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Subject:

F33615-98-D-6000

FOIA Control Number:

03-135LK

Date Reproduced:

2/10/03

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE
U - CPFF

PAGE OF PAGES
1 of 5

2. AMENDMENT/MODIFICATION NO.
18

3. EFFECTIVE DATE

4. REQUISITION/PURCHASE REQ. NO.
SEE SCHEDULE

5. PROJECT NO. (If applicable)

6. ISSUED BY AFRL/MLKH CODE

FA8650

7. ADMINISTERED BY (If other than Item 6)

CODE

S3605A

USAF/AFMC
AIR FORCE RESEARCH LABORATORY
2310 EIGHTH STREET, BUILDING 167
WRIGHT-PATTERSON AFB OH 45433-7801
JEANETTE M. ZIMMER 937-656-9046
jeanette.zimmer@wpafb.af.mil

DCMA DAYTON
AREA C BUILDING 30
1725 VAN PATTON DRIVE
WRIGHT-PATTERSON AFB OH 45433-5302

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code)

SYTRONICS, INC
4433 DAYTON-XENIA ROAD, BUILDING 1
DAYTON OH 45432
(937) 431-6100

MAILING DATE

JUN 28 2002

(X)

9A. AMENDMENT OF SOLICITATION NO.

9B. DATED (SEE ITEM 11)

10A. MODIFICATION OF CONTRACT/ORDER NO.

F33615-98-D-6000 0004

10B. DATED (SEE ITEM 13)

25 SEP 1998

CODE 1EE69

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

12. ACCOUNTING AND APPROPRIATION DATA (If required)

SEE SCHEDULE

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

(X)

A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: () THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. ITEM 10A.

B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation data, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).

C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:

X D. OTHER (Specify type of modification and authority)
Limitation of Funds Clause, FAR 52.232-22

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.)

SUBJECT: Incremental Funding, Establishment of CLINs 0005 and 0006 and Administrative Change
CHANGE IN PRICE: .75 (decrease)
CHANGE IN OBLIGATION: \$73,800.00 (increase)

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 SIGNER (Type or print)

JAMES DAVID BOX
Contracting Officer

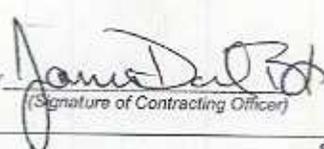
15B. CONTRACTOR/OFFEROR

15C. DATE SIGNED

16B. UNITED STATES OF AMERICA

16C. DATE SIGNED

(Signature of person authorized to sign)

BY 
(Signature of Contracting Officer)

27 June 02

1a. Pursuant to FAR Clause 52.232-22 Limitation of Funds, this modification increases the funds allotted to this delivery order by \$73,800.00. In accordance with the contractor's email dated 24 Jun 2002, the additional funding is expected to cover performance through 31 Jul 2002. The contractor's email is incorporated herein by reference.

b. In addition, two additional CLINs will be added as indicated in Section B. As a result of the additional CLINs, CLIN 0001 estimated cost will be decreased by the total cost amounts of these two CLINs.

c. This modification also makes an Administration Change to this delivery order by decreasing the total contract value by 75 cents in order to make the dollar value of the contract even, as it is not normal Government procedure to award contracts with cents.

2. As a result of paragraphs 1a and 1b, this delivery order is hereby modified as follows:

a. SECTION B - SUPPLIES OR SERVICES:

5352.232-9001 Implementation of Limitation of Funds (AFMC) (JUL 1997)

(a) The sum allotted to this Delivery Order and available for payment of costs under CLINs 0001-0006 through 31 Jul 2002 in accordance with the clause in Section I entitled Limitation of Funds, is \$17,611,018.00, an increase of \$73,800.00 from \$17,537,218.00.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
0001	CLIN Change		\$2,240,243.00
		Lot	NTE -\$36,000.75
	<i>Noun:</i>	RESEARCH AND DATA	
	<i>Total Quantity:</i>	1	
	<i>New Total Item Amount:</i>	\$2,240,243.00	
	<i>ACRN:</i>	9	
	<i>NSN:</i>	N - Not Applicable	
	<i>DD1423 is Exhibit:</i>	A	
	<i>Contract type:</i>	U - COST PLUS FIXED FEE	
	<i>Inspection:</i>	DESTINATION	
	<i>Acceptance:</i>	DESTINATION	
	<i>FOB:</i>	DESTINATION	
	<i>Descriptive Data:</i>		
	THE CONTRACTOR SHALL CONDUCT RESEARCH IN ACCORDANCE WITH THE REVISED STATEMENT OF WORK ENTITLED "BIOACOUSTIC, NOISE, AND VIBRATION RESEARCH AND SUSTAINMENT EFFORT", DATED 30 AUGUST 2000.		
000119	CLIN Change		
	<i>Noun:</i>	Funding Info Only	
	<i>ACRN:</i>	AU	+\$37,800.00

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
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OPERATIONS AND MAINTENANCE (O&M) (3400)

0005	CLIN Establish	1	EST \$13,500.00
	<i>Noun:</i>	Each	EST \$13,500.00
	<i>ACRN:</i>	O&M (3400) IN SUPPORT OF RESEARCH AND DEVELOPMENT	
	<i>NSN:</i>	AZ	
	<i>DD1423 is Exhibit:</i>	N - Not Applicable	
	<i>Contract type:</i>	A	
	<i>Inspection:</i>	U - COST PLUS FIXED FEE	
	<i>Acceptance:</i>	DESTINATION	
	<i>FOB:</i>	DESTINATION	
	<i>Descriptive Data:</i>		
	The contractor shall conduct research in accordance with Section J Attachment 3, Statement of Work entitled "T-1 Noise Measurement and Analysis". The contractor shall deliver data in accordance with Section J, Exhibit A, the Contract Data Requirements List, DD Form 1423, dated 30 Jun 1998.		

PRODUCTION (3010) CLIN

0006	CLIN Establish	1	EST \$22,500.00
	<i>Noun:</i>	Each	EST \$22,500.00
	<i>ACRN:</i>	PRODUCTION (3010) IN SUPPORT OF RESEARCH AND DEVELOPMENT	
	<i>NSN:</i>	AY	
	<i>DD1423 is Exhibit:</i>	N - Not Applicable	
	<i>Contract type:</i>	A	
	<i>Inspection:</i>	U - COST PLUS FIXED FEE	
	<i>Acceptance:</i>	DESTINATION	
	<i>FOB:</i>	DESTINATION	
	<i>Descriptive Data:</i>		
	The contractor shall conduct research in accordance with Section J, Attachment 2, Statement of Work entitled "T-38C Noise Measurement and Analysis". The contractor shall deliver data in accordance with Section J, Exhibit A, the Contract Data Requirements List, DD Form 1423, dated 30 Jun 1998.		

b. SECTION F - DELIVERIES OR PERFORMANCE:

ITEM	SUPPLIES SCHEDULE DATA	QTY	SHIP TO	MARK FOR	TRANS PRI	DATE
0005		1	FY1456			30 Dec 2002

Noun: O&M (3400) IN SUPPORT OF RESEARCH AND DEVELOPMENT
ACRN: AZ
Descriptive Data:
 The scheduled delivery date is for completion of all research and data as required by the Statement of Work, Attachment 3, and delivery of all reports in accordance with Exhibit A, Contract Data Requirements List.

0006		1	FY1456			30 Dec 2002
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Noun: PRODUCTION (3010) IN SUPPORT OF RESEARCH AND DEVELOPMENT
ACRN: AY
Descriptive Data:
 The scheduled delivery date is for completion of all research and data as required by the Statement of Work, Attachment 2, and delivery of all reports in accordance with Exhibit A, Contract Data Requirements List.

c. SECTION G - CONTRACT ADMINISTRATION/PAYMENT DATA:

ACRN	Appropriation/Lmt Subhead/Supplemental Accounting Data	Obligation Amount
AU	ACRN Change 57 23600 292 47A8 632830 6HCB00 02020 63231F 503000 F03000 New ACRN Amount: \$122,800.00 Funding breakdown: On CLIN 000119: +\$37,800.00 PRIMIPR: GWSHE027201113 \$37,800.00 JON: 28303002 Descriptive data: PR Complete JON for P00018, \$37,800 is 28303004	\$37,800.00
AY	ACRN Establish 57 23010 112 3620 11420W 020000 00000 000000 503000 F03000 New ACRN Amount: \$22,500.00 Funding breakdown: On CLIN 0006: +\$22,500.00 PRIMIPR: GWSHE027201088 \$22,500.00 Descriptive data: PR COMPLETE Reference MIPR #HYTAF002720021, dated 11 Apr 2002, Total Amount \$25,000, \$22,500 on DO 0004 and \$2,500 on DO 0001	\$22,500.00

ACRN Appropriation/Lmt Subhead/Supplemental Accounting Data Obligation Amount

AZ ACRN Establish \$13,500.00

57 23400 302 6410 141090 030000 53400 85756F 660700 F60700

New ACRN Amount: \$13,500.00

Funding breakdown: On CLIN 0005: +\$13,500.00

PRIMIPR: GWSHE027201090 \$13,500.00

Descriptive data:

PR COMPLETE

Reference MIPR #S0221054, dated 03 May 2002, Total Amount \$15,000, \$13,500 on DO 0004 and \$1,500 on DO 0001

3. All other terms and conditions remain unchanged.

**STATEMENT OF WORK
T-38C NOISE MEASUREMENT AND ANALYSIS**

The contractor shall collect the flyover and ground runup noise data on the T-38C aircraft. This noise data is required to meet NEPA requirements to assess the impact of any aircraft modification. AFRL researchers will collect the data using their calibrated noise collection system. After data collection, the data shall be analyzed and processed into the required Noisemap format needed to prepare the NEPA documentation. The contractor shall provide the data to the T-38C SPO as part of their upgrade requirements for this aircraft.

**STATEMENT OF WORK
T-1 NOISE MEASUREMENT AND ANALYSIS**

The contractor shall conduct field ground run-up and flyover acoustic measurement on T-1 type aircraft performing operational maneuvers at Randolph AFB, Texas. The contractor shall collect the data and reduce into a suitable format for Noisemap 7.0 as required to meet AICUZ and EPA guidelines. The reports will define the limits of the acceptable noise from aircraft engines performing operational maneuvers.

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE
U - CPFF

PAGE OF PAGES
1 of 6

2. AMENDMENT/MODIFICATION NO.
43

3. EFFECTIVE DATE

4. REQUISITION/PURCHASE REQ. NO.
SEE SCHEDULE

5. PROJECT NO. (If applicable)

6. ISSUED BY AFRL/MLKH CODE

FA8650

7. ADMINISTERED BY (If other than Item 5)

CODE

S3605A

USAF/AFMC
AIR FORCE RESEARCH LABORATORY
2310 EIGHTH STREET, BUILDING 167
WRIGHT-PATTERSON AFB OH 45433-7801
JEANETTE M. ZIMMER 937-656-9046
jeanette.zimmer@wpafb.af.mil

DCMA DAYTON
AREA C BUILDING 30
1725 VAN PATTON DRIVE
WRIGHT-PATTERSON AFB OH 45433-5302

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code)

SYTRONICS, INC
4433 DAYTON-XENIA ROAD, BUILDING 1
DAYTON OH 45432
(937) 431-6100

MAILING DATE

AUG 06 2002

(X)

9A. AMENDMENT OF SOLICITATION NO.

9B. DATED (SEE ITEM 11)

10A. MODIFICATION OF CONTRACT/ORDER NO.

F33615-98-D-6000 0001

10B. DATED (SEE ITEM 13)

25 SEP 1998

CODE 1EE69

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

12. ACCOUNTING AND APPROPRIATION DATA (if required)

SEE SCHEDULE

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

- (X) A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: () THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. ITEM 10A.
- B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation data, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
- C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
- X D. OTHER (Specify type of modification and authority)
Limitation of Funds Clause, FAR 52.232-22

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.)

SUBJECT: Incremental Funding and Establishment of SubCLIN 0005AB and Restructure of CLINs
CHANGE IN PRICE: None
CHANGE IN OBLIGATION: \$40,000.00 (increase)

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 SIGNER (Type or print)

JAMES DAVID BOX
Contracting Officer

15B. CONTRACTOR/OFFEROR

15C. DATE SIGNED

16B. UNITED STATES OF AMERICA

16C. DATE SIGNED

(Signature of person authorized to sign)

BY 
(Signature of Contracting Officer)

2 AUG 02

1a. Pursuant to FAR 52.232-22 Limitation of Funds, this modification increases the funds allotted to this delivery order by \$40,000.00. In accordance with the contractor's email dated 30 Jul 2002, the additional funding is expected to cover performance through 05 Mar 2003. The contractor's email is incorporated herein by reference.

b. In addition, the properties of CLINs 0005 and 0006 are changed to be "parent" CLINs, which will allow for SubCLINs. As a result, the information in CLINs 0005 and 0006, added in P00041, is moved to 0005AA and 0006AA. CLINs 0005 and 0006 descriptive data is changed as indicated herein.

c. This modification also adds SubCLIN 0005AB as indicated herein.

2. As a result of the above paragraphs, this delivery order is hereby specifically modified as follows:

a. SECTION B - SUPPLIES OR SERVICES:

5352.232-9001 Implementation of Limitation of Funds (AFMC) (JUL 1997)

(a) The sum allotted to this Delivery Order and available for payment of costs under CLINs 0001-0006 through 05 Mar 2003 in accordance with the clause in Section I entitled Limitation of Funds, is \$18,773,173.00 an increase of \$40,000.00 from \$18,733,173.00.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
0001	CLIN Change	Lot	EST \$21,360,695.00 EST -\$30,000.00
	<i>Noun:</i>	RESEARCH & DATA	
	<i>Total Quantity:</i>	1	
	<i>New Total Item Amount:</i>	\$21,360,695.00	
	<i>ACRN:</i>	9	
	<i>NSN:</i>	N - Not Applicable	
	<i>DD1423 is Exhibit:</i>	A	
	<i>Contract type:</i>	U - COST PLUS FIXED FEE	
	<i>Inspection:</i>	DESTINATION	
	<i>Acceptance:</i>	DESTINATION	
	<i>FOB:</i>	DESTINATION	
	<i>Descriptive Data:</i>		
	The contractor shall conduct research in accordance with Section J Attachment 1, Statement of Work entitled "Human Factors Research and Sustaining Effort", dated 17 June 1998, and Section J Attachment 2, Statement of Work entitled "Human Factors Research and Sustaining Effort, Increase Level of Effort, dated 20 Dec 2001. The contractor shall deliver data in accordance with Exhibit A, the Contract Data Requirements List, DD Form 1423, dated 18 May 1998, attached hereto.		
000424	CLIN Establish	Funding Info Only	
	<i>Noun:</i>	FH	
	<i>ACRN:</i>	+\$10,000.00	
OPERATIONS & MAINTENANCE (O&M) (3400)			
0005	CLIN Change	-1	-\$1,500.00
	<i>Noun:</i>	O&M (3400) IN SUPPORT OF RESEARCH AND DEVELOPMENT	
	<i>NSN:</i>	N - Not Applicable	
	<i>Descriptive Data:</i>		
	The contractor shall conduct research in accordance with the specific SOWs detailed in the SubCLINs.		

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
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OPERATIONS & MAINTENANCE (O&M) (3400)

0005AA	CLIN Establish	1 Lot	EST \$1,500.00 EST \$1,500.00
	<i>Noun:</i>	O&M (3400) R&D IN SUPPORT OF THE T-1	
	<i>ACRN:</i>	FE	
	<i>NSN:</i>	N - Not Applicable	
	<i>DD1423 is Exhibit:</i>	A	
	<i>Contract type:</i>	U - COST PLUS FIXED FEE	
	<i>Inspection:</i>	DESTINATION	
	<i>Acceptance:</i>	DESTINATION	
	<i>FOB:</i>	DESTINATION	
	<i>Descriptive Data:</i>		
	The contractor shall conduct research in accordance with Section J, Attachment 4, Statement of Work entitled "T-1 Noise Measurement and Analysis". The contractor shall deliver data in accordance with Section J, Exhibit A, the Contract Data Requirements List, DD Form 1423, dated 18 May 1998.		

0005AB	CLIN Establish	1 Lot	\$30,000.00 \$30,000.00
	<i>Noun:</i>	O&M (3400) R&D IN SUPPORT OF USAFWS/RA	
	<i>ACRN:</i>	FG	
	<i>NSN:</i>	N - Not Applicable	
	<i>DD1423 is Exhibit:</i>	A	
	<i>Contract type:</i>	U - COST PLUS FIXED FEE	
	<i>Inspection:</i>	DESTINATION	
	<i>Acceptance:</i>	DESTINATION	
	<i>FOB:</i>	DESTINATION	
	<i>Descriptive Data:</i>		
	The contractor shall conduct research in accordance with Section J, Attachment 5, Statement of Work paragraph 3.1.4.1. The contractor shall deliver data in accordance with Section J, Exhibit A, the Contract Data Requirements List, DD Form 1423, dated 18 May 1998.		

PRODUCTION (3010) CLIN

0006	CLIN Change	-1	-\$2,500.00
	<i>Noun:</i>	PRODUCTION (3010) IN SUPPORT OF RESEARCH AND DEVELOPMENT	
	<i>NSN:</i>	N - Not Applicable	
	<i>DD1423 is Exhibit:</i>	A	
	<i>Descriptive Data:</i>		
	The contractor shall conduct research in accordance with the specific SOWs detailed in the SubCLINs.		

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
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PRODUCTION (3010) CLIN

0006AA	CLIN Establish	1 Lot	EST \$2,500.00 EST \$2,500.00
	<i>Noun:</i>	PRODUCTION (3010) R&D IN SUPPORT OF THE T-38C	
	<i>ACRN:</i>	FD	
	<i>NSN:</i>	N - Not Applicable	
	<i>DD1423 is Exhibit:</i>	A	
	<i>Contract type:</i>	U - COST PLUS FIXED FEE	
	<i>Inspection:</i>	DESTINATION	
	<i>Acceptance:</i>	DESTINATION	
	<i>FOB:</i>	DESTINATION	

Descriptive Data:

The contractor shall conduct research in accordance with Section J, Attachment 3, Statement of Work entitled "T-38C Noise Measurement and Analysis". The contractor shall deliver data in accordance with Section J, Exhibit A, the Contract Data Requirements List, DD Form 1423, dated 18 May 1998.

b. SECTION F - DELIVERIES OR PERFORMANCE:

ITEM	SUPPLIES SCHEDULE DATA	QTY	SHIP TO	MARK FOR	TRANS PRI	DATE
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0005AA		1	FA8650			30 Dec 2002
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Noun:

ACRN:

Descriptive Data:

The scheduled delivery date is for completion of all research and data as required by the Statement of Work, Attachment 4, and delivery of all reports in accordance with Exhibit A, Contract Data Requirements List.

O&M (3400) R&D IN SUPPORT OF THE T-1
FE

ITEM	SUPPLIES SCHEDULE DATA	QTY	SHIP TO	MARK FOR	TRANS PRI	DATE
0005AB		1	FA8650			30 Dec 2002

Noun: O&M (3400) R&D IN SUPPORT OF USAFWS/RA
ACRN: FG
Descriptive Data:
 The scheduled delivery date is for completion of all research and data as required by the Statement of Work, Attachment 5, and delivery of all reports in accordance with Exhibit A, Contract Data Requirements List.

0006AA		1	FA8650			30 Dec 2002
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Noun: PRODUCTION (3010) R&D IN SUPPORT OF THE T-38C
ACRN: FD
Descriptive Data:
 The scheduled delivery date is for completion of all research and data as required by the Statement of Work, Attachment 3, and delivery of all reports in accordance with Exhibit A, Contract Data Requirements List.

c. SECTION G - CONTRACT ADMINISTRATION/PAYMENT DATA:

ACRN	Appropriation/Lmt Subhead/Supplemental Accounting Data	Obligation Amount
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FD	ACRN Change 57 23010 112 3620 11420W 020000 00000 000000 503000 F03000 Total ACRN Amount: \$2,500.00 Funding breakdown: On CLIN 0006: -\$2,500.00 On CLIN 0006AA: +\$2,500.00	+0.00
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Descriptive data:
 PR COMPLETE
 Reference of AF 616 #HYTAF002720021, dated 11 Apr 2002, Total Amount \$25,000, \$22,500 on DO 0004 and \$2,500 on DO 0001

FE	ACRN Change 57 23400 302 6410 141090 030000 53400 85756F 660700 F60700 Total ACRN Amount: \$1,500.00 Funding breakdown: On CLIN 0005: -\$1,500.00 On CLIN 0005AA: +\$1,500.00	+0.00
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Descriptive data:
 PR COMPLETE
 PR GWSHE02721090 is hereby changed to GWSHE027201123
 Reference MIPR #S0221054, dated 03 May 2002, Total Amount \$15,000, \$13,500 on DO 0004 and \$1,500 on DO 0001

ACRN	Appropriation/Lmt Subhead/Supplemental Accounting Data	Obligation Amount
FG	ACRN Establish 57 23400 302 7821 37132X 010000 59200 27417F 667100 FB4852 New ACRN Amount: \$30,000.00 Funding breakdown: On CLIN 0005AB: +\$30,000.00 PRIMIPR: GWSHE027201123 \$30,000.00 JON: 71840865 Descriptive data: Reference AF 616 #000000S2260106 DTD 24 Apr 2002 and Chg 001 DTD 28 May 2002 PR Complete	\$30,000.00
FH	ACRN Establish 21 22040 0000 0 57 1105 P665326 3080 252B 000 000 S02086 New ACRN Amount: \$10,000.00 Funding breakdown: On CLIN 000424: +\$10,000.00 PRIMIPR: GWSHE027201123 \$10,000.00 JON: 71841003 Descriptive data: Reference MIPR 2HAFR5T051 DTD 07 Jun 2002 PR Complete	\$10,000.00

17 MAY 2002

- d. SECTION J - ATTACHMENTS/EXHIBITS is modified to incorporate Attachment 5, SOW paragraph 3.1.4.1.
- 3. All other terms and conditions remain unchanged.

STATEMENT OF WORK PARAGRAPH 3.1.4.1
Delivery Order 0001
Contract F33615-98-D-6000

This work paragraph will be new work under paragraph 3.1.4 Developmental Research

This contractual effort will be used to transfer technology resident at the Air Force Research Laboratory to both industry and the Government. Specifically, to transfer a spatial audio capability to the communications system upgrade being considered by the 98th Operations Support Squadron that will be located in the Range Control facility at Nellis AFB, NV. In addition, to transfer the same capability to the AWACS System Program Office, by way of their prime contractor, the Boeing Company, Kent, WA. This effort will prototype human interfaces within a realistic man-in-the-loop simulation facility, using technology developed at the Research Laboratory as well as commercially available, off-the-shelf hardware.

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT				1. CONTRACT ID CODE U - CPFF	PAGE OF PAGES 1 of 3
2. AMENDMENT/MODIFICATION NO. 37		3. EFFECTIVE DATE		4. REQUISITION/PURCHASE REQ. NO. SEE SCHEDULE	
6. ISSUED BY AFRL/MLKH CODE		FA8650		5. PROJECT NO. (If applicable)	
USAF/AFMC AIR FORCE RESEARCH LABORATORY 2310 EIGHTH STREET, BUILDING 167 WRIGHT-PATTERSON AFB OH 45433-7801 JEANETTE M. ZIMMER 937-656-9046 jeanette.zimmer@wpafb.af.mil				7. ADMINISTERED BY (If other than Item 6) DCMA DAYTON AREA C BUILDING 30 1725 VAN PATTON DRIVE WRIGHT-PATTERSON AFB OH 45433-5302 CODE S3605A	
8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code) SYTRONICS, INC 4433 DAYTON-XENIA ROAD, BUILDING 1 DAYTON OH 45432 (937) 431-6100				9A. AMENDMENT OF SOLICITATION NO.	
MAILING DATE APR 23 2002				9B. DATED (SEE ITEM 11)	
				10A. MODIFICATION OF CONTRACT/ORDER NO. F33615-98-D-6000 0001	
CODE 1EE69		FACILITY CODE		10B. DATED (SEE ITEM 13) 25 SEP 1998	
11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS					
<input type="checkbox"/> The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of 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 completing Items 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.					
12. ACCOUNTING AND APPROPRIATION DATA (If required) SEE SCHEDULE					
13. THIS ITEM APPLIES ONLY TO MODIFICATION OF CONTRACTS/ORDERS, IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.					
(X) A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: () THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. ITEM 10A.					
B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation data, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).					
X C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF: 52.243-2 Changes -- Cost Reimbursement					
D. OTHER (Specify type of modification and authority)					
E. IMPORTANT: Contractor <input type="checkbox"/> is not, <input checked="" type="checkbox"/> is required to sign this document and return 1 copies to the issuing office.					
14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.) SUBJECT: Additional Within Scope Effort CHANGE IN PRICE: \$4,247,611.00 (increase) CHANGE IN OBLIGATION: \$71,730 (increase)					
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) BARRETT L. MYERS President			16A. NAME AND TITLE OF SIGNER (Type or print) JAMES DAVID BOX Contracting Officer		
15B. CONTRACTOR/OFFEROR <i>B L Myers</i> (Signature of person authorized to sign)		15C. DATE SIGNED 19 APR 2002		16B. UNITED STATES OF AMERICA BY <i>James David Box</i> (Signature of Contracting Officer)	
NSN 7540-01-152-8070		30-105		16C. DATE SIGNED 22 APR 02	

1. Pursuant to FAR Clause 52.243-2 Changes -- Cost Reimbursement, the purpose of this modification is to add additional within scope effort under SOW paragraphs 3.2.3, 3.2.6, 3.2.8, and 3.3. This modification increases the total estimated contract value by \$4,247,611.00 and increases the current obligation by \$71,730.00. The period of performance remains unchanged.

2. As a result of paragraph 1, this delivery order is hereby modified as follows:

a. SECTION A - CONTRACT FORM:

Block 25 of DD Form 1155, JUN 94, is hereby changed from \$17,147,084.00 to \$21,394,695.00, an increase of \$4,247,611.00.

b. SECTION B - SUPPLIES OR SERVICES:

1. 5352.216-9001 Payment of Fee (AFMC)(CPFF)(JUL 1997) is modified to read as follows:

Estimated Cost: \$20,106,734.00

Fixed Fee: \$1,287,961.00

2. 5352.232-9001 Implementation of Limitation of Funds (AFMC) (JUL 1997)

(a) The sum allotted to this Delivery Order and available for payment of costs under CIINs 0001-0004 through 15 Sep 2002, in accordance with the clause in Section I entitled Limitation of Funds and contractor's email dated 17 Apr 2002 and incorporated herein by reference, is \$17,216,314.00, an increase of \$71,730.00 from \$17,144,584.00.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
0001	CLIN Change		EST \$21,394,695.00 EST +\$4,247,611.00
	<i>Noun:</i>	LO	
	<i>Total Quantity:</i>	RESEARCH & DATA	
	<i>New Total Item Amount:</i>	1	
	<i>ACRN:</i>	\$21,394,695.00	
	<i>NSN:</i>	9	
	<i>DD1423 is Exhibit:</i>	N - Not Applicable	
	<i>Contract type:</i>	A	
	<i>Inspection:</i>	U - COST PLUS FIXED FEE	
	<i>Acceptance:</i>	DESTINATION	
	<i>FOB:</i>	DESTINATION	
	<i>Descriptive Data:</i>	DESTINATION	
	The contractor shall conduct research in accordance with Section J Attachment 1, Statement of Work entitled "Human Factors Research and Sustaining Effort", dated 17 June 1998, and Section J Attachment 2, Statement of Work entitled "Human Factors Research and Sustaining Effort, Increase Level of Effort, dated 20 Dec 2001. The contractor shall deliver data in accordance with Exhibit A, the Contract Data Requirements List, DD Form 1423, dated 18 May 1998, attached hereto.		
000401	CLIN Change		
	<i>Noun:</i>	Funding Info Only	
	<i>ACRN:</i>	EF	+\$50,000.00
000414	CLIN Change		
	<i>Noun:</i>	Funding Info Only	
	<i>ACRN:</i>	EU	+\$16,730.00

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
000419	CLIN Establish Noun: ACRN:	Funding Info Only EZ	+\$5,000.00

c. SECTION G - CONTRACT ADMINISTRATION/PAYMENT DATA:

ACRN	Appropriation/Lmt Subhead/Supplemental Accounting Data	Obligation Amount
EF	ACRN Change 57 23600 292 47A8 627184 6HC000 02060 62202F 503000 F03000 New ACRN Amount: \$685,449.00 Funding breakdown: On CLIN 000401: +\$50,000.00 PRIMIPR: GWSHE027201083 \$50,000.00 JON: 7184CH22 Descriptive data: PR Complete	+\$50,000.00
EU	ACRN Change 57 23600 292 47A8 633257 6HCVOO 02050 63231F 503000 F03000 New ACRN Amount: \$220,457.00 Funding breakdown: On CLIN 000414: +\$16,730.00 PRIMIPR: GWSHE027201081 \$16,730.00 JON: 32570221 Descriptive data: PR Complete	+\$16,730.00
EZ	ACRN Establish 97 10400 FCAA 000 39998 0 068941 2D 000000 A910 YK001231 New ACRN Amount: \$5,000.00 Funding breakdown: On CLIN 000419: +\$5,000.00 PRIMIPR: GWSHE027201085 \$5,000.00 Descriptive data: PR Complete MIPR NO N3999802MP20773 DTD 14 JAN 02 AND AMENDMENT 01 DTD 27 MAR 02	\$5,000.00

3. All other terms and conditions remain unchanged.

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE
U - CPFF

PAGE OF PAGES
1 of 5

2. AMENDMENT/MODIFICATION NO. 41	3. EFFECTIVE DATE FA8650	4. REQUISITION/PURCHASE REQ. NO. SEE SCHEDULE	5. PROJECT NO. (If applicable)
6. ISSUED BY AFRL/MLKH CODE USAF/AFMC AIR FORCE RESEARCH LABORATORY 2310 EIGHTH STREET, BUILDING 167 WRIGHT-PATTERSON AFB OH 45433-7801 JEANETTE M. ZIMMER 937-656-9046 jeanette.zimmer@wpafb.af.mil		7. ADMINISTERED BY (If other than Item 6) CODE S3605A DCMA DAYTON AREA C BUILDING 30 1725 VAN PATTON DRIVE WRIGHT-PATTERSON AFB OH 45433-5302	

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code) SYTRONICS, INC 4433 DAYTON-XENIA ROAD, BUILDING 1 DAYTON OH 45432 (937) 431-6100	MAILING DATE JUN 28 2002	(X) 9A. AMENDMENT OF SOLICITATION NO. 9B. DATED (SEE ITEM 11) 10A. MODIFICATION OF CONTRACT/ORDER NO. F33615-98-D-6000 0001 10B. DATED (SEE ITEM 13) 25 SEP 1998
CODE 1EE69	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 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required)
SEE SCHEDULE

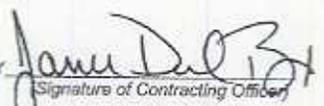
13. THIS ITEM APPLIES ONLY TO MODIFICATION OF CONTRACTS/ORDERS, IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

(X)	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: () THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. ITEM 10A. B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation data, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b). C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF: X D. OTHER (Specify type of modification and authority) Limitation of Funds Clause, FAR 52.232-22
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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.)
SUBJECT: Incremental Funding and Establishment of CLINs 0005 and 0006
CHANGE IN PRICE: None
CHANGE IN OBLIGATION: \$4,000.00 (increase)

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 SIGNER (Type or print) JAMES DAVID BOX Contracting Officer		
15B. CONTRACTOR/OFFEROR	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA	16C. DATE SIGNED
_____ (Signature of person authorized to sign)		BY  Signature of Contracting Officer	27 June 02

1a. Pursuant to FAR Clause 52.232-22 Limitation of Funds, this modification increases the funds allotted to this delivery order by \$4,000.00. In accordance with the contractor's email dated 24 Jun 2002, the additional funding is expected to cover performance through 01 Oct 2002. The contractor's email is incorporated herein by reference.

b. In addition, two additional CLINs will be added as indicated in Section B. As a result of the additional CLINs, CLIN 0001 estimated cost will be decreased by \$4,000.00, the total cost amounts of the two additional CLINs.

2. As a result of paragraphs 1a and 1b, this delivery order is hereby modified as follows:

a. SECTION B - SUPPLIES OR SERVICES:

5352.232-9001 Implementation of Limitation of Funds (AFMC) (JUL 1997)

(a) The sum allotted to this Delivery Order and available for payment of costs under CLINs 0001-0006 through 01 Oct 2002 in accordance with the clause in Section I entitled Limitation of Funds, is \$17,541,218.00, an increase of \$4,000.00 from \$17,537,218.00.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
0001	CLIN Change		EST \$21,390,695.00 EST -\$4,000.00
	<i>Noun:</i>	Lot RESEARCH & DATA	
	<i>Total Quantity:</i>	1	
	<i>New Total Item Amount:</i>	\$21,390,695.00	
	<i>ACRN:</i>	9	
	<i>NSN:</i>	N - Not Applicable	
	<i>DD1423 is Exhibit:</i>	A	
	<i>Contract type:</i>	U - COST PLUS FIXED FEE	
	<i>Inspection:</i>	DESTINATION	
	<i>Acceptance:</i>	DESTINATION	
	<i>FOB:</i>	DESTINATION	
	<i>Descriptive Data:</i>		
	The contractor shall conduct research in accordance with Section J Attachment 1, Statement of Work entitled "Human Factors Research and Sustaining Effort", dated 17 June 1998, and Section J Attachment 2, Statement of Work entitled "Human Factors Research and Sustaining Effort, Increase Level of Effort, dated 20 Dec 2001. The contractor shall deliver data in accordance with Exhibit A, the Contract Data Requirements List, DD Form 1423, dated 18 May 1998, attached hereto.		

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
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OPERATIONS & MAINTENANCE (O&M) (3400)

0005	CLIN Establish	1	EST \$1,500.00
		Lot	EST \$1,500.00
	<i>Noun:</i>	O&M (3400) IN SUPPORT OF RESEARCH AND DEVELOPMENT	
	<i>ACRN:</i>	FE	
	<i>NSN:</i>	N - Not Applicable	
	<i>DD1423 is Exhibit:</i>	A	
	<i>Contract type:</i>	U - COST PLUS FIXED FEE	
	<i>Inspection:</i>	DESTINATION	
	<i>Acceptance:</i>	DESTINATION	
	<i>FOB:</i>	DESTINATION	
	<i>Descriptive Data:</i>		

The contractor shall conduct research in accordance with Section J, Attachment 4, Statement of Work entitled "T-1 Noise Measurement and Analysis". The contractor shall deliver data in accordance with Section J, Exhibit A, the Contract Data Requirements List, DD Form 1423, dated 18 May 1998.

PRODUCTION (3010) CLIN

0006	CLIN Establish	1	EST \$2,500.00
		Lot	EST \$2,500.00
	<i>Noun:</i>	PRODUCTION (3010) IN SUPPORT OF RESEARCH AND DEVELOPMENT	
	<i>ACRN:</i>	FD	
	<i>NSN:</i>	N - Not Applicable	
	<i>DD1423 is Exhibit:</i>	A	
	<i>Contract type:</i>	U - COST PLUS FIXED FEE	
	<i>Inspection:</i>	DESTINATION	
	<i>Acceptance:</i>	DESTINATION	
	<i>FOB:</i>	DESTINATION	
	<i>Descriptive Data:</i>		

The contractor shall conduct research in accordance with Section J, Attachment 3, Statement of Work entitled "T-38C Noise Measurement and Analysis". The contractor shall deliver data in accordance with Section J, Exhibit A, the Contract Data Requirements List, DD Form 1423, dated 18 May 1998.

b. SECTION F - DELIVERIES OR PERFORMANCE:

ITEM	SUPPLIES SCHEDULE DATA	QTY	SHIP TO	MARK FOR	TRANS PRI	DATE
0001		1	FA8650			25 Sep 2003

Noun: RESEARCH & DATA
ACRN: 9

Descriptive Data:
 The scheduled delivery date is for completion of all research and data as required by the Statements of Work, Attachments 1 and 2, and delivery of all reports in accordance with Exhibit A, Contract Data Requirements List.

0005		1	FA8650			30 Dec 2002
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Noun: O&M (3400) IN SUPPORT OF RESEARCH AND DEVELOPMENT

ACRN: FE

Descriptive Data:
 The scheduled delivery date is for completion of all research and data as required by the Statement of Work, Attachment 4, and delivery of all reports in accordance with Exhibit A, Contract Data Requirements List.

0006		1	FA8650			30 Dec 2002
------	--	---	--------	--	--	-------------

Noun: PRODUCTION (3010) IN SUPPORT OF RESEARCH AND DEVELOPMENT

ACRN: FD

Descriptive Data:
 The scheduled delivery date is for completion of all research and data as required by the Statement of Work, Attachment 3, and delivery of all reports in accordance with Exhibit A, Contract Data Requirements List.

c. SECTION G - CONTRACT ADMINISTRATION/PAYMENT DATA:

ACRN	Appropriation/Lmt Subhead/Supplemental Accounting Data	Obligation Amount
FD	ACRN Establish 57 23010 112 3620 11420W 020000 00000 000000 503000 F03000 <i>New ACRN Amount:</i> \$2,500.00 <i>Funding breakdown:</i> On CLIN 0006: +\$2,500.00 <i>PRMIPR:</i> GWSHE027201088 \$2,500.00 <i>Descriptive data:</i> PR COMPLETE Reference MIPR #HYTAF002720021, dated 11 Apr 2002, Total Amount \$25,000, \$22,500 on DO 0004 and \$2,500 on DO 0001	\$2,500.00

ACRN	Appropriation/Lmt Subhead/Supplemental Accounting Data	Obligation Amount
FE	ACRN Establish 57 23400 302 6410 141090 030000 53400 85756F 660700 F60700 New ACRN Amount: \$1,500.00 Funding breakdown: On CLIN 0005: +\$1,500.00 PRIMIPR: GWSHE02721090 \$1,500.00 Descriptive data: PR COMPLETE Reference MIPR #S0221054, dated 03 May 2002, Total Amount \$15,000, \$13,500 on DO 0004 and \$1,500 on DO 0001	\$1,500.00

3. All other terms and conditions remain unchanged.

-2-

**STATEMENT OF WORK
T-38C NOISE MEASUREMENT AND ANALYSIS**

The contractor shall collect the flyover and ground runup noise data on the T-38C aircraft. This noise data is required to meet NEPA requirements to assess the impact of any aircraft modification. AFRL researchers will collect the data using their calibrated noise collection system. After data collection, the data shall be analyzed and processed into the required Noisemap format needed to prepare the NEPA documentation. The contractor shall provide the data to the T-38C SPO as part of their upgrade requirements for this aircraft.

**STATEMENT OF WORK
T-1 NOISE MEASUREMENT AND ANALYSIS**

The contractor shall conduct field ground run-up and flyover acoustic measurement on T-1 type aircraft performing operational maneuvers at Randolph AFB, Texas. The contractor shall collect the data and reduce into a suitable format for Noisemap 7.0 as required to meet AICUZ and EPA guidelines. The reports will define the limits of the acceptable noise from aircraft engines performing operational maneuvers.

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE
U - CPFF

PAGE OF PAGES
1 of 3

2. AMENDMENT/MODIFICATION NO.
P00005

3. EFFECTIVE DATE

4. REQUISITION/PURCHASE REQ. NO.

5. PROJECT NO. (If applicable)

6. ISSUED BY AFRL/MLKH CODE

FA8650

7. ADMINISTERED BY (If other than item 6) CODE S3605A

USAF/AFMC
AIR FORCE RESEARCH LABORATORY
2310 EIGHTH STREET, BUILDING 167
WRIGHT-PATTERSON AFB OH 45433-7801
JEANETTE M. ZIMMER 937-656-9046
jeanette.zimmer@wpafb.af.mil

DCMA DAYTON
AREA C BUILDING 30
1725 VAN PATTON DRIVE
WRIGHT-PATTERSON AFB OH 45433-5302

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code)

SYTRONICS, INC
4433 DAYTON-XENIA ROAD, BUILDING 1
DAYTON OH 45432
(937) 431-6110

MAILING DATE
AUG 06 2002

(X) 9A. AMENDMENT OF SOLICITATION NO.

9B. DATED (SEE ITEM 11)

X 10A. MODIFICATION OF CONTRACT/ORDER NO.
F33615-98-D-6000

10B. DATED (SEE ITEM 13)
25 SEP 1998

CODE 1EE69 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 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required)

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

(X) A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: () THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. ITEM 10A.

X B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation data, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).

C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:

D. OTHER (Specify type of modification and authority)

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.)

SUBJECT: Administrative Change
CHANGE IN PRICE: None.
CHANGE IN OBLIGATION: None.

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 SIGNER (Type or print)
JAMES DAVID BOX
Contracting Officer

15B. CONTRACTOR/OFFEROR

15C. DATE SIGNED

16B. UNITED STATES OF AMERICA

16C. DATE SIGNED
2 AUG 02

(Signature of person authorized to sign)

BY  Signature of Contracting Officer

1. The purpose of this administrative modification is to modify the descriptive data of CLINs 0001, 0005, and 0006 to reflect the ceiling dollar amounts of these CLINs. This change should have been reflected in P0004; however, Government personnel inadvertently omitted this information.

2. As a result of the above, this Delivery Order Contract, Section B SUPPLIES OR SERVICES, is specifically modified as follows:

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
0001	CLIN Change		
	<i>Noun:</i> <i>NSN:</i> <i>DD1423 is Exhibit:</i> <i>Contract type:</i> <i>Inspection:</i> <i>Acceptance:</i> <i>FOB:</i>	RESEARCH & DATA N - Not Applicable A U - COST PLUS FIXED FEE SOURCE SOURCE SOURCE	
	<i>Descriptive Data:</i> The contractor shall perform research as required by individual delivery orders in accordance with said Statement of Work. The Contractor shall provide data in accordance with Contract Data Requirements List, DD Form 1423, designated as Exhibit A, Section J, specified in the individual delivery order. Data requirements are Not Separately Priced (NSP). Subcontracting, Research Subjects, Material and Travel will be accomplished under this CLIN in accordance with the delivery order Statement of Work.		
	The ceiling amount for this CLIN is: \$48,696,000.00		
0005	CLIN Change		
	<i>Noun:</i> <i>NSN:</i> <i>DD1423 is Exhibit:</i> <i>Contract type:</i> <i>Inspection:</i> <i>Acceptance:</i> <i>FOB:</i>	O&M (3400) IN SUPPORT OF RESEARCH AND DEVELOPEMENT N - Not Applicable A U - COST PLUS FIXED FEE DESTINATION DESTINATION DESTINATION	
	<i>Descriptive Data:</i> The contractor shall perform research as required by individual Delivery Orders in accordance with subsequent statements of work (SOW). The contractor shall provide data in accordance with contract data requirements list, DD Form 1423, designated as Exhibit A, Section J, specified in the individual Delivery Order. Data requirements are not separately priced (NSP). Subcontracting, research subjects, material and travel will be accomplished under this CLIN in accordance with the Delivery Order SOW.		
	The ceiling amount for this CLIN is: \$301,500.00		

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
------	----------------------	-------------------	---------------------------------

0006

CLIN Change

Noun: PRODUCTION (3010) IN SUPPORT OF RESEARCH AND DEVELOPMENT

NSN: N - Not Applicable

Contract type: U - COST PLUS FIXED FEE

Inspection: DESTINATION

Acceptance: DESTINATION

FOB: DESTINATION

Descriptive Data:

The contractor shall perform research as required by individual Delivery Orders in accordance with subsequent statements of work (SOW). The contractor shall provide data in accordance with contract data requirements list, DD Form 1423, designated as Exhibit A, Section J, specified in the individual Delivery Order. Data requirements are not separately priced (NSP). Subcontracting, research subjects, material and travel will be accomplished under this CLIN in accordance with the Delivery Order SOW.

The ceiling amount for this CLIN is: \$2,500.00

c. SECTION H SPECIAL CONTRACT REQUIREMENTS:

H023 INDEFINITE QUANTITY (SEP 1997) is hereby modified to read as follows:

This is an Indefinite Quantity contract as contemplated by FAR 16.504. The total scope of the technical tasks for which Orders may be issued is set forth in paragraph 2.0 of the attached Statement of Objectives. The maximum dollar amount the Government may order under this contract is as follows:

CLIN 0001: \$48,696,000.00

CLIN 0005: \$301,500.00

CLIN 0006: \$2,500.00

and the minimum amount is \$100,000.00.

3. All other terms and conditions remain unchanged.

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE
U - CPFF

PAGE OF PAGES
1 of 2

2. AMENDMENT/MODIFICATION NO.
P00004

3. EFFECTIVE DATE

4. REQUISITION/PURCHASE REQ.NO.

5. PROJECT NO. (If applicable)

6. ISSUED BY AFRL/MLKH CODE

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

FA8650

USAF/AFMC
AIR FORCE RESEARCH LABORATORY
2310 EIGHTH STREET, BUILDING 167
WRIGHT-PATTERSON AFB OH 45433-7801
JEANETTE M. ZIMMER 937-656-9046
jeanette.zimmer@wpafb.af.mil

S3605A

DCMA DAYTON
AREA C BUILDING 30
1725 VAN PATTON DRIVE
WRIGHT-PATTERSON AFB OH 45433-5302

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code)

SYTRONICS, INC
4433 DAYTON-XENIA ROAD, BUILDING 1
DAYTON OH 45432
(937) 431-6110

MAILING DATE
JUN 28 2002

(X) 9A. AMENDMENT OF SOLICITATION NO.

9B. DATED (SEE ITEM 11)

X 10A. MODIFICATION OF CONTRACT/ORDER NO.
F33615-98-D-6000

10B. DATED (SEE ITEM 13)
25 SEP 1998

CODE 1EE69 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 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

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

(X) A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: () THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. ITEM 10A.

X B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation data, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).

C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:

D. OTHER (Specify type of modification and authority)

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.)

SUBJECT: Establishment of CLINs 0005 and 0006
CHANGE IN PRICE: None.
CHANGE IN OBLIGATION: None.

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 SIGNER (Type or print)
JAMES DAVID BOX
Contracting Officer

15B. CONTRACTOR/OFFEROR

15C. DATE SIGNED

16B. UNITED STATES OF AMERICA

16C. DATE SIGNED
27 June 02

(Signature of person authorized to sign)

BY  (Signature of Contracting Officer)

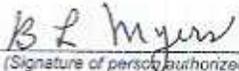
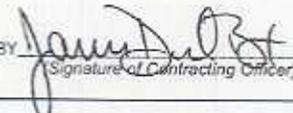
1. This administrative modification is issued to establish CLINs 0005 and 0006 at no change in cost or obligation to reflect additional funding sources. (CLIN 0004 is not being used here as it has been used under separate delivery order as a separate funding CLIN.)

2. As a result of the above, this Delivery Order Contract is specifically modified as follows:

SECTION B SUPPLIES OR SERVICES:

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
0005	CLIN Establish		
	<i>Noun:</i> <i>NSN:</i> <i>DD1423 is Exhibit:</i> <i>Contract type:</i> <i>Inspection:</i> <i>Acceptance:</i> <i>FOB:</i>	O&M (3400) IN SUPPORT OF RESEARCH AND DEVELOPEMENT N - Not Applicable A U - COST PLUS FIXED FEE DESTINATION DESTINATION DESTINATION	
	<i>Descriptive Data:</i> The contractor shall perform research as required by individual Delivery Orders in accordance with subsequent statements of work (SOW). The contractor shall provide data in accordance with contract data requirements list, DD Form 1423, designated as Exhibit A, Section J, specified in the individual Delivery Order. Data requirements are not separately priced (NSP). Subcontracting, research subjects, material and travel will be accomplished under this CLIN in accordance with the Delivery Order SOW.		
0006	CLIN Establish		
	<i>Noun:</i> <i>NSN:</i> <i>Contract type:</i> <i>Inspection:</i> <i>Acceptance:</i> <i>FOB:</i>	PRODUCTION (3010) IN SUPPORT OF RESEARCH AND DEVELOPEMENT N - Not Applicable U - COST PLUS FIXED FEE DESTINATION DESTINATION DESTINATION	
	<i>Descriptive Data:</i> The contractor shall perform research as required by individual Delivery Orders in accordance with subsequent statements of work (SOW). The contractor shall provide data in accordance with contract data requirements list, DD Form 1423, designated as Exhibit A, Section J, specified in the individual Delivery Order. Data requirements are not separately priced (NSP). Subcontracting, research subjects, material and travel will be accomplished under this CLIN in accordance with the Delivery Order SOW.		

3. All other terms and conditions remain unchanged.

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT				1. CONTRACT ID CODE U - CPFF	PAGE OF PAGES 1 of 3
2. AMENDMENT/MODIFICATION NO. 05	3. EFFECTIVE DATE FA8650	4. REQUISITION/PURCHASE REQ. NO. SEE SCHEDULE	5. PROJECT NO. (if applicable)		
6. ISSUED BY AFRL/MLKH CODE	7. ADMINISTERED BY (if other than Item 6) DCMA DAYTON AREA C BUILDING 30 1725 VAN PATTON DRIVE WRIGHT-PATTERSON AFB OH 45433-5302	CODE S3605A			
8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code) SYTRONICS, INC 4433 DAYTON-XENIA ROAD, BUILDING 1 DAYTON OH 45432 (937) 431-6100		9A. AMENDMENT OF SOLICITATION NO.		9B. DATED (SEE ITEM 11)	
<div style="text-align: center;"> <p>2002 0 8 70P</p> <p>MAILING DATE</p> </div>		10A. MODIFICATION OF CONTRACT/ORDER NO. F33615-98-D-6000 0007		10B. DATED (SEE ITEM 13) 20 SEP 2001	
		CODE 1EE69		FACILITY CODE	
11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS					
<input type="checkbox"/> The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of 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 completing Items 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.					
12. ACCOUNTING AND APPROPRIATION DATA (if required) SEE SCHEDULE					
13. THIS ITEM APPLIES ONLY TO MODIFICATION OF CONTRACTS/ORDERS, IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.					
(X)	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: () THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. ITEM 10A.				
	B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation data, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).				
X	C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF: 52.243-2 Changes -- Cost Reimbursement				
	D. OTHER (Specify type of modification and authority)				
E. IMPORTANT: Contractor <input type="checkbox"/> is not, <input checked="" type="checkbox"/> is required to sign this document and return 1 copies to the issuing office.					
14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.) SUBJECT: In-Scope Change to the Statement of Work (SOW) and Incremental Funding CHANGE IN PRICE: \$216,142.00 (increase) CHANGE IN OBLIGATION: \$321,000.00 (increase)					
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) BARRETT L. MYERS, President			16A. NAME AND TITLE OF SIGNER (Type or print) JAMES DAVID BOX Contracting Officer		
15B. CONTRACTOR/OFFEROR	15C. DATE SIGNED 24 July 2002	16B. UNITED STATES OF AMERICA		16C. DATE SIGNED 26 July 02	
 (Signature of person authorized to sign)		BY  (Signature of Contracting Officer)			

1. Pursuant to FAR Clause 52.243-2 Changes -- Cost Reimbursement, the purpose of this modification is to make an in-scope change to the SOW as detailed herein. This modification increases the total estimated contract value by \$216,142.00 and increases the current obligation by \$321,000.00. The period of performance remains unchanged.

2. As a result of paragraph 1, this delivery order is hereby modified as follows:

a. SECTION A - CONTRACT FORM:

Block 25 of DD Form 1155, JUN 94, is hereby changed from \$932,809.00 to \$1,148,951.00, an increase of \$216,142.00.

b. SECTION B - SUPPLIES OR SERVICES:

1. 5352.216-9001 Payment of Fee (AFMC)(CPFF)(JUL 1997) is modified to read as follows:
 Estimated Cost: \$1,073,786.00
 Fixed Fee: \$75,165.00

2. 5352.232-9001 Implementation of Limitation of Funds (AFMC) (JUL 1997)
 (a) The sum allotted to this Delivery Order and available for payment of costs under CLINs 0001-0003 through 31 Dec 2002, in accordance with the clause in Section I entitled Limitation of Funds and contractor's confirmation of negotiation's letter, dated 23 Jul 2002 and incorporated herein by reference, is \$1,103,655.00, an increase of \$321,000.00 from \$782,655.00.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
0001	CLIN Change		\$1,148,951.00
		Lot	NTE +\$216,142.00
	<i>Noun:</i>	RESEARCH AND DATA	
	<i>Total Quantity:</i>	1	
	<i>New Total Item Amount:</i>	\$1,148,951.00	
	<i>ACRN:</i>	9	
	<i>NSN:</i>	N - Not Applicable	
	<i>DD1423 is Exhibit:</i>	A	
	<i>Contract type:</i>	U - COST PLUS FIXED FEE	
	<i>Inspection:</i>	DESTINATION	
	<i>Acceptance:</i>	DESTINATION	
	<i>FOB:</i>	DESTINATION	
	<i>Descriptive Data:</i>		
	The contractor shall conduct research in accordance with the Statement of Work entitled "Vision Display Research for Strike Helmet 21" dated 04 Jun 2001 and Statement of Work entitled Within Scope Change dated 10 Jul 2002 (Attachments 1 and 2, respectively, of Section J). The contractor shall also submit data in accordance with Exhibit A, Contract Data Requirements Lists (CDRLs), DD Form 1423, dated 02 Jun 2000.		
000103	CLIN Change		
	<i>Noun:</i>	Funding Info Only	
	<i>ACRN:</i>	AC	+\$321,000.00

b. SECTION F - DELIVERIES OR PERFORMANCE:

ITEM	SUPPLIES SCHEDULE DATA	QTY	SHIP TO	MARK FOR	TRANS PRI	DATE
0001		1	U			26 MARO

Noun: RESEARCH AND DATA
ACRN: 9
Descriptive Data:
 The scheduled delivery date is for completion of all research and data required by the Statements of Work, Attachments 1 and 2, and delivery of all reports in accordance with Exhibit A, Contract Data Requirements List. Technical effort is to be completed 25 months after contract award and the final report is to be completed 26 months after contract award.

c. SECTION G - CONTRACT ADMINISTRATION/PAYMENT DATA:

ACRN	Appropriation/Lmt Subhead/Supplemental Accounting Data	Obligation Amount
AC	ACRN Change 57 23600 292 47A8 627184 6HCV00 02050 62202F 503000 F03000 <i>New ACRN Amount:</i> \$366,296.00 <i>Funding breakdown:</i> On CLIN 000103: +\$321,000.00 <i>PR/MIPR:</i> GWSHE027201126 \$321,000.00 <i>Descriptive data:</i> PR COMPLETE \$45,296 is for JON 71841115 \$321,000 is for JON 71841117	+\$321,000.00

d. SECTION J - ATTACHMENTS/EXHIBITS is modified to incorporate the Statement of Work entitled Within Scope Change, dated 10 Jul 2002, as attachment 2.

3. All other terms and conditions remain unchanged.

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE
U - CPFF

PAGE OF PAGES
1 of 2

2. AMENDMENT/MODIFICATION NO.
04

3. EFFECTIVE DATE
FA8650

4. REQUISITION/PURCHASE REQ.NO.
SEE SCHEDULE

5. PROJECT NO. (If applicable)

6. ISSUED BY AFRL/MLKH CODE

7. ADMINISTERED BY (If other than item 6) CODE S3605A

USAF/AFMC
AIR FORCE RESEARCH LABORATORY
2310 EIGHTH STREET, BUILDING 167
WRIGHT-PATTERSON AFB OH 45433-7801
JEANETTE M. ZIMMER 937-656-9046
jeanette.zimmer@wpafb.af.mil

BCMA DAYTON
AREA C BUILDING 30
1725 VAN PATTON DRIVE
WRIGHT-PATTERSON AFB OH 45433-5302

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code)

SYTRONICS, INC
4433 DAYTON-XENIA ROAD, BUILDING 1
DAYTON OH 45432
(937) 431-6100

MAILING DATE
JUN 21 2002

(X) 9A. AMENDMENT OF SOLICITATION NO.

9B. DATED (SEE ITEM 11)

10A. MODIFICATION OF CONTRACT/ORDER NO.
F33615-98-D-6000 0007

X 10B. DATED (SEE ITEM 13)
20 SEP 2001

CODE 1EE69 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 6 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required)
SEE SCHEDULE

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

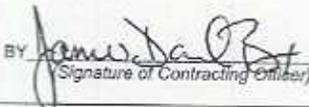
- (X) A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: () THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. ITEM 10A.
- B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation data, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
- C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
- X D. OTHER (Specify type of modification and authority)
Limitation of Funds Clause, FAR 52.232-22

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.)

SUBJECT: Incremental Funding
CHANGE IN PRICE: None
CHANGE IN OBLIGATION: \$45,296.00 Increase
PROGRAM MANAGER: Ronald Yates, AFRL/HECP, Wright-Patterson AFB OH 45433
PAYMENT OFFICE: DFAS-CO/North Entitlement Operations, PO Box 182266, Columbus OH 43218-2266

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 SIGNER (Type or print)	
		JAMES DAVID BOX Contracting Officer	
15B. CONTRACTOR/OFFEROR	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA	16C. DATE SIGNED
(Signature of person authorized to sign)		BY  (Signature of Contracting Officer)	19 June 02

1. Pursuant to the authority of the Limitation of Funds Clause, this modification increases the funding allocated to this delivery order by \$45,296.00.

2. As a result of the above paragraph, this Delivery Order is hereby modified as follows:

a. SECTION B SUPPLIES OR SERVICES:

1. 5352.232-9001 - IMPLEMENTATION OF LIMITATION OF FUNDS (AFMC) (JUL 1997) is hereby changed to read as follows:

(a) The sum allotted to this contract Delivery Order and available for payment of costs under CLINs 0001-0003 through 30 Sep 2002, in accordance with the clause in Section I entitled Limitation of Funds and contractor's email dated 14 Jun 2002, incorporated herein by reference, is increased by \$45,296.00 from \$782,655.00 to \$827,951.00.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
000103	CLIN Establish Noun: ACRN:	Funding Info Only AC	+\$45,296.00

b. SECTION G - CONTRACT ADMINISTRATION/PAYMENT DATA:

ACRN	Appropriation/Lmt Subhead/Supplemental Accounting Data	Obligation Amount
AC	ACRN Establish 57 23600 292 47A8 627184 6HCV00 02050 62202F 503000 F03000 New ACRN Amount: \$45,296.00 Funding breakdown: On CLIN 000103: +\$45,296.00 PR/MIPR: GWSHE027201093 \$45,296.00 Descriptive data: JON: 71841115 PR COMPLETE	\$45,296.00

3. All other terms and conditions remain unchanged.

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE
U - CPFF

PAGE OF PAGES
1 of 2

2. AMENDMENT/MODIFICATION NO. 03	3. EFFECTIVE DATE FA8650	4. REQUISITION/PURCHASE REQ.NO. SEE SCHEDULE	5. PROJECT NO. (if applicable)
6. ISSUED BY AFRL/MLKH CODE		7. ADMINISTERED BY (if other than Item 6) CODE S3605A	
USAF/AFMC AIR FORCE RESEARCH LABORATORY 2310 EIGHTH STREET, BUILDING 167 WRIGHT-PATTERSON AFB OH 45433-7801 JEANETTE M. ZIMMER 937-656-9046 jeanette.zimmer@wpafb.af.mil		DCMA DAYTON AREA C BUILDING 30 1725 VAN PATTON DRIVE WRIGHT-PATTERSON AFB OH 45433-5302	

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code) SYTRONICS, INC 4433 DAYTON-XENIA ROAD, BUILDING 1 DAYTON OH 45432 (937) 431-6100	MAILING DATE APR 19 2002	9A. AMENDMENT OF SOLICITATION NO. 9B. DATED (SEE ITEM 11) 10A. MODIFICATION OF CONTRACT/ORDER NO. F33615-98-D-6000 0007 10B. DATED (SEE ITEM 13) 20 SEP 2001
CODE 1EE69 FACILITY CODE	(X)	

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

12. ACCOUNTING AND APPROPRIATION DATA (if required)
SEE SCHEDULE

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

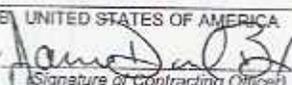
(X)	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: () THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. ITEM 10A.
	B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation data, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
	C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
X	D. OTHER (Specify type of modification and authority) Limitation of Funds Clause, FAR 52.232-22

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.)

SUBJECT: Incremental Funding
 CHANGE IN PRICE: None
 CHANGE IN OBLIGATION: \$167,300.00 Increase
 PROGRAM MANAGER: Ronald Yates, AFRL/HECP, Wright-Patterson AFB OH 45433
 PAYMENT OFFICE: DFAS-CO/North Entitlement Operations, PO Box 182266, Columbus OH 43218-2266

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 SIGNER (Type or print) JAMES DAVID BOX Contracting Officer
15B. CONTRACTOR/OFFEROR (Signature of person authorized to sign)	16B. UNITED STATES OF AMERICA BY  (Signature of Contracting Officer)
15C. DATE SIGNED	16C. DATE SIGNED 18 APR 02

1. Pursuant to the authority of the Limitation of Funds Clause, this modification increases the funding allocated to this delivery order by \$167,300.00.

2. As a result of the above paragraphs, this Delivery Order is hereby modified as follows:

b. SECTION B SUPPLIES OR SERVICES:

1. 5352.232-9001 - IMPLEMENTATION OF LIMITATION OF FUNDS (AFMC) (JUL 1997) is hereby changed to read as follows:

(a) The sum allotted to this contract Delivery Order and available for payment of costs under CLINs 0001-0003 through 31 Aug 2002, in accordance with the clause in Section I entitled Limitation of Funds and contractor's email dated 16 Apr 2002 incorporated herein by reference, is increased by \$167,300.00 from \$615,355.00 to 782,655.00.

2. Contractor's email is hereby incorporated by reference.

SECTION G - CONTRACT ADMINISTRATION/PAYMENT DATA:

<u>ACRN</u>	<u>Appropriation/Lmt Subhead/Supplemental Accounting Data</u>	<u>Obligation Amount</u>
AB	ACRN Change 57 23600 292 47A8 633257 6HCV00 02050 63231F 503000 F03000 New ACRN Amount: \$344,573.00 Funding breakdown: On CLIN 000102: +\$167,300.00 PRIMIPR: GWSHE027201080 \$167,300.00 JON: 32570221 Descriptive data: PR COMPLETE	+\$167,300.00

3. All other terms and conditions remain unchanged.

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE
U - CPFF

PAGE OF PAGES
1 of 2

2. AMENDMENT/MODIFICATION NO.
02

3. EFFECTIVE DATE
FA8650

4. REQUISITION/PURCHASE REQ. NO.
SEE SCHEDULE

5. PROJECT NO. (If applicable)

6. ISSUED BY AFRL/MLKH CODE

7. ADMINISTERED BY (If other than Item 6) CODE S3605A

USAF/AFMC
AIR FORCE RESEARCH LABORATORY
2310 EIGHTH STREET, BUILDING 167
WRIGHT-PATTERSON AFB OH 45433-7801
JEANETTE M. ZIMMER 937-656-9046
jeanette.zimmer@wpafb.af.mil

DCMA DAYTON
AREA C BUILDING 30
1725 VAN PATTON DRIVE
WRIGHT-PATTERSON AFB OH 45433-5302

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code)

SYTRONICS, INC
4433 DAYTON-XENIA ROAD, BUILDING 1
DAYTON OH 45432
(937) 431-6100

MAILING DATE

FEB 15 2002

(X) 9A. AMENDMENT OF SOLICITATION NO.

9B. DATED (SEE ITEM 11)

X 10A. MODIFICATION OF CONTRACT/ORDER NO.
F33615-98-D-6000 0007

10B. DATED (SEE ITEM 13)
20 SEP 2001

CODE 1EE69 FACILITY CODE

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

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12. ACCOUNTING AND APPROPRIATION DATA (If required)
SEE SCHEDULE

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

- (X) A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: () THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. ITEM 10A.
- B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation data, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
- C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
- X D. OTHER (Specify type of modification and authority)
Limitation of Funds Clause, FAR 52.232-22

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.)

SUBJECT: Incremental Funding
CHANGE IN PRICE: None
CHANGE IN OBLIGATION: \$177,273.00 Increase
PROGRAM MANAGER: Ronald Yates, AFRL/HECP, Wright-Patterson AFB OH 45433
PAYMENT OFFICE: DFAS-CO/North Entitlement Operations, PO Box 182266, Columbus OH 43218-2266

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 SIGNER (Type or print) JAMES DAVID BOX Contracting Officer
15B. CONTRACTOR/OFFEROR (Signature of person authorized to sign)	16B. UNITED STATES OF AMERICA BY <u>James David Box</u> (Signature of Contracting Officer)
15C. DATE SIGNED 30-105	16C. DATE SIGNED 14 FEB 02

1. Pursuant to the authority of the Limitation of Funds Clause, this modification increases the funding allocated to this delivery order by \$177,273.00.

2. As a result of the above paragraphs, this Delivery Order is hereby modified as follows:

b. SECTION B SUPPLIES OR SERVICES:

1. 5352.232-9001 - IMPLEMENTATION OF LIMITATION OF FUNDS (AFMC) (JUL 1997) is hereby changed to read as follows:

(a) The sum allotted to this contract Delivery Order and available for payment of costs under CLINs 0001-0003 through 31 Jul 2002, in accordance with the clause in Section I entitled Limitation of Funds and contractor's email dated 13 Feb 2002 incorporated herein by reference, is increased by \$177,273.00 from \$438,082.00 to \$615,355.00.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
000102	CLIN Establish Noun: ACRN:	Funding Info Only AB	+\$177,273.00

SECTION G - CONTRACT ADMINISTRATION/PAYMENT DATA:

ACRN	Appropriation/Lmt Subhead/Supplemental Accounting Data	Obligation Amount
AB	ACRN Establish 57 23600 292 47A8 633257 6HCV00 02050 63231F 503000 F03000 New ACRN Amount: \$177,273.00 Funding breakdown: On CLIN 000102: +\$177,273.00 PRIMIPR: GWSHE027201035 \$177,273.00 JON: 32570221 Descriptive data: PR COMPLETE	\$177,273.00

3. All other terms and conditions remain unchanged.

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE
U - CPFF

PAGE OF PAGES
1 of 3

2. AMENDMENT/MODIFICATION NO.
01

3. EFFECTIVE DATE
FA8650

4. REQUISITION/PURCHASE REQ. NO.
SEE SCHEDULE

5. PROJECT NO. (If applicable)

6. ISSUED BY AFRL/MLKH CODE

USAF/AFMC
AIR FORCE RESEARCH LABORATORY
2310 EIGHTH STREET, BUILDING 167
WRIGHT-PATTERSON AFB OH 45433-7801
JEANETTE M. ZIMMER 937-255-0405
jeanette.zimmer@wpafb.af.mil

7. ADMINISTERED BY (If other than Item 6) CODE S3605A

DCMA DAYTON
AREA C BUILDING 30
1725 VAN PATTON DRIVE
WRIGHT-PATTERSON AFB OH 45433-5302

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code)

SYTRONICS, INC
4433 DAYTON-XENIA ROAD, BUILDING 1
DAYTON OH 45432
(937) 431-6100

MAILING DATE
DEC 03 2001

9A. AMENDMENT OF SOLICITATION NO. (X)

9B. DATED (SEE ITEM 11)

10A. MODIFICATION OF CONTRACT/ORDER NO.
F33615-98-D-6000 0007 (X)

10B. DATED (SEE ITEM 13)
20 SEP 2001

CODE 1EE69 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 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:

is extended, is not extended.

(a) By completing Items 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required)
SEE SCHEDULE

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

(X) A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: () THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. ITEM 10A.

B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).

C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:

X D. OTHER (Specify type of modification and authority)
Limitation of Funds Clause, FAR 52.232-22

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.)

SUBJECT: Incremental Funding and Change to Payment Office Address
CHANGE IN PRICE: None
CHANGE IN OBLIGATION: \$22,727.00 Increase
PROGRAM MANAGER: Ronald Yates, AFRL/HECP, Wright-Patterson AFB OH 45433
PAYMENT OFFICE: DFAS-CO/North Entitlement Operations, PO Box 182266, Columbus OH 43218-2266

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 SIGNER (Type or print)	
		JAMES DAVID BOX Contracting Officer	
15B. CONTRACTOR/OFFEROR	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA BY <i>James David Box</i> Signature of Contracting Officer	16C. DATE SIGNED 19 NOV 01
(Signature of person authorized to sign)			

1a. Pursuant to the authority of the Limitation of Funds Clause, this modification increases the funding allocated to this delivery order by \$22,727.00.

b. As a result of workload realignment, the payment office is changed as hereby amended as indicated below.

2. As a result of the above paragraphs, this Delivery Order is hereby modified as follows:

a. Block 15 of the DD Form 1155, JAN 1998 (EG) is hereby changed from: DFAS-CO/New Dominion Division, PO Box 182041, Columbus OH 43218-2041, to DFAS-CO/North Entitlement Operations, PO Box 182266, Columbus OH 43218-2266.

b. SECTION B SUPPLIES OR SERVICES:

1. 5352.232-9001 - IMPLEMENTATION OF LIMITATION OF FUNDS (AFMC) (JUL 1997) is hereby changed to read as follows:

(a) The sum allotted to this contract Delivery Order and available for payment of costs under CLINs 0001-0003 through 15May02, in accordance with the clause in Section I entitled Limitation of Funds and contractor's email dated 15Nov01 is increased by \$22,767.00 from \$415,355.00 to 438,082.00.

2. The Contractor's email dated 15Nov01 is hereby incorporated by reference.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
000101	CLIN Change Noun: ACRN: Descriptive Data: P00001: PR: GWSHE027201007, \$22,727.00 Basic: PR: GWSHE017201144, \$365,355.00 GWSHE017201115, \$50,000.00 Contract JON: 7184CH22 Contract RCCC: 6HC000 Funding RCCC: 6HCV00	Funding Info Only AA	+\$22,727.00

SECTION G - CONTRACT ADMINISTRATION/PAYMENT DATA:

ACRN Appropriation/Lmt Subhead/Supplemental Accounting Data Obligation Amount

AA ACRN Change +\$22,727.00
57 13600 291 47A8 633257 6HCV00 02050 63231F 503000 F03000
New ACRN Amount: \$438,082.00
Funding breakdown: On CLIN 000101: +\$22,727.00
PRIMIPR: GWSHE027201007 \$22,727.00
JON: 32570221
Descriptive data:
PR IS COMPLETE

ORDER FOR SUPPLIES OR SERVICES

PAGE 1 OF 5

1. CONTRACT/PURCH ORDER/AGREEMENT NO. **F33615-98-D-6000** 2. DELIVERY ORDER/ CALL NO. **0007** 3. DATE OF ORDER/CALL (YYYYMMDD) 4. REQUISITION/PURCH REQUEST NO. **SEE SCHEDULE** 5. PRIORITY **DO-C9**

6. ISSUED BY **AFRL/MLKH USAF/AFMC** CODE **FA8650** 7. ADMINISTERED BY (if Other than 6) CODE **S3605A** 8. DELIVERY FOB DESTINATION OTHER (See Schedule if other)

AIR FORCE RESEARCH LABORATORY
2310 8TH STREET, BUILDING 167
WRIGHT-PATTERSON AFB OH 45433-7801
CHERYL K. ROBERTSON (937) 656-9046
cheryl.robertson@wpafb.af.mil

DCMC DAYTON
AREA C BUILDING 30
1725 VAN PATTON DRIVE
WRIGHT-PATTERSON AFB OH 45433-5302

SCD: C PAS: (NONE)

9. CONTRACTOR CODE **1EE69** FACILITY 10. DELIVER TO FOB POINT BY (Date) (YYYYMMDD) **SEE SCHEDULE** 11. X IF BUSINESS IS SMALL SMALL DISADVANTAGED WOMEN-OWNED

NAME AND ADDRESS **SYTRONICS, INC**
4433 DAYTON-XENIA ROAD, BUILDING 1
DAYTON OH 45432
(937) 431-6100 GREENE COUNTY

MAILING DATE
SEP 25 2001

12. DISCOUNT ITEMS **N** 13. MAIL INVOICES TO ADDRESS IN BLOCK **SEE BLOCK 15 (PAYMENT OFFICE)**

14. SHIP TO CODE 15. PAYMENT WILL BE MADE BY CODE **SC1018**

SEE SCHEDULE

DFAS-CO/NEW DOMINION DIVISION
P O BOX 182041
COLUMBUS OH 43218-2041

EFT:T

MARK ALL PACKAGES AND PAPERS WITH IDENTIFICATION NUMBERS IN BLOCKS 1 AND 2.

16. DELIVERY CALL This delivery order/call is issued on another Government agency or in accordance with and subject to terms and conditions of above numbered contract.

OF PURCHASE Reference your furnish the following on items specified herein.

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

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

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

17. ACCOUNTING AND APPROPRIATION DATA/LOCAL USE **SEE SCHEDULE**

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

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

24. UNITED STATES OF AMERICA
JAMES DAVID BOX
 BY: *James David Box* 20 SEP 01
 CONTRACTING/ORDERING OFFICER

25. TOTAL **\$932,809.00**

26. QUANTITY IN COLUMN 20 HAS BEEN INSPECTED RECEIVED ACCEPTED, AND CONFORMS TO THE CONTRACT EXCEPT AS NOTED

DATE SIGNATURE AND TITLE OF AUTHORIZED GOVERNMENT REPRESENTATIVE

27. SHIP NO. 28. D.O. VOUCHER NO. 29. DIFFERENCES

30. INITIALS

31. PAID BY 32. PAYMENT COMPLETE PARTIAL FINAL 33. AMOUNT VERIFIED CORRECT FOR

34. CHECK NUMBER

35. BILL OF LADING

36. I CERTIFY THIS ACCOUNT IS CORRECT AND PROPER FOR PAYMENT.

DATE SIGNATURE AND TITLE OF CERTIFYING OFFICER

37. RECEIVED AT 38. RECEIVED BY (Print) 39. DATE RECEIVED (YYYYMMDD) 40. TOTAL CONTAINERS 41. S/R ACCOUNT NO. 42. S/R VOUCHER NO.

1. In accordance with the provisions of the Basic Contract and this delivery order, the Contractor shall accomplish the effort described in the attached Statement of Work (SOW), dated 4 Jun 2001, and entitled "Vision Display Research for Strike Helmet 21", at a total not to exceed amount of \$932,809.00.

SECTION B

1. 5352.216-9001 PAYMENT OF FEE (AFMC)(CPFF)(JUL 1997)

The estimated cost and fee for this delivery order are shown below. The applicable fixed fee or target fee set forth below may be increased or decreased only by negotiation and modification of the contract delivery order for added or deleted work. As determined by the contracting officer, it shall be paid as it accrues, in regular installments based upon the percentage of completion of work (or the expiration of the agreed-upon period(s) for term contract(s).

Estimated Cost: \$871,784.00
 Fixed Fee: \$61,025.00

2. 5352.232-9001 IMPLEMENTATION OF LIMITATION OF FUNDS (AFMC) (JUL 1997)

(a) The sum allotted to this contract delivery order and available for payment of costs under CLINs 0001-0003 through 30 Apr 2002 in accordance with the clause in Section I entitled "Limitation of Funds" is \$388,182.00.

(b) In addition to the amount allotted under the "Limitation of Funds" clause, the additional amount of \$27,173.00 is obligated for payment of fee for work completed under CLINs 0001-0003.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
0001		1 LO	\$932,809.00 NTE \$932,809.00
	<i>Noun:</i>	RESEARCH AND DATA	
	<i>ACRN:</i>	9	
	<i>Security:</i>	U	
	<i>NSN:</i>	N - Not Applicable	
	<i>DD1423 is Exhibit:</i>	A	
	<i>Contract type:</i>	U - COST PLUS FIXED FEE	
	<i>Inspection:</i>	DESTINATION	
	<i>Acceptance:</i>	DESTINATION	
	<i>FOB:</i>	DESTINATION	
	<i>Descriptive Data:</i>		
	THE CONTRACTOR SHALL CONDUCT RESEARCH IN ACCORDANCE WITH THE STATEMENT OF WORK ENTITLED "VISION DISPLAY RESEARCH FOR STRIKE HELMET 21", DATED 4 JUNE 2001. THE CONTRACTOR SHALL ALSO SUBMIT DATA IN ACCORDANCE WITH EXHIBIT A, THE CONTRACT DATA REQUIREMENTS LIST, DD FORM 1423, DATED 1 JUNE 2000, ATTACHED HERETO.		

