMINISTERED BY (IF OTHER THAN BLOCK 7) DCMAO BOSTON 495 SUMMER ST BOSTON MA 02210-2138			
9. CONTRACTOR NAME AND ADDRESS MRS TECHNOLOGY INC 10 ELIZABETH DR CHELMSFORD MA 01824 COUNTY: MIDDLESEX PHONE: (508) 0450 P00003 ISSUED BEFORE P00002		CODE 0M5A8	FACILITY CODE	10. SECURITY CLASS		
			IF "9" FOR MULTIPLE FACILITIES SEE SECT "K"	11. DISCOUNT FOR PROMPT PAYMENT		
			MAILING DATE JAN 21 1994	NET DAYS 1 N % DAYS 2 NO % DAYS 3 NO % DAYS		
13. THIS BLOCK APPLIES ONLY TO AMENDMENTS OF SOLICITATIONS				12. PURCHASE OFFICE POINT OF CONTACT LMG/L35/LMG		
<input type="checkbox"/> The above numbered solicitation is amended as set forth in block 17. <input type="checkbox"/> The hour and date specified for receipt of offers is extended. <input type="checkbox"/> is not extended.						
Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation, or as amended by one of the following methods: (a) By signing and returning _____ copies of this 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 ISSUING OFFICE PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter provided such telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.						
14. THIS BLOCK APPLIES ONLY TO MODIFICATIONS OF CONTRACTS						
<input checked="" type="checkbox"/> THIS CHANGE IS ISSUED PURSUANT TO SPECIAL CONTRACT REQUIREMENT H-13, "OPTION" THE CHANGES SET FORTH HEREIN ARE MADE TO THE ABOVE NUMBERED CONTRACT/ORDER.						
<input type="checkbox"/> THE ABOVE NUMBERED CONTRACT IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (SUCH AS CHANGES IN PAYING OFFICE, APPROPRIATION DATA, ETC.) SET FORTH HEREIN.						
<input type="checkbox"/> THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF _____ IT MODIFIES THE ABOVE NUMBERED CONTRACT AS SET FORTH HEREIN.						
<input type="checkbox"/> THIS MODIFICATION IS ISSUED PURSUANT TO _____						
15. CONTRACT ADMINISTRATION DATA						
4. KIND OF MOD	5. MOD ABBY RECIPIENT ADR PT	6. DATE OF SIGNATURE MODIFICATION	7. CHANGE IN CONTRACT AMOUNT INCREASE (+) DECREASE (-)	8. LOSING PO/CAO ON TRANSFER	9. GAINING PO/CAO ON TRANSFER	10. SVC/AGENCY USE
B			3,183,475.00+			
16. ENTER ANY APPLICABLE CHANGES						
A. PAY CODE	B. EFFECTIVE DATE OF AWARD	C. CONTRACT TYPE (1)TYPE (2)KIND	D. TYPE CONTR	E. SURV CRIT	F. SPL CONTR PROVISIONS	G. PAYING OFC CODE
17. REMARKS (Except as provided herein, all items and conditions of the contract, as heretofore changed, remain unchanged and in full force and effect)						
SUBJECT: EXERCISE OF OPTION 2 (PHASE III) PROJECT ENGINEER: ROBERT CROSS, WL/MTEC, (513) 255-2461 FINANCE OFFICE: DFAS-CO/BUNKER HILL, PO BOX 182077, COLUMBUS OH 43218-2077						
18. CONTRACTOR/OFFEROR IS NOT REQUIRED TO SIGN THIS DOCUMENT <input checked="" type="checkbox"/> CONTRACTOR/OFFEROR IS REQUIRED TO SIGN THIS DOCUMENT AND RETURN COPIES TO ISSUING OFFICE <input type="checkbox"/>						
19. CONTRACTOR/OFFEROR (Signature of person authorized to sign)				22. UNITED STATES OF AMERICA (Signature of Contracting Officer)		
BY				BY Mark D. Bennington		
20. NAME AND TITLE OF SIGNER (Type or print)		21. DATE SIGNED		23. NAME OF CONTRACTING OFFICER (Type or print)		24. DATE SIGNED
				MARK D. BENNINGTON		94 Jan 21

SCHEDULE

The purpose of this modification is to exercise Option 2 (Phase III) of this contract, as specified by Special Contract Requirement H-13.

- FIRST: Section A, Award/Contract Cover Page, AFSC Form 706 (67X), Block 22, is increased by \$3,183,475.00 for a new total contract amount of \$13,022,095.00
- SECOND: Section F, Supplies Schedule Data, is amended as shown on page 3 herein.
- THIRD: Section G, Accounting Classification Data, AFSC Form 703 (69K), is amended as shown on page 4 herein.
- FOURTH: Section H, Special Contract Requirements, is amended as follows:
- a. Paragraph 9, COST, is amended to read \$12,314,037.00 in lieu of \$9,303,659.00
 - b. Paragraph 10, FEE is amended to read \$708,058.00 in lieu of \$534,961.00
- FIFTH: Section J, Exhibit A, Contract Data Requirements List (DD Form 1423) Data Item No. A012, is required due to exercise of Option 2 (Phase III).

PART I SECTION F OF THE SCHEDULE SUPPLIES SCHEDULE DATA				1. PROC INSTRUMENT ID NO. (PIIN) F33615-92-C-5805		2. SPIIN P00004		3. PAGE 3 OF 4	
4. ITEM NO. 0001	5. ACRN XA	6. TSP PRI	7. MILSTRIP DOC NO. AND SUFFIX	8. COM ITEM SERIAL NO.	9. ENDING SERIAL NO. (WHEN APPL)	10. CLIN IDENT EXHIBIT			
11. DEL SCHED DATE 95SEP30	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY* 1	14. SCTY CLAS U U	15. SHIP TO	16. MARK FOR				
A.	A.	A.							
B.	B.	B.							
C.	C.	C.							
17. DESCRIPTIVE DATA									
<p>The scheduled delivery date, Block 11A, for the approved final technical report is 95 Sep 30.</p> <p>All data shall be delivered in accordance with Exhibit A, Contract Data Requirements List, DD Form 1423, dated 92 Jan 17.</p> <p>Technical effort must be completed no later than 95 Mar 31.</p> <p>If Option 3 is exercised, the date in Block 11A above will be changed to 96 May 21 and completion of technical effort will be changed to 95 Dec 22.</p>									
4. ITEM NO. 0002	5. ACRN XA	6. TSP PRI	7. MILSTRIP DOC NO. AND SUFFIX	8. COM ITEM SERIAL NO.	9. ENDING SERIAL NO. (WHEN APPL)	10. CLIN IDENT EXHIBIT			
11. DEL SCHED DATE 95MAY21	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY* 1	14. SCTY CLAS U U	15. SHIP TO	16. MARK FOR				
A.	A.	A.							
B.	B.	B.							
C.	C.	C.							
17. DESCRIPTIVE DATA									
<p>The scheduled delivery date, Block 11A, for the large area microlithography tool components is 95 May 21.</p> <p>Any microlithography tool components shall remain in place at the contractor's facility.</p> <p>If Option 3 is exercised, the delivery date for the microlithography tool components will be changed to 95 Dec 20.</p>									
4. ITEM NO.	5. ACRN	6. TSP PRI	7. MILSTRIP DOC NO. AND SUFFIX	8. COM ITEM SERIAL NO.	9. ENDING SERIAL NO. (WHEN APPL)	10. CLIN IDENT EXHIBIT			
11. DEL SCHED DATE	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY*	14. SCTY CLAS	15. SHIP TO	16. MARK FOR				
A.	A.	A.							
B.	B.	B.							
C.	C.	C.							
17. DESCRIPTIVE DATA									

* REPRESENTS A NET INCREASE/DECREASE WHEN NO + OR - APPEARS AFTER THE ITEM NO.
 E = ESTIMATED
 - (IN QTY) = DECREASE
 + OR - (IN ITEM NO.) = ADDITION OR DELETION

PART I SECTION G OF THE SCHEDULE ACCOUNTING CLASSIFICATION DATA			1. PROC INSTRUMENT ID NO. (PIIN)	2. SPIIN	3. PAGE 4 OF 4
4. APPROPRIATION AND ACCOUNTING DATA A. SCTY CLAS B. ACRN C. APPROPRIATION			F33615-92-C-5805	P00002	
D. LIMIT SUBHEAD			E. SUPPLEMENTAL ACCTG CLASSIFICATION		
U AD+	9740400	1302	D14 47WL 4T1000 080820 00000 62708E 595600		
F. CPN RECIPIENT D00A0D	G. OBLIGATION AMOUNT*		H. NON-CLIN/CLIN	I. PR/MIPR DATA	J. PAYING OFC CODE
F95600	\$ 3,183,475.00			FY1133-94-05060	
8. DESCRIPTIVE DATA			COMPLETE		
JON: DARK0251					
CCC: 676500					
ARPA ORDER NO #8082-67 dated 93 Dec 15 Expires 94 Sep 15					
4. APPROPRIATION AND ACCOUNTING DATA A. SCTY CLAS B. ACRN C. APPROPRIATION			E. SUPPLEMENTAL ACCTG CLASSIFICATION		
D. LIMIT SUBHEAD			E. SUPPLEMENTAL ACCTG CLASSIFICATION		
F. CPN RECIPIENT D00A0D	G. OBLIGATION AMOUNT*		H. NON-CLIN/CLIN	I. PR/MIPR DATA	J. PAYING OFC CODE
	\$				
8. DESCRIPTIVE DATA			DISBURSEMENT TO BE MADE FROM OLDEST YEAR FUNDS FIRST		
4. APPROPRIATION AND ACCOUNTING DATA A. SCTY CLAS B. ACRN C. APPROPRIATION			E. SUPPLEMENTAL ACCTG CLASSIFICATION		
D. LIMIT SUBHEAD			E. SUPPLEMENTAL ACCTG CLASSIFICATION		
F. CPN RECIPIENT D00A0D	G. OBLIGATION AMOUNT*		H. NON-CLIN/CLIN	I. PR/MIPR DATA	J. PAYING OFC CODE
	\$				
8. DESCRIPTIVE DATA					
4. APPROPRIATION AND ACCOUNTING DATA A. SCTY CLAS B. ACRN C. APPROPRIATION			E. SUPPLEMENTAL ACCTG CLASSIFICATION		
D. LIMIT SUBHEAD			E. SUPPLEMENTAL ACCTG CLASSIFICATION		
F. CPN RECIPIENT D00A0D	G. OBLIGATION AMOUNT*		H. NON-CLIN/CLIN	I. PR/MIPR DATA	J. PAYING OFC CODE
	\$				
8. DESCRIPTIVE DATA					
4. APPROPRIATION AND ACCOUNTING DATA A. SCTY CLAS B. ACRN C. APPROPRIATION			E. SUPPLEMENTAL ACCTG CLASSIFICATION		
D. LIMIT SUBHEAD			E. SUPPLEMENTAL ACCTG CLASSIFICATION		
F. CPN RECIPIENT D00A0D	G. OBLIGATION AMOUNT*		H. NON-CLIN/CLIN	I. PR/MIPR DATA	J. PAYING OFC CODE
	\$				
8. DESCRIPTIVE DATA					

