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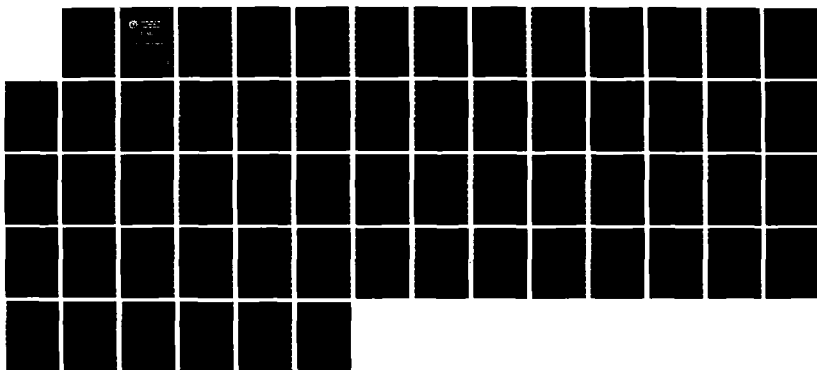
TSAR (THEATER SIMULATION OF AIRBASE RESOURCES) DATABASE
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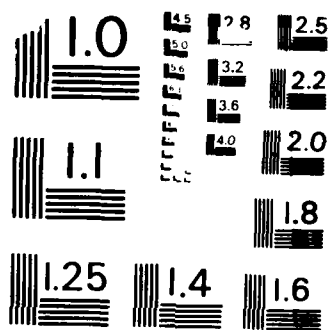
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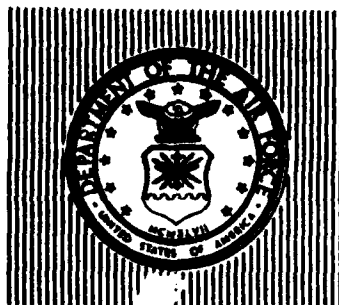
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UNITED STATES AIR FORCE



**ASSISTANT CHIEF OF STAFF,
CENTER FOR
STUDIES AND ANALYSES**

TSAR DATABASE DICTIONARY

**TSAR Munitions Database Segment
Documentation - F-4E, A-10, F-15, F-16**

21 NOVEMBER 1986

Prepared for
TACTICAL SUPPORT DIVISION
Air Force Center for Studies and Analyses
Pentagon, Washington, D.C. 20330-5420

Prepared by
ORLANDO TECHNOLOGY, INC.
P.O. Box 855
Shalimar, Florida 32579

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SECURITY CLASSIFICATION OF THIS PAGE

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FIELD	GROUP	SUB GR.														
19. ABSTRACT (Continue on reverse if necessary and identify by block number) A significant problem for analysts and simulation model users is the availability of complete documentation of input databases. The Theater Simulation of Airbase Resources (TSAR) model is no exception. This TSAR dictionary documents munitions database segments for the F-4E, A-10, F-15 and F-16 weapon systems. It lists primary and alternate munitions, assembly requirements and components, standard combat loads, and base munition and component levels.																
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PREFACE

The Assistant Chief of Staff for Studies and Analyses (AF/SA) has a continuing requirement for investigations into advanced fighter aircraft operations and support topics. A recurring need involves studies of readiness, survivability, and sustainability. Several methodologies have been used over the years. The current state-of-the-art techniques for these purposes are two Monte Carlo simulation models developed in the late 1970s by The Rand Corporation, Theater Simulation of Airbase Resources (TSAR) and TSAR Inputs using Airbase Damage Assessment (TSARINA). These models, like other simulation models, are build to study and analyze a system's processes. In this case the "system" is the collection of resources called an airbase and the process of interest is the interaction of those resources resulting in the generation of aircraft sorties. A system's problem can often be described and studied through "what if" excursions about a defined base case. The base case and the excursions of interest could be viewed as related problem scenarios. In both TSAR and TSARINA the scenario to be studied is modeled through the database. Therefore the analyst must know the logic embodied in the program structure, but most importantly, completely understand the scenario as described in an extensive database. The differences between scenarios involving the same aircraft type may only involve changing several cards, but building the components of the baseline database and/or acquiring sufficient understanding of what is contained in such a database are significant tasks. Hence the need for a disciplined development and adequate documentation. Given that a baseline database exists, the modeler must replace, merge, or modify various database segments to fashion a new scenario or to specify excursions from the base case. Alternative data segments which are clearly documented are therefore often needed. The availability and limited documentation of databases for both TSAR and TSARINA impose practical limitations to their usefulness.