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
000101	<p><i>Noun:</i> Funding Info Only <i>ACRN:</i> AA <i>Descriptive Data:</i> PR: GWSHE017201144 (\$365,355.00) GWSHE017201115 (\$50,000.00) Contract JON: 7184CH22 Contract RCCC: 6HC000 Funding RCCC: 6HCV00</p>	\$415,355.00	
0002	<p><i>Noun:</i> SOFTWARE <i>Security:</i> U <i>NSN:</i> N - Not Applicable <i>Contract type:</i> U - COST PLUS FIXED FEE <i>Inspection:</i> DESTINATION <i>Acceptance:</i> DESTINATION <i>FOB:</i> DESTINATION <i>Descriptive Data:</i> The contractor shall provide software as required in the Statement of Work, dated 4 Jun 2001, atch 1. The cost of this CLIN is included in CLIN 0001.</p>	1 LO	NSP NSP
0003	<p><i>Noun:</i> HARDWARE <i>Security:</i> U <i>NSN:</i> N - Not Applicable <i>Contract type:</i> U - COST PLUS FIXED FEE <i>Inspection:</i> DESTINATION <i>Acceptance:</i> DESTINATION <i>FOB:</i> DESTINATION <i>Descriptive Data:</i> The contractor shall provide hardware as required in the Statement of Work, dated 4 Jun 2001, atch 1. The cost of this CLIN is included in CLIN 0001.</p>	1 LO	NSP NSP

ITEM	SUPPLIES SCHEDULE DATA	QTY	SHIP TO	MARK FOR	TRANS PRI	DATE
0001		1	U			26 MARO

Noun: RESEARCH AND DATA
ACRN: 9
Sec. Class: U

Descriptive Data:
 The scheduled delivery date is for completion of all research and data required by the Statement of Work, atch 1, and delivery of all reports in accordance with Exhibit A, Contract Data Requirements List. Technical effort is to be completed 25 months after contract award and the final report is to be completed 26 months after contract award.

0002		1	U			26 MARO
------	--	---	---	--	--	---------

Noun: SOFTWARE
Sec. Class: U

Descriptive Data:
 The scheduled delivery date is for any software to be delivered in accordance with the Statement of Work, dated 4 Jun 2001.

0003		1	U			26 MARO
------	--	---	---	--	--	---------

Noun: HARDWARE
Sec. Class: U

Descriptive Data:
 The scheduled delivery date is for any hardware to be delivered in accordance with the Statement of Work, dated 4 Jun 2001.

ACRN	Appropriation/Lmt Subhead/Supplemental Accounting Data	Obligation Amount
------	--	-------------------

AA	57 13600 291 47A8 633257 6HCV00 02050 63231F 503000 F03000	\$415,355.00
	<i>Funding breakdown:</i> On CLIN 000101: \$415,355.00	
	<i>PRMIPR:</i> GWSHE017201115 \$50,000.00	
	GWSHE017201144 \$365,355.00	
	<i>JON:</i> 32570306	
	<i>Descriptive data:</i> PR IS COMPLETE	

LIST OF ATTACHMENTS

DOCUMENT	PGS	DATE	TITLE
EXHIBIT A	5	01 JUN 2000	Contract Data Requirements List
ATTACHMENT 1	3	04 JUN 2001	Statement of Work entitled "VISION DISPLAY RESEARCH FOR STRIKE HELMET 21"

STATEMENT OF WORK
DELIVERY ORDER 0007

TITLE: Vision Display Research for Strike Helmet 21
DATE: 4 June 2001

1.0 SCOPE

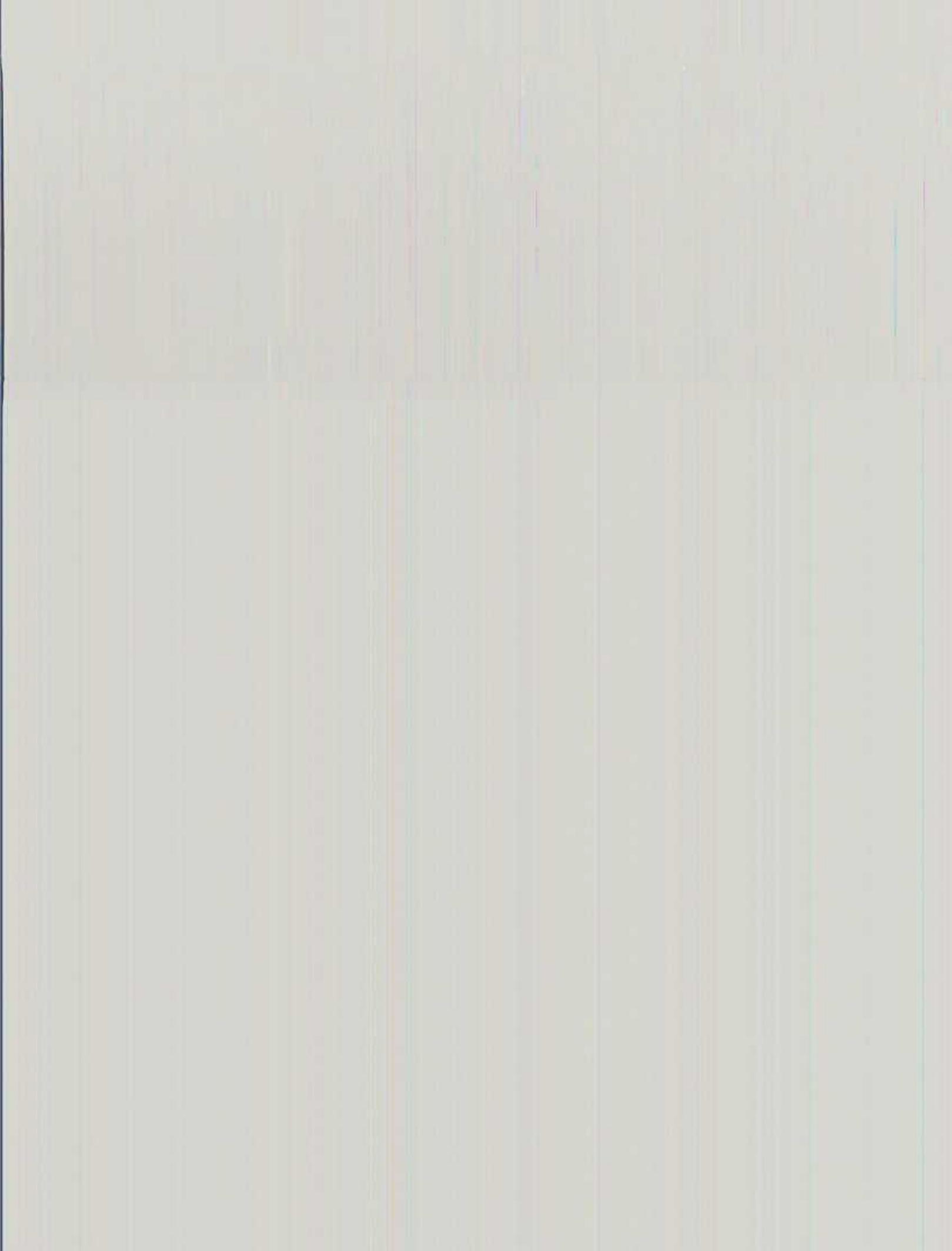
The contractor shall provide the necessary on-going technical, administrative, and subcontracting services necessary to sustain programs supporting the Vision Display Research (VDR) area. The required work will be supporting the Design Parameters for Visually Coupled Systems, Night Vision Operations, Visual Image Evaluation of Windscreens, and the Helmet Mounted Sensory Technologies (HMST) programs. The scope of the required support includes; (1) planning and execution of an exploratory development research plan, (2) designing, fabricating, integrating, maintaining, documenting, and testing of VDR hardware and software, (3) design, fabricate and integrate a new cockpit control panel for the Strike Helmet 21 program, and (4) supporting helmet system certification and flight testing.

2.0 REFERENCE DOCUMENTS

1. Visually-Coupled Acquisition and Targeting System (VCATS) System Requirements Document (SRD), F41624-93-R-6024, Pages 75 - 120, December 11, 1997.
2. High Voltage Quick-Disconnect Connector Harness System for Air Force Helmet Mounted Displays, UDR-TR-93-131.
3. Quick-Disconnect Harness System Test Procedure, UDR-TR-93-128.
4. VCATS Interface Control Document, Interconnect, W5, Module V Specification 105640
5. Annual Book of American Society for Testing and Materials (ASTM) Standards Section 15 (1997). E 691, F 319-91, F 801-96, F 943-90, F 1165-88, F 1181-86, F 1252-89, F1316-90.
6. Pinkus, A. and Task, H. L. (1997). The Effects of Aircraft Transparencies on Night Vision Goggle-Mediated Visual Acuity. *SAFE Symposium 1997*, Sep 8-10, pp. 93-104.

3.0 REQUIREMENTS

3.1 Exploratory Development and Research



3.1.1 Research Program Plan

3.1.1.1 The contractor shall develop a research program plan to support the development and evaluation of VDR. The goal of the research program shall be to investigate fundamental issues involved in the development and evaluation of VDR.

3.1.1.2 The contractor shall support the development of protocols supporting the use of human subjects. The protocol shall reflect the nature of the experimentation to be done, any safety implications of research facilities or experimental methods, general descriptions of research facility capability and characteristics.

3.1.1.3 The contractor shall monitor ongoing technical developments in the area of VDR. The contractor shall maintain a program plan such that it accurately reflects current research lines within the program, progress of the research program, significant accomplishments, and anticipated facility and resource requirements. (CDRL A001, A004)

3.1.1.4 The contractor shall support, develop, and evaluate helmet mounted display symbology for day and night missions in all weather conditions.

3.1.2 Experimental Plans

The contractor shall develop experimental plans for each experiment. Experiment plans shall include detail specification of specific experimental manipulations to be performed, specific measures of performance to be obtained, resource requirements, operating tolerances, analysis techniques to be employed, technical support requirements, and subject requirements. Experimental plans shall be submitted to the government for coordination. (CDRL A001, A004)

3.1.3 Research

The contractor shall collect pre-experimental data to assure that the facility is operating within tolerance specified in the experimental plan and the procedures can be implemented accurately. Following verification of experimental plans, the contractor shall collect the experimental data. The contractor shall conduct appropriate descriptive and inferential statistical analyses using the experimental data. The contractor shall prepare graphical, pictorial, and tabular summaries of the statistical analyses, and shall prepare written documentation in the form of technical reports. (CDRL A001, A005)

3.2 VDR Development and Facility Operations

3.2.1 VDR Hardware and Software Development

The contractor shall design, fabricate, integrate, document, test, and/or subcontract support to maintain, modify, or develop VDR hardware and software. (CDRL A001, A002, A003, A005)

3.2.2 Helmet Vehicle Interface

The contractor shall develop and fabricate improvements for the helmet vehicle interface. The contractor shall develop hardware solutions for biodynamic interference suppression for helmet mounted displays. The contractor shall provide documentation on any developed or upgraded hardware or software. (CDRL A001, A002, A003, A005)

3.2.3 Cockpit Control Panel

The contractor shall design, fabricate, and integrate a new cockpit control panel (CCP) for integration into the Strike Helmet 21 platform. The new CCP must be able to work in a military aircraft environment. The contractor shall provide documentation on any developed or upgraded hardware or software. (CDRL A001, A002, A003, A005)

3.2.4 Facility Operation and Maintenance

The contractor shall maintain and operate the Helmet-Mounted Systems Technologies/Visually-Coupled Systems (HMST/VCS), Night Vision Operations, and the Visual Image Evaluation of Windscreens Laboratories and facilities. The systems shall be put under configuration control. Equipment failures shall be recorded by the contractor and maintained in an automated record log. Recalibration of facility equipment and repair shall be performed or subcontracted by the contractor. Performance of the repaired equipment shall be measured by the contractor to ensure requirement satisfaction. Test equipment required for recalibration and measurement shall be acquired by the contractor. The documentation will include operating procedures and will be updated after any modifications are made. (CDRL A002, A003, A005)

3.3 Helmet Testing

The contractor shall assist the HMST program in supporting helmet testing and safety-of-flight certification. The contractor shall provide support to flight certification and safety tests at WPAFB, and remote military and contractor test facilities.

3.4 Management

The contractor shall document progress and provide financial status of the effort. (CDRL A001, A002)

Public reporting burden for this collection of information is estimated to average 220 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503. Please DO NOT RETURN your form to either of these addresses. Send completed form to the Government Issuing Contracting Officer for the Contract/PR No. listed in Block E.

A. CONTRACT LINE ITEM NO. 0001		B. EXHIBIT A		C. CATEGORY: N/A REP: DOD 5010.12-1 AMSDL TDP _____ TM _____ OTHER _____			
D. SYSTEM/ITEM PROJECT 7184/DO. 0007			E. CONTRACT/PR NO. F33615-98-D-6000/0007		F. CONTRACTOR SYTRONICS, INC		
1. DATA ITEM NO. A002	2. TITLE OF DATA ITEM STATUS REPORT			3. SUBTITLE VDR For Strike Helmet 21			
4. AUTHORITY (Data Acquisition Document No.) DI-MGMT-80368/T			5. CONTRACT REFERENCE SOW Para 3.2.1; 3.2.2; *		6. REQUIRING OFFICE AFRL/HECV		
7. DD 250 REQ LT	9. DIST STATEMENT REQUIRED C	10. FREQUENCY ASREQ	12. DATE OF FIRST SUBMISSION See Blk 16	14. DISTRIBUTION			
8. APP CODE N/A		11. AS OF DATE 0	13. DATE OF SUBSEQUENT SUBMISSION See Blk 16	a. ADDRESSEE	b. COPIES		
16. REMARKS Blk 4 - Tailored to allow contractor's format and to delete Block 10, para 10.2.2.3. * 3.2.3; 3.4 Blk 12/13 - ASREQ means to document the status of this effort.				AFRL/HECV	Draft	Final	
					0	1	0
15. TOTAL				0	1	0	
G. PREPARED BY TANYA S. ELLIFRITT AFRL/HECV, (937) 255-7589		H. DATE 31-MAY-00	I. APPROVED BY <i>Tanya S. Ellifritt</i> Data Manager Det 1 AFRL/WSPT		J. DATE 01-JUN-00		

17. PRICE GROUP
18. ESTIMATED TOTAL PRICE

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE
U - CPFF

PAGE OF PAGES
1 of 3

2. AMENDMENT/MODIFICATION NO.
05

3. EFFECTIVE DATE

4. REQUISITION/PURCHASE REQ.NO.
SEE SCHEDULE

5. PROJECT NO. (If applicable)

6. ISSUED BY AFRL/MLKH CODE

FA8650

7. ADMINISTERED BY (If other than Item 6)

CODE

S3605A

USAF/AFMC
AIR FORCE RESEARCH LABORATORY
2310 EIGHTH STREET, BUILDING 167
WRIGHT-PATTERSON AFB OH 45433-7801
JEANETTE ZIMMER 937-656-9046
jeanette.zimmer@wpafb.af.mil

DCMA DAYTON
AREA C BUILDING 30
1725 VAN PATTON DRIVE
WRIGHT-PATTERSON AFB OH 45433-5302

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code)

SYTRONICS, INC
4433 DAYTON-XENIA ROAD, BUILDING 1
DAYTON OH 45432
(937) 431-6110

MAILING DATE

DEC 30 2002

(X)

9A. AMENDMENT OF SOLICITATION NO.

9B. DATED (SEE ITEM 11)

10A. MODIFICATION OF CONTRACT/ORDER NO.

F33615-98-D-6000 0008

10B. DATED (SEE ITEM 13)

03 JUL 2002

X

CODE 1EE69

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

12. ACCOUNTING AND APPROPRIATION DATA (if required)
SEE SCHEDULE

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

(X)

A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: () THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. ITEM 10A.

B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation data, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).

C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:

X D. OTHER (Specify type of modification and authority)
Limitation of Funds Clause, FAR 52.232-22

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.)

SUBJECT: Incremental Funding
CHANGE IN PRICE: None
CHANGE IN OBLIGATION: \$73,600.00(Increase)

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)

15A. NAME AND TITLE OF SIGNER (Type or print)

JEANETTE ZIMMER
Contracting Officer

15B. CONTRACTOR/OFFEROR

15C. DATE SIGNED

16B. UNITED STATES OF AMERICA

16C. DATE SIGNED

(Signature of person authorized to sign)

(Signature of Contracting Officer)

1. Pursuant to FAR 52.232-22 Limitation of Funds, this modification increases the funds allotted to this delivery order by \$73,600.00.

2. As a result of the above, this delivery order is hereby specifically modified as follows:

a. SECTION B - SUPPLIES OR SERVICES:

5352.232-9001 Implementation of Limitation of Funds (AFMC) (JUL 1997)

(a) The sum allotted to this Delivery Order and available for payment of costs under CLINs 0001-0005 through 28 Feb 2003 in accordance with the clause in Section I entitled Limitation of Funds and contractor's emails dated 05 Dec 2002 and 27 Dec 2002, incorporated herein by reference, is \$876,187.00, an increase of \$73,600.00 from \$802,587.00.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
000108	CLIN Establish <i>Noun:</i> <i>ACRN:</i>	Funding Info Only AJ	+55,200.00
000109	CLIN Establish <i>Noun:</i> <i>ACRN:</i>	Funding Info Only AK	+18,400.00

c. SECTION G - CONTRACT ADMINISTRATION/PAYMENT DATA:

ACRN	Appropriation/Lmt Subhead/Supplemental Accounting Data	Obligation Amount
AJ	ACRN Establish 5733600 293 47A8 627184 6HCP00 02040 62202F 503000 F03000 <i>New ACRN Amount:</i> \$55,200.00 <i>Funding breakdown:</i> On CLIN 000108: +\$55,200.00 <i>PR/MIPR:</i> GWSHE037201005 \$55,200.00 <i>Descriptive data:</i> PR COMPLETE Additional Information for 000805 \$32,200 is for JON 71840863 \$23,000 is for JON 71840864	\$55,200.00
AK	ACRN Establish 5733600 293 47A8 625024 6HCP00 02040 62500F 503000 F03000 <i>New ACRN Amount:</i> \$18,400.00 <i>Funding breakdown:</i> On CLIN 000109: +\$18,400.00 <i>PR/MIPR:</i> GWSHE037201005 \$18,400.00 JON: 71840868 <i>Descriptive data:</i> PR COMPLETE	\$18,400.00

3. All other terms and conditions remain unchanged.

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE
U - CPFF

PAGE OF PAGES
1 of 3

2. AMENDMENT/MODIFICATION NO.
04

3. EFFECTIVE DATE
FA8650

4. REQUISITION/PURCHASE REQ.NO.

5. PROJECT NO. (if applicable)

6. ISSUED BY AFRL/MLKH CODE

7. ADMINISTERED BY (If other than Item 6) CODE S3605A

USAF/AFMC
AIR FORCE RESEARCH LABORATORY
2310 EIGHTH STREET, BUILDING 167
WRIGHT-PATTERSON AFB OH 45433-7801
JEANETTE ZIMMER 937-656-9046
jeanette.zimmer@wpafb.af.mil

BCMA DAYTON
AREA C BUILDING 30
1725 VAN PATTON DRIVE
WRIGHT-PATTERSON AFB OH 45433-5302

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code)

SYTRONICS, INC
4433 DAYTON-XENIA ROAD, BUILDING 1
DAYTON OH 45432
(937) 431-6110

MAILING DATE
DEC 30 2002

9A. AMENDMENT OF SOLICITATION NO.

9B. DATED (SEE ITEM 11)

10A. MODIFICATION OF CONTRACT/ORDER NO.
F33615-98-D-6000 0008

10B. DATED (SEE ITEM 13)
03 JUL 2002

CODE 1EE69 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 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

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

(X) A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: () THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. ITEM 10A.

B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation data, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).

C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:

X D. OTHER (Specify type of modification and authority)
Limitation of Funds Clause, FAR 52.232-22

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.)

SUBJECT: Incremental Funding Change and Administrative Change
CHANGE IN PRICE: None
CHANGE IN OBLIGATION: \$44,448.00 (Decrease)

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 SIGNER (Type or print)	
		JEANETTE ZIMMER Contracting Officer	
15B. CONTRACTOR/OFFEROR	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA	16C. DATE SIGNED
			30 Dec 2002
(Signature of person authorized to sign)		 (Signature of Contracting Officer)	

1a. Pursuant to FAR 52.232-22 Limitation of Funds, this modification decreases the funds allotted to this delivery order by \$44,448.00.

b. In addition, this modification corrects administrative errors made by Government personnel in the processing of P000803 that were inadvertent in nature and not intended to be binding by either party. The corrections are evidenced in the deletion of ACRNs AF, AG and AH. The date shown below in the Implementation of Limitation of Funds clause remains unchanged due to the fact that P000805 will be immediately processed to add an additional increment of funds.

2. As a result of the above, this delivery order is hereby specifically modified as follows:

a. SECTION B - SUPPLIES OR SERVICES:

5352.232-9001 Implementation of Limitation of Funds (AFMC) (JUL 1997)

(a) The sum allotted to this Delivery Order and available for payment of costs under CLINs 0001-0005 through 28 Feb 2003 in accordance with the clause in Section I entitled Limitation of Funds and contractor's email dated 05 Dec 2002, incorporated herein by reference, is \$802,587.00, a decrease of \$44,448.00 from \$847,035.00.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
000105	CLIN Deletion ACRN: AF		
000106	CLIN Deletion ACRN: AG		
000107	CLIN Deletion ACRN: AH		

c. SECTION G - CONTRACT ADMINISTRATION/PAYMENT DATA:

ACRN	Appropriation/Lmt Subhead/Supplemental Accounting Data	Obligation Amount
AF	ACRN Deletion 57 33600 293 47A8 627184 6HCVOO 02050 62202F 503000 F03000 New ACRN Amount: \$.00	
AG	ACRN Deletion 57 33600 293 47A8 627184 6HCP00 02040 62202F 503000 F03000 New ACRN Amount: \$.00	
AH	ACRN Deletion 57 33600 293 47A8 625024 6HCP00 02040 62500F 503000 F03000 New ACRN Amount: \$.00	

3. All other terms and conditions remain unchanged.

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE
U - CPFF

PAGE OF PAGES
1 of 3

2. AMENDMENT/MODIFICATION NO.
03

3. EFFECTIVE DATE

4. REQUISITION/PURCHASE REQ. NO.
SEE SCHEDULE

5. PROJECT NO. (if applicable)

6. ISSUED BY AFRU/MLKH CODE

FA8650

7. ADMINISTERED BY (if other than Item 6)

CODE

S3605A

USAF/AFMC
AIR FORCE RESEARCH LABORATORY
2310 EIGHTH STREET, BUILDING 167
WRIGHT-PATTERSON AFB OH 45433-7801
JEANETTE M. ZIMMER 937-656-9046
jeanette.zimmer@wpafb.af.mil

DCMA DAYTON
AREA C BUILDING 30
1725 VAN PATTON DRIVE
WRIGHT-PATTERSON AFB OH 45433-5302

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code)

SYTRONICS, INC
4433 DAYTON-XENIA ROAD, BUILDING 1
DAYTON OH 45432
(937) 431-6110

MAILING DATE

DEC 11 2002

(X)

9A. AMENDMENT OF SOLICITATION NO.

9B. DATED (SEE ITEM 11)

10A. MODIFICATION OF CONTRACT/ORDER NO.

F33615-98-D-6000 0008

10B. DATED (SEE ITEM 13)

03 JUL 2002

CODE 1EE69

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

12. ACCOUNTING AND APPROPRIATION DATA (if required)

SEE SCHEDULE

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

(X)

A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: () THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. ITEM 10A.

B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation data, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).

C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:

X D. OTHER (Specify type of modification and authority)
Limitation of Funds Clause, FAR 52.232-22

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.)

SUBJECT: Incremental Funding
CHANGE IN PRICE: None
CHANGE IN OBLIGATION: \$44,448.00(increase)

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 SIGNER (Type or print)

JAMES DAVID BOX
Contracting Officer

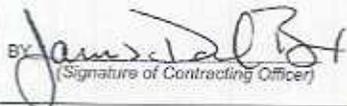
15B. CONTRACTOR/OFFEROR

15C. DATE SIGNED

16B. UNITED STATES OF AMERICA

16C. DATE SIGNED

(Signature of person authorized to sign)

BY 
(Signature of Contracting Officer)

9 Dec 02

1. Pursuant to FAR 52.232-22 Limitation of Funds, this modification increases the funds allotted to this delivery order by \$44,448.00.

2. As a result of the above, this delivery order is hereby specifically modified as follows:

a. SECTION B - SUPPLIES OR SERVICES:

5352.232-9001 Implementation of Limitation of Funds (AFMC) (JUL 1997)

(a) The sum allotted to this Delivery Order and available for payment of costs under CLINs 0001-0005 through 28 Feb 2003 in accordance with the clause in Section I entitled Limitation of Funds and contractor's email dated 05 Dec 2002, incorporated herein by reference, is \$847,035.00, an increase of \$44,448.00 from 802,587.00.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
000105	CLIN Establish Noun: ACRN:	Funding Info Only AF	+\$38,048.00
000106	CLIN Establish Noun: ACRN:	Funding Info Only AG	+\$4,800.00
000107	CLIN Establish Noun: ACRN:	Funding Info Only AH	+\$1,600.00

c. SECTION G - CONTRACT ADMINISTRATION/PAYMENT DATA:

ACRN	Appropriation/Lmt Subhead/Supplemental Accounting Data	Obligation Amount
AF	ACRN Establish 57 33600 293 47A8 627184 6HCVOO 02050 62202F 503000 F03000 New ACRN Amount: \$38,048.00 Funding breakdown: On CLIN 000105: +\$38,048.00 PRIMIPR: GWSHE037201023 \$38,048.00 JON: 71841119 Descriptive data: PR COMPLETE	\$38,048.00

ACRN	Appropriation/Lmt Subhead/Supplemental Accounting Data	Obligation Amount
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AG	ACRN Establish 57 33600 293 47A8 627184 6HCP00 02040 62202F 503000 F03000 New ACRN Amount: \$4,800.00 Funding breakdown: On CLIN 000106: +\$4,800.00 PRIMIPR: GWSHE037201023 \$4,800.00 JON: 71840863 Descriptive data: PR COMPLETE Additional Information for P0003 \$2,800 is for JON 71840863 \$2,000 is for JON 71840864	\$4,800.00
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AH	ACRN Establish 57 33600 293 47A8 625024 6HCP00 02040 62500F 503000 F03000 New ACRN Amount: \$1,600.00 Funding breakdown: On CLIN 000107: +\$1,600.00 PRIMIPR: GWSHE037201023 \$1,600.00 JON: 71840868	\$1,600.00
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3. All other terms and conditions remain unchanged.

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT				1. CONTRACT ID CODE U - CPFF	PAGE OF PAGES 1 of 3		
2. AMENDMENT/MODIFICATION NO. 02		3. EFFECTIVE DATE		4. REQUISITION/PURCHASE REQ.NO. SEE SCHEDULE		5. PROJECT NO. (If applicable)	
6. ISSUED BY AFRL/MLKH CODE		FA8650		7. ADMINISTERED BY (If other than Item 6)		CODE S3605A	
USAF/AFMC AIR FORCE RESEARCH LABORATORY 2310 EIGHTH STREET, BUILDING 167 WRIGHT-PATTERSON AFB OH 45433-7801 JEANETTE M. ZIMMER 937-656-9046 jeanette.zimmer@wpafb.af.mil				DCMA DAYTON AREA C BUILDING 30 1725 VAN PATTON DRIVE WRIGHT-PATTERSON AFB OH 45433-5302			
8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code)						9A. AMENDMENT OF SOLICITATION NO.	
SYTRONICS, INC 4433 DAYTON-XENIA ROAD, BUILDING 1 DAYTON OH 45432 (937) 431-6110						(X)	
MAILING DATE SEP 27 2002						9B. DATED (SEE ITEM 11)	
						10A. MODIFICATION OF CONTRACT/ORDER NO. F33615-98-D-6000 0008	
CODE 1EE69		FACILITY CODE		10B. DATED (SEE ITEM 13)		03 JUL 2002	
11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS							
<input type="checkbox"/> The above numbered solicitation is amended as set forth in item 14. The hour and date specified for receipt of 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 completing items 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.							
12. ACCOUNTING AND APPROPRIATION DATA (If required) SEE SCHEDULE							
13. THIS ITEM APPLIES ONLY TO MODIFICATION OF CONTRACTS/ORDERS, IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.							
(X)							
A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: () THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. ITEM 10A.							
B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation data, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).							
C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:							
X D. OTHER (Specify type of modification and authority) Limitation of Funds Clause, FAR 52.232-22							
E. IMPORTANT: Contractor <input checked="" type="checkbox"/> is not, <input type="checkbox"/> is required to sign this document and return _____ copies to the issuing office.							
14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.) SUBJECT: Incremental Funding CHANGE IN PRICE: None CHANGE IN OBLIGATION: \$278,937 (increase)							
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)				15A. NAME AND TITLE OF SIGNER (Type or print)			
				JAMES DAVID BOX Contracting Officer			
15B. CONTRACTOR/OFFEROR		15C. DATE SIGNED		16B. UNITED STATES OF AMERICA		16C. DATE SIGNED	
(Signature of person authorized to sign)				BY  (Signature of Contracting Officer)		27 Sep 02	

1. Pursuant to FAR 52.232-22 Limitation of Funds, this modification increases the funds allotted to this delivery order by \$278,937.00.

2. As a result of the above, this delivery order is hereby specifically modified as follows:

a. SECTION B - SUPPLIES OR SERVICES:

5352.232-9001 Implementation of Limitation of Funds (AFMC) (JUL 1997)

(a) The sum allotted to this Delivery Order and available for payment of costs under CLINs 0001-0005 through 31 Dec 2002 in accordance with the clause in Section I entitled Limitation of Funds and contractor's email dated 27 Sep 2002, incorporated herein by reference, is \$802,587.00, an increase of \$278,937.00 from 523,650.00.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
000101	CLIN Change Noun: ACRN:	Funding Info Only AA	+\$37,303.00
000102	CLIN Change Noun: ACRN:	Funding Info Only AC	+\$236,787.00
000103	CLIN Establish Noun: ACRN:	Funding Info Only AD	+\$1,423.00
000104	CLIN Establish Noun: ACRN:	Funding Info Only AE	+\$3,424.00

c. SECTION G - CONTRACT ADMINISTRATION/PAYMENT DATA:

ACRN	Appropriation/Lmt Subhead/Supplemental Accounting Data	Obligation Amount
AA	ACRN Change 57 23600 292 4762 644637 1P1267 59200 63790F 503000 F03000 New ACRN Amount: \$215,953.00 Funding breakdown: On CLIN 000101: +\$37,303.00 PR/MIPR: GWSHE02721152 \$37,303.00 Descriptive data: PR COMPLETE Reference: AF Form 616 HIAC0002710006 dated 01 Apr 2002	+\$37,303.00

ACRN	Appropriation/Lmt Subhead/Supplemental Accounting Data	Obligation Amount
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AC	ACRN Change 57 23600 292 47A8 627184 6HCP00 02040 62202F 503000 F03000	+\$236,787.00
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New ACRN Amount:	\$311,787.00	
Funding breakdown:	On CLIN 000102:	+\$236,787.00
PRIMIPR:	GWSHE027201157	\$70,969.00
	GWSHE027201150	\$165,818.00

JON: 71840868
Descriptive data:

PR Complete

Additional Information for 000802:

JON 71840862-\$3,720.00
JON 71840863-\$20,559.00
JON 71840864-\$36,928.00
JON 71840865-\$175,580

AD	ACRN Establish 57 23600 292 47A8 691999 6HC000 59200 000000 503000 F03000	\$1,423.00
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New ACRN Amount:	\$1,423.00	
Funding breakdown:	On CLIN 000103:	+\$1,423.00
PRIMIPR:	GWSHE027201149	\$1,423.00

JON: 718408DA
Descriptive data:
PR COMPLETE

AE	ACRN Establish 57 23600 292 47A8 627184 6HCA00 02010 62202F 503000 F03000	\$3,424.00
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New ACRN Amount:	\$3,424.00	
Funding breakdown:	On CLIN 000104:	+\$3,424.00
PRIMIPR:	GWSHE027201151	\$3,424.00

JON: 71840865
Descriptive data:
PR COMPLETE

3. All other terms and conditions remain unchanged.

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE
U - CPFF

PAGE OF PAGES
1 of 4

2. AMENDMENT/MODIFICATION NO.
01

3. EFFECTIVE DATE
FA8650

4. REQUISITION/PURCHASE REQ. NO.
SEE SCHEDULE

5. PROJECT NO. (If applicable)

6. ISSUED BY AFRL/MLKH CODE

7. ADMINISTERED BY (If other than Item 6) CODE S3605A

USAF/AFMC
AIR FORCE RESEARCH LABORATORY
2310 EIGHTH STREET, BUILDING 167
WRIGHT-PATTERSON AFB OH 45433-7801
JEANETTE M. ZIMMER 937-656-9046
jeanette.zimmer@wpafb.af.mil

DCMA DAYTON
AREA C BUILDING 30
1725 VAN PATTON DRIVE
WRIGHT-PATTERSON AFB OH 45433-5302

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code)

SYTRONICS, INC
4433 DAYTON-XENIA ROAD, BUILDING 1
DAYTON OH 45432
(937) 431-6110

MAILING DATE
AUG 06 2002

(X) 9A. AMENDMENT OF SOLICITATION NO.

9B. DATED (SEE ITEM 11)

X 10A. MODIFICATION OF CONTRACT/ORDER NO.
F33615-98-D-6000 0008

10B. DATED (SEE ITEM 13)
03 JUL 2002

CODE 1EE69 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 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (if required)
SEE SCHEDULE

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

(X) A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: () THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. ITEM 10A.

B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation data, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).

C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:

X D. OTHER (Specify type of modification and authority)
Limitation of Funds Clause, FAR 52.232-22

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.)

SUBJECT: Incremental Funding and Establishment of CLIN 0005
CHANGE IN PRICE: None
CHANGE IN OBLIGATION: \$345,000.00 (increase)

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 SIGNER (Type or print)
JAMES DAVID BOX
Contracting Officer

15B. CONTRACTOR/OFFEROR

15C. DATE SIGNED

16B. UNITED STATES OF AMERICA

16C. DATE SIGNED

(Signature of person authorized to sign)

BY  Signature of Contracting Officer

5 AUG 02

1a. Pursuant to FAR 52.232-22 Limitation of Funds, this modification increases the funds allotted to this delivery order by \$345,000.00. In accordance with the contractor's email dated 01 Aug 2002, the additional funding is expected to cover performance through 30 Sep 2002. The contractor's email is incorporated herein by reference.

b. In addition, this modification establishes CLIN 0005 and SubCLIN 0005AA as shown herein.

2. As a result of the above paragraphs, this delivery order is hereby specifically modified as follows:

a. SECTION B - SUPPLIES OR SERVICES:

5352.232-9001 Implementation of Limitation of Funds (AFMC) (JUL 1997)

(a) The sum allotted to this Delivery Order and available for payment of costs under CLINs 0001-0005 through 30 Sep 2002 in accordance with the clause in Section I entitled Limitation of Funds, is \$523,650.00, an increase of \$345,000.00 from \$178,650.00.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
0001	CLIN Change		EST \$1,229,747.00 EST -\$270,000.00
		Lot	
	<i>Noun:</i>	RESEARCH AND DATA	
	<i>Total Quantity:</i>	1	
	<i>New Total Item Amount:</i>	\$1,229,747.00	
	<i>ACRN:</i>	9	
	<i>NSN:</i>	N - Not Applicable	
	<i>DD1423 is Exhibit:</i>	A	
	<i>Contract type:</i>	U - COST PLUS FIXED FEE	
	<i>Inspection:</i>	DESTINATION	
	<i>Acceptance:</i>	DESTINATION	
	<i>FOB:</i>	DESTINATION	
	<i>Descriptive Data:</i>		
	Conduct Research in accordance with Attachment 1 to Section J, Statement of Work (SOW), entitled "Research for Multi-Sensory Interfaces to Optimize Warfighter Performance," dated 06 May 2002.		
	Deliver data in accordance with Exhibit A, Contract Data Requirements List, DD Form 1423, dated 01 Apr 2002.		

OPERATIONS AND MAINTENANCE (O&M) 3400

000102	CLIN Establish		
	<i>Noun:</i>	Funding Info Only	
	<i>ACRN:</i>	AC	+\$75,000.00

OPERATIONS AND MAINTENANCE (O&M) 3400

0005	CLIN Establish		
	<i>Noun:</i>	O&M IN SUPPORT OF RESEARCH AND DEVELOPMENT	
	<i>NSN:</i>	N - Not Applicable	
	<i>DD1423 is Exhibit:</i>	A	
	<i>Descriptive Data:</i>		
	The contractor shall conduct research in accordance with the specific SOWs detailed in the SubCLINs.		

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
------	----------------------	-------------------	---------------------------------

OPERATIONS AND MAINTENANCE (O&M) 3400

0005AA	CLIN Establish	1 Lot	EST \$270,000.00 EST \$270,000.00
	<i>Noun:</i>	O&M (3400) R&D IN SUPPORT OF USAFWS/RA	
	<i>ACRN:</i>	AB	
	<i>NSN:</i>	N - Not Applicable	
	<i>DD1423 is Exhibit:</i>	A	
	<i>Contract type:</i>	U - COST PLUS FIXED FEE	
	<i>Inspection:</i>	DESTINATION	
	<i>Acceptance:</i>	DESTINATION	
	<i>FOB:</i>	DESTINATION	
	<i>Descriptive Data:</i>		

The contractor shall conduct research in accordance with Section J, Attachment 2, Statement of Work paragraph 3.1.4.1. The contractor shall deliver data in accordance with Section J, Exhibit A, the Contract Data Requirements List, DD Form 1423, dated 18 May 1998.

b. SECTION F - DELIVERIES OR PERFORMANCE:

ITEM	SUPPLIES SCHEDULE DATA	QTY	SHIP TO	MARK FOR	TRANS PRI	DATE
0005AA		1	FA8650			30 Dec 2002
	<i>Noun:</i>		O&M (3400) R&D IN SUPPORT OF USAFWS/RA			
	<i>ACRN:</i>		AB			

c. SECTION G - CONTRACT ADMINISTRATION/PAYMENT DATA:

ACRN	Appropriation/Lmt Subhead/Supplemental Accounting Data	Obligation Amount
AB	ACRN Establish 57 23400 302 7821 37132X 010000 59200 27417F 667100 FB4852	\$270,000.00
	<i>New ACRN Amount:</i> \$270,000.00	
	<i>Funding breakdown:</i> On CLIN 0005AA: +\$270,000.00	
	<i>PRIMIPR:</i> GWSHE027201124 \$270,000.00	
	<i>JON:</i> 71840865	
	<i>Descriptive data:</i>	
	Reference AF 616 #000000S2260106 Dated 24 Apr 2002 and Chg 001 dated 28 May 2002	
	PR Complete	

ACRN	Appropriation/Lmt Subhead/Supplemental Accounting Data	Obligation Amount
AC	ACRN Establish 57 23600 292 47A8 627184 6HCP00 02040 62202F 503000 F03000 New ACRN Amount: \$75,000.00 Funding breakdown: On CLIN 000102: +\$75,000.00 PR/MIPR: GWSHE027201131 \$75,000.00 JON: 71840868 Descriptive data: PR Complete	\$75,000.00

d. SECTION J - ATTACHMENTS/EXHIBITS is modified to incorporate Attachment 2, SOW paragraph 3.1.4.1.

3. All other terms and conditions remain unchanged.

STATEMENT OF WORK PARAGRAPH 3.1.4.1
Delivery Order 0008
Contract F33615-98-D-6000

This work paragraph will be new work under paragraph 3.1.4 Developmental Research

This contractual effort will be used to transfer technology resident at the Air Force Research Laboratory to both industry and the Government. Specifically, to transfer a spatial audio capability to the communications system upgrade being considered by the 98th Operations Support Squadron that will be located in the Range Control facility at Nellis AFB, NV. In addition, to transfer the same capability to the AWACS System Program Office, by way of their prime contractor, the Boeing Company, Kent, WA. This effort will prototype human interfaces within a realistic man-in-the-loop simulation facility, using technology developed at the Research Laboratory as well as commercially available, off-the-shelf hardware.

ORDER FOR SUPPLIES OR SERVICES

1. CONTRACT/PURCH ORDER/AGREEMENT NO. F33615-98-D-6000	2. DELIVERY ORDER/ CALL NO. 0008	3. DATE OF ORDER/CALL (YYYYMMDD)	4. REQUISITION/PURCH REQUEST NO. SEE SCHEDULE	5. PRIORITY DO-C9
---	-------------------------------------	-------------------------------------	--	----------------------

6. ISSUED BY AFRL/MLKH, - USAF/AFMC AIR FORCE RESEARCH LABORATORY 2310 EIGHTH STREET, BUILDING 167 WRIGHT-PATTERSON AFB OH 45433-7801 JEANETTE M. ZIMMER 937-656-9046 jeanette.zimmer@wpafb.af.mil	CODE FA8650	7. ADMINISTERED BY (if Other than 6) DCMA DAYTON AREA C BUILDING 30 1725 VAN PATTON DRIVE WRIGHT-PATTERSON AFB OH 45433-5302	CODE S3605A	8. DELIVERY FOB <input checked="" type="checkbox"/> DESTINATION <input type="checkbox"/> OTHER <small>(See Schedule F other)</small>
--	----------------	--	----------------	---

9. CONTRACTOR NAME AND ADDRESS SYTRONICS, INC 4433 DAYTON-XENIA ROAD, BUILDING 1 DAYTON OH 45432 (937) 431-6110	CODE 1EE69	FACILITY	10. DELIVER TO FOB POINT BY (Date) (YYYYMMDD) SEE SCHEDULE	11. X IF BUSINESS IS <input checked="" type="checkbox"/> SMALL <input type="checkbox"/> SMALL DISADVANTAGED WOMEN-OWNED
MAILING DATE JUL 10 2002			12. DISCOUNT ITEMS N	
			13. MAIL INVOICES TO ADDRESS IN BLOCK SEE BLOCK 15 (PAYMENT OFFICE)	

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

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

SYTRONICS, Inc.	<i>B L Myers</i> SIGNATURE	BARRETT L. MYERS, President	03 July 2002 DATE SIGNED (YYYYMMDD)
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If this box is marked, supplier must sign Acceptance and return the following number of copies: 1

17. ACCOUNTING AND APPROPRIATION DATA/LOCAL USE
SEE SCHEDULE

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

24. UNITED STATES OF AMERICA	<p><i>James David Box</i> BY: JAMES DAVID BOX</p> <p style="text-align: right;">3 July 02 CONTRACTING/ORDERING OFFICER</p>	25. TOTAL \$1,499,747.00
<p><small>*If quantity accepted by the Government is same as quantity ordered, indicate by X. If different, enter actual quantity accepted below quantity ordered, and encircle.</small></p>		29. DIFFERENCES

26. QUANTITY IN COLUMN 20 HAS BEEN <input type="checkbox"/> INSPECTED <input type="checkbox"/> RECEIVED <input type="checkbox"/> ACCEPTED, AND CONFORMS TO THE CONTRACT EXCEPT AS NOTED	27. SHIP NO.	28. D.O. VOUCHER NO.	30. INITIALS
DATE SIGNATURE AND TITLE OF AUTHORIZED GOVERNMENT REPRESENTATIVE	<input type="checkbox"/> PARTIAL	32. PAID BY	33. AMOUNT VERIFIED CORRECT FOR
	<input type="checkbox"/> FINAL		
36. I CERTIFY THIS ACCOUNT IS CORRECT AND PROPER FOR PAYMENT. DATE SIGNATURE AND TITLE OF CERTIFYING OFFICER	<input type="checkbox"/> COMPLETE	34. CHECK NUMBER	35. BILL OF LADING
	<input type="checkbox"/> PARTIAL		
	<input type="checkbox"/> FINAL		

37. RECEIVED AT	38. RECEIVED BY (Print)	39. DATE RECEIVED (YYYYMMDD)	40. TOTAL CONTAINERS	41. S/R ACCOUNT NO.	42. S/R VOUCHER NO.
-----------------	-------------------------	------------------------------	----------------------	---------------------	---------------------

1. In accordance with the provisions of the Basic Contract and this Delivery Order, the contractor shall accomplish the effort described in the attached Statement of Work (SOW) entitled Research for Multi-Sensory INTERfaces to Optimize Warfighter Performance, dated 06 May 2002. The total amount of this delivery order that is not to be exceeded is \$1,499,747.00.

a. SECTION B - SUPPLIES OR SERVICES:

1. 5352.216-9001 PAYMENT OF FEE (AFMC) (CPFF)(JUL1997)

The estimated cost and fee for this delivery order are shown below. The applicable fixed fee set forth below may be increased or decreased only by negotiation and modification of the contract delivery order for added or deleted work. As determined by the contracting officer, it shall be paid as it accrues, in regular installments based upon the percentage of completion of work.

Estimated Cost: \$1,401,633.00
 Fixed Fee: \$98,114.00

2. 5352.232-9001 IMPLEMENTATION OF LIMITATION OF FUNDS (AFMC) (JUL 1997)

(a) The sum allotted to this contract delivery order and available for payment of costs under CLINs 0001-0003 through 31 Dec 2002 in accordance with the clause in Section I entitled "Limitation of Funds" and contractor email dated 02 Jul 2002, incorporated herein by reference, is \$166,144.00.

(b) In addition to the amount allotted under the "Limitation of Funds" clause, the additional amount of \$12,506.00 is obligated for payment of fee for work completed under CLINs 0001-0003.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
0001		1 Lot	EST \$1,499,747.00 EST \$1,499,747.00
	<i>Noun:</i>	RESEARCH AND DATA	
	<i>ACRN:</i>	9	
	<i>NSN:</i>	N - Not Applicable	
	<i>DD1423 is Exhibit:</i>	A	
	<i>Contract type:</i>	U - COST PLUS FIXED FEE	
	<i>Inspection:</i>	DESTINATION	
	<i>Acceptance:</i>	DESTINATION	
	<i>FOB:</i>	DESTINATION	
	<i>Descriptive Data:</i>		
	Conduct Research in accordance with Attachment 1 to Section J, Statement of Work (SOW), entitled "Research for Multi-Sensory Interfaces to Optimize Warfighter Performance," dated 06 May 2002.		
	Deliver data in accordance with Exhibit A, Contract Data Requirements List, DD Form 1423, dated 01 Apr 2002.		
000101			
	<i>Noun:</i>	Funding Info Only	
	<i>ACRN:</i>	AA	\$178,650.00

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
0002	<p><i>Noun:</i> SOFTWARE</p> <p><i>ACRN:</i> U</p> <p><i>NSN:</i> N - Not Applicable</p> <p><i>Contract type:</i> U - COST PLUS FIXED FEE</p> <p><i>Inspection:</i> DESTINATION</p> <p><i>Acceptance:</i> DESTINATION</p> <p><i>FOB:</i> DESTINATION</p> <p><i>Descriptive Data:</i> Deliver software in accordance with the attached SOW dated 06 May 2002.</p>	1 Lot	NSP NSP

0003	<p><i>Noun:</i> HARDWARE</p> <p><i>ACRN:</i> U</p> <p><i>NSN:</i> N - Not Applicable</p> <p><i>Contract type:</i> U - COST PLUS FIXED FEE</p> <p><i>Inspection:</i> DESTINATION</p> <p><i>Acceptance:</i> DESTINATION</p> <p><i>FOB:</i> DESTINATION</p> <p><i>Descriptive Data:</i> Deliver hardware in accordance with the attached SOW dated 06 May 2002.</p>	1 Lot	NSP NSP
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b. SECTION F - DELIVERIES OR PERFORMANCE:

ITEM	SUPPLIES SCHEDULE DATA	QTY	SHIP TO	MARK FOR	TRANS PRI	DATE
0001	<p><i>Noun:</i> RESEARCH AND DATA</p> <p><i>ACRN:</i> 9</p> <p><i>Descriptive Data:</i> The scheduled delivery date for the approved final technical report is 23 months after mailing date. All data shall be delivered in accordance with Exhibit A, Contract Data Requirements List, DD Form 1423, dated 01 Apr 2002. The technical effort must be completed no later than 19 months after mailing date.</p>	1	FA8650		23	MARO
0002	<p><i>Noun:</i> SOFTWARE</p> <p><i>ACRN:</i> U</p> <p><i>Descriptive Data:</i> The scheduled delivery date for computer software is 19 months after mailing date.</p>	1	FY1456		19	MARO

ITEM	SUPPLIES SCHEDULE DATA	QTY	SHIP TO	MARK FOR	TRANS PRI	DATE
0003		1	FY1456			19 MARO

Noun: HARDWARE
ACRN: U

Descriptive Data:

The scheduled delivery date for hardware is 19 months after mailing date.

c. SECTION G - CONTRACT ADMINISTRATION DATA:

ACRN	Appropriation/Lmt Subhead/Supplemental Accounting Data	Obligation Amount
AA	57 23600 292 4762 644637 1P1267 59200 63790F 503000 F03000 <i>Funding breakdown:</i> On CLIN 000101: \$178,650.00 <i>PRIMIPR:</i> GWSHE027201103 \$178,650.00 <i>Descriptive data:</i> PR COMPLETE AF Form 616 HIAC0002710006, DATED 01 APR 2002	\$178,650.00

d. SECTION J - LIST OF ATTACHMENTS:

LIST OF ATTACHMENTS

DOCUMENT	PGS	DATE	TITLE
EXHIBIT A	12	01 APR 2002	CONTRACT DATA REQUIREMENTS LISTS (CDRLS)
ATTACHMENT 1	11	06 MAY 2002	STATEMENT OF WORK ENTITLED RESEARCH MULTI-SENSORY INTERFACES TO OPTIMIZE WARFIGHTER PERFORMANCE

CONTRACT DATA REQUIREMENTS LIST
(1 Data Item)

F Approved
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 220 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503. Please DO NOT RETURN your form to either of these addresses. Send completed form to the Government Issuing Contracting Officer for the Contract/PR No. listed in Block E.

A. CONTRACT LINE ITEM NO. 0001		B. EXHIBIT A		C. CATEGORY: N/A REF: DOD 5010.12-1 AMSDL TDP _____ TM _____ OTHER _____				
D. SYSTEM/ITEM 7184CH22			E. CONTRACT/PR NO. F33615-98-D-600010		F. CONTRACTOR SYTRONICS, INC			
1. DATA ITEM NO. A007	2. TITLE OF DATA ITEM COMPUTER SOFTWARE DEVELOPMENT			3. SUBTITLE				
4. AUTHORITY (Data Acquisition Document No.) DI-IPSC-80942			5. CONTRACT REFERENCE Sec C Para. 3.1.4; 3.2.1		6. REQUIRING OFFICE AFRL/HECP			
7. DD 250 REQ LT	9. DIST STATEMENT REQUIRED B	10. FREQUENCY ASREQ	12. DATE OF FIRST SUBMISSION ASREQ	14. DISTRIBUTION				
8. APP CODE A		11. AS OF DATE ASREQ	13. DATE OF SUBSEQUENT SUBMISSION ASREQ R/ASR	15. TOTAL				
16. REMARKS Tailored to allow contractor format. ASREQ means as required to document the computer software development under this contract, submit as generated. Approval/disapproval by letter from the Air Force Program Manager within 30 days after receipt. Disapproval requires correction/resubmission within 30 days after receipt of Air Force comments. R/ASR means revisions as required to maintain up to date and accurate drawings and lists. Revisions are subject to the approval cycle as stated.				a. ADDRESSEE	b. COPIES			
				AFRL/HBCP	Draft	Final	Reg	Repro
					1	1	0	
G. PREPARED BY RONALD E. JONES AFRL/HECP, (937) 255-7687				H. DATE 01-APR-02	I. APPROVED BY Katherine Regland Data Manager Det 1 AFRL/WSPT	J. DATE 01-APR-02		

17. PRICE GROUP

18. ESTIMATED TOTAL PRICE

CONTRACT DATA REQUIREMENTS LIST
(1 Data Item)

F Approved
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 220 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503. Please DO NOT RETURN your form to either of these addresses. Send completed form to the Government Issuing Contracting Officer for the Contract/PR No. listed in Block E.

A. CONTRACT LINE ITEM NO. 0001		B. EXHIBIT A	C. CATEGORY: N/A REF: DOD 5010.12-1 AMSDL TDP _____ TM _____ OTHER _____					
D. SYSTEM/ITEM 7184CH22		E. CONTRACT/PR NO. F33615-98-D-600010	F. CONTRACTOR SYTRONICS, INC					
1. DATA ITEM NO. A009	2. TITLE OF DATA ITEM STATUS REPORT		3. SUBTITLE LABOR COST					
4. AUTHORITY (Data Acquisition Document No.) DI-MGMT-80368/T		5. CONTRACT REFERENCE Sec C Para. 3.2.4		6. REQUIRING OFFICE AFRL/HECP				
7. DD 250 REQ LT	8. DIST STATEMENT REQUIRED B	10. FREQUENCY SEMI-MONTHLY	12. DATE OF FIRST SUBMISSION *	14. DISTRIBUTION				
8. APP CODE N/A	11. AS OF DATE *	13. DATE OF SUBSEQUENT SUBMISSION *	a. ADDRESSEE					
16. REMARKS Tailored to allow contractor's format and to delete Block 10, para 10.2.2.3. * Submit on the 15th and the last day of the month, except when the final report is due to be submitted, then omit this item.				b. COPIES				
				Draft		Final		
					Reg	Repro		
				ADMN/ACO	0	1	0	
				AFRL/CO	0	1	0	
				AFRL/HECP	0	1	0	
				AFRL/HEP	0	1	0	
15. TOTAL				0	4	0		
G. PREPARED BY RONALD E. FAYTES AFRL/HECP		H. DATE 01-APR-02	I. APPROVED BY Kathleen E. Baglad Data Manager Det 1 AFRL/WSPT		J. DATE 01-APR-02			

17. PRICE GROUP
18. ESTIMATED TOTAL PRICE

INSTRUCTIONS FOR COMPLETING DD FORM 142

(See DoD 5010.12-M for detailed instructions.)

FOR GOVERNMENT PERSONNEL

- Item A. Self-explanatory.
- Item B. Self-explanatory.
- Item C. Mark (X) appropriate category: TDP - Technical Data Package; TM - Technical Manual; Other - other category of data, such as "Provisioning," "Configuration Management", etc.
- Item D. Enter name of system/item being acquired that data will support.
- Item E. Self-explanatory (to be filled in after contract award).
- Item F. Self-explanatory (to be filled in after contract award).
- Item G. Signature of preparer of CDRL.
- Item H. Date CDRL was prepared.
- Item I. Signature of CDRL approval authority.
- Item J. Date CDRL was approved.
- Item 1. See DoD FAR Supplement Subpart 4.71 for proper numbering.
- Item 2. Enter title as it appears on data acquisition document cited in Item 4.
- Item 3. Enter subtitle of data item for further definition of data item (optional entry).
- Item 4. Enter Data Item Description (DID) number, military specification number, or military standard number listed in DoD 5010.12-L (AMSDL), or one-time DID number, that defines data content and format requirements.
- Item 5. Enter reference to tasking in contract that generates requirement for the data item (e.g., Statement of Work paragraph number).
- Item 6. Enter technical office responsible for ensuring adequacy of the data item.
- Item 7. Specify requirement for inspection/acceptance of the data item by the Government.
- Item 8. Specify requirement for approval of a draft before preparation of the final data item.
- Item 9. For technical data, specify requirement for contractor to mark the appropriate distribution statement on the data (ref. DoDD 5230.24).
- Item 10. Specify number of times data items are to be delivered.
- Item 11. Specify as-of-data item, when applicable.
- Item 12. Specify when first submittal is required.
- Item 13. Specify when subsequent submittals are required, when applicable.
- Item 14. Enter addressees and number of draft/final copies to be delivered to each addressee. Explain reproducible copies in Item 16.
- Item 15. Enter total number of draft/final copies to be delivered.
- Item 16. Use for additional/clarifying information for Items 1 through 15. Examples are: Tailoring of documents cited in Item 4; Clarification of submittal dates in Items 12 and 13; Explanation of reproducible copies in Item 14; Desired medium for delivery of the data item.

FOR THE CONTRACTOR

Item 17. Specify appropriate price group from one of the following groups of effort in developing estimated prices for each data item listed on the DD Form 1423.

a. Group I. Definition - Data which is not otherwise essential to the contractor's performance of the primary contracted effort (production, development, testing, and administration) but which is required by DD Form 1423.

Estimated Price - Costs to be included under Group I are those applicable to preparing and assembling the data item in conformance with Government requirements, and the administration and other expenses related to reproducing and delivering such data items to the Government.

b. Group II. Definition - Data which is essential to the performance of the primary contracted effort but the contractor is required to perform additional work to conform to Government requirements with regard to depth of content, format, frequency of submittal, preparation, control, or quality of the data item.

Estimated Price - Costs to be included under Group II are those incurred over and above the cost of the essential data item without conforming to Government requirements, and the administrative and other expenses related to reproducing and delivering such data item to the Government.

c. Group III. Definition - Data which the contractor must develop for his internal use in performance of the primary contracted effort and does not require any substantial change to conform to Government requirements with regard to depth of content, format, frequency of submittal, preparation, control, and quality of the data item.

Estimated Price - Costs to be included under Group III are the administrative and other expenses related to reproducing and delivering such data item to the Government.

d. Group IV. Definition - Data which is developed by the contractor as part of his normal operating procedures and his effort in supplying these data to the Government is minimal.

Estimated Price - Group IV items should normally be shown on the DD Form 1423 at no cost.

Item 18. For each data item, enter an amount equal to that portion of the total price which is estimated to be attributable to the production or development for the Government of that item of data. These estimated data prices shall be developed only from those costs which will be incurred as a direct result of the requirement to supply the data, over and above those costs which would otherwise be incurred in performance of the contract if no data were required. The estimated data prices shall not include any amount for rights of data. The Government's right to use the data shall be governed by the pertinent provisions of the contract.

STATEMENT OF WORK
Delivery Order 0008

Research for Multi-Sensory Interfaces to Optimize Warfighter Performance
6 May 2002

DESCRIPTION OF WORK

1.0. **SCOPE.** The purpose of this effort is to provide research and sustainment for the on-going development and evaluation of intelligent multi-sensory interface concepts and technologies employing combinations of virtual and non-virtual techniques. The programs supported by this research include Advanced Unmanned Air Vehicle Interfaces, Virtual Air Commanders, Real-Time Human Engineering for Unmanned Combat Air Vehicle Automation, and Crew Interfaces for Satellite Operations. The laboratories that support these program areas are described in the attachment referred to in paragraph 2.2.

2.0. **APPLICABLE DOCUMENTS**

- 2.1. MIL M-38784C Manual, Technical, General Style and Format Requirements
- 2.2. Interface Research Facilities – Attachment 1
- 2.3. US/Australian Virtual Air Commander Summary Statement of Intent

3.0. **REQUIREMENTS**

- 3.1. Research Plans
 - 3.1.1. Research Program Planning

3.1.1.1. The contractor shall develop a research program plan for the development and evaluation of intelligent interface technology, multi-sensory virtual interfaces and synthetic environments. The contractor shall plan the investigation of fundamental issues involved in the development and evaluation of intelligent interfaces and the construction of operating interfaces, which demonstrate characteristics of these issues. The contractor shall investigate research issues which include, but are not limited to, multi-sensory interactions in supporting human performance, integration of multi-sensory information to facilitate flight control and tele-operation, perception of dynamic orientation, design and evaluation of multi-sensory cockpit interfaces, development and evaluation of real-time models of human perception, cognition, and control performance, development and evaluation of direct and in-direct measurement of operator state, and affects of closing the loop between the operator and system using adaptive algorithms which dynamically modify characteristics of displayed information and control device-to-modality linkages. The contractor shall document, in technical reports, conference proceedings, and journal articles, the results of this research, along with research conducted in support of other programs. The contractor shall maintain a report of journal article submissions and publications, update the report monthly, and make it easily accessible to the Government.

F33615-98-D-6000 DO 0008

ATTACHMENT 1

Page 1 of 11

3.1.1.2. The contractor shall monitor ongoing technical developments in the area of virtual interfaces and synthetic environments. The contractor shall maintain the program plan such that it accurately reflects current research lines within the program, progress of the research program, significant accomplishments, anticipated facility and resource requirements, and projected research products. The contractor shall submit the research program plan to the Government for coordination on a regular basis. (CDRL Data Item #s A001 and A002)

3.1.1.3. The contractor shall develop protocols for the use of human subjects in support of the programs listed in paragraph 1.0. The objective of the protocols is to characterize the nature of the experimentation to be done, identify any safety implications of research facilities or experimental methods, and describe the research facility capability and characteristics. (CDRL Data Item # A002)

3.1.2. Experimental Plans

The contractor shall develop an overall research program plan to coordinate the use of experimental facilities and other resources as well as to establish procedures for planning experiments, determining the number of subjects needed, and estimating costs and schedule requirements. The contractor shall track the cost and schedule for individual experiments and shall consolidate this tracking into rolled-up research areas for management review. The contractor shall develop individual experimental plans for each experiment conducted in support of the programs listed in paragraph 1.0. The contractor shall develop the experimental plans to include detailed specification of specific experimental manipulations to be performed, specific measures of human performance to be obtained, specific facility requirements and operating tolerances, analysis techniques to be employed, technical requirements, and subject requirements. The contractor shall submit individual experimental plans to the government for coordination. (CDRL Data Item # A002)

3.1.3. Experimental Research

The contractor shall collect pre-experimental pilot data to assure that the facilities are operating within tolerances specified in the experimental plan and that experimental procedures can be implemented accurately. Following verification of pre-experimental pilot data, the contractor shall collect experimental data using subjects from the contractor's subject pool or Government supplied subjects. The contractor shall conduct appropriately descriptive and inferential statistical analyses using experimental data. The contractor shall perform statistical analyses using graphical, pictorial, and tabular summaries; shall document in detail those analyses, and shall brief and present research finding and results. The contractor shall also attend conferences and symposia and present the results of experimental research as required to transition research results to other Government, industrial, and academic institutions. (CDRL Data Item #s A002, A003, and A004)

3.1.4. Developmental Research

The contractor shall develop crew system interface hardware and software (in the form of prototypes, conceptual demonstrations, models, and simulations) as specified in laboratory research plans. These items shall initially be documented in a form that identifies and describes the hardware and software requirements specifications. The contractor shall use the specification documents to design, fabricate, implement, code, and install the items in laboratory and field environments. The contractor shall test the prototypes, demonstrations, models, and simulations for their capability to improve the planning, design, development, and operation of Air Force and human systems. The contractor shall report technical research. The contractor shall develop briefings and presentations of human factors research and sustaining efforts to include, but not be limited to, graphics, animation, multimedia, and photographic elements. The contractor shall attend conferences and symposia and present the results of developmental research as required to transition research results to other Government agencies, industry, and academic institutions. (CDRL Data Item #s A002, A003, A004, A005, and A006)

3.2. Research Facility Sustainment

3.2.1. As required by the research programs listed in paragraph 1.0, the contractor shall provide all engineering and related effort necessary to effect and document changes to existing research facilities or to integrate new and unique components which will enhance research goals, improve equipment reliability, increase productivity, enhance flexibility, or improve fidelity. (CDRL Data Item # A005)

3.2.2. The contractor shall supply all consumable materials required for uninterrupted research. The contractor shall provide equipment and materials needed for testing, inspection, calibration, repair, upgrading, or integration when such equipment is not already part of existing inventory and is required to conduct or enhance research.

3.2.3. During the conduct of research, the contractor shall operate, maintain, and calibrate the research equipment in compliance with maintenance, operating, and calibration procedures.

3.2.4. As necessary to sustain the on-going research program, the contractor shall code, upgrade, test, debug, calibrate, maintain, and document the software required for conducting laboratory research, experimentation, concept demonstrations, simulation, and data reduction and analysis. (CDRL Data Item #s A006 and A007)

3.2.5. The contractor shall incorporate new hardware components, software products, and new functional capabilities consistent with the contract research requirements.

3.2.7. The contractor shall provide a pool of people to serve as research subjects in various simulations and laboratory experiments in support of programs listed in paragraph 1.0. The contractor shall provide screening, scheduling and training of subjects for human performance experiments.

3.5 Virtual Air Commander Development

For the US/Australian Virtual Air Commander Project Arrangement, as depicted in paragraph 2.3 of this SOW, the contractor shall research and develop adaptive and immersive multi-modal interfaces. The contractor shall acquire equipment, software and sustain the development and delivery of systems required under the MOU. The contractor shall conceptualize interface designs, analyze their potential effectiveness, fabricate prototypes, and evaluate their ability to increase performance of future weapon systems. The contractor shall document, in technical reports, journal articles, and conference proceedings, the resulting interfaces and their subsequent evaluations. The contractor shall produce and submit an experimental plan to be reviewed by the Government in support of this MOU. The contractor shall integrate Australian-developed equipment or concepts in the HEC laboratory facilities.

3.5.1 Systems engineering

The contractor shall perform systems engineering to include, but not be limited to, computer architecture design, acquisition, installation, integration, systems documentation, and systems and configuration management as required within the experimental plan. Systems designed and developed shall be documented. The contractor shall provide configuration management plans and hardware and software specifications for interacting with representative of the Australian Government. For periodic briefings held between the Government and representatives of the Australian Government, the contractor shall prepare briefings and participate in technical discussions both in the US and in Australia. (CDRL Data Item #s A003, A004, A005, and A006)

3.5.2 Hardware development

The contractor shall develop, acquire and integrate hardware required to implement the Virtual Air Commander flight simulations, both in the US and in Australia, as described in paragraph 2.3 document of this SOW and the experimental plan. The contractor shall install and interface helmet mounted displays, magnetic helmet tracking systems, and auditory display equipment. The contractor shall document all developed or modified hardware to be transferred to the Australian Government through appropriate channels. (CDRL Data Item #s A002 and A005)

3.5.3 Software development

The contractor shall develop, acquire and integrate software required to implement the Virtual Air Commander flight simulations, both in the US and in Australia, as described in paragraph 2.3 of this SOW and the experimental plan. The contractor shall validate and verify the operation and correctness of all software produced by developing acceptance test procedures for each individual device as well as overall system performance. The contractor shall document all developed or modified software to be transferred to the Australian Government through appropriate channels. (CDRL Data Item #s A002, A006, and A007)

3.5.4 Collaborative research plan

The Contractor shall develop a joint research plan with Australian Government agencies to support the goals of the Virtual Air Commander Project Arrangement as described in paragraph 2.3 document of this SOW. The contractor shall interact on a regular basis

with the appropriate Australian Government personnel to establish research plans and timelines, generate experimental designs, collect experimental data, perform joint data analyses, coordinate experimental work, and co-author and present papers. (CDRL Data Item #s A002, A003, and A004)

3.5.5 System installation in Australia

In compliance with the US/Australian research plan, the contractor shall travel to designated facilities and install and maintain the equipment and software. The contractor shall document any enhancements and upgrades to the installed hardware and software. The contractor shall train representatives of the Australian Government regarding the modification and operation of the adaptive and immersive interface devices and systems. (CDRL Data Item #s A002, A005, and A007)

3.5.6 Interface design

The contractor shall conceptualize, prototype, evaluate, and document immersive, adaptive interface alternatives as required to support the experimental plan. The contractor shall analyze each alternative to the greatest extent possible for performance and implementation characteristics. The contractor shall document in briefings, journal articles, conference proceedings, and technical reports these design alternatives. With Government approval and using existing laboratory facilities, the contractor shall demonstrate individual adaptive interface concepts. The contractor shall integrate these individual interface concepts into existing interface configurations when appropriate. (CDRL Data Item #s A003, A004, A005, and A006)

3.3. Management of Effort

The contractor shall document progress and financial status of the above efforts in compliance with Delivery Order 0001, Paragraph 3.3. In addition, the contractor shall maintain a network-based reporting of resource allocation and utilization for cost, equipment, and personnel. This report shall be accessible by the Government, serve as a tool for review of project costs and schedule, and support development of cost and schedule recovery plans. (CDRL Data Item #s A008, A009 and A010)

AFRL/HEC Laboratories and Facilities

Advanced UAV Interface Defense Technology Objective.....	1
Crew Interfaces for Satellite Operations Laboratory.....	2
Flight Psychophysiology Laboratory.....	3
Human Sensory Feedback Laboratory.....	4
Synthesized and Human Aerospace Forces in an Immersion Research Environment.....	5

1. Advanced UAV Interface Defense Technology Objective
POC: Maj Mark Draper, PhD, AFRL/HECP

a. Description: With increased prevalence and sophistication of unmanned air vehicles (UAV) comes the critical problem of how these vehicles are to be controlled. In designing an optimal interface to support UAV operations, a basic and essential issue is the dimensionality of the display, ranging from two-dimensional (2-D) displays to flat perspective view displays and beyond to multi-sensory, 3-D immersive displays promoting "virtual presence." Initially, this DTO will focus on enhancements to the existing Predator Ground Station by incorporating improved human factors engineering of existing interfaces and incorporation of immersive and 3-D perspective technologies. Ultimately, this DTO will develop and evaluate perspective view and immersive interface concepts supporting future unmanned vehicles. This advanced human-machine interface will reduce operator workload, increase operator situational awareness (SA), and measurably improve overall system performance in current and future UAVs. Located in Bldg33, Room 120.

b. Equipment/Facilities:

- 1) 10" Color CRT Monitors (PC)
- 2) 17" Color CRT Monitors (PC)
- 3) Dual 750 MHz Pentium III PC
- 4) Dual 600 MHz Pentium III PC
- 5) 1000 MHz Pentium III PC
- 6) 600 MHz Pentium III PC
- 7) 333 MHz Pentium II PC
- 8) 233 MHz Pentium II PC
- 9) Quadra 800 Apple Computer, 14" Color Monitor (Apple)
- 10) Telex IC-1F intercom units
- 11) SONY LDI-100B Glasstron HMD & Controller
- 12) Panasonic VHS VCR, Immersion Corp Force Feedback Control Stick
- 13) Scan Do Ultra Video Converter
- 14) SN 008 3-D Localization System (Veridian)
- 15) Kaiser ProView Stereo HMD & Controller

- 16) 10" Color CRT Monitors (PC)
- 17) 17" Color CRT Monitors (PC)
- 18) Dual 1.2 GHz Pentium IV PC
- 19) 128 MB Video Cards (GForce3 - PC)
- 20) 21" CRT Color Flat screen Monitors (PC)
- 21) Video Mixer
- 22) Audio Mixer
- 23) Headphones
- 24) Microphones

2. Crew Interfaces for Satellite Operations Laboratory
POC: June J. Skelly, PhD, AFRL/HECP

a. Description: In the Air Force operational satellite control environment, there is currently a dearth of operator centered design emphasis, i.e., workstation/control center designs based on sound Human Machine Interface (HMI) principles of cognitive science. Specifically, AF satellite control centers are currently equipped with 1960's level technology and HMI designs that largely ignore: (1) human information processing capabilities/limitations; (2) steadily increasing operator workload as a function of added task complexity associated with supporting both old and new satellite missions, and tighter time constraints. The current solution for ensuring fail-safe satellite control operations is the redundancy built in to the system in terms of manpower. However, recently, the Air Force Space Command has advocated: (1) reduction in overall manpower support to control centers; (2) redesign of satellite controller's workstations with an emphasis on efficiency; and (3) massive upgrades to the AF Space Network nodes to accommodate the current increase in satellite missions, as well as new mission CONOPS. Therefore, we have entered into a collaborative arrangement to address these issues with the Center for Research Support (CERES) at Schriever AFB. We plan both on-site research efforts at the CERES facility and in-house research to explore advanced interface technology solutions to these issues. We plan to develop new HMI enabling technologies and to transfer our existing technologies where appropriate, to meet the unique needs/requirements of space operations and the current AF emphasis on automating these systems. Located in Bldg33, Room 023.

b. Equipment/Facilities

- 1) Cat Mid Tower Enlight
- 2) MBX Intel AGP Vid&Aud
- 3) CPK P-11
- 4) SDRAM OC133 256MB
- 5) CDRW Plextor
- 6) CDI Asus 52x
- 7) Disc Drive Teac Floppy
- 8) West Dig 60GB IDE
- 9) Keyboard Keytronic
- 10) MS Intel Optic Mouse
- 11) Monitor 20.1" Viewsonic

- 12) SPK Yamaha Speakers
- 13) OPS MS Windows 2000
- 14) SOF MS Office Pro XP
- 15) Toshiba Satellite Pro
- 16) Monitor Port Replicator
- 17) 3-button scroll mouse
- 18) Keyboard
- 19) Carrying case
- 20) 17" add-on touch screen
- 21) Visual Basic 6.0 Pro

3. Flight Psychophysiology Laboratory
POC: Glenn Wilson, PhD, AFRL/HECP

a. Description: The lab conducts research using psychophysiological measures to investigate operator state. Mental workload is of primary concern. Laboratory, simulator and flight environments are used. It is a well-accepted principle of design that human capabilities and limitations, task demands, and environmental constraints must be addressed during weapon system development. However, with on-going changes in: (1) the composition and skill-mix of the warfighter population, (2) the environments in which warfighters must operate, and (3) the operational tempo of the battlefield, a human engineering process that occurs 7-10 years before a system is fielded will not adequately account for changing demands on the warfighter. A potential solution is to continually adapt the weapons system to warfighter capabilities and limitations, task demands, and environmental constraints, i.e., to implement human engineering as a real-time process. Technology to enable this process will be developed under this workunit. The application focus for this work will be uninhabited combat air vehicles (UCAV). Specifically, we will develop real-time operator functional state assessment tools to assist with the implementation and control of UCAV automation. The objective will be to minimize required UCAV system manning, while ensuring that workload and performance remain within acceptable levels. Located in Bldg 33, Room 229.

b. Equipment/Facilities:

- 1) Standard psychophysiological equipment, including amplifiers for up to 64 channels of EEG
- 2) Data collection and analysis computers (PCs)
- 3) Stimulus presentation computers
- 4) Ambulatory recorders worn by simulator and flight subjects to collect data
- 5) UCAV simulation devices and operator interfaces

4. Human Sensory Feedback Laboratory
POC: Daniel Repperger, PhD, AFRL/HECP

a. Description: The present studies in the Human Sensory Feedback (HSF) Laboratory in building 441 include teleoperation investigations with humans in the presence of time delays. We manipulate displays (direct view, camera views, and virtual

reality views) to see if humans can perform tasks at a remote location when having to deal with time delays. This supports space related efforts investigating how to clean a mirror in a space based laser application. The MERLIN system was used to perform the cleaning operation of a space based laser. The virtual reality display was developed in Open GL architecture. The FREFLEX robotic system has been used to investigate how forces exerted back on the human operator can modify his biodynamic response in the performance of certain tasks. For the work being accomplished in the HSF Laboratory in building 33, the motion chair device was used to investigate means of injecting haptic (force reflecting signals) into a joystick as well as into the motion of the chair device. For the pneumatic muscle system, several faculty members presently work on this system to better understand the means of controlling such a device through feedback principals. In addition, the MEMS (Micro Electrical Mechanical Systems) are used to sense feedback and to help control the pneumatic muscle system as well as in other applications in which it is desired to measure force and temperature at remote and distant locations involving humans in certain biodynamic tasks. Located in Bldg. 248, Room 340 and Bldg 441, Room 1-120.

b. Equipment/Facilities:

- 1) A lateral moving motion chair for studies involving tracking and haptic interfaces. (33)
- 2) A haptic (force-reflecting joystick) attached to the motion chair. (33)
- 3) A 3 degree of freedom force reflecting Phantom (haptic interface). (33)
- 4) A second force-reflecting joystick (Immersion Inc.) that we use for studying supervisory control and interaction of subjects with a haptic interface. (33)
- 5) A pneumatic muscle test station is used to study pneumatic muscle technology and feedback means of controlling such a device. (33)
- 6) A large, haptic stick (Engineering Matters), which is being tested for UCAV applications. (33)
- 7) MEMS (Micro Electro Mechanical System) devices to measure pressure, temperature, and force. (33)
- 8) An antenna array system to collect data from the MEMS systems. (33)
- 9) About 5 computers are used to support some of the above electrical and mechanical systems. (33)
- 10) A MERLIN 6 degree of freedom robot is used to demonstrate teleoperation scenarios.(441)
- 11) A FREFLEX is a 7-degree-of-freedom robotic force reflecting interface device that investigates modulation of force in interaction with humans.
- 12) Controllers for the MERLIN, UNIX systems computers, and 2 additional PCs support the operation of the MERLIN and the FREFLEX.