*REPRESENTS NET AMOUNT OF INCREASE DECREASE WHEN MODIFYING AN EXISTING ACRN.
 + OR IN ACRN = ADDITION OR DELETION IN \$ - DECREASE NOTE TO CONTRACTOR: Submit Invoices to paying office unless otherwise specified in the descriptive data item hereon.

NFI AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT						PAGE OF	
2. PROC INSTRUMENT ID NO. (PIIN)	3. SPIIN	4. EFFECTIVE DATE	5. REQUISITION/PURCHASE REQUEST PROJECT NO.	6. BDC/DW/RATING		13	
F33615-92-C-5805	P00002		FY1133-93-05177 FY1133-94-05032				
7. ISSUED BY DEPARTMENT OF THE AIR FORCE AIR FORCE MATERIEL COMMAND (ASC) WRIGHT LABORATORY (WL/MLKT) WRIGHT-PATTERSON AFB OH 45433-7607 CONTRACT NEGOTIATOR: CAPT MARK GARST PHONE: (513) 255-7143			8. REGISTERED BY (IF OTHER THAN BLOCK 7) DCMAO BOSTON 495 SUMMER ST BOSTON MA 02210-2138		CODE FA8650 S2206A		
9. CONTRACTOR NAME AND ADDRESS MRS TECHNOLOGY INC. 10 ELIZABETH DR. CHELMSFORD MA 01824 COUNTY: MIDDLESEX PHONE: (508) 250-0450 P00003 ISSUED BEFORE P00002			CODE 0M5A8 FACILITY CODE		10. SECURITY CLAS U		
			IF "9" FOR MULTIPLE FACILITIES SEE SECT "K"		11. DISCOUNT FOR PROMPT PAYMENT		
			MAILING DATE JAN 21 1994		1 ST N % DAYS NET DAYS 2 ND % DAYS OTHER IF "9" 3 RD % DAYS SEE SECT "E"		
13. THIS BLOCK APPLIES ONLY TO AMENDMENTS OF SOLICITATIONS					12. PURCHASE OFFICE POINT OF CONTACT LMG/L78/LMG		
<input type="checkbox"/> The above numbered solicitation is amended as set forth in block 17.			The hour and date specified for receipt of Offers <input type="checkbox"/> is extended <input type="checkbox"/> is not extended				
Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation, or as amended by one of the following methods: (a) By signing and returning _____ copies of this 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 ISSUING OFFICE PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter provided such telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.							
14. THIS BLOCK APPLIES ONLY TO MODIFICATIONS OF CONTRACTS							
<input type="checkbox"/> THIS CHANGE IS ISSUED PURSUANT TO _____ THE CHANGES SET FORTH HEREIN ARE MADE TO THE ABOVE NUMBERED CONTRACT/ORDER.							
<input type="checkbox"/> THE ABOVE NUMBERED CONTRACT IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (SUCH AS CHANGES IN PAYING OFFICE, APPROPRIATION DATA, ETC.) SET FORTH HEREIN.							
<input checked="" type="checkbox"/> THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF <u>THE "CHANGES" CLAUSE OF THE CONTRACT CLAUSES</u> IT MODIFIES THE ABOVE NUMBERED CONTRACT AS SET FORTH HEREIN.							
<input type="checkbox"/> THIS MODIFICATION IS ISSUED PURSUANT TO _____							
15. CONTRACT ADMINISTRATION DATA							
A. KIND OF MOD	B. MOD ABST RECIPIENT ADP RT	C. DATE OF SIGNATURE MODIFICATION	D. CHANGE IN CONTRACT AMOUNT INCREASE (+) DECREASE (-)	E. LOSING PO/CAO ON TRANSFER	F. GAINING PO/CAO ON TRANSFER	G. SVC/AGENCY USE	
C			\$ 1,381,946.00+				
16. ENTER ANY APPLICABLE CHANGES							
A. PAY CODE	B. EFFECTIVE DATE OF AWARD	C. CONTRACT (1)TYPE (2)KIND	D. TYPE CONTR	E. SURV CRIT	F. SPL CONTR PROVISIONS	G. PAYING OFC CODE	H. DATE SIGNED
							I. SECURITY (1)CLAS (2) DATE OF DD 254
17. REMARKS (Except as provided herein, all items and conditions of the contract, as heretofore changed, remain unchanged and in full force and effect.) SUBJECT: PROGRAM RESTRUCTURE PROJECT ENGINEER: ROBERT CROSS, WL/MTEC, (513) 255-2461 FINANCE OFFICE: (SC1016) DFAS-CO/BUNKER HILL, P.O. BOX 182077 COLUMBUS OH 43218-2077							
18. CONTRACTOR/OFFEROR IS NOT REQUIRED TO SIGN THIS DOCUMENT <input type="checkbox"/> CONTRACTOR/OFFEROR IS REQUIRED TO SIGN THIS DOCUMENT AND RETURN COPIES TO ISSUING OFFICE <input checked="" type="checkbox"/>							
19. CONTRACTOR/OFFEROR (Signature of person authorized to sign) BY <i>R. E. Waltz</i>				22. UNITED STATES OF AMERICA (Signature of Contracting Officer) BY <i>Mark D. Bennington</i>			
20. NAME AND TITLE OF SIGNER (Type or print) RICHARD E. WALTZ (CFO)		21. DATE SIGNED 1/20/94		23. NAME OF CONTRACTING OFFICER (Type or print) MARK D. BENNINGTON		24. DATE SIGNED 94 Jan 21	

SCHEDULE OF CHANGES

- FIRST: Section A, Award/Contract Cover Page, AFSC Form 706 (67X), Block 22, is amended to read \$9,838,620.00 in lieu of \$8,456,674.00, an increase of \$1,381,946.00
- SECOND: Amend Section B, Supplies Line Item Data, AFSC Form 705 (70E), as attached hereto.
- THIRD: Section C, Description/Specifications, dated 92 Jan 17, is amended by deleting it in its entirety and replacing it with Section C, Description/Specifications, dated 93 Sep 09, as shown on pages 5 through 11 herein. All changes are shown in bold print.
- FOURTH: Section F, Supplies Schedule Data, is amended as shown on page 12 herein. New dates for technical effort and technical reporting, depending on exercise of future options, are shown below:

<u>OPTION</u>	<u>END TECH EFFORT</u>	<u>FINAL REPORT</u>
2	95 MAR 31	95 SEP 31
3	95 DEC 22	96 MAY 21

The dates for delivery of the microlithography tool change as follows:

<u>OPTION</u>	<u>DELIVERY DATE</u>
2	95 MAY 21
3	95 DEC 20

- FIFTH: Amend Section G, Accounting Classification Data, AFSC Form 703 (69K), as attached hereto.
- SIXTH: Section H, Special Contract Requirements, is amended as follows:
- a. Paragraph 9, **COST**, is amended to read \$9,303,659.00 in lieu of \$3,838,099.00. This paragraph was inadvertently left unchanged as a result of P00001.
 - b. Paragraph 10, **FEE**, is amended to read \$534,961.00 in lieu of \$220,691.00. This paragraph was inadvertently left unchanged as a result of P00001.

- c. Paragraph 13, **OPTION**, is amended to increase the amount for Option 1, Phase II amounts with the following:

Option 1, Phase II	Estimated Cost	\$5,465,560.00
	Fixed Fee	\$ 314,269.00
	Total	\$5,779,829.00

Also, change the Phase III (Option 2) exercise date from 93 Nov 21 to 94 Jan 21.

- d. Paragraph 19, **LIST OF DATA TO BE PROVIDED WITH OTHER THAN UNLIMITED RIGHTS**, is amended to remove the item entitled "Laser Triggering Subsystem Concept and Design".

SEVENTH: Amend Section I, Contract Clauses, Paragraph 1, to include the following clause:

52.245-17 Special Tooling (Dec 1989)

EIGHTH: Amend Section J, Exhibit A, Contract Data Requirements List (DD Form 1423) Data Item No. A008, Block 16, by amending the contingent delivery dates for the final report as follows:

	<u>BLOCK 11</u>	<u>BLOCK 12</u>	<u>BLOCK 13</u>
Option 1	94 AUG 22	94 SEP 22	94 DEC 22
Option 2	95 MAR 31	95 APR 30	95 SEP 30
Option 3	95 DEC 22	96 JAN 22	96 MAY 21

NINTH: This Supplemental Agreement constitutes a full and complete settlement of all the claims of the contractor under this contract, including the clause entitled, "Changes", arising out of or by reason of the changes effected hereby.

