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Subject:

F33657-98-R-2033

FOIA Control Number: 03-166LK

Date Reproduced: 2/26/03

CLIN STRUCTURE
(contract)

CONTRACT FILES

SOLICITATION/CONTRACT/ORDER FOR COMMERCIAL ITEMS

OFFEROR TO COMPLETE BLOCKS 12, 17, 23, 24, & 30

1. REQUISITION NUMBER

PAGE 1 OF 75

2. CONTRACT NO. F33657-99-D-2025

3. AWARD/EFFECTIVE DATE JUN 11 1999

4. ORDER NUMBER

5. SOLICITATION NUMBER F33657-98-R-2033

6. SOLICITATION ISSUE DATE 01/28/99

7. FOR SOLICITATION INFORMATION CALL: a. NAME JERRY C. PETERANGELO

b. TELEPHONE NUMBER (No collect calls) (923) 255-9950

8. OFFER DUE DATE/ LOCAL TIME 04/28/99

9. ISSUED BY CODE FA8621

USAF/AFMC
HQ AERONAUTICAL SYSTEMS CENTER
2240 B STREET ROOM 231
WRIGHT-PATTERSON AFB OH 45433-7111
DAVID C. GOETZ (937) 255-7388 X266

DAVID.GOETZ@ASC-YW.WPAFB.AF.MIL

10. THIS ACQUISITION IS
- [x] UNRESTRICTED
- [ ] SET ASIDE % FOR
  - [ ] SMALL BUSINESS
  - [ ] SMALL DISAV. BUSINESS
  - [ ] 8(A)

SIC: 8299

SIZE STANDARD: $18.5M

11. DELIVERY FOR FOB DESTINATION UNLESS BLOCK IS MARKED
- [ ] SEE SCHEDULE

12. DISCOUNT TERMS Net 30

- [x] 13a. THIS CONTRACT IS A RATED ORDER UNDER DPASS (15 CFR 700)

13b. RATING DO-C9

14. METHOD OF SOLICITATION
- [ ] RFQ
- [ ] IFB
- [x] RFP

15. DELIVER TO CODE

SEE SCHEDULE

MAILING DATE JUN 11 1999

16. ADMINISTERED CODE S3605A

DCMC DAYTON – GYO1
BUILDING 30 AREA C
1725 VAN PATTON DRIVE
WRIGHT-PATTERSON AFB OH 45433-5309

SDC: C PAS: (NONE)

17a. CONTRACTOR/ OFFEROR CODE 4X260 FACILITY CODE 25500

LOCKHEED MARTIN INTEGRATED SYSTEMS, INC.
6801 ROCKLEDGE DRIVE
BETHESDA, MD 20817-1803
TELEPHONE NO. (330) 796-3967 (A. BARBER)

- [x] 17b. CHECK IF REMITTANCE IS DIFFERENT AND PUT SUCH ADDRESS IN OFFER

18a. PAYMENT WILL BE MADE BY SC1018

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

18b. SUBMIT INVOICES TO ADDRESS SHOWN IN BLOCK 18a. UNLESS BLOCK BELOW IS CHECKED
- [ ] SEE ADDENDUM

19. ITEM NO.	20. SCHEDULE OF SUPPLIES/SERVICES	21. QUANTITY	22. UNIT	23. UNIT PRICE	24. AMOUNT
	SEE SCHEDULE (Attach Additional Sheets as Necessary)			SEE CONTRACT ATTACHMENT 6	SEE CONTRACT ATTACHMENT 6

25. ACCOUNTING AND APPROPRIATION DATA SEE DELIVERY ORDER

26. TOTAL AWARD AMOUNT (For Govt. Use Only) $0.00

- [ ] 27a. SOLICITATION INCORPORATES BY REFERENCE FAR 52.212-1, 52.212-4, FAR 52.212-3 AND 52.212-5 ARE ATTACHED [ ] ARE [ ] ARE NOT ATTACHED
- [x] 27b. CONTRACT/PURCHASE ORDER INCORPORATES BY REFERENCE FAR 52.212-4. FAR IS ATTACHED. ADDENDA [x] ARE [ ] ARE NOT ATTACHED

28. CONTRACTOR IS REQUIRED TO SIGN THIS DOCUMENT AND RETURN 1 COPIES
- [x] TO ISSUING OFFICE. CONTRACTOR AGREES TO FURNISH AND DELIVER ALL ITEMS SET FORTH OR OTHERWISE IDENTIFIED ABOVE AND ON ANY ADDITIONAL SHEETS SUBJECT TO THE TERMS AND CONDITIONS SPECIFIED HEREIN.

29. AWARD OF CONTRACT: REFERENCE _____ OFFER
- [ ] DATED _____. YOUR OFFER ON SOLICITATION (BLOCK 5), INCLUDING ADDITIONS OR CHANGES WHICH ARE SET FORTH HEREIN, IS ACCEPTED AS TO ITEMS

30a. SIGNATURE OF OFFEROR/CONTRACTOR Richard J. Masi

31a. UNITED STATES OF AMERICA (SIGNATURE OF CONTRACTING OFFICER) Jerry C. Peterangelo

30b. NAME AND TITLE OF SIGNER RICHARD J. MASI, PRESIDENT

30c. DATE SIGNED 28 APRIL 1999

31b. NAME OF CONTRACTING OFFICER JERRY C. PETERANGELO

31c. DATE SIGNED 11 June 1999

32a. QUANTITY IN COLUMN 21 HAS BEEN
- [ ] RECEIVED
- [ ] INSPECTED
- [ ] ACCEPTED, AND CONFORMS TO THE CONTRACT, EXCEPT AS NOTED

32b. SIGNATURE OF AUTHORIZED GOVT. REPRESENTATIVE

32c. DATE

33. SHIP NUMBER PARTIAL FINAL

VOUCHER NUMBER

35. AMOUNT VERIFIED CORRECT FOR

36. PAYMENT
- [ ] COMPLETE
- [ ] PARTIAL
- [ ] FINAL

37. CHECK NUMBER

38. S/R ACCOUNT NUMBER

39. S/R VOUCHER NUMBER

40. PAID BY

41a. I CERTIFY THIS ACCOUNT IS CORRECT AND PROPER FOR PAYMENT

41b. SIGNATURE AND TITLE OF CERTIFYING OFFICER

41c. DATE

42a. RECEIVED BY (Print)

42b. RECEIVED AT (Location)

42c. DATE REC'D (YY/MM/DD)

42d. TOTAL CONTAINERS

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
0001			

TRAINING CAPABILITY REQUIREMENTS ASSESSMENTS (TCRA)

security: U
descriptive data:
THE CONTRACTOR SHALL CONDUCT A TRAINING CAPABILITY REQUIREMENTS ASSESSMENT (TCRA) IN ACCORDANCE WITH THE FOLLOWING SubCLINs.

0001AA

TCRA # 1 See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL CONDUCT TRAINING CAPABILITY REQUIREMENTS ASSESSMENTS (TCRA) #1. THE RESULTS OF TCRA #1 SHALL BE PRESENTED AT THE CONTRACTORS FACILITY. SERVICES ORDERED AGAINST THIS SubCLIN SHALL BE CONSIDERED COMPLETED IN ACCORDANCE WITH THE EXIT CRITERIA FOR THE TCRA #1 LISTED IN THE INTEGRATED MASTER PLAN (IMP) AND THE STATEMENT OF WORK (SOW) PARAGRAPHS 1.2 AND 3.7.1, BOTH ATTACHED TO THE CONTRACT.

0001AB

TCRA # 2 See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL CONDUCT TRAINING CAPABILITY REQUIREMENTS ASSESSMENTS (TCRA) #2. THE RESULTS OF TCRA #2 SHALL BE PRESENTED AT THE CONTRACTORS FACILITY. SERVICES ORDERED AGAINST THIS SubCLIN SHALL BE CONSIDERED COMPLETED IN ACCORDANCE WITH THE EXIT CRITERIA FOR THE TCRA #2 LISTED IN THE INTEGRATED MASTER PLAN (IMP) AND THE STATEMENT OF WORK (SOW) PARAGRAPHS 1.2 AND 3.7.1, BOTH ATTACHED TO THE CONTRACT.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
0001AC			
	TCRA # 3		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL CONDUCT TRAINING CAPABILITY REQUIREMENTS ASSESSMENTS (TCRA) #3. THE RESULTS OF TCRA #3 SHALL BE PRESENTED AT THE CONTRACTORS FACILITY. SERVICES ORDERED AGAINST THIS SubCLIN SHALL BE CONSIDERED COMPLETED IN ACCORDANCE WITH THE EXIT CRITERIA FOR THE TCRA #3 LISTED IN THE INTEGRATED MASTER PLAN (IMP) AND THE STATEMENT OF WORK (SOW) PARAGRAPHS 1.2 AND 3.7.1, BOTH ATTACHED TO THE CONTRACT.

0002			
	TRAINING CAPABILITY ASSESSMENT (TCA)		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE THE SERVICES THAT ALLOW THE GOVERNMENT TO PERFORM TCAs TO VALIDATE TRAINING REQUIREMENTS. TCA's SHALL TAKE PLACE AT THE CONTRACTORS FACILITY. TCA's MUST BE COMPLETED PRIOR TO THE START OF SIMULATION CERTIFICATION. SERVICES ORDERED AGAINST THIS SubCLIN SHALL BE CONSIDERED COMPLETED IN ACCORDANCE WITH SOW PARAGRAPHS 3.0.5.6 AND 4.1, ATTACHED TO THE CONTRACT.

0003

SIMULATION CERTIFICATION

security: U
descriptive data:
THE CONTRACTOR SHALL HAVE THE COMPLETE SYSTEM AVAILABLE FOR SIMULATION CERTIFICATION PRIOR TO THE START OF SERVICE, IAW THE FOLLOWING SubCLINS.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
0003AA			
	SIMULATION CERTIFICATION # 1		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL HAVE THE F-16 BLOCK 50 LEVEL B SIMULATION SERVICE AVAILABLE FOR SIMULATION SERVICE AVAILABLE FOR SIMULATION CERTIFICATION PRIOR TO THE START OF SERVICE, IAW THE DOCUMENTS INCORPORATED HEREIN. SERVICES ORDERED AGAINST THIS SubCLIN SHALL BE CONSIDERED COMPLETED IN ACCORDANCE WITH THE SOW PARAGRAPHS 3.9.6 and 4.3, ATTACHED TO THE CONTRACT.

0003AB			
	SIMULATION CERTIFICATION # 2		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL HAVE THE F-16 BLOCK 50 LEVEL C SIMULATION SERVICE AVAILABLE FOR SIMULATION CERTIFICATION PRIOR TO THE START OF SERVICE, IAW THE DOCUMENTS INCORPORATED HEREIN. SERVICES ORDERED AGAINST THIS SubCLIN SHALL BE CONSIDERED COMPLETED IN ACCORDANCE WITH THE SOW PARAGRAPHS 3.9.6 and 4.3, ATTACHED TO THE CONTRACT.

0004			
	DATA		NSP

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE DATA FOR THE F-16 Block 40/50 MTC SIMULATION TRAINING SERVICE, IAW THE DOCUMENTS INCORPORATED HEREIN AND LISTED IN EXHIBIT A.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
0005			
	UPGRADE EVALUATION		TBD

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE UPGRADE EVALUATION AND INTEGRATION CAPABILITY FOR THE F-16 BLOCK 40/50 MTC. THE F-16 MTC AT SHAW AFB WILL BE AVAILABLE FOR CONTRACTOR USE DURING EVALUATION OR INTEGRATION TASKS ON A TRAINING SERVICE NON-INTERFERENCE BASIS. SEE PROVISION A-003 MTC UPGRADE.

0006			
	SIMULATION AVAILABILITY - SHAW AFB		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 50 LEVEL A SIMULATION SERVICE AT SHAW AFB, IAW THE DOCUMENTS INCORPORATED HEREIN.

0007			
	SIMULATION AVAILABILTY - SHAW AFB		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 50 LEVEL B SIMULATION SERVICE AT SHAW AFB, IAW THE DOCUMENTS INCORPORATED HEREIN, WITH SERVICES NOT TO START EARLIER THAN AUG 2001.

0008			
	SERVICE AVAILABILITY - SHAW AFB		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 50 LEVEL C SIMULATION SERVICE AT SHAW AFB, IAW THE DOCUMENTS INCORPORATED HEREIN, WITH SERVICES NOT TO START EARLIER THAN AUG 2001.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
0009			
	SIMULATION SURGE - SHAW AFB		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 50 LEVEL C MTC SURGE CAPABILITY TRAINING SERVICE AVAILABILITY AT SHAW AFB, IAW THE DOCUMENTS INCORPORATED HEREIN.

0010			
	SITE SURVEY AND PREPARATION - SHAW AFB		See Attachment 6

security: U
descriptive data:
THE CONTRACTOR SHALL CONDUCT A SITE SURVEY AND PERFORM NECESSARY PREPARATION AT SHAW AFB, AS NEEDED TO ACCOMPLISH THE EFFORT REQUIRED BY THE DOCUMENTS INCORPORATED HEREIN.

0010AA			
	SITE SURVEY #1		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL CONDUCT A SITE SURVEY AT AND PREPARE A SITE REQUIREMENTS REPORT FOR SHAW AFB AS NEEDED. SERVICES ORDERED AGAINST THIS SubCLIN SHALL BE CONSIDERED COMPLETED IN ACCORDANCE WITH THE STATEMENT OF WORK PARAGRAPH 3.7.2, ATTACHED TO THE CONTRACT.

0010AB			
	SITE SURVEY AND PREPARATION # 2		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL CONDUCT A PREINSTALLATION SITE SURVEY TO VERIFY FACILITY MODIFICATIONS ARE DONE CORRECTLY AND PREPARE A FINAL FACILITY REPORT AND DETAILED INSTALLATION SCHEDULE AT SHAW AFB. SERVICES ORDERED AGAINST THIS subCLIN SHALL BE CONSIDERED COMPLETED IN ACCORDANCE WITH THE STATEMENT OF WORK PARA. 3.7.3, ATTACHED TO THE CONTRACT.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
0010AC			
	SITE SURVEY AND PREPARATION #3 - SHAW AFB		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL CONDUCT A PREINSTALLATION SITE SURVEY FOR THE F-16 BLOCK 50 LEVEL C SIMULATION SERVICES TO VERIFY FACILITY MODIFICATIONS ARE DONE CORRECTLY AND PREPARE A FINAL FACILITY REPORT AND DETAILED INSTALLATION SCHEDULE. SERVICES ORDERED AGAINST THIS subCLIN SHALL BE BE CONSIDERED COMPLETED IN ACCORDANCE WITH THE STATEMENT OF WORK PARA. 3.7.3, ATTACHED TO THE CONTRACT.

0011			
	SIMULATION AVAILABILITY - MOUNTAIN HOME AFB		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 50 LEVEL A SIMULATION SERVICE AT MOUNTAIN HOME AFB, IAW THE DOCUMENTS INCORPORATED HEREIN.

0012			
	SIMULATION AVAILABILITY - MOUNTAIN HOME AFB		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 50 LEVEL B SIMULATION SERVICE AT MOUNTAIN HOME AFB, IAW THE DOCUMENTS INCORPORATED HEREIN.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
0013			
	SIMULATION AVAILABILITY - MOUNTAIN HOME AFB		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 50 LEVEL C SIMULATION SERVICE AT MOUNTAIN HOME AFB, IAW THE DOCUMENTS INCORPORATED HEREIN.

0014			
	SIMULATION SURGE - MOUNTAIN HOME AFB		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 50 LEVEL C MTC SURGE CAPABILITY TRAINING SERVICE AVAILABILITY AT MOUNTAIN HOME AFB, IAW THE DOCUMENTS INCORPORATED HEREIN.

0015			
	SITE SURVEY AND PREPARATION - MOUNTAIN HOME AFB		See Attachment 6

security: U
descriptive data:
THE CONTRACTOR SHALL CONDUCT A SITE SURVEY AND PERFORM NECESSARY PREPARATION AT MOUNTAIN HOME AFB, AS NEEDED TO ACCOMPLISH THE EFFORT REQUIRED BY THE DOCUMENTS INCORPORATED HEREIN

0015AA			
	SITE SURVEY AND PREPARATION # 1 - MOUNTAIN HOME AFB		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL CONDUCT A SITE SURVEY AT AND PREPARE A SITE REQUIREMENTS REPORT FOR MOUNTAIN HOME AFB AS NEEDED. SERVICES ORDERED AGAINST THIS SubCLIN SHALL BE CONSIDERED COMPLETED IN ACCORDANCE WITH THE STATEMENT OF WORK PARAGRAPH 3.7.2, ATTACHED TO THE CONTRACT.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
0015AB			
	SITE SURVEY AND PREPARATION # 2 - MOUNTAIN HOME		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL CONDUCT A PREINSTALLATION SITE SURVEY FOR THE F-16 BLOCK 50 LEVEL B SIMULATION SERVICE TO VERIFY FACILITY MODIFICATIONS ARE DONE CORRECTLY AND PREPARE A FINAL FACILITY REPORT AND DETAILED INSTALLATION SCHEDULE. SERVICES ORDERED AGAINST THIS SubCLIN SHALL BE CONSIDERED COMPLETED IN ACCORDANCE WITH THE STATEMENT OF WORK PARA. 3.7.3, ATTACHED TO THE CONTRACT.

0015AC

SITE SURVEY AND PREPARATION #3 - MOUNTAIN HOME AFB — See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL CONDUCT A PREINSTALLATION SITE SURVEY FOR THE F-16 BLOCK 50 LEVEL C SIMULATION SERVICES TO VERIFY FACILITY ARE DONE CORRECTLY AND PREPARE A FINAL FACILITY REPORT AND DETAILED INSTALLATION SCHEDULE. SERVICES ORDERED AGAINST THIS SubCLIN SHALL BE CONSIDERED COMPLETED IN ACCORDANCE WITH THE STATEMENT OF WORK PARA. 3.7.3, ATTACHED TO THE CONTRACT.

0016

SIMULATION AVAILABILITY - EGLIN AFB — See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 50 LEVEL A SIMULATION SERVICE AT EGLIN AFB, IAW THE DOCUMENTS INCORPORATED HEREIN.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
0017			
	SIMULATION AVAILABILITY - EGLIN AFB		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 50 LEVEL B SIMULATION SERVICE AT EGLIN AFB, IAW THE DOCUMENTS INCORPORATED HEREIN.

0018			
	SIMULATION AVAILABILITY - EGLIN AFB		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 50 LEVEL C SIMULATION SERVICE AT EGLIN AFB, IAW THE DOCUMENTS INCORPORATED HEREIN.

0019			
	SIMULATION SURGE - EGLIN AFB		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 50 LEVEL C MTC SURGE CAPABILITY TRAINING SERVICE AVAILABILITY AT EGLIN AFB, IAW THE DOCUMENTS INCORPORATED HEREIN.

0020			
	SITE SURVEY AND PREPARATION - EGLIN AFB		See Attachment 6

security: U
descriptive data:
THE CONTRACTOR SHALL CONDUCT A SITE SURVEY AND PERFORM NECESSARY PREPARATION AT EGLIN AFB, AS NEEDED TO ACCOMPLISH THE EFFORT REQUIRED BY THE DOCUMENTS INCORPORATED HEREIN.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
0020AA			
	SITE SURVEY AND PREPARATION # 1 - EGLIN AFB		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL CONDUCT A SITE SURVEY AT AND PREPARE A SITE SURVEY REPORT FOR EGLIN AFB AS NEEDED. SERVICES ORDERED AGAINST THIS SubCLIN SHALL BE CONSIDERED COMPLETED IN ACCORDANCE WITH THE STATEMENT OF WORK 3.7.2, ATTACHED TO THE CONTRACT.

0020AB			
	SITE SURVEY AND PREPARATION # 2		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL CONDUCT A PREINSTALLATION SITE SURVEY TO VERIFY FACILITY MODIFICATIONS ARE DONE CORRECTLY AND PREPARE A FINAL FACILITY REPORT AND DETAILED INSTALLATION SCHEDULE AT EGLIN AFB. SERVICES ORDERED AGAINST THIS SubCLIN SHALL BE CONSIDERED COMPLETED IN ACCORDANCE WITH PARA 3.7.3 OF THE STATEMENT OF WORK, ATTACHED TO THE CONTRACT.

0021			
	SIMULATION AVAILABILITY - HILL AFB		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 40 LEVEL A SIMULATION SERVICE AT HILL AFB, IAW THE DOCUMENTS INCORPORATED HEREIN.

0022			
	SIMULATION AVAILABILITY - HILL AFB		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 40 LEVEL B SIMULATION SERVICE AT HILL AFB, IAW THE DOCUMENTS INCORPORATED HEREIN.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
0023			
	SIMULATION AVAILABILITY - HILL AFB		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 40 LEVEL C SIMULATION SERVICE AT HILL AFB, IAW THE DOCUMENTS INCORPORATED HEREIN.

0024			
	SIMULATION SURGE - HILL AFB		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 40 LEVEL C MTC SURGE CAPABILITY TRAINING SERVICE AVAILABILITY AT HILL AFB, IAW THE DOCUMENTS INCORPORATED HEREIN.

0025			
	SITE SURVEY AND PREPARATION - HILL AFB		See Attachment 6

security: U
descriptive data:
THE CONTRACTOR SHALL CONDUCT A SITE SURVEY AND PERFORM NECESSARY PREPARATION AT HILL AFB, AS NEEDED TO ACCOMPLISH THE EFFORT REQUIRED BY THE DOCUMENTS INCORPORATED HEREIN.

0025AA			
	SITE SURVEY AND PREPARATION #1 - HILL AFB		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL CONDUCT A SITE SURVEY AT AND PREPARE A SITE SURVEY REPORT FOR HILL AFB AS NEEDED. SERVICES ORDERED AGAINST THIS SubCLIN SHALL BE CONSIDERED COMPLETED IN ACCORDANCE WITH THE STATEMENT OF WORK 3.7.2, ATTACHED TO THE CONTRACT.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
0025AB			
	SITE SURVEY AND PREPARATION #2 - HILL AFB		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL CONDUCT A PREINSTALLATION SITE SURVEY TO VERIFY FACILITY MODIFICATIONS ARE DONE CORRECTLY AND PREPARE A FINAL FACILITY REPORT AND DETAILED INSTALLATION SCHEDULE AT HILL AFB. SERVICES ORDERED AGAINST THIS SubCLIN SHALL BE CONSIDERED COMPLETED IN ACCORDANCE WITH PARA 3.7.3 OF THE STATEMENT OF WORK, ATTACHED TO THE CONTRACT.

0026 See Attachment 6

SIMULATION AVAILABILITY - MOODY AFB

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 40 LEVEL A SIMULATION SERVICE AT MOODY AFB, IAW THE DOCUMENTS INCORPORATED HEREIN.

0027

SIMULATION AVAILABILITY - MOODY AFB See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 40 LEVEL B SIMULATION SERVICE AT MOODY AFB, IAW THE DOCUMENTS INCORPORATED HEREIN.

0028

SIMULATION AVAILABILITY - MOODY AFB See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 40 LEVEL C MTC SIMULATION SERVICE AT MOODY AFB, IAW THE DOCUMENTS INCORPORATED HEREIN.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
0029			
	SIMULATION SURGE - MOODY AFB		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 40 LEVEL C MTC SURGE CAPABILITY TRAINING SERVICE AVAILABILITY AT MOODY AFB, IAW THE DOCUMENTS INCORPORATED HEREIN.

0030			
	SITE SURVEY AND PREPARATION - MOODY AFB		See Attachment 6

security: U
descriptive data:
THE CONTRACTOR SHALL CONDUCT A SITE SURVEY AND PERFORM NECESSARY PREPARATION AT MOODY AFB, AS NEEDED TO ACCOMPLISH THE EFFORT REQUIRED BY THE DOCUMENTS INCORPORATED HEREIN.

0030AA			
	SITE SURVEY AND PREPARATION #1 - MOODY AFB		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL CONDUCT A SITE SURVEY AT AND PREPARE A SITE REQUIREMENTS REPORT FOR MOODY AFB AS NEEDED. SERVICES ORDERED AGAINST THIS SubCLIN SHALL BE CONSIDERED COMPLETED IN ACCORDANCE WITH PARAGRAPH 3.7.2 OF THE STATEMENT OF WORK, ATTACHED TO THE CONTRACT.

0030AB			
	SITE SURVEY AND PREPARATION #2 - MOODY AFB		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL CONDUCT A PREINSTALLATION SITE SURVEY TO VERIFY FACILITY MODIFICATIONS ARE DONE CORRECTLY AND PREPARE A FINAL FACILITY REPORT AND DETAILED INSTALLATION SCHEDULE AT MOODY AFB. SERVICES ORDERED AGAINST THIS SubCLIN SHALL BE CONSIDERED COMPLETED IN ACCORDANCE WITH PARA 3.7.3 OF THE STATEMENT OF WORK, ATTACHED TO THE CONTRACT.

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

0031

RESERVED

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
Reserved.

0032

SIMULATION AVAILABLITY - NELLIS AFB — See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 40/50 LEVEL A SIMULATION SERVICE AT NELLIS AFB, IAW THE DOCUMENTS INCORPORATED HEREIN.

0033

SIMULATION AVAILABILITY - NELLIS AFB — See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 40/50 LEVEL B SIMULATION SERVICE AT NELLIS AFB, IAW THE DOCUMENTS INCORPORATED HEREIN.

0034

SIMULATION AVAILABILITY - NELLIS AFB — See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 40/50 LEVEL C SIMULATION SERVICE AT NELLIS AFB, IAW THE DOCUMENTS INCORPORATED HEREIN.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
0035			
	SIMULATION SURGE - NELLIS AFB		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 40/50 LEVEL C MTC SURGE CAPABILITY TRAINING SERVICE AVAILABILITY AT NELLIS AFB, IAW THE DOCUMENTS INCORPORATED HEREIN.

0036			
	SITE SURVEY AND PREPARATION - NELLIS AFB		See Attachment 6

security: U
descriptive data:
THE CONTRACTOR SHALL CONDUCT A SITE SURVEY AND PERFORM NECESSARY PREPARATION AT NELLIS AFB, AS NEEDED TO ACCOMPLISH THE EFFORT REQUIRED BY THE DOCUMENTS INCORPORATED HEREIN.

0036AA			
	SITE SURVEY AND PREPARATION #1 - NELLIS AFB		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL CONDUCT A SITE SURVEY AT AND PREPARE A SITE REQUIREMENTS REPORT FOR NELLIS AFB AS NEEDED. SERVICES ORDERED AGAINST THIS SubCLIN SHALL BE CONSIDERED COMPLETED IN ACCORDANCE WITH PARAGRAPH 3.7.2 OF THE STATEMENT OF WORK, ATTACHED TO THE CONTRACT.

0036AB			
	SITE SURVEY AND PREPARATION #2 - NELLIS AFB		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL CONDUCT A PREINSTALLATION SITE SURVEY TO VERIFY FACILITY MODIFICATIONS ARE DONE CORRECTLY AND PREPARE A FINAL FACILITY REPORT AND DETAILED INSTALLATION SCHEDULE AT NELLIS AFB. SERVICES ORDERED AGAINST THIS SubCLIN SHALL BE CONSIDERED COMPLETED IN ACCORDANCE WITH PARA 3.7.3 OF THE STATEMENT OF WORK, ATTACHED TO THE CONTRACT.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
0037			
	SIMULATION AVAILABILITY - EIELSON AFB, PACAF		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 40 LEVEL A SIMULATION SERVICE AT EIELSON AFB, IAW THE DOCUMENTS INCORPORATED HEREIN.

0038			
	SIMULATION AVAILABILITY - EIELSON AFB, PACAF		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 40 LEVEL B SIMULATION SERVICE AT EIELSON AFB, IAW THE DOCUMENTS INCORPORATED HEREIN.

0039			
	SIMULATION AVAILABILITY - EIELSON AFB, PACAF		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 40 LEVEL C SIMULATION SERVICE AT EIELSON AFB, IAW THE DOCUMENTS INCORPORATED HEREIN.

0040			
	SIMULATION SURGE - EIELSON AFB, PACAF		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 40 LEVEL C MTC SURGE CAPABILITY TRAINING SERVICE AVAILABILITY AT EIELSON AFB, IAW THE DOCUMENTS INCORPORATED HEREIN.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
0041			
	SITE SURVEY AND PREPRATION - EIELSON AFB, PACAF		See Attachment 6

security: U
descriptive data:
THE CONTRACTOR SHALL CONDUCT A SITE SURVEY AND PERFORM NECESSARY PREPARATION AT EIELSON AFB, AS NEEDED TO ACCOMPLISH THE EFFORT REQUIRED BY THE DOCUMENTS INCORPORATED HEREIN.

0041AA			
	SITE SURVEY AND PREPARATION #1 - EIELSON AFB, PACAF		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL CONDUCT A SITE SURVEY AT AND PREPARE A SITE SURVEY REPORT FOR EIELSON AFB, PACAF, AS NEEDED. SERVICES ORDERED AGAINST THIS SubCLIN SHALL BE CONSIDERED COMPLETED IN ACCORDANCE WITH THE STATEMENT OF PARAGRAPH 3.7.2, ATTACHED TO THE CONTRACT.

0041AB			
	SITE SURVEY AND PREPARATION #2 - EIELSON AFB, PACAF		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL CONDUCT A PREINSTALLATION SITE SURVEY TO VERIFY FACILITY MODIFICATIONS ARE DONE CORRECTLY AND PREPARE A FINAL FACILITY REPORT AND DETAILED INSTALLATION SCHEDULE AT EIELSON AFB, PACAF. SERVICES ORDERED AGAINST THIS SubCLIN SHALL BE CONSIDERED COMPLETED IN ACCORDANCE WITH PARAGRAPH 3.7.3 OF THE STATEMENT OF WORK, ATTACHED TO THE CONTRACT.

0042			
	SIMULATION AVAILABILITY - CANNON AFB		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 40 LEVEL A SIMULATION SERVICE AT CANNON AFB, IAW THE DOCUMENTS INCORPORATED HEREIN.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
0043			
	SIMULATION AVAILABILITY - CANNON AFB		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 40 LEVEL B SIMULATION SERVICE AT CANNON AFB, IAW THE DOCUMENTS INCORPORATED HEREIN.

0044			See Attachment 6
	SIMULATION AVAILABILITY - CANNON AFB		

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 40 LEVEL C SIMULATION SERVICE AT CANNON AFB, IAW THE DOCUMENTS INCORPORATED HEREIN.

0045			
	SIMULATION SURGE - CANNON AFB		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 40 LEVEL C MTC SURGE CAPABILITY TRAINING SERVICE AVAILABILITY AT CANNON AFB, IAW THE DOCUMENTS INCORPORATED HEREIN.

0046			
	SITE SURVEY AND PREPARATION - CANNON AFB		See Attachment 6

security: U
descriptive data:
THE CONTRACTOR SHALL CONDUCT A SITE SURVEY AND PERFORM NECESSARY PREPARATION AT CANNON AFB, AS NEEDED TO ACCOMPLISH THE EFFORT REQUIRED BY THE DOCUMENTS INCORPORATED HEREIN.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
0046AA			
	SITE SURVEY AND PREPARATION #1 - CANNON AFB		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL CONDUCT A SITE SURVEY AT AND PREPARE A SITE SURVEY REPORT FOR CANNON AFB AS NEEDED. SERVICES ORDERED AGAINST THIS SubCLIN SHALL BE CONSIDERED COMPLETED IN ACCORDANCE WITH THE STATEMENT OF WORK 3.7.2, ATTACHED TO THE CONTRACT.

0046AB

SITE SURVEY AND PREPARATION #2 - CANNON AFB — See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL CONDUCT A PREINSTALLATION SITE SURVEY TO VERIFY FACILITY MODIFICATIONS ARE DONE CORRECTLY AND PREPARE A FINAL FACILITY REPORT AND DETAILED INSTALLATION SCHEDULE AT CANNON AFB. SERVICES ORDERED AGAINST THIS SubCLIN SHALL BE CONSIDERED COMPLETED IN ACCORDANCE WITH PARA 3.7.3 OF THE STATEMENT OF WORK, ATTACHED TO THE CONTRACT.

0047

SIMULATION AVAILABILITY - MISAWA AB, PACAF — See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 50 LEVEL A SIMULATION SERVICE AT MISAWA AB, IAW THE DOCUMENTS INCORPORATED HEREIN.

0048

SIMULATION AVAILABILITY - MISAWA AB, PACAF — See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 50 LEVEL B SIMULATION SERVICE AT MISAWA AB, IAW THE DOCUMENTS INCORPORATED HEREIN.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
0049			
	SIMULATION AVAILABILITY - MISAWA AB, PACAF		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 50 LEVEL C SIMULATION SERVICE AT MISAWA AB, IAW THE DOCUMENTS INCORPORATED HEREIN.

0050			
	SIMULATION SURGE - MISAWA AB, PACAF		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 50 LEVEL C MTC SURGE CAPABILITY TRAINING SERVICE AVAILABILITY AT MISAWA AB, IAW THE DOCUMENTS INCORPORATED HEREIN.

0051			
	SITE SURVEY AND PREPARATION - MISAWA AB, PACAF		See Attachment 6

security: U
descriptive data:
THE CONTRACTOR SHALL CONDUCT A SITE SURVEY AND PERFORM NECESSARY PREPARATION AT MISAWA AB, AS NEEDED TO ACCOMPLISH THE EFFORT REQUIRED BY THE DOCUMENTS INCORPORATED HEREIN.

0051AA			
	SITE SURVEY AND PREPARATION #1 - MISAWA AB, PACAF		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL CONDUCT A SITE SURVEY AT AND PREPARE A SITE SURVEY REPORT FOR MISAWA AB, PACAF, AS NEEDED. SERVICES ORDERED AGAINST THIS SubCLIN SHALL BE CONSIDERED COMPLETED IN ACCORDANCE WITH THE STATEMENT OF PARAGRAPH 3.7.2, ATTACHED TO THE CONTRACT.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
0051AB			
	SITE SURVEY AND PREPARATION #2 - MISAWA AB, PACAF		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL CONDUCT A PREINSTALLATION SITE SURVEY TO VERIFY FACILITY MODIFICATIONS ARE DONE CORRECTLY AND PREPARE A FINAL FACILITY REPORT AND DETAILED INSTALLATION SCHEDULE AT MISAWA AB, PACAF. SERVICES ORDERED AGAINST THIS SubCLIN SHALL BE CONSIDERED COMPLETED IN ACCORDANCE WITH PARA 3.7.3 OF THE STATEMENT OF WORK, ATTACHED TO THE CONTRACT.

0052			
	SIMULATION AVAILABILITY - OSAN AB, PACAF		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 40 LEVEL A SIMULATION SERVICE AT OSAN AB, IAW THE DOCUMENTS INCORPORATED HEREIN.

0053			
	SIMULATION AVAILABILITY - OSAN AB, PACAF		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 40 LEVEL B SIMULATION SERVICE AT OSAN AB, IAW THE DOCUMENTS INCORPORATED HEREIN.

0054			
	SIMULATION AVAILABILITY - OSAN AB, PACAF		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 40 LEVEL C SIMULATION SERVICE AT OSAN AB, IAW THE DOCUMENTS INCORPORATED HEREIN.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
0055			
	SIMULATION SURGE - OSAN AB, PACAF		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 40 LEVEL C MTC SURGE CAPABILITY TRAINING SERVICE AVAILABILITY AT OSAN AB, IAW THE DOCUMENTS INCORPORATED HEREIN.

0056			
	SITE SURVEY AND PREPARATION - OSAN AB, PACAF		See Attachment 6

security: U
descriptive data:
THE CONTRACTOR SHALL CONDUCT A SITE SURVEY AND PERFORM NECESSARY PREPARATION AT OSAN AB, AS NEEDED TO ACCOMPLISH THE EFFORT REQUIRED BY THE DOCUMENTS INCORPORATED HEREIN.

0056AA			
	SITE SURVEY AND PREPARATION #1 - OSAN AB, PACAF		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL CONDUCT A SITE SURVEY AT AND PREPARE A SITE SURVEY REPORT FOR OSAN AFB, PACAF, AS NEEDED. SERVICES ORDERED AGAINST THIS SubCLIN SHALL BE CONSIDERED COMPLETED IN ACCORDANCE WITH THE STATEMENT OF PARAGRAPH 3.7.2, ATTACHED TO THE CONTRACT.

0056AB			
	SITE SURVEY AND PREPARATION #2 - OSAN AB, PACAF		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL CONDUCT A PREINSTALLATION SITE SURVEY TO VERIFY FACILITY MODIFICATIONS ARE DONE CORRECTLY AND PREPARE A FINAL FACILITY REPORT AND DETAILED INSTALLATION SCHEDULE AT OSAN AB, PACAF. SERVICES ORDERED AGAINST THIS SubCLIN SHALL BE CONSIDERED COMPLETED IN ACCORDANCE WITH PARA 3.7.3 OF THE STATEMENT OF WORK, ATTACHED TO THE CONTRACT.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
0057			
	SIMULATION AVAILABILITY - AVIANO AB, USAFE		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 40 LEVEL A SIMULATION SERVICE AT AVIANO AB, IAW THE DOCUMENTS INCORPORATED HEREIN.

0058			
	SIMULATION AVAILABILITY - AVIANO AB, USAFE		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 40 LEVEL B SIMULATION SERVICE AT AVIANO AB, IAW THE DOCUMENTS INCORPORATED HEREIN.

0059			
	SIMULATON AVAILABILITY AVIANO AB, USAFE		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 40 LEVEL C SIMULATION SERVICE AT AVIANO AB, IAW THE DOCUMENTS INCORPORATED HEREIN.

0060			
	SIMULATION SURGE - AVIANO AB, USAFE		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 40 LEVEL C MTC SURGE CAPABILITY TRAINING SERVICE AVAILABILITY AT AVIANO AB, IAW THE DOCUMENTS INCORPORATED HEREIN.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
0061			
	SITE SURVEY AND PREPARATION - AVIANO AB, USAFE		See Attachment 6

security: U
descriptive data:
THE CONTRACTOR SHALL CONDUCT A SITE SURVEY AND PERFORM NECESSARY PREPARATION AT AVIANO AB, AS NEEDED TO ACCOMPLISH THE EFFORT REQUIRED BY THE DOCUMENTS INCORPORATED HEREIN.

0061AA			
	SITE SURVEY AND PREPARATION #1 - AVIANO AB, USAFE		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL CONDUCT A PREINSTALLATION SITE SURVEY TO VERIFY FACILITY MODIFICATIONS ARE DONE CORRECTLY AND PREPARE A FINAL FACILITY REPORT AND DETAILED INSTALLATION SCHEDULE AT AVIANO AB, USAFE. SERVICES ORDERED AGAINST THIS SubCLIN SHALL BE CONSIDERED COMPLETED IN ACCORDANCE WITH PARA 3.7.2 OF THE STATEMENT OF WORK, ATTACHED TO THE CONTRACT.

0061AB			
	SITE SURVEY AND PREPARATION # 2 - AVIANO AB, USAFE		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL CONDUCT A PREINSTALLATION SITE SURVEY TO VERIFY FACILITY MODIFICATIONS ARE DONE CORRECTLY AND PREPARE A FINAL FACILITY REPORT AND DETAILED INSTALLATION SCHEDULE AT AVIANO AB, USAFE. SERVICES ORDERED AGAINST THIS SubCLIN SHALL BE CONSIDERED COMPLETED IN ACCORDANCE WITH PARA 3.7.3 OF THE STATEMENT OF WORK, ATTACHED TO THE CONTRACT.

0062			
	SIMULATION AVAILABILITY - SPANGDAHLEM AB, USAFE		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 50 LEVEL A SIMULATION SERVICE AT SPANGDAHLEM AB, IAW THE DOCUMENTS INCORPORATED HEREIN.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
0063			
	SIMULATION AVAILABILITY - SPANGDAHLEM AB, USAFE		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 50 LEVEL B SIMULATION SERVICE AT SPANGDAHLEM AB, IAW THE DOCUMENTS INCORPORATED HEREIN.

0064			
	SIMULATION AVAILABILITY AB, USAFE		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 50 LEVEL C SIMULATION SERVICE AT SPANGDAHLEM AB, IAW THE DOCUMENTS INCORPORATED HEREIN.

0065			
	SIMULATION SURGE - SPANGDAHLEM AB, USAFE		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 50 LEVEL C MTC SURGE CAPABILITY TRAINING SERVICE AVAILABILITY AT SPANGDAHLEM AB, IAW THE DOCUMENTS INCORPORATED HEREIN.

0066			
	SITE SURVEY AND PREPARATION - SPANGDAHLEM AB, USAFE		See Attachment 6

security: U
descriptive data:
THE CONTRACTOR SHALL CONDUCT A SITE SURVEY AND PERFORM NECESSARY PREPARATION AT SPANGDAHLEM AB, AS NEEDED TO ACCOMPLISH THE EFFORT REQUIRED BY THE DOCUMENTS INCORPORATED HEREIN.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
0066AA			
	SITE SURVEY AND PREPARATION # 1 - SPANGDAHLEM AB, USAFE	See Attachment 6	

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL CONDUCT A SITE SURVEY AT AND PREPARE A SITE SURVEY REPORT FOR SPANGDAHLEM AB, USAFE, AS NEEDED. SERVICES ORDERED AGAINST THIS SubCLIN SHALL BE CONSIDERED COMPLETED IN ACCORDANCE WITH THE STATEMENT OF PARAGRAPH 3.7.2, ATTACHED TO THE CONTRACT.

0066AB			
	SITE SURVEY AND PREPARATION # 2 - SPANGDAHLEM AB, USAFE	See Attachment 6	

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL CONDUCT A PREINSTALLATION SITE SURVEY TO VERIFY FACILITY MODIFICATIONS ARE DONE CORRECTLY AND PREPARE A FINAL FACILITY REPORT AND DETAILED INSTALLATION SCHEDULE AT SPANGDHALEM AB, USAFE. SERVICES ORDERED AGAINST THIS SubCLIN SHALL BE CONSIDERED COMPLETED IN ACCORDANCE WITH PARA 3.7.3 OF THE STATEMENT OF WORK, ATTACHED TO THE CONTRACT.

0067			
	SIMULATION AVAILABILITY - DES MOINE ANG	See Attachment 6	

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 40 LEVEL A SIMULATION SERVICE AT DES MOINE ANG, IAW THE DOCUMENTS INCORPORATED HEREIN.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
0068			
	SIMULATION AVAILABILITY - DES MOINE ANG		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 40 LEVEL B SIMULATION SERVICE AT DES MOINE ANG, IAW THE DOCUMENTS INCORPORATED HEREIN.

0069			
	SIMULATION AVAILABILITY - DES MOINE ANG		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 40 LEVEL C SIMULATION SERVICE AT DES MOINE ANG, IAW THE DOCUMENTS INCORPORATED HEREIN.

0070			
	SIMULATION SURGE - DES MOINE ANG		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 40 LEVEL C MTC SURGE CAPABILITY TRAINING SERVICE AVAILABILITY AT DES MOINE ANG, IAW THE DOCUMENTS INCORPORATED HEREIN.

0071			
	SITE SURVEY AND PREPARATION - DES MOINE ANG		See Attachment 6

security: U
descriptive data:
THE CONTRACTOR SHALL CONDUCT A SITE SURVEY AND PERFORM NECESSARY PREPARATION AT DES MOINE AFB, AS NEEDED TO ACCOMPLISH THE EFFORT REQUIRED BY THE DOCUMENTS INCORPORATED HEREIN.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
0071AA			
	SITE SURVEY AND PREPARATION # 1 - DES MOINES ANG		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL CONDUCT A SITE SURVEY AT AND PREPARE A SITE SURVEY REPORT FOR DES MOINE AFB, AS NEEDED. SERVICES ORDERED AGAINST THIS SubCLIN SHALL BE CONSIDERED COMPLETED IN ACCORDANCE WITH THE STATEMENT OF PARAGRAPH 3.7.2, ATTACHED TO THE CONTRACT.

0071AB			
	SITE SURVEY AND PREPARATION # 2 - DES MOINES ANG		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL CONDUCT A PREINSTALLATION SITE SURVEY TO VERIFY FACILITY MODIFICATIONS ARE DONE CORRECTLY AND PREPARE A FINAL FACILITY REPORT AND DETAILED INSTALLATION SCHEDULE AT DES MOINE ANG. SERVICES ORDERED AGAINST THIS SubCLIN SHALL BE CONSIDERED COMPLETED IN ACCORDANCE WITH PARA 3.7.3 OF THE STATEMENT OF WORK, ATTACHED TO THE CONTRACT.

0072			
	SIMULATION AVAILABILITY - KIRTLAND ANG		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 40 LEVEL A SIMULATION SERVICE AT KIRTLAND ANG, IAW THE DOCUMENTS INCORPORATED HEREIN.

0073			
	SIMULATION AVAILABILITY - KIRTLAND ANG		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 40 LEVEL B SIMULATION SERVICE AT KIRTLAND ANG, IAW THE DOCUMENTS INCORPORATED HEREIN.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
0074			
	SIMULATION AVAILABILITY - KIRTLAND ANG		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 40 LEVEL C SIMULATION SERVICE AT KIRTLAND ANG, IAW THE DOCUMENTS INCORPORATED HEREIN.

0075

SIMULATION SURGE - KIRTLAND ANG — See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 40 LEVEL C MTC SURGE CAPABILITY TRAINING SERVICE AVAILABILITY AT KIRTLAND ANG, IAW THE DOCUMENTS INCORPORATED HEREIN.

0076

SITE SURVEY AND PREPARATION - KIRTLAND ANG — See Attachment 6

security: U
descriptive data:
THE CONTRACTOR SHALL CONDUCT A SITE SURVEY AND PERFORM NECESSARY PREPARATION AT KIRTLAND ANG, AS NEEDED TO ACCOMPLISH THE EFFORT REQUIRED BY THE DOCUMENTS INCORPORATED HEREIN.

0076AA

SITE SURVEY AND PREPARATION # 1 - KIRTLAND AFB — See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL CONDUCT A SITE SURVEY AT AND PREPARE A SITE SURVEY REPORT FOR KIRTLAND AFB, AS NEEDED. SERVICES ORDERED AGAINST THIS SubCLIN SHALL BE CONSIDERED COMPLETED IN ACCORDANCE WITH THE STATEMENT OF PARAGRAPH 3.7.2, ATTACHED TO THE CONTRACT.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
0076AB			
	SITE SURVEY AND PREPARATION # 2 - KIRTLAND AFB		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL CONDUCT A PREINSTALLATION SITE SURVEY TO VERIFY FACILITY MODIFICATIONS ARE DONE CORRECTLY AND PREPARE A FINAL FACILITY REPORT AND DETAILED INSTALLATION SCHEDULE AT KIRTLAND AFB. SERVICES ORDERED AGAINST THIS SubCLIN SHALL BE CONSIDERED COMPLETED IN ACCORDANCE WITH PARA 3.7.3 OF THE STATEMENT OF WORK, ATTACHED TO THE CONTRACT.

0077			
	SIMULATION AVAILABILITY - MCENTIRE ANG		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 50 LEVEL A SIMULATION SERVICE AT MCENTIRE ANG, IAW THE DOCUMENTS INCORPORATED HEREIN.

0078			
	SIMULATION AVAILABILITY - MCENTIRE ANG		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 50 LEVEL B SIMULATION SERVICE AT MCENTIRE ANG, IAW THE DOCUMENTS INCORPORATED HEREIN.

0079			
	SIMULATION AVAILABILITY - MCENTIRE ANG		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 50 LEVEL C SIMULATION SERVICE AT MCENTIRE ANG, IAW THE DOCUMENTS INCORPORATED HEREIN.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
0080			
	SIMULATION SURGE - MCENTIRE ANG		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 50 LEVEL C MTC SURGE CAPABILITY TRAINING SERVICE AVAILABILITY AT MCENTIRE ANG, IAW THE DOCUMENTS INCORPORATED HEREIN.

0081			
	SITE SURVEY AND PREPARATION - MCENTIRE ANG		See Attachment 6

security: U
descriptive data:
THE CONTRACTOR SHALL CONDUCT A SITE SURVEY AND PERFORM NECESSARY PREPARATION AT McENTIRE ANG, AS NEEDED TO ACCOMPLISH THE EFFORT REQUIRED BY THE DOCUMENTS INCORPORATED HEREIN.

0081AA			
	SITE SURVEY AND PREPARATION # 1 - MCENTIRE ANG		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL CONDUCT A SITE SURVEY AT AND PREPARE A SITE SURVEY REPORT FOR MCENTIRE AFB, AS NEEDED. SERVICES ORDERED AGAINST THIS SubCLIN SHALL BE CONSIDERED COMPLETED IN ACCORDANCE WITH THE STATEMENT OF PARAGRAPH 3.7.2, ATTACHED TO THE CONTRACT.

0081AB			
	SITE SURVEY AND PREPARATION # 2 - MCENTIRE AFB		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL CONDUCT A PREINSTALLATION SITE SURVEY TO VERIFY FACILITY MODIFICATIONS ARE DONE CORRECTLY AND PREPARE A FINAL FACILITY REPORT AND DETAILED INSTALLATION SCHEDULE AT MCENTIRE AFB. SERVICES ORDERED AGAINST THIS SubCLIN SHALL BE CONSIDERED COMPLETED IN ACCORDANCE WITH PARA 3.7.3 OF THE STATEMENT OF WORK, ATTACHED THE CONTRACT.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
0082			
	SIMULATION AVAILABILITY - TOLEDO ANG		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 40 LEVEL A SIMULATION SERVICE AT TOLEDO ANG, IAW THE DOCUMENTS INCORPORATED HEREIN.

0083

SIMULATION AVAILABILITY - TOLEDO ANG — See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 40 LEVEL B SIMULATION SERVICE AT TOLEDO ANG, IAW THE DOCUMENTS INCORPORATED HEREIN.

0084

SIMULATION AVAILABILITY - TOLEDO ANG — See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 40 LEVEL C SIMULATION SERVICE AT TOLEDO ANG, IAW THE DOCUMENTS INCORPORATED HEREIN

0085

SIMULATION SURGE - TOLEDO ANG — See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 40 LEVEL C MTC SURGE CAPABILITY TRAINING SERVICE AVAILABILITY AT TOLEDO ANG, IAW THE DOCUMENTS INCORPORATED HEREIN.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
0086			
	SITE SURVEY AND PREPARATION - TOLEDO ANG		See Attachment 6

security: U
descriptive data:
THE CONTRACTOR SHALL CONDUCT A SITE SURVEY AND PERFORM NECESSARY PREPARATION AT TOLEDO ANG, AS NEEDED TO ACCOMPLISH THE EFFORT REQUIRED BY THE DOCUMENTS INCORPORATED HEREIN.

0086AA			
	SITE SURVEY AND PREPARATION # 1 - TOLEDO ANG		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL CONDUCT A SITE SURVEY AT AND PREPARE A SITE SURVEY REPORT FOR TOLEDO, AS NEEDED. SERVICES ORDERED AGAINST THIS SubCLIN SHALL BE CONSIDERED COMPLETED IN ACCORDANCE WITH THE STATEMENT OF PARAGRAPH 3.7.2, ATTACHED TO THE CONTRACT.

0086AB			
	SITE SURVEY AND PREPARATION # 2 - TOLEDO ANG		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL CONDUCT A PREINSTALLATION SITE SURVEY TO VERIFY FACILITY MODIFICATIONS ARE DONE CORRECTLY AND PREPARE A FINAL FACILITY REPORT AND DETAILED INSTALLATION SCHEDULE AT TOLEDO ANG. SERVICES ORDERED AGAINST THIS SubCLIN SHALL BE CONSIDERED COMPLETED IN ACCORDANCE WITH PARA 3.7.3 OF THE STATEMENT OF WORK, ATTACHED THE CONTRACT.

0087			
	SIMULATION AVAILABILITY - TULSA ANG		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 40 LEVEL A SIMULATION SERVICE AT TULSA ANG, IAW THE DOCUMENTS INCORPORATED HEREIN.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
0088			
	SIMULATION AVAILABILITY - TULSA ANG		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 40 LEVEL B SIMULATION SERVICE AT TULSA ANG, IAW THE DOCUMENTS INCORPORATED HEREIN.

0089

SIMULATION AVAILABILITY - TULSA ANG — See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 40 LEVEL C SIMULATION SERVICE AT TULSA ANG, IAW THE DOCUMENTS INCORPORATED HEREIN.

0090

SIMULATION SURGE - TOLEDO ANG — See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 40 LEVEL C MTC SURGE CAPABILITY TRAINING SERVICE AVAILABILITY AT TULSA AFB, IAW THE DOCUMENTS INCORPORATED HEREIN.

0091

SITE SURVEY AND PREPARATION - TULSA ANG — See Attachment 6

security: U
descriptive data:
THE CONTRACTOR SHALL CONDUCT A SITE SURVEY AND PERFORM NECESSARY PREPARATION AT TULSA ANG, AS NEEDED TO ACCOMPLISH THE EFFORT REQUIRED BY THE DOCUMENTS INCORPORATED HEREIN.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
0091AA			
	SITE SURVEY AND PREPARATION # 1 - TULSA ANG		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL CONDUCT A SITE SURVEY AT AND PREPARE A SITE SURVEY REPORT FOR TULSA ANG, AS NEEDED. SERVICES ORDERED AGAINST THIS SubCLIN SHALL BE CONSIDERED COMPLETED IN ACCORDANCE WITH THE STATEMENT OF PARAGRAPH 3.7.2, ATTACHED TO THE CONTRACT.

0091AB			
	SITE SURVEY AND PREPARATION # 2 - TULSA ANG		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL CONDUCT A PREINSTALLATION SITE SURVEY TO VERIFY FACILITY MODIFICATIONS ARE DONE CORRECTLY AND PREPARE A FINAL FACILITY REPORT AND DETAILED INSTALLATION SCHEDULE AT TULSA ANG. SERVICES ORDERED AGAINST THIS SubCLIN SHALL BE CONSIDERED COMPLETED IN ACCORDANCE WITH PARA 3.7.3 OF THE STATEMENT OF WORK AND EXIT CRITERIA 'SIMULATION SERVICES ACTIVATED' LISTED IN THE IMP, BOTH ATTACHED THE CONTRACT.

0092			
	SIMULATION AVAILABILITY - LUKE AFB, AETC		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 50 LEVEL A SIMULATION SERVICE AT LUKE AETC, IAW THE DOCUMENTS INCORPORATED HEREIN.

0093

INFO CLIN - SIMULATION AVAILABILITY - LUKE AETC

security: U

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
0093AA			
	SIMULATION AVAILABILITY - LUKE AFB, AETC		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 40 LEVEL B SIMULATION SERVICE AT LUKE AETC, IAW THE DOCUMENTS INCORPORATED HEREIN.

0093AB			
	SIMULATION AVAILABILITY - LUKE AFB, AETC		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 40 LEVEL B SIMULATION SERVICE AT LUKE AETC, IAW THE DOCUMENTS INCORPORATED HEREIN.

0094			
	SIMULATION AVAILABILITY		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 40 LEVEL C SIMULATION SERVICE AT LUKE AETC, IAW THE DOCUMENTS INCORPORATED HEREIN.

0095			
	SIMULATION SURGE - LUKE AFB, AETC		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 40 LEVEL C MTC SURGE CAPABILITY TRAINING SERVICE AVAILABILITY AT LUKE AETC, IAW THE DOCUMENTS INCORPORATED HEREIN.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
0096			
	SITE SURVEY AND PREPARATION - LUKE AFB, AETC		See Attachment 6

security: U
descriptive data:
THE CONTRACTOR SHALL CONDUCT A SITE SURVEY AND PERFORM NECESSARY PREPARATION AT LUKE AETC, AS NEEDED TO ACCOMPLISH THE EFFORT REQUIRED BY THE DOCUMENTS INCORPORATED HEREIN.

0096AA			
	SITE SURVEY AND PREPARATION # 1 - LUKE AETC		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL CONDUCT A SITE SURVEY AT AND PREPARE A SITE SURVEY REPORT FOR LUKE AETC, AS NEEDED. SERVICES ORDERED AGAINST THIS SubCLIN SHALL BE CONSIDERED COMPLETED IN ACCORDANCE WITH THE STATEMENT OF PARAGRAPH 3.7.2, ATTACHED TO THE CONTRACT.

0096AB			
	SITE SURVEY AND PREPARATION # 2 - LUKE AETC		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL CONDUCT A PREINSTALLATION SITE SURVEY TO VERIFY FACILITY MODIFICATIONS ARE DONE CORRECTLY AND PREPARE A FINAL FACILITY REPORT AND DETAILED INSTALLATION SCHEDULE AT LUKE AETC. SERVICES ORDERED AGAINST THIS SubCLIN SHALL BE CONSIDERED COMPLETED IN ACCORDANCE WITH PARA 3.7.3 OF THE STATEMENT OF WORK, ATTACHED TO THE CONTRACT.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
0096AC			
	SITE SURVEY AND PREPARATION # 3 - LUKE AETC		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL CONDUCT A PREINSTALLATION SITE SURVEY TO VERIFY FACILITY MODIFICATIONS ARE DONE CORRECTLY AND PREPARE A FINAL FACILITY REPORT AND DETAILED INSTALLATION SCHEDULE AT LUKE AFB. SERVICES ORDERED AGAINST THIS SubCLIN SHALL BE CONSIDERED COMPLETED IN ACCORDANCE WITH PARA 3.7.3 OF THE STATEMENT OF WORK, ATTACHED TO THE CONTRACT.

0096AD			
	SITE SURVEY AND PREPARATION # 4 - LUKE AFB, AETC		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL CONDUCT A PREINSTALLATION SITE SURVEY TO VERIFY FACILITY IS READY AND PREPARE A DETAIL INSTALLATION SCHEDULE FOR THE F-16 BLOCK 40 LEVEL B #2 AT LUKE AFB, AETC. SERVICES ORDERED AGAINST THIS SubCLIN SHALL BE CONSIDERED COMPLETED IN ACCORDANCE WITH THE STATEMENT OF WORK PARAGRAPH 3.7.3, ATTACHED TO THE CONTRACT.

0096AE			
	SITE SURVEY AND PREPARATION # 5 - LUKE AFB, AETC		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL CONDUCT A PREINSTALLATION SITE SURVEY TO VERIFY FACILITY IS READY AND PREPARE A DETAIL INSTALLATION SCHEDULE FOR THE F-16 BLOCK 40 LEVEL C AT LUKE AFB, AETC. SERVICES ORDERED AGAINST THIS SubCLIN SHALL BE CONSIDERED COMPLETED IN ACCORDANCE WITH PARAGRAPH 3.7.3 OF THE STATEMENT OF WORK, ATTACHED TO THE CONTRACT.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
0097			
	CONTINUITY OF SERVICES		TBD

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE CONTINUITY OF SERVICES FOR THE F-16 BLOCK 40/50 MTC TRAINING SERVICE IAW THE CONTRACT PROVISION A-8 FAR 52.237-3 CONTINUITY OF SERVICES. THE TRANSITION SERVICE PERIOD OF PERFORMANCE SHALL BE 180 DAYS.

0098			
	CONTINGENCY DATABASE SERVICES		TBD

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE CONTINGENCY DATABASE SERVICES TO SUPPORT THE F-16 BLOCK 40/50 MTC TRAINING SERVICE IAW THE DOCUMENTS INCORPORATED HEREIN.

0099			
	TRANSPORTABILITY MTC SERVICES		TBD

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE FOR THE INFREQUENT DISASSEMBLY, PACKING, TRANSPORTATION, REASSEMBLY, AND CHECKOUT OF F-16 BLOCK 40/50 SIMULATION SERVICES REQUIRED TO REDEPLOY SERVICES AT ANY ACC, USAFE, AND/OR PACAF SITE TO AN OVERSEAS OPERATING LOCATION, IAW THE DOCUMENTS INCORPORATED HEREIN AND/OR SPECIFIED IN A DELIVERY ORDER.

ITEM	SUPPLIES OR SERVICES	Qty Purch Unit	Unit Price Total Item Amount
0100			
	MOBILE MTC SERVICES		See Attachment 6

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE F-16 BLOCK 40/50 LEVEL C MOBILE MTC SIMULATION SERVICE FOR DES MOINES ANG, MCENTIRE ANG, TOLEDO ANG, KIRTLAND ANG, AND TULSA ANG SITES. THE MOBILE MTC SIMULATION SERVICE SHALL BE RELOCATABLE FOUR TIMES A YEAR (QUARTERLY) TO SUPPORT THE ANG OPERATING LOCATIONS, IAW THE DOCUMENTS INCORPORATED HEREIN. THE CONTRACTOR SHALL PROVIDE FOR ANY DISASSEMBLY, PACKING, TRANSPORTATION, REASSEMBLY, AND/OR CHECKOUT REQUIRED TO RELOCATE THE SIMULATION SERVICE FROM ONE SITE TO ANOTHER SITE.

0101			
	SERVICE ADJUSTMENTS		NSP

security: U
contract type: J - FIRM FIXED PRICE
descriptive data:
THE CONTRACTOR SHALL PROVIDE "SWING CLAUSE PROCUREMENTS" FOR THE F-16 BLOCK 40/50 MTC SIMULATION SERVICE IN ACCORDANCE WITH THE STATEMENT OF WORK AT NO CHANGE IN THE CONTRACT PRICE OR OBLIGATION. INDIVIDUAL ENGINEERING CHANGE PROPOSALS (ECPs) AND CONTRACT CHANGE PROPOSALS (CCPs) SHALL BE INCORPORATED VIA SEPARATE SUBLINE ITEMS ESTABLISHED UNDER THIS ITEM.

SubCLIN	CCP/ECP	TITLE	VALUE	CUM Total	BALANCE	MOD NUMBER

SPECIAL PROVISIONS

A-001 FAR 52.212-4 CONTRACT TERMS AND CONDITIONS — COMMERCIAL ITEMS

FAR 52.212-4 is hereby tailored in accordance with FAR 12.302, to incorporate to the maximum extent practicable, customary commercial market practices.

CONTRACT TERMS AND CONDITIONS--COMMERCIAL ITEMS (APR 1998)

(a) Inspection/Acceptance. The Contractor shall only tender for acceptance those items that conform to the requirements of this contract. The Government reserves the right to inspect or test any supplies or services that have been tendered for acceptance. The Government may require repair or replacement of nonconforming supplies or re-performance of nonconforming services at no increase in contract price. The Government must exercise its post-acceptance rights:

(1) Within a reasonable time after the defect was discovered or should have been discovered; and

(2) Before any substantial change occurs in the condition of the item, unless the change is due to the defect in the item.

(b) Assignment. The Contractor or its assignee's rights to be paid amounts due as a result of performance of this contract, may be assigned to a bank, trust company, or other financing institution, including any Federal lending agency in accordance with the Assignment of Claims Act (31 U.S.C. 3727).

(c) Changes. Changes in the terms and conditions of this contract may be made only by written agreement of the parties.

(d) Disputes. This contract is subject to the Contract Disputes Act of 1978, as amended (41 U.S.C. 601-613). Failure of the parties to this contract to reach agreement on any request for equitable adjustment, claim, appeal or action arising under or relating to this contract shall be a dispute to be resolved in accordance with the clause at FAR 52.233-1, Disputes, which is incorporated herein by reference. The Contractor shall proceed diligently with performance of this contract, pending final resolution of any dispute arising under the contract.

(e) Definitions. The clause at FAR 52.202-1, Definitions, is incorporated herein by reference.

(f) Excusable delays. The Contractor shall be liable for default unless nonperformance is caused by an occurrence beyond the reasonable control of the Contractor and without its fault or negligence such as, acts of God or the public enemy, acts of the Government in either its sovereign or contractual capacity, fires, floods, epidemics, quarantine restrictions, strikes, unusually severe weather, and delays of common carriers. The Contractor shall notify the Contracting Officer in writing as soon as it is reasonably possible after the commencement of any excusable delay, setting forth the full particulars in connection therewith, shall remedy such occurrence with all reasonable dispatch, and shall promptly give written notice to the Contracting Officer of the cessation of such occurrence.

(g) Invoice. The Contractor shall submit an original invoice and three copies (or electronic invoice, if authorized) to the address designated in the contract to receive invoices. An invoice must include--

(1) Name and address of the Contractor;

(2) Invoice date;

(3) Contract number, contract line item number and, if applicable, the order number;

(4) Description, quantity, unit of measure, unit price and extended price of the items delivered;

(5) Shipping number and date of shipment including the bill of lading number and weight of shipment if shipped on Government bill of lading;

(6) Terms of any prompt payment discount offered;

(7) Name and address of official to whom payment is to be sent; and

(8) Name, title, and phone number of person to be notified in event of defective invoice.

Invoices will be handled in accordance with the Prompt Payment Act (31 U.S.C. 3903) and Office of Management and Budget (OMB) Circular A-125, Prompt Payment. Contractors are encouraged to assign an identification number to each invoice.

(h) Patent indemnity. The Contractor shall indemnify the Government and its officers, employees and agents against liability, including costs, for actual or alleged direct or contributory infringement of, or inducement to infringe, any United States or foreign patent, trademark or copyright, arising out of the performance of this contract, provided the Contractor is reasonably notified of such claims and proceedings.

(i) Payment. Payment shall be made for items accepted by the Government that have been delivered to the delivery destinations set forth in this contract. The Government will make payment in accordance with the Prompt Payment Act (31 U.S.C. 3903) and Office of Management and Budget (OMB) Circular A-125, Prompt Payment. Unless otherwise provided by an addendum to this contract, the Government shall make payment in accordance with the clause at FAR 52.232-33, Mandatory Information for Electronic Funds Transfer Payment, which is incorporated herein by reference. In connection with any discount offered for early payment, time shall be computed from the date of the invoice. For the purpose of computing the discount earned, payment shall be considered to have been made on the date which appears on the payment check or the specified payment date if an electronic funds transfer payment is made. *Delivery payments under this contract are permitted as evidenced by a properly submitted invoice by the Contractor and approved by the Government.*[5]

(j) Risk of loss*. Title for all simulation service hardware shall remain with the Contractor, and therefore all risk of loss, shall be borne by the Contractor.

(k) Taxes. The contract price includes all applicable Federal, State, and local taxes and duties, including all foreign taxes, fees, and duties.

(l)* Termination for the Government's convenience. The Government reserves the right to terminate this contract or any part hereof, for its sole convenience. In the event of such termination, the Contractor shall immediately stop all work hereunder and shall immediately cause any and all of its suppliers and subcontractors to cease work.

(1) Termination for the Government's convenience prior to the issuance of a funded task order shall result in no payment to the Contractor of any amount for any work performed or costs incurred whatsoever.

(2) Termination for the Government's convenience after the issuance of a funded task order(s) Subject to the terms of this contract, the Contractor shall be paid, up to the amount of funds obligated on the funded task order(s): (A) a percentage of the contract price reflecting the percentage of the services delivered and accepted prior to the notice of termination; (B) reasonable charges the Contractor can demonstrate to the satisfaction of the Government using its standard record keeping system, have resulted from the termination; and (C) preparatory costs, start-up costs, and costs for or associated with developing, designing, procuring, producing and fielding the means by which the services hereunder are to be provided. Anticipatory profits hereunder shall not be paid to the Contractor. The Government is not obligated to reimburse the Contractor for work performed, reasonable charges resulting from the termination, and costs incurred in excess of the total amount of funds obligated by the Government on the funded task order(s). For payment under this clause, the Contractor shall not be required to comply with the cost accounting standards or contract cost principles. This paragraph does not give the Government any right to audit the Contractor's records. The Contractor shall not be paid for any work performed or costs incurred which reasonably could have been avoided.

[5]Contract Modification P00005

(3) In the event the Government terminates this contract for its convenience and subject to the availability of funds, the Government may acquire the Contractor's simulation hardware, and software, used in the provision of the services under this contract. Under such circumstances, the Contractor will enter into negotiations with the Government for the lease or purchase of the same.

(m) Termination for cause. The Government may terminate this contract, or any part hereof, for cause in the event of any default by the Contractor, or if the Contractor fails to comply with any contract terms and conditions, or fails to provide the Government, upon request, with adequate assurances of future performance. In the event of termination for cause, the Government shall not be liable to the Contractor for any amount for supplies or services not accepted, and the Contractor shall be liable to the Government for any and all rights and remedies provided by law. If it is determined that the Government improperly terminated this contract for default, such termination shall be deemed a termination for convenience.

(n) Title*. Title to items supplied by the contractor and used for simulation services under this contract shall remain with the Contractor.

(o) Limitation of liability. Except as otherwise provided by an express warranty, the Contractor will not be liable to the Government for consequential damages resulting from any defect or deficiencies in accepted items.

(p) Other compliances. The Contractor shall comply with all applicable Federal, State and local laws, executive orders, rules and regulations applicable to its performance under this contract.

(q) Compliance with laws unique to Government contracts. The Contractor agrees to comply with 31 U.S.C. 1352 relating to limitations on the use of appropriated funds to influence certain Federal contracts; 18 U.S.C. 431 relating to officials not to benefit; 40 U.S.C 327, et seq., Contract Work Hours and Safety Standards Act; 41 U.S.C. 51-58, Anti-Kickback Act of 1986; 41 U.S.C. 265 and 10 U.S.C. 2409 relating to whistle blower protections; 49 U.S.C 40118, Fly American; and 41 U.S.C. 423 relating to procurement integrity.

(r) Order of precedence. Any inconsistencies in this solicitation or contract shall be resolved by giving precedence in the following order:

(1) The schedule of supplies/services.

(2) The Assignments, Disputes, Payments, Invoice, Other Compliances, and Compliance with Laws Unique to Government Contracts paragraphs of this clause.

(3) The clause at 52.212-5.

(4) Addenda to this solicitation or contract, including any license agreements for computer software.

(5) Solicitation provisions if this is a solicitation.

(6) Other paragraphs of this clause.

(7) The Standard Form 1449.

(8) *The performance specification.

(9) *Statement of Work.

(10) * Integrated Master Plan.

(11) *Other documents, exhibits, and attachments.

* Tailored

** Deleted

(s) Billing Procedures. Service billings shall be submitted monthly at the hourly rate identified in Attachment 6 of this contract. The monthly hours billed are based on the number of hours of days in the month the system is required to be available, Performance Specification paragraph 3.6.5, and Clause A-

017, Facility Hours of Operation, times the percentage of actual availability, calculated via Clause A-016, Service Availability Accounting. The records regarding availability shall be forwarded to the PCO/ACO along with the monthly billing or invoice. This payment clause (s) applies to service orders associated with the Simulation Availability CLIN for each site only. All other CLINs will be billed in accordance with FAR 52.212-4(i) payment.