5. Synthesized and Human Aerospace Forces in an Immersive Research Environment
POC: Mike Haas, PhD, AFRL/HECP

a. Description: The Synthesized and Human Aerospace Forces in an Immersive Research Environment (SAFIRE) is a state-of-the-art virtual environment research

facility whose mission is to develop and evaluate advanced, multi-sensory virtual interfaces for future United States Air Force crewstations. The facility consists of several autonomous research stations that can support individual research efforts or be combined to form a multi-participant virtual environment. The SAFIRE is a general-purpose research environment that can be configured to support applied research regarding the design of advanced human-vehicle interfaces, including aircraft and ground vehicles. It can also be configured to support more fundamental research on multi-sensory perception and human performance in virtual environments. One research station within the SAFIRE is the Fusion Interfaces for Tactical Environments (FITE) research station that includes standard F-16 controls and an array of six eight-inch liquid crystal head-down displays. This Project Arrangement, under the US/Australian Co-Operative and Collaborative Research Development and Engineering Agreement (CCRDE), supports a joint exploratory and advanced demonstration program pursuing the design, development, and evaluation of a class of crew station concepts common to Airborne Early Warning and Control (AEWC) aircraft, air-to-ground strike aircraft, and ground-based Uninhabited Combat Air Vehicle (UCAV) control stations. The Virtual Air Commanders Project Arrangement involves two Governmental organizations, the Human Effectiveness Directorate of the Air Force Research Laboratory and the Aeronautical and Maritime Research Laboratory, Defense Science and Technology Organisation (DSTO), Australia. The products of this effort will include: (1) Quantification of potential benefits arising from the application of advanced control and display technologies to the AWACS platform, (2) advanced virtual crew system demonstrators for AEWC aircraft, ground-based UCAV applications, and air-to-ground strike aircraft, and (3) risk reduction for the acquisition community concerning the utilization and requirements for virtual control and display devices used within AWACS, UCAV, and Common Space Interfaces. SAFIRE supports a broad range of human factors engineering research efforts geared toward the development of future-generation, multi-sensory crewstations. The human factors engineering research program includes: Joint development of advanced crew-station concepts with French and British scientists and engineers; Development of pilot-vehicle interface concepts which adapt in real-time to the pilot's state of workload and situation awareness; Integration of physiological measures of workload to optimize information display in real time; Integration of alternative control technologies including brain-actuated control and eye line-of-sight control; Development of haptic feedback information to facilitate vehicular control; and Evaluation of advanced crewstation interface concepts by means of multi-participant simulated air combat scenarios. SAFIRE is currently supporting an international, cooperative research and development program with the French government. This work is geared toward the development of an advanced multi-sensory suite of fighter cockpit displays and controls utilizing technology developed by United States and French manufacturers. Once completed, SAFIRE will contain the only joint U.S./French fighter cockpit in the United States. The success of this project has led to a proposed international cooperative initiative with the United Kingdom. Located in Bldg 33, Room 1001.

b. Equipment/Facilities:

SAFIRE

- 1) A 40-foot diameter dome which includes a high-resolution, large field-of-view (70 degrees vertical by 150 degrees horizontal) interactive visual display
- 2) Silicon Graphics Onyx computer image generator drives the SAFIRE dome display.
- 3) Auditory displays capable of presenting simulated three-dimensional, externalized sound information
- 4) Electro-hydraulic control loader system to provide augmented haptic cueing information

FITE crewstation

- 1) Three-dimensional auditory cueing
- 2) Haptic cueing provided by an electro-hydraulic control loader system
- 3) Tactical all-aspect helmet mounted display

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE
U - CPFF

PAGE OF PAGES
1 of 3

2. AMENDMENT/MODIFICATION NO. 02	3. EFFECTIVE DATE FA8650	4. REQUISITION/PURCHASE REQ.NO. SEE SCHEDULE	5. PROJECT NO. (If applicable)
6. ISSUED BY AFRL/MLKH CODE	7. ADMINISTERED BY (If other than Item 6) DCMA DAYTON AREA C BUILDING 30 1725 VAN PATTON DRIVE WRIGHT-PATTERSON AFB OH 45433-8302	CODE	S3605A

USAF/AFMC
AIR FORCE RESEARCH LABORATORY
2310 EIGHTH STREET, BUILDING 167
WRIGHT-PATTERSON AFB OH 45433-7801
JEANETTE M. ZIMMER 937-656-9046
jeanette.zimmer@wpafb.af.mil

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code) SYTRONICS, INC 4433 DAYTON-XENIA ROAD, BUILDING 1 DAYTON OH 45432 (937) 431-6110	(X)	9A. AMENDMENT OF SOLICITATION NO.
		9B. DATED (SEE ITEM 11)
	X	10A. MODIFICATION OF CONTRACT/ORDER NO. F33615-98-D-6000 0010
		10B. DATED (SEE ITEM 13) 26 JUN 2002

MAILING DATE
DEC 12 2002

CODE 1EE69 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 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. **FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER.** If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required)
SEE SCHEDULE

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

(X)	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: () THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. ITEM 10A.
	B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation data, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
	C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
X	D. OTHER (Specify type of modification and authority) Limitation of Funds Clause, FAR 52.232-22

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.)
SUBJECT: Incremental Funding
CHANGE IN PRICE: None
CHANGE IN OBLIGATION: \$643,632.00 Increase

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 SIGNER (Type or print) JAMES DAVID BOX Contracting Officer
15B. CONTRACTOR/OFFEROR	16B. UNITED STATES OF AMERICA
15C. DATE SIGNED	16C. DATE SIGNED 6 Dec 02

(Signature of person authorized to sign)

BY  (Signature of Contracting Officer)

3. All other terms and conditions remain unchanged.

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

 1. CONTRACT ID CODE
U - CPFF

 PAGE OF PAGES
1 of 3

 2. AMENDMENT/MODIFICATION NO.
01

3. EFFECTIVE DATE

 4. REQUISITION/PURCHASE REQ. NO.
SEE SCHEDULE

5. PROJECT NO. (If applicable)

 6. ISSUED BY **AFRL/MLKH** CODE

FA8650

7. ADMINISTERED BY (If other than Item 6)

CODE

S3605A
**USAF/AFMC
 AIR FORCE RESEARCH LABORATORY
 2310 EIGHTH STREET, BUILDING 167
 WRIGHT-PATTERSON AFB OH 45433-7801
 JEANETTE M. ZIMMER 937-656-9046
 jeanette.zimmer@wpafb.af.mil**
**DCMA DAYTON
 AREA C BUILDING 30
 1725 VAN PATTON DRIVE
 WRIGHT-PATTERSON AFB OH 45433-5302**

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code)

**SYTRONICS, INC
 4433 DAYTON-XENIA ROAD, BUILDING 1
 DAYTON OH 45432
 (937) 431-6110**
MAILING DATE
SEP 27 2002

(X)

9A. AMENDMENT OF SOLICITATION NO.

9B. DATED (SEE ITEM 11)

10A. MODIFICATION OF CONTRACT/ORDER NO.

F33615-98-D-6000 0010

10B. DATED (SEE ITEM 13)

26 JUN 2002

 CODE **1EE69**

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

 12. ACCOUNTING AND APPROPRIATION DATA (If required)
SEE SCHEDULE

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

- | | | |
|-----|----|--|
| (X) | A. | THIS CHANGE ORDER IS ISSUED PURSUANT TO: () THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. ITEM 10A. |
| | B. | THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation data, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b). |
| | C. | THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF: |
| X | D. | OTHER (Specify type of modification and authority)
Limitation of Funds Clause, FAR 52.232-22 |

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.)

**SUBJECT: Incremental Funding
 CHANGE IN PRICE: None
 CHANGE IN OBLIGATION: \$115,484.00 Increase**

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 SIGNER (Type or print)

**JAMES DAVID BOX
 Contracting Officer**

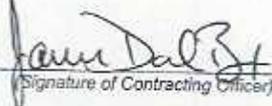
15B. CONTRACTOR/OFFEROR

15C. DATE SIGNED

16B. UNITED STATES OF AMERICA

16C. DATE SIGNED

(Signature of person authorized to sign)

 BY 
 (Signature of Contracting Officer)

27 Sep 02

1. Pursuant to the authority of the Limitation of Funds Clause 52.232-22, this modification increases the funding allocated to this delivery order by \$115,484.00

2. As a result of the above paragraph, this Delivery Order is hereby modified as follows:

a. SECTION B SUPPLIES OR SERVICES:

1. 5352.232-9001 - IMPLEMENTATION OF LIMITATION OF FUNDS (AFMC) (JUL 1997) is hereby changed to read as follows:

(a) The sum allotted to this contract Delivery Order and available for payment of costs and fee under CLINs 0001-0003 through 31 Oct 2002, in accordance with the clause in Section I entitled Limitation of Funds and contractor's email dated 26 Sep 2002, incorporated herein by reference, is increased by \$115,484.00 from \$202,854.00 to \$318,338.00.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
000103	CLIN Change Noun: ACRN:	Funding Info Only AC	+\$79,484.00
000107	CLIN Establish Noun: ACRN:	Funding Info Only AG	+\$36,000.00

b. SECTION G - CONTRACT ADMINISTRATION/PAYMENT DATA:

ACRN	Appropriation/Lmt Subhead/Supplemental Accounting Data	Obligation Amount
AC	ACRN Change 57 23600 292 47A8 691999 6HC000 59200 000000 503000 F03000 New ACRN Amount: \$138,560.00 Funding breakdown: On CLIN 000103: +\$79,484.00 PRIMIPR: GWSHE027201145 \$79,484.00 JON: 718411RB Descriptive data: PR COMPLETE	+\$79,484.00
AG	ACRN Establish 57 23600 292 47A8 627184 6HC000 02060 62202F 503000 F03000 New ACRN Amount: \$36,000.00 Funding breakdown: On CLIN 000107: +\$36,000.00 PRIMIPR: GWSHE027201153 \$36,000.00 JON: 71841117 Descriptive data: PR COMPLETE	\$36,000.00

3. All other terms and conditions remain unchanged.

1. In accordance with the provisions of the Basic Contract and this Delivery Order, the contractor shall accomplish the effort described in the attached Statement of Work (SOW) entitled Research to Support Visual Display Systems, dated 14 Mar 2002. The total amount of this delivery order that is not to be exceeded is \$1,299,841.00.

a. SECTION B - SUPPLIES OR SERVICES:

1. 5352.216-9001 PAYMENT OF FEE (AFMC) (CPFF)(JUL1997)

The estimated cost and fee for this delivery order are shown below. The applicable fixed fee set forth below may be increased or decreased only by negotiation and modification of the contract delivery order for added or deleted work. As determined by the contracting officer, it shall be paid as it accrues, in regular installments based upon the percentage of completion of work.

Estimated Cost: \$1,214,805

Fixed Fee: \$85,036

2. 5352.232-9001 IMPLEMENTATION OF LIMITATION OF FUNDS (AFMC) (JUL 1997)

(a) The sum allotted to this contract delivery order and available for payment of costs under CIINs 0001-0003 through 30 Sep 2002 in accordance with the clause in Section I entitled "Limitation of Funds" and contractor email dated 20 Jun 2002, incorporated herein by reference, is \$188,654.00.

(b) In addition to the amount allotted under the "Limitation of Funds" clause, the additional amount of \$14,200.00 is obligated for payment of fee for work completed under CLINs 0001-0003.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
0001	<p><i>Noun:</i> RESEARCH AND DATA</p> <p><i>ACRN:</i> 9</p> <p><i>NSN:</i> N - Not Applicable</p> <p><i>DD1423 is Exhibit:</i> A</p> <p><i>Contract type:</i> U - COST PLUS FIXED FEE</p> <p><i>Inspection:</i> DESTINATION</p> <p><i>Acceptance:</i> DESTINATION</p> <p><i>FOB:</i> DESTINATION</p> <p><i>Descriptive Data:</i> Conduct Research entitled "Research to Support Visual Display Systems" in accordance with Attachment 1, SOW dated 14 Mar 2001. Deliver data in accordance with Exhibit A, Contract Data Requirements List, DD Form 1423, dated 01 Apr 2002.</p>	1 Lot	\$1,299,841.00 NTE \$1,299,841.00
000101	<p><i>Noun:</i> Funding Info Only</p> <p><i>ACRN:</i> AA</p>		\$67,500.00

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
000102	<i>Noun:</i> Funding Info Only <i>ACRN:</i> AB		\$13,500.00
000103	<i>Noun:</i> Funding Info Only <i>ACRN:</i> AC		\$59,076.00
000104	<i>Noun:</i> Funding Info Only <i>ACRN:</i> AD		\$44,704.00
000105	<i>Noun:</i> Funding Info Only <i>ACRN:</i> AE		\$16,200.00
000106	<i>Noun:</i> Funding Info Only <i>ACRN:</i> AF		\$1,874.00
0002	<i>Noun:</i> SOFTWARE <i>ACRN:</i> U <i>NSN:</i> N - Not Applicable <i>Contract type:</i> U - COST PLUS FIXED FEE <i>Inspection:</i> DESTINATION <i>Acceptance:</i> DESTINATION <i>FOB:</i> DESTINATION <i>Descriptive Data:</i> Deliver software in accordance with the attached SOW dated 14 Mar 2002.	1 Lot	NSP NSP
0003	<i>Noun:</i> HARDWARE <i>ACRN:</i> U <i>NSN:</i> N - Not Applicable <i>Contract type:</i> U - COST PLUS FIXED FEE <i>Inspection:</i> DESTINATION <i>Acceptance:</i> DESTINATION <i>FOB:</i> DESTINATION <i>Descriptive Data:</i> Deliver hardware in accordance with the attached SOW dated 14 Mar 2002.	1 Lot	NSP NSP

b. SECTION F - DELIVERIES OR PERFORMANCE:

ITEM	SUPPLIES SCHEDULE DATA	QTY	SHIP TO	MARK FOR	TRANS PRI	DATE
0001		1	FA8650			23 MARO

Noun: RESEARCH AND DATA
 ACRN: 9

Descriptive Data:

The scheduled delivery date for the approved final technical report is 23 months after mailing date. All data shall be delivered in accordance with Exhibit A, Contract Data Requirements List, DD Form 1423, dated 01 Apr 2002. The technical effort must be completed no later than 19 months after mailing date.

0002		1	FY1456			19 MARO
------	--	---	--------	--	--	---------

Noun: SOFTWARE
 ACRN: U

Descriptive Data:

The scheduled delivery date for computer software is 19 months after mailing date.

0003		1	FY1456			19 MARO
------	--	---	--------	--	--	---------

Noun: HARDWARE
 ACRN: U

Descriptive Data:

The scheduled delivery date for hardware is 19 months after mailing date.

c. SECTION G - CONTRACT ADMINISTRATION DATA:

ACRN	Appropriation/Lmt Subhead/Supplemental Accounting Data	Obligation Amount
------	--	-------------------

AA		\$67,500.00
----	--	-------------

57 23600 292 47A8 627184 6HM000 00500 62202F 503000 F03000

Funding breakdown: On CLIN 000101: \$67,500.00

PRIMIPR: GWSHE027204011 \$67,500.00

JON: 71846011

Descriptive data:

PR COMPLETE

AB		\$13,500.00
----	--	-------------

97 10400 5600 X6147203326GS0AC13000000046404503000F03000

Funding breakdown: On CLIN 000102: \$13,500.00

PRIMIPR: GWSHE027201110 \$13,500.00

JON: 71841117

Descriptive data:

PR COMPLETE

AF Form 616 # HLUGFG02720016, dated 22 Apr 02

ACRN Appropriation/Lmt Subhead/Supplemental Accounting Data Obligation Amount

AC 57 23600 292 47A8 691999 6HC000 59200 000000 503000 F03000 \$59,076.00
 Funding breakdown: On CLIN 000103: \$59,076.00
 PRIMIPR: GWSHE027201108 \$59,076.00
 JON: 718411RB
 Descriptive data:
 PR COMPLETE

AD 57 23600 292 47A8 627184 6HCV00 02050 62202F 503000 F03000 \$44,704.00
 Funding breakdown: On CLIN 000104: \$44,704.00
 PRIMIPR: GWSHE02721108 \$44,704.00
 JON: 71841115
 Descriptive data:
 PR COMPLETE

AE 57 23600 292 47A8 627184 6HCB00 02020 62202F 503000 F03000 \$16,200.00
 Funding breakdown: On CLIN 000105: \$16,200.00
 PRIMIPR: GWSHE027201108 \$16,200.00
 JON: 71841118
 Descriptive data:
 PR Complete

AF 57 13600 291 47A8 627184 6HCV00 02050 62202F 503000 F03000 \$1,874.00
 Funding breakdown: On CLIN 000106: \$1,874.00
 PRIMIPR: GWSHE027201108 \$1,874.00
 JON: 71841119
 Descriptive data:
 PR Complete

d. SECTION J - LIST OF ATTACHMENTS:

LIST OF ATTACHMENTS

DOCUMENT	PGS	DATE	TITLE
EXHIBIT A - -	12	01 APR 2002	CONTRACT DATA REQUIREMENTS LISTS (CDRLS)
ATTACHMENT 1	8	14 MAR 2002	STATEMENT OF WORK ENTITLED RESEARCH TO SUPPORT VISUAL DISPLAY SYSTEMS

CONTRACT DATA REQUIREMENTS LIST (1 Data Item)

Form Approved
OM 5. 0704-0188

Public reporting burden for this collection of information is estimated to average 220 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503. Please DO NOT RETURN your form to either of these addresses. Send completed form to the Government Issuing Contracting Officer for the Contract/PR No. listed in Block E.

A. CONTRACT LINE ITEM NO. 0001		B. EXHIBIT A		C. CATEGORY: N/A REF: DOD 5010.12-1 AMSDL TDP _____ TM _____ OTHER _____	
D. SYSTEM/ITEM 7184CH22			E. CONTRACT/PR NO. F33615-98-D-600010		F. CONTRACTOR SYTRONICS, INC
1. DATA ITEM NO. A001	2. TITLE OF DATA ITEM SCIENTIFIC AND TECHNICAL REPORTS			3. SUBTITLE Final Report	
4. AUTHORITY (Data Acquisition Document No.) DI-MISC-80711A/T			5. CONTRACT REFERENCE Sec C Para. 3.1.1.1;3.1.1.2		6. REQUIRING OFFICE AFRL/HECP
7. DO 250 REQ XX	8. DIST STATEMENT REQUIRED B	10. FREQUENCY ONE/R	12. DATE OF FIRST SUBMISSION 20MAC	14. DISTRIBUTION a. ADDRESSEE AFRL/HECP b. COPIES Draft Final Reg Repro	
8. APP CODE A		11. AS OF DATE 19MAC	13. DATE OF SUBSEQUENT SUBMISSION 23MAC		
16. REMARKS <p>Tailored to require the official AFRL emblem to be placed in the upper right hand corner of the front cover with affected entries adjusted as required (AFRL will supply a copy of the emblem); Block 10, para 10.3 is clarified so that distribution to DTIC shall only be through Air Force distribution channels.</p> <p>Approval/disapproval by letter from the Air Force Program Manager within 60 days after receipt. Disapproval requires correction/resubmission within 30 days after receipt of Air Force comments.</p> <p>Draft report shall be unbound, in standard size type, double-spaced and single-sided.</p> <p>Reproducibles shall be 1). a CAMERA READY, unbound, suitable for offset reproduction, and 2). on 3.5" floppy disk (or CD-ROM, or ZIP drive disk) compatible with MS-Office for Windows, and both shall incorporate all changes made in the corrected draft. All photos shall be glossy finished. Submit the reproducible(s) with the final corrected version only.</p> <p>The contractor is reminded that the National Industrial Security Program Operating Manual, DOD 5220.22-M, Chapter 4, Paragraph 4-208 (a), dated January 1995 requires that records be maintained when documents derive classified from multiple sources.</p>					
G. PREPARED BY RONALD E. Y... AFRL/HECP, (937)255-7587				H. DATE 01-APR-02	I. APPROVED BY K... Data Manager Det 1 AFRL/WSPT
				J. DATE 01-APR-02	15. TOTAL 2 2 2

17. PRICE GROUP
18. ESTIMATED TOTAL PRICE

CONTRACT DATA REQUIREMENTS LIST (1 Data Item)

Form Approved
OM 3. 0704-0188

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A. CONTRACT LINE ITEM NO. 0001		B. EXHIBIT A	C. CATEGORY: N/A REF: DOD 5010.12-1 AMSDL TDP _____ TM _____ OTHER _____	
D. SYSTEM/ITEM 7184CH22		E. CONTRACT/PR NO. F33615-98-D-600010		F. CONTRACTOR SYTRONICS, INC
1. DATA ITEM NO. A002	2. TITLE OF DATA ITEM SCIENTIFIC AND TECHNICAL REPORTS		3. SUBTITLE Contractor's Billing Voucher	
4. AUTHORITY (Data Acquisition Document No.) DI-MISC-80711A/T		5. CONTRACT REFERENCE Sec C Para. 3.1.1.1, *		6. REQUIRING OFFICE AFRL/HECP
7. DD 250 REQ LT	8. DIST STATEMENT REQUIRED B	10. FREQUENCY MTHLY	12. DATE OF FIRST SUBMISSION **	14. DISTRIBUTION
8. APP CODE N/A		11. AS OF DATE **	13. DATE OF SUBSEQUENT SUBMISSION **	
15. REMARKS				
* 3.1.1.2; 3.1.2, 3.1.3, 3.1.4				
Tailored to require only a photocopy of the contractor's billing voucher which is prepared by the contractor to receive payment for this contract's work. Block 10, para 10.3 is clarified so that distribution to DTIC will be through Air Force distribution channels.				
** Submit with Data Item A003.				
Submit via email compatible with MS-Office for Windows.				
15. TOTAL				
				0 5 1
G. PREPARED BY RONALD E. YATES AFRL/HECP, (937)255-7587		H. DATE 01-APR-02	I. APPROVED BY <i>Ronald E. Yates</i> Data Manager Det 1 AFRL/WSPT	
			J. DATE 01-APR-02	

17. PRICE GROUP
18. ESTIMATED TOTAL PRICE

CONTRACT DATA REQUIREMENTS LIST (1 Data Item)

Approved
OM O. 0704-0188

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A. CONTRACT LINE ITEM NO. 0001		B. EXHIBIT A	C. CATEGORY: N/A REF: DOD 5010.12-1 AMSDL TDP _____ TM _____ OTHER _____	
D. SYSTEM/ITEM 7184CH22		E. CONTRACT/PR NO. F33615-98-D-600010	F. CONTRACTOR SYTRONICS, INC	
1. DATA ITEM NO. A003	2. TITLE OF DATA ITEM FUNDS AND MAN-HOUR EXPENDITURE REPORT		3. SUBTITLE	
4. AUTHORITY (Data Acquisition Document No.) DI-FNCL-80331/T		5. CONTRACT REFERENCE Sec C, Para. 3.3		6. REQUIRING OFFICE AFRL/HECP
7. DD 250 REQ LT	9. DIST STATEMENT REQUIRED B	10. FREQUENCY MTHLY	12. DATE OF FIRST SUBMISSION **	14. DISTRIBUTION
8. APP CODE N/A		11. AS OF DATE *	13. DATE OF SUBSEQUENT SUBMISSION **	
16. REMARKS				
<p>Tailored to allow contractor's format.</p> <p>* At the close of the contractor's monthly accounting period.</p> <p>** 25 days after Block 11 time.</p> <p>Submit via e-mail.</p>				
15. TOTAL				
G. PREPARED BY RONALD E. <i>Ronald E. Yates</i>		H. DATE 01-APR-02	I. APPROVED BY <i>Kathleen England</i> Data Manager Det 1 AFRL/WSPT	
APRL/HECP, (937)255-7587			J. DATE 01-APR-02	

17. PRICE GROUP
18. ESTIMATED TOTAL PRICE

CONTRACT DATA REQUIREMENTS LIST (1 Data Item)

Form Approved
OMB No. 0704-0188

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A. CONTRACT LINE ITEM NO. 0001		B. EXHIBIT A	C. CATEGORY: TDP _____ TM _____ OTHER _____		N/A REF: DOD 5010.12-1 AMSDL		
D. SYSTEM/ITEM 7184CH22		E. CONTRACT/PR NO. P33615-98-D-600010		F. CONTRACTOR SYTRONICS, INC			
1. DATA ITEM NO. A006	2. TITLE OF DATA ITEM PRESENTATION MATERIAL			3. SUBTITLE			
4. AUTHORITY (Data Acquisition Document No.) DI-ADMN-81373/T		5. CONTRACT REFERENCE Sec C Para. 3.1.3; 3.1.4		6. REQUIRING OFFICE AFRL/HECP			
7. DD 250 REQ LT	8. DIST STATEMENT REQUIRED B	9. FREQUENCY ASREQ	10. DATE OF FIRST SUBMISSION *	14. DISTRIBUTION			
8. APP CODE N/A		11. AS OF DATE *	13. DATE OF SUBSEQUENT SUBMISSION *	a. ADDRESSEE			
16. REMARKS				b. COPIES			
				Draft	Final		
<p>Tailored to require only view graphs and hard copy. Submittal of the actual viewgraph is not required if the presentation is computer generated.</p> <p>ASREQ means as required to document topics under discussion at briefings and reviews.</p> <p>* Submit at each briefing or review as appropriate.</p> <p>Maximum # of view graphs shall not exceed 400 for this contract.</p> <p>Reproducible shall be the on CD-ROM compatible with MS-Office.</p>				AFRL/HECP	0	1	1

17. PRICE GROUP
18. ESTIMATED TOTAL PRICE

3. PREPARED BY RONALD E. V... AFRL/HECP, (937)255-7587		H. DATE 01-APR-02	I. APPROVED BY <i>[Signature]</i> Data Manager Det 1 AFRL/WSPT	J. DATE 01-APR-02
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CONTRACT DATA REQUIREMENTS LIST (1 Data Item)

Form Approved
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 220 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503. Please DO NOT RETURN your form to either of these addresses. Send completed form to the Government Issuing Contracting Officer for the Contract/PR No. listed in Block E.

A. CONTRACT LINE ITEM NO. 0001		B. EXHIBIT A	C. CATEGORY: N/A REF: DOD 5010.12-1 AMSDL TDP _____ TM _____ OTHER _____	
D. SYSTEM/ITEM 7184CH22		E. CONTRACT/PR NO. F33615-98-D-600010		F. CONTRACTOR SYTRONICS, INC
1. DATA ITEM NO. A007	2. TITLE OF DATA ITEM COMPUTER SOFTWARE DEVELOPMENT			3. SUBTITLE
4. AUTHORITY (Data Acquisition Document No.) DI-IPSC-80942		5. CONTRACT REFERENCE Sec C Para. 3.1.4; 3.2.1		6. REQUIRING OFFICE AFRL/HECP
7. DD 250 REQ LT	9. DIST STATEMENT REQUIRED B	10. FREQUENCY ASREQ	12. DATE OF FIRST SUBMISSION ASREQ	14. DISTRIBUTION
8. APP CODE A		11. AS OF DATE ASREQ	13. DATE OF SUBSEQUENT SUBMISSION ASREQ R/ASR	
16. REMARKS				
<p>Tailored to allow contractor format.</p> <p>ASREQ means as required to document the computer software development under this contract, submit as generated.</p> <p>Approval/disapproval by letter from the Air Force Program Manager within 30 days after receipt. Disapproval requires correction/resubmission within 30 days after receipt of Air Force comments.</p> <p>R/ASR means revisions as required to maintain up to date and accurate drawings and lists. Revisions are subject to the approval cycle as stated.</p>				
15. TOTAL				
			1 1 0	

17. PRICE GROUP
18. ESTIMATED TOTAL PRICE

G. PREPARED BY RONALD E. YAMM <i>Ronald E. Yam</i>	H. DATE 01-APR-02	I. APPROVED BY Ronald E. Yam Data Manager Det 1 AFRL/WSPT	J. DATE 01-APR-02
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INSTRUCTION 3 FOR COMPLETING DD FORM 142

(See DoD 5010.12-M for detailed instructions.)

FOR GOVERNMENT PERSONNEL

- Item A. Self-explanatory.
- Item B. Self-explanatory.
- Item C. Mark (X) appropriate category: TDP - Technical Data Package; TM - Technical Manual; Other - other category of data, such as "Provisioning," "Configuration Management", etc.
- Item D. Enter name of system/item being acquired that data will support.
- Item E. Self-explanatory (to be filled in after contract award).
- Item F. Self-explanatory (to be filled in after contract award).
- Item G. Signature of preparer of CDRL.
- Item H. Date CDRL was prepared.
- Item I. Signature of CDRL approval authority.
- Item J. Date CDRL was approved.

- Item 1. See DoD FAR Supplement Subpart 4.71 for proper numbering.
- Item 2. Enter title as it appears on data acquisition document cited in Item 4.
- Item 3. Enter subtitle of data item for further definition of data item (optional entry).
- Item 4. Enter Data Item Description (DID) number, military specification number, or military standard number listed in DoD 5010.12-L (AMSDL), or one-time DID number, that defines data content and format requirements.
- Item 5. Enter reference to tasking in contract that generates requirement for the data item (e.g., Statement of Work paragraph number).
- Item 6. Enter technical office responsible for ensuring adequacy of the data item.
- Item 7. Specify requirement for inspection/acceptance of the data item by the Government.
- Item 8. Specify requirement for approval of a draft before preparation of the final data item.
- Item 9. For technical data, specify requirement for contractor to mark the appropriate distribution statement on the data (ref. DoDD 5230.24).
- Item 10. Specify number of times data items are to be delivered.
- Item 11. Specify as-of-data item, when applicable.
- Item 12. Specify when first submittal is required.
- Item 13. Specify when subsequent submittals are required, when applicable.
- Item 14. Enter addressees and number of draft/final copies to be delivered to each addressee. Explain reproducible copies in Item 16.
- Item 15. Enter total number of draft/final copies to be delivered.
- Item 16. Use for additional/clarifying information for Items 1 through 15. Examples are: Tailoring of documents cited in Item 4; Clarification of submittal dates in Items 12 and 13; Explanation of reproducible copies in Item 14; Desired medium for delivery of the data item.

FOR THE CONTRACTOR

Item 17. Specify appropriate price group from one of the following groups of effort in developing estimated prices for each data item listed on the DD Form 1423.

a. Group I. Definition - Data which is not otherwise essential to the contractor's performance of the primary contracted effort (production, development, testing, and administration) but which is required by DD Form 1423.

Estimated Price - Costs to be included under Group I are those applicable to preparing and assembling the data item in conformance with Government requirements, and the administration and other expenses related to reproducing and delivering such data items to the Government.

b. Group II. Definition - Data which is essential to the performance of the primary contracted effort but the contractor is required to perform additional work to conform to Government requirements with regard to depth of content, format, frequency of submittal, preparation, control, or quality of the data item.

Estimated Price - Costs to be included under Group II are those incurred over and above the cost of the essential data item without conforming to Government requirements, and the administrative and other expenses related to reproducing and delivering such data item to the Government.

c. Group III. Definition - Data which the contractor must develop for his internal use in performance of the primary contracted effort and does not require any substantial change to conform to Government requirements with regard to depth of content, format, frequency of submittal, preparation, control, and quality of the data item.

Estimated Price - Costs to be included under Group III are the administrative and other expenses related to reproducing and delivering such data item to the Government.

d. Group IV. Definition - Data which is developed by the contractor as part of his normal operating procedures and his effort in supplying these data to the Government is minimal.

Estimated Price - Group IV items should normally be shown on the DD Form 1423 at no cost.

Item 18. For each data item, enter an amount equal to that portion of the total price which is estimated to be attributable to the production or development for the Government of that item of data. These estimated data prices shall be developed only from those costs which will be incurred as a direct result of the requirement to supply the data, over and above those costs which would otherwise be incurred in performance of the contract if no data were required. The estimated data prices shall not include any amount for rights of data. The Government's right to use the data shall be governed by the pertinent provisions of the contract.

STATEMENT OF WORK
Delivery Order 0010

Research to Support Visual Display Systems
14 Mar 02

DESCRIPTION OF WORK

1.0. SCOPE. The purpose of this effort is to provide research and sustainment to enhance warfighter vision and visual interfaces to improve weapon system effectiveness during day and night operations. The programs supported by this research include Aerospace Displays Program, Crew Station Avionics, High Definition Display Technology Program, Organic Light Emitting Diode Dual Use in Science and Technology, and Windscreen Visual Interface Effects. The laboratories that support these program areas are described in the attachment referred to in paragraph 2.2.

2.0. APPLICABLE DOCUMENTS

2.1. MIL M-38784C Manual, Technical, General Style and Format Requirements

2.2. Display Laboratories – Attachment 1

3.0. REQUIREMENTS

3.1. Research Plans

3.1.1. Research Program Planning

3.1.1.1. The purpose of this effort is to provide the necessary on-going research and sustainment of the programs listed in paragraph 1.0. The scope of the required research and sustainment includes; (1) planning and execution of exploratory development research plans and (2) designing, fabricating, integrating, maintaining, documenting, and testing of visual display technology (VDT) hardware and software. The contractor shall maintain a report of journal article submissions and publications, update the report monthly, and make it easily accessible to the Government. (CDRL Data Item #s A001 and A002)

3.1.1.2. The contractor shall monitor on-going technical developments in the general research areas relevant to the HEC laboratories and shall maintain the program plans such that they accurately reflect current research trends within the programs, the progress of the research programs, significant accomplishments, anticipated facilities and resource requirements, and projected research products. The research program plans shall be coordinated with the Government on a regular basis. (CDRL Data Item #s A001 and A002)

3.1.1.3. The contractor shall support the development of protocols supporting the use of human subjects in the HEC laboratories. The objective of the protocols are to characterize the nature of the experimentation to be done, any safety implications of research facilities or experimental

methods, along with the general descriptions of research facility capabilities and characteristics. (CDRL A002)

3.1.2. Experimental Planning

The contractor shall develop protocols for the use of human subjects in support of the programs listed in paragraph 1.0. The objective of the protocols is to characterize the nature of the experimentation to be done, identify any safety implications of research facilities or experimental methods, and describe the research facility capability and characteristics. (CDRL Data Item # A002)

3.1.3. Experimental Research

The contractor shall collect pre-experimental pilot data to assure that the facilities are operating within tolerances specified in the experimental plan and that experimental procedures can be implemented accurately. Following verification of pre-experimental pilot data, the contractor shall collect experimental data using subjects from the contractor's subject pool or Government supplied subjects. The contractor shall conduct appropriate descriptive and inferential statistical analyses using experimental data. The contractor shall perform statistical analyses using graphical, pictorial, and tabular summaries; shall document in detail these analyses, and shall brief and present research finding and results. The contractor shall also attend conferences and symposia and present the results of experimental research as required to transition research results to other Government, industrial, and academic institutions. (CDRL Data Item #s A002, A003, and A004)

3.1.4. Developmental Research

The contractor shall develop crew system interface hardware and software (in the form of prototypes, conceptual demonstrations, models, and simulations) as specified in laboratory research plans. These items shall initially be documented in a form that identifies and describes the hardware and software requirements specifications. The contractor shall use the specification documents to design, fabricate, implement, code, and install the items in laboratory and field environments. The contractor shall test the prototypes, demonstrations, models, and simulations for their capability to improve the planning, design, development, and operation of Air Force and human systems. The contractor shall report technical research development. The contractor shall develop briefings and presentations of human factors research and sustaining efforts to include, but not be limited to, graphics, animation, multimedia, and photographic elements. The contractor shall attend conferences and symposia and present the results of developmental research as required to transition research results to other Government agencies, industry, and academic institutions. (CDRL Data Item #s A002, A003, A004, A005, and A006)

3.2. Research Facility Sustainment

3.2.1. As required by the research programs listed in paragraph 1.0, the contractor shall provide all engineering and related effort necessary to effect and document changes to existing research facilities or to integrate new and unique components which will enhance research goals, improve equipment reliability, increase productivity, enhance flexibility, or improve fidelity. (CDRL Data Item # A005)

3.2.2. The contractor shall supply all consumable materials required for uninterrupted research. The contractor shall provide equipment and materials needed for testing, inspection, calibration, repair, upgrading, or integration when such equipment is not already part of existing inventory and is required to conduct or enhance research.

3.2.3. During the conduct of research, the contractor shall operate, maintain, and calibrate the research equipment in compliance with maintenance, operating, and calibration procedures.

3.2.4. As necessary to sustain the on-going research program, the contractor shall code, upgrade, test, debug, calibrate, maintain, and document the software required for conducting laboratory research, experimentation, concept demonstrations, simulation, and data reduction and analysis. (CDRL Data Item #s A006 and A007)

3.2.5. The contractor shall incorporate new hardware components, software products, and new functional capabilities consistent with the contract research requirements.

3.2.6. The contractor shall provide a pool of persons to serve as research subjects in various simulations and laboratory experiments. The contractor shall provide screening, scheduling and training of subjects for human performance experiments.

3.3. Management of Effort

The contractor shall document progress and financial status of the above efforts in compliance with Delivery Order 0001, Paragraph 3.3. In addition, the contractor shall maintain a network-based reporting of resource allocation and utilization for cost, equipment, and personnel. This report shall be accessible by the Government, serve as a tool for review of project costs and schedule, and support development of cost and schedule recovery plans. (CDRL Data Item #s A008, A009 and A010)

AFRL/HEC Laboratories and Facilities

Aerospace Vision Experimental Lab	1
Color Display Laboratory.....	2
Display Test and Evaluation Laboratory.....	3
Dynamic Visual Assessment Facility.....	4
Night Vision Operations Laboratory.....	5
Visual Image Evaluation of Windscreens Laboratory	6
Visual Symbology Test & Evaluation Facility.....	7

1. Aerospace Vision Experimental Lab

POC: Dr. Gary Martinsen, AFRL/HECV

a. Description: The Aerospace Vision Experimental Laboratory (AVXL) conducts current and future vision and visual display R&D. AVXL uses state-of-the-art equipment to conduct a unique blend of research projects including specialized analyses and evaluations to characterize human visual capabilities under laboratory conditions and in the field. The derived human interface principles are used to address visual needs unique to the Air Force aviator and ancillary personnel. AVXL includes a team of human-factors scientists, display engineers, computer scientists, research optometrists, and visual psychophysicists. Some of the current research interests include quantification of laser eye protection provided by night vision goggles, visual display symbology research, assessment of runway safety instruments and lighting, and exploitation of information processing techniques as applied to sensor image enhancement. Located in Bldg 248, Room 306.

b. Equipment/Facilities:

- 1) Several Pentium based PCs for symbology research
- 2) One VisionWorks PC capable of generating vision research experiments
- 3) Optical benches and equipment (lenses, filters, mirrors)
- 4) Ophthalmic examination eye lane and equipment for vision/eye exams
- 5) Double Purkinje-image eye tracker and infrared optometer for assessing ocular posture while viewing virtual displays

2. Color Display Laboratory

POC: Paul Havig, PhD, AFRL/HECV

a. Description: A laboratory for performing experiments on human color vision and electronic color displays. Current and future research includes evaluation of models for predicting display colorimetry, determination of field-rate requirements for field-sequential color displays, development of a portable color calibration system, determination of hue, luminance, and contrast requirements for colored HMD symbology, and development of variable-transmittance visor technology to enhance contrast of HMDs. Located in Bldg 248, Room 306

b. Equipment/Facilities:

- 1) Custom-built Maxwellian-view field-sequential color display
- 2) Custom-built subtractive-color LCD systems (2)
- 3) PC equipped with a Cambridge Research Systems video card (3 x 15-bit RGB DACs)
- 4) PC equipped with an Univision Piranha video card (3 x 10-bit RBG DACs); MS Visual C++ 5.0 and DEC Visual FORTRAN 5.0 compilers
- 5) EDL 19-inch color CRT monitor with custom color-stabilization system
- 6) MAG MX17F 17-inch color monitor
- 7) Photo Research model 705 spectroradiometer with PC interface
- 8) LMT model 1200 filter colorimeter with RS-232 interface
- 9) LMT model L1009 photometer
- 10) LMT model B360J illumination meter
- 11) Hoffman LS-65 spectral radiance standard
- 12) Osram wavelength standard
- 13) Vision-testing equipment

3. Display Test and Evaluation Laboratory

POC: Denise Aleva, AFRL/HECV

a. Description: The mission of the Display Characterization Laboratory is to evaluate current and upcoming display technologies for specific Air Force applications. This requires an understanding not only of the specific display technology and its capabilities and limitations but also the capabilities and limitations of the human visual system, the tasks to be performed and characteristics of the environment which may affect the operator-display interaction. To this end, the Display Characterization Laboratory conducts both display hardware measurements and assessments of human performance using the displays under expected environmental conditions. Typical Display Laboratory activities include characterization of off-the-shelf displays of all types. In addition, the laboratory is often called upon to evaluate prototype displays which may look promising for Air Force applications. Display luminance/contrast capabilities, color gamut, visibility in various ambient illumination conditions, off axis visibility, reflection and night vision goggle compatibility are just some of the issues which must be addressed. Laboratory personnel also assist Air Force program managers and engineers in creating display specifications for their particular applications. As new display technologies are developed, procedures for characterization of these new displays must be standardized. Laboratory personnel are working in collaboration with the National Institute of Standards and Technology and the Vehicular Display Metrology Working Group to develop and standardize display characterization procedures. Located in Building 248, Rooms 306A and 306B.

b. Equipment/Facilities:

- 1) Instrument Systems 320 Optical Spectrum Analyzer
- 2) Photo Research Pritchard 1980A Photometer with scanning slit
- 3) Photo Research PR-650 portable luminance telephotometer/colorimeter
- 4) Optical bench with associated optical test fixtures
- 5) Photographic Equipment
- 6) Hoffman Engineering LM-33-52 Specular and Diffuse Contrast Measurement Test Set
- 7) Various integrating spheres and light sources
- 8) Video pattern generating equipment
- 9) Oscilloscopes

4. Dynamic Visual Assessment Facility

POC: Alan Pinkus, PhD, AFRL/HECV

a. Description: The Dynamic Visual Assessment Facility, a.k.a. "The Zoom Lane", studies pilot vision when either the pilot or the target is physically moving and the pilot is viewing through multiple optical systems ranging from windscreens, visors, and night vision devices. The zoom lane features a 200 foot-long room containing a motorized cart on rails. The zoom cart can precisely move along the rails at up to 5 mph carrying up to 2000 pounds including its payload. The payload of the cart can include one person and various types of optical equipment ranging from aircraft windscreens to video cameras and night vision devices. Contractor support includes maintenance of the cart's mechanical systems and programming of two PC computers and one special-purpose motion-control computer. Current and prospective research includes studies of visual acuity through gold-coated windscreens while wearing night vision goggles, SCUD missile launcher detection using a desert terrain board, and visual acuity at distances between 20 and 200 feet while still or while approaching an optometric display located in Bldg 248A, Room 3008.

b. Equipment/Facilities:

- 1) A 200 foot zoom lane with motorized cart on rails
- 2) Several lighting systems for creating the broad range of intensities from daylight to starlight
- 3) Optometric charts
- 4) 3-dimensional scales models
- 5) 8-ft by 8-ft terrain boards (4)

5. Night Vision Operations (NVO) Laboratory

POC: Peter L Marasco, PhD, AFRL/HECV

a. Description: The Night Vision Operations (NVO) Laboratory conducts research in four primary areas: night lighting systems, enhancements to night vision goggle (NVG) design and engineering, NVG measurement, and human visual performance. The first area, night lighting systems, is concerned with cockpit lighting, exterior lighting for formation flying and aerial

refueling, and covert runway lights. A key program in this area is the testing of and research on night vision imaging system (NVIS) compatible cockpit lighting, which is essential for maximizing NVG performance. The second research area, NVG engineering enhancements, addresses wider-fields-of-view, better resolution, and improved NVG head-up displays. Two important programs in this area are addressing technical approaches to expand the NVG field-of-view and investigating alternative display sources for integrating symbology into an NVG. The third area, NVG measurement, is dedicated to assessing system performance. The focus of this project is the development of standardized methods to quantify the NVG system's optical characteristics in terms of visual performance impact. The final research area is concerned with human factors and human visual performance using night vision devices. A significant activity underway is the study of intra-ocular and inter-ocular luminance requirements for maximizing mission safety and effectiveness. The laboratory is located in Bldg 248, Room 302.

b. Equipment/Facilities:

- 1) Spectra Research Pritchard 1980A and 1980B Photometers
- 2) Spectra Research 1980C Scanning Radiometer
- 3) Hoffman Integrating Sphere Calibrated Light Sources
- 4) Hoffman ANV-120 NVIS Goggle Gain Tester
- 5) Hoffman ANV-126 Goggle Test Set
- 6) EG&G Gamma Scientific GS-4100A Scanning Radiometer
- 7) Calibrated Night Sky Illuminators

6. Visual Image Evaluation of Windscreens Laboratory

POC: Alan Pinkus, PhD, AFRL/HECV

a. Description: The Visual Image Evaluation of Windscreens (VIEW) develops optical measurement techniques, equipment and standards for use in the specification, manufacture and quality assurance of aircraft transparencies. The current thick, laminated plastic windscreens are not as clear as the older glass windscreens, resulting reduced optical quality. The problem is further compounded by modern aerodynamic designs that require complex transparency shapes. The VIEW team actively studies the quantification of transparency optical quality, develops new measurement instrumentation and methodologies, leads in the development of industry standards, and investigates how certain optical qualities affect aircrew visual performance. The facility is equipped to measure all canopy and windscreen optical qualities for a large variety of aircraft including F-4, F-15, F-16, F-18, F-22, F-111, C-130, B-1B, A-7, A-10 and T-38. Major topics of study are: American Society for Testing and Materials Standards for haze and craze testing, infrared transmissivity and night vision goggle performance, limits of binocular disparity and pilot visual fatigue, craze and haze quantification and the effects of polycarbonate on weapons system aiming accuracy. Located in Bldg 33, Room 022 and Bldg 248A, Room 3006.

b. Equipment/Facilities:

- 1) Angular deviation measurement system,
- 2) Eight-by-eight foot light box, which trans-illuminates a variety of test patterns
- 3) Extended-range spectroradiometer
- 4) Photometers

- 5) Optical benches with associated optical test fixtures for bread boarding test devices
- 6) Haze testers
- 7) Photographic equipment
- 8) Lasers

7. Visual Symbology Test & Evaluation Facility

POC: 1Lt Chris Jenkins, AFRL/HECV

a. Description: The Visual Symbology Test & Evaluation Facility (ViSTEF) is located in Bldg 248, Room 306. ViSTEF is primarily concerned with the development and evaluation of flight symbology for fixed-wing aircraft. This focus encompasses primary flight symbology for HUD-based airframes as well as HMD-based aircraft such as the F-35 Joint Strike Fighter. The lab development team is comprised of human factors engineers and psychologists working to develop new symbology concepts for on and off-axis use under a variety of operational conditions and during day, night, and all-weather environments. The main simulation platform is the Tactical High Off-boresight Research (THOR) simulator. THOR consists of a pair of generic fighter aircraft cockpit shells with state-of-the-art wide field of view HUDs, Keiser HMDs, and reconfigurable touch screen LCDs for multifunction HDD use. Located in Bldg 248, Room 305.

b. Equipment/Facilities:

- 1) Local Area Network of Network: Client-server based, heterogeneous intranet (100 BaseT Ethernet) running Windows 98, Windows NT, and IRIX operating systems. The network consists of 5 nodes.
- 2) 3 Nodes have Flock of Birds head tracking and Kaiser Helmet Mounted Displays.

c. Software: Software development is done using a mixture of C/C++ and Fortran using OpenGL and SGI Performer.

ORDER FOR SUPPLIES OR SERVICES

PAGE 1 OF 5

1. CONTRACT/PURCH ORDER/AGREEMENT NO. F33615-98-D-6000	2. DELIVERY ORDER/ CALL NO. 0007	3. DATE OF ORDER/ CALL (YYYYMMDD)	4. REQUISITION/PURCH REQUEST NO. SEE SCHEDULE
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5. ISSUED BY: AFRL/MLKH USAF/AFMC AIR FORCE RESEARCH LABORATORY 2310 8TH STREET, BUILDING 167 WRIGHT-PATTERSON AFB OH 45433-7801 CHERYL K. ROBERTSON (937) 656-9046 cheryl.robertson@wpafb.af.mil	CODE FA8650	7. ADMINISTERED BY (If Other than G) DCMC DAYTON AREA C BUILDING 30 1725 VAN PATTON DRIVE WRIGHT-PATTERSON AFB OH 45433-5302	CODE S3605A
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9. CONTRACTOR SYTRONICS, INC 4433 DAYTON-XENIA ROAD, BUILDING 1 DAYTON OH 45432 (937) 431-6100 GREENE COUNTY	CODE 1EE69	FACILITY	10. DELIVER TO FOB POINT BY (Date) (YYYYMMDD) SEE SCHEDULE	8. DELIVERY FOB <input checked="" type="checkbox"/> DESTINATION <input type="checkbox"/> OTHER <small>(See Schedule if other)</small>
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MAILING DATE
SEP 25 2001

14. SHIP TO SEE SCHEDULE	CODE	15. PAYMENT WILL BE MADE BY DFAS-CO/NEW DOMINION DIVISION P O BOX 182041 COLUMBUS OH 43218-2041 EFT:T	CODE SC1018	11. X IF BUSINESS IS <input checked="" type="checkbox"/> SMALL <input type="checkbox"/> SMALL DISADVANTAGED <input type="checkbox"/> WOMEN-OWNED
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16. TYPE OF ORDER	DELIVERY/ CALL <input checked="" type="checkbox"/>	PURCHASE <input type="checkbox"/>	This delivery order/call is issued on another Government agency or in accordance with and subject to terms and conditions of above numbered contract. Reference your _____ furnish the following on items specified herein. ACCEPTANCE. THE CONTRACTOR HEREBY ACCEPTS THE OFFER REPRESENTED BY THE NUMBERED PURCHASE ORDER AS IT MAY PREVIOUSLY HAVE BEEN OR IS NOW MODIFIED, SUBJECT TO ALL OF THE TERMS AND CONDITIONS SET FORTH, AND AGREES TO PERFORM THE SAME.		
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NAME OF CONTRACTOR	SIGNATURE	TYPED NAME AND TITLE	DATE SIGNED (YYYYMMDD)
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17. ACCOUNTING AND APPROPRIATION DATA/LOCAL USE
SEE SCHEDULE

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

*If quantity accepted by the Government is same as quantity ordered, indicate by X. If different, enter actual quantity accepted below quantity ordered and encircle.	24. UNITED STATES OF AMERICA JAMES DAVID BOX BY: <i>James David Box</i> CONTRACTING/ORDERING OFFICER	25. TOTAL \$932,809.00
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26. QUANTITY IN COLUMN 20 HAS BEEN <input type="checkbox"/> INSPECTED <input type="checkbox"/> RECEIVED <input type="checkbox"/> ACCEPTED, AND CONFORMS TO THE CONTRACT EXCEPT AS NOTED	27. SHIP NO.	28. D.O. VOUCHER NO.	29. DIFFERENCES	30. INITIALS
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35. I CERTIFY THIS ACCOUNT IS CORRECT AND PROPER FOR PAYMENT. DATE _____ SIGNATURE AND TITLE OF CERTIFYING OFFICER _____	32. PAYMENT <input type="checkbox"/> COMPLETE <input type="checkbox"/> PARTIAL <input type="checkbox"/> FINAL	32. PAID BY	33. AMOUNT VERIFIED CORRECT FOR	34. CHECK NUMBER	35. BILL OF LADING
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37. RECEIVED AT	38. RECEIVED BY (Print)	39. DATE RECEIVED (YYYYMMDD)	40. TOTAL CONTAINERS	41. SIR ACCOUNT NO.	42. SIR VOUCHER NO.
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1. In accordance with the provisions of the Basic Contract and this delivery order, the Contractor shall accomplish the effort described in the attached Statement of Work (SOW), dated 4 Jun 2001, and entitled "Vision Display Research for Strike Helmet 21", at a total not to exceed amount of \$932,809.00.

SECTION B

1. 5352.216-9001 PAYMENT OF FEE (AFMC)(CPFF)(JUL 1997)

The estimated cost and fee for this delivery order are shown below. The applicable fixed fee or target fee set forth below may be increased or decreased only by negotiation and modification of the contract delivery order for added or deleted work. As determined by the contracting officer, it shall be paid as it accrues, in regular installments based upon the percentage of completion of work (or the expiration of the agreed-upon period(s) for term contract(s).

Estimated Cost: \$871,784.00
 Fixed Fee: \$61,025.00

2. 5352.232-9001 IMPLEMENTATION OF LIMITATION OF FUNDS (AFMC) (JUL 1997)

(a) The sum allotted to this contract delivery order and available for payment of costs under CLINs 0001-0003 through 30 Apr 2002 in accordance with the clause in Section I entitled "Limitation of Funds" is \$388,182.00.

(b) In addition to the amount allotted under the "Limitation of Funds" clause, the additional amount of \$27,173.00 is obligated for payment of fee for work completed under CLINs 0001-0003.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
0001		1	\$932,809.00
		LO	NTE \$932,809.00
	<i>Noun:</i>	RESEARCH AND DATA	
	<i>ACRN:</i>	9	
	<i>Security:</i>	U	
	<i>NSN:</i>	N - Not Applicable	
	<i>DD1423 is Exhibit:</i>	A	
	<i>Contract type:</i>	U - COST PLUS FIXED FEE	
	<i>Inspection:</i>	DESTINATION	
	<i>Acceptance:</i>	DESTINATION	
	<i>FOB:</i>	DESTINATION	
	<i>Descriptive Data:</i>		
	THE CONTRACTOR SHALL CONDUCT RESEARCH IN ACCORDANCE WITH THE STATEMENT OF WORK ENTITLED "VISION DISPLAY RESEARCH FOR STRIKE HELMET 21", DATED 4 JUNE 2001. THE CONTRACTOR SHALL ALSO SUBMIT DATA IN ACCORDANCE WITH EXHIBIT A, THE CONTRACT DATA REQUIREMENTS LIST, DD FORM 1423, DATED 1 JUNE 2000, ATTACHED HERETO.		

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
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000101	<p><i>Noun:</i> Funding Info Only</p> <p><i>ACRN:</i> AA</p> <p><i>Descriptive Data:</i></p> <p>PR: GWSHE017201144 (\$365,355.00)</p> <p>GWSHE017201115 (\$50,000.00)</p> <p>Contract JON: 7184CH22</p> <p>Contract RCCC: 6HC000</p> <p>Funding RCCC: 6HCV00</p>		\$415,355.00
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0002	<p><i>Noun:</i> SOFTWARE</p> <p><i>Security:</i> U</p> <p><i>NSN:</i> N - Not Applicable</p> <p><i>Contract type:</i> U - COST PLUS FIXED FEE</p> <p><i>Inspection:</i> DESTINATION</p> <p><i>Acceptance:</i> DESTINATION</p> <p><i>FOB:</i> DESTINATION</p> <p><i>Descriptive Data:</i></p> <p>The contractor shall provide software as required in the Statement of Work, dated 4 Jun 2001, atch 1.</p> <p>The cost of this CLIN is included in CLIN 0001.</p>	1 LO	NSP NSP
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0003	<p><i>Noun:</i> HARDWARE</p> <p><i>Security:</i> U</p> <p><i>NSN:</i> N - Not Applicable</p> <p><i>Contract type:</i> U - COST PLUS FIXED FEE</p> <p><i>Inspection:</i> DESTINATION</p> <p><i>Acceptance:</i> DESTINATION</p> <p><i>FOB:</i> DESTINATION</p> <p><i>Descriptive Data:</i></p> <p>The contractor shall provide hardware as required in the Statement of Work, dated 4 Jun 2001, atch 1.</p> <p>The cost of this CLIN is included in CLIN 0001.</p>	1 LO	NSP NSP
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SCHEDULE

ITEM	SUPPLIES SCHEDULE DATA	QTY	SHIP TO	MARK FOR	TRANS PRI	DATE
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0001		1	U			26 MARO
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Noun: RESEARCH AND DATA

ACRN: 9

Sec. Class: U

Descriptive Data:

The scheduled delivery date is for completion of all research and data required by the Statement of Work, atch 1, and delivery of all reports in accordance with Exhibit A, Contract Data Requirements List. Technical effort is to be completed 25 months after contract award and the final report is to be completed 26 months after contract award.

0002		1	U			26 MARO
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Noun: SOFTWARE

Sec. Class: U

Descriptive Data:

The scheduled delivery date is for any software to be delivered in accordance with the Statement of Work, dated 4 Jun 2001.

0003		1	U			26 MARO
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Noun: HARDWARE

Sec. Class: U

Descriptive Data:

The scheduled delivery date is for any hardware to be delivered in accordance with the Statement of Work, dated 4 Jun 2001.

ACRN	Appropriation/Lmt Subhead/Supplemental Accounting Data	Obligation Amount
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AA		\$415,355.00
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57 13600 291 47A8 633257 6HCV00 02050 63231F 503000 F03000

Funding breakdown: On CLIN 000101: \$415,355.00

PRIMIPR: GWSHE017201115 \$50,000.00

GWSHE017201144 \$365,355.00

JON: 32570306

Descriptive data:

PR IS COMPLETE

LIST OF ATTACHMENTS

<u>DOCUMENT</u>	<u>PGS</u>	<u>DATE</u>	<u>TITLE</u>
EXHIBIT A	5	01 JUN 2000	Contract Data Requirements List
ATTACHMENT 1	3	04 JUN 2001	Statement of Work entitled "VISION DISPLAY RESEARCH FOR STRIKE HELMET 21"

STATEMENT OF WORK
DELIVERY ORDER 0007

TITLE: Vision Display Research for Strike Helmet 21
DATE: 4 June 2001

1.0 SCOPE

The contractor shall provide the necessary on-going technical, administrative, and subcontracting services necessary to sustain programs supporting the Vision Display Research (VDR) area. The required work will be supporting the Design Parameters for Visually Coupled Systems, Night Vision Operations, Visual Image Evaluation of Windscreens, and the Helmet Mounted Sensory Technologies (HMST) programs. The scope of the required support includes; (1) planning and execution of an exploratory development research plan, (2) designing, fabricating, integrating, maintaining, documenting, and testing of VDR hardware and software, (3) design, fabricate and integrate a new cockpit control panel for the Strike Helmet 21 program, and (4) supporting helmet system certification and flight testing,

2.0 REFERENCE DOCUMENTS

1. Visually-Coupled Acquisition and Targeting System (VCATS) System Requirements Document (SRD), F41624-93-R-6024, Pages 75 - 120, December 11, 1997.
2. High Voltage Quick-Disconnect Connector Harness System for Air Force Helmet Mounted Displays, UDR-TR-93-131.
3. Quick-Disconnect Harness System Test Procedure, UDR-TR-93-128.
4. VCATS Interface Control Document, Interconnect, W5, Module V Specification 105640
5. Annual Book of American Society for Testing and Materials (ASTM) Standards Section 15 (1997). E 691, F 319-91, F 801-96, F 943-90, F 1165-88, F 1181-86, F 1252-89, F1316-90.
6. Pinkus, A. and Task, H. L. (1997). The Effects of Aircraft Transparencies on Night Vision Goggle-Mediated Visual Acuity. *SAFE Symposium 1997*, Sep 8-10, pp. 93-104.

3.0 REQUIREMENTS

3.1 Exploratory Development and Research

3.1.1 Research Program Plan

3.1.1.1 The contractor shall develop a research program plan to support the development and evaluation of VDR. The goal of the research program shall be to investigate fundamental issues involved in the development and evaluation of VDR.

3.1.1.2 The contractor shall support the development of protocols supporting the use of human subjects. The protocol shall reflect the nature of the experimentation to be done, any safety implications of research facilities or experimental methods, general descriptions of research facility capability and characteristics.

3.1.1.3 The contractor shall monitor ongoing technical developments in the area of VDR. The contractor shall maintain a program plan such that it accurately reflects current research lines within the program, progress of the research program, significant accomplishments, and anticipated facility and resource requirements. (CDRL A001, A004)

3.1.1.4 The contractor shall support, develop, and evaluate helmet mounted display symbology for day and night missions in all weather conditions.

3.1.2 Experimental Plans

The contractor shall develop experimental plans for each experiment. Experiment plans shall include detail specification of specific experimental manipulations to be performed, specific measures of performance to be obtained, resource requirements, operating tolerances, analysis techniques to be employed, technical support requirements, and subject requirements. Experimental plans shall be submitted to the government for coordination. (CDRL A001, A004)

3.1.3 Research

The contractor shall collect pre-experimental data to assure that the facility is operating within tolerance specified in the experimental plan and the procedures can be implemented accurately. Following verification of experimental plans, the contractor shall collect the experimental data. The contractor shall conduct appropriate descriptive and inferential statistical analyses using the experimental data. The contractor shall prepare graphical, pictorial, and tabular summaries of the statistical analyses, and shall prepare written documentation in the form of technical reports. (CDRL A001, A005)

3.2 VDR Development and Facility Operations

3.2.1 VDR Hardware and Software Development

The contractor shall design, fabricate, integrate, document, test, and/or subcontract support to maintain, modify, or develop VDR hardware and software. (CDRL A001, A002, A003, A005)

3.2.2 Helmet Vehicle Interface

The contractor shall develop and fabricate improvements for the helmet vehicle interface. The contractor shall develop hardware solutions for biodynamic interference suppression for helmet mounted displays. The contractor shall provide documentation on any developed or upgraded hardware or software. (CDRL A001, A002, A003, A005)

3.2.3 Cockpit Control Panel

The contractor shall design, fabricate, and integrate a new cockpit control panel (CCP) for integration into the Strike Helmet 21 platform. The new CCP must be able to work in a military aircraft environment. The contractor shall provide documentation on any developed or upgraded hardware or software. (CDRL A001, A002, A003, A005)

3.2.4 Facility Operation and Maintenance

The contractor shall maintain and operate the Helmet-Mounted Systems Technologies/Visually-Coupled Systems (HMST/VCS), Night Vision Operations, and the Visual Image Evaluation of Windscreens Laboratories and facilities. The systems shall be put under configuration control. Equipment failures shall be recorded by the contractor and maintained in an automated record log. Recalibration of facility equipment and repair shall be performed or subcontracted by the contractor. Performance of the repaired equipment shall be measured by the contractor to ensure requirement satisfaction. Test equipment required for recalibration and measurement shall be acquired by the contractor. The documentation will include operating procedures and will be updated after any modifications are made. (CDRL A002, A003, A005)

3.3 Helmet Testing

The contractor shall assist the HMST program in supporting helmet testing and safety-of-flight certification. The contractor shall provide support to flight certification and safety tests at WPAFB, and remote military and contractor test facilities.

3.4 Management

The contractor shall document progress and provide financial status of the effort. (CDRL A001, A002)

AMENDMENT OF SOLICITATION / MODIFICATION OF CONTRACT

CONTRACT ID CODE
U - CPFF

PAGE OF PAGES
1 of 2

2. AMENDMENT/MODIFICATION NO. 01	3. EFFECTIVE DATE FA8650	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO. (if applicable)
6. ISSUED BY AFRL/MLKH CODE USAFAFMC AIR FORCE RESEARCH LABORATORY 2310 EIGHTH STREET, BUILDING 167 WRIGHT-PATTERSON AFB OH 45433-7801 ANNETTE B. HENDERSON (937) 656-9046 annette.henderson@ws.wpafb.af.mil	7. ADMINISTERED BY (if other than item 6) DCMC DAYTON AREA C BUILDING 30 1725 VAN PATTON DRIVE WRIGHT-PATTERSON AFB OH 45433-5302 CODE S3605A		

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code) SYTRONICS, INC 4433 DAYTON-XENIA ROAD, BUILDING 1 DAYTON OH 45432 (937) 429-1466 GREENE COUNTY	(X)	9A. AMENDMENT OF SOLICITATION NO.
		9B. DATED (SEE ITEM 11)
	X	10A. MODIFICATION OF CONTRACT/ORDER NO. F33615-98-D-6000 0006
		10B. DATED (SEE ITEM 13) 13 JUL 2000
CODE 1EE69	FACILITY CODE 1EE69	

MAILING DATE
FEB 09 2001

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

12. ACCOUNTING AND APPROPRIATION DATA (if required)

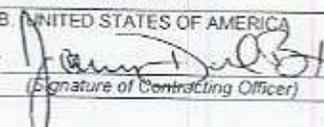
13. THIS ITEM APPLIES ONLY TO MODIFICATION OF CONTRACTS/ORDERS, IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

(X)	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: () THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. ITEM 10A.
	B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
	C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
X	D. OTHER (Specify type of modification and authority) Excusable Delays Clause, FAR 52.249-14 and Contractor's E-Mail dated 8 Jan 01

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.)
SUBJECT: No Cost Time Extension
Program Manager: Don Monk, AFRL/HECA, Wright-Patterson AFB, OH. 45433
Payment Office: (SC1018) DFAS-CO/ New Dominion Division, PO Box 182041, Columbus, OH. 43218-2041
The Contracting Officers e-mail address is: james.box@wpafb.af.mil

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 SIGNER (Type or print) JAMES DAVID BOX Contracting Officer
15B. CONTRACTOR/OFFEROR (Signature of person authorized to sign)	15C. DATE SIGNED 30-105
16B. UNITED STATES OF AMERICA BY  (Signature of Contracting Officer)	16C. DATE SIGNED 29 JAN 01

1. This modification is being issued pursuant to the Excusable Delays Clause to extend the period of performance at no cost to either party from 14 January 2001 to 11 March 2001. All other terms and conditions remain the same.

ITEM	SUPPLIES SCHEDULE DATA	QTY	SHIP TO	MARK FOR	TRANS PRI	DATE
0001		1	U			11 Mar 2001
	<i>Noun:</i>					RESEARCH AND DATA
	<i>ACRN:</i>					9
	<i>Sec. Class:</i>					U
	<i>Descriptive Data:</i>					
	The scheduled delivery date is extended from 14 January 2001 to 11 March 2001.					
0002		1	U			11 Mar 2001
	<i>Noun:</i>					SOFTWARE
	<i>Sec. Class:</i>					U
	<i>Descriptive Data:</i>					
	The scheduled delivery date is extended from 14 January 2001 to 11 March 2001					

2. Section J - Contract Data Requirements List is amended as shown

CDRL A003 Scientific and Technical Reports - Final Report

Block 13. Date of Subsequent Submission is changed from 6 MARO to 11 March 01.

ORDER FOR SUPPLIES OR SERVICES

PAGE 1 OF 6

1. CONTRACT/PURCH ORDER/AGREEMENT NO. F33615-98-D-6000	2. DELIVERY ORDER/ CALL NO. 0006	3. DATE OF ORDER/ CALL (YYYYMMDD)	4. REQUISITION/PURCH REQUEST NO. SEE SECTION G	5. PRIORITY DO-C9
---	-------------------------------------	--------------------------------------	---	----------------------

AFRL/MLKH USAF/AFMC AIR FORCE RESEARCH LABORATORY 2310 EIGHTH STREET, BUILDING 167 WRIGHT-PATTERSON AFB OH 45433-7801 ANNETTE B. HENDERSON (937) 656-9046 annette.henderson@ws.wpafb.af.mil	CODE FA8650	7. ADMINISTERED BY (If Other than G) DCMC DAYTON AREA C - BUILDING 30 1725 VAN PATTON DRIVE WRIGHT-PATTERSON AFB OH 45433-5302 SCD: C PAS: (NONE)	CODE S3605A	8. DELIVERY FOB <input checked="" type="checkbox"/> DESTINATION <input type="checkbox"/> OTHER <small>(See Schedule if other)</small>
---	----------------	--	----------------	--

9. CONTRACTOR SYTRONICS, INC 4433 DAYTON-XENIA ROAD, BUILDING 1 DAYTON OH 45432 (937) 429-1466 GREENE COUNTY	CODE 1EE69	MAILING DATE JUL 14 2000	10. DELIVER TO FOB POINT BY (Date) (YYYYMMDD) SEE SCHEDULE	11. <input checked="" type="checkbox"/> BUSINESS IS <input type="checkbox"/> SMALL <input type="checkbox"/> SMALL DISADVANTAGED <input type="checkbox"/> WOMEN-OWNED
			12. DISCOUNT ITEMS N	
13. MAIL INVOICES TO ADDRESS IN BLOCK SEE BLOCK 15 (PAYMENT OFFICE)				

14. SHIP TO SEE SCHEDULE	CODE	15. PAYMENT WILL BE MADE BY DFAS-CO/NEW DOMINION DIVISION P O BOX 182041 COLUMBUS OH 43218-2041 EFT:T	CODE SC1018	MARK ALL PACKAGES AND PAPERS WITH IDENTIFICATION NUMBERS IN BLOCKS 1 AND 2.
-----------------------------	------	---	----------------	---

16. TYPE OF ORDER	DELIVERY/ CALL <input checked="" type="checkbox"/>	This delivery order/call is issued on another Government agency or in accordance with and subject to terms and conditions of above numbered contract.
	PURCHASE <input type="checkbox"/>	Reference you furnish the following on items specified herein: ACCEPTANCE. THE CONTRACTOR HEREBY ACCEPTS THE OFFER REPRESENTED BY THE NUMBERED PURCHASE ORDER AS IT MAY PREVIOUSLY HAVE BEEN OR IS NOW MODIFIED, SUBJECT TO ALL OF THE TERMS AND CONDITIONS SET FORTH, AND AGREES TO PERFORM THE SAME.

NAME OF CONTRACTOR	SIGNATURE	TYPED NAME AND TITLE	DATE SIGNED (YYYYMMDD)
# If this box is marked, supplier must sign Acceptance and return the following number of copies:			

17. ACCOUNTING AND APPROPRIATION DATA/LOCAL USE
See Section G

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

*If quantity accepted by the Government is same as quantity ordered, indicate by X. If different, enter actual quantity accepted below quantity ordered and encircle.	24. UNITED STATES OF AMERICA BY: JAMES DAVID BOX <i>James David Box</i> 13 JUL 00 CONTRACTING/ORDERING OFFICER	25. TOTAL	\$136,869.00
		29. DIFFERENCES	

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

36. I CERTIFY THIS ACCOUNT IS CORRECT AND PROPER FOR PAYMENT. DATE SIGNATURE AND TITLE OF CERTIFYING OFFICER	32. PAYMENT <input type="checkbox"/> COMPLETE <input type="checkbox"/> PARTIAL <input type="checkbox"/> FINAL	34. CHECK NUMBER	35. BILL OF LADING
---	--	------------------	--------------------

37. RECEIVED AT	38. RECEIVED BY (Print)	39. DATE RECEIVED (YYYYMMDD)	40. TOTAL CONTAINERS	41. S/R ACCOUNT NO.	42. S/R VOUCHER NO.
-----------------	-------------------------	------------------------------	----------------------	---------------------	---------------------

1. In accordance with the provisions of the Basic Contract and this delivery order, the Contractor shall accomplish the effort described in the attached Statement of Work (SOW), dated 17 March 2000, and entitled "Requirements and Technical Concepts for Aviation (RTCA) Compliance Review", at a total not to exceed amount of \$136,869.00.

SECTION B

1. 5352.216-9001 PAYMENT OF FEE (AFMC)(CPFF)(JUL 1997)

The estimated cost and fee for this delivery order are shown below. The applicable fixed fee or target fee set forth below may be increased or decreased only by negotiation and modification of the contract delivery order for added or deleted work. As determined by the contracting officer, it shall be paid as it accrues, in regular installments based upon the percentage of completion of work (or the expiration of the agreed-upon period(s) for term contract(s).

Estimated Cost: \$127,915.00

Fixed Fee: \$8,954.00

2. 52.232-20 LIMITATION OF COSTS (APR 1984)

(a) The sum allotted to this contract delivery order and available for payment of costs under CLINs 0001-0003 through 14 January 2001 (completion date of the delivery order) in accordance with the clause in Section I entitled "Limitation of Costs" is \$127,915.00.

(b) In addition to the amount allotted under the "Limitation of Costs" clause, the additional amount of \$8,954.00 is obligated for payment of fee for work completed under CLINs 0001-0003.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
------	----------------------	-------------------	---------------------------------

0001		1 LO	\$136,869.00 NTE \$136,869.00
	<i>Noun:</i> RESEARCH AND DATA		
	<i>ACRN:</i> 9		
	<i>Security:</i> U		
	<i>NSN:</i> N - Not Applicable		
	<i>DD1423 is Exhibit:</i> A		
	<i>Contract type:</i> U - COST PLUS FIXED FEE		
	<i>Inspection:</i> DESTINATION		
	<i>Acceptance:</i> DESTINATION		
	<i>FOB:</i> DESTINATION		
	<i>Descriptive Data:</i>		

THE CONTRACTOR SHALL CONDUCT RESEARCH IN ACCORDANCE WITH THE STATEMENT OF WORK ENTITLED "REQUIREMENTS AND TECHNICAL CONCEPTS FOR AVIATION (RTCA) COMPLIANCE REVIEW", DATED 17 MARCH 2000. THE CONTRACTOR SHALL ALSO SUBMIT DATA IN ACCORDANCE WITH EXHIBIT A, THE CONTRACT DATA REQUIREMENTS LIST, DD FORM 1423, DATED 12 APRIL 2000, ATTACHED HERETO.

000101		Funding Info Only	
	<i>Noun:</i>	AA	\$136,869.00
	<i>ACRN:</i>		
	<i>Descriptive Data:</i>		

PR: GWSHE007201121
 Contract JON: 71841118 (136,869.00)
 Funding JON: 7184CH22
 Contract RCCC: 6HC000
 Funding RCCC: 6HCV00

0002		1 LO	NSP NSP
	<i>Noun:</i> SOFTWARE		
	<i>ACRN:</i>		
	<i>Security:</i> U		
	<i>NSN:</i> N - Not Applicable		
	<i>Contract type:</i> U - COST PLUS FIXED FEE		
	<i>Inspection:</i> DESTINATION		
	<i>Acceptance:</i> DESTINATION		
	<i>FOB:</i> DESTINATION		
	<i>Descriptive Data:</i>		

The contractor shall provide software as required in the Statement of Work, dated 17 March 2000, atch 1. The cost of this CLIN is included in CLIN 0001.

ITEM	SUPPLIES SCHEDULE DATA	QTY	SHIP TO	MARK FOR	TRANS PRI	DATE
0001		1	U			14 Jan 2001

Noun: RESEARCH AND DATA
ACRN: 9
Sec. Class: U
Descriptive Data:

The scheduled delivery date is for completion of all research and data required by the Statement of Work, atch 1, and delivery of all reports in accordance with Exhibit A, Contract Data Requirements List. Technical effort is to be completed 4 MAC (14 November 2000) and documentation is to be completed 6 MAC (14 January 2001).

0002		1	U			14 Jan 2001
------	--	---	---	--	--	-------------

Noun: SOFTWARE
Sec. Class: U
Descriptive Data:

The scheduled delivery date is for any software to be delivered in accordance with the Statement of Work, dated 17 March 2000.

ACRN	Appropriation/Lmt Subhead/Supplemental Accounting Data	Obligation Amount
------	--	-------------------

AA	97 00100 4802 8A 85A1 CS17V2 GIMA88 5921K 35102B 52	\$136,869.00
----	---	--------------

Funding breakdown: On CLIN 000101: \$136,869.00
PR/MIPR: GWSHE007201121 \$136,869.00

Descriptive data:

MIPR: MIPRG100F89S032 dated 28 Feb 00
 Contract JON: 7184CH22
 Funding JON: 71841118 (136,869.00)
 Contract RCCC: 6HC000
 Funding RCCC: 6HCV00
 PR IS COMPLETE

PAYMENT OFFICE: The fund cite listed above is incomplete due to the limitations of Conwrite. The correct fund cite is as follows: 9700100.4802 8A0 85A1 CS17V2 GIMA88 5921K 35102B 525700 1GKXXXXX

1. G005 PAYMENT INSTRUCTIONS FOR MULTIPLE ACCOUNTING CLASSIFICATION CITATIONS (FEB 1997)

PAYMENT FOR ALL EFFORT UNDER THIS DELIVERY ORDER SHOULD BE MADE IN THE ORDER AND AMOUNTS SHOWN IN THE INFORMATIONAL SUBLINE(S) IN SECTION B, CLIN 0001 OF THE CONTRACT AND RECAPPED BELOW. EXHAUST THE FUNDS IN EACH ACRN BEFORE USING FUNDS FROM THE NEXT LISTED ACRN.