PART I SECTION B OF THE SCHEDULE SUPPLIES LINE ITEM DATA		1. PROC INSTRUMENT ID NO. (PIIN) F33615-92-C-5805	2. SPIIN P00002	3. PAGE 4 OF 13
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4. ITEM NO. 0001	5. QUANTITY 1	6. PURCH UNIT LO	7. UNIT PRICE N	8. TOTAL ITEM AMOUNT* N	13. CIRR
9. SCTY10. ACRN CLAS U XA N		11. NSN		12. FSCM AND PART NUMBER	
14. SITE CODES A. POA B. ACP C. FOB D D D		15. NOUN RESEARCH AND DATA		16. SVC/AGENCY USE	
17. PR/MIPR DATA FY1133-92-05022		18. AUTHORIZED RATE A. PROGRESS PAY B. RECoup		19. CONTRACT PERCENT FEE	
22. 1ST DISCOUNT A. B. DAYS		23. 2ND DISCOUNT A. B. DAYS		24. 3RD DISCOUNT A. B. DAYS	
25. NET DAYS		26. QUANTITY VARIANCE A. OVER B. UNDER		27. TYPE CONTRACT	
28. OPR		29. DESCRIPTIVE DATA		21. ITEM/PROJ MGR FY1133	

Conduct research entitled "PROTOTYPE DEVELOPMENT OF A VERY LARGE-AREA HIGH PERFORMANCE MICROLITHOGRAPHY TOOL" in accordance with Section C, Description/Specifications dated 93SEP09. Delivery data in accordance with Exhibit A, Contract Data Requirements List, DD Form 1423, dated 92JAN17.

Phase II, as set forth in paragraphs 4.2 thru 4.2.1.8 of Section C, may be obtained in accordance with the provisions of Section H-13 for Option 1.

Phase III, as set forth in paragraphs 4.3 thru 4.3.1.4 of Section C, may be obtained in accordance with the provisions of Section H-13 for Option 2.

Phase IV, as set forth in paragraph 4.4 through 4.4.1.2 of Section C, may be obtained in accordance with the provisions of Section H-13 for Option 3.

4. ITEM NO.	5. QUANTITY	6. PURCH UNIT	7. UNIT PRICE	8. TOTAL ITEM AMOUNT*	13. CIRR
9. SCTY10. ACRN CLAS		11. NSN		12. FSCM AND PART NUMBER	
14. SITE CODES A. POA B. ACP C. FOB		15. NOUN		16. SVC/AGENCY USE	
17. PR/MIPR DATA		18. AUTHORIZED RATE A. PROGRESS PAY B. RECoup		19. CONTRACT PERCENT FEE	
22. 1ST DISCOUNT A. B. DAYS		23. 2ND DISCOUNT A. B. DAYS		24. 3RD DISCOUNT A. B. DAYS	
25. NET DAYS		26. QUANTITY VARIANCE A. OVER B. UNDER		27. TYPE CONTRACT	
28. OPR		29. DESCRIPTIVE DATA		21. ITEM/PROJ MGR	

*REPRESENTS NET AMOUNT OF INCREASE/DECREASE WHEN MODIFYING EXISTING ITEM NO.
 N = NOT APPLICABLE
 U = UNDEFINIZED
 NSP = NOT SEPARATELY PRICED
 E = ESTIMATED
 - (IN QTY AND \$) = DECREASE
 + OR - (IN ITEM NO.) = ADDITION OR DELETION
 CIRR: CONTROLLED ITEM RPT RQMT

SITE CODES:
 S = SOURCE
 D = DESTINATION
 O = INTERMEDIATE

SECTION C

DESCRIPTION/SPECIFICATIONS

93 SEP 09

**PROTOTYPE DEVELOPMENT OF A VERY LARGE-AREA
HIGH PERFORMANCE MICROLITHOGRAPHY TOOL****1.0 OBJECTIVE:**

1.1 The primary objective of this program is to develop a new generation **high throughput** large-area microlithography tool suitable for imaging active matrix liquid crystal displays (AMLCD) substrates up to **600 mm x 500 mm in size**.

1.2 The specific objective of this program shall be the construction of a working full scale prototype of a large area microlithography tool capable of imaging glass substrates up to **600 mm x 500 mm in size** at approximately a **two-to-three-fold** increase in imaging throughput rates as compared to any currently available large area microlithography tool.

2.0 SCOPE:

2.1 This is a four phase program with Phase I being the basic program and Phases II, III, and IV are options 1, 2, and 3, respectively. The entire program will develop and construct a working prototype, high speed, microlithography machine capable of imaging glass substrates up to **600 mm x 500 mm in size** at throughput rates significantly better than any currently available large area microlithography tool. **This effort includes the development of the following subsystem components which will be designed, constructed and integrated:**

- 2.1.1 **A dual X-Y stage subsystem based on linear stepping motor technology**
- 2.1.2 A high-power illumination subsystem
- 2.1.3 A novel imaging subsystem capable of image scale adjustment of ≤ 100 ppm and image resolution of $\leq 3\mu\text{m}$
- 2.1.4 An automatic calibration metrology and control subsystem
- 2.1.5 An automatic, high-speed substrate alignment subsystem
- 2.1.6 An automatic reticle storage and handling subsystem
- 2.1.7 An automatic, high-speed, externally-interfaceable substrate handling system
- 2.1.8 An environmental control subsystem
- 2.1.9 Job setup and execution control software

2.2 The four (4) phases consist of system specification and architecture development, mainframe prototype development, additional subsystem development, and beta site partnering. Phases II, III, and IV are extensions of the mainframe prototype development in Phase I. Also, in Phases II, III, and IV, additional subsystems and control software shall be developed, all subsystems shall be integrated and the prototype system shall be tested at the contractor's facility..

SECTION C

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3.0 BACKGROUND:

3.1 This program is one of several contracts that are being awarded as a result of the solicitation by the Defense Advanced Research Projects Agency (DARPA), Broad Agency Announcement (BAA) No. 91-06, titled "High Definition Systems".

3.2 The most critical problem in cockpits today is the lack of pilot/crew situation awareness. The present cockpit displays, namely cathode ray tubes (CRTs), have several disadvantages which limit the fusing of the data and presenting situation information to the pilot. Active matrix liquid crystal displays (AMLCDs) are the cockpit designer's choice for replacing CRTs since they are sunlight readable with full color capability. In addition, AMLCDs provide a large viewing area and are fail soft with small instrument depth.

3.3 The active matrix liquid crystal technology must be developed in the United States so that the displays required by the military are available from domestic sources. These programs, under DARPA/MANTECH auspices, will develop the manufacturing equipment necessary to establish the domestic manufacturing capability for large area active matrix liquid crystal displays. The Tri-Service needs for AMLCD cockpit displays are approximately 45,000 by the turn of the century. Most military display requirements are common with commercial aircraft and, in many instances, the critical component (AMLCD active glass) is common with commercial applications including portable computers, virtual reality workstations, and television receivers.

4.0 TECHNICAL REQUIREMENTS/TASKS:**4.1 Phase I. Basic Effort****4.1.1 Task I-System Specification and Architecture Development** (CDRL #A008, #A009, #A016)

4.1.1.1 The contractor shall develop a system functional specification and detail the expectation of performance levels. This effort shall involve customer research activity to test the system requirements and shall include a detailed system error budget analysis in order to qualify the expected performance levels.

4.1.1.2 The contractor shall develop, with the assistance of one or more commercial photoresist vendors, optimized photoresists for use with the high-power exposure technique.

4.1.1.3 The contractor shall develop the opto-mechanical architecture that supports the required specifications. The contractor shall address major conceptual issues such as base and camera bridging structure, camera size and mounting, reticle handling, and substrate transport.

SECTION C

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4.1.1.4 The contractor shall develop the control electronics architecture to establish the computing structure and control system electronics modularity levels.

4.1.1.5 The contractor shall develop the control software architecture to establish the structure that shall contain the control applications software and software services needed to run the machine and analyze information produced by the machine.

4.1.2 **Task II-Mainframe Prototype Development** (CDRL #A008, #A009, #A016)

4.1.2.1 **The contractor shall design the X-Y motion subsystem including:** the base and vibration isolation subsystem; stage motors and platen; stage mainframe structure; stage positioning metrology including the possible use of mirror replication; substrate transfer, banking, and chucking mechanics; electro-optic calibration sensor module; stage resident control electronics and access software; cable and hose connections to the fixed world; and the X-Y stage digital control servo.

4.1.2.2 **The contractor shall design the high-power illumination subsystem including:** illumination source evaluation and selection; illumination light conditioning optics and mechanics; aperaturing optics, mechanics, and controls; illumination triggering controls; and illumination safety system design. The contractor shall breadboard any high risk modules to determine operational feasibility.

4.1.2.3 The contractor shall design the imaging subsystem including: **developing the detailed performance specifications of the lens system, evaluate and select a subcontractor to perform the detailed design and fabrication;** and optical column setup and alignment fixturing; optical column mounting structure; reticle positioning and alignment subsystem; automatic lens accuracy control subsystem; image scale adjustment control subsystem; and automatic focus control subsystem. The contractor shall breadboard any high risk modules to determine operational feasibility.

4.1.2.4 The contractor shall design the alignment metrology subsystem including: evaluating new sensor techniques, and developing hardware and sensor control software. The contractor shall breadboard any high risk modules to determine operational feasibility.

4.1.2.5 The contractor shall design and fabricate the control system support electronics and software including: evaluating, selecting, and integrating system and subsystem control processors and operating systems; designing the overall system electronics packing and cabling.

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4.1.2.6 The contractor shall design the application software including: hardware device driver development; software services development, e.g. calibration, database, communications, user interface; control application software development, e.g. job preparation, job execution control, calibration sequence control, and data visualization utilities. The contractor shall perform initial prototyping.