(t) Electronic Funds Transfer
CitiBank
ABA # 021000089
Lockheed Martin Integrated Systems, Inc.
Account # 40688049

(u) Facilitation of Data Requests. In the event the Contractor cannot obtain the required data necessary to support the specifications in the contract due to the inability to establish Associate Contractor Agreements, Proprietary Data Exchange Agreements or the inability of some Government agencies to release information direct to the Contractor, etc., the Government may provide assistance to facilitate the flow of information to the Contractor. The Contractor shall agree that any data received from any Government agency shall not relieve the Contractor of its requirements and shall not be the cause for the submission of claims or equitable adjustments on the basis of late delivery, or the delivery of unsuitable information. All classified information supplied in support of this contract shall be accepted by the Contractor against this contract for accountability purposes. None of the data supplied by the Government shall be used by the Contractor for purposes other than the performance of the contract, except as otherwise provided by this clause. None of the data provided by the Government shall be duplicated, copied, or otherwise reproduced by the Contractor for purposes other than performance of the contract, except as otherwise provided by this clause.

Disposition Instructions: These instructions apply to all data provided, whether the information is classified, limited distribution, or licensed from commercial entities. At the conclusion of this contract, the Contractor shall follow the Procurement Contracting Officer (PCO) disposition instructions at no additional cost to the contract. The Contractor shall, at the discretion of the PCO, destroy or return all data provided and all copies of the data. Derived products, which must be used in accordance with, and bear the appropriate classification and/or distribution restrictions based on applicable classification laws, manuals, and export control regulations, may be used for work under other Government contracts or other potential applications with the prior approval of the Government PCO.[4]

(w) Preparation of Annotated Contract. The Contractor shall maintain an indexed, integrated, annotated and current version of this contract. This conformed contract, including all attachments shall be reproduced and distributed to the Procuring Contracting Officer (PCO) and the government Program Manager as changes occur, but not less than every six months, or in accordance with written direction of the PCO. The Contractor shall include "change bars" and a reference to the contract modification that incorporated the change on every page of the contract that is modified. These references shall serve as an "audit trail" over the life of the contract. As a minimum, and in lieu of a complete copy of the contract or attachments for each modification, slip pages may be furnished to the PCO and Program Manager by the Contractor in the manner noted above. This form of the contract shall be used solely to enhance contract administration. Use of any version of the conformed contract does not constitute

[4]Contract Modification P00004

agreement of either party as to its accuracy. The contractual source document shall be controlling in all instances.[5]

A-002 PROPRIETARY INFORMATION/LICENSE/DATA RIGHTS

1. "Proprietary Data" shall be that information, data, or material in oral or written form which is identified to the Government as proprietary at the time of disclosure.

a) Information, data, or material claimed to be or embody the proprietary and/or trade secret information of the Contractor or any Subcontractor, and which is not information, data or material formally delivered or required to be delivered or furnished under this contract, but which is nevertheless disclosed to the Government, may be marked as "Proprietary Data" or otherwise as appropriate. Such markings must specifically identify the entity claiming the data as proprietary or trade secret. Any such information, data or material claimed to be proprietary or trade secret data which is disclosed orally must be placed in written form with appropriate markings within thirty (30) days of its disclosure and provided to the Government. The Government will respect such proprietary markings on information, data or material not formally delivered or required to be delivered or furnished under this contract and will restrict disclosure of such information, data or material according to the terms of the proprietary markings or, if the information, data or material is marked only as "Proprietary Data" will restrict disclosure to only those employees in the relevant organization within the Government who have a "need to know" the Proprietary Data in connection with this contract. The Government will exercise reasonable precautions to ensure that such employees do not make unauthorized disclosures or use not contemplated by this contract. The foregoing shall not apply to any information which is or comes in the public domain, or is obtained or developed independently and without violation of the Contract.

b) Information, data or material claimed to be the proprietary and/or trade secret information of the Contractor, and which is information, data or material formally delivered or required to be delivered under this contract, shall be marked in accordance with the provisions of DFARS 252.227-7015. In accordance, with DFARS 227.7102, et seq, Contractor and Subcontractors shall be permitted to mark Proprietary Data in accordance with its commercial practices and appropriate legal requirements. The Contractor and Subcontractors, as the case may apply, shall retain all right, title and ownership to all intellectual property and related intellectual property rights (existing and/or new), for example, inventions and data, and related patents, trade secrets, and copyrights, resulting from work performed under this Contract, or any subcontract. The Contractor and Subcontractor, as the case may apply, shall also retain all right, title, and interest to simulation service hardware.

2. This Contract does not grant any license to the Government in any intellectual property or related intellectual property rights now or later owned or controlled by Contractor or Subcontractor unless that license is expressly made a part of this Contract. Nothing contained in this Contract shall prevent or limit the Contractor or Subcontractor from manufacturing, using, selling or licensing products, associated items, or data anywhere in the world.

[5]Contract Modification P00005

3. No data, information or material other than that specifically identified in this Contract as a deliverable item will be formally delivered or considered furnished under this Contract.

A-003 MTC UPGRADE

The Contractor shall incorporate technologies that enhance training capabilities into the service at no increase in contract price, based upon the recommendations of the training technology insertion board (TTIB), until the contractor has expended one hundred seventy thousand ($170,000.00) dollars within each year. As additional sites are added, the dollars to be expended within each year shall be increased by seventy thousand ($70,000.00) dollars per site and service level. In addition, the Contractor may implement technology insertion upgrades, at no increase in contract price and outside the cumulative amount defined above, if it determines that such upgrades are necessary and cost-effective to improve availability, replace obsolete hardware, or otherwise improve or maintain the quality of the simulation capability. Technology evaluation efforts may be accomplished at a Shaw AFB MTC on a non-interference basis. These dollars are incorporated in the service hourly rates. In the event that either the Contractor or the Government proposes a technology insertion effort that will not be accomplished using one of the techniques described in this subparagraph but is considered a high priority by the TTIB, the Government may at its discretion provide additional funding.

A-004 U. S. GOVERNMENT EXPORT AUTHORITY (Applicable to International Site Activation)

The export and/or re-export of simulation service hardware, technical data, and/or direct products of technical data delivered hereunder is subject to U.S. Government export control regulations. The contractor shall comply with laws and regulations regarding such exports and/or re-exports. The exporter or re-exporter of record (the contractor) shall obtain any required U.S. export authorization or technical assistance agreements required for completion of any services contemplated by this contract. The Air Force will assist the Contractor in applying for such authorizations as appropriate.

A-005 NOTICE

Any notice required to be given under the provisions of this Contract shall be effective if delivered by letter, fax or telegram sent to the other party at the address listed below, except that any party may, by notice to the other parties' authorized representative pursuant to this clause, change its designated address and recipient:

Government:

ASC/YWI
2240 B Street, Room 231
Wright-Patterson AFB OH
45433-7111

F-16 Block 40/50 MTC Contracting Officer
(937) 255-7388 x266
(937) 656-7538 (FAX)

Contractor:

Lockheed Martin Integrated Systems, Inc.[1]
1210 Massillon Road
Akron, Ohio
44315-0001

Contract Manager, F-16 MTC
(330) 796-7031
(330) 796-8974 (FAX)

A-006 SITE VISIT

The Contractor shall inspect the site where services are to be performed and satisfy itself regarding all general and local conditions that may affect the cost of contract performance, to the extent that the information is reasonably obtainable. In no event shall failure to inspect the site constitute grounds for a claim after service is ordered at that site.

A-007 FAR 52.237-2 PROTECTION OF GOVERNMENT BUILDINGS, EQUIPMENT, AND VEGETATION (APR 1984)

The Contractor shall use reasonable care to avoid damaging existing buildings, equipment, and vegetation on the Government installation. If the Contractor's failure to use reasonable care causes damage to any of this property, the Contractor shall replace or repair the damage at no expense to the Government as the Contracting Officer directs. If the Contractor fails or refuses to make such repair or replacement, the Contractor shall be liable for the cost, which may be deducted from the contract price.

A-008 FAR 52.237-3 CONTINUITY OF SERVICES (JAN 1991))

(a) The Contractor recognizes that the services under this contract are vital to the Government and must be continued without interruption and that, upon contract expiration, a successor, either the Government or another contractor, may continue them. The Contractor agrees to--

(1) Furnish phase-in training; and

(2) Exercise its best efforts and cooperation to effect an orderly and efficient transition to a successor.

(b) The Contractor shall, upon the Contracting Officer's written notice, (1) furnish phase-in, phase-out services for up to 180 days after this contract expires and (2) negotiate in good faith a plan with a successor to determine the nature and extent of phase-in, phase-out services required. The plan shall specify a training program and a date for transferring responsibilities for each division of work described in the plan, and shall be subject to the Contracting Officer's approval. The Contractor shall provide sufficient experienced personnel during the phase-in, phase-out period to ensure that the services called for by this contract are maintained at the required level of proficiency.

[1]Contract Modification P00001

(c) The Contractor shall allow as many personnel as practicable to remain on the job to help the successor maintain the continuity and consistency of the services required by this contract. The Contractor also shall disclose necessary personnel records and allow the successor to conduct on-site interviews with these employees. If selected employees are agreeable to the change, the Contractor shall release them at a mutually agreeable date and negotiate transfer of their earned fringe benefits to the successor.
(d) The Contractor shall be reimbursed for all reasonable phase-in, phase-out costs (i.e., costs incurred within the agreed period after contract expiration that result from phase-in, phase-out operations) and a fee (profit) not to exceed a pro rata portion of the fee (profit) under this contract.

A-009 FAR 52.216-18 ORDERING (OCT 1995)

(a) Any supplies and services to be furnished under this contract shall be ordered by issuance of delivery orders or task orders by the individuals or activities designated in the Schedule. Such orders may be issued from Contract Award through fifteen years after contract award.
(b) All delivery orders or task orders are subject to the terms and conditions of this contract. In the event of conflict between a delivery order or task order and this contract, the contract shall control.
(c) If mailed, a delivery order or task order is considered "issued" when the Government deposits the order in the mail. Orders may be issued orally, by facsimile, or by electronic commerce methods only if authorized in the Schedule.

A-010 FAR 52-216-19 ORDER LIMITATIONS (OCT 1995)

(a) Minimum order. When the Government requires supplies or services covered by this contract in an amount of less than one hour, the Government is not obligated to purchase, nor is the Contractor obligated to furnish, those supplies or services under the contract.
(b) Maximum order. The Contractor is not obligated to honor--

(1) Any order for a single item in excess of 8,760 hours (24 hours/day, 365 days per year) per site;
(2) Any order for a combination of items in excess of 157,680 hours (18 sites); or
(3) A series of orders from the same ordering office within 30 days that together call for quantities exceeding the limitation in subparagraph (b)(1) or (2) of this section.

(c) If this is a requirements contract (i.e., includes the Requirements clause at subsection 52.216-21 of the Federal Acquisition Regulation (FAR)), the Government is not required to order a part of any one requirement from the Contractor if that requirement exceeds the maximum-order limitations in paragraph (b) of this section.
(d) Notwithstanding paragraphs (b) and (c) of this section, the Contractor shall honor any order exceeding the maximum order limitations in paragraph (b), unless that order (or orders) is returned to the ordering office within 5 days after issuance, with written notice stating the Contractor's intent not to ship the item (or items) called for and the reasons. Upon receiving this notice, the Government may acquire the supplies or services from another source.

A-011 FAR 52.216-21 REQUIREMENTS (OCT 1995)

(a) This is a requirements contract for the supplies or services specified, and effective for the period stated, in the Schedule. The quantities of supplies or services specified in the Schedule are estimates only and are not purchased by this contract. Except as this contract may otherwise provide, if the Government's requirements do not result in orders in the quantities described as "estimated" or "maximum" in the Schedule, that fact shall not constitute the basis for an equitable price adjustment.

(b) Delivery or performance shall be made only as authorized by orders issued in accordance with the Ordering clause. Subject to any limitations in the Order Limitations clause or elsewhere in this contract, the Contractor shall furnish to the Government all supplies or services specified in the Schedule and called for by orders issued in accordance with the Ordering clause. The Government may issue orders requiring delivery to multiple destinations or performance at multiple locations.

(c) Except as this contract otherwise provides, the Government shall order from the Contractor all the supplies or services specified in the Schedule that are required to be purchased by the Government activity or activities specified in the Schedule.

(d) The Government is not required to purchase from the Contractor requirements in excess of any limit on total orders under this contract.

(e) If the Government urgently requires delivery of any quantity of an item before the earliest date that delivery may be specified under this contract, and if the Contractor will not accept an order providing for the accelerated delivery, the Government may acquire the urgently required goods or services from another source.

(f) Any order issued during the effective period of this contract and not completed within that period shall be completed by the Contractor within the time specified in the order. The contract shall govern the Contractor's and Government's rights and obligations with respect to that order to the same extent as if the order were completed during the contract's effective period; provided, that the Contractor shall not be required to make any deliveries under this contract beyond 90 days after expiration of the ordering period, except within the scope of clause A-008 for continuity of services.

A-012 5352.245-9004 BASE SUPPORT (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 Contrac-

tor, 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: Shaw AFB, Mountain Home AFB, Eglin AFB, Hill AFB, Moody AFB, Nellis AFB, Luke AFB, Eielson AFB, Cannon AFB, Misawa AB, Osan AB, Aviano AB, Spangdahlem AB, Des Moines ANG, Kirtland AFB, McEntire ANG, Toledo ANG, and Tulsa ANG.

(f) The Contractor agrees to request written authorization from the Contracting Officer for support not later than 90 days before the required in-place dates at each Air Force installation, and immediately for any required changes. The Contracting Officer shall issue timely written authorization in response to a Contractor's request. Concurrently send support authorization to the Administrative Contracting Officer or to the contract administration office if re-delegated to the Air Force installation where the support is provided.

A-013 AWARD TERM CLAUSE

In addition to the terms set forth elsewhere in the contract, the contractor may earn an award term extension/reduction on the basis of performance during the evaluation periods.

(a) Monitoring of Performance. The performance monitors, whose findings are reported to the Award Term Review Board (ATRB), will continually monitor the contractor's performance. The ATRB recommends an award term to the Term Determining Official (TDO) who makes the final decision of the award term amount based on the contractor's performance during the award term evaluation period.

(b) Award Term Plan. The evaluation criteria and associated grades are specified in the award term plan. The evaluation periods with the associated award term extensions/reductions and performance criteria with associated award term times are also specified in the award term plan.

(c) Modification of Award Term Plan. Unilateral changes may be made to the award term plan at any time during contract performance. Where the government or contractor desires a change to the award term plan and a mutual agreement cannot be reached within 60 days, the Government reserves the right to make unilateral changes prior to the start of an award term period.

(d) Contractor's Self-Assessment. The contractor's self-evaluation is submitted to the CO within five working days after the end of the evaluation period. The written assessment of the contractor's performance throughout the evaluation period may also contain any information that may be reasonably expected to assist the ATRB in evaluating the contractor's performance. The contractor's self-assessment may not exceed 15 pages.

(e) Disputes. All decisions regarding the award term including, but not limited to, the amount of the award term if any; the methodology used to calculate the award term, the calculation of the award term, the contractor's entitlement of the award term, and the nature and success of the contractor's performance are within the discretion of the TDO and are not subject to the disputes clause.

(f) Changes to Contract Term. The contract will be unilaterally modified to reflect the award term extension or reduction. The total contract period of performance under this clause will not exceed fifteen years. At any time the award term decision of the TDO fails to extend the term of the contract more than two years beyond the date of the decision, the Government reserves the right to cease the operation of the award term provision and the period of performance of the contract will not extend beyond the term as set forth in the contract at that time.

A-014 DELIVERIES AND PERFORMANCE

a. PERIOD OF PERFORMANCE

Performance under this contract shall be from DATE OF AWARD through seven years with award term periods from minus two years up to eight additional years.

b. DELIVERIES

The Contractor shall use reasonable diligence to provide the services to meet the dates identified in the delivery orders and complete the services identified in the performance specification. Not later than the time period specified in the following table, the Government shall issue a Letter of Intent (LOI) to activate a site. This letter of intent shall be for information only and will not constitute a commitment on the part of the Government. This letter shall take into consideration current and projected availability requirements and anticipated funding for the new site.

LOI Lead Time *	F-16 MTC Sites
Contract Award	Shaw AFB & Mt Home
19 months	Level B & C Service
15.5 months	Level A Service
17 months	1st Block 40 (Osan & Luke only)
23 months	Mobile MTC

* Lead times in this table reflect the number of months in advance of the planned activation dates for the designated sites set forth in the Contract.

Within 30 calendar days following LOI, the Government will issue a delivery order for the Site Survey at the site to be activated, pursuant to the appropriate subCLIN (Site Survey and Preparation #1) for that site. Depending on the potential number of simulation services ordered at a site and not later than 4 months prior to the specific simulation service site activation, the appropriate subCLIN (Site Survey and Preparation #2, #3, #4, and/or #5) delivery orders will be issued. If the Site Survey and Preparation orders are not issued within the time period specified in this Clause A-014, the start of service at that site will be delayed day for day beyond the service start date specified in the Contract.

The Government shall not, by virtue of anything contained in this Contract (including, without limitation, any designation or identification by the Contractor to fulfill any of the provisions of this Contract), acquire special property or insurable interest in the simulation service hardware or software.

The Contracting Officer may authorize early delivery for the simulation services.

A-015 SERVICE CONTRACT ACT WAGE DETERMINATIONS

In the event that the Service Contract Act, as amended, is applicable to this procurement. The wage determinations listed below and attached to Attachment 7 of this contract are hereby incorporated.

Wage Determination No.	Area	Date of Last Revision
94-2361 REV (*17*)	NM, Albuquerque	*07/05/2001*[7]
94-2517 REV (*21*)	TX, Northwest Texas NM, Curry County	*05/31/2001*[7]
94-2017 REV (*25*)	AK, Statewide	*08/23/2001*[7]
94-2023 REV (*21*)	AZ, Phoenix	*05/31/2001*[7]
94-2121 REV (*18*)	FL, Northwest Florida Okaloosa County	*07/20/2001*[7]

94-2131 REV (*19*)	GA, Albany Lanier County	*05/31/2001*[7]
94-2205 REV (*17*)	IA, Des Moines	*06/28/2001*[7]
94-2159 REV (*17*)	ID, Statewide	*07/03/2001*[7]
94-2331 REV (*18*)	NV, Las Vegas	*06/19/2001*[7]
94-2425 REV (*12*)	OH, Toledo	*05/31/2001*[7]
94-2433 REV (*20*)	OK, Tulsa	*07/05/2001*[7]
94-2475 REV (*17*)	SC, Columbia	*05/31/2001*[7]
94-2531 REV (*18*)	UT, Statewide	*06/13/2001*[7]

A-016 SERVICE AVAILABILITY ACCOUNTING

A. Level A Availability Accounting

1. The Level A system is segregated into the following elements:

ACC F-16 Level A Elements

Cockpit with IOS
Visual
Combat environment

2. The cockpit with IOS and either the Visual or the Combat environment must be available for Availability to be non-zero.

a. All three elements being available are scored as 100% availability.

b. The cockpit plus either of the other two elements is scored as 66% availability. An element is non-available from the time that the government first reports the outage. Failure of the contractor's problem reporting system does not constitute a failure to notify. An element becomes available again upon successful completion of repair.

c. Monthly availability is calculated according to the following formula:

$$\textit{Lvl A Availability(\%)} = \frac{\textit{\# hours at 100\% *100 + \# hours at 66\% * 66}}{\textit{Total number of hours in month}}$$

[7]Contract Modification P00007

d. The total number of hours in a month are number of days in a month * 24 hours a day. For example, January has 31 days, so it has 31 * 24 = 744 hours.

B. Level B and Level C Availability Accounting

1. The F-16 Block 40/50 system is segregated into the following system elements:

ACC F-16 MTC	Elements	Points
Brief/DB System	2 room	2 (1 each)
IOS	4 stations	4 (1 each)
Pilot Stations*	4 cockpits	4 (1 each)
Manned Threats	4 stations	4 (1 each)
Mission Control Equip	1 station	1
Local Network	1 network	1
Long Haul Connect	1 system	5
Observation Area	1 room	1
Total Elements Available		22

*Pilot stations include the synthetic environment to support the scheduled mission.

NOTE: These segments may be adjusted based on contractor selected design of the system. For example, if a separate threat environment exists to support each cockpit, a threat environment element may be added and counted like 4 cockpits or manned threats.

2. The MTC shall have 95% availability. Each of the above elements will contribute the points indicated toward the monthly service availability calculation:

$$Availability(\%) = \left(\frac{\text{Available Required Elements} - \text{Not Mission Capable Elements}}{\text{Required Elements}} \right) * 100$$

a) Required Elements. Required elements are identified on the final daily schedule (normally 1600 the day prior) presented to the contractor. Schedule changes coordinated after a final schedule is established will not be charged against the contractor if the contractor is unable to support late request. However, additional points can be achieved for a training mission by supporting late schedule changes (see paragraph 2.d below and examples). If these elements on the final daily schedule are classified Not Mission Capable Elements, these elements will be excluded from the definition of required elements.

b) Available Required Elements. An element is considered available if the element was used in the mission and provided or supported effective mission training for the primary trainees or objectives. If the element is down, in a degraded condition, or not able to be used to support the mission and/or objective due to failure of another element, the ele-

ment is considered not available. (Ex: If the cockpit stations fail, it is very unlikely that any elements can be considered available.) If team training is scheduled and the team is non-effective, all elements scheduled by the team shall be considered non-effective. The crew or instructor responsible for accomplishing the mission will determine mission effectiveness. If long-haul connections are disrupted due to problems at remote sites (e.g., power, phone lines) there will be no decrement to the mission points.

NOTE: The basis for the effective/non-effective decision will be patterned after wing policy for accomplishing effective training flights in the aircraft. Crews will attempt alternate missions in an attempt to get effective training; however, basic qualification type missions, emergency procedure practice and/or instrument missions will not normally substitute for team mission training unless a team member specifically has that mission type as an identified training requirement.

c) Not Mission Capable Elements. An element is considered "Not Mission Capable" (NMC) when it is down for a period exceeding one day. This NMC category protects the government from the circumstance of being unable to schedule a desired mission because the mission requires the use of an NMC element, and the element is known to be NMC. For example, two instructor stations are down for an extended period of time. If the user only schedules two instructors due to this condition, the contractor would continue to get 100% availability without the NMC provision. Thus, any mission conducted during a period that any element is NMC will loose element points for NMC elements.

d. Any missions requested by the user and supported by the contractor after the final daily schedule is presented to the contractor are credited to the required elements available (numerator) of the availability formula and zero points are added to the required elements (denominator). If late requested elements are only partially effective or are not effective, the contractor is not penalized in any way; however, no points for the mission will be included in the availability accounting period.

3. The on-site Project Officer (PO) is the final authority for determining whether the device meets the mission requirements. The MTC contractor and PO shall meet as required, but not less than weekly, to resolve the accounting of availability factors. The ANG POs will meet with the contractor no less than monthly. Availability shall be calculated on a monthly basis but a review of the factors will be accomplished weekly while the events are still current. In the event of a disagreement between the Government and the contractor's accounting of mission availability data, the decision of the PO shall stand with the contractor's position documented at the point(s) of disagreement. Complete details of events/problems that affect the training schedule including facility conditions and any other factors affecting the availability of the device shall be documented by the contractor, certified by PO and attached to the contractor's service billing invoice.

4. Each month the cumulative elements available for all missions (available required elements minus NMC elements) will be divided by the cumulative elements required for all missions to calculate the monthly availability percentage. This monthly availability percentage will then be multiplied by the hours available for that month for billing pur-

poses. If no missions are scheduled or flown in any given month, the availability rating will be 100% as long as the contractor staffs the MTC.

5. Under no circumstances shall the availability percentage be more than 100% in any month.

6. Availability will not be calculated until operational service starts.

7. Availability for a day that no elements are scheduled or used will be 100%; however, zero points will be added to both elements of the formula, 0 scheduled, 0 used.

8. Availability for level B service will be a subset of the MTC elements using the same scheduled versus effective formula.

The following examples are provided for clarification:

Example One:

Force Protection Mission Commander Upgrade Training: Long haul DMT with 4 x F-15C at Eglin, AWACS at Tinker, 4 x F-16C cockpits the F-16 site.

Elements Required/Scheduled	Points
1 Briefing system	1 point
2 IOS	2 points
4 Pilot Stations	4 points
4 Threat Stations	4 points
1 Mission Control Station	1 point
Local network	1 point
Mission Observation	1 point
Debrief System	1 point
1 Long Haul Connect	5 points
1 debriefing system	1 point
Elements required/scheduled	21 points

Case I: All required elements are logged effective by the crew, the availability rating is 21/21 for the scheduled mission.

Case II: One pilot station in the second element lost the visual display system 10 minutes after the mission started. The second element "aborted" and had no reasonable alternate mission. The second element instructor station was no longer required. The primary mission was conducted with a 2-ship element and logged as effective for the mission upgrade pilot because the syllabus allowed a 2-ship lead for this specific mission. One IOS and two cockpits became non-effective, therefore, 3 elements are non-effective for a score of 18/21.

Case III: The mission commander upgrade pilot station failed for loss of visual display system 15 minutes after the mission started. The DMT wide mission was not stopped and the F-15 flight lead at Eglin took over the force protection lead. F-16 cockpits were swapped and the mission restarted 15 minutes later and attempted as a two ship but tim-

ing, other minor delays and mission flow did not allow the F-16 upgrade pilot to accomplish the required training; therefore, Non Effective. No effective mission training was accomplished in the period. The availability rating is 0/21.

Example Two:

One element (2-ship) is scheduled for a DMT SEAD mission and the second element is flying local low level and range familiarization ride with two threat stations for support. The local mission requested no MTC briefing

Elements	Points
1 Briefing system	1 point
2 IOS	2 points
4 Pilot Stations	4 points
4 Threat Stations (2 for each mission)	4 points
1 Local network	1 point
1 Long haul Network/Setup	5 points
2 Debriefing systems	2 points
Elements required/scheduled	20 points

Case I: All required elements are logged effective by the crew for Missions #1 and #2. The availability rating is 20/20 for the scheduled missions.

Case II: The DMT mission was non-effective due to a failure in the MTC contractor's equipment inside the MPOP. One DMT mission pilot and the instructor stayed and did a single ship emergency procedure mission to prepare for an upcoming qualification requirement. The local mission went as scheduled. Loss of one cockpit, two threat stations, and the long haul network (8 element points) were deducted for an availability of 12/20. If the DMT mission failure is determined to be out of the control of the MTC contractor (ex: O&I connectivity issues), the loss would not be counted.

Case III: The DMT mission goes as planned but the second element is a no-show. Availability is 20/20.

Example Three:

No mission is scheduled for the period on the final daily schedule. The user requests to add a 4 ship local mission requiring the following after the final schedule:

Elements Required/Not Scheduled	Points
1 Briefing System	1 point
1 IOS	1 points
4 Pilot Stations	4 points
Combat Environment	1 point
1 Debriefing System	1 point

Local network	1 point
Elements Required/Not scheduled	9 points
Elements Required/Scheduled	0

Availability is 9 points for 0 points required. 9 will be added to the available elements (numerator) for the cumulative period. No points will be added to the required (denominator) elements. For example, if the contractor points for the cumulative period was 390/412 (94.6%), the new score would be 399/412 (96.8%).

C. Availability Accounting Applicable to All Orders

1. This section C is applicable to any order placed under this contract: Level A, Level B, or Level C training.
2. The system or element will be counted as available if downtime is time lost due to excusable delays as defined in FAR 52.212-4(f).

3. Availability of 95% or better will be billed at 100% of the hourly rate. If availability were to drop below 95%, the government would pay a fraction of the hourly rate. That fraction would be actual availability divided by 95%.

A-017 FACILITY HOURS OF OPERATION

1. The Level B or C services at Shaw and Luke are required to be available for operations 10 hours/day, 5 days/week, Monday through Friday, excluding federal holidays, the Friday after Thanksgiving, and six operational down days each year, or 2430 hours per year. The Level B and C services at Mountain Home AFB, Eglin AFB, Hill AFB, Moody AFB, Nellis AFB, Eielson AFB, Cannon AFB, Misawa AB, Osan AB, Aviano AB, Spangdahlem AB, are required to be available 8 hours/day, 5 days/week, Monday through Friday, excluding federal holidays, the Friday after Thanksgiving, and six operational down days each year, or 1945 hours per year. Normal daily operating hours will be established at each site. The hours of availability may slide within the time window of 0400 to 2400. Any scheduled hours outside the 0400 to 2400 window and/or outside the scheduled consecutive hour day will be considered surge, including any scheduled Saturday or Sunday work.

2. The fixed site Level B and C service availability at the ANG sites (Des Moines ANG, Kirtland AFB, McEntire ANG, Toledo ANG, and Tulsa ANG) is ten hours per day, six days per week plus one Sunday per month, or 3240 hours per year. Individuals manning the system will have to flex their work schedules inside the availability hours based to meet the unit requirements each week. The ANG expects these systems to be operated 24-30 hours per month (approximately 6 hours per week). Based on this average, the annual usage is forecast to be 300-360 hours per year.

3. Level A service if ordered is required to be available as a turn-key operation 24 hours a day each day of the year, or 8760 hours per year. Maintenance and contractor support to start initial maintenance actions within 48 hours following notification. Failure of the

Contractor's problem reporting system does not constitute a failure to notify. Simulation service utilization hours required annually is anticipated to be 1200 hours.

4. The Air Force Project Officer will notify the contractor's site manager at least 7 days in advance of a change to sites normal hours of operation specified above. The contractor shall be required to operate the site, at no change in contract price, during the specified hours for the period specified by the Air Force Project Officer. The contractor is not obligated to change the normal hours of operation unless the 7 days advance notice is provided.

5. Surge hours will be ordered by the ASC/YW contracting officer as requirements are identified. Once ordered, use of surge hours will be scheduled at least 12 hours in advance by the Air Force Project Officer. The contractor shall provide up to 150 hours per year at all sites where Level C Simulation Service has been ordered other than Air National Guard sites where the contractor shall provide up to 50 hours per year. The contractor is not obligated to provide ordered surge hours scheduled less than 12 hours in advance. The contractor is to provide a 24 hour, 365 days per year problem reporting system. The contractor will provide toll free telephone access to this system.

6. The ANG mobile Level C service should be available to meet training requirements of 3240 hours per year availability. If the mobile service is the only service available to the ANG unit, the availability will be similar to the ANG fixed site. If the ANG unit already has a fixed Level A service, many of the low end training events will have already been accomplished. The ANG anticipates the total annual usage in this case would decrease to 150-200 hours per year, reflecting its more exclusive use for higher order training events. The Level A service usage in this case is anticipated to decrease to 200-250 hours per year.

A-018 REQUIREMENTS EXCLUSIONS

1. The Government reserves the right to contract with other sources for F-16 Block 40/50 trainers or trainer services not configured for Distributed Mission Training (DMT). Distributed Mission Training (DMT) is defined as locally or longhaul networked simulations.

2. The Government reserves the right to contract with other sources for F-16 Block 40/50 DMT trainers or services for USAFE, AETC, and/or ANG sites that have not had delivery orders issued. Once delivery orders have been issued for a site, services for that site fall within the scope of Clause A-011.

A-019 ASSOCIATE CONTRACTOR AGREEMENTS (AFMC) (JUL 1997)

(a) The Contractor shall enter into Associate Contractor Agreements (ACA) for any portion of the contract requiring joint participation in the accomplishment of the Govern-

ment's requirement. The agreements shall include the basis for sharing information, data, technical knowledge, expertise, and/or resources essential to the integration of the F-16 Block 40/50 MTC which shall ensure the greatest degree of cooperation for the development of the program to meet the terms of the contract. Associate contractors are listed in (h) below.

(b) ACAs shall include the following general information:

(1) Identify the associate contractors and their relationships.
(2) Identify the program involved and the relevant Government contracts of the associate contractors.
(3) Describe the associate contractor interfaces by general subject matter.
(4) Specify the categories of information to be exchanged or support to be provided.
(5) Include the expiration date (or event) of the ACA.
(6) Identify potential conflicts between relevant Government contracts and the ACA; include agreements on protection of proprietary data and restrictions on employees.

(c) A copy of such agreement shall be provided to the Contracting Officer for review before execution of the document by the cooperating contractors.
(d) Nothing in the foregoing shall affect compliance with the requirements of the clause at 5352.209-9002, Organizational Conflict of Interest.
(e) The Contractor is not relieved of any contract requirements or entitled to any adjustments to the contract terms because of a failure to resolve a disagreement with an associate contractor.
(f) Liability for the improper disclosure of any proprietary data contained in or referenced by any agreement shall rest with the parties to the agreement, and not the Government.
(g) All costs associated with the agreements are included in the negotiated cost of this contract.
(h) The following contractors are associate contractors with whom agreements are required:

Contractor	**Address**	**Program/Contract**
TRW, Inc. – Tactical Systems SBU	*1762 Glenn Curtiss St Carson CA 90746*	DMT O&I *F33657-98-D-2061*[6]
Boeing/McDonnell Douglas Aircraft and Missile Systems	St Louis, MO	JDAM/F08626-94-C-0003 F-15 MSIP CTSS/ F33657-97-D-0025
Northrop Grumman	Baltimore, MD	AN/ALQ-131(v)14 ECM POD/ F09603-97-C-0080
Raytheon Systems Company	Tucson, AZ	HARM/N00019-93-C-0148 JSOW/N00019-91-C-0196 AIM-9/N00019-97-C-0027 AIM-120/TBD

[6]Contract Modification P00006

MIDSCO, Inc	Fairfield, NJ	Link 16/N00039-94-C-0008
British Aerospace	Arlington, VA	BLU-107/B/TBD
Plexsys Interface Products, Inc.	Portland, OR	AWACS MTC: F33657-98-D-0021
LM Tactical Aircraft Systems	Ft Worth, TX	F-16 Blk 50: F33657-94-C-2259 F-16 Blk 40: F33657-95-C-2028
LM Sanders	Nashua, NH	AFMSS/F19628-93-C-0016
LM Integrated Systems	Orlando, FL	WCMD/F08626-95-C-0106 JASSM/F08626-96-C-0002
LM Fairchild	Yonkers, NY	ALR-56/F09603-98-C-0350

(End of clause)

A-020 SWING CLAUSE ADJUSTMENTS

For all changes to individual orders which the Contractor determines to have a price increase or decrease of $25,000.00 or less (including options), the Contractor shall submit an estimate of the price impact in lieu of a price proposal. The contractor shall refer to this Provision and shall state in its proposal that the changes are proposed at no change in price. If any change to an individual order results in a price increase or decrease of $25,000.00 or less, the CO may issue a unilateral modification (Definitive Change Order) to this contract which shall cite this paragraph, reference the contractor's proposal, and direct the changes to be accomplished at no change in the contract price or obligation. Issuance of the Definitive Change Order shall constitute acceptance of the Contractor's proposal, shall be binding on both parties, and shall constitute a full, complete and final settlement for all changes directed thereby. The Government reserves the right to negotiate the estimated price impact of any proposal submitted pursuant to this provision prior to issuance of a unilateral change order. When the cumulative price increase/decrease of all priced changes issued pursuant to this paragraph exceeds $500,000.00, this paragraph shall only be applicable to proposals that reduce the cumulative price. All other changes shall be processed in accordance with other provisions of this contract. Price associated with this provision shall be separately tracked. Actual cost for determining price shall be made available for audit upon request.

Swing Clause Procurements

Mod NUMBER	CCP/ECP TITLE	Amount Remaining in "SWING" POOL

(End of sample)

A-021 APPLICABILITY OF STATUS OF FORCES AGREEMENTS (SOFA)

This contract and its pricing are based upon the assumption that Status of Forces Agreements (SOFA) and any tax exemptions provided in such agreements are applicable to the Contractor and Subcontractor employees performing work under this contract in countries other than the United States. If for any reason a SOFA Agreement(s) is determined not to apply to the Contractor or Subcontractor employees, an equitable adjustment in contract prices(s) shall be made.

A-022 WARRANTY

The Contractor warrants that the Simulation Service shall pass the criteria identified in the SIMCERT plan dated ( ). The contractor understands that the SIMCERT shall be amended over time to reflect changing requirements based on new aircraft functional systems. As the aircraft is modified by the Government, the Training Task List, attached to the Performance Specification, shall be amended bilaterally to reflect new

tasks created by new systems or software processes. The contractor shall modify the MTC as required to meet SIMCERT certification criteria on any decertified training task identified in the Training Task List. The Contractor agrees to make all repairs necessary, at no increase in price, to bring this service up to SIMCERT criteria.

A-023 INDEFINITE QUANTITY

As prescribed in 16.506(e), insert the following clause:
Indefinite Quantity (Oct 1995)
(a) This is an indefinite quantity contract for the supplies or services specified, and effective for the period stated, in the Schedule. The quantities of supplies and services specified in the Schedule are estimates only and are not purchased by this contract.
(b) Delivery or performance shall be made only as authorized by orders issued in accordance with the Ordering clause. The Contractor shall furnish to the Government, when and if ordered, the supplies or services specified in the Schedule up to and including the quantity designated in the Schedule as the "maximum." The Government shall order at least the quantity of supplies or services designated in the Schedule as the "minimum."
(c) Except for any limitations on quantities in the Order Limitations clause or in the Schedule, there is no limit on the number of orders that may be issued. The Government may issue orders requiring delivery to multiple destinations or performance at multiple locations.
(d) Any order issued during the effective period of this contract and not completed within that period shall be completed by the Contractor within the time specified in the order. The contract shall govern the Contractor's and Government's rights and obligations with respect to that order to the same extent as if the order were completed during the contract's effective period; provided, that the Contractor shall not be required to make any deliveries under this contract after 90 days after expiration of the ordering period, except within the scope of Clause A-008 for continuity of services.

PAGES 69-74 CONTAIN A CLAUSE THAT WAS RECENTLY ADDED TO THE CONTRACT (NOT BASIC) THAT CONTAINS COST INFORMATION THAT WOULD HAVE BEEN DENIED. SINCE YOU DID NOT WANT PRICE OR COST INFORMATION IT IS BEING MAINTAINED WITHIN THE CONTRACTING OFFICE.

B-001 FAR 52.252-2 CLAUSES INCORPORATED BY REFERENCE (FEB 1998)

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

(End of Clause)

NO. FAR CLAUSE TITLE

B-101. 52.212-5 CONTRACT TERMS AND CONDITIONS REQUIRED TO IMPLEMENT STATUTES OR EXECUTIVE ORDERS — COMMERCIAL ITEMS (OCT 1998)

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

52.222-3: Convict Labor (E.O. 11755); and
52.233-3: Protest After Award (31 U.S.C 3553).

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

_X_(1) 52.203-6, Restrictions on Subcontractor Sales to the Government (JUL 1995), with Alternate I (OCT 1995) (41 U.S.C. 253g and 10 U.S.C. 2402).
____(2) RESERVED.
_X_(3) 52.219-8, Utilization of Small Business Concerns and Small Disadvantaged Business Concerns (JUN 1997) (15 U.S.C. 637 (d) (2) and (3)).
____(4) 52.219-9, Small, Small Disadvantaged and Women-Owned Small Business Subcontracting Plan (AUG 1998) (15 U.S.C. 637 (d) (4)).
____(5) 52.219-14, Limitation on Subcontracting (DEC 1996) (15 U.S.C. 637 (a) (14)).
_X_(6) (i) 52.219-23, Notice of Price Evaluation Adjustment for Small Disadvantaged Business Concerns (Pub. L. 103-355, section 7102, and 10 USC 2323) (If the offeror elects to waive the adjustment, it shall so indicate in its offer.)
_X_ (ii) Alternate 1 of 52.219-23,
_X_(7) 52.222-26, Equal Opportunity (APR 1984) (E.O. 11246).
_X_(8) 52.222-35, Affirmative Action for Special Disabled and Vietnam Era Veterans (APR 1998) (38 U.S.C. 4212).
_X_(9) 52.222-36, Affirmative Action for Handicapped Workers (JUN 1998) (29 U.S.C. 793).
_X_(10) 52.222-37, Employment Reports on Special Disabled Veterans and Veterans of the Vietnam Era (APR 1998) (38 U.S.C. 4212).
_X_(11) 52.225-3, Buy American Act—Supplies (41 U.S.C 10).

X (12) 52.225-9, Buy American Act—Trade Agreements Act Balance of Payments Program (41 U.S.C. 10, 19 U.S.C. 2501-2582).
____(13) [Reserved]
____(14) 52.225-18, European Union Sanctions for End Products (E.O. 12849).
____(15) 52.225-19, European Union Sanctions for Services (E.O. 12849).
____(16) (i) 52.225-21, Buy American Act—North American Free Trade Agreement Implementation Act—Balance of Payments Program (41 U.S.C. 10, Pub. L. 103-87).
(ii) Alternate I of 52.225r-21.
X (17) 52.229-10, State of New Mexico Gross Receipts and Compensating Tax
X (18) 52.239-1, Privacy or Security Safeguards (AUG 96) (5 U.S.C. 552a).
X (19) 52.247-64, Preference for Privately Owned U.S.-Flag Commercial Vessels (46 U.S.C. 1241).

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

X (1) 52.222-41, Service Contract Act of 1965, As amended (MAY 1989) (41 U.S.C. 351, et seq.).
X (2) 52.222-42, Statement of Equivalent Rates for Federal Hires (MAY 1989) (29 U.S.C. 206 and 41 U.S.C. 351, et seq.).
X (3) 52.222-43, Fair Labor Standards Act and Service Contract Act—Price Adjustment (MAY 1989) (Multiple Year and Option Contracts) (29 U.S.C. 206 and 41 U.S.C. 351 et seq.).
____(4) 52.222-44, Fair Labor Standards Act and Service Contract Act—Price Adjustment (MAY 1989) (29 U.S.C. 206 and 41 U.S.C. 351 et seq.).
____(5) 52.222-47, SCA Minimum Wages and Fringe Benefits Applicable to Successor Contract Pursuant to Predecessor Contractor Collective Bargaining Agreement (CBA) (MAY 1989) (41 U.S.C. 351 et seq.).

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

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

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

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

(e) Notwithstanding the requirements of the clauses in paragraphs (a), (b), (c), or (d), of this clause, the Contractor is not required to include any FAR clause, other than those listed below (and as may be required by an addenda to this paragraph to establish the reasonableness of prices under Part 15), in a subcontract for commercial items or commercial components--).

(1) 52.222-26, Equal Opportunity (Apr 1984) (E.O. 11246);

(2) 52.222-35, Affirmative Action for Special Disabled and Vietnam Era Veterans (APR 1998) (38 U.S.C. 2012 (a));

(3) 52.222-36, Affirmative Action for Handicapped Workers (JUN 1998) (29 U.S.C. 793)

B-102 252.212-7001 CONTRACT TERMS AND CONDITIONS REQUIRED TO IMPLEMENT STATUTES OR EXECUTIVE ORDERS APPLICABLE TO DEFENSE ACQUISITIONS OF COMMERCIAL ITEMS NOV 1995 (IAW DFARS 212.301 (f) (iv)

252.212-7001 Contract Terms and Conditions Required to Implement Statutes or Executive Orders Applicable to Defense Acquisitions of Commercial Items. (MAR 1998)

(a) The Contractor agrees to comply with the Defense Federal Acquisition Regulation Supplement (DFARS) clause 252.247-7023, Transportation of Supplies by Sea, which is included in this contract by reference to implement 10 U.S.C. 2631.

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

X 252.205-7000 Provision of Information to Cooperative Agreement Holders (10 U.S.C. 2416).

X 252.206-7000 Domestic Source Restriction (10 U.S.C. 2304).

___ 252.219-7001 Notice of Partial Small Business Set-Aside with Preferential Consideration for Small Disadvantaged Business Concerns

___ (Alternate I) (Section 9004, Pub. L. 101-165 (10 U.S.C. 2301 (repealed) note)).

___ 252.219-7002 Notice of Small Disadvantaged Business Set- Aside

___ (Alternate I) (15 U.S.C. 644).

___ 252.219-7003 Small Business and Small Disadvantaged Business Subcontracting Plan (DoD Contracts) (15 U.S.C. 637).

___ 252.219-7005 Incentive for Subcontracting with Small Businesses, Small Disadvantaged Businesses, Historically Black Colleges and Universities and Minority Institutions

___ (Alternate I) (Section 9004, Pub. L. 101-165 (10 U.S.C. 2301 (repealed) note)).

___ 252.219-7006 Notice of Evaluation Preference for Small Disadvantaged Business Concerns

___ (Alternate I) (15 U.S.C. 644).

___ 252.225-7001 Buy American Act and Balance of Payment Program (41 U.S.C. 10a-10d, E.O. 10582).

___ 252.225-7007 Buy American Act--Trade Agreements--Balance of Payments Program

X (Alternate I) (41 U.S.C. 10a-10d, 19 U.S.C. 2501-2518, and 19 U.S.C. 3301 note).

___ 252.225-7012 Preference for Certain Domestic Commodities.

252.225-7014 Preference for Domestic Specialty Metals (10 U.S.C. 2241 note).

___ 252.225-7015 Preference for Domestic Hand or Measuring Tools (10 U.S.C. 2241 note).

___ 252.225-7021 Trade Agreements (____Alternate I) (19U.S.C. 2501-2518 and 19 U.S.C. 3301note).

___ 252.225-7027 Restriction on Contingent Fees for Foreign Military Sales (22 U.S.C. 2779).
___ 252.225-7028 Exclusionary Policies and Practices of Foreign Governments (22 U.S.C. 2755).
___ 252.225-7029 Restriction on Acquisition of Air Circuit Breakers (10 U.S.C. 2534(a)(3)).
___ 252.225-7036 Buy American Act--North American Free Trade Agreement Implementation Act--Balance of Payment Program (____Alternate I) (41 U.S.C. 10a-10d and 19 U.S.C. 3301 note).
___ 252.227-7015 Technical Data--Commercial Items (10 U.S.C. 2320).
___ 252.227-7037 Validation of Restrictive Markings on Technical Data (10 U.S.C. 2321).
_X_ 252.243-7002 Certification of Requests for Equitable Adjustment (10 U.S.C. 2410)
_X_ 252.247-7024 Notification of Transportation of Supplies by Sea (10 U.S.C. 2631).

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

___ 252.225-7014, Preference for Domestic Specialty Metals, Alternate I (10 U.S.C. 2241 note).

(End of clause)

B-002 252.247-7024 NOTIFICATION OF TRANSPORTATION OF SUPPLIES BY SEA (NOV 1995) (IAW DFARS 247.573(c))

(a) The Contractor has indicated by 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.

B-003 5352.223-9000 ELIMINATION OF USE OF CLASS I OZONE DEPLETING SUBSTANCES (ODS) (MAY 1996) (IAW AFFARS 5323.890-7)

(a) It is the 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.

B-004 252.204-7004 REQUIRED CENTRAL CONTRACTOR REGISTRATION (MAR 1998)

(a) Definitions. As used in this clause-

(1) "Central Contractor Registration (CCR) database" means the primary DoD repository for contractor information required for the conduct of business with DoD.

(2) "Data Universal Number System (DUNS) number" means the 9-digit number assigned by Dun and Bradstreet Information Services to identify unique business entities.

(3) "Data Universal Numbering System +4 (DUNS+4) number" means the DUNS number assigned by Dun and Bradstreet plus a 4-digit suffix that may be assigned by a parent (controlling) business concern. This 4-digit suffix may be assigned at the discretion of the parent business concern for such purposes as identifying subunits or affiliates of the parent business concern.

(4) "Registered in the CCR database" means that all mandatory information, including the DUNS number or the DUNS+4 number, if applicable, and the corresponding Commercial and Government Entity (CAGE) code, is in the CCR database; the DUNS number and the CAGE code have been validated; and all edits have been successfully completed.

(b) (1) By submission of an offer, the offeror acknowledges the requirement that a prospective awardee must be registered in the CCR database prior to award, during performance, and through final payment of any contract resulting from this solicitation, except for awards to foreign vendors for work to be performed outside the United States.

(2) The offeror shall provide its DUNS or, if applicable, its DUNS+4 number with its offer, which will be used by the Contracting Officer to verify that the offeror is registered in the CCR database.

(3) Lack of registration in the CCR database will make an offeror ineligible for award.

(4) DoD has established a goal of registering an applicant in the CCR database within 48 hours after receipt of a complete and accurate application via the Internet. However, registration of an applicant submitting an application through a method other than the Internet may take up to 30 days. Therefore, offerors that are not registered should consider applying for registration immediately upon receipt of this solicitation.

(c) The Contractor is responsible for the accuracy and completeness of the data within the CCR, and for any liability resulting from the Government's reliance on inaccurate or incomplete data. To remain registered in the CCR database after the initial registration, the Contractor is required to confirm on an annual basis that its information in the CCR database is accurate and complete.

(d) Offerors and contractors may obtain information on registration and annual confirmation requirements by calling 1-888-227-2423, or via the Internet at http://ccr.edi.disa.mil.

B-005 252.225-7000 BUY AMERICAN ACT—BALANCE OF PAYMENTS PROGRAM CERTIFICATE (DEC 1991)

(a) Definitions. "Domestic end product," "qualifying country," "qualifying country end product," and "nonqualifying country end product" have the meanings given in the Buy American Act and Balance of Payments Program clause of this solicitation.

(b) Evaluation. Offers will be evaluated by giving preference to domestic end products and qualifying country end products over nonqualifying country end products.

(c) Certifications.

(1) The Offeror certifies that-

(i) Each end product, except those listed in paragraphs (c)(2) or (3) of this clause, is a domestic end product; and

(ii) Components of unknown origin are considered to have been mined, produced, or manufactured outside the United States or a qualifying country.

(2) The Offeror certifies that the following end products are qualifying country end products:

Qualifying Country End Products

Line Item Number Country of Origin

(List only qualifying country end products.)

(3) The Offeror certifies that the following end products are nonqualifying country end products:

Nonqualifying Country End Products

Line Item Number Country of Origin (If known)

SECTION J - LIST OF ATTACHMENTS AND EXHIBITS

Document	Pgs	Date	Title
Exhibit A	10	18 Feb 1999	DD Form 1525 - Exhibit A, Contract Data Requirements List[1]
Attachment 1	34	28 Apr 1999	Statement of Work (SOW)[2,4]
Attachment 2	127[6]	28 Apr 1999	Performance Specification[2,3,4,6]
Attachment 2A	21	28 Apr 1999	ANG Mobile Addendum Specification
Attachment 3	12	12 Apr 1999	Subcontracting Plan for Small, Small Disadvantaged, and Women-Owned Small Business Concerns
Attachment 4	20	28 Apr 1999	Integrated Master Plan[4]
Attachment 5	10	02 Sep 1998	DD Form 254 - Contract Security Classification Specification[1]
Attachment 6	7	28 Apr 1999	Pricing Matrix[3]
Attachment 7	106	22 Jan 1999	SCA Wage Determination[7]
Attachment 8	1	22 Jan 1999	Simulation Service Requirements and Schedule
Attachment 9	10	Undated	Award Term Plan for F-16 Block 40/50 Mission Training Center

[1]Contract Modification P00001
[2]Contract Modification P00002
[3]Contract Modification P00003
[4]Contract Modification P00004
[6]Contract Modification P00006
[7]Contract Modification P00007

SPECIFICATION

PERFORMANCE SPECIFICATION

for the

F-16 BLOCK 40/42/50/52

MISSION TRAINING CENTER (MTC)

Contract No.:	F33657-99-D-2025
Document No.:	3483S1000
Revision:	A
Date:	28 Apr 1999

Approved by:

F-16 MTC Technical Director Ed Harris Date: 26 Apr 99

F-16 MTC Program Director Date: 26 APR 99

Director, Quality Assurance Date: 26 APR 99

Vice President, Engineering Date: 26 APR '99

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98

Revision History

Revision	Revision Date	Change Description
Original	8 Mar 1999	
A	28 Apr 1999	Incorporate Evaluation Notice Clarifications

Table of Contents

1.0 SCOPE **7**

1.1 GENERAL DESCRIPTION 7
1.2 DOCUMENT OVERVIEW 7

2.0 REFERENCED DOCUMENTS **8**

2.1 GOVERNMENT DOCUMENTS 8
2.1.1 ASC/YWIP Documents *8*
2.1.2 Other Government Documents, Drawings, and Publications *8*
2.1.3 Standards and Handbooks *9*
2.2 COMMERCIAL STANDARDS 9
2.3 CONTRACTOR DOCUMENTS 10

3.0 SIMULATION SERVICE PERFORMANCE REQUIREMENTS **11**

3.1 SIMULATION SERVICE DEFINITION 11
3.1.1 Simulation Service Overview *11*
3.1.2 Simulation Service Levels *11*
3.1.2.1 Simulation Service Level A 11
3.1.2.2 Simulation Service Level B 11
3.1.2.3 Simulation Service Level C 11
3.1.3 Simulation Service Level Upgrades *12*
3.1.4 Simulation Service Operating Locations *12*
3.2 GENERAL PERFORMANCE REQUIREMENTS 12
3.2.1 F-16 Missions and Operations *12*
3.2.1.1 Threshold Missions and Operations 12
3.2.1.2 Objective Missions and Operations 12
3.2.2 F-16 Training Tasks *12*
3.2.3 System Latency *12*
3.2.3.1 Single Cockpit Latency 12
3.2.3.2 Locally Networked Cockpit Latency 12
3.3 SIMULATION SERVICE ELEMENTS 12
3.3.1 Ownship Simulation *12*
3.3.1.1 Cockpit 12
3.3.1.1.1 Flight Controls 13
3.3.1.1.2 Control Panels 13
3.3.1.1.3 Upfront Controls 13
3.3.1.1.4 Color Multi-Function Displays 13
3.3.1.1.5 Head-Up Display (HUD) 13
3.3.1.2 Aircraft Handling Characteristics 13
3.3.1.2.1 Aerodynamic Performance 14
3.3.1.2.2 Ground Handling 14
3.3.1.3 Avionics and Weapon Systems 14
3.3.1.3.1 Avionics Systems 14
3.3.1.3.2 Maverick EO/IR Weapon Simulation 15
3.3.1.3.3 Ownship Weapons Validation 15
3.3.1.3.4 Ownship Ordnance 15
3.3.1.4 Aural / Comm Subsystem 15
3.3.1.4.1 Computer-Generated Audio 15
3.3.1.4.2 Aural Cues 16
3.3.1.4.3 Interference 16

3.3.1.4.4 Communication Jamming 16
3.3.1.4.5 Audio System Equipment 17
3.3.1.5 Real-Time Input/Output System 17
3.3.2 Visual Systems 17
3.3.2.1 Visual System Characteristics 18
3.3.2.1.1 Architecture 18
3.3.2.1.2 Update Rate 18
3.3.2.1.3 Image Resolution 18
3.3.2.1.4 Polygon Capacity 18
3.3.2.1.5 Light Capacity 18
3.3.2.1.6 Computed Visual Range 19
3.3.2.1.7 Database Storage Capacity 19
3.3.2.1.8 Maximum Motion Systems 19
3.3.2.1.9 Aircraft Representation 19
3.3.2.1.10 Missile/Bomb Representation 20
3.3.2.1.11 Ground Threat Representation 20
3.3.2.1.12 Flare Representation 20
3.3.2.1.13 Aerial Refueling 21
3.3.2.1.14 Generic Terrain/Ocean 21
3.3.2.1.15 Ownship Tracers 21
3.3.2.1.16 Ownship Lights 21
3.3.2.1.17 Visual Environment 21
3.3.2.2 Level A Visual System 24
3.3.2.2.1 HUD Representation 24
3.3.2.3 Level B and C Visual System 24
3.3.2.3.1 Instantaneous Field of View 24
3.3.2.3.2 Display Facets 24
3.3.2.3.3 HUD Representation 25
3.3.2.3.4 Target Projection 25
3.3.3 Synthetic Environment 26
3.3.3.1 Natural Environment 26
3.3.3.2 Databases 26
3.3.3.2.1 Database Capture Criteria 26
3.3.3.3 Manmade Environment 27
3.3.3.3.1 Constructive Entities 28
3.3.3.3.2 Electronic Combat Environment (ECE) 28
3.3.3.3.3 Constructive Ordnance 29
3.3.4 Threat Stations (Level C Only) 30
3.3.5 Modular Control Equipment (MCE) Workstation (Level C Only) 30
3.3.6 Instructor Operator Station (IOS) 30
3.3.6.1 Training Scenario Management 32
3.3.6.2 Scenario Creation 32
3.3.6.3 Scenario Setup and Execution 32
3.3.6.4 Malfunctions (Appendix E) 33
3.3.6.5 Training Exercise Monitoring 33
3.3.6.6 Communications 34
3.3.6.7 Freeze and Reset 34
3.3.6.7.7 Mark Point 35
3.3.6.8 Mission Playback 36
3.3.6.9 Cockpit Control Interface (CCI) 37
3.3.7 Briefing/Debriefing (B/DB) Systems (Level B and C Only) 37
3.3.7.1 Briefing Capability 37
3.3.7.2 Debriefing Capability 38
3.3.7.3 Mission Observation Capability (Level C Only) 38
3.4 DMT CONNECTIVITY 39
3.4.1 DMT Networking 39
3.4.2 DMT Interoperability 39

3.4.3 Simultaneous Training *39*
3.5 FACILITIES 40
3.5.1 Facility Space *40*
3.5.2 Utilities *40*
3.6 AVAILABILITY 40
3.6.1 Required Availability *40*
3.6.2 Level A Availability Accounting *40*
3.6.3 Level B and Level C Availability Accounting *40*
3.6.4 Surge Availability *40*
3.6.5 Available Operating Hours *40*
3.7 ENVIRONMENT, SAFETY AND HEALTH 40
3.7.1 Fire Detection Alarm and Suppression System *41*
3.7.2 Emergency Power-Off Switches *41*
3.7.3 Emergency Lighting *41*
3.7.4 Precautionary Markings *41*
3.8 SECURITY 41
3.8.1 F-16 DMT System Simulations and MTC Security *41*
3.8.2 System Security *41*
3.8.2.1 Site Facility Security 42
3.8.2.2 Computer Security 42
3.8.3 Network Security *42*
3.8.4 Emissions Security *42*
3.8.5 Physical Security *43*
3.9 TRANSPORTABLE MTC SERVICES 43
3.10 GROWTH AND SPARE 43
3.11 PHYSICAL CHARACTERISTICS 43
3.11.1 Weight *43*
3.11.2 Physical Space *43*
3.11.2.1 Walkspace 43
3.11.2.2 Equipment Cooling and Ventilation 43
3.11.3 Environmental Operating Conditions *43*
3.11.3.1 Natural Environment 44
3.11.3.2 Operation 44
3.11.3.3 Storage 44
3.11.3.4 Transportation 44
3.12 DESIGN AND CONSTRUCTION CONSTRAINTS 44
3.12.1 Materials *44*
3.12.2 Nameplates and Product Markings *44*
3.12.3 Workmanship *44*
3.12.4 Interchangeability *45*
3.12.5 Human Engineering *45*
3.13 Y2K COMPLIANCE 45
4.0 QUALIFICATION PROVISIONS 46
4.1 GENERAL 46
4.1.1 Contractor Conducted Tests *46*
4.1.1.1 Subsystem Verification Testing (SSVT) 46
4.1.1.2 Hardware and Software Integration (HSI) and Test 46

4.1.1.3 System Verification Testing (SVT) 46
4.1.1.4 System Performance Evaluation (SPE) 46
4.1.2 Methods of Verification *46*

5.0 REQUIREMENTS TRACEABILITY 51

APPENDIX A - PILOT TRAINING TASK LIST (TTL) 52

APPENDIX B - RESERVED 70

APPENDIX C - COCKPIT COMPONENT REQUIREMENTS MATRIX 71

APPENDIX D - THREAT AND ENTITY LIST 91

APPENDIX E - EMERGENCY PROCEDURES AND MALFUNCTIONS 99

APPENDIX F - ACRONYMS AND ABBREVIATIONS 112

1.0 SCOPE

1.1 GENERAL DESCRIPTION

This document specifies the general simulation services performance requirements for the Combat Air Forces' (CAF) F-16 Block 40/42/50/52 system simulations and Mission Training Centers (MTCs). In this document, the terms Block 40 and Block 50 refer to F-16 Block 40/42/50/52. System simulation refers to an F-16 Block 40 or 50 training device that is capable of training the F-16 Training Task List (TTL) attached as Appendix A. MTC refers to a training capability that contains two to four system simulations and their associated instructor operator stations, threat stations, modular control equipment (MCE) workstation, and a brief/debrief (B/DB) system. MTC is also referred to as a Level C simulation service. Distributed Mission Training (DMT) refers to physically separated and networked simulation services. The F-16 system simulations and MTCs shall be part of a larger DMT system that integrates other dissimilar system simulations.

1.2 DOCUMENT OVERVIEW

This document states the performance requirements for the F-16 Blocks 40/42 and 50/52 MTCs as derived from the Simulation Capability Requirements Document (SCRD).

2.0 REFERENCED DOCUMENTS

2.1 GOVERNMENT DOCUMENTS

This section lists Government, commercial, and contractor documents cited in this specification or used as guidelines in the preparation of this specification, to the extent specified herein.

2.1.1 ASC/YWIP Documents

The following ASC/YWIP documents served as guidelines for the preparation of this specification and form a part of this specification to the extent specified herein:

- Statement of Objectives for the F-16 Block 40/42/50/52 Mission Training Center (MTC), F-16 MTC Revolutionizing Training Division, Training Systems Product Group, Aeronautical Systems Center (ASC/YWIP), WPAFB, OH.
- Simulation Capability Requirements Document (SCRD) for F-16 Blocks 40/42/50/52 Mission Training Center (MTC) Program, F-16 MTC IPT Revolutionizing Training Division, Training Systems Product Group, Aeronautical Systems Center (ASC/YWIP), WPAFB, OH, 22 Jan 99.

2.1.2 Other Government Documents, Drawings, and Publications

The following other Government documents, drawings, and publications form a part of this document to the extent specified herein. Unless otherwise specified, the issues are those cited in the specification.

T.O. 1F-16CJ-1	Flight Manual, USAF Series Aircraft, F-16 C/D Blocks 50 and 52
T.O. 1F-16CG-1	Flight Manual, USAF Series Aircraft, F-16 C/D Blocks 40 and 42
T.O. 1F-16CJ-1-2	Supplemental Flight Manual, USAF Series Aircraft, F-16 C/D Blocks 50 and 52
T.O. 1F-16CG-1-2	Supplemental Flight Manual, USAF Series Aircraft, F-16 C/D Blocks 40 and 42
T.O. 1F-16CJ-6CF-1	Acceptance and Functional Check Flight Manual, USAF Series Aircraft, F-16 C/D Blocks 50 and 52
T.O. 1F-16CG-6CF-1	Acceptance and Functional Check Flight Manual, USAF Series Aircraft, F-16 C/D Blocks 40 and 42
T.O. 1F-16CJ-34-1-1	Avionics and Nonnuclear Weapons Delivery Flight Manual, USAF Series Aircraft, F-16 C/D Blocks 50 and 52
T.O. 1F-16CG-34-1-1	Avionics and Nonnuclear Weapons Delivery Flight Manual, USAF Series Aircraft, F-16 C/D Blocks 40 and 42
T.O. 1F-16C-25-D-A	Nuclear and Practice Bomb Delivery
T.O. 1-1C-1	Flight Manual Basic Flight Crew Air Refueling Manual
T.O. 1-1C-1-30	F-16 Flight Crew Air Refueling Procedures with KC-135/KC-10
AFI 11-F-16 Vol 1	F-16 Training
AFI 11-217 Vol 2	Instrument Flight Procedures
AFI-11-214	Aircrew and Wpns Director Proced. For Air Ops
MCI 11-F-16 Vol 3	F-16 Pilot Operational Procedures
MCH 11-F-16 Vol 5	F-16 Combat Fundamentals
MCM 3-1 Vol 1 (S)	Mission Employment Tactics General Planning and Employment
MCM 3-1 Vol 2 (S)	Threat Reference Guide and Counter Tactics
MCM 3-1 Vol 3 (S)	F-16 Tactical Employment

NSTISSAM/ TEMPEST 2-95	Red/Black Installation Guidance, 12 Dec 95
NSTISSI 7000 (C)	TEMPEST Countermeasures for Facilities (U), 29 Nov 93
Annex A of NSTISSI 7000 (S)	TEMPEST Countermeasures for Facilities (U), 03 Jun 91
Change 1 to Annex A Of NSTISSI 7000 (Issued via NSTISSI Memo, Serial: NSTISSC-054/91 (S)	TEMPEST Countermeasures for Facilities (U), 17 Sep 91
Annex C of NSTISSI 7000 (C)	TEMPEST Countermeasures for Facilities (U), 19 Sep 95

2.1.3 Standards and Handbooks

The following Government standards and handbooks served as a guideline for this specification to the extent specified herein:

- AFOSH Standards
- Requirement 1 of MIL-STD-454 Safety Design Criteria - Personnel Hazards
- MIL-STD-1472E Human Engineering Design Criteria for Military Systems
- 29 CFR 1910, Code of Federal Regulations, Title 29 Labor (OSHA)
- DoD 5220.22-M National Industrial Security Program Operating Manual (NISPOM), through Industrial Security Letter (ISL) 97-1
- Training System Product Group Program Protection Plan, 15 Feb 1996
- F-16 Multi-mission Fighter Security Classification Guide, 1 Sept 97, with Letter Change No. 1, 24 Mar 98
- MIL-STD-100, Standard Practice for Engineering Drawings
- MIL-HDBK-232A Red/Black Engineering - Installation Guidelines
- MIL-HDBK-419A Grounding, Bonding, and Shielding for Electronic Equipment and Facilities
- MIL-STD-188-124A Grounding, Bonding, and Shielding for Common Long-Haul/Tactical Communication Systems

2.2 COMMERCIAL STANDARDS

The following commercial standards form a part of this document to the extent specified herein. Unless otherwise specified, the issues are those cited in the specification.

- NFPA 70 National Electric Code
- NFPA National Fire Codes
- ANSI IT7.215 Data Projection Equipment and Large Screen Data Displays - Test Methods and Performance Characteristics
- ANSI C84.1-1989 Power Systems - Voltage Ratings for Power Systems and Equipment (60-Hz)

2.3 CONTRACTOR DOCUMENTS

The following Lockheed Martin documents served as guidelines for this specification and form a part of this specification to the extent specified herein:

- Environment, Safety and Health Manual, Lockheed Martin Tactical Defense Systems, Akron, OH
- Engineering Manual, Lockheed Martin Tactical Defense Systems, Akron, OH

3.0 SIMULATION SERVICE PERFORMANCE REQUIREMENTS

3.1 SIMULATION SERVICE DEFINITION

3.1.1 Simulation Service Overview

F-16 Block 40 and 50 simulation services shall operate fully in the United States Air Force (USAF) DMT network. Simulation service elements shall meet interoperability standards established by industry and the USAF through the DMT Operations and Integration (O&I) contractor. The system simulations shall be capable of training all aircraft missions and procedures as specified in the F-16 TTL (Appendix A). Training tasks include, but are not limited to, emergency procedures, initial qualification training, weapons and tactics training, and mission qualification training. The system simulations shall also provide the capability to perform system upgrade training, advanced skills training (i.e., flight lead, instructor pilot, mission commander, etc.), tactics validation, operational test and evaluation, mission rehearsal, and exercise support.

3.1.2 Simulation Service Levels

3.1.2.1 Simulation Service Level A

Level A service shall provide one or more system simulations at an operating location. Each system simulation shall provide, as a minimum, the capability to train all Level A tasks identified in the F-16 TTL. Level A system simulations shall provide a visual system that allows F-16 pilots to train all level A tasks identified in the F-16 TTL. Level A system simulations shall be capable of operating in a DMT and stand-alone configuration.

3.1.2.2 Simulation Service Level B

Level B service shall provide one to four networked system simulations at an operating location. Each system simulation shall provide, as a minimum, the capability to train all Level B tasks identified in the F-16 TTL. Level B system simulations shall provide a visual system with the full field of view (FOV) experienced by the pilot in the aircraft that allows F-16 pilots to train all Level B tasks identified in the F-16 TTL. Level B service shall also provide, as a minimum, a briefing and debriefing capability. Level B system simulations shall be capable of operating in a DMT and stand-alone configuration.

3.1.2.3 Simulation Service Level C

Level C service shall provide two to four fully DMT integrated system simulations at an operating location. Each system simulation shall provide, as a minimum, the capability to train all Level C tasks identified in the F-16 TTL. Level C system simulations shall provide a visual system with the full FOV experienced by the pilot in the aircraft that allows F-16 pilots to train all Level C tasks identified in the F-16 TTL. Level C service at an operating location shall provide a number of virtual threat stations equal to the number of system simulations; a briefing, debriefing, and mission observation capability; and a separate MCE workstation for local command and control support. Level C system simulations shall be capable of operating in a DMT and stand-alone configuration.

3.1.3 Simulation Service Level Upgrades

Level A and Level B simulation services shall be capable of being upgraded to any higher service level.

3.1.4 Simulation Service Operating Locations

USAF simulation service requirements for each operating location are provided as Contract Attachment 8.

3.2 GENERAL PERFORMANCE REQUIREMENTS

3.2.1 F-16 Missions and Operations

3.2.1.1 Threshold Missions and Operations

The system simulations shall provide the capability to train all of the following F-16 threshold missions and operations: Defensive Counter Air (2vX and 4vX to include Beyond Visual Range (BVR) employment), Offensive Counter Air, Suppression of Enemy Air Defenses (SEAD) (Block 50), Low Altitude Navigation and Targeting Infrared for Night (LANTIRN) (Block 40), Medium Altitude Operations and Tactics, Air Interdiction, Weather Approach Procedures, and Emergency Procedures.

3.2.1.2 Objective Missions and Operations

The system simulations shall provide the capability to train the following objective missions and operations: Basic Fighter Maneuvers (BFM), Air Combat Maneuvering (ACM), Close Air Support (CAS), and nuclear operations.