The author of TSAR and TSARINA, Don Emerson, has provided analysts with extremely powerful tools for tactical support analysis. They are very well written and documented. The real problem for the analyst is locating sources of data to make use of the full richness inherent in the models. It was clear to those of us at the Air Force Center for Studies and Analyses (AFCSA) that if our results and observations were going to be credible, the databases and assumptions they embodied would need to be documented. Our intent was to collect selected databases within AFCSA to support current and projected studies. Quality documentation of these databases was necessary to permit analysts to understand the assumptions, limitations, and level of detail that was being portrayed. The resultant availability of databases and standardization of documentation will not only directly support in-house investigations but will also facilitate studies across the analysis community. Because of the scope of such a task, a contract was let to ensure its timely accomplishment.

Orlando Technology, Inc., was awarded a competitive contract for TSAR/TSARINA support tasks. The tasks focus around the model databases and database segments. They began with the existing model databases and updated them based on the most current government data available. These databases were to be documented in three ways. The first is a dictionary for each database and separate database segment, which translates the database codes to their English equivalents. Secondly, graphic network models are needed for those portions of the database which model decision logic networks for repair tasks. And finally,

an index is needed to cross-reference the database segments, dictionary, and the network models to facilitate their use by modelers and analysts. The TSAR dictionary documents components and assembly requirements for primary and alternate munitions for the F-4E, A-10, F-15 and F-16. It lists standard combat loads and munitions and component levels at typical units.

The long term intent is to build on these basic databases by the use of a database management system to facilitate changes, updates, and analysis scenario development. As the models mature and the user community grows, the model databases will continue to evolve and grow in depth and breadth. This document should be viewed as an advanced prototype which will hopefully continue to mature and increase in usefulness.

Our hope is that you will wear out this document through constant useage. Pass along your comments and criticisms so that future improvements can incorporate the user community's collective insights.

SALVATORE R. BOSCO, Lt Col, USAF
AFCSA/SAGP
Washington, DC 20330-5420

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TSAR DATA BASE DOCUMENTATION
F-15 MUNITIONS DATA BASE SEGMENT

18 NOV 1986

PREPARED FOR
AIR FORCE CENTER FOR STUDIES AND ANALYSES
PENTAGON, WASHINGTON D.C. 20330-5420

PREPARED BY
ORLANDO TECHNOLOGY, INC.
P.O. BOX 855
SHALIMAR, FLORIDA 32579

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I MUNITIONS ASSEMBLY REQUIREMENTS

(CARD TYPE #11/1)