4.2 Phase II (Option 1)

4.2.1 **Mainframe Prototype Development** (CDRL #A008, #A009, #A016)

4.2.1.1 The contractor shall **fabricate**, integrate and test the X-Y motion subsystem.

4.2.1.2 The contractor shall fabricate, integrate and test the high-power illumination subsystem.

4.2.1.3 The contractor shall fabricate, integrate, and test the imaging subsystem.

4.2.1.4 The contractor shall fabricate, integrate and test the alignment metrology subsystem.

4.2.1.5 The contractor shall **specify and procure a low cost, temporary** the environmental control subsystem.

4.2.1.6 The contractor shall integrate and test the control system support electronics and software.

4.2.1.7 The contractor shall develop and test the application software.

4.3 Phase III (Option 2)

4.3.1 **Mainframe Prototype Development** (CDRL #A008, #A009, #A016)

4.3.1.1 The contractor shall develop the reticle storage and handling subsystem.

4.3.1.2 The contractor shall develop the in-system material transport subsystem.

4.3.1.3 The contractor shall perform system integration, test, and characterization. This effort includes basic first layer imaging test & characterization and overlay imaging test and characterization.

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4.3.1.4 The contractor shall define the detailed design requirements for the final environmental control system, evaluate and select a vendor, and procure the final chamber.

4.4 Phase IV (Option 3)

4.4.1 Task I - Mainframe Prototype Development (CDRL #A008, #A009, #A014, #A016)

4.4.1.1 The contractor shall perform system integration, test, and characterization. This effort includes reticle and substrate handling subsystems integration, and **final environmental control system integration.**

4.4.1.2 The contractor shall develop preliminary operation manuals, preliminary setup and calibration manuals, and preliminary acceptance test manuals.

4.4.2 Task II - Beta Site Partnering

4.4.2.1 The contractor shall interview, evaluate, and select one or more beta site partners. The contractor shall prepare draft beta site agreements for one or more partners. The contractor shall present recommendations for beta site partnering to the Government at a Quarterly Review. This task does not include execution of any beta site agreements.

4.5 Program Management/Planning: (Applicable to Phases I, II, III, and IV) The contractor shall conduct administrative and financial management functions during the course of this effort including: detailed scheduling of activities and milestones; defining work tasks, subtasks and all interrelationships; purchasing materials; defining skill levels required and allocating labor resources accordingly; defining and managing subcontractor activities (if any); budgeting, allocating, forecasting of funds and tracking status of funds; documenting all work problems, and progress toward the accomplishment of the overall tasks and the overall program objectives. The contractor shall notify and discuss the impact of key personnel changes with the Air Force prior to the effective date of change. (CDRL #A001, #A002, #A003, #A004, #A007, #A011, #A013, #A014)

5.0 DATA AND OTHER DELIVERABLES:

5.1 Data is listed on the DD Form 1423.

5.2 The contractor shall construct and deliver one (1) display board to describe the program. The size shall be 76 x 76 cm with 3.8 cm radius corners. It shall be of heavy construction to withstand repeated baggage handling, or, have a carrying case. The board shall be white with medium blue lettering of vinyl or silk screening. Color photographs and three-dimensional objects shall be securely attached. Velcro strips shall be permanently adhered to the back for mounting. Company logos are not permitted. Information displayed shall demonstrate by pictures and models, the program products (partially and/or fully completed or

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assembled)--the who, what, where, when, why, how, applications and projected savings--of the program. (CDRL A010)

5.3 One (1) large-area microlithography tool

6.0 SPECIAL CONSIDERATIONS:

6.1 Quarterly Reviews: The contractor shall conduct quarterly program status reviews to Government personnel. The purpose of the review is to provide a detailed account of the administrative, financial, and technical health of the program; to list accomplishments and problem areas; and to detail future program plans. (CDRL #A005, #A006, #A007)

6.1.1 Industry Workshops - The contractor shall conduct workshops, in conjunction with selected quarterly reviews. The purpose of these workshops shall be to transmit significant technical progress of this program, in a timely manner, to appropriate representatives of Government and industry. An invitation list will be developed by the contractor and the Air Force. The contractor shall invite the attendees, in addition to providing a meeting facility for approximately twenty-five (25) invited individuals. It is anticipated the frequency of these workshops will be semi-annually.

6.2 End of the Contract Debriefing: The contractor shall conduct a debriefing subsequent to the completion of the technical effort and prior to approval of final report. The purpose of the debriefing shall be to transmit the results of this program, in a timely manner, to appropriate representatives of Government and industry. An invitation list will be supplied to the contractor by the Air Force. The contractor shall invite the attendees, in addition to providing a meeting facility for approximately one hundred (100) invited individuals.

6.2.1 An on-site review of the prototype microlithography tool shall be conducted for all End of the Contract Debriefing attendees.

6.3 Environmental Assessment: The contractor shall assess the environmental consequences of the technology established under this program from the standpoint of the program itself and from the standpoint of future scale-up to production quantities. If the technology is found to have adverse environmental consequences, the contractor shall provide suggestions for making the technology environmentally acceptable and indicate what economic impact the suggestions will have on the technology.

6.4 System Safety: A system safety program, including hazard analysis, shall be performed in accordance with MIL-STD-882B. The prime objective is to formalize an approach to eliminate hazards through engineering, design, education, management policy, and supervisory control, with constraints of operational effectiveness, time, and cost, throughout the equipment's life cycle. (CDRL #A015)

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6.5 Program Highlights: The contractor shall ensure the documentation of this program by timely photographic coverage of significant events and milestones. (CDRL #A012)

PART I SECTION F OF THE SCHEDULE SUPPLIES SCHEDULE DATA			1. PROC INSTRUMENT ID NO. (PIIN) F33615-92-C-5805		2. SPIIN P00002		3. PAGE 12 OF 13	
4. ITEM NO.	5. ACRN	6. TSP PRI	7. MILSTRIP DOC NO. AND SUFFIX	8. COM ITEM SERIAL NO.	9. ENDING SERIAL NO. (WHEN APPL)	10. CLIN IDENT EXHIBIT		
0001	XA							
11. DEL SCHED DATE	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY*	14. SCTY CLAS	15. SHIP TO	16. MARK FOR			
A. 94DEC22	A.	A. 1	U					
B.	B.	B.	D.	D.	D.			
C.	C.	C.	E.	E.	E.			
17. DESCRIPTIVE DATA								
<p>THE SCHEDULED DELIVERY DATE, BLOCK 11A, FOR THE APPROVED FINAL TECHNICAL REPORT IS 94 DEC 22. ALL DATA SHALL BE DELIVERED IN ACCORDANCE WITH EXHIBIT A, CONTRACT DATA REQUIREMENTS LIST, DD FORM 1423, DATED 92 JAN 17. TECHNICAL EFFORT MUST BE COMPLETED NO LATER THAN 94 AUG 22. SEE SECTION H FOR FY1133 ADDRESS.</p> <p>IF OPTION 2 IS EXERCISED, THE DATE IN BLOCK 11A ABOVE WILL BE CHANGED TO 95SEP30 AND COMPLETION OF TECHNICAL EFFORT WILL BE CHANGED TO 95MAR31</p> <p>IF OPTION 3 IS EXERCISED, THE DATE IN BLOCK 11A ABOVE WILL BE CHANGED TO 96MAY21 AND COMPLETION OF TECHNICAL EFFORT WILL BE CHANGED TO 95DEC22.</p>								
4. ITEM NO.	5. ACRN	6. TSP PRI	7. MILSTRIP DOC NO. AND SUFFIX	8. COM ITEM SERIAL NO.	9. ENDING SERIAL NO. (WHEN APPL)	10. CLIN IDENT EXHIBIT		
0002	XA							
11. DEL SCHED DATE	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY*	14. SCTY CLAS	15. SHIP TO	16. MARK FOR			
A. 94MAR21	A.	A. 1	U	U				
B.	B.	B.	D.	D.	D.			
C.	C.	C.	E.	E.	E.			
17. DESCRIPTIVE DATA								
<p>THE SCHEDULED DELIVERY DATE, BLOCK 11A, FOR THE LARGE AREA MICROLITHOGRAPHY TOOL COMPONENTS IS 94 MAR 21. ANY MICROLITHOGRAPHY TOOL COMPONENTS SHALL REMAIN IN PLACE AT THE CONTRACTOR'S FACILITY.</p> <p>IF OPTION 2 IS EXERCISED, THE DELIVERY DATE FOR THE MICROLITHOGRAPHY TOOL COMPONENTS WILL BE CHANGED TO 95MAY21.</p> <p>IF OPTION 3 IS EXERCISED, THE DELIVERY DATE FOR THE MICROLITHOGRAPHY TOOL COMPONENTS WILL BE CHANGED TO 95DEC20.</p>								
4. ITEM NO.	5. ACRN	6. TSP PRI	7. MILSTRIP DOC NO. AND SUFFIX	8. COM ITEM SERIAL NO.	9. ENDING SERIAL NO. (WHEN APPL)	10. CLIN IDENT EXHIBIT		
11. DEL SCHED DATE	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY*	14. SCTY CLAS	15. SHIP TO	16. MARK FOR			
A.	A.	A.						
B.	B.	B.	D.	D.	C.			
C.	C.	C.	E.	E.	E.			
17. DESCRIPTIVE DATA								

* REPRESENTS A NET INCREASE/DECREASE WHEN NO + OR - APPEARS AFTER THE ITEM NO.