3.2.2 F-16 Training Tasks

The system simulations shall provide the capability to train the F-16 TTL tasks in accomplishment of the F-16 missions and operations listed in paragraph 3.2.1.

3.2.3 System Latency

3.2.3.1 Single Cockpit Latency

The total system latency for a single cockpit shall be less than 100 milliseconds (stick input to OTW display).

3.2.3.2 Locally Networked Cockpit Latency

The total system latency for a locally networked cockpit shall be less than 150 milliseconds (stick input to OTW display of another locally networked cockpit).

3.3 SIMULATION SERVICE ELEMENTS

3.3.1 Ownship Simulation

Paragraphs in this section apply to all simulation service levels.

3.3.1.1 Cockpit

3.3.1.1.0.1 All system simulation cockpits shall be a high-fidelity representation of the F-16 Block 40 or 50 aircraft cockpits, including controls, displays, and avionics.

3.3.1.1.0.2 All cockpit components shall provide high physical (three-dimensional) and functional fidelity of the actual equipment on the aircraft (Appendix C).

3.3.1.1.0.3 Communication systems including both voice and data shall replicate performance in the aircraft.

3.3.1.1.0.4 Cockpits shall be capable of training night vision tasks.

3.3.1.1.1 Flight Controls

The simulator flight controls, i.e., rudder pedals, side-stick controller, throttle quadrant and hands-on controls (HOTAS) shall replicate the appearance, feel, size, positioning and functions as in the F-16C Block 40/42/50/52 aircraft.

3.3.1.1.2 Control Panels

Simulator cockpit panel assemblies shall replicate the look and feel of aircraft panels. All panel assembly controls, indicators, switches, displays and illumination shall appear to the pilot to operate and function like the actual aircraft.

3.3.1.1.3 Upfront Controls

The upfront controls (ICP and DED) shall replicate the appearance, functions, operation, displays and illumination of the F-16C Block 40/42/50/52 aircraft.

3.3.1.1.4 Color Multi-Function Displays

The color multi-function display set (CMFDS) shall be a high-fidelity simulation of the aircraft system.

3.3.1.1.5 Head-Up Display (HUD)

The HUD shall be simulated by projecting the display information (symbology, cues, scales, reticles) on the forward screen of the OTW visual display. Displayed information shall be a high-fidelity representation of the aircraft HUD capabilities, operating modes and symbology.

a. The HUD remote control panel shall replicate the appearance, function and switch controls as in the actual aircraft. Switch controls shall select the corresponding display options, scales, cues and text as in the aircraft.
b. The HUD display shall provide for air-to-air, air-to-ground, and navigation master modes.
c. The HUD shall display Combined Altitude Radar Altimeter (CARA) information in the same format as the aircraft.

3.3.1.2 Aircraft Handling Characteristics

3.3.1.2.0.1 The system simulation shall provide an accurate simulation of F-16 Block 40 and 50 handling characteristics for all ground and flight regimes, and aircraft configurations.

3.3.1.2.0.2 Appropriate flight and ground characteristics shall be simulated for abnormal operations and emergencies as identified in the F-16 TTL.

3.3.1.2.0.3 The simulation system shall accurately simulate and provide the ability to select any applicable F-16 engine and associated instruments.

3.3.1.2.1 Aerodynamic Performance

All system simulations shall provide a high-fidelity aerodynamic simulation of the F-16 aircraft. This flight model shall realistically represent the entire F-16 aircraft flight envelope including abnormal flight conditions such as deep stalls, departures, spins, and excessive G-force maneuvering.

The system simulation shall provide realistic representation of the aircraft flight environment, aircraft flying qualities and performance (FQ&P) characteristics, and aerodynamic ground effects. Aerodynamic performance shall be simulated through an integrated set of simulation software models as defined below:

a. Atmospheric Model
b. Inertial Reference Model
c. Aerodynamic Coefficients
d. Aerodynamic Effects
e. Equations of Motion
f. Weight and Balance/Mass Properties
g. Winds/Turbulence Model

3.3.1.2.2 Ground Handling

All system simulations shall provide a high-fidelity ground-handling simulation of the F-16 aircraft.

The F-16 ground-handling simulation shall include the entire ground-handling envelope, including:

a. Normal procedures for ground operations
b. Landing emergencies after ground contact
c. Severe ground-handling maneuvers
d. Runway conditions
e. Crash conditions
f. Arresting hook

3.3.1.3 Avionics and Weapon Systems

The system simulation shall accurately replicate the operation of all F-16 Block 40 and 50 avionics and weapons system functions.

3.3.1.3.1 Avionics Systems

The F-16 MTC system simulations shall simulate mission management, sensors, communications, navigation, identification, penetration aids, and weapon interface functions.

3.3.1.3.1.1 F-16 Block 50/52 Fire Control Radar

The system shall simulate the operation of the fire control radar configuration for Block 50/52 aircraft in all air-to-air and air-to-ground modes of operation. The initial configuration shall be AN/APG-68(V)5.

3.3.1.3.1.2 F-16 Block 40/42 Fire Control Radar

The system shall simulate the operation of the fire control radar configuration for Block 40/42 aircraft in all air-to-air and air-to-ground modes of operation. The initial configuration shall be AN/APG-68(V)2.

3.3.1.3.1.3 HARM Targeting Pod

The F-16 MTC shall include a simulation of the HARM Targeting Pod functions. These include simulations for target detection, identification, and ranging of ground-based RF threats.

3.3.1.3.1.4 LANTIRN Targeting Pod

The F-16 Block 40 MTC system shall include a simulation of the LANTIRN Targeting Pod functions. These include simulation of the Fixed Imaging Navigation Sensor (FINS), Target Acquisition Sensor (TAS), laser transmitter/receiver for ranging and designating targets for LGB deliveries and terrain-following radar (TFR) systems.

3.3.1.3.2 Maverick EO/IR Weapon Simulation

3.3.1.3.2.1 The F-16 MTC system shall simulate the operation of the AGM-65 A/B/D/G weapon system.

3.3.1.3.2.2 The system shall provide IR sensor model, IR sensor database, video tracker simulation and CMFD display presentation suitable for supporting all training tasks associated with Maverick Weapon employment on the F-16 Block 40 and Block 50 aircraft.

3.3.1.3.2.3 The system shall accurately simulate system handoff, pre-launch procedures, launch, flyout and response to countermeasures.

3.3.1.3.3 Ownship Weapons Validation

All ownship weapon simulation models shall be validated.

3.3.1.3.4 Ownship Ordnance

3.3.1.3.4.1 The system shall accurately simulate prelaunch procedures, launch, missile/bomb/ bullet flyout, target tracking, detonation (if appropriate), and battle damage (damage models, fire, smoke, debris, target behavioral change) to other combat entities or natural entities in the synthetic environment.

3.3.1.3.4.2 The F-16 MTC Block 50/52 systems shall support the simulation of all weapons certified for carriage per F-16CJ-1-2 and documented in 1F-16CJ-34-1-1 and its supplements.

3.3.1.3.4.3 The F-16 MTC Block 40/42 systems shall support the simulation of all weapons certified for carriage per F-16CG-1-2 and documented in 1F-16CG-34-1-1 and its supplements.

3.3.1.3.4.4 The effects of countermeasures to include, but not be limited to, chaff, flares, and jamming on active ordnance shall be accurately simulated.

3.3.1.3.4.5 The effects of entity maneuvering on active ordnance shall be accurately simulated.

3.3.1.4 Aural / Comm Subsystem

The aural/comm subsystem shall be comprised of COTS computational hardware and software which shall provide the source of computer-generated audio and routing and level adjustment of all audio signals (computer-generated or spoken).

3.3.1.4.1 Computer-Generated Audio

The system shall generate warning and identification tones together with digitized voice warnings.

3.3.1.4.1.1 Warning and Identification Tones

The audio system shall simulate warning and identification tones associated with the aircraft avionics. These tones shall be:

a. Instrument landing system (ILS) Morse code identification
b. TACAN Morse code identification
c. Ownship missile tones
d. Radar warning receiver (RWR) tones
e. IFF tone
f. UHF radar bomb scoring (RBS) tone

3.3.1.4.1.2 Digitized Voice Warning

The audio system shall simulate the aircraft digital audio voice message system.

3.3.1.4.2 Aural Cues

Sounds that are perceptible in the cockpit during all phases of operation shall be simulated with respect to approximate location, frequency and amplitude. The following sounds shall be provided:

a. Engine whine (normal RPM range)
b. Engine afterburner segments
c. Engine stall and stagnation
d. Engine seizure
e. Emergency power unit (EPU) startup and run
f. Tire squeal at touchdown
g. Tire noise on runway
h. Landing gear retraction and extension
i. Ownship missile launch
j. Ownship gun firing
k. Explosions near ownship
l. Ground cart(s)
m. Environmental control system noise
n. Refueling boom contact and disengagement
o. Tanker noise when on/near the boom
p. Jet fuel starter (JFS)
q. Defog
r. Afterburner stall
s. Blown tire
t. Engine inlet buzz
u. Engine fire
v. Engine start rumble

3.3.1.4.3 Interference

The audio system shall be capable of generating random noise to simulate radio interference.

3.3.1.4.4 Communication Jamming

The audio system shall be capable of simulating sounds associated with communication jamming equipment.

3.3.1.4.5 Audio System Equipment

3.3.1.4.5.1 The audio system shall provide the following equipment:

a. Earphone/microphone headsets for instructor and cockpit communications. The connection to the headset shall be compatible with the cockpit disconnect.
b. A speaker system for the simulated aural cues. The speaker system shall utilize multiple speakers placed in the cockpit area to provide cues to simulate the direction of the audio source.
c. Audio system computational unit and analog-to-digital conversion equipment.

3.3.1.4.5.2 The audio system shall have the capability for private and multi-ship communication between cockpits and the instructor operator station (IOS).

3.3.1.4.5.3 Capability to simulate realistic radio communications within the four-ship simulation system shall be provided.

3.3.1.4.5.4 Capability to simulate realistic radio communications between the four-ship simulation system and other DMT participants shall be provided.

3.3.1.4.5.5 Capability to allow private communication from any cockpit to the IOS shall be provided in a manner which prevents other networked devices from overhearing the dialogue.

3.3.1.5 Real-Time Input/Output System

3.3.1.5.1 The real-time input/output (RTIO) system shall interface the cockpit and portions of the IOS with the computational subsystem.

3.3.1.5.2 The RTIO shall handle all analog, discrete and synchro signals associated with cockpit indicators, controls, and all IOS control discretes.

3.3.1.5.3 The RTIO shall convert these signals to and from engineering units for use by the IOS and computational subsystem models.

3.3.1.5.4 The RTIO shall be capable of providing the ownship avionics with updates to support the ownship 50-Hz frame rates.

3.3.1.5.5 Provisions shall be made for a user interface to any diagnostics and debug functions resident within the RTIO system.

3.3.2 Visual Systems

3.3.2.0.1 The F-16 Visual System shall provide the sufficient visual cues, image quality and positional accuracy to allow a pilot to perform the F-16 air-to-surface and air-to-air mission tasks as identified in the F-16 TTL at the level A, B, & C simulation service.

3.3.2.0.2 Visual cues presented to the pilot shall accurately replicate those in the F-16 aircraft and shall not present false, negative training perceptions in comparison to F-16 aircraft operations.

3.3.2.0.3 The visual system, in combination with the visual database, shall simulate scenery for in-flight mission profiles that include, but are not limited to, the following day/night, all weather tasks:

a) Taxi, takeoffs, circling overhead patterns, approaches and closed patterns under Visual Meteorological Conditions (VMC).

b) Takeoff and approach/landing under Instrument Meteorological Conditions (IMC).
c) Offensive and defensive counter air with support for a minimum of 4 v 4 tactical engagements.
d) BFM/ACM, tactical formation, mutual support, and determination of target aspect, closure, and identification at range.
e) Suppression of Enemy Air Defenses (SEAD).
f) Low/medium altitude operations and tactics with support for target ingress, defensive maneuvers, target engagement, and target egress.
g) Emergency procedures.

3.3.2.1 Visual System Characteristics

The F-16 visual system shall provide the following system level characteristics. System characteristics are all inclusive for level A, B, & C unless otherwise specified.

3.3.2.1.1 Architecture

3.3.2.1.1.1 The visual system shall be configured to simultaneously provide visual imagery for all display screens.

3.3.2.1.1.2 The visual system shall provide the capability to render a full color, photo-textured, anti-aliased, transparent, fogged, shaded, and lighted terrain model with weather effects.

3.3.2.1.1.3 The visual system shall be modular in design to support transportability and deployability.

3.3.2.1.1.4 The visual system shall be scaleable and extensible in design to enable an increase in basic attributes (polygons, pixels, resolution, etc.) and allow upgrades as technology develops.

3.3.2.1.2 Update Rate

The visual system shall compute a new visual scene using new position and attitude information at a minimum of 60 times per second to ensure a smooth dynamic response to all ownship and moving model maneuvers. In addition to ensuring a smooth dynamic response to all ownship and moving model maneuvers, the update rate shall be sufficient to satisfy all requirements of the TTL.

3.3.2.1.3 Image Resolution

3.3.2.1.3.1 The visual system shall have sufficient resolution to meet the training requirements of the TTL.

3.3.2.1.3.2 The image shall be displayed in a non-interlaced format.

3.3.2.1.4 Polygon Capacity

3.3.2.1.4.1 The visual system shall be capable of computing and generating three dimensional representations of polygonal surfaces that represent terrain and model definitions.

3.3.2.1.4.2 The visual system shall have a system capacity of generating and displaying a minimum surface capacity sufficient to meet the training requirements of the TTL.

3.3.2.1.5 Light Capacity

3.3.2.1.5.1 The visual system shall be capable of generating normal light and special purpose lights.

3.3.2.1.5.2 Lights shall include normal light types (e.g., lights found in population centers), special-purpose lights (e.g., strobing, blinking, rotating directional and colored lights that are typically associated with airfields) and lights associated with moving models.

3.3.2.1.6 Computed Visual Range

The visual system shall have the ability to compute a visual scene from the eyepoint to a range of at least 90 nautical miles, regardless of the effects of visibility limitations (fog, haze, etc.).

3.3.2.1.7 Database Storage Capacity

3.3.2.1.7.1 The visual system shall provide on-line storage of at least 500,000 square nautical miles (snm) of visual database.

3.3.2.1.7.2 The database shall not be constrained in shape or size in any direction.

3.3.2.1.8 Maximum Motion Systems

3.3.2.1.8.1 The system shall allocate and update 64 dynamic motion systems at the specified visual system update rate.

3.3.2.1.8.2 Additional dynamic motion systems up to a maximum of 252 shall be provided at the expense of a slower update rate.

3.3.2.1.8.3 A motion system is defined as any displayed dynamic object in the visual environment surrounding the ownship aircraft (i.e. aircraft, ordnance, ground sites, flares, sun/moon, etc.).

3.3.2.1.8.4 Priority logic shall be utilized to ensure that only objects within visual range are allocated a motion system.

3.3.2.1.9 Aircraft Representation

3.3.2.1.9.1 The visual system shall provide a visual representation of all air-to-air threat models in the visual database.

3.3.2.1.9.2 All aircraft platforms listed in Appendix D shall have visual models provided which accurately represent the real aircraft.

3.3.2.1.9.3 The visual system shall have the capability to display up to 16 dynamic aircraft.

3.3.2.1.9.4 Control of moveable surfaces on aircraft (e.g., swing wing, flaps, air brake, gear, refueling boom) shall be provided.

3.3.2.1.9.5 Selectable lighting control of aircraft lighting systems shall be provided.

3.3.2.1.9.6 Selectable static model part activation (e.g., afterburner, stores, markings) shall be provided.

3.3.2.1.9.7 An aircraft kill shall be visually represented by a large explosion in the visual scene.

3.3.2.1.9.8 The visual system shall provide selectable aircraft battle damage.

3.3.2.1.9.9 At a minimum, engine smoke and fire, battle scarring, and fuel leak with vapor trail shall be available for selection by the host simulation at predefined locations on the aircraft.

3.3.2.1.10 Missile/Bomb Representation

3.3.2.1.10.1 The visual system shall provide a visual representation of up to 32 missiles or bombs in-flight.

3.3.2.1.10.2 Missiles shall be visually represented by a missile model flyout with a visual smoke plume until motor burnout.

3.3.2.1.10.3 Bombs shall be visually represented by a bomb model flyout.

3.3.2.1.10.4 Applicable missile trails shall be provided.

3.3.2.1.10.5 The visual system shall provide a visual representation of up to 20 surface-to-air missiles (SAMs) in-flight.

3.3.2.1.10.6 A missile accompanied by a launch plume shall represent all SAM types.

3.3.2.1.10.7 All missile fuzings not terminating in an aircraft or ground threat kill shall be visually represented by a small explosion in the visual scene.

3.3.2.1.10.8 All bomb fuzings terminating in a ground threat kill shall be visually represented by a small explosion with lingering smoke/fire in the visual scene.

3.3.2.1.11 Ground Threat Representation

3.3.2.1.11.1 The visual system shall provide a visual representation of ground threat sites available in the visual database when commanded and positioned by the host simulation.

3.3.2.1.11.2 Up to 10 ground threats shall be provided by the visual system.

3.3.2.1.11.3 Anti-aircraft artillery sites shall be visually represented by a visual model with gun flash.

3.3.2.1.11.4 The visual system shall provide for control of tracer streams and ordnance detonation.

3.3.2.1.11.5 Ground tracers shall be visually represented by a predefined string of raster lights.

3.3.2.1.11.6 Ordnance detonation shall be visually represented by a small explosion.

3.3.2.1.11.7 A ground threat kill shall be visually represented by a large explosion with lingering smoke/fire in the visual scene.

3.3.2.1.11.8 The visual system shall provide a visual representation of damaged ground threat sites with debris available in the visual database.

3.3.2.1.12 Flare Representation

3.3.2.1.12.1 The visual system shall provide flare representation via a flare group when commanded and positioned by the host simulation.

3.3.2.1.12.2 Flare use by friendly and threat aircraft shall be provided.

3.3.2.1.13 Aerial Refueling

3.3.2.1.13.1 The visual system shall provide aerial refueling simulation including stow, pre-contact, connect, contact, disconnect and breakaway modes for tanker aircraft specified in the visual database.

3.3.2.1.13.2 Tanker aircraft shall include operational day/night director lighting.

3.3.2.1.13.3 Boom operation, director lighting, and collision light control shall be provided by the visual system.

3.3.2.1.13.4 The visual system shall allow refueling on predefined receiver aircraft types. Aerodynamic flow field effects shall not be simulated by the visual system.

3.3.2.1.14 Generic Terrain/Ocean

3.3.2.1.14.1 For visual databases containing a coastline, the visual system shall present generic terrain or generic ocean when the ownship position is located off the visual database coordinates.

3.3.2.1.14.2 Determination of display of generic terrain or generic ocean shall depend on ownship location with regards to a predetermined latitude or longitude for coastline reference.

3.3.2.1.15 Ownship Tracers

3.3.2.1.15.1 The visual system shall be capable of displaying 16 dynamic gun tracer bullets from ownship when commanded and positioned by the host simulation.

3.3.2.1.15.2 Ownship tracer bullets shall be represented by raster lightpoints that fade over distance.

3.3.2.1.16 Ownship Lights

3.3.2.1.16.1 The visual system shall provide up to two selectable ownship light lobes to simulate landing and taxi lights.

3.3.2.1.16.2 Lobe glare effects shall be visible in both reduced visibility or reduced ambient lighting conditions.

3.3.2.1.16.3 The visual system shall also simulate strobe and beacon lights by providing a local brightening of the visual scene.

3.3.2.1.17 Visual Environment

3.3.2.1.17.1 Ambient Light

3.3.2.1.17.1.1 The visual system shall provide simulated ambient light levels for the following conditions:

a) Bright day
b) Overcast day
c) Dusk/dawn
d) Night
e) Continuous time of day

3.3.2.1.17.1.2 The levels shall be controllable by the host simulator.

3.3.2.1.17.1.3 The effects of sun or moon illumination angle shall be portrayed on all applicable features in the out-the-window visual scenes.

3.3.2.1.17.1.4 These effects shall include the darkening of the inherent feature color, but shall not include dynamic shadows of terrain features.

3.3.2.1.17.2 Sun/Moon

3.3.2.1.17.2.1 The visual system shall provide a display of the sun and moon.

3.3.2.1.17.2.2 Sun/moon placement shall be based on time of day and collocated in azimuth and elevation with the illumination source providing scene shading.

3.3.2.1.17.2.3 Sun/moon visibility shall be based on prevailing weather conditions.

3.3.2.1.17.2.4 Sun or moon display shall be selectable by the host simulation.

3.3.2.1.17.3 Visibility

3.3.2.1.17.3.1 The visual system shall simulate the effects of reduced visibility due to atmospheric attenuation.

3.3.2.1.17.3.2 Visibility attenuation, due to haze, shall be computed for all features and objects (surfaces, lightpoints, etc.) in the out-the-window visual scenes.

3.3.2.1.17.3.3 Haze /visibility shall be controllable by the host simulation over a range of 0 to at least 90 nm.

3.3.2.1.17.4 Runway Visual Range (RVR)

3.3.2.1.17.4 1 The visual system shall simulate fog effects that reduce the visibility near the ground.

3.3.2.1.17.4.2 Visibility attenuation, due to fog, shall be computed for all features and objects (surfaces, lightpoints, etc.) in the out-the-window visual scenes.

3.3.2.1.17.4.3 RVR visibility and fog depth shall be controllable by the host simulator.

3.3.2.1.17.4.4 RVR shall be able to be enabled or disabled.

3.3.2.1.17.4.5 The following RVR conditions shall be controllable by the host simulation:

a) Runway visibility range of 0 meters to the current visibility setting, in increments of 100 meters or less.
b) Ground fog height of 0 to 20,000 meters MSL, in increments of 100 meters or less
c) Ground fog visibility enable/disable - enables the visibility of the ground fog layer when ownship is above the layer.
d) Patchy ground fog enable/disable - enables scud conditions in ground fog.

3.3.2.1.17.5 Sky/Clouds

3.3.2.1.17.5.1 The visual system shall simulate sky, clouds, and overcast conditions for all ambient light levels.

3.3.2.1.17.5.2 The sky shall fade according to defined horizon color and intensity, visibility, and ambient light level.

3.3.2.1.17.5.3 Cloud conditions shall include as a minimum clear, scattered, and overcast with scud.

3.3.2.1.17.5.4 All cloud conditions shall be controllable by the host simulator during mission initialization.

3.3.2.1.17.5.5 Clear day shall be portrayed with a clear blue sky.

3.3.2.1.17.5.6 Scattered clouds shall be portrayed with a patchy white texture pattern in the clear sky.

3.3.2.1.17.5.7 Solid clouds shall be portrayed with textured cloud top and bottoms to enhance velocity cues and cloud distance cues.

3.3.2.1.17.5.8 The simulation of the solid cloud scud shall include the effects of rapid fade-outs, and fade-ins and momentary loss of all visual reference cues.

3.3.2.1.17.5.9 Ambient light levels shall be adjusted for prevailing cloud conditions.

3.3.2.1.17.5.10 The following cloud conditions shall be controllable by the host simulation:

a) Clear/scattered clouds.
b) Up to 2 solid cloud layers.
c) Cloud bottom over the range of 0 to 20,000 meters MSL, in increments of 100 meters or less. Cloud shall provide reduced terrain illumination below the cloud bottom.
d) Cloud top over the range of 0 to 20,000 meters MSL, in increments of 100 meters or less, with a minimum cloud layer thickness of 1024 meters. Visibility shall transition to clear sky above the cloud top.
e) Scud condition for solid clouds:
    (1) Cloud top transition region - Scud on/off control.
    (2) Cloud bottom transition region - Scud on/off control.

3.3.2.1.17.6 Thunderstorms

3.3.2.1.17.6.1 The visual system shall simulate thunderstorm conditions.

3.3.2.1.17.6.2 The visual system shall provide random lightning effects and decreased visibility as ownship nears the storm center.

3.3.2.1.17.6.3 All thunderstorm conditions shall be controllable by the host simulation.

3.3.2.1.17.7 Object Shadows

3.3.2.1.17.7.1 The visual system shall provide movable shadows on predefined models within the visual scene.

3.3.2.1.17.7.2 Shadows shall be activated based on prevailing lighting conditions and shall be placed based upon the sun/moon lighting direction.

3.3.2.1.17.8 Horizon

3.3.2.1.17.8.1 The visual system shall provide horizon depression to simulate earth curvature for high-altitude and low-altitude flight.

3.3.2.1.17.8.2 The visual system shall provide directional horizon glow based on sun position.

3.3.2.1.17.9 Rain

The visual system shall provide a general decrease in visibility due to rainfall.

3.3.2.1.17.10 Snow

The visual system shall provide color and texture consistent with snow on the simulated terrain and solid and patchy conditions on runway surfaces.

3.3.2.1.17.11 Seasonal Effects

The visual system shall provide the ability to select up to four seasons on the simulated terrain.

3.3.2.1.17.12 Blowing Snow and Sand

The visual system shall provide the ability to simulate the visibility obscuration effects of blowing snow and sand.

3.3.2.1.17.13 Contrails

The visual system shall provide the ability to present contrails as applicable to aircraft and missiles operating in the environment.

3.3.2.2 Level A Visual System

3.3.2.2.1 The screens shall provide the field of view sufficient for performing the level A tasks specified the F-16 TTL.

3.3.2.2.2 The level A visual display shall be composed of 3 rear projected display screens.

3.3.2.2.1 HUD Representation

The HUD symbology shall be combined with the out-the-window scenery and projected on the forward screen of the display subsystem.

3.3.2.3 Level B and C Visual System

3.3.2.3.1 Instantaneous Field of View

3.3.2.3.1.1 The level B/C visual system shall provide a minimum instantaneous field of view of 360 degrees horizontal by 135 degrees vertical.

3.3.2.3.1.2 Masks shall be provided to accurately replicate the real-world OTW FOV of an F-16 aircraft.

3.3.2.3.2 Display Facets

3.3.2.3.2.1 The level B/C visual display shall be composed of rear projected display screens.

3.3.2.3.2.2 The facets shall be arranged to allow pilot ingress/egress.

3.3.2.3.2.3 Screen panels that intersect the cockpit structure shall butt to the sill line of the cockpit.

3.3.2.3.3 HUD Representation

3.3.2.3.3.1 A separate video projector shall be used to display the HUD symbology on the visual display.

3.3.2.3.3.2 The projected image shall encompass the instantaneous field of view for the F-16 HUD.

3.3.2.3.3.3 The HUD symbology shall overlay the forward screen out-the-window scenery

3.3.2.3.4 Target Projection

3.3.2.3.4.1 The Level B/C visual system shall permit the use of an additional Target Projection System (TPS).

3.3.2.3.4.2 The TPS shall provide up to seven displayable targets simultaneously displayed anywhere within the instantaneous field of view.

3.3.2.3.4.3 Up to seven of the 16 air-to-air targets as specified in aircraft representation shall be assigned to the TPS.

3.3.2.3.4.4 The remainder of those targets shall be displayed in the background scene.

3.3.2.3.4.5 The targets displayed by the TPS shall transition to the background scene at a predetermined fixed range based on target size and load management.

3.3.2.3.4.6 Target Range Limitations

Maximum target detection range shall be provided to 12.5 nautical miles relative distance from ownship.

3.3.2.3.4.7 Target Resolution

3.3.2.3.4.7.1 The TPS shall provide sufficient resolution to determine target aspect and rate changes of a typical airborne tactical aircraft (e.g., SU-27) up to 18,000 feet.

3.3.2.3.4.7.2 The TPS shall provide the following Tally-Ho (detection) and Silhouette ID range on the horizon during a clear weather day for a typical airborne tactical aircraft (e.g., SU-27).

Target Aspect Angle	Tally-Ho Range	Silhouette ID Range
180° to 160°	2.7 – 6.8 nm	0.4 – 1.1 nm
150° to 120°	8.5 – 12.1 nm	1.3 – 1.8 nm
110° to 070°	12.4 nm	1.9 – 2.0 nm
060° to 030°	12.1 – 8.5 nm	1.8 – 1.3 nm
020° to 000°	6.8 – 2.7 nm	1.1 – 0.4 nm

3.3.2.3.4.8 Target Update Rate

The TPS shall compute and display new positional data for targets at a minimum of 60 times per second to ensure a smooth dynamic response to all ownship and moving model maneuvers.

3.3.2.3.4.9 Target Level of Detail Enhancement

3.3.2.3.4.9.1 The TPS shall provide smooth transitions between levels of detail on target models.

3.3.2.3.4.9.2 All target models specified herein shall incorporate sufficient detail to provide aspect and rate changes proportional to the ranges specified for a typical airborne tactical aircraft (e.g., SU-27).

3.3.3 Synthetic Environment

3.3.3.0.1 The system simulation shall create a high-fidelity synthetic environment capable of supporting a full range of mission scenarios for all simulation service levels.

3.3.3.0.2 All system simulations shall support a variable mix of constructive and virtual entities.

3.3.3.0.3 The system simulation shall provide a correlated environment for OTW visual, electronic combat, navigation, sensor and weapon systems.

3.3.3.0.4 The synthetic environment shall support training for single-, two-, three-, or four-ship operations.

3.3.3.1 Natural Environment

3.3.3.1.1 The system simulations shall create a high-fidelity natural environment (terrain, atmosphere, weather) that is capable of supporting F-16 aircraft mission scenarios for all modes of training tasks identified in the TTL.

3.3.3.1.2 Constructive entities shall realistically interact with other synthetic environment entities in terms of flight maneuvers, avionics, and weapon systems, while operating within high-fidelity atmospheric and weather conditions.

3.3.3.1.3 The atmospheric environment shall have the capability to simulate effects of weather phenomena (e.g., rain, wind, etc.) on the ownship and all other entities operating in the environment.

3.3.3.1.4 The atmospheric model shall model the propagation of IR energy through the atmosphere.

3.3.3.1.5 The atmospheric model shall model the propagation of RF energy through the atmosphere.

3.3.3.1.6 The weather shall be modifiable under operator control during real-time.

3.3.3.2 Databases

The system simulation shall provide databases containing geospecific and geotypical cultural features in support of visual, sensor, and weapons simulation sufficient for pilots to perform all tasks required by the TTL.

3.3.3.2.1 Database Capture Criteria

3.3.3.2.1.1 High-Resolution (Enhanced) Areas

At least 50% of each database shall consist of high-resolution areas.

The high-resolution areas shall be 0.5-meter phototexture or better.

The minimum capture criteria for geospecific two-dimensional and three-dimensional features within all high-resolution areas shall be equivalent to that of DFAD Level I or better as required to meet the training requirements of the TTL.

The geopositioned feature density shall be a minimum of 45,000 two-dimensional and three-dimensional features per 1° by 1° geocell in enhanced areas.

The high-resolution areas shall also contain a minimum of 10 geospecific features within each of five or more enhanced target areas, as required to meet the training requirements of the TTL.

The minimum capture criteria for elevation data shall be equivalent to DTED Level I.

3.3.3.2.1.2 Background (General) Areas

The capture criteria for background areas shall be:

a) At least 30-meter phototexture, or better
b) Geospecific feature density (and types, including two-dimensional and three-dimensional features) of DFAD Level I or better as required to meet the training requirements of the TTL
c) The minimum capture criteria for elevation data shall be equivalent to DTED Level I.

3.3.3.2.2 The system simulation shall provide interoperable and correlated terrain cultural models in compliance with the DMT O&I standards.

3.3.3.2.3 An environmental reference database complying with and referenced to World Geodetic System - 84 (WGS-84) shall be generated.

3.3.3.2.4 The environmental reference database shall include both terrain and features. Stacking levels of all features shall be accurately depicted.

3.3.3.2.5 The attribution of databases shall be extensible so that as system requirements evolve, additional attributes of features can be captured without forcing recollection or regeneration of previously compiled databases. Hence, previously compiled databases shall serve as primary source material for extension and augmentation to meet new requirements.

3.3.3.2.6 Surface materials shall be assigned to each polygon or texture representing terrain and topographic features to support radar and infrared sensor simulation. This surface material must be derivable from color or multi-spectral image data if available.

3.3.3.2.7 Individual polygons which use texture maps in the visual to represent details such as doors, windows, etc. shall have corresponding textures/materials assigned in the IR and DRLMS databases to ensure correlation between the visual, IR and radar displays.

3.3.3.3 Manmade Environment

3.3.3.3.0.1 The system simulation shall create a high-fidelity manmade environment that is capable of supporting F-16 aircraft mission scenarios for all modes of training tasks identified in the F-16 TTL.

3.3.3.3.0.2 All threat and weapon simulation models shall be validated.

3.3.3.3.1 Constructive Entities

3.3.3.3.1.1 The system simulations shall include a high-fidelity, interactive, constructive simulation environment.

3.3.3.3.1.2 The constructive entities shall provide hostile, neutral, and friendly synthetic force participants that intelligently interact with each other as well as all other virtual participants.

3.3.3.3.1.3 The constructive environment shall support entities, as listed in Appendix D, capable of effectively operating either on the terrain surface or as an airborne platform.

3.3.3.3.1.4 All constructive players shall be controllable by an instructor or software scripts in a manner that supports high-fidelity mission training.

3.3.3.3.1.4.1 Airborne constructive players shall be controllable from the IOS.

3.3.3.3.1.4.2 Ground-based constructive players shall be software-script controllable.

3.3.3.3.1.5 Software scripts shall be easily modified to accurately simulate current real-world intelligence doctrine for threats.

3.3.3.3.1.6 The constructive entities shall include high-fidelity flight models of all airborne threats.

3.3.3.3.1.7 Constructive players shall respond accurately to F-16 countermeasures and pilot tactics.

3.3.3.3.1.8 No artifacts (e.g., degraded simulation frame rates, perceptible time lags, etc.) shall occur when all combinations of selected constructive and virtual models are simultaneously active in the synthetic environment.

3.3.3.3.2 Electronic Combat Environment (ECE)

3.3.3.3.2.1 The system simulations shall include an ECE capable of accurately simulating interactive ground and airborne threats, to include high-fidelity simulations of radar and IR emissions for the systems and equipment listed in Appendix D.

3.3.3.3.2.2 The ECE shall incorporate real-world intelligence doctrine in the behavior of threat models.

3.3.3.3.2.3 Real-world intelligence doctrine shall include, but not be limited to, combat flight tactics, and combat operation of Jammers, Anti-aircraft artillery, Radars, and Missile Systems (JARMS).

3.3.3.3.2.4 The ECE shall accurately account for all types of occulting, including visual, electro-optical, and deployed countermeasures.

3.3.3.3.2.5 The ECE shall realistically model the electronic combat entities listed in Appendix D and their effects in sufficient detail to train the TTL tasks.

3.3.3.3.2.6 The ECE shall accurately model and integrate the effects of countermeasures to include, but not limited to, chaff, flares, jamming, anti-radar maneuvers, and frequency hopping.

3.3.3.3.2.7 Constructive entities shall include friendly, neutral, and hostile air entities as well as ground-based threats.

3.3.3.3.2.8 All threats shall be designed to operate as if they were under the control of a realistic, co-ordinated Integrated Air Defense System (IADS) or offensive attack command and control structure.

3.3.3.3.2.8.1 Each ECE entity shall have the capability to operate under a user-selected IADS model representing a particular set of national or political tactics and doctrine.

3.3.3.3.2.8.2 A minimum of three IADS models shall be provided with the system: US, Former Soviet Union (FSU), and a third organization to be identified by the USAF.

3.3.3.3.2.8.3 The characteristics of each provided IADS shall be user-modifiable.

3.3.3.3.2.8.4 The user shall have the capability to add additional IADS models as necessary to reflect new combat theaters and changing geopolitical conditions.

3.3.3.3.2.9 Airborne entities modeled in the synthetic environment shall accurately model the entity's performance and visual characteristics. Airborne threats shall exhibit behavior typical to the threat selected with reference to MCM 3-1, Vol. II.

3.3.3.3.2.10 Surface entities modeled in the synthetic environment shall accurately model entity's performance and visual characteristics. Surface threats shall exhibit behavior typical to the threat selected with reference to MCM 3-1, Vol. II.

3.3.3.3.2.11 Up to 200 virtual entities shall be supported in the synthetic environment. These virtual entities shall consist of a combination of up to 120 aircraft, up to 50 weapons, and up to 84 land- and sea-based threats and targets, moving or stationary.

3.3.3.3.2.12 The electronic environment shall model all virtual and constructive emitters operating in the synthetic environment. The interaction of these emitters, including effects of electronic countermeasures shall be accurate representations of real-world electronic combat performance. The simulated electromagnetic spectrum shall be designed to support:

a. Radio transmissions including Have Quick and secure voice systems
b. Datalink operations
c. IFF interrogation and reply
d. Ground-based navigation stations
e. GPS signals
f. Airborne radar platforms including active missiles
g. Ground-based radar platforms including all ATC, search, and track radars
h. RWRs
i. Electronic countermeasure pods, platforms, and decoys
j. Chaff
k. Flares and IR decoys

3.3.3.3.3 Constructive Ordnance

3.3.3.3.3.1 The system shall accurately simulate the weapons stores listed in Appendix D, including prelaunch procedures visible to external entities, launch, missile/bomb/bullet flyout, target tracking,

detonation (if appropriate), and battle damage (damage models, fire, smoke, debris, target behavioral change) to other combat entities or natural entities in the synthetic environment.

3.3.3.3.3.2 The system shall simulate both hostile and friendly force ordnance operating simultaneously within the synthetic environment.

3.3.3.3.3.3 The effects of countermeasures to include, but not limited to, chaff, flares, and jamming on active ordnance shall be accurately simulated.

3.3.3.3.3.4 The effects of ownship maneuvering on active ordnance shall be accurately simulated.

3.3.4 Threat Stations (Level C Only)

3.3.4.1 The simulation service shall provide virtual threat stations to allow human adversaries (man-in-the-loop) to operate red, blue or gray airborne threat systems.

3.3.4.2 The threat stations shall be capable of controlling any preprogrammed airborne threat.

3.3.4.3 During simulation execution, each threat station shall have the ability to switch from controlling one threat to controlling any other depicted airborne threat in the simulation at the operator's discretion.

3.3.4.4 Threats shall operate using normal operating parameters when control is released.

3.3.4.5 The threat stations shall be capable of participating in local and long haul DMT networked training.

3.3.4.6 Threat station re-configurable characteristics shall focus on flight characteristics, threat capabilities, and weapons loads.

3.3.4.7 Threat platform types shall be fully selectable from the threat station. Selection of threat platform types shall be fully correlated with the synthetic environment.

3.3.4.8 The threat station pilot interface shall be representative of the F-16 B50T5 configuration.

3.3.4.9 The threat station weapon and ordnance models shall be validated.

3.3.5 Modular Control Equipment (MCE) Workstation (Level C Only)

3.3.5.1 The simulation service shall provide the capability to simulate an MCE workstation.

3.3.5.2 The MCE workstation shall allow a qualified MCE operator to provide ground control intercept support.

3.3.5.3 The MCE workstation shall provide sufficient fidelity to allow an operator to provide realistic radar control to a training exercise.

3.3.6 Instructor Operator Station (IOS)

3.3.6.0.1 The IOS shall be capable of supporting from one to four system simulations.

3.3.6.0.2 The IOS shall enable instructors to train F-16 pilots on all tasks identified in the F-16 TTL.

3.3.6.0.3 All system simulations shall provide an interface to the IOS system at every cockpit.

3.3.6.0.4 The IOS shall provide the capability to create, modify, setup, execute, monitor, evaluate, and record training mission scenarios for all modes of training.

3.3.6.0.5 One IOS shall be provided for each System Simulation (SS) cockpit.

3.3.6.0.6 Each IOS shall include high-resolution color displays providing:

a. Exercise loading and control capability
b. Tactical environment control capability
c. Malfunction control capability
d. Aircraft systems monitoring capability
e. Cockpit display monitoring capability
f. Plot capability, including Tactical Situation Display and ILS/GCA plot
g. Mark point capability
h. Record/playback capability
i. Network Setup (resource allocation)
j. Event Timeline Display

3.3.6.0.7 The displays shall present a set of Control and Display windows, with the capability to present any window on any of the monitors.

3.3.6.0.8 The IOS shall have the capability to repeat the displays available to the pilot. These repeat displays shall be:

a. Pilot boresight view of the OTW visual with HUD overlay
b. RWR display
c. RCMFD and LCMFD

3.3.6.0.9 To allow immediate selection of time-critical functions (freeze, etc.), keyboard function keys may be used.

3.3.6.0.10 For pilot-solo operation, the capability shall be provided for limited IOS control at the cockpit. Refer to 3.3.6.9.

3.3.6.0.11 Each IOS display shall be capable of displaying multiple windows (minimum of 2) simultaneously.

3.3.6.0.12 All IOS windows shall have a consistent layout and nomenclature.

3.3.6.0.13 Provisions shall be made for an emergency stop switch that shall disconnect all power to the MTC.

3.3.6.0.14 Each IOS shall provide the capability to set up a network mission.

3.3.6.0.15 During initiation of a locally networked exercise, it shall be possible to designate any participating IOS as the "master" to control mission execution.

3.3.6.0.16 Mission initialization shall include the assignment of participating cockpits to any F-16 entity in the scenario. This assignment may not be changed during mission execution.

3.3.6.0.17 The master IOS shall have the capability to reset/deplete/freeze fuel, weapons, chaff, and flares for any of the networked cockpits in real time.

3.3.6.1 Training Scenario Management

3.3.6.1.1 The IOS shall provide training scenario management capabilities for all modes of training.

3.3.6.1.2 The capability to share scenarios and missions between networked sites shall be provided.

3.3.6.1.3 The IOS shall allow the operator to provide radar control, including broadcast and tactical control in all modes of operation. The IOS shall enable the operator to input other tactical information including IDM, IDC, and IDT data, and then pass it on to the system simulation.
3.3.6.1.4 The IOS shall provide the capability to provide air traffic control functionality, including ground-controlled approach procedures.

3.3.6.1.5 At mission initialization, the available resources shall be assessed and allocated to support the desired cockpit/threat station/MCE network configuration for the training exercise.

3.3.6.2 Scenario Creation

3.3.6.2.1 The IOS scenario creation capability shall provide instructors a flexible, user-friendly mission scenario generation system that allows for design, modification, and storage of pre-planned mission scenarios for F-16 pilot training.

3.3.6.2.2 The IOS shall include a capability to generate and/or modify scenarios off-line on a COTS, IBM-compatible personal computer, and import these scenarios to the system simulation.

3.3.6.2.3 The scenario creation tool shall allow instructors a flexible, user-friendly, mission scenario generation capability external to the IOS system and allow for all the same design, modification, and storage of pre-planned mission scenarios for F-16 pilot training.

3.3.6.2.4 This scenario creation system shall allow the generation of training scenarios without use of the IOS.

3.3.6.2.5 The scenario creation capability shall allow the import of mission data generated through the Air Force Mission Support System (AFMSS) and the Personal Flight Planning System (PFPS).

3.3.6.2.6 An archive capability shall be provided to allow missions generated using the scenario creation system to be centrally stored for access by any local IOS.

3.3.6.2.7 The IOS shall have a consistent interface for scenario generation and modification with the Off-line Scenario Generation System.

3.3.6.3 Scenario Setup and Execution

3.3.6.3.1 The IOS shall provide the capability to select, load, and run pre-programmed training scenarios.

3.3.6.3.2 The IOS shall provide the capability to load and display mission data produced on AFMSS and the PFPS.

3.3.6.3.3 The IOS shall provide the capability to modify training scenarios and mission events during execution.

3.3.6.3.4 The IOS shall provide the capability to input, delete, activate and control threats and sensor entities seamlessly during training exercise.

3.3.6.3.5 The IOS shall have the capability to set global weather parameters as well as the capability to select specific cells within the gridded weather database and adjust the salient weather and atmosphere parameters during the exercise.

3.3.6.4 Malfunctions (Appendix E)

3.3.6.4.1 The IOS shall provide the capability to insert malfunctions, which require pilot response or notification to remedy during scenario creation, scenario setup, or scenario execution.

3.3.6.4.2 Each malfunction shall be presented realistically, such that pilot corrective actions would be performed as in the actual aircraft.

3.3.6.4.3 Malfunctions shall be modeled to accurately represent degraded/failed system performance that would be perceived by the pilot in an actual aircraft under the same conditions.

3.3.6.4.4 Multiple malfunctions per system, and simultaneous malfunctions in more than one system shall be selectable.

3.3.6.4.5 The IOS shall have the capability to provide random or preprogrammed malfunctions.

3.3.6.4.6 There shall be sufficient malfunctions modeled to exercise all emergency procedures in the F-16 TTL.

3.3.6.4.7 Each IOS shall allow malfunctions to be introduced manually by the instructor during execution of an exercise in addition to allowing malfunction activation to be predefined during scenario creation.

3.3.6.4.8 Predefined malfunction activation shall be based on the values of a set of "trigger" parameters (including height, speed, ownship damage level, or other malfunctions) defined for each of the predefined malfunctions.

3.3.6.4.9 The master IOS shall have the capability to introduce malfunctions to any one of the networked cockpits.

3.3.6.5 Training Exercise Monitoring

3.3.6.5.1 The IOS shall provide the instructor the ability to select and monitor any combination or all displays and instrument indications of each cockpit.

3.3.6.5.2 The IOS shall provide the capability to monitor any combination or all communications, and to observe any system sensor outputs, including data links and stores' sensors.

3.3.6.5.3 The IOS shall provide the capability to select an overhead "God's-eye view" of the engagement area with the capability to zoom in and out, and 3-dimensionally rotate any areas of interest.

3.3.6.5.4 The IOS shall have a 3D moving map window for viewing and modifying the environment. The 3D map shall show threats with range rings, planned route, NAVAIDS, and terrain features, as a minimum.

3.3.6.5.5 The 3D map shall consist of a movable "God's-eye" viewpoint as a minimum. All entities, except ownship, shall be movable in real-time on this window by the mouse.

3.3.6.5.6 The 3D map shall have a range of de-clutter functions to maximize operator monitoring of the simulation scenario.

3.3.6.5.7 Switch History pages shall be provided to show sequential lists of selections made by the pilot in addition to significant events in the exercise.

3.3.6.5.8 Weapon scoring pages shall be provided at the IOS to allow evaluation of ownship attacks and engagements.

3.3.6.5.9 The repeat instrument display at the IOS shall provide monitoring of switch selection in the cockpit.

3.3.6.5.10 The exercise-monitoring capabilities of each participating IOS shall be dynamically selectable to show data and displays derived from any participating SS cockpit.

3.3.6.6 Communications

3.3.6.6.1 The IOS shall provide the capability for the instructors to have private communication with any selected participant on the network in a manner that prevents any other participants from overhearing the dialogue.

3.3.6.6.2 Instructors or pilots shall be able to initiate private communication.

3.3.6.6.3 The IOS shall have the capability to issue communications to all DMT stations simultaneously.

3.3.6.6.4 The IOS stations shall be capable of IOS-to-IOS communication between DMT stations.

3.3.6.6.5 Instructors shall be able to initiate and/or override communication jamming.

3.3.6.7 Freeze and Reset

3.3.6.7.1 The IOS shall provide the capability to freeze and reset ownship scenarios for all modes of training.

3.3.6.7.2 The IOS shall provide for restarting at the point of freeze, start of mission, or at a dynamically selected point in the mission.

3.3.6.7.3 The term "dynamically" in 3.3.6.7.2 is defined to be the capability to restart the exercise either at a previously defined mark point or the beginning of the scenario.

3.3.6.7.4 The IOS shall have the capability to freeze or reset the quantity of expendables to include, but not be limited to fuel, flares, chaff, and munitions.

3.3.6.7.5 The IOS shall provide reset capability in a timely manner so there is no impact to the training scenario other than that required to reposition and stabilize the ownship.

3.3.6.7.6 In addition to manually initiated freeze, automatic freeze shall take place under "crash and/or terminal damage" conditions, with the capability to select a crash override at the IOS to inhibit this automatic action.

3.3.6.7.7 Mark Point

3.3.6.7.7.1 The IOS shall be able to retain a minimum of ten mark points.

3.3.6.7.7.2 The IOS shall be able to set a mark point at any time and also have the capability to automatically set mark points at regular intervals specified by the IOS.

3.3.6.7.7.3 The IOS shall be able to repeatedly reset the simulation to any identified mark point.

3.3.6.7.7.4 The interval between mark points shall be selectable, with a minimum interval of 15 seconds.

3.3.6.7.7.5 Mark point shall be defined as a point during the simulation where the "state" data is saved.

3.3.6.7.7.6 Loading of a scenario shall reset the mark point recording buffer to the beginning.

3.3.6.7.7.7 The IOS shall display a graphical icon with a unique identifier on the Tactics page when a mark point is selected.

3.3.6.7.7.8 The mark point graphical icon shall be placed on the ownship track at the point in time where the selection was made.

3.3.6.7.7.9 Mark point selection shall be disabled during simulation replay.

3.3.6.7.7.10 The IOS shall have the capability to select, deselect, or delete a mark point.

3.3.6.7.7.11 In networked mode, mark point control and operation shall be the same for local networked (non-DMT) and single-ship simulations.

3.3.6.7.7.12 All simulators in the local network scenario shall reset to the same mark point as a group.

3.3.6.7.7.13 When a reset to a mark point is selected, the simulation software, at a minimum, shall restore the data required to perform the following:

a. Initialize the ownship aircraft and all locally mastered entities to the position at the mark point time.
b. All aircraft entities shall be initialized to stable straight and level flight (Trim).
c. Weapons in flight at the time of the mark point shall be considered expended and shall not be initialized.

d. All entities' tactical responses shall be initialized to a "no threat" condition. Once the simulation goes to Operate, they shall immediately react to any threat within range.
e. Non-tactical characteristics such as routes shall be initialized so that the entity shall continue on the flight plan/route it would have been on at the time the mark point was selected, assuming the entity was not reacting to any threats.
f. Command and control system shall reassess the current situation "from scratch" after reset. This may result in different decisions being made than those made after the mark point state save was taken.
g. Indications shall be displayed at the IOS for alignment of cockpit switches in order to minimize the transition to Operate.
h. Scenario history shall not be reset. It shall continue to record histories on flyout of mark point.
i. Track histories shall be re-initialized.
j. Threat Station:
   - Restore entity position and velocities
   - Restore entity expendable quantities (i.e., weapon load and stores, fuel, chaff and flares)
   - Restore damage level of the entity
k. Visual System:
   - Restore visual database
   - Dynamic effects (explosions, etc.) in progress shall not be saved.
m. DRLMS System:
   - Restore DRLMS database
   - Restore DRLMS mode
n. Communication selections shall not be restored.
o. Host Computer:
   - Restore ownship position and velocities
   - Restore current expendable quantities (i.e., weapon load and stores, fuel, chaff and flares)
   - Restore landing gear and tail hook state
   - Restore current mission file
   - Restore active air field
   - Restore active malfunctions
   - Restore damage level of the ownship
p. Combat Environment Simulation:
   - Restore mastered entities position and velocities
   - Restore mastered entities expendable quantities (i.e., weapon load and stores, fuel, chaff and flares)
   - Restore entity route data (i.e., where the entity is in this route)
   - Restore weather set
   - Restore damage level of the entities
q. Command and Control historical data shall not be restored.

3.3.6.8 Mission Playback

3.3.6.8.1 The IOS shall provide a playback capability including audio that stores whole and partial mission segments of the training scenario for replay at the cockpit and IOS.

3.3.6.8.2 Mission recording shall include, but not be limited to, HUD, MFDs, RWR, audio, and OTW visual presentations.

3.3.6.8.3 All playback capabilities shall include the ability to specify the beginning and end of the record segment.

3.3.6.8.4 Mission playback capability shall be 90 minutes minimum.

3.3.6.8.5 Initiation and termination of exercise recording shall be manually selected at the IOS.

3.3.6.8.6 The record /replay at the cockpit and IOS is in addition to the capability provided to allow brief/debrief of exercises away from the simulator.

3.3.6.9 Cockpit Control Interface (CCI)

3.3.6.9.1 The cockpit control interface shall enable pilots to have limited IOS control to include start, stop, reset, scenario selection, and reset the quantity of expendables to include, but not be limited to, fuel, flares, chaff and munitions while seated in the cockpit.

3.3.6.9.2 The cockpit control interface shall be designed so that it does not obstruct any of the OTW visuals or cockpit systems.

3.3.6.9.3 No foreign controls shall be added to the inside of the cockpit to support the CCI controls.

3.3.6.9.4 The CCI shall not be required to support NVGs.

3.3.7 Briefing/Debriefing (B/DB) Systems (Level B and C Only)

3.3.7.0.1 The B/DB system shall provide a briefing, debriefing, and mission observation capability.

3.3.7.0.2 The B/DB system shall allow for the briefing, debriefing, and mission observation capabilities to be used interchangeably.

3.3.7.0.3 The B/DB system shall support briefing, mission execution, and debriefing simultaneously.

3.3.7.0.4 The full B/DB system shall be compatible with other DMT networked B/DB systems.

3.3.7.0.5 The B/DB system shall have the ability to use mission data provided from AFMSS and PFPS.

3.3.7.0.6 All B/DB systems shall provide real-time networking with other DMT B/DB systems to provide video teleconferencing and interactively play B/DB data.

3.3.7.0.7 The B/DB systems shall provide simultaneous video teleconferencing to support briefing and debriefing functions.

3.3.7.0.8 The B/DB system shall have the capability to allow viewing at remote sites (e.g., Squadron Briefing Room).

3.3.7.1 Briefing Capability

3.3.7.1.1 The briefing capability shall provide instructors the ability to conduct pre-mission planning and briefing to prepare F-16 pilots for the mission scenario.

3.3.7.1.2 The briefing system shall display the output of Air Force Mission Support System (AFMSS) and the Personal Flight Planning System (PFPS).

3.3.7.1.3 Each briefing capability shall support at least 8 people.

3.3.7.2 Debriefing Capability

3.3.7.2.1 The debriefing capability shall provide the ability to conduct debriefing of the F-16 pilots on the training scenario.

3.3.7.2.2 The debriefing system shall playback recorded segments of a training mission from any cockpit's perspective at normal or accelerated speeds.

3.3.7.2.3 The debriefing system shall provide the capability to simultaneously playback individual cockpit recordings for selectable console displays and audio, to include, but not limited to, HUD with correlated OTW visual, MFDs, RWR, and OTW visual presentations.

3.3.7.2.4 The debriefing system shall provide the capability to maintain mission situational awareness during the debrief.

3.3.7.2.5 The debriefing system shall playback missions from any perspective of the battlefield or selectable cockpit views (blue, gray or red).

3.3.7.2.6 The systems shall display information from all MTC cockpits simultaneously.

3.3.7.2.7 The recording function shall have the ability to specify the beginning and end of a record.

3.3.7.2.8 The recordings shall be achievable on removable media for playback on commercially available off-the-shelf multimedia equipment, and be transferable to other sites over the network.

3.3.7.2.9 Recording time length shall be, as a minimum, 120 minutes without changing the record media.

3.3.7.2.10 All debriefing systems shall provide the capability to network with the Air National Guard's USAF Personal Computer Debriefing System (PCDS).

3.3.7.2.11 Each debriefing capability shall support at least 8 people.

3.3.7.3 Mission Observation Capability (Level C Only)

3.3.7.3.1 The mission observation system shall provide a "God's-eye view," selectable cockpit views (blue, gray or red), and full battlefield observations (observation of the entire scenario, or meaningful portions thereof).

3.3.7.3.2 Mission observation shall allow simultaneous display of each cockpit's information.

3.3.7.3.3 The mission observation system shall provide real-time observation of active or previously recorded scenarios.

3.3.7.3.4 The mission observation room shall provide the capability for at least 20 people to view active or recorded missions.

3.4 DMT CONNECTIVITY

3.4.1 DMT Networking

3.4.1.1 All system simulations shall be integrated into DMT networks and interoperate with designated DMT federations established by the O&I contractor.

3.4.1.2 All system simulations shall include the necessary communications equipment to connect to the DMT long haul networks at each operating location.

3.4.1.3 The F-16 MTC HLA network shall provide the connectivity with the DMT environment at the military point of presence (MPOP).

3.4.1.4 Routers, bridges, and other network equipment shall be provided as necessary to isolate network segments during non-networked, Level A, B, or C training.

3.4.1.5 All system simulations shall provide a simulation object model (SOM) and an HLA-compliant interface for communication with other networked players, including DMT players.

3.4.2 DMT Interoperability

3.4.2.1 The F-16 simulation service contractor shall comply with all DMT interoperability standards.

3.4.2.2 The F-16 MTC system simulations shall be inter-operable with other USAF DMT participants in accordance with the DMT O&I standards.

3.4.2.3 The brief/debrief system shall be capable of exchanging information with other USAF DMT network participants.

3.4.2.4 The SOMs supported by each MTC shall be compatible with requirements identified by the DMT O&I contractor, and shall be available to the O&I contractor or the designated federation manager.

3.4.3 Simultaneous Training

3.4.3.1 All system simulations at a given location shall provide the capability to conduct simultaneous, independent, training scenarios.

3.4.3.2 A minimum of one DMT network hookup shall be within an MTC at any given time. (For example, two devices in a four ship MTC might be running a DMT networked mission, while the third and fourth devices are each concurrently running stand-alone missions.)

3.5 FACILITIES

3.5.1 Facility Space

Facility space for a two-ship Level B or Level C installation shall be a space 45 feet wide by 45 feet long by 15 feet high for the simulations and associated computer equipment. Floor space requirements for all service levels and configurations are provided in the following table.

Configuration	Service Level		
	A	B	C
One-ship	800 sq ft	1000 sq ft	N/A
Two-ship	1500 sq ft	2000 sq ft	2000 sq ft
Four-ship	3000 sq ft	4000 sq ft	4000 sq ft

Equipment for the Briefing/Debriefing and Mission Observation rooms and for Modular Control Equipment shall not be included in the areas defined in the table above. This equipment shall be located in proximity to the simulation systems and require no more than 2000 square feet of floor space.

3.5.2 Utilities

The nominal facility power to be provided is 220V 3-Phase at 500 KVA. The F-16 MTC contractor shall supply any required power conditioning equipment. The nominal facility heating, ventilation and air conditioning (HVAC) shall be sufficient to maintain the equipment in the operating environment specified in paragraph 3.11.3.2.

3.6 AVAILABILITY

3.6.1 Required Availability

Simulation services shall be available for a minimum of 95% of the scheduled operating hours.

3.6.2 Level A Availability Accounting

Level A availability accounting shall be in accordance with Contract F33657-99-D-2025 Clause A-16, Service Availability Accounting.

3.6.3 Level B and Level C Availability Accounting

Level B and Level C availability accounting shall be in accordance with Contract F33657-99-D-2025 Clause A-16, Service Availability Accounting.

3.6.4 Surge Availability

The F-16 MTC shall be capable of operating in surge mode in accordance with Contract F33657-99-D-2025, Clause A-17, Facility Hours of Operation.

3.6.5 Available Operating Hours

The F16 MTC facility hours of operation shall be in accordance with Contract F33657-99-D-2025 Clause A-17, Facility Hours of Operation.

3.7 ENVIRONMENT, SAFETY AND HEALTH

All services shall be designed to comply with AFOSH standards to minimize safety hazards to all per-

sonnel using or maintaining the equipment, while in an operative or non-operative state. In addition, materials used in the construction of the equipment shall not support the propagation of flame. The design effort shall minimize and control hazards associated with the generation of toxic or noxious gases. Each system simulation and IOS system shall provide an emergency switch that shall bring the entire system to an immediate safe and stopped condition without damaging the system.

3.7.1 Fire Detection Alarm and Suppression System

The design shall include a complete smoke/fire detection, alarm and suppression system that operates from facility power. The design, installation and operation of the system shall be done IAW best commercial practices as defined in NFPA National Fire Codes. The simulator fire control panel shall have the capability to interconnect to the facility fire control panel.

3.7.2 Emergency Power-Off Switches

Emergency power-off switches shall be provided at multiple locations throughout the training system and shall be fail safe. Emergency power-off shall occur automatically when a critical smoke/fire condition is detected. When emergency power-off is initiated, all power to the training equipment, including utility power, shall be automatically removed, and emergency lighting interior to the visual display system shall automatically activate.

3.7.3 Emergency Lighting

Emergency lighting shall be provided to illuminate the walkway within the simulation system area in order to facilitate the egress of the student pilot. The emergency lighting shall activate automatically upon loss of facility power. The system shall include provisions to turn off the emergency lighting upon deliberate shutdown of facility power.

3.7.4 Precautionary Markings

In all instances where parts, subassemblies, assemblies, and units of ground, aircraft or aircraft support equipment are used in the simulation equipment, and the parts/equipment have been modified in any way for the training equipment such parts/equipment shall be marked with the following precautionary marking:

"WARNING: FOR GROUND TRAINER USE ONLY"

3.8 SECURITY

The F-16 DMT System Simulations and MTC shall meet all security requirements of the DD Form 254.

3.8.1 F-16 DMT System Simulations and MTC Security

The system simulations and MTCs shall be capable of handling and processing TOP SECRET information. The simulation service elements shall be designed for future accreditation for TS/SCI and SAR in the DMT environment.

3.8.2 System Security

The F-16 MTC shall comply with all requirements delineated in the DD Form 254 Contract Security Classification Specification, the F-16 Multi-mission Fighter Security Classification Guide and its subordinate guides.

3.8.2.1 Site Facility Security

Implementation of security measures shall be by mutual cooperation between the contractor, the using activity and the Cognizant Security Authority (CSA).

3.8.2.2 Computer Security

Computer security requirements shall apply to all F-16 MTC subsystems and equipment which process or are connected to units which process classified national security information.

3.8.2.2.1 General-purpose computing systems (systems capable of multi-user, multi-tasking operation) shall operate in dedicated or system high mode.

3.8.2.2.2 Embedded systems (systems dedicated to single task processing or with limited operator interface capability) shall operate in dedicated or system high mode when functioning in either stand-alone mode or as part of the larger system.

3.8.2.2.3 Systems which do not process classified information in and of themselves and which possess a well defined and documented interface which would preclude the transfer of classified information into the system shall be identified as UNCLASSIFIED, but shall be protected with the same physical and operational mechanisms as are employed for classified systems.

3.8.2.2.4 No simulation system terminals or other peripherals, regardless of the specific subsystem to which they are connected, shall be installed outside of designated closed areas.

3.8.2.2.5 All classified computers integrated as a part of the simulation system shall incorporate removable mass storage media and volatile memory to support rapid and efficient system classification upgrade and/or downgrade.

a. The use of non-volatile memory shall be limited to the non-volatile RAM chip typically used in computer systems to store system specific parameters and the time-of-day.
b. The system shall provide the capability to inspect, using a low-level diagnostic tool, the contents of any non-volatile memory in order to support verification that no classified information has been inadvertently stored in the device.

3.8.3 Network Security

Each individual simulation system shall be categorized as a Unified Network for the purposes of accreditation by the Designated Approving Authority (DAA).

3.8.3.1 Any collection of collocated simulation systems and supporting equipment (briefing/debriefing, Mission Operations Center, etc.) connected for the purpose of exercising a common mission shall be categorized as a Unified Network.

3.8.3.2 All simulation system networks that extend outside of protected areas shall be protected through the use of either data encryption equipment or protected distribution systems.

3.8.4 Emissions Security

All commercially available computational equipment incorporated into F-16 MTC shall, as a minimum, be certified by the vendor to comply with the applicable FCC (commercial, industrial and business) technical specifications.

3.8.4.1 All equipment incorporated into the F-16 MTC shall be electromagnetically compatible with itself and with other equipment in the system.

3.8.4.2 The F-16 MTC shall adhere to best commercial practices for bonding, grounding and shielding in the construction of new equipment or modification of existing equipment.

3.8.4.3 At a minimum, all F-16 MTC systems shall be installed in accordance with Red/Black Equipment Separation and Red Signal Line/Black Power Line separation requirements as outlined in MIL-HDBK-232.

3.8.4.4 Additional Red/Black installation techniques shall be applied as determined necessary by the local USAF EMSEC authority through an EMSEC vulnerability analysis.

3.8.5 Physical Security

The F-16 MTC shall be designed for continuous operation in a Government-provided facility meeting the local standards for open storage of computer systems operating at the SECRET level.

3.9 TRANSPORTABLE MTC SERVICES

The simulation service elements for ACC, USAFE, and PACAF shall be designed for infrequent disassembly, transportability, and assembly at overseas deployed operating locations. Best commercial practice shall be used for packing and shipment.

3.10 GROWTH AND SPARE

The system shall be designed to permit expansion of capacity for technology insertion without significant design changes to existing hardware and without making the existing equipment obsolete.

3.11 PHYSICAL CHARACTERISTICS

3.11.1 Weight

The maximum floor loading shall not exceed 250 pounds per square foot (psf) and the maximum point floor loading shall not exceed 100 pounds per square inch (psi).

3.11.2 Physical Space

The physical space utilized by the F-16 MTC configurations shall be as described in section 3.5 herein.

3.11.2.1 Walkspace

The F-16 MTC shall be designed to allow a minimum of 36 inches of walkspace around the perimeter of major components and work stations.

3.11.2.2 Equipment Cooling and Ventilation

Adequate thermal design shall be employed to maintain parts within their operating temperature limits under specified operating conditions

3.11.3 Environmental Operating Conditions

3.11.3.1 Natural Environment

The F-16 MTC training system shall operate in the environment specified below. The components shall also operate after transportation and storage in the environments specified below.

3.11.3.2 Operation

a. Temperature: 15°C to 27°C
b. Relative Humidity: 20% to 80% (non-condensing)
c. Altitude: Sea level to 10,000 ft above sea level

3.11.3.3 Storage

a. Temperature: 0°C to 60°C
b. Relative Humidity: Up to 90% (non-condensing)
c. Altitude: Sea level to 40,000 ft above sea level

3.11.3.4 Transportation

a. Temperature: 0°C to 50°C
b. Relative Humidity: 10% to 90% (non-condensing)
c. Altitude: Sea level to 40,000 ft above sea level

3.12 DESIGN AND CONSTRUCTION CONSTRAINTS

3.12.1 Materials

Material used in the construction and support of the F-16 MTC shall be of the best commercial quality, with maximum use of COTS components and equipment from contractor's commercial products lists. Designs built to best commercial practices, as defined in applicable IPC class 2 standards shall be used for the design and construction of the F-16 MTC. Simulated or synthetic components shall be of high fidelity and shall replicate the interior appearance, feel, size, positioning, operation, display, symbology, illumination, and function of the F-16C Block 50 and Block 40 aircraft. Simulated or synthetic components shall meet the reliability requirements of the simulator and shall be economical considering both the initial cost and the support cost over the life of the simulator.

3.12.2 Nameplates and Product Markings

A durable nameplate shall be securely fastened to each F-16 MTC major component. The nameplate shall indicate the manufacturer, nomenclature, serial number and be labeled "Property of Lockheed Martin." All safety hazards shall be provided with adequate and conspicuous warning signs.

3.12.3 Workmanship

The F-16 MTC shall be designed and constructed in accordance with the precepts of modern engineering practice. The selection of materials, parts, and processes shall be based on reliability, cost, schedule, and proven performance. The design shall utilize, to the maximum extent possible, COTS equipment for which existing commercial support systems are available. The construction of the F-16 MTC shall conform to best commercial practices as defined in IPC standards (class 2) for workmanship. The equipment including parts and accessories shall conform to best commercial practices so that any damage or defect that could make part of the equipment unsatisfactory for its operation or function is avoided.

3.12.4 Interchangeability

Interchangeable items shall be as defined in MIL-STD-100 and shall possess both mechanical and electrical compatibility to permit their installation as interchangeable assemblies, subassemblies, and parts without regard to the manufacturer or supplier.

3.12.4.1 The F-16 MTC hardware and software shall be modular in design. Common parts, assemblies, and units shall be used to the maximum extent possible. Parts, assemblies, and units having the same part number shall be directly and completely interchangeable.

3.12.5 Human Engineering

The F-16 MTC shall be designed in accordance with sound human engineering principles, particularly emphasizing man-machine interface and hazards and safety considerations using MIL-STD-1472E as a guide.

3.12.5.1 Scenario input and IOS shall be designed with common design principles emphasizing intuitive operation by personnel with minimum operator training.

3.13 Y2K COMPLIANCE

All information technology items must be Year 2000 compliant. Year 2000 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.

4.0 QUALIFICATION PROVISIONS

4.1 GENERAL

This section establishes the requirements for verification of the F-16 MTC performance and design characteristics and operability. The objective of the verification is to ensure that the requirements of this specification have been met.

4.1.1 Contractor Conducted Tests

4.1.1.1 Subsystem Verification Testing (SSVT)

Defined as subsystem inspections and functional testing, performed by F-16 MTC Contractor Quality Assurance personnel, required to verify that the F-16 MTC subsystems meet their applicable specification requirements. The SSVTs shall be conducted by the F-16 MTC Contractor using Contractor-developed Acceptance Test Procedures (ATPs). These tests, and their results, shall be the basis for beginning Hardware and Software Integration (HSI) and Test.

4.1.1.2 Hardware and Software Integration (HSI) and Test

Defined as subsystem installation, checkout, inspection and functional testing, performed by F-16 MTC Contractor personnel, required to integrate the subsystems into the F-16 MTC system. The subsystems shall be installed and the required hardware and software checkouts accomplished. The subsystems shall be systematically integrated, inspected, and incrementally tested during Hardware and Software Integration (HSI). HSI shall be conducted by F-16 MTC Contractor using Contractor-developed HSI test plans and procedures. These tests, and their results, shall be the basis for beginning System Verification Testing (SVT).

4.1.1.3 System Verification Testing (SVT)

Defined as inspections and functional testing, performed by F-16 MTC Contractor Quality Assurance personnel, required to verify that all simulation services comply with the applicable requirements of the performance specification. The contractor shall plan for, include, and facilitate USAF Subject Matter Experts (SMEs) involvement and witnessing of verification tests. The F-16 MTC Contractor shall conduct a system verification review to ensure that all performance requirements have been met prior to the start of simulator certification (SIMCERT). The SVT shall be conducted by F-16 MTC Contractor using F-16 MTC Contractor-developed Acceptance Test Procedures (ATPs). All contractor verification data shall be available for government review and use. This test, and its results, shall be the basis for beginning System Performance Evaluation (SPE).