MUNITION DESCRIPTION	MUN#	QUAN	PERSONNEL		AGE		TIME (MIN)	ALT PROC	PER SUBST
			TYPE	#	#1	#2			
AIM-7E	1	6	22	3	56	-	180	36	-
AIM-9P	2	3	22	3	56	-	150	37	-
AIM-120	3	3	22	3	56	-	21	-	-
AGM-45-9	4	4	22	6	83	56	60	38	-
AGM-45-10	5	4	22	6	83	56	60	38	-
AGM-45G-3	6	4	22	6	83	56	60	38	-
AGM-45G-4	7	4	22	6	83	56	60	38	-
AGM-45G-6	8	4	22	6	83	56	60	38	-
AGM-83 (AUR)	9	2	22	2	56	-	9	-	-
AGM-88A (AUR)	10	2	22	2	56	-	9	-	-
CBU-52	11	9	30	15	55	58	24	-	-
CBU-58	12	9	30	15	55	58	24	-	-
CBU-87 (AUR)	13	6	30	5	58	-	12	-	-
GBU-10 HD	14	12	30	15	83	58	60	39	-
GBU-10 LD	15	12	30	15	83	58	60	39	-
GBU-15	16	12	30	15	83	58	45	40	-
GBU-24	17	12	30	15	83	58	45	40	-
MK-20 (AUR)	18	10	30	3	55	58	30	-	-
MK-82 HD	19	12	30	15	83	58	24	41	-
MK-82 LD	20	12	30	15	83	58	24	41	-
MK-84	21	12	30	15	83	58	18	42	-
DURANDAL (AUR)	22	9	30	2	83	-	30	-	-
ERAM (AUR)	23	9	30	2	83	-	30	-	-
SFW (AUR)	24	9	30	2	83	-	24	-	-
EXTERNAL TANK	25	5	23	2	-	-	60	-	-
GUN AMMO LOAD	26	-	-	-	-	-	-	-	-
ECM POD	27	-	-	-	-	-	-	-	-
PAVE PENNY POD	28	-	-	-	-	-	-	-	-
LANTIRN POD	29	-	-	-	-	-	-	-	-

II ALTERNATE MUNITIONS ASSEMBLY REQUIREMENTS

(CARD TYPE #11/1)

TASK DESCRIPTION	TSAR#	QUAN	PERSONNEL		AGE		TIME (MIN)	ALT PROC	PER SUBST
			TYPE	#	#1	#2			
ALT AIM-7/AGE-57	36	6	22	3	57	-	180	-	-
ALT AIM-9/AGE-57	37	3	22	3	57	-	150	-	-
ALT AIM-120/AGE-57	38	4	22	6	83	57	60	-	-
ALT GBU/AGE-56	39	12	30	15	83	56	60	43	-
ALT GBU/AGE-56	40	12	30	15	83	56	45	44	-
ALT MK-82/AGE-56	41	12	30	15	83	56	24	45	-
ALT MK-84/AGE-56	42	12	30	15	83	56	18	46	-
ALT GBU/AGE-57	43	12	30	15	83	57	60	-	-
ALT GBU/AGE-57	44	12	30	15	83	57	45	-	-
ALT MK-82/AGE-57	45	12	30	15	83	57	24	-	-
ALT MK-84/AGE-57	46	12	30	15	83	57	18	-	-

III MUNITION COMPONENTS

(CARD TYPE #11/2)

III.1 MUNITION #1 - AIM-7E

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
40	GUIDANCE & CONTROL	1
41	ROCKET MOTOR	1
42	WARHEAD	1

III.2 MUNITION #2 - AIM-9P

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
43	GUIDANCE & CONTROL	1
44	ROCKET MOTOR	1
45	WARHEAD	1
46	TARGET DETECTOR	1
47	CANARD	4
48	WING & ROLLERON	4

III.3 MUNITION #3 - AIM-120

ALL UP ROUND (AUR) - NO COMPONENTS REPRESENTED

III.4 MUNITION #4 - AGM-45-9

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
49	MK-78 MOTOR	1
50	WARHEAD (WAW-9B)	1
51	CONTROL SECTION	1
52	GUIDANCE (MK-49-1/O)	1

III.5 MUNITION #5 - AGM-45-10

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
49	MK-78 MOTOR	1
50	WARHEAD (WAW-9B)	1
51	CONTROL SECTION	1
53	GUIDANCE (MK-50)	1

III.6 MUNITION #6 - AGM-45G-3

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
49	MK-78 MOTOR	1
50	WARHEAD (WAU-9B)	1
51	CONTROL SECTION	1
54	GUIDANCE (MK-24)	1

III.7 MUNITION #7 - AGM-45G-4

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
49	MK-78 MOTOR	1
50	WARHEAD (WAU-9B)	1
51	CONTROL SECTION	1
55	GUIDANCE (MK-25)	1

III.8 MUNITION #8 - AGM-45G-6

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
49	MK-78 MOTOR	1
50	WARHEAD (WAU-9B)	1
51	CONTROL SECTION	1
56	GUIDANCE (MK-36)	1