E = ESTIMATED

- (IN QTY) = DECREASE

+ OR - (IN ITEM NO.) = ADDITION OR DELETION

PART I SECTION G OF THE SCHEDULE ACCOUNTING CLASSIFICATION DATA			1. PROC INSTRUMENT ID NO. (PIIN)	2. SPIIN	3.
			F33615-92-C-5805	P00002	PAGE 13 OF 13
4. APPROPRIATION AND ACCOUNTING DATA			5. SUPPLEMENTAL ACCTS CLASSIFICATION		
A. SCTY CLAS	B. ACRN	C. APPROPRIATION	D. LIMIT SUBHEAD	E.	
U	AC+	9730400	1302	D13 47WL 3T1000 080820 00000 62708E	595600
F. CPN RECIPIENT		G. OBLIGATION AMOUNT*	H. NON-CLIN/CLIN	I. PR/MIPR DATA	J. PAYING OFC CODE
DODAAO					
F95600		\$1,381,946.00		FY1133-93-05177	
8. DESCRIPTIVE DATA			COMPLETE		
JON: DARK0251					
CCC: 676500					
PR= \$674,415.00			ARPA ORDER 8082, AMD 66, DATED 06 DEC 93 AND ARPA ORDER 8082, AMD 51, DATED 15 JUN 93		
4. APPROPRIATION AND ACCOUNTING DATA			5. SUPPLEMENTAL ACCTS CLASSIFICATION		
A. SCTY CLAS	B. ACRN	C. APPROPRIATION	D. LIMIT SUBHEAD	E.	
U	AC				
F. CPN RECIPIENT		G. OBLIGATION AMOUNT*	H. NON-CLIN/CLIN	I. PR/MIPR DATA	J. PAYING OFC CODE
DODAAO					
S				FY1133-94-05032+	
8. DESCRIPTIVE DATA			COMPLETE		
JON: 30950115					
CCC: 676500					
PR= \$707,531.00			ARPA ORDER 8082, AMD 58, DATED 23 SEP 93		
4. APPROPRIATION AND ACCOUNTING DATA			5. SUPPLEMENTAL ACCTS CLASSIFICATION		
A. SCTY CLAS	B. ACRN	C. APPROPRIATION	D. LIMIT SUBHEAD	E.	
F. CPN RECIPIENT		G. OBLIGATION AMOUNT*	H. NON-CLIN/CLIN	I. PR/MIPR DATA	J. PAYING OFC CODE
DODAAO					
S					
8. DESCRIPTIVE DATA			DISBURSEMENT TO BE MADE FROM OLDEST YEAR FUNDS FIRST		
4. APPROPRIATION AND ACCOUNTING DATA			5. SUPPLEMENTAL ACCTS CLASSIFICATION		
A. SCTY CLAS	B. ACRN	C. APPROPRIATION	D. LIMIT SUBHEAD	E.	
F. CPN RECIPIENT		G. OBLIGATION AMOUNT*	H. NON-CLIN/CLIN	I. PR/MIPR DATA	J. PAYING OFC CODE
DODAAO					
S					
8. DESCRIPTIVE DATA					
4. APPROPRIATION AND ACCOUNTING DATA			5. SUPPLEMENTAL ACCTS CLASSIFICATION		
A. SCTY CLAS	B. ACRN	C. APPROPRIATION	D. LIMIT SUBHEAD	E.	
F. CPN RECIPIENT		G. OBLIGATION AMOUNT*	H. NON-CLIN/CLIN	I. PR/MIPR DATA	J. PAYING OFC CODE
DODAAO					
S					
8. DESCRIPTIVE DATA					

*REPRESENTS NET AMOUNT OF INCREASE DECREASE WHEN MODIFYING AN EXISTING ACRN.

+ OR IN ACRN = ADDITION OR DELETION

IN \$ - DECREASE

NOTE TO CONTRACTOR: Submit invoices to paying office unless otherwise specified in the descriptive data item hereon.

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT						1. PAGE 1 OF 4
2. PROC INSTRUMENT ID NO. (PIIN) F33615-92-C-5805	3. SPIIN P00003	4. EFFECTIVE DATE MAIL DATE	5. REQUISITION/PURCHASE REQUEST PROJECT NO.	6. BDC/DMS RATING		
7. ISSUED BY DEPARTMENT OF THE AIR FORCE AIR FORCE MATERIEL COMMAND (ASC) WRIGHT LABORATORY (WL/MLKT) WRIGHT-PATTERSON AFB OH 45433-7607 CONTRACT NEGOTIATOR: CAPT MARK GARST PHONE: (513) 255-7143			8. ADMINISTERED BY (IF OTHER THAN BLOCK 7) DCMAO BOSTON 495 SUMMER ST BOSTON MA 02210-2138			
9. CONTRACTOR NAME AND ADDRESS MRS TECHNOLOGY INC. 10 ELIZABETH DR. CHELMSFORD MA 01824 COUNTY: MIDDLESEX PHONE: (508) 250-0450 P00003 ISSUED BEFORE P00002		CODE 0M5A8	FACILITY CODE	10. SECURITY CLAS U		
			IF "9" FOR MULTIPLE FACILITIES SEE SECT "K"	11. DISCOUNT FOR PROMPT PAYMENT		
			MAILING DATE DEC 02 1993	NET DAYS 1 N % DAYS 2 ND % DAYS 3 RD % DAYS		
13. THIS BLOCK APPLIES ONLY TO AMENDMENTS OF SOLICITATIONS				12. PURCHASE OFFICE POINT OF CONTACT LMG/L78/LMG		
<input type="checkbox"/> The above numbered solicitation is amended as set forth in block 17.				The hour and date specified for receipt of Offers <input type="checkbox"/> is extended <input type="checkbox"/> is not extended		
Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation, or as amended by one of the following methods: (a) By signing and returning _____ copies of this 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 ISSUING OFFICE PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter provided such telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.						
14. THIS BLOCK APPLIES ONLY TO MODIFICATIONS OF CONTRACTS						
<input type="checkbox"/> THIS CHANGE IS ISSUED PURSUANT TO _____ THE CHANGES SET FORTH HEREIN ARE MADE TO THE ABOVE NUMBERED CONTRACT/ORDER.						
<input checked="" type="checkbox"/> THE ABOVE NUMBERED CONTRACT IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (SUCH AS CHANGES IN PAYING OFFICE, APPROPRIATION DATA, ETC.) SET FORTH HEREIN.						
<input type="checkbox"/> THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF _____ IT MODIFIES THE ABOVE NUMBERED CONTRACT AS SET FORTH HEREIN.						
<input type="checkbox"/> THIS MODIFICATION IS ISSUED PURSUANT TO _____						
15. CONTRACT ADMINISTRATION DATA						
A. KIND OF MOD	B. MOD ASST RECIPIENT ADP #	C. DATE OF SIGNATURE MODIFICATION	D. CHANGE IN CONTRACT AMOUNT INCREASE (+) DECREASE (-)	E. LOSING PO/CAO ON TRANSFER	F. GAINING PO/CAO ON TRANSFER	G. SVC/AGENCY USE
F			S			
16. ENTER ANY APPLICABLE CHANGES						
A. PAY CODE	B. EFFECTIVE DATE OF AWARD	C. CONTRACT (1)TYPE (2)KIND	D. TYPE CONTR	E. SURV CRIT	F. SPL CONTR PROVISIONS	G. PAYING OFF CODE
H. DATE SIGNED						
I. SECURITY (1)CLAS (2) DATE OF DD 254						
17. REMARKS (Except as provided herein, all items and conditions of the contract, as heretofore changed, remain unchanged and in full force and effect.) SUBJECT: ADDITION OF ACRN XA FOR FUNDING PROJECT ENGINEER: ROBERT CROSS, WL/MTEC, (513) 255-2461 FINANCE OFFICE: (SC1016) DFAS-CO/BUNKER HILL, P.O. BOX 182077 COLUMBUS OH 43218-2077						
18. <input checked="" type="checkbox"/> CONTRACTOR/OFFEROR IS NOT REQUIRED TO SIGN THIS DOCUMENT <input type="checkbox"/> CONTRACTOR/OFFEROR IS REQUIRED TO SIGN THIS DOCUMENT AND RETURN COPIES TO ISSUING OFFICE						
19. CONTRACTOR/OFFEROR (Signature of person authorized to sign)				22. UNITED STATES OF AMERICA (Signature of Contracting Officer)		
BY				BY		
20. NAME AND TITLE OF SIGNER (Type or print)				23. NAME OF CONTRACTING OFFICER (Type or print)		24. DATE SIGNED
				WILLIAM G. VASILEFF		01 DEC 1993

PART I SECTION B OF THE SCHEDULE
SUPPLIES LINE ITEM DATA

1. PROC INSTRUMENT ID NO. (PIIN) F33615-92-C-5805		2. SPIIN P00003	3. PAGE 2 OF 4
4. ITEM NO. 0001	5. QUANTITY* 1	6. PURCH UNIT LO	7. UNIT PRICE \$ N
8. TOTAL ITEM AMOUNT* \$ N		13. CIRP	
9. SCTY 10. ACRN CLAS U XA N	11. NSN N	12. FSCM AND PART NUMBER	
14. SITE CODES A.POA B.ACP C.FOB D D D	15. NOUN RESEARCH AND DATA	16. SVC/AGENCY USE	
17. PR/MIPR DATA FY1133-92-05022	18. AUTHORIZED RATE A.PROGRESS PAY B.RECOUP	19. CONTRACT PERCENT FEE	20. SVC ID NO.
21. ITEM/PROJ MGR FY1133		28. OPR	
22. 1ST DISCOUNT A. B.DAYS	23. 2ND DISCOUNT A. B.DAYS	24. 3RD DISCOUNT A. B.DAYS	25. NET DAYS
26. QUANTITY VARIANCE A. OVER B. UNDER		27. TYPE CONTRACT	
29. DESCRIPTIVE DATA			

CONDUCT RESEARCH ENTITLED 'PROTOTYPE DEVELOPMENT OF A VERY LARGE AREA HIGH PERFORMANCE MICROLITHOGRAPHY TOOL" IN ACCORDANCE WITH SECTION C, DESCRIPTION/SPECIFICATIONS DATED 92 JAN 17.
DELIVER DATA IN ACCORDANCE WITH EXHIBIT A, CONTRACT DATA REQUIREMENTS LIST, DD FORM 1423, DATED 92 JAN 17.