4.1.1.4 System Performance Evaluation (SPE)

Defined as inspections and integrated system functional testing required to verify that the F-16 MTC complies with the applicable requirements of the performance specification and provides the capability to accomplish the training tasks identified in the F-16 Block 40/42/50/52 Training Task List (TTL). The SPE shall be conducted by the F-16 MTC Contractor.

4.1.2 Methods of Verification

Quality assurance requirements for the MTC shall be in accordance with the quality requirements as defined in this specification. Table 4-1 provides a Verification Cross-Reference Index (VCRI) between the system requirements and the verification methods.

Verification shall be accomplished by the methods defined below:

a. Not Applicable – This column shall be used if the particular paragraph cannot be verified.

b. Compliance – This column shall be used for paragraphs in which the Contractor shall inform the Government via a letter that the contractor has complied with the requirements. This letter shall be delivered to the Government at the SVT Test Readiness Review (TRR).

c. Inspection – Inspection shall consist of the physical verification that a specification requirement is met by the comparison of that requirement to the documentation. The inspection shall be checked by QA and validated at physical configuration audit (PCA).

d. Analysis – Analysis shall consist of the verification that a specification requirement is met by a technical evaluation of equations, charts, data reduction, and/or representative data. When analysis has been produced by engineering on a given subject it shall be presented to the configuration management function and collected for the FCA. This shall occur prior to the completion of hardware/software integration (HSI).

e. Demonstration – Demonstration is defined as an uninstrumented test where success is determined by observation alone. Included in this category are tests that verify the accomplishment of a system requirement by the presentation of a physical object or capability. Demonstration procedures shall be documented in the Acceptance Test Procedures (ATP). Demonstration shall be accomplished by the test team using the ATP during SVT.

f. Test – Test shall consist of the verification of specification requirements by exercising applicable portions of the simulation system, under a set of defined conditions and procedures, which produce an expected response for a known set of stimuli. Test procedures shall be documented in the ATPs. Test shall be conducted by the test team using the ATPs during SVT.

Table 4-1. Verification Cross-Reference Index

NA – Not Applicable	*2 – Inspection*	*4 – Demonstration*
1 – Compliance	*3 – Analysis*	*5 – Test*

System Specification Reqt / Para. No.	Verification Method					
	NA	*1*	*2*	*3*	*4*	*5*
3.0 Simulation Service Performance Requirements	X					
3.1 Verification of Simulation Service Definition	X					
3.1.1 Verification of Simulation Service Overview		X				
3.1.2 Verification of Simulation Service Levels		X				
3.1.2.1 Verification of Simulation Service Level A			X			
3.1.2.2 Verification of Simulation Service Level B			X			
3.1.2.3 Verification of Simulation Service Level C			X			
3.1.3 Verification of Simulation Service Level Upgrades		X				
3.1.4 Verification of Simulation Service Operating Locations		X				
3.2 Verification of General Performance Requirements	X					
3.2.1 Verification of F-16 Missions and Operations					X	
3.2.1.1 Verification of Threshold Missions and Operations					X	
3.2.1.2 Verification of Objective Missions and Operations					X	
3.2.2 Verification of F-16 Training Tasks					X	
3.2.3 Verification of System Latency	X					
3.2.3.1 Verification of Single Cockpit Latency						X
3.2.3.2 Verification of Locally Networked Cockpit Latency						X
3.3 Verification of Simulation Service Elements	X					
3.3.1 Verification of Ownship Simulation					X	
3.3.1.1 Verification of Cockpit			X			
3.3.1.2 Verification of Aircraft Handling Characteristics						X
3.3.1.3 Verification of Avionics and Weapon Systems				X		X
3.3.1.4 Verification of Aural / Comm Subsystem						X
3.3.1.5 Verification of RTIO System						X
3.3.2 Verification of Visual Systems					X	
3.3.2.1 Verification of Visual System Characteristics						X
3.3.2.2 Verification of Level A Visual System						X
3.3.2.3 Verification of Level B & C Visual System						X
3.3.3 Verification of Synthetic Environment					X	
3.3.3.1 Verification of Natural Environment						X
3.3.3.2 Verification of Databases						X
3.3.3.3 Verification of Manmade Environment				X		X
3.3.4 Verification of Threat Stations (Level C Only)				X	X	
3.3.5 Verification of MCE Workstation (Level C Only)					X	
3.3.6 Verification of IOS					X	
3.3.6.1 Verification of Training Scenario Management					X	
3.3.6.2 Verification of Scenario Creation					X	
3.3.6.3 Verification of Scenario Setup and Execution					X	
3.3.6.4 Verification of Malfunctions						X
3.3.6.5 Verification of Training Exercise Monitoring					X	
3.3.6.6 Verification of Communications					X	

NA – Not Applicable *2 – Inspection* *4 – Demonstration*
1 – Compliance *3 – Analysis* *5 – Test*

System Specification Reqt / Para. No.	Verification Method					
	NA	*1*	*2*	*3*	*4*	*5*
3.3.6.7 Verification of Freeze and Reset					X	
3.3.6.8 Verification of Mission Playback					X	
3.3.6.9 Verification of Cockpit Control Interface					X	
3.3.7 Verification of B/DB Systems (Levels B&C Only)					X	
3.3.7.1 Verification of Briefing Capability					X	
3.3.7.2 Verification of Debriefing Capability					X	
3.3.7.3 Verification of MOC (Level C Only)					X	
3.4 Verification of DMT Connectivity					X	
3.4.1 Verification of DMT Networking					X	
3.4.2 Verification of DMT Interoperability					X	
3.4.3 Verification of Simultaneous Training					X	
3.5 Verification of Facilities	X					
3.5.1 Verification of Facility Space			X			
3.5.2 Verification of Utilities			X			
3.6 Verification of Availability	X					
3.6.1 Verification of Required Availability				X		
3.6.2 Verification of Level A System Availability Accounting			X			
3.6.3 Verification of Level B & C Availability Accounting			X			
3.6.4 Verification of Surge Availability					X	
3.6.5 Verification of Available Operating Hours			X			
3.7 Verification of Environment, Safety and Health			X			
3.7.1 Verification of Fire Detection Alarm & Suppression System			X			
3.7.2 Verification of Emergency Power-off Switches			X			
3.7.3 Verification of Emergency Lighting			X			
3.7.4 Verification of Precautionary Markings			X			
3.8 Verification of Security			X			
3.8.1 Verification of F-16 DMT System Sims & MTC Security			X			
3.8.2 Verification of System Security			X			
3.8.2.1 Verification of Site Facility Security			X			
3.8.2.2 Verification of Computer Security			X			
3.8.3 Verification of Network Security			X			
3.8.4 Verification of Emissions Security			X	X		
3.8.5 Verification of Physical Security			X			
3.9 Verification of Transportable MTC Services	X					
3.10 Verification of Growth and Spare				X		
3.11 Verification of Physical Characteristics			X			
3.11.1 Verification of Weight			X			
3.11.2 Verification of Physical Space			X			
3.11.2.1 Verification of Walkspace			X			
3.11.2.2 Verification of Equipment Cooling and Ventilation			X			
3.11.3 Verification of Environmental Operating Conditions			X			
3.11.3.1 Verification of Natural Environment			X			
3.11.3.2 Verification of Operation			X			

NA – Not Applicable	*2 – Inspection*	*4 – Demonstration*			
1 – Compliance	*3 – Analysis*	*5 – Test*			
System Specification Reqt / Para. No.	**Verification Method**				
	NA	*1*	*2*	*3*	*4*	*5*
3.11.3.3 Verification of Storage			X			
3.11.3.4 Verification of Transportation			X			
3.12 Verification of Design and Construction Constraints			X			
3.12.1 Verification of Materials			X			
3.12.2 Verification of Nameplates and Product Markings			X			
3.12.3 Verification of Workmanship			X			
3.12.4 Verification of Interchangeability			X			
3.12.5 Verification of Human Engineering			X			
3.13 Verification of Y2K Compliance						X

5.0 REQUIREMENTS TRACEABILITY

Requirements traceability shall be maintained between the following documents:

- Performance Specification to Interface Control Documents (ICDs)
- Performance Specification to Subsystem Specifications
- Subsystem Specifications to ICDs
- Subsystem Specifications to Configuration Items (CIs)
- CIs to Work Breakdown Structure (WBS)
- Performance and Subsystem Specifications to Test Procedures
- Test Procedures to Verification Test Reports
- CIs to Current Field Configurations

APPENDIX A

Pilot Training Task List (TTL)

WARNING – This appendix contains technical data whose export is restricted by the Arms Export Control Act (Title 22, U.S.C. SEC 2751, et seq.) or the Export Administration Act of 1979, as amended, Title 50, U.S.C., App 2401 et seq. Violations of these export laws are subject to severe criminal penalties. Disseminate in accordance with provisions of DoD Directive 5230.25.

Overview

1. The attached TTL is in matrix format. F-16 pilot training tasks are listed in rows. F-16 aircraft blocks are listed in columns. Each "Block" column is further subdivided into service Levels A, B, and C. Applicable columns are marked for every pilot training task.

2. The "X-" in the Level A column denotes a capability that may be limited by the visual system field-of-view.

3. The "O" in the Levels of Service columns denotes an objective task. These training tasks are desired but not mandatory.

4. The parenthetical expression "(IOS or Player)," located beside certain tasks in the "Training Task Description" column, indicates communication calls must be made by an instructor at the Instructor Operating Station (IOS) in the absence of the appropriate DMT participant.

5. References to Block 40 include Block 42, and references to Block 50 include Block 52.

6. References to Block 40 engines include the GE 100 and PW 220. References to Block 50 engines include the GE 129 and PW 229.

7. Certain tasks are derived from external documents. The Reference Key below identifies these specific documents by "REF" from the TTL. This reference key is provided for information only. It may not be all-inclusive of source documentation used to compile the TTL.

150

ID #	TASK ID CODE	TRAINING TASK DESCRIPTION	LEVELS OF SERVICE						REF
			BLOCK 40			BLOCK 50			
			Level			Level			
			A	B	C	A	B	C	
		PHASE 1: PREMISSION							
1	1	Perform Premission tasks							
2	1.1	Collect Mission Data							
3	1.1.1	Obtain Air Tasking Order (ATO)							
4	1.1.2	Obtain Intel Briefing							
5	1.1.3	Obtain weather brief							
6	1.1.3.1	Collect aircraft performance data							
7	1.1.3.2	Collect tactical data							
8	1.1.3.3	Obtain TDA							
9	1.1.4	Collect Operations Data							
10	1.1.4.1	Collect navigation data							
11	1.1.4.2	Collect ordnance data							
12	1.2	Perform Mission Planning							3
13	1.2.1	Perform Combat Mission Planning							
14	1.2.2.1	Plan Air-to-Surface (A-S) Mission							
15	1.2.2.1.1	Evaluate Threats/ALE 40 /47 / 50 setup							
16	1.2.2.1.2	Plan Delivery Profile							
17	1.2.2.1.3	Plan egress profile (altitude, airspeed, heading and fuel)							
18	1.2.2.2	Plan Air-to-Air (A-A) Mission							
19	1.2.3	Plan for Air Refueling							11,12
20	1.3	Input data into AFMSS / PFPS and retrieve (DTC)							4
21	1.4	Prepare Mission Briefing		x	x		x	x	3
22	1.5	Conduct Mission Briefing		x	x		x	x	3
23	1.5.1	Ground Ops / Takeoff/Departure		x	x		x	x	
24	1.5.2	Recovery / Landing		x	x		x	x	
25	1.5.3	Advanced Handling / Instrument		x	x		x	x	
26	1.5.4	Air Refueling		x	x		x	x	
27	1.5.5	Air-to-Air		x	x		x	x	
28	1.5.5.1	ACT / Intercept		x	x		x	x	
29	1.5.5.2	BFM / ACM/ WVR weapons employment		x	x		x	x	
30	1.5.5.3	Offensive Counter Air (OCA)		x	x		x	x	
31	1.5.5.3.1	Force Protection (Escort)		x	x		x	x	
32	1.5.5.3.2	Sweep		x	x		x	x	
33	1.5.5.4	Defensive Counter Air (DCA)		x	x		x	x	
34	1.5.6	Air-to-Surface		x	x		x	x	
35	1.5.6.1	Basic Surface Attack		x	x		x	x	7
36	1.5.6.2	Close Air Support (CAS)		x	x		x	x	
37	1.5.6.3	Forward Air Controller - FAC(A)		x	x		x	x	
38	1.5.6.4	Suppression of Enemy Air defenses (SEAD)					x	x	
39	1.5.6.5	Offensive Counter Air (OCA): Air-to-Surface		x	x		x	x	
40	1.5.6.6	Air Interdiction / killer Scout		x	x		x	x	
41	1.5.6.7	Nuclear		x	x		x	x	
42	1.5.6.8	Combat Search and Rescue (CSAR)		x	x		x	x	
43	1.5.7	Low-Level / Medium Level Navigation		x	x		x	x	
44	1.5.8	LANTIRN		x	x		x	x	
45	1.5.9	Alert (DCA / FAC / CAS)		x	x		x	x	
46	1.5.10	Alert (DCA / SEAD)					x	x	
47	1.5.11	Composite Force Mission		x	x		x	x	
48	1.6	Select mission appropriate personal / survival equipment and suit up							
49	1.6.1	Prepare / Check flight gear (G-suit inflation / combat edge)							
50	1.6.2	Prepare Chemical Warfare Gear							
		PHASE 2: PRETAKEOFF							
51	2	Perform Pretakeoff Tasks	x	x	x	x	x	x	1,2,4,5,6
52	2.1	Perform Day Ground Operations	x	x	x	x	x	x	1,2,4
53	2.1.1	Perform Before Entering Cockpit Check							

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54	2.1.2	Perform Cockpit Interior Checks	x	x	x	x	x	x	
55	2.1.3	Perform 'after cockpit check is complete - verify' check	x	x	x	x	x	x	
56	2.1.4	Perform 'before starting engine' checks	x	x	x	x	x	x	
57	2.1.5	Start Engine	x	x	x	x	x	x	
58	2.1.6	Perform After Engine Start Checks	x	x	x	x	x	x	
59	2.1.7	Perform 'Before Taxi' Checks	x	x	x	x	x	x	
60	2.1.7.1	Perform Bit Checks (HTS / RALT / AMRAAM / HARM)				x	x	x	
61	2.1.7.2	Perform HTS Start-up / ALIC Loading				x	x	x	
62	2.1.7.3	Perform Bit checks (FLIR / TFR / TGP / RALT / AMRAAM)	x	x	x				
63	2.1.7.4	Perform FLIR Tuning / Boresight Check / Adj FLIR gain level	x	x	x				
64	2.1.7.5	Perform DTC / DTS Transfer	x	x	x	x	x	x	
65	2.1.7.6	Perform Avionics setup	x	x	x	x	x	x	
66	2.1.7.7	Perform Maverick Boresight and Dive Toss check	x	x	x	x	x	x	
67	2.2	Perform Night Ground Operations	x	x	x	x	x	x	1,2,4,5,6
68	2.2.1	Selectively adjust cockpit lighting for night flight	x	x	x	x	x	x	
69	2.2.2	Select exterior lights as required	x	x	x	x	x	x	
70	2.2.3	Turn on taxi and landing lights as required	x	x	x	x	x	x	
71	2.2.4	Select NVIS lighting as required	x	x	x	x	x	x	
72	2.2.5	Adjust FLIR gain level				x	x	x	
73	2.3	Perform Ground Operations Under Alert Conditions	x	x	x	x	x	x	
74	2.3.1	Perform Alert Preflight	x	x	x	x	x	x	
75	2.3.1.1	Perform exterior inspection for alert conditions							
76	2.3.1.2	Perform munitions inspection for alert conditions							
77	2.3.2	Set-Up Cockpit for Alert Conditions (Cocked)	x	x	x	x	x	x	
78	2.3.2.1	Perform a/c interior inspection for cocked condition with power off	x	x	x	x	x	x	
79	2.3.2.2	Perform a/c interior inspection for cocked condition with power on	x	x	x	x	x	x	
80	2.3.2.3	Perform procedures for NUC loading alert status	o	o	o	o	o	o	
81	2.3.3	Perform Launch/Scramble Procedures	x	x	x	x	x	x	
82	2.4	Communicate with ground (IOS simulation)	x	x	x	x	x	x	
83	2.5	Perform Taxi Procedures	x	x	x	x	x	x	1,2,3
84	2.5.1	Perform 'brakes and NWS' checks	x	x	x	x	x	x	
85	2.5.2	Perform 'heading' check	x	x	x	x	x	x	
86	2.5.3	Perform 'Flight Instrument check'	x	x	x	x	x	x	
87	2.5.4	Perform IDM / IDT check	x	x	x	x	x	x	
88	2.5.5	Perform Manual Programming ALE 40 / 47 / 50	x	x	x	x	x	x	
89	2.6	Perform 'before takeoff' checks	x	x	x	x	x	x	1,2
90	2.7	Contact tower (IOS simulation)	x	x	x	x	x	x	
91	2.8	Perform runway lineup	x	x	x	x	x	x	
		PHASE 3: TAKEOFF							
92	3	Perform Takeoff	x	x	x	x	x	x	1,2
93	3.1	Perform Normal Takeoff	x	x	x	x	x	x	
94	3.1.1	Perform Single ship takeoff	x	x	x	x	x	x	
95	3.1.1.1	Perform Mil Pwr takeoff	x	x	x	x	x	x	
96	3.1.1.2	Perform AB takeoff	x	x	x	x	x	x	
97	3.1.2	Perform Formation takeoff		x	x		x	x	
98	3.1.2.1	Perform Mil Pwr takeoff as lead		x	x		x	x	
99	3.1.2.2	Perform AB takeoff as lead		x	x		x	x	
100	3.1.2.3	Perform Mil Pwr takeoff as wingman		x	x		x	x	
101	3.1.2.4	Perform AB takeoff as wingman		x	x		x	x	
102	3.1.2.5	Perform Night Formation Takeoff		x	x		x	x	
103	3.2	Perform takeoff in a crosswind	x	x	x	x	x	x	
104	3.3	Perform 'heavy weight' takeoff	x	x	x	x	x	x	
105	3.4	Perform takeoff with asymmetric stores	x	x	x	x	x	x	
106	3.5	Perform Instrument/Night Takeoff	x	x	x	x	x	x	
107	3.6	Establish normal communications (IOS simulation)	x	x	x	x	x	x	
		PHASE 4: DEPARTURE / CLIMB							
108	4	Perform Departure / Climb	x	x	x	x	x	x	1,2,5,6
109	4.1	Perform Standard Instrument Departure (SID)	x	x	x	x	x	x	
110	4.2	Perform Normal Departure	x	x	x	x	x	x	1,2
111	4.2.1	Perform Single Ship Departure	x	x	x	x	x	x	
112	4.2.1.1	Perform departure on Mil power climb schedule	x	x	x	x	x	x	

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113	4.2.1.2	Perform departure on AB climb schedule	x	x	x	x	x	x	
114	4.2.1.3	Intercept correct departure track/heading	x	x	x	x	x	x	
115	4.2.1.4	Establish UHF communications during departure (IOS simulation)	x	x	x	x	x	x	
116	4.2.1.5	Establish VHF communications during departure (IOS simulation)	x	x	x	x	x	x	
117	4.2.2	Perform Formation Departure		x	x		x	x	5,6
118	4.2.2.1	Perform departure as lead		x	x		x	x	
119	4.2.2.2	Perform departure as wingman		x	x		x	x	
120	4.2.2.2.1	Perform close formation departure		x	x		x	x	
121	4.2.2.2.2	Perform straight ahead rejoin		x	x		x	x	
122	4.2.2.2.3	Perform overshoot and recovery on straight ahead rejoin		x	x		x	x	
123	4.2.2.2.4	Perform turning rejoin		x	x		x	x	
124	4.2.2.2.5	Perform overshoot and recovery on turning rejoin		x	x		x	x	
125	4.3	Perform Tactical Departure	x	x	x	x	x	x	5,6
126	4.3.1	Perform Single Ship Tactical Departure	x	x	x	x	x	x	
127	4.3.1.1	Perform tactical departure on Mil power climb schedule	x	x	x	x	x	x	
128	4.3.1.2	Perform tactical departure on AB climb schedule	x	x	x	x	x	x	
129	4.3.1.3	Intercept correct tactical departure track/heading	x	x	x	x	x	x	
130	4.3.2	Perform Formation Tactical Departure		x	x		x	x	
131	4.3.2.1	Perform tactical departure as formation lead		x	x		x	x	
132	4.3.2.2	Perform tactical departure as wingman		x	x		x	x	
133	4.4	Perform Trail Departure	x	x	x	x	x	x	5,6
134	4.4.1	Perform radar trail departure as lead	x	x	x	x	x	x	
135	4.4.2	Perform radar trail departure as wingman	x	x	x	x	x	x	
136	4.4.3	Perform trail departure as lead without radar	x	x	x	x	x	x	
137	4.4.4	Perform trail departure as wingman without radar	x	x	x	x	x	x	
138	4.4.5	Perform IDT Trail	x	x	x	x	x	x	
139	4.4.6	Perform FLIR Trail	x	x	x				
140	4.5	Perform Weapons Systems Checks	x	x	x	x	x	x	4
141	4.5.1	Perform checks on A-A weapons systems	x	x	x	x	x	x	
142	4.5.2	Perform checks on conventional A-S weapons systems	x	x	x	x	x	x	
143	4.5.3	Perform checks on nuclear A-S weapons system	x	x	x	x	x	x	
144	4.5.4	Perform TGP Checks (A / A; A / G)	x	x	x				
145	4.6	Perform Join-up procedures	x	x	x	x	x	x	5,6
146	4.7	Perform level-off procedures	x	x	x	x	x	x	1,2
		PHASE 5: ENROUTE							
147	5	Perform Enroute Procedures	x	x	x	x	x	x	1,2,4,5,6
148	5.1	Perform Basic instrument Flight in IMC	x	x	x	x	x	x	1,6
149	5.1.1	Perform straight and level flight	x	x	x	x	x	x	
150	5.1.2	Perform normal turns to a heading	x	x	x	x	x	x	
151	5.1.3	Perform steep banked turns to a heading	x	x	x	x	x	x	
152	5.1.4	Perform climbs and descents to an altitude	x	x	x	x	x	x	
153	5.1.5	Perform acceleration/deceleration with and without speedbrake	x	x	x	x	x	x	
154	5.1.6	Perform combination basic maneuvers	x	x	x	x	x	x	
155	5.1.7	Employ autopilot enroute	x	x	x	x	x	x	
156	5.2	Perform Spatial Disorientation/Unusual Attitude Recoveries	x	x	x	x	x	x	1,2,5,6
157	5.2.1	Perform nose low attitude recovery	x	x	x	x	x	x	
158	5.2.2	Perform nose high attitude recovery	x	x	x	x	x	x	
159	5.2.3	Perform inverted recovery (with/without TV Code 105)	x	x	x	x	x	x	
160	5.3	Perform Enroute Navigation	x	x	x	x	x	x	1,2,4,5,6
161	5.3.1	Navigate Visually		x	x		x	x	
162	5.3.1.1	Use aerial map to visually confirm present position		x	x		x	x	
163	5.3.1.2	Visually enter nav route		x	x		x	x	
164	5.3.1.3	Navigate by dead reckoning		x	x		x	x	
165	5.3.2	Perform Instrument Navigation	x	x	x	x	x	x	
166	5.3.2.1	Perform TACAN & DME Navigation	x	x	x	x	x	x	
167	5.3.2.1.1	Tune and identify TACAN station	x	x	x	x	x	x	
168	5.3.2.1.2	Perform direct to/from station navigation	x	x	x	x	x	x	
169	5.3.2.1.3	Perform arc navigation	x	x	x	x	x	x	
170	5.3.2.1.4	Identify station passage	x	x	x	x	x	x	
171	5.3.2.1.5	Perform time and distance check	x	x	x	x	x	x	
172	5.3.2.1.6	Perform groundspeed check	x	x	x	x	x	x	
173	5.3.2.1.7	Perform course interception	x	x	x	x	x	x	
174	5.3.2.1.8	Maintain course	x	x	x	x	x	x	

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175	5.3.2.1.9	Perform fix-to-fix navigation	x	x	x	x	x	x	
176	5.3.2.1.10	Perform radial-to-arc interception	x	x	x	x	x	x	
177	5.3.2.1.11	Perform arc-to-radial interception	x	x	x	x	x	x	
178	5.3.2.1.12	Use HSD for position	x	x	x	x	x	x	
179	5.3.2.2	Perform INS Navigation	x	x	x	x	x	x	
180	5.3.2.2.1	Configure INS for steerpoint selection	x	x	x	x	x	x	
181	5.3.2.2.2	Proceed to steerpoint using INS data display	x	x	x	x	x	x	
182	5.3.2.2.3	Update INS and MMC	x	x	x	x	x	x	
183	5.3.2.2.3.1	Using radar fix	x	x	x	x	x	x	
184	5.3.2.2.3.2	Using targeting pod	x	x	x	x	x	x	
185	5.3.2.2.3.3	Using HUD fix	x	x	x	x	x	x	
186	5.3.2.2.3.4	Using visual overfly fix		x	x		x	x	
187	5.3.3	Use Radar Ground Map as an Aid to Navigation	x	x	x	x	x	x	
188	5.3.3.1	Set up radar for ground mapping mode	x	x	x	x	x	x	
189	5.3.3.2	Verify/correct course using radar ground returns	x	x	x	x	x	x	
190	5.3.3.3	Use the aerial navigation map to correlate radar depiction	x	x	x	x	x	x	
191	5.3.3.4	Use Ground Map Radar for weather avoidance	x	x	x	x	x	x	
192	5.3.4	Navigate using Air Traffic Control procedures	x	x	x	x	x	x	
193	5.3.4.1	Establish/Maintain normal ATC communications (IOS simulation)	x	x	x	x	x	x	
194	5.3.5	Navigate using Ground Controlled Intercept (GCI) procedures (IOS or player)	x	x	x	x	x	x	
195	5.4	Perform Cruise Energy Management Operations	x	x	x	x	x	x	1,2,5,6
196	5.4.1	Manage cruise energy using 'Range mode'	x	x	x	x	x	x	
197	5.4.2	Manage cruise energy using 'Endurance mode'	x	x	x	x	x	x	
198	5.4.3	Manage cruise energy using 'Home mode'	x	x	x	x	x	x	
199	5.4.4	Manage cruise energy using 'TOS mode'	x	x	x	x	x	x	
200	5.5	Perform Aircraft Handling Procedures/maneuvers for multiple configurations	x	x	x	x	x	x	1,2
201	5.5.1	Perform Angle of Attack (AOA)/G limiter maneuvers	x	x	x	x	x	x	
202	5.5.2	Perform afterburner (AB) maneuvers at slow speed	x	x	x	x	x	x	
203	5.5.3	Perform afterburner (AB) maneuvers at high speed	x	x	x	x	x	x	
204	5.5.4	Perform slow flight maneuvers	x	x	x	x	x	x	
205	5.5.5	Perform vertical recovery maneuvers	x	x	x	x	x	x	
206	5.5.6	Perform G-awareness maneuver	x	x	x	x	x	x	
207	5.5.7	Perform horn awareness and recovery training series (HARTS)	x	x	x	x	x	x	
208	5.6	Perform Formation Enroute Procedures		x	x		x	x	5,6
209	5.6.1	Perform LANT check		x	x				
210	5.6.2	Perform "Prior-to-letdown" check		x	x		x	x	
211	5.6.3	Perform Basic Formation Maneuvers - Lead/Wingman		x	x		x	x	5,6
212	5.6.3.1	Fly in 'fingertip' formation		x	x		x	x	
213	5.6.3.2	Fly in 'route' formation		x	x		x	x	
214	5.6.3.3	Perform crossunders		x	x		x	x	
215	5.6.3.4	Fly in 'echelon' formation		x	x		x	x	
216	5.6.3.5	Perform pitchouts and rejoins		x	x		x	x	
217	5.6.3.6	Change Lead		x	x		x	x	
218	5.6.3.7	Perform lost wingman procedures		x	x		x	x	
219	5.6.3.8	Fly in 'line-abreast' formation		x	x		x	x	
220	5.6.3.9	Fly in 'trail' formation		x	x		x	x	
221	5.6.3.10	Fly in 'wedge' formation		x	x		x	x	
222	5.6.3.11	Fly fighting wing formation		x	x		x	x	
223	5.6.3.12	Fly chase formation		x	x		x	x	
224	5.6.4	Fly 2-Ship Formations (line abreast, wedge and fighting wing)		x	x		x	x	
225	5.6.4.1	Fly 3-Ship Formations (VIC, wedge, fluid three, 3-ship spread)		x	x		x	x	
226	5.6.4.2	Fly 4-Ship Formations (box/offset, box, wedge, fluid/spread four)		x	x		x	x	
227	5.6.4.3	Perform Multi-Ship Turns		x	x		x	x	
228	5.6.4.3.1	Perform 'delayed 90' degree turns		x	x		x	x	
229	5.6.4.3.2	Perform 'delayed 45' degree turns		x	x		x	x	
230	5.6.4.3.3	Perform 'in-place 180' degree turns		x	x		x	x	
231	5.6.4.3.4	Perform 'comm-out' turns		x	x		x	x	
232	5.6.4.3.5	Perform 'fluid turns'		x	x		x	x	
233	5.6.4.3.6	Perform 'cross turns and shackles'		x	x		x	x	
234	5.6.4.3.7	Perform 'weaves'		x	x		x	x	
235	5.6.4.3.8	Perform 'check' turns		x	x		x	x	
236	5.6.4.3.9	Perform 'vertical positioning' maneuvers		x	x		x	x	
237	5.6.4.4	Perform visual lookout in tactical formation		x	x		x	x	
238	5.6.4.5	Fly in visual mixed force tactical formations		x	x		x	x	
239	5.6.4.6	Fly night/weather/BVR tactical formation - Lead/Wingman		x	x		x	x	
240	5.6.5	Fly Night Vision Goggle (NVG) Formations		o	o		o	o	8

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241	5.6.5.1	Fly NVG Close		o	o		o	o	
242	5.6.5.2	Fly 2-ship NVG Fluid		o	o		o	o	
243	5.6.5.3	Fly 2-ship NVG Night Line Abreast (NLAB)		o	o		o	o	
244	5.6.5.4	Fly 4-ship NVG Offset Box		o	o		o	o	
245	5.6.5.5	Fly 4-ship NVG Offset Box Turn		o	o		o	o	
246	5.6.5.6	Fly night fluid four		o	o		o	o	
247	5.6.5.7	Perform Night NVG Multi-ship Turns		o	o		o	o	
248	5.6.5.7.1	Fly NLAB 90-Degree Turn		o	o		o	o	
249	5.6.5.7.2	Fly NLAB 180-Degree Turn		o	o		o	o	
250	5.6.5.8	Change Tactical Lead		o	o		o	o	
251	5.6.5.9	Perform "Blind" procedures		o	o		o	o	
252	5.6.5.10	Perform Threat Reactions in chaff/flare environment		o	o		o	o	
253	5.6.6	Fly close formation in instrument conditions - Wingman		x	x		x	x	5,6
254	5.6.7	React to unplanned single-ship situation		x	x		x	x	
255	5.7	Fly Medium Altitude (Above MSA) LANTIRN Ingress	x	x	x				5,6
256	5.7.1	Perform FLIR tuning	x	x	x				
257	5.7.2	Fly Formation (FLIR trail)	x	x	x				
258	5.7.3	React to threats	x-	x	x				6,8
259	5.8	Fly Low Altitude Enroute (<5K AGL)	x	x	x	x	x	x	5,6
260	5.8.1	Perform low altitude hazard awareness maneuvering	x	x	x	x	x	x	
261	5.8.2	Perform low altitude dead reckoning navigation	x	x	x	x	x	x	
262	5.8.3	Use Digital Terrain System (DTS)	x	x	x	x	x	x	
263	5.8.3.1	Use Terrain Reference Navigation (TRN)	x	x	x	x	x	x	
264	5.8.3.2	Use Data Base Terrain Cueing (DBTC)	x	x	x	x	x	x	
265	5.8.3.3	Use Obstacle Warning Cueing (OWC)	x	x	x	x	x	x	
266	5.8.3.4	Use Predictive Ground Collision Avoidance System (PGCAS)	x	x	x	x	x	x	
267	5.8.4	Perform low altitude radar-assisted navigation	x	x	x	x	x	x	
268	5.8.5	Perform low level route timing	x	x	x	x	x	x	
269	5.8.6	Perform TOS check	x	x	x	x	x	x	
270	5.8.7	Employ terrain masking	x-	x	x	x-	x	x	
271	5.8.8	Perform low-altitude NVD navigation at night (Below MSA)	x-	x	x	x-	x	x	
272	5.8.8.1	Actuate NVIS compatible cockpit lighting as required	x	x	x	x	x	x	
273	5.8.8.2	Use NVG no LANTIRN	x-	x	x	x-	x	x	
274	5.8.8.3	Fly Low Altitude LANTIRN Operations	x-	x	x				5,6
275	5.8.8.3.1	Perform TFR Letdown	x	x	x				
276	5.8.8.3.2	Perform Tactical Navigation	x-	x	x				
277	5.8.8.3.3	Perform Terrain Masking	x-	x	x				
278	5.8.8.3.4	Perform TFR Fly-ups	x	x	x				
279	5.8.8.3.5	React to low altitude threat	x-	x	x				
280	5.8.8.3.6	Use NVG with LANTIRN	x-	x	x				
281	5.8.9	Perform visual lookout	x-	x	x	x-	x	x	
282	5.8.10	Perform 'fence check' at low altitude	x	x	x	x	x	x	
283	5.8.11	Perform sensor operations during low level flight	x	x	x	x	x	x	
284	5.8.12	Maintain situational awareness (SA) during low level flight	x-	x	x	x-	x	x	
285	5.8.12.1	Maintain visual SA	x-	x	x	x-	x	x	
286	5.8.12.2	Use IDM to maintain SA	x	x	x	x	x	x	
287	5.8.12.3	Use IDL to maintain SA				x	x	x	
288	5.8.12.4	Use IDT to maintain SA	x	x	x				
289	5.8.12.5	Use RWR to maintain SA	x	x	x	x	x	x	
290	5.8.12.6	Use radar to maintain SA	x	x	x	x	x	x	
291	5.8.12.7	Use PGCAS to maintain SA	x	x	x	x	x	x	
292	5.8.12.7.1	Disable / Override PGCAS	x	x	x	x	x	x	
293	5.8.12.8	Use HSD to maintain SA							
294	5.8.13	Perform safe recovery procedures during low level flight	x	x	x	x	x	x	5,6
295	5.8.14	Respond to degraded/failed systems during low level flight	x	x	x	x	x	x	
296	5.8.15	Fly Low Altitude tactical formations (line abreast / wedge)		x	x		x	x	5,6
297	5.8.16	Perform Route Abort Procedures	x	x	x	x	x	x	5,6
298	5.9	Perform Air-to-Air Refueling	x-	x	x	x-	x	x	11,12
		PHASE 6: COMBAT							
299	6	Perform Combat Missions	x-	x	x	x-	x	x	4,5,6,14
300	6.1	Rendezvous with support /assignment acft (escort, FAC, CSAR, etc.)		x	x		x	x	
301	6.2	Perform Fence Checks	x	x	x	x	x	x	
302	6.3	Perform Ingress	x	x	x	x	x	x	

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303	6.3.1	Perform med alt / High alt Ingress	x	x	x	x	x	x	
304	6.3.1.1	Perform day medium/high altitude ingress (5k AGL-25K AGL / >25k)	x	x	x	x	x	x	
305	6.3.1.2	Perform night/IMC medium/high altitude ingress (Above MSA)	x	x	x	x	x	x	
306	6.3.2	Perform Low Altitude Ingress	x	x	x	x	x	x	
307	6.3.2.1	Perform day low altitude ingress (<5K AGL)	x	x	x	x	x	x	
308	6.3.2.2	Perform night low altitude ingress (below MSA)	x	x	x	x	x	x	
309	6.3.3	Arrive at target at predetermined TOT	x	x	x	x	x	x	
310	6.3.4	ID target using aerial nav map and onboard systems	x	x	x	x	x	x	
311	6.4	Perform Battle Management and Data Transfer	x	x	x	x	x	x	
312	6.4.1	Receive Target Data	x	x	x	x	x	x	
313	6.4.1.1	Identify cues for incoming target data - IDM	x	x	x	x	x	x	
314	6.4.1.2	Receive target data	x	x	x	x	x	x	
315	6.4.1.2.1	Via Improved Data Modem (IDM)	x	x	x	x	x	x	
316	6.4.1.2.2	Via Radio Voice communications	x	x	x	x	x	x	
317	6.4.1.2.3	Via ADSI / Rivet Joint / JSTARS / Other ELINT platforms	x	x	x	x	x	x	
318	6.4.1.3	Acknowledge receipt of target data	x	x	x	x	x	x	
319	6.4.2	Analyze target data	x	x	x	x	x	x	
320	6.4.3	Transmit Target Data	x	x	x	x	x	x	
321	6.4.3.1	"Signal" intention to transmit target data - IDM	x	x	x	x	x	x	
322	6.4.3.2	Via radio voice communication	x	x	x	x	x	x	
323	6.4.3.3	Via IDM	x	x	x	x	x	x	
324	6.4.3.4	Via IDT (Blk 40)	x	x	x				
325	6.4.3.5	Via IDL (Blk 50 air-to-air targets)				x	x	x	
326	6.4.3.6	Confirm transmittal/receipt of target data	x	x	x	x	x	x	
327	6.4.4	Plan ordnance delivery	x	x	x	x	x	x	
328	6.4.4.1	Determine / select weapon of choice	x	x	x	x	x	x	
329	6.4.4.2	Determine tactics / attack maneuver	x	x	x	x	x	x	
330	6.4.4.3	Select delivery mode for desired ordnance / delivery	x	x	x	x	x	x	
331	6.5	Perform Air-Air Combat	x-	x	x	x-	x	x	5,6,14
332	6.5.1	Perform Offensive Counter Air (OCA) Mission		x	x		x	x	
333	6.5.1.1	Perform Sweep		x	x		x	x	
334	6.5.1.2	Perform Escort		x	x		x	x	
335	6.5.1.2.1	Perform tactical strike force escort		x	x		x	x	
336	6.5.1.2.2	Perform reconnaissance escort		x	x		x	x	
337	6.5.1.2.3	Perform bomber / airlift escort		x	x		x	x	
338	6.5.2	Perform Defensive Counter Air (DCA) Mission		x	x		x	x	
339	6.5.2.1	Perform Combat Air Patrol (CAP)		x	x		x	x	
340	6.5.2.1.1	Establish Communication with GCI / AWACS (IOS or player)		x	x		x	x	
341	6.5.2.1.2	Perform Roving CAP		x	x		x	x	
342	6.5.2.1.3	Perform point CAP		x	x		x	x	
343	6.5.2.1.4	Perform barrier CAP (BARCAP)		x	x		x	x	
344	6.5.2.1.5	Perform area combat air patrol (AREACAP)		x	x		x	x	
345	6.5.2.1.6	Perform Low-Altitude CAP		x	x		x	x	
346	6.5.2.1.7	Perform night / adverse weather DCA Operations		x	x		x	x	
347	6.5.2.1.7.1	Perform non-NVG DCA operations		x	x		x	x	
348	6.5.2.1.7.2	Perform NVG DCA operations		x	x		x	x	
349	6.5.3	Perform Intercepts (Applies to both OCA & DCA Missions)	x-	x	x	x-	x	x	
350	6.5.3.1	Perform Basic Intercepts (Day, Night, or IMC)	x	x	x	x	x	x	
351	6.5.3.1.1	Use radar ECCM modes against jamming tgts	x	x	x	x	x	x	
352	6.5.3.1.2	Perform Straight through with visual ID	x	x	x	x	x	x	
353	6.5.3.1.3	Perform Low Aspect	x	x	x	x	x	x	
354	6.5.3.1.4	Perform Medium Aspect	x	x	x	x	x	x	
355	6.5.3.1.5	Perform High Aspect	x	x	x	x	x	x	
356	6.5.3.1.6	Perform Stern Conversion	x	x	x	x	x	x	
357	6.5.3.1.7	Perform Front / Stern Reattack	x	x	x	x	x	x	
358	6.5.3.2	Perform BVR Tactical Intercepts	x	x	x	x	x	x	
359	6.5.3.2.1	Respond to receipt of initial A-A target data	x	x	x	x	x	x	
360	6.5.3.2.2	Locate BVR target using EW, IDM or radar.	x	x	x	x	x	x	
361	6.5.3.2.3	Acquire BVR target with radar	x	x	x	x	x	x	
362	6.5.3.2.4	Lock on target with radar	x	x	x	x	x	x	
363	6.5.3.2.5	Lock on target with TGP	x	x	x				
364	6.5.3.2.6	Determine target heading, altitude and airspeed	x	x	x	x	x	x	
365	6.5.3.2.7	Relay radar acquisition information	x	x	x	x	x	x	
366	6.5.3.2.8	Assess the tactical situation (presence of other a/c)	x	x	x	x	x	x	
367	6.5.3.2.8.1	Use NCTR to aid in identifying friend/foe	x	x	x	x	x	x	
368	6.5.3.2.8.2	Use RCR to determine target density	x	x	x	x	x	x	

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369	6.5.3.2.9					Determine attack feasibility	x	x	x	x	x	x	
370	6.5.3.2.10					Plan tactical intercept BVR	x	x	x	x	x	x	
371	6.5.3.2.11					Determine type of intercept	x	x	x	x	x	x	
372	6.5.3.2.12					Establish Intercept Geometry	x	x	x	x	x	x	
373	6.5.3.2.12.1					Determine collision course geometry	x	x	x	x	x	x	
374	6.5.3.2.12.2					Determine stern conversion geometry	x	x	x	x	x	x	
375	6.5.3.2.13					Perform Single Ship Tactical Intercept to a Stern Conversion	x	x	x	x	x	x	
376	6.5.3.2.14					Perform Beam Quadrant Tactical Intercept	x	x	x	x	x	x	
377	6.5.3.2.14.1					Perform beam quadrant horizontal conversion	x	x	x	x	x	x	
378	6.5.3.2.14.2					Perform beam quadrant vertical conversion	x	x	x	x	x	x	
379	6.5.3.2.15					Perform Front Quarter Tactical Intercept	x	x	x	x	x	x	
380	6.5.3.2.15.1					Perform front quarter horizontal conversion	x	x	x	x	x	x	
381	6.5.3.2.15.2					Perform front quarter vertical conversion (low-to-high/ high-to-low)	x	x	x	x	x	x	
382	6.5.3.2.16					Perform Head-on Tactical Intercept	x	x	x	x	x	x	
383	6.5.3.2.16.1					Perform head-on horizontal conversion	x	x	x	x	x	x	
384	6.5.3.2.16.2					Perform head-on vertical conversion (low-to-high / high-to-low)	x	x	x	x	x	x	
385	6.5.3.3					Perform Formation Tactical Intercepts - BVR		x	x		x	x	
386	6.5.3.3.1					Lead Formation Tactical Intercepts - BVR		x	x		x	x	
387	6.5.3.3.1.1					Sort and assign targets - BVR		x	x		x	x	
388	6.5.3.3.2					Perform Formation Tactical Intercepts as Wingman - BVR		x	x		x	x	
389	6.5.3.3.2.1					Sort and acknowledge target assignment - BVR		x	x		x	x	
390	6.5.3.3.3					Perform 2-v-X BVR tactical intercepts		x	x		x	x	
391	6.5.3.3.4					Perform 3-v-X BVR tactical intercepts		x	x		x	x	
392	6.5.3.3.5					Perform 4-v-X BVR tactical intercepts		x	x		x	x	
393	6.5.3.3.6					Perform BVR Tactical Intercept in a Multi-Bogey Environment	x	x	x	x	x	x	
394	6.5.3.3.6.1					Sort BVR targets in a multi-bogey environment	x	x	x	x	x	x	
395	6.5.3.3.6.2					Determine least target density environment - BVR	x	x	x	x	x	x	
396	6.5.3.3.6.3					Determine commit/no commit decision - BVR	x	x	x	x	x	x	
397	6.5.3.3.6.4					Perform BVR multi-bandit targeting assignment	x	x	x	x	x	x	
398	6.5.3.3.6.5					Perform high aspect angle BVR attack	x	x	x	x	x	x	
399	6.5.3.3.6.6					Perform blow-through maneuver	x	x	x	x	x	x	
400	6.5.3.3.7					Perform tactical intercept using GCI (IOS or player)	x	x	x	x	x	x	
401	6.5.3.3.8					Perform tactical intercept with 'jamming' from target or degraded radar	x	x	x	x	x	x	
402	6.5.3.3.9					Perform tactical intercept on a high altitude target	x	x	x	x	x	x	
403	6.5.3.3.10					Perform tactical intercept on a high/fast flyer	x	x	x	x	x	x	
404	6.5.3.3.11					Perform tactical intercept on a low altitude target	x	x	x	x	x	x	
405	6.5.3.3.12					Perform tactical intercepts on a low/slow flyer	x	x	x	x	x	x	
406	6.5.3.3.13					Perform tactical intercept on an orbiting target	x	x	x	x	x	x	
407	6.5.3.3.14					Perform tactical intercept in a "comm jamming" environment	x	x	x	x	x	x	
408	6.5.3.4					Select weapons to employ BVR in A-A scenario	x	x	x	x	x	x	
409	6.5.3.5					Employ Weapons BVR	x	x	x	x	x	x	
410	6.5.3.5.1					Employ AIM-120 missile BVR	x	x	x	x	x	x	
411	6.5.3.5.2					Employ AIM-9 missile BVR	x	x	x	x	x	x	
412	6.5.3.6					Maneuver Within Visual Range (WVR)	x-	x	x	x-	x	x	
413	6.5.3.6.1					Perform visual search	x-	x	x	x-	x	x	
414	6.5.3.6.2					Acquire target visually	x-	x	x	x-	x	x	
415	6.5.3.6.2.1					Acquire target visually (Day)	x-	x	x	x-	x	x	
416	6.5.3.6.2.2					Acquire target visually at night with NVG	x-	x	x	x-	x	x	
417	6.5.3.6.3					Identify Bogey	x-	x	x	x-	x	x	
418	6.5.3.6.3.1					Identify bogey using stern conversion to VID	x-	x	x	x-	x	x	
419	6.5.3.6.3.1.1					VID Day	x	x	x	x	x	x	
420	6.5.3.6.3.1.2					VID at night with NVG	o-	o	o	o-	o	o	
421	6.5.3.6.3.2					Relay VID information	x-	x	x	x-	x	x	
422	6.5.3.6.4					Maneuver to Weapons Delivery Parameters	x	x	x	x	x	x	
423	6.5.3.6.4.1					Select offensive and counteroffensive maneuvers	x	x	x	x	x	x	
424	6.5.3.6.4.2					Perform Offensive Basic Fighter Maneuvers (BFM)	x	x	x	x	x	x	
425	6.5.3.6.4.2.1					Perform Pursuit	x	x	x	x	x	x	
426	6.5.3.6.4.2.1.1					Perform pure pursuit	x	x	x	x	x	x	
427	6.5.3.6.4.2.1.2					Perform lag pursuit	x	x	x	x	x	x	
428	6.5.3.6.4.2.1.3					Perform lead pursuit	x	x	x	x	x	x	
429	6.5.3.6.4.2.2					Perform acceleration maneuver	x	x	x	x	x	x	
430	6.5.3.6.4.2.3					Perform low yo-yo	x	x	x	x	x	x	
431	6.5.3.6.4.2.4					Perform high yo-yo	x	x	x	x	x	x	
432	6.5.3.6.4.2.5					Perform lag roll	x	x	x	x	x	x	
433	6.5.3.6.4.2.6					Perform quarter plane maneuver	x	x	x	x	x	x	
434	6.5.3.6.4.2.7					Perform Immelmann turn	x	x	x	x	x	x	

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435	6.5.3.6.4.2.8							Perform guns tracking	x	x	x	x	x	x	
436	6.5.3.6.4.2.9							Perform high and low aspect gunshot	x	x	x	x	x	x	
437	6.5.3.6.4.3						Employ Defensive BFM		x	x	x	x	x	x	
438	6.5.3.6.4.3.1							Employ Defensive BFM teamwork and mutual support	x	x	x	x	x	x	
439	6.5.3.6.4.3.2							Perform separation/extension	x	x	x	x	x	x	
440	6.5.3.6.4.3.3							Perform defensive hard turn	x	x	x	x	x	x	
441	6.5.3.6.4.3.4							Perform guns-break turn	x	x	x	x	x	x	
442	6.5.3.6.4.3.5							Perform missile-break turn	x	x	x	x	x	x	
443	6.5.3.6.4.3.6							Perform jink-out	x	x	x	x	x	x	
444	6.5.3.6.4.3.7							Perform reversal	x	x	x	x	x	x	
445	6.5.3.6.4.3.8							Perform scissors	x	x	x	x	x	x	
446	6.5.3.6.4.3.9							Perform high AOA flight maneuvering	x	x	x	x	x	x	
447	6.5.3.6.4.3.10							Perform high 'G' roll over the top	x	x	x	x	x	x	
448	6.5.3.6.4.3.11							Perform high 'G' roll underneath	x	x	x	x	x	x	
449	6.5.3.6.4.3.12							Employ Offensive/Defensive ACM Teamwork/Mutual Support	x	x	x	x	x	x	
450	6.5.3.6.4.3.12.1							Employ 2-v-X tactics as engaged fighter	x	x	x	x	x	x	
451	6.5.3.6.4.3.12.2							Employ 2-v-X tactics as supporting fighter	x	x	x	x	x	x	
452	6.5.3.3.5					Employ combat energy management			x	x	x	x	x	x	
453	6.5.3.3.6					Employ Weapons Within Visual Range			x	x	x	x	x	x	
454	6.5.3.3.6.1						Employ WVR Weapons With Radar Lock-On		x	x	x	x	x	x	
455	6.5.3.3.6.1.1							Acquire Radar Target	x	x	x	x	x	x	
456	6.5.3.3.6.1.1.1							Acquire target in 'air-to-sir' mode	x	x	x	x	x	x	
457	6.5.3.3.6.1.1.2							Acquire target in 'missile override' mode	x	x	x	x	x	x	
458	6.5.3.3.6.1.1.3							Acquire target in 'dogfight' mode	x	x	x	x	x	x	
459	6.5.3.3.6.1.2							Employ AIM-120 missile WVR with radar lock-on	x	x	x	x	x	x	
460	6.5.3.3.6.1.3							Employ gun using EEGS with radar lock-on	x	x	x	x	x	x	
461	6.5.3.3.6.2						Employ WVR Weapons Without Radar Lock-On		x	x	x	x	x	x	
462	6.5.3.3.6.2.1							Employ all AIM-9 modes WVR without radar lock-on	x	x	x	x	x	x	
463	6.5.3.3.6.2.2							Employ gun using EEGS without radar lock-on	x	x	x	x	x	x	
464	6.5.3.3.6.2.3							Employ AIM-120 missile WVR in visual-only mode	x	x	x	x	x	x	
465	6.5.3.3.6.3						Identify Degraded Wpns employment systems (HUD, etc.)		x	x	x	x	x	x	
466	6.5.3.3.6.4						Employ WVR weapons in jamming / chaff environment		x	x	x	x	x	x	
467	6.5.3.4				Perform post-combat rendezvous procedures				x	x	x	x	x	x	
468	6.5.3.5				Perform outbound fence check				x	x	x	x	x	x	
469	6.5.3.6				Perform visual battle damage assessment of flight members					x	x		x	x	
470	6.5.3.7				Perform A-A operations with visibility restricted				x	x	x	x	x	x	
471	6.5.3.8				Perform A-A operations with visibility restricted at night				x	x	x	x	x	x	
472	6.6		Perform Air-Surface Combat						x-	x	x	x-	x	x	5,6,14
473	6.6.1		Attack Target						x-	x	x	x-	x	x	
474	6.6.1.1				Perform GP Bombs / Cluster Bomb Unit Attacks				x-	x	x	x-	x	x	
475	6.6.1.1.1					Employ Low-altitude 2-ship options				x	x		x	x	
476	6.6.1.1.1.1						Perform echelon-pop attacks			x	x		x	x	
477	6.6.1.1.1.2						Perform split-pop attacks			x	x		x	x	
478	6.6.1.1.1.3						Perform trail attacks			x	x		x	x	
479	6.6.1.1.1.4						Perform shooter cover			x	x		x	x	
480	6.6.1.1.1.5						Perform loft attacks			x	x		x	x	
481	6.6.1.1.1.5.1							Perform simultaneous loft		x	x		x	x	
482	6.6.1.1.1.5.2							Perform loft on the wing		x	x		x	x	
483	6.6.1.1.1.5.3							Perform trail loft		x	x		x	x	
484	6.6.1.1.2					Fly medium altitude 2-ship attacks				x	x		x	x	
485	6.6.1.1.2.1						Fly medium altitude roll-in CCIP			x	x		x	x	
486	6.6.1.1.2.1.1							Perform Flyup		x	x		x	x	
487	6.6.1.1.2.1.2							Fly medium altitude Ingress		x	x		x	x	
488	6.6.1.1.2.1.3							Fly CAS Patterns		o	o		o	o	
489	6.6.1.1.2.2						Perform System Deliveries			x	x		x	x	
490	6.6.1.1.2.2.1							Acquire Tgt with TGP or GM radar		x	x		x	x	
491	6.6.1.1.2.2.2							Perform blind CCRP using GPS		x	x		x	x	
492	6.6.1.1.2.2.3							Perform bunt delivery		x	x		x	x	
493	6.6.1.1.3					Fly single-ship pop-up attacks			x-	x	x	x-	x	x	
494	6.6.1.1.4					Perform Flyup attacks			x-	x	x	x-	x	x	
495	6.6.1.2				Perform LGB Attacks				x	x	x				
496	6.6.1.2.1					Perform Level / laydown Delivery			x	x	x				
497	6.6.1.2.2					Perform Loft Delivery			x	x	x				
498	6.6.1.2.3					Perform Buddy Lase				x	x		x	x	
499	6.6.1.2.3.1						Within flight			x	x				
500	6.6.1.2.3.2						Using external assets		x	x	x	x	x	x	

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501	6.6.1.2.3.3							Using ground laser designator (GLD)	x	x	x	x	x	x	
502	6.6.1.2.3.4							During low altitude operations (below MSA in TFR limits)	x	x	x				
503	6.6.1.3					Perform Medium Altitude (above MSA) LANTIRN Attack			x	x	x				
504	6.6.1.3.1						Perform Direct Attack		x	x	x				
505	6.6.1.3.1.1							Perform Direct Bunt maneuver	x	x	x				
506	6.6.1.3.1.2							Perform Direct Roll and Pull maneuver	x	x	x				
507	6.6.1.3.2						Perform TGP /LGB employment		x	x	x				
508	6.6.1.3.3						Perform Maverick employment		x	x	x				
509	6.6.1.3.4						Employ LANTIRN assisted GP bombing		x	x	x				
510	6.6.1.3.4.1							Use TGP for CCRP	x	x	x				
511	6.6.1.3.4.2							Use FLIR for CCRP / CCIP / Dive Toss	x	x	x				
512	6.6.1.4					Perform Low Altitude (below MSA) LANTIRN Attack			x	x	x				
513	6.6.1.4.1						Perform direct bunt pop		x	x	x				
514	6.6.1.4.2						Perform pop using roll and pull		x	x	x				
515	6.6.1.4.3						Perform LGB attack (within TFR limits)		x	x	x				
516	6.6.1.4.3.1							Perform loft profile (self-lase)	x	x	x				
517	6.6.1.4.3.2							Perform Level profile	x	x	x				
518	6.6.1.4.3.3							Perform TGP / LDGP attack	x	x	x				
519	6.6.1.4.3.4							Perform TGP / LGB Flyup attack	x	x	x				
520	6.6.1.4.3.5							Perform NVP direct attack	x	x	x				
521	6.6.1.4.3.5.1							Perform Dive Toss delivery	x	x	x				
522	6.6.1.4.3.5.2							Perform CCRP delivery	x	x	x				
523	6.6.1.4.3.5.3							Perform CCIP delivery	x	x	x				
524	6.6.1.4.3.6							Perform Level Delivery	x	x	x				
525	6.6.1.4.3.7							Perform Maverick attacks	x	x	x				
526	6.6.1.5					Perform Coordinated Attacks With Other Aircraft/Flights				x	x		x	x	
527	6.6.1.5.1						Perform sequential attack			x	x		x	x	
528	6.6.1.5.2						Perform offset trail attack			x	x		x	x	
529	6.6.1.5.3						Perform welded wing attack			x	x		x	x	
530	6.6.1.5.4						Perform random attack			x	x		x	x	
531	6.6.1.6					Deliver Ordnance			x	x	x	x	x	x	4,5,6,14
532	6.6.1.6.1						Deliver Ordnance Visually		x	x	x	x	x	x	
533	6.6.1.6.1.1							Deliver precision guided munitions visually	x	x	x				
534	6.6.1.6.1.2							Deliver Smart Weapons (JDAM/JSOW/WCMD)	x	x	x	x	x	x	
535	6.6.1.6.1.3							Deliver Sensor Fuzed Weapons (SFW)	x	x	x	x	x	x	
536	6.6.1.6.1.4							Deliver HARM				x	x	x	
537	6.6.1.6.1.4.1							Deliver HAD EOM mode				x	x	x	
538	6.6.1.6.1.4.2							Deliver HAD DL mode				x	x	x	
539	6.6.1.6.1.4.3							Deliver HAD MEM mode				x	x	x	
540	6.6.1.6.1.4.4							Deliver HAD RUK mode				x	x	x	
541	6.6.1.6.1.4.5							Deliver POS EOM mode				x	x	x	
542	6.6.1.6.1.4.6							Deliver POS RUK mode				x	x	x	
543	6.6.1.6.1.4.7							Deliver HAS mode				x	x	x	
544	6.6.1.6.1.4.8							Deliver DL mode				x	x	x	
545	6.6.1.6.1.4.9							Perform anti-compromise				x	x	x	
546	6.6.1.6.1.4.10							Perform all sub-modes				x	x	x	
547	6.6.1.6.1.5							Deliver EO / IR Ordnance (Maverick)	x	x	x	x	x	x	
548	6.6.1.6.1.5.1							Deliver Maverick using 'Preplanned' mode	x	x	x	x	x	x	
549	6.6.1.6.1.5.2							Deliver Maverick using 'VIS' mode	x	x	x	x	x	x	
550	6.6.1.6.1.5.3							Deliver Maverick using 'bore' mode	x	x	x	x	x	x	
551	6.6.1.6.1.6							Deliver GP bombs, rockets, cluster munitions, and guns	x	x	x	x	x	x	
552	6.6.1.6.1.6.1							Perform Computed Systems Ordnance Delivery	x	x	x	x	x	x	
553	6.6.1.6.1.6.1.1							Use CCIP Delivery	x	x	x	x	x	x	
554	6.6.1.6.1.6.1.1.1							Deliver low-drag munitions using CCIP	x	x	x	x	x	x	
555	6.6.1.6.1.6.1.1.2							Deliver high-drag munitions using CCIP	x	x	x	x	x	x	
556	6.6.1.6.1.6.1.1.3							Perform CCIP Rockets delivery	x	x	x	x	x	x	
557	6.6.1.6.1.6.1.1.4							Perform CCIP strafe	x	x	x	x	x	x	
558	6.6.1.6.1.6.1.2							Perform CCRP direct delivery	x	x	x	x	x	x	
559	6.6.1.6.1.6.1.3							Perform CCRP delivery from OAP	x	x	x	x	x	x	
560	6.6.1.6.1.6.1.4							Perform strafe	x	x	x	x	x	x	
561	6.6.1.6.1.6.1.5							Deliver ordnance using VIP	x	x	x	x	x	x	
562	6.6.1.6.1.6.1.6							Deliver ordnance using VRP	x	x	x	x	x	x	
563	6.6.1.6.1.6.1.7							Deliver ordnance using VLADD	x	x	x	x	x	x	
564	6.6.1.6.1.6.1.8							Use DTOS Ordnance Delivery	x	x	x	x	x	x	
565	6.6.1.6.1.6.1.8.1							Perform high altitude dive toss attack	x	x	x	x	x	x	
566	6.6.1.6.1.6.1.8.2							Perform low altitude dive toss attack	x	x	x	x	x	x	

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567	6.6.1.6.1.6.2	Use Manual Ordnance Delivery	x	x	x	x	x	x	
568	6.6.1.6.1.6.2.1	Perform manual toss	x	x	x	x	x	x	
569	6.6.1.6.1.6.2.2	Perform manual LADD	x	x	x	x	x	x	
570	6.6.1.6.1.6.2.3	Perform manual level delivery	x	x	x	x	x	x	
571	6.6.1.6.1.6.2.4	Perform manual dive delivery	x	x	x	x	x	x	
572	6.6.1.6.1.6.2.5	Perform manual strafe (LAS/HAS)	x	x	x	x	x	x	
573	6.6.1.6.2	Perform 'Blind' Ordnance Delivery	x	x	x	x	x	x	
574	6.6.1.6.2.1	Perform direct LADD delivery	x	x	x	x	x	x	
575	6.6.1.6.2.2	Perform LADD delivery from OAP	x	x	x	x	x	x	
576	6.6.1.6.2.3	Deliver ordnance using Beacon mode	x	x	x	x	x	x	
577	6.6.2	Perform Safe Escape or Frag avoidance Escape Maneuver	x	x	x	x	x	x	
578	6.6.2.1	Perform Turning Maneuver Level Turn (TMLT)	x	x	x	x	x	x	
579	6.6.2.2	Perform Climbing Safe Escape Maneuver (CSEM)	x	x	x	x	x	x	
580	6.6.2.3	Perform Level Straight Through (LST)	x	x	x	x	x	x	
581	6.6.2.4	Perform Recovery above ordnance frag altitude	x	x	x	x	x	x	
582	6.6.3	Perform Bomb Damage Assessment (BDA)	x	x	x	x	x	x	
583	6.6.3.1	Visually assess miss distance and target damage for re-attack		x	x		x	x	
584	6.6.4	Perform Delivery Error Analysis	x	x	x	x	x	x	
585	6.6.5	Perform A-S Combat in Specialized Situations	x	x	x	x	x	x	
586	6.6.5.1	Perform A-S Combat With Restricted Visibility	x	x	x	x	x	x	
587	6.6.5.1.1	Perform A-S Combat at Night	x	x	x	x	x	x	
588	6.6.5.1.1.1	Perform night A-S combat with flares	x	x	x	x	x	x	
589	6.6.5.1.1.2	Perform night A-S combat with ground illumination (without flares)	x	x	x	x	x	x	
590	6.6.5.1.1.3	Perform A-S combat at night using FLIR/TGP	x	x	x				
591	6.6.5.1.1.4	Perform A-S combat at night using NVG	x	x	x	x	x	x	
592	6.6.5.1.2	Perform A-S combat in inclement weather	x	x	x	x	x	x	
593	6.6.5.2	Compensate for ground situation/rules of engagement	x	x	x	x	x	x	
594	6.6.5.3	Compensate for type of ordnance near friendly forces	x	x	x	x	x	x	
595	6.6.5.4	Compensate for heavyweight condition	x	x	x	x	x	x	
596	6.6.5.4.1	Jettison ordnance/stores	x	x	x	x	x	x	
597	6.6.5.5	Employ electronic countermeasures (ECM)	x	x	x	x	x	x	
598	6.7	Perform Tactical Communications	x	x	x	x	x		
599	6.7.1	Perform tactical communications with controlling agencies	x	x	x	x	x	x	
600	6.7.1.1	Perform tactical communications with local range controller (IOS)	x	x	x	x	x	x	
601	6.7.1.2	Perform tactical communications with ABCCC (IOS)	x	x	x	x	x	x	
602	6.7.1.3	Perform tactical communications with GCI (IOS or player)	x	x	x	x	x	x	
603	6.7.1.4	Perform tactical com with GFAC or FAC(A)- CAS Mission (IOS or player)		x	x				
604	6.7.1.5	Perform tactical communications with AWACS (IOS or player)	x	x	x	x	x	x	
605	6.7.1.6	Perform tactical communications with Rivet Joint / JSTARS (IOS or player)	x	x	x	x	x	x	
606	6.7.1.7	Perform tactical, com with TACP (CAS Mission) (IOS)		x	x				
607	6.7.1.8	Perform tactical com with Jolly (CSAR mission) (IOS)		x	x		x	x	
608	6.7.1.9	Perform tactical com with Survivor (CSAR Mission) (IOS)		x	x		x	x	
609	6.7.2	Respond to comm jamming	x	x	x	x	x	x	
610	6.7.3	Communicate with Have Quick	x	x	x	x	x	x	
611	6.7.4	Communicate with secure agencies using secure voice (KY-58/KY-100)	x	x	x	x	x	x	
612	6.7.5	Perform authentication procedures	x	x	x	x	x	x	
613	6.7.6	Perform descriptive and directive commentary	x	x	x	x	x	x	
614	6.7.7	Perform Flight Coordination		x	x		x	x	
615	6.7.7.1	Perform flight coordination visually with communications out		x	x		x	x	
616	6.7.7.2	Perform flight coordination by radio		x	x		x	x	
617	6.7.8	Communicate inflight reports	x	x	x	x	x	x	
		PHASE 7: DETECT AND RESPOND TO THREATS							
618	7	Detect and Respond to Threats	x-	x	x	x-	x	x	5.6
619	7.1	Visually detect airborne threat	x-	x	x	x-	x	x	
620	7.1.1	Detect airborne threat using radar	x	x	x	x	x	x	
621	7.1.2	Detect airborne threat using RWR	x	x	x	x	x	x	
622	7.1.3	Respond to airborne threat	x-	x	x	x-	x	x	
623	7.1.3.1	Perform Notch		x	x		x	x	
624	7.1.3.2	Perform Orthogonal Break		x	x		x	x	
625	7.1.3.3	Perform IR missile defense	x-	x	x	x-	x	x	
626	7.1.3.4	Perform Break Turn	x-	x	x	x-	x	x	
627	7.2	Detect and Respond to Surface Threat	x	x	x	x	x	x	
628	7.2.1	Detect surface threat using RWR	x	x	x	x	x	x	

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629	7.2.2	Visually detect surface threat		x	x		x	x	
630	7.2.3	Respond to surface threat	x	x	x	x	x	x	
631	7.2.4	Disengage threat(s)	x	x	x	x	x	x	
632	7.2.4.1	Select disengagement maneuver	x	x	x	x	x	x	
633	7.2.4.2	Disengage threat using extension maneuver	x	x	x	x	x	x	
634	7.2.4.3	Disengage threat by using high angle gun or missile separation maneuver	x	x	x	x	x	x	
635	7.3	React to the Threat	x	x	x	x	x	x	
636	7.3.1	React to the Immediate Threat	x	x	x	x	x	x	
637	7.3.1.1	Identify the Threat	x-	x	x	x-	x	x	
638	7.3.1.1.1	Locate the Threat	x	x	x	x	x	x	
639	7.3.1.1.1.1	Interpret RWR	x	x	x	x	x	x	
640	7.3.1.1.1.2	Perform visual search for threat		x	x		x	x	
641	7.3.1.1.1.3	Perform radar search for threat	x	x	x	x	x	x	
642	7.3.1.1.2	Identify SAMs	x-	x	x	x-	x	x	
643	7.3.1.1.3	Identify A-A Threat (enemy aircraft and assumed ordnance)	x-	x	x	x-	x	x	
644	7.3.1.2	Perform preemptive maneuver (terrain masking)	x	x	x	x	x	x	
645	7.3.1.3	Respond To Threat After Identification	x	x	x	x	x	x	
646	7.3.1.3.1	Respond to Anti-Aircraft-Artillery (AAA)	x	x	x	x	x	x	
647	7.3.1.3.1.1	Perform AAA evasive maneuver	x	x	x	x	x	x	
648	7.3.1.3.1.2	Perform AAA counteroffensive	x	x	x	x	x	x	
649	7.3.1.3.2	Respond to SAM	x	x	x	x	x	x	
650	7.3.1.3.2.1	Perform SAM evasive maneuvers	x	x	x	x	x	x	
651	7.3.1.3.2.1.1	Perform GLIB II	x	x	x	x	x	x	
652	7.3.1.3.2.1.2	Perform LVL S	x	x	x	x	x	x	
653	7.3.1.3.2.1.3	Perform 3D Jinks	x	x	x	x	x	x	
654	7.3.1.3.2.1.4	Perform Orthogonal Roll based on SAM visual		x	x		x	x	
655	7.3.1.3.2.2	Dispense chaff/flares against SAM threat	x	x	x	x	x	x	
656	7.3.1.3.2.3	Dispense Active Towed Decoy (ATD)	x	x	x	x	x	x	
657	7.3.1.3.3	Respond to A-A threat	x	x	x	x	x	x	
658	7.3.1.3.3.1	Dispense chaff/flares against A-A threat	x	x	x	x	x	x	
659	7.3.1.3.3.2	Dispense ATD	x	x	x	x	x	x	
660	7.3.1.3.3.3	Employ weapons against specific A-A threats	x	x	x	x	x	x	
661	7.3.1.3.3.4	Perform evasive maneuvers	x-	x	x	x-	x	x	
		PHASE 8: RECOVERY							
662	8	Perform Recovery Procedures	x	x	x	x	x	x	1,2
663	8.1	Perform Descent/Before Landing Procedures	x	x	x	x	x	x	
664	8.1.1	Perform descent check	x	x	x	x	x	x	
665	8.1.2	Perform VFR descent	x	x	x	x	x	x	
666	8.1.3	Perform radar enroute descent	x	x	x	x	x	x	
667	8.2	Perform min risk routing	x	x	x	x	x	x	
668	8.3	Perform descent procedures in formation		x	x		x	x	
669	8.4	Perform Approach	x	x	x	x	x	x	
670	8.4.1	Perform Terminal Area VFR approach	x	x	x	x	x	x	
671	8.4.1.1	Perform tactical approach	x	x	x	x	x	x	
672	8.4.1.2	Perform overhead approach		x	x		x	x	
673	8.4.1.3	Perform straight-in approach	x	x	x	x	x	x	
674	8.4.1.4	Perform before landing checks	x	x	x	x	x	x	
675	8.4.1.5	Perform VFR traffic pattern breakout/re-entry procedures	x	x	x	x	x	x	
676	8.4.1.6	Perform go-around	x	x	x	x	x	x	
677	8.4.1.7	Perform closed pattern		x	x		x	x	
678	8.4.2	Perform Terminal Area IFR approach	x	x	x	x	x	x	
679	8.4.2.1	Perform TACAN holding	x	x	x	x	x	x	
680	8.4.2.2	Perform TACAN penetration	x	x	x	x	x	x	
681	8.4.2.3	Perform TACAN approach	x	x	x	x	x	x	
682	8.4.2.4	Perform ILS approach	x	x	x	x	x	x	
683	8.4.2.5	Perform GCA Approach	x	x	x	x	x	x	
684	8.4.2.5.1	Perform Airport Surveillance Radar (ASR) approach	x	x	x	x	x	x	
685	8.4.2.5.2	Perform Precision Approach Radar (PAR) approach	x	x	x	x	x	x	
686	8.4.2.6	Perform circling approach		x	x		x	x	
687	8.4.2.7	Perform airborne radar approach	x	x	x	x	x	x	
688	8.4.2.8	Perform missed approach	x	x	x	x	x	x	
689	8.5	Perform Approach in Formation		x	x		x	x	
690	8.6	Perform visual formation tactical recovery		x	x		x	x	