ACRN	SUBCLIN NO.	TOTAL OBLIGATED
AA	000101	\$136,869.00

<u>DOCUMENT</u>	<u>PGS</u>	<u>DATE</u>	<u>TITLE</u>
EXHIBIT A	5	12 APR 2000	Contract Data Requirements List
ATTACHMENT 1	2	17 MAR 2000	Statement of Work entitled "Requirements and Technical Concepts for Aviation (RTCA) Compliance Review"

Delivery Order Number 0006
Description of Work
17 March 2000

Requirements and Technical Concepts for Aviation (RTCA) Compliance Review

1.0 SCOPE: The Requirements and Technical Concepts for Aviation (RTCA), Inc. is a non-for-profit organization formed to advance the art and science of aviation and aviation electronic systems for the benefit of the public. RTCA documentation is often the basis for FAA Technical Standard Orders (TSOs) which are usually adopted by the services for inclusion in their directives, standards and instructions for aviation in the National Airspace System. RTCA/DO-200A and 201A are the two documents forming the basis for this statement of work. These documents, although not part of a TSO or incorporated into the services' guidance yet, will be the guidelines used to resolve compliance issues concerning the Digital Aeronautical Flight Information File (DAFIF) and its use in Flight Management Systems and Flight Planning Systems. While the responsibility for approving the DAFIF data as compliant rests with the user of the data, it is incumbent upon the data provider to make available to the data users the documentation necessary to evaluate the degree to which the data provider's processes are RTCA compliant. The purpose of this work effort is to produce documentation suitable to be provided to data users and to make recommendations to resolve any areas found to be non-compliant.

2.0 APPLICABLE DOCUMENTS:

- 2.1 RTCA/DO-200A, Standards for Processing Aeronautical Data
- 2.2 RTCA/DO-201A, Standards for Aeronautical Data
- 2.3 AFRL Mapping, Charting and Geodesy (MC&G) Information Requirements Analysis Methodology

3.0 REQUIREMENTS

- 3.1 NON-TECHNICAL: The contractor shall exercise administrative and financial management functions during the course of this effort, which shall include, scheduling of activities and milestones, documenting status, outlining contractor activities and progress toward accomplishment of objectives, forecasting and making recommendations on funding and funding changes, program planning, detailed descriptions of overall effort results and documentation of new technological breakthroughs. (CDRL A001, A002)
- 3.2 DETERMINE DOCUMENTATION REQUIREMENTS: The contractor shall review the above RTCA documents to ascertain the degree of documentation necessary to reflect compliance.
- 3.3 DOCUMENT NIMA PROCESS: The contractor shall document the processes used by NIMA to gather, evaluate, provide, and maintain data on a consistent

and recurring basis and the process used to provide that evaluated information in an "incorruptible" format to the data users.

- 3.4 COMPLIANCE EVALUATION: The contractor shall compare the RTCA document review to the process documentation and identify areas where DAFIF is RTCA compliant and where DAFIF is non-RTCA compliant.
- 3.5 DOCUMENTATION: The contractor shall produce documentation suitable to be provided to data users which reflects the results of the review and process documentation described above. In addition, the contractor shall produce a list of recommendations to resolve any areas found to be non-compliant during the review and comparison. The compliance review process, results and recommendations shall be documented in a technical report and briefing/ presentation materials. (CDRL A003, A004)

CONTRACT DATA REQUIREMENTS LIST
(1 Data Item)

Approved
OI O. 0704-0188

Public reporting burden for this collection of information is estimated to average 220 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503. Please DO NOT RETURN your form to either of these addresses. Send completed form to the Government Issuing Contracting Officer for the Contract/PR No. listed in Block E.

A. CONTRACT LINE ITEM NO. 0001		B. EXHIBIT A		C. CATEGORY: N/A REF: DOD 5010.12-1 AMSDL TDP _____ TM _____ OTHER _____			
D. SYSTEM/ITEM			E. CONTRACT/PR NO. F33615-98-D-6000/0006		F. CONTRACTOR SYTRONICS, INC		
1. DATA ITEM NO. A001	2. TITLE OF DATA ITEM STATUS REPORT			3. SUBTITLE			
4. AUTHORITY (Data Acquisition Document No.) DI-MGMT-80368/T		5. CONTRACT REFERENCE DO # 3, Para 3.1		6. REQUIRING OFFICE AFRL/HECA			
7. DO 250 REQ LT	9. DIST STATEMENT REQUIRED F	10. FREQUENCY MTHLY	12. DATE OF FIRST SUBMISSION *	14. DISTRIBUTION			
8. APP CODE N/A		11. AS OF DATE *	13. DATE OF SUBSEQUENT SUBMISSION *	a. ADDRESSEE			
16. REMARKS Tailored to allow contractor's format and to delete Block 10, para 10.2.2.3. * Submit with Data Item #A003, except when final report is due to be submitted, then omit this item.				b. COPIES			
				Draft		Final	
					Reg	Repro	
				ADMN/ACO	0	1	0
				AFRL/CO	0	1	0
AFRL/HEC	0	1	0				
AFRL/HEC A	0	2	0				
15. TOTAL				0	5	0	
G. PREPARED BY TANYA S. ELLIFRETT AFRL/HECA, (937)255-7589		H. DATE 12-APR-00	I. APPROVED BY <i>[Signature]</i> Data Manager Det 1 AFRL/WSPT		J. DATE 12-APR-00		

17. PRICE GROUP
18. ESTIMATED TOTAL PRICE

(See DoD 5010.12-M for detailed instructions.)

FOR GOVERNMENT PERSONNEL

- Item A. Self-explanatory.
- Item B. Self-explanatory.
- Item C. Mark (X) appropriate category: TDP - Technical Data Package; TM - Technical Manual; Other - other category of data, such as "Provisioning," "Configuration Management", etc.
- Item D. Enter name of system/item being acquired that data will support.
- Item E. Self-explanatory (to be filled in after contract award).
- Item F. Self-explanatory (to be filled in after contract award).
- Item G. Signature of preparer of CDRL.
- Item H. Date CDRL was prepared.
- Item I. Signature of CDRL approval authority.
- Item J. Date CDRL was approved.
- Item 1. See DoD FAR Supplement Subpart 4.71 for proper numbering.
- Item 2. Enter title as it appears on data acquisition document cited in Item 4.
- Item 3. Enter subtitle of data item for further definition of data item (optional entry).
- Item 4. Enter Data Item Description (DID) number, military specification number, or military standard number listed in DoD 5010.12-L (AMSDL), or one-time DID number, that defines data content and format requirements.
- Item 5. Enter reference to tasking in contract that generates requirement for the data item (e.g., Statement of Work paragraph number).
- Item 6. Enter technical office responsible for ensuring adequacy of the data item.
- Item 7. Specify requirement for inspection/acceptance of the data item by the Government.
- Item 8. Specify requirement for approval of a draft before preparation of the final data item.
- Item 9. For technical data, specify requirement for contractor to mark the appropriate distribution statement on the data (ref. DoDD 5230.24).
- Item 10. Specify number of times data items are to be delivered.
- Item 11. Specify as-of-data item, when applicable.
- Item 12. Specify when first submittal is required.
- Item 13. Specify when subsequent submittals are required, when applicable.
- Item 14. Enter addressees and number of draft/final copies to be delivered to each addressee. Explain reproducible copies in Item 15.
- Item 15. Enter total number of draft/final copies to be delivered.
- Item 16. Use for additional/clarifying information for Items 1 through 15. Examples are: Tailoring of documents cited in item 4; Clarification of submittal dates in items 12 and 13; Explanation of reproducible copies in item 14; Desired medium for delivery of the data item.

FOR THE CONTRACTOR

Item 17. Specify appropriate price group from one of the following groups of effort in developing estimated prices for each data item listed on the DD Form 1423.

a. Group I. Definition - Data which is not otherwise essential to the contractor's performance of the primary contracted effort (production, development, testing, and administration) but which is required by DD Form 1423.

Estimated Price - Costs to be included under Group I are those applicable to preparing and assembling the data item in conformance with Government requirements, and the administration and other expenses related to reproducing and delivering such data items to the Government.

b. Group II. Definition - Data which is essential to the performance of the primary contracted effort but the contractor is required to perform additional work to conform to Government requirements with regard to depth of content, format, frequency of submittal, preparation, control, or quality of the data item.

Estimated Price - Costs to be included under Group II are those incurred over and above the cost of the essential data item without conforming to Government requirements, and the administrative and other expenses related to reproducing and delivering such data item to the Government.

c. Group III. Definition - Data which the contractor must develop for his internal use in performance of the primary contracted effort and does not require any substantial change to conform to Government requirements with regard to depth of content, format, frequency of submittal, preparation, control, and quality of the data item.

Estimated Price - Costs to be included under Group III are the administrative and other expenses related to reproducing and delivering such data item to the Government.

d. Group IV. Definition - Data which is developed by the contractor as part of his normal operating procedures and his effort in supplying these data to the Government is minimal.

Estimated Price - Group IV items should normally be shown on the DD Form 1423 at no cost.

Item 18. For each data item, enter an amount equal to that portion of the total price which is estimated to be attributable to the production or development for the Government of that item of data. These estimated data prices shall be developed only from those costs which will be incurred as a direct result of the requirement to supply the data, over and above those costs which would otherwise be incurred in performance of the contract if no data were required. The estimated data prices shall not include any amount for rights of data. The Government's right to use the data shall be governed by the pertinent provisions of the contract.

ORDER FOR SUPPLIES OR SERVICES

1. CONTRACT/PURCH ORDER/AGREEMENT NO. F33615-98-D-6000		2. DELIVERY ORDER/ CALL NO. 0005		3. DATE OF ORDER/ CALL (YYYYMMDD) 99APR22		4. REQUISITION/PURCH REQUEST NO. SEE SECTION G		5. PRIORITY DO-C9	
AFRL/MLKH USAF/AFMC AIR FORCE RESEARCH LABORATORY 2530 C STREET, BUILDING 7 WRIGHT-PATTERSON AFB, OH. 45433-7607 BUYER: ANNETTE HENDERSON (937)656-6273			CODE FA8650		7. ADMINISTERED BY (If Other than G) DCMC DAYTON AREA C BUILDING 30 1725 VAN PATTON DRIVE WRIGHT-PATTERSON AFB OH 45433-5302			CODE S3605A	
9. CONTRACTOR SYTRONICS, INC 4433 DAYTON-XENIA ROAD, BUILDING 1 DAYTON OH 45432 (937) 429-1466 GREENE COUNTY				CODE 1EE69		FACILITY 1EE69		10. DELIVER TO FOB POINT BY (Date) (YYYYMMDD) SEE SCHEDULE	
NAME AND ADDRESS				11. X IF BUSINESS IS		12. DISCOUNT ITEMS N		13. MAIL INVOICES TO ADDRESS IN BLOCK SEE BLOCK 15 (PAYMENT OFFICE)	
								<input checked="" type="checkbox"/> SMALL <input type="checkbox"/> SMALL DISADVANTAGED WOMEN-OWNED	
14. SHIP TO SEE SCHEDULE				CODE		15. PAYMENT WILL BE MADE BY DFAS-CO/NEW DOMINION DIVISION P O BOX 182041 COLUMBUS OH 43218-2041		CODE SC1018	
								MARK ALL PACKAGES AND PAPERS WITH IDENTIFICATION NUMBERS IN BLOCKS 1 AND 2.	
16. DELIVERY/ CALL <input checked="" type="checkbox"/>		This delivery order/call is issued on another Government agency or in accordance with and subject to terms and conditions of above numbered contract.							
16. PURCHASE <input type="checkbox"/>		Reference your _____ furnish the following on items specified herein.							
16. ORDER		ACCEPTANCE. THE CONTRACTOR HEREBY ACCEPTS THE OFFER REPRESENTED BY THE NUMBERED PURCHASE ORDER AS IT MAY PREVIOUSLY HAVE BEEN OR IS NOW MODIFIED, SUBJECT TO ALL OF THE TERMS AND CONDITIONS SET FORTH, AND AGREES TO PERFORM THE SAME.							

MAILING DATE
APR 26 1999

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

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

17. ACCOUNTING AND APPROPRIATION DATA/LOCAL USE

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

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

24. UNITED STATES OF AMERICA
BY: JAMES H. DAY *James H. Day*
CONTRACTING/ORDERING

25. TOTAL \$204,985.63

29. DIFFERENCES

26. QUANTITY IN COLUMN 20 HAS BEEN

INSPECTED RECEIVED ACCEPTED, AND CONFORMS TO THE CONTRACT EXCEPT AS NOTED

27. SHIP NO. _____ 28. D.O. VOUCHER NO. _____

32. PAID BY _____ 30. INITIALS _____

31. AMOUNT VERIFIED CORRECT FOR _____

32. PAYMENT _____ 34. CHECK NUMBER _____

33. COMPLETE _____ 35. BILL OF LADING _____

33. PARTIAL _____

33. FINAL _____

36. I CERTIFY THIS ACCOUNT IS CORRECT AND PROPER FOR PAYMENT.

DATE _____ SIGNATURE AND TITLE OF AUTHORIZED GOVERNMENT REPRESENTATIVE _____

DATE _____ SIGNATURE AND TITLE OF CERTIFYING OFFICER _____

37. RECEIVED AT _____ 38. RECEIVED BY (Print) _____ 39. DATE RECEIVED (YYYYMMDD) _____

40. TOTAL CONTAINERS _____ 41. S/R ACCOUNT NO. _____ 42. S/R VOUCHER NO. _____

1. In accordance with the provisions of the Basic Contract and this delivery order, the Contractor shall accomplish the effort described in the attached Statement of Work (SOW), dated 7 April 1999, and entitled "Proof-Of-Concept Prototype Speech Processing System", at a total not to exceed amount of \$204,985.63.

SECTION B

1. 5352.216-9001 PAYMENT OF FEE (AFMC)(CPFF)(JUL 1997)

The estimated cost and fee for this delivery order are shown below. The applicable fixed fee or target fee set forth below may be increased or decreased only by negotiation and modification of the contract delivery order for added or deleted work. As determined by the contracting officer, it shall be paid as it accrues, in regular installments based upon the percentage of completion of work (or the expiration of the agreed-upon period(s) for term contract(s).

Estimated Cost: \$191,575.35

Fixed Fee: \$13,410.28

2. 52.232-20 LIMITATION OF COSTS (APR 1984)

(a) The sum allotted to this contract delivery order and available for payment of costs under CLINs 0001-0003 through 22 October 2000 (completion date of the delivery order) in accordance with the clause in Section I entitled "Limitation of Costs" is \$191,575.35.

(b) In addition to the amount allotted under the "Limitation of Costs" clause, the additional amount of \$13,410.28 is obligated for payment of fee for work completed under CLINs 0001-0003.

ITEM	SUPPLIES OR SERVICES	Qty		Unit Price	
		Purch	Unit	Total	Item Amount
0001	CLIN Establish		1		NTE \$204,985.63
	RESEARCH AND DATA		LO		NTE \$204,985.63
	acrn: 9				
	security: U				
	nsn: N - NOT APPLICABLE				
	DD1423 is Exhibit: A				
	contract type: U - COST PLUS FIXED FEE				
	inspection: DESTINATION				
	acceptance: DESTINATION				
	fob: DESTINATION				
	descriptive data:				
	THE CONTRACTOR SHALL CONDUCT RESEARCH IN ACCORDANCE WITH THE STATEMENT OF WORK ENTITLED "PROOF-OF-CONCEPT PROTOTYPE SPEECH PROCESSING SYSTEM", DATED 7 APRIL 1999. THE CONTRACTOR SHALL ALSO SUBMIT DATA IN ACCORDANCE WITH EXHIBIT A, THE CONTRACT DATA REQUIREMENTS LIST, DD FORM 1423, DATED 15 APRIL 1999, ATTACHED HERETO.				
000101	Info SubCLIN Establish				
	FUNDING INFO ONLY				
	acrn: AA			\$204,985.63	
	descriptive data:				
	PR: FY8990-99-HC552				
	JON: 71844104 (205K)				
	7184CH22				
	CCC: 6HC000				
0002	CLIN Establish		1		NSP
	HARDWARE		LO		NSP
	security: U				
	nsn: N - NOT APPLICABLE				
	contract type: U - COST PLUS FIXED FEE				
	inspection: DESTINATION				
	acceptance: DESTINATION				
	fob: DESTINATION				
	descriptive data:				
	DELIVER HARDWARE IN ACCORDANCE WITH THE STATEMENT OF WORK, DATED 7 APRIL 1999. THE COST OF THIS CLIN IS INCLUDED IN CLIN 0001.				

<u>ITEM</u>	<u>SUPPLIES OR SERVICES</u>	<u>Qty</u>	<u>Unit Price</u>
		<u>Purch Unit</u>	<u>Total Item Amount</u>
0003	CLIN Establish	1	NSP
	SOFTWARE	LO	NSP

security: U
nsn: N - NOT APPLICABLE
DD1423 is Exhibit: A
contract type: U - COST PLUS FIXED FEE
inspection: DESTINATION
acceptance: DESTINATION
fob: DESTINATION

descriptive data:
THE CONTRACTOR SHALL PROVIDE SOFTWARE AS REQUIRED IN STATEMENT OF WORK, DATED 7
APRIL 1999, ATCH 1. THE COST OF THIS CLIN IS INCLUDED IN CLIN 0001.

ITEM	SUPPLIES SCHEDULE DATA	Qty	Ship To	Mark For	Trans Pri	Date
0001	CLIN Del Sch Establish	1	U			22 Oct 2000

noun: RESEARCH AND DATA
 acrn: 9
 sec class: U

descriptive data:
 The scheduled delivery date is for completion of all research and data required by the Statement of Work, atch 1, and delivery of all reports in accordance with Exhibit A. Contract Data Requirements List. Technical effort is to be completed 16 MAC (22 August 2000) and documentation is to be completed 18 MAC (22 October 2000).

0002	CLIN Del Sch Establish	1	U			22 Aug 2000
------	------------------------	---	---	--	--	-------------

noun: HARDWARE
 sec class: U

descriptive data:
 The scheduled delivery date is for delivery of all hardware in accordance with the Statement of Work, dated 7 April 1999.

0003	CLIN Del Sch Establish	1	U			22 Aug 2000
------	------------------------	---	---	--	--	-------------

noun: SOFTWARE
 sec class: U

descriptive data:
 The scheduled delivery date is for any software to be delivered in accordance with Statement of Work, dated 7 April 1999.

ACRN Appropriation/Lmt Subhead/Supplemental Accounting Data Obligation
Amount

AA ACRN Establish
5793400 309 43KG X003BS/010000 592 28007F 503000 F03000 \$204,985.63

funding breakdown: On Clin 000101: \$204,985.63

pr/mipr: FY8990-99-HC552 \$204,985.63 (pr is complete)

descriptive data:

MIPR: AF Form 616 #S9710402 dated 07 Apr 99

JON: 71844104 (205K)

7184CH22

CCC: 6HC000

1. G005 PAYMENT INSTRUCTIONS FOR MULTIPLE ACCOUNTING CLASSIFICATION CITATIONS (FEB 1997)

PAYMENT FOR ALL EFFORT UNDER THIS DELIVERY ORDER SHOULD BE MADE IN THE ORDER AND AMOUNTS SHOWN IN THE INFORMATIONAL SUBLINE(S) IN SECTION B, CLIN 0001 OF THE CONTRACT AND RECAPPED BELOW. EXHAUST THE FUNDS IN EACH ACRN BEFORE USING FUNDS FROM THE NEXT LISTED ACRN.

ACRN	SUBCLIN NO.	TOTAL OBLIGATED
AA	000101	\$204,985.63

2. G008 INCREMENTAL FUNDING (APR 1997)

THE DELIVERY ORDER WILL BE INCREMENTALLY FUNDED PURSUANT TO THE LIMITATION OF FUNDS CLAUSE, FAR 52.232-22. FUNDS ARE HEREBY OBLIGATED IN THE AMOUNT OF \$204,985.63 (COMPLETES FUNDING ON THIS ORDER) AND IT IS ESTIMATED THEY ARE SUFFICIENT FOR CONTRACT PERFORMANCE THROUGH 22 OCTOBER 2000. (COMPLETION OF PERIOD OF PERFORMANCE)

SECTION I - AFMC FAR CLAUSES

1. 5352.245-9000 GOVERNMENT FURNISHED PROPERTY (GFP) (AFMC) (JUL 1997)

Pursuant to the Government Property Clause herein, the Government shall furnish this item(s) of property listed below as Government-Furnished Property (GFP) to the Contractor, f.o.b. destination, for use in performance of this contract delivery order. Upon completion of the contract delivery order, the Contractor shall obtain disposition instructions from the Government Property Administrator of the activity having responsibility for administration of the contract.

Government Furnished Equipment to be furnished to Contractor:

- (1) Two Sun Ultra 10 workstations to host the analysis software and associated speech databases.
- (2) Two portable computers to support field demonstrations.

2. 5352.245-9004 BASE SUPPORT (AFMC) (JUL 1997) - ALTERNATE I (JUL 1997)

Base support shall be provided by the Government to the Contractor in accordance with this clause.

(e) Following are installations where base support will be provided:

Work will be accomplished at Wright-Patterson AFB, OH., Area B, in AFRL/HEC's Speech and Communication, Research, Engineering, Analysis and Modeling Facility, Building 248, Room 109.

SECTION J - LIST OF ATTACHMENTS

Atch 1 Statement of Work, entitled "Proof-Of-Concept Prototype Speech Processing System", dated 7 April 1999.

Exhibit A DD Form 1423, Contract Data Requirements List (CDRLs), dated 15 April 1999.

Delivery Order Number 0005
Description of Work
7 April 1999

Proof-of-Concept Prototype Speech Processing System

1.0 SCOPE: Research in speech technology investigates its effectiveness in supporting improved warfighter training during air operations exercises. The purpose of this work effort is to build a prototype and evaluate the military worth of the speech processing system in air operations training. The development and evaluation of a proof-of-concept prototype speech processing system is required that can manipulate various types of information in the speech signal. The prototype also should be able to evaluate the importance of that information for speaker identity and emotional state determination. A speech processing system will be evaluated with human listeners using speech collected in house and from standard speech databases.

2.0 APPLICABLE DOCUMENTS

2.1 AFRL/HECA Research Protocol Number 83-58, Human Exposure to Acoustic Energy

3.0 REQUIREMENTS

3.1 NON-TECHNICAL: The contractor shall exercise administrative and financial management functions during the course of this effort, which shall include, scheduling of activities and milestones, documenting status, outlining contractor activities and progress toward accomplishment of objectives, forecasting and making recommendations on funding and funding changes, program planning, detailed descriptions of overall effort results and documentation of new technological breakthroughs. (CDRL A001, A002)

3.2 SPEECH SIGNAL INFORMATION: The contractor shall identify and define information in the speech signal that determines the identity of the speaker and of their emotional state.

3.3 DESIGN TECHNIQUES:

3.3.1 Design Develop: The contractor shall develop techniques to manipulate the information in the speech signal that is important for speaker identity and emotional state identification. The contractor shall develop manipulating techniques to be capable of being incorporated into a portable system (CDRL A003, DI-MISC-80711)

3.3.2 Evaluate: The contractor shall evaluate the effectiveness of the manipulation techniques by performing experiments with human listeners and with machine recognition techniques (CDRL A003, DI-MISC-80711)

3.3.3 The contractor shall install and check-out the prototype system to assure that it will interface with the equipment and facilities at the 353rd Combat Training Squadron, Eielson AFB, AK.

3.4 DESIGN TEST SUPPORT: The contractor shall support Human listener tests to perform laboratory assessment of the prototype speech processing system. Tests are to be conducted in AFRL/HEC Performance and Communication, Research and Technology Facility, Bldg. 441, Rm. 0-107, Wright-Patterson AF Base, Ohio using currently approved experimental protocols of the Air Force Research Laboratory, Human Effectiveness Directorate (AFRL/HECA), Research Protocol #83-58, Human Exposure to Acoustic Energy.

3.5 PROTOTYPE: The contractor shall build a prototype speech processing system in accordance with the approved design. The objective of the system is to have capabilities for (CDRL A003, DI-MISC-80711; A004, DI-IPSC-81443):

3.4.1 Both laboratory and portable operation,

3.4.2 Near real-time operation, and the

3.4.3 Ability to manipulate the information identified in paragraph 3.3.

3.6 FIELD ASSESSMENT SUPPORT: The contractor shall participate in the assessment of the prototype speech system at the 353rd Combat Training Squadron, Eielson AFB, AK in June 2000. The contractor shall assist in installation, checkout, and training of personnel that will perform the assessment (CDRL A003, DI-MISC-80711)

CDRL ADDRESSES

AFRL/HECA (Dr. Timothy Anderson)
2255 H Street, Bldg 248
Wright-Patterson AFB, OH. 45433-7022

AFRL/MLKH (Mr. Jim Day)
2530 C St., Bldg 7
Wright-Patterson AFB, OH. 45433-7607

AFRL/HEC (Ms. Helen Redwine-Smith)
2255 H Street, Bldg 248
Wright-Patterson AFB, OH. 45433-7022

AFRL/HEF (Ms. Margaret Crutchfield)
2245 Monahan Way
Wright-Patterson AFB, OH. 45433-7008

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

CONTRACT ID CODE
U - CPFF

PAGE OF PAGES
1 of 5

2. AMENDMENT/MODIFICATION NO. 08	3. EFFECTIVE DATE FA8650	4. REQUISITION/PURCHASE REQ NO. See Section G	5. PROJECT NO. (if applicable)
6. ISSUED BY AFRL/MLKH CODE	7. ADMINISTERED BY (if other than Item 5) DCMC DAYTON AREA C BUILDING 30 1725 VAN PATTON DRIVE WRIGHT-PATTERSON AFB, OH 45433-5302	CODE S3605A	
USAF/AFMC AIR FORCE RESEARCH LABORATORY 2310 EIGHTH STREET, BUILDING 167 WRIGHT-PATTERSON AFB OH 45433-7801 ANNETTE B. HENDERSON (937) 656-9046 annette.henderson@ws.wpafb.af.mil			

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code) SYTRONICS, INC 4433 DAYTON-XENIA ROAD, BUILDING 1 DAYTON OH 45432 (937) 429-1466 GREENE COUNTY	(X)	9A. AMENDMENT OF SOLICITATION NO.
		9B. DATED (SEE ITEM 11)
	X	10A. MODIFICATION OF CONTRACT/ORDER NO. F33615-98-D-6000 0004
		10B. DATED (SEE ITEM 13) 25 SEP 1998
CODE 1EE69	FACILITY CODE/ 1EE69	

MAILING DATE
SEP 20 2000

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

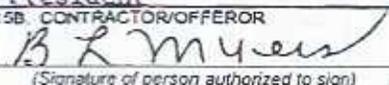
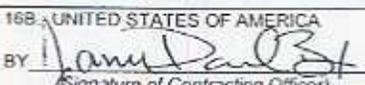
12. ACCOUNTING AND APPROPRIATION DATA (if required)
See Section G

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

(X)	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: () THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. ITEM 10A.
	B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
X	C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF: The "Changes" Clause FAR 52.243-2
	D. OTHER (Specify type of modification and authority)

E. IMPORTANT: Contractor is not, is required to sign this document and return 1 copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)
 SUBJECT: Descope to the Statement of Work, Incremental Funding, and Extension to the Period of Performance
 CHANGE IN OBLIGATION: \$60,263.00 (Increase)
 CHANGE IN DELIVERY ORDER TOTAL: \$1,235,264.30 (Decrease)
 PROGRAM MANAGER: Don Monk, AFRL/HECA, Wright-Patterson AFB, OH. 45433
 PAYMENT OFFICE: (SC1018) DFAS-CO/New Dominion Division, P.O. Box 182041, Columbus, OH. 43218
 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) BARRETT L. MYERS President	16A. NAME AND TITLE OF SIGNER (Type or print) JAMES DAVID BOX Contracting Officer
15B. CONTRACTOR/OFFEROR  (Signature of person authorized to sign)	16B. UNITED STATES OF AMERICA BY:  (Signature of Contracting Officer)
15C. DATE SIGNED 09/19/00	16C. DATE SIGNED 19 SEP 00

1. This supplemental agreement is being issued pursuant to the Changes Clause, FAR 52.243-2, to incorporate the revised Statement of Work (SOW) dated 30 August 2000, and update the SOW paragraph references in the Contract Data Requirements List in Section J of the subject delivery order. The new total amount for this delivery order is \$2,276,243.75, a decrease of \$1,235,264.30, from \$3,511,508.05. This modification is also being issued to extend the period of performance from 25 September 2000 to 25 September 2003 in Section F, and to add incremental funding to this delivery order in Section G for a new total amount allotted of \$536,434.00, an increase of \$60,263.00 from \$476,171.00.

2. Section A - Cover Page is amended as shown:

Block 25 of DD Form 1155 Delete: \$3,511,508.05
Add: \$2,276,243.75

3. Section B - is modified as follows:

5352.216-9001 PAYMENT OF FEE (AFMC)(CPFF)(JUL 1997)

Delete: Estimated Cost: \$3,317,681.17 Add: Estimated Cost: \$2,133,195.79
Fixed Fee: \$193,826.88 Fixed Fee: \$143,047.96

5352.232-9001 IMPLEMENTATION OF LIMITATION OF FUNDS (AFMC)(JUL 1997)

(a) The sum allotted to this contract delivery order and available for payment of costs under CLINs 0001-0003 through 15 October 2000 in accordance with the clause in Section I entitled Limitation of Funds, and e-mail from the contractor on 18 September 2000 incorporated herein by reference, is \$499,850.00, an increase of \$56,046.00, from \$443,804.00.

(b) In addition to the amount allotted under the Limitation of Funds clause, the additional amount of \$36,584.00 is obligated for payment of fee for work completed under CLINs 0001-0003, an increase of \$4,217.00 (7%), from \$32,367.00.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
0001	CLIN Change		\$2,276,243.75
		LO	NTE -\$1,235,264.30
	<i>Noun:</i>	RESEARCH AND DATA	
	<i>Total Quantity:</i>	1	
	<i>New Total Item Amount:</i>	\$2,276,243.75	
	<i>ACRN:</i>	9	
	<i>Security:</i>	U	
	<i>NSN:</i>	N - Not Applicable	
	<i>DD1423 is Exhibit:</i>	A	
	<i>Contract type:</i>	U - COST PLUS FIXED FEE	
	<i>Inspection:</i>	DESTINATION	
	<i>Acceptance:</i>	DESTINATION	
	<i>FOB:</i>	DESTINATION	
	<i>Descriptive Data:</i>		

THE CONTRACTOR SHALL CONDUCT RESEARCH IN ACCORDANCE WITH THE REVISED STATEMENT OF WORK ENTITLED "BIOACOUSTIC, NOISE, AND VIBRATION RESEARCH AND SUSTAINMENT EFFORT", DATED 30 AUGUST 2000.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
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000109	CLIN Establish Noun: ACRN: Descriptive Data:	Funding Info Only AJ	+\$60,263.00
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PR: GWSHE007201148
 Contract JON: 7184CH22
 Funding JON: 71841608 (\$60,263.00)
 Contract RCCC: 6HC000
 Funding RCCC: 6HCB00

0002	CLIN Change	LO	NSP NSP
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Noun: HARDWARE
 Total Quantity: 1
 Total Item Amount: \$0.00
 ACRN: U
 Security: U
 NSN: N - Not Applicable
 Contract type: U - COST PLUS FIXED FEE
 Inspection: DESTINATION
 Acceptance: DESTINATION
 FOB: DESTINATION

Descriptive Data:

DELIVER HARDWARE IN ACCORDANCE WITH REVISED STATEMENT OF WORK, DATED 30 AUGUST 2000.

0003	CLIN Change	LO	NSP NSP
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Noun: SOFTWARE
 Total Quantity: 1
 Total Item Amount: \$0.00
 ACRN: U
 Security: U
 NSN: N - Not Applicable
 Contract type: U - COST PLUS FIXED FEE
 Inspection: DESTINATION
 Acceptance: DESTINATION
 FOB: DESTINATION

Descriptive Data:

THE CONTRACTOR SHALL PROVIDE SOFTWARE AS REQUIRED IN REVISED STATEMENT OF WORK, DATED 30 AUGUST 2000, ATCH 1.

ITEM	SUPPLIES SCHEDULE DATA	QTY	SHIP TO	MARK FOR	TRANS PRI	DATE
------	------------------------	-----	---------	----------	-----------	------

0001		1	U			25 Sep 2003
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Noun: RESEARCH AND DATA
ACRN: 9
Sec. Class: U
Descriptive Data:

The scheduled delivery date is extended from 25 September 2000 to 25 September 2003.

0002		1	U			25 Sep 2003
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Noun: HARDWARE
ACRN: U
Sec. Class: U
Descriptive Data:

The scheduled delivery date is extended from 25 September 2000 to 25 September 2003.

0003		1	U			25 Sep 2003
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Noun: SOFTWARE
ACRN: U
Sec. Class: U
Descriptive Data:

The scheduled delivery date is for any software to be delivered in accordance with Statement of Work, dated 30 August 2000.

4. G008 INCREMENTAL FUNDING (APR 1997)

The delivery order will be incrementally funded pursuant to the Limitation of Funds Clause, FAR 52.232-22. Funds are hereby obligated in the amount of \$536,434.00 and it is estimated they are sufficient for contract performance through 15 October 2000.

ACRN	Appropriation/Lmt Subhead/Supplemental Accounting Data	Obligation Amount
------	--	-------------------

AJ	ACRN Establish 57 93600 299 47A8 627184 6HCB00-59200 62202F 503000 F03000	\$60,263.00
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New ACRN Amount: \$60,263.00

Funding breakdown: On CLIN 000109: +\$60,263.00

PR/MIPR: GWSHE007201148 \$60,263.00

JON: 71841608 WBS:

Descriptive data:

Contract JON: 7184CH22
 Funding JON: 71841608 (\$60,263.00)
 Contract RCCC: 6HC000
 Funding RCCC: 6HCB00
 PR is complete.

5. Section J - is amended as shown:

Delete: Atch 1 Statement of Work, entitled "Bioacoustic, Noise, and Vibration Research and Sustaining Effort", dated 30 June 1998.

Add: Atch 1 Statement of Work, entitled "Bioacoustic, Noise, and Vibration Research and Sustainment Effort (Revision #1a), dated 30 August 2000.

Exhibit A DD Form 1423, Contract Data Requirements List (CDRLs), dated 30 June 1998 is revised as shown:

Data Item A003, Block 16. Remarks: Reference to Blk 5 now reads: SOW para 3.1.3, 3.1.4, 3.2.1.2.2, 3.2.1.3.3, 3.2.1.3.4, 3.3.1, 3.3.2, 3.3.3, 3.3.4, and 3.3.5.

Data Item A004, Block 16. Remarks: Reference to BLK 5 now reads: SOW para 3.1.3, 3.1.4, 3.2.1.2.2, 3.2.1.3.3, 3.3.1, 3.3.2, 3.3.3, 3.3.4, and 3.3.5.

Data Item A005 Block 16. Remarks: Reference to BLK 5 now reads: SOW para 3.1.4, 3.2.1.2.2, 3.2.1.3.1, 3.2.1.3.3, 3.2.2.3, 3.2.2.4, 3.3.1, 3.3.2, 3.3.3, 3.3.4, and 3.3.5.

6. This supplemental agreement constitutes a full settlement of any claims of the contractor arising out of or in connection with the changes effected hereby.

REVISED STATEMENT OF WORK
DELIVERY ORDER 0004

TITLE: Bioacoustic, Noise, and Vibration Research and Sustainment Effort

(Revision # 1a)

REVISION DATE: 30 August 2000

DESCRIPTION OF WORK

1.0 SCOPE: This effort requires ongoing and sustaining research, development, and technical efforts for the research programs in the bioacoustic, biocommunications and human vibration laboratories. The required work includes (a) development and implementation of research plans, experimentation, and prototypes and (b) the sustainment of the bioacoustic and biocommunication laboratories.

2.0 APPLICABLE DOCUMENTS:

- 2.1. ANSI S3.2-1989: *Method for Measuring the Intelligibility of Speech Over Communication Systems*
- 2.2. ANSI S12.6-1997: *Method for the Measurement of the Real-Ear Attenuation of Hearing Protectors*
- 2.3. ANSI S.12.42-1995: *Microphone-In-Real-Ear and Acoustic Test Fixture Methods for the Measurement of Insertion Loss of Circumaural Hearing Protection Devices*
- 2.4. Air Force Instruction (AFI) 40-402: *The Use of Human Subjects in Research, Development, Test and Evaluation*

3.0 REQUIREMENTS:

3.1. Bioacoustic Protection, Audio Displays, Vibroacoustic Modeling and Acoustic Remote Threat Detection Research Programs

3.1.1. Research Planning

3.1.1.1. The contractor shall develop individual research plans to support the combination of experimentation, development, and evaluation in the various research programs to be conducted in the Bioacoustic, Biocommunications, and Human Vibration Laboratories.

3.1.1.2. The contractor shall monitor on-going technical developments in the general research areas relevant to Bioacoustic Protection, Audio Displays, Vibroacoustic Modeling and Acoustic Remote Threat Detection Research Programs and shall maintain the program plans such that they accurately reflect current research trends within the programs, the progress of the research programs, significant accomplishments, anticipated facilities and resource requirements, and projected research products. The contractor shall coordinate the research program plans with the Government for approval before implementation. (CDRLs A001 and A002)

3.1.1.3. The contractor shall support the development of protocols supporting the use of human subjects in the Bioacoustic, Biocommunications, and Human Vibration Laboratories. The objectives of the protocols are to characterize the nature of the experimentation to be done, any safety implications of research facilities or experimental methods, along with the general descriptions of research facility capabilities and characteristics. (CDRL A002)

3.1.2. Experimental Planning

The contractor shall plan for the development of experiments to be conducted within the Bioacoustic, Biocommunications, and Human Vibration Laboratories in conjunction with the associated research plan. The objectives of experimental planning are to develop detailed specification of specific experimental manipulations to be performed, specific measures of human performance to be performed, specific facility requirements and operating tolerances, analysis techniques to be employed, technical requirements, and subject requirements. The contractor shall coordinate experimental plans with the Government for approval before implementation. (CDRL A002)

3.1.3. Experimental Research

The contractor shall collect pre-experimental pilot data to assure that the Bioacoustic, Biocommunications, and Human Vibration Laboratories are operating within tolerances specified in the experimental plan and that experimental procedures can be implemented accurately. Following verification of pre-experimental pilot data, the contractor shall collect experimental data using subjects from the contractor's subject pool or Government supplied subjects. The contractor shall conduct appropriate descriptive and inferential statistical analyses using experimental data. The contractor shall perform statistical analyses using graphical, pictorial, and tabular summaries; shall document in the form of technical reports, journal reports, and conference proceedings papers; and shall present research finding and results. Any of these analyses, written documentation, or briefing/presentation materials may require the incorporation of graphics, animation, multimedia, and photographic elements. The contractor shall attend conferences and symposia and present the results of experimental research to transition research results to other Government, industrial, and academic institutions. (CDRLs A002, A003, and A004)

3.1.4. Developmental Research

The contractor shall develop crew system interface hardware and software (in the form of prototypes, conceptual demonstrations, models, and simulations) as specified in bioacoustic, noise, and vibration laboratory research plans. The contractor shall identify and describe hardware and software requirements specifications. The contractor shall use the specification documents to design, fabricate, implement, code, and install the items in laboratory and field environments. The contractor shall test the prototypes, demonstrations, models, and simulations for their capability to improve the planning, design, development, and operation of Air Force and human systems. The contractor shall report technical research development in documents and conference proceedings. The contractor shall develop graphics and other presentation materials required for the Bioacoustic Protection, Audio Displays, Vibroacoustic Modeling and Acoustic Remote Threat Detection Research Programs to include, but not be limited to, charts, animation, multimedia, and photographic elements. The contractor shall attend conferences and symposia and present the results of developmental research as required to transition research results to other Government agencies, industry, and academic institutions. (CDRLs A002, A003, A004, A005, and A006)

3.2. Bioacoustic and Biocommunications Laboratories Sustainment

3.2.1. Bioacoustics Laboratory Sustainment.

3.2.1.1. Psychoacoustics Measurement Chamber. The contractor shall provide research, sustainment, and research subjects for the Psychoacoustics measurement Chamber. This is used for experimentation in basic research areas that include, but are not limited to, signal detection theory, materialization, distance perception, and speech perception.

3.2.1.2. Active Noise Reduction Chamber.

3.2.1.2.1. The contractor shall provide research, sustaining effort, and research subjects for the Active Noise Reduction (ANR) Chamber. An existing KEMAR acoustic manikin shall be available to the contractor for electro-acoustic performance experiments. The contractor shall maintain necessary monitoring and noise control equipment. The contractor shall comply with the ANSI 12.42 -1995, *Microphone-In-Real-Ear and Acoustic Test Fixture Methods for the Measurement of Insertion Loss of Circumaural Hearing Protection Devices*, for all data collected the ANR lab. The contractor shall sustain

and upgrade software as needed. The contractor shall sustain the subject stations during non-data collection times.

3.2.1.2.2. The contractor shall develop, test, document, and report advanced (semi-insert) active noise reduction headsets that provide at least 10 dB average active attenuation from 100Hz to 2kHz and provide at least 80 percent intelligibility using the modified rhyme test in a 115 dB overall sound pressure level pink noise environment. (CDRLs A003, A004, A005, A006, and A007)

3.2.1.3. Auditory Localization Facility.

3.2.1.3.1. The contractor shall provide research, sustaining effort, and research subjects for the Auditory Localization Facility (ALF). The contractor shall determine auditory-visual-vestibular interactions and measure human localization performance in terms of accuracy and reaction time. Multiple (up to 15) audio targets may be presented at a time. The contractor shall conduct audio-visual interaction experiments using LEDs co-located with the loudspeakers or HMDs. In conducting these experiments, the contractor shall use both free-field and virtual sound sources. The contractor shall design, fabricate, and install a subject dynamic, orientation device capable of 2-revolutions/second. The contractor shall sustain the subject stations during non-data collection times. (CDRL A005)

3.2.1.3.2. The contractor shall collect inter-aural time delays (ITDs) and head-related transfer function (HRTFs) in the ALF or other suitable facility. After measurement, the contractor shall process the data for use in the virtual audio hardware. The contractor shall sustain the acoustic research mannequins and shall make custom pinnae molds.

3.2.1.3.3. The contractor shall sustain virtual audio equipment including the auditory localization cue synthesizer (ALCS), 3-Dimensional audio display generator (ADG) and future versions. The contractor shall conduct parameter studies to determine the optimum characteristics of virtual displays. The contractor shall also design, implement, test, document and report an IC chip version of the virtual audio hardware. (CDRLs A003, A004, A005, A006, and A007)

3.2.1.3.4. Hearing Protector Performance Chamber. The contractor shall provide research, sustaining effort, and research subjects for the Hearing Protector Performance Chamber (HPP). The contractor shall collect data in compliance with ANSI S12.6-1997, *Method for the Measurement of the Real-Ear Attenuation of Hearing Protectors*. The contractor shall conduct and document the periodic calibration of this facility in order to demonstrate its accordance with ANSI S12.6-1997. The contractor shall conduct this calibration at interval not to exceed 30 days between calibrations. The contractor shall sustain all test equipment including: the PC, printer, attenuators, noise generator, filters, loudspeakers, subject response button, video camera, and monitor. The contractor shall install software upgrades for this system as needed. The contractor shall sustain the subject stations during non-data collection times. (CDRL A003)

3.2.2. Biocommunications Laboratory Sustainment.

3.2.2.1. Voice Communication Research and Evaluation System

3.2.2.1.1. The contractor shall provide research, sustaining effort, and research subjects for the Voice Communication Research and Evaluation System (VOCRES). The contractor shall determine speech intelligibility performance of various communications equipment in accordance with ANSI S3.2-1989, *Method for Measuring the Intelligibility of Speech Over Communication Systems*. Studies include performance evaluation of personal protective equipment, bandwidth and spectrum shaping supporting digital audio technology for aircraft and performance of hearing impaired listeners in AF operational noise environments. The contractor shall provide a panel of at least 10 subjects for approximately four hours per workday for data collection. The contractor shall sustain the subject stations during non-data collection times

3.2.2.1.2. The contractor shall establish baseline communication effectiveness of intelligent jamming and speaker normalization for new hardware or jamming methods as they become available.

3.2.2.2. Performance and Communications Research and Technology. The contractor shall provide research, sustaining effort, and research subjects for the Performance and Communications Research and Technology (PACRAT) Chamber. This facility is used to study the relationship between intelligibility and task completion. The contractor shall implement the Voice Communication Effectiveness Task (VCET) in this lab. The contractor shall establish baseline communication effectiveness of intelligent jamming and speaker normalization for new hardware or jamming methods as they become available. The contractor shall provide a panel of at least 10 subjects for approximately four hours per workday for data collection. The contractor shall sustain the subject stations during non-data collection times.

3.2.2.3. Speech Communication in Occupational Noise Environments. The contractor shall provide research, sustaining effort, and research subjects for the Speech Communication in Occupational Noise Environments (SCONE) chamber. SCONE is a computer-controlled test chamber used to assess the speech intelligibility performance of hearing-impaired individuals who work in high noise environments. The contractor shall install and document software and hardware upgrades for this chamber. (CDRLs A005, A006, and A007)

3.2.2.4 Audio Symbology Chamber. The contractor shall design a six station listening lab such that each station is capable of stand alone operation, has integrated two channel headphones, has internal signal processing capability, and has an Ethernet interface capability. The contractor shall fabricate, document, install these stations in room 0-101, Building 441. The contractor shall sustain the subject stations during non-data collection times. (CDRL A005)

3.2.2.5 Electronics Laboratory. The contractor shall operate and provide sustaining effort for the Electronics Lab. The contractor shall provide expendable supplies such as solder, hook-up wire, resistors, capacitors, digital ICs, sockets, connectors and the like. The contractor shall control, inventory on an annual basis, and maintain all handtools, soldering irons, pocket voltmeters and the like.

3.3. Bioacoustic Protection, Audio Displays, Vibroacoustic Modeling and Acoustic Remote Threat Detection Research Programs

3.3.1. Virtual Audio Integration. The contractor shall integrate, document, and report virtual audio hardware into aircraft and other operational environments. This involves integration with ANR, HMDs, and other hardware. Operational environments include, but are not limited to, fighter and other aircraft, ATC towers and command and control stations. (CDRLs A003, A004, and A005)

3.3.2. Speech Intelligibility Measurement System. The contractor shall develop, fabricate, test, document, and report a portable speech intelligibility measurement system. The contractor shall develop 10 subject stations with the capability of operating at least two hours entirely from battery power. The contractor shall perform data collection and data analysis for experiments using the modified rhyme test and diagnostic rhyme test. (CDRLs A003, A004, and A005)

3.3.3. Field Attenuation Research Measurement System. The contractor shall develop a field attenuation measurement system that will be a transportable, audiometric booth for testing hearing protection devices. Contractor shall use this measurement system to collect field hearing protector attenuation performance data at USAF and other military installations in the continental US. The contractor shall investigate various palletizing options to determine the best means to transport the booth and shall consider the various environmental requirements of various pallet options such as, but not limited to, cooling, lighting, and noise. The contractor shall design the entire system to be self-sufficient and self-contained providing at a minimum electric generation, power conditioning, and temperature control. The contractor shall design the temperature control system such that the booth inside temperature is 70 degrees F within plus or minus 2 degrees F for outside ambient temperatures down to -10 degrees F and up to 110 degrees F. The contractor shall design the system such it adheres to both the ANSI-12.6-1997 and ANSI 12.42-1996 attenuation measurement procedures and is able to collect hearing threshold data at the audiometric frequencies from 125 Hz to 8000 Hz. The contractor shall design the system such that it is capable of conducting

measurements using the two different methods on two separate subjects simultaneously. The contractor shall provide all test equipment that is required to (a) implement the test procedures; (b) record, store, and transmit subject data; and (c) insure the comfort and safety of the system operators and subjects. The contractor shall develop, fabricate, modify, upgrade, document, report, and sustain this field transportable attenuation measurement system. (CDRLs A003, A004, and A005) .

3.3.4. Aircrew Communications Enhancement System. The contractor shall develop the Aircrew Communications Enhancement (ACCENT) System that will be an interactive, highly intelligible digital intercom system for airborne applications. The contractor shall design this laboratory development consisting of multiple workstations that are interconnected by a high-speed fiber optic bus and contain the appropriate 16-bit A/D and D/A conversion of at least 40,000 times per second. The contractor shall expand the workstation capability to allow the integration of various audio technologies to include active noise reduction, sound localization, automatic voice switching, speech recognition and voice control, speech (voice) synthesis, variable audio bandwidth, fiber optic data bus, speech (voice) enhancement, improved microphones and microphone arrays, and the like. The contractor shall fabricate, install, test, document, and report the ACCENT System. Using the ACCENT System, the contractor shall test and demonstrate the effectiveness of the integrated technologies in enhancing the communications and performance of aircrews in noisy environments. The ACCENT System shall be located in the Audio Command, Control, and Communication Laboratory, the Performance and Communications Research and Technology (PACRAT) Facility, or the Voice Communication Research and Evaluation System (VOCRES). (CDRLs A003, A004, and A005)

3.3.5. Active Noise Cancellation for Multi-Engine Aircraft. The contractor shall design, fabricate, and install an active synchrophasing system for use on USAF C-130 aircraft for the purpose of reducing internal and external noise profiles. The contractor shall develop the system such that it maintains the desired propeller phase relationships within 1 degree while in climb, cruise, or descent. The contractor shall collect, analyze, and report the performance data on the system and aircraft. (CDRLs A003, A004, and A005)

3.3.6. Human Subject Pool. The contractor shall maintain a human subject pool for response testing to various acoustic stimuli as required. The contractor shall perform audiometric screening on all members of the research subject panel. The contractor shall perform baseline audiometry on all potential research subjects prior to their employment and shall collect audiometric data on the entire subject panel biweekly. The contractor shall immediately report any hearing threshold shifts greater than 10 dB from baseline to the government principal investigator and the research audiologist. The number of subjects is expected to range from 12-24 individuals and they shall be used in the efforts described in section 3 and associated subparagraphs. The contractor shall obtain subjects possessing normal peripheral auditory acuity, be at least 18 years of age, and have 3 to 4 hours available to work each day. The contractor shall comply with Air Force Instruction (AFI) 40-402, *The Use of Human Subjects in Research, Development, Test and Evaluation*.

ORDER FOR SUPPLIES OR SERVICES

(Contractor must submit four copies of invoice.)

Form Approved
OMB No 0704-0187
Expires Jun 30, 1997

PAGE 1 OF 6

Public reporting burden for this collection of information is estimated to average 1 hour 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 of 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 (0704-0187), Washington, DC 20503.

**PLEASE DO NOT RETURN YOUR FORM TO EITHER OF THESE ADDRESSES.
SEND YOUR COMPLETED FORM TO THE PROCUREMENT OFFICIAL IDENTIFIED IN ITEM 6.**

1. CONTRACT PURCH ORDER NO. F33615-98-D-6000		2. DELIVERY ORDER NO. 0004		3. DATE OF ORDER (YYMMDD) 98SEP25		4. REQUISITION PURCHASE REQUEST NUMBER SEE SECTION G		5. PRIORITY DO-C9	
6. ISSUED BY AFRG/MLKT USAP/AFMC AIR FORCE RESEARCH LABORATORY/ 2530 C STREET, BUILDING 7 WRIGHT-PATTERSON AFB OH 45433-7607 ANNETTE B. HENDERSON (937) 255-7143 X26		7. ADMINISTERED BY (if other than 6) DCMC DAYTON AREA C BUILDING 30 1725 VAN PATTON DRIVE WRIGHT-PATTERSON AFB OH 45433-5302		8. DELIVERY FOB <input checked="" type="checkbox"/> DEST <input type="checkbox"/> OTHER (SEE SCHEDULE IF OTHER)		9. CONTRACTOR SYTRONICS, INC 4433 DAYTON-XENIA ROAD, BUILDING 1 DAYTON OH 45432 (937) 429-1466 GREENE COUNTY		10. DELIVER TO FOB POINT BY (DATE) (YYMMDD) SEE SCHEDULE	
11. MARK IF BUSINESS <input checked="" type="checkbox"/> SMALL <input type="checkbox"/> SMALL DISAD- VANTAGED <input type="checkbox"/> WOMAN OWNED		12. DISCOUNT TERM N		13. MAIL INVOICES TO SEE BLOCK 15 (PAYMENT OFFICE)		14. SHIP TO SEE SCHEDULE		15. PAYMENT WILL BE MADE BY DFAS-CO/NEW DOMINION DIVISION P O BOX 182041 COLUMBUS OH 43218-2041	
16. DELIVERY <input checked="" type="checkbox"/> PURCHASE <input type="checkbox"/>		This delivery order is issued on another Government agency or in accordance with and subject to terms and conditions of above numbered contract. Reference your _____ furnish the following on terms specified herein ACCEPTANCE. THE CONTRACTOR HEREBY ACCEPTS THE OFFER REPRESENTED BY THE NUMBERED PURCHASE ORDER AS IT MAY PREVIOUSLY HAVE BEEN OR IS NOW MODIFIED, SUBJECT TO ALL OF THE TERMS AND CONDITIONS SET FORTH AND AGREES TO PERFORM THE SAME							
NAME OF CONTRACTOR		SIGNATURE		TYPED NAME AND TITLE		DATE SIGNED (YYMMDD)			
<input type="checkbox"/> If this box is marked, supplier must sign Acceptance and return the following number of copies									
17. ACCOUNTING AND APPROPRIATION DATA/LOCAL USE SEE SECTION G									
18. ITEM NO.	19. SCHEDULE OF SUPPLIES/SERVICE	20. QUANTITY ORDERED/ACCEPTED *	21. UNIT	22. UNIT PRICE	23. AMOUNT				
	SEE SCHEDULE								
*If quantity accepted by the Government is same as quantity ordered, indicate by X. If different, enter actual quantity accepted below quantity ordered and encircle.		24. UNITED STATES OF AMERICA <i>James H Day</i> BY: JAMES H. DAY		25. TOTAL \$3,511,508.05		29. DIFFERENCES			
26. QUANTITY IN COLUMN 20 HAS BEEN <input type="checkbox"/> INSPECTED <input type="checkbox"/> RECEIVED <input type="checkbox"/> ACCEPTED, AND CONFORMS TO CONTRACT, EXCEPT AS NOTED		27. SHIP TO <input type="checkbox"/> PARTIAL <input type="checkbox"/> FINAL		28. DO VOUCHER NO		30. INITIALS			
DATE SIGNATURE OF AUTHORIZED GOVERNMENT REPRESENTATIVE		31. PAYMENT <input type="checkbox"/> COMPLETE <input type="checkbox"/> PARTIAL <input type="checkbox"/> FINAL		32. PAID BY		33. AMOUNT VERIFIED CORRECT FOR			
36. I certify this account is correct and proper for payment		37. RECEIVED AT		38. RECEIVED BY (Print)		39. DATE RECEIVED (YYMMDD)		40. TOTAL CONTAINERS	
DATE		41. SR ACCOUNT NO.		42. SR VOUCHER NO.					

- I. In accordance with the provisions of the Basic Contract and this delivery order, the Contractor shall accomplish the effort described in the attached Statement of Work (SOW), dated 30 June 1998, and entitled "Bioacoustic, Noise, and Vibration Research and Sustaining Effort", at a total not to exceed amount of \$3,511,508.05.

SECTION B

I. 5352.216-9001 PAYMENT OF FEE (AFMC)(CPFF)(JUL 1997)

The estimated cost and fee for this delivery order are shown below. The applicable fixed fee or target fee set forth below may be increased or decreased only by negotiation and modification of the contract delivery order for added or deleted work. As determined by the contracting officer, it shall be paid as it accrues, in regular installments based upon the percentage of completion of work (or the expiration of the agreed-upon period(s) for term contract(s).

Estimated Cost: \$3,317,681.17

Fixed Fee: \$ 193,826.88

2. 5352.232-9001 IMPLEMENTATION OF LIMITATION OF FUNDS (AFMC) (JUL 1997)

- (a) The sum allotted to this contract delivery order and available for payment of costs under CLINs 0001-0003 through 1 November 1998 in accordance with the clause in Section I entitled "Limitations of Funds" is \$18,600.00.
- (b) In addition to the amount allotted under the "Limitations of Funds" clause, the additional amount of \$1,400.00 is obligated for payment of fee for work completed under CLINs 0001-0003.

SECTION B

F33615-98-D-6000 0004

ITEM	SUPPLIES/SERVICE	QTY	UNIT	UNIT PRICE	TOTAL AMOUNT
0001		1	LO	\$3,511,508.05	\$3,511,508.05

noun:
RESEARCH & DATA

acrn: contract type:
9 U - COST PLUS FIXED FEE

security: UNCLASSIFIED fob: DESTINATION inspection: DESTINATION acceptance: DESTINATION stock number (nsn): N - NOT APPLICABLE

descriptive data:
THE CONTRACTOR SHALL CONDUCT RESEARCH IN ACCORDANCE WITH THE STATEMENT OF WORK ENTITLED "BIOACOUSTIC, NOISE, AND VIBRATION RESEARCH AND SUSTAINING EFFORT", DATED 30 JUNE 1998. THE CONTRACTOR SHALL ALSO SUBMIT DATA IN ACCORDANCE WITH EXHIBIT A, THE CONTRACT DATA REQUIREMENTS LIST, DD FORM 1423, DATED 30 JUNE 1998, ATTACHED HERETO.

ITEM	SUPPLIES/SERVICE	QTY	UNIT	UNIT PRICE	TOTAL AMOUNT
000101					

noun:
FUNDING INFO ONLY

acrn: AA \$20,000.00

descriptive data:
PR NUMBER GHECA9872HC123

ITEM	SUPPLIES/SERVICE	QTY	UNIT	UNIT PRICE	TOTAL AMOUNT
0002		1	LO	NSP	NSP

noun:
HARDWARE

Acrn: U contract type:
U - COST PLUS FIXED FEE

security: UNCLASSIFIED fob: DESTINATION inspection: DESTINATION acceptance: DESTINATION stock number (nsn): N - NOT APPLICABLE

descriptive data:
DELIVER HARDWARE IN ACCORDANCE WITH STATEMENT OF WORK, DATED 30 JUNE 1998. THE COST OF THIS CLIN IS INCLUDED IN CLIN 0001.

ITEM	SUPPLIES/SERVICE	QTY	UNIT	UNIT PRICE	TOTAL AMOUNT
0003		1	LO	NSP	NSP

noun: SOFTWARE

acrn: U contract type: U - COST PLUS FIXED FEE

security: UNCLASSIFIED fob: DESTINATION inspection: DESTINATION acceptance: DESTINATION stock number (nsn): N - NOT APPLICABLE

descriptive data:
 THE CONTRACTOR SHALL PROVIDE SOFTWARE AS REQUIRED IN STATEMENT OF WORK, DATED 30 JUNE 1998, ATCH 1. THE COST OF THIS CLIN IS INCLUDED IN CLIN 0001.

SECTION F**F33615-98-D-6000 0004**

<u>ITEM</u>	<u>QTY</u>	<u>SHIP TO</u>	<u>MARK FOR</u>	<u>TRANS</u> <u>PRI</u>	<u>DATE</u>
0001	1	U			25 Sep 2000

noun:
RESEARCH & DATA

acrn: security:
9 U

descriptive data:
The scheduled delivery date is for completion of all research and data as required by the Statement of Work, atch 1, and delivery of all reports in accordance with Exhibit A, Contract Data Requirements List.

<u>ITEM</u>	<u>QTY</u>	<u>SHIP TO</u>	<u>MARK FOR</u>	<u>TRANS</u> <u>PRI</u>	<u>DATE</u>
0002	1	U			25 Sep 2000

security:
U

descriptive data:
The scheduled delivery date is for delivery of all hardware in accordance with the Statement of Work, dated 30 June 1998.

<u>ITEM</u>	<u>QTY</u>	<u>SHIP TO</u>	<u>MARK FOR</u>	<u>TRANS</u> <u>PRI</u>	<u>DATE</u>
0003	1	U			25 Sep 2000

security:
U

descriptive data:
The scheduled delivery date is for any software to be delivered in accordance with Statement of Work, dated 30 June 1998.

SECTION G

F33615-98-D-6000 0004

ACRN	OBLIGATION AMOUNT
AA	\$20,000.00
On Clin 000101:	\$20,000.00

Fund cite:

57 83600 298 47A8 627184 686600 592 62202F 503000 F03000

descriptive data:
PR IS COMPLETE.

PR: GHECA9872HC123
JON:7184CH22
CCC:686600

1. G005 PAYMENT INSTRUCTIONS FOR MULTIPLE ACCOUNTING CLASSIFICATION CITATIONS (FEB 1997)

PAYMENT FOR ALL EFFORT UNDER THIS DELIVERY ORDER SHOULD BE MADE IN THE ORDER AND AMOUNTS SHOWN IN THE INFORMATIONAL SUBLINE(S) IN SECTION B, CLIN 0001 OF THE CONTRACT AND RECAPPED BELOW. EXHAUST THE FUNDS IN EACH ACRN BEFORE USING FUNDS FROM THE NEXT LISTED ACRN.

ACRN	SUBCLIN NO.	TOTAL OBLIGATED
AA	000101	\$20,000.00

2. G008 INCREMENTAL FUNDING (APR 1997)

THE DELIVERY ORDERS WILL BE INCREMENTALLY FUNDED PURSUANT TO THE LIMITATION OF FUNDS CLAUSE, FAR 52.232-22. FUNDS ARE HEREBY OBLIGATED IN THE AMOUNT OF \$20,000.00 AND IT IS ESTIMATED THEY ARE SUFFICIENT FOR CONTRACT PERFORMANCE THROUGH 1 NOVEMBER 1998.

SECTION J - LIST OF ATTACHMENTS

Atch 1 Statement of Work, entitled "Bioacoustic, Noise, and Vibration Research and Sustaining Effort", dated 30 June 1998.

Exhibit A DD Form 1423, Contract Data Requirements List (CDRLs), dated 30 June 1998.

STATEMENT OF WORK
Delivery Order 0004

Bioacoustic, Noise, and Vibration Research and Sustaining Effort
30 Jun 98

DESCRIPTION OF WORK

1.0 SCOPE: This effort requires ongoing and sustaining research, development, and technical efforts for the research programs in the bioacoustic, noise, and vibration laboratories. The required work includes (a) development and implementation of research plans, experimentation, and prototypes and (b) the sustainment of the bioacoustic, noise, and vibration laboratories and facilities.

2.0 APPLICABLE DOCUMENTS:

- 2.1. ANSI S3.2-1989: *Method for Measuring the Intelligibility of Speech Over Communication Systems*
- 2.2. ANSI S12.6-1997: *Method for the Measurement of the Real-Ear Attenuation of Hearing Protectors*
- 2.3. ANSI S.12.42-1995: *Microphone-In-Real-Ear and Acoustic Test Fixture Methods for the Measurement of Insertion Loss of Circumaural Hearing Protection Devices*
- 2.4. Air Force Instruction (AFI) 40-402: *The Use of Human Subjects in Research, Development, Test and Evaluation*

3.0 REQUIREMENTS:

3.1. Bioacoustic, Noise, and Vibration Research Program

3.1.1. Research Planning

3.1.1.1. The contractor shall develop individual research plans to support the combination of experimentation, development, and evaluation in the various research programs of the bioacoustic, noise, and vibration laboratories.

3.1.1.2. The contractor shall monitor on-going technical developments in the general research areas relevant to the bioacoustic, noise, and vibration laboratories and shall maintain the program plans such that they accurately reflect current research trends within the programs, the progress of the research programs, significant accomplishments, anticipated facilities and resource requirements, and projected research products. The contractor shall coordinate the research program plans with the Government for approval before implementation. (CDRLs A001 and A002)

3.1.1.3. The contractor shall support the development of protocols supporting the use of human subjects in the bioacoustic, noise, and vibration laboratories. The objectives of the protocols are to characterize the nature of the experimentation to be done, any safety implications of research facilities or experimental methods, along with the general descriptions of research facility capabilities and characteristics. (CDRL A002)

3.1.2. Experimental Planning

The contractor shall plan for the development of experiments to be conducted within the bioacoustic, noise, and vibration laboratories, in conjunction with the associated research plan. The objectives of experimental planning are to develop detailed specification of specific experimental manipulations to be performed, specific measures of human performance to be performed, specific facility requirements and operating tolerances, analysis techniques to be employed, technical requirements, and subject requirements. The contractor shall coordinate experimental plans with the Government for approval before implementation. (CDRL A002)

3.1.3. Experimental Research

The contractor shall collect pre-experimental pilot data to assure that the bioacoustic, noise, and vibration facilities are operating within tolerances specified in the experimental plan and that experimental procedures can be implemented accurately. Following verification of pre-experimental pilot data, the contractor shall collect experimental data using subjects from the contractor's subject pool or Government supplied subjects. The contractor shall conduct appropriate descriptive and inferential statistical analyses using experimental data. The contractor shall perform statistical analyses using graphical, pictorial, and tabular summaries; shall document in the form of technical reports, journal reports, and conference proceedings papers; and shall present research finding and results. Any of these analyses, written documentation, or briefing/presentation materials may require the incorporation of graphics, animation, multimedia, and photographic elements. The contractor shall attend conferences and symposia and present the results of experimental research to transition research results to other Government, industrial, and academic institutions. (CDRLs A002, A003, and A004)

3.1.4. Developmental Research

The contractor shall develop crew system interface hardware and software (in the form of prototypes, conceptual demonstrations, models, and simulations) as specified in bioacoustic, noise, and vibration laboratory research plans. The contractor shall identify and describe hardware and software requirements specifications. The contractor shall use the specification documents to design, fabricate, implement, code, and install the items in laboratory and field environments. The contractor shall test the prototypes, demonstrations, models, and simulations for their capability to improve the planning, design, development, and operation of Air Force and human systems. The contractor shall report technical research development in documents and conference proceedings. The contractor shall develop graphics and other presentation materials of bioacoustic, biocommunication, and environmental noise research and sustaining efforts to include, but not be limited to, charts, animation, multimedia, and photographic elements. The contractor shall attend conferences and symposia and present the results of developmental research as required to transition research results to other Government agencies, industry, and academic institutions. (CDRLs A002, A003, A004, A005, and A006)

3.2. Bioacoustic, Noise, and Vibration Laboratories and Facilities Sustainment

3.2.1. Bioacoustics and Biocommunication Sustainment.

3.2.1.1. **Psychoacoustics Laboratory.** The contractor shall provide research, sustainment, and research subjects for the Psychoacoustics Laboratory. This laboratory is used for experimentation in basic research areas that include, but are not limited to, signal detection theory, materialization, distance perception, and speech perception.

3.2.1.2. Active Noise Reduction Laboratory.

3.2.1.2.1. The contractor shall provide research, sustaining effort, and research subjects for the Active Noise Reduction (ANR) Laboratory. An existing KEMAR acoustic manikin shall be available to the contractor for electroacoustic performance experiments. The contractor shall maintain necessary monitoring and noise control equipment. The contractor shall comply with the ANSI 12.42 -1995, *Microphone-In-Real-Ear and Acoustic Test Fixture Methods for the Measurement of Insertion Loss of Circumaural Hearing Protection Devices*, for all data collected the ANR lab. The contractor shall sustain and upgrade software as needed. The contractor shall sustain the subject stations during non-data collection times.

3.2.1.2.2. The contractor shall develop, test, document, and report advanced (semi-insert) active noise reduction headsets that provide at least 10 dB average active attenuation from 100Hz to 2kHz and provide at least 80 percent intelligibility using the modified rhyme test in a 115 dB overall sound pressure level pink noise environment. (CDRLs A003, A004, A005, A006, and A007)

3.2.1.3. Auditory Localization Facility.

3.2.1.3.1. The contractor shall provide research, sustaining effort, and research subjects for the Auditory Localization Facility (ALF). The contractor shall determine auditory-visual-vestibular interactions and measure human localization performance in terms of accuracy and reaction time. Multiple (up to 15) audio targets may be

presented at a time. The contractor shall conduct audio-visual interaction experiments using LEDs co-located with the loudspeakers or HMDs. In conducting these experiments, the contractor shall use both free-field and virtual sound sources. The contractor shall design, fabricate, and install a subject dynamic, orientation device capable of 2-revolutions/second. The contractor shall sustain the subject stations during non-data collection times. (CDRL A005)

3.2.1.3.2. The contractor shall collect inter-aural time delays (ITDs) and head-related transfer function (HRTFs) in the ALF or other suitable facility. After measurement, the contractor shall process the data for use in the virtual audio hardware. The contractor shall sustain the acoustic research mannequins and shall make custom pinnae molds.

3.2.1.3.3. The contractor shall sustain virtual audio equipment including the auditory localization cue synthesizer (ALCS), 3-Dimensional audio display generator (ADG) and future versions. The contractor shall conduct parameter studies to determine the optimum characteristics of virtual displays. The contractor shall also design, implement, test, document and report an IC chip version of the virtual audio hardware. (CDRLs A003, A004, A005, A006, and A007)

3.2.1.4. Speech Processing and Neural Network Laboratory.

3.2.1.4.1. The contractor shall provide research, sustaining effort and research subjects for the Speech Processing and Neural Network Laboratory (SPNN). Nine SUN SPARC stations and three PCs form the core of the lab. The contractor shall develop, integrate, document, report and sustain software for research and development of auditory models and neural networks. The contractor shall provide approximately six subject hours per week for the application of neural networks to speech coding, speech recognition, speaker recognition, and speech synthesis in noisy environments.

3.2.1.4.2. The contractor shall develop, investigate, document, and report intelligent jamming and speaker normalization techniques for use in voice communication information warfare using the software and hardware tools in the SPNN for prototype development. (CDRLs A003, A004, A006, and A007)

3.2.1.4.3. Station Listening Laboratory. The contractor shall design a six station listening lab such that each station is capable of stand alone operation, has integrated two channel headphones, has internal signal processing capability, and has an Ethernet interface capability. The contractor shall fabricate, document, install these stations in room 0-101, Building 441. The contractor shall sustain the subject stations during non-data collection times. (CDRL A005)

3.2.1.5. Voice Communication Research and Evaluation System Laboratory.

3.2.1.5.1. The contractor shall provide research, sustaining effort, and research subjects for the Voice Communication Research and Evaluation System (VOCRES) laboratory. The contractor shall determine speech intelligibility performance of various communications equipment in accordance with ANSI S3.2-1989, *Method for Measuring the Intelligibility of Speech Over Communication Systems*. Studies include performance evaluation of personal protective equipment, bandwidth and spectrum shaping supporting digital audio technology for aircraft and performance of hearing impaired listeners in AF operational noise environments. The contractor shall provide a panel of at least 10 subjects for approximately four hours per workday for data collection. The contractor shall sustain the subject stations during non-data collection times

3.2.1.5.2. The contractor shall establish baseline communication effectiveness of intelligent jamming and speaker normalization for new hardware or jamming methods as they become available.

3.2.1.6. Performance and Communications Research and Technology Laboratory. The contractor shall provide research, sustaining effort and research subjects for the Performance and Communications Research and Technology (PACRAT) laboratory. This facility is used to study the relationship between intelligibility and task completion. The contractor shall implement the Voice Communication Effectiveness Task (VCET) in this lab. The contractor shall establish baseline communication effectiveness of intelligent jamming and speaker normalization for new hardware or jamming methods as they become available. The contractor shall provide a panel of at least 10 subjects for approximately four hours per workday for data collection. The contractor shall sustain the subject stations during non-data collection times.

- 3.2.1.7. Sound Attenuation Measurement of Personal Equipment Items Facility. The contractor shall provide research, sustaining effort and research subjects for the Sound Attenuation Measurement of Personal Equipment Items (SAMPEI) Facility. The contractor shall conduct and document the periodic calibration of this facility. The contractor shall sustain all test equipment including: the PC, printer, attenuators, noise generator, filters, loudspeakers, subject response button, video camera, and monitor. The contractor shall install software upgrades for this system as needed. The contractor shall sustain the subject stations during non-data collection times. (CDRL A003)
- 3.2.1.8. Speech Communication in Occupational Noise Environments. The contractor shall provide research, sustaining effort and research subjects for the Speech Communication in Occupational Noise Environments (SCONE) facility. SCONE is a computer-controlled test facility used to assess the speech intelligibility performance of hearing-impaired individuals who work in high noise environments. The contractor shall install and document software and hardware upgrades for this facility. (CDRLs A005, A006, and A007)
- 3.2.1.9. Real-Ear Attenuation at Threshold Measurement Facility. The contractor shall provide research, sustaining effort, and research subjects for the Real-Ear Attenuation at Threshold (REAT) Measurement Facility. The contractor shall collect data in compliance with ANSI S12.6-1997, *Method for the Measurement of the Real-Ear Attenuation of Hearing Protectors*. The contractor shall conduct and document the periodic calibration of this facility in order to demonstrate its accordance with ANSI S12.6-1997. The contractor shall conduct this calibration at interval not to exceed 30 days between calibrations. The contractor shall sustain all test equipment including: the PC, printer, attenuators, noise generator, filters, loudspeakers, subject response button, video camera, and monitor. The contractor shall install software upgrades for this system as needed. The contractor shall sustain the subject stations during non-data collection times. (CDRL A003)
- 3.2.1.10. Electronics Laboratory. The contractor shall operate and provide sustaining effort for the Electronics Lab. The contractor shall provide expendable supplies such as solder, hook-up wire, resistors, capacitors, digital ICs, sockets, connectors and the like. The contractor shall control, inventory on an annual basis, and maintain all handtools, soldering irons, pocket voltmeters and the like.
- 3.2.1.11. Computer Aided Design Facility. The contractor shall operate and provide sustaining effort for the Computer Aided Design Facility by operating this facility approximately five hours per workday for the in-house research program. The contractor shall provide expendables, as well as, required system repairs.
- 3.2.1.12. Audio-Visual Equipment Management. The contractor shall organize and manage the equipment rooms. The contractor shall document and inventory the equipment describing the users, organizations, locations of the equipment, and return dates. The contractor shall follow physical security precautions.
- 3.2.1.13. Microphone Development. The contractor shall develop, test, document, and report noise-canceling, 2 to 13 element, phased-array microphones and fiber optic microphones for near field speech measurement. (CDRLs A003, A004, and A005)
- 3.2.1.14. Virtual Audio Integration. The contractor shall integrate, document, and report virtual audio hardware into aircraft and other operational environments. This involves integration with ANR, HMDs, and other hardware. Operational environments include, but are not limited to, fighter and other aircraft, ATC towers and command and control stations. (CDRLs A003, A004, and A005)
- 3.2.1.15. Speech Intelligibility Measurement System. The contractor shall develop, fabricate, test, document, and report a portable speech intelligibility measurement system. The contractor shall develop 10 subject stations with the capability of operating at least two hours entirely from battery power. The contractor shall perform data collection and data analysis for experiments using the modified rhyme test and diagnostic rhyme test. (CDRLs A003, A004, and A005)

3.2.1.16. Field Attenuation Research Measurement System. The contractor shall develop a field attenuation measurement system that will be a transportable, audiometric booth for testing hearing protection devices. Contractor shall use this measurement system to collect field hearing protector attenuation performance data at USAF and other military installations in the continental US. The contractor shall investigate various palletizing options to determine the best means to transport the booth and shall consider the various environmental requirements of various pallet options such as, but not limited to, cooling, lighting, and noise. The contractor shall design the entire system to be self sufficient and self contained providing at a minimum electric generation, power conditioning, and temperature control. The contractor shall design the temperature control system such that the booth inside temperature is 70 degrees F within plus or minus 2 degrees F for outside ambient temperatures down to -10 degrees F and up to 110 degrees F. The contractor shall design the system such it adheres to both the ANSI-12.6-1997 and ANSI 12.42-1996 attenuation measurement procedures and is able to collect hearing threshold data at the audiometric frequencies from 125 Hz to 8000 Hz. The contractor shall design the system such that it is capable of conducting measurements using the two different methods on two separate subjects simultaneously. The contractor shall provide all test equipment that is required to (a) implement the test procedures; (b) record, store, and transmit subject data; and (c) insure the comfort and safety of the system operators and subjects. The contractor shall develop, fabricate, modify, upgrade, document, report, and sustain this field transportable attenuation measurement system. (CDRLs A003, A004, and A005)

3.2.1.17. Aircrew Communications Enhancement System. The contractor shall develop the Aircrew Communications Enhancement (ACCENT) System that will be an interactive, highly intelligible digital intercom system for airborne applications. The contractor shall design this laboratory development consisting of multiple workstations that are interconnected by a high-speed fiber optic bus and contain the appropriate 16-bit A/D and D/A conversion of at least 40,000 times per second. The contractor shall expand the workstation capability to allow the integration of various audio technologies to include active noise reduction, sound localization, automatic voice switching, speech recognition and voice control, speech (voice) synthesis, variable audio bandwidth, fiber optic data bus, speech (voice) enhancement, improved microphones and microphone arrays, and the like. The contractor shall fabricate, install, test, document, and report the ACCENT System. Using the ACCENT System, the contractor shall test and demonstrate the effectiveness of the integrated technologies in enhancing the communications and performance of aircrews in noisy environments. The ACCENT System shall be located in the Audio Command, Control, and Communication Laboratory, the Performance and Communications Research and Technology (PACRAT) Facility, or the Voice Communication Research and Evaluation System (VOCRES). (CDRLs A003, A004, and A005)

3.2.1.18. Active Noise Cancellation for Multi-Engine Aircraft. The contractor shall design, fabricate, and install an active synchrophasing system for use on USAF C-130 aircraft for the purpose of reducing internal and external noise profiles. The contractor shall develop the system such that it maintains the desired propeller phase relationships within 1 degree while in climb, cruise, or descent. The contractor shall collect, analyze, and report the performance data on the system and aircraft. (CDRLs A003, A004, and A005)

3.2.1.19. Human Subject Pool. The contractor shall maintain a human subject pool for response testing to various acoustic stimuli as required. The contractor shall perform audiometric screening on all members of the research subject panel. The contractor shall perform baseline audiometry on all potential research subjects prior to their employment and shall collect audiometric data on the entire subject panel biweekly. The contractor shall immediately report any hearing threshold shifts greater than 10 dB from baseline to the government principal investigator and the research audiologist. The number of subjects is expected to range from 12-24 individuals and they shall be used in the efforts described in section 3 and associated subparagraphs. The contractor shall obtain subjects possessing normal peripheral auditory acuity, be at least 18 years of age, and have 3 to 4 hours available to work each day. The contractor shall comply with Air Force Instruction (AFI) 40-402, *The Use of Human Subjects in Research, Development, Test and Evaluation*.