4. ITEM NO. 0002		5. QUANTITY* 1	6. PURCH UNIT LO	7. UNIT PRICE \$ N	8. TOTAL ITEM AMOUNT* \$ N	13. CIRP
9. SCTY 10. ACRN CLAS U XA N	11. NSN N	12. FSCM AND PART NUMBER		16. SVC/AGENCY USE		
14. SITE CODES A.POA B.ACP C.FOB S S S	15. NOUN LARGE AREA MICROLITHOGRAPHY TOOL	16. SVC/AGENCY USE				
17. PR/MIPR DATA FY1133-92-05022	18. AUTHORIZED RATE A.PROGRESS PAY B.RECOUP	19. CONTRACT PERCENT FEE	20. SVC ID NO.	21. ITEM/PROJ MGR FY1133		
22. 1ST DISCOUNT A. B.DAYS	23. 2ND DISCOUNT A. B.DAYS	24. 3RD DISCOUNT A. B.DAYS	25. NET DAYS	26. QUANTITY VARIANCE A. OVER B. UNDER		27. TYPE CONTRACT
29. DESCRIPTIVE DATA						

DELIVER THE LARGE AREA MICROLITHOGRAPHY TOOL IN ACCORDANCE WITH SECTION C, DESCRIPTION/SPECIFICATIONS PARAGRAPH 5.3, DATED 92 JAN 17.

*REPRESENTS NET AMOUNT OF INCREASE/DECREASE WHEN MODIFYING EXISTING ITEM NO.

N = NOT APPLICABLE
U = UNDEFINITIZED
NSP = NOT SEPARATELY PRICED

E = ESTIMATED
- (IN QTY AND \$) = DECREASE
+ OR - (IN ITEM NO.) = ADDITION OR DELETION
CIRR: CONTROLLED ITEM RPT RQMT

SITE CODES: S = SOURCE
D = DESTINATION
O = INTERMEDIATE

PART I SECTION F OF THE SCHEDULE SUPPLIES SCHEDULE DATA				1. PROC INSTRUMENT ID NO. (PIIN) F33615-92-C-5805		2. SPIIN P00003		3. PAGE 3 OF 4	
4. ITEM NO.	5. ACRN	6. TSP PRI	7. MILSTRIP DOC NO. AND SUFFIX	8. CON ITEM SERIAL NO.	9. ENDING SERIAL NO. (WHEN APPL)	10. CLIN IDENT EXHIBIT			
0001	XA								
11. DEL SCHED DATE	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY*		14. SCTY CLAS	15. SHIP TO	16. MARK FOR			
A. 94APR21	A.	A. 1		U	U				
B.	B.	B.		D.	D.	13. DEL SCHEDULE QTY*			
C.	C.	C.		E.	E.	E.			
17. DESCRIPTIVE DATA									
THE SCHEDULED DELIVERY DATE, BLOCK 11A, FOR THE APPROVED FINAL TECHNICAL REPORT IS 93 JUL 21. ALL DATA SHALL BE DELIVERED IN ACCORDANCE WITH EXHIBIT A, CONTRACT DATA REQUIREMENTS LIST, DD FORM 1423, DATED 92 JAN 17. TECHNICAL EFFORT MUST BE COMPLETED NO LATER THAN 93 NOV 22.									
4. ITEM NO.	5. ACRN	6. TSP PRI	7. MILSTRIP DOC NO. AND SUFFIX	8. CON ITEM SERIAL NO.	9. ENDING SERIAL NO. (WHEN APPL)	10. CLIN IDENT EXHIBIT			
0002	XA								
11. DEL SCHED DATE	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY*		14. SCTY CLAS	15. SHIP TO	16. MARK FOR			
A. 93DEC21	A.	A. 1		U	U				
B.	B.	B.		D.	D.	13. DEL SCHEDULE QTY*			
C.	C.	C.		E.	E.	E.			
17. DESCRIPTIVE DATA									
THE SCHEDULED DELIVERY DATE, BLOCK 11A, FOR THE LARGE AREA MICROLITHOGRAPHY TOOL COMPONENTS IS 93 DEC 21. ANY MICROLITHOGRAPHY TOOL COMPONENTS SHALL REMAIN IN PLACE AT THE CONTRACTOR'S FACILITY.									
4. ITEM NO.	5. ACRN	6. TSP PRI	7. MILSTRIP DOC NO. AND SUFFIX	8. CON ITEM SERIAL NO.	9. ENDING SERIAL NO. (WHEN APPL)	10. CLIN IDENT EXHIBIT			
11. DEL SCHED DATE	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY*		14. SCTY CLAS	15. SHIP TO	16. MARK FOR			
A.	A.	A.							
B.	B.	B.		D.	D.	13. DEL SCHEDULE QTY*			
C.	C.	C.		E.	E.	E.			
17. DESCRIPTIVE DATA									

* REPRESENTS A NET INCREASE/DECREASE WHEN NO + OR - APPEARS AFTER THE ITEM NO.

E = ESTIMATED

- (IN QTY) = DECREASE

+ OR - (IN ITEM NO.) = ADDITION OR DELETION

PART I SECTION G OF THE SCHEDULE ACCOUNTING CLASSIFICATION DATA			1. PROC INSTRUMENT ID NO. (PIIN) F33615-92-C-5805	2. SPIIN P00003	3. PAGE 4 OF 4
4. APPROPRIATION AND ACCOUNTING DATA A. SCTY CLAS B. ACRN C. APPROPRIATION		D. LIMIT SUBHEAD	E. SUPPLEMENTAL ACCTS CLASSIFICATION		
U XA+ SPECIAL					
K. CPN RECIPIENT DODAAD		G. OBLIGATION AMOUNT*	H. NON-CLIN/CLIN	I. PR/MIPR DATA	J. PAYING OFC CODE
S					
6. DESCRIPTIVE DATA					
DISBURSEMENT IS TO BE ACCOMPLISHED FROM OLDEST YEAR FUNDS FIRST					
4. APPROPRIATION AND ACCOUNTING DATA A. SCTY CLAS B. ACRN C. APPROPRIATION		D. LIMIT SUBHEAD	E. SUPPLEMENTAL ACCTS CLASSIFICATION		
K. CPN RECIPIENT DODAAD		G. OBLIGATION AMOUNT*	H. NON-CLIN/CLIN	I. PR/MIPR DATA	J. PAYING OFC CODE
S					
6. DESCRIPTIVE DATA					
4. APPROPRIATION AND ACCOUNTING DATA A. SCTY CLAS B. ACRN C. APPROPRIATION		D. LIMIT SUBHEAD	E. SUPPLEMENTAL ACCTS CLASSIFICATION		
K. CPN RECIPIENT DODAAD		G. OBLIGATION AMOUNT*	H. NON-CLIN/CLIN	I. PR/MIPR DATA	J. PAYING OFC CODE
S					
6. DESCRIPTIVE DATA					
4. APPROPRIATION AND ACCOUNTING DATA A. SCTY CLAS B. ACRN C. APPROPRIATION		D. LIMIT SUBHEAD	E. SUPPLEMENTAL ACCTS CLASSIFICATION		
K. CPN RECIPIENT DODAAD		G. OBLIGATION AMOUNT*	H. NON-CLIN/CLIN	I. PR/MIPR DATA	J. PAYING OFC CODE
S					
6. DESCRIPTIVE DATA					
4. APPROPRIATION AND ACCOUNTING DATA A. SCTY CLAS B. ACRN C. APPROPRIATION		D. LIMIT SUBHEAD	E. SUPPLEMENTAL ACCTS CLASSIFICATION		
K. CPN RECIPIENT DODAAD		G. OBLIGATION AMOUNT*	H. NON-CLIN/CLIN	I. PR/MIPR DATA	J. PAYING OFC CODE
S					
6. DESCRIPTIVE DATA					

*REPRESENTS NET AMOUNT OF INCREASE DECREASE WHEN MODIFYING AN EXISTING ACRN.

+ OR IN ACRN = ADDITION OR DELETION IN \$ - DECREASE

NOTE TO CONTRACTOR: Submit Invoices to paying office unless otherwise specified in the descriptive data item hereon.

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE 92-C-5805 PAGE 1 OF 3 PAGES 3

AMENDMENT/MODIFICATION NO.	3. EFFECTIVE DATE 73 FEB 89	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO. (If applicable)
ISSUED BY DEFENSE LOGISTICS AGENCY DCHAD-BOSTON-GFACA-Q1 495 SUMNER STREET BOSTON, MA 02210 (C. Haley/(617)451-4143)	CODE S2206A	7. ADMINISTERED BY (If other than item 6)	CODE

NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code) MRS Technology, Inc. 10 Elizabeth Drive Chelmsford, MA 01824-4112 MAILING DATE MAR 9 1993	9A. AMENDMENT OF SOLICITATION NO.
	9B. DATED (SEE ITEM 11)
	10A. MODIFICATION OF CONTRACT/ORDER All Contracts Assigned Cage Code No. DMSAB
	10B. DATED (SEE ITEM 13)

CODE DMSAB FACILITY CODE

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

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

IS EXTENDED, IS NOT EXTENDED.

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods:

a) By completing items 9 and 15, and returning copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment number. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

2. ACCOUNTING AND APPROPRIATION DATA (If required)
N/A

5. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS, IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.
B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES. (such as changes in paying office, appropriation date, etc..) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF: FAR Clause 52.232-28
D. OTHER (Specify type of modification and authority)

IMPORTANT: Contractor is not, is required to sign this document and return copies to the issuing office.

DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)

The purpose of this modification is to incorporate FAR Clause 52.232-28, to allow for the electronics transfer of payment under the contract directly to the contractor's account at a financial institution.