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691	8.7	Perform LANTIRN night rejoin	x	x	x				
692	8.8	Perform FLIR during recovery	x	x	x				
693	8.9	Employ FLIR during approach / landing	x	x	x				
		PHASE 9: LANDING							
694	9	Perform Landing	x	x	x	x	x	x	1,2
695	9.1	Perform day full-stop landing	x	x	x	x	x	x	
696	9.2	Perform night full-stop landing	x	x	x	x	x	x	
697	9.3	Perform day touch-and-go landing	x	x	x	x	x	x	
698	9.4	Perform night touch-and-go landing	x	x	x	x	x	x	
699	9.5	Perform minimum run landing	x	x	x	x	x	x	
700	9.6	Perform reduced RCR landing	x	x	x	x	x	x	
701	9.7	Perform landing during windshear conditions	x	x	x	x	x	x	
702	9.8	Perform Crosswind Landings	x	x	x	x	x	x	
703	9.8.1	Perform day crosswind landings	x	x	x	x	x	x	
704	9.8.2	Perform night crosswind landings	x	x	x	x	x	x	
705	9.8.3	Perform reduced RCR crosswind landings	x	x	x	x	x	x	
706	9.9	Perform Short Field Landing	x	x	x	x	x	x	
707	9.10.	Perform Formation Landings		x	x		x	x	
708	9.10.1	Perform Formation Landings-Lead/Wingman		x	x		x	x	
709	9.10.1.1	Land or go-around from formation approach		x	x		x	x	
710	9.10.1.2	Perform night full-stop formation landing		x	x		x	x	
711	9.10.1.3	Perform Crosswind Formation Landings (day / night)		x	x		x	x	
		PHASE 10: POST FLIGHT							
712	10	Perform Postflight Procedures	x	x	x	x	x	x	
713	10.1	Perform de-arm aircraft procedures	x	x	x	x	x	x	
714	10.2	Perform hot refueling procedures	x	x	x	x	x	x	
715	10.3	Perform Quick Turn-Around Procedures	x	x	x	x	x	x	
716	10.4	Perform 'prior to engine shutdown' checks	x	x	x	x	x	x	
717	10.5	Perform engine shutdown procedures	x	x	x	x	x	x	
718	10.6	Perform egress procedures for leaving the cockpit	x	x	x	x	x	x	
719	10.7	Perform Mission Debrief	x	x	x	x	x	x	
		EMERGENCY PROCEDURES (EPs) and ABNORMAL PROCEDURES							
	Premission								
	Pretakeoff								1,2,3,5,6
720		Perform Pretakeoff Abnormal/Emergency Procedures	x	x	x	x	x	x	
721		Perform Engine Starting Emergencies *	x	x	x	x	x	x	
722		Respond to hung/no start (ground)	x	x	x	x	x	x	
723		Perform emergency shut down of engine on the ground	x	x	x	x	x	x	
724		Respond to jet fuel starter (JFS) malfunction	x	x	x	x	x	x	
725		Respond to JFS run light not going out	x	x	x	x	x	x	
726		Respond to engine start overtemp/hot start (ground)	x	x	x	x	x	x	
727		Respond to engine auto acceleration (ground)	x	x	x	x	x	x	
728		Perform Miscellaneous Ground Emergencies	x	x	x	x	x	x	
729		Perform emergency ground weapons jettison	x	x	x	x	x	x	
730		Respond to brake failure during taxi	x	x	x	x	x	x	
731		Respond to hot brakes	x	x	x	x	x	x	
732		Respond to anti-skid malfunction during taxi	x	x	x	x	x	x	
733		Respond to nosewheel steering failure/hard-over during taxi	x	x	x	x	x	x	
734		Respond to main generator failure on the ground	x	x	x	x	x	x	
735		Respond to 'activated EPU/hydrazine leak'	x	x	x	x	x	x	
736		Perform Ground Egress	x	x	x	x	x	x	
737		Respond to main/standby generator failure	x	x	x	x	x	x	
738		Perform cold weather ops	x	x	x	x	x	x	
739		Perform hot weather / desert gnd ops	x	x	x	x	x	x	
	Takeoff								

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161

740	Respond to Takeoff Emergencies	x	x	x	x	x	x	
741	Respond to delayed rotation	x	x	x	x	x	x	
742	Respond to engine malfunction	x	x	x	x	x	x	
743	Respond to engine fire	x	x	x	x	x	x	
744	Respond to engine failure	x	x	x	x	x	x	
745	Respond to afterburner malfunction	x	x	x	x	x	x	
746	Respond to low thrust	x	x	x	x	x	x	
747	Respond to landing gear failure to retract	x	x	x	x	x	x	
748	Respond to landing gear handle failure to raise	x	x	x	x	x	x	
749	Respond to solenoid failure	x	x	x	x	x	x	
750	Respond to blown tire on takeoff	x	x	x	x	x	x	
751	Perform aborted takeoff procedure	x	x	x	x	x	x	
752	Perform departure-end arrestment	x	x	x	x	x	x	
753	Perform ejection procedures at low altitude	x	x	x	x	x	x	
754	Perform emergency stores jettison	x	x	x	x	x	x	
	Departure / Climb and Enroute							
755	Respond To Inflight Emergencies (as required)	x	x	x	x	x	x	
756	Respond to Environmental Control System Malfunctions	x	x	x	x	x	x	
757	Respond to cockpit pressure/temperature malfunction	x	x	x	x	x	x	
758	Respond to equipment hot caution light	x	x	x	x	x	x	
759	Respond to Canopy Malfunctions	x	x	x	x	x	x	
760	Respond to CANOPY warning light on	x	x	x	x	x	x	
761	Respond to canopy loss/penetration in flight	x	x	x	x	x	x	
762	Respond to Engine Malfunctions *	x	x	x	x	x	x	
763	Respond to Engine Stalls	x	x	x	x	x	x	
764	Respond to AB associated engine stalls	x	x	x	x	x	x	
765	Respond to non-AB engine stall	x	x	x	x	x	x	
766	Perform engine stall recovery	x	x	x	x	x	x	
767	Respond to inlet buzz	x	x	x	x	x	x	
768	Respond to tower shaft failure	x	x	x	x	x	x	
769	Respond to engine failure (flameout)	x	x	x	x	x	x	
770	Respond to low altitude engine failure	x	x	x	x	x	x	
771	Respond to engine fire	x	x	x	x	x	x	
772	Respond to overheat caution light	x	x	x	x	x	x	
773	Respond to engine overheat	x	x	x	x	x	x	
774	Respond to ECS overheat	x	x	x	x	x	x	
775	Respond to gearwell overheat	x	x	x	x	x	x	
776	Respond to EPU overheat	x	x	x	x	x	x	
777	Respond to oil system malfunction	x	x	x	x	x	x	
778	Respond to engine fault caution light	x	x	x	x	x	x	
779	Respond to engine seizure	x	x	x	x	x	x	
780	Respond to SEC caution light	x	x	x	x	x	x	
781	Respond to nozzle failure	x	x	x	x	x	x	
782	Respond to FTIT indicator failure	x	x	x	x	x	x	
783	Respond to zero/erroneous RPM indications	x	x	x	x	x	x	
784	Respond to abnormal engine response	x	x	x	x	x	x	
785	Respond to AB blowout/failure to light	x	x	x	x	x	x	
786	Perform Air Start	x	x	x	x	x	x	
787	Perform high altitude air start considerations	x	x	x	x	x	x	
788	Perform low altitude air start considerations	x	x	x	x	x	x	
789	Perform airstart procedures	x	x	x	x	x	x	
790	Respond to birdstrike	x	x	x	x	x	x	
791	Respond to engine overspeed	x	x	x	x	x	x	
792	Respond to Fuel Malfunctions	x	x	x	x	x	x	
793	Respond to Fuel Management System PFL	x	x	x	x	x	x	
794	Respond to fuel imbalance	x	x	x	x	x	x	
795	Respond to FUEL LOW	x	x	x	x	x	x	
796	Respond to HOT FUEL/OIL or gravity feed	x	x	x	x	x	x	
797	Respond to FUEL HOT caution light	x	x	x	x	x	x	
798	Respond to fuel leak	x	x	x	x	x	x	
799	Respond to trapped external fuel	x	x	x	x	x	x	
800	Respond to Electrical System Failures	x	x	x	x	x	x	
801	Respond to single generator failure	x	x	x	x	x	x	
802	Respond to FLCS Permanent Magnet Generator (PMG) failure	x	x	x	x	x	x	

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803							Respond to main/standby/EPU generator failure	x	x	x	x	x	x	
804							Respond to Emergency Power Unit (EPU) Malfunctions	x	x	x	x	x	x	
805							Respond to EPU PMG failure	x	x	x	x	x	x	
806							Respond to uncommanded EPU operation	x	x	x	x	x	x	
807							Respond to abnormal EPU operation	x	x	x	x	x	x	
808							Respond to EPU failure	x	x	x	x	x	x	
809							Respond to aircraft battery failure	x	x	x	x	x	x	
810							Respond to FLCS RLY light	x	x	x	x	x	x	
811							Respond to partial electrical power loss	x	x	x	x	x	x	
812							Respond to emergency power distribution	x	x	x	x	x	x	
813							Respond to Hydraulic System Failures	x	x	x	x	x	x	
814							Respond to Single Hydraulic System Failure	x	x	x	x	x	x	
815							Respond to hydraulic SYS A failure	x	x	x	x	x	x	
816							Respond to hydraulic SYS B failure	x	x	x	x	x	x	
817							Respond to dual hydraulic system failure	x	x	x	x	x	x	
818							Respond to SYS B and generator failure (PTO shaft)	x	x	x	x	x	x	
819							Respond to OBOGS /O BIGS malfunction	x	x	x	x	x	x	
820							Respond to PBG malfunctions	x	x	x	x	x	x	
821							Respond to voice warning/caution message	x	x	x	x	x	x	
822							Respond to smoke or fumes	x	x	x	x	x	x	
823							Respond to structural damage	x	x	x	x	x	x	
824							Perform controllability check	x	x	x	x	x	x	
825							Respond to Flight Control System Failures	x	x	x	x	x	x	
826							Respond to air data malfunctions	x	x	x	x	x	x	
827							Respond to CADC malfunction	x	x	x	x	x	x	
828							Respond to AOA malfunction	x	x	x	x	x	x	
829							Respond to pitot heat failure	x	x	x	x	x	x	
830							Respond to FLCS electronic malfunctions	x	x	x	x	x	x	
831							Respond to FLCS single electronic malfunction	x	x	x	x	x	x	
832							Respond to FLCS dual electronic malfunction	x	x	x	x	x	x	
833							Respond to FLCS temperature malfunction	x	x	x	x	x	x	
834							Respond to servo actuator malfunction	x	x	x	x	x	x	
835							Respond to leading edge flap (LEF) malfunction (symmetric)	x	x	x	x	x	x	
836							Respond to LEF malfunction (asymmetric)	x	x	x	x	x	x	
837							Respond to DBU ON warning light	x	x	x	x	x	x	
838							Respond to trim malfunction	x	x	x	x	x	x	
839							Respond to stick interference	x	x	x	x	x	x	
840							Perform Out-of-Control Recovery	x	x	x	x	x	x	
841							Respond to stall/departure	x	x	x	x	x	x	
842							Respond to inverted spin/stall	x	x	x	x	x	x	
843							Respond to INS Failure	x	x	x	x	x	x	
844							Respond to INS computer failure (less 39TV)	x	x	x	x	x	x	
845							Respond to total INS failure	x	x	x	x	x	x	
846							Respond to GPS failure/degradation	x	x	x	x	x	x	
847							Respond to DTS failure	x	x	x	x	x	x	
848							Respond to IFF failure	x	x	x	x	x	x	
849							Respond to MMC failure	x	x	x	x	x	x	
850							Respond to MMC reset (recycle)	x	x	x	x	x	x	
851							Respond to External Stores Malfunctions	x	x	x	x	x	x	
852							Respond to hung store	x	x	x	x	x	x	
853							Perform stores emergency jettison	x	x	x	x	x	x	
854							Perform stores selective jettison	x	x	x	x	x	x	
855							Respond to avionics caution light	x	x	x	x	x	x	
856							Perform Ejection Procedures	x	x	x	x	x	x	
857							Perform controlled ejection under emergency conditions	x	x	x	x	x	x	
858							Perform ejection (immediate)	x	x	x	x	x	x	
859							Respond to failure of canopy to separate	x	x	x	x	x	x	
860							Respond to ejection seat failure	x	x	x	x	x	x	
861							Perform Air Refueling - Emergency Procedures	x-	x	x	x-	x	x	
862							Perform "Emergency Breakaway" Procedures	x	x	x	x	x	x	
863							Perform a "brute force disconnect"	x	x	x	x	x	x	
864							Perform "pressure refueling"	x	x	x	x	x	x	
865							Respond to slipway door failure to close following AR	x	x	x	x	x	x	
866							Perform NORDO refueling		x	x		x	x	
867							Respond to jet wash turbulence	x-	x	x	x-	x	x	
868							Perform Air Refueling - Abnormal Conditions	x-	x	x	x-	x	x	

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869	Perform Radio Silent (EMCON)	x-	x	x	x-	x	x	
870	Perform Lost Wingman Procedures		x	x		x	x	
	Combat and Respond To Threats							
871	Respond to battle damage and malfunctions during the mission	x	x	x	x	x	x	
872	Respond to Air-to-Air weapons system faults/malfunctions	x	x	x	x	x	x	
873	Respond to AIM-9 overheat (coolant leak)	x	x	x	x	x	x	
874	Respond to missile slave fail	x	x	x	x	x	x	
875	Respond to Maverick video failure	x	x	x	x	x	x	
876	Respond to Radar malfunctions	x	x	x	x	x	x	
877	Respond to VSP	x	x	x	x	x	x	
878	Respond to BUP	x	x	x	x	x	x	
879	Respond to auto-restart	x	x	x	x	x	x	
880	Respond to RWR BIT failure	x	x	x	x	x	x	
881	Respond to ECM pod band failure	x	x	x	x	x	x	
882	Respond to HTS malfunction				x	x	x	
883	Respond to HARM failure				x	x	x	
884	Respond to LANTIRN NVP failure / degraded condition	x	x	x				
885	Respond to LANTIRN TGP failure / degraded condition	x	x	x				
886	Respond to ALIC malfunction				x	x	x	
887	Respond to IDM failure				x	x	x	
	Recovery							
888	Perform maximum range descent with minimum fuel/emergency fuel state	x	x	x	x	x	x	
889	Perform Recovery Under Degraded/Emergency Conditions	x	x	x	x	x	x	
890	Perform Degraded Flight Instruments Recovery	x	x	x	x	x	x	
891	Perform NORDO recovery	x	x	x	x	x	x	
892	Respond to tower light signals	x	x	x	x	x	x	
893	Perform "gyro-out" approach	x	x	x	x	x	x	
894	Perform "HUD-out" recovery using primary panel instruments	x	x	x	x	x	x	
895	Perform "standby ADI and standby compass" recovery	x	x	x	x	x	x	
896	Perform Flameout and SFO Recoveries	x	x	x	x	x	x	
897	Perform flameout/SFO penetration and approach under IMC	x	x	x	x	x	x	
898	Perform VFR Flameout/SFO Recovery	x	x	x	x	x	x	
899	Perform overhead Flameout/SFO recovery		x	x		x	x	
900	Perform straight-in Flameout/SFO recovery	x	x	x	x	x	x	
	Landing							
901	Perform Landing Under Degraded/Emergency Conditions	x	x	x	x	x	x	
902	Perform alternate gear extension	x	x	x	x	x	x	
903	Perform approach-end arrestment on landing	x	x	x	x	x	x	
904	Perform departure-end arrestment on landing	x	x	x	x	x	x	
905	Perform 'landing gear failure to extend' procedures	x	x	x	x	x	x	
906	Respond to gear handle fail to lower	x	x	x	x	x	x	
907	Perform landing with LG unsafe/up	x	x	x	x	x	x	
908	Land with asymmetric stores in normal conditions	x	x	x	x	x	x	
909	Land with asymmetric stores in a crosswind	x	x	x	x	x	x	
910	Land with a blown main tire	x	x	x	x	x	x	
911	Land with a blown nose gear tire	x	x	x	x	x	x	
912	Land with a stuck throttle (Thrust Too High for Landing)	x	x	x	x	x	x	
913	Land with nosewheel steering failure/hardover	x	x	x	x	x	x	
914	Land with NLG WOW switch failure	x	x	x	x	x	x	
915	Land with single/dual hydraulic system failure	x	x	x	x	x	x	
916	Land with electrical system failure	x	x	x	x	x	x	
917	Land with engine failure	x	x	x	x	x	x	
918	Land with fuel system failure	x	x	x	x	x	x	
919	Land with flap failure	x	x	x	x	x	x	
920	Land with failed brakes	x	x	x	x	x	x	
921	Land with HUD out	x	x	x	x	x	x	
922	Land with activated EPU	x	x	x	x	x	x	
923	Land from flameout/SFO approach	x	x	x	x	x	x	
924	Land from overhead approach		x	x		x	x	
925	Land from straight-in approach	x	x	x	x	x	x	

WARNING – This appendix contains technical data whose export is restricted by the Arms Export Control Act (Title 22, U.S.C. SEC 2751, et seq.) or the Export Administration Act of 1979, as amended, Title 50, U.S.C., App 2401 et seq. Violations of these export laws are subject to severe criminal penalties. Disseminate in accordance with provisions of DoD Directive 5230.25.

164

926										Land with anti-skid malfunction	x	x	x	x	x	x	
927										Land in icy / wet conditions	x	x	x	x	x	x	
	Post Flight																
928										Perform Ground Emergencies	x	x	x	x	x	x	
929										Perform Emergency ground egress							
930										Perform procedures for emergency ground canopy jettison	x	x	x	x	x	x	
931										Respond to 'hot refueling' emergency	x	x	x	x	x	x	
932										Respond to hot brakes	x	x	x	x	x	x	

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165

Appendix B

Reserved

Appendix C

Cockpit Component Requirements Matrix

FIDELITIES DEFINED

The following definitions apply to this matrix:

Functional Fidelity
The functional fidelity level specifies functional commonality of the trainer component (indicators, controls, switches, etc.,) to that of the actual aircraft or support equipment component it represents, as perceptible by the pilot. Features such as the capability to interact with other displays/controls, reaction time, control/display ratio, and direction and range of response are considered. The level specified shall be the minimum required to accomplish the training objectives. The following are the definitions of each level of functional fidelity:

CODE	DESCRIPTION
H	High - Identical to actual aircraft component; functional differences not discernible by the pilot.
M	Medium - An operational simulation similar to the aircraft component. Functions not required to support training are not implemented.
L	Low - Component is not electrically or mechanically functional.
---	Component is not represented

Physical Fidelity
The physical fidelity level specifies the required resemblance to the actual aircraft or support equipment component(s), as perceptible by the pilot. Features of components are evaluated and divided into the following categories:

CODE	DESCRIPTION
H	High - A full three-dimensional replication of the aircraft component.
M	Medium - A thre-dimensional representation similar to the actual component in physical appearance, but with at least one perceptible, physical difference from the aircraft, which does not impact training tasks.
L	Low - The component is represented by a two-dimensional graphic or mockup.
---	Not represented

Lighting Fidelity

The cockpit lighting requirement is to provide full fidelity cockpit lighting. The cockpit lighting fidelity description contained in the requirements matrix applies to all cockpit panels and instruments, which are panel lit in the aircraft.

NOTES:

Note 1 Fidelity of identified item is as indicated. Item is a growth option or reserved in U.S. Aircraft (FMS only) and its fidelity would be High if growth option incorporated.

Note 2 Fidelity is "H" in LANTIRN equipped aircraft, "L" in other aircraft.

Note 3 The only function is to provide an indication that the cartridge is inserted.

Note 4 Flood lighting includes the following cockpit lighting:

a. Left console flood lights
b. Left glareshield flood light
c. Left glareshield spot light
d. Center pedestal flood light
e. Right glareshield spot light
f. Right glareshield flood light
g. Right console flood lights
h. Utility light

Note 5 Rivets, fixtures and fittings of the actual aircraft seat do not need to be represented to provide the "appearance" of the actual aircraft seat.

Note 6 All faceplates are backlit and NVIS compatible. All lighting is controlled by applicable cockpit controls.

Note 7 Canopy controls will be physically operable and, as appropriate, their positions will be sensed by the simulation. There will be no actual canopy.

Note 8 See para 3.3.1.1.5.

The matrix includes the entire complement of cockpit components that represent the USAF F-16, B40/42/50/52 configurations. Unless otherwise included, common hardware (screws, bolts, clamps, etc.) is not listed in this matrix.

	Physical Fidelity	Functional Fidelity
COCKPIT LIGHTING		
Panel Lighting	H	H
Instrument Lighting	H	H
Flood Lighting (See Note 4)	H	H
ANTI-G PANEL & G-SUIT HOSE CONNECTION		
Faceplate	H	H (Note 6)
TEST Button	H	L
G-Suit Hose Connection	H	L
TEST PANEL		
Faceplate	H	H (Note 6)
FIRE & OHEAT DETECT Test Button	H	H
OXY QTY Indicator Test Switch	H	H
MAL & IND LTS Test Button	H	H
PROBE HEAT Switch	H	H
EPU/GEN Switch	H	H
FLCS PWR TEST Switch	H	H
FLCS PWR Indicator Lights	H	H
CHECKLIST & MAPS CASE	H	H
MANUAL CANOPY CONTROL Handcrank	H	M (Note 7)
EXT LIGHTING CONTROL PANEL		
Faceplate	H	H (Note 6)
ANTI-COLLISION Switch	H	H
FLASH STEADY Switch	H	H
WING TAIL Switch	H	H
FUSELAGE Switch	H	H
AERIAL REFUELING Knob	H	H
MASTER Switch	H	H
FORM Knob	H	H
FLT CONTROL PANEL		
Faceplate	H	H (Note 6)
MANUAL TF FLYUP Switch	H	H (Note 2)
DIGITAL BACKUP Switch	H	H
ALT FLAPS Switch	H	H
RUN FAIL Light	H	H
BIT Switch	H	H

	Physical Fidelity	Functional Fidelity
FLCS RESET Switch	H	H
LE FLAPS Switch	H	H
DEFOG CONTROL		
Faceplate	H	H (Note 6)
DEFOG Lever	H	M
MANUAL TRIM PANEL		
Faceplate	H	H (Note 6)
TRIM/AP DISC Switch	H	H
PITCH TRIM Indicator	H	H
PITCH TRIM Wheel	H	H
YAW TRIM Knob	H	H
ROLL TRIM Indicator	H	H
ROLL TRIM Wheel	H	H
AUX COMM PANEL		
Faceplate	H	H (Note 6)
IFF MASTER Knob	H	H
M-4 CODE Switch	H	H
TACAN CHANNEL Selector Levers	H	H
TACAN FUNCTION Switch	H	H
IFF MODE 4 REPLY Switch	H	H
IFF MODE 4 MONITOR Switch	H	H
CNI Knob	H	H
FUEL CONTROL PANEL		
Faceplate	H	H (Note 6)
FUEL MASTER Switch And Guard	H	H
TANK INERTING Switch	H	H
ENG FEED Switch	H	H
AIR REFUEL Switch	H	H
CANOPY JETTISON		
Jettison "T" Handle	H	M (Note 7)
AVTR CONTROL PANEL		
Faceplate	H	H (Note 6)
CTVS Indicator	H	L
AVTR Indicator	H	L
TEST Switch	H	L
DISPLAY SELECT Knob	H	L

	Physical Fidelity	Functional Fidelity
ON/OFF/AUTO Switch	H	L
ELECTRICAL PANEL		
Faceplate	H	H (Note 6)
MAIN PWR Switch	H	H
FLCS PMG Indicator Light	H	H
MAIN GEN Indicator Light	H	H
STBY GEN Indicator Light	H	H
EPU GEN Indicator Light	H	H
EPU PMG Indicator Light	H	H
FLCS Indicator Lights	H	H
ACFT BATT TO FLCS Indicator Light	H	H
ACFT BATT FAIL Indicator Light	H	H
ELEC CAUTION RESET Button	H	H
EPU CONTROL PANEL		
Faceplate	H	H (Note 6)
EPU Switch And Guard	H	H
EPU Run Indicator	H	H
HYDRAZN Indicator	H	H
AIR Indicator	H	H
AUDIO 2 PANEL		
Faceplate	H	H (Note 6)
INTERCOM Knob	H	H
TACAN Power Knob	H	H
ILS Power Knob	H	H
HOT MIC/CIPHER Switch	H	H
AUDIO 1 PANEL		
Faceplate	H	H (Note 6)
COMM 1 (UHF) Power Knob	H	H
COMM 1 Mode Knob	H	H
COMM 2 (VHF) Power Knob	H	H
COMM 2 Mode Knob	H	H
Secure Voice Knob	H	H
MSL Tone Knob	H	H
THREAT Tone Knob	H	H
TF Tone Knob	H	H (Note 2)
ENGINE & JET START CONTROL PANEL		
Faceplate	H	H (Note 6)

	Physical Fidelity	Functional Fidelity
JFS Switch	H	H
RUN Light	H	H
ENG CONT Switch	H	H
AB RESET Switch	H	H
MAX POWER Switch	H	L (Note 1)
THROTTLE QUADRANT		
Handle/Grip	H	H
UHF/VHF/IFF Transmit Switch	H	H
DOG FIGHT Override Switch	H	H
ANT ELEV Knob	H	H
MAN RNG/UNCAGE Knob/Switch	H	H
RDR CURSOR/ENABLE Switch	H	H
SPD BRK Switch	H	H
Foot	H	H
Friction Control	H	H
Cutoff Release	H	H
Throttle Mechanical Detents (OFF Idle, Idle, Mil, AB, and Max AB)	H	H
Throttle Stripe	H	H
UHF RADIO BACKUP CONTROL PANEL		
Faceplate (HAVE QUICK II, 2)	H	H (Note 6)
Preset Channel Card and Access Door	H	H
FILL Connector	H	H
CHAN Display	H	H
Frequency/Status Display	H	H
CHAN Knob	H	H
STATUS Button	H	H
Manual Frequency Knobs	H	H
Mode Knob	H	H
SQUELCH Switch	H	H
VOL Knob (inactive)	H	L (Note 1)
T-TONE Switch	H	H
Function Knob	H	H
A-3-2 Knob	H	H
TEST DISPLAY Button	H	H
LOAD Button	H	H
ZERO Switch	H	H
CMDS (Countermeasures Dispenser Set) Panel		
Faceplate	H	H (Note 6)

	Physical Fidelity	Functional Fidelity
MODE Selector Switch	H	H
PRGM Selector Switch	H	H
JETT Switch	H	H
MWS Switch (Not Used)	H	H
JMR Switch (Not Used)	H	H
RWR Switch	H	H
NO GO/GO Display	H	H
DISPENSE RDY Display	H	H
CMDS Panel Inventory Displays	H	H
CMDS 01 Switch	H	H
CMDS 02 Switch	H	H
CMDS CH Switch	H	H
CMDS FL Switch	H	H
ECM Panel		
Faceplate	H	H (Note 6)
STBY/OPR/OFF Main Control Switch	H	H
DIM Knob	H	H
XMIT Switch	H	H
BIT Switch	H	H
1 S/A/F/T Pushbutton/Indicator	H	H
2 S/A/F/T Pushbutton/Indicator	H	H
3 S/A/F/T Pushbutton/Indicator	H	H
4 S/A/F/T Pushbutton/Indicator	H	H
5 S/A/F/T Pushbutton/Indicator	H	H
ALT HI/LO Pushbutton/Indicator	H	H
FRM A/C Pushbutton/Indicator	H	H
SPL RP/A/IC/RG Pushbutton/Indicator	H	H
MANUAL PITCH PANEL		
Faceplate	H	H (Note 6)
MPO Switch	H	H
CANOPY HANDLE	H	M (Note 7)
CANOPY SWITCH	H	M (Note 7)
THREAT WARNING AUX PANEL		
Faceplate	H	H (Note 6)
POWER Pushbutton/Indicator	H	H
SEARCH Pushbutton/Indicator	H	H
ACT/PWR Pushbutton/Indicator	H	H

	Physical Fidelity	Functional Fidelity
ALTITUDE Pushbutton/Indicator	H	H
DIM Control Knob	H	H
Audio 1 Panel THREAT Tone Volume Control	H	H
ALT GEAR HANDLE		
"T" Handle	H	H
ALT GEAR Reset Button	H	H
SPEED BRAKE POSITION INDICATOR	H	H
LANDING GEAR CONTROL PANEL		
Faceplate	H	H (Note 6)
LG Handle	H	H
LG Handle Warning Light	H	H
LG Handle Down Permission Button	H	H
DN LOCK REL Button	H	H
LANDING TAXI Light Switch	H	H
HORN SILENCER Button	H	H
STORES CONFIG Switch	H	H
GRD JETT ENABLE Switch	H	H
BRAKES Channel Switch	H	H
ANTI-SKID Switch	H	H
EMER STORES JETTISON Button	H	H
WHEELS Down Lights (3)	H	H
HOOK Switch	H	H
ALT GEAR Handle	H	H
ALT GEAR Reset Button	H	H
MISCELLANEOUS CONTROL PANEL		
Faceplate	H	H (Note 6)
Autopilot ROLL Switch	H	H
Autopilot PITCH Switch	H	H
ADV Model Switch	H	H
MASTER ARM Switch	H	H
ALT REL Button	H	H
LASER ARM Switch	H	H
RF Switch	H	H
DRAG CHUTE DEPLOY Switch And Guard	H	H
LEFT-HAND WARNING LIGHTS		
IFF IDENT Button	H	H
Blank Buttons (2)	H	L (Note 1)

	Physical Fidelity	Functional Fidelity
FAULT ACK Button	H	H
TF FAIL Light	H	H (Note 2)
ECM Light	H	H
MASTER CAUTION Warning Light	H	H
COLOR MULTIFUNCTION DISPLAYS		
Faceplate	H	H (Note 6)
SYM Rocker Switch	H	H
CON Rocker Switch	H	H
BRT Rocker Switch	H	H
GAIN Rocker Switch	H	H
Option Select Buttons (OSB) (20)	H	H
Display	H	H
THREAT WARNING PRIME PANEL		
Faceplate	H	H (Note 6)
HANDOFF Switchbutton/Indicator	H	H
LAUNCH Switchbutton/Indicator	H	H
MODE Switchbutton/Indicator	H	H
UNKNOWN Switchbutton/Indicator	H	H
SYS/TEST Switchbutton/Indicator	H	H
TGT/SEP Switchbutton/Indicator	H	H
THREAT WARNING AZIMUTH INDICATOR		
Faceplate	H	H (Note 6)
Display	H	H
INT Control	H	H
Display Adjustment Screws (2)	H	L
LH INSTRUMENT PANEL COCKPIT SPOTLIGHT	H	H
AOA INDEXER		
Red Indicator (High AOA)	H	H
Green Indicator (On-Speed)	H	H
Yellow Indicator (Low AOA)	H	H
Dimming Control Lever	H	H
HEAD UP DISPLAY		
Combiner Glass	H	M (Note 8)
AIR REFUELING STATUS INDICATOR		
RDY Indicator	H	H

	Physical Fidelity	Functional Fidelity
AR/NWS Indicator	H	H
DISC Indicator	H	H
Dimming Control	H	H
INTEGRATED CONTROL PANEL		
Faceplate	H	H (Note 6)
HUD SYM Control Thumbwheel Switch	H	H
HUD/FLIR BRT Control Thumbwheel Switch	H	H (Note 2)
HUD/FLIR CONT Control Thumbwheel Switch	H	H (Note 2)
HUD RET DEPR Control Thumbwheel Switch	H	H
COM 1 Switch	H	H
COM 2 Switch	H	H
IFF Switch	H	H
LIST Switch	H	H
A-A Switch	H	H
A-G Switch	H	H
T-ILS/1 Switch	H	H
ALOW/2/N Switch	H	H
3 Switch	H	H
RCL Switch	H	H
STPT/4/W Switch	H	H
CRUS/5 Switch	H	H
TIME/6/E Switch	H	H
ENTR Switch	H	H
MARK/7 Switch	H	H
FIX/8/S Switch	H	H
A-CAL/9 Switch	H	H
M-SEL/0/-Switch	H	H
DED Increment/Decrement Switch	H	H
Data Control Switch	H	H
Drift Cut-Out Switch	H	H
FLIR INCREMENT/DECREMENT Switch	H	H (Note 2)
WX Mode Switch	H	H (Note 2)
FLIR GAIN/LVL/AUTO Switch	H	H (Note 2)
AIRSPEED/MACH INDICATOR		
Faceplate	H	H (Note 6)
Max Allowable Equiv Airspeed Pointer	H	H
Indicated Airspeed	H	H
Mach Number Indicator	H	H
Reference Index	H	H
Airspeed Dial	H	H

	Physical Fidelity	Functional Fidelity
Set Index Control	H	H
ALTIMETER		
Faceplate	H	H (Note 6)
PNEU/ELEC Mode Indicator	H	H
Altitude Dial	H	H
Barometric Pressure Set Control	H	H
Barometric Pressure Indicator	H	H
Mode Switch	H	H
Altitude Indicator Drum	H	H
ANGLE OF ATTACK (AOA) INDICATOR		
Faceplate	H	H (Note 6)
Reference Line	H	H
AOA Scale	H	H
ATTITUDE DIRECTOR INDICATOR (ADI)		
Faceplate	H	H (Note 6)
Glide Slope Warning Flag	H	H
Attitude Sphere	H	H
Pitch Scale	H	H
Upper Bank Index Pointer	H	H
Localizer Deviation Bar	H	H
LOC Warning Flag	H	H
AUX Warning Flag	H	H
Pitch Trim Index	H	H
Pitch Trim Knob	H	H
Rate-of-Turn Scale	H	H
Rate-of-Turn Needle	H	H
Slip Indicator (Ball)	H	H
Lower Bank Index Pointer	H	H
Lower Bank Scale	H	H
Miniature Aircraft Symbol	H	H
Glide Slope Deviation Bar and Pointer	H	H
OFF Warning Flag	H	H
Glide Slope Deviation Scale	H	H
Horizon Line	H	H
VERTICAL VELOCITY INDICATOR		
Faceplate	H	H (Note 6)
Reference Line	H	H
VVI Scale	H	H

178

	Physical Fidelity	Functional Fidelity
INSTR MODE SELECT PANEL		
Faceplate	H	H (Note 6)
INSTR MODE Knob	H	H
INSTR HDG Knob	H	H
HORIZONTAL SITUATION INDICATOR (HSI)		
Faceplate	H	H (Note 6)
Range Indicator (MILES)	H	H
Warning Flag - Range Indicator	H	H
Heading Reference Marker	H	H
Upper Lubber Line	H	H
COURSE Selector Window	H	H
Bearing Pointer	H	H
OFF Warning Flag	H	H
TO-FROM Indicator	H	H
Miniature Aircraft Symbol	H	H
CRS Set Knob	H	H
Course Arrow - Tail	H	H
Bearing Pointer - Tail	H	H
Lower Lubber Line	H	H
HDG Set Knob	H	H
Course Deviation Indicator	H	H
Course Deviation Scale	H	H
Warning Flag - Course Deviation	H	H
Course Arrow	H	H
Compass Card	H	H
FUEL QUANTITY SELECT PANEL		
Faceplate	H	H (Note 6)
FUEL QTY SEL Knob	H	H
EXT FUEL TRANS Switch	H	H
MARKER BEACON (MRK BCN) LIGHT	H	H
PEDAL ADJUSTMENT (PEDAL ADJ) HANDLE	H	H
CENTER PEDESTAL AIR VENT	H	M
RUDDER PEDAL ASSEMBLY		
Rudder Pedals (2)	H	H
Brake Pedals (2)	H	H
Feel Spring Assembly	H	H

	Physical Fidelity	Functional Fidelity
DATA ENTRY DISPLAY		
Alphanumeric Display	H	H
STANDBY ATTITUDE INDICATOR		
Faceplate	H	H (Note 6)
Pitch Reference Scale	H	H
Miniature Aircraft Symbol	H	H
Pitch Trim Reference Scale	H	H
PULL TO CAGE Control	H	H
Roll Reference Scale	H	H
Roll Index Pointer	H	H
Attitude Drum	H	H
OFF Flag	H	H
COCKPIT SPOTLIGHTS	H	H
FUEL FLOW INDICATOR		
Faceplate	H	H (Note 6)
4 Digit Counter	H	H
RIGHT HAND WARNING LIGHTS		
ENGINE Warning Light H	H	H
ENG FIRE Warning Light	H	H
HYD/OIL PRESS Warning Light	H	H
DUAL FC Warning Light	H	H
CANOPY Warning Light	H	H
TO/LDG CONFIG Warning Light	H	H
Blank Light Assembly	H	L (Note 1)
OIL PRESSURE INDICATOR		
Pointer	H	H
Dial	H	H
NOZZLE POSITION INDICATOR		
Pointer	H	H
Dial	H	H
TACHOMETER		
Pointer	H	H
Dial	H	H

	Physical Fidelity	Functional Fidelity
FAN TURBINE INLET TEMPERATURE INDICATOR		
Pointer	H	H
Dial	H	H
MAGNETIC COMPASS		
Faceplate	H	H (Note 6)
Pointer	H	H
Dial	H	H
Dial Markings	H	H
FUEL QUANTITY INDICATOR		
Pointer (2)	H	H
Dial	H	H
Totalizer	H	H
HYD PRESS INDICATORS (A and B)		
Placard	H	H
Pointer - A Indicator	H	H
Dial - A Indicator	H	H
Pointer - B Indicator	H	H
Dial - B Indicator	H	H
PILOT FAULT LIST DISPLAY		
Alphanumeric Display	H	H
CAUTION PANEL		
Faceplate	H	H (Note 6)
FLCS FAULT Indicator	H	H
ELEC SYS Indicator	H	H
PROBE HEAT Indicator	H	H
CADC Indicator	H	H
STORES CONFIG Indicator	H	H
ATF NOT ENGAGED Indicator	H	H (Note 2)
FWD FUEL LOW Indicator	H	H
AFT FUEL LOW Indicator	H	H
ENGINE FAULT Indicator	H	H
SEC Indicator	H	H
FUEL/OIL HOT Indicator	H	H
INLET ICING Indicator	H	H
OVERHEAT Indicator	H	H
EEC Indicator	H	H
BUC Indicator	H	H

	Physical Fidelity	Functional Fidelity
Indicator (Blank)	H	H
AVIONIC FAULT Indicator	H	H
EQUIP HOT Indicator	H	H
RADAR ALT Indicator	H	H
IFF Indicator	H	H
NUCLEAR Indicator	H	H
Indicator (Blank)	H	L (Note 1)
Indicator (Blank)	H	L (Note 1)
Indicator (Blank)	H	L (Note 1)
SEAT NOT ARMED Indicator	H	H
NWS FAIL Indicator	H	H
ANTI-SKID Indicator	H	H
HOOK Indicator	H	H
OXY LOW Indicator	H	H
CABIN PRESS Indicator	H	H
Indicator (Blank)	H	L (Note 1)
Indicator (Blank)	H	L (Note 1)
LIQUID OXYGEN QUANTITY INDICATOR	H	L
EPU FUEL QUANTITY INDICATOR		
Pointer	H	H
Dial	H	H
CABIN PRESSURE ALT INDICATOR		
Faceplate	H	H (Note 6)
Dial Scale	H	H
Pointer	H	H
CLOCK		
Faceplate	H	H (Note 6)
Pointers (4)	H	H
Start/Stop Button	H	H
Adjustment Knob	H	H
SIDESTICK CONTROLLER		
Handle/Grip	H	H
NWS A/R DISC MSL STEP Button	H	H
TRIM Button	H	H
Display Management Switch	H	H
Target Management Switch	H	H
Countermeasures Management Switch	H	H

	Physical Fidelity	Functional Fidelity
Expand/FOV Button	H	H
Paddle Switch	H	H
CAMERA/GUN Trigger Switch	H	H
WPN REL Button	H	H
SNSR PWR PANEL		
Faceplate	H	H (Note 6)
LEFT HDPT Power Switch	H	H
RIGHT HDPT Power Switch	H	H
FCR Power Switch	H	H
RDR ALT Power Switch	H	H
HUD REMOTE CONTROL PANEL		
Faceplate	H	H (Note 6)
VV/VAH ATT/ Switch	H	H
FPM Switch	H	H
DED DATA Switch	H	H
DEPR RET Switch	H	H
Velocity Switch	H	H
ALT Switch	H	H
Brightness Control Switch	H	H
TEST Switch	H	H
NUCLEAR CONSENT PANEL		
Faceplate	H	H (Note 6)
Nuclear Consent Switch And Guard	H	H
PLAIN Cipher Switch	H	H
SEAT ADJUST SWITCH		
SEAT ADJ Decal	H	H (Note 6)
Seat Adjust Switch	H	H
ZEROIZE SWITCH PANEL		
Faceplate	H	H (Note 6)
ZEROIZE Switch	H	M
Zeroize Switch Guard	H	H
VOICE MESSAGE SWITCH PANEL		
Faceplate	H	H (Note 6)
VOICE MESSAGE Switch	H	H

	Physical Fidelity	Functional Fidelity
INTERIOR LIGHTING CONTROL PANEL		
Faceplate	H	H (Note 6)
PRIMARY CONSOLES Brightness Knob	H	H
PRIMARY INST PNL Brightness Knob	H	H
DATA ENTRY DISPLAY Brightness Knob	H	H
FLOOD CONSOLES Brightness Knob	H	H
FLOOD INST PNL Brightness Knob	H	H
MAL & IND LTS Switch	H	H
INDV LTS CONT Switch	H	H
NVIS Switch	H	H
AIR COND PANEL		
Faceplate	H	H (Note 6)
TEMP Control Knob	H	L
AIR SOURCE Knob	H	M
SECURE VOICE CONTROL PANEL		
Faceplate	H	H (Note 6)
MODE Knob	H	H
VOLUME Knob	H	H
FILL Knob	H	H
PLAIN Cipher Switch	H	H
Power Knob	H	H
PILOTS WRIST SUPPORT	H	H
PILOTS ARMREST		
Pilots Armrest Assembly	H	H
Armrest Support Assembly	H	H
Armrest Intercostal	H	H
AVIONICS POWER PANEL		
Faceplate	H	H (Note 6)
MMC Power Switch	H	H
ST STA Power Switch	H	H
MFD Power Switch	H	H
UFC Power Switch	H	H
INS Control Switch	H	H
GPS Power Switch	H	H
DL Power Switch	H	H
MAP Power Switch	H	H

	Physical Fidelity	Functional Fidelity
ANTENNA SELECT PANEL		
Faceplate	H	H (Note 6)
IFF ANT SEL Switch	H	H
UHF ANT SEL Switch	H	H
UTILITY LIGHT	H	H
MAP & DATA STOWAGE	H	H
DATA TRANSFER UNIT		
Faceplate	H	H (Note 6)
DTC Receptacle	H	M (Note 3)
Data Transfer Cartridge	H	M
OXYGEN REGULATOR PANEL		
Faceplate	H	H (Note 6)
Oxygen REGULATOR FLOW Indicator	H	M
OXYGEN SUPPLY Indicator	H	M
MODE Lever (Note 3)	H	M
Diluter Lever	H	M
EMER/NORM/TEST MASK Lever	H	M
Oxygen Hose and Connections	H	M
Comm Cord	H	H
EJECTION SEAT ASSEMBLY	(Note 5)	
Seat Frame w/Cushions	H	H
Seat Rail	H	M
Emergency Oxygen Green Ring	H	M
SHOULDER HARNESS Knob	H	M
Ejection Safety Lever	H	M
RADIO BEACON Switch	H	M
Survival KIT DEPLOYMENT Switch	H	M
Ejection Handle (PULL TO EJECT)	H	M
EMERGENCY MANUAL CHUTE Handle	H	L
Survival Kit Ripcord	---	---
Electronic Recovery Sequencer Batt Ind.	---	---
Emergency Oxygen Bottle w/Pressure Gage	H	L
Lapbelt And Survival Kit Straps	H	M
Emergency Oxygen Hose Quick-Disconnect	H	L
Inertia Reel Straps	H	M
Recovery Parachute Assembly	H	L
FLCS Data Recorder	---	---

	Physical Fidelity	Functional Fidelity
Environmental Sensor Pitots	---	---
Shoulder Harness Straps/Recovery	H	M
Parachute Risers	---	---

Appendix D

Threat and Entity List

The following tables define the platforms and weapon systems supported by and simulated within the F-16 Mission Training Center (MTC) Tactical Environment. These systems shall be simulated in accordance with the approved design criteria including (in order of precedence):

a. Multi-Command Manual 3-1 Volume II – Threat tactics and Countertactics
b. Electronic Warfare Integrated Reprogrammable Database (EWIRDB)
c. Defense Intelligence Agency (DIA)-approved Handbooks, Intelligence Input Data Packages, and Systems Analyses as available for the subject system
d. Vendor data and technical specifications when available
e. Other sources (classified and unclassified) as available

NOTE: The enclosed tables were developed using data available through various Jane's publications in order to maintain the unclassified status. They are intended to provide a complete list of Aircraft MDS, Ship Class and Surface and Naval Weapon Systems to be simulated. The specific list of associated equipment (radar systems, IFF, radios, etc.) shall be updated using the best available intelligence prior to the System Requirements Review. Following the update, the list shall be identified as a stand-alone, classified appendix to the Performance Specification and shall be submitted to the Government for approval through classified channels.

Table 1 – Aircraft Platform Equipment Fit and Weapons

Aircraft MDS	Aircraft Name	Radar	Nuts Name	Warning Receiver	VHF Comm	UHF Comm	IFF	Gun	Missiles	ECM	Chaff/Flare
A-10A	Thunderbolt II			AN/ALR-67	AN/ARC-222	AN/ARC-164	AN/APX-101	GAU-8		AN/ALQ-131; AN/ALQ-184	AN/ALE-40
	Mainstay	Liann AEW&C; Weather Radar; Navigation Radar		R/I			Yes			Yes	Flare
[illegible]-1B	Lancer	AN/APQ-164		AN/ALR-56M; IDECM	—	AN/ARC-164	AN/APX-101			AN/ALQ-161/A	AN/ALE-48
B-2A	Spirit	AN/APQ-181; AN/APN-238		AN/APR-50		AN/ARC-215	AN/APX-110				
B-52H	Stratofortress	AN/APQ-166		AN/ALR-20; AN/ALR-46(V)	AN/ARC-210(V)	AN/ARC-164(V)	AN/APX-64(V)			AN/ALQ-155; AN/ALQ-122; AN/ALQ-153; AN/ALQ-172(V)2; AN/ALT-16A; AN/ALT-28; AN/ALT-32A	AN/ALE-20; AN/ALE-24
C-130H2	Hercules	AN/APN-241		AN/AAR-47; AN/ALR-69	AN/ARC-186	AN/ARC-164	AN/APX-72(V); AN/APX-100(V)	-	-	AN/ALQ-131	AN/ALE-40
C-17A	Globemaster III	AN/APS-133		AN/AAR-47	AN/ARC-186	AN/ARC-164	AN/APX-100(V)2; AN/APX-105				AN/ALE-47
C-21A	Learjet	PRIMUS 3000			VHF-22B	AN/ARC-164	AN/APX-100(V)2				
E-3C	Sentry	AN/APS-133(V)2; AN/APY-1		AN/AYR-2	AN/ARC-166	AN/ARC-169E	AN/APX-78; AN/APX-101(V)				
E-8C	ISTARS	AN/APS-133(V)1; AN/APY-3			AN/ARC-186		AN/APX-78; AN/APX-101; AN/APX-105				
F/A-18A	Hornet	AN/APG-73									
F-1	Mirage										
F-117A	Nighthawk	—				AN/ARC-164	AN/APX-101(V)				
F-14	Tomcat	AN/APG-73		AN/ALR-67				M61A1	AIM-7; AIM-9; AGM-88; AIM-120; AGM-65	AN/ALQ-165; AN/ALQ-167	AN/ALE-39
F-15A/B	Eagle	AN/APG-63		AN/ALQ-128; AN/ALR-56A		AN/ARC-164	AN/APX-76; AN/APX-101	M-61A1	AIM-7; AIM-9; AIM-120; AGM-65	AN/ALQ-131; AN/ALQ-135C; AN/ALC-176; AN/ALQ-184(V)1; AN/ALQ-188	AN/ALE-45
F-15C/D	Eagle	AN/APG-70(V)		AN/ALQ-128; AN/ALR-56C		AN/ARC-164	AN/APX-76; AN/APX-101	M-61A1	AIM-7; AIM-9; AIM-120; AGM-65	AN/ALQ-131; AN/ALQ-135C; AN/ALC-176; AN/ALQ-184(V)1; AN/ALQ-188	AN/ALE-45
F-15E	Strike Eagle	AN/APG-70(V)		AN/ALQ-128; AN/ALR-56C		AN/ARC-164	AN/APX-76; AN/APX-101	M-61A1	AIM-7; AIM-9; AIM-120; AGM-65	AN/ALQ-135C; AN/ALQ-135D	AN/ALE-45
F-16A/B	Falcon	AN/APG-66(V)1		AN/ALR-69	AN/ARC-186	AN/ARC-164	AN/APX-101; AN/APX-109	M-61A1	AIM-7; AIM-9; AIM-120; AGM-65	AN/ALQ-131; AN/ALQ-184	AN/ALE-40

Aircraft MDS	Aircraft Name	Radar	Nate Name	Warning Receiver	VHF Comm	UHF Comm	IFF	Gun	Missiles	ECM	Chaff/Flare
F-16C/D	Falcon	AN/APG-68		AN/ALR-56M	AN/ARC-186	AN/ARC-164	AN/APX-101	M-61A1	AIM-7; AIM-9; AIM-120; AGM-65; AGM-88	AN/ALQ-131; AN/ALQ-184	
F-4E	Phantom										
[illegible]E	Tiger II										
[illegible]Mk 4	Tornado	TI 99		Hermes		Rohde&Schwarz	SSR-3100	27 mm Mause (2)	AIM-9L; ALARM	Sky Shadow	BOZ 109
[illegible]0	Blackhawk	AN/APN-239		AN/APR-39A(V)1	AN/ARC-186	AN/ARC-164	AN/APX-100(V)			AN/ALQ-144A(V)3	M-130
[illegible]0A	Extender	AN/APS-133(V)			618M-3A	AN/ARC-164	AN/APX-78; AN/APX-101				
EC-135R	Stratotanker	WXR-700XW			AN/ARC-186	AN/ARC-164(V)	AN/APX-64(V)				
Mi-24P	Hind-F			Hot Brick; Sirena-3M	Yes	Yes		Gsh-30-2	AT-2; AT-6; AA-8		ASO-2V
Mi-28N	Havoc			Yes	Yes	Yes	Yes	2A42 30 mm	AT-6; SA-16	Yes	Chaff/Flare
Mi-8T	Hip-C			Hot Brick;	R-860				57 mm Rocket		ASO-2V
MiG-21	Fishbed										
MiG-23	Flogger G										
MiG-23UB	Foxbat B										
MiG-27	Flogger J										
MiG-29S	Fulcrum C	N019M	Slot Back	SPO-15LM	R-862	R-862	SRO-2; SRZ-15	Gsh-301	R-60T (AA-8); R-27R1 (AA-10A); R-27RE1; R-27T1; R-27TE1; R-73E (AA-11); R-77 (AA-12);	SO-69	BVP-30-35M
MiG-31M	Foxhound B	NIIP N007 S-800	Flash Dance	RWR				Gsh-6-23	R-33 (AA-9); R-40T (AA-6); R-37; R-77 (AA-12);	Yes	
Mirage 2000E		RDM		Spirale	TRT ERA 7000	TRT ERA 7000	CNI NRAI-11	DEFA 544 30 mm (2)	R530D; Magic; Magic 2;	Yes	
Mirage 5											
RC-135S	River Joint	AN/APN-242			AN/ARC-186(V)	AN/ARC-164(V)	AN/APX-64(V)				
SU-17	Fitter H										
SU-24M	Fencer D	Navigation; TF		SPO-15; LO-82				GSh-6-23M	AS-7; AS-10; AS-11; AS-12; AS-13; AS-14; AS-17; AA-8	Germ-P	Chaff/Flare
SU-25K	Frogfoot A			Sirena-3			SRO-2	Ao-17A 30 mm	AS-7; AS-10; AS-14; AA-2D; AA-8		ASO-2V
SU-27P	Flanker-B	N001 Zhuk	Slot Back	SPO-15; LO-82				GSh-301	AA-10A, AA-10B; A-10C; AA-10D;	Active ECM	Chaff/Flare
Super Etendard											
TU-16	Badger										
TU-22	Blinder										
TU-26	Backfire B										

Table 2 – Naval Platform Equipment Fit and Weapons

Ship Class	Missiles	Guns	Countermeasures	ESM/ECM	Radar
Admiral Kuznetsov	SA-N-9 Gauntlet; SA-N-11 Grisson	CADS-N-1	PK-10 and PK-2 Chaff	Foot Ball; Wine Flask; Flat Track; Ball Shield	Hot Flash; Hot Spot; Sky Watch; Top Plate B; Strut Pair; Cross Sword
[illegible]	—	—	—	—	—
[illegible]-igh Burke - Flight 1	Standard SM-2MR	Phalanx	Super RBOC; Flares; Chaff	AN/SLQ-32(V)3	AN/SPY-1D; AN/SPG-62
Hover Craft - LEBED	—	30 mm (2)	—	—	—
Kara	SA-N-6 Grumble; SA-N-4 Gecko; SA-N-3 Goblet	76 mm; 30 mm	PK-10 and PK-2 Chaff	Side Globe; Bell Shan; Bell Clout;	Top Sail; Flat Screen; Head Net C; Head Light B; Pop Group; Top Dome; Owl Screech; Bass Tilt
Landing Craft - Air Cushion	—	GPU-5	—	—	—
Los Angeles	—	—	—	—	AN/BPS-15A
Nimitz	Sea Sparrow;	Phalanx	Super RBOC; Flares; Chaff	AN/ALQ-32(V)4	AN/SPS-48E; AN/SPS-49(V)5; Mk 23; Mk 95
Sarna	—	—	—	—	—
Sovremenny	SA-N-7 Gadfly; SA-N-17 Grizzly	130 mm; 30 mm	PK-10 and PK-2 Chaff	Foot Ball	Top Plate; Front Dome; Kite Screech; Bass Tilt
Ticonderoga	Standard SM-2MR; Sea Sparrow	Phalanx	Super RBOC; Flares; Chaff	AN/SLQ-32(V)3	AN/SPY-1B; AN/SPS-49(V)8; AN/SPQ-9A; AN/SPG-62
Utility Landing Craft - LCU 1600	—	12.7 mm (2)	—	—	—

Table 3 – Naval Weapon Systems

System Nomenclature	NATO Name	Missile	Anti-Aircraft Gun	Offboard EWR	Onboard EWR	Offboard FCR	Onboard FCR	Aux Radar 1	Aux radar 2	Other Sensor Type	IFF
F2H	Grizzly	SA-N-12 (SA-17)	—	—	—	Front Dome	—	—	—	—	—
Rif	Grumble	SA-N-6 (SA-10A)	—	Top Pair; Top Sail; Top Steer; Head Net	—	Top Dome	—	—	—	—	—
GWS-25	Sea Wolf	Sea Wolf	—	Type 967; Type 968	—	Type 910	—	—	—	—	—
Gws-30	Sea Dart	Sea Dart	—	Type 1022; Type 996	—	Type 909	—	—	—	—	—
Igla	Gimlet	SA-N-10 (SA-16)	—	—	—	—	—	—	—	—	—
Kashtan Air Defense System	Grissom	SA-N-11 (SA-19)	GSh-30K (2)	Hot Flash	—	Hot Flash	—	—	—	—	—
M-1 Volnya	Goa	SA-N-1 (SA-3)	—	Head Net A	—	Peel Group	—	—	—	—	—
M-22 Uragan	Gadfly	SA-N-7 (SA-11)	—	—	—	Front Dome	—	—	—	—	—
Mark 15	Phalanx	—	20 mm (M61A1)	—	—	—	AN/UPS-2	—	—	—	—
OSA-M	Gecko	SA-N-4 (SA-8)	—	Pop Group	—	Pop Group	—	—	—	—	—
RIM-66M5	SM-2MR Blk IIIB	Standard Missile 2	—	AN/SPY-1; AN/SPS-49	—	AN/SPG-62	—	—	—	—	—
RIM-7	Sea Sparrow	Sea Sparrow	—	—	—	Mk 95	—	—	—	TV System	—
SAHV-3	Sea Crotale	R440N	—	Sea Giraffe	—	—	Naval Crotale	—	—	—	—
Shtorm	Goblet	SA-N-3	—	Top Sail	—	Head Light	—	—	—	—	—
Strela 2	Grail	SA-N-5 (SA-7)	—	—	—	—	—	—	—	—	—
Strela 3	Gremlin	SA-N-8 (SA-14)	—	—	—	—	—	—	—	—	—
Tor-M1	Gauntlet	SA-N-9 (SA-15)	—	Sky Watch; Top Plate	—	Cross Sword	—	—	—	—	—

Table 4 – Surface Threat Equipment Fit and Weapons

System Nomenclature	NATO Name	Missile	Anti-Aircraft Gun	Offboard EWR	Onboard EWR	Offboard FCR	Onboard FCR	Aux Radar 1	Aux radar 2	Other Sensor Type	IFF
2K11 Krug	Ganef	SA-4	—	Long Track	—	Pat Hand	—	Thin Skin	—	—	—
2K12 Kub	Gainful	SA-6	—	Spoon Rest; Flat Face; Long Track; Straight Flush	—	Straight Flush	—	Thin Skin B	—	—	Score Board
2S6M Air Defense System (Tunguska)	Grison	SA-19	Quad 30 mm	Dog Ear	Hot Shot	—	Hot Shot	—	—	1A29M Optical Sight	IRL138
9K31 Strela-1	Gaskin	SA-9	—	—	—	—	—	—	—	—	—
9K33 Osa	Gecko	SA-8	—	—	—	—	—	—	—	Flat Box A	—
9K35 Strela 10	Gopher	SA-13	—	Dog Ear	—	—	—	—	—	—	—
9K37 Buk-1M	Gadfly	SA-11	—	Snow Drift	—	—	—	—	—	Flat Box B	—
9M311	Grison	SA-19	—	Dog Ear	Hot Shot	—	Fire Dome	—	—	—	—
Blowpipe	—	Blowpipe	—	—	—	—	Hot Shot	—	—	—	—
Buk-2M	Grizzly	SA-17	—	Snow Drift	—	Chair Back	—	—	—	—	—
Crotale 3000	—	Crotale 3000	—	Mirador IV	—	—	Crotale	—	—	—	—
FIM-43	—	Redeye	—	—	—	—	—	—	—	TV Tracking	—
FIM-92	—	Stinger	—	—	—	—	—	—	—	—	—
GDF-005	—	—	Twin 35 mm	Skyguard	—	Skyguard	—	—	—	—	—
Igla	Grouse	SA-18	—	—	—	—	—	—	—	—	—
Igla-1	Gimlet	SA-16	—	—	—	—	—	—	—	—	—
Javelin	—	Javelin	—	—	—	—	—	—	—	—	—
KS-12	M1939/M1944	—	85 mm	—	—	Fire Can	—	—	—	—	—
L/70 BOFORS	—	—	40 mm	—	—	Flycatcher	—	—	—	—	—
M163	Vulcan	—	20 mm	—	—	AN/VPS-2	—	—	—	—	—
M48A3	Improved Chaparral	MIM-72C	—	AN/MPQ-49	—	—	—	—	—	FLIR	—
MIM-104	—	Patriot	—	—	—	AN/MPQ-53	—	—	—	—	—
MIM-23B	—	Improved Hawk	—	AN/MPQ-50; AN/MPQ-55	—	AN/MPQ-57	—	AN/MPQ-51	—	—	—
Mistral	Mistral	Mistral	—	—	—	—	—	—	—	—	—
NASAMS	—	AIM-120A	—	—	—	AN/MPQ-64	—	—	—	—	—
Rapier	—	Rapier	—	—	Rapier	Blindfire	—	—	—	—	—
RBS-70	—	RBS-70	—	PS-70/R Giraffe	—	—	—	—	—	Laser Beam Rider	—
RBS-90	—	RBS-90	—	PS-90 Giraffe 75; PS-91 HARD	—	—	—	—	—	Laser Beam Rider	—
Roland 2	—	Roland 2	—	MPDR 16	—	—	Domino 30	—	—	—	LMT NRAI-6A
S-125 Neva	Goa	SA-3	—	Flat Face; Squat Eye	—	Low Blow	—	Side Net	—	TV	—

System Nomen-clature	NATO Name	Missile	Anti-Aircraft Gun	Offboard EWR	Onboard EWR	Offboard FCR	Onboard FCR	Aux Radar 1	Aux radar 2	Other Sensor Type	IFF
S-200 Angara	Gammon	SA-5	—	Big Back; Square Pair	—	Square Pair	—		—	—	—
S-300PMU	Grumble	SA-10b	—	Clam Shell	—	Flap Lid B	—	—	—	—	—
90V	Gladiator	SA-12a	—	Bill Board A; High Screen	—	Grill Pan	—	—	—	—	—
	—	—	57mm	Flat Face	—	Fire Can; Flap Wheel	—	—	—	LLTV Sensor	—
S-75 Dvina/Volkhov	Guideline	SA-2	—	Spoon Rest; Flat Face; Knife Rest	—	Fan Song	—	Side Net	—	—	Score Board
Shahine	—	Shahine	—	Shahine	—	—	Shahine	—	—	—	—
Skyguard	—	—	—	—	—	—	—	—	—	—	—
Skyshield	—	—	35 mm	Skyshield	—	Skyshield	—	—	—	—	—
Starstreak	—	Starstreak	—	—	—	—	—	—	—	—	—
Strela-2M	Grail	SA-7	—	Long Track; Flat Face	Land Roll	—	Land Roll	Thin Skin B	—	—	—
Strela-3	Gremlin	SA-14	—	—	—	—	—	—	—	—	—
Tor-M1	Gauntlet	SA-15	—	—	Tor	—	Tor	—	—	—	—
ZSU-23-4	Shilka	—	Quad 23 mm	Dog Ear	—	—	Gun Dish	—	—	Optical Sight	—
ZSU-57-2	Pair/Sparka	—	Twin 57 mm	—	—	—	—	—	—	—	—
ZU-23	—	—	Twin 23 mm	—	—	—	—	—	—	—	—

Appendix E

Emergency Procedures and Malfunctions

This Appendix provides a list of T.O. 1F-16CJ-1 Emergency Procedures and Malfunctions supported by the F-16 MTC.

EMERGENCY PROCEDURES
GROUND EMERGENCIES
Fire/Overheat/Fuel Leak (Ground)
Hot Start (Ground)
Hung Start / No Start
Engine Autoacceleration (Ground)
Brake Failure
Main Generator Failure (Ground)
Main and Standby Generator Failure (Ground)
Emergency Ground Jettison
Activated EPU/Hydrazine Leak
Nose Wheel Steering Failure / Hardover
Ground Egress
TAKEOFF EMERGENCIES
Abort
Engine failure on takeoff
AB malfunction on takeoff
Low thrust on takeoff or at low altitude (Non-AB) RPM rollback
Low thrust on takeoff or at low altitude (Non-AB) Nozzle open
Engine fire on takeoff
Landing Gear Fails to Retract
Landing Gear Handle Will Not Raise
Blown Tire on Takeoff
Delayed Rotation
TAKEOFF EMERGENCIES
Canopy Warning Light On
Cockpit Pressure Malfunction
EQUIP HOT Caution Light
Ejection
Ejection (Immediate)
Ejection (Time Permitting)
ELECTRICAL
FLCS PMG Failure
Single Generator Failure (in Flight)
Main and Standby Generator Failure (in Flight)
Main, Standby, and EPU Generator Failure
EPU Malfunctions

FLCS RLY Light
Partial Electrical Power Loss Malfunctions
Aircraft Battery Failure
Emergency Power Distribution
ENGINE
Engine Fire
OVERHEAT Caution Light
Oil System Malfunction
Engine Fault Caution Light
SEC Caution Light
FTIT Indicator Failure
Engine Alternator Failure
Zero RPM/Erroneous RPM Indication
Abnormal Engine Response
Afterburner Blowout / Failure to Light
AB Associated Engine Stall
Non-AB engine stalls
Engine Stall recovery
Inlet Buzz
Engine Overspeed
Engine Failure or Flameout
Tower Shaft Failure
Low Altitude Engine Failure or Flameout
High Altitude Airstart Considerations
Low Altitude Airstart Considerations
Airstart Procedures
Flameout Landing
Engine Vibrations
JETTISON
Selective Jettison
Emergency Jettison
FLIGHT CONTROL SYSTEM
Air Data Malfunctions
AOA Malfunctions
CADC Malfunctions
Servo Malfunctions
FLCS Electronic Malfunctions
FLCS Single Electronic Failure
FLCS Dual Electronic Failure
FLCS Temperature Malfunctions

DBU ON Warning Light
Leading Edge Flap Malfunction (Symmetric)
Leading Edge Flap Malfunction (Asymmetric)
Autopilot Malfunctions
Trim Malfunction
Out-of-Control Recovery
FUEL
Fuel Management System PFL
Fuel Leak
Fuel Low
Hot Fuel / Oil or Gravity Feed
Fuel Imbalance
Trapped External Fuel
HYDRAULICS
Single Hydraulic Failure
System A Failure
System B Failure
Dual Hydraulic Failure
System B and Generator Failure (PTO Shaft)
INS Failures
INS Computer Failure
Total INS Failure
LANDING EMERGENCIES
Simulated Flameout (SFO) Landing
Controllability Check
Cable Arrestment
Landing With a Blown Tire
Landing With a Blown Main Gear Tire
Landing With a Blown Nose Gear Tire
LG Extension Malfunctions
LG Fails to Extend
Alternate Landing Gear Extension
Landing With LG Unsafe/UP
Antiskid Malfunction (Landing)
Asymmetric Stores (Landing)
EMERGENCY PROCEDURES ECONOMICALLY SUPPORTED THROUGH INSTRUCTOR FEEDBACK
Fire/Overheat/Fuel Leak (Ground)

Canopy Loss / Penetration in Flight
Ejection
Failure of Canopy to Separate
Ejection Seat Failure
Hot Brakes
Hot Refueling Emergency
Oxygen Malfunction
PBG Malfunction
Smoke or Fumes/Electrical Fire
Low Altitude Ejection
Cockpit Temperature Malfunction
PDG Malfunction
Smoke or Fumes
EMERGENCY PROCEDURES NOT SUPPORTED
Emergency Entrance
Ditching
Bird Strike
Stick Interference
Net Arrestment

Supported Malfunctions - Malfunctions reflect the capability of the simulation to induce malfunctions into the cockpit environment to cause a desired effect. (For example, the ENGINE FIRE model shall turn on the FIRE light and raise the FTIT, etc.) These malfunctions shall be manually selected in run-time or pre-scheduled by the instructor/operator. These malfunctions also support the Emergency Procedures in the previous section. The following F-16 malfunctions, listed by system, shall be supported in the F-16 MTC. Malfunctions annotated by "**(R)**" indicates the malfunction is resettable/cleared by proper cockpit action.