3.2.2. Environmental Noise Sustainment

3.2.2.1. Environmental Noise. The contractor shall sustain environmental noise monitoring and testing programs. The contractor shall calibrate and enhance the noise monitoring equipment, computerized acquisition equipment,

noise testing equipment, and computer programs used for environmental noise research. This shall include, but not be limited to, modifications to the following hardware, software or firmware: NOISECHECK equipment and software, Boom Event Analyzer Recorder (BEAR), PCBOOM, BOOMMAP, NOISEMAP and other noise prediction models. The contractor shall develop and document new software programs as required to analyze, retrieve, manipulate, and display noise data and to improve noise models required for environmental noise assessments. The contractor shall document and report results from environmental research and noise prediction modeling. (CDRLs A003, A004, A006, and A007)

3.2.3. Vibration Sustainment

3.2.3.1. Single Axis, Servo Hydraulic, Vibration Facility. The contractor shall sustain the Single Axis Servo Hydraulic Vibration Facility to support the research in this facility. This facility is used to evaluate the coupling effects of heavy equipment, such as, but not limited to, seating systems on human biodynamic response and visual performance. (CDRLs A003 and A004)

3.2.3.2. Single Axis, Electrodynamic Vibration Facility. The contractor shall sustain the Single Axis, Electrodynamic Vibration Facility to support the research in this facility. This facility is used to assess the effects of small/light items, such as, but not limited to, seat cushions/materials and helmet-mounted systems on human body resonance behavior, biodynamic response, and visual performance. (CDRLs A003 and A004)

3.2.3.3. Six Degree of Freedom Vibration Facility. The contractor shall sustain the Six Degree of Freedom Vibration Facility (SIXMODE) to support the research in this facility. This facility is used to evaluate a variety of human and human surrogate responses in complex vibratory environments including, but not limited to, biodynamic response, performance, comfort, and health effects. (CDRLs A003 and A004)

CONTRACT DATA REQUIREMENTS LIST

(2 Data Items)

Form Approved
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 220 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to: Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503. Please DO NOT RETURN your form to either of these addresses. Send completed form to the Government-Issuing Contracting Officer for the Contract/PR No. listed in Block E.

A. CONTRACT LINE ITEM NO. 0001		B. EXHIBIT A		C. CATEGORY TDP TM OTHER		
D. SYSTEM / ITEM PROJECT 7184/DO-0004			E. CONTRACT / PR NO. F33615-98-D-6000/0004		F. CONTRACTOR SYTRONICS, INC.	
1. DATA ITEM NO. A001	2. TITLE OF DATA ITEM TECHNICAL REPORT - STUDY/SERVICES			3. SUBTITLE DO-0004 Literature Search - Research Trends		
4. AUTHORITY (Data Acquisition Document No.) DI-MISC-80508		5. CONTRACT REFERENCE SOW para 3.1.1.2		6. REQUIRING OFFICE AFRL/HEC		
7. DD 250 REQ XX	9. DIST STATEMENT REQUIRED N/A	10. FREQUENCY ASREQ	12. DATE OF FIRST SUBMISSION See Blk 16	14. DISTRIBUTION		
8. APP CODE NA	11. AS OF DATE NA	13. DATE OF SUBSEQUENT SUBMISSION See Blk 16	a. ADDRESSEE			b. COPIES
16. REMARKS Blk 12/13: ASREQ means as required by human factors research and sustaining efforts and technical interchange meetings. Not to exceed 100 items per search without government approval.				AFRL/HEC	Draft	Final
15. TOTAL →				0	2	0

1. DATA ITEM NO. A002	2. TITLE OF DATA ITEM STATUS REPORT		3. SUBTITLE Bioacoustic Research			
4. AUTHORITY (Data Acquisition Document No.) DI-MGMT-80368		5. CONTRACT REFERENCE SOW para 3.1.1.2, 3.1.1.3, 3.1.2, 3.1.3, 3.1.4		6. REQUIRING OFFICE AFRL/HEC		
7. DD 250 REQ LT	9. DIST STATEMENT REQUIRED N/A	10. FREQUENCY ASREQ	12. DATE OF FIRST SUBMISSION See Blk 16	14. DISTRIBUTION		
8. APP CODE NA	11. AS OF DATE NA	13. DATE OF SUBSEQUENT SUBMISSION See Blk 16	a. ADDRESSEE			b. COPIES
16. REMARKS Blk 4: Tailored to delete para 10.2.2.3 and to accept contractor format. Blk 10/12/13: ASREQ means as required by adaptive interface technology and technical interchange meetings.				AFRL/HEC	Draft	Final
15. TOTAL →				0	1	0

G. PREPARED BY DONALD L. MONK AFRL/HECA, DSN 785-8814		H. DATE 30 Jun 98	I. APPROVED BY ELONA BEANS, DM <i>Elona Beans</i>		J. DATE 30 Jun 98
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17. PRICE GROUP

18. ESTIMATED TOTAL PRICE

17. PRICE GROUP

18. ESTIMATED TOTAL PRICE

**F33615-98-D-6000/0004
Exhibit A**

CONTRACT DATA - REQUIREMENTS LIST
(1 Data Item)

Form Approved
OMB No. 0704-0188

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

A. CONTRACT LINE ITEM NO. 0001	B. EXHIBIT A	C. CATEGORY TDP TM OTHER
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D. SYSTEM/ITEM PROJECT 7184/DO-0004	E. CONTRACT/PR NO. F33615-98-D-6000/0004	F. CONTRACTOR SYTRONICS, INC.
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1. DATA ITEM NO. A003	2. TITLE OF DATA ITEM SCIENTIFIC AND TECHNICAL REPORT	3. SUBTITLE Bioacoustic Research
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4. AUTHORITY (Data Acquisition Document No.) DI-MISC-80711	5. CONTRACT REFERENCE See Blk 16	6. REQUIRING OFFICE AFRL/HEC
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7. DD 250 REQ See Blk 16	9. DIST STATEMENT REQUIRED TBD	10. FREQUENCY ASGEN	12. DATE OF FIRST SUBMISSION See Blk 16	14. DISTRIBUTION	
8. APP CODE A	11. AS OF DATE NA	13. DATE OF SUBSEQUENT SUBMISSION See Blk 16	a. ADDRESSEE AFRL/HEC		b. COPIES
					Draft
					Final
					Reg
					Repro

16. REMARKS

Blk 4: Tailored to clarify para 10.2 (...in accordance with ANSI...): Delete from ANSI para 2.2.2.1 and references to "Report Number;" 2.2.4, 2.4.5, 4.4.1, and 4.5; and contractor format is acceptable for para 3.1.

Blk 5: SOW para 3.1.3, 3.1.4, 3.2.1.2.2, 3.2.1.3.3, 3.2.1.4.2, 3.2.1.7, 3.2.1.13, 3.2.1.14, 3.2.1.15, 3.2.1.16, 3.2.1.17, 3.2.1.18, 3.2.2.1, 3.2.3.1, 3.2.3.2, 3.2.3.3

Blk 7: Draft Copies = LT and Final Copy = XX

Blk 8: Approval/disapproval of draft copy by the Air Force with 30 days after receipt. After receipt of Air Force comments, corrections and submission of final copy with 30 days.

Blk 9: To be determined by AFRL/HEC after review of draft copy.

Blk 10: ASGEN means as generated by human factors research and sustaining efforts and technical interchange meetings.

Blk 12/13: Submit within 45 days after completion of Blk 10.

Blk 14b: Reproducible shall be camera read original (or laser quality print), size 8.5 x 11 inches, bond paper, unbound. Electronic media acceptable if compatible with AFRL/HEC computer systems. All photographs shall be glossy toned.

* The Air Force approval authority for this CDRL will be the program manager.

15. TOTAL →	2	1	1
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17. PRICE GROUP

18. ESTIMATED TOTAL PRICE

G. PREPARED BY DONALD L. MONK AFRL/HECA, DSN 785-8814	H. DATE 30 Jun 98	I. APPROVED BY <i>Elona Beans</i> ELONA BEANS, DM AFRL/HE, DSN 785-2423	J. DATE 30 Jun 98
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CONTRACT DATA REQUIREMENTS LIST

(2 Data Items)

Form Approved
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 220 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to: Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503. Please DO NOT RETURN your form to either of these addresses. Send completed form to the Government-Issuing Contracting Officer for the Contract/PR No. listed in Block E.

A. CONTRACT LINE ITEM NO. 0001		B. EXHIBIT A	C. CATEGORY TDP TM OTHER				
D. SYSTEM / ITEM PROJECT 7184/DO-0004		E. CONTRACT / PR NO. F33615-98-D-6000/0004		F. CONTRACTOR SYTRONICS, INC.			
1. DATA ITEM NO. A006	2. TITLE OF DATA ITEM COMPUTER SOFTWARE SYSTEM DOCUMENT		3. SUBTITLE Bioacoustic Research				
4. AUTHORITY (Data Acquisition Document No.) DI-IPSC-80942		5. CONTRACT REFERENCE See Blk 16		6. REQUIRING OFFICE AFRL/HEC			
7. DD 250 REQ XX	9. DIST STATEMENT REQUIRED TBD	10. FREQUENCY ASGEN	12. DATE OF FIRST SUBMISSION See Blk 16				
8. APP CODE NA	11. AS OF DATE NA		13. DATE OF SUBSEQUENT SUBMISSION See Blk 16				
16. REMARKS Blk 5: SOW para 3.1.4, 3.2.1.2.2, 3.2.1.3.3, 3.2.1.4.2, 3.2.1.8, 3.2.2.1 Blk 9: To be determined by AFRL/HEC prior to submission. Blk 10: ASGEN means as generated by human factors research and sustaining efforts and technical interchange meetings. Blk 12/13: Submit within 45 days after completion of Blk 10.			14. DISTRIBUTION				
			a. ADDRESSEE		b. COPIES		
			AFRL/HEC		Draft	Final	
						Reg	Repro
					0	2	0
		15. TOTAL →		0 2 0			

1. DATA ITEM NO. A007		2. TITLE OF DATA ITEM COMPUTER PROGRAM END ITEM DOCUMENTATION		3. SUBTITLE Bioacoustic Research				
4. AUTHORITY (Data Acquisition Document No.) DI-IPSC-80590A		5. CONTRACT REFERENCE See Blk 16		6. REQUIRING OFFICE AFRL/HEC				
7. DD 250 REQ XX	9. DIST STATEMENT REQUIRED TBD	10. FREQUENCY ASGEN	12. DATE OF FIRST SUBMISSION See Blk 16					
8. APP CODE NA	11. AS OF DATE NA		13. DATE OF SUBSEQUENT SUBMISSION See Blk 16					
16. REMARKS Blk 5: SOW para 3.2.1.3.3, 3.2.1.4.2, 3.2.1.8, 3.2.2.1 Blk 9: To be determined by AFRL/HEC prior to submission. Blk 10: ASREQ as required by human factors research and sustaining efforts and technical interchange meetings. Blk 12/13: Submit within 45 days after completion of Blk 10.			14. DISTRIBUTION					
			a. ADDRESSEE			b. COPIES		
			AFRL/HEC			Draft	Final	
							Reg	Repro
						0	2	0
			15. TOTAL →		0 2 0			

G. PREPARED BY DONALD L. MONK AFRL/HECA, DSN 785-8814		H. DATE 30 Jun 98	I. APPROVED BY ELONA BEANS, DM AFRL/HE, DSN 785-2423	J. DATE 30 Jun 98
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17. PRICE GRC

18. ESTIMATED TOTAL PRICE

17. PRICE GRC

18. ESTIMATED TOTAL PRICE

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE
U - CPFF

PAGE OF PAGES
1 of 2

2. AMENDMENT/MODIFICATION NO. 17	3. EFFECTIVE DATE	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO. (If applicable)
6. ISSUED BY AFRL/MLKH CODE	FA8650	7. ADMINISTERED BY (If other than Item 6) DCMC DAYTON AREA C BUILDING 30 1725 VAN PATTON DRIVE WRIGHT-PATTERSON AFB OH 45433-5302	
USAF/AFMC AIR FORCE RESEARCH LABORATORY 2310 EIGHTH STREET, BUILDING 167 WRIGHT-PATTERSON AFB OH 45433-7801 JEANETTE M. ZIMMER 937-255-0405 jeanette.zimmer@wpafb.af.mil		CODE S3605A	

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code) SYTRONICS, INC 4433 DAYTON-XENIA ROAD, BUILDING 1 DAYTON OH 45432 (937) 429-1466 GREENE COUNTY	MAILING DATE NOV 30 2001	(X) 9A. AMENDMENT OF SOLICITATION NO. 9B. DATED (SEE ITEM 11) 10A. MODIFICATION OF CONTRACT/ORDER NO. F33615-98-D-6000 0003 10B. DATED (SEE ITEM 13) 25 SEP 1998
CODE 1EE69	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 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required)

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

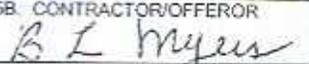
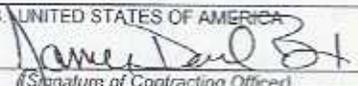
(X)	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: () THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. ITEM 10A.
	B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
X	C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF: FAR 52.249-14 Excusable Delays
	D. OTHER (Specify type of modification and authority)

E. IMPORTANT: Contractor is not, is required to sign this document and return 1 copies to the issuing office.

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

SUBJECT: No-Cost Time Extension
 CHANGE IN OBLIGATION: None
 CHANGE IN CONTRACT AMOUNT: None
 PROGRAM MANAGER: Ronald Yates, AFRL/HECP, Wright-Patterson AFB, OH 45433
 PAYMENT OFFICE: (SC1018) DFAS-CO/New Dominion, PO Box 182041, Columbus OH, 43218-2041

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) BARRETT L. MYERS President	16A. NAME AND TITLE OF SIGNER (Type or print) JAMES DAVID BOX Contracting Officer
15B. CONTRACTOR/OFFEROR  (Signature of person authorized to sign)	15C. DATE SIGNED 14 Nov 2001
16B. UNITED STATES OF AMERICA BY  (Signature of Contracting Officer)	16C. DATE SIGNED 20 NOV 01

1. Pursuant to FAR 52.249-14 Excusable Delays, this modification extends the period of performance for CLINs 0001, 0002 and 0003 to 30 Oct 02.

2. As a result of paragraph 1 the Delivery Order is hereby modified as follows:

SECTION F - DELIVERIES OR PERFORMANCE:

ITEM	SUPPLIES SCHEDULE DATA	QTY	SHIP TO	MARK FOR	TRANS PRI	DATE
0001		1	U			30 Oct 2002
	<i>Noun:</i>	RESEARCH AND DATA				
	<i>ACRN:</i>	9				
	<i>Sec. Class:</i>	U				
	<i>Descriptive Data:</i>					
	The scheduled delivery date is for completion of all research and data as required by the Statement of Work, atch 1, and delivery of all reports in accordance with Exhibit A, Contract Data Requirements List.					
0002		1	U			30 Oct 2002
	<i>Noun:</i>	HARDWARE				
	<i>ACRN:</i>	U				
	<i>Sec. Class:</i>	U				
	<i>Descriptive Data:</i>					
	The scheduled delivery date is for delivery of all hardware in accordance with the Statement of Work, dated 17 June 1998.					
0003		1	U			30 Oct 2002
	<i>Noun:</i>	SOFTWARE				
	<i>ACRN:</i>	U				
	<i>Sec. Class:</i>	U				
	<i>Descriptive Data:</i>					
	The scheduled delivery date is for delivery of all software in accordance with the Statement of Work, dated 17 June 1998.					

3. All other terms and conditions remain unchanged.

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT				1. CONTRACT ID CODE U - CPFF	PAGE OF PAGES 1 of 3
2. AMENDMENT/MODIFICATION NO. 13		3. EFFECTIVE DATE		4. REQUISITION/PURCHASE REQ.NO. See Section G	
6. ISSUED BY AFRL/MLKH CODE		FA8650		5. PROJECT NO. (If applicable)	
USAF/AFMC AIR FORCE RESEARCH LABORATORY 2310 8TH STREET, BUILDING 167 WRIGHT-PATTERSON AFB OH 45433-7801 CHERYL K. ROBERTSON (937) 656-9046 cheryl.robertson@wpafb.af.mil				7. ADMINISTERED BY (If other than Item 6) DCMC DAYTON AREA C BUILDING 30 1725 VAN PATTON DRIVE WRIGHT-PATTERSON AFB OH 45433-5302	
8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code)				9A. AMENDMENT OF SOLICITATION NO.	
SYTRONICS, INC 4433 DAYTON-XENIA ROAD, BUILDING 1 DAYTON OH 45432 (937) 429-1466 GREENE COUNTY				(X)	
MAILING DATE APR 04 2001				9B. DATED (SEE ITEM 11)	
				10A. MODIFICATION OF CONTRACT/ORDER NO. F33615-98-D-6000 0003	
CODE 1EE69		FACILITY CODE 1EE69		10B. DATED (SEE ITEM 13) 25 SEP 1998	
11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS					
<input type="checkbox"/> The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of 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 completing Items 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.					
12. ACCOUNTING AND APPROPRIATION DATA (If required) See Section G					
13. THIS ITEM APPLIES ONLY TO MODIFICATION OF CONTRACTS/ORDERS, IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.					
(X)					
A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: () THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. ITEM 10A.					
B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).					
C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:					
X D. OTHER (Specify type of modification and authority) Mutual Agreement of the Parties and Limitation of Funds Clause, FAR 52.232-22					
E. IMPORTANT: Contractor <input checked="" type="checkbox"/> is not, <input type="checkbox"/> is required to sign this document and return _____ copies to the issuing office.					
14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.) SUBJECT: No-Cost Time Extension and Incremental Funding CHANGE IN OBLIGATION: \$96,500.00 (Increase) CHANGE IN CONTRACT AMOUNT: None PROGRAM MANAGER: Ronald Yates, AFRL/HECP, Wright-Patterson AFB, OH 45433 PAYMENT OFFICE:(SC1018) DFAS-CO/New Dominion, PO Box 182041, Columbus OH, 43218-2041 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 SIGNER (Type or print)		
			JAMES DAVID BOX Contracting Officer		
15B. CONTRACTOR/OFFEROR (Signature of person authorized to sign)		15C. DATE SIGNED		16B. UNITED STATES OF AMERICA BY <u>James David Box</u> (Signature of Contracting Officer)	
				16C. DATE SIGNED 2 APR 01	

1. This modification is being issued to extend the period of performance for CLINs 0001, 0002 and 0003 until 31 Dec-01. The revised date is in accordance with the contractor's e-mail dated 16 Mar 01 and hereby incorporated by reference. Additionally, pursuant to the the authority of the Limitation of Funds clause (52.232-22) this delivery order is incrementally funded in the amount of \$2,795,396.00, an increase of \$96,500.00.

2. Section B - is amended as follows:

5352.232-9001 IMPLEMENTATION OF LIMITATION OF FUNDS (AFMC) (JUL 1997)

(a) The sum allotted to this contract Delivery Order and available for payment of costs under CLINs 0001-0003 through 31 May 2001 in accordance with the clause in Section I entitled Limitation of Funds, is \$2,795,396.00, an increase of \$96,500.00.

3. G008 INCREMENTAL FUNDING (APR 1997)

The Delivery Order will be incremenatally funded pursuant to the Limitation of Funds clause, FAR 52.232-11. Funds are hereby obligated in the amount of \$2,795,396.00 and it is estimated they are sufficient for contract performance through 31 May 01.

4. All other terms and conditions remain unchanged.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
000114	CLIN Change Noun: ACRN: Descriptive Data: PR: GWSHE017201042 GWSHE017201089 Contract JON: 7184CH22 Funding JON: 71840868 (\$53,000.00) 71840869 (\$43,500.00) Contract RCCC: 6HC000 Funding RCCC: 6HCP00	Funding Info Only AP	+\$96,500.00

ITEM	SUPPLIES SCHEDULE DATA	QTY	SHIP TO	MARK FOR	TRANS PRI	DATE
0001		1	U			31 Dec 2001

Noun: RESEARCH AND DATA
 ACRN: 9
 Sec. Class: U

Descriptive Data:

The scheduled delivery date is for completion of all research and data as required by the Statement of Work, atch 1, and delivery of all reports in accordance with Exhibit A, Contract Data Requirements List.

0002		1	U			31 Dec 2001
------	--	---	---	--	--	-------------

Noun: HARDWARE
 ACRN: U
 Sec. Class: U

Descriptive Data:

The scheduled delivery date is for delivery of all hardware in accordance with the Statement of Work, dated 17 June 1998.

0003		1	U			31 Dec 2001
------	--	---	---	--	--	-------------

Noun: SOFTWARE
 ACRN: U
 Sec. Class: U

Descriptive Data:

The scheduled delivery date is for delivery of all software in accordance with the Statement of Work, dated 17 June 1998.

ACRN	Appropriation/Lmt Subhead/Supplemental Accounting Data	Obligation Amount
------	--	-------------------

AP	ACRN Change 57 13600 291 47A8 627184 6HCP00 02040 62202F 503000 F03000	+\$96,500.00
----	---	---------------------

New ACRN Amount: \$321,500.00

Funding breakdown: On CLIN 000114: +\$96,500.00

PRMIPR: GWSHE017201042 \$53,000.00
 GWSHE017201089 \$43,500.00

JON: 7184CH22

Descriptive data:

Contract JON: 7184CH22
 Funding JON: 71840868 (\$53,000.00)
 71840869 (\$43,500.00)

Contract RCCC: 6HC000
 Funding RCCC: 6HCP00

PR IS COMPLETE

ORDER FOR SUPPLIES OR SERVICES

(Contractor must submit four copies of invoice.)

Form Approved
OMB No 0704-0187
Expires Jun 30, 1997

PAGE 1 OF 6

Public reporting burden for this collection of information is estimated to average 1 hour 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 of 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 (0704-0187), Washington, DC 20503.

**PLEASE DO NOT RETURN YOUR FORM TO EITHER OF THESE ADDRESSES.
SEND YOUR COMPLETED FORM TO THE PROCUREMENT OFFICIAL IDENTIFIED IN ITEM 6.**

1. CONTRACT PURCH ORDER NO. F33615-98-D-6000		2. DELIVERY ORDER NO. 0003		3. DATE OF ORDER (YYMMDD) 98SEP25		4. REQUISITION PURCHASE REQUEST NUMBER SEE SECTION G		5. PRIORITY DO-C9					
6. ISSUED BY AFRL/MLRT USAP\AFMC AIR FORCE RESEARCH LABORATORY/ 2530 C STREET, BUILDING 7 WRIGHT-PATTERSON AFB OH 45433-7607 ANNETTE B. HENDERSON (937) 255-7143 X26			7. ADMINISTERED BY (If other than 6) DCMC DAYTON AREA C BUILDING 30 1725 VAN PATTON DRIVE WRIGHT-PATTERSON APB OH 45433-5302 SCD: C PAS: (NONE)			8. DELIVERY FOB <input checked="" type="checkbox"/> DEST <input type="checkbox"/> OTHER (SEE SCHEDULE IF OTHER)							
9. CONTRACTOR SYTRONICS, INC 4433 DAYTON-XENIA ROAD, BUILDING 1 DAYTON OH 45432 (937) 429-1466 GREENE COUNTY			10. DELIVER TO FOB POINT BY (DATE) (YYMMDD) SEE SCHEDULE		11. MARK IF BUSINESS <input checked="" type="checkbox"/> SMALL <input type="checkbox"/> SMALL DISAD- VANTAGED <input type="checkbox"/> WOMAN OWNED								
14. SHIP TO SEE SCHEDULE			15. PAYMENT WILL BE MADE BY DFAS-CO/NEW DOMINION DIVISION P O BOX 182041 COLUMBUS OH 43218-2041			12. DISCOUNT TERM N			13. MAIL INVOICES TO SEE BLOCK 15 (PAYMENT OFFICE)				
16. DELIVERY <input checked="" type="checkbox"/>		This delivery order is issued on another Government agency or in accordance with and subject to terms and conditions of above numbered contract.											
TYPE OF ORDER		Reference your _____ furnish the following on terms specified herein											
PURCHASE		ACCEPTANCE. THE CONTRACTOR HEREBY ACCEPTS THE OFFER REPRESENTED BY THE NUMBERED PURCHASE ORDER AS IT MAY PREVIOUSLY HAVE BEEN OR IS NOW MODIFIED. SUBJECT TO ALL OF THE TERMS AND CONDITIONS SET FORTH, AND AGREES TO PERFORM THE SAME											
NAME OF CONTRACTOR _____ SIGNATURE _____ TYPED NAME AND TITLE _____ DATE SIGNED (YYMMDD) _____													
<input type="checkbox"/> If this box is marked, supplier must sign Acceptance and return the following number of copies _____													
17. ACCOUNTING AND APPROPRIATION DATA/LOCAL USE SEE SECTION G													
18. ITEM NO.		19. SCHEDULE OF SUPPLIES/SERVICE			20. QUANTITY ORDERED/ACCEPTED *		21. UNIT		22. UNIT PRICE		23. AMOUNT		
		SEE SCHEDULE											
*If quantity accepted by the Government is same as quantity ordered, indicate by X. If different, enter actual quantity accepted below quantity ordered and encircle.				24. UNITED STATES OF AMERICA <i>James H Day 24 Sep 98</i> BY: JAMES H DAY CONTRACTING/ORDERING OFFICER				25. TOTAL		\$3,059,031.42		29.	
26. QUANTITY IN COLUMN 20 HAS BEEN <input type="checkbox"/> INSPECTED <input type="checkbox"/> RECEIVED <input type="checkbox"/> ACCEPTED, AND CONFORMS TO CONTRACT, EXCEPT AS NOTED				27. SHIP TO <input type="checkbox"/> PARTIAL <input type="checkbox"/> FINAL		28. DO VOUCHER NO		30. INITIALS		33. AMOUNT VERIFIED CORRECT FOR			
DATE _____ SIGNATURE OF AUTHORIZED GOVERNMENT REPRESENTATIVE _____				31. PAYMENT <input type="checkbox"/> COMPLETE <input type="checkbox"/> PARTIAL <input type="checkbox"/> FINAL		32. PAID BY		34. CHECK NUMBER					
36. I certify this account is correct and proper for payment								35. BILL OF LADING NO.					
37. RECEIVED AT		38. RECEIVED BY (Print)		39. DATE RECEIVED (YYMMDD)		40. TOTAL CONTAINERS		41. SR ACCOUNT NO.		42. SR VOUCHER NO.			

1. In accordance with the provisions of the Basic Contract and this delivery order, the Contractor shall accomplish the effort described in the attached Statement of Work (SOW), dated 17 June 1998, and entitled "Basic, Exploratory, and Advanced Development of Adaptive Interface Technology", at a total not to exceed amount of \$3,059,031.42.

SECTION B

1. 5352.216-9001 PAYMENT OF FEE (AFMC)(CPFF)(JUL 1997)

The estimated cost and fee for this delivery order are shown below. The applicable fixed fee or target fee set forth below may be increased or decreased only by negotiation and modification of the contract delivery order for added or deleted work. As determined by the contracting officer, it shall be paid as it accrues, in regular installments based upon the percentage of completion of work (or the expiration of the agreed-upon period(s) for term contract(s).

Estimated Cost: \$2,874,404.78

Fixed Fee: \$ 184,626.64

2. 5352.232-9001 IMPLEMENTATION OF LIMITATION OF FUNDS (AFMC) (JUL 1997)

- (a) The sum allotted to this contract delivery order and available for payment of costs under CLINs 0001-0003 through 1 November 1998 in accordance with the clause in Section I entitled "Limitations of Funds" is \$18,600.00.
- (b) In addition to the amount allotted under the "Limitations of Funds" clause, the additional amount of \$1,400.00 is obligated for payment of fee for work completed under CLINs 0001-0003.

SECTION B

F33615-98-D-6000 0003

<u>ITEM</u>	<u>SUPPLIES/SERVICE</u>	<u>QTY</u>	<u>UNIT</u>	<u>UNIT PRICE</u>	<u>TOTAL AMOUNT</u>
0001		1	LO	\$3,059,031.42	\$3,059,031.42

noun:
RESEARCH & DATA

acrn: contract type:
9 U - COST PLUS FIXED FEE

security: fob: inspection: acceptance: stock number(nsn):
UNCLASSIFIED DESTINATION DESTINATION DESTINATION N - NOT APPLICABLE

descriptive data:
THE CONTRACTOR SHALL CONDUCT RESEARCH IN ACCORDANCE WITH THE STATEMENT OF WORK ENTITLED "BASIC, EXPLORATORY, AND ADVANCED DEVELOPMENT OF ADAPTIVE INTERFACE TECHNOLOGY", DATED 17 JUNE 1998. THE CONTRACTOR SHALL ALSO SUBMIT DATA IN ACCORDANCE WITH EXHIBIT A, THE CONTRACT DATA REQUIREMENTS LIST, DD FORM 1423, DATED 18 MAY 1998, ATTACHED HERETO.

<u>ITEM</u>	<u>SUPPLIES/SERVICE</u>	<u>QTY</u>	<u>UNIT</u>	<u>UNIT PRICE</u>	<u>TOTAL AMOUNT</u>
000101					

noun:
FUNDING INFO ONLY

acrn:
AA \$20,000.00

descriptive data:
PR NUMBER GHECA9872HC122

<u>ITEM</u>	<u>SUPPLIES/SERVICE</u>	<u>QTY</u>	<u>UNIT</u>	<u>UNIT PRICE</u>	<u>TOTAL AMOUNT</u>
0002		1	LO	NSP	NSP

noun:
HARDWARE

Acrn: contract type:
U U - COST PLUS FIXED FEE

security: fob: inspection: acceptance: stock number(nsn):
UNCLASSIFIED DESTINATION DESTINATION DESTINATION N - NOT APPLICABLE

descriptive data:
DELIVER HARDWARE IN ACCORDANCE WITH STATEMENT OF WORK, DATED 17 JUNE 1998. THE COST OF THIS CLIN IS INCLUDED IN CLIN 0001.

ITEM	SUPPLIES/SERVICE	QTY	UNIT	UNIT PRICE	TOTAL AMOUNT
0003		1	LO	NSP	NSP

noun:
SOFTWARE

acrn: contract type:
U U - COST PLUS FIXED FEE

security: fob: inspection: acceptance: stock number(nsn):
UNCLASSIFIED DESTINATION DESTINATION DESTINATION N - NOT APPLICABLE

descriptive data:
THE CONTRACTOR SHALL PROVIDE SOFTWARE AS REQUIRED IN STATEMENT OF WORK, DATED 17 JUNE 1998, ATCH 1. THE COST OF THIS CLIN IS INCLUDED IN CLIN 0001.

SECTION F

F33615-98-D-6000 0003

<u>ITEM</u>	<u>QTY</u>	<u>SHIP TO</u>	<u>MARK FOR</u>	<u>TRANS PRI</u>	<u>DATE</u>
0001	1	U			25 Mar 2001

noun:
RESEARCH & DATA

acrn: security:
9 U

descriptive data:
The scheduled delivery date is for completion of all research and data as required by the Statement of Work, atch 1, and delivery of all reports in accordance with Exhibit A, Contract Data Requirements List.

<u>ITEM</u>	<u>QTY</u>	<u>SHIP TO</u>	<u>MARK FOR</u>	<u>TRANS PRI</u>	<u>DATE</u>
0002	1	U			25 Mar 2001

security:
U

descriptive data:
The scheduled delivery date is for delivery of all hardware in accordance with the Statement of Work, dated 17 June 1998.

<u>ITEM</u>	<u>QTY</u>	<u>SHIP TO</u>	<u>MARK FOR</u>	<u>TRANS PRI</u>	<u>DATE</u>
0003	1	U			25 Mar 2001

security:
U

descriptive data:
The scheduled delivery date is for any software to be delivered in accordance with Statement of Work, dated 17 June 1998.

SECTION G

F33615-98-D-6000 0003

<u>ACRN</u>	<u>OBLIGATION AMOUNT</u>
AA	\$20,000.00
On Clin 000101:	\$20,000.00

fund cite:

57 83600 298 47A8 627184 686600 592 62202F 503000 F03000

descriptive data:

PR IS COMPLETE.

PR: GHECA9872HC122
JON:7184CH22
CCC:686600

1. G005 PAYMENT INSTRUCTIONS FOR MULTIPLE ACCOUNTING CLASSIFICATION CITATIONS (FEB 1997)

PAYMENT FOR ALL EFFORT UNDER THIS DELIVERY ORDER SHOULD BE MADE IN THE ORDER AND AMOUNTS SHOWN IN THE INFORMATIONAL SUBLINE(S) IN SECTION B, CLIN 0001 OF THE CONTRACT AND RECAPPED BELOW. EXHAUST THE FUNDS IN EACH ACRN BEFORE USING FUNDS FROM THE NEXT LISTED ACRN.

ACRN	SUBCLIN NO.	TOTAL OBLIGATED
AA	000101	\$20,000.00

2. G008 INCREMENTAL FUNDING (APR 1997)

THE DELIVERY ORDERS WILL BE INCREMENTALLY FUNDED PURSUANT TO THE LIMITATION OF FUNDS CLAUSE, FAR 52.232-22. FUNDS ARE HEREBY OBLIGATED IN THE AMOUNT OF \$20,000.00 AND IT IS ESTIMATED THEY ARE SUFFICIENT FOR CONTRACT PERFORMANCE THROUGH 1 NOVEMBER 1998.

SECTION J - LIST OF ATTACHMENTS

Atch 1 Statement of Work, entitled "Basic, Exploratory, and Advanced Development of Adaptive Interface Technology", dated 17 June 1998.

Exhibit A DD Form 1423, Contract Data Requirements List (CDRLs), dated 18 May 1998.

STATEMENT OF WORK
Delivery Order 0003

Basic, Exploratory, and Advanced Development
of Adaptive Interface Technology
17 Jun 98

DESCRIPTION OF WORK

1.0 SCOPE. The purpose of this effort is to provide research and sustainment for the on-going development and evaluation of adaptive interface concepts and technologies employing combinations of virtual and non-virtual techniques. The scope of the required work includes (1) planning and execution of a combination of basic research, exploratory development, and advanced development, (2) sustaining effort of the Human Interface research facilities utilized in the development and evaluation of adaptive interface technology, such as the Synthesized Immersion Research Environment (SIRE) and Combat Observation and Visualization Environment (COVE), (3) perform research specified by the US/French Memorandum of Understanding (MOU) regarding the Cooperative Development and Evaluation of Super Cockpit Technologies to include hardware and software development, systems integration, research plan development and execution, and documentation, (4) perform research in the adaptive interface development within the requirements of the US/British Vista Warrior Project Arrangement to include hardware and software development, systems integration, research plan development and execution, and documentation, (5) perform research as specified in the US/Australian Virtual Air Commander Project Arrangement to include hardware and software development, systems integration, research plan development and execution, and documentation, (6) perform research as specified in the CRDA with the Kettering Medical Center for developing interface technology applicable to neuro-surgery to include hardware and software development, systems integration, research plan development and execution, and documentation, and (7) perform research for the New World Vista Program, specifically the development of multi-sensory and adaptive display and control concepts and their application to synthetic task environments (STE) such as the Predator STE.

2.0 APPLICABLE DOCUMENTS

- 2.1 US/French MOU Regarding the Cooperative Development of Super Cockpit Technologies and Program Arrangement One.
- 2.2 US/British Vista Warrior Project Arrangement
- 2.3 US/Australian Virtual Air Commander Summary Statement of Intent
- 2.4 CRDA with Kettering Medical Center
- 2.5 Proposal to AFOSR entitled *Understanding attentional mechanisms underlying increases in performance associated with multi-sensory displays.*
- 2.6 *Defense Technology Objective HS.23.02 - Immersive, Adaptive Interfaces for UAVs*

3.0 REQUIREMENTS

3.1 Exploratory Development and Research

3.1.1 Research program plan

3.1.1.1. The contractor shall develop a research program plan for the development and evaluation of adaptive interface technology, multi-sensory virtual interfaces and synthetic environments. The contractor shall plan the investigation of fundamental issues involved in the development and evaluation of adaptive interfaces and the construction of operating interfaces which demonstrate characteristics of these issues. The contractor shall investigate research issues which include, but are not limited to, multi-sensory interactions in supporting human performance, integration of multi-sensory information to facilitate flight control and tele-operation, perception of dynamic orientation, design and evaluation of multi-sensory cockpit interfaces, development and evaluation of real-time models of human perception, cognition, and control performance, development and evaluation of direct and in-direct measurement of operator state, and affects of closing the loop between the operator and system using adaptive algorithms which dynamically modify characteristics of displayed information and control device-to-modality linkages. The contractor shall plan, perform, and document research supporting the proposal to AFOSR's

Atch 1

Page 1 of 10

F33615-98-D-6000/0003

New World Vista program, as depicted in paragraph 2.5. The contractor shall document, in technical reports, conference proceedings, and journal articles, the results of this research, along with research conducted in support of other programs. The contractor shall maintain a report of journal article submissions and publications, update the report monthly, and make it easily accessible to the Government.

3.1.1.2. The contractor shall monitor ongoing technical developments in the area of virtual interfaces and synthetic environments. The contractor shall maintain the program plan such that it accurately reflects current research lines within the program, progress of the research program, significant accomplishments, anticipated facility and resource requirements, and projected research products. The contractor shall submit the research program plan to the Government for coordination on a regular basis. (CDRLs A001 and A002)

3.1.1.3. The contractor shall develop protocols for the use of human subjects in the SIRE, COVE, and other HEC virtual environments facilities. The objective of the protocols is to characterize the nature of the experimentation to be done, identify any safety implications of research facilities or experimental methods, and describe the research facility capability and characteristics.

3.1.2 Experimental plans

The contractor shall develop an overall research program plan to coordinate the use of experimental facilities and other resources as well as to establish procedures for planning experiments, determining the number of subjects needed, and estimating costs and schedule requirements. The contractor shall track the cost and schedule for individual experiments and shall consolidate this tracking into rolled-up research areas for management review. The contractor shall develop individual experimental plans for each experiment conducted in the SIRE, COVE, STORM, and the ACT facility, along with experiments conducted externally to HEC facilities, in conjunction with the overall research program plan. The contractor shall develop the experimental plans to include detailed specification of specific experimental manipulations to be performed, specific measures of human performance to be obtained, specific facility requirements and operating tolerances, analysis techniques to be employed, technical requirements, and subject requirements. The contractor shall submit individual experimental plans to the government for coordination. (CDRL A002)

3.1.3 Experimental research

Contractor shall assure that the facility is operating within tolerances specified in the experimental plan and that experimental procedures can be implemented accurately. Following verification of facility operations and experimental procedures, the contractor shall collect experimental data using subjects from the contractor's subject pool or Government-supplied crew members. The contractor shall conduct appropriate descriptive and inferential statistical analyses of the experimental data using graphical, pictorial, and tabular summaries to illustrate and describe the data. The contractor shall document the research findings in the form of briefings, technical reports, journal articles, and conference proceedings papers. The contractor shall also attend conferences and present the results of experimental research as required to transition research results to other Governmental agencies, industry, and academic institutions. (CDRLs A002, A003, and A004)

3.1.4 Interface conceptualization

The contractor shall conceptualize novel interfaces that may have application to Air Force crew stations and utilize both virtual and non-virtual control and display devices. The contractor shall document the interface concepts in a form supporting the generation of hardware and software requirements specifications. The contractor shall demonstrate these interface concepts within the SIRE, COVE, and the Predator STE as independent concepts as well as integrated into a coherent crew station concept. The contractor shall evaluate the concepts within controlled experimental conditions as independent concepts as well as globally evaluated as parts of a coherent crew station. The development of real-time adaptive interface concepts shall be the prevalent design domain. This design domain includes the use of real-time computational models of the human operator, such as a modified EPIC model, as ideal observers combined with real-time human operator state estimators. The contractor shall use differences in estimated and measured operator state to adapt interface display and control characteristics in real-time such that overall weapon system performance is improved. (CDRLs A002, A003, A004, A005, A006, and A007)

3.2 Research Facility Sustainment

In order to perform the research the contractor shall sustain the SIRE, COVE, and Predator STE research facilities. This shall include the image generation hardware and software, the computational and networking hardware and software, the projection systems, helmet mounted displays and sights, and audio image generation and portrayal system. The contractor shall manage the configuration of the research facilities, equipment, and systems. The contractor shall document equipment failures in an automated record log. After repair of equipment, the contractor shall assess the repaired equipment to ensure requirement satisfaction and shall re-calibrate the facility equipment. The contractor shall provide all test equipment required for re-calibration and measurement. (CDRLs A002, A005, A006, and A007)

The contractor shall provide documentation on all hardware configurations in the SIRE, COVE, and Predator STE labs. This documentation will include operating procedures and will be updated when any hardware modifications are made. The contractor shall develop a documentation methodology for system software configuration which shall involve the following:

- Systems software requirements
- Software design
- System software use

The contractor shall develop software that performs the following functions and maintain documentation that describes the configuration of developed software which includes, but is not limited to, the following:

- Head-up display
- Helmet mounted display
- Liquid crystal display
- Audio image generation
- Aircraft aerodynamics
- Haptic image generation
- Data acquisition
- Manned combat models
- Digital threat models
- Weapon models
- Shared memory
- Simulated avionics displays
- Synthetic environment immersion
- COVE experimental facilities
- Cognitive-Perceptual-Control models (such as EPIC, SOAR, or HOMER)
- MODSAF and EADSIM
- DIS-compliance Interface software and hardware

3.2.1 Computational architecture interconnecting SIRE workstations

The contractor shall develop a computational architecture interconnecting SIRE, COVE, and other HEC workstations, along with MODSAF or EADSIM models. This interconnection shall be DIS compliant whenever possible. The contractor shall configure the existing computational resources and shall acquire additional computational resources to create a system of networked computers sharing a network server and controlling research stimuli sequences, generating 3-dimensional data bases, supporting analysis of empirical data, creating and editing audio stimuli, and supporting regular software backup and configuration management procedures. The contractor shall acquire appropriate compiler, linker, and other software development tool licenses to support the interconnected architecture. The contractor shall ensure that the interconnection does not interfere with real-time operations within the facility by developing concurrent operation requirements prior to architecture design finalization and developing metrics to test the concurrent operations against requirements once installed. The contractor shall also conceptualize alternative interfaces to the SIMAF facility. (CDRLs A002, A005, A006, and A007)

3.2.2 Graphics/computational architecture in Predator STE

The contractor shall provide graphics display hardware and software, and computational upgrades to the Predator simulation enabling the Predator STE to continue adaptive interface development and evaluations. The contractor shall develop performance requirements for the graphics and computational equipment and shall submit those

Atch 1

Page 3 of 10

F33615-98-D-6000/0003

requirements to the Government for coordination. The contractor shall integrate the provided graphics hardware and software into the Predator STE and characterize its performance. (CDRLs A002, A005, A006, and A007)

3.2.3 Virtual audio components

Studies requiring the use of 3-D localized sound and auditory communications will be commonplace within the SIRE/COVE/Predator STE during the period of this delivery order. The contractor shall survey the industry with respect to virtual auditory localization. The contractor shall procure, design, implement, and install all necessary audio and localization equipment needed to execute the research program plan. The contractor shall integrate and maintain both hardware and software for the audio localization systems in the SIRE/COVE/Predator STE for the research program plan. The contractor shall design, incorporate, and maintain an unobtrusive stereo intercom system into the SIRE/COVE/Predator STE environments. This system shall provide two way communication between all of the stations in the SIRE, but shall also have the ability to isolate two way communication of any one or more stations from any other one or more stations. In addition to two way communication, audio inputs shall be provided so external audio sources may be utilized. (CDRLs A002, A005, A006, and A007)

3.2.4 Three-dimensional model building

3.2.4.1. The contractor shall furnish and produce database modeling tools to be used for creation and modification of terrain, virtual environments, and other necessary 3D elements. The tools shall support conversion of all widely utilized model storage formats. The contractor shall furnish hardware necessary to generate, view, and store terrain databases, 3D virtual environments, and 3D elements. The contractor shall minimize utilization of the of the primary graphics generator and reinforce simultaneous operations and development activities. (CDRLs A006 and A007)

3.2.4.2. The contractor shall furnish or produce two terrain databases of sufficient detail for an air-to-ground based simulator and one terrain data base supporting simulated air-to-air combat. In addition, the contractor shall create and purchase appropriate target models of perceptual importance for placement within the terrain database. Terrain and objects provided shall be available in at least three detail levels to allow the data to be used with all graphics generators in the SIRE/COVE/Predator STE. The contractor shall furnish or produce software capable of generating different detail levels. (CDRLs A006 and A007)

3.2.4.3. The contractor shall provide software for sustaining the research program plan. The contractor shall furnish tools for 3D data format and 2D image format conversion. The contractor shall furnish, produce, modify, and maintain software required for data visualization and perceptual research. (CDRLs A006 and A007)

3.2.4.4. To enhance technology transition, the contractor shall document software algorithms and techniques which provide enhanced perceptual characteristics to visual presentations within virtual and synthetic environments. The contractor shall report this research technology using technical reports, journal articles, and conference proceedings. Algorithms in this category include camouflage generation and placement in 3D environments, interactive and automatic level-of-detail algorithms, and enhancing depth of field perception through graphic modification. (CDRLs A006 and A007)

3.2.4.5. The contractor shall develop models on the Silicon Graphics Onyx, or replacement systems, that includes, but is not limited to, the following graphics capabilities:

- Atmospheric visibility studies (e.g. glare, fog, smoke, smog)
- Night/day cockpit illumination intensity studies
- High-G turns or critical maneuver studies
- Tight flight formation studies
- Terrain and surface vessel detection capability
- Aircraft carrier takeoff and landing studies

3.2.4.6. The contractor shall propose alternatives for replacing the Silicon Graphics Onyx in the SIRE. The contractor shall evaluate at least one alternative that uses six Pentium-based systems incorporating graphics-accelerating card-sets supporting the OpenGL language. The contractor shall develop performance requirements for the graphics and computational equipment and shall submit those requirements to the Government for coordination before integration.

3.2.5 Characterization of system performance

The contractor shall develop techniques for measuring system and facility performance characteristics. The contractor shall evaluate metrics that include, but are not limited to, the following:

3.2.5.1 Speed (e.g. computational speed of processors, and draw rates of points, lines, and polygons)

3.2.5.2 Efficiency (the amount of data collection that can take place without impacting performance, optimization of code, optimum ordering of processing tasks, and elimination of processing redundancy)

3.2.5.3. Resource consumption (e.g. CPU time, no. processors, memory utilization (RAM/disk), power consumption, network activity, shared memory access)

3.2.5.4 Response time (e.g. aggregate delay time of individual time delays for each system component)

3.2.5.5. Mean-time between failure (i.e. given a particular system configuration being able to predict when a system failure will take place)

3.2.5.6. Synthetic environment immersion capability and perceptual realism

3.2.6 Physiologic-based workload metrics with computational models of operator state

The contractor shall integrate physiologic-based workload monitors with real-time models of operator state and shall correlate their outputs under complex flight simulation environments within the SIRE and the Predator STE. The contractor shall determine and implement hardware and software modifications required. The contractor shall install necessary components into the SIRE and shall also conduct tests and evaluations to quantify operational reliability and metric robustness. The contractor shall also develop a "concept demonstrator" incorporating a closed-loop system in which the output of the workload monitor and operator model is used to modulate the amount and type of sensory information presented to a subject.

3.2.7 Alternative controls integration with the SIRE/COVE/Predator STE

Contractor shall research the design of alternative controls techniques. The contractor shall evaluate the effectiveness of alternative control techniques in operationally relevant tasks that are supplied from external sources. To enable virtual interface design prototyping, the contractor shall integrate alternative control techniques and technologies into the SIRE/COVE/ and Predator STE. These alternative controls include, but are not limited to, data gloves, eye line-of-sight measurement and control systems, brain activated control systems, whole-body movement detection systems, voice actuated control and recognition systems, and touch sensitive systems.

3.2.8 High performance computing resources for human engineering applications

The contractor shall provide technical sustainment for the planned use of high performance computing resources in the technical domain of human factors and human engineering research. The contractor shall conduct periodic technical literature reviews and technology assessments of both the high performance computing domain and human engineering/human factors domains. The contractor shall identify and document (1) linkages, or needs, in the human factors/human engineering domains that high performance computing may satisfy, and (2) opportunities that high performance computing may enable in the human engineering/human factors domain. (CDRL A001)

3.3 US/French Super Cockpit Development

For the US/French MOU, as depicted in paragraph 2.1 document of this SOW, the contractor shall research and develop partially immersive multi-modal interfaces which utilize US and French fabricated control and display devices. The contractor shall acquire equipment, software and sustain the development and delivery of systems required under the MOU. The contractor shall conceptualize interface designs, analyze their potential effectiveness, fabricate prototypes, and evaluate their ability to increase performance of future weapon systems. The contractor shall document, in technical reports, journal articles, and conference proceedings, the resulting interfaces and their subsequent evaluations. The contractor shall produce and submit an experimental plan to be reviewed by the Government in support of this MOU.

3.3.1 Systems engineering

The contractor shall perform systems engineering to include, but not be limited to, computer architecture design, acquisition, installation, and integration, systems documentation, and systems and configuration management as required within the experimental plan. Utilization of the SIRE and COVE for the US/French MOU must be integrated in the experimental plan. Systems designed and developed shall be documented. The contractor shall provide configuration management plans and hardware and software specifications supporting interaction with representative of the French Government. For periodic briefings held between the Government and representatives of the French Government, the contractor shall prepare briefings and participate in technical discussions both in the US and in France. (CDRLs A003, A004, A005, and A006)

3.3.2 Hardware development

The contractor shall develop, acquire and integrate hardware required to implement the US/French Super cockpit flight simulations, both in the US and in France, as described in paragraph 2.1 document of this SOW and the experimental plan. The contractor shall install and interface helmet mounted displays, magnetic helmet tracking systems, and auditory display equipment. The contractor shall document all developed or modified hardware to be transferred to the French Government through appropriate channels. (CDRLs A002 and A005)

3.3.3 Software development

The contractor shall develop, acquire and integrate software required to implement the US/French Super cockpit flight simulations, both in the US and in France, as described in paragraph 2.1 document of this SOW and the experimental plan. This software encompasses all operational aspects of the Integrated Visually coupled system (MSID), the Mini Visually Coupled Airborne Systems Simulator (Mini-VCASS) and the Binocular Visually Coupled system (C-VCASS). The contractor shall validate and verify the operation and correctness of all software produced by developing acceptance test procedures for each individual device as well as overall system performance. The contractor shall document all developed or modified software to be transferred to the French Government through appropriate channels. (CDRLs A002, A006, and A007)

3.3.4 Collaborative research plan with French CERMA and CEV

The Contractor shall develop a joint research plan with the French CERMA and CEV agencies to achieve the goals of the US/French MOU as described in paragraph 2.1 document of this SOW. The contractor shall interact on a regular basis with the appropriate CERMA and CEV personnel to establish research plans and timelines, generate experimental designs, collect experimental data, perform joint data analyses, coordinate experimental work, and co-author and present papers. (CDRLs A002, A003, and A004)

3.3.5 System installation in France

In compliance with the collaborative US/French research plan, the contractor shall travel to designated facilities and install and sustain the equipment and software. The contractor shall document any enhancements and upgrades to the installed hardware and software. The contractor shall train representatives of the French Government regarding the modification and operation of the virtual interface devices and systems. (CDRLs A002, A005, and A007)

3.3.6 Interface design

The contractor shall conceptualize, prototype, evaluate, and document adaptive interface alternatives as required to support the experimental plan. The contractor shall analyze each alternative to the greatest extent possible for performance and implementation characteristics. The contractor shall document in briefings, journal articles, conference proceedings, and technical reports these design alternatives. With Government approval and using existing laboratory facilities, the contractor shall demonstrate individual adaptive interface concepts. The contractor shall integrate these individual interface concepts into existing interface configurations when appropriate. (CDRLs A003, A004, A005, and A006)

3.4 US/British Vista Warrior development

For the US/British Vista Warrior Project, as depicted in paragraph 2.2 document of this SOW, the contractor shall research and develop adaptive and immersive multi-modal interfaces. The contractor shall acquire equipment, software and sustain the development and delivery of systems required under the MOU. The contractor shall conceptualize interface designs, analyze their potential effectiveness, fabricate prototypes, and evaluate their ability

Atch 1

Page 6 of 10

F33615-98-D-6000/0003

to increase performance of future weapon systems. The contractor shall document, in technical reports, journal articles, and conference proceedings, the resulting interfaces and their subsequent evaluations. The contractor shall produce and submit an experimental plan to be reviewed by the Government in support of this MOU. The contractor shall integrate British-developed equipment in the SIRE and ACT laboratories as required under the Vista Warrior Project Arrangement.

3.4.1 Systems engineering

The contractor shall perform systems engineering to include, but not be limited to, computer architecture design, acquisition, installation, integration, systems documentation, and systems and configuration management as required within the experimental plan. Utilization of the SIRE, ACT, and COVE for Vista Warrior must be integrated in the research program plan. Systems designed and developed shall be documented. The contractor shall provide configuration management plans and hardware and software specifications for interacting with representative of the British Government. For periodic briefings held between the Government and representatives of the British Government, the contractor shall prepare briefings and participate in technical discussions both in the US and in the UK. (CDRLs A003, A004, A005, and A006)

3.4.2 Hardware development

The contractor shall develop, acquire and integrate hardware required to implement the US/UK Vista Warrior flight simulations, both in the US and in the UK, as described in paragraph 2.2 document of this SOW and the experimental plan. The contractor shall install and interface helmet mounted displays, magnetic helmet tracking systems, alternative control devices, adaptive interface components, and auditory display equipment. The contractor shall document all developed or modified hardware to be transferred to the UK Government through appropriate channels. (CDRLs A002 and A005)

3.4.3 Software development

The contractor shall develop, acquire and integrate software required to implement the US/UK Vista Warrior flight simulations, both in the US and in the UK, as described in paragraph 2.2 of this SOW and the experimental plan. The contractor shall validate and verify the operation and correctness of all software produced by developing acceptance test procedures for each individual device as well as overall system performance. The contractor shall document all developed or modified software to be transferred to the British Government through appropriate channels. (CDRLs A002, A006, and A007)

3.4.4 Collaborative research plan with DERA and the CHS

The Contractor shall develop a joint research plan with the DERA and the CHS to achieve the goals of the Vista Warrior Project Arrangement as described in paragraph 2.2 document this SOW. The contractor shall interact on a regular basis with the appropriate DERA and CHS personnel to establish research plans and timelines, generate experimental designs, collect experimental data, perform joint data analyses, coordinate experimental work, and co-author and present papers. (CDRLs A002, A003, and A004)

3.4.5 System installation in the UK

In compliance with the US/UK research plan, the contractor shall travel to designated facilities and install and sustain the equipment and software. The contractor shall document any enhancements and upgrades to the installed hardware and software. The contractor shall train representatives of the British Government regarding the modification and operation of the adaptive and immersive interface devices and systems. (CDRLs A002, A005, and A007)

3.4.6 Interface design

The contractor shall conceptualize, prototype, evaluate, and document immersive, adaptive interface alternatives as required to support the experimental plan. The contractor shall analyze each alternative to the greatest extent possible for performance and implementation characteristics. The contractor shall document, in briefings, journal articles, conference proceedings, and technical reports, these design alternatives. With Government approval and using existing laboratory facilities, the contractor shall demonstrate individual adaptive interface concepts. The contractor shall integrate these individual interface concepts into existing interface configurations when appropriate. (CDRLs A003, A004, A005, and A006)

3.5 Virtual Air Commander Development

For the US/Australian Virtual Air Commander Project Arrangement, as depicted in paragraph 2.3 of this SOW, the contractor shall research and develop adaptive and immersive multi-modal interfaces. The contractor shall acquire equipment, software and sustain the development and delivery of systems required under the MOU. The contractor shall conceptualize interface designs, analyze their potential effectiveness, fabricate prototypes, and evaluate their ability to increase performance of future weapon systems. The contractor shall document, in technical reports, journal articles, and conference proceedings, the resulting interfaces and their subsequent evaluations. The contractor shall produce and submit an experimental plan to be reviewed by the Government in support of this MOU. The contractor shall integrate Australian-developed equipment or concepts in the HEC laboratory facilities.

3.5.1 Systems engineering

The contractor shall perform systems engineering to include, but not be limited to, computer architecture design, acquisition, installation, integration, systems documentation, and systems and configuration management as required within the experimental plan. Utilization of the SIRE, STORM, and COVE for Virtual Air Commander must be integrated in the research program plan. Systems designed and developed shall be documented. The contractor shall provide configuration management plans and hardware and software specifications for interacting with representative of the Australian Government. For periodic briefings held between the Government and representatives of the Australian Government, the contractor shall prepare briefings and participate in technical discussions both in the US and in Australia. (CDRLs A003, A004, A005, and A006)

3.5.2 Hardware development

The contractor shall develop, acquire and integrate hardware required to implement the Virtual Air Commander flight simulations, both in the US and in Australia, as described in paragraph 2.3 document of this SOW and the experimental plan. The contractor shall install and interface helmet mounted displays, magnetic helmet tracking systems, and auditory display equipment. The contractor shall document all developed or modified hardware to be transferred to the Australian Government through appropriate channels. (CDRLs A002 and A005)

3.5.3 Software development

The contractor shall develop, acquire and integrate software required to implement the Virtual Air Commander flight simulations, both in the US and in Australia, as described in paragraph 2.3 of this SOW and the experimental plan. The contractor shall validate and verify the operation and correctness of all software produced by developing acceptance test procedures for each individual device as well as overall system performance. The contractor shall document all developed or modified software to be transferred to the Australian Government through appropriate channels. (CDRLs A002, A006, and A007)

3.5.4 Collaborative research plan

The Contractor shall develop a joint research plan with Australian Government agencies to support the goals of the Virtual Air Commander Project Arrangement as described in paragraph 2.3 document of this SOW. The contractor shall interact on a regular basis with the appropriate Australian Government personnel to establish research plans and timelines, generate experimental designs, collect experimental data, perform joint data analyses, coordinate experimental work, and co-author and present papers. (CDRLs A002, A003, and A004)

3.5.5 System installation in Australia

In compliance with the US/Australian research plan, the contractor shall travel to designated facilities and install and maintain the equipment and software. The contractor shall document any enhancements and upgrades to the installed hardware and software. The contractor shall train representatives of the Australian Government regarding the modification and operation of the adaptive and immersive interface devices and systems. (CDRLs A002, A005, and A007)

3.5.6 Interface design

The contractor shall conceptualize, prototype, evaluate, and document immersive, adaptive interface alternatives as required to support the experimental plan. The contractor shall analyze each alternative to the greatest extent possible for performance and implementation characteristics. The contractor shall document in briefings, journal articles, conference proceedings, and technical reports these design alternatives. With Government approval and using existing laboratory facilities, the contractor shall demonstrate individual adaptive interface concepts. The

Atch 1

contractor shall integrate these individual interface concepts into existing interface configurations when appropriate. (CDRLs A003, A004, A005, and A006)

3.6 CRDA with Kettering Medical Center

For the CRDA between the Kettering Medical Center (KMC) and the Human Effectiveness Directorate, as depicted in paragraph 2.4 document of this SOW, the contractor shall develop a research plan specific to the creation and evaluation of interface concepts. Also, the contractor shall integrate hardware and software supplied by the Kettering Medical Center into the SIRE facility as necessary to enable the SIRE facility to support research and development of interfaces concepts for neuro-surgery according to the research plan. Additionally, the contractor shall develop or acquire any hardware and software deemed necessary to implement the research plan and the CRDA, and not supplied by the Kettering Medical Center, and shall integrated such hardware and software into the SIRE facility. The contractor shall document research results as briefings and journal articles and shall submit them for publication after they have been cleared for public release by the Government. The contractor shall interact on a regular basis with the appropriate Kettering Medical Center personnel to establish research plans and timelines, generate experimental designs, collect experimental data, perform joint data analyses, coordinate experimental work, and co-author papers. (CDRLs A003, A005, A006, and A007)

3.6.1 System installation in the Kettering Medical Center

When required under the AFRL/HE - KMC research plan, the contractor shall integrate hardware and software into facilities at the Kettering Medical Center to support the demonstration and evaluation of interface concepts in the medical environment. (CDRLs A005 and A007)

3.7 DTO HS.23.02

For DTO HS.23.02, as depicted in paragraph 2.6 document of this SOW, the contractor shall research and develop adaptive and immersive multi-modal interfaces for the Predator and for futureUCAV platforms. The contractor shall acquire equipment, software and sustain the development and delivery of systems required under the DTO. The contractor shall conceptualize interface designs, analyze their potential effectiveness, fabricate prototypes, and evaluate their ability to increase performance of future weapon systems. The contractor shall document, in technical reports, journal articles, and conference proceedings, the resulting interfaces and their subsequent evaluations. The contractor shall produce and submit an experimental plan to be reviewed by the Government in support of this DTO. The contractor shall integrate interface concepts onto fielded training systems when deemed necessary by the Government to support the DTO.

3.7.1 Systems Engineering

The contractor shall perform systems engineering to include, but not be limited to, computer architecture design, acquisition, installation, integration, systems documentation, and systems and configuration management as required within the experimental plan. Utilization of the SIRE, STORM, Predator STE, and COVE for in support of the DTO must be integrated in the research program plan. Systems designed and developed shall be documented. The contractor shall develop configuration management plans and hardware and software specifications for interacting with representatives of other Government Agencies. The contractor shall prepare briefing materials and participate in technical discussions when requested by the Government. (CDRLs A003, A004, A005, and A006)

3.7.2 Hardware development

The contractor shall develop, acquire and integrate hardware required to implement DTO flight simulations, as described in paragraph 2.6 of this SOW and the experimental plan. The contractor shall install and interface helmet mounted displays, magnetic helmet tracking systems, alternative control devices, adaptive interface components, and auditory display equipment. The contractor shall document all developed or modified hardware to be transferred to other Government agencies through appropriate Government channels. (CDRLs A002 and A005)

3.7.3 Software development

The contractor shall develop, acquire and integrate software required to realize the DTO flight simulations, as described in paragraph 2.6 of this SOW and the experimental plan. The contractor shall validate and verify the operation and correctness of all software produced by developing acceptance test procedures for each individual

device as well as overall system performance. The contractor shall document all developed or modified software to be transferred to other Government agencies through appropriate Government channels. (CDRLs A002, A006, and A007)

3.7.4 Collaborative research plan

The Contractor shall develop a joint research plan with the Navy's SPAWAR in San Diego to support the goals of the DTO as described in paragraph 2.6 of this SOW. It is envisioned the Navy will contribute 2-D/3-D visual display concepts to the program as well as conducting experiments to evaluate the integration of these concepts into the tele-robotic UAV environment. The contractor shall interact on a regular basis with the appropriate Navy personnel to establish research plans and timelines, generate experimental designs, collect experimental data, perform joint data analyses, coordinate experimental work, and co-author papers. (CDRLs A002, A003, and A004)

3.7.5 Interface design

As defined by the collaborative AFRL/HE - SPAWAR research plan and the DTO, the contractor shall conceptualize, prototype, evaluate, and document immersive, adaptive interface alternatives as required to support. The contractor shall analyze each alternative to the greatest extent possible, for performance and implementation characteristics. The contractor shall document, in briefings, journal articles, conference proceedings, and technical reports, these design alternatives. With Government approval and using existing laboratory facilities, the contractor shall demonstrate individual adaptive interface concepts. The contractor shall integrate these individual interface concepts into existing interface configurations when appropriate. (CDRLs A003, A004, A005, and A006)

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT				1. CONTRACT ID CODE U - CPFF	PAGE OF PAGES 1 of 2
2. AMENDMENT/MODIFICATION NO. 11		3. EFFECTIVE DATE FA8650		4. REQUISITION/PURCHASE REQ. NO. SEE SCHEDULE	
6. ISSUED BY AFRL/MLKH CODE		7. ADMINISTERED BY (If other than Item 6)		5. PROJECT NO. (If applicable) S3605A	
USAF/AFMC AIR FORCE RESEARCH LABORATORY/MLKH 2310 EIGHTH STREET, BUILDING 167 WRIGHT-PATTERSON AFB OH 45433-7801 JAMES DAVID BOX (937) 656-6274 James.Box@wpafb.af.mil			DCMC DAYTON AREA C BUILDING 30 1725 VAN PATTON DRIVE WRIGHT-PATTERSON AFB OH 45433-5302		
8. NAME AND ADDRESS OF CONTRACTOR (No. street, county, State and ZIP Code)				9A. AMENDMENT OF SOLICITATION NO.	
SYTRONICS, INC 4433 DAYTON-XENIA ROAD, BUILDING 1 DAYTON OH 45432 (937) 429-1466 GREENE COUNTY				9B. DATED (SEE ITEM 11)	
MAILING D. SEP 19 2001				10A. MODIFICATION OF CONTRACT/ORDER NO. F33615-98-D-6000 0002	
				10B. DATED (SEE ITEM 13) 25 SEP 1998	
CODE 1EE69	FACILITY CODE 1EE69		11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS		
<input type="checkbox"/> The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of 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 completing Items 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.					
12. ACCOUNTING AND APPROPRIATION DATA (If required) SEE SCHEDULE					
13. THIS ITEM APPLIES ONLY TO MODIFICATION OF CONTRACTS/ORDERS, IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.					
(X)	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: () THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. ITEM 10A.				
	B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).				
X	C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF: MUTUAL AGREEMENT OF THE PARTIES				
	D. OTHER (Specify type of modification and authority)				
E. IMPORTANT: Contractor <input type="checkbox"/> is not, <input checked="" type="checkbox"/> is required to sign this document and return <u>1</u> copies to the issuing office.					
14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)					
SUBJECT: De-Scope of Order to Effort Completed PROGRAM MANAGER: Doug Franck, AFRL/HECV, Wright-Patterson AFB OH 45433 PAYMENT OFFICE: (SC1018) DFAS-CO/New Dominion Division, P.O. Box 182041, Columbus OH 43218-2041 CHANGE IN DELIVERY ORDER PRICE: -\$365,356.42 (new price is \$2,166,691.00) CHANGE IN OBLIGATION: -\$365,355.00					
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) BARRETT L. MYERS President			16A. NAME AND TITLE OF SIGNER (Type or print) JAMES DAVID BOX Contracting Officer		
15B. CONTRACTOR/OFFEROR <i>B.R. Myers</i> (Signature of person authorized to sign)		15C. DATE SIGNED 14 Sep 2001		16B. UNITED STATES OF AMERICA BY <i>James David Box</i> (Signature of Contracting Officer)	
NSN 7540-01-152-8070		30-105		18C. DATE SIGNED 14 SEP 01	

1. Pursuant to the authority set forth on the cover page of this modification, subject Delivery Order is hereby amended by de-scoping the order to work completed.
2. As a result of this de-scope Section B, AFMC Clause 5352.216-9001, Payment of Fee, is amended as follows: Estimated Cost is changed to **\$2,042,605.00**, from \$2,397,103.01, a difference of **\$354,498.01**. Fixed Fee is changed to **\$124,087.00**, from \$133,944.41, a difference of **\$10,857.41**. The total Price is changed to **\$2,166,691.00**, from \$2,532,047.42, a difference of **\$365,356.42**.
3. All other terms and conditions remain unchanged.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
0001	CLIN Change		\$2,166,691.00
		LO	-\$365,356.42
	<i>Noun:</i>	RESEARCH & DATA	
	<i>Total Quantity:</i>	1	
	<i>New Total Item Amount:</i>	\$2,166,691.00	
	<i>ACRN:</i>	9	
	<i>Security:</i>	U	
	<i>NSN:</i>	N - Not Applicable	
	<i>DD1423 is Exhibit:</i>	A	
	<i>Contract type:</i>	U - COST PLUS FIXED FEE	
	<i>Inspection:</i>	DESTINATION	
	<i>Acceptance:</i>	DESTINATION	
	<i>FOB:</i>	DESTINATION	
	<i>Descriptive Data:</i>		
	The contractor shall conduct research in accordance with the Statement of Work entitled "Visual Display Technology (VDT)" dated 17 June 1998. The contractor shall also submit data in accordance with Exhibit A, the Contract Data Requirements List, DD Form 1423, dated 18 May 1998, attached hereto.		
000107	CLIN Change		
	<i>Noun:</i>	Funding Info Only	
	<i>ACRN:</i>	AG	-\$365,355.42
	<i>Descriptive Data:</i>		
	PR: GWSHE017201011		
	JON: 32570306		
	RCCC: 6HCV00		
ACRN	Appropriation/Lmt Subhead/Supplemental Accounting Data		Obligation Amount
AG	ACRN Change		-\$365,355.00
	57 13600 291 47A8 633257 6HCV00 02050 63231F 503000 F03000		
	<i>New ACRN Amount:</i>	\$139,385.92	
	<i>Funding breakdown:</i>	On CLIN 000107: -\$365,355.42	
	<i>PRIMIPR:</i>	GWSHE017201142 -\$365,355.00	
	JON: 32570306		
	<i>Descriptive data:</i>		
	RCCC: 6HCV00		
	PR IS COMPLETE.		

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE U - CPFF	PAGE OF PAGES 1 of 2
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2. AMENDMENT/MODIFICATION NO. 07	3. EFFECTIVE DATE	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO. (If applicable)
6. ISSUED BY AFRL/MLKH CODE	FA8650	7. ADMINISTERED BY (If other than item 6) DCMC DAYTON AREA C BUILDING 30 1725 VAN PATTON DRIVE WRIGHT-PATTERSON AFB OH 45433-5302 CODE S3605A	
USAF/AFMC AIR FORCE RESEARCH LABORATORY 2310 EIGHTH STREET, BUILDING 167 WRIGHT-PATTERSON AFB OH 45433-7801 ANNETTE B. HENDERSON (937) 656-9046 annette.henderson@ws.wpafb.af.mil			

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code) SYTRONICS, INC 4433 DAYTON-XENIA ROAD, BUILDING 1 DAYTON OH 45432 (937) 429-1466 GREENE COUNTY	MAILING DATE JUL 18 2000	(X) 9A. AMENDMENT OF SOLICITATION NO. 9B. DATED (SEE ITEM 11) 10A. MODIFICATION OF CONTRACT/ORDER NO. F33615-98-D-6000 0002 10B. DATED (SEE ITEM 13) 25 SEP 1998
CODE 1EE69	FACILITY CODE 1EE69	

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

12. ACCOUNTING AND APPROPRIATION DATA (If required)

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

(X)	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: () THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. 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) Excusable Delays Clause, FAR 52.249-14 and Contractor's e-mail dated 16 July 2000
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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.)

SUBJECT: No-Cost Time Extension
PROGRAM MANAGER: Don Monk, AFRL/HECA, Wright-Patterson AFB, OH. 45433, (937) 255-8814
PAYMENT OFFICE: (SC1018) DFAS-CO/New Dominion Division, P.O. Box 182041, Columbus, OH. 43218-2041
 The Contracting Officers e-mail address is: james.box@wpafb.af.mil

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 SIGNER (Type or print) JAMES DAVID BOX Contracting Officer
15B. CONTRACTOR/OFFEROR	16B. UNITED STATES OF AMERICA BY  (Signature of Contracting Officer)
(Signature of person authorized to sign)	16C. DATE SIGNED 18 JUL 00

1. This modification is being issued pursuant to the Excusable Delays Clause to extend the period of performance for CLINs 0001-0003 from 25 September 2000 to 25 September 2001. There will be no change to the total amount of the delivery order.

ITEM	SUPPLIES SCHEDULE DATA	QTY	SHIP TO	MARK FOR	TRANS PRI	DATE
0001		1	U			25 Sep 2001

Noun: RESEARCH & DATA
ACRN: 9
Sec. Class: U
Descriptive Data:

The scheduled delivery date is extended from 25 September 2000 to 25 September 2001.

0002		1	U			25 Sep 2001
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Noun: HARDWARE
ACRN: U
Sec. Class: U
Descriptive Data:

The scheduled delivery date is extended from 25 SEP 2000 to 25 SEP 2001.

0003		1	U			25 Sep 2001
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Noun: SOFTWARE
ACRN: U
Sec. Class: U
Descriptive Data:

The scheduled delivery date is extended from 25 September 2000 to 25 September 2001.

2. All other terms and conditions remain the same.

ORDER FOR SUPPLIES OR SERVICES

(Contractor must submit four copies of invoice.)

Form Approved
OMB No 0704-0187
Expires Jun 30, 1997

PAGE 1 OF 6

Public reporting burden for this collection of information is estimated to average 1 hour 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 of 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 (0704-0187), Washington, DC 20503.

**PLEASE DO NOT RETURN YOUR FORM TO EITHER OF THESE ADDRESSES.
SEND YOUR COMPLETED FORM TO THE PROCUREMENT OFFICIAL IDENTIFIED IN ITEM 6.**

1. CONTRACT PURCH ORDER NO. F33615-98-D-6000		2. DELIVERY ORDER NO. 0002		3. DATE OF ORDER (YYMMDD) 98SEP25		4. REQUISITION PURCHASE REQUEST NUMBER SEE SECTION G		5. PRIORITY DO-C9	
6. ISSUED BY AFRL/MLRT USAF/AFMC AIR FORCE RESEARCH LABORATORY/ 2530 C STREET, BUILDING 7 WRIGHT-PATTERSON AFB OH 45433-7607 ANNETTE B. HENDERSON (937) 255-7143 X26			7. ADMINISTERED BY (If other than 6) DCMC DAYTON AREA C BUILDING 30 1725 VAN PATTON DRIVE WRIGHT-PATTERSON AFB OH 45433-5302 SCD: C PAS: (NONE)		8. DELIVERY FOB <input checked="" type="checkbox"/> DEST <input type="checkbox"/> OTHER (SEE SCHEDULE IF OTHER)				
9. CONTRACTOR SYTRONICS, INC 4433 DAYTON-XENIA ROAD, BUILDING 1 DAYTON OH 45432 (937) 429-1466 GREENE COUNTY			10. DELIVER TO FOB POINT BY (DATE) (YYMMDD) SEE SCHEDULE		11. MARK IF BUSINESS <input checked="" type="checkbox"/> SMALL <input type="checkbox"/> SMALL DISAD- VANTAGED <input type="checkbox"/> WOMAN OWNED				
14. SHIP TO SEE SCHEDULE			15. PAYMENT WILL BE MADE BY DFAS-CO/NEW DOMINION DIVISION P O BOX 182041 COLUMBUS OH 43218-2041		12. DISCOUNT TERM N		13. MAIL INVOICES TO SEE BLOCK 15 (PAYMENT OFFICE)		

MAILING DATE
SEP 24 1998

14. DELIVERY	<input checked="" type="checkbox"/>	This delivery order is issued on another Government agency or in accordance with and subject to terms and conditions of above numbered contract.
TYPE OF ORDER	PURCHASE	Reference your _____ furnish the following on terms specified herein
ACCEPTANCE. THE CONTRACTOR HEREBY ACCEPTS THE OFFER REPRESENTED BY THE NUMBERED PURCHASE ORDER AS IT MAY PREVIOUSLY HAVE BEEN OR IS NOW MODIFIED. SUBJECT TO ALL OF THE TERMS AND CONDITIONS SET FORTH, AND AGREES TO PERFORM THE SAME		

NAME OF CONTRACTOR	SIGNATURE	TYPED NAME AND TITLE	DATE SIGNED (YYMMDD)
	<input type="checkbox"/> If this box is marked, supplier must sign Acceptance and return the following number of copies		

17. ACCOUNTING AND APPROPRIATION DATA/LOCAL USE
SEE SECTION G

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

*If quantity accepted by the Government is same as quantity ordered, indicate by X. If different, enter actual quantity accepted below quantity ordered and encircle.	24. UNITED STATES OF AMERICA <i>James H Day</i> BY: JAMES H DAY CONTRACTING/ORDERING OFFICER	25. TOTAL 29. \$ 2,532,047.42
---	--	-------------------------------------

26. QUANTITY IN COLUMN 20 HAS BEEN <input type="checkbox"/> INSPECTED <input type="checkbox"/> RECEIVED <input type="checkbox"/> ACCEPTED, AND CONFORMS TO CONTRACT, EXCEPT AS NOTED		27. SHIP TO <input type="checkbox"/> PARTIAL <input type="checkbox"/> FINAL	28. DO VOUCHER NO.	30. INITIALS
DATE SIGNATURE OF AUTHORIZED GOVERNMENT REPRESENTATIVE		31. PAYMENT <input type="checkbox"/> COMPLETE <input type="checkbox"/> PARTIAL <input type="checkbox"/> FINAL	32. PAID BY	33. AMOUNT VERIFIED CORRECT FOR
36. I certify this account is correct and proper for payment		34. CHECK NUMBER		
DATE SIGNATURE AND TITLE OF CERTIFYING OFFICER		35. BILL OF LADING NO.		