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

NAME AND TITLE OF SIGNER (Type or print) John L. Steele, Jr. P. Finance & Administration	14A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) MICHAEL J. DIONIS Administrative Contracting Officer
9. CONTRACTOR/OFFICER <i>J.L. Steele</i> Signature of person authorized to sign)	13C. DATE SIGNED 2/11/93
10B. UNITED STATES OF AMERICA BY: <i>Michael J. Dionis</i> (Signature of Contracting Officer)	14C. DATE SIGNED 2/18/93

CONTINUATION SHEET

NAME OF OFFERER OR CONTRACTOR: MRS Technology, Inc.

ITEM NO.	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	<p>a. For Electronic Funds Transfer (EFT) payments, the following information applies:</p> <p><u>Name and Address of Financial Institution</u></p> <p>Bay Bank Boston 175 Federal Street Boston, MA 02110</p> <p><u>ABA Number of Financial Institution</u></p> <p>011001742</p> <p><u>Contractor's Account Number at Financial Institution</u></p> <p>9944-2036</p> <p>2. This modification only effects contracts, purchase orders, and delivery orders for which the payment office is DFAS-Columbus.</p> <p>3. All other terms and conditions remain unchanged.</p> <p>4. As a result of this modification there will be no change in the contract amount.</p> <p><u>DISTRIBUTION:</u> 1-FILE 1-READING FILE 1-MOD FILE 1-GFACA 1-DFAS-CO 3-GFACA-Q1 10-PCO</p>				

PAYMENT INFORMATION FORM
ACH VENDOR PAYMENT SYSTEM

This form is used for ACH payments with an addendum record that carries payment-related information. Recipients of these payments should bring this information to the attention of their financial institution when presenting this form to completion.

PAPERWORK REDUCTION ACT STATEMENT

The information being collected on this form is required under the provision of 31 U.S.C. 3322 and 31 CFR 201. This information will be used by the Treasury Department to transmit payment data, by electronic means, to vendor's financial institution. Failure to provide the requested information may delay or prevent the receipt of payments through the Automated Clearing House Payment System.

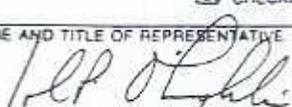
COMPANY INFORMATION

NAME MRS Technology, Inc.	
ADDRESS 10 Elizabeth Drive Chelmsford, MA 01824	
CONTACT PERSON NAME Susan Germanetto	TELEPHONE NUMBER (508) 250-0450

AGENCY INFORMATION

NAME DEFENSE FINANCE & ACCOUNTING SERVICE - COLUMBUS CENTER	
ADDRESS ATTN: DFAS-CO- DP ^{FPR} , P. O. BOX 182317 COLUMBUS, OH 43218-2317	
CONTACT PERSON NAME GLENDA B. BROWN	TELEPHONE NUMBER (614) 338-5704

FINANCIAL INSTITUTION INFORMATION

NAME Bay Bank Boston	
ADDRESS 175 Federal Street Boston, MA 02110	
ACH COORDINATOR NAME Jill Rosa	TELEPHONE NUMBER (617) 394-3175
NINE-DIGIT ROUTING TRANSIT NUMBER <u>0</u> <u>1</u> <u>1</u> <u>0</u> <u>0</u> <u>1</u> <u>7</u> <u>4</u> <u>2</u>	
DEPOSITOR ACCOUNT TITLE MRS Technology, Inc.	
DEPOSITOR ACCOUNT NUMBER 9944-2036	
TYPE OF ACCOUNT <input checked="" type="checkbox"/> CHECKING <input type="checkbox"/> SAVINGS	
SIGNATURE AND TITLE OF REPRESENTATIVE  Vice President	TELEPHONE NUMBER (617) 556-6651

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

PAGE 1 OF 5

2. PROC INSTRUMENT ID NO. (PIIN) F33615-92-C-5805	3. SPIIN P00001	4. EFFECTIVE DATE MAIL DATE	5. REQUISITION/PURCHASE REQUEST PROJECT NO. FY1133-93-05063	6. BDC/DMS RATING
--	--------------------	--------------------------------	---	-------------------

7. ISSUED BY DEPARTMENT OF THE AIR FORCE AIR FORCE MATERIEL COMMAND (ASC) WRIGHT LABORATORY (WL/MLKT) WRIGHT-PATTERSON AFB, OH 45433-6503 NEGOTIATOR: CAPT DAVID PETRILLO PHONE: (513) 255-7143	8. ADMINISTERED BY (IF OTHER THAN BLOCK 7) DCMAO BOSTON 495 SUMMER STREET BOSTON MA 02210-2138
---	---

9. CONTRACTOR NAME AND ADDRESS MRS TECHNOLOGY, INC. 10 ELIZABETH DRIVE CHELMSFORD MA 01824 PHONE: (508) 250-0450 COUNTY: MIDDLESEX	CODE 0M5A8	FACILITY CODE	10. SECURITY CLAS U
IF '9' FOR MULTIPLE FACILITIES SEE SECT 'K'		11. DISCOUNT FOR PROMPT PAYMENT	
MAILING DATE DEC 13 1992		1 1 N % DAYS NET DAYS ST	2 1 ND % DAYS OTHER IF '9'
		3 1 RD % DAYS SEE SECT 'E'	12. PURCHASE OFFICE POINT OF CONTACT LDP/L78/LDP

13. THIS BLOCK APPLIES ONLY TO AMENDMENTS OF SOLICITATIONS

The above numbered solicitation is amended as set forth in block 17.

The hour and date specified for receipt of Offers is extended is not extended

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation, or as amended by one of the following methods:

(a) By signing and returning _____ copies of this 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 ISSUING OFFICE PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER if by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter provided such telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

14. THIS BLOCK APPLIES ONLY TO MODIFICATIONS OF CONTRACTS

THIS CHANGE IS ISSUED PURSUANT TO SPECIAL CONTRACT REQUIREMENT H-13, "OPTION"
THE CHANGES SET FORTH HEREIN ARE MADE TO THE ABOVE NUMBERED CONTRACT/ORDER.

THE ABOVE NUMBERED CONTRACT IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (SUCH AS CHANGES IN PAYING OFFICE, APPROPRIATION DATA, ETC.) SET FORTH HEREIN.

THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF _____ IT MODIFIES THE ABOVE NUMBERED CONTRACT AS SET FORTH HEREIN.

THIS MODIFICATION IS ISSUED PURSUANT TO _____

15. CONTRACT ADMINISTRATION DATA

A. KIND OF MOD	B. MOD ARSY RECIPIENT ADP PT	C. DATE OF SIGNATURE MODIFICATION	D. CHANGE IN CONTRACT AMOUNT INCREASE (+) DECREASE (-)	E. LOSING PD/CAO ON TRANSFER	F. GAINING PD/CAO ON TRANSFER	G. SVC/AGENCY USE
B			\$4,397,884.00+			

16. ENTER ANY APPLICABLE CHANGES

A. PAY CODE	B. EFFECTIVE DATE OF AWARD	C. CONTRACT (1)TYPE (2)KIND	D. TYPE CONTR	E. SURV CRIT	F. SPL CONTR PROVISIONS	G. PAYING OFF CODE	H. DATE SIGNED	I. SECURITY (1)CLAS (2) DATE OF DD 254
-------------	----------------------------	-----------------------------	---------------	--------------	-------------------------	--------------------	----------------	--

17. REMARKS (Except as provided herein, all items and conditions of the contract, as heretofore changed, remain unchanged and in full force and effect.)

SUBJECT: EXERCISE OF OPTION I and CORRECTION OF ADMINISTRATIVE ERROR
PROJECT ENGINEER: ROBERT CROSS, WL/MTEC, (513) 255-2461
FINANCE OFFICE: DFAS-CO/BUNKER HILL, P.O. BOX 182077, COLUMBUS OH 43218-2077

18. CONTRACTOR/OFFEROR IS NOT REQUIRED TO SIGN THIS DOCUMENT CONTRACTOR/OFFEROR IS REQUIRED TO SIGN THIS DOCUMENT AND RETURN COPIES TO ISSUING OFFICE

19. CONTRACTOR/OFFEROR (Signature of person authorized to sign)
BY _____

20. NAME AND TITLE OF SIGNER (Type or print)
WILLIAM G. VASILEFF

21. DATE SIGNED
17 DEC 1992

22. UNITED STATES OF AMERICA (Signature of Contracting Officer)
BY _____

23. NAME OF CONTRACTING OFFICER (Type or print)
WILLIAM G. VASILEFF

24. DATE SIGNED
17 DEC 1992

SCHEDULE

This modification is issued to exercise Option I (Phase II) of this contract, as specified by Special Contract Requirement H-13. It also corrects an administrative error pertaining to the delivery of CLIN 0002. The contract stipulates that delivery of the Microlithography Tool Components shall be in place at the contractor's facility. However, the FOB block of the AFSC Form 705 was incorrectly coded "D" for "Destination," and the ship to block of the AFSC 706 was incorrectly coded as "FY1133" for shipment to Wright-Patterson Air Force Base. These errors have herein been corrected. Accordingly, the contract is changed as follows:

- FIRST: Section A--The total contract amount in Block 22 of AFSC Form 701 is increased by \$4,397,884 for a new total contract amount of \$8,456,674.
- SECOND: Section B--The code in block 14C of AFSC Form 705 is changed to "S" for FOB Source, indicating that delivery will take place at the contractor's facility.
- THIRD: Section F--Scheduled deliveries are revised in accordance with Section F of the original contract as specified on AFSC Form 706 contained herein.
- FOURTH: Section F--Additionally, for CLIN 0002, block 15 of AFSC Form 706 is changed to a blank, indicating that delivery will take place at the contractor's facility.
- FIFTH: Section G--ACRN AB is established per AFMC Form 733 contained herein in the amount of \$4,397,884.
- SIXTH: Section J--CDRL A008 - As specified on original DD Form 1423-1 dated 17 Jan 92, Block 11 is 93NOV22, Block 12 is 93DEC21, and Block 13 is 94APR21.
- SEVENTH: Section J--CDRL A012 - As specified on original DD Form 1423-1 dated 17 Jan 92, this report is now required due to exercise of Option I (Phase II).