SUPPORTED MALFUNCTIONS	
Hydraulics	
	System A Leak (Low Rate)
	System A Leak (High Rate)
	System A Pressure Low (2600 PSI)
	System A Hydraulic Pump Failure
	System B Leak (Low Rate)
	System B Leak (High Rate)
	System B Pressure Low (2600 PSI)
	System B Hydraulic Pump Failure
	Dual Hydraulic Failure
	System B and Generator Failure (PTO Shaft)
	Hydraulic / Oil Pressure Sensor Failure

Electric
Main Generator Failure (R)
Main Generator Failure
Main Generator Failure Without EPU Start Signal
Main and Standby Generator Failure
FLCS PMG Failure
Partial Electrical Power Loss Malfunctions
Overcurrent Protection Unit No. 1 (R)
Overcurrent Protection Unit No. 1
Overcurrent Protection Unit No. 2
Non-Essential AC Bus No. 2 Failure
Essential AC Bus No. 1 Failure
Essential AC Bus No. 2 Failure
Essential DC Bus No. 1 Failure
Essential DC Bus No. 2 Failure
Electrical System Caution Sensor Failure
Main, Standby and EPU Generator Failure
EPU Malfunctions
EPU Generator Failure
EPU PMG Failure
Uncommanded EPU Activation On Bleed Air
EPU on Secondary Speed Control
EPU on Tertiary Speed Control
Uncontrolled EPU Overspeed / OVV
EPU Underspeed
EPU Bleed Air Valve Failure (Closed)
FLCS Relay Light
A/C Battery Failure
Fuel
Trapped External Fuel (R)
Fuel Leak Malfunctions
A-1 Tank Leak
A-1 Internal Tank Leak
F-1 Tank Leak
Left Wing Fuel Leak
Right Wing Fuel Leak
High Fuel Flow - Leak Behind Transmitter
Fuel Imbalance - Aft Heavy
Fuel Management System Fail
Reservoir Fuel Level Sensing Fail
Fuel Hot Caution Light Illuminated

Engine
Hot Start (R)
Hung Start (R)
Engine Failure to Start (R)
JFS Fails to Start (R)
JFS Auto Shutdown Failure (Ground)
Engine Fire
Engine Auto-Acceleration (Ground)
Engine Flameout (R)
Engine Loss of Thrust - SEC FIX
Engine Loss of Thrust - AB FIX
Afterburner Blowout (R)
Afterburner No Light (R)
Engine Seizure
Engine Stall (AB Associated) (R)
Engine Stall (Non-AB Related) (R)
Engine Stagnation (R)
Tower Shaft Failure
Engine Oil Pump Failure
Oil Pressure Increase Low (Idle - Mil +/- 5 PSI)
DEEC Fail - FTIT Input Fail
Nozzle Failed Open
Nozzle Failure Closed
FTIT Indicator Out of Limits
Engine Alternator Failure
Engine Bus Failure
Auto SEC Transfer
Abnormal Engine Response
RPM Will Not Decrease
Main Fuel Pump Failure
Engine Warning Light (False)
Engine Anti Ice Valve
Other
Brake Failure Malfunctions
Left Brake Failure (Channel Change)
Right Brake Failure (Anti-Skid)
Total Brake Failure (Anti-Skid)
Nose Wheel Steering Failure
Nose Wheel Steering Hardover
Anti-Skid Failure
Landing Gear Handle Solenoid Failure

Landing Gear Will Not Retract
Blown Tire (Nosewheel)
Blown Tire (Left Main Gear)
Blown Tire (Right Main Gear)
Tail Hook Failure To Extend
Canopy Not Locked Light Illuminated
Failure of Canopy To Separate During Ejection
Cockpit Pressure Failure (R)
Oxygen Low Light Illuminated
ECS Failure - Equipment Hot Caution Light (R)
Overheat Malfunctions
Wheel Well Overheat (R)
EPU Bay Overheat
ECS Bay Overheat
Engine Compartment Overheat
PTO Shaft Failure
AOA Malfunctions
Single AOA Failure (R)
Dual AOA Failure (R)
AOA Icing (Probes Full Deflection In Track)
Probe Heat Fail / AOA Icing (Single) (R)
NLG WOW Switch Failure - Inflight Position
NLG WOW Switch Failure -Ground Position
LMG WOW Switch Failure -Inflight Position
LMG WOW Switch Failure -Ground Position
RMG WOW Switch Failure -Inflight Position
RMG WOW Switch Failure -Ground Position
LMG Fail Extend < 2.5 G (R-LG Handle Cycle) (R)
RMG Fail Extend (R-LG Handle Cycle) (R)
NLG Fail Extend (R-LG Handle Cycle) (R)
Alternate LG Extension Failure
Total Pneumatic Failure
DFLCS
Single Failure Pitot Static Pressure (R)
Dual Failure of Pitot Static Pressure
CADC Bus A & B Failure
CADC Total Failure
Pitch, Roll, and/or Yaw Malfunctions
Autopilot Failure - Pitch
Autopilot Failure - Roll
Branch A Power Supply Failure
Branch B Power Supply Failure

Branch C Power Supply Failure
FLCS AMUX Bus Failure
FLCS DMUX Bus Failure
FLCS Dual Failure
Coil Current Monitor Failure
FLCS Hot Temperature
Servo Actuator Malfunctions
Left Flaperon ISA First Failure
Left Flaperon ISA Second Failure
Left Horizontal Tail ISA First Failure
Left Horizontal Tail ISA Second Failure
Right Flaperon ISA First Failure
Right Flaperon ISA Second Failure
Right Horizontal Tail ISA First Failure
Right Horizontal Tail ISA Second Failure
Rudder ISA First Failure
Rudder ISA Second Failure
Leading Edge Flap Symmetric (R)
Leading Edge Flap Asymmetric
Leading Edge Flap Asymmetric (90 Degrees Up)
Trim Button Fail
Runaway Trim
Structural Damage - Controllable
Structural Damage - Crash
Weapons / Stores
Hung Store Malfunctions
Hung Store Station 1
Hung Store Station 2
Hung Store Station 3
Hung Store Station 4
Hung Store Station 5
Hung Store Station 6
Hung Store Station 7
Hung Store Station 8
Hung Store Station 9
Selective Jettison Failure
Emergency Jettison Failure - All Stations (3,4,5,6,7)
AGM - 65 Malfunctions
AGM - 65 Weapon Video Failure (Station 3)
AGM - 65 Weapon Video Failure (Station 4)
AGM - 65 Weapon Video Failure (Station 6)
AGM - 65 Weapon Video Failure (Station 7)

AGM - 65 Weapon Lock-on Failure (Station 3)
AGM - 65 Weapon Lock-on Failure (Station 4)
AGM - 65 Weapon Lock-on Failure (Station 6)
AGM - 65 Weapon Lock-on Failure (Station 7)
AIM - 9 (All Types) Malfunctions
AIM - 9 Slave Mode Failure PFL # 001 (Station 1)
AIM - 9 Slave Mode Failure PFL # 001 (Station 2)
AIM - 9 Slave Mode Failure PFL # 001 (Station 3)
AIM - 9 Slave Mode Failure PFL # 001 (Station 7)
AIM - 9 Slave Mode Failure PFL # 001 (Station 8)
AIM - 9 Slave Mode Failure PFL # 001 (Station 9)
AIM - 9 Seeker Alignment Failure (Station 1)
AIM - 9 Seeker Alignment Failure (Station 2)
AIM - 9 Seeker Alignment Failure (Station 3)
AIM - 9 Seeker Alignment Failure (Station 7)
AIM - 9 Seeker Alignment Failure (Station 8)
AIM - 9 Seeker Alignment Failure (Station 9)
AIM - 9 Audio Failure (Station 1)
AIM - 9 Audio Failure (Station 2)
AIM - 9 Audio Failure (Station 3)
AIM - 9 Audio Failure (Station 7)
AIM - 9 Audio Failure (Station 8)
AIM - 9 Audio Failure (Station 9)
AIM - 9 Coolant Failure (Station 1)
AIM - 9 Coolant Failure (Station 2)
AIM - 9 Coolant Failure (Station 3)
AIM - 9 Coolant Failure (Station 7)
AIM - 9 Coolant Failure (Station 8)
AIM - 9 Coolant Failure (Station 9)
AIM -120A Malfunctions
AMRAAM Bit Failure (Station 1)
AMRAAM Bit Failure (Station 2)
AMRAAM Bit Failure (Station 3)
AMRAAM Bit Failure (Station 7)
AMRAAM Bit Failure (Station 8)
AMRAAM Bit Failure (Station 9)
AMRAAM Data Link (Station 1)
AMRAAM Data Link (Station 2)
AMRAAM Data Link (Station 3)
AMRAAM Data Link (Station 7)
AMRAAM Data Link (Station 8)
AMRAAM Data Link (Station 9)
BRU-55 Rack Malfunctions

		BRU-55 Station Failure (Station 3 or 7)
		BRU-55 Launch Failure (Station 3 or 7)
		BRU-55 Power Failure (Station 3 or 7)
		BRU-55 Nose Arm Failure (Station 3 or 7)
		BRU-55 Tail Arm Failure (Station 3 or 7)
	HARM Malfunctions	
		HARM Seeker Failure (Station 3, 4, 6, or 7)
		HARM Seeker Degraded (Station 3, 4, 6, or 7)
		HARM Control System Degraded (Station 3, 4, 6, or 7)
		HARM Nav System Degraded (Station 3, 4, 6, or 7)
		HARM Targeting System Malfunction (Station 3, 4, 6, or 7)
	JDAM Malfunctions	
		JDAM Bus Failure (Station 3 or 7)
		JDAM CPU Failure (Station 3 or 7)
		JDAM GPS Failure (Station 3 or 7)
		JDAM Telemetry Failure (Station 3 or 7)
	LANTIRN Malfunctions	
		LANTIRN Navigation Pod Failure
		LANTIRN Targeting Pod Failure
	JSOW Malfunctions	
		JSOW Bus Failure (Station 3 or 7)
		JSOW CPU Failure (Station 3 or 7)
		JSOW GPS Failure (Station 3 or 7)
		JSOW Telemetry Failure (Station 3 or 7)
	WCMD Malfunctions	
		WCMD Bus Failure (Station 3 or 7)
		WCMD CPU Failure (Station 3 or 7)
		WCMD GPS Failure (Station 3 or 7)
		WCMD Telemetry Failure (Station 3 or 7)
	Jammed Gun	
	Runaway Gun	
	Aircraft Launcher Interface Computer Failure	
	Stick Weapon Release Button Failure	
Self Defense / Penetration Aids	ALE-47 Malfunctions	
		Failure of Chaff to Dispense
		Failure of Flares to Dispense
		Manual Mode Degraded
		Semiautomatic Mode Degraded
		Automatic Mode Degraded
	ECM Pod Malfunctions	
		ECM Pod Total Failure
	ALR-56M Malfunctions	

			EW Bus Failure
			RWR BMUX Failure
			Failure of C/D RF Band
			Failure of E/J RF Band 2
			Quadrant Failure of C/D Band
			Quadrant Failure of E/J Band
			Failure of RWR Audio
			Failure of Azimuth Display
Avionics			
	UHF Receiver Failure		
	UHF Transmitter Failure		
	VHF Receiver Failure		
	VHF - AM Transmitter Failure		
	VHF - FM Transmitter Failure		
	HQ Radio Malfunction		
	TACAN Malfunctions		
		TACAN Bearing Lockon Failure	
		TACAN Range Lockon Failure	
	ILS Malfunctions		
			Glideslope Receiver Power Failure
			Localizer Receiver Power Failure
			Marker Beacon Power Failure
			ILS Total Power Failure
	INS Malfunctions		
		INS Computer Failure	
		INS Total Failure (Platform Does Not Erect)	
	GPS Malfunctions		
			Total GPS Failure
			No Keys Loaded in GPS
			Insufficient Number of Keys Loaded
			GPS Key Expiration Time is Within 2 Hours
			GPS Key Format Invalid at Load Time
			GPS Key is Not Verified - "Key Invalid"
	Total DTS Failure		
	Total IDM Failure (R)		
	IFF Malfunctions		
			IFF Transponder Mode 4 Failure (R)
	HUD Malfunctions		
			Total HUD Failure
			RSU Failure
	CMFD Malfunctions		
		Total EUPDG Failure	

Left CMFD Failure
Right CMFD Failure
FCR Malfunctions
Total FCR Failure
FCR Track / Lockon Failure
Total UFC Failure (R)
Total DED Failure (R)
MMC Malfunctions
MMC Supply Overtemp
MB1 Module Failure
MB2 Module Failure
MB3 Module Failure
WM1 Module Failure
WM2 Module Failure
ADS Failure
Instrument Malfunctions
Airspeed / Mach Indicator Failure
Altimeter Error / CADC Failure
ADI Failure
STBY ADI Failure
AOA Indicator Failure
Fuel Flow Indicator Failure
Oil Pressure Indicator Failure
Nozzle Position Indicator Failure
RPM Indicator Failure
Fuel Quantity Indicator Failure
Hyd A & B Indicator Failures
Radar Altimeter Malfunctions
Radar Altimeter Power Failure (R)
Radar Altimeter "Latchup"
Radar Altimeter False Lock
Air Refueling Malfunctions
Brute Force Disconnect
Pressure Refueling
A/R Door Failure to Close

Appendix F

Acronyms and Abbreviations

A	Analysis
AAA	Anti-aircraft artillery
AAED	Advanced airborne expendable decoy
AAI	Air-to-air intercept
AB	Afterburner
ACA	Associate Contractor Agreement
ACQ	Acquisition
ACM	Air Combat Maneuvering
ACRIU	Advanced conventional remote interface units
ADC	Air data computer
ADI	Attitude director indicator
ADRG	ARC digitized raster graphics
ADSI	Air Defense System Integration
AFB	Air Force Base
AFMSS	Air Force Mission Support System
AGL	Above ground level
AGM	Air-to-ground missile
AGR	Air-to-ground ranging mode
AI	Air intercept
AIC	Aircraft input/output set
ALIC	Air Launch Interface Computer
AJ	Anti-jamming
AMRAAM	Advanced medium range air-to-air missile
AMRIU	Advanced missile remote interface units
AOA	Angle of attack
ARWR	Advanced radar warning receiver
ASC YWIP	Aeronautical Systems Center
ATC	Air traffic control
ATO	Air Tasking Order
ATP	Acceptance test procedure
AWACS	Airborne Warning and Control System
B/DB	Briefing/debriefing
BCN	Beacon mode
BDA	Bomb Damage Assessment
BFM	Basic fighter maneuvers
BIT	Built-in test
BLK	Block
BVR	Beyond visual range

CADC	Central air data computer
CAF	Combat Air Forces
CAP	Combat Air Patrol
CARA	Combined Altitude Radar Altimeter
CAS	Close air support
CBU	Cluster bomb unit
CCIP	Continuously Computed Impact Point
CCITS	Continuous centrally integrated test system
CCRP	Continuously computer release point
CDI	Course deviation indicator
CG	Center of gravity
CI	Configuration items
CMFDS	Color multi-function display set
CNI	Communication, navigation and identification
CONUS	Continental United States
COTS	Commercial off-the-shelf
CR	Contrast ratio
CRM	Combined radar mode
CRT	Cathode ray tube
CSAR	Combat search and rescue
CSC	Computer software component
CSCI	Computer software configuration item
CSEM	Climbing Escape Maneuver
CWBS	Contract work breakdown structure
DAA	Designated approving authority
DAL	Data accession list
DBGS	Database generation system
DBS	Doppler beam sharpening
DBTC	Data Base Terrain Cueing
DCA	Defensive Counter Air
DCL	Design criteria list
DCS	Data control switch
DCW	Digital Chart of the World
DED	Data entry display
DFAD	Digital feature analysis data
DFLCS	Digital flight control system
DL	Data Link
DMA	Defense Mapping Agency
DMT	Distributed mission training

DOF	Degrees-of-freedom
DRLMS	Digital radar land mass system
DTC	Data transfer cartridge
DTE	Data transfer equipment
DTED	Digital terrain elevation
DTOS	Dive/toss submode
DTS	Data Transfer System, Digital Terrain System
DTU	Data transfer unit
ECCM	Electronic counter-countermeasures
ECE	Electronic combat environment
ECM	Electronic Counter Measures
ECP	Engineering change proposal
ECS	Environmental control system
EEC	Electronic engine control
EEGS	Enhanced Envelope Gun Sight
ELINT	Electronic Intelligence
EO	Electro-optical
EOM	Equations of Motion
EP	Emergency procedure
EPU	Emergency power unit
ESH	Environmental Safety & Health
EUPDG	Enhanced upgraded programmable display generator
EW	Early warning
EXP	Expanded ground map
FAC	Forward air controller
FAC(A)	Forward air controller (Airborne)
FCA	Functional configuration audit
FCC	Fire control computer
FCR	Fire control radar
FEBA	Forward edge of battle area
FFOV	Full field-of-view
FLCS	Flight control system
FLIR	Forward looking infrared
FMT	Full mission trainer
FOB	Forward operating base
FOM	Federation object model
FOV	Field of view
FQ&P	Flying qualities and performance
FTIT	Fan turbine inlet temperature

FTT	Fixed target track
FZ	Freeze submode
GCA	Ground control approach
GCCS	Global command & control system
GCD	Ground contract dynamics
GCI	Ground controlled intercept
GIS	Geographic Information System
GLD	Ground Laser Designator
GP	General Purpose
GPS	Global positioning system
HAD	HARM Attack Display
HARM	High-speed anti-radiation missile
HARTS	Horn Awareness & Recovery Training Series
HLA	High-level architecture
HOTAS	Hands-on throttle & stick
HSD	Horizontal situation display
HSI	Horizontal situational indicator
HSI	Hardware/software integration
HTS	HARM Targeting System
HUD	Head-up display
HWCI	Hardware configuration item
IADS	Integrated air defense system
IAW	In accordance with
ICD	Interface control document
ICITS	Interruptive centrally integrated test system
ICP	Integrated control panel
IDL	Improved data link
IDM	Improved data modem
IDT	Improved Data Transfer
IFF	Identification friend or foe
IFR	Instrument Flight Rules
IG	Image generator
ILS	Instrument landing system
IMC	Instrument Meteorological Condition
INS	Inertial navigation system
IOS	Instructor/operator station
IP	Initial point
IPT	Integrated product team
IR	Infrared

IRM	Inertial reference model
ISL	Industrial Security Letter
JAAT	Joint air attack team
JARMS	Jammers, Anti-aircraft artillery, Radars, and Missile Systems
JDAM	Joint Direct Attack Munition
JFS	Jet fuel starter
JSOW	Joint Standoff Weapon
JSTARS	Joint surveillance target attack radar system
JTIDS	Joint Tactical Information Display Systems
LADD	Low-altitude drogue delivery
LANT	LANTIRN
LANTIRN	Low Altitude Navigation and Targeting Infrared for Night
LAS	Low Angle Strafe
LCOS	Lead computing optical sight
LEF	Leading edge flaps
LG	Landing gear
LGB	Laser guided bomb
LHN	Long-haul networks
LMTDS	Lockheed Martin Tactical Defense Systems
LPI	Low probability of intercept
MCE	Modular control environment
MCM	Microcomputer configuration management
MDF	Mission data file
MEM	Memory
MFD	Multifunction display
MFDS	Multifunction display system
MK	Mark
MMC	Modular mission computer
MPOP	Military point of presence
MPS	Mission processing set
MSA	Minimum Safe Altitude
MSEC	Milliseconds
MSL	Mean sea level
MSS	Mission support system
MTBF	Mean-time-between-failures
MTC	Mission training center
MTTR	Mean time to repair
MUX	Multiplexer
NCTR	Non-cooperative target recognition

NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
NISPOM	National Industrial Security Program Operating Manual
NLAB	Night Line Abreast
NLG	Nose landing gear
NM	Nautical mile
NUC	Nuclear
NVD	Night Vision Device
NVG	Night vision goggles
NVIS	Night vision imaging system
NWS	Nose wheel steering
O&I	Operations and integration
OAP	Offset aim point
OBS	On-board stores
OCA	Offensive Counter Air
OFP	Operational flight program
OLP	Optical line pair
Ops Eval	Operational evaluation
OSHA	Occupational Safety and Health Administration
OTW	Out-the-window
OWC	Obstacle Warning Cueing
P	Pitch
P3I	Pre-planned product improvement
PCA	Physical configuration audit
PCDS	Personal computer debriefing system
PFMT	Pre-flight message tape
PFPS	Personal flight planning system
PGCAS	Predictive Ground Collision Avoidance System
PHST	Packaging, handling, storage and transportation
PO	Project officer
PSI	Pounds per square inch
PTRK	Point contrast track
PW	Pratt & Whitney
QAR	Quality assurance representative
R	Roll
RALT	RADAR Altimeter
RBS	Radar bomb scoring
RCR	Runway condition reading, Rate Cluster Resolution
REILS	Runway end identification light system

RFOV	Reduced field-of-view
RGB	Red, green, blue
RIU	Remote interface unit
RNRIU	Ruggedized/non-ruggedized nuclear remote interface units
RPM	Rotations per minute
RTIO	Real-time input/output
RUK	Range Unknown
RVR	Runway visual range
RWR	Radar warning receiver
RWS	Range while search
SA	Situational Awareness
SAM	Surface-to-air missile
SCRD	Simulation Capability Requirements Document
SDP	Software Development Plan
SID	Standard Instrument Departure
SEAD	Suppression of enemy air defense
SFW	Sensor Fused Weapon
SIF	Selective identification feature
SIMCERT	Simulator Certification
SME	Subject matter expert
SMS	Stores management system
SNM	Square nautical mile
SOM	Simulation object model
SOW	Statement of Work
SPE	System performance evaluation
SR	Slant range
SRD	System requirements document
SRR	System requirements review
SSC	Side stick controller
SSPO	Supporting security police organization
ST	Self-test
STBY	Standby
STT	Single target track
SVT	System verification test
T/O	Takeoff
TACAN	Tactical air navigation
TACP	Tactical Air Control Party
TAS	Target acquisition sensor
TBMCS	Theater battle management core system

TBP	To be provided
TDA	Tactical Decision Aid
TEF	Trailing edge flaps
TFR	Terrain following radar
TGP	Targeting Pod
TMLT	Turning Maneuver Level Turn
TOD	Time of day
TOS	Time Over Steer point
TOT	Time Over Target
TRN	Terrain Referenced Navigation
TRR	Test readiness review
TTL	Training Task List
TWS	Track while search
UFC	Upfront controls
ULS	Up look search
UPDG	Upgraded program display generated
VASI	Visual approach slope indicator
VCRI	Verification cross-reference index
VFR	Visual Flight Rules
VID	Visual Identification
VIG	Visual image generator
VIP	Visual Initial Point
VLADD	Visual Low Altitude Drogue Delivery
VLC	Very low clearance
VMU	Voice message unit
VRP	Visual Release Point
WAC	Wide angle collimated
WCMD	Wind Corrected Munitions Dispenser
WFOV	Wide field-of-view
WGS	World Geodetic System
WNINTEL	Warning Notice Intelligence
WPAFB	Wright-Patterson Air Force Base
WOW	Weight on wheels
WVR	Within Visual Range
WX	Weather
Y	Yaw

ADDENDUM SPECIFICATION
for the
F-16 BLOCK 40/42/50/52
AIR NATIONAL GUARD (ANG) MOBILE
MISSION TRAINING CENTER (MTC)

This specification has been prepared as an Addendum to:
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Table of Contents

1.0 SCOPE **5**
1.1 GENERAL DESCRIPTION 5
1.2 DOCUMENT OVERVIEW 5
2.0 REFERENCED DOCUMENTS **5**
2.1 GOVERNMENT DOCUMENTS 5
2.1.1 ASC/YWIP Documents 5
2.1.2 Other Government Documents, Drawings, and Publications 5
2.1.3 Standards and Handbooks 5
2.2 COMMERCIAL STANDARDS 6
2.3 CONTRACTOR DOCUMENTS 6
3.0 SIMULATION SERVICE PERFORMANCE REQUIREMENTS **6**
3.1 SIMULATION SERVICE DEFINITION 6
3.1.1 Simulation Service Overview 6
3.1.2 Simulation Service Levels 6
3.1.3 Simulation Service Level Upgrades 7
3.1.4 Simulation Service Operating Locations 7
3.2 GENERAL PERFORMANCE REQUIREMENTS 7
3.3 SIMULATION SERVICE ELEMENTS 7
3.3.1 Ownship Simulation 7
3.3.2 Visual Systems 7
3.3.3 Synthetic Environment 9
3.3.4 Threat Stations 9
3.3.5 Modular Control Equipment (MCE) Workstation 9
3.3.6 Instructor Operator Station (IOS) 9
3.3.7 Briefing/Debriefing (B/DB) Systems 9
3.4 DMT CONNECTIVITY 10
3.4.1 DMT Networking 10
3.4.2 DMT INTEROPERABILITY 10
3.4.3 SIMULTANEOUS TRAINING 10
3.5 FACILITIES 10
3.6 AVAILABILITY 10
3.6.1 Required Availability 10
3.6.2 Level A Availability Accounting 10
3.6.3 Level C Availability Accounting 10
3.6.4 Surge Availability 10
3.6.5 Available Operating Hours 11
3.6.6 Mobile MTC Non-Availability 11
3.7 ENVIRONMENT, SAFETY AND HEALTH 11
3.8 SECURITY 11
3.9 ANG MOBILE/TRANSPORTABLE MTC SERVICES 11
3.9.1 Mobility 11

3.9.2 Transportability *11*
3.9.3 Packaging *12*
3.9.4 Packaging Tools *12*
3.9.5 Teardown *12*
3.9.6 Unpack/Install *12*
3.9.7 Interchangeability *12*
3.10 GROWTH AND SPARE 12
3.11 PHYSICAL CHARACTERISTICS 12
3.12 DESIGN AND CONSTRUCTION CONSTRAINTS 12
3.12.1 Materials *12*
3.12.2 Nameplates and Product Markings *12*
3.12.3 Workmanship *12*
3.12.4 Interchangeability *13*
3.12.5 Human Engineering *13*
3.13 Y2K COMPLIANCE 13

4.0 QUALIFICATION PROVISIONS 13

4.1 GENERAL 13
4.1.1 Contractor-Conducted Tests *13*
4.1.2 Methods of Verification *13*

5.0 REQUIREMENTS TRACEABILITY 15

APPENDIX A - PILOT TRAINING TASK LIST (TTL) 16

APPENDIX B - RESERVED 17

APPENDIX C - COCKPIT COMPONENT REQUIREMENT MATRIX 18

APPENDIX D - THREAT AND ENTITY LIST 19

APPENDIX E - EMERGENCY PROCEDURES AND MALFUNCTIONS 20

APPENDIX F - ACRONYMS AND ABBREVIATIONS 21

1.0 SCOPE

1.1 GENERAL DESCRIPTION

This Addendum to the Performance Specification for the F-16 Block 40/42/50/52 Mission Training Center (MTC) specifies the general simulation services performance requirements that the F-16 simulation service Contractor shall provide to address the Air National Guard (ANG) mobile simulation service training objectives.

1.2 DOCUMENT OVERVIEW

No changes this Section.

2.0 REFERENCED DOCUMENTS

2.1 GOVERNMENT DOCUMENTS

No changes this Section.

2.1.1 ASC/YWIP Documents

No changes this Section.

2.1.2 Other Government Documents, Drawings, and Publications

No changes this Section.

2.1.3 Standards and Handbooks

The following Government standards and handbooks served as a guideline for this specification to the extent specified herein:

- AFOSH Standards
- Requirement 1 of MIL-STD-454 Safety Design Criteria - Personnel Hazards
- MIL-STD-1472E Human Engineering Design Criteria for Military Systems
- 29 CFR 1910, Code of Federal Regulations, Title 29 Labor (OSHA)
- DoD 5220.22-M National Industrial Security Program Operating Manual (NISPOM), through Industrial Security Letter (ISL) 97-1
- Training System Product Group Program Protection Plan, 15 Feb 1996
- F-16 Multi-mission Fighter Security Classification Guide, 1 Sept 97, with Letter Change No. 1, 24 Mar 98
- MIL-STD-100, Standard Practice for Engineering Drawings
- MIL-HDBK-232A Red/Black Engineering - Installation Guidelines
- MIL-HDBK-419A Grounding, Bonding, and Shielding for Electronic Equipment and Facilities
- MIL-STD-188-124A Grounding, Bonding, and Shielding for Common Long-Haul/Tactical Communication Systems

- MIL-STD-1366D Transportability Criteria
- MIL-STD-209J Interface Standard for Lifting and Tie-down Provisions

2.2 COMMERCIAL STANDARDS

No changes this Section.

2.3 CONTRACTOR DOCUMENTS

The following Lockheed Martin documents served as guidelines for this specification and form a part of this specification to the extent specified herein:

- 3483S1000 Rev A - Performance Specification for the F-16 Block 40/42/50/52 Mission training Center (MTC)
- Environment, Safety and Health Manual, Lockheed Martin Tactical Defense Systems, Akron, OH
- Engineering Manual, Lockheed Martin Tactical Defense Systems, Akron, OH

3.0 SIMULATION SERVICE PERFORMANCE REQUIREMENTS

3.1 SIMULATION SERVICE DEFINITION

3.1.1 Simulation Service Overview

No changes this Section.

3.1.2 Simulation Service Levels

3.1.2.1 Simulation Service Level A

N/A

3.1.2.2 Simulation Service Level B

N/A

3.1.2.3 Simulation Service Level C

A modified, mobile Level C simulation service shall be provided to service all ANG simulation service locations specified herein. The mobile simulation service shall provide four fully DMT-integrated system simulations. Each system simulation shall provide, as a minimum, the capability to train all Level C tasks identified in the F-16 Training Task List (TTL). The system simulations shall provide a visual system with the full field of view (FOV) experienced by the pilot in the aircraft that allows F-16 pilots to train all Level C tasks identified in the TTL. The mobile simulation service shall provide four threat stations, one common brief/debrief (B/DB) capability, and a separate modular control equipment (MCE) workstation. The mobile simulation service shall operate in a DMT and stand-alone configuration. The mobile simulation service shall be relocatable four times a year (quarterly) to support training for all the ANG simulation service locations.

3.1.3 Simulation Service Level Upgrades

No changes this Section.

3.1.4 Simulation Service Operating Locations

No changes this Section.

3.2 GENERAL PERFORMANCE REQUIREMENTS

No changes this Section.

3.3 SIMULATION SERVICE ELEMENTS

3.3.1 Ownship Simulation

No changes this Section.

3.3.2 Visual Systems

3.3.2.0.1 The F-16 visual system shall provide sufficient visual cues, image quality and positional accuracy to allow a pilot to perform the F-16 air-to-surface and air-to-air mission tasks as identified in the F-16 TTL at the Level C simulation service.

3.3.2.0.2 No changes this Section.

3.3.2.0.3 No changes this Section.

3.3.2.1 Visual System Characteristics

The F-16 visual system shall provide the following system-level characteristics. System characteristics are all inclusive for Level C unless otherwise specified.

3.3.2.1.1 Architecture

No changes this Section.

3.3.2.1.2 Update Rate

No changes this Section.

3.3.2.1.3 Image Resolution

No changes this Section.

3.3.2.1.4 Polygon Capacity

No changes this Section.

3.3.2.1.5 Light Capacity

No changes this Section.

3.3.2.1.6 Computed Visual Range

No changes this Section.

3.3.2.1.7 Database Storage Capacity

No changes this Section.

3.3.2.1.8 Maximum Motion Systems

No changes this Section.

3.3.2.1.9 Aircraft Representation

No changes this Section.

3.3.2.1.10 Missile/Bomb Representation

No changes this Section.

3.3.2.1.11 Ground Threat Representation

No changes this Section.

3.3.2.1.12 Flare Representation

No changes this Section.

3.3.2.1.13 Aerial Refueling

No changes this Section.

3.3.2.1.14 Generic Terrain/Ocean

No changes this Section.

3.3.2.1.15 Ownship Tracers

No changes this Section.

3.3.2.1.16 Ownship Lights

No changes this Section.

3.3.2.1.17 Visual Environment

No changes this Section.

3.3.2.2 Level A Visual System

N/A

3.3.2.3 Level C Visual System

3.3.2.3.1 Instantaneous Field of View

3.3.2.3.1.1 The Level C visual system shall provide a minimum instantaneous field of view (IFOV) of 360° horizontal by 135° vertical.

3.3.2.3.1.2 No changes this Section.

3.3.2.3.2 Display Facets

3.3.2.3.2.1 The Level C visual display shall be composed of rear-projected display screens.

3.3.2.3.2.2 No changes this Section.

3.3.2.3.2.3 No changes this Section.

3.3.2.3.3 HUD Representation

No changes this Section.

3.3.2.3.4 Target Projection

3.3.2.3.4.1 The Level C visual system design shall permit the use of an additional Target Projector System (TPS).

3.3.2.3.4.2 No changes this Section.

3.3.2.3.4.3 No changes this Section.

3.3.2.3.4.4 No changes this Section.

3.3.2.3.4.5 No changes this Section.

3.3.2.3.4.6 Target Range Limitations

No changes this Section.

3.3.2.3.4.7 Target Resolution

No changes this Section.

3.3.2.3.4.8 Target Update Rate

No changes this Section.

3.3.2.3.4.9 Target Level of Detail Enhancement

No changes this Section.

3.3.3 Synthetic Environment

No changes this Section.

3.3.4 Threat Stations

No changes this Section.

3.3.5 Modular Control Equipment (MCE) Workstation

No changes this Section.

3.3.6 Instructor Operator Station (IOS)

No changes this Section.

3.3.7 Briefing/Debriefing (B/DB) Systems

No changes this Section.

3.3.7.1 Briefing Capability

No changes this Section.

3.3.7.2 Debriefing Capability

No changes this Section.

3.3.7.3 Mission Observation Capability

N/A

3.4 DMT CONNECTIVITY

3.4.1 DMT Networking

3.4.1.1 No changes this Section.

3.4.1.2 No changes this Section.

3.4.1.3 No changes this Section.

3.4.1.4 Routers, bridges, and other network equipment shall be provided as necessary to isolate network segments during non-networked, Level C training.

3.4.1.5 No changes this Section.

3.4.2 DMT INTEROPERABILITY

No changes this Section.

3.4.3 SIMULTANEOUS TRAINING

No changes this Section.

3.5 FACILITIES

No changes this Section.

3.6 AVAILABILITY

3.6.1 Required Availability

No changes this Section.

3.6.2 Level A Availability Accounting

N/A

3.6.3 Level C Availability Accounting

Level C availability accounting shall be in accordance with Contract F33657-99-D-2025 Clause A-016, Service Availability Accounting.

3.6.4 Surge Availability

No changes this Section.

3.6.5 Available Operating Hours

No changes this Section.

3.6.6 Mobile MTC Non-Availability

The mobile MTC will not be available during relocation between ANG facilities. The relocation will require six days for teardown, seven days for transportation between ANG facilities, and ten days for set-up. This system unavailability will occur during every move between ANG facilities, anticipated to be quarterly.

3.7 ENVIRONMENT, SAFETY AND HEALTH

No changes this Section.

3.8 SECURITY

No changes this Section.

3.9 ANG MOBILE/TRANSPORTABLE MTC SERVICES

3.9.1 Mobility

The mobile MTC service shall be designed for frequent disassembly, transportability, and re-assembly at the ANG service locations specified herein. The mobile simulation service shall be relocatable four times a year (quarterly) to support training for all of the ANG simulation service locations.

3.9.2 Transportability

The mobile MTC components shall be capable of transportation by air, highway, or rail. Should the mobile MTC be classified as a transportability problem as defined by MIL-STD-1366D, paragraph 4.4, the Contractor shall prepare a transportability report in contractor format containing the data elements described in DI-PACK-80880A. This report will be included in the data accession list. Adequate tie-down points and markings shall be provided on the mobile MTC components, or their shipping packages. When packaged for transportation, the components of the mobile MTC shall be capable of sustaining the loads and shocks normally incident to any of the modes of transportation specified herein, without damage that would render the simulator incapable of satisfactory operation upon reassembly.

3.9.2.1 Air Transportation

The mobile MTC shall be transportable via C-17 and C-5A aircraft. The four-ship mobile MTC shall be capable of being loaded in, and transported via, two C-17 cargo aircraft, or one C-5A cargo aircraft.

3.9.2.2 Highway Transportation

The mobile MTC shall be transportable via commercial trucking carrier, conforming to all highway travel size restrictions and load limits.

3.9.2.3 Rail Transportation

The mobile MTC shall be transportable via rail carrier, conforming to all rail-car size restrictions and load limits.

3.9.3 Packaging

All mobile MTC components shall be self-contained in shipping packages, or shall utilize separate reusable packaging. All packaging shall include external identification labels and markings to enable determination of item contents and critical transportation instructions. The packaging shall protect the MTC components from the shock and environmental stress induced from normal transportation.

3.9.4 Packaging Tools

All fasteners and tools required to disassemble, pack, secure, unpack, and reassemble the mobile MTC components shall be included with the mobile MTC. These tools shall be contained within one or more packages which remain with the mobile MTC.

3.9.5 Teardown

The mobile MTC shall be designed to enable completion of teardown and packing of equipment within six days.

3.9.6 Unpack/Install

The mobile MTC shall be designed to enable completion of unpacking, installation, and verification of equipment operation in ten days.

3.9.7 Interchangeability

The mobile MTC components shall be interchangeable with the Level C MTC components.

3.10 GROWTH AND SPARE

No changes this Section.

3.11 PHYSICAL CHARACTERISTICS

No changes this Section.

3.12 DESIGN AND CONSTRUCTION CONSTRAINTS

No changes this Section.

3.12.1 Materials

No changes this Section.

3.12.2 Nameplates and Product Markings

No changes this Section.

3.12.3 Workmanship

No changes this Section.

3.12.3.1 The materials and workmanship used in the mobile MTC shall reflect the requirement for frequent assembly and disassembly. Connectors shall be selected to withstand multiple connect/disconnect operations without failure. Framework and racks shall be braced to withstand shock associated with movement by the means specified in Paragraph 3.9.2. Where required, provisions for pinning, or strapping equipment, or otherwise securing assemblies for transport shall be provided. Lifting points and center of gravity shall be identified on each end item. The mobile MTC shall meet the physical, functional, and operational environment attributes for transportation assets of the Defense Transportation System as well as for commercial transportation.

3.12.4 Interchangeability

No changes this Section.

3.12.5 Human Engineering

No changes this Section.

3.13 Y2K COMPLIANCE

No changes this Section.

4.0 QUALIFICATION PROVISIONS

4.1 GENERAL

No changes this Section.

4.1.1 Contractor-Conducted Tests

No changes this Section.

4.1.2 Methods of Verification

Quality assurance requirements for the MTC shall be in accordance with the quality requirements as defined in this specification. Table 4-1 provides a Verification Cross-Reference Index (VCRI) between the system requirements and the verification methods.

Verification shall be accomplished by the methods defined below:

a. Not Applicable – This column shall be used if the particular paragraph cannot be verified.
b. Compliance – This column shall be used for paragraphs in which the Contractor shall inform the Government via a letter that the Contractor has complied with the requirements. This letter shall be delivered to the Government at the SVT Test Readiness Review (TRR).
c. Inspection – Inspection shall consist of the physical verification that a specification requirement is met by the comparison of that requirement to the documentation. The inspection shall be checked by QA and validated at physical configuration audit (PCA).

d. Analysis – Analysis shall consist of the verification that a specification requirement is met by a technical evaluation of equations, charts, data reduction, and/or representative data. When analysis has been produced by engineering on a given subject it shall be presented to the configuration management function and collected for the functional configuration audit (FCA). This shall occur prior to the completion of hardware/software integration (HSI).

e. Demonstration – Demonstration is defined as an un-instrumented test where success is determined by observation alone. Included in this category are tests that verify the accomplishment of a system requirement by the presentation of a physical object or capability. Demonstration procedures shall be documented in the Acceptance Test Procedures (ATPs). Demonstration shall be accomplished by the test team using ATPs during SVT.

f. Test – Test shall consist of the verification of specification requirements by exercising applicable portions of the simulation system, under a set of defined conditions and procedures, which produce an expected response for a known set of stimuli. Test procedures shall be documented in the ATPs. Test shall be conducted by the test team using ATPs during SVT.

Table 4-1. Verification Cross-Reference Index

NA – Not Applicable	*2 – Inspection*	*4 – Demonstration*			
1 – Compliance	*3 – Analysis*	*5 – Test*			
System Specification Reqt / Para. No.	**Verification Method**				
	NA	*1*	*2*	*3*	*4*	*5*
3.0 Simulation Service Performance Requirements	X					
3.1 Verification of Simulation Service Definition	X					
3.1.2 Verification of Simulation Service Levels		X				
3.1.2.3 Verification of Simulation Service Level C			X			
3.2 Verification of General Performance Requirements	X					
3.3 Verification of Simulation Service Elements	X					
3.3.2 Visual Systems	X					
3.3.2.1 Visual System Characteristics						X
3.3.2.3 Level C Visual System						X
3.4 Verification of DMT Connectivity	X					
3.4.1 DMT Networking					X	
3.5 Verification of Facilities	X					
3.6 Verification of Availability	X					
3.6.3 Level C Availability Accounting			X			
3.6.6 Verification of Mobile MTC Non-Availability			X			
3.7 Verification of Environment, Safety and Health			X			
3.8 Verification of Security			X			
3.9 Verification of ANG Mobility/Transportability	X					
3.9.1 Verification of Mobility				X		
3.9.2 Verification of Transportation				X		
3.9.2.1 Verification of Air Transportation				X		
3.9.2.2 Verification of Highway Transportation				X		
3.9.2.3 Verification of Rail Transportation				X		
3.9.3 Verification of Packaging			X			
3.9.4 Verification of Packaging Tools			X			
3.9.5 Verification of Teardown				X		
3.9.6 Verification of Unpack/Install				X		
3.9.7 Verification of Interchangeability			X			
3.10 Verification of Growth and Spare	X					
3.11 Verification of Physical Characteristics	X					
3.12 Verification of Design and Construction Constraints	X					
3.12.3 Verification of Workmanship			X			
3.13 Verification of Y2K Compliance	X					

5.0 REQUIREMENTS TRACEABILITY

No changes this Section.

Appendix A

Pilot Training Task List (TTL)

No changes this Section.

WARNING – This appendix contains technical data whose export is restricted by the Arms Export Control Act (Title 22, U.S.C. SEC 2751, et seq.) or the Export Administration Act of 1979, as amended, Title 50, U.S.C., App 2401 et seq. Violations of these export laws are subject to severe criminal penalties. Disseminate in accordance with provisions of DoD Directive 5230.25.

Appendix B

RESERVED

Appendix C

Cockpit Component Requirement Matrix

No changes this Section.

WARNING – This appendix contains technical data whose export is restricted by the Arms Export Control Act (Title 22, U.S.C. SEC 2751, et seq.) or the Export Administration Act of 1979, as amended, Title 50, U.S.C., App 2401 et seq. Violations of these export laws are subject to severe criminal penalties. Disseminate in accordance with provisions of DoD Directive 5230.25.

Appendix D

Threat And Entity List

No changes this Section.

WARNING – This appendix contains technical data whose export is restricted by the Arms Export Control Act (Title 22, U.S.C. SEC 2751, et seq.) or the Export Administration Act of 1979, as amended, Title 50, U.S.C., App 2401 et seq. Violations of these export laws are subject to severe criminal penalties. Disseminate in accordance with provisions of DoD Directive 5230.25.

Appendix E

Emergency Procedures And Malfunctions

No changes this Section.

WARNING – This appendix contains technical data whose export is restricted by the Arms Export Control Act (Title 22, U.S.C. SEC 2751, et seq.) or the Export Administration Act of 1979, as amended, Title 50, U.S.C., App 2401 et seq. Violations of these export laws are subject to severe criminal penalties. Disseminate in accordance with provisions of DoD Directive 5230.25.

Appendix F

Acronyms And Abbreviations

No changes this Section.

WARNING – This appendix contains technical data whose export is restricted by the Arms Export Control Act (Title 22, U.S.C. SEC 2751, et seq.) or the Export Administration Act of 1979, as amended, Title 50, U.S.C., App 2401 et seq. Violations of these export laws are subject to severe criminal penalties. Disseminate in accordance with provisions of DoD Directive 5230.25.

STATEMENT OF WORK
(SOW)

SOW

63

STATEMENT OF WORK

for the
F-16 Mission Training Center

28 April 1999

Contract No.:	F33657-99-D-2025
Revision:	
Date:	28 Apr 1999

Table of Contents

STATEMENT OF WORK 1

1.0 INTRODUCTION 4

1.1 SCOPE 4
1.1.1 Simulation Services Definitions 4
1.1.2 General Performance Requirements 5
1.1.3 Simulation Service Operating Location 5
1.2 MTC TRAINING CAPABILITY REQUIREMENTS ANALYSIS 5
1.2.1 Training Mission Objective/MTC Analysis Update 6
1.2.2 MTC Mission Scenarios 6
1.2.3 MTC Training Catalog 6
1.2.4 MTC Formative Evaluation 6
1.2.5 MTC Summative Evaluation 6

2.0 APPLICABLE DOCUMENTS 7

2.1 COMPLIANCE DOCUMENTS 7
2.1.1 Government Documents 7
2.1.2 Non-Government Documents 7
2.2 DATA ACCESSION LIST (DAL) 7

3.0 CONTRACTOR REQUIREMENTS 8

3.0.1 SIMULATION SERVICE ELEMENTS 8
3.0.1.1 Simulation System Ownership 8
3.0.1.2 Subsystem Acquisition 8
3.0.2 SYSTEM ENGINEERING 8
3.0.3 HARDWARE ENGINEERING 9
3.0.4 SOFTWARE ENGINEERING 9
3.0.5 SYSTEM INTEGRATION AND TESTING 10
3.0.5.1 Hardware Installation and Checkout 10
3.0.5.2 Software Installation and Checkout 10
3.0.5.3 Hardware/Software Integration (HSI) 10
3.0.5.4 System Verification Tests (SVT) and Verification Review 11
3.0.5.5 Training Capability Assessment (TCA) 11
3.0.5.6 Sensor Databases 11
3.0.6 TRAINING CAPABILITIES REQUIREMENTS ASSESSMENT 12
3.1 PROGRAM MANAGEMENT 12
3.1.1 Program Management Reviews 12
3.1.2 Configuration and Baseline Management 12
3.1.3 Integrated Master Plan 12
3.1.4 Integrated Master Schedule 13
3.2 DMT O&I CONTRACTOR INTERFACE 14
3.2.1 O&I Working Groups 14
3.2.2 O&I Integrated Product Team Membership 14
3.2.3 Compliance to DMT Interoperability Standards 14
3.2.4 ACAs with Other DMT Federation Contractors 14
3.3 FEDERATION AND SIMULATION OBJECT MODELS 14
3.3.1 Simulation Object Model Development Process 14
3.3.2 Federation Object Model Development Process 15
3.3.3 F-16 DMT SOM Coordination with DMT O&I Contractor 15
3.3.4 First DMT Federation 15
3.4 CONCURRENCY 15

3.4.1 Aircraft Concurrency *15*
3.4.2 Training on Required Aircraft Configuration *15*
3.4.3 Verification of Concurrency Modification *16*
3.5 TECHNOLOGY INSERTION 16
3.5.1 Training Technology Insertion Board (TTIB) *16*
3.5.2 Upgrade Evaluation and Verification *16*
3.5.3 Technology Insertion Roadmap *17*
3.6 FACILITY SERVICES 17
3.7 SITE SURVEYS 17
3.7.1 Quick-Look Site Surveys *17*
3.7.2 Site-Specific Survey *18*
3.7.3 Pre-installation Site Survey *18*
3.7.4 Facilities Modification Review *18*
3.8 SECURITY 18
3.8.1 Program Security *18*
3.8.2 Program Protection Plan *19*
3.8.3 Technology Control/Assessment Plan *19*
3.8.4 Automated Information Systems Management *20*
3.9 F-16 MTC SERVICE SUPPORT TASKS 20
3.9.1 Site Activation *20*
3.9.2 System Simulation and MTC Support *20*
3.9.3 Technical Assistance *22*
3.9.4 Government Instructor Training *22*
3.9.5 Contingency Databases *22*
3.9.6 Simulator Certification *22*
3.9.7 Support for Systems Evaluation *23*

4.0 ASSESSMENTS, EVALUATIONS, AND CERTIFICATION 23

4.1 SUPPORT FOR ASSESSMENTS 23
4.2 VALIDATION OF THREATS AND WEAPON MODELS 23
4.3 TRAINING CAPABILITY ASSESSMENT (TCA) 23
4.4 SIMULATION CERTIFICATION 23

APPENDIX A - F-16 ROADMAPS 24

1.0 INTRODUCTION

This Statement of Work (SOW) describes the efforts to be performed by the Contractor on the F-16 Mission Training Center (MTC) program. The Contractor shall plan and perform all the efforts necessary to provide simulation training services at the United States Air Force (USAF) designated F-16 Block 50 and 40 mission training sites. This SOW is based on the SOO and SCRD and includes the derived tasks based on the Contractor's proposed approach to implementing the program.

1.1 Scope

This SOW encompasses all the efforts required for the Contractor to provide F-16 Block 40/42/50/52 system simulation and mission training services at the Mission Training Centers (MTCs) for USAF F-16 active duty and Air National Guard (ANG) pilots. The SOW delineates the tasks necessary to achieve the objectives of the F-16 MTC program throughout the life of the contract. The Contractor shall own, maintain, and keep the system simulations concurrent with the F-16 fleet. The Contractor shall incorporate new technologies into the service at appropriate times during the period of performance. System simulations shall provide Level A (individual), Level B (team), or Level C (intra-team) distributed mission training capabilities. The Contractor shall work with the DMT Operations & Integration (O&I) contractor and other DMT site contractors to ensure full interoperability when the F-16 system simulations interact realistically with other DMT players.

1.1.1 Simulation Services Definitions

The Contractor shall provide simulation training services for the Combat Air Forces' (CAF) F-16 Block 40/42/50/52 system simulations and MTCs. In this document, the terms Block 40 and Block 50 refer to F-16 Block 40/42/50/52. System simulation refers to an F-16 Block 40 or 50 training device that is capable of training the level appropriate F-16 Training Task List (TTL). MTC refers to a training capability that contains two to four system simulations and their associated instructor operator stations (IOS), threat stations, modular control equipment workstation, and a brief/debrief (B/DB) system. MTC is also referred to as a Level C simulation service. Distributed Mission Training (DMT) refers to physically separated and networked simulation services. The F-16 system simulations and MTCs shall be part of a larger DMT system that integrates other similar and dissimilar system simulations.

1.1.1.1 Simulation Service Overview

The Contractor shall provide F-16 Block 40 and 50 simulation services to operate fully in the USAF DMT network. Simulation service elements shall meet interoperability standards established by industry and the USAF through the DMT O&I contractor. The system simulations shall be capable of training all aircraft missions and procedures as specified in the F-16 TTL for the simulation's designated level of service. Training tasks include, but are not limited to, emergency procedures, initial qualification training, weapons and tactics training, and mission qualification training. The system simulations shall also provide the capability to perform system upgrade training, advanced skills training (i.e., flight lead, instructor pilot, mission commander, etc.), tactics validation, operational test and evaluation, mission rehearsal, and exercise support.

1.1.1.2 Simulation Service Levels

The Contractor shall provide simulation services at three levels of capability as directed by the

Procuring Contracting Officer (PCO). These three levels are defined in Attachment 2 to this contract.

1.1.1.3 Simulation Service Level Upgrades

The Contractor shall provide the Level A and Level B simulation systems with the capability of being upgraded to any higher service level.

1.1.2 General Performance Requirements

1.1.2.1 F-16 Missions and Operations

The Contractor shall provide system simulations, which provide the capability to train all of the F-16 threshold missions as defined in Attachment 2 of the contract.

The system simulations shall, after technology insertion, provide the capability to train all the objective missions as defined in Attachment 2 of the contract.

Missions shall follow guidance given in MCI 11-F16, Vol. 5, F-16 Combat Aircraft Fundamentals, and the corresponding unit Designed Operation Capability (DOC) Statement.

1.1.2.2 F-16 Training Tasks

The system simulations shall provide the capability to train F-16 TTL tasks for the threshold missions. The system simulations shall provide the capability to train F-16 TTL tasks for the objective missions after the respective simulation system elements have undergone technology insertion. Subsequent references to the TTL in this document refer to tasks necessary to accomplish threshold missions.

1.1.3 Simulation Service Operating Location

The Contractor shall provide F-16 MTC simulation services at each site activated at the direction of the PCO. The F-16 MTC sites, anticipated activation date, level of service and number of cockpits are provided in Attachment 8, Simulation Service Requirements and Schedule.

1.2 MTC Training Capability Requirements Analysis

The Contractor shall confirm the MTC training task list (TTL) with ACC. The Contractor shall define the core typical mission training profiles and scenarios from the training descriptions provided. Training activities shall include Mission Qualification Training (MQT), Two/Four-Ship Flight Lead Upgrade (2/4FLUG), Instructor Pilot Upgrade (IPUG), Mission Commander Upgrade, and Continuation Training.

Preliminary objectives shall be derived for future Air Expeditionary Force (AEF) Preparation and Mission Rehearsal. The confirmed missions to be trained in the MTC shall include:

a. Defensive Counter Air (DCA) (2vX and 4vX, both within and beyond visual range)
b. Offensive Counter Air (OCA)
c. Suppression of Enemy Air Defenses (SEAD)
d. Low Altitude Navigation and Targeting Infrared for Night (LANTIRN)
e. Medium Altitude Operations
f. Tactics
g. Air Interdiction (AI)
h. Weather Approach Procedures

i. Emergency Procedures
j. Basic Fighter Maneuvers (BFM)
k. Air Combat Maneuvering (ACM)
l. Close Air Support (CAS)
m. Killer Scout
n. Combat Search and Rescue (CSAR)
o. NVG Operations
p. Nuclear Operations

1.2.1 Training Mission Objective/MTC Analysis Update

The Contractor shall update the Training Mission Objective/MTC Analysis. The training objective shall be identified for each training mission confirmed for the MTC. For each mission training event, the training goal, condition, and performance standard shall be established. MTC training strategies which capitalize on the MTC training capabilities and enhance individual and team training shall be selected. The hierarchy of MTC training objectives shall follow a building block approach to training.

1.2.2 MTC Mission Scenarios

A core set of MTC mission scenarios for test shall be written that are confirmed by ACC as representative of the missions to be trained in the MTC and the TTL. The mission scenarios shall be set in real-world situations to which pilots may be assigned. Assessment criteria shall be organized in conjunction with ACC in a grade sheet to be used as an assessment tool for determining when designed mission objectives have been achieved. Mission materials shall be prepared for each core mission scenario.

1.2.3 MTC Training Catalog

The Contractor shall maintain an MTC Training Catalog. The Catalog shall be a summary of training missions and other individual and team training activities outlined for accomplishment in the MTC. These activities shall cover the training capability of the MTC. During system level formative evaluation, the training capability assessment will confirm the training activities listed in the MTC Training Catalog. Summative evaluation, including SIMCERT, will lead to accreditation of the training activities to be listed in the MTC Training Catalog.

1.2.4 MTC Formative Evaluation

The Contractor shall conduct formative evaluation of the first MTC. Activities shall include Training Capability Requirements Assessments (TCRA1, TCRA2, TCRA3) and Training Capability Assessment (TCA). Activities during formative evaluation shall confirm that all MTC training requirements are documented, properly allocated, and satisfied by the simulation services design. The related integration and test approach shall validate that the simulation services achieve the full performance capability for meeting the training requirements.

1.2.5 MTC Summative Evaluation

The Contractor shall conduct summative evaluation of the first MTC. The Contractor shall support system evaluations on each simulation service location for a period of three months. At the conclusion of this period at each location, the Training System Readiness Review (TSRR) shall confirm the MTC Training Catalog for the given site.

2.0 APPLICABLE DOCUMENTS

The following documents of the exact issue shown form a part of this SOW only to the extent specified herein. In the event of conflict between the documents referenced herein and the contents of this SOW, the SOW shall be considered the superseding requirement, with the exception that the most stringent security requirement shall apply until clarification is received.

2.1 Compliance Documents

Documents listed are directly referenced in the main body of this SOW.

2.1.1 Government Documents

AFOSH Standards
Air Force Policy Directive 33-2
Air Force System Security Instruction 5102
Air Force System Security Instruction 5024
Air Force System Security Instruction 5027
DoD 5220.22-M, National Industrial Security Program Operating Manual (NISPOM), 1 Jan 95
DoD Directive 2040.2, International Transfer of Technology, Goods, Services, and Munitions, 17 Jan 84
DoD Directive 5200.1, DoD Information Security Program, 17 Jun 97
DoD Directive 5200.28, Security Requirements for Automated Information Systems, 21 Mar 88
DoD Directive 5200.39, Security, Intelligence, and Counterintelligence Support to Acquisition Program Protection, 10 Sep 97
DoD Directive 5230.24, Distribution Statements on Technical Documents, 18 Mar 87
DoD Directive 5230.25, Withholding Unclassified Technical Data from Public Release, 6 Nov 84
DoD Manual 5200.1, Acquisition Systems Protection Program, 16 Mar 94
TSPG CPI List, 15 Apr 98
TSPG Program Protection Plan, 15 Feb 96

2.1.2 Non-Government Documents

3483S1000	Performance Specification
EIA/IS-649	National Consensus Standards for Configuration Management, October 1995
MIL-STD-973	Configuration Management, Commercial Standards

2.2 Data Accession List (DAL)

The F-16 simulation service Contractor shall establish and maintain a Data Accession List (DAL). The DAL and the data included on the list shall be available to authorized Government personnel for reference. The list shall include the identification number, title and in-house release date of internally generated program data as a minimum, e.g., drawings, specifications, trade studies, test reports, meeting agendas, schedules, subcontract data, etc. It shall be maintained by the SEIT Data Management and shall be kept current. Requests for data shall be processed through the SEIT Data Manager. The DAL shall be available for viewing on the F-16 MTC website.

3.0 CONTRACTOR REQUIREMENTS

The Contractor shall produce, test, and deliver F-16 Block 40/42/50/52 system simulations and MTCs in accordance with the Government-approved F-16 MTC Performance Specification, Document No. 3483S1000.

3.0.1 Simulation Service Elements

The simulation system shall include the following simulation service elements: Ownship simulation, Visual Systems, Synthetic Environment, Threat Stations, Modular Control Equipment (MCE) workstations, Instructor Operator Stations (IOS), Brief/Debrief (B/DB) Systems, and DMT Connectivity. Simulation systems installed at the USAF designated facilities shall be comprised of some or all of the simulation service elements as defined in the referenced performance specification for the specific Level (A, B or C) of training service. The specific configurations to be installed at a particular site will be defined at the time the service task order is issued. The anticipated simulation service by site is provided in Attachment 8.

3.0.1.1 Simulation System Ownership

The Contractor shall own, maintain, and provide the system simulation with greater than 95% availability in meeting USAF training requirements. Each system simulation shall be maintained in a configuration which is concurrent with the home station aircraft at each location where a system simulation is deployed. All system simulations and MTCs shall be interoperable over a DMT-compliant network.

3.0.1.2 Subsystem Acquisition

The system simulation shall be comprised, to the largest extent possible, of commercial off-the-shelf (COTS) subsystems and major components. The use of COTS components and non-developmental items (NDI) shall serve the purpose of minimizing development risks. The Contractor shall identify and acquire subsystems and major components of the system simulations in accordance with Contractor-prepared plans for subsystems acquisition and subcontract management.

3.0.2 System Engineering

The Contractor shall perform system engineering tasks to ensure proper implementation and verification of the requirements contained in the performance specification. The Contractor's ISO 9001 certified processes shall be followed to accomplish the following:

- System engineering
- System design and development
- Specialty engineering integration
- System integration and testing
- Requirements verification
- Technical reviews and meetings
- Configuration management
- Data Management
- Risk Management

Additionally, the Contractor shall maintain approved processes for the accomplishment of the following program-specific tasks:

- Acquisition and management of data for aircraft concurrency, weapon systems, and synthetic environment
- Attaining compliance with O&I standards
- Technical and business implementation of the Training Technology Insertion Board and the Technology Insertion Plan
- Preparation of new software and reuse of existing software to meet performance specification requirements
- Verification that all performance specification requirements are met, including Contractor-conducted verifications and support of Government-conducted verifications, evaluations and certifications
- Provide the database generation capability to create contingency databases

3.0.3 Hardware Engineering

The Contractor shall perform all activities and tasks necessary to develop, integrate, test, and document the hardware subsystems, components, and assemblies which comprise the system simulations. These activities and tasks shall produce the following:

- Material Purchase Specifications/Procurement Requests
- Subsystem/Component Specifications
- Source Control/Vendor Item Drawings
- Interface Design Documents
- Bills of Materials
- Installation Drawings
- Site Requirement Reports
- Subsystem Test Procedures
- Operations and Maintenance Manuals

3.0.4 Software Engineering

The Contractor shall perform all software engineering activities and tasks in accordance with the Contractor's approved processes and software engineering guidelines. Software development, integration, testing, and verification shall be performed in accordance with the Contractor's Software Development Plan (SDP), which the Contractor shall prepare and approve specifically for the F-16 MTC Program. The SDP shall identify all activities and tasks for:

- Software development (new software)
- Software rehost (existing software)/production of CSCs and CSCIs
- Software integration and testing (of real-time load builds)

Software engineering tasks shall be scheduled in the IMS and shall include the following:

- Modifications/update of existing software documentation
- Software rehost and modification
- CSU code and unit testing
- CSC and CSCI builds
- CSC-CSC interface(s) verification
- I/O handler verification
- CSCI-CSCI interface(s) verification
- Software architecture verification
- Database(s) integration

- Real-time load builds
- Computer resource utilization and timing analysis
- Subsystem test procedures/requirements verification

3.0.5 System Integration and Testing

The Contractor shall conduct an integration and test program that verifies that the F-16 MTC simulation service meets the specified system/subsystem requirements. System Integration and Test shall be depicted in the Contractor's Integrated Master Plan (IMP) and Integrated Master Schedule (IMS). The Contractor shall chair Test Planning Working Group (TPWG) meetings, which resolve such matters as test schedules, planning, coordination, and Acceptance Test Procedure (ATP) changes. The Contractor shall prepare ATPs to verify the F-16 MTC trainer's compliance with the requirements of the System Specifications. A test log shall be maintained at each trainer to record all test activities and shall be available for review by the customer. Test Discrepancies (TDs) shall be written for any hardware, software or system anomaly. The Contractor shall maintain an automated TD tracking system.

The Contractor shall provide familiarization training to Government personnel sufficient to operate the simulation system and associated equipment. The Contractor shall provide office space, telephone access, facsimile, etc., for the Government while in-plant testing is being conducted. The Contractor shall conduct Test Readiness Reviews (TRRs) prior to the proposed start of hardware software integration system verification test (SVT), and system performance evaluation (SPE) to review and verify each F-16 MTC is ready to commence the applicable test.

3.0.5.1 Hardware Installation and Checkout

F-16 MTC hardware subsystem shall be initially installed at the Contractor's facility and systematically checked until all subsystems have been thoroughly inspected, tested, and verified to be in compliance with all applicable specifications.

3.0.5.2 Software Installation and Checkout

F-16 MTC software subsystem computer software components (CSCs) and computer software configuration items (CSCIs) shall be installed at the Contractor's facility and systematically checked until all subsystems have been thoroughly inspected, tested, and verified to be in compliance with all applicable specifications. During the checkout of the CSCIs, all elements of the software architecture shall be integrated and tested in a logical sequence to ensure that a real-time system load can be built and run on the host computer system with no failures or abnormal halts. The Contractor shall conduct an F-16 MTC software load warm start for the first build to verify the process can produce usable loads from all source media during the Integration and Test phase.

3.0.5.3 Hardware/Software Integration (HSI)

The Contractor shall perform HSI to integrate each tested subsystem and real-time software subsystem into a functional F-16 MTC system that reflects the performance of the F-16 Block 40 and 50 aircraft. HSI shall be performed at the Contractor's facility for the first F-16 MTC system. HSI for subsequent systems will be performed at the site at which the system will reside. The Contractor shall prepare an HSI Integration Plan which describes the coordinated sequence of events in which each F-16 MTC subsystem is integrated into a total system in a logical building-block approach.

3.0.5.4 System Verification Tests (SVT) and Verification Review

The Contractor shall conduct both quantitative and qualitative performance testing in the form of SVT and System Performance Evaluation (SPE).

3.0.5.4.1 System Verification Test

The SVT shall be accomplished by conducting all tests contained in the ATPs that are generated to verify compliance with the requirements of the Performance Specification. Tests shall include all applicable inspections, analyses, demonstrations, and tests as described in Section 4.0 of the applicable F-16 MTC Performance Specification. SVT testing shall be conducted at the Contractor facility using the ATPs. The Contractor shall conduct a short functional test period at the end of the SVT to obtain an early operational assessment of the capability of the F-16 MTC to provide the training required to meet TTL requirements. Government personnel are invited and encouraged to witness the test procedures.

3.0.5.4.2 System Performance Evaluation (SPE)

Upon completion of the SVT, the Contractor shall conduct an SPE to verify that the F-16 MTC System can perform mission training as specified in the TTL. At the conclusion of SVT and SPE, the Contractor shall prepare and submit for review by the Customer an Acceptance Test Report that describes in full detail the results of the acceptance test.

3.0.5.4.3 System Verification Review (SVR)

The Contractor shall support a joint Government/Contractor system verification review to ensure that all performance requirements have been met prior to the start of SIMCERT.

3.0.5.5 Training Capability Assessment (TCA)

The Contractor shall support a TCA to be conducted by the USAF. The TCA shall consist of hardware and software testing and Operational Aircrew Evaluation. Upon satisfactory completion of the in-plant TCA testing, a Contractor assessment will be made to authorize shipment of the F-16 MTC to its designated destination. If the ready-to-ship assessment determines that the F-16 MTC device has not completed the TCA satisfactorily, it shall remain in plant until the discrepancies are corrected and the TCA can be completed. The Contractor shall be responsible for the shipment, installation, and setup of the F-16 MTC at each site. Informal Test Progress Reports will be prepared and provided at each SVT and SPE daily briefing. They will include ATP tests run, TDs written, status of each TD (in-work, ready for recheck, rejected, and closed), scheduled hours used, and trainer availability needed to perform the testing.

3.0.5.6 Sensor Databases

The Contractor shall provide geospecific topographic cultural databases in support of visual, sensor, and weapons simulation sufficient for pilots to perform target identification tasks as required by the F-16 TTL. The Contractor shall provide interoperable and correlated terrain cultural models in compliance with DMT O&I standards. The simulation service Contractor shall provide: two separate 57,600 square nautical mile (snm) geospecific databases of two separate combat theaters, one 57,600 snm geospecific database of the "Red Flag" gaming area, and as a minimum, one 43,200 snm geospecific database corresponding to the geographic location of the ordered service. For each new service location ordered, the simulation service Contractor shall provide at least one 43,200 snm geospecific database of the local area and a 57,600 snm geospecific da-

tabase for an additional combat theater. All databases created shall be available to all F-16 Block 40 and 50 locations to support DMT operations.

3.0.6 Training Capabilities Requirements Assessment

The Contractor shall conduct Training Capabilities Requirements Assessments (TCRA) to trace the training capabilities of the F-16 MTC back to the TTL. The TCRAs shall be conducted to the level necessary to ensure that the F-16 MTC can be integrated into the F-16 training syllabus. Additional TCRAs shall be conducted as part of Concurrency and Technology Insertion Upgrades. TCRA results shall be documented in a TCRA Report and updated each time a TCRA is conducted. The TCRA Report shall be listed on the DAL and available for review by authorized Government personnel.

3.1 Program Management

The Contractor shall apply appropriate program management processes and procedures to meet the contractual requirements of this program. These efforts shall include internal Contract Work Breakdown Structure (CWBS), Earned Value Management Systems, IMP, IMS, configuration and baseline management, and subsystem acquisition management.

3.1.1 Program Management Reviews

The F-16 MTC program is a fee-for-service program and as such no formal program management reviews are required. However, the pre-installation activities are defined in the IMP and scheduled per the IMS. These activities are being executed in an Integrated Product Team (IPT) environment. The Government is invited to attend all IPTs and all program and design reviews. Program status relative to the IMP and IMS will be reviewed at all major IMP milestones.

3.1.2 Configuration and Baseline Management

The Contractor shall implement and maintain a program for configuration item (CI) identification and control to ensure adequate configuration identification, control, and status accounting of all hardware and software, including vendor equipment, for the life cycle of the system. All F-16 MTC training assets have been defined into baseline configurations and shall be controlled using the Contractor's documented configuration management processes.

3.1.3 Integrated Master Plan

The Contractor shall develop and maintain an IMP to manage all aspects of the F-16 MTC program. The IMP shall clearly identify important program events that are critical to the successful execution of the program. Each event shall include accomplishments and appropriate measurable criteria to clearly establish whether the event has been successfully met. Each event will have associated entrance criteria to establish when the event begins and exit criteria that must be satisfied to successfully complete the event. The IMP shall consist of two sections:

a. Section 1: Introduction. The Contractor shall include any assumptions and guidelines for application of the IMP. This section shall include a dictionary that contains definitions of the selected services and terms used in the accomplishment criteria in Section 2 of the IMP. The Contractor shall also include a description of the purpose, expected results and entrance and exit criteria for each event in Section 2.

b. Section 2: Events/Accomplishments/Criteria. The Contractor shall define events, accomplishments, and entrance/exit criteria.

3.1.4 Integrated Master Schedule

The Contractor shall develop and maintain an IMS that shows the tasks to be accomplished to satisfy the IMP criteria and meet the events. The IMS shall incorporate all program plans to upgrade the performance of system elements, integrate new and legacy software, key performance evaluations, MTC integration, test and verification concurrency and technology insertion updates.

The IMS shall contain sufficient detailed provide understanding of the program tasks and activities. The IMS shall:

a. Show task interdependencies by identifying the task sequencing relationships and the duration of all tasks. Indicate the critical path for the most likely duration of the IMS. Provide the ground rules and assumptions used in estimating task duration.
b. Use a single number system that correlates IMS tasks/activities to the SOW and IMP.
c. Be developed using the following calendar information: 8-hour workdays, 5 days per week, to include holidays and applicable company shutdowns.

The Contractor shall utilize an IMS in the management of the F-16 MTC program. The IMS shall be integrated with SOW and IMP and provide visibility into the criteria to meet the events. The IMS shall correlate with the program plans for subsystem acquisition, subsystem integration, system integration and test, initiation of service, etc. The IMS should show task interdependencies by showing the duration for each task and task sequencing relationships allowing for the identification of the critical path.

3.1.5 Subsystem Acquisition (or Subcontract) Management Supplier/ACA/Procurement

The Contractor shall utilize its documented internal processes and procedures to manage teammates, subcontractors and suppliers. These processes and procedures shall provide management visibility and control of subcontractors to ensure that each subcontractor meets the requirements of their subcontract. Significant activities at subcontractor, vendor, and supplier facilities shall be identified in the F-16 MTC Program IMP.

3.1.5.1 Subcontractor Program Management Reviews

The Contractor shall conduct subcontractor program management reviews and require subcontractor status reports periodically with key teammates and subcontractors. These reviews shall provide management insight to schedule status, accomplishments, staffing requirements, risk identification and resolution, and design criteria status. Program management reviews conducted with subcontractor and vendors shall include status against the IMS.

3.1.5.2 Subcontractor Production Readiness Reviews

The Contractor shall conduct subsystem production readiness reviews with subcontractors for major subsystems to ensure all subsystem requirements are properly allocated to each subcontractor subsystem and the subcontractors have a clear plan to deliver fully functional subsystems that meet the requirements.