37. RECEIVED AT	38. RECEIVED BY (Print)	39. DATE RECEIVED (YYMMDD)	40. TOTAL CONTAINERS	41. SR ACCOUNT NO.	42. SR VOUCHER NO.
-----------------	-------------------------	----------------------------	----------------------	--------------------	--------------------

1. In accordance with the provisions of the Basic Contract and this delivery order, the Contractor shall accomplish the effort described in the attached Statement of Work (SOW), dated 17 June 1998, and entitled "Visual Display Technology" at a total not to exceed amount of \$2,532,047.42.

SECTION B

1. 5352.216-9001 PAYMENT OF FEE (AFMC)(CPFF)(JUL 1997)

The estimated cost and fee for this delivery order are shown below. The applicable fixed fee or target fee set forth below may be increased or decreased only by negotiation and modification of the contract delivery order for added or deleted work. As determined by the contracting officer, it shall be paid as it accrues, in regular installments based upon the percentage of completion of work (or the expiration of the agreed-upon period(s) for term contract(s).

Estimated Cost: \$2,397,103.01

Fixed Fee: \$134,944.41

2. 5352.232-9001 IMPLEMENTATION OF LIMITATION OF FUNDS (AFMC) (JUL 1997)

- (a) The sum allotted to this contract delivery order and available for payment of costs under CLINs 0001-0003 through 1 November 1998 in accordance with the clause in Section I entitled "Limitations of Funds" is \$18,600.00.
- (b) In addition to the amount allotted under the "Limitations of Funds" clause, the additional amount of \$1,400.00 is obligated for payment of fee for work completed under CLINs 0001-0003.

SECTION B

F33615-98-D-6000 0002

<u>ITEM</u>	<u>SUPPLIES/SERVICE</u>	<u>QTY</u>	<u>UNIT</u>	<u>UNIT PRICE</u>	<u>TOTAL AMOUNT</u>
0001		1	LO	\$2,532,047.42	\$2,532,047.42

noun:
RESEARCH & DATA

acrn: contract type:
9 U - COST PLUS FIXED FEE

security: fob: inspection: acceptance: stock number(nsn):
UNCLASSIFIED DESTINATION DESTINATION DESTINATION N - NOT APPLICABLE

descriptive data:
THE CONTRACTOR SHALL CONDUCT RESEARCH IN ACCORDANCE WITH THE STATEMENT OF WORK ENTITLED "VISUAL DISPLAY TECHNOLOGY (VDT)" DATED 17 JUNE 1998. THE CONTRACTOR SHALL ALSO SUBMIT DATA IN ACCORDANCE WITH EXHIBIT A, THE CONTRACT DATA REQUIREMENTS LIST, DD FORM 1423, DATED 18 MAY 1998, ATTACHED HERETO.

<u>ITEM</u>	<u>SUPPLIES/SERVICE</u>	<u>QTY</u>	<u>UNIT</u>	<u>UNIT PRICE</u>	<u>TOTAL AMOUNT</u>
000101					

noun:
FUNDING INFO ONLY

acrn:
AA \$20,000.00

descriptive data:
PR NUMBER GHECA9872HC121

<u>ITEM</u>	<u>SUPPLIES/SERVICE</u>	<u>QTY</u>	<u>UNIT</u>	<u>UNIT PRICE</u>	<u>TOTAL AMOUNT</u>
0002		1	LO	NSP	NSP

noun:
HARDWARE

Acrn: contract type:
U U - COST PLUS FIXED FEE

security: fob: inspection: acceptance: stock number(nsn):
UNCLASSIFIED DESTINATION DESTINATION DESTINATION N - NOT APPLICABLE

descriptive data:
DELIVER HARDWARE IN ACCORDANCE WITH STATEMENT OF WORK, DATED 17 JUNE 1998. THE COST OF THIS CLIN IS INCLUDED IN CLIN 0001.

<u>ITEM</u>	<u>SUPPLIES/SERVICE</u>	<u>QTY</u>	<u>UNIT</u>	<u>UNIT PRICE</u>	<u>TOTAL AMOUNT</u>
0003		1	LO	NSP	NSP

noun:
SOFTWARE

acrn: contract type:
U U - COST PLUS FIXED FEE

security: fob: inspection: acceptance: stock number(nsn):
UNCLASSIFIED DESTINATION DESTINATION DESTINATION N - NOT APPLICABLE

descriptive data:
THE CONTRACTOR SHALL PROVIDE SOFTWARE AS REQUIRED IN STATEMENT OF WORK, DATED
17 JUNE 1998, ATCH 1. THE COST OF THIS CLIN IS INCLUDED IN CLIN 0001.

SECTION F

F33615-98-D-6000 0002

<u>ITEM</u>	<u>QTY</u>	<u>SHIP TO</u>	<u>MARK FOR</u>	<u>TRANS</u> <u>PRI</u>	<u>DATE</u>
0001	1	U			25 Sep 2000

noun:
RESEARCH & DATA

acrn: security:
9 U

descriptive data:

The scheduled delivery date is for completion of all research and data as required by the Statement of Work, atch 1, and delivery of all reports in accordance with Exhibit A, Contract Data Requirements List.

<u>ITEM</u>	<u>QTY</u>	<u>SHIP TO</u>	<u>MARK FOR</u>	<u>TRANS</u> <u>PRI</u>	<u>DATE</u>
0002	1	U			25 Sep 2000

security:
U

descriptive data:

The scheduled delivery date is for delivery of all hardware in accordance with the Statement of Work, dated 17 June 1998.

<u>ITEM</u>	<u>QTY</u>	<u>SHIP TO</u>	<u>MARK FOR</u>	<u>TRANS</u> <u>PRI</u>	<u>DATE</u>
0003	1	U			25 Sep 2000

security:
U

descriptive data:

The scheduled delivery date is for any software to be delivered in accordance with Statement of Work, dated 17 June 1998.

SECTION GF33615-98-D-6000 0002

<u>ACRN</u>	<u>OBLIGATION AMOUNT</u>
AA	\$20,000.00
On Clin 000101:	\$20,000.00

fund cite:

57 83600 298 47A8 627184 686600 592 62202F 503000 F03000

descriptive data:

PR IS COMPLETE.

PR: GHECA9872HC121

JON:7184CH22

CCC:686600

1. G005 PAYMENT INSTRUCTIONS FOR MULTIPLE ACCOUNTING CLASSIFICATION CITATIONS (FEB 1997)

PAYMENT FOR ALL EFFORT UNDER THIS DELIVERY ORDER SHOULD BE MADE IN THE ORDER AND AMOUNTS SHOWN IN THE INFORMATIONAL SUBLINE(S) IN SECTION B, CLIN 0001 OF THE CONTRACT AND RECAPPED BELOW. EXHAUST THE FUNDS IN EACH ACRN BEFORE USING FUNDS FROM THE NEXT LISTED ACRN.

ACRN	SUBCLIN NO.	TOTAL OBLIGATED
AA	000101	\$20,000.00

2. G008 INCREMENTAL FUNDING (APR 1997)

THE DELIVERY ORDERS WILL BE INCREMENTALLY FUNDED PURSUANT TO THE LIMITATION OF FUNDS CLAUSE, FAR 52.232-22. FUNDS ARE HEREBY OBLIGATED IN THE AMOUNT OF \$20,000.00 AND IT IS ESTIMATED THEY ARE SUFFICIENT FOR CONTRACT PERFORMANCE THROUGH 1 NOVEMBER 1998.

SECTION J - LIST OF ATTACHMENTS

Atch 1 Statement of Work, entitled "Visual Display Technology (VDT)", dated 17 June 1998.

Exhibit A DD Form 1423, Contract Data Requirements List (CDRLs), dated 18 May 1998.

STATEMENT OF WORK
Delivery Order 0002

Visual Display Technology (VDT)
17 Jun 98

DESCRIPTION OF WORK

1.0 SCOPE. The purpose of this effort is to provide the necessary on-going research and sustainment of the Design Parameters for Visually Coupled Systems, Night Vision Operations, Visual Image Evaluation of Windscreens, and the Helmet Mounted Sensory Technologies (HMST) programs. The scope of the required research and sustainment includes; (1) planning and execution of exploratory development research plans, (2) designing, fabricating, integrating, maintaining, documenting, and testing of VDT hardware and software, and (3) helmet system certification and flight testing.

2.0 REFERENCE DOCUMENTS

2.1 Visually-Coupled Acquisition and Targeting System (VCATS) System Requirements Document (SRD), F41624-93-R-6024, Pages 75 - 120, December 11, 1997.

2.2 High Voltage Quick-Disconnect Connector Harness System for Air Force Helmet Mounted Displays, UDR-TR-93-131.

2.3 Quick-Disconnect Harness System Test Procedure, UDR-TR-93-128.

2.4 VCATS Interface Control Document, Interconnect, W5, Module V Specification 105640

2.5 US/UK Project Arrangement on Vista Warrior

2.6 Panoramic Night Vision Goggle (PNVG) Phase II Statement of Work, F41624-96-C-6005, July 12, 1996

2.7 Annual Book of American Society for Testing and Materials (ASTM) Standards Section 15 (1997). E 691, F 319-91, F 801-96, F 943-90, F 1165-88, F 1181-86, F 1252-89, F1316-90.

2.8 Pinkus, A. and Task, H. L. (1997). The Effects of Aircraft Transparencies on Night Vision Goggle-Mediated Visual Acuity. *SAFE Symposium 1997*, Sep 8-10, pp. 93-104.

3.0 REQUIREMENTS

3.1 Exploratory Development and Research

3.1.1 Research Program Plan

3.1.1.1 The contractor shall develop a research program plan for developing and evaluating of VDT. The contractor shall plan the investigation of fundamental issues involved in the development and evaluation of VDT.

3.1.1.2 The contractor shall monitor ongoing technical developments in the area of VDT. The contractor shall maintain a program plan such that it accurately reflects current research lines within the program, progress of the research program, significant accomplishments, and anticipated facility and resource requirements. The contractor shall submit research program plans for coordination with the Government on a regular basis. (CDRLs A001 and A002)

3.1.1.3 The contractor shall develop protocols supporting the use of human subjects. The objective of the protocols are to characterize the nature of the experimentation to be done, identify any safety implications of research facilities or experimental methods, describe the research facility capability and characteristics.

3.1.2 Experimental Plans

The contractor shall plan for the development and conduct of each experiment. The objective of experiment planning is to develop detail specification of specific experimental manipulations to be performed, specific measures of performance to be obtained, resource requirements, operating tolerances, analysis techniques to be employed, technical requirements, and subject requirements. The contractor shall submit experimental plans to the Government for coordination. (CDRL A002)

3.1.3 Research and Experimentation

Contractor shall collect pre-experimental data to assure that the facility is operating within tolerance specified in the experimental plan and the procedures can be implemented accurately. Following verification of experimental plans, the contractor shall collect the experimental data. The contractor shall conduct appropriate descriptive and inferential statistical analyses using the experimental data. The contractor shall perform statistical analyses using graphical, pictorial, and tabular summaries; shall document research and analyses in the form of technical reports, journal reports, and conference proceedings papers, and shall brief and present findings and results. These analyses, written documentation, or briefing/presentation materials shall include, but not be limited to, graphics, animation, multimedia, and photographic elements. The contractor shall also attend conferences and symposia and present the results of experimental research as required to transition research results to other Government agencies, industry, and academic institutions. (CDRLs A002, A003, and A004)

3.2 VDT Hardware/Software Development and Sustainment

3.2.1 VDT Hardware and Software Development

The contractor shall design, fabricate, integrate, document, test, maintain, modify, or develop VDT hardware and software. (CDRLs A002, A003, A004, A005, A006, and A007)

3.2.2 Biodynamic Interference Suppression and Helmet Vehicle Interfaces

The contractor shall develop hardware solutions for biodynamic interference suppression for helmet mounted displays. The contractor shall fabricate improvements for the helmet vehicle interface. The contractor shall provide document on any developed or upgraded hardware. (CDRL A005)

3.2.3 Facility Sustainment

The contractor shall sustain the Night Vision Operations and the Visual Image Evaluation of Windscreens Laboratories. The contractor shall maintain configuration control of the laboratory and all equipment and test objects. The contractor shall record equipment failures and document the failures in an automated record log. Recalibration of the facility shall be performed by the contractor. Repaired equipment shall be assessed by the contractor to ensure requirement satisfaction. The contractor shall provide all test equipment required for recalibration and measurement. Documentation will include operating procedures and will be updated after any modifications are made. (CDRLs A002 and A005)

3.3 Helmet Certification and Flight Testing

3.3.1 Helmet Testing and Certification

In performing HMST research, the contractor shall perform helmet testing and safety-of-flight certification. The contractor shall sustain engineering and technical efforts for flight certification and safety tests at WPAFB, at remote military facilities, and at contractor test facilities.

3.3.2 Flight Test Sustainment

The contractor shall perform on-site human factors, engineering, and technical sustainment for flight test portions of HMST research at the 53rd Test Wing, Nellis AFB, Nevada or other test sites. This sustainment will include loading and downloading of software, analysis of data, and the sustainment of VDT test assets.

CONTRACT DATA REQUIREMENTS LIST

(2 Data Items)

Form Approved
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 220 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to: Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503. Please DO NOT RETURN your form to either of these addresses. Send completed form to the Government-Issuing Contracting Officer for the Contract/PR No. listed in Block E.

A. CONTRACT LINE ITEM NO. 0001		B. EXHIBIT A		C. CATEGORY TBP - TM - OTHER	
D. SYSTEM / ITEM PROJECT 7184/DO-2			E. CONTRACT / PR NO. F33615-98-D-6000/0002		F. CONTRACTOR SYTRONICS, INC.
1. DATA ITEM NO. A004	2. TITLE OF DATA ITEM PRESENTATION MATERIALS			3. SUBTITLE Visual Display Technology	
4. AUTHORITY (Data Acquisition Document No.) DI-ADMN-81373			5. CONTRACT REFERENCE SOW para 3.2.1		6. REQUIRING OFFICE AFRL/HEC
7. DD 250 REQ LT	9. DIST STATEMENT REQUIRED TBD	10. FREQUENCY ASGEN	12. DATE OF FIRST SUBMISSION See Blk 16		14. DISTRIBUTION
8. APP CODE NA	11. AS OF DATE NA		13. DATE OF SUBSEQUENT SUBMISSION See Blk 16		
16. REMARKS					
Blk 9: To be determined by AFRL/HEC prior to submission of presentations.					
Blk 10: ASGEN means as generated by human factors research and sustaining efforts and technical interchange meetings.					
Blk 12/13: Submit within 25 days after completion of Blk 10.					
Blk 14b: Electronic media acceptable.					
15. TOTAL →				0 2 0	

1. DATA ITEM NO. A005		2. TITLE OF DATA ITEM COMMERCIAL DRAWINGS AND ASSOC LISTS		3. SUBTITLE Visual Display Technology	
4. AUTHORITY (Data Acquisition Document No.) DI-DRPR-81003			5. CONTRACT REFERENCE SOW para 3.2.2, 3.2.3		6. REQUIRING OFFICE AFRL/HEC
7. DD 250 REQ XX	9. DIST STATEMENT REQUIRED TBD	10. FREQUENCY ASGEN	12. DATE OF FIRST SUBMISSION See Blk 16		14. DISTRIBUTION
8. APP CODE NA	11. AS OF DATE NA		13. DATE OF SUBSEQUENT SUBMISSION See Blk 16		
16. REMARKS					
Blk 9: To be determined by AFRL/HEC prior to submission of drawings.					
Blk 10: ASGEN means as generated by human factors research and sustaining efforts and technical interchange meetings. Not to exceed 25 requirements per year without government approval.					
Blk 12/13: Submit within 25 days after completion of Blk 10.					
15. TOTAL →				0 2 0	

G. PREPARED BY DONALD L. MONK AFRL/HECA. DSN 785-8814		H. DATE 18 May 98	I. APPROVED BY ELONA BEANS, DM AFRL/HE. DSN 785-2423	J. DATE 18 May 98
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17. PRICE GR

18. ESTIMATE TOTAL PR

17. PRICE GR

18. ESTIMATE TOTAL PR

CONTRACT DATA REQUIREMENTS LIST
(2 Data Items)

Form Approved
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 220 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to: Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503. Please DO NOT RETURN your form to either of these addresses. Send completed form to the Government-Issuing Contracting Officer for the Contract/PR No. listed in Block E.

A. CONTRACT LINE ITEM NO 0001		B. EXHIBIT A		C. CATEGORY TQP TM OTHER	
D. SYSTEM / ITEM PROJECT 7184/DO-2			E. CONTRACT / PR NO. F33615-98-D-6000/0002		F. CONTRACTOR SYTRONICS, INC.
1. DATA ITEM NO. A006	2. TITLE OF DATA ITEM COMPUTER SOFTWARE SYSTEM DOCUMENT			3. SUBTITLE Visual Display Technology	
4. AUTHORITY (Data Acquisition Document No.) DI-IPSC-80942			5. CONTRACT REFERENCE SOW para 3.2.1		6. REQUIRING OFFICE AFRL/HEC
7. DD 250 REQ XX	9. DIST STATEMENT REQUIRED TBD	10. FREQUENCY ASGEN	12. DATE OF FIRST SUBMISSION See Blk 16		14. DISTRIBUTION
8. APP CODE NA		11. AS OF DATE NA	13. DATE OF SUBSEQUENT SUBMISSION See Blk 16		
15. REMARKS					
Blk 9: To be determined by AFRL/HEC prior to submission.					
Blk 10: ASGEN means as generated by human factors research and sustaining efforts and technical interchange meetings.					
Blk 12/13: Submit within 45 days after completion of Blk 10.					
16. DISTRIBUTION					
a. ADDRESSEE					
b. COPIES					
Draft					
Final					
Reg					
Repro					
AFRL/HEC 0 2 0					
15. TOTAL --> 0 2 0					
1. DATA ITEM NO. A007	2. TITLE OF DATA ITEM COMPUTER PROGRAM END ITEM DOCUMENTATION			3. SUBTITLE Visual Display Technology	
4. AUTHORITY (Data Acquisition Document No.) DI-IPSC-80590A			5. CONTRACT REFERENCE SOW para 3.2.1		6. REQUIRING OFFICE AFRL/HEC
7. DD 250 REQ XX	9. DIST STATEMENT REQUIRED TBD	10. FREQUENCY ASGEN	12. DATE OF FIRST SUBMISSION See Blk 16		14. DISTRIBUTION
8. APP CODE NA		11. AS OF DATE NA	13. DATE OF SUBSEQUENT SUBMISSION See Blk 16		
15. REMARKS					
Blk 9: To be determined by AFRL/HEC prior to submission.					
Blk 10: ASREQ as required by human factors research and sustaining efforts and technical interchange meetings.					
Blk 12/13: Submit within 45 days after completion of Blk 10.					
16. DISTRIBUTION					
a. ADDRESSEE					
b. COPIES					
Draft					
Final					
Reg					
Repro					
AFRL/HEC 0 2 0					
15. TOTAL --> 0 2 0					
G. PREPARED BY DONALD L. MONK AFRL/HECA, DSN 785-8814			H. DATE 18 May 98	I. APPROVED BY ELONA BEANS, DM <i>Elona Beans</i> AFRL/HE, DSN 785-2423	
				J. DATE 18 May 98	

17. PRICE GR
18. ESTIMATE
TOTAL PRI

17. PRICE GR
18. ESTIMATE
TOTAL PRI

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE
U - CPFF

PAGE OF PAGES
1 of 4

2. AMENDMENT/MODIFICATION NO.

33

3. EFFECTIVE DATE

FA8650

4. REQUISITION/PURCHASE REQ. NO.
SEE SCHEDULE

5. PROJECT NO. (If applicable)

6. ISSUED BY

AFRL/MLKH

CODE

USAF/AFMC
AIR FORCE RESEARCH LABORATORY
2310 EIGHTH STREET, BUILDING 167
WRIGHT-PATTERSON AFB OH 45433-7801
JEANETTE M. ZIMMER 937-656-9046
jeanette.zimmer@wpafb.af.mil

7. ADMINISTERED BY (If other than Item 6)

CODE

S3605A

DCMA DAYTON
AREA C BUILDING 30 -
1725 VAN PATTON DRIVE
WRIGHT-PATTERSON AFB OH 45433-5302

8. NAME AND ADDRESS OF CONTRACTOR (No. street, county, State and ZIP Code)

SYTRONICS, INC
4433 DAYTON-XENIA ROAD, BUILDING 1
DAYTON OH 45432
(937) 431-6100

MAILING DATE

JAN 31 2002

(X)

9A. AMENDMENT OF SOLICITATION NO.

9B. DATED (SEE ITEM 11)

10A. MODIFICATION OF CONTRACT/ORDER NO.

F33615-98-D-6000 0001

10B. DATED (SEE ITEM 13)

25 SEP 1998

CODE 1EE69

FACILITY CODE

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

The above numbered solicitation is amended as set forth in Item 4. 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 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required)

SEE SCHEDULE

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

- (X)
- A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: () THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. ITEM 10A.
 - B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation data, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
 - X C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
52.243-2 Changes -- Cost Reimbursement
 - D. OTHER (Specify type of modification and authority)

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.)

SUBJECT: In-Scope Change to the Statement of Work (SOW)
CHANGE IN PRICE: \$1,518,547.05 (increase)
CHANGE IN OBLIGATION: \$683,885.00 (increase)

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)

BARRETT L. MYERS
President

16A. NAME AND TITLE OF SIGNER (Type or print)

JAMES DAVID BOX
Contracting Officer

15B. CONTRACTOR/OFFEROR

B L Myers
(Signature of person authorized to sign)

15C. DATE SIGNED

28 Jan 2002

16B. UNITED STATES OF AMERICA

BY *James David Box*
(Signature of Contracting Officer)

16C. DATE SIGNED

29 JAN 02

NSN 7540-01-152-8070

30-105

PREVIOUS EDITION UNUSABLE
ConWrite Version 4.2.5
Created 28 Jan 2002 9:51 AM

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

1. Pursuant to FAR Clause 52.243-2 Changes -- Cost Reimbursement, the purpose of this modification is to make an in-scope change to the SOW as detailed herein. This modification increases the total estimated contract value by \$1,518,547.05 and increases the current obligation by \$683,885.00. The period of performance remains unchanged.

2. As a result of paragraph 1, this delivery order is hereby modified as follows:

a. SECTION A - CONTRACT FORM:

Block 25 of DD Form 1155, JUN 94, is hereby changed from \$15,628,536.95 to \$17,147,084.00, an increase of \$1,518,547.05.

b. SECTION B - SUPPLIES OR SERVICES:

1. 5352.216-9001 Payment of Fee (AFMC)(CPFF)(JUL 1997) is modified to read as follows:

Estimated Cost: \$16,152,138.00

Fixed Fee: \$994,946.00

2. 5352.232-9001 Implementation of Limitation of Funds (AFMC) (JUL 1997)

(a) The sum allotted to this Delivery Order and available for payment of costs under CIINs 0001-0004 through 01 Aug 2002, in accordance with the clause in Section I entitled Limitation of Funds and contractor's confirmation of negotiation's letter, dated 25 Jan 2002 and incorporated herein by reference, is \$16,256,408.00, an increase of \$683,885.00 from \$15,572,523.00.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
0001	CLIN Change		EST \$17,147,084.00 EST +\$1,518,547.05
	<i>Noun:</i>	LO	
	<i>Total Quantity:</i>	RESEARCH & DATA	
	<i>New Total Item Amount:</i>	1	
	<i>ACRN:</i>	\$17,147,084.00	
	<i>NSN:</i>	9	
	<i>DD1423 is Exhibit:</i>	N - Not Applicable	
	<i>Contract type:</i>	A	
	<i>Inspection:</i>	U - COST PLUS FIXED FEE	
	<i>Acceptance:</i>	DESTINATION	
	<i>FOB:</i>	DESTINATION	
	<i>Descriptive Data:</i>		
	The contractor shall conduct research in accordance with Section J Attachment 1, Statement of Work entitled "Human Factors Research and Sustaining Effort", dated 17 June 1998, and Section J Attachment 2, Statement of Work entitled "Human Factors Research and Sustaining Effort, Increase Level of Effort, dated 20 Dec 2001. The contractor shall deliver data in accordance with Exhibit A, the Contract Data Requirements List, DD Form 1423, dated 18 May 1998, attached hereto.		
000402	CLIN Change		
	<i>Noun:</i>	Funding Info Only	
	<i>ACRN:</i>	EG	+\$40,000.00
	<i>Descriptive Data:</i>		

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
000403	CLIN Change <i>Noun:</i> <i>ACRN:</i>	Funding Info Only EH	+\$5,300.00
000412	CLIN Establish <i>Noun:</i> <i>ACRN:</i>	Funding Info Only ES	+\$338,585.00
000413	CLIN Establish <i>Noun:</i> <i>ACRN:</i>	Funding Info Only ET	+\$300,000.00

ITEM	SUPPLIES SCHEDULE DATA	QTY	SHIP TO	MARK FOR	TRANS PRI	DATE
0001		1	U			25 Sep 2003
	<i>Noun:</i>		RESEARCH & DATA			
	<i>ACRN:</i>	9				
	<i>Descriptive Data:</i>	The scheduled delivery date is for completion of all research and data as required by the Statements of Work, Attachments 1 and 2, and delivery of all reports in accordance with Exhibit A, Contract Data Requirements List.				

c. SECTION G - CONTRACT ADMINISTRATION/PAYMENT DATA:

ACRN	Appropriation/Lmt Subhead/Supplemental Accounting Data	Obligation Amount
EG	ACRN Change 57 23600 292 47A8 6206MD 6HT000 59200 62202F 503000 F03000 <i>New ACRN Amount:</i> \$120,000.00 <i>Funding breakdown:</i> On CLIN 000402: +\$40,000.00 <i>PRIMIPR:</i> GWSHE027201028 \$40,000.00 JON: 9983CMPR <i>Descriptive data:</i> PR Complete JON FOR PR GWSHE027201023 and 1028 IS 9983CMPR	+\$40,000.00

ACRN	Appropriation/Lmt Subhead/Supplemental Accounting Data	Obligation Amount
EH	- ACRN Change 57 23600 292 47A8 6206MD 6HZF00 59200 62202F 503000 F03000 <i>New ACRN Amount:</i> \$15,900.00 <i>Funding breakdown:</i> On CLIN 000403: +\$5,300.00 <i>PRIMIPR:</i> GWSHE027201028 \$5,300.00 JON: 9983MISC <i>Descriptive data:</i> PR Complete	\$5,300.00
ES	ACRN Establish 57 23600 292 47A8 627184 6HCP00 02040 62202F 503000 F03000 <i>New ACRN Amount:</i> \$338,585.00 <i>Funding breakdown:</i> On CLIN 000412: +\$338,585.00 <i>PRIMIPR:</i> GWSHE027201028 \$338,585.00 JON: 71840863 <i>Descriptive data:</i> PR COMPLETE \$209,307-JON 71840863 \$107,600-JON 71840865 \$10,218-JON 71840868 \$9,600-JON 71840869 \$1,860-JON 71840864	\$338,585.00
ET	ACRN Establish 57 23600 292 47A8 627184 6HCA00 02010 62202F 503000 F03000 <i>New ACRN Amount:</i> \$300,000.00 <i>Funding breakdown:</i> On CLIN 000413: +\$300,000.00 <i>PRIMIPR:</i> GWSHE027201030 \$300,000.00 <i>Descriptive data:</i> PR COMPLETE \$250,000-JON 71841001 \$50,000-JON 71841002	\$300,000.00

d. SECTION J - ATTACHMENTS/EXHIBITS is modified to incorporate the Statement of Work entitled Human Factors Research and Sustaining Effort Increase Level of Effort, dated 20 Dec 2001, as attachment 2.

3. All other terms and conditions remain unchanged.

Contract F33615-98-D-6000
Delivery Order 0001
Human Factors Research and Sustaining Effort
Increase Level of Effort
20 Dec 2001

This effort is covered under the original contract statement of objectives in paragraph 2.2 and 2.3.

Delivery Order 001

Paragraph 3.1 Research Plans

Add Paragraph 3.1.5
Operational Centers Research

The USAF has had an increase emphasis in the area of research that relates to Air Operations Centers (AOC's) and the processing of complex mission data from multiple sources in a manner such that crewmembers can best process and utilize this information in performing their mission. This has come about as the emphasis on the Air Expeditionary Force concept has matured and expanded. The basic tenets of the research are covered in paragraphs 2.2 regarding collaboration and 2.3 regarding mission-effective interfaces with complex operations. The contractor shall perform Experimental Research and Developmental Research as laid out in Paragraphs 3.1.3 and 3.1.4 as relates to Air Operations Centers. This effort will integrate ongoing research from the existing research labs into a laboratory that will develop concepts for use in Air Operations Centers.

ORDER FOR SUPPLIES OR SERVICES
(Contractor must submit four copies of invoice)

Form Approved
OMB No 0704-0187
Expires Jun 30, 1997

PAGE 1 OF 6

Public reporting burden for this collection of information is estimated to average 1 hour 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 of 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 (0704-0187), Washington, DC 20503.

PLEASE DO NOT RETURN YOUR FORM TO EITHER OF THESE ADDRESSES.
SEND YOUR COMPLETED FORM TO THE PROCUREMENT OFFICIAL IDENTIFIED IN ITEM 6.

1. CONTRACT PURCH ORDER NO. F33615-98-D-6000		2. DELIVERY ORDER NO. 0001		3. DATE OF ORDER (YYMMDD) 98SEP25		4. REQUISITION PURCHASE REQUEST NUMBER SEE SECTION G		5. PRIORITY DO-C9		
6. ISSUED BY AFRM/MLKT USAF/AFMC AIR FORCE RESEARCH LABORATORY/ 2530 C STREET, BUILDING 7 WRIGHT-PATTERSON AFB OH 45433-7607 ANNETTE B. HENDERSON (937) 255-7143 X262			7. ADMINISTERED BY (If other than 6) DCMC DAYTON AREA C BUILDING 30 1725 VAN PATTON DRIVE WRIGHT-PATTERSON AFB OH 45433-5302 SCD: C PAS: (NONE)			8. DELIVERY FOR <input checked="" type="checkbox"/> DEST <input type="checkbox"/> OTHER (SEE SCHEDULE IF OTHER)				
9. CONTRACTOR SYTRONICS, INC 4433 DAYTON-XENIA ROAD, BUILDING 1 DAYTON OH 45432 (937) 429-1466 GREENE COUNTY			10. DELIVER TO FOR POINT BY (DATE) (YYMMDD) SEE SCHEDULE		11. MARK IF BUSINESS <input checked="" type="checkbox"/> SMALL <input type="checkbox"/> SMALL DISAD- VA NTAGED <input type="checkbox"/> WOMAN OWNED		12. DISCOUNT TERM N			
14. SHIP TO SEE SCHEDULE			15. PAYMENT WILL BE MADE BY IFAS-CO/NEW DOMINION DIVISION P O BOX 182041 COLUMBUS OH 43218-2041			13. MAIL INVOICES TO SEE BLOCK 15 (PAYMENT OFFICE)			MARK ALL PACKAGES AND PAPERS WITH CONTRACT OR ORDER NUMBER	
16. DELIVERY <input checked="" type="checkbox"/> This delivery order is issued on another Government agency or in accordance with and subject to terms and conditions of above numbered contract. TYPE OF ORDER PURCHASE Reference your _____ furnish the following on terms specified herein ACCEPTANCE. THE CONTRACTOR HEREBY ACCEPTS THE OFFER REPRESENTED BY THE NUMBERED PURCHASE ORDER AS IT MAY PREVIOUSLY HAVE BEEN OR IS NOW MODIFIED. SUBJECT TO ALL OF THE TERMS AND CONDITIONS SET FORTH, AND AGREES TO PERFORM THE SAME										

MAILING DATE
SEP 24 1998

NAME OF CONTRACTOR _____ SIGNATURE _____ TYPED NAME AND TITLE _____ DATE SIGNED (YYMMDD) _____
 If this box is marked, supplier must sign Acceptance and return the following number of copies _____

17. ACCOUNTING AND APPROPRIATION DATA/LOCAL USE
SEE SECTION G

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

*If quantity accepted by the Government is same as quantity ordered, indicate by X. If different, enter actual quantity accepted below quantity ordered and encircle.
24. UNITED STATES OF AMERICA
James H Day 24 Sep 98
BY: JAMES H DAY CONTRACTING/ORDERING OFFICER

25. TOTAL \$15,628,536.95
29. DIFFERENCES
26. QUANTITY IN COLUMN 20 HAS BEEN
 INSPECTED RECEIVED ACCEPTED, AND CONFORMS TO CONTRACT, EXCEPT AS NOTED
27. SHIP TO
 PARTIAL
 FINAL
28. DO VOUCHER NO
30. INITIALS
31. PAID BY
32. PAID BY
33. AMOUNT VERIFIED CORRECT FOR

DATE SIGNATURE OF AUTHORIZED GOVERNMENT REPRESENTATIVE
34. CHECK NUMBER
35. BILL OF LADING NO.
36. I certify this account is correct and proper for payment
DATE SIGNATURE AND TITLE OF CERTIFYING OFFICER

37. RECEIVED AT
38. RECEIVED BY (Print)
39. DATE RECEIVED (YYMMDD)
40. TOTAL CONTAINERS
41. SR ACCOUNT NO.
42. SR VOUCHER NO.

1. In accordance with the provisions of the Basic Contract and this delivery order, the Contractor shall accomplish the effort described in the attached Statement of Work (SOW), dated 17 June 1998, and entitled "Human Factors Research and Sustaining Effort" at a total not to exceed amount of \$15,628,536.95.

SECTION B

1. 5352.216-9001 PAYMENT OF FEE (AFMC)(CPFF)(JUL 1997)

The estimated cost and fee for this delivery order are shown below. The applicable fixed fee or target fee set forth below may be increased or decreased only by negotiation and modification of the contract delivery order for added or deleted work. As determined by the contracting officer, it shall be paid as it accrues, in regular installments based upon the percentage of completion of work (or the expiration of the agreed-upon period(s) for term contract(s).

Estimated Cost: \$14,722,243.87

Fixed Fee: \$ 906,293.08

2. 5352.232-9001 IMPLEMENTATION OF LIMITATION OF FUNDS (AFMC) (JUL 1997)

- (a) The sum allotted to this contract delivery order and available for payment of costs under CLINs 0001-0003 through 25 December 1998 in accordance with the clause in Section I entitled "Limitations of Funds" is \$60,450.00.
- (b) In addition to the amount allotted under the "Limitations of Funds" clause, the additional amount of \$4,550.00 is obligated for payment of fee for work completed under CLINs 0001-0003.

SECTION B

F33615-98-D-6000 0001

<u>ITEM</u>	<u>SUPPLIES/SERVICE</u>	<u>QTY</u>	<u>UNIT</u>	<u>UNIT PRICE</u>	<u>TOTAL AMOUNT</u>
0001		1	LO	\$15,628,536.95	\$15,628,536.95

noun:
RESEARCH & DATA

acrn: contract type:
9 U - COST PLUS FIXED FEE

security: fob: inspection: acceptance: stock number(nsn):
UNCLASSIFIED DESTINATION DESTINATION DESTINATION N - NOT APPLICABLE

descriptive data:
THE CONTRACTOR SHALL CONDUCT RESEARCH IN ACCORDANCE WITH THE STATEMENT OF WORK ENTITLED "HUMAN FACTORS RESEARCH AND SUSTAINING EFFORT", DATED 17 JUNE 1998. THE CONTRACTOR SHALL ALSO SUBMIT DATA IN ACCORDANCE WITH EXHIBIT A, THE CONTRACT DATA REQUIREMENTS LIST, DD FORM 1423, DATED 18 MAY 1998, ATTACHED HERETO.

<u>ITEM</u>	<u>SUPPLIES/SERVICE</u>	<u>QTY</u>	<u>UNIT</u>	<u>UNIT PRICE</u>	<u>TOTAL AMOUNT</u>
000101					

noun:
FUNDING INFO ONLY

acrn:
AA \$65,000.00

descriptive data:
PR NUMBER GHECA9872HC120

<u>ITEM</u>	<u>SUPPLIES/SERVICE</u>	<u>QTY</u>	<u>UNIT</u>	<u>UNIT PRICE</u>	<u>TOTAL AMOUNT</u>
0002		1	LO	NSP	NSP

noun:
HARDWARE

Acrn: contract type:
U U - COST PLUS FIXED FEE

security: fob: inspection: acceptance: stock number(nsn):
UNCLASSIFIED DESTINATION DESTINATION DESTINATION N - NOT APPLICABLE

descriptive data:
DELIVER HARDWARE IN ACCORDANCE WITH STATEMENT OF WORK, DATED 17 JUNE 1998. THE COST OF THIS CLIN IS INCLUDED IN CLIN 0001.

ITEM	SUPPLIES/SERVICE	QTY	UNIT	UNIT PRICE	TOTAL AMOUNT
0003		1	LO	NSP	NSP

noun:
SOFTWARE

acrn: contract type:
U U - COST PLUS FIXED FEE

security: fob: inspection: acceptance: stock number (nsn):
UNCLASSIFIED DESTINATION DESTINATION DESTINATION N - NOT APPLICABLE

descriptive data:
THE CONTRACTOR SHALL PROVIDE SOFTWARE AS REQUIRED IN STATEMENT OF WORK, DATED 17 JUNE 1998, ATCH 1. THE COST OF THIS CLIN IS INCLUDED IN CLIN 0001.

SECTION F

F33615-98-D-6000 0001

<u>ITEM</u>	<u>QTY</u>	<u>SHIP TO</u>	<u>MARK FOR</u>	<u>TRANS</u> <u>PRI</u>	<u>DATE</u>
0001	1	U			25 Mar 2001

noun:
RESEARCH & DATA

acrn: security:
9 U

descriptive data:
The scheduled delivery date is for completion of all research and data as required by the Statement of Work, atch 1, and delivery of all reports in accordance with Exhibit A, Contract Data Requirements List.

<u>ITEM</u>	<u>QTY</u>	<u>SHIP TO</u>	<u>MARK FOR</u>	<u>TRANS</u> <u>PRI</u>	<u>DATE</u>
0002	1	U			25 Mar 2001

security:
U

descriptive data:
The scheduled delivery date is for delivery of all hardware in accordance with the Statement of Work, dated 17 June 1998.

<u>ITEM</u>	<u>QTY</u>	<u>SHIP TO</u>	<u>MARK FOR</u>	<u>TRANS</u> <u>PRI</u>	<u>DATE</u>
0003	1	U			25 Mar 2001

security:
U

descriptive data:
The scheduled delivery date is for any software to be delivered in accordance with Statement of Work, dated 17 June 1998.

SECTION G

F33615-98-D-6000 0001

ACRN
AAOBLIGATION AMOUNT
\$65,000.00

On Clin 000101: \$65,000.00

fund cite:

57 83600 298 47A8 627184 686600 592 62202F 505000 F03000

descriptive data:

PR IS COMPLETE.

PR: GHECA9872HC120
JON:7184CH22
CCC:686600

1. G005 PAYMENT INSTRUCTIONS FOR MULTIPLE ACCOUNTING CLASSIFICATION CITATIONS (FEB 1997)

PAYMENT FOR ALL EFFORT UNDER THIS DELIVERY ORDER SHOULD BE MADE IN THE ORDER AND AMOUNTS SHOWN IN THE INFORMATIONAL SUBLINE(S) IN SECTION B, CLIN 0001 OF THE CONTRACT AND RECAPPED BELOW. EXHAUST THE FUNDS IN EACH ACRN BEFORE USING FUNDS FROM THE NEXT LISTED ACRN.

ACRN	SUBCLIN NO.	TOTAL OBLIGATED
AA	000101	\$65,000.00

2. G008 INCREMENTAL FUNDING (APR 1997)

THE DELIVERY ORDERS WILL BE INCREMENTALLY FUNDED PURSUANT TO THE LIMITATION OF FUNDS CLAUSE, FAR 52.232-22. FUNDS ARE HEREBY OBLIGATED IN THE AMOUNT OF \$65,000.00 AND IT IS ESTIMATED THEY ARE SUFFICIENT FOR CONTRACT PERFORMANCE THROUGH 25 DECEMBER 1998.

SECTION J - LIST OF ATTACHMENTS

Atch 1 Statement of Work, entitled "Human Factors Research and Sustaining Effort", dated 17 June 1998.

Exhibit A DD Form 1423, Contract Data Requirements List (CDRLs), dated 18 May 1998.

STATEMENT OF WORK
Delivery Order 0001

Human Factors Research and Sustaining Effort
17 Jun 98

DESCRIPTION OF WORK

1.0. SCOPE. The purpose of this effort is to provide on-going and sustaining research, technical, and administrative effort for research programs in the HEC laboratories. The required work includes (a) development and implementation of research plans; (b) sustaining effort of the HEC laboratories, facilities, and information network; and (c) administration and financial management of the contract activities.

2.0. APPLICABLE DOCUMENTS

2.1. MIL M-38784C Manual, Technical, General Style and Format Requirements

3.0. REQUIREMENTS

3.1. Research Plans

3.1.1. Research Program Planning

3.1.1.1. The contractor shall develop individual research plans to support the combination of experimentation, development, and evaluation in the various research programs of the HEC laboratories. The contractor shall plan to (a) extending human behavioral and/or performance theories and to provide empirical definition and verification; (b) transforming empirical data into guidelines, methodologies, and tools that enable effective transfer of human performance technology to the planning, design, and development of Air Force equipment and human systems; and (c) developing new techniques and technology for interfacing humans to high-performance weapon systems together with the metrics and simulation techniques to measure operator performance.

3.1.1.2. The contractor shall monitor on-going technical developments in the general research areas relevant to the HEC laboratories and shall maintain the program plans such that they accurately reflect current research trends within the programs, the progress of the research programs, significant accomplishments, anticipated facilities and resource requirements, and projected research products. The research program plans shall be coordinated with the Government on a regular basis. (CDRLs A001 and A002)

3.1.1.3. The contractor shall support the development of protocols supporting the use of human subjects in the HEC laboratories. The objective of the protocols are to characterize the nature of the experimentation to be done, any safety implications of research facilities or experimental methods, along with the general descriptions of research facility capabilities and characteristics. (CDRL A002)

3.1.2. Experimental Planning

The contractor shall plan the development of experiments to be conducted within the HEC laboratories, in conjunction with the associated research plan. The objectives of experimental planning is to develop

detailed specification of specific experimental manipulations to be performed, specific measures of human performance to be performed, specific facility requirements and operating tolerances, analysis techniques to be employed, technical requirements, and subject requirements. The contractor shall submit experimental plans to the Government for coordination. (CDRL A002)

3.1.3. Experimental Research

The contractor shall collect pre-experimental pilot data to assure that the facilities are operating within tolerances specified in the experimental plan and that experimental procedures can be implemented accurately. Following verification of pre-experimental pilot data, the contractor shall collect experimental data using subjects from the contractor's subject pool or Government supplied subjects. The contractor shall conduct appropriate descriptive and inferential statistical analyses using experimental data. The contractor shall perform statistical analyses using graphical, pictorial, and tabular summaries; shall document in the form of technical reports, journal reports, and conference proceedings papers, and shall brief and present research finding and results. Any of these analyses, written documentation, or briefing/presentation materials may require the incorporation of graphics, animation, multimedia, and photographic elements. The contractor shall also attend conferences and symposia and present the results of experimental research as required to transition research results to other Government, industrial, and academic institutions. (CDRLs A002, A003, and A004)

3.1.4. Developmental Research

The contractor shall develop crew system interface hardware and software (in the form of prototypes, conceptual demonstrations, models, and simulations) as specified in laboratory research plans. These items shall initially be documented in a form that identifies and describes the hardware and software requirements specifications. The contractor shall use the specification documents to design, fabricate, implement, code, and install the items in laboratory and field environments. The contractor shall test the prototypes, demonstrations, models, and simulations for their capability to improve the planning, design, development, and operation of Air Force and human systems. The contractor shall report technical research development in both written documents and conference proceedings. The contractor shall develop briefings and presentations of human factors research and sustaining efforts to include, but not be limited to, graphics, animation, multimedia, and photographic elements. The contractor shall attend conferences and symposia and present the results of developmental research as required to transition research results to other Government agencies, industry, and academic institutions. (CDRLs A002, A003, A004, A005, and A006)

3.2. HEC Laboratories and Network Sustainment

3.2.1. As required by the research programs, the contractor shall provide all engineering and related effort necessary to effect and document changes to existing AFRL/HEC laboratory facilities or to integrate new and unique components which will enhance research goals, improve equipment reliability, increase productivity, enhance flexibility, or improve fidelity. (CDRL A005)

3.2.2. The contractor shall supply all consumable materials required for uninterrupted research. The contractor shall provide equipment and materials needed for testing, inspection, calibration, repair, upgrading, or integration when such equipment is not already part of existing inventory and is required to conduct or enhance research.

3.2.3. During the conduct of research, the contractor shall operate, maintain, and calibrate the research equipment in compliance with maintenance, operating, and calibration procedures.

3.2.4. As necessary to sustain the on-going research program, the contractor shall code, upgrade, test, debug, calibrate, maintain, and document the software required for conducting laboratory research, experimentation, concept demonstrations, simulation, and data reduction and analysis. (CDRLs A006 and A007)

3.2.5. The contractor shall incorporate new hardware components, software products, and new functional capabilities consistent with the contract research requirements.

3.2.6. The contractor shall provide a shop for machining and fabricating research articles, to include, but not be limited to, prototypes, fixtures, mounting brackets, and the like.

3.2.7. The contractor shall provide a pool of persons to serve as research subjects in various simulations and laboratory experiments. The contractor shall provide screening, scheduling and training of subjects for human performance experiments.

3.2.8 For research conducted within and among the distributed HEC laboratories, the contractor shall provide sustaining effort for the Crew System Interface laboratories information networks, including hardware fault determination and repair, software updates, training in system usage, engineering development, installation of enhancements and upgrades, and system software configuration. This network shall include workstations, network servers and controllers, and other associated hardware and software. The contractor shall maintain documentation on the network hardware and software. (CDRL A007)

3.3. Management of Effort

The contractor shall exercise administrative and financial management functions for all active delivery orders which shall include scheduling of activities and milestones relative to all contract activities, describing technical and financial status, outlining contractor activities, forecasting, program planning, and describing in detail the overall results of the efforts. In addition, the contractor shall maintain a network-based reporting of resources and expenditures. This report shall be accessible by the Government and will serve as a tool for project status review. (CDRLs A008, A009 and A010)

CONTRACT D...A REQUIREMENTS LIST

(2 Data Items)

Form Approved
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 220 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to: Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503. Please DO NOT RETURN your form to either of these addresses. Send completed form to the Government-Issuing Contracting Officer for the Contract/PR No. listed in Block E.

A. CONTRACT LINE ITEM NO 0001		B. EXHIBIT A		C. CATEGORY TDP TM OTHER	
D. SYSTEM / ITEM PROJECT 7184/DO-1			E. CONTRACT / PR NO. F33615-98-D-6000/0001		F. CONTRACTOR SYTRONICS, INC.
1. DATA ITEM NO A001	2. TITLE OF DATA ITEM TECHNICAL REPORT - STUDY/SERVICES			3. SUBTITLE DO 0001 Literature Search - Research Trends	
4. AUTHORITY (Data Acquisition Document No.) DI-MISC-80508			5. CONTRACT REFERENCE SOW para 3.1.1.2		6. REQUIRING OFFICE AFRL/HEC
7. DD 250 REQ XX	9. DIST STATEMENT REQUIRED N/A	10. FREQUENCY ASREQ	12. DATE OF FIRST SUBMISSION See Blk 16		14. DISTRIBUTION
8. APP CODE NA	11. AS OF DATE NA	13. DATE OF SUBSEQUENT SUBMISSION See Blk 16			
15. REMARKS Blk 12/13: ASREQ means as required by human factors research and sustaining efforts and technical interchange meetings. Not to exceed 100 items per search without government approval.					
16. REMARKS	17. PRC	18. EST TO	18. EST TO	18. EST TO	18. EST TO
1. DATA ITEM NO A002	2. TITLE OF DATA ITEM STATUS REPORT			3. SUBTITLE Human Factors Research & Sustaining Effort	
4. AUTHORITY (Data Acquisition Document No.) DI-MGMT-80368			5. CONTRACT REFERENCE SOW para 3.1.1.2, 3.1.1.3, 3.1.2, 3.1.3, 3.1.4		6. REQUIRING OFFICE AFRL/HEC
7. DD 250 REQ LT	9. DIST STATEMENT REQUIRED N/A	10. FREQUENCY ASREQ	12. DATE OF FIRST SUBMISSION See Blk 16		14. DISTRIBUTION
8. APP CODE NA	11. AS OF DATE NA	13. DATE OF SUBSEQUENT SUBMISSION See Blk 16			
15. REMARKS Blk 4 Tailored to delete para 10.2.2.3 and to accept contractor format. Blk 10/12/13: ASREQ means as required by human factors research, sustaining efforts, and technical interchange meetings.					
16. REMARKS	17. PRC	18. EST TO	18. EST TO	18. EST TO	18. EST TO
G. PREPARED BY DONALD L. MONK AFRL/HECA, DSN 785-8814			H. DATE 18 May 98	I. APPROVED BY ELONA BEANS, DM AFRL/HE, DSN 785-2423	
			J. DATE 18 May 98		

CONTRACT DATA REQUIREMENTS LIST

(2 Data Items)

Form Approved
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 220 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to: Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503. Please DO NOT RETURN your form to either of these addresses. Send completed form to the Government Issuing Contracting Officer for the Contract/PR No. listed in Block E.

A. CONTRACT LINE ITEM NO. 0001		B. EXHIBIT A	C. CATEGORY TDP TM OTHER	
D. SYSTEM / ITEM PROJECT 7184/DO-1		E. CONTRACT / PR NO. F33615-98-D-6000/0001		F. CONTRACTOR SYTRONICS, INC.
1. DATA ITEM NO. A004	2. TITLE OF DATA ITEM PRESENTATION MATERIALS		3. SUBTITLE Experimental and Developmental Research	
4. AUTHORITY (Data Acquisition Document No.) DI-ADMN-81373		5. CONTRACT REFERENCE SOW para 3.1.3, 3.1.4		6. REQUIRING OFFICE AFRL/HEC
7. DD 250 REQ LT	9. DIST STATEMENT REQUIRED TBD	10. FREQUENCY ASGEN	12. DATE OF FIRST SUBMISSION See Blk 16	
8. APP CODE NA		11. AS OF DATE NA	13. DATE OF SUBSEQUENT SUBMISSION See Blk 16	
16. REMARKS Blk 9: To be determined by AFRL/HEC prior to submission of presentations. Blk 10: ASGEN means as generated by human factors research, sustaining efforts, and technical interchange meetings. Blk 12/13: Submit within 25 days after completion of Blk 10. Blk 14b: Electronic media acceptable			14. DISTRIBUTION	
			a. ADDRESSEE	
			b. COPIES	
			Draft	
			Reg	
			Repro	
			AFRL/HEC	
			vugraphs	
			0	
			1	
			0	
			hardcopies	
			0	
			1	
			0	
			15. TOTAL ----->	
			0	
			2	
			0	

1. DATA ITEM NO. A005		2. TITLE OF DATA ITEM COMMERCIAL DRAWINGS AND ASSOC LISTS		3. SUBTITLE Laboratories and Network	
4. AUTHORITY (Data Acquisition Document No.) DI-DRPR-81003		5. CONTRACT REFERENCE SOW para 3.2.1		6. REQUIRING OFFICE AFRL/HEC	
7. DD 250 REQ XX	9. DIST STATEMENT REQUIRED TBD	10. FREQUENCY ASGEN	12. DATE OF FIRST SUBMISSION See Blk 16		
8. APP CODE NA		11. AS OF DATE NA	13. DATE OF SUBSEQUENT SUBMISSION See Blk 16		
16. REMARKS Blk 9: To be determined by AFRL/HEC prior to submission of drawings. Blk 10: ASGEN means as generated by human factors research and sustaining efforts and technical interchange meetings. Not to exceed 25 requirements per year without government approval. Blk 12/13: Submit within 25 days after completion of Blk 10					14. DISTRIBUTION
					a. ADDRESSEE
					b. COPIES
					Draft
					Reg
					Repro
					AFRL/HEC
					0
					2
					0
					15. TOTAL ----->
					0
					2
					0

G. PREPARED BY DONALD L. MONK AFRL/HECA, DSN 785-8814		H. DATE 18 May 98	I. APPROVED BY ELONA BEANS, DM AFRL/HE, DSN 785-2423 <i>Elona Beans</i>	J. DATE 18 May 98
---	--	-----------------------------	--	-----------------------------

17 PR
18 EST
TOT

17 PRIC
18 EST
TOTA

CONTRACT DATA REQUIREMENTS LIST

(2 Data Items)

Form Approved
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 220 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503. Please DO NOT RETURN your form to either of these addresses. Send completed form to the Government-issuing Contracting Officer for the Contract/PR No. listed in Block E.

A. CONTRACT LINE ITEM NO 0001		B. EXHIBIT A	C. CATEGORY TDP TM OTHER	
D. SYSTEM / ITEM PROJECT 7184/DO-1		E. CONTRACT / PR NO. F33615-98-D-6000/0001		F. CONTRACTOR SYTRONICS, INC.
1. DATA ITEM NO A006	2. TITLE OF DATA ITEM COMPUTER SOFTWARE SYSTEM DOCUMENT		3. SUBTITLE Laboratories and Network	
4. AUTHORITY (Data Acquisition Document No.) DI-IPSC-80942		5. CONTRACT REFERENCE SOW para 3.2.4.3.2.8		6. REQUIRING OFFICE AFRL/HEC
7. DD 250 REQ XX	9. DIST STATEMENT REQUIRED TBD	10. FREQUENCY ASGEN	12. DATE OF FIRST SUBMISSION See Blk 16	14. DISTRIBUTION
8. APP CODE NA	11. AS OF DATE NA		13. DATE OF SUBSEQUENT SUBMISSION See Blk 16	
16. REMARKS				
Blk 9: To be determined by AFRL/HEC prior to submission.				
Blk 10: ASGEN means as generated by human factors research and sustaining efforts and technical interchange meetings.				
Blk 12/13: Submit within 45 days after completion of Blk 10.				
15. TOTAL ----->		0 2 0		

1. DATA ITEM NO A007		2. TITLE OF DATA ITEM COMPUTER PROGRAM END ITEM DOCUMENTATION		3. SUBTITLE Laboratories and Network			
4. AUTHORITY (Data Acquisition Document No.) DI-IPSC-80590A		5. CONTRACT REFERENCE SOW para 3.2.4.3.2.8		6. REQUIRING OFFICE AFRL/HEC			
7. DD 250 REQ XX	9. DIST STATEMENT REQUIRED TBD	10. FREQUENCY ASGEN	12. DATE OF FIRST SUBMISSION See Blk 16	14. DISTRIBUTION			
8. APP CODE NA	11. AS OF DATE NA		13. DATE OF SUBSEQUENT SUBMISSION See Blk 16	a. ADDRESSEE	b. COPIES		
16. REMARKS					Draft	Final	
						AFRL/HEC	Reg
Blk 9: To be determined by AFRL/HEC prior to submission.					0		2
15. TOTAL ----->		0 2 0					

G. PREPARED BY DONALD L. MONK AFRL/HECA, DSN 785-8814		H. DATE 18 May 98	I. APPROVED BY ELONA BEANS, DM AFRL/HE, DSN 785-2423	J. DATE 18 May 98
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17 PR

18 EST
TOT

17 PRIC

18 ESTM
TOTA

Exhibit A

AWARD / CONTRACT

THIS CONTRACT IS A RATED ORDER UNDER DPAS (15 CFR 350)

ing
 CS
 HASE REQUEST / PROJECT NO.

2. CONTRACT (PROC. INST. IDENT.) NO.
 F33615-98-D-6000

2. EFFECTIVE DATE
 25 SEP 1998
 CODE FAB650

4. REQUISITION
 See Schedule

3. ISSUED BY AFRL/MLKT
 USAF/AFMC
 AIR FORCE RESEARCH LABORATORY/
 2530 C STREET, BUILDING 7
 WRIGHT-PATTERSON AFB OH 45433-7607
 BUYER: ANNETTE HENDERSON, AFRL/MLKT
 (937) 255-7143

6. ADMINISTERED BY (IF OTHER THAN ITEM 5) CODE
 DCMC DAYTON
 AREA C BUILDING 30
 1725 VAN PATTON DRIVE
 WRIGHT-PATTERSON AFB OH 45433-530
 EFT: T SCD: C PAS: (NONE)

7. NAME AND ADDRESS OF CONTRACTOR (NO., STREET, CITY, COUNTY, STATE AND ZIP CODE)

SYTRONICS, Inc.
 4433 Dayton-Xenia Road; Bldg 1
 Dayton OH 45432

MAILING DATE
SEP 24 1998

8. DELIVERY
 FOB Origin Other
 9. DISCOUNT FOR PROMPT PAYMENT
 10. SUBMIT INVOICES (4 COPIES UNLESS OTHERWISE SPECIFIED) TO THE ADDRESS SHOWN IN CODE

CAGE CODE 1EE69

FACILITY CODE 1EE69

11. SHIP TO / MARK FOR
 See Section F

12. PAYMENT WILL BE MADE BY
 DFAS-CO/NEW DOMINION DIVISION
 P O BOX 182041
 COLUMBUS OH 43218-2041

13. AUTHORITY FOR OTHER THAN FULL AND OPEN COMPETITION

15A. ITEM NO
 See Section B

15B. SUPPLIES/SERVICES

14. ACCOUNTING AND APPROPRIATION DATA
 See Section G

15C. QUANTITY 15D. UNIT 15E. UNIT PRICE

15G. TOTAL AMOUNT OF CONTRACT NTE \$49,00

16. Table of Contents

SEC	DESCRIPTION	PAGE(S)	SEC	DESCRIPTION
	PART I - THE SCHEDULE			PART II - CONTRACT CLAUSES
✓ A	SOLICITATION/CONTRACT FORM	1	✓ I	CONTRACT CLAUSES
✓ B	SUPPLIES OR SERVICES AND PRICES/COSTS	2		PART III - LIST OF DOCUMENTS, EXHIBITS & ATTACHMENTS
✓ C	DESCRIPTION/SPECS./WORK STATEMENT	5	✓ J	LIST OF ATTACHMENTS
✓ D	PACKAGING AND MARKING	6		PART IV - REPRESENTATIONS AND INSTRUCTIONS
✓ E	INSPECTION AND ACCEPTANCE	7	K	REPRESENTATIONS, CERTIFICATIONS AND OTHER STATEMENTS OF OFFERORS
✓ F	DELIVERIES OR PERFORMANCE	8	L	INSTRS., CONDS., AND NOTICES TO OFFEROR
✓ G	CONTRACT ADMINISTRATION DATA	9	M	EVALUATION FACTORS FOR AWARD
✓ H	SPECIAL CONTRACT REQUIREMENTS	11		

17. **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 services set forth or otherwise identified above and on any continuation sheets for the consideration stated herein. The rights and obligations of the parties to this contract shall be subject to and governed by the following documents: (a) this award/contract, (b) the solicitation, if any, and (c) such provisions, representations, certifications, and specifications, as are attached or incorporated by reference herein. (Attachments are listed herein.)

18. **Award** (Contractor is not required to sign this document)
 Your offer on solicitation number including the additions or changes made additions or changes set forth in full above, is hereby accepted as to items listed any continuation sheets. This award consummates the contract which consists following documents: (a) the Government's solicitation and your offer, and (b) award/contract. No further contractual document is necessary.

19A. NAME AND TITLE OF SIGNER (TYPE OR PRINT)
 BARRETT L. MYERS, President

20A. NAME OF CONTRACTING OFFICER
 JAMES H. DAY

19B. Name of Contractor
 by B L Myers
 (signature of person authorized to sign)

19C. Date Signed
 08/28/98

20B. United States of America
 by James H Day
 (signature of Contracting Officer)

20C. Date
 245

PART I - THE SCHEDULE
SECTION B

SUPPLIES OR SERVICES AND PRICES/COST
F33615-98-D-6000

ITEM	SUPPLIES/SERVICE	QTY	UNIT	UNIT PRICE	TOTAL AMOUNT
0001		1	LO		NTE \$49,000,000.00

noun:
RESEARCH & DATA

contract type:
U - COST PLUS FIXED FEE

security: UNCLASSIFIED fob: DESTINATION inspection: DESTINATION acceptance: DESTINATION stock number (nsn): N - NOT APPLICABLE

descriptive data:
THE CONTRACTOR SHALL PERFORM RESEARCH AS REQUIRED BY INDIVIDUAL DELIVERY ORDERS IN ACCORDANCE WITH SAID STATEMENT OF WORK. THE CONTRACTOR SHALL PROVIDE DATA IN ACCORDANCE WITH CONTRACT DATA REQUIREMENTS LIST, DD FORM 1423, DESIGNATED AS EXHIBIT A, SECTION J, SPECIFIED IN THE INDIVIDUAL DELIVERY ORDER. DATA REQUIREMENTS ARE NOT SEPARATELY PRICED (NSP). SUBCONTRACTING, RESEARCH SUBJECTS, MATERIAL AND TRAVEL WILL BE ACCOMPLISHED UNDER THIS CLIN IN ACCORDANCE WITH THE DELIVERY ORDER STATEMENT OF WORK.

ITEM	SUPPLIES/SERVICE	QTY	UNIT	UNIT PRICE	TOTAL AMOUNT
0002		1	LO	NSP	NSP

noun:
HARDWARE

contract type:
U - COST PLUS FIXED FEE

security: UNCLASSIFIED fob: DESTINATION inspection: DESTINATION acceptance: DESTINATION stock number (nsn): N - NOT APPLICABLE

descriptive data:
THE CONTRACTOR SHALL PROVIDE HARDWARE AS REQUIRED IN INDIVIDUAL DELIVERY ORDERS IN ACCORDANCE WITH SECTION J, ATTACHMENT 1, STATEMENT OF WORK FOR EACH DELIVERY ORDER. THE COST OF THIS CLIN IS INCLUDED IN CLIN 0001.

<u>ITEM</u>	<u>SUPPLIES/SERVICE</u>	<u>QTY</u>	<u>UNIT</u>	<u>UNIT PRICE</u>	<u>TOTAL AMOUNT</u>
0003		1	LO	NSP	NSP

noun:
SOFTWARE

contract type:
U - COST PLUS FIXED FEE

security: UNCLASSIFIED fob: DESTINATION inspection: DESTINATION acceptance: DESTINATION stock number (nsn): N - NOT APPLICABLE

descriptive data:
THE CONTRACTOR SHALL PROVIDE SOFTWARE AS REQUIRED IN INDIVIDUAL DELIVERY ORDERS IN ACCORDANCE WITH SECTION J, ATTACHMENT 1, STATEMENT OF WORK FOR EACH ORDER. THE COST OF THIS CLIN IS INCLUDED IN CLIN 0001.

A. AIR FORCE MATERIEL COMMAND FAR CONTRACT CLAUSES IN FULL TEXT

1. 5352.216-9001 PAYMENT OF FEE (AFMC) (CPFF) (JUL 1997)

The estimated cost and fee for this delivery order are shown below. The applicable fixed fee or target fee set forth below may be increased or decreased only by negotiation and modification of the contract delivery order for added or deleted work. As determined by the contracting officer, it shall be paid as it accrues, in regular installments based upon the percentage of completion of work (or the expiration of the agreed-upon period(s) for term contracts).

Estimated Cost TBN on each delivery order
Fixed Fee TBN on each delivery order

Applicable to following Line Items: CLINs 0001-0003

2. 5352.232-9001 IMPLEMENTATION OF LIMITATION OF FUNDS (AFMC) (JUL 1997)

(a) The sum allotted to this contract delivery order and available for payment of costs under CLINs 0001-0003 through date to be established on each delivery order in accordance with the clause in Section I entitled "Limitation of Funds" is TBN on each delivery order.

(b) In addition to the amount allotted under the "Limitation of Funds" clause, the additional amount of TBN on each delivery order is obligated for payment of fee for work completed under CLINs 0001-0003.

A. ADMINISTRATIVE AND ONE-TIME-USE CLAUSES IN FULL TEXT

1. C003 INCORPORATED DOCUMENTS/REQUIREMENTS (APR 1998)

THE STATEMENT OF OBJECTIVES (SOO) ENTITLED "RESEARCH AND SUSTAINMENT FOR CREW SYSTEM INTERFACE LABORATORIES, DATED 17 JUNE 1998 IS INCORPORATED IN SECTION J, ATTACHMENT I

A. AIR FORCE MATERIEL COMMAND FAR CONTRACT CLAUSES IN FULL TEXT

1. 5352.247-9008 CONTRACTOR COMMERCIAL PACKAGING AND MARKING (AFMC) (JUL 1997)

(a) Items shall be packaged and marked in accordance with the Contractor's best commercial practice to ensure undamaged arrival at destination. Individual shipments exceeding 150 pounds, 108 inches in length, or 130 inches in girth plus length shall be packaged on skidded crates or palletized to allow handling by forklift.

(b) The exterior container shall be marked (readable from 24 inches): "NOT FOR OUTSIDE STORAGE."

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

I. FEDERAL ACQUISITION REGULATION CONTRACT CLAUSES

52.246-08 INSPECTION OF RESEARCH AND DEVELOPMENT -- COST-REIMBURSEMENT (APR 1984)

II. DEFENSE FEDERAL ACQUISITION REGULATION SUPPLEMENT CONTRACT CLAUSES

252.246-7000 MATERIAL INSPECTION AND RECEIVING REPORT (DEC 1991)

A. ADMINISTRATIVE AND ONE-TIME-USE CLAUSES IN FULL TEXT

1. E006 RECEIVING REPORT (DD FORM 250) MAILING ADDRESS (APR 1998)

(a) Submit original DD Form(s) 250 for all items deliverable under this contract (e.g. hardware, software, exhibit line items, status reports, services, etc.) to the following address:

AFRL/HECA

Attn: Don Monk

2255 H Street

Wright-Patterson AFB OH 45433-7022

(b) In addition, a copy of the DD Form 250 shall accompany each shipment for all deliverable items. Shipment addresses are specified in Section F of the schedule and/or on the Contract Data Requirements List.

(c) **PROCESSING STATUS.** Any inquiry as to the processing status of a DD Form 250 should be made to the following office:

Mr. Don Monk, AFRL/HECA, (937) 255-8814

2. E007 INSPECTION AND ACCEPTANCE AUTHORITY (APR 1998)

Inspection and acceptance for all Contract and Exhibit Lines or Subline Items shall be accomplished by the Program Manager, Air Force Research Laboratory.

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

I. FEDERAL ACQUISITION REGULATION CONTRACT CLAUSES

52.242-15 STOP-WORK ORDER (AUG 1989) - ALTERNATE I (APR 1984)
52.247-34 F.O.B. DESTINATION (NOV 1991)
52.247-55 F.O.B. POINT FOR DELIVERY OF GOVERNMENT-FURNISHED PROPERTY (APR 1984)

A. AIR FORCE MATERIEL COMMAND FAR CONTRACT CLAUSES IN FULL TEXT

1. 5352.247-9017 F.O.B. POINT FOR DELIVERY OF GOVERNMENT-FURNISHED PROPERTY (AFMC) (JUL 1997)

The f.o.b. point for delivery of Government-furnished property, as defined in FAR 52.247-55, F.o.b. Point for Delivery of Government-Furnished Property, shall be:

(a) To be specified on each delivery order .

(b) To be specified on each delivery order .

B. ADMINISTRATIVE AND ONE-TIME-USE CLAUSES IN FULL TEXT

1. F003 CONTRACT DELIVERIES (FEB 1997)

The following terms, if used within this contract in conjunction with contract delivery requirements (including data deliveries), are hereby defined as follows:

(a) "MAC" and "MARO" mean "months after the effective date for award of the contractual action (as shown in block 3, Section A, SF 26)".

(b) "WARO" means "weeks after the effective date for award of the contractual action".

(c) "DARO" means "days after the effective date for award of the contractual action".

(d) "ASREQ" means "as required". Detailed delivery requirements are then specified elsewhere in Section F.

2. F007 SHIPMENT ADDRESS (SEP 1997)

FY8990
AFRL/WSMM
Bldg 93, Area B
2635 G Street
WPAFB, OH 45433-7603

FUNDING TO BE ACCOMPLISHED ON INDIVIDUAL DELIVERY ORDERS ONLY.

A. AIR FORCE FEDERAL ACQUISITION REGULATION SUPPLEMENT CONTRACT CLAUSES IN FULL TEXT

1. 5352.232-9000 REMITTANCE ADDRESS (MAY 1996)

If the remittance address is different from the mailing address, enter the remittance address below. Failure to provide this information may impact payment.
same as block 7 on Standard Form 26

B. ADMINISTRATIVE AND ONE-TIME-USE CLAUSES IN FULL TEXT

1. G002 LABORATORY CONTRACT MANAGER (MAY 1997)

Laboratory Contract Manager: Don Monk, AFRL/HEC, Bldg 248, Area B, WPAFB, OH 45433

2. G005 PAYMENT INSTRUCTIONS FOR MULTIPLE ACCOUNTING CLASSIFICATION CITATIONS (FEB 1997)

Payment for all effort under this delivery order should be made in the order and amounts shown in the informational subline(s) in Section B, CLIN 0001 of the contract and recapped below. Exhaust the funds in each ACRN before using funds from the next listed ACRN.

ACRN	SUBCLIN NO.	TOTAL OBLIGATED
------	-------------	-----------------

3. G006 INVOICE AND PAYMENT - COST REIMBURSEMENT (FEB 1997)

Invoices (or public vouchers), supported by a statement of cost for performance under this contract, shall be submitted to the cognizant Defense Contract Audit Agency (DCAA) office. Under the provisions of DFARS 242.803(b), the DCAA auditor, is designated as the authorized representative of the contracting officer (CO) for examining vouchers received directly from the contractor.

4. G008 INCREMENTAL FUNDING (APR 1997)

The delivery orders will be incrementally funded pursuant to the Limitation of Funds clause, FAR 52.232-22. Funds are hereby obligated in the amount of (TBN on individual delivery orders) and it is estimated that they are sufficient for contract performance through (TBD on individual delivery orders).

5. G014 FINAL PATENT REPORT (OCT 1997)

In accordance with 5327.305-3(b)90, the Administrative Contracting Officer shall forward the final patent report (e.g., DD Form 882, Report of Inventions and Subcontracts) and any related information to AFMC LO/JAZI

Bldg 11, Area B
2240 B Street, Suite 5
WPAFB, OH. 45433-7109

6. G015 IMPLEMENTATION OF TAXPAYER IDENTIFICATION NUMBER (APR 1998)

In accordance with FAR 52.204-03, Taxpayer Identification Number is 31-1081302.

A. ADMINISTRATIVE AND ONE-TIME-USE CLAUSES IN FULL TEXT

1. H023 INDEFINITE QUANTITY (SEP 1997)

This is an Indefinite Quantity contract as contemplated by FAR 16.504. The total scope of the technical tasks for which Orders may be issued is set forth in paragraph 2.0 of the attached Statement of Objectives. The maximum dollar amount the Government may order under this contract is \$49,000,000.00 ; the minimum amount is \$100,000.00 .

2. H024 ORDERING PROCEDURES (SEP 1997)

(a) Orders will be issued by a Procuring Contracting Officer in accordance with the Ordering clause of this contract. However, the following procedures shall be used for negotiation of orders.

(1) The Contracting Officer will provide the Contractor of each proposed Order which will include a description of work to be performed, description of expertise required, and desired completion date. Prior to this notification it is highly encouraged that the Contractor and Government work together to develop the proposed Statement of Work, expertise required, delivery schedule, etc.

(2) The Contractor shall then: (i) submit a cost proposal, identifying labor categories and number of hours within each category required for the performance of the proposed work; (ii) identify and provide rationale for all non-labor cost elements required for performance; and (iii) identify any Government property, base support, etc., required for performance. This proposal shall be submitted concurrently to the program manager and the contracting office.

(3) Upon receipt of the proposal, the Contracting Officer will analyze the proposal and, if acceptable, issue an Order directing the Contractor to commence performance, or if the proposal is not fully acceptable as offered, negotiations shall be conducted prior to issuance of any Order . In the event issues pertaining to a proposed work cannot be resolved to the satisfaction of the Contracting Officer, the Contracting Officer reserves the right to withdraw and cancel the proposed work. In such event, the Contractor shall be notified, in writing, of the Contracting Officer's decision. This decision shall be final and conclusive and shall not be subject to the Disputes clause or the Contract Disputes Act.

(b) The Contractor is not authorized to commence performance prior to issuance of the Order by the Contracting Officer.

(c) Electronic communications will be utilized whenever possible.

3. H025 INCORPORATION OF SECTION K BY REFERENCE (APR 1997)

Section K of the solicitation is hereby incorporated by reference.