Contract Number F33615-92-C-5805, P00001

PART I SECTION B OF THE SCHEDULE
SUPPLIES LINE ITEM DATA

1. PROC INSTRUMENT ID NO. (PIIN) F33615-92-C-5805		2. SPIIN P00001	3. PAGE 3	OF 5
4. ITEM NO. 0002	5. QUANTITY* 1	6. PURCH UNIT LO	7. UNIT PRICE \$ N	8. TOTAL ITEM AMOUNT*
9. SCTY10.ACRN CLAS U AA	11. NSN N	12. FSCM AND PART NUMBER S LARGE AREA MICROLITHOGRAPHY TOOL		13. CIRR
14. SITE CODES A.PQA B.ACP C.FOB	15. NOUN S	16. SVC/AGENCY USE		17. PR/MIPR DATA
18. AUTHORIZED RATE A.PROGRESS PAY B.RECOUP		19. CONTRACT PERCENT FEE	20. SVC ID NO.	21. ITEM/PROJ MGR FY1456
22. 1ST DISCOUNT A. B.DAYS	23. 2ND DISCOUNT A. B.DAYS	24. 3RD DISCOUNT A. B.DAYS	25. NET DAYS	26. QUANTITY VARIANCE A. OVER B. UNDER
27. TYPE CONTRACT 28. OPR				
29. DESCRIPTIVE DATA				

DELIVER THE LARGE AREA MICROLITHOGRAPHY TOOL IN ACCORDANCE WITH SECTION C, DESCRIPTION/SPECIFICATIONS, PARAGRAPH 5.3, DATED 92JAN17.
BLOCK 14C IS CHANGED TO "S" FOR SOURCE INDICATING THAT DELIVERY WILL TAKE PLACE AT THE CONTRACTOR'S FACILITY.

4. ITEM NO.	5. QUANTITY*	6. PURCH UNIT	7. UNIT PRICE	8. TOTAL ITEM AMOUNT*
9. SCTY10.ACRN CLAS	11. NSN	12. FSCM AND PART NUMBER		13. CIRR
14. SITE CODES A.PQA B.ACP C.FOB	15. NOUN	16. SVC/AGENCY USE		17. PR/MIPR DATA
18. AUTHORIZED RATE A.PROGRESS PAY B.RECOUP		19. CONTRACT PERCENT FEE	20. SVC ID NO.	21. ITEM/PROJ MGR
22. 1ST DISCOUNT A. B.DAYS	23. 2ND DISCOUNT A. B.DAYS	24. 3RD DISCOUNT A. B.DAYS	25. NET DAYS	26. QUANTITY VARIANCE A. OVER B. UNDER
27. TYPE CONTRACT 28. OPR				
29. DESCRIPTIVE DATA				

*REPRESENTS NET AMOUNT OF INCREASE/DECREASE WHEN MODIFYING EXISTING ITEM NO.
N = NOT APPLICABLE
U = UNDEFINITIZED
NSP = NOT SEPARATELY PRICED
E = ESTIMATED
- (IN QTY AND \$) = DECREASE
+ OR - (IN ITEM NO.) = ADDITION OR DELETION
CIRR: CONTROLLED ITEM RPT RQMT

SITE CODES:
S = SOURCE
D = DESTINATION
O = INTERMEDIATE

PART I SECTION F OF THE SCHEDULE SUPPLIES SCHEDULE DATA			1. PROC INSTRUMENT ID NO. (PIIN) F33615-92-C-5805		3. SPIIN P00001		PAGE 4 OF 5		
4. ITEM NO.	5. ACRN	6. TSP PRI	7. MILSTRIP DOC NO. AND SUFFIX	8. CON ITEM SERIAL NO.	9. ENDING SERIAL NO. (WHEN APPL)	10. CLIN IDENT EXHIBIT			
0001	AB+								
11. DEL SCHED DATE	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY*		14. SCTY CLAS	15. SHIP TO	16. MARK FOR			
A. 94APR21	A.	A. 1		U	FY1133				
B.	B.	B.		D.	D.	13. DEL SCHEDULE QTY*			
C.	C.	C.		E.	E.	E.			
17. DESCRIPTIVE DATA									
THE SCHEDULED DELIVERY DATE, BLOCK 11A, FOR THE APPROVED FINAL TECHNICAL REPORT IS 94APR21. ALL DATA SHALL BE DELIVERED IN ACCORDANCE WITH EXHIBIT A, CONTRACT DATA REQUIREMENTS LIST, DD FORM 1423, DATED 92JAN17. SEE SECTION H FOR FY1133 ADDRESS. TECHNICAL EFFORT MUST BE COMPLETED NO LATER THAN 93NOV22.									
4. ITEM NO.	5. ACRN	6. TSP PRI	7. MILSTRIP DOC NO. AND SUFFIX	8. CON ITEM SERIAL NO.	9. ENDING SERIAL NO. (WHEN APPL)	10. CLIN IDENT EXHIBIT			
0002	AB+								
11. DEL SCHED DATE	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY*		14. SCTY CLAS	15. SHIP TO	16. MARK FOR			
A. 93DEC21	A.	A. 1		U	0M5A8				
B.	B.	B.		D.	D.	13. DEL SCHEDULE QTY*			
C.	C.	C.		E.	E.	E.			
17. DESCRIPTIVE DATA									
THE SCHEDULED DELIVERY DATE, BLOCK 11A, FOR THE LARGE AREA MICROLITHOGRAPHY TOOL COMPONENTS IS 93DEC21. ANY MICROLITHOGRAPHY TOOL COMPONENTS SHALL REMAIN IN PLACE AT THE CONTRACTOR'S FACILITY.									
4. ITEM NO.	5. ACRN	6. TSP PRI	7. MILSTRIP DOC NO. AND SUFFIX	8. CON ITEM SERIAL NO.	9. ENDING SERIAL NO. (WHEN APPL)	10. CLIN IDENT EXHIBIT			
11. DEL SCHED DATE	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY*		14. SCTY CLAS	15. SHIP TO	16. MARK FOR			
A.	A.	A.							
B.	B.	B.		D.	D.	13. DEL SCHEDULE QTY*			
C.	C.	C.		E.	E.	E.			
17. DESCRIPTIVE DATA									

* REPRESENTS A NET INCREASE/DECREASE WHEN NO + OR - APPEARS AFTER THE ITEM NO.
E = ESTIMATED

- (IN QTY) = DECREASE

+ OR - (IN ITEM NO.) = ADDITION OR DELETION

PART I SECTION G OF THE SCHEDULE ACCOUNTING CLASSIFICATION DATA		1. PROF. INSTRUMENT ID NO. (FIM#) F33615-92-C-5805	2. SPIN# P00001	3. PAGE 5	OF 5
4. APPROPRIATION AND ACCOUNTING DATA A. SCTY CLAS B. ACRN C. APPROPRIATION U AB+ 9720400		D. LIMIT SUBHEAD 1302	E. SUPPLEMENTAL ACCTG CLASSIFICATION D12 47WL 2T1000 080820 00000 62708F 595600		
F. CPN RECIPIENT D93600		G. OBLIGATION AMOUNT* 4,397,884.00	H. NON-CLIN/CLIN	I. PR/MIPR DATA FY1133-93-05063 COMPLETE	
J. PAYING OFC CODE					
6. DESCRIPTIVE DATA JON: DARK0251 CCC: 676500 ARPA ORDER NO. 8082, AMENDMENT 20, PROGRAM CODE NO 2T10, DATED 20APR92, AND AMENDMENT 37, PROGRAM CODE NO. 2T10, DATED 12NOV92.					

4. APPROPRIATION AND ACCOUNTING DATA A. SCTY CLAS B. ACRN C. APPROPRIATION		D. LIMIT SUBHEAD	E. SUPPLEMENTAL ACCTG CLASSIFICATION		
F. CPN RECIPIENT DDDAAD		G. OBLIGATION AMOUNT*	H. NON-CLIN/CLIN	I. PR/MIPR DATA	
J. PAYING OFC CODE					
6. DESCRIPTIVE DATA					

4. APPROPRIATION AND ACCOUNTING DATA A. SCTY CLAS B. ACRN C. APPROPRIATION		D. LIMIT SUBHEAD	E. SUPPLEMENTAL ACCTG CLASSIFICATION		
F. CPN RECIPIENT DDDAAD		G. OBLIGATION AMOUNT*	H. NON-CLIN/CLIN	I. PR/MIPR DATA	
J. PAYING OFC CODE					
6. DESCRIPTIVE DATA					

4. APPROPRIATION AND ACCOUNTING DATA A. SCTY CLAS B. ACRN C. APPROPRIATION		D. LIMIT SUBHEAD	E. SUPPLEMENTAL ACCTG CLASSIFICATION		
F. CPN RECIPIENT DDDAAD		G. OBLIGATION AMOUNT*	H. NON-CLIN/CLIN	I. PR/MIPR DATA	
J. PAYING OFC CODE					
6. DESCRIPTIVE DATA					

4. APPROPRIATION AND ACCOUNTING DATA A. SCTY CLAS B. ACRN C. APPROPRIATION		D. LIMIT SUBHEAD	E. SUPPLEMENTAL ACCTG CLASSIFICATION		
F. CPN RECIPIENT DDDAAD		G. OBLIGATION AMOUNT*	H. NON-CLIN/CLIN	I. PR/MIPR DATA	
J. PAYING OFC CODE					
6. DESCRIPTIVE DATA					

* REPRESENTS NET AMOUNT OF INCREASE DECREASE WHEN MODIFYING AN EXISTING ACRN.
+ OR - IN ACRN = ADDITION OR DELETION IN \$ - DECREASE
NOTE TO CONTRACTOR: Submit invoices to paying office unless otherwise specified in the descriptive data item hereon.