3.1.5.3 Associate Contractor Agreements

The Contractor shall enter into Associate Contractor Agreements (ACAs) for any portion of the contract requiring joint participation in the accomplishment of the contract requirements. These

agreements shall include the basis for sharing information, data, technical knowledge, expertise and/or resources essential to the integration of the F-16 Block 40/50 MTC which shall ensure the greatest degree of cooperation for the development of the program to meet the terms of the contract. In addition to agreements with contractors providing hardware, software, and source data for use in the F-16 simulation system, the Contractor shall enter into an ACA with the DMT O&I contractor.

The Contractor shall assume total responsibility for acquiring data under any required ACA. In the event that an associate contractor requires validation of the need for data, the Contractor shall prepare a letter addressed to the appropriate Government agency identifying the specific data required for the F-16 MTC SPO to endorse and forward to that agency.

3.2 DMT O&I Contractor Interface

The Contractor shall establish an ACA with the DMT O&I contractor and participate in the establishment of standards to be used in the conduct of DMT exercises.

3.2.1 O&I Working Groups

The Contractor shall attend and be an active participant in DMT O&I working group meetings. The Contractor shall represent the F-16 MTC in the working group meetings and shall provide the means for the federation members to define the specific roles of the F-16 MTC systems in the exercise.

3.2.2 O&I Integrated Product Team Membership

The Contractor shall represent the F-16 MTC federate in the DMT IPT. The team will support the development of federation model(s) and the associated environment(s). This activity will take into account the design of the scenario(s), data sources, and the sponsor-generated exercise objectives.

3.2.3 Compliance to DMT Interoperability Standards

The Contractor shall comply with the DMT O&I interoperability standards and federation object models for individual DMT exercises. The Contractor shall support future development of the DMT interoperability standards as they apply to the F-16 MTC program.

3.2.4 ACAs with Other DMT Federation Contractors

The Contractor shall enter into ACAs with other contractors fielding services for federations in which the F-16 MTC will participate.

3.3 Federation and Simulation Object Models

3.3.1 Simulation Object Model Development Process

The Contractor shall develop Simulation Object Models (SOMs) for the F-16 MTC. The model shall describe the capabilities of the F-16 simulation system, identifying the system's public attributes, transferable attributes, and attributes that must be imported. The Contractor shall define the available HLA interactions.

3.3.2 Federation Object Model Development Process

The Contractor shall use the F-16 MTC SOMs along with the exercise scenario, exercise execution environment, and the sponsor objectives to support the development of the Federation Object Model (FOM).

3.3.3 F-16 DMT SOM Coordination with DMT O&I Contractor

The Contract shall support the O&I contractor in the development of the Federation Sponsor Objectives and the resulting scenarios and data sources. The Contractor shall use the F-16 MTC SOMs to support the development of a compliant FOM(s) and an execution object model.

3.3.4 First DMT Federation

The Contractor shall ensure that the F-16 MTC system simulation is a federate in the first planned DMT Federation, consisting of the F-15C MTC, AWACS MTC, and the F-16 MTC training system.

3.4 Concurrency

The Contractor shall maintain the F-16 MTC system simulations concurrent with the F-16 Block 40 and 50 home station aircraft as long as the F-16 MTC simulation services are provided by this contract. Concurrency modifications will be developed and incorporated into the F-16 MTC program as they are fielded in the aircraft at the F-16 MTC site. The near term roadmap is provided in Appendix A.

3.4.1 Aircraft Concurrency

The Contractor is the F-16 Aircraft Prime contractor and participates in the F-16 Aircraft Roadmap Change Process. The Contractor shall be an active member of the Configuration Update Working Group (CUWG) to participate in the F-16 strategic training planning process. The Contractor shall extend its ACA with the other F-16 aircraft weapon systems and avionics subcontractors to include use of their data for the F-16 MTC program. These ACAs shall provide access to design data not available from the aircraft prime for use on the F-16 MTC program. The Contractor shall also enter into an ACA with the DMT O&I contractor to maintain concurrency with HLA Federation Standards. The Contractor shall establish a working relationship with the appropriate Government agencies for threat data. The Contractor shall establish a working relationship with the appropriate Government agency for Joint Defense Imagery Systems JDIS imagery asset capability for databases and for coordination to use existing database assets from Interoperable Visuals/Sensors for ACC (IVACC), other known source data, or local base photography.

3.4.2 Training on Required Aircraft Configuration

The Contractor shall implement an F-16 MTC change process that ensures that concurrency upgrade changes functionally match the aircraft and provide the training capability required to support the overall F-16 training objectives. For F-16 MTC simulation systems installed prior to the aircraft change, the Contractor will develop the modification kit associated with the aircraft change and provide the kit to all activated F-16 MTC locations. The installation of each modification kit will be scheduled by the PCO base organization to coincide with the configuration of the aircraft at each site. As directed by the host base, concurrency changes will be installed no earlier than 60 and no later than 0 days prior to aircraft change IOC date on the individual bases. All concurrency changes developed prior to installation of a simulation system at a host base will

be incorporated as the baseline configuration for the installation, unless direction to not incorporate the change is received from the PCO. All data used to implement the service concurrency change shall be included on the DAL (DAL, Data Item A0001).

3.4.3 Verification of Concurrency Modification

The Contractor shall verify that each upgrade is installed correctly. The Contractor shall provide a verification test sufficient to verify that the change has been properly installed and meets the training object for the particular systems affected by the modification. The Contractor shall support the AF during the SIMCERT Evaluation period associated with the concurrency upgrade. The scheduling of the concurrency modification shall include time to conduct SIMCERT and meet the availability for training at each F-16 Block 40 and 50 home station no earlier that 60 days prior to, and no later than the implementation of the upgrade on the aircraft.

3.5 Technology Insertion

As part of a long-term simulation service performance improvement strategy, the Contractor shall maintain an F-16 MTC system Technology Insertion Program, which will introduce new or enhanced capabilities that are required to meet the user training objectives. The implementation of the Technology Insertion program shall be as described below.

3.5.1 Training Technology Insertion Board (TTIB)

The Contractor shall chair the F-16 MTC Training Technology Insertion Board (TTIB) comprised of Contractor and Government personnel. The TTIB shall develop and maintain a prioritized list of candidate technology insertion efforts. Candidate technologies for inclusion on the list may be identified by Contractor or Government organizations. The Contractor shall support the TTIB in evaluating candidate technologies by analyzing system requirements; collecting relevant technical, cost, and schedule data; evaluating the training effectiveness; and performing risk analysis. The Contractor shall analyze and evaluate new technologies as to their training effectiveness against the TTL and make a recommendation to the TTIB. Recommendations shall include the projected benefits of incorporating the candidate technology, the level of effort required to develop and install the resulting modification kits, and the appropriate timing of the incorporation of the new technology. The TTIB shall approve new technologies for insertion and monitor the Contractor's insertion process to ensure that new training objectives are met.

3.5.2 Upgrade Evaluation and Verification

3.5.2.1 Upgrade Evaluation

The Contractor shall incorporate technologies that enhance training capabilities into the service based upon the recommendations of the TTIB. The Contractor shall establish an annual budget for conducting technology evaluations. The Contractor shall conduct the TTIB requested technology evaluations until the Contractor has expended all the funds in the annual budget. As additional sites are added, additional budgets per site and service level shall be established. Technology evaluation efforts may be accomplished at Shaw AFB MTC on a non-interference with training basis.

3.5.2.2 Verification of Technology Insertion Modifications

The Contractor shall conduct an incremental TCRA during the installation of modifications for technology insertion and document the results. The Contractor shall incorporate the new technology once the TTIB approval is given. A technology insertion, once approved by the TTIB,

becomes the baseline for future F-16 MTC installations. For simulations systems already installed at a USAF facility, modification kits will be developed for retrofitting new technologies into the fielded systems. The Contractor shall verify that each new technology upgrade is installed correctly and shall provide a verification test sufficient to verify that the modification has been installed properly without adversely affecting the performance of other components of the simulation system. The Contractor shall support the USAF in the conduct of any SIMCERT Evaluation associated with the installation of any technology insertion modification. All data used to implement the service technology change shall be included on the DAL (DAL, Data Item A0001).

3.5.3 Technology Insertion Roadmap

The Contractor shall develop and maintain an F-16 MTC system integrated Technology Insertion Roadmap which documents the planned new or enhanced capabilities required to meet user training objectives.

3.6 Facility Services

The government will provide all building facilities for the F-16 MTC, including heating, air conditioning and humidity control; electrical connection and power; and standard telephone lines. The Contractor shall exercise proper diligence to ensure that through action or negligence, the Government-provided facilities are not subject to any abuse, damage or excessive wear other than that encountered during normal use. The Contractor shall comply with the requirements of Contract clause A-12 5352.245-9004 Base Support (July 1997) and conduct an initial assessment of Government-provided facilities and identify deficiencies to the Government. The Contractor shall provide its own additional communication services, power conditioning, janitorial service, and any material, equipment and services required to provide the simulation service.

3.7 Site Surveys

The Contractor shall conduct site surveys at each F-16 MTC location. These surveys shall include: a "quick-look" survey, detail facility modification surveys, periodic modification progress reviews, facilities modification acceptance reviews, and pre-installation reviews.

3.7.1 Quick-Look Site Surveys

After receipt of the initial delivery order, the Contractor shall conduct a "quick-look" review of each potential F-16 MTC site identified in Attachment 8, Simulation Service Requirements and Schedule. The Contractor shall visit each location in accordance with prior coordination through the PCO, ACC and location host command. During the visit, the Contractor shall assess the adequacy of the buildings as they exist and as the local site officials plan to modify them between the quick-look and the date planned for the commencement of training services at that site. The assessment shall include a review of the adequacy of available utilities (power, heating air conditioning and humidity control) and the adequacy of the space, overhead clearance, security features, floor loading and passageways. The report delivered following the review shall address each site and provide, at a minimum, the Contractor's preliminary assessment of potential Government support needs at each site and a projection of facility alterations that may be required. In addition, the report shall also identify preliminary Contractor plans for accommodating any unique site conditions identified during the review.

3.7.2 Site-Specific Survey

After receipt of a specific task order to conduct the site survey at a specified location, the Contractor shall conduct a detailed site survey. The Contractor shall work with Government civil engineering personnel in an IPT environment to identify facilities deficiencies. A Site Requirement Report, including all identified deficiencies, recommended corrective actions, and a preliminary equipment installation drawing, shall be issued.

3.7.3 Pre-installation Site Survey

The Contractor shall perform a pre-installation site survey prior to installing any equipment at the F-16 MTC locations. The objective of the pre-installation site survey is to verify that identified facilities modifications have been successfully accomplished. This survey will also result in a detail site activation plan, which includes consideration for prevention of damage to existing Government buildings, equipment, roadways, and vegetation. If a particular installation cannot be accomplished without damaging any existing Government asset, the plan shall include the repair or replacement of those assets as part of the installation actions.

3.7.4 Facilities Modification Review

If the Government deems it necessary, the Contractor shall assist the Government in making the facilities modifications. The level of assistance required shall be defined by the PCO in a separate contract action. The assistance may include developing architectural and structural drawings, site plans, electrical and mechanical drawings, HVAC specifications, contractor qualification and selection, and participation in 35%, 65%, 95%, and 100% progress reviews. As part of the Contractor's participation in the facility modification reviews, the Contractor shall immediately notify the PCO of progress impediments which would impact the site activation schedule and the follow-on simulation services. The Contractor shall also assume responsibility for facilities modifications if contracted for such services by the PCO.

3.8 Security

3.8.1 Program Security

The Contractor shall execute all aspects of the F-16 MTC program in accordance with the National Industrial Security Program Operations Manual (NISPOM – DoD 5220.22-M) and such other supplementary requirements as may be imposed by the Government. The Contractor's Government Security Office (GSO) shall be the single point of contact between the Government and the program for all matters related to operation of the F-16 MTC program at Contractor's facility and the F-16 MTC field sites. The Contractor's GSO shall be the primary point of interface between all subcontractor/teammate Facility Security Officers (FSOs) and the Government for issues related to the execution of their assigned tasks under the program. This shall not preclude the subcontractor/teammate FSOs from executing their responsibilities for reporting to their local Cognizant Security Authority (CSA) under the NISPOM.

The Contractor shall establish a Program Security Representative (PSR) for the F-16 MTC program. The PSR shall be responsible to the Program Manager and the GSO for day-to-day operation of security related aspects of the F-16 MTC program. The PSR's responsibility shall include performance of area checks, coordination of access to program areas by other than program personnel, auditing of automated information systems records and compliance with the Technology Assessment/Control Plan.

The PSR shall serve as a point of contact for the GSO to obtain information regarding the technical aspects of the MTC program. The PSR shall identify the operational desires of the program to the GSO and assist in coordinating the implementation of physical, operational and automated information security measures to meet these needs. This shall include the identification of special area needs (open storage, etc.), protected distribution systems, and other concerns as they arise. The PSR shall respond to questions from the GSO and shall support periodic internal and external security reviews as required.

The PSR shall serve as a point of contact for the Program Manager and the Integrated Product Development (IPD) Systems Engineering and Integration Team (SEIT). The PSR shall provide assessments of the impact of implementation decisions on overall program operations, both locally and on-site, and the configuration of the system hardware and software. The PSR shall have primary security engineering responsibility and shall ensure that all security requirements derived from the DD Form 254, NISPOM, AFSSIs, the Department of Defense Directives and Regulations and Lockheed Martin corporate and divisional procedures are incorporated into the design and operating procedures.

The PSR shall assist the GSO in the coordination of security requirements across all the F-16 MTC team members. The primary mechanism for imposition of requirements onto subcontractors and teammates shall be the subcontractor's DD Form 254, SOW and supplementary contract clauses. The PSR shall review all acquisition packages to ensure that security requirements have been properly allocated based on the provider's scope of work, and documented in the contractual paperwork.

3.8.2 Program Protection Plan

In coordination with the GSO, the PSR shall develop an F-16 MTC-specific Program Protection Plan (PPP). In addition to the classified aspects of the program, this plan shall address the Critical Program Information (CPI) and the protection mechanisms to be implemented for its protection. The plan shall document the contribution to the CPI by the members of the MTC team and shall serve as a checkpoint for the development of acquisition packages. The PSR shall, in coordination with the GSO, ensure that each of the subcontractors and teammates receives a copy of the PPP and shall urge the subcontractors to implement those portions of the PPP that may be applicable to the work they are performing in their facilities.

The PSR, in conjunction with the GSO, shall provide an initial briefing to all F-16 MTC program personnel to ensure that they fully understand the requirements of the PPP and other governing security documentation. The PSR, in conjunction with the GSO, shall conduct annual awareness training sessions with all Contractor and subcontractor personnel to maintain their awareness of the classified and CPI aspects of the program.

3.8.3 Technology Control/Assessment Plan

The Contractor shall develop and maintain a Technology Assessment/Control Plan for the protection of data restricted from release by the International Traffic in Arms Regulation (ITAR – 22 CFR Parts 121 – 130) and the Export Administration Regulations (15 CFR Parts 768-799). The PSR shall assist the Contractor Export Control Official and the GSO in the development and modification of export/import license requests.

The PSR shall assist the GSO in the maintenance of the plan itself and shall be responsible for monitoring day-to-day compliance with the plan. The PSR shall provide the primary point of contact for questions related to the releasability of information to foreign national teammates. When the PSR is uncertain, they shall request the SEIT to appoint a working group to review the information and provide a recommendation. Should the working group be unable to make a determination, the information will be forwarded to the Government Program Office with an enclosure explaining why the information must be released and a request for recommendation.

3.8.4 Automated Information Systems Management

The PSR shall be responsible to the divisional Information Systems Security Officer (ISSO) for the development and maintenance of all Automated Information System (AIS) Security Plans (AISSP) and Standard Practice Procedures (SPP) as required by NISPOM Chapter 8. The PSR shall also be responsible for the execution of these plans once approved including all audit requirements.

The PSR shall also assist the ISSO in the development of any program-specific Certification and Accreditation (C&A) packages required by the Government for the systems being delivered to support the F-16 MTC contract.

The PSR shall assist the ISSO and on-site personnel in the preparation of C&A packages and site-specific AIS SPPs. On-site personnel shall have final responsibility for coordinating operational plans with the local Cognizant Security Authority (CSA).

The PSR shall have the responsibility to complete, submit and maintain, as necessary, the Emissions Security Assessment Requests per the DD Form 254. All ESARs shall be routed through the Contractor ISSO prior to submission through contracts.

3.9 F-16 MTC SERVICE SUPPORT TASKS

3.9.1 Site Activation

The Contractor shall pack and ship all components of the F-16 MTC simulation systems to the sites identified in Appendix B as directed by the PCO. The Contractor shall provide all the personnel, equipment, procedures and services required to receive, unpack, install, assemble and check out the simulation systems in the Government-furnished facility at the designated sites. If exercised, the Contractor shall provide a mobile four-ship Level C MTC for use by the ANG. The Contractor, with the coordination of the PCO or designated alternate, shall relocate the mobile system from one ANG base to another of the five listed in Appendix B quarterly.

3.9.2 System Simulation and MTC Support

The Contractor shall provide the necessary expertise and resources to support F-16 DMT training events. The Contractor shall evaluate all F-16 DMT system simulations and MTC performance with respect to meeting user training objectives. The Contractor shall recommend corrective actions to the government. The Contractor shall provide the necessary assets in spares, support equipment, technical data, personnel and expertise to maintain the deployed F-16 MTC assets at the required availability.

3.9.2.1 Surge Capability Training Services

The Contractor shall provide surge capability training service availability at all sites. The F-16 MTC shall be capable of operating 24 hours a day for up to three days at a time. Surge hours will be ordered by the ASC/YW contracting officer as requirements are identified. Once ordered, use of surge hours will be scheduled at least 12 hours in advance by the Air Force Project Officer. The Contractor shall support the use of ordered and scheduled surge hours.

3.9.2.2 Transportability of MTC Services

The Contractor shall provide for the infrequent disassembly, packing, transportation, reassembly, and checkout of F-16 block 40/50 simulation services required to redeploy services at any ACC, USAFE, and/or PACAF site to a CONUS or OCONUS operating location. When directed by the PCO, the contractor shall initiate a redeployment effort in the same manner the Contractor performs other site activations, including performing site surveys and site preparation services requested by the PCO.

3.9.2.3 Mobile MTC Services

A modified and mobile level C simulation service shall be provided to service all ANG simulation systems at Des Moines ANG, McEntire ANG, Toledo ANG, Kirtland ANG, and Tulsa ANG sites. The mobile simulation service shall provide four fully DMT-integrated system simulations. It shall provide, as a minimum, the capability to train all Level C tasks identified in the F-16 TTL. It shall provide a visual system, with the full FOV experienced by the pilot in the aircraft, that allows F-16 pilots to train all Level C tasks identified in the TTL. The mobile simulation service shall provide four threat stations, one common B/DB capability, and a separate MCE workstation. The mobile MTC simulation service shall be relocatable four times a year (quarterly) to support the ANG operating locations. The contractor shall provide for any disassembly, packing, transportation, reassembly, and/or checkout required to relocate the simulation service from one site to another.

3.9.2.4 Continuity of Services

The Contractor recognizes that the services provided under this contract are vital to the Government and must be continued without interruption and that, upon contract expiration, a successor, either the Government or another contractor, may continue them. In the event that the Contractor is not the successful bidder for the follow-on contract, the Contractor shall support the Government's efforts to complete a smooth transition to the new MTC operator. Specifically, upon the Contracting Officer's written notice, the Contractor shall: (1) furnish phase-in, phase-out services for up to 180 days after this contract expires and (2) negotiate in good faith a plan with the successor to determine the nature and extent of phase-in, phase-out services required. The plan shall specify a training program and a date for transferring responsibilities for each division of work described in the plan, and shall be subject to the Contracting Officer's approval. The Contractor shall provide sufficient experienced personnel during the phase-in, phase-out period to ensure that the services called for by this contract are maintained at the required level of proficiency.

The Contractor shall also allow as many personnel as practicable to remain on the job to help the successor maintain the continuity and consistency of the services required by this contract. The Contractor shall also disclose necessary personnel records and allow the successor to conduct on-site interviews with those employees. If selected employees are agreeable to the change, the

Contractor shall release them at a mutually agreeable date and negotiate transfer of their earned fringe benefits to the successor.

3.9.2.5 Master Library Support

The F-16 MTC shall contain a master technical data library consisting of design and technical documentation and data. As a minimum, the master library shall contain the following data:

1. Applicable F-16 technical data and aircraft manuals
2. F-16 MTC drawings, development and product specifications
3. F-16 MTC design documentation
4. COTS technical documentation and manuals
5. F-16 MTC software and firmware on electronic media
6. Equipment user's manuals
7. Operating procedures for F-16 MTC components
8. Developed databases
9. F-16 MTC indentured data list
10. F-16 MTC technical manuals
11. F-16 MTC recommended spares list
12. F-16 MTC recommended support equipment list
13. F-16 MTC reliability and maintainability data
14. F-16 MTC logistics data
15. Relevant MIL standards
16. Relevant Government regulations
17. Acceptance Test Procedures
18. Acceptance Test Reports

Each site shall have electronic access to the master technical data library.

3.9.3 Technical Assistance

The Contractor shall provide technical assistance to Government instructors and personnel for system simulations and MTC operation. The F-16 MTC Contractor shall provide technical support to all sites to maintain the service and to install and update training scenarios.

3.9.4 Government Instructor Training

The Contractor shall provide training for instructors on operating all simulation service elements. The training will be conducted during the activation of new F-16 MTC locations. The Contractor shall also provide training to instructors after installation of significant modifications that affect the way the instructor operates the equipment.

3.9.5 Contingency Databases

The simulation service contractor shall provide the database generation capability to create contingency database services to support the F-16 Block 40/50 MTC training service. When requested by the PCO, the Contractor shall develop databases for all sensor simulations to enable the USAF to conduct training in a contingency area.

3.9.6 Simulator Certification

The Contractor shall plan for and facilitate all Government evaluations and certifications of the simulation services. The Government will conduct a SIMCERT on all simulation service elements to validate the training capability of the training simulation service. Support of SIMCERT

shall include personnel to operate and maintain the simulation systems during the initial and annual SIMCERT.

3.9.7 Support for Systems Evaluation

The Contractor shall support the evaluation of the F-16 MTC by providing the assets required to perform the evaluations of the tasks described in section 4. In addition, the Contractor shall support the Government's evaluations of upgrades and potential enhancements to the training system. The support, which will be provided to the Government, may include operating the equipment, installing modifications, assessing the effects of modifications, reviewing and modifying courseware and syllabus and other training-related activities.

4.0 ASSESSMENTS, EVALUATIONS, AND CERTIFICATION

4.1 Support for Assessments

The Contractor shall support all Government assessments, evaluations, and certifications. The support shall include, but not be limited to, USAF Subject Matter Expert (SME) involvement and witnessing of Contractor verification tests, Government review of verification data, system verification review prior to SIMCERT, system validation, system SIMCERTs, and system evaluations on each service location after service has started.

4.2 Validation of Threats and Weapon Models

The simulation service contractor shall validate threat and weapon simulation models. All contractor internal verification and validation data and results shall be available for review and use by the Government. The system validation shall be accomplished prior to SIMCERT.

4.3 Training Capability Assessment (TCA)

The Contractor shall support the Government in performance of a TCA to validate training requirements prior to the start of the initial simulation services. The TCA shall be conducted in the Contractor facility prior to shipment of the simulation service.

4.4 Simulation Certification

The Contractor shall support the Government SIMCERT to be conducted on-site at each F-16 MTC home airfield. The Government shall provide to the Contractor a SIMCERT Plan that describes the process to be followed and the Contractor's responsibilities during the certification testing. This plan shall be provided 120 days prior to start of SIMCERT.

Appendix A

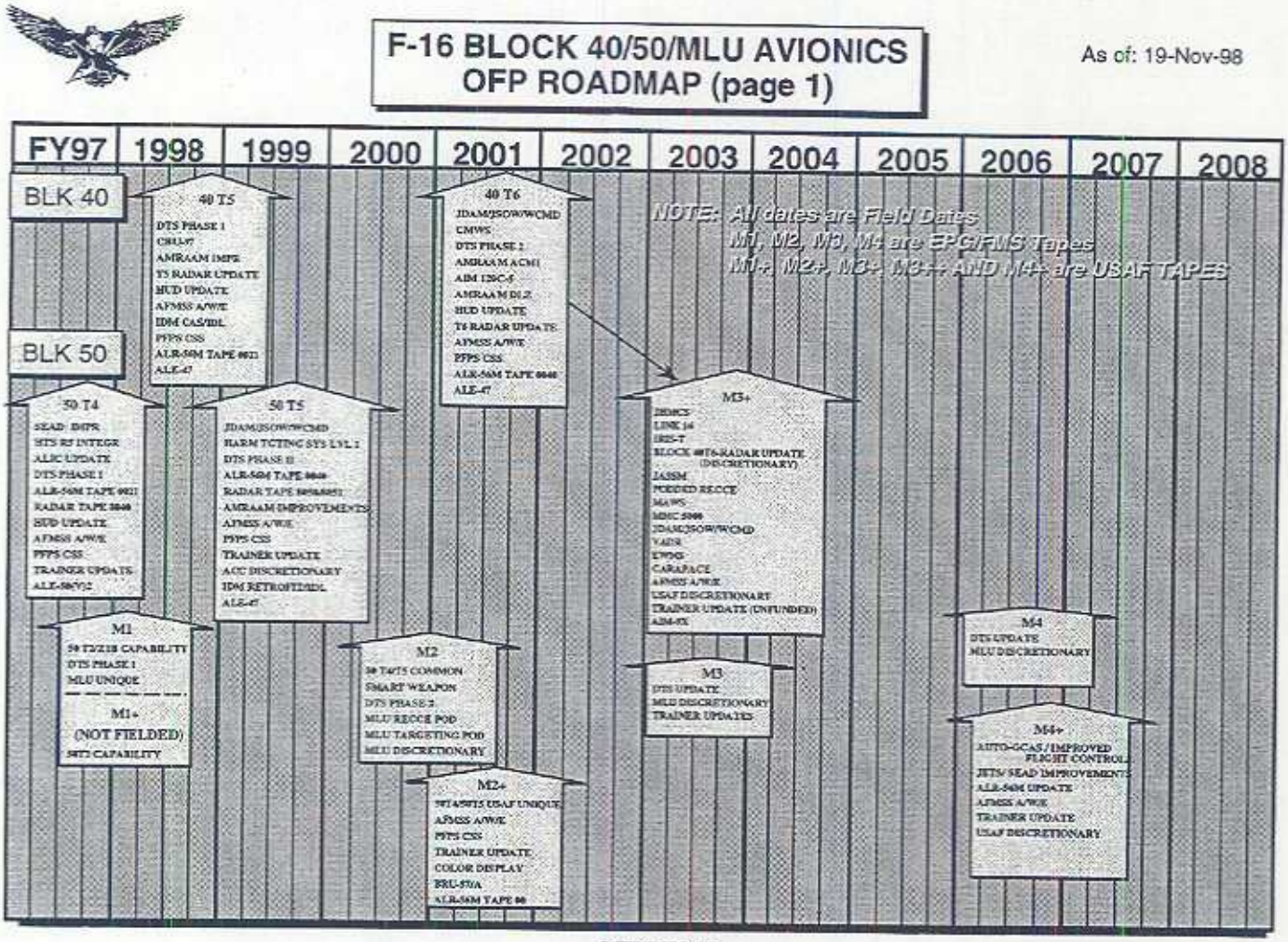
F-16 Block 40/42/50/52

Concurrency Roadmap

F-16 Roadmaps

WARNING - This document contains technical data whose export is restricted by the Arms Export Control Act (Title 22, U.S.C., Sec 2751, et seq.) or the Export Administration Act of 1979, as amended, Title 50, U.S.C., App. 2401 et seq. Violations of these export laws are subject to severe criminal penalties. Disseminate in accordance with provisions of DoD Directive 5230.25.

Distribution Statement E
Distribution authorized to U.S Government Agencies only.
This document contains Foreign Government Information, 2 April 98.
Other requests for this document shall be referred to ASC/YPRX.



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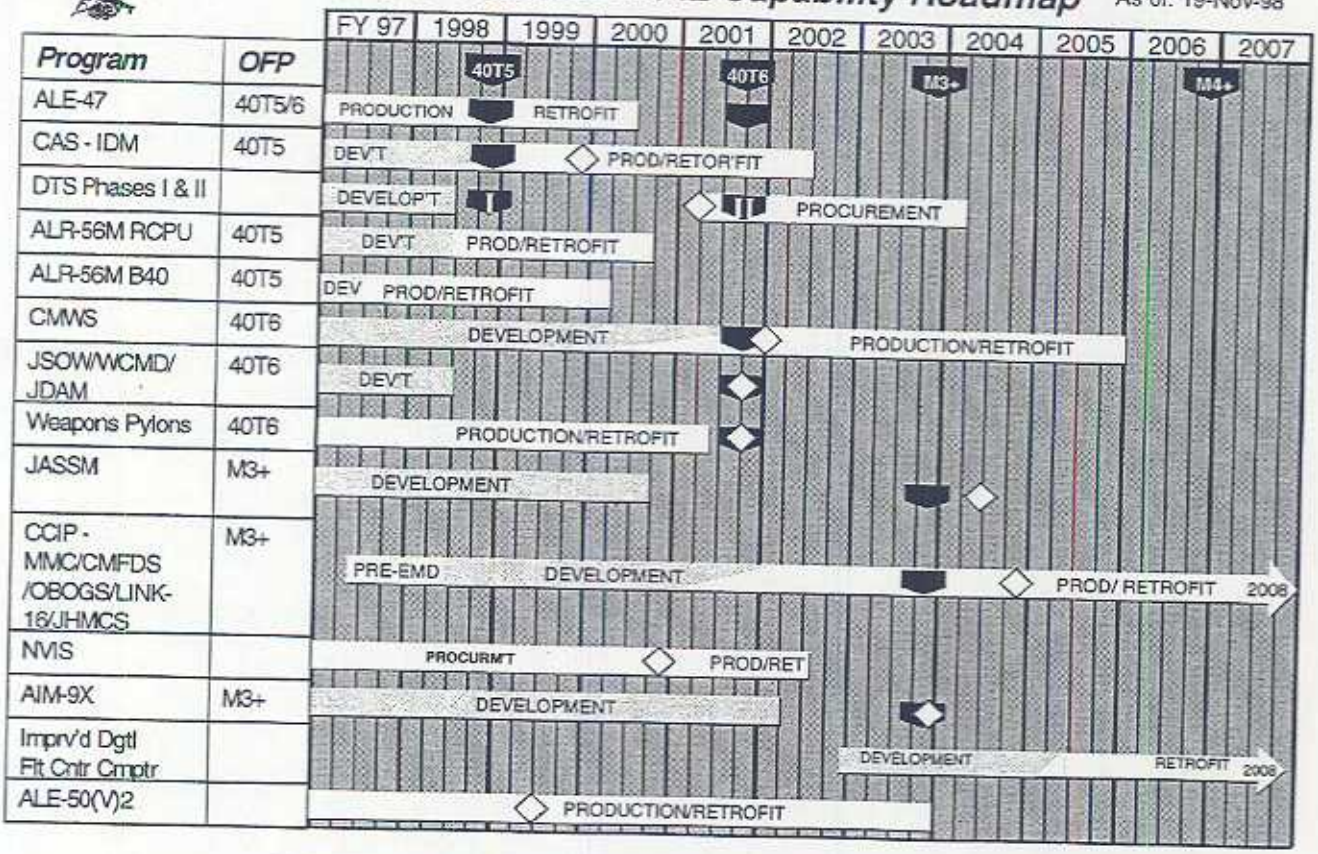
88

USAF F-16 Block 40/42 Capability Roadmap

As of: 19-Nov-98



LEGEND OFP Release Date ◇ Date Capability First Available

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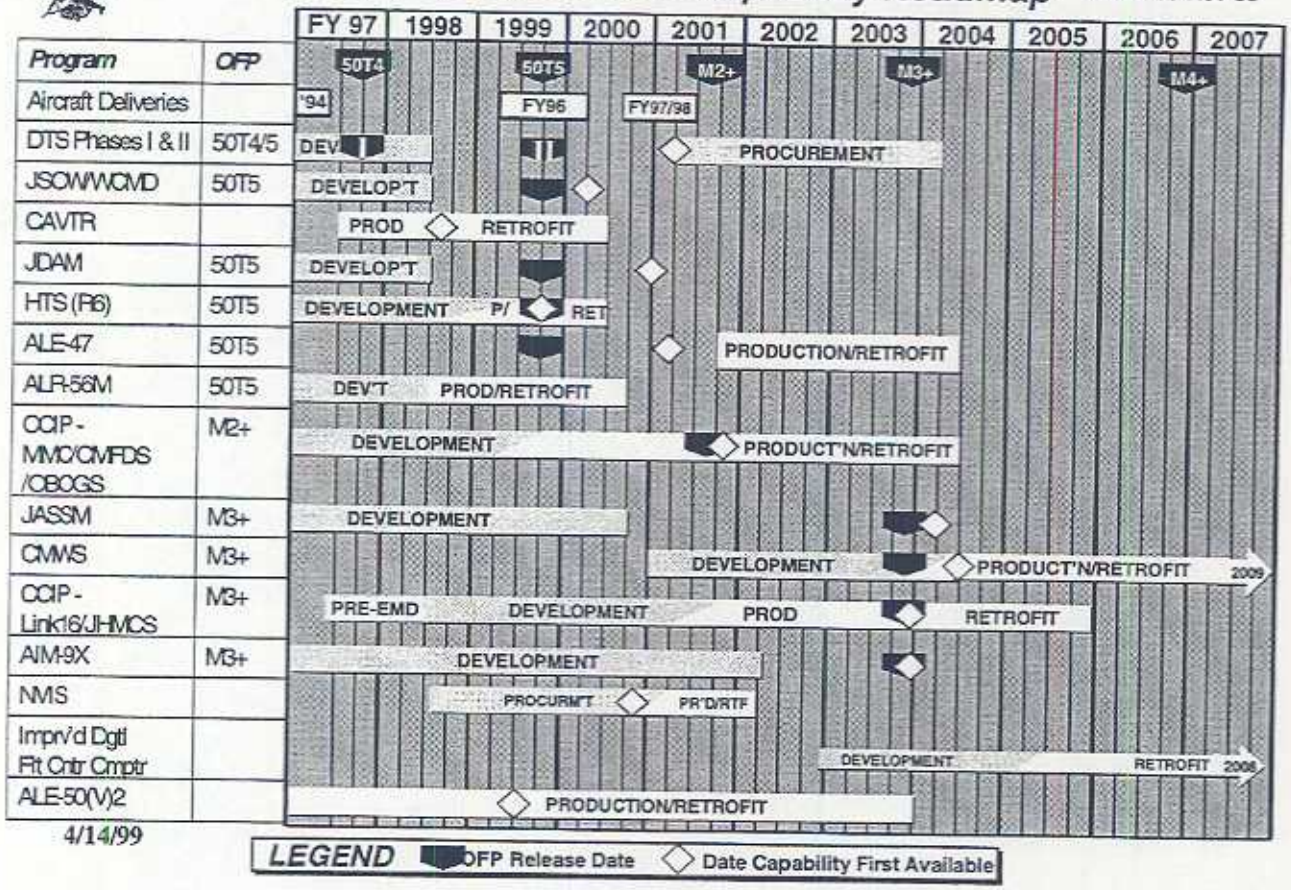
USAF F-16 Block 50/52 Capability Roadmap

As of: 19-Nov-98



4/14/99

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USAF F-16 Ogden Depot Mod Roadmap

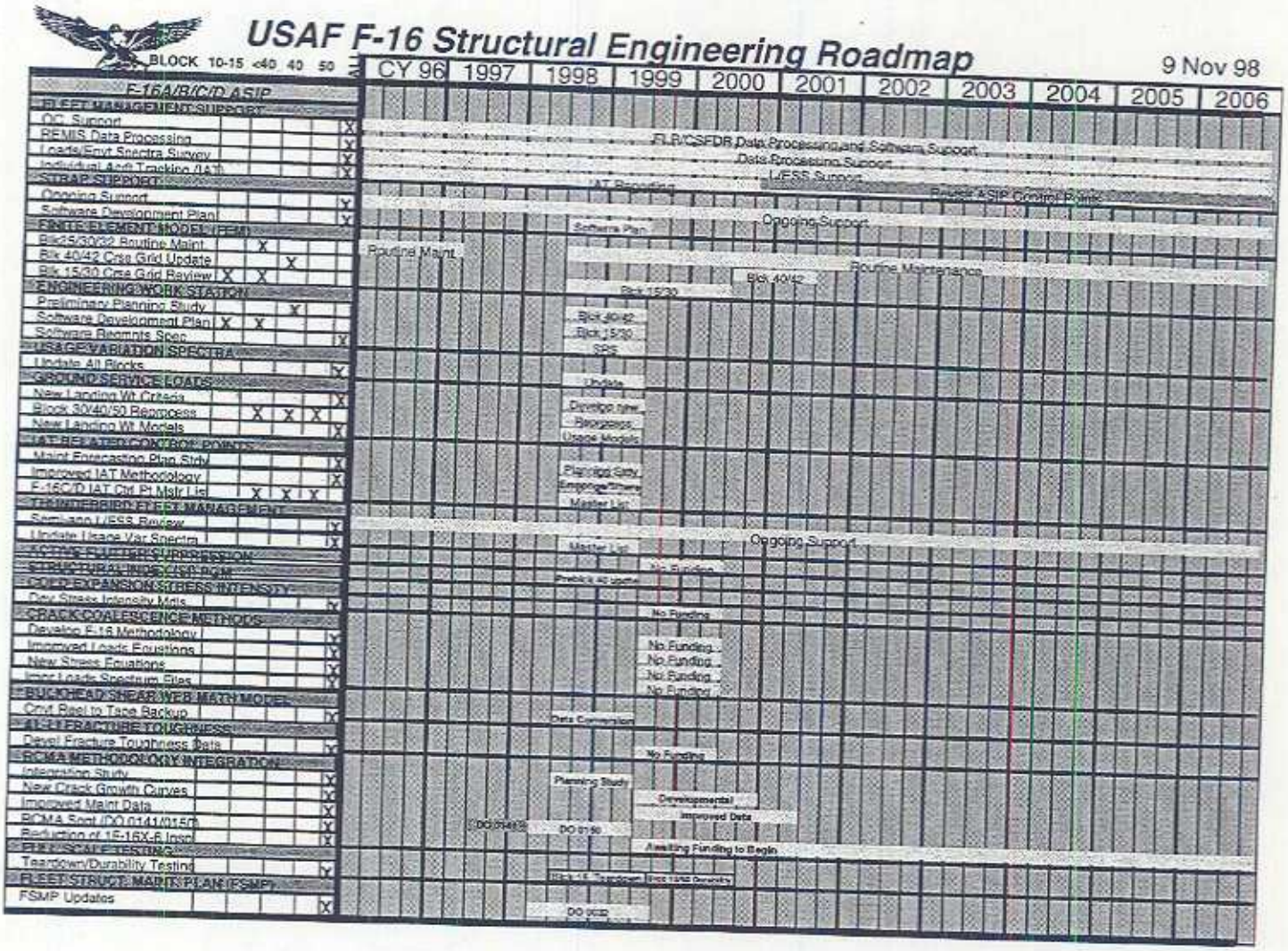
As of: 19-Nov-98

Block 50 from the USAF F-16 Ogden Depot Mod Roadmap

Block 50/52	Total A/C	Flow Time	FY 99	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
CAVTR*	238		119	119									
MMC	245	120			36	72	72	65					
Color Displays	245	0			36	72	72	65					
OBOGS	245	0			36	72	72	65					
Structrl Impmnts	155	0			36	72	47						
HG II	234	0			36	72	72	54					
ALE-47	232	25			36	72	72	54					
JHMCS	251	0					26	72	72	72 9			
Link 16	251	150 90					26	72	72	72 9			
CMWS	251	60						20	40	40	60		
NVIS*	251	14		170	81								

LEGEND: Driving Mod; Driven Mod; Independent Mod; * Field Team; ** Depot/Field Team Combo

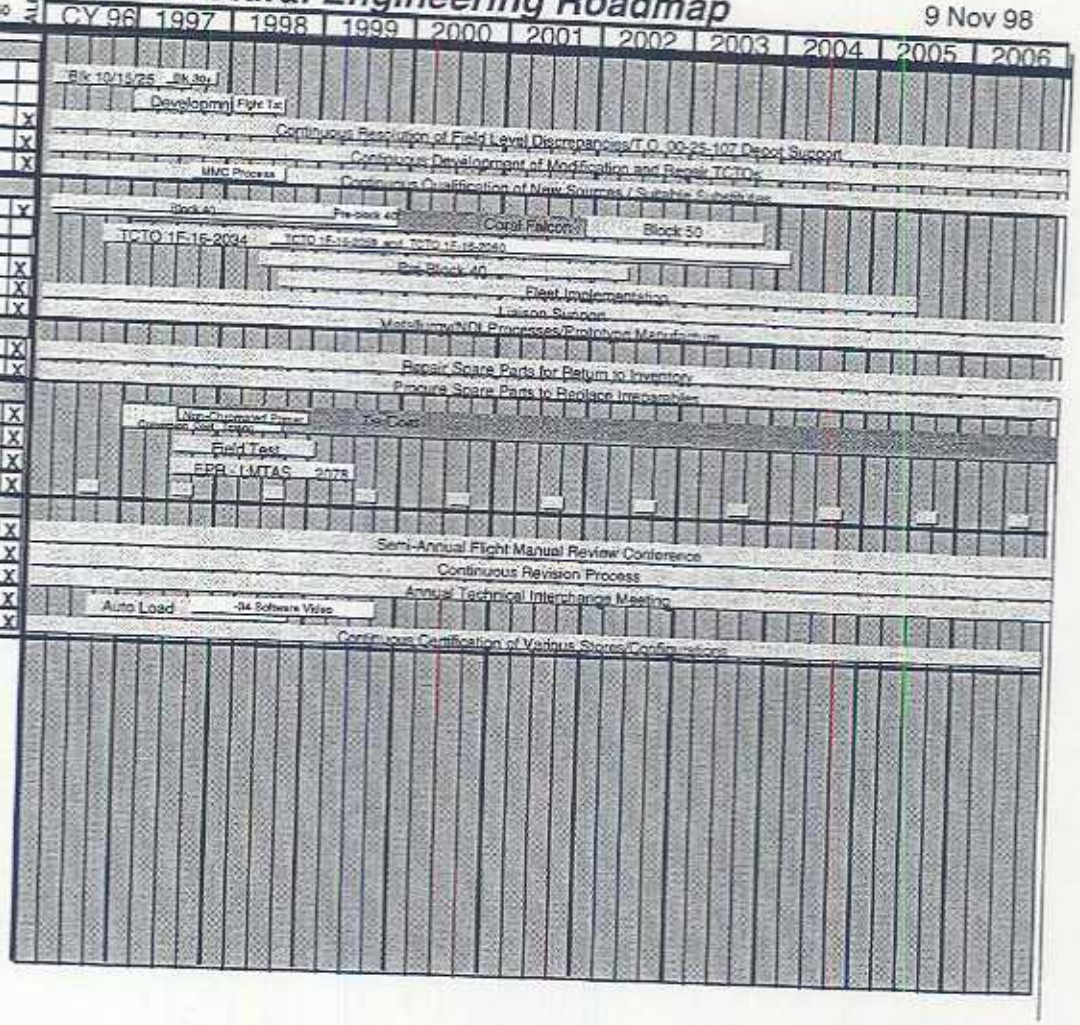
91


USAF F-16 Structural Engineering Roadmap
9 Nov 98
BLOCK 10-15 <40 40 50
CY 96 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006
F-16A/B/C/D ASIP
FLEET MANAGEMENT SUPPORT
OC Support
REMIS Data Processing
Loads/Envt Spectra Survey
Individual Acft Tracking (IAT)
STRAP SUPPORT
Ongoing Support
Software Development Plan
FINITE ELEMENT MODEL (FEM)
Blk25/30/32 Routine Maint
Blk 40/42 Crse Grid Update
Blk 15/30 Crse Grid Review
ENGINEERING WORK STATION
Preliminary Planning Study
Software Development Plan
Software Reqmnts Spec
USAGE VARIATION SPECTRA
Update All Blocks
GROUND SERVICE LOADS
New Landing Wt Criteria
Block 30/40/50 Reprocess
New Landing Wt Models
IAT RELATED CONTROL POINTS
Maint Forecasting Plan Stdy
Improved IAT Methodology
F-16C/D IAT Ctrl Pt Mstr List
THUNDERBIRD FLEET MANAGEMENT
Semi-Lang L/ESS Review
Update Usage Var Spectra
ACTIVE FLUTTER SUPPRESSION
STRUCTURAL INDEX/SP PGM
COLD EXPANSION STRESS INTENSITY
Dev Stress Intensity Mdls
CRACK COALESCENCE METHODS
Develop F-16 Methodology
Improved Loads Equations
New Stress Equations
Impr Loads Spectrum Files
BULKHEAD SHEAR WEB MATH MODEL
Cnvt Reel to Tape Backup
ALL FRACTURE TOUGHNESS
Devel Fracture Toughness Data
RCMA METHODOLOGY INTEGRATION
Integration Study
New Crack Growth Curves
Improved Maint Data
RCMA Sqnt (DO 0141/0150)
Reduction of 1E-16X-6 Insp
FULL SCALE TESTING
Teardown/Durability Testing
FLEET STRUCT. MAINT. PLAN (FSMP)
FSMP Updates
FLR/CSFDR Data Processing and Software Support
Data Processing Support
L/ESS Support
IAT Reporting
Reduce ASIP Control Points
Ongoing Support
Software Plan
Routine Maint
Routine Maintenance
Blk 40/42
Blk 15/30
Blk 40/42
Blk 15/30
SRS
Update
Develop new
Reprocess
Usage Models
Planning Study
Emerge/Share
Master List
Ongoing Support
Master List
No Funding
Preblk 40 update
No Funding
No Funding
No Funding
No Funding
No Funding
Data Conversion
No Funding
Planning Study
Developmental
Improved Data
DO 0141
DO 0150
Awaiting Funding to Begin
Blk 15 Teardown
Blk 15/30 Durability
DO 0032

USAF F-16 Structural Engineering Roadmap

9 Nov 98

BLOCK	10-15	<40	40	50	ALL
SUSTAINMENT/INTEGRITY					
357 Bulkhead Rep	X	X			
479 Bonded Rep	X	X			
Field Lvl Discrep					X
Mod/Repair TCTOs					X
New Srcs/Suit Subs					X
MODIFICATION/REPAIR					
Falcon Up					X
Service Life Imp (SLIP)	X	X			
341 Bulkhead Rpr	X	X			
Mtl Matrix Comp (MMC)					X
Liaison Support					X
Lab Anal/Prototyping					X
COMPONENTS SUPPORT					
Spares Repair (BSD)					X
Spares Proc (SSD)					X
CORROSION/ENVIRONMENTAL					
Primers					X
Pacer Gem					X
Wing Rib Corr Rpr					X
Annual CPAB Mtg					X
OPERATIONAL INTEGRATION					
Flight Manuals					X
Muns Ldg Manual					X
Wght & Bal Docs					X
Elec Data Conversion					X
Seek Eagle Cert					X



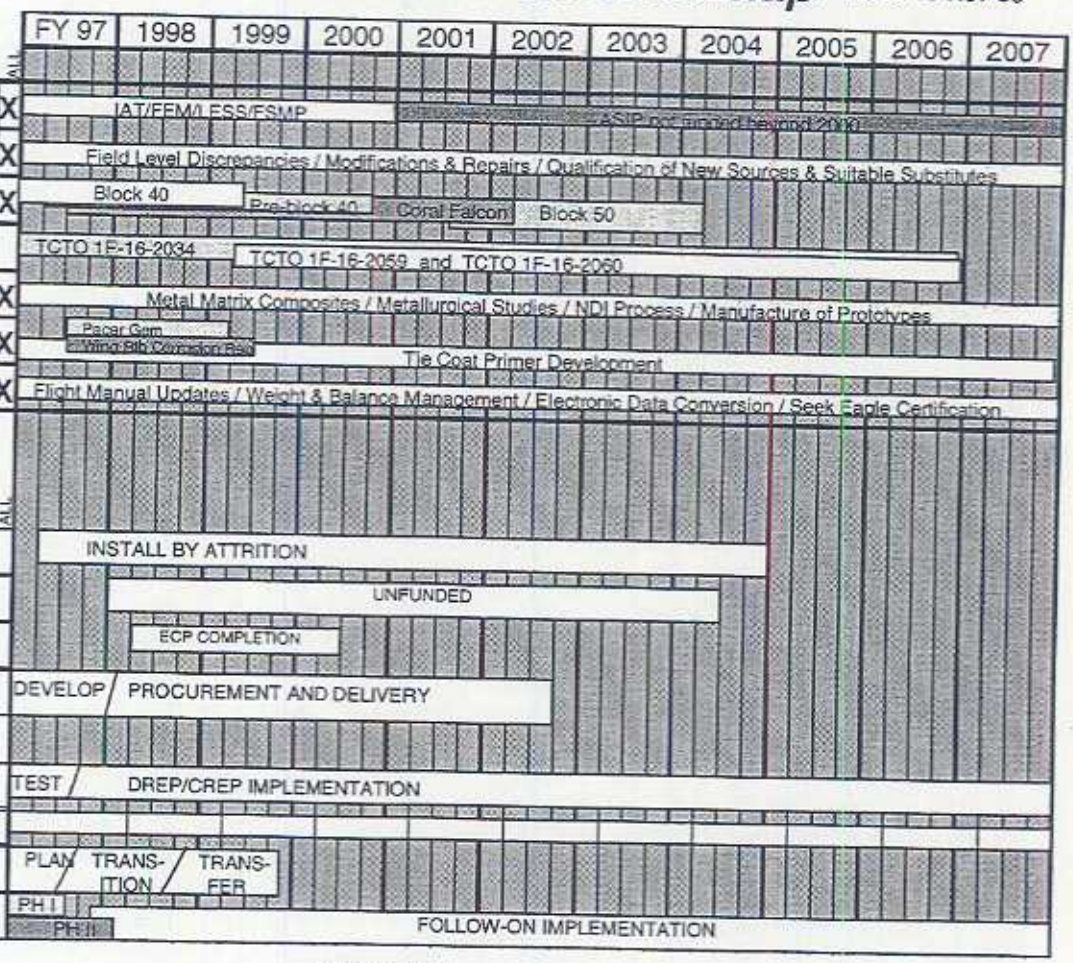
USAF F-16 Sustainment Roadmap

As of: 19-Nov-98

STRUCTURES	BLOCK 10-15	<40	40	50	ALL
Aircraft Structural Integrity Program					X
Sustainment/Integrity					X
Falcon Up					X
SLIP	X	X			
Modification/Repair					X
Corrosion/ Environmental					X
Operational Integration					X

RADAR	BLOCK 10-15	<40	40	50	ALL
MLPRF					
Antenna					
DMT Study					
PSP					

OTHER
Pacer Lean
Post Production Support
Consolidate Cust Support
Electronic Data Transfer



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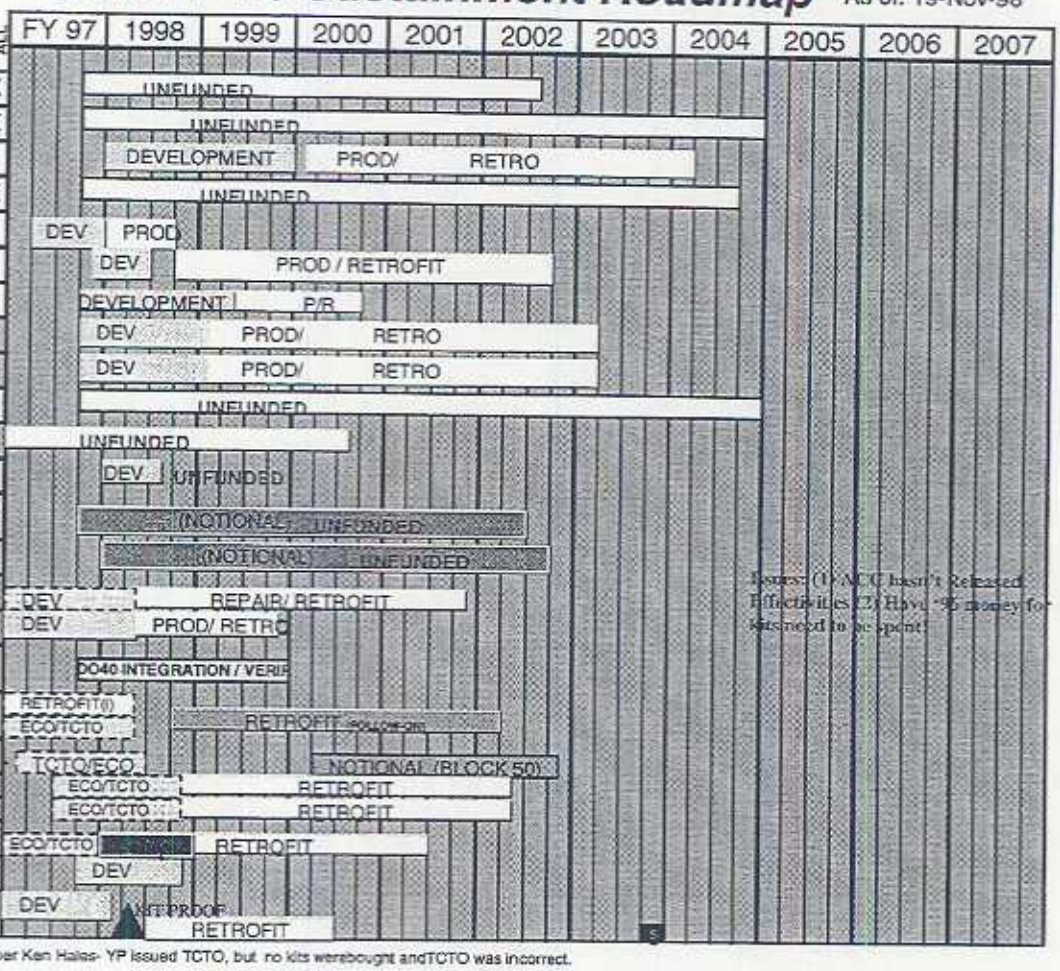
USAF F-16 Sustainment Roadmap

As of: 19-Nov-98

AVIONICS / BLOCK	10-15	<40	40	50	ALL
ENG STUDIES					X
F3I					X
PIP GAC			X	X	
DMS					X
GAC BATTERY			X	X	
GAC (PIP) MEMORY (YP)			X	X	
UCADC/ CADC				X	
EBFCC		X			
Air Data Probe Heat Mond					X
R&M					X
Main Aircraft Battery		X			
Battelle R&M Study					X
R&M FOLLOW-ON STUDIES					X
COD					X
HUD TUBE UNIT ASSY					
SIDESTICK BOOT					X
Linked Mods (Pre-Blk 40) Integration/CC		X			
NVIS (initial)		X	X	X	
IAVTR		X		X	
CMS I & II (EWMS) (M AV)		X			
SADL (MISSION AV)		X			
Block 40 Pylon Upgrade			X		
JHMCS (Pre-Integration)			X	X	
HUD ON EMER BUS			X		



Issues: (1) ACC hasn't Released Effectivities (2) Have 95 money for kits need to be spent!

* Add AMRIU per Ken Hales- YP issued TCTO, but no kits werebought andTCTO was incorrect.

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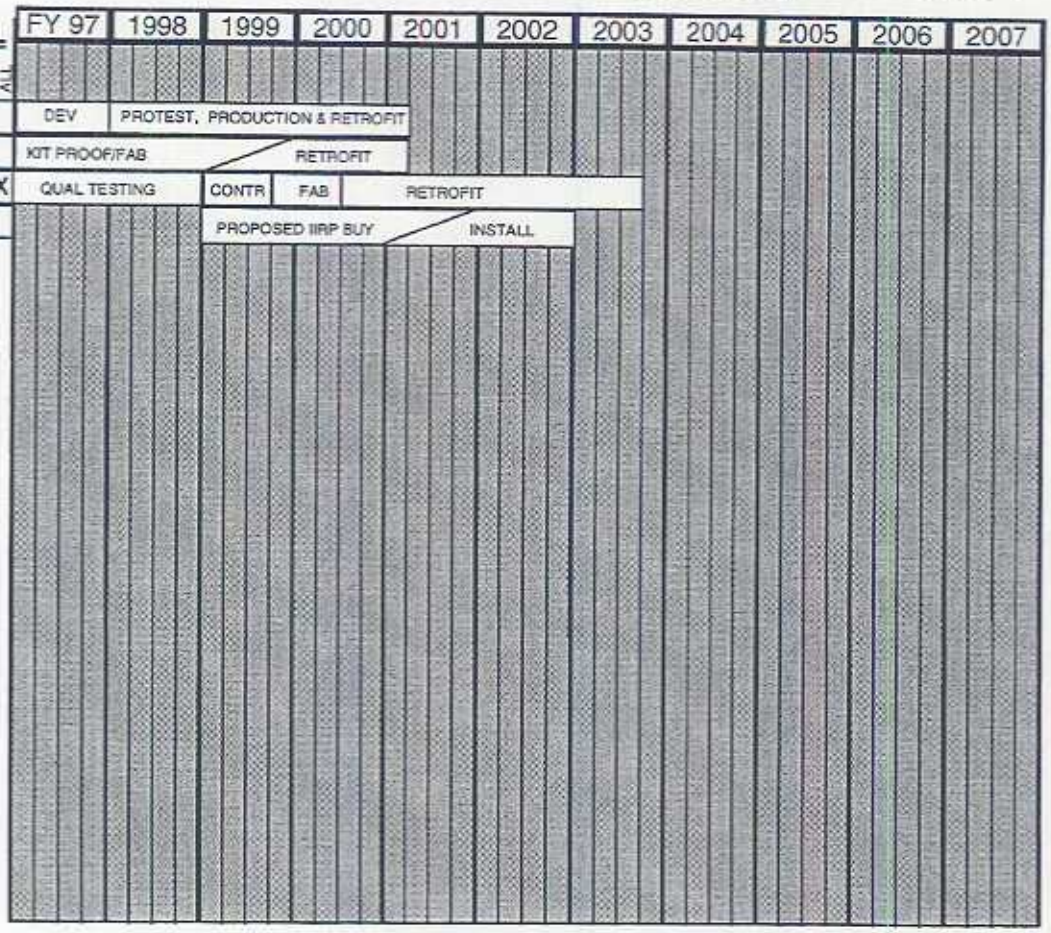
USAF F-16 Sustainment Roadmap

As of: 19-Nov-98

ELECTROMECHANICAL

BLOCK	10-15 50	<40	40		ALL
F-16 ANTISKID		X	X	X	
F-16 C/D AERP		X	X	X	
CANOPY ACTU					X
LW IIRP	X	X			



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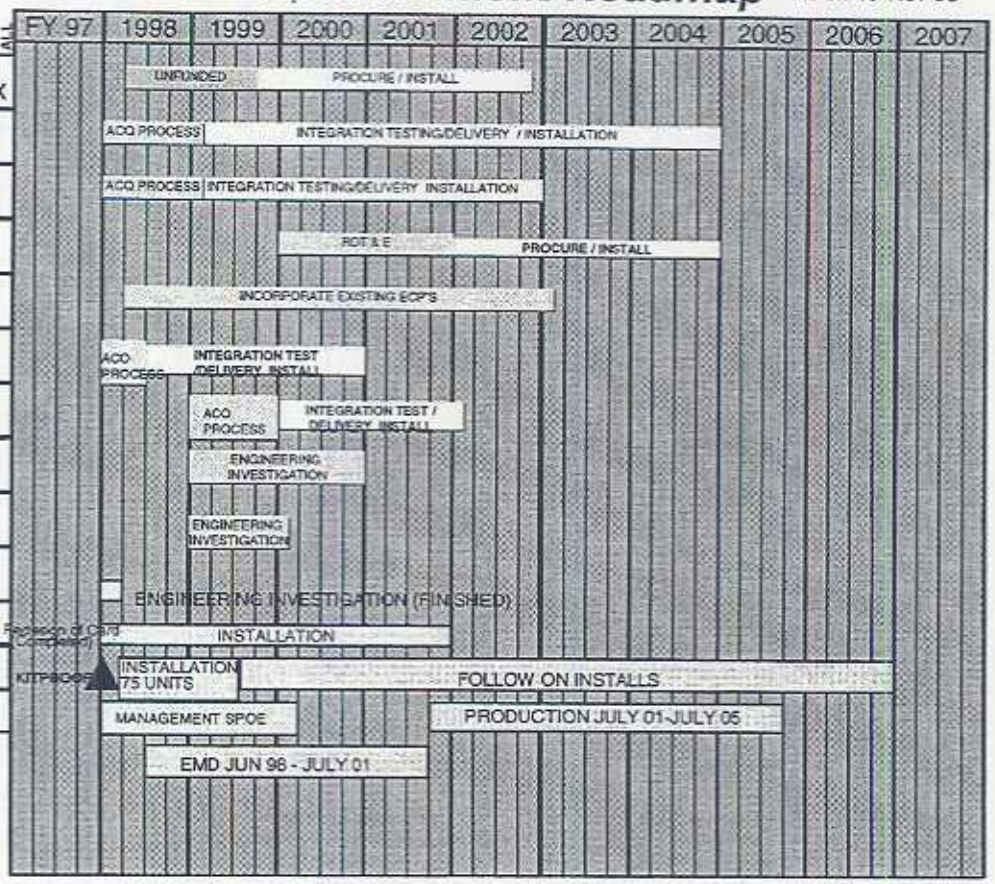
USAF F-16 Sustainment Roadmap

As of: 19-Nov-98

BLOCK	RADAR 10-15	<40	40	50	ALL
ANTENNA					X
PSP BLK 30 (Power Supply)		X			
PSP BLK 30 (Memory Replacement)		X	X		
EXCITER-RECEIVER PROCESSOR		X	X		
DMT		X	X		
MLPRF (Low Noise Assy) FET AMP		X	X		
MLPRF LNA replacement		X	X		
MLPRF (Freq Multiplier)		X	X		
MLPRF (Transmit Microwave)		X	X		
C/D Band Ant (Radome Redesign ant)		X	X		
Adv Interference Blanker Unit (A1 circuit card)		X	X	X	
Counter Measures Set		X	X	X	
Common Missile Warn Sys (EMD phase)		X			



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CLIN STRUCTURE
(solicitation)

RFP

MEMORANDUM FOR U.S. DEPARTMENT OF COMMERCE
COMMERCE BUSINESS DAILY
P .O. BOX 5999
CHICAGO, IL 60680

FROM: ASC/YWI
Building 11
2240 B Street, Room 231
Wright-Patterson AFB OH 45433-7111

SUBJECT: Synopsis - Solicitation

1. NA!!

2. 0128!!

3. 99!!

4. GPO391030!!

5. 45433-7111!!

6. 69!!

7. ASC/YWI, Building 11, 2240 B Street, Room 231, Wright-Patterson AFB OH 45433-7111!!

8. F-16 Block 40/50 Mission Training Center (MTC) Program!!

9. F33657-98-R-2033!!

10. 030399 !!

11. Contact, Jerry C. Peterangelo, Contracting Officer, (937) 255-7388 ext. 266, fax (937) 656-7538!!

12. N/A!!

13. N/A!!

14. N/A!!

15. N/A!!

16. N/A!!

17. This is Part 1 of 2 of Request for Proposal (RFP) F33657-98-R-2033 for the F-16 Block 40/50 Mission Training Center (MTC) Program (herein referred to as F-16 MTC). This is a combined synopsis/solicitation for commercial services prepared in accordance with the format in FAR Subpart 12.6, as supplemented with additional information included in this notice. There are two parts to this RFP. This is Part 1, which contains the program's, technical/management requirements and the instructions conditions, and notices to offerors (ICNO). Part 2 is in a succeeding CBD announcement and contains the basis for award and the evaluation criteria/standards. Both announcements constitute the only solicitation; proposals are being requested and a written solicitation will not be issued. This procurement will utilize an electronic bulletin board for solicitation reference documents in an effort to streamline the communication process between the government and industry and is accessible through the World Wide Web at the following Internet address: "http://www.pixs.wpafb.af.mil/pixslibr/DMTRFP/DMTRFP.asp". For questions concerning operation of the PIXS system contact the system administrator, Mr. Johnny Harshbarger, at (937) 255-2739. All addenda referenced herein that are located on the bulletin board will be noted as "(on PIXS as "document name" dated xx)."

Statement of Objectives: The requirement of the F-16 MTC program is to procure contractor provided simulation services. To safely and affordably train the way we fight, the Combat Air Forces (CAF) require a unit-level F-16 MTC pilot training capability suitable to accomplish ground-based training (i.e., ability to fly a complete mission from takeoff to landing involving all training tasks as an uninterrupted flight) for selected mission elements and safety of flight tasks, many of which cannot be routinely trained in the aircraft. Initial service will be ordered

at Shaw AFB and Mt. Home AFB. Through the contract resulting from this solicitation, the same or similar services may be ordered at all of the F-16 Block 40/50 ACC, USAFE, PACAF, AETC, and ANG wings. Once deployed, the service will enable networked mission training within a single wing and between multiple wings. This program will provide the capability to train in a multi-ship role at geographically separated locations and to train full mission profiles against interactive threats. Instructors and courseware will be provided by the government. The government does not intend to acquire any hardware or software but merely to buy simulation capability on a cost per training hour basis. The offeror will be responsible for system operation; system maintenance; product baseline management; system simulation modification and upgrade; and some basic instruction for contract and Air Force instructors in the operational use of the simulation equipment as well as keeping the system simulation concurrent with the changing configuration of the fielded F-16 Block 40/50 aircraft, and inserting new capabilities as they become available.

The Simulation Capability Requirements Document (SCRD) (on PIXS as "scrd.doc" dated 22 Jan 99) defines the requirement. All Documents referenced in the SCRD are located on the PIXS, or directions for obtaining them are on PIXS. Foreign sources/contractors are excluded from being selected as prime contractor on this effort. The selected contractor shall be required to hold a Top Secret SCI facility clearance in order to perform this program. Security requirements are provided on the DD Form 254, CONTRACT SECURITY CLASSIFICATION SPECIFICATION (posted on PIXS as "dd254. pdf" dated 3 Sep 98).

The government intends to award a single Indefinite-Delivery Indefinite-Quantity (IDIQ) requirements type contract in the May 99 timeframe in order to satisfy the above requirements. Shaw AFB Level B service will begin in Dec 01 and be upgraded to Level C service NLT Apr 02. Mt. Home AFB Level B service will begin NLT Apr 02. Shaw AFB could receive Level B or C service, and Mt. Home AFB could receive Level B service, no earlier than Aug 01, if proposed by the offeror. The simulation service requirements and schedule for all F-16 MTC sites are posted on PIXS as "servschd.doc" dated 22 Jan 99. The initial ordering period for the contract will be seven years, beginning at contract award. Additional ordering periods (up to eight years) may be earned in accordance with the Award Term Clause that shall be included in each offeror's contract. O&M Funds currently budgeted for this solicitation by fiscal year (FY) are as follows: ($ millions)

FY99 $1.3M FY00 $10.2M FY01 $17.0M FY02 $13.7M FY03 $14.4M

The provision at FAR 52.212-1, Instructions to Offerors - Commercial Items, applies to this RFP and is amended as specified in this solicitation. This solicitation incorporates provisions and clauses in effect through FAC 97-6. The applicable small business size standard is $18,500,000.00 IAW FAR 19.102. The SIC code is 8299. Offerors should propose a business solution that satisfies mission performance requirements and provides for an executable program. Proposals submitted in response to this solicitation must meet all the requirements specified in this solicitation, to include any requirements documents referenced herein; failure to do so may result in rejection of the proposal. There is no small business set-aside for this requirement. The response to this solicitation shall consist of a written proposal and oral presentation. An oral presentation and capability demonstration is required, and shall be IAW with the proposal preparation instructions as posted on PIXS as "prepinst.doc" dated 22 Jan 99. Address all

requests for solicitation and communication concerning the acquisition to ASC/YWI, Bldg. 11, 2240 B Street Suite 7, Wright-Patterson AFB OH 45433-7111, ATTN: Mr. Jerry C. Peterangelo, Contracting Officer, (937)255-7388 ext.266, fax (937) 656-7538.

The offerors shall submit a formal Intent to Bid Notice in writing. The notice will be used for a lottery to establish a date for the oral presentation and demonstration, and must be received at the above address / fax NLT 12:00 Noon EST on 8 Feb 99. The notice shall also include written procedures for government personnel to submit visit requests as well as detailed directions to the site where the oral presentation will be held.

The offeror's proposal will consist of four volumes. Volume I Past and Present Performance shall be submitted by 12:00 Noon EST on 15 Feb 99. Volume II Technical/Management and Volume III Model Contract shall be submitted by 12:00 Noon EST on 3 Mar 99. Volume IV Price/Final Contract shall be submitted by 12:00 Noon EST on 19 Apr 99. Submit all volumes to: ASC/SYG, Attn: F-16 Block 40/50 MTC Source Selection (Mr. Jerry C. Peterangelo), Building. 125, 2335 Seventh St. Room 5, WPAFB OH 45433-7111. Direct all communications concerning this acquisition to ASC/YWI, Mr. Jerry C. Peterangelo, Contracting Officer, (937)255-7388 ext. 266, fax (937) 656-7538. In addition, provide one paper copy of the proposal to both the Cognizant DCMC Office and the Cognizant DCAA Office. Be sure to advise the ACO and DCAA for the prime and subcontractors that the proposal is "For Official Use Only" and "Source Selection Information (See FAR 3.104)". Only Volume IV Price/Final Contract shall contain pricing data. The delayed submission of Volume IV Price/Final Contract is to allow the offerors and government to have full understanding on all aspects of the solicitation

and proposal, except price, prior to submission of Volume IV. Detailed instructions for preparing each proposal volume are on PIXS as "prepinst.doc" dated 22 Jan 99. All interchanges between the offeror and the government, unless otherwise specifically noted by the procuring contracting officer (PCO), will be for clarification purposes only and will not constitute discussions within the meaning of FAR 15.306. The government intends to award without discussions but reserves the right to make a partial award or to award no contract if there are no acceptable proposals. If discussions are required, the PCO shall notify the offerors in writing.