4. H029 IMPLEMENTATION OF DISCLOSURE OF INFORMATION (OCT 1997)

In order to comply with DFARS 252.204-7000, Disclosure of Information, the following copies of the information to be released are required at least 45 days prior to the scheduled release date:

- (a) 3 copies to: Office of Public Affairs, ASC/PA
1865 Fourth St., Ste 15
Wright-Patterson AFB, OH. 45433-7129

(b) 1 copy to: Contracting Officer, James H. Day, 2530 C St., Wright-Patterson AFB, OH. 45433-7607

(c) 1 copy to: Program Manager, Don Monk, 2255 H St., Bldg. 248, Wright-Patterson AFB, OH. 45433

Contract Clauses in this section are from the FAR, Defense FAR Sup, Air Force FAR Sup, and the Air Force Materiel Command FAR Sup, and are current through the following updates:

FAR: FAC 97-05; DFAR: DAC 91-13; AFFAR: 1996 Edition; AFMCFAR: 1997 Edition; AFAC: AFAC 96-1; DL.: thru DL 98-017; Class Deviations: thru CD 98-00008; IPN: 98-009;

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

L. FEDERAL ACQUISITION REGULATION CONTRACT CLAUSES

- 52.202-01 DEFINITIONS (OCT 1995)
- 52.203-03 GRATUITIES (APR 1984)
- 52.203-05 COVENANT AGAINST CONTINGENT FEES (APR 1984)
- 52.203-06 RESTRICTIONS ON SUBCONTRACTOR SALES TO THE GOVERNMENT (JUL 1995)
- 52.203-07 ANTI-KICKBACK PROCEDURES (JUL 1995)
- 52.203-08 CANCELLATION, RESCISSION, AND RECOVERY OF FUNDS FOR ILLEGAL OR IMPROPER ACTIVITY (JAN 1997)
- 52.203-10 PRICE OR FEE ADJUSTMENT FOR ILLEGAL OR IMPROPER ACTIVITY (JAN 1997)
- 52.203-12 LIMITATION ON PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS (JUN 1997)
- 52.204-02 SECURITY REQUIREMENTS (AUG 1996) - ALTERNATE I (APR 1984)
- 52.204-04 PRINTING/COPYING DOUBLE-SIDED ON RECYCLED PAPER (JUN 1996)
- 52.209-06 PROTECTING THE GOVERNMENT'S INTEREST WHEN SUBCONTRACTING WITH CONTRACTORS DEBARRED, SUSPENDED, OR PROPOSED FOR DEBARMENT (JUL 1995)
- 52.211-05 MATERIAL REQUIREMENTS (OCT 1997)
- 52.211-15 DEFENSE PRIORITY AND ALLOCATION REQUIREMENTS (SEP 1990)
- 52.213-01 FAST PAYMENT PROCEDURE (FEB 1998)
- 52.215-02 AUDIT AND RECORDS -- NEGOTIATION (AUG 1996)
- 52.215-08 ORDER OF PRECEDENCE--UNIFORM CONTRACT FORMAT (OCT 1997)
- 52.215-10 PRICE REDUCTION FOR DEFECTIVE COST OR PRICING DATA (OCT 1997)
- 52.215-11 PRICE REDUCTION FOR DEFECTIVE COST OR PRICING DATA--MODIFICATIONS (OCT 1997)
- 52.215-12 SUBCONTRACTOR COST OR PRICING DATA (OCT 1997)
- 52.215-13 SUBCONTRACTOR COST OR PRICING DATA--MODIFICATIONS (OCT 1997)
- 52.215-14 INTEGRITY OF UNIT PRICES (OCT 1997)
- 52.215-15 TERMINATION OF DEFINED BENEFIT PENSION PLANS (OCT 1997)
- 52.215-17 WAIVER OF FACILITIES CAPITAL COST OF MONEY (OCT 1997)
- 52.215-18 REVERSION OR ADJUSTMENT OF PLANS FOR POSTRETIREMENT BENEFITS (PRB) OTHER THAN PENSIONS (OCT 1997)
- 52.215-19 NOTIFICATION OF OWNERSHIP CHANGES (OCT 1997)
- 52.215-21 REQUIREMENTS FOR COST OR PRICING DATA OR INFORMATION OTHER THAN COST OR PRICING DATA--MODIFICATIONS (OCT 1997)
- 52.216-07 ALLOWABLE COST AND PAYMENT (APR 1998)
- 52.216-08 FIXED FEE (MAR 1997)
- 52.216-18 ORDERING (OCT 1995)
Para (a), Issued from date is '25 SEP 1998'
Para (a), Issued through date is '25 SEP 2003'
- 52.216-19 ORDER LIMITATIONS (OCT 1995)
Para (a), Dollar amount or quantity is '\$100,000.00'

Para (b)(1), Dollar amount or quantity is '\$49,000,000.00'
 Para (b)(2), Dollar amount or quantity is '\$49,000,000.00'
 Para (b)(3), Number of days is '30'
 Para (d), Number of days is '30'
 52.216-22 INDEFINITE QUANTITY (OCT 1995)
 Para (d), Date is '25 SEP 2004'
 52.219-08 UTILIZATION OF SMALL, SMALL DISADVANTAGED AND WOMEN-OWNED SMALL
 BUSINESS CONCERNS (JUN 1997)
 52.222-01 NOTICE TO THE GOVERNMENT OF LABOR DISPUTES (FEB 1997)
 52.222-02 PAYMENT FOR OVERTIME PREMIUMS (JUL 1990)
 Para (a), Dollar amount is '\$0.00'
 52.222-03 CONVICT LABOR (AUG 1996)
 52.222-35 AFFIRMATIVE ACTION FOR DISABLED VETERANS AND VETERANS OF THE VIETNAM
 ERA (APR 1998)
 52.222-36 AFFIRMATIVE ACTION FOR WORKERS WITH DISABILITIES (JUN 1998)
 52.222-37 EMPLOYMENT REPORTS ON DISABLED VETERANS AND VETERANS OF THE VIETNAM
 ERA (APR 1998)
 52.223-02 CLEAN AIR AND WATER (APR 1984)
 52.223-05 POLLUTION PREVENTION AND RIGHT-TO-KNOW INFORMATION (APR 1998)
 52.223-06 DRUG-FREE WORKPLACE (JAN 1997)
 52.223-14 TOXIC CHEMICAL RELEASE REPORTING (OCT 1996)
 52.225-11 RESTRICTIONS ON CERTAIN FOREIGN PURCHASES (AUG 1998)
 52.227-01 AUTHORIZATION AND CONSENT (JUL 1995) - ALTERNATE I (APR 1984)
 52.227-02 NOTICE AND ASSISTANCE REGARDING PATENT AND COPYRIGHT INFRINGEMENT (AUG
 1996)
 52.227-10 FILING OF PATENT APPLICATIONS -- CLASSIFIED SUBJECT MATTER (APR 1984)
 52.227-11 PATENT RIGHTS -- RETENTION BY THE CONTRACTOR (SHORT FORM) (JUN 1997)
 52.228-07 INSURANCE -- LIABILITY TO THIRD PERSONS (MAR 1996)
 52.232-09 LIMITATION ON WITHHOLDING OF PAYMENTS (APR 1984)
 52.232-17 INTEREST (JUN 1996)
 52.232-20 LIMITATION OF COST (APR 1984)
 52.232-22 LIMITATION OF FUNDS (APR 1984)
 52.232-23 ASSIGNMENT OF CLAIMS (JAN 1986)
 52.232-25 PROMPT PAYMENT (JUN 1997)
 Para (b)(1), Contract financing payments shall be made on the '30th day'
 52.233-01 DISPUTES (OCT 1995)
 52.233-03 PROTEST AFTER AWARD (AUG 1996) - ALTERNATE I (JUN 1985)
 52.237-02 PROTECTION OF GOVERNMENT BUILDINGS, EQUIPMENT AND VEGETATION (APR 1984)
 52.242-01 NOTICE OF INTENT TO DISALLOW COSTS (APR 1984)
 52.242-03 PENALTIES FOR UNALLOWABLE COSTS (OCT 1995)
 52.242-04 CERTIFICATION OF FINAL INDIRECT COSTS (JAN 1997)
 52.242-13 BANKRUPTCY (JUL 1995)
 52.243-02 CHANGES -- COST-REIMBURSEMENT (AUG 1987) - ALTERNATE V (APR 1984)
 52.243-06 CHANGE ORDER ACCOUNTING (APR 1984)
 52.243-07 NOTIFICATION OF CHANGES (APR 1984)
 Para (b), Number of calendar days is '30'
 Para (d), Number of calendar days is '30'
 52.244-02 SUBCONTRACTS (AUG 1998) - ALTERNATE I (AUG 1998)
 Para (k), Paragraphs (d) and (f) of this clause to not apply to the following subcontracts which were
 evaluated during negotiations: 'to be specified on each delivery order'
 'N/A'
 52.244-05 COMPETITION IN SUBCONTRACTING (DEC 1996)
 52.245-05 GOVERNMENT PROPERTY (COST-REIMBURSEMENT, TIME-AND-MATERIAL, OR LABOR-
 HOUR CONTRACTS) (DEVIATION) (JAN 1986)
 52.245-18 SPECIAL TEST EQUIPMENT (FEB 1993)

- 52.245-19 GOVERNMENT PROPERTY FURNISHED "AS IS" (APR 1984)
- 52.246-23 LIMITATION OF LIABILITY (FEB 1997)
- 52.247-01 COMMERCIAL BILL OF LADING NOTATIONS (APR 1984)
- 52.249-06 TERMINATION (COST-REIMBURSEMENT) (SEP 1996)
- 52.249-14 EXCUSABLE DELAYS (APR 1984) - -
- 52.251-01 GOVERNMENT SUPPLY SOURCES (APR 1984)
- 52.253-01 COMPUTER GENERATED FORMS (JAN 1991)

II. DEFENSE FEDERAL ACQUISITION REGULATION SUPPLEMENT CONTRACT CLAUSES

- 252.203-7001 SPECIAL PROHIBITION ON EMPLOYMENT (JUN 1997)
- 252.203-7002 DISPLAY OF DOD HOTLINE POSTER (DEC 1991)
- 252.204-7000 DISCLOSURE OF INFORMATION (DEC 1991)
- 252.204-7003 CONTROL OF GOVERNMENT PERSONNEL WORK PRODUCT (APR 1992)
- 252.204-7004 REQUIRED CENTRAL CONTRACTOR REGISTRATION (MAR 1998)
- 252.205-7000 PROVISION OF INFORMATION TO COOPERATIVE AGREEMENT HOLDERS (DEC 1991)
- 252.209-7000 ACQUISITION FROM SUBCONTRACTORS SUBJECT TO ON-SITE INSPECTION UNDER THE INTERMEDIATE-RANGE NUCLEAR FORCES (INF) TREATY (NOV 1995)
- 252.209-7004 SUBCONTRACTING WITH FIRMS THAT ARE OWNED OR CONTROLLED BY THE GOVERNMENT OF A TERRORIST COUNTRY (MAR 1998)
- 252.215-7000 PRICING ADJUSTMENTS (DEC 1991)
- 252.222-7002 COMPLIANCE WITH LOCAL LABOR LAWS (OVERSEAS) (JUN 1997)
- 252.223-7004 DRUG-FREE WORK FORCE (SEP 1988)
- 252.223-7006 PROHIBITION ON STORAGE AND DISPOSAL OF TOXIC AND HAZARDOUS MATERIALS (APR 1993)
- 252.225-7001 BUY AMERICAN ACT AND BALANCE OF PAYMENTS PROGRAM (MAR 1998)
- 252.225-7009 DUTY-FREE ENTRY--QUALIFYING COUNTRY SUPPLIES (END PRODUCTS AND COMPONENTS) (MAR 1998)
- 252.225-7012 PREFERENCE FOR CERTAIN DOMESTIC COMMODITIES (SEP 1997)
- 252.225-7014 PREFERENCE FOR DOMESTIC SPECIALTY METALS (MAR 1998) - ALTERNATE I (MAR 1998)
- 252.225-7026 REPORTING OF CONTRACT PERFORMANCE OUTSIDE THE UNITED STATES (MAR 1998)
- 252.225-7031 SECONDARY ARAB BOYCOTT OF ISRAEL (JUN 1992)
- 252.225-7043 ANTITERRORISM/FORCE PROTECTION POLICY FOR DEFENSE CONTRACTORS OUTSIDE THE UNITED STATES (JUN 1998) Information and guidance pertaining to DoD antiterrorism/force protection can be obtained from HQ AFSC/SFPT, telephone (210) 671-0927/0928.
- 252.227-7013 RIGHTS IN TECHNICAL DATA--NONCOMMERCIAL ITEMS (NOV 1995)
- 252.227-7014 RIGHTS IN NONCOMMERCIAL COMPUTER SOFTWARE AND NONCOMMERCIAL COMPUTER SOFTWARE DOCUMENTATION (JUN 1995)
- 252.227-7016 RIGHTS IN BID OR PROPOSAL INFORMATION (JUN 1995)
- 252.227-7019 VALIDATION OF ASSERTED RESTRICTIONS--COMPUTER SOFTWARE (JUN 1995)
- 252.227-7025 LIMITATIONS ON THE USE OR DISCLOSURE OF GOVERNMENT-FURNISHED INFORMATION MARKED WITH RESTRICTIVE LEGENDS (JUN 1995)
- 252.227-7030 TECHNICAL DATA--WITHHOLDING OF PAYMENT (OCT 1988)
- 252.227-7034 PATENTS--SUBCONTRACTS (APR 1984)
- 252.227-7036 DECLARATION OF TECHNICAL DATA CONFORMITY (JAN 1997)
- 252.227-7037 VALIDATION OF RESTRICTIVE MARKINGS ON TECHNICAL DATA (NOV 1995)
- 252.227-7039 PATENTS--REPORTING OF SUBJECT INVENTIONS (APR 1990)
- 252.231-7000 SUPPLEMENTAL COST PRINCIPLES (DEC 1991)
- 252.232-7009 PAYMENT BY ELECTRONIC FUNDS TRANSFER (CCR) (JUN 1998)
- 252.233-7001 CHOICE OF LAW (OVERSEAS) (JUN 1997)
- 252.235-7010 ACKNOWLEDGMENT OF SUPPORT AND DISCLAIMER (MAY 1995)
 Para (a), name of contracting agency(ies): 'AFRL/MLKT'
 Para (a), contract number(s): 'F33615-98-D-6000'
 Para (b), name of contracting agency(ies): 'AFRL/MLKT'

252.235-7011 Para (a), name of contracting agency(ies): 'AFRL/MLKT'
252.239-7000 Para (a), contract number(s): 'F33615-98-D-6000'
252.242-7000 Para (b), name of contracting agency(ies): 'AFRL/MLKT'
252.242-7004 FINAL SCIENTIFIC OR TECHNICAL REPORT (MAY 1995)
252.243-7002 PROTECTION AGAINST COMPROMISING EMANATIONS (DEC 1991)
252.245-7001 POSTAWARD CONFERENCE (DEC 1991)
252.251-7000 MATERIAL MANAGEMENT AND ACCOUNTING SYSTEM (SEP 1996)
REQUESTS FOR EQUITABLE ADJUSTMENT (MAR 1998)
REPORTS OF GOVERNMENT PROPERTY (MAY 1994)
ORDERING FROM GOVERNMENT SUPPLY SOURCES (MAY 1995)

Para (f), Contractor's address is 'Sytronics, Inc
Attn: Terry Fulbright
4433 Dayton-Xenia Rd. Bldg 1
Dayton, OH. 45432
(937) 429-1466 Ext. 102'
Para (f), Government remittance address is 'AFRL/HECA
Attn: Don Monk
2255 H St.
Wright-Patterson AFB, OH. 45433-7022
(937) 255-8814'

A. FEDERAL ACQUISITION REGULATION CONTRACT CLAUSES IN FULL TEXT

1. 52.222-21 PROHIBITION OF SEGREGATED FACILITIES (DEVIATION) (APR 1984)

(a) "Segregated facilities," as used in this clause, means any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees, that are segregated by explicit directive or are in fact segregated on the basis of race, color, religion, sex or national origin because of written or oral policies, or employee custom. The term does not include separate or single-user rest rooms and necessary dressing or sleeping areas, which shall be provided to assure privacy between the sexes.

(b) The Contractor agrees that it does not and will not maintain or provide for its employees any segregated facilities at any of its establishments, and that it does not and will not permit its employees to perform their services at any location under its control where segregated facilities are maintained. The Contractor agrees that a breach of this clause is a violation of the Equal Opportunity clause in this contract.

(c) The Contractor shall include this clause in every subcontract that contains the clause of this contract entitled "Equal Opportunity".

2. 52.222-26 EQUAL OPPORTUNITY (DEVIATION) (APR 1984)

(a) If, during any 12-month period (including the 12 months preceding the award of this contract), the Contractor has been or is awarded nonexempt Federal contracts and/or subcontracts that have an aggregate value in excess of \$10,000, the Contractor shall comply with subparagraphs (b)(1) through (11) below. Upon request, the Contractor shall provide information necessary to determine the applicability of this clause.

(b) During performing this contract, the Contractor agrees as follows:

(1) The Contractor shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. Note: It shall not be a violation of E.O. 11246 for a contractor to extend a publicly announced preference in employment to Indians living on or near an Indian reservation in connection with employment opportunities on or near an Indian reservation. See 22.807(b)(4).

(2) The Contractor shall take affirmative action to ensure that applicants are employed, and that

employees are treated during employment, without regard to their race, color, religion, sex, or national origin. This shall include, but not be limited to, (i) employment, (ii) upgrading, (iii) demotion, (iv) transfer, (v) recruitment or recruitment advertising, (vi) layoff or termination, (vii) rates of pay or other forms of compensation, and (viii) selection for training, including apprenticeship.

(3) The Contractor shall post in conspicuous places available to employees and applicants for employment the notices to be provided by the Contracting Officer that explain this clause.

(4) The Contractor shall, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, or national origin.

(5) The Contractor shall send, to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding, the notice to be provided by the Contracting Officer advising the labor union or workers' representative of the Contractor's commitments under this clause, and post copies of the notice in conspicuous places available to employees and applicants for employment.

(6) The Contractor shall comply with Executive Order 11246, as amended, and the rules, regulations, and orders of the Secretary of Labor.

(7) The Contractor shall furnish to the contracting agency all information required by Executive Order 11246, as amended, and by the rules, regulations, and orders of the Secretary of Labor. The Contractor shall, within 30 days following the award, file Standard Form 100 (EEO-1), or any successor form, unless filed within 12 months preceding the date of award.

(8) The Contractor shall permit access to its premises by the contracting officer or the Office of Federal Contract Compliance Programs (OFCCP) for the purpose of conducting on-site compliance reviews and inspecting such books, records, accounts, and other materials as may be relevant to an investigation to ascertain the Contractor's compliance with the applicable rules, regulations, and orders.

(9) If the OFCCP determines that the Contractor is not in compliance with this clause or any rule, regulation, or order of the Secretary of Labor, this contract may be canceled, terminated, or suspended in whole or in part and the Contractor may be declared ineligible for further Government contracts, under the procedures authorized in Executive Order 11246, as amended. In addition, sanctions may be imposed and remedies invoked against the Contractor as provided in Executive Order 11246, as amended; in the rules, regulations, and orders of the Secretary of Labor; or as otherwise provided by law.

(10) The Contractor shall include the terms and conditions of subparagraph (b)(1) through (11) of this clause in every subcontract or purchase order that is not exempted by the rules, regulations, or orders of the Secretary of Labor issued under Executive Order 11246, as amended, so that these terms and conditions will be binding upon each subcontractor or vendor.

(11) The Contractor shall take such action with respect to any subcontract or purchase order as the contracting officer may direct as a means of enforcing these terms and conditions, including sanctions for noncompliance; provided, that if the Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of any direction, the Contractor may request the United States to enter into the litigation to protect the interests of the United States.

(c) Notwithstanding any other clause in this contract, disputes relative to this clause will be governed by the procedures in 41 CFR 60-1.1.

3. 52.222-29 NOTIFICATION OF VISA DENIAL (DEVIATION) (APR 1984)

It is a violation of Executive Order 11246, as amended, for a Contractor to refuse to employ any applicant or not to assign any person hired in the United States, on the basis that the individual's race, color, religion, sex, or national origin is not compatible with the policies of the country where the work is to be performed or for whom the work will be performed

(41 CFR 60-1.10). The Contractor agrees to notify the U.S. Department of State, Assistant Secretary, Bureau of Political-Military Affairs (PM), 2201 C Street NW, Room 7325, Washington, DC 20520, and the Deputy Assistant Secretary for Federal Contract Compliance Programs, when it has knowledge of any employee or potential employee being denied an entry visa to a country in which the Contractor is required to perform this contract, and it believes the denial is attributable to the race, color, religion, sex, or national origin of the employee or potential employee.

4. 52.223-11 OZONE-DEPLETING SUBSTANCES (JUN 1996)

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

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

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

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

5. 52.244-06 SUBCONTRACTS FOR COMMERCIAL ITEMS AND COMMERCIAL COMPONENTS (APR 1998)

(a) Definitions.

"Commercial item", as used in this clause, has the meaning contained in the clause at 52.202-1, Definitions.

"Subcontract", as used in this clause, includes a transfer of commercial items between divisions, subsidiaries, or affiliates of the Contractor or subcontractor at any tier.

(b) To the maximum extent practicable, the Contractor shall incorporate, and require its subcontractors at all tiers to incorporate, commercial items or nondevelopmental items as components of items to be supplied under this contract.

(c) Notwithstanding any other clause of this contract, the Contractor is not required to include any FAR provision or clause, other than those listed below to the extent they are applicable and as may be required to establish the reasonableness of prices under Part 15, in a subcontract at any tier for commercial items or commercial components:

(1) 52.222-26, Equal Opportunity (E.O. 11246);

(2) 52.222-35, Affirmative Action for Disabled Veterans and Veterans of the Vietnam Era (38 U.S.C. 4212(a));

(3) 52.222-36, Affirmative Action for Handicapped Workers (29 U.S.C. 793); and

(4) 52.247-64, Preference for Privately-Owned U.S.-Flagged Commercial Vessels (46 U.S.C. 1241)(flow down not required for subcontracts awarded beginning May 1, 1996).

(d) The Contractor shall include the terms of this clause, including this paragraph (d), in subcontracts awarded under this contract.

6. 52.245-05 GOVERNMENT PROPERTY (COST-REIMBURSEMENT, TIME-AND-MATERIAL, OR LABOR-HOUR CONTRACTS) (DEVIATION) (JAN 1986)

(a) Government-furnished property.

(1) The term "Contractor's managerial personnel," as used in paragraph (g) of this clause, means any of

Section I F33615-98-D-6000

the Contractor's directors, officers, managers, superintendents, or equivalent representatives who have supervision or direction of--

- (i) All or substantially all of the Contractor's business;
- (ii) All or substantially all of the Contractor's operation at any one plant, or separate location at which the contract is being performed; or
- (iii) A separate and complete major industrial operation connected with performing this contract.

(2) The Government shall deliver to the Contractor, for use in connection with and under the terms of this contract, the Government-furnished property described in the Schedule or specifications, together with such related data and information as the Contractor may request and as may be reasonably required for the intended use of the property (hereinafter referred to as "Government-furnished property").

(3) The delivery or performance dates for this contract are based upon the expectation that Government-furnished property suitable for use will be delivered to the Contractor at the times stated in the Schedule or, if not so stated, in sufficient time to enable the Contractor to meet the contract's delivery or performance dates.

(4) If Government-furnished property is received by the Contractor in a condition not suitable for the intended use, the Contractor shall, upon receipt, notify the Contracting Officer, detailing the facts, and, as directed by the Contracting Officer and at Government expense, either effect repairs or modification or return or otherwise dispose of the property. After completing the directed action and upon written request of the Contractor, the Contracting Officer shall make an equitable adjustment as provided in paragraph (h) of this clause.

(5) If Government-furnished property is not delivered to the Contractor by the required time or times, the Contracting Officer shall, upon the Contractor's timely written request, make a determination of the delay, if any, caused the Contractor and shall make an equitable adjustment in accordance with paragraph (h) of this clause.

(b) Changes in Government-furnished property.

(1) The Contracting Officer may, by written notice, (i) decrease the Government-furnished property provided or to be provided under this contract or (ii) substitute other Government-furnished property for the property to be provided by the Government or to be acquired by the Contractor for the Government under this contract. The Contractor shall promptly take such action as the Contracting Officer may direct regarding the removal, shipment, or disposal of the property covered by this notice.

(2) Upon the Contractor's written request, the Contracting Officer shall make an equitable adjustment to the contract in accordance with paragraph (h) of this clause, if the Government has agreed in the Schedule to make such property available for performing this contract and there is any--

- (i) Decrease or substitution in this property pursuant to subparagraph (b)(1) above; or
- (ii) Withdrawal of authority to use property, if provided under any other contract or lease.

(c) Title.

(1) The Government shall retain title to all Government-furnished property.

(2) Title to all property purchased by the Contractor for which the Contractor is entitled to be reimbursed as a direct item of cost under this contract shall pass to and vest in the Government upon the vendor's delivery of such property.

(3) Title to all other property, the cost of which is reimbursable to the Contractor, shall pass to and vest

in the Government upon--

- (i) Issuance of the property for use in contract performance;
- (ii) Commencement of processing of the property for use in contract performance; or
- (iii) Reimbursement of the cost of the property by the Government, whichever occurs first.

(4) All Government-furnished property and all property acquired by the Contractor, title to which vests in the Government under this paragraph (collectively referred to as "Government property"), are subject to the provisions of this clause. Title to Government property shall not be affected by its incorporation into or attachment to any property not owned by the Government, nor shall Government property become a fixture or lose its identity as personal property by being attached to any real property.

(d) Use of Government property. The Government property shall be used only for performing this contract, unless otherwise provided in this contract or approved by the Contracting Officer.

(e) Property administration.

(1) The Contractor shall be responsible and accountable for all Government property provided under the contract and shall comply with Federal Acquisition Regulation (FAR) Subpart 45.5, as in effect on the date of this contract.

(2) The Contractor shall establish and maintain a program for the use, maintenance, repair, protection, and preservation of Government property in accordance with sound business practice and the applicable provisions of FAR Subpart 45.5.

(3) If damage occurs to Government property, the risk of which has been assumed by the Government under this contract, the Government shall replace the items or the Contractor shall make such repairs as the Government directs. However, if the Contractor cannot effect such repairs within the time required, the Contractor shall dispose of the property as directed by the Contracting Officer. When any property for which the Government is responsible is replaced or repaired, the Contracting Officer shall make an equitable adjustment in accordance with paragraph (h) of this clause.

(f) Access. The Government and all its designees shall have access at all reasonable times to the premises in which any Government property is located for the purpose of inspecting the Government property.

(g) Limited risk of loss.

(1) The Contractor shall not be liable for loss or destruction of, or damage to, the Government property provided under this contract or for expenses incidental to such loss, destruction, or damage, except as provided in subparagraphs (2) and (3) below.

(2) The Contractor shall be responsible for loss or destruction of, or damage to, the Government property provided under this contract (including expenses incidental to such loss, destruction, or damage)--

(i) That results from a risk expressly required to be insured under this contract, but only to the extent of the insurance required to be purchased and maintained or to the extent of insurance actually purchased and maintained, whichever is greater;

(ii) That results from a risk that is in fact covered by insurance or for which the Contractor is otherwise reimbursed, but only to the extent of such insurance or reimbursement;

(iii) For which the Contractor is otherwise responsible under the express terms of this contract;

(iv) That results from willful misconduct or lack of good faith on the part of the Contractor's managerial personnel; or

(v) That results from a failure on the part of the Contractor, due to willful misconduct or lack of good faith on the part of the Contractor's managerial personnel, to establish and administer a program or system for the control, use, protection, preservation, maintenance, and repair of Government property as required by paragraph (e) of this clause.

(3)(i) If the Contractor fails to act as provided by subdivision (g)(2)(v) above, after being notified (by certified mail addressed to one of the Contractor's managerial personnel) of the Government's disapproval, withdrawal of approval, or nonacceptance of the system or program, it shall be conclusively presumed that such failure was due to willful misconduct or lack of good faith on the part of the Contractor's managerial personnel.

(ii) In such event, any loss or destruction of, or damage to, the Government property shall be presumed to have resulted from such failure unless the Contractor can establish by clear and convincing evidence that such loss, destruction, or damage--

(A) Did not result from the Contractor's failure to maintain an approved program or system; or

(B) Occurred while an approved program or system was maintained by the Contractor.

(4) If the Contractor transfers Government property to the possession and control of a subcontractor, the transfer shall not affect the liability of the Contractor for loss or destruction of, or damage to, the property as set forth above. However, the Contractor shall require the subcontractor to assume the risk of, and be responsible for, any loss or destruction of, or damage to, the property while in the subcontractor's possession or control, except to the extent that the subcontract, with the advance approval of the Contracting Officer, relieves the subcontractor from such liability. In the absence of such approval, the subcontract shall contain appropriate provisions requiring the return of all Government property in as good condition as when received, except for reasonable wear and tear or for its use in accordance with the provisions of the prime contract.

(5) The contractor shall notify the contracting officer upon loss or destruction of, or damage to, Government property provided under this contract, with the exception of low value property for which loss, damage, or destruction is reported at contract termination, completion, or when needed for contract performance. The Contractor shall take all reasonable action to protect the Government property from further damage, separate the damaged and undamaged Government property, put all the affected Government property in the best possible order, and furnish to the Contracting Officer a statement of--

(i) The lost, destroyed, or damaged Government property;

(ii) The time and origin of the loss, destruction, or damage;

(iii) All known interests in commingled property of which the Government property is a part;

and

(iv) The insurance, if any, covering any part of or interest in such commingled property.

(6) The Contractor shall repair, renovate, and take such other action with respect to damaged Government property as the Contracting Officer directs. If the Government property is destroyed or damaged beyond practical repair, or is damaged and so commingled or combined with property of others (including the Contractor's) that separation is impractical, the Contractor may, with the approval of and subject to any conditions imposed by the Contracting Officer, sell such property for the account of the Government. Such sales may be made in order to minimize the loss to the Government, to permit the resumption of business, or to accomplish a similar purpose. The Contractor shall be entitled to an equitable adjustment in the contract price for the expenditures made in performing the obligations

under this subparagraph (g)(6) in accordance with paragraph (h) of this clause. However, the Government may directly reimburse the loss and salvage organization for any of their charges. The Contracting Officer shall give due regard to the Contractor's liability under this paragraph (g) when making any such equitable adjustment.

(7) The Contractor shall not be reimbursed for, and shall not include as an item of overhead, the cost of insurance or of any reserve covering risk of loss or destruction of, or damage to, Government property, except to the extent that the Government may have expressly required the Contractor to carry such insurance under another provision of this contract.

(8) In the event the Contractor is reimbursed or otherwise compensated for any loss or destruction of, or damage to, Government property, the Contractor shall use the proceeds to repair, renovate, or replace the lost, destroyed, or damaged Government property or shall otherwise credit the proceeds to, or equitably reimburse, the Government, as directed by the Contracting Officer.

(9) The Contractor shall do nothing to prejudice the Government's rights to recover against third parties for any loss or destruction of, or damage to, Government property. Upon the request of the Contracting Officer, the Contractor shall, at the Government's expense, furnish to the Government all reasonable assistance and cooperation (including the prosecution of suit and the execution of instruments of assignment in favor of the Government) in obtaining recovery. In addition, where a subcontractor has not been relieved from liability for any loss or destruction of, or damage to, Government property, the Contractor shall enforce for the benefit of the Government the liability of the subcontractor for such loss, destruction, or damage.

(h) Equitable adjustment. When this clause specifies an equitable adjustment, it shall be made to any affected contract provision in accordance with the procedures of the Changes clause. When appropriate, the Contracting Officer may initiate an equitable adjustment in favor of the Government. The right to an equitable adjustment shall be the Contractor's exclusive remedy. The Government shall not be liable to suit for breach of contract for--

- (1) Any delay in delivery of Government-furnished property;
- (2) Delivery of Government-furnished property in a condition not suitable for its intended use;
- (3) A decrease in or substitution of Government-furnished property; or
- (4) Failure to repair or replace Government property for which the Government is responsible.

(i) Final accounting and disposition of Government property. Upon completing this contract, or at such earlier dates as may be fixed by the Contracting Officer, the Contractor shall submit, in a form acceptable to the Contracting Officer, inventory schedules covering all items of Government property not consumed in performing this contract or delivered to the Government. The Contractor shall prepare for shipment, deliver f.o.b. origin, or dispose of the Government property as may be directed or authorized by the Contracting Officer. The net proceeds of any such disposal shall be credited to the cost of the work covered by this contract or paid to the Government as directed by the Contracting Officer. The foregoing provisions shall apply to scrap from Government property; provided, however, that the Contracting Officer may authorize or direct the Contractor to omit from such inventory schedules any scrap consisting of faulty castings or forgings or of cutting and processing waste, such as chips, cuttings, borings, turnings, short ends, circles, trimmings, clippings, and remnants, and to dispose of such scrap in accordance with the Contractor's normal practice and account for it as a part of general overhead or other reimbursable costs in accordance with the Contractor's established accounting procedures.

(j) Abandonment and restoration of Contractor premises. Unless otherwise provided herein, the Government--

- (1) May abandon any Government property in place, at which time all obligations of the Government regarding such abandoned property shall cease; and
- (2) Has no obligation to restore or rehabilitate the Contractor's premises under any circumstances (e.g., abandonment, disposition upon completion of need, or contract completion). However, if the Government-furnished

property (listed in the Schedule or specifications) is withdrawn or is unsuitable for the intended use, or if other Government property is substituted, then the equitable adjustment under paragraph (h) of this clause may properly include restoration or rehabilitation costs.

(k) Communications. All communications under this clause shall be in writing.

(l) Overseas contracts. If this contract is to be performed outside the United States of America, its territories, or possessions, the words "Government" and "Government-furnished" (wherever they appear in this clause) shall be construed as "United States Government" and "United States Government-furnished," respectively.

7. 52.247-67 SUBMISSION OF COMMERCIAL TRANSPORTATION BILLS TO THE GENERAL SERVICES ADMINISTRATION FOR AUDIT (JUN 1997)

(a)(1) In accordance with paragraph (a)(2) of this clause, the Contractor shall submit to the General Services Administration (GSA) for audit, legible copies of all paid freight bills/invoices, commercial bills of lading (CBL's), passenger coupons, and other supporting documents for transportation services on which the United States will assume freight charges that were paid (i) by the Contractor under a cost-reimbursement contract, and (ii) by a first-tier subcontractor under a cost-reimbursement subcontract thereunder.

(2) Cost-reimbursement Contractors shall only submit for audit those CBL's with freight shipment charges exceeding \$50.00. Bills under \$50.00 shall be retained on-site by the Contractor and made available for GSA on-site audits. This exception only applies to freight shipment bills and is not intended to apply to bills and invoices for any other transportation services.

(b) The Contractor shall forward copies of paid freight bills/invoices, CBL's, passenger coupons, and supporting documents as soon as possible following the end of the month, in one package to the General Services Administration, ATTN: FWA, 1800 F Street, NW., Washington DC 20405. The Contractor shall include the paid freight bills/invoices, CBL's, passenger coupons, and supporting documents for first-tier subcontractors under a cost-reimbursement contract. If the inclusion of the paid freight bills/invoices, CBL's, passenger coupons, and supporting documents for any subcontractor in the shipment is not practicable, the documents may be forwarded to GSA in a separate package.

(c) Any original transportation bills or other documents requested by GSA shall be forwarded promptly by the Contractor to GSA. The Contractor shall ensure that the name of the contracting agency is stamped or written on the face of the bill before sending it to GSA.

(d) A statement prepared in duplicate by the Contractor shall accompany each shipment of transportation documents. GSA will acknowledge receipt of the shipment by signing and returning the copy of the statement. The statement shall show--

- (1) The name and address of the Contractor;
- (2) The contract number including any alpha-numeric prefix identifying the contracting office;
- (3) The name and address of the contracting office;
- (4) The total number of bills submitted with the statement; and

(5) A listing of the respective amounts paid or, in lieu of such listing, an adding machine tape of the amounts paid showing the Contractor's voucher or check numbers.

8. 52.252-02 CLAUSES INCORPORATED BY REFERENCE (FEB 1998)

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

9. 52.252-06 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 Defense Federal Acquisition Regulation Supplement (48 CFR Chapter 2) clause with an authorized deviation is indicated by the addition of "(DEVIATION)" after the name of the regulation.

B. DEFENSE FAR SUPP CONTRACT CLAUSES IN FULL TEXT

1. 252.247-7023 TRANSPORTATION OF SUPPLIES BY SEA (NOV 1995)

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

(1) "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.

(2) "Department of Defense" (DoD) means the Army, Navy, Air Force, Marine Corps, and defense agencies.

(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. However, effective May 1, 1996, the term does not include a supplier, materialman, distributor, or vendor of commercial items or commercial components.

(6) "Supplies" means all property, except land and interests in land, that is clearly identifiable for eventual use by or owned by the DoD at the time of transportation by sea.

(i) An item is clearly identifiable for eventual use by the DoD if, for example, the contract documentation contains a reference to a DoD contract number or a military destination.

(ii) "Supplies" includes (but is not limited to) public works; buildings and facilities; ships; floating equipment and vessels of every character, type, and description, with parts, subassemblies, accessories, and equipment; machine tools; material; equipment; stores of all kinds; end items; construction materials; and components of the foregoing.

(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 U.S.-flag vessels in the transportation by sea of any supplies to be furnished in the performance of this contract. The Contractor and its subcontractors may request that the Contracting Officer authorize shipment in foreign-flag vessels, or designate available U.S.-flag vessels, if the Contractor or a subcontractor believes that--

(1) U.S.-flag vessels are not available for timely shipment;

(2) The freight charges are inordinately excessive or unreasonable; or

(3) Freight charges are higher than charges to private persons for transportation of like goods.

(c) The Contractor must submit any request for use of other than U.S.-flag vessels in writing to the Contracting Officer at least 45 days prior to the sailing date necessary to meet its delivery schedules. The Contracting Officer will process requests submitted after such date(s) as expeditiously as possible, but the Contracting Officer's failure to grant approvals to meet the shipper's sailing date will not of itself constitute a compensable delay under this or any other clause of this contract. Requests 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; and

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

(d) The Contractor shall, within 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) 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; and
- (10) Name of the steamship company.

(e) The Contractor agrees to provide with its final invoice under this contract 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 U.S.-flag vessels were used for all ocean shipments under

the contract;

(3) Ocean transportation was used, and 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. The Contractor shall describe these shipments in the following format:

ITEM	CONTRACT	
DESCRIPTION	LINE ITEMS	QUANTITY

TOTAL

(f) If the final invoice does not include the required representation, the Government will reject and return it to the Contractor as an improper invoice for the purposes of the Prompt Payment clause of this contract. 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.

(g) The Contractor shall include this clause, including this paragraph (g) in all subcontracts under this contract, which exceed the simplified acquisition threshold in Part 13 of the Federal Acquisition Regulation.

2. 252.247-7024 NOTIFICATION OF TRANSPORTATION OF SUPPLIES BY SEA (NOV 1995)

(a) The Contractor has indicated by the response to the solicitation provision, Representation of Extent of Transportation by Sea, that it did not anticipate transporting by sea any supplies. If, however, after the award of this contract, the Contractor learns that supplies, as defined in the Transportation of Supplies by Sea clause of this contract, will be transported by sea, the Contractor--

(1) Shall notify the Contracting Officer of that fact; and

(2) Hereby agrees to comply with all the terms and conditions of the Transportation of Supplies by Sea clause of 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, except (effective May 1, 1996) subcontracts for the acquisition of commercial items or components.

C. AIR FORCE FEDERAL ACQUISITION REGULATION SUPPLEMENT CONTRACT CLAUSES IN FULL TEXT

1. 5352.204-9000 NOTIFICATION OF GOVERNMENT SECURITY ACTIVITY (MAY 1996)

Thirty days before the date contractor operations will begin on base, the contractor shall notify the security police activity shown in the distribution block of the DD Form 254, DOD Contract Security Classification Specification, as to:

(a) The name, address, and telephone number of this contract company's representative and designated alternate in the U.S. or overseas area, as appropriate;

(b) The contract number and military contracting command;

(c) The highest classification category of defense information to which contractor employees will have access;

(d) The Air Force installations in the U.S. (in overseas areas, identify only the APO number(s)) where the contract work will be performed;

- (e) The date contractor operations will begin on base in the U.S. or in the overseas area;
- (f) The estimated completion date of operations on base in the U.S. or in the overseas area; and
- (g) Any changes to information previously provided under this clause.

This requirement is in addition to visit request procedures contained in DOD 5220.22-M, National Industrial Security Program Operating Manual.

2. 5352.204-9001 VISITOR GROUP SECURITY AGREEMENTS (MAY 1996)

Prior to beginning operations involving classified information on an installation identified on the DD Form 254 where the contractor is not required to have a facility security clearance, the contractor shall enter into a security agreement (or understanding) with the installation commander to ensure that the contractor's security procedures are properly integrated with those of the installation. As a minimum, the agreement shall identify the security actions which will be performed:

(a) By the installation for the contractor, such as providing storage and classified reproduction facilities, guard services, security forms, security inspections under DOD 5220.22-M, classified mail services, security badges, visitor control, and investigating security incidents; and

(b) Jointly by the contractor and the installation, such as packaging and addressing classified transmittals, security checks, internal security controls, and implementing emergency procedures to protect classified material.

3. 5352.223-9000 ELIMINATION OF USE OF CLASS I OZONE DEPLETING SUBSTANCES (ODS) (MAY 1996)

(a) It is Air Force policy to preserve mission readiness while minimizing dependency on Class I Ozone Depleting Substances (ODS), and their release into the environment, to help protect the Earth's stratospheric ozone layer.

(b) Unless a specific waiver has been approved, Air Force procurements:

(1) May not include any specification, standard, drawing, or other document that requires the use of a Class I ODS in the design, manufacture, test, operation, or maintenance of any system, subsystem, item, component, or process; and

(2) May not include any specification, standard, drawing, or other document that establishes a requirement that can only be met by use of a Class I ODS;

(c) For the purposes of Air Force policy, the following are Class I ODS:

(1) Halons: 1011, 1202, 1211, 1301, and 2402;

(2) Chlorofluorocarbons (CFCs): CFC-11, CFC-12, CFC-13, CFC-111, CFC-112, CFC-113, CFC-114, CFC-115, CFC-211, CFC-212, CFC-213, CFC-214, CFC-215, CFC-216, and CFC-217, and the blends R-500, R-501, R-502, and R-503; and

(3) Other Controlled Substances: Carbon Tetrachloride, Methyl Chloroform, and Methyl Bromide.

(d) The Air Force has reviewed the requirements specified in this contract to reflect this policy. Where considered essential, specific approval has been obtained to require use of the following substances:

Substance Application/Use Quantity (lbs)
none

(e) To assist the Air Force in implementing this policy, the offeror/contractor is required to notify the contracting

officer if any Class I ODS not specifically listed above is required in the performance of this contract.

4. 5352.223-9001 HEALTH AND SAFETY ON GOVERNMENT INSTALLATIONS (JUN 1997)

(a) In performing work under this contract on a Government installation, the contractor shall:

- (1) Comply with the specific health and safety requirements established by this contract;
- (2) Comply with the health and safety rules of the Government installation that concern related activities not directly addressed in this contract;
- (3) Take all reasonable steps and precautions to prevent accidents and preserve the health and safety of contractor and Government personnel performing or in any way coming in contact with the performance of this contract; and
- (4) Take such additional immediate precautions as the contracting officer may reasonably require for health and safety purposes.

(c) The contracting officer may, by written order, direct Air Force Occupational Safety and Health Standards (AFOSH) and/or health/safety standards as may be required in the performance of this contract and any adjustments resulting from such direction will be in accordance with the Changes clause of this contract.

(d) Any violation of these health and safety rules and requirements, unless promptly corrected as directed by the contracting officer, shall be grounds for termination of this contract in accordance with the Default clause of this contract.

5. 5352.235-9000 SCIENTIFIC/TECHNICAL INFORMATION (STINFO) (MAY 1996)

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

Defense Technical Information Center, DTIC/BCS
8725 John J. Kingman Road, Suite 0944
Fort Belvoir, VA 22060-6218
(703) 767-8273

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.

6. 5352.242-9000 CONTRACTOR ACCESS TO AIR FORCE INSTALLATIONS (MAY 1996)

(a) The contractor shall obtain base identification and vehicle passes for all contractor personnel who make frequent visits to or perform work on the Air Force installation(s) cited in the contract. Contractor personnel are required to wear or prominently display installation identification badges or contractor-furnished, contractor identification badges while visiting or performing work on the installation.

(b) The contractor shall submit a written request on company letterhead to the contracting officer listing the following: contract number, location of work site, start and stop dates, and names of employees and subcontractor employees needing access to the base. The letter will also specify the individual(s) authorized to sign for a request for base identification credentials or vehicle passes. The contracting officer will endorse the request and forward it to the issuing base pass and registration office or security police for processing. When reporting to the registration office, the authorized contractor individual(s) should provide a valid driver's license, current vehicle registration, valid vehicle insurance certificate, to obtain a vehicle pass.

(c) During performance of the contract, the contractor shall be responsible for obtaining required identification for newly assigned personnel and for prompt return of credentials and vehicle passes for any employee who no longer requires access to the work site.

(d) When work under this contract requires unescorted entry to controlled or restricted areas, the contractor shall comply with AFI 31-209, the Air Force Resource Protection Program, and AFI 31-501, Personnel Security Program Management, as applicable.

(e) Upon completion or termination of the contract or expiration of the identification passes, the prime contractor shall ensure that all base identification passes issued to employees and subcontractor employees are returned to the issuing office.

(f) Prior to submitting an invoice for final payment, the prime contractor shall obtain a clearance certification from the issuing office which states all base identification passes have been turned in, accounted for, or transferred to a follow-on contract. This certification shall be submitted to the contracting officer prior to submission of the final invoice for payment.

(g) Failure to comply with these requirements may result in withholding of final payment.

D. AIR FORCE MATERIEL COMMAND FAR CONTRACT CLAUSES IN FULL TEXT

1. 5352.209-9002 ORGANIZATIONAL CONFLICT OF INTEREST (AFMC) (JUL 1997)

(a) The following restrictions and definitions apply to prevent conflicting roles which may bias the Contractor's judgment or objectivity, or to preclude the Contractor from obtaining an unfair competitive advantage in concurrent or future acquisitions.

(1) Descriptions or definitions:

"Contractor" means the business entity receiving the award of this contract, its parents, affiliates, divisions and subsidiaries.

"Development" means all efforts towards solution of broadly-defined problems. This may encompass research, evaluating technical feasibility, proof of design and test, or engineering of programs not yet approved for acquisition or operation.

"Proprietary Information" means all information designated as proprietary in accordance with law and regulation, and held in confidence or disclosed under restriction to prevent uncontrolled distribution. Examples include limited or restricted data, trade secrets, sensitive financial information, and computer software; and may appear in cost and pricing data or involve classified information.

2. 5352.209-9002 ORGANIZATIONAL CONFLICT OF INTEREST (AFMC) (JUL 1997) - ALTERNATE III (JUL 1997)

(b) The Contractor may gain access to proprietary information of other companies during contract performance. The Contractor agrees to enter into company-to-company agreements to (1) protect another company's information from unauthorized use or disclosure for as long as it is considered proprietary by the other company and (2) refrain from using the information for any purpose other than that for which it was furnished. For information purposes, the Contractor shall furnish copies of these agreements to the Contracting Officer. These agreements are not intended to protect information which is available to the Government or to the Contractor from other sources and furnished voluntarily without restriction.

3. 5352.209-9002 ORGANIZATIONAL CONFLICT OF INTEREST (AFMC) (JUL 1997) - ALTERNATE V (JUL 1997)

(c) The Contractor agrees to accept and to complete issued delivery orders, provided that no new organizational conflicts of interest are created by the acceptance of that order. The Contracting Officer shall identify the organizational

Section I F33615-98-D-6000

conflict of interest in each order. The Contractor shall not contract with Government prime Contractors or first-tier subcontractors in such a way as to create an organizational conflict of interest.

4. 5352.209-9002 ORGANIZATIONAL CONFLICT OF INTEREST (AFMC) (JUL 1997) - ALTERNATE VI (JUL 1997)

(d) The above restrictions shall be included in all subcontracts, teaming arrangements, and other agreements calling for performance of work which is subject to the organizational conflict of interest restrictions identified in this clause, unless excused in writing by the Contracting Officer.

5. 5352.215-9009 TRAVEL (AFMC) (JUL 1997)

(a) The Contractor may be required to travel within the contiguous United States and overseas. The Contractor may be required to travel by Government-provided transportation. Travel requirements will be reimbursed by separate voucher and must be approved in advance by the Contracting Officer. Travel requirements will be identified, proposed, and negotiated in individual task orders on a cost-reimbursement basis. Billable travel costs are air fare, ground transportation, and per diem costs, not labor hours. The Contractor shall be responsible for obtaining any passports or visas and making travel arrangements to and from any CONUS location.

(1) Per diem, air fare, and all other allowable travel costs shall be reimbursed in accordance with the Federal Acquisition Regulation. All travel within overseas areas shall be approved in advance by the Contracting Officer.

(2) The Government may provide travel to and from overseas work sites via Air Mobility Command (AMC) flights, if available. AMC travel fees may be Contractor-paid and invoiced to the Government. The Government will be responsible for obtaining travel clearances and issuance of any required special orders.

(b) Use of AMC transportation shall be approved in advance by the Contracting Officer or designee. Orders authorizing AMC travel will specify the Contractor's Customer Identification Code (CIC). If the Contractor does not have CIC number, the orders will state "special account handling: billing for AMC transportation will be forwarded to Sytronics, Inc., 4433 Dayton-Xenia Rd., Bldg. 1, Dayton, OH. 45432 ." Use of AMC transportation is subject to availability.

(c) The travel CLIN is intended to pay for travel occurring at the direction of the Government, performed in conjunction with a specific trip authorized in a task order. Travel by clerical support personnel shall be approved in advance by the Contracting Officer.

6. 5352.227-9000 EXPORT-CONTROLLED DATA RESTRICTIONS (AFMC) (JUL 1997)

(a) For the purpose of this clause,

(1) Foreign person is any person who is not a citizen or national of the U.S. or lawfully admitted to the U.S. for permanent residence under the Immigration and Nationality Act, and includes foreign corporations, international organizations, and foreign governments;

(2) Foreign representative is anyone, regardless of nationality or citizenship, acting as an agent, representative, official, or employee of a foreign government, a foreign-owned or influenced firm, corporation or person;

(3) Foreign sources are those sources (vendors, subcontractors, and suppliers) owned and controlled by a foreign person.

(b) The Contractor shall place a clause in subcontracts containing appropriate export control restrictions, set forth in this clause.

(c) Nothing in this clause waives any requirement imposed by any other U.S. Government agency with respect to employment of foreign nationals or export controlled data and information.

(d) Equipment and technical data generated or delivered under this contract are controlled by the International Traffic in Arms Regulation (ITAR), 22 CFR Sections 121 through 128. An export license is required before assigning any foreign source to perform work under this contract or before granting access to foreign persons to any equipment and technical data generated or delivered during performance (see 22 CFR Section 125). The Contractor shall notify the Contracting Officer and obtain written approval of the Contracting Officer prior to assigning or granting access to any work, equipment, or technical data generated or delivered under this contract to foreign persons or their representatives. The notification shall include the name and country of origin of the foreign person or representative, the specific work, equipment, or data to which the person will have access, and whether the foreign person is cleared to have access to technical data (DoD 5220.22-M, National Industrial Security Program Operating Manual (NISPOM)).

7. 5352.228-9001 INSURANCE CLAUSE IMPLEMENTATION (AFMC) (JUL 1997)

The Contractor shall obtain and maintain the minimum kinds and amounts of insurance during performance of this contract as specified by FAR 28.307-2, Liability, and contemplated by FAR 52.228-5, Insurance--Work on a Government Installation, and/or 52.228-7, Insurance--Liability to Third Persons.

8. 5352.237-9001 CONTRACTOR IDENTIFICATION (AFMC) (JUL 1997)

(a) Contractor personnel and their subcontractors must identify themselves as Contractors or subcontractors during meetings, telephone conversations, in electronic messages, or correspondence related to this contract.

(b) Contractor-occupied facilities (on AFMC or other Government installations) such as offices, separate rooms, or cubicles must be clearly identified with Contractor supplied signs, name plates or other identification, showing that these are work areas for Contractor or subcontractor personnel.

9. 5352.245-9000 GOVERNMENT-FURNISHED PROPERTY (GFP) (AFMC) (JUL 1997)

Pursuant to the Government Property clause herein, the Government shall furnish the item(s) of property listed below as Government-Furnished Property (GFP) to the Contractor, f.o.b. destination, for use in performance of this contract. Upon completion of the contract, the Contractor shall obtain disposition instructions from the Government Property Administrator of the activity having responsibility for administration of the contract.

ITEMNR	NSN	NOUN	PART NO	QTY	DELIVERY DATE
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See Section J Attachment

10. 5352.245-9004 BASE SUPPORT (AFMC) (JUL 1997) - ALTERNATE I (JUL 1997)

Base support shall be provided by the Government to the Contractor in accordance with this clause. Failure by the Contractor to comply with the requirements of this clause shall release the Government, without prejudice, from its obligation to provide base support by the date(s) required. If warranted, and if the Contractor has complied with the requirements of this clause, an equitable adjustment shall be made if the Government fails to provide base support by the date(s) required.

(a) Base support includes Government-controlled working space, material, equipment, services (including automatic data processing), or other support (excluding use of the Defense Switched Network (DSN)) which the Government determines can be made available at, or through, any Air Force installation where this contract shall be performed. All Government property in the possession of the Contractor, provided through the base support clause, shall be used and managed in accordance with the Government Property clauses.

(b) The Air Force installations providing the support shall be listed in subparagraph (e), and the Government support to be furnished by each installation under this contract shall be listed in subparagraph (f).

(c) Unless otherwise stipulated in the contract schedule, support shall be provided on a no-charge-for-use basis and the value shall be a part of the Government's contract consideration.

(d) The Contractor agrees to immediately report (with a copy to the cognizant CAO) inadequacies, defective Government-Furnished Property (GFP) or nonavailability of support stipulated by the contract schedule, together with a

recommended plan for obtaining the required support. The Government agrees to determine (within 10 workdays) the validity and extent of the involved requirement and the method by which it shall be fulfilled (e.g., purchase, rental, lease, GFP, etc.). Facilities shall not be purchased under this clause. Additionally, the Contractor (or authorized representative) shall not purchase, or otherwise furnish any base support requirement provided by the clause (or authorize others to do so), without prior written approval of the Contracting Officer regarding the price, terms, and conditions of the proposed purchase, or approval of other arrangements.

(e) Following are installations where base support will be provided : **To be specified in each delivery order .**

(f) The Government support to be furnished under this contract is : **To be specified in each delivery order .** Because of the nature and location(s) of the work performed, the value of such equipment is undeterminable. The Contractor shall not incur any cost resulting from nonsupport prior to Contracting Officer concurrence in accordance with this clause.

Alternate I (AFMC)(JUL 1997). As prescribed in 5345.106-90(b), add the following paragraph (g) to the basic clause:

(g) When this contract is a cost, cost-reimbursement, time-and-materials, or labor hour contract, the Contractor agrees that in the performance of this contract or any major subcontract no direct or indirect costs for property will be incurred if the Government determines that property is available at, or through any Air Force installation where this contract shall be performed. Only the prior written approval of the Contracting Officer can relieve the Contractor from this restriction.

11. 5352.245-9010 SPECIAL TEST EQUIPMENT (AFMC) (JUL 1997)

The contract **delivery order costs** includes all special test equipment required for performance, including those items to be fabricated or acquired for the Government's account under this contract, as identified in Attachment **to be specified on each delivery order .**

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

LIST OF ATTACHMENTS
F33615-98-D-6000

<u>DOCUMENT</u>	<u>DATE</u>	<u>PGS</u>	<u>TITLE</u>
ATCH 1	17 JUN 1998	4	STATEMENT OF OBJECTIVES, ENTITLED "RESEARCH AND SUSTAINMENT FOR CREW SYSTEM INTERFACE LABORATORIES"
ATCH 2	21 SEP 1998	7	DEPARTMENT OF DEFENSE CONTRACT SECURITY CLASSIFICATION SPECIFICATION DD FORM 254,
ATCH 3	UNDATED	4	BASE SUPPORT AND GOVERNMENT FURNISHED PROPERTY
ATCH 4	UNDATED	19	AFRL/HEC LABORATORIES AND FACILITIES

STATEMENT OF OBJECTIVES

RESEARCH AND SUSTAINMENT
FOR
CREW SYSTEM INTERFACE
LABORATORIES

17 Jun 98

Prepared by

AIR FORCE MATERIEL COMMAND (AFMC)
AIR FORCE RESEARCH LABORATORY (AFRL)
HUMAN EFFECTIVENESS DIRECTORATE (HE)
CREW SYSTEM INTERFACE DIVISION (AFRL/HEC)

**STATEMENT OF OBJECTIVES
RESEARCH AND SUSTAINMENT FOR
CREW SYSTEM INTERFACE LABORATORIES**

17 JUN 1998

1. **SCOPE.** This effort is to provide the scientific, engineering, technical, and experimental subjects and materials required to conduct human factors technology research and development in and to provide sustaining effort for the Air Force Research Laboratory, Human Effectiveness Directorate, Crew System Interface Division (AFRL/HEC) laboratories and facilities.

2. **RESEARCH AND DEVELOPMENT REQUIREMENTS:**

1. Perform analyses and modeling of human and system performance. Conduct information requirements analyses and conceptual workstation interface designs for information superiority and distributed information warfare architectures.
2. Conduct research and develop techniques for fostering collaboration in multiplace/distributed crew systems and assessing distributed crew station design concepts. Assess impacts of crew aiding technologies and develop function allocation methodologies between crew members and between operators and automation.
3. Develop mission-effective interfaces with complex operational hardware and software matched to fit the capabilities and limits of human perception and performance. Adapt those interfaces to meet the changing conditions of operational situations and the state of the operator.
4. Develop visual display interface technologies to enhance situation awareness and combat effectiveness. Research emphasis is on visually coupled systems, night vision technology, miniature virtual displays, optical/visual effects of aerospace transparencies, and related vision research.
5. Conduct research to mitigate the effects of acoustic and vibratory environments in order to enhance the performance and safety of Air Force personnel.
6. Assess laboratory equipment for proper maintenance, calibration and operation, that new features are properly designed, fabricated, installed, or interfaced, that computer software is designed and implemented to accomplish real-time, man-in-the-loop simulations, data acquisition, and data reduction, and that experiments are properly designed, conducted, and analyzed.
7. Rapid reconfiguration of laboratory facilities and short notice accomplishment of new research and development programs in order to meet schedule requirements.

3. **RESEARCH AND DEVELOPMENT FUNCTIONAL AREAS:**

Conduct research and development in and provide sustaining effort for the following functional areas: helmet mounted and visually coupled systems using advanced display / control concepts including visual, auditory and tactile media; advanced crew station integration; information requirements and man-machine interface for theater battle management; specialized night vision operations devices with heads-up displays; behavioral workload and situation assessment metrics/performance; neuro-psychological and electro-physiological correlates of crew performance and workload; image source and optical display quality analysis and visual characteristics; visual performance capability; optical properties of windscreens; visual image processing; basic visual perception

processes for displays; decision making performance including with dissonant information; man-in-space biotechnology; human interaction with complex automation; real-time analysis of optical / electro-optical imagery; active psychophysical techniques for analysis of perceptual motor performance; crew performance in precision weapons employment and automatic target recognition using state-of-the-art artificial intelligence technology; multi-sensory virtual and immersive interface concepts; virtual control; virtual and non-virtual display integration; human performance visualization techniques; intelligent data access methods; pilot situational awareness; neural network applications; development and evaluation of crew stations and crew interfaces for Uninhabited Aerial Vehicles (UAVs) and the military spaceplane; human modeling (behavioral, visual, aural, and cognition), simulation, performance assessment and measurement; development and evaluation of hands-free and other nonconventional controllers; robotic and exoskeleton controllers; human sensory feedback; real-time information/intelligence/imagery in the cockpit; advanced imagery / intelligence exploitation techniques and workstation; information operations; 3D audio; active noise reduction; speech recognition and synthesis; integrated aural interfaces; environmental noise assessment and modeling; and noise and vibration effects on warfighter performance and effectiveness.

4. The contractor will obtain Government authorization prior to purchasing materials in awarded delivery orders.

5. DELIVERY ITEMS: Deliverables will be specified in each delivery order and could include data, software, and hardware:

- | | |
|--------------------|--|
| (a) DI-ADMIN-81373 | -- Presentation Materials, AsGen |
| (b) DI-DRPR-81003 | -- Commercial Drawings, AsGen |
| (c) DI-E-3115B | -- Class II Modification Documentation Aerospace Vehicles, AsReq |
| (d) DI-FNCL-80331 | -- Funds And Man-Hour Expenditure Report, Mthly |
| (e) DI-IPSC-80590A | -- Computer Program End Item Documentation, AsGen |
| (f) DI-IPSC-81443 | -- Software User Manual (SUM), AsGen |
| (g) DI-IPSC-80942 | -- Computer Software System Document, AsGen |
| (h) DI-MGMT-80368 | -- Status Report, Mthly, Wekly, & AsGen |
| (i) DI-MGMT-81468 | -- Contract Funds Status Report (CFSR), Qrtly |
| (j) DI-MISC-80711 | -- Scientific And Technical Reports, AsGen |
| (k) DI-MISC-80508 | -- Technical Report, AsReq |
| (l) DI-SAFT-80101 | -- System Safety Hazard Analysis, AsReq |
| (m) DI-SAFT-80102 | -- Safety Assessment Report, AsReq |

6. INFORMATION TECHNOLOGY COMPLIANCE. All information technology acquired for the government under this contract shall be year 2000 compliant. Non-compliant items must be upgraded and be compliant no later than 31 December 1999. Year 200 compliant means information technology that accurately processes date/time data (including, but not limited to, calculating, comparing, and sequencing) from, into, and between the twentieth and twenty-first centuries, and the years 1999 and 2000 and leap

year calculations. Furthermore, year 2000 compliant information technology, when used in combination with other information technology, shall accurately process date/time data if the other information technology properly exchanges date/time data with it.

7. SECURITY REQUIREMENTS: TOP SECRET/SCI personnel clearance requirements apply. AFRL/HEC facilities with SECRET clearance are available as base support. All classified contractor work performance, up to and including SECRET, will occur at Wright-Patterson AFB, Bldg. 248, Area B. TOP SECRET/SCI information will be limited to access only and this access will be in approved Air Force facilities. No TOP SECRET/SCI information will be received or generated.

8. OTHER SPECIAL REQUIREMENTS: (1) International Traffic in Arms Regulation.

(2) Human Subject Usage- The contractor must certify that all testing on human subjects will be conducted in conformance with Human Subject Program Guidelines that conform to Air Force Instruction (AFI) 40-402, Use of Human Subjects in Research, Development, Test, and Evaluation. (incorporated herein by reference)

(3) Management of Effort - The contractor shall exercise administrative and financial management functions for all active delivery orders which shall include scheduling of activities and milestones relative to all contract activities, describing technical and financial status, outlining contractor activities, forecasting, program planning, and describing in detail the overall results of the efforts. In addition, the contractor shall maintain a network-based reporting of resources and expenditures. This report shall be accessible by the Government and will serve as a tool for project status review.

**DEPARTMENT OF DEFENSE
CONTRACT SECURITY CLASSIFICATION SPECIFICATION**

(The requirements of the DoD Industrial Security Manual apply to all security aspects of this effort)

1. CLEARANCE AND SAFEGUARDING

a. FACILITY CLEARANCE REQUIRED

TOP SECRET

b. LEVEL OF SAFEGUARDING REQUIRED

SECRET

2. THIS SPECIFICATION IS FOR: *(X and complete as applicable)*

a. PRIME CONTRACT NUMBER
F33615-98-D-6000 Exp Date: 03 Sep 26

b. SUBCONTRACT NUMBER

c. SOLICITATION OR OTHER NUMBER DUE Date (YYMMDD)

3. THIS SPECIFICATION IS: *(X and complete as applicable)*

a. ORIGINAL *(Complete date in all cases)* Date (YYMMDD)
98 06 08

b. REVISED *(Supersedes all previous specs)* Revision No. Date (YYMMDD)

c. FINAL *(Complete Item 5 in all cases)* Date (YYMMDD)

4. IS THIS A FOLLOW-ON CONTRACT? YES NO. If Yes, complete the following:

Classified material received or generated under _____ *(Preceding Contract Number)* is transferred to this follow-on contract

5. IS THIS A FINAL DD FORM 254? YES NO. If Yes, complete the following:

In response to the contractor's requested dated _____, retention of the identified classified material is authorized for the period of _____

6. CONTRACTOR *(Include Commercial and Government Entity (CAGE) Code)*

a. NAME, ADDRESS, AND ZIP CODE SYTRONICS, INC. 4433 DAYTON-XENIA RD., BLDG 1 DAYTON OH 45432	b. CAGE CODE 1EE69	c. COGNIZANT SECURITY OFFICE <i>(Name, Address, and Zip Code)</i> DEFENSE SECURITY SERVICE 610 SOUTH CANAL STREET CHICAGO IL 60607-4577
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7. SUBCONTRACTOR

a. NAME, ADDRESS, AND ZIP CODE N/A	b. CAGE CODE N/A	c. COGNIZANT SECURITY OFFICE <i>(Name, Address, and Zip Code)</i> N/A
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B. ACTUAL PERFORMANCE

a. LOCATION N/A	b. CAGE CODE N/A	c. COGNIZANT SECURITY OFFICE <i>(Name, Address, and Zip Code)</i> N/A
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9. GENERAL IDENTIFICATION OF THIS PROCUREMENT

Research and Sustainment for Crew System Interface Laboratories

10. THIS CONTRACT WILL REQUIRE ACCESS TO:

	YES	NO
a. COMMUNICATIONS SECURITY (COMSEC) INFORMATION		<input checked="" type="checkbox"/>
b. RESTRICTED DATA		<input checked="" type="checkbox"/>
c. CRITICAL NUCLEAR WEAPON DESIGN INFORMATION		<input checked="" type="checkbox"/>
d. FORMERLY RESTRICTED DATA		<input checked="" type="checkbox"/>
e. INTELLIGENCE INFORMATION		
(1) Sensitive Compartmented Information (SCI)	<input checked="" type="checkbox"/>	
(2) Non-SCI	<input checked="" type="checkbox"/>	
f. SPECIAL ACCESS INFORMATION		<input checked="" type="checkbox"/>
g. NATO INFORMATION		<input checked="" type="checkbox"/>
h. FOREIGN GOVERNMENT INFORMATION	<input checked="" type="checkbox"/>	
i. LIMITED DISSEMINATION INFORMATION		<input checked="" type="checkbox"/>
j. FOR OFFICIAL USE ONLY INFORMATION		<input checked="" type="checkbox"/>
k. OTHER <i>(Specify)</i>		<input checked="" type="checkbox"/>

11. IN PERFORMING THIS CONTRACT, THE CONTRACTOR WILL:

	YES	NO
a. HAVE ACCESS TO CLASSIFIED INFORMATION ONLY AT ANOTHER CONTRACTOR'S FACILITY OR A GOVERNMENT ACTIVITY		<input checked="" type="checkbox"/>
b. RECEIVE CLASSIFIED DOCUMENTS ONLY		<input checked="" type="checkbox"/>
c. RECEIVE AND GENERATE CLASSIFIED MATERIAL	<input checked="" type="checkbox"/>	
d. FABRICATE, MODIFY, OR STORE CLASSIFIED HARDWARE		<input checked="" type="checkbox"/>
e. PERFORM SERVICES ONLY		<input checked="" type="checkbox"/>
f. HAVE ACCESS TO U.S. CLASSIFIED INFORMATION OUTSIDE THE U.S. PUERTO RICO, U.S. POSSESSIONS AND TRUST TERRITORIES		<input checked="" type="checkbox"/>
g. BE AUTHORIZED TO USE THE SERVICES OF DEFENSE TECHNICAL INFORMATION CENTER (DTIC) OR OTHER SECONDARY DISTRIBUTION CENTER	<input checked="" type="checkbox"/>	
h. REQUIRE A COMSEC ACCOUNT		<input checked="" type="checkbox"/>
i. HAVE TEMPEST REQUIREMENTS	<input checked="" type="checkbox"/>	
j. HAVE OPERATIONS SECURITY (OPSEC) REQUIREMENTS	<input checked="" type="checkbox"/>	
k. BE AUTHORIZED TO USE THE DEFENSE COURIER SERVICE		<input checked="" type="checkbox"/>
l. OTHER <i>(Specify)</i> Notification of government security activity is required.	<input checked="" type="checkbox"/>	

12. PUBLIC RELEASE. Any information (classified or unclassified) pertaining to this contract shall not be released for public dissemination except as provided by the Industrial Security Manual or unless it has been approved for public release by appropriate Government authority. Proposed public releases shall be submitted for approval prior to release.

Direct Through (Specify):

ASC/PA
1865 4th Street
Wright-Patterson AFB OH 45433-7129

to the Directorate for Freedom of Information and Security Review, Office of the Assistant Secretary of Defense (Public Affairs) for review. In the case of non-DoD User Agencies, requests for disclosure shall be submitted to that agency.

13. SECURITY GUIDANCE. The security classification guidance need for this classified effort is identified below. If any difficulty is encountered in applying this guidance or if any other contributing factor indicates a need for changes in this guidance, the contractor is authorized and encouraged to provide recommended changes; to challenge the guidance or the classification assigned to any information or material furnished or generated under this contract; and to submit any questions for interpretation of this guidance to the official identified below. Pending final decision, the information involved shall be handled and protected at the highest level of classification assigned or recommended. (Fill in as appropriate for the classified effort. Attach, or forward under separate correspondence, any documents/guidelines/extracts reference herein. Add additional pages as needed to provide complete

- a. Ref Blk 11c: All classified contractor work performance, up to and including SECRET, will occur at Wright-Patterson AFB OH, Bldg 248, Area B. Contractor will only have access to SCI information in approved facilities at HQ Air Intelligence Agency, Kelly AFB TX; Air Force Information Warfare Center, Kelly AFB TX; National Air Intelligence Center, Wright-Patterson AFB OH; Air Force Technology Applications Center, Patrick AFB FL.
- b. Ref Blk 11c: Any classified information, up to and including SECRET, generated in the performance of this contract shall require the contractor to either apply derivative classification and markings consistent with the source material. Special considerations apply. See addendum.
- d. Ref Blk 11i: EMSEC requirements apply and are incumbent on the US Government. See addendum.
- e. Ref Blk 11l: The notification of Government Security Activity and Visitor Group Security Agreement Clause applies. See contract clause for details.
- f. Ref Blk 10e(2): General Intelligence Material/Foreign disclosure applies. See addendum.
- g. Contract monitor is: Donald L. Monk, AFRL/HECA, (937) 255-8814.
Billet monitor is: Gilbert G. Kuperman, AFRL/HECA, (937) 255-3727.
- h. The National Industrial Security Program Operating Manual (NISPOM) Jan 98 applies.

14. ADDITIONAL SECURITY REQUIREMENTS. Requirements, in addition to ISM requirements, are established for this contract. (If Yes, identify the pertinent contractual clauses in the contract document itself, or provide an appropriate statement which identifies the additional requirements. Provide a copy of the requirements to the cognizant security office. Use Item 13 if additional space is needed.) Yes No

Ref Blk 10e(1): SCI requirements apply. See addendum.

15. INSPECTIONS. Elements of this contract are outside the inspection responsibility of the cognizant security office. (If Yes, identify specific areas or elements carved out and the activity responsible for inspections. Use Item 13 if additional space is needed.) Yes No

Ref Blk 10e(1): SCI requirements apply. See addendum.
DIS is relieved of inspection for on-base performance. ASC/SYS will provide security oversight. ASC/CVS will maintain security oversight for SCI requirements. Performance will occur at AFRL/HEC, Bldg 248, WPAFB OH

16. CERTIFICATION AND SIGNATURE. Security requirements stated herein are complete and adequate for safeguarding the classified information to be released or generated under this classified effort. All questions shall be referred to the official named below.

a. TYPED NAME OF CERTIFYING OFFICIAL	b. TITLE	c. TELEPHONE (Include Area Code)
James H. Day	Contracting Officer	(937) 255-7143

d. ADDRESS (Include Zip Code)
AFRL/MLKT
2530 C Street
Wright-Patterson AFB OH 45433

e. SIGNATURE
James H. Day

ASC/SYS
COORDINATOR
PC-ONLY

17. REQUIRED DISTRIBUTION

<input checked="" type="checkbox"/>	a. CONTRACTOR
<input type="checkbox"/>	b. SUBCONTRACTOR
<input checked="" type="checkbox"/>	c. COGNIZANT SECURITY OFFICE FOR PRIME AND SUBCONTRACTOR
<input type="checkbox"/>	d. U.S. ACTIVITY RESPONSIBLE FOR OVERSEAS SECURITY ADMINISTRATION
<input type="checkbox"/>	e. ADMINISTRATION CONTRACTING OFFICER
<input checked="" type="checkbox"/>	f. OTHERS AS NECESSARY

12/28/98

GENERAL INTELLIGENCE MATERIAL/FOREIGN DISCLOSURE

1. **Special Requirements for General and Foreign Intelligence Material.** In addition to the requirements and controls for classified material, the Director, Central Intelligence, sets up additional requirements and controls for intelligence in the possession of contractors. The contractor must:
 - a. Maintain control of all intelligence materials released in his or her custody in accordance with DOD 5220.22-M, the National Industrial Security Program Operating Manual (NISPOM), January 1995, paragraphs 5-200, 201 and 202 for control. Contractors agrees that all intelligence material released, all reproductions and other material generated (including reproductions) are the property of the US Government.
 - b. Maintain control of all reproduced intelligence data in the same manner as the original.
 - c. Destroy intelligence materials in accordance with approved methods identified in the NISPOM.
 - d. Restrict access to those individuals with a valid need-to-know who are actually providing services under the contract. Further dissemination to other contractors, subcontractors, or other government agencies and private individuals or organization is prohibited unless authorized in writing by the Contracting Officer's Representative (COR) with prior approval of ASC/NAIC/POA.
 - e. Not release intelligence data to foreign nationals or immigrant aliens, regardless of their security clearance or contract status, without advance written permission from the COR, Foreign Disclosure Policy Office (ASC/SYSR), and ASC/NAIC/POA.
 - f. Ensure that each employee having access to intelligence material is fully aware of the special security requirements for this material.
2. **Returning Intelligence to the Air Force.** Contractors must return intelligence data to the COR at the termination or completion of a contract unless the COR has provided written approval for the contractor to retain for an additional two years. If retention is required beyond the two year period, the contractor must again request and receive written retention authority from the COR. If the COR grants retention authority, he or she must provide a copy of the written approval to ASC/NAIC/POA.
3. **Release of Classified and Unclassified Information to Foreign Government and Their Representatives.** Any military activity or defense contractor receiving a request from a foreign government or a representative thereof, for intelligence data about this program, shall forward the request to ASC/SYSR and ASC/NAIC/POA. Information released under Foreign Military Sales (FMS) must comply with the specific USAF disclosure guidance issued for the specific FMS customer.

21 August 1996

USE OF SPECIAL INTELLIGENCE MARKINGS1. Authorized Control Markings of Intelligence Information

a. "Dissemination and Extraction of Information Controlled by Originator (ORCON)".

This marking is used only on classified intelligence that clearly identifies or would reasonably permit ready identification of intelligence sources or methods that are particularly susceptible to countermeasures that would nullify or measurably reduce their effectiveness. It is used to enable the originator to maintain continuing knowledge and supervision of the further use of intelligence beyond the original dissemination. This control marking may not be used when an item of information will reasonably be protected by use of any other markings specified herein, or by the application of the "need-to-know" principle and safeguarding procedures of the security classification system.

b. "Not Releasable to Foreign Nationals (NOFORN)"

This control marking is used to identify classified intelligence material that may not be released in any form to foreign governments, foreign nationals, or non-US citizens without permission of the US Government originator, and then only when released in compliance with the National Disclosure Policy.

c. "Authorized for Release to (Name of country(ies)/international organization)"

This marking is used to identify classified intelligence material that the US Government Originator has predetermined to be releasable or has been released through established foreign disclosure channels to the indicated country(ies) or organization.

2. Procedures Governing Use of Control Markings

a. Any recipient desiring to use intelligence in a manner contrary to the restrictions established by the control markings set forth above, shall obtain the advanced permission of the originating agency. Such permission applies only to the specific purposes agreed to by the originator and does not automatically apply to all recipients. Originator will ensure that prompt consideration is given to recipients' requests, with particular attention to reviewing and editing if necessary, sanitized or paraphrased versions to derive a text suitable for release subject to lesser or no control markings.

b. The control markings authorized above shall be shown on the title page, front cover, and other applicable pages of documents, incorporated in the text of electrical communications, shown on graphics, and associated (in full or abbreviated form) with data stored or processed in automatic data processing systems. The control markings also shall be indicated by parenthetical use of the markings abbreviations at the beginning or end of the appropriate portions. If the control markings apply to several or all portions, the document may be marked with a statement to this effect rather than marking each portion individually.

c. The control markings in paragraph one (1) shall be individually assigned at the time of preparation of intelligence products and used in conjunction with security classifications and other markings specified by EO 12958 and its implementing ISOO Directive. The markings shall be carried forward to any new format in which the same information is incorporated including oral and visual presentations.

Current Guidance

Implementation of DCID 1/7, 16 Apr 96, Postponed. Page 4 of 7
F33615-98-D-6
atch 2

SENSITIVE COMPARTMENTED INFORMATION CLAUSES
(SCIF NOT REQUIRED)

The following controls will apply to Sensitive Compartmented Information (SCI) provided under this contract:

1. Item 14: USAFINTEL 201-1, DOD TS-5105.21-M-1, DCID 1/14 and 1/21, and DIAM 50-5 provide the necessary guidance for EMSEC (emission security), physical, personnel and information security measures and is part of the SCI security specifications for the contract.
2. Item 15: This contract requires access to SCI. The National Air Intelligence Center (NAIC) Special Security Office (SSO) has exclusive security responsibility for all SCI released to the contractor or developed under this contract. The Defense Intelligence Agency (DIA), or its designee, shall be responsible for all inspections of the contractor to insure compliance with SCI Directives/Regulations. All SCI will be handled in accordance with security requirements furnished by the Aeronautical System Center (ASC) SSO, located in ASC/CVS.
3. SCI will not be released to contractor employees without the specific release approval by the originator of the material as outlined in the governing directives and based on prior approval and certification of "need to-know" by the contract monitor, _____
4. Names of contractor personnel requiring access to SCI and justification for SCI billets will be submitted to the ASC SSO after contract monitor approval/concurrence. Upon receipt of written approval from the contract monitor, the Contractor Special Security Officer (CSSO) may submit the necessary forms to DISCO for a Single Scope Background Investigation (SSBI) for those personnel nominated for SCI access in accordance with the National Industrial Security Program Operating Manual (NISPOM).
5. Inquiries pertaining to classification guidance on SCI will be directed to the contract monitor listed in 3 above.
6. All SCI furnished to the contractor in support of this contract remains the property of the Department of Defense, or the agency or command that releases it. Upon completion or cancellation of the contract, SCI furnished will be returned to the NAIC SSO.
7. This contract requires that _____ SCI contract billets be established in order to fulfill the contractual obligations incurred. Access will be granted by the sponsoring government agency. Upon completion or cancellation of the contract, the CSSO will debrief all personnel not required for contract close-out and those billets will be disestablished.
8. Access will be granted only at the sponsoring agency and other accredited SCI Facilities (SCIF) as approved by the government Contract Monitor..