Capability Demonstration - The Offeror shall provide a capability demonstration that explains the contractor's approach for providing the required simulation services. The capability demonstration shall be conducted in accordance with AFFARS Appendix AA-302 and the rules of engagement described herein. As a part of the capability demonstration, the offeror shall provide an oral presentation. Following the capability demonstration, the government will conduct a limited question and answer session.

An Ombudsman has been appointed to hear concerns from offerors or potential offerors during the proposal development phase of this acquisition. The purpose of the Ombudsman is not to diminish the authority of the program director or contracting officer, but communicate contractor concerns, issues, disagreements, and recommendations to the appropriate government personnel. When requested, the Ombudsman will maintain strict confidentiality as to the source of the concern. The Ombudsman does not participate in the evaluation of proposals or in the source selection process. Interested parties are invited to contact ASC's Ombudsman, Mr. Stephen J. Plaisted, 1790 10th Street, Room 208, Wright-Patterson AFB OH 45433-7642; E-mail:

plaistsj@sy.wpafb.af.mil; Phone: (937) 255-9095. The Ombudsman should only be contacted with issues or problems that have been previously brought to the attention of the contracting officer and could not be satisfactorily resolved at that level.

MEMORANDUM FOR U.S. DEPARTMENT OF COMMERCE
COMMERCE BUSINESS DAILY
P .O. BOX 5999
CHICAGO, IL 60680

FROM: ASC/YWI
Building 11
2240 B Street, Room 231
Wright-Patterson AFB OH 45433-7111

SUBJECT: Synopsis - Solicitation

1. NA!!

2. 0128!!

3. 99!!

4. GPO391030!!

5. 45433-7111!!

6. 69!!

7. ASC/YWI, Building 11, 2240 B Street, Room 231, Wright-Patterson AFB OH 45433-7111!!

8. F-16 Block 40/50 Mission Training Center (MTC) Program!!

9. F33657-98-R-2033!!

10. 030399!!

11. Contact, Jerry C. Peterangelo, Contracting Officer, (937) 255-7388 ext. 266, fax (937) 656-7538!!

12. N/A!!

13. N/A!!

14. N/A!!

15. N/A!!

16. N/A!!

17. This is Part 2 of 2 of Request for Proposal (RFP) F33657-98-R-2033 for the F-16 Block 40/50 Mission Training Center (MTC) Program (herein referred to as F-16 MTC). Part 1, describing the program's technical/management requirements and the instructions, conditions and notices to offerors (ICNO), is contained in the preceding CBD announcement. This part contains the basis for award and the evaluation criteria/standards. The basis for award will be IAW FAR 52.212-2. The following will be inserted into paragraph (a): "The source selection will be conducted IAW streamlined AFFARS Appendix AA procedures and the AFMC Supplement thereto." While the government source selection evaluation team and the Source Selection Authority (SSA) will strive for maximum objectivity, the source selection process, by its nature, is subjective and, therefore, professional judgment is implicit throughout the entire process. The government reserves the right to award without discussions. The government intends to award only one contract. However, the government reserves the right to award no contract at all, depending on the quality of the proposal(s) submitted and the availability of funds. Award will be made to the offeror who is deemed technically acceptable and responsible IAW the Federal Acquisition Regulation and whose proposal conforms to the requirements of this solicitation and is judged to represent the best value to the government. To arrive at best value, the various components of the offeror's proposal will be evaluated for consistency, both within the proposal, and with this solicitation and supporting documents. The proposal will be evaluated against criteria as defined below. All rating components will be presented to the SSA for his integrated assessment. The offeror's proposal will be evaluated to determine the extent that the offeror understands the training requirements, has

committed to meeting the requirements, and offers a sound approach to meeting the requirements defined in the F-16 MTC Simulation Capability Requirements Document (SCRD). Proposed processes, activities, and methodologies will be evaluated to ensure that the requirements of the SCRD will be satisfied. The Evaluation Criteria are:

Technical/Management Factor

Subfactor T1 – Simulation Utility

Subfactor T2 – Processes

Subfactor T3 – Schedule

General Considerations

RFP Terms and Conditions

Pre-Award Survey

Price Factor.

Technical/Management Factor

An integrated evaluation will be performed using information from all aspects of the offeror's written proposal and oral presentation with demonstration, including but not limited to the offeror's approach, Statement of Work (SOW), performance specification, Integrated Master Plan (IMP), and Integrated Master Schedule (IMS). The evaluation of this factor will be based upon the following sub-factors:

Subfactor T1 – Simulation Utility

The offeror's proposed technical approach will be evaluated for its ability to meet F-16 requirements as described in the SCRD. The evaluation will include as a minimum, ownship simulation, visual system, synthetic environment, threat station,

modular control equipment (MCE), Instructor Operator Station, local/long haul networking, and briefing/debriefing systems.

Evaluation Standard:

The standard is met when the offeror's proposed simulation service: a) incorporates a concurrent high fidelity ownship simulation, including the cockpit, aircraft handling, avionics, and weapons systems of the F-16 in accordance with the SCRD; b) incorporates a visual system, image generator and display, that provides the simulation user with a detailed visual capability, that accomplishes F-16 training in accordance with the SCRD; c) incorporates synthetic environments and databases that support training scenarios in accordance with the SCRD; d) provides simulation system users with a synthetic combat environment (electronic and ordnance) that supports a full range of mission scenarios including using constructive and virtual interactive red, gray, and blue entities, MCE, threat stations; provides control of such entities; and includes the effects of weapons and passive and active countermeasures, in accordance with the SCRD; e) provides networking of all systems in a stand-alone MTC and supports long-haul networking and interoperability with MTCs of similar and dissimilar aircraft that supports team training in accordance with the SCRD; f) includes a brief, debrief, and observation capability in accordance with the SCRD; and g) incorporates an Instructor Operator Station (IOS) which enables management of training sessions in accordance with the SCRD.

Subfactor T2 – Processes:

The offeror's processes will be evaluated to ensure training services will be delivered in accordance with the SCRD. The evaluation will include, as a minimum, the process of obtaining and managing data for the ownship simulation, synthetic environment, and concurrency with the operational aircraft at each site; the process for attaining compliance with Operations and Integration (O&I) standards; the process to insert new technologies into the service; the process to achieve a sound systems integration of new and reused software into the simulation service; and the process for verifying that the simulation service will satisfy the proposed specification.

Evaluation Standard:

The standard is met when the offeror's proposed simulation service: a) has identified a sound approach to manage the data, data sources, and business relationships necessary to meet SCRD requirements, IMP milestones, and service delivery dates; b) has identified a sound technical and business approach leading to compliance with O&I standards; c) has identified a sound technical and business approach for technology insertion, in accordance with the SCRD; d) has identified a sound technical approach to integrate new and reused software into the simulation service; and e) defines a method for verifying that the simulation service will satisfy the proposed specification in accordance with the SCRD.

Subfactor T3 – Schedule

The offeror's IMS will be evaluated for realism (the scope of work and the task duration are compatible), reasonableness (the scheduling methodology is logical),

and completeness (the schedule fully and adequately addresses all RFP requirements). The offeror's integrated proposal will be evaluated to ensure that the offeror is able to support training capability assessments and the operational evaluation, provide mission training services, and meet aircraft concurrency requirements.

Evaluation Standard:

The standard is met when the offeror's proposal demonstrates that the offeror has a sound, well-integrated approach to deliver all services required by the SCRD on schedule.

General Considerations

RFP Terms and Conditions

The government will evaluate the offeror's proposal to ensure compliance with the RFP's terms and conditions. Failure to comply with the terms and conditions of the RFP may result in the offeror being removed from consideration for award.

Pre-Award Survey

The government reserves the right to conduct a pre-award survey.

Price

The government will evaluate proposed prices to determine the evaluation price for the 15-year period of performance. The evaluation price will include the simulation service price IAW evaluation price matrix.

All proposed prices will be evaluated for reasonableness as defined in AFFARS Appendix AA-308 and IAW FAR 12.209. Any proposal that is materially unbalanced as to the price for the 15-year period of performance will be considered deficient. IAW FAR 15.304, the above evaluation criteria are listed in descending order of importance with Technical/Management being most important. General Considerations and Price are of equal importance but when combined are of lesser importance than Technical/Management. Within the Technical/Management Factor, the sub-factors are in descending order of importance. The government will perform the following risk assessments: (1) A proposal risk assessment of the risks associated with the offeror's proposed approach to accomplish the solicitation requirement. (2) A performance risk assessment based on the offeror's relevant past and present performance. The government plans to review performance data provided by the offeror, the AFMC Contractor Performance Assessment Reporting (CPAR) System, government questionnaires, and commercially available sources. Performance risk will be reported at the factor level.

A color/adjectival rating, a proposal risk assessment, and a performance risk assessment will be assigned as follows: Each technical/management subfactor will receive a color/adjectival rating (Blue, Green, Yellow, Red) and proposal risk assessment (Low, Moderate, High) per AFFARS Appendix AA. Each factor (technical/management and price) will receive a performance risk assessment. Price will not receive a color/adjectival rating or proposal risk assessment. When the integrated assessment of all aspects of the evaluation is accomplished, the

color/adjectival ratings, proposal risk assessments and performance risk assessments are all considered equally; any one of these considerations can influence the source selection authority's (SSA) decision. Evaluation of the basic seven-year ordering period plus the potential eight-year award term shall not obligate the government to issue orders for all 15 years.

A written notice of award or acceptance of an offer, mailed or otherwise furnished to the successful offeror, within the time for acceptance specified in the offer, shall result in a binding contract without further action by either party. Before the specified expiration time in the solicitation, the government may accept an offer (or part of an offer), whether or not there are negotiations after its receipt, unless a written notice of withdrawal is received before award.

Offerors must include in their proposal a completed copy of the provision at FAR 52.212-3, Offeror Representations and Certifications - Commercial Items, and DFARS 252.212-7000, Offeror Representations and Certifications - Commercial Items (On PXIS as "rep&cert.doc" dated 22 Jan 99) This documentation shall be submitted with the Model Contract Volume III and Price/Final Contract Volume IV.

The clause at 52.212-4, applies to this acquisition. Each offeror's proposed commercial terms and conditions will be addenda to 52.212-4. The Model contract: Offerors shall propose provisions which provide for (1) an award term incentive to allow performance out to 15 years ("Award Term Clause" on PIXS contained in "model-k.doc"

dated 22 Jan 99) and a draft award term plan (may be attached to the contract) as "at_plan.doc" dated 22 Jan 99 (2) a site visit to comply with the intent of FAR 52.237-1, (3) protection of government buildings, equipment and vegetation to comply with the intent of FAR 52.237-2, (4) continuity of services for a successor contractor to comply with the intent of FAR 52.237-3, (5) extension of services to comply with the intent of FAR 52.217-8, (6) commercial acceptance of the service, (7) base support to comply with the intent of AFMC FAR Sup 5352.245-9000 (on PIXS contained in "model-k.doc" dated 22 Jan 99). In accordance with FAR 12.301(e) the following FAR clauses are to be incorporated either in full or by reference into the contract (1) FAR 52.216-18 ORDERING (APR 1984) subparagraph (a) insert "from the contract award date through seven years after the contract award date", (2) FAR 52.216-19 ORDER LIMITATIONS (OCT 1995) subparagraph (a) "Minimum order" insert "one hour", (b)(1) insert "4,160 hours per site", (b)(2) insert "74,800 (18 sites) hours", (b)(3) insert "90 days", (d) insert "5 days", (3) FAR 52.216-21 REQUIREMENTS (OCT 1995) insert in subparagraph (f) "90 days after expiration of the ordering period"

The clause at 52.212-5, applies to this acquisition with the following FAR clauses applicable to this acquisition: 52.219-8, 52.219-9. The Service Contract Act (SCA) applies to contracts which have labor categories other than bona-fide executives (supervisors), administrators (managers), or professionals (predominantly intellectual, varied work, traditionally requiring prolonged, advanced learning, original or creative work, or teaching). Definitions of these exemptions are found in Title 29, CFR 541. If the offeror's proposal involves services only of such exempt employees, the resulting

contract will not be subject to SCA. However, if the offeror's proposal has a significant (defined as 20% or more) number of nonexempt service employees working on the resulting contract, SCA will apply and the following clauses are applicable to this acquisition: 52.222-41, 52.222-42, 52.222-43, 52.222-44, and 52.222-47. If the SCA is applicable, the offerors shall include the SCA applicable wages in Volume III Model Contract and Volume IV Price/Final Contract. The clause at DFARS 252.212-7001 applies to this acquisition with the following DFARS clauses applicable to this acquisition: 252.219-7003 and 252.219-7006. If the offeror is under the Comprehensive SB/SDB Subcontracting Plan Test Program, propose the appropriate clauses.

Simulation Capability Requirements Document (SCRD)

for

F-16 Blocks 40/42/50/52
Mission Training Center (MTC) Program

22 Jan 99

F-16 MTC IPT
Revolutionizing Training Division
Training Systems Product Group
Aeronautical Systems Center

ASC/YWIP
2240 B Street
Wright-Patterson AFB, OH 45433-7111

1.0. SCOPE

1.1 General Description. This document specifies the general simulation services performance requirements for the Combat Air Forces' (CAF) F-16 Block 40/42/50/52 system simulations and Mission Training Centers (MTCs). In this document the terms Block 40 and Block 50 refer to F-16 Block 40/42/50/52. System simulation refers to an F-16 Block 40 or 50 training device that is capable of training the F-16 Training Task List (TTL) attached as Appendix A. MTC refers to a training capability that contains two to four system simulations and their associated instructor operator stations, threat stations, mission control equipment workstation, and a brief/debrief system. MTC is also referred to as a Level C simulation service. Distributed Mission Training (DMT) is defined as locally or long haul networked simulations. The F-16 system simulations and MTCs shall be part of a larger DMT system that integrates other dissimilar system simulations.

2.0 APPLICABLE DOCUMENTS

2.1 Reference Documents. Documents listed are directly referenced in the main body of this SCRD.

2.1.1 Government Documents.

AFOSH Standards
Air Force Policy Directive 33-2
Air Force System Security Instruction 5102
Air Force System Security Instruction 5024
Air Force System Security Instruction 5027
DoD 5220.22-M, National Industrial Security Program Operating Manual (NISPOM), 1 Jan 95
DoD Directive 2040.2, International Transfer of Technology, Goods, Services, and Munitions, 17 Jan 84
DoD Directive 5000.1, Defense Acquisition, 15 Mar 96
DoD Directive 5200.1, DoD Information Security Program, 17 Jun 97
DoD Directive 5200.28, Security Requirements for Automated Information Systems, 21 Mar 88
DoD Directive 5200.39, Security, Intelligence, and Counterintelligence Support to Acquisition Program Protection, 10 Sep 97
DoD Directive 5230.24, Distribution Statements on Technical Documents, 18 Mar 87
DoD Directive 5230.25, Withholding Unclassified Technical Data from Public Release, 6 Nov 84
DoD Manual 5200.1, Acquisition Systems Protection Program, 16 Mar 94
DoD Regulation 5000.2, Mandatory Procedures for Major Defense Acquisition Programs (MDAPS) and Major Automated Information System (MAIS) Acquisition Programs, 15 Mar 96
TSPG CPI List, 15 Apr 98
TSPG Program Protection Plan, 15 Feb 96

2.1.2 Non-Government Documents.

None.

3.0 SIMULATION SERVICE PERFORMANCE REQUIREMENTS

3.1 Simulation Service Definition.

3.1.1 Simulation Service Overview. F-16 Block 40 and 50 simulation services shall operate fully in the United States Air Force (USAF) DMT network. Simulation service elements shall meet interoperability standards established by industry and the USAF through the DMT Operations and Integration (O&I) contractor. The system

simulations shall be capable of training all aircraft missions and procedures as specified in the F-16 TTL. Training tasks include, but are not limited to, emergency procedures, initial qualification training, weapons and tactics training, and mission qualification training. The system simulations shall also provide the capability to perform system upgrade training, advanced skills training (i.e. flight lead, instructor pilot, mission commander, etc.), tactics validation, operational test and evaluation, mission rehearsal, and exercise support.

3.1.2 Simulation Service Levels.

3.1.2.1 Simulation Service Level A. Level A service shall provide one or more system simulations at an operating location. Each system simulation shall provide, as a minimum, the capability to train all level A tasks identified in the F-16 TTL. Level A system simulations shall provide a visual system that allows F-16 pilots to train all level A tasks identified in the F-16 TTL. Level A system simulations shall be capable of operating in a DMT and stand-alone configuration.

3.1.2.2 Simulation Service Level B. Level B service shall provide one to four networked system simulations at an operating location. Each system simulation shall provide, as a minimum, the capability to train all level B tasks identified in the F-16 TTL. Level B system simulations shall provide a visual system with the full Field Of View (FOV) experienced by the pilot in the aircraft that allow F-16 pilots to train all level B tasks identified in the F-16 TTL. Level B service shall also provide, as a minimum, a briefing and debriefing capability. Level B system simulations shall be capable of operating in a DMT and stand-alone configuration.

3.1.2.3 Simulation Service Level C. Level C service shall provide two to four fully DMT integrated system simulations at an operating location. Each system simulation shall provide, as a minimum, the capability to train all level C tasks identified in the F-16 TTL. Level C system simulations shall provide a visual system with the full FOV experienced by the pilot in the aircraft that allow F-16 pilots to train all level C tasks identified in the F-16 TTL. Level C service at an operating location shall provide a number of virtual threat stations equal to the number of system simulations; a briefing, debriefing, and mission observation capability; and a separate Modular Control Equipment (MCE) workstation for local command and control support. Level C system simulations shall operate in a DMT and stand-alone configuration.

3.1.3 Simulation Service Level Upgrades. Level A and Level B simulation services shall be capable of being upgraded to any higher service level.

3.2 General Performance Requirements.

3.2.1 F-16 Missions and Operations. The system simulations shall provide the capability to train all of the following F-16 threshold missions and operations: Defensive Counter Air (2vX and 4vX to include Beyond Visual Range (BVR) employment), Offensive Counter Air, Suppression of Enemy Air Defenses (SEAD) (Block 50), Low Altitude Navigation and Targeting Infrared Night (LANTIRN) (Block 40), Medium Altitude Operations and Tactics, Air Interdiction, Weather Approach Procedures, and Emergency Procedures. The system simulations should provide the capability to train all of the following objective missions and operations: Basic Fighter Maneuvers (BFM), Air Combat Maneuvering (ACM), Close Air Support (CAS), Killer Scout, Combat Search and Rescue (CSAR), Night Vision Goggle (NVG) operations, and nuclear operations.

3.2.2 F-16 Training Tasks. The system simulations shall provide the capability to train the F-16 TTL tasks in accomplishment of the F-16 missions and operations listed in SCRD paragraph 3.2.1.

3.3 Simulation Service Elements.

3.3.1 Ownship Simulation. The subsequent paragraphs in this section apply to all simulation service levels.

3.3.1.1 Cockpits. All system simulation cockpits shall be a high-fidelity representation of the F-16 Block 40 or 50

aircraft cockpits, including controls, displays, and avionics. All cockpit components shall provide high physical (3-dimensional) and functional fidelity of the actual equipment on the aircraft. The cockpits should provide an immersive environment to enhance the F-16 pilot's experience by stimulating their perception by using a combination of sensory cues. Cockpits should be capable of training night vision tasks identified in the F-16 TTL. Communication systems including both voice and data shall replicate performance in the aircraft.

3.3.1.2 Aircraft Handling Characteristics. The system simulation shall provide an accurate simulation of F-16 Block 40 and 50 handling characteristics for all ground and flight regimes, and aircraft configurations. Appropriate flight and ground characteristics shall be simulated for abnormal operations and emergencies as identified in the F-16 TTL. The simulation system shall accurately simulate and provide the ability to select any applicable F-16 engine.

3.3.1.3 Avionics and Weapon Systems. The system simulation shall accurately replicate the operation of all F-16 Block 40 and 50 avionics and weapons system functions.

3.3.2 Visual Systems. The visual systems shall support F-16 air-to-surface and air-to-air mission tasks. The visual system shall provide sufficient visual cues, image quality and positional accuracy to accomplish the F-16 TTL. Visual cues presented to the pilot shall accurately replicate those in the F-16 aircraft and shall not present false, negative, or inappropriate training perceptions in comparison to F-16 aircraft operations. The visual system shall be correlated with all sensors and displayed information in the cockpit. The visual system shall support dense, geo-specific topographic databases and moving models. The visual system shall be capable of displaying representations of hostile and friendly weapons effects including, but not limited to, air and surface missile launch, missiles in flight, anti-aircraft artillery (AAA), bomb detonations, and gun tracers. The visual system shall provide visual cues including, but not limited to, employment of flares, afterburner effects, and contrails. The visual system shall accurately replicate environmental effects including, but not limited to, variable sun positions, darkness, moon illumination, dawn, dusk, weather effects, visual degradation from clouds and cloud decks, fog, rain, snow, and seasonal effects to accomplish the F-16 TTL. The visual system should support both direct and indirect lighting effects with selectable shadows on all objects/entities in the environment. The visual system shall allow for realistic visual ranging, height above terrain determination, occulting, and target range, aspect, and closure determination. Glare effects of ownship lighting on the atmosphere shall be simulated.

3.3.2.1 Simulation Service Level A Visual System. The visual system shall provide the capability to train F-16 pilots on level A tasks and procedures identified in the F-16 TTL.

3.3.2.2 Simulation Service Levels B and C Visual System. The visual system shall support multi-ship employment tasks to include tactical formations, mutual support, air-to-air engagements, air-to-ground engagements, defensive maneuvers, element target attack, target ingress, and target egress. All visual systems shall support visual maneuvering with a minimum of eight active aircraft in the synthetic environment for 4 versus 4 engagements. Visual system display resolution shall support accurate pilot visual determination of all other aircraft's identity, detection range, aspect angle, and closure rate at slant ranges required to accomplish the tasks and procedures identified in the F-16 TTL. The system simulation out-the-window (OTW) field-of-view shall accurately replicate the real-world OTW field-of-view of an F-16 aircraft.

3.3.3 Synthetic Environment. The system simulation shall create a high fidelity synthetic environment capable of supporting a full range of mission scenarios for all simulation service levels. The system simulation shall provide a correlated environment for out-the-window visual, electronic combat, navigation, sensor and weapon systems. The synthetic environment shall support training for single, two, three, or four ship operations.

3.3.3.1 Natural Environment. The system simulations shall create a high-fidelity natural environment (terrain, atmosphere, weather) that is capable of supporting F-16 aircraft mission scenarios for all modes of training tasks identified in the F-16 TTL. All system simulations shall support a variable mix of constructive and virtual entities. Constructive entities shall realistically interact with all other synthetic environment entities in terms of flight maneuvers, avionics, and weapon systems, while operating within high-fidelity atmospheric and weather conditions.

3.3.3.2 Databases. The system simulation shall provide geo-specific topographic cultural databases in support of visual, sensor, and weapons simulation sufficient for pilots to perform target identification tasks as required by the F-16 TTL. The system simulation shall provide interoperable and correlated, terrain cultural models in compliance with the DMT O&I standards. The simulation service contractor shall provide two separate 57,600 square nautical mile (snm) geo-specific databases of two separate combat theaters, one 57,600 snm geo-specific database of the "Red Flag" gaming area, and, as a minimum, one 43,200 snm geo-specific database corresponding to the geographic location of the ordered service. For each new service location ordered, the simulation service contractor shall provide at least one 43,200 snm geo-specific database of the local area and a 57,600 snm geo-specific database for an additional combat theater. All databases created shall be available to all F-16 Block 40 and 50 locations to support DMT operations.

3.3.3.2.1 Contingency Databases. The simulation service contractor shall provide the database generation capability to create contingency databases.

3.3.3.3 Manmade Environment. The system simulation shall create a high-fidelity manmade environment that is capable of supporting F-16 aircraft mission scenario for all modes of training tasks identified in the F-16 TTL.

3.3.3.3.1 Constructive Entities. The system simulations shall include a high-fidelity, interactive, constructive simulation environment. The constructive entities shall provide hostile, neutral, and friendly synthetic force participants that intelligently interact with each other as well as all other virtual participants. The constructive environment shall support entities capable of effectively operating either on the terrain surface or as an airborne platform. All constructive players shall be controllable by an instructor or software scripts in a manner that supports high-fidelity mission training. Software scripts shall be easily modified in order to accurately simulate current real-world intelligence doctrine for threats. The constructive entities shall include high-fidelity flight models of all airborne threats. Constructive players shall respond accurately to F-16 countermeasures and pilot tactics. No artifacts (i.e. degraded simulation frame rates, perceptible time lags, etc.) shall occur when all combinations of selected constructive and virtual models are simultaneously active in the synthetic environment.

3.3.3.3.2 Electronic Combat Environment (ECE). The system simulations shall include an ECE capable of accurately simulating interactive ground and airborne threats, to include high-fidelity simulations of RADAR and Infrared (IR) emissions. The ECE shall incorporate real-world intelligence doctrine in the behavior of threat models. Real-world intelligence doctrine shall include, but not be limited to, combat flight tactics, and combat operation of Jammers, Anti-Aircraft Artillery, RADARs, and Missile Systems (JARMS). The ECE shall accurately account for all types of occulting, including visual, electro-optical, and deployed counter-measures. The ECE shall realistically model electronic combat entities and their effects in sufficient detail to train the F-16 TTL tasks. The ECE shall accurately model and integrate the effects of countermeasures to include, but not limited to, chaff, flares, jamming, anti-radar maneuvers, and frequency hopping. Constructive entities shall include friendly, neutral, and hostile air entities as well as ground based threats. All threats shall be designed to operate as if they were under the control of a realistic, coordinated Integrated Air Defense System (IADS) or offensive attack command and control structure.

3.3.3.3.3 Ordnance. The system shall accurately simulate weapons stores and status management, malfunctions, prelaunch procedures, launch, missile/bomb/bullet flyout, target tracking, detonation (if appropriate), and battle damage (damage models, fire, smoke, debris, target behavioral change) to other combat entities or natural entities in the synthetic environment. The system shall simulate both hostile and friendly forces ordnance operating simultaneously within the synthetic environment. The effects of countermeasures to include, but not limited to, chaff, flares, and jamming on active ordnance shall be accurately simulated.

3.3.4 Threat Stations. Level C simulation service shall include a number of virtual threat stations equal to the number of system simulations to allow human adversaries (man-in-the loop) to operate red, blue or gray airborne threat systems. These stations shall be capable of controlling any preprogrammed airborne threat. During simulation execution, each threat station shall have the ability to switch from controlling one threat to controlling any other depicted airborne threat in the simulation at the operator's discretion. Threats shall operate in normal operating parameters when control is released. The threat stations shall be capable of participating in local and long haul DMT networked training. The threat station reconfigurable characteristics shall focus on flight characteristics,

threat capabilities, and weapons loads. Threat platform types shall be fully selectable from the threat station. Selection of threat platform types shall be fully correlated with the synthetic environment.

3.3.5 Modular Control Equipment (MCE) Workstation. One MCE workstation shall be provided for each Level C simulation service. The MCE workstation shall allow a qualified MCE operator to provide ground control intercept support. The MCE workstation shall provide sufficient fidelity to allow an operator to provide realistic radar control to a training scenario. The MCE workstation should replicate the effects of terrain, clutter, noise, chaff, jamming, and probability of detection and track uncertainties on the information displayed to the workstation operator.

3.3.6 Instructor Operator Station (IOS). The IOS shall be capable of supporting from one to four system simulations. The IOS shall enable instructors to train F-16 pilots on all tasks identified in the F-16 TTL. All system simulations shall provide an interface to the IOS system at every cockpit. The IOS shall provide the capability to create, modify, setup, execute, monitor, evaluate, and record training mission scenarios for all modes of training.

3.3.6.1 Training Scenario Management. The IOS shall provide training scenario management capabilities for all modes of training. The capability to share scenarios and missions between networked sites shall be provided. The IOS shall allow the operator to provide radar control including broadcast and tactical control in all modes of operation, and have the ability to input other tactical information. The IOS shall provide the capability to provide air traffic control functionality including ground controlled approach procedures.

3.3.6.2 Scenario Creation. The IOS scenario creation capability shall provide instructors a flexible, user friendly, mission scenario generation system that allows for design, modification, and storage of pre-planned mission scenarios for F-16 pilot training. The IOS shall include a capability to generate and/or modify scenarios off-line on a Commercial Off the Shelf (COTS) IBM compatible personal computer, and import these scenarios to the system simulation. The scenario creation tool shall allow instructors a flexible, user friendly, mission scenario generation capability external to the IOS system and allow for all the same design, modification, and storage of pre-planned mission scenarios for F-16 pilot training.

3.3.6.3 Scenario Setup and Execution. The IOS shall provide the capability to select, load, and run pre-programmed training scenarios. The IOS shall provide the capability to load and display mission data produced on Air Force Mission Support System (AFMSS) and the Personal Flight Planning System (PFPS). The IOS shall provide the capability to modify training scenarios and mission events during execution. The IOS shall provide the ability to input, delete, activate and control threats and sensor entities seamlessly during training scenarios.

3.3.6.4 Malfunctions. The IOS shall provide the capability to insert malfunctions requiring pilot response or notification to remedy during scenario creation, scenario setup, or scenario execution. Each malfunction shall be presented realistically, such that pilot corrective actions would be performed as in the actual aircraft. Malfunctions shall be modeled to accurately represent degraded/failed system performance that would be perceived by the pilot in an actual aircraft under the same conditions. Multiple malfunctions per system, and simultaneous malfunctions in more than one system shall be selectable. The IOS shall have the capability to provide random or preprogrammed malfunctions. There shall be sufficient malfunctions modeled to exercise all emergency procedures in the F-16 TTL.

3.3.6.5 Scenario Monitoring. The IOS shall provide the instructor the ability to select and monitor any combination or all displays and instrument indications of each cockpit. The IOS shall provide the capability to monitor any combination or all communications, and to observe any system sensor outputs including data links and stores' sensors. The IOS shall provide the capability to select an overhead "God's eye view" of the engagement area with the capability to zoom in and out, and 3-dimensionally rotate any areas of interest.

3.3.6.6 Communications. The IOS shall provide the capability for the instructors to have private communication with any selected participant on the network in a manner that prevents any other participants from overhearing the dialogue. Instructors or pilots shall be able to initiate private communication. The IOS shall have the capability to issue communications to all DMT stations simultaneously. The IOS stations shall have the capability to do IOS to

IOS communication between DMT stations. Instructors shall be able to initiate and/or override communication jamming.

3.3.6.7 Freeze and Reset. The IOS shall provide the capability to freeze and reset ownship scenarios for all modes of training. The IOS shall provide for restarting at the point of freeze, start of mission, or at a dynamically selected point in the mission. The IOS shall be able to retain a minimum of ten mark points. The IOS shall be able to set a mark point at any time and also have the capability to automatically set mark points at regular intervals specified by the IOS. The IOS shall be able to repeatedly reset the simulation to any identified mark point. The IOS shall have the capability to freeze or reset the quantity of expenables to include, but not limited to, fuel, flares, chaff, and munitions. The IOS shall provide reset capability in a timely manner so there is no impact to the training scenario.

3.3.6.8 Mission Playback. The IOS shall provide a playback capability including audio that stores whole and partial mission segments of the training scenario for replay at the cockpit and IOS. Mission recording shall include, but not be limited to, Head-Up Display (HUD), Multi-Function Displays (MFDs), RADAR Warning Receiver (RWR), audio, and OTW visual presentations. All playback capabilities shall include the ability to specify the beginning and end of the record segment. Mission playback capability must be at least 90 minutes.

3.3.6.9 Cockpit Control Interface. The cockpit control interface shall enable pilots to have limited IOS control to include start, stop, reset, scenario selection, and reset the quantity of expendables to include, but not limited to, fuel, flares, chaff, and munitions while seated in the cockpit. The cockpit control interface shall be designed so that it does not obstruct any of the out-the-window visuals or cockpit systems.

3.3.7 Briefing / Debriefing (B/DB) Systems. The B/DB system shall provide a briefing, debriefing, and mission observation capability. The B/DB system shall allow for the briefing, debriefing, and mission observation capabilities to be used interchangeably. The B/DB system shall support briefing, mission execution, and debriefing simultaneously. The full B/DB system shall be compatible with other DMT networked B/DB systems. The B/DB system shall have the ability to use mission data provided from AFMSS and PFPS. All B/DB systems shall provide real-time networking with other DMT B/DB systems to provide video teleconferencing and interactively play B/DB data. The B/DB systems shall provide simultaneous video teleconferencing to support briefing and debriefing functions.

3.3.7.1 Briefing Capability. The briefing capability shall provide instructors the ability to conduct pre-mission planning and briefing to prepare F-16 pilots for the mission scenario. The briefing capability shall display the output of AFMSS and PFPS. Each briefing capability shall support at least 8 people.

3.3.7.2 Debriefing Capability. The debriefing capability shall provide the ability to conduct debriefing of the F-16 pilots on the training scenario. The debriefing capability shall playback recorded segments of a training mission from any cockpit's perspective at normal or accelerated speeds. The debriefing capability shall provide the capability to simultaneously playback individual cockpit recordings for selectable console displays and audio, to include, but not limited to, MFDs, RWR, and OTW visual presentations with and without correlated HUD. The debriefing capability shall provide the capability to maintain mission situational awareness during the debrief. The debriefing capability shall playback missions from any perspective of the battlefield or selectable cockpit views (blue, gray or red), and simultaneously display information from all MTC cockpits. The recording function shall have the ability to specify the beginning and end of a record. The recordings shall be achievable on removable media for playback on commercially available off-the-shelf multimedia equipment, and be transferable to other sites over the network. Recording time length shall be, as a minimum, 120 minutes without changing the record media. All debriefing systems shall provide the capability to network with the Air National Guard's USAF Personal Computer Debriefing System (PCDS). Each debriefing capability shall support at least 8 people.

3.3.7.3 Mission Observation Capability. The mission observation capability shall provide a full battlefield observation in a "God's-eye view" (observation of the entire scenario, or meaningful portions thereof), selectable cockpit views (blue, gray or red), and selectable observations from any point in space. Mission observation shall allow simultaneous display of each cockpit's information. The mission observation system shall provide real-time

observation of active or previously recorded scenarios. The mission observation room shall provide the capability for at least 20 people to view active or recorded missions.

3.4 DMT Connectivity.

3.4.1 DMT Networking. All system simulations shall be integrated into DMT networks and inter-operate with designated DMT federations established by the O&I contractor. All system simulations shall include the necessary communications equipment to connect to the DMT long haul networks at each operating location. The DMT O&I contractor will assist the MTC contractor in determining the requirements for the MTC external interface. The simulation service contractor is responsible for all MTC networking. All DMT long haul network issues and capabilities will be the responsibility of the DMT O&I contractor.

3.4.2 DMT Interoperability. The F-16 simulation service contractor shall work with the Operations & Integration contractor and other DMT federate contractors to ensure full interoperability and realistic interactions between the F-16 system simulations and other DMT federates. The F-16 simulation service contractor shall comply with all DMT interoperability standards. The F-16 simulation service contractor shall establish an Associate Contractor Agreement (ACA) with the O&I contractor. The F-16 simulation service contractor shall participate in all relevant DMT working groups and O&I Integrated Product Teams (IPT)s.

3.4.3 Simultaneous Training. All system simulations at a given location shall provide the capability to conduct simultaneous, independent, training scenarios. A minimum of one DMT network hookup shall be within an MTC at any given time. (For example, two devices in a four ship MTC might be running a DMT networked mission, while the third and fourth devices are each concurrently running stand-alone missions.)

3.5 Facilities.

3.5.1 Nominal Facility. The government will provide all building facilities for the F-16 DMT system simulations and MTC, to include heating, air conditioning, electrical connections, utilities, and standard phone lines. The nominal facility space that will be provided is a 45 feet long by 45 feet wide by 15 feet high space for a two-ship MTC with IOSs, threat stations, and all associated hardware (excluding B/DB system). The government will provide additional space for the B/DB system. The nominal facility power will be 208V/800 Amp 500KVA and 444V/400 Amps 112.5 KVA. The nominal facility heating, ventilation and air conditioning (HVAC) will be a 30 ton unit and 2 each 50 ton split systems with re-heat and humidity controls.

3.5.2 Facilities Support. The F-16 simulation service contractor shall provide their own additional communication services, power conditioning, janitorial service for the facility, and any internal technical systems required to provide the service.

3.5.3 Site Surveys. The contractor shall conduct a site survey to plan for deployment and facility interfaces for each F-16 system simulation and MTC location where service is ordered. The contractor shall ensure the F-16 DMT system simulations and MTC interface properly with the environmental, structural, mechanical, communications, electrical subsystems of the facility in which it is installed, to include 3-D footprint, power, door sizes, facility security level, floor load limit, and air conditioning capacity (BTU).

3.6 Availability. Simulation services shall be available for a minimum of 95% of the scheduled operating hours.

3.7 Environment, Safety, and Health. All services shall be designed to comply with AFOSH standards to minimize safety hazards to all personnel using or maintaining the equipment, while in an operative or non-operative

state. In addition, materials used in the construction of the equipment shall not support the propagation of flame. The design effort shall minimize and control hazards associated with the generation of toxic or noxious gases. Each system simulation and IOS system shall provide an emergency switch that shall bring the entire system to an immediate safe and stopped condition without damaging the system.

3.8 Security. The F-16 DMT System Simulations and MTC shall meet all security requirements of the DD 254.

3.8.1 F-16 DMT System Simulations and MTC Security. The system simulations and MTCs shall be capable of handling and processing TOP SECRET information. The simulation service elements should be designed for future accreditation for TS/SCI and SAR in the DMT environment. The simulation service contractor shall obtain and provide the necessary cryptographic capability to connect the F-16 simulation service elements in a DMT configuration.

3.8.2 Acquisition Systems Protection.

3.8.2.1 The contractor shall ensure security program requirements are integrated into all program areas of this contract as required by DoD Regulation 5000.2, 15 Mar 96, Part 4, paragraph 4.8.5, Program Protection Planning, and DoD Directive 5000.1, 15 Mar 96, requiring System Security procedures and practices, and DoD Directive 5200.39, Security, Intelligence, and Counterintelligence Support to Acquisition Program Protection, 10 Sep 97. The contractor shall establish, implement and maintain these requirements IAW the provisions of DoD Manual 5200.1 the Acquisition Systems Protection Program, 16 Mar 94, and the TSPG Program Protection Plan, 15 Feb 96.

3.8.2.2 The contractor shall ensure that information systems included in the F-16 MTC adhere to the requirements in Air Force Policy Directive 33-2, Air Force System Security Instruction (AFSSI) 5102, AFSSI 5024 and AFSSI 5027. The contractor shall support certification and accreditation (C&A) of the F-16 MTC by performing the tasks of the Designated Approving Authority (DAA) Representative I.A.W. AFSSI 5024, 1 Sep 97, paragraph 2.8.1.2, and completing the C&A process checklist in AFSSI 5024 Vol. II, Attachment 2.

3.8.3 Information Security.

3.8.3.1 The contractor shall comply with all security requirements as identified in the Department of Defense Contract Security Classification Specification (DD Form 254). These requirements will be executed in accordance with DoD 5220.22-M, National Industrial Security Program Operating Manual (NISPOM), 1 Jan 95 and DoD Directive 5200.1, the DoD Information Security Program, 17 Jun 97.

3.8.3.2 The contractor shall provide for the protection of classified information up to the TOP SECRET level for classified information and materials received or generated as a part of the execution of this contract.

3.8.4 Technology Control.

3.8.4.1 The protection standards and guidance described in DoD Manual 5200.1, the Acquisition Systems Protection Manual, Chapter 5, 16 Mar 94, are required to prevent foreign intelligence collection and/or the unauthorized disclosure of information governed by the International Traffic in Arms Regulation (ITAR) and/or the Export Administration Regulation (EAR) during the acquisition process.

3.8.4.2 Distribution of unclassified Critical Program Information (CPI) (see DoD Manual 5200.1 the Acquisition Systems Protection Program 16 Mar 94, Chapter 3, paragraph F, and the TSPG CPI List 15 April 98) will be made in accordance with DoD Directive 2040.2, International Transfer of Technology, Goods, Services, and Munitions, 17 Jan 84. All such documents will be properly marked in accordance with DoD Directive 5230.24, Distribution Statements on Technical Documents, 18 Mar 87. Technical documents not subject to distribution are defined in DoD Directive 5230.25, Withholding Unclassified Technical Data from Public Release, 6 Nov 84.

3.8.5 Automated Information Systems (AIS). The contractor shall ensure all required AIS is implemented in accordance with DoD Directive 5200.28, Security Requirements for Automated Information Systems, 21 Mar 88.

3.9 Transportable/Mobile MTC Services.

3.9.1 Transportable MTC. The simulation service elements for ACC, USAFE, and PACAF should be designed for infrequent disassembly, transportability, and assembly at overseas deployed operating locations.

3.9.2 Mobile MTC. A modified and mobile level C simulation service shall be provided to service all ANG simulation service locations specified herein. The mobile simulation service shall provide four fully DMT integrated system simulations. Each system simulation shall provide, as a minimum, the capability to train all Level C tasks identified in the F-16 TTL. The system simulations shall provide a visual system with the full FOV experienced by the pilot in the aircraft that allows F-16 pilots to train all Level C tasks identified in the TTL. The mobile simulation service shall provide four threat stations, one common brief/debrief capability, and a separate MCE workstation. The mobile simulation service shall operate in a DMT and stand-alone configuration. The mobile simulation service shall be relocatable four times a year (quarterly) to support training for all of the ANG simulation service locations. The simulation service contractor shall provide a separate specification that specifies the performance requirements for the ANG mobile MTC. This requirement should not influence the design for any other F-16 simulation service.

3.10 Concurrency. The simulation service contractor shall maintain the system simulations concurrent with the F-16 Block 40 and 50 home station aircraft. Concurrency upgrades shall be completed not earlier than 60 days prior to, and not later than implementation on the first home station aircraft.

3.11 Technology Insertion. The F-16 simulation service contractor shall chair a F-16 MTC Training Technology Insertion Board (TTIB) comprised of contractor and Government personnel. The TTIB will produce a prioritized list of candidate technology insertion efforts. The F-16 simulation service contractor shall incorporate new technologies into the service during the current service period of performance. The F-16 simulation service contractor shall develop and maintain an integrated roadmap to introduce new or enhanced capabilities required to meet the user training objectives.

3.12 Data Accession List (DAL). The F-16 simulation service contractor shall establish and maintain a Data Accession List (DAL). The DAL and the included data on the list shall be available to government personnel for reference.

3.13 Simulation Service Support Tasks.

3.13.1 Training Support. The F-16 simulation service contractor shall provide the necessary expertise and resources to support F-16 DMT training events. The contractor shall evaluate all F-16 DMT system simulations and MTC performance with respect to meeting user training objectives. The contractor shall recommend corrective actions to the government.

3.13.2 Technical Assistance. The F-16 simulation service contractor shall provide technical assistance to government instructors and personnel for system simulations and MTC operation. The F-16 MTC contractor shall provide technical support to all sites to maintain the service and to install and update training scenarios.

3.13.3 Government Instructor Training. The F-16 simulation service contractor shall provide training for instructors on how to operate all simulation service elements.

4.0 Verification and Validation.

4.1 Contractor System Verification Testing. The F-16 simulation service contractor shall verify that all simulation services meet specification requirements by subsystem, system, and integrated system testing. The contractor shall plan for, include, and facilitate USAF Subject Matter Experts (SMEs) involvement and witnessing of verification tests. All contractor verification data shall be available for government review and use. The simulation service contractor shall support a joint Government/Contractor system verification review to ensure that all performance requirements have been met prior to the start of simulator certification (SIMCERT).

4.2 System Validation. The simulation service contractor shall validate threat and weapon simulation models. All contractor internal verification and validation data and results shall be available for review and use by the Government. The system validation shall be accomplished prior to SIMCERT.

4.3 Simulator Certification. The F-16 simulation service contractor shall plan for and facilitate all Government evaluations and certifications of the simulation services. The Government will conduct a simulator certification on all simulation service elements, to validate the training capability prior to the start of each simulation service. Additionally, SIMCERT will be conducted annually for all simulation service elements and following TTIB updates or concurrency upgrades. The SIMCERT will be conducted IAW the Government developed SIMCERT Plan.

4.4 System Evaluation. The F-16 simulation service contractor shall plan for and facilitate all Government system evaluations of the simulation services. The Government will conduct a system evaluation on each simulation service location after service has started. The system evaluation will be conducted IAW the Government developed System Evaluation Plan.

4.5 Y2K Compliance. All information technology items must be year 2000 compliant. Year 2000 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.

5.0 ACRONYMS

AAA	Anti-Aircraft Artillery
ACA	Associate Contractor Agreement
ACC	Air Combat Command
ACM	Air Combat Maneuvering
AFOSH	Air Force Operation, Safety and Health
ASC	Aeronautical System Center
AFMSS	Air Force Mission Support System
B/DB	Brief/Debrief
BFM	Basic Fighter Maneuvers
BTU	British Thermal Unit
BVR	Beyond Visual Range
CAF	Combat Air Force
CAS	Close Air Support
COTS	Commercial Off-The-Shelf
CIS	Combat Information System
CE	Constructive Environment
CSAR	Combat Search and Rescue
DAL	Data Accession List
DMT	Distributed Mission Training
FOM	Federation Object Model
FOV	Field of View
ECE	Electronic Combat Environment
GCCS	Global Command and Control System
HLA	High Level Architecture
HUD	Head-Up Display
IADS	Integrated Air Defense System
IBM	International Business Machine
IOS	Instructor/Operator Stations
IPT	Integrated Product Team
IR	Infrared
JARMS	Jammers, Anti-Aircraft Artillery, RADARs and Missile Systems
LANTIRN	Low Altitude Navigation and Target Infrared Night
MCE	Modular Control Equipment
MFD	Multi-Functional Display
MTC	Mission Training Center
NVG	Night Vision Goggle
NVIS	Night Vision Imaging System
PCDS	Personal Computer Debriefing System
PFPS	Personal Flight Planning System
TTL	Training Task List
O&I	Operations and Integration
OTW	Out-the-Window
RWR	Radar Warning Receiver
SCRD	Simulation Capability Requirements Document
SEAD	Suppression of Enemy Air Defense
snm	Square Nautical Mile
SE	Synthetic Environment
SIMCERT	Simulator Certification
SME	Subject Matter Expert
SOM	Simulation Object Model
TSS	Training Support Squadron
USAF	United States Air Force

Appendix A

F-16 Block 40/42/50/52 Mission Training Center (MTC) F-16 Training Task List (TTL)

(Request the TTL from YWIP, Major Ken Gotski.)

F-16 BLOCK 40/50 MISSION TRAINING CENTER (MTC)

CONTRACT DATA REQUIREMENTS LIST (CDRL)

18 Feb 99

PREPARED BY

TRAINING SYSTEMS PRODUCT GROUP
AERONAUTICAL SYSTEMS CENTER
WRIGHT-PATTERSON AIR FORCE BASE, OHIO 45433-7111

428

F-16 BLOCK 40/50 MTC CDRL

LIST OF EFFECTIVE PAGES

Date of issue for original and changed pages are:

Original 18 Feb 99

The total number of pages in this CDRL is 9, consisting of the following:

PAGE NUMBERS	CHANGE NUMBER	CONTRACT MOD NUMBER
General Instruction, 4 thru 5		Original
DD Form 1423-1		Original
A-1		

429

F-16 BLOCK 40/50 MTC CDRL

TABLE OF CONTENTS

	PAGE NUMBER
LIST OF EFFECTIVE PAGES	2
TABLE OF CONTENTS	3
GENERAL INSTRUCTIONS	4
CDRL ADDRESS LIST	6
DATA ITEM INDEX	7
DD FORMs 1423-1	
EXHIBIT A	A-1

430

F-16 BLOCK 40/50 MTC CDRL
GENERAL INSTRUCTIONS

1. **SCOPE**: This Contract Data Requirements List (CDRL) establishes the data to be delivered by the contractor and the submittal, approval and distribution requirements of all the CDRL items contained herein.

2. **GENERAL**: The Data item Descriptions (DIDs) specified in the CDRL are in DOD 5010.12L, Acquisition Management System and Data Requirements Control List (AMSDL).

3. **MODIFICATION OF DATA REQUIREMENTS**:

a. During the performance of this contract, the contracting officer (CO) unilaterally may change the place of delivery and technical office for any data line item, notwithstanding the provisions of the clause of SECTION I of the Schedule of the Contract, entitled "Changes".

b. From time to time during the performance of this contract, the CO unilaterally may make other administrative and clarification changes to the CDRLs. The contract price will constitute full satisfaction of any entitlement of equitable adjustment under the "Changes" clause provided the Contractor agrees to accept such change at no change in contract price.

c. Unilateral action pursuant to paragraphs a and b above shall be by the issuance of a CO letter or message which will reference this paragraph as its authority. Any change pursuant to paragraph b above which does impact the contract price shall not be acted upon by the Contractor but shall require notification of the estimated impact to the CO.

4. **DATA PREPARATION**:

a. Electronic delivery / media of CDRL documentation shall be via protected web page, classified data will be available at the contractor's facility by the PCO. The electronic data must comply with the following:

(1) The contractor shall use software compatible with Microsoft Office Suite, Word 7.0, Excel 7.0, PowerPoint 7.0 and Project 4.0 for creating all documents. As the versions of this software change over time the Government reserves the right to require version updates by all parties, at no additional cost to the Government, by letter from the CO citing this paragraph as its authority.

(2) It is the responsibility of the contractor to mail all documentation to the organizations listed in Block 14 of the DD Forms 1423-1. (E-mail addresses will be made available to the contractor.)

NOTE: If the Government and the contractor agree to submit data electronically, the contractor has the option to deliver large documents by diskette.

5. **DOCUMENTATION MARKING**: The contractor shall be responsible for annotating the appropriate document's date. The following applicable statement(s) shall be placed on the cover page (except engineering drawings which shall be marked on the top sheet) of all documents:

a. Distribution Statement A:

"Approved for public release; distribution is unlimited."

b. Distribution Statement B:

431

"Distribution authorized to U.S. Government Agencies only; Proprietary Data; (date of determination). Other requests for this document shall be referred to the Acquisition Security Program Manager, Training Systems Product Group, ASC/YW, Wright-Patterson AFB OH 45433-7111."

c. Distribution Statement C:

"Distribution authorized to US Government agencies and their contractor; Software Documentation; (date of determination). Other requests for this document shall be referred to the Acquisition Security Program Manager, Training Systems Product Group, ASC/YW, Wright-Patterson AFB OH 45433-7111."

d. Distribution Statement D:

"Distribution authorized to the DoD and DoD contractors only; Critical Technology; (date of determination). Other requests for this document shall be referred to the Acquisition Security Program Manager, Training Systems Product Group, ASC/YW, Wright-Patterson AFB OH 45433-7111."

e. Additional notices: In addition to the distribution statement, the following notices shall also be used when appropriate:

WARNING

"This document contains technical data whose export is restricted by the Arms Export Control Act (Title 22, U.S.C., SEC 2751 et seq.) or the Export administration Act of 1979, as amended. Title 50, U.S.C., App 2401 et seq. Violations of these export laws are subject to severe criminal penalties. Disseminate in accordance with provisions of DoD Directive 5230.25."

"DESTRUCTION NOTICE. For classified documents follow the procedures in DoD 5220.22-M, National Industrial Security Program Operating Manual. For unclassified, limited documents, destroy by any method that will prevent disclosure of contents or reconstruction of the document."

432

F-16 BLOCK 40/50 MTC

ADDRESS LIST

OFFICE SYMBOL	MAILING ADDRESS
ASC/YWI	ASC/YWI 2240 B Street, Room 231 Wright-Patterson AFB OH 45433-7111
ACC/DOT	Shaw AFB, SC
Site DOT	TBD

433

F-16 BLOCK 40/50 MTC

CDRL DATA ITEM INDEX

CDRL No.	Data Item Description/Title	Authority	Contract References
A0001	Data Accession List (DAL)	DI-MGMT-81453	2.2
A0002	Site Requirement Report	N/A	3.7.2

434

CONTRACT DATA REQUIREMENTS LIST (CDRL)

FOR THE

F-16 BLOCK 40/50 MTC

EXHIBIT A

18 Feb 99

PREPARED BY

TRAINING SYSTEMS PRODUCT GROUP
AERONAUTICAL SYSTEMS CENTER
WRIGHT-PATTERSON AIR FORCE BASE

435

CONTRACT DATA REQUIREMENTS LIST

Form Approved
OMB No. 0704-0188

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE
A0001	Data Accession List (DAL)	

4. AUTHORITY (Data Acquisition Document No.)	5. CONTRACT REFERENCE:	6. REQUIRING OFFICE
DI MGMT-81453	SOW para. 2.2	ASC/YWI

7. DD 250 REQ.	9. DIST STATEMENT	10. FREQUENCY	12. DATE OF FIRST SUBMISSION	14. DISTRIBUTION
N/A	D	BLK 16	BLK 16	1. COPIES
8. APP CODE			13. DATE SUBSEQUENT SUBMISS	
			BLK 16	

2. REMARKS

BLOCK 4:

a. The DAL shall include all documents and data, including computer software and Technology Insertion Reports, which are internally generated or subcontracted for in the performance of this contract but not otherwise deliverable.

b. For ease of reference, the DAL shall be sectioned by specialty areas.

BLOCKS 10 and 12: Available electronically in near real time, as required.

BLOCKS 5 and 14: SOW references and addresses will be listed in each delivery order, if ordered.

BLOCK 14: Data will be available through a password protected web site in formats compatible with software used by ASC/YW. Classified data will be available for review at the contractor's facility or as requested by the Procuring Contracting Officer.

a. ADDRESSEE	Draft	Final Reg	Final Repro
ASC/YWI - DATA	001	001	000
See BLK 16			
TOTAL	1	1	0

G. PREPARED BY	H. DATE	I. APPROVED BY	J. DATE
/signed/ KENNETH GOTSKI, Maj, USAF F-16 Block 40/50 MTC Program Manager	14 Jan 99	/signed/ RICHARD G. HONNEWELL DMT Program Manager, ASC/YWI	14 Jan 99

436

CONTRACT DATA REQUIREMENTS LIST

Form Approved
OMB No. 0704-0188

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE
A0002	SITE REQUIREMENT REPORT	

4. AUTHORITY (Data Acquisition Document No.)	5. CONTRACT REFERENCE:	6. REQUIRING OFFICE
BLK 16	SOW para. 3.7.2	ASC/YWI

7. DD 250 REQ.	9. DIST STATEMENT	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
N/A	D	BLK 16	BLK 16
8. APP CODE			**13. DATE SUBSEQUENT SUBMISS**
			BLK 16

14. DISTRIBUTION

a. ADDRESSEE	b. COPIES Draft	Final Reg	Final Repro
ASC/YWI - DATA	000	001	000
See BLK 16			
ACC/DOT	000	001	000
Surveyed Site DOT	000	001	000
TOTAL	0	3	0

16. REMARKS

BLOCK 4:

a. This document shall be generated in contractor format. A separate report will be generated for each site surveyed. Quick-Look reports will be prepared to cover the five regions as required.
Southeast
Southwest
PACAF
USAFE
ANG

b. The content of the report shall include but not be limited to the following:

3. Site Surveyed
4. Site Survey Methodology
5. Location and Site Plan
6. Structural Requirement
   a. Floor loading and footprint
   b. Ingress and passage
7. Electrical and Grounding Requirements
8. Mechanical and Environmental Requirements
9. Communications
10. Lighting
11. Office and Work Space
12. Storage Facilities
13. Hazardous Materials
14. Security
15. Special Installation Instructions
16. Installation Drawings
17. Other

BLOCKS 10 and 12: Available electronically in near real time 30 days after the authorization to conduct a site survey.

BLOCK 14: Data will be available through a password protected web site in formats compatible with software used by ASC/YW. Classified data will be available for review at the contractor's facility or as requested by the Procuring Contracting Officer.

G. PREPARED BY	H. DATE	I. APPROVED BY	J. DATE
/signed/ KENNETH GOTSKI, Maj, USAF F-16 Block 40/50 MTC Program Manager	14 Jan 99	/signed/ RICHARD G. HONNEWELL DMT Program Manager, ASC/YWI	14 Jan 99

Table 1 – Aircraft Platform Equipment Fit and Weapons

Aircraft MDS	Aircraft Name	Radar	Nato Name	Warning Receiver	VHF Comm	UHF Comm	IFF	Gun	Missiles
A-10A	Thunderbolt II			AN/ALR-67	AN/ARC-222	AN/ARC-164	AN/APX-101	GAU-8	
A-50U	Mainstay	Liana AEW&C; Weather Radar; Navigation Radar		R/I			Yes		
B-1B	Lancer	AN/APQ-164		AN/ALR-56M; IDECM	----	AN/ARC-164	AN/APX-101		
B-2A	Spirit	AN/APQ-181; AN/APN-238		AN/APR-50		AN/ARC-215	AN/APX-110		
B-52H	Stratofortress	AN/APQ-166		AN/ALR-20; AN/ALR-46(V)	AN/ARC-210(V)	AN/ARC-164(V)	AN/APX-64(V)		
C-130H2	Hercules	AN/APN-241		AN/AAR-47; AN/ALR-69	AN/ARC-186	AN/ARC-164	AN/APX-72(V); AN/APX-100(V)	-	-
C-17A	Globemaster III	AN/APS-133		AN/AAR-47	AN/ARC-186	AN/ARC-164	AN/APX-100(V)2; AN/APX-105		
C-21A	Learjet	PRIMUS 3000			VHF-22B	AN/ARC-164	AN/APX-100(V)2		
E-3C	Sentry	AN/APS-133(V)2; AN/APY-1		AN/AYR-2	AN/ARC-166	AN/ARC-169E	AN/APX-78; AN/APX-101(V)		
E-8C	JSTARS	AN/APS-133(V)1; AN/APY-3			AN/ARC-186		AN/APX-78; AN/APX-101; AN/APX-105		
F/A-18A	Hornet	AN/APG-73							
F-1	Mirage								
F-117A	Nighthawk	----				AN/ARC-164	AN/APX-101(V)		
F-14	Tomcat	AN/APG-73		AN/ALR-67				M61A1	AIM-7; AIM-9; AGM-88; AIM- AGM-65
F-15A/B	Eagle	AN/APG-63		AN/ALQ-128; AN/ALR-56A		AN/ARC-164	AN/APX-76; AN/APX-101	M-61A1	AIM-7; AIM-9; AIM-120; AGM
F-15C/D	Eagle	AN/APG-70(V)		AN/ALQ-128; AN/ALR-56C		AN/ARC-164	AN/APX-76; AN/APX-101	M-61A1	AIM-7; AIM-9; AIM-120; AGM
F-15E	Strike Eagle	AN/APG-70(V)		AN/ALQ-128; AN/ALR-56C		AN/ARC-164	AN/APX-76; AN/APX-101	M-61A1	AIM-7; AIM-9; AIM-120; AGM
F-16A/B	Falcon	AN/APG-66(V)1		AN/ALR-69	AN/ARC-186	AN/ARC-164	AN/APX-101; AN/APX-109	M-61A1	AIM-7; AIM-9; AIM-120; AGM

Aircraft MDS	Aircraft Name	Radar	Nato Name	Warning Receiver	VHF Comm	UHF Comm	IFF	Gun	Missiles
F-16C/D	Falcon	AN/APG-68		AN/ALR-56M	AN/ARC-186	AN/ARC-164	AN/APX-101	M-61A1	AIM-7; AIM-9; AIM-120; AGM AGM-88
F-4E	Phantom								
F-5E	Tiger II								
GR. Mk 4	Tornado	TI ??		Hermes		Rohde&Schwarz	SSR-3100	27 mm Mause (2)	AIM-9L; ALAR
HH-60G	Blackhawk	AN/APN-239		AN/APR-39A(V)1	AN/ARC-186	AN/ARC-164	AN/APX-100(V)		
KC-10A	Extender	AN/APS-133(V)			618M-3A	AN/ARC-164	AN/APX-78; AN/APX-101		
KC-135R	Stratotanker	WXR-700XW			AN/ARC-186	AN/ARC-164(V)	AN/APX-64(V)		
Mi-24P	Hind-F			Hot Brick; Sirena-3M	Yes	Yes		Gsh-30-2	AT-2; AT-6; AA
Mi-28N	Havoc			Yes	Yes	Yes	Yes	2A42 30 mm	AT-6; SA-16
Mi-8T	Hip-C			Hot Brick;	R-860				57 mm Rocket
MIG-21	Fishbed								
MIG-23	Flogger G								
MIG-25RB	Foxbat B								
MIG-27	Flogger J								
MIG-29S	Fulcrum C	N019M	Slot Back	SPO-15LM	R-862	R-862	SRO-2; SRZ-15	Gsh-301	R-60T (AA-8); R 27R1 (AA-10A) 27RE1; R-27T1; 27TE1; R-73E (A 11); R-77 (AA-1
MIG-31M	Foxhound B	NIIP N007 S-800	Flash Dance	RWR				Gsh-6-23	R-33 (AA-9); R- (AA-6); R-37; R (AA-12);
Mirage 2000E		RDM		Spirale	TRT ERA 7000	TRT ERA 7000	CNI NRAI-11	DEFA 544 30 mm (2)	R530D; Magic; Magic 2;
Mirage 5									
RC-135S	Rivet Joint	AN/APN-242			AN/ARC-186(V)	AN/ARC-164(V)	AN/APX-64(V)		
SU-17	Fitter H								
SU-24M	Fencer D	Navigation; TF		SPO-15; LO-82				GSh-6-23M	AS-7; AS-10; AS 11; AS-12; AS-1 AS-14; AS-17; A
SU-25K	Frogfoot A			Sirena-3			SRO-2	Ao-17A 30 mm	AS-7; AS-10; AS 14; AA-2D; AA-
SU-27P	Flanker-B	N001 Zhuk	Slot Back	SPO-15; LO-82				GSh-301	AA-10A. AA-10 A-10C; AA-10D
Super Etendard									
TU-16	Badger								
TU-22	Blnder								
TU-26	Backfire B								

Table 2 – Naval Platform Equipment Fit and Weapons

Ship Class	Missiles	Guns	Countermeasures	ESM/ECM
Admiral Kustnezov	SA-N-9 Gauntlet; SA-N-11 Grisson	CADS-N-1	PK-10 and PK-2 Chaff	Foot Ball; Wine Flask; Flat Track; Ball Shield
Alpha	----	----	----	----
Arleigh Burke - Flight I	Standard SM-2MR	Phalanx	Super RBOC; Flares; Chaff	AN/SLQ-32(V)3
Hover Craft - LEBED	----	30 mm (2)	----	----
Kara	SA-N-6 Grumble; SA-N-4 Gecko; SA-N-3 Goblet	76 mm; 30 mm	PK-10 and PK-2 Chaff	Side Globe; Bell Slam; Bell Clou
Landing Craft - Air Cushion	----	GPU-5	----	----
Los Angeles	----	----	----	----
Nimitz	Sea Sparrow;	Phalanx	Super RBOC; Flares; Chaff	AN/ALQ-32(V)4
Serna	----	----	----	----
Sovremenny	SA-N-7 Gadfly; SA-N-17 Grizzly	130 mm; 30 mm	PK-10 and PK-2 Chaff	Foot Ball
Ticonderoga	Standard SM-2MR; Sea Sparrow	Phalanx	Super RBOC; Flares; Chaff	AN/SLQ-32(V)3
Utility Landing Craft - LCU 1600	----	12.7 mm (2)	----	----

Table 3 – Naval Weapon Systems

System Nomenclature	NATO Name	Missile	Anti-Aircraft Gun	Offboard EWR	Onboard EWR	Offboard FCR	Onboard FCR	Aux Radar 1	Aux radar
EZH	Grizzly	SA-N-12 (SA-17)	----	----	----	Front Dome	----	----	----
Fort/Rif	Grumble	SA-N-6 (SA-10A)	----	Top Pair; Top Sail; Top Steer; Head Net	----	Top Dome	----	----	----
GWS-25	Sea Wolf	Sea Wolf	----	Type 967; Type 968	----	Type 910	----	----	----
Gws-30	Sea Dart	Sea Dart	----	Type 1022; Type 996	----	Type 909	----	----	----
Igla	Gimlet	SA-N-10 (SA-16)	----	----	----	----	----	----	----
Kashtan Air Defense System	Grissom	SA-N-11 (SA-19)	GSh-30K (2)	Hot Flash	----	Hot Flash	----	----	----
M-1 Volnya	Goa	SA-N-1 (SA-3)	----	Head Net A	----	Peel Group	----	----	----
M-22 Uragan	Gadfly	SA-N-7 (SA-11)	----	----	----	Front Dome	----	----	----
Mark 15	Phalanx	----	20 mm (M61A1)	----	----	----	AN/UPS-2	----	----
OSA-M	Gecko	SA-N-4 (SA-8)	----	Pop Group	----	Pop Group	----	----	----
RIM-66M5	SM-2MR Blk IIIB	Standard Missile 2	----	AN/SPY-1; AN/SPS-49	----	AN/SPG-62	----	----	----
RIM-7	Sea Sparrow	Sea Sparrow	----	----	----	Mk 95	----	----	----
SAHV-3	Sea Crotale	R440N	----	Sea Giraffe	----	----	Naval Crotale	----	----
Shtorm	Goblet	SA-N-3	----	Top Sail	----	Head Light	----	----	----
Strela 2	Grail	SA-N-5 (SA-7)	----	----	----	----	----	----	----
Strela 3	Gremlin	SA-N-8 (SA-14)	----	----	----	----	----	----	----
Tor-M1	Gauntlet	SA-N-9 (SA-15)	----	Sky Watch; Top Plate	----	Cross Sword	----	----	----

Table 4 – Surface Threat Equipment Fit and Weapons

System Nomenclature	NATO Name	Missile	Anti-Aircraft Gun	Offboard EWR	Onboard EWR	Offboard FCR	Onboard FCR	Aux Radar 1	Au
2K11 Krug	Ganef	SA-4	----	Long Track	----	Pat Hand	----	Thin Skin	----
2K12 Kub	Gainful	SA-6	----	Spoon Rest; Flat Face; Long Track; Straight Flush	----	Straight Flush	----	Thin Skin B	----
2S6M Air Defense System (Tunguska)	Grison	SA-19	Quad 30 mm	Dog Ear	Hot Shot	----	Hot Shot	----	----
9K31 Strela-1	Gaskin	SA-9	----	----	----	----	----	----	----
9K33 Osa	Gecko	SA-8	----	----	----	----	----	----	----
9K35 Strela 10	Gopher	SA-13	----	Dog Ear	----	----	----	----	----
9K37 Buk-1M	Gadfly	SA-11	----	Snow Drift	----	----	----	----	----
9M311	Grison	SA-19	----	Dog Ear	Hot Shot	----	Fire Dome	----	----
Blowpipe	----	Blowpipe	----	----	----	----	Hot Shot	----	----
Buk-2M	Grizzly	SA-17	----	Snow Drift	----	----	----	----	----
Crotale 3000	----	Crotale 3000	----	Mirador IV	----	Chair Back	----	----	----
FIM-43	----	Redeye	----	----	----	----	Crotale	----	----
FIM-92	----	Stinger	----	----	----	----	----	----	----
GDF-005	----	----	Twin 35 mm	Skyguard	----	Skyguard	----	----	----
Igla	Grouse	SA-18	----	----	----	----	----	----	----
Igla-1	Gimlet	SA-16	----	----	----	----	----	----	----
Javelin	----	Javelin	----	----	----	----	----	----	----
KS-12	M1939/M1944	----	85 mm	----	----	----	----	----	----
L/70 BOFORS	----	----	40 mm	----	----	Fire Can	----	----	----
M163	Vulcan	----	20 mm	----	----	Flycatcher	----	----	----
M48A3	Improved Chaparral	MIM-72C	----	AN/MPQ-49	----	AN/VPS-2	----	----	----
MIM-104	----	Patriot	----	----	----	----	----	----	----
MIM-23B	----	Improved Hawk	----	AN/MPQ-50; AN/MPQ-55	----	AN/MPQ-53	----	----	----
Mistral	Mistral	Mistral	----	----	----	AN/MPQ-57	----	AN/MPQ-51	----
NASAMS	----	AIM-120A	----	----	----	----	----	----	----
Rapier	----	Rapier	----	----	Rapier	AN/MPQ-64	----	----	----
RBS-70	----	RBS-70	----	PS-70/R Giraffe	----	Blindfire	----	----	----
RBS-90	----	RBS-90	----	PS-90 Giraffe 75; PS-91 HARD	----	----	----	----	----
Roland 2	----	Roland 2	----	MPDR 16	----	----	Domino 30	----	----
S-125 Neva	Goa	SA-3	----	Flat Face; Squat Eye	----	Low Blow	----	Side Net	----

System Nomen-clature	NATO Name	Missile	Anti-Aircraft Gun	Offboard EWR	Onboard EWR	Offboard FCR	Onboard FCR
S-200 Angara	Gammon	SA-5	----	Big Back; Square Pair	----	Square Pair	----
S-300PMU	Grumble	SA-10b	----	Clam Shell	----	Flap Lid B	----
S-300V	Gladiator	SA-12a	----	Ball Board A; High Screen	----	Grill Pan	----
S-60	----	----	57mm	Flat Face	----	Fire Can; Flap Wheel	----
S-75 Dvina/Volkhov	Guideline	SA-2	----	Spoon Rest; Flat Face; Knife Rest	----	Fan Song	----
Shahine	----	Shahine	----	Shahine	----	----	Shahine
Skyguard	----	----	----	----	----	----	----
Skyshield	----	----	35 mm	Skyshield	----	Skyshield	----
Starstreak	----	Starstreak	----	----	----	----	----
Strela-2M	Grail	SA-7	----	Long Track; Flat Face	Land Roll	----	Land Roll
Strela-3	Gremlin	SA-14	----	----	----	----	----
Tor-M1	Gauntlet	SA-15	----	----	Tor	----	Tor
ZSU-23-4	Shilka	----	Quad 23 mm	Dog Ear	----	----	Gun Dish
ZSU-57-2	Pair/Sparka	----	Twin 57 mm	----	----	----	----
ZU-23	----	----	Twin 23 mm	----	----	----	----