EMISSION SECURITY (EMSEC) REQUIREMENTS
(FORMERLY TEMPEST REQUIREMENTS)

EMISSIONS SECURITY ASSESSMENT REQUEST (ESAR)

FOR ALL CLASSIFIED SYSTEMS

1. The contractor shall ensure that compromising emanations (EMSEC) conditions related to this contract are minimized.
2. The contractor shall provide countermeasure assessment data to the Contracting Officer (CO), in the form of an ESAR. The ESAR shall provide only specific responses to the data required in paragraph 3 below. The contractor's standard security plan shall NOT be used as a "stand-alone" ESAR response. The contractor shall NOT submit a detailed facility analysis/assessment. The ESAR information will be used to complete an EMSEC Countermeasures Assessment Review of the contractor's facility to be performed by the government EMSEC authority using current Air Force EMSEC directives. EMSEC is applied on a case-by-case basis and further information may be required to complete the review. The contractor shall provide this information to the CO when requested. After the evaluation of the ESAR by the government EMSEC authority, additional EMSEC requirements may be necessary. When changes to the information required in paragraph 3 below occurs (including, but not limited to, relocation, additions, or deletions of equipment from the original approved room), the contractors shall notify the CO of these changes. Upon request, the contractor shall submit to the CO a new ESAR, identifying the new configuration at least 30 days before the change occurs. The contractor shall NOT commence processing with the new configuration until receiving, as a minimum, interim approval from the CO.
3. *ESAR contents shall include, as a minimum, the following information:
 - a. The specific classification and special categories of material to be processed/handled by electronic means. Include percentage of each classification level used including unclassified (i.e., 5% Top Secret, 10% Secret/SAR, 25% Secret, 65% Unclassified).
 - b. The specific location (complete address, building/room number, or office) where classified processing will be performed. Include identification of any other contractor/company located within 200 meters of the facility.
 - c. Attach a copy of the Defense Investigative Service (DIS) Form 147 to validate physical security and approved storage level of the facility.
 - d. Provide the name, title, and telephone number (commercial and/or DSN) of a point of contact at the facility where processing will occur.
4. The prime contractor shall ensure that all subcontractors and/or vendors comply with EMSEC requirements when performing classified processing related to this contract. The subcontractor will provide the above documentation through their prime to the CO to complete the ESAR.

*NOTE: A copy of your Automated Information System Security Plan(s) (AISSP) will suffice.

SPECIAL CONSIDERATIONS (AFSSM 7011 EXTRACT)

3.5. Special Items. People may innocently introduce other radio devices, such as pagers, hand-held portable transceiver radios, cellular telephones, cordless telephones, and cordless microphones into the area processing classified national security information with disastrous results. Also, alarm systems may use radio transmitters to alert remotely located security or fire-fighting teams.

3.5.1. Hand-Held Radios. Hand-held radio transceivers used with intrabase radios (sometimes abbreviated IBR) and land mobile radios (sometimes abbreviated LMR) deserve special consideration because of their unique operational applications. A person may carry these devices into an area where classified national security information is processed. If the person carrying such a device works in the facility, either turn off the device and use the telephone or separate it 2 meters from classified processors: no transmissions are allowed. If the person carrying the device is a short-term visitor, it is not necessary to turn off the radio because the visitor usually moves about in the facility. Infrequent transmissions are allowed, but only for short durations.

3.5.2. Beepers and Pagers. Beepers and pagers deserve special consideration because of their unique operational applications. A person may carry these devices into an area where classified national security information is processed. If the person carrying such a device works in the facility, either turn off the device and use the telephone or keep the device 2 meters from classified processors. If the person carrying the device is a short-term visitor, it is not necessary to turn off the device because the visitor usually moves about in the facility. If the device has a transmit capability, follow the instructions for hand-held radios.

3.5.3. Alarm Systems. The mode of operation of alarm systems radio frequency transmitters will determine their treatment. Any such transmitter with a continuous transmit mode or a high duty cycle (transmits most of the time) must meet the same separation requirements as all other fixed transmitters. If they do not meet these requirements, exclude them from operating in the classified national security information processing area. Low duty cycle (transmits short bursts infrequently) systems are not considered hazards and require no special treatment.

3.5.4. Cellular Telephones. When a cellular telephone is used as an operational necessity separate it 5 meters from RED equipment. When the cellular telephone is a personal asset, its use is prohibited. Disable the unit from receiving calls or separate it 10 meters from RED processors.

3.5.5. Cordless Telephones. When a radio frequency cordless telephone is used as an operational necessity, separate it 5 meters from RED equipment. When the cordless telephone is a personal asset, its use is prohibited. Disable the personal cordless telephone from receiving calls or separate it 10 meters from RED processors. There are no separation requirements for infrared cordless telephones.

3.5.6. Cordless Microphones.

3.5.6.1. Radio Frequency Cordless Microphones. When a radio frequency cordless microphone, encrypted or unencrypted, is used for briefing either classified national security information or unclassified information, separate it 10 meters from RED equipment. Using unencrypted radio frequency cordless microphones for classified briefings is prohibited.

3.5.6.2. Infrared Cordless Microphones. Using an infrared cordless microphone for briefing classified national security information requires a closed room: keep the doors closed and cover the windows with drapes.

3.5.7. Cordless Keyboards. When a radio frequency cordless keyboard is used, separate it 10 meters from RED equipment. Radio frequency cordless keyboards cannot be used to process classified national security information unless encrypted.

3.5.8. Wireless Local Area Networks. When a radio frequency wireless local area network is used, separate the transmitter and receiver units 10 meters from RED equipment.

The complete document can be obtained from the Air Force Information Protection Home Page (<http://www.afca.scott.af.mil/gc/gci/>).

BASE SUPPORT

1. The contractor shall be provided access to and use of the AFRL/HEC laboratories and facilities to be supported as described in the Supplement package to this PRDA announcement. This shall include access to all pertinent Government computation, simulation, and control equipment necessary for contract performance.
2. The contractor shall be provided access to and use of the following in these locations in these locations of Area B, WPAFB:
 - (a) office space, work space, support services, and storage in Building 197 (approximately 8,000 sq ft)
 - (b) office space (approximately 1,200 sq ft) in Building 248
 - (c) office space, work space, and storage in Buildings 441 and 824.
 - (d) Additional office space and work space (such as for work benches and storage lockers) shall be provided within the HEC laboratories and facilities as required.
3. Office furniture, work benches, and file cabinets will be provided by the Government. Custodial responsibility for such property will remain with the Air Force.
4. Telephones will be provided by the Government.
5. The contractor will have access to the services available at the Wright-Patterson AFB shops. These services include black anodization of aluminum parts, sandblasting, and provision of lumber and aluminum sheet cut and bent to specification.
6. With the approval of the AFRL/HEC contract monitor, contractor personnel will have access to the Aeronautical Systems Center/Wright Research Site Technical Library.
7. In select cases, training in maintenance or programming of newly, acquired, state-of-the-art, highly specialized laboratory and simulation equipment may be provided by the Government.
8. The following equipment will be provided to the contractor as Government furnished property for performance under this program:

GOVERNMENT FURNISHED PROPERTY (GFP)

	BARCODE	DESCRIPTION	STOCK NR	QTY	COST	SERIAL
78	M003618	DISPLAY FORMATTER	6625L000104MRL	1	1,195.00	B010279
132	M003648	20 MHZ SWEEP GENERATOR	6625L860036MRL	1	1,353.00	969-01538
43	M003654	VIDEO MONITOR 9IN	5820L000059MRL	1	137.00	28355
15	M003657	DRILL PRESS	3413L000008MRL	1	150.00	68-315
70	M003661	DIG. PLUG-IN METER	6625010106782	1	588.00	B020476
67	M003662	PLUG-IN/UNIV COUNT DC	6625005302635	1	828.00	B163092
99	M003664	DC PLUG IN POWER SUPPLY	6625L001607MRL	1	150.00	B040581
103	M003665	PLUG-IN RNMP GENERATOR	6625W01626MRL	1	175.00	B101210
111	M003666	PLUG-IN FUNCTION GENERATOR	6625L001674MRLD	1	490.00	B020901
90	M003667	PLUG-IN PULSE GENERATOR	6625L000795MRL	1	2,040.00	B010608
72	M003668	PLUG-IN FUNCTION GEN.	6625010359742	1	1,310.00	B020279
110	M003669	DUAL TRACE AMP. PLUG-IN	6625L001661MRLD	1	1,050.00	B073787
109	M003671	DUAL TIME BASE PLUG-IN	6625L001661MRLC	1	910.00	B136639
75	M003672	DIG. PLUG-IN METER	6625L000093MRL	1	505.00	B149194
97	M003673	DIGITAL BENCH METER	6625L001424MRL	1	780.00	2632
71	M003674	OSCILLOSCOPE	6625010335066	1	1,995.00	1541A00375

63	M003675	MAINFRAME FOR PLUG-INS	6625003737528	1	262.00	B101502
66	M003676	MAINFRAME FOR PLUG-INS	6625003737528	1		B112544
130	M003678	FUNCTION GENERATOR	6625L860034MRL	1	339.00	8915957
64	M003679	MAINFRAME FOR PLUG-INS	6625003737528	1	262.00	B107909
112	M003682	VIDEO MONITOR	6625L001682MRL	1	160.00	90945
87	M003686	DIGITAL HAND HELD METER	6625L000537MRL	1	149.00	94327
39	M003688	CORDLESS DRILL	5130L860002MRL	1	128.00	6955
121	M003689	DIGITAL PROBE METER	6625L860014MRL	1	45.00	60208026
124	M003690	DIGITAL HAND HELD METER	6625L860016MRL	1	97.00	51213304
83	M003691	DIG. CAPACITANCE METER	6625L000292MRL	1	60.00	A29085
80	M003692	DIGITAL PROBE METER	6625L000258MRL	1	68.00	40327475
129	M003693	TRIPLE POWER SUPPLY	6625L860022MRL	1	495.00	5020593
31	M003696	DESOLDERING STATION	3439L000002MRL	1	330.00	
60	M003698	PROBE HI-VOLT	6625001018759	1	402.00	LA039001
95	M003699	PROBE CURRENT	6625L001292MRL	1	250.00	11218
106	M003700	LOGIC TRIGGER	6625L001655	1	445.00	1512G00184
61	M003703	SCOPE CART	6625002615185	1	970.00	
108	M003704	OSCILLOSCOPE MAINFRAME	6625L001661MRLA	1	1,675.00	B163360
128	M003706	TRIPLE POWER SUPPLY	6625L860022MRL	1	495.00	5020581
117	M003707	SCOPE PROBE	6625L860012MRL	1	93.00	
115	M003708	SCOPE PROBE	6625L860012MRL	1	93.00	
118	M003709	SCOPE PROBE	6625L860012MRL	1	93.00	
119	M003710	SCOPE PROBE	6625L860012MRL	1	93.00	
120	M003711	SCOPE PROBE	6625L860012MRL	1	93.00	
122	M003712	DIGITAL PROBE METER	6625L860014MRL	1	45.00	60208022
123	M003713	DIGITAL HAND HELD METER	6625L860014MRL	1		60208052
125	M003714	DIGITAL HAND HELD METER	6625L860016MRL	1	97.00	51213253
42	M003716	VIDEO MONITOR	5820L000003MRL	1	1,000.00	G31000420
53	M003718	DC POWER SUPPLY	6120L000023MRL	1	350.00	236
12	M003720	TABLE SAW	3220W000008MRL	1	490.00	3353.P0953
17	M003721	HAND DRILL	3413L000021MRL	1	58.00	B3323
25	M003722	LATHE W/DIAL ATTACHMENT	3416L000014MRL	1	21,359.00	4-0101-0781
36	M003723	WISE MITER	5120L000013MRL	1	125.00	
37	M003724	3-WAY VISE	5120L000015MRL	1	580.00	81176
86	M003725	COUNTERBORE/ SPOT FACER	6625L000331MRL	1	495.00	
114	M003726	CLEAN & FINISH MACHINE	6625L850029MRL	1	747.00	
158	M003727	WORKBENCH	7125L000007MRL	1	174.00	
169	M003728	CLEANER VACUUM & KIT	7910005306260	1	373.00	LA136004
11	M003729	SANDER BELT/DISC	3220L000001MRL	1	425.00	330284
13	M003730	BAND SAW	3405L000003MRL	1	1,500.00	387305
14	M003731	BENCH DRILL PRESS	3413L000006MRL	1	129.00	LA202001
19	M003732	GRINDER BENCH	3415L000001MRL	1	49.00	LA160001
16	M003733	DRILL SHARPENER	3413L000010MRL	1	89.00	17979
20	M003734	PRECISION SINE PLATE	3415L000011MRL	1	835.00	SP128S2
21	M003735	ANGLE PLATE PRECISION	3415L000012MRL	1	275.00	
22	M003736	SURFACE PLATE SUPERIOR	3415L000013MRL	1	294.00	3664
24	M003737	LATHE 220V	3416L000012MRL	1	10,903.00	HLV-H-6060-M
26	M003738	MACHINE MILLING W/ACC.	3417L000005MRL	1	13,528.00	J-156125
32	M003739	TABLE HYDRAULIC	3990L000003MRL	1	575.00	
47	M003740	VERNIER CALIPER GEAR	5820L000190MRL	1	359.00	
48	M003741	VERNIER CALIPER	5820L000192MRL	1	148.00	
88	M003742	PATHFINDER 5 DIGIT READOUT	6625L000548MRL	1	1,650.00	P10-0-6184
162	M003743	TURRET PUNCH/WORK TABLE	7460L000004MRL	1	7,531.00	BE-2047
170	M003744	COMPRESSOR W/SPRAY GUN	8020L000001MRL	1	180.00	14246

171	M003745	AIR BRUSH SET	8020L000002MRL	1	90.00	
38	M003746	ROTARY HAMMER	5120L860002MRL	1	485.00	14772
77	M004835	LOGIC ANALYZER	6625L000102MRLB	1	3,640.00	B020629
73	M004844	DIG. PLUG-IN METER	6625L000034MRL	1	405.00	B031013
104	M004845	PLUG-IN PULSE GENERATOR	6625L001645MRL	1	395.00	B0211558
163	M005121	LETTERING MACH	7490L000002MRL	1	595.00	145650
84	M005122	LIGHTBOX PORTABLE	6625L000327MRL	1	461.00	12-83
143	M005124	DRAFTING MACHINE	6675L000011MRLD	1	417.00	
144	M005125	DRAFTING MACHINE MUTOH	6675L000011MRLD	1	417.00	
147	M005127	TABLE DRAFTING RANGER	6675L000041MRL	1	175.00	
51	M005129	TALK-A-PHONE P.A. SYSTEM	5830L000016MRL	1	85.00	LA164013
49	M005130	TALK-A-PHONE P.A. SYSTEM	5830L000016MRL	1	85.00	LA164018
81	M005134	DIGITAL PROBE METER	6625L000258MRL	1	68.00	40327477
116	M005135	SCOPE PROBE	6625L860012MRL	1	93.00	
93	M005137	DC POWER SUPPLY	6625L001263MRL	1	80.00	LA159016
58	M005138	DC POWER SUPPLY	6130L000023MRL	1	80.00	120004
157	M005139	FIELD TESTER	7025L000025MRL	1	5,094.00	NS00135
89	M005140	DIGITAL HAND HELD METER	6625L000582MRL	1	207.00	3420178
96	M005141	I/O TESTER RS232	6625L001295MRL	1	199.00	23979
41	M005142	MALE CRIMP TOOL	5315L860004MRL	1	180.00	38638
40	M005143	FEMALE PIN CRIMP TOOL	5315L860002MRL	1	190.00	39005
151	M005144	CAMERA, INSTAMATIC	6720L000005MRL	1	92.00	
150	M005145	PROBE TEMP	6685L000012MRL	1	175.00	010-6058-00
45	M005147	DIGI DESIGNER	5820L0C0121MRL	1	120.00	LA164011
52	M005148	P.A. SYSTEM	5830L000032MRL	1	250.00	LA160015
79	M005152	DIGITAL HAND HECD METER	6625L000241MRL	1	231.00	3495763
44	M005153	DIGI DESIGNER	5820L000121MRL	1	120.00	LA136003
131	M005155	FUNCTION GENERATOR	6625L860034MRL	1	339.00	8915958
65	M005156	MAINFRAME FOR PLUG-INS	6625003737528	1	262.00	B110627
56	M005157	DC POWER SUPPLY	6130L000013MRL	1	250.00	A72687
62	M005158	OSCILLOSCOPE	6625003228716	1	2,583.00	B258573
134	M005159	AC POWER SUPPLY	6625L870023MRL	1	156.00	104-03523
136	M005160	DC POWER SUPPLY	6625L870024MRL	1	203.00	146-00898
135	M005161	DC POWER SUPPLY	6625L870024MRL	1	203.00	146-00906
137	M005162	DC POWER SUPPLY	6625L870024MRL	1	203.00	146-00767
1	M005163	DIGITAL PROBE METER		1	55.00	70303292
2	M005164	DIGITAL PROBE METER		1	55.00	70303238
28	M005165	WELDER & GRINDER	3432L880001MRL	1	1,199.00	8799032
7	M005172	CABLE TIE TOOL		1	75.00	BJF2074
8	M005173	CABLE TIE TOOL		1	75.00	BJF2075
30	M005177	SOLDER STATION	3438L870005MRL	1	165.00	
35	M005178	HEAT GUN W/HOLDER	4940L870001MRL	1	80.00	
6	M005179	ORBITAL SANDER		1	77.00	6RMR1
10	M005181	OPTICAL CHOPPER		1	695.00	02-2699
9	M005183	HAND TRUCK		1	180.00	
3	M005184	HAND TOOL/ MODULAR CRIMP		1	160.00	
34	M005187	HEAT GUN W/HOLDER	4940L870001MRL	1	80.00	
29	M005188	SOLDER STATION	3438L870005MRL	1	165.00	
133	M005194	DIGITAL HAND HELD METER	6625L870012MRL	1	159.00	4000314
155	M005203	MAGNIFIER LIGHT	6760L000045MRL	1	63.00	
101	M005204	OP-AMP DESIGNER	6625L001615MRL	1	150.00	10
55	M005205	DC POWER AMPLIFIER	6130L000012MRL	1	375.00	1605
91	M005209	PLUG-IN PULSE GENERATOR	6625L000795MRL	1	2,040.00	B010630
172	M005210	AIR BRUSH SET	8020L000002MRL	1	50.00	451660

168	M005212	CLEANER VACUUM TANR TY	7910002671207	1	225.00	
154	M005218	MAGNIFIER LIGHT	6760L000045MRL	1	63.00	
85	M005219	LOGIC ANALYZER	6625L000329MRL	1	3,975.00	B34SYSRE5008
161	M005220	CALCULATOR, PRINTING PD	7420L000006MRL	1	110.00	77A15222
142	M005224	DRAFT TABLE W/AUX DRWR	6675L000009MRL	1	587.00	
153	M005225	LAMP	6740L000017MRL	1	81.00	
167	M005226	ELECTRIC ERASER	7510L000005MRL	1	53.00	
166	M005227	ELECTRIC ERASER	7510L000005MRL	1	53.00	
164	M005228	ELECTRIC ERASER	7490L860001MRL	1	40.00	
165	M005229	ELECTRIC ERASER	7510L000005MRL	1	53.00	
102	M005232	OP AMP DESIGNER	6625L001615MRL	1	150.00	8
145	M005235	DRAFTING MACHINE	6675L000025MRL	1	225.00	396716
100	M005253	OP AMP DESIGNER	6625W01615MRL	1	150.00	20
4	M006310	HEAT GUN		1	59.00	1186
5	M006311	HEAT GUN		1	59.00	100664
113	M006320	UNIV COUNTER, PLUG-IN	6625L005302635	1	820.00	B132238
74	M006322	OSCILLOSCOPE	6625L000077MRL	1	1,344.00	B27621
76	M006323	DIG. PLUG-IN METER	6625L000093MRL	1	395.00	B093780
139	M006332	PROTO BRD DESIGN STATION	6625L870052MRL	1	275.00	169170
138	M006333	PROTO BRD DESIGN STATION	6625L870052MRL	1	275.00	169150
27	M007848	MILLING MACHINE	3417L890001MRL	1		249690
18	M007851	HOLE SHOOTER	3413L890001MRL	1		611-42988
23	M007853	GRINDER/W/LIGHT	3415L890001MRL	1		504200058
160	M007855	DRAFTING TABLE LIGHT	7195L890W2MRL	1		
159	M007857	DRAFTING MACHINE	7195L890001MRL	1		Y861494

Digital Audio Technology for Aircraft (DATA)

Bioacoustic Anthropometric Manikins for Acoustic Research (BAMAR)

KEMAR acoustic manikin

AFRL/HEC LABORATORIES AND FACILITIES

GROUP A

1. Alternative Control Technology Laboratory	5
2. Aviation Vision Lab	6
3. Behavioral Visualization Laboratory	7
4. Computerized Anthropometric Research and Design Laboratory	7
5. Cockpit Accommodation Laboratory	7
6. Collaborative Systems Technology Laboratory	8
7. Color Display Laboratory	9
8. Cognitive Assessment Laboratory	9
9. Crew Aiding and Information Warfare Analysis Laboratory	10
10. Dynamic Visual Assessment Facility	11
11. Flight Psychophysiology Laboratory	12
12. Multi-Operator Design Assessment Laboratory	12
13. Night Vision Operations Laboratory	13
14. Synthesized Immersion Research Environment	13
15. Visually Coupled Systems Development and Visual Interface Laboratory	14
16. Visual Image Evaluation of Windscreens Laboratory	15
17. Building 248 Conference Room	15
18. Building 33 Conference Room	15
19. HEC Computer Network	16
20. Human Sensory Feedback Laboratory	17

GROUP B (Bioacoustic, Noise, and Vibration)

21. Active Noise Reduction Laboratory (ANR)	18
22. Auditory Localization Research Facility (ALF)	18
23. Performance And Communications Research And Technology System (PACRAT)	18
24. Psychoacoustics Laboratory	19
25. Real Ear Attenuation at Threshold (REAT) Chamber Facility	19
26. Sound Attenuation Measurement Of Personal Equipment Items (SAMPEI)	20
27. Speech Communications in Occupational Noise Environments (SCONE) Facility	20
28. Speech Processing And Neural Network Laboratory (SPNN)	21
29. Voice Communication Research And Evaluation System (VOCRES)	21
30. Single Axis Servo Hydraulic Vibration Facility	22
31. Six Degree Of Freedom Vibration Facility	22
32. Unholtz-Dickie Electrodynamic Single Axis Vibration Facility	23

1. Alternative Control Technology Laboratory (ACT) POC: Dr Grant McMillan, AFRL/HECP

A. Description: Non-conventional techniques for communication and control have tremendous potential for increasing the effectiveness of aerospace systems. Enabling technologies include head- and eye-position tracking, hand and facial gesture recognition, tongue-, teeth-, or jaw-activated switches, muscle and brain electrical signal processing, and speech recognition. These technologies can reduce operator workload and fatigue, increase the speed and accuracy of human-machine interaction, and reduce operator training time. The Alternative Control Technology (ACT) program stresses optimal system design, with the goal of exploiting the combined potential of conventional and alternative controls. The laboratory is developing new biological sensor technology, signal processing methodology, pattern recognition techniques, and high-speed software algorithms. ACT's goal is to develop effective control interfaces. Current efforts include research and development to optimize alternative controls, quantify operator performance, and evaluate candidate applications. Ongoing investigations address interface issues, control law design, training protocols, and system design. It is anticipated that near term research will focus on the following types of alternative controllers: low-cost, hands-free controllers that can be used with wearable

computers, an "EEG-based eye tracker" interface using modulated stimuli; and an interface that integrates eye-tracking and voice recognition systems for cockpit tasks. Future work will explore multi-modal control issues, including how alternative controls can best be used with other alternative controls, as well as conventional controls, to make system inputs. Located in Bldg 33, Room 340.

B. Equipment/Facilities:

(1) Brain Actuated Controllers (BAC) - Prototype electronic/computer systems that permit control of external devices by electro-encephalographic (EEG) activity. In one approach, operators are trained to modify the strength of their visual evoked response (VER) to a modulated light. The BAC system measures and processes the evoked response in real-time and converts it into a control signal which can operate systems such as the roll axis tracking simulator, functional electrical stimulators, computer systems, etc. This system includes a stimulus (modulated light), scalp electrodes, biological signal amplifiers, filters, a computer system (DEC MicroVax II and Silicon Graphics IRIS system), and specialized hardware to measure the strength of the VER. A recent implementation of this system uses biological signal amplifiers and a IBM-compatible personal computer to accomplish the same goal. An alternative form of BAC (implemented on a PC-based system) harnesses the naturally occurring EEG responses to modulated stimuli.

(2) CyberLink - Commercially-available system that records electro-myographic (EMG), electro-oculographic (EOG), and EEG signals from forehead electrodes and translates these inputs into multiple control signals. The CyberLink is a PC-based system.

(3) BioMuse - A commercially-available development system for implementing EMG (muscle) based control, EOG (eye position) based control, with potential for EEG based control. It includes an electrode system, biological signal amplifiers, filters and digital signal processing capability to support the development of alternative control systems.

(4) Eye/Head Tracking System - The key component is an ISCAN RK-426 Pupil/Corneal Reflection Tracking System, a real-time digital image processor that simultaneously tracks the center of a subject's pupil and a bright corneal reflection over the pupil area. The system is currently being retrofitted to interface with both an Ascension PC-Bird™ 3 space tracker (to collect helmet position/rotation data) and prototype eye/voice interface software.

(5) Roll-Axis Tracking Simulator (RATS) - a high performance, single degree-of-freedom motion base, capable of simulating the roll positions, velocities, and accelerations of modern fighter aircraft. It can produce 360 degree roll motion, 180 degree per second peak velocity, and accelerations in excess of 1000 degrees per second per second. It is a single place simulator with a right-hand mounted force stick and a 14 inch color monitor mounted at eye-level. Visual displays are generated by a Silicon Graphics IRIS system. The simulator is controlled by a DEC MicroVax II computer system. These are the same systems used in the older BAC controller described above.

(6) Although not currently under evaluation, the following are additional equipment items that may be utilized in upcoming research:

(a) Prototype head-mounted facial sensor system array developed in-house to measure Masseter muscle tone, lip movement/position and tongue movement/position.

(b) Commercially available (Words+) infrared/sound/touch switch.

(c) Motorola product which senses voice, teeth clicks, etc. through bone vibrations in the ear canal.

(d) Commercially-available spandex glove fitted with a fiber optic system which provides information on hand and joint position.

2. Aviation Vision Lab POC: Dr Brian Tsou, AFRL/HECP

A. Description: The Aerospace Vision Laboratory (AVL) is a hot bench for current and future visual display R&D. AVL is interested in a diversity of researchers who can use its state-of-the-art equipment to conduct a unique blend of research projects including specialized analyses and evaluations to characterize human visual capacities under laboratory conditions; then systematically applies such human interface principles to visual display design; and, finally, documents performance limitations under real or simulated operational conditions. Currently, AVL includes a team of human-factors scientists, display engineers, computer scientists, research optometrists, and visual psychophysicists. Some of the current research

interests include: integration of binocular visual display systems with the human visual system and advanced weapons systems; testing of visually coupled display perceptual issues and visual display symbology research; and exploitation of information processing techniques as applied to sensor image enhancement. Located in Bldg 248, Room 306.

B. Equipment/Facilities:

- (1) A state-of-the-art large field-of-view binocular helmet-mounted display, and infinity focus optical apparatus integrated with the Vision Works, designed specifically for binocular and peripheral vision research.
- (2) 60-meter zoom lane with moving terrain board for dynamic visual assessment.
- (3) Visually coupled display simulator dedicated for symbology research.
- (4) Double Purkinje-image eye tracker and infrared optometer for assessing ocular posture while viewing virtual displays.

3. Behavioral Visualization Laboratory POC: Don Monk, AFRL/HECA

A. Description: The Behavioral Visualization Laboratory (BVL) is a research facility for the development, testing, and evaluation of crew-system design support tools and technologies. Research programs within the Behavioral Visualization Laboratory are developing and applying computer aiding techniques to support designers in accessing and understanding behavioral data. The BVL is pioneering the development of interactive behavioral test benches which allow designers to visualize the performance impacts of design decisions upon interface designs. A behavioral test bench consolidates the critical elements of a phenomenon so that designers can easily explore, analyze, and experience its most significant factors by manipulating the various stimuli, variables, and conditions in a setting similar to the design problem. One of the lab's recent products, Computer Aided Systems Human Engineering: Performance Visualization System (CASHE:PVS), incorporates these test benches in its primary behavioral visualization tool, the Perception and Performance Prototyper (P3). CASHE:PVS is an electronic implementation of the Engineering Data Compendium, a four-volume reference work on human sensation, perception, and performance tailored in format and content for system designers. It also incorporates MIL-STD-1472D, with hyperlinks between the two documents. Located in Building 248, room 209.

B. Equipment/Facilities:

- (1) Network of Macintosh computers

4. Computerized Anthropometric Research and Design Laboratory POC: Kathy Robinette, AFRL/HECP

A. Description: The Computerized Anthropometric Research and Design (CARD) laboratory develops specialized methods to analyze three-dimensional, anthropometric data, develops models to quantitatively describe that data, and hosts several large databases. Currently, the laboratory is maintained, supported, and operated under a separate contract. However, the CARD lab will require the use of statistical and subject recruitment services of this contract. Located in Bldg 248A, Room 3005

B. Equipment/Facilities:

- (1) Statistical software,
 - (a) SAS
 - (b) Statistica

5. Cockpit Accommodation Laboratory. POC: Greg Zehner, AFRL/HECP

A. Description: The Cockpit Accommodation Laboratory examines USAF aircraft to determine accommodation limits. Functional operational requirements (pass/fail criteria which define the limits for an aircraft) are established and anthropometric evaluations on each aircraft are performed to determine the minimum body sizes that meet these limits. These results define the quantification of the largest and smallest people (and combinations of body segments) that can safely operate a particular aircraft. The critical issues of this research are: safety of flight, pilot selection criteria, military standards, and design criteria. Flight tests will be involved in gathering data. Interviews and questionnaires will be used to help define the functional requirements. A CD-ROM, (with multimedia presentations) will be produced using

high-tech audio and video recording equipment. The CD-ROM and tapes will be available to aircraft manufacturers who are interested in the process of cockpit anthropometric evaluations, as well as to the general public. The Cockpit Accommodation Lab also makes recommendations, based on anthropometric evaluations, for cockpit modifications to the various USAF aircraft. Computer models will be developed and validated using anthropometric data collected in the aircraft cockpit. Using 3-D digitizing capabilities, digital maps of USAF aircraft cockpits will be made. Subjects will also be digitized and the accommodation of these subjects in the aircraft will be analyzed. Located in Bldg 248, Room 339.

B. Equipment/Facilities:

- (1) Media 100 non-linear digital video editing suit
- (2) Digital video camera
- (3) 8 track audio recording and editing system
- (4) FARO Arm for 3-D digitizing

6. Collaborative Systems Technology Laboratory POC: Dr Robert Eggleston, AFRL/HECI

A. The Collaborative Systems Technology (CST) laboratory supports scientific studies and exploratory development of innovative collaborative work concepts. The laboratory examines individual, team, and collaborative work structures, activity process behaviors, and outcome performance involving interactions among sets of human, intelligent machine entities, and various levels of agent mediation. In general, the aim of the research is to establish requirements for future collaborative support systems as integral components of network mediated work environments. Collaborative support systems may encompass information visualization and decision support components. Experiments using a limited number (4 or less) of small teams (size: 5 or less) are conducted: 1) to test collaborative support concepts, 2) to gain better understanding of factors that affect team work, collaborative formation and sustainment under various real-world work conditions, and 3) to support the development of work performance behavioral models. General characteristics of the work domains include: coordinated information fusion; requirements for team situation awareness; requirements for dynamic and/or on-demand colleague backup; and individual, team, and collaborative decision making, and problem solving work under stressful, highly dynamic and uncertain mission situations. While any suitable research paradigm is used in these investigations, as needed, the research is guided mainly by the precepts of cognitive engineering and ecological psychology. Variable manipulations may cover a wide range, including: team structure, process, composition, size; communication modes and structures; physical interface factors (e.g. virtual displays and controls), properties, and behaviors; and computer network properties and behaviors that may interact with collaborative support concepts to impact individual, team, and collaborative performance. The research also involves knowledge capture activities in selected application domains based on the use of the full range of cognitive engineering concepts and methods, including the use of observational studies in field settings. Currently, this research is aimed at application opportunities in the areas of uninhabited vehicle operations, and theater level joint force planning activities required to support command and control of military operations. Located in Bldg 248, Room 209.

B. Equipment/Facilities:

- (1) Network: Client-server based, heterogeneous intranet (100 BaseT ethernet) running Windows NT and IRIX operating systems. The network is switch connectable to a LAN and consists of 11 nodes populated with a mixture of IRIS and Intergraph computers (dual video cards and dual screens). Direct live video feeds are also provided at each work station by QUICK CAM II and by SGI Nperson camera system.
- (2) Software: Computer mediated collaboration is supported by Group Kit and Microsoft NetMeeting. Military simulation tools include Extended Air Defense Simulation, version 6.0 and ModSAF, kit C. Image rendering is support by OpenGVS. Locally produced software is developed in C, C++, Java, VMRL, Tcl. Observational data captured by audio and video recording is analyzed with support from the ADIVA software tool.
- (3) Four head-mounted display systems
- (4) Multi-sensor magnet based position and orientation sensing systems
- (5) Electric field sensing system

(6) Two image projection systems, one using dual In Focus LP 620 projectors controlled by an Intergraph 425 with dual video cards and projecting to a 16 foot by 8 foot large screen display.

7. Color Display Laboratory POC: Dr. David Post, AFRL/CFHV

A. Description: A laboratory for performing experiments on human color vision and electronic color displays. Future research may include: Evaluation of models for predicting display colorimetry; determination of field-rate requirements for field-sequential color displays; comparisons of monochrome vs. color-coded HMD symbology; testing compatibility of maps produced using various printing technologies with colored illumination (NIMA funded); development of subtractive-color LCDs; and development of variable-transmittance visor technology to enhance contrast of HMDs. Located in Bldg 248, Room 306.

B. Equipment/Facilities:

- (1) Custom-built Maxwellian-view field-sequential color display
- (2) Custom-built subtractive-color LCD systems (2)
- (3) Pentium PC running Windows 95, equipped with a Cambridge Research Systems video card (3 x 15-bit RGB DACs)
- (4) 486 PC running DOS 6.0/Windows 3.1, equipped with a Univision Piranha video card (3 x 10-bit RBG DACs); MS Visual C++ 5.0 and DEC Visual Fortran 5.0 compilers
- (5) Aydin 9000 19-inch color CRT monitor with custom color-stabilization system
- (6) MAG MX17F 17-inch color monitor
- (7) Photo Research model 703 spectroradiometer with PC interface
- (8) LMT model 1200 filter colorimeter with RS-232 interface
- (9) LMT model L1009 photometer
- (10) LMT model B360J illumination meter
- (11) Hoffman LS-65 spectral radiance standard
- (12) Osram wavelength standard
- (13) Vision-testing equipment

8. Cognitive Assessment Laboratory POC: Gary B. Reid, AFRL/HECP

A. Description: The Cognitive Assessment Laboratory develops metrics which quantify the cognitive state of the pilot when operating complex systems. Such quantification provides a basis for reasoned design, acquisition, test, and evaluation decisions of Air Force systems. Cognitive Assessment Laboratory research is divided into two main categories: mental workload and situation awareness. Mental workload concerns the cognitive demands placed on a human operator or pilot in performing the tasks necessary for mission success. Mental workload is the amount of information throughput that the mission demands from the human. Situation awareness, on the other hand, represents the quality of the information perceived by the human. Good situation awareness is experienced when the human clearly understands the current situation and perceives a route to mission success. The Cognitive Assessment Laboratory research program is designed to scientifically examine these intuitive concepts in order to bring the appropriate cognitive theories and models to bear upon understanding human operator performance, and to create tools that can be used by system evaluators for determining the acceptability of a system or to diagnose its shortcomings. Laboratory research makes use of performance metrics, as well as, physiological, behavioral and subjective metrics. A major emphasis is on producing models of human performance in operational missions to enable prediction of the future cognitive state and performance level of the operator. Cognitive Assessment Laboratory researchers always aim at packaging the results of their studies in the form of specific system evaluation guidelines and tools, such as Subjective Workload Assessment Technique (SWAT), the Subjective Workload Dominance Technique (SWORD), and the Situation Awareness Rating Technique (SART). Cognitive Assessment Laboratory researchers have also studied and produced guidelines for the application of secondary task workload assessment, performance-based situation assessment using either memory probes or embedded implicit probes, and subjective ratings of situation awareness. Cognitive Assessment Laboratory researchers often work with Air Force system evaluators on the assessment of new systems or proposed system modifications. In recent years, Cognitive Assessment Laboratory researchers have been involved in evaluations of: new formats for the F-16 HUD; designs for tactical situation

displays; new systems in the Edwards AFB AFTI-16 test aircraft; the C-17 cockpit design; crew reduction in the KC-135; and the navigator station in the Quiet Knight II prototype. Ongoing research in the CAL include topics such as spatial cognition and spatial location issues, both related to defining components of situation awareness; the determination of workload "redline"; measures for determining operator state in real-time; and SCUD hunt mission decomposition and analysis for modeling purposes. Located in Bldg 33, Room 225.

B. Equipment/Facilities:

(1) Simulator for Tactical Operations Research and Measurement (STORM) - a PC-based, moderate-fidelity simulator of a ground-attack variant of the F-16 provides a setting with far more complexity and realism than traditional cognitive psychology tasks.

(a) "Out-the-window" display projected onto an 8' x 6' screen by an Apollo QXP575A projector

(b) 486DX-66 computer equipped with XTAR Corporation Falcon 4000 graphics accelerator and array processor boards

(c) 486SX-25 processor with multi-channel VGA card and an Advanced Gravis wavetable sound card

(d) (The two computer systems are linked via a high-speed serial interface. In the near future, both systems will be replaced by a single Intergraph computer system running Windows NT.)

(e) ISCAN ETL-410 Eye Tracking Laboratory for recording and analyzing eye movement behavior.

(f) Workload Assessment Monitor (WAM) is used to record physiological indices such as heart rate, EEG, and eye-blink behavior

(2) Three rapidly reconfigurable booths for traditional cognitive psychological research allowing efficient evaluation of competing theories or metric approaches with simple laboratory tasks.

(3) Software

(a) MacShapa -Task decomposition software installed on an Macintosh Centris 650 computer interfaced to a Panasonic DS850 video record/playback deck. A JVC TDW317 dual tape deck is used for analyzing audio tapes associated with the mission.

(b) Systat 6.0 and 7.0

(c) C++, Metaware High C compiler, and an XTAR proprietary graphics language

9. Crew Aiding and Information Warfare Analysis Laboratory POC: Gil Kuperman, AFRL/HECA

A. Description: The Crew Aiding and Information Warfare Analysis Laboratory (CIWAL) supports the design and integration of advanced avionics, including integrated multiple sensors and multi-sensor fusion, assisted/automatic target cuers and recognizers, off-board intelligence and force direction, accurate and precise strike weapons, and on-board mission/sensor managers and planners. CIWAL is located within a secret-level, TEMPEST approved vault. The lab contains a simulator (formerly called Strategic Avionics Battle Management Research and Evaluation (SABER)) with capability to simulate multiple (up to four) crew aircraft platforms or (up to five) battle management/command and control stations and to execute real-time scenarios. Research efforts in CIWAL are geared toward designing, developing, and assessing advanced human-machine interface concepts. Specific research metrics include crew size versus level of automation, crew performance, crew situational awareness, crew workload, and identification of training requirements. Experiments in the lab generate data on each of these areas as well as on the electro-physiological correlates of workload. Current Studies include: USAF Theater Missile Defense (TMD) Attack Operations (AO) Engagement-Level Sensitivity Trade-Off Studies; A Comparison of ATR Performance, Unaided Human Performance, and Aided Human Performance for single, multiple and sequential sensor target acquisition concepts; TESSA (TMS Eagle Smart sensor ATC) Aided FLIR Operator Performance Study; System Performance and Utility Assessment for J-STARS Enhanced synthetic aperture radar (ESAR)/ATR Flight Demonstration; Using Eye Movements and Pupillary Response to Study Visual Search in a Target Detection Task; and Subcontracting support for Information Warfare and Aiding the Intelligence Analyst in Situations of Information Overload. Future studies may include: Operator Performance Study with 3rd Gen FLIR/ATR; Operator Performance Study with J-STARS ESAR/ATR and Inverse SAR (ISAR)/ATR Sensors; Effects of Confusers on Operator Target

Acquisition Performance; Exploration of the potential applicability of DataWall technology in support of Information Protect operations as conducted in an Information Operations Center (IOC). Located in Bldg 248, Room B07.

B. Equipment/Facilities:

- (1) Computers
 - (a) DEC VAX 8650 System
 - (b) Silicon Graphics 3000 Workstations (21)
 - (c) Dynair System 21 Video Switch
 - (d) Silicon Graphics Indigo Workstation
 - (e) Silicon Graphics Indigo 2 Graphics Workstation
 - (f) Silicon Graphics Indy Graphics Workstations (3)
 - (g) Waterfall image analyst workstation on a Sun SparcStation 20
 - (h) Ultra PC
 - (i) NCD PC
 - (j) Micron Millennia PC
- (2) Printers
 - (a) Kodak XL7700 Color Printer
 - (b) Apple Color Laser Writer Printer 12/660PS
 - (c) HP Laser Jet Printer 5P
 - (d) HP Laser Jet Printer 5MP (classified printer)
- (3) Special Software
 - (a) MathCAD, mathematical analysis package
 - (b) ELT 2500, Electronic Light Table image analysis package
 - (c) EADSIM, engagement simulation package
- (4) Panasonic Optical Disk Player LQ3020
- (5) Panasonic Optical Disk Recorder TQ3031F
- (6) Panasonic VCR AG1970
- (7) Sony Hi8 VCR (8mm) EVO-9500A
- (8) LC Technologies Eyegaze System

10. Dynamic Visual Assessment Facility POC: Dr Rik Warren, AFRL/HECV

A. Description: The Dynamic Visual Assessment Facility, a.k.a. "The Zoom Lane", studies pilot vision when either the pilot or the target is physically moving and the pilot is viewing through multiple optical systems ranging from windscreens, visors, and night vision devices. The zoom lane features a 200 foot-long room containing a motorized cart on rails. The zoom cart can precisely move along the rails at up to 5 mph carrying up to 2000 pounds including its payload. The payload of the cart can include one person and various types of optical equipment ranging from aircraft windscreens to video cameras and night vision devices. Contractor support includes maintenance of the cart's mechanical systems and programming of two PC computers and one special-purpose motion-control computer. Current and prospective research includes studies of visual acuity through gold-coated windscreens while wearing night vision goggles, SCUD missile launcher detection using a desert terrain board, and visual acuity at distances between 20 and 200 feet while still or while approaching an optometric display located in Bldg 248A, Room 3008.

B. Equipment/Facilities:

- (1) A 200 foot zoom lane with motorized cart on rails
- (2) Lighting systems for creating the broad range of intensities from daylight to starlight
- (3) Optometric charts
- (4) 3-dimensional scales models
- (5) 8 ft by 8 ft terrain boards (4)

11. Flight Psychophysiology Laboratory POC: Dr Glenn Wilson, AFRL/HECP

A. Description: The lab conducts research using psychophysiological measures to investigate operator state. Mental workload is of primary concern. Laboratory, simulator and flight environments are used. In the laboratory, complex cognitive tasks are used. Experimental data collected includes physiological data (e.g., heart rate, eye blinks, brain waves, respiration and electrodermal responses), as well as performance and subjective measures operator functional state classification is one of the major goals. Neural networks and other classifiers are being used to determine operator state using physiological and performance data. Studies are underway to correlate EEG with fMRI images. Wearable computers to assess operator state are being developed which collect and analyze physiological data in real time to provide feedback to systems. This information is used by the system to aid the operator during states of lowered efficiency due to high mental workload, fatigue, etc. Located in Bldg 33, Room 229.

B. Equipment/Facilities:

- (1) Standard psychophysiological equipment including, amplifiers for up to 64 channels of EEG
- (2) Data collection and analysis computers (PCs)
- (3) Stimulus presentation computers
- (4) Ambulatory recorders worn by simulator and flight subjects to collect data

12. Multi-Operator Design Assessment Laboratory POC: Ed Martin, AFRL/HECI

A. Description: The Multi-Operator Design Assessment Laboratory (MODAL) explores crewstation design, multiplace interactions, and crew aiding issues. Performance, subjective, and physiological measures are collected using dynamic, interactive Engineering Research Simulators and an Avionics Visual Instrument Development System (AVIDS). This data is then used to design and evaluate crewstation systems. The Multi-Operator Design Assessment Laboratory is certified to operate at the Secret level. The MODAL laboratory develops methods for designing and evaluating interfaces and crew aiding technologies in multiplace crew aircraft. It works closely with Systems Program Offices (SPOs) and engineering organizations to apply candidate evaluation and design tools to real world problems—primarily bomber aircraft. Control and display concepts can be implemented and evaluated at varying levels of fidelity and complexity, allowing different levels of control and flexibility in the design and assessment process. Candidate designs can be objectively evaluated against existing interfaces or against each other to assess their handling qualities. Using part-task simulation in high-fidelity crew stations, MODAL develops ways to compare existing and candidate displays for workload and situation awareness impact or improvement. Different measures of workload and situation awareness are compared and tested for use in different testing conditions. Tools are being developed to measure and evaluate the effects of interface changes and dynamics in this context. High-resolution video recording allows the use and evaluation of post hoc data extraction tools designed to discover subtle relationships which, although not readily apparent, could have major impacts in a full mission scenario. The Multi-Operator Design Assessment Laboratory has performed a wide variety of research studies, including: Rivet Ace/Specific operator workload and performance studies; Electronic Warfare Study/Combined multi-crewstation research for B-52; VSD Instrument Landing System/Display design and evaluation for B-1B; Crew Centered Bomber Model/Complete mathematical modeling of entire B-1B crew complement and aircraft; Radar Cursor/Enhanced Design Study for B-2; Towed Decoy Control Panel/Development; and an evaluation of control panel for the B1-B Towed Decoy System. Located in Bldg 248, Room B03.

B. Equipment/Facilities:

- (1) An Engineering Research Simulator, a high-fidelity, four-place, multi-station bomber simulator that emulates the functions of flight, offensive, and defensive stations. Sophisticated engineering models replicate the aircraft equations of motion, control/display software, and external environment of the functional aircraft.
- (2) A Multiplace Crewstation Simulator, a two-place, side-by-side bomber simulator using high-fidelity models of aircraft flight, navigation, and defensive functions as well as representations of the actual controls and displays.
- (3) An Avionics Visual Instrument Development System, a rapid prototyping system that permits on-the-fly screen design, including touch screen capabilities, in stand-alone systems or

integrated into a cockpit environment. This system allows replication of any display, including its control functions, and is used to evaluate candidate display prototypes before they are entered into one of the full mission simulators. The display can then be imported into either the Engineering Research Simulator or the Multiplace Crewstation Simulator for evaluation in mission context.

13. Night Vision Operations (NVO) Laboratory POC: Jeff Craig, AFRL/HECV

A. Description: The Night Vision Operations (NVO) laboratory performs research in four primary areas. The first area, night lighting systems, is concerned with cockpit lighting, formation flying/refueling, and covert runway lights. A key program in this area is research on night vision goggle (NVG) compatible cockpit lighting, which is essential for maximizing NVG performance. The second research area, NVG enhancements, addresses wider fields-of-view, better resolution, and compatible head-up displays. Two important programs in this area are addressing technical approaches to expand the NVG field-of-view and the investigation of alternative display sources for integrating symbology with an NVG. The third area, NVG measurement, is dedicated to assessing and validating system performance. The focus of this project is development of a standardized method to measure the optical performance characteristics of the NVG system. The final research area is concerned with human factors and human performance using night vision devices. A significant activity underway is studying NVG focusing requirements for maximizing mission safety and effectiveness. Located in Bldg 248, Room 302.

B. Equipment/Facilities:

- (1) Spectra Pritchard Photometer
- (2) Hoffman Integrating Spheres
- (3) Hoffman ANV-120 NVIS Goggle Gain Tester
- (4) Hoffman ANV-126 Goggle Test Set
- (5) EG&G Gamma Scientific GS-4100A Radiometer
- (6) Calibrated Night Sky Illuminators

14. Synthesized Immersion Research Environment POC: Dr Mike Haas, AFRL/HECP

A. Description: The Synthesized Immersion Research Environment (SIRE) is a state-of-the-art virtual environment research facility whose mission is to develop and evaluate advanced, multi-sensory virtual interfaces for future United States Air Force crewstations. The facility consists of several autonomous research stations which can support individual research efforts or be combined to form a multi-participant virtual environment. The SIRE is a general purpose research environment that can be configured to support applied research regarding the design of advanced human-vehicle interfaces, including aircraft and ground vehicles. It can also be configured to support more fundamental research on multi-sensory perception and human performance in virtual environments. One research station within the SIRE is the Fusion Interfaces for Tactical Environments (FITE) research station which includes standard F-16 controls and an array of six eight-inch liquid crystal head-down displays. SIRE supports a broad range of human factors engineering research efforts geared toward the development of future-generation, multi-sensory crewstations. The human factors engineering research program includes: Joint development of advanced crew-station concepts with French and British scientists and engineers; Development of pilot-vehicle interface concepts which adapt in real-time to the pilot's state of workload and situation awareness; Integration of physiological measures of workload to optimize information display in real time; Integration of alternative control technologies including brain-actuated control and eye line-of-sight control; Development of haptic feedback information to facilitate vehicular control; and Evaluation of advanced crewstation interface concepts by means of multi-participant simulated air combat scenarios. SIRE is currently supporting an international, cooperative research and development program with the French government. This work is geared toward the development of an advanced multi-sensory suite of fighter cockpit displays and controls utilizing technology developed by United States and French manufacturers. Once completed, SIRE will contain the only joint U.S./French fighter cockpit in the United States. The success of this project has led to a proposed international cooperative initiative with the United Kingdom. Located in Bldg 33, Room 1001.

B. Equipment/Facilities:

- (1) SIRE
 - (a) A 40-foot diameter dome which includes a high-resolution, large field-of-view (70 degrees vertical by 150 degrees horizontal) interactive visual display
 - (b) Silicon Graphics Onyx computer image generator drives the SIRE dome display.
 - (c) Auditory displays capable of presenting simulated three-dimensional, externalized sound information
 - (d) Electro-hydraulic control loader system to provide augmented haptic cueing information
- (2) FTTE crewstation
 - (a) Three-dimensional auditory cueing
- (3) Haptic cueing provided by an electro-hydraulic control loader system
- (4) Tactical all-aspect helmet mounted display

15. Visually Coupled Systems Development and Visual Interface Laboratory POC: Dean Kocian, AFRL/HECV

A. Description: The Visually Coupled Systems (VCS) Development and Visual Interface Laboratory deals with human and equipment engineering research involving the relationships between helmet-mounted-display design, component technology improvements, and human operator performance. Visually coupled systems are imaging devices which relay information to and receive feedback (such as eye or head position) from the viewer. Examples of such systems are sighting and targeting mechanisms and helmet-mounted displays, which are devices that integrate position/orientation tracking, optics and imaging devices (such as CRTs or LCDs) and are mounted or integrated onto the flight helmet. The lab focuses on critical system and component tests and human factors experiments to solve the problems of integrating helmet-mounted-display systems with the human visual system and advanced weapons systems. The lab's research results are used to develop new designs or features that satisfy the criteria established through other studies. Currently, the lab seeks to optimize helmet-mounted-display and miniature CRT phosphors, gun designs, and cathodes by investigating binocular vision, resolution, and contrast perception. One of the main efforts of the Visually Coupled Systems Development and Visual Interface Laboratory is improved cathode ray tube design. The lab initiated a program to develop an improved tube design by incorporating an additional grid electrode between the normal acceleration grid and the focus grid. The new grid improves control of the electron beam focus over larger dynamic luminance ranges. A second program of the Visually Coupled Systems Development and Visual Interface Lab investigates conditions under which the human visual system best detects targets. Current models of human contrast perception use estimates of internal noise based on studies of visual detection in external noise. The lab will study human visual performance under extreme display conditions, an area which has not been systematically examined. Extreme display conditions are those that are far from optimum, such as a very small field-of-view, or low contrast and noisy imagery. The lab aims to understand and satisfy users' operational needs through useful and timely research and component technology improvements. Located in Bldg 248A, Room 3006.

B. Equipment/Facilities:

- (1) Wide field-of-view and infinity-focus optical apparatus has been developed specifically for binocular vision research. It is capable of two independent but synchronized stereo presentations with 15 bits of grayscale (0.003% of contrast).
- (2) Custom-built miniature CRT test station using a liquid-cooled CCD-based photometer is capable of testing miniature CRTs to their bandwidth limits (0.1% of modulation) with the same interconnect hardware used in military vehicles.
- (3) Combined optics and image source test facility provides specific high-quality performance testing of design parameters crucial for helmet-mounted-display/visually coupled systems development.

16. Visual Image Evaluation of Windscreens Laboratory POC: Dr Alan Pinkus, AFRL/HECV

A. Description: The Visual Image Evaluation of Windscreens (VIEW) develops optical measurement techniques, equipment and standards for use in the specification, manufacture and quality assurance of aircraft transparencies. The current thickly, laminated plastic windscreens are not as clear as the older glass windscreens, resulting reduced optical quality. The problem is further compounded by modern aerodynamic designs that require complex transparency shapes. The VIEW team actively studies the quantification of transparency optical quality, develops new measurement instrumentation and methodologies, leads in the development of industry standards, and investigates how certain optical qualities affect aircrew visual performance. The facility is equipped to measure all canopy and windscreen optical qualities for a large variety of aircraft including F-4, F-15, F-16, F-18, F-22, F-111, C-130, B-1B, A-7, A-10 and T-38. Major topics of study are: American Society for Testing and Materials Standards for haze and craze testing, infrared transmissivity and night vision goggle performance, limits of binocular disparity and pilot visual fatigue, craze and haze quantification, effect of polycarbonate on weapons system aiming accuracy, and automatic grid line slope measurement. Located in Bldg 248A, Room 3006.

B. Equipment/Facilities:

- (1) Angular deviation measurement system,
- (2) Eight-by-eight foot light box which transilluminates a variety of test patterns
- (3) Extended-range spectrapotometer
- (4) Photometers
- (5) Optical benches with associated optical test fixtures for breadboarding test devices
- (6) Haze testers,
- (7) Photographic equipment
- (8) Lasers.

17. Building 248 Conference Room POC: TSgt Wiley Wells, AFRL/HECA

A. Description: The building 248 conference room provides a state-of-the-art briefing facility for up to 25 people. The facility can be reconfigured to meet a variety of briefing, presentation, or training needs. Located in Bldg 248, Room 201

B. Equipment/Facilities:

- (1) Epson PowerLite 5000 LCD projector
- (2) Macintosh PPC computer
- (3) Pentium MMX computer
- (4) Sony SEN 561 CD sound system
- (5) Crestron integrated controller
- (6) Pictel video conferencing system

18. Building 33 Conference Room POC: TSgt Jeff Kern, AFRL/HECP

A. Description: The building 33 conference room provides a state-of-the-art briefing facility for up to 30 people. The facility can be reconfigured to meet a variety of briefing, presentation, or training needs. Located in Bldg 33, Room 126.

B. Equipment/Facilities:

- (1) Proxima 5100 LCD projector
- (2) Macintosh PPC computer
- (3) Pentium MMX computer
- (4) Sony SEN 561 CD sound system
- (5) Ibid electronic whiteboard
- (6) Crestron integrated controller

19. HEC Computer Network POC: Randy Yates, AFRL/HECA

A. Description: The HEC Computer Network provides the connectivity for the HEC team (the government personnel, the on-site contractors, several off-site personnel, and the HEC laboratories).

B. Configurations

(1) Network: The network covers 4 buildings: 248 (including bridge), 33 (CFH side), 197 and 196. All 4 buildings have identical cable plants. Each building is wired in a star configuration consisting of Category 3 UTP cable (3-pair) and a Cabletron MMAC hub at the center. The twisted pair cabling and Cabletron hubs use 10BaseT Ethernet. Buildings 197, 196 and 33 connect to building 248 using DEC Fiber Optic Ethernet Repeaters. Building 248 connects to building 29 by DEC Fiber Optic Repeaters and a DEC Fiber Optic LAN Bridge.

(2) Servers: All division desktop computers have access to three Novell Netware 4.1 file server. Building 196 users (CSERIAC) have access to a Windows 3.5 NT Server. A Sun Netra server hosts the division's public internet and the private intranet homepages.

(3) Computers: The following personal computers are connected to the network:

- (a) Pentium Class - 56
- (b) 486/66 - 42
- (c) 486/50 - 15
- (d) 486/33 - 40
- (e) Mac Power PC - 25
- (f) Mac 030/040 - 33

(4) Operation Systems:

- (a) Windows 3.X
- (b) Windows 95
- (c) Windows NT
- (d) Novell Netware 4.X
- (e) Solaris 2.X
- (f) Mac OS 7.X
- (g) Mac OS 8.X

(5) E-Mail

- (a) Novell Groupwise 5.2 Approximately 250 users

20. Human Sensory Feedback Laboratory POC: Maj Tim Adam, AFRL/HECP

A. Description: The Human Sensory Feedback Laboratory develops and performs experiments using high-fidelity graphical and dynamic simulations of the interaction between a slave robot and its environment. Various pieces of research equipment with controlling computers and support measurement of human arm motions and performance metrics of the various tasks are interfaced with interactive simulations involving force reflecting joystick controllers, audio systems (such as 3-D audio), and high-fidelity graphics in multi-sensory studies. Located in Bldg 441.

B. Equipment/Facilities:

- (1) Force reflection devices such as the PHANTOM
- (2) Immersion joysticks,
- (3) FREFLEX exoskeleton system
- (4) Pneumatic Muscle System,
- (5) Various tactile devices

Bioacoustic, Noise, and Vibration Laboratories and Facilities**21. Active Noise Reduction Laboratory POC: Lt Col Carolyn Bennett, AFRL/HECB**

A. The ANR conducts research and development in electroacoustic techniques and technology for adjusting and controlling effective acoustic levels in the ear. Located in Bldg 441, Room 1-23.

B. Equipment/ Facilities

- (1) Triple-walled acoustic chamber
- (2) PC computers for controlling measurement procedures
- (3) Database management system
- (4) Various descriptor and analysis software packages
- (5) KEMAR acoustic manikin

22. Auditory Localization Research Facility (ALF) POC: Mr. Richard L. McKinley, AFRL/HECB

A. Description: Auditory Localization Research Facility (ALF) is a unique facility that enables basic and applied research on signal location not possible with any other system. It is used to research binaural hearing, situational awareness, and human auditory localization ability in azimuth, elevation and distance. Subjects positioned inside the sphere identify the locations of auditory targets presented from sources over the entire sphere. Head related transfer functions, which contain the effects of pinnae (ears) on the audio signal to the listener, are recorded for use in the Auditory Localization Cue Synthesizer. ALF is in constant use researching basic human localization questions, facilitation of target acquisition, potential threat reduction, increased situational awareness, audio/visual search, and enhancement of the intelligibility of competing and multiple message communications. Widespread interest in ALF has generated interactions with other agencies that include ARPA, NASA, ARMY, MIT, numerous other universities, and the Veterans Administration. Top auditory scientists visit the ALF facility and conduct unique studies and investigations that are not possible elsewhere. Data collected in ALF have accelerated specific research efforts in combined audio/visual target acquisition. ALF is also used in the understanding of speech reception of complex and multiple competing messages. Located in Bldg 441, Room 1-1.

B. Equipment/ Facilities

- (1) A 4.26 meter diameter geodesic sphere located inside a 6.1 X 6.1 X 6.1 meter anechoic chamber.
- (2) Located inside the sphere, 272 loudspeakers for presenting single or multiple signals either stationary or moving from any location on the sphere. Visual targets are also present at the 272 loudspeaker locations for studies of audio/visual search capability.
- (3) Electro-Acoustics lab located in Bldg 441, Room 1-116.

23. Performance And Communications Research And Technology System POC: Mr. Richard L. McKinley, AFRL/HECB

A. Description: Performance And Communications Research And Technology System (PACRAT) is a dedicated system that emulates all voice communications system, operator, and environmental variables essential to good voice communications. The system is used to measure, analyze, and evaluate all aspects of voice communications systems and their effectiveness under task loading and other disruptive factors. Imbedded techniques allow voice communications to be assessed in terms of factors that include complexity of the task, criticality of the task, and the time required to complete the task. Research continues to enhance procedures that will determine how much communication is necessary to successfully complete tasks. An extensive voice communications database has been maintained for almost two decades containing air and ground communications, male and female speech, key foreign languages, and effects of

various noise environments. The system has been successfully used to measure communications performance of flight helmet systems, microphones, oxygen masks, headphones, digital speech coders and decoders, and new audio technologies of active noise reduction and 3-dimensional audio displays in both general and custom flight scenarios. PACRAT allows manipulations of voice communications systems and components to optimize their operational effectiveness. Special features of PACRAT have enabled successful test and measurement projects in electronic warfare voice communications. An electronic warfare and conventional voice communications effectiveness database are maintained. Located in Bldg 441, Room 1-124.

B. Equipment/ Facilities

- (1) Reverberation chamber (1019 cubic meter)
- (2) Programmable high intensity sound system that creates levels as high as 137 decibels.
- (3) Ten individual operator stations each contain aircraft and high fidelity research intercom systems, performance tasks, aircraft joystick controller, oxygen mask, large color display and multi-function keypad control displays.
- (4) Imbedded software include a Voice Communications Effectiveness Task, a Voice Communications Jamming Model, and performance tasks which measure the effectiveness of total voice communications systems and individual components, including operators.

24. Psychoacoustics Laboratory POC: LTC Carolyn Bennett, AFRL/HECB

A. Description: The Psychoacoustics Lab conducts basic research in signal detection theory, lateralization, distance perception, and speech perception. Located in Bldg 441, Room 1-22.

25. Real Ear Attenuation at Threshold Chamber Facility POC: LTC Carolyn Bennett, AFRL/HECB

A. Description: The Real Ear Attenuation at Threshold (REAT) Chamber Facility is for the non-routine measurement of real - ear attenuation characteristics of personal hearing protective devices. The chamber is constructed to meet or exceed the national standards of ANSI S 12.6 - 1997, *Method for the Measurement of the Real-Ear Attenuation of Hearing Protectors*. Located in Bldg 441, Room 1-20

B. Equipment/ Facilities

- (1) A room within a room using six-inch concrete floor, walls and ceiling separated from the outer structure by a six-inch air gap with entrance of two acoustic sound doors.
- (2) Test apparatus for real ear attenuation measurement includes a noise generator, a third-octave band filter set, calibrated attenuators, an on-off switch, loudspeakers, power amplifiers and head positioning device.
- (3) A microphone and a microphone preamplifier inside the measurement chamber are connected to a microphone amplifier, a digital voltmeter and interfaced with a Compaq 386 PC with color monitor and HP Laserjet printer.
- (4) A subject response button located inside the chamber is connected to a control box outside the chamber.
- (5) A set of 8 Bose four-inch speakers mounted one foot from and facing each corner inside the chamber and a set of two fifteen inch diameter Community Light & Sound speakers mounted facing two adjacent corners at mid-height are connected to two separate channels of an amplifier.
- (6) Two Wilsonics programmable attenuators
- (7) Control box containing a pink noise generator, a third-octave filter set and a pulse generator.
- (8) Video monitor and a talk-over system allowing the experimenter and subject to remain in constant contact.

26. Sound Attenuation Measurement Of Personal Equipment Items (SAMPEI) POC: Mr. Richard L. McKinley, AFRL/HECB

A. Description: Sound Attenuation Measurement Of Personal Equipment Items (SAMPEI) is a dedicated facility that measures the sound attenuation characteristics of personal equipment items that include hearing protectors, headsets, helmets, and personal environmental ensembles. The measurement system utilizes human volunteers and is in full compliance with the American National Standards Institute, Standard S12.6, "Measurement of Real-Ear Attenuation of Hearing Protectors." Data generated by this system are used by hearing conservation personnel to determine the effectiveness of particular personal equipment items in minimizing the adverse effects of high level noise on personnel in hazardous noise environments. Measurements are used to determine whether particular items of equipment provide adequate protection from the exposures of personnel to the noises of specific environments and occupational situations. These data provide insight into the reasons why specific devices are inferior and do not provide acceptable performance for DOD needs. This facility was used to quantify the noise excluding properties of the helmets for the new Army Vehicular Intercommunication System for use in all Army and Marine tracked vehicles. SAMPEI is successfully used in the measurement and evaluation of developmental equipment that include voice communications headsets for aircraft maintenance personnel and for operators of ground vehicles, flight helmet systems in tactical aircraft, chemical defense, and environmental clean-up ensembles, firefighter helmet systems, and a wide range of insert and circumaural hearing protection devices. Located in Bldg 441, Room 1-24.

B. Equipment/ Facilities

- (1) Triple-walled acoustic chamber in which test stimuli are presented to subjects wearing the personal equipment items being evaluated.
- (2) PC computers for controlling measurement procedures eliminates the need for an expert operator. Menu-driven software provides flexible measurements.
- (3) Database management system
- (4) Various descriptor and analysis software packages

27. Speech Communications In Occupational Noise Environments Measurement Facility POC: Mr. Richard L. McKinley, AFRL/HECB

A. Description: Speech Communications In Occupational Noise Environments (SCONE) is a laboratory/clinical facility that is used to measure the ability of an individual to understand speech communications in noise. The noise in which the subject is measured is an accurate spectrum and level emulation of the individual's actual work environment. The basic measure for the assessment is the Modified Rhyme Test. Once the conditions for the individual's test are entered into the computer system, the speech materials are presented and the subject responses are recorded automatically. The subject responds to each individual test item by selecting the response key that corresponds to what the subject believes was heard. The responses are evaluated to indicate the speech communication capability of the subject. SCONE was developed jointly with Aeromedical Consultant Services as an alternative to inflight tests of communications effectiveness of aviators with hearing loss. The noise environments in which the aviators fly are maintained in an embedded database in the measurement system for immediate use. The operator selects the appropriate noise for the subject. Noises not in the database are usually easily measured and entered. The aviators wear their own flight helmets and oxygen masks during the evaluation. Consequently, the facility and measurement procedure provide results that have high validity in showing how the aviator performs in flight. SCONE is a unique facility with essentially unlimited applications for the objective measurement of speech reception in noise. The work place, or any other air or ground noise environment in which people must communicate, can be accurately recreated in the facility. Occupational medicine and hearing conservation personnel experience difficulty determining if an individual with a hearing loss should return to the noisy work environment. Those returned with communications difficulties can be a threat to themselves as well as others. Those prohibited from returning may have satisfactory voice communication. SCONE can provide an objective assessment of the individual's

communications abilities in noise to aid the decision maker. Informed decisions of this nature will reduce risk, increase safety, and enhance mission effectiveness. Located in Bldg 441.

B. Equipment/ Facilities

- (1) A one-person audiometric booth
- (2) High intensity sound system that produces any in-flight or ground noise environment selected by the test administrator
- (3) A fully automated personal computer based system

28. Speech Processing And Neural Network Laboratory (SPNN) POC Dr Raymond Slyh, AFRL/HECA

A. Description: The Speech Processing And Neural Network Laboratory (SPNN) research laboratory is focused on the optimization of the performance of voice technologies, such as automatic speech recognition, in the adverse acoustic and mission elements. Advanced signal processing techniques, various neurophysiological auditory models, neural networks, and speech enhancement tools are employed to increase robustness and accuracy of target systems. The value of auditory models and neural nets as preprocessors for automatic speech recognition and for speaker identification is measured. A voice modification workbench is used to assess the performance of various voice modification methodologies from inside and outside the laboratory. Neural networks have proven successful in the modeling of human localization performance. Microphone array algorithms are used for speech enhancement. Worldwide interest in these efforts has developed interactions with Air Force and DoD agencies, as well as industry. Graduate researchers and scientists are involved from several universities including Cambridge University in England and Bochum University in Germany. Visiting scientists spend their summers working in the SPNN lab on topics of direct interest to the Air Force. One payoff of this research is the development of audio signal processing algorithms that are more robust in adverse environments and across multiple talkers. The SPNN laboratory has developed and routinely uses measurement methodologies, databases, workbenches, and enhancements to interactive voice interfaces including voice response, voice warning, automatic speech recognition, and speech of stressed communicators in response to existing and anticipated Air Force needs. Located in Bldg 441, Room 0-102.

B. Equipment/ Facilities

- (1) Two SUN SPARC 10 high performance work stations
 - (2) Seven SUN SPARC 2 high performance work stations
 - (3) A Hidden Markov model tool kit for speech recognition
 - (4) Extensive software sets for signal analyses, classification, and neural network
 - (5) Multiple digital signal processing chips are used for computational-intensive algorithms.
- Several different models of the human peripheral auditory system

29. Voice Communication Research And Evaluation System (VOCRES) POC: Mr. Richard L. McKinley, AFRL/HECB

A. Description: Voice Communication Research And Evaluation System (VOCRES) is a research facility dedicated to the measurement of voice communications effectiveness of operators, components, and systems under emulated operational conditions. Evaluations and analyses are made using the primary metrics of speech intelligibility, reaction time, and operator confidence. Special analyses are also accomplished of digital speech and of jammed voice communications. The system is used to measure, analyze, and evaluate all aspects of voice communications systems and their effects on speech intelligibility. The overall goal is to optimize speech communications in all operational environments. Research also includes encrypted speech. VOCRES has been in daily operation for almost two decades. A substantial database has been maintained that includes air and ground communications, male and female speech, performance of normal and non-normal hearing subjects, and speech degraded by various factors, including high level noise. Successful programs in VOCRES have

developed unique voice jammers, active noise reduction headsets, 3-dimensional audio enhancement of speech reception, novel microphones, a speech communications jamming model, and exploited foreign communication material. Data collected in VOCRES have proven to be accurate estimates of speech intelligibility performance in a wide range of operational situations. Located in Bldg 441, Room 0-1.

B. Equipment/ Facilities

- (1) Large reverberation chamber
- (2) Programmable high intensity sound system that creates sound pressure levels of over 130 dB.

Almost any operational noise environment can be emulated.

(3) Ten individual communications stations comprise the heart of the system with each containing an oxygen mask, flight helmet, headset, visual display, and subject response keypads. They also contain an aircraft intercom and a high fidelity research intercom system.

- (4) An electronic warfare "hot bench"
- (5) Digital speech coders
- (6) Vocoders

30. Single Axis Servo Hydraulic Vibration Facility POC: Dr. Suzanne Smith, AFRL/HECB

A. Description: The Single Axis Servo Hydraulic Vibration Facility is a dedicated facility for measuring the effects of vertical vibration on the operator, and their task effectiveness. The system is designed especially for human testing with the capability of setting limits for several parameters including analog input signals, the actuator differential pressure, and the table displacement. The system can be set to 'indicate' that a preset limit has been exceeded, 'trip' or cause the motion of the table to stop, and 'shut' which causes the removal of hydraulic power from the table. The single-axis electrodynamic facility is capable of achieving a higher payload as compared to the electrodynamic facility, and is therefore suited for evaluating the coupling effects of heavier equipment, such as seating systems, on human biodynamic response and visual performance. The facility has recently been upgraded and manrating is anticipated to be completed by Spring, 1998. Located in Bldg 824.

B. Equipment/ Facilities

- (1) Single axis, electro-hydraulic system capable of generating vertical motion in the frequency range of DC to 40 Hz. The system has a double amplitude of 15 cm and force limit of 40 kilonewtons (kN). The system can reach an acceleration level of approximately 4 g peak (39 meters/sec²). Vibration table measures 90 cm X 90 cm and has a maximum payload of 4 kilonewtons (kN).
- (2) Pressure relief valves that limit the acceleration capability of the actuator.
- (3) Automatic shutdown system (ASDS) which automatically ramps the table to zero if any present parameter limits are exceeded. The parameters can include acceleration and velocity depending on the transducer selected to monitor the table activity.
- (4) The signal generation capable of generating a variety of waveforms including sinusoidal, sum-of-sines, and random signatures through menu-driven software.
- (5) The data acquisition system can collect data at a maximum sampling rate of 100 kHz depending on the number of active channels. The system is currently configured to simultaneously collect up to 32 channels of data.

31. Six Degree Of Freedom Vibration Facility POC: Dr. Suzanne Smith, AFRL/HECB

A. Description: The Six Degree Of Freedom Vibration Facility (SIXMODE) is a manrated, state-of-the-art, six degree-of-freedom vibration simulator capable of single- and combined-axis vibrations in the three translational directions (X, Y, and Z) and in the three angular directions (Roll, Pitch, and Yaw). The SIXMODE is specifically designed for human testing and includes extensive safety features and shutdown mechanisms. Safety limits can be set for such parameters as velocity, table displacement, or acceleration; actuator acceleration, displacement, or differential pressure, and specified analog inputs. The system can

be set to 'indicate', 'trip', or 'shut' when a particular limit has been exceeded. 'Indicate' notifies the operator that the limit has been exceeded, 'trip' stops the motion of the table, and 'shut' completely removes hydraulic power from the table. The SIXMODE is capable of producing a wide variety of accelerations and waveforms in the single and combined axes and has the capability for evaluating a variety of human and human surrogate responses in complex vibratory environments including biodynamic, performance, comfort, and health effects. Specifically, the SIXMODE is ideal for assessing the performance of seating systems, helmet-mounted systems, and other equipment used in the operational vibration environment. Located in Bldg 824.

B. Equipment/ Facilities

(1) Servo-hydraulic system capable of a double amplitude of 15 cm and operates in the frequency range of DC to 40 Hz with a peak linear acceleration of 4 g peak (39 meters/sec²) at 4 Hz and above. The maximum payload is 5.3 kilonewtons (kN). The maximum angular acceleration used for humans is 15 rad/sec².

(2) Vibration table with dimensions of 183 cm X 183 cm.

(3) Signal generation software designed to reproduce the vibration histories recorded on aerospace and ground vehicles for simulating environmental conditions in the laboratory.

(4) Data acquisition system can collect 32 channels of data at a maximum sampling rate of 50 kHz per channel.

(5) Three manual shutdown switches located at the table, control room, and pump room.

(6) Pressure relief valves for each actuator that physically limit the acceleration capability of the actuator. Two valves limit pressure buildup in the snubber regions located at the extreme ends of the actuator, and two valves limit the maximum differential pressure buildup across the piston.

32. Unholtz-Dickie Electrodynamic Single Axis Vibration Facility POC: Dr. Suzanne Smith

A. The Unholtz-Dickie Electrodynamic Single Axis Vibration Facility is a dedicated, manrated facility for measuring effects of vertical vibration on the operator, and task effectiveness. Given the limited payload of the platform, the facility is primarily used to evaluate human body resonance behavior and visual performance. The facility is specifically capable of assessing the effects of seat cushions/materials and helmet-mounted systems on human biodynamic response and visual performance. Located in Bldg 824.

B. Equipment/ Facilities, AFRL/HECB

(1) Unholtz-Dickie Type 250D-56 vibration exciter capable of generating vertical motion in the frequency range of DC to 5000 Hz. The relatively small exciter is made usable for human testing by employing a specially designed platform and rigid chair assembly. The assembly is support by four floor-mounted outrigger posts each fitted with special purpose air bags as the primary support members. The air bags are used to offset the static structural weight and have a constant force response allowing for good waveform generation. The platform has a maximum double amplitude of 3.8 centimeters (cm) and force limit of approximately 7 kilonewtons (kN). The maximum payload is 1.1 kilonewtons (kN).

(2) Automatic shutdown system (ASDS), specially designed to ramp the forcing function up to full power during normal operation, and will also automatically ramp it down to zero power if any of the preset parameter limits are exceeded. The preset ASDS parameters can be selected from a number of functions such as acceleration, velocity, or other transducer equipment. System position and thermal limits are also used with the ASDS for maximum safety.

(3) Signal generator capable of generating a variety of waveforms including sinusoidal, sum-of-sines, and random signatures through menu-driven software.

(4) Data acquisition system that can collect data at a maximum sampling rate of 100 kHz depending on the number of active channels. The system is currently configured to simultaneously collect up to 32 channels of data.