III.9 MUNITION #9 - AGM-65

ALL UP ROUND (AUR) - NO COMPONENTS REPRESENTED

III.10 MUNITION #10 - AGM-88A

ALL UP ROUND (AUR) - NO COMPONENTS REPRESENTED

III.11 MUNITION #11 - CBU-52

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
57	ARMING WIRE (13 FEET)	1
58	NOSE FUZE (MK-303 OR FMU-56)	1
59	CBU-52 BOMB BODY/SUU 30	1

III.12 MUNITION #12 - CBU-58

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
57	ARMING WIRE (13 FEET)	1
58	NOSE FUZE (MK-303 OR FMU-56)	1
60	CBU-58 BOMB BODY/SUU 30	1

III.13 MUNITION #13 - CBU-87

ALL UP ROUND (AUR) - NO COMPONENTS REPRESENTED

III.14 MUNITION #14 - GBU-10 HIGH DRAG

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
57	ARMING WIRE (13 FEET)	1
61	MK-84 BOMB BODY	1
62	CCG MAU-169 & AFG MXU 651	1
63	FUZE FMU-81	1
64	BOOSTER & TAPE FZU 2/B	4
65	ADAPTER BOOSTER M147TL	1
66	DRIVE ASSEMBLY	1
67	COUPLER MAU-870 & SHAFT MAU-86	1
68	DELAYS	1
69	TAIL FUZE (M-905)	1

III.15 MUNITION #15 - GBU-10 LOW DRAG

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
61	MK-84 BOMB BODY	1
62	CCG MAU-169 & AFG MXU 651	1
63	FUZE FMU-81	1
64	BOOSTER & TAPE FZU 2/B	5
65	ADAPTER BOOSTER M147TL	1

III.16 MUNITION #16 - GBU-15

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
61	MK-84 BOMB BODY	1
70	GUIDANCE ADAPTER	1
71	CONTROL UNIT	1
72	TARGET DETECTION DEVICE	1
73	AIRFOIL GROUP	1
74	RECEIVER TRANSMITTER	1
75	FMU-124 A/B FUZE	1

III.17 MUNITION #17 - GBU-24

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
61	MK-84 BOMB BODY	1
76	CCG	1
77	AIRLERN	1
78	FUZE	1

III.18 MUNITION #18 - MK-20

ALL UP ROUND (AUR) - NO COMPONENTS REPRESENTED

III.19 MUNITION #19 - MK-82 HIGH DRAG

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
57	ARMING WIRE (13 FEET)	1
69	TAIL FUZE (M-905)	1
79	MK-82 BOMB BODY	1
80	FIN AMMO (MK-15) OR FIN CHUTE (BSU-49)	1
81	NOSE FUZE (M-904)	1
82	NOSE BOOSTER (XM-147)	1
83	TAIL FUZE (FMU-54)	1
84	DELAY FUZE (FZU)	1
85	ARMING LANYARD	1
86	TAIL BOOSTER (XM-148)	1

III.20 MUNITION #20 - MK-82 LOW DRAG

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
57	ARMING WIRE (13 FEET)	1
69	TAIL FUZE (M-905)	1
79	MK-82 BOMB BODY	1
81	NOSE FUZE (M-904)	1
82	NOSE BOOSTER (XM-147)	1
86	TAIL BOOSTER (XM-148)	1
87	FIN (MAU-93)	1
88	DELAY (INST)	2

III.21 MUNITION #21 - MK-84

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
57	ARMING WIRE (13 FEET)	1
61	MK-84 BOMB BODY	1
69	TAIL FUZE (M-905)	1
81	NOSE FUZE (M-904)	1
82	NOSE BOOSTER (XM-147)	1
86	TAIL BOOSTER (XM-148)	1
88	DELAY (INST)	2
89	FIN CONICAL (MK-84)	1

III.22 MUNITIONS #22 THRU #29

ALL UP ROUND (AUR) - NO COMPONENTS REPRESENTED

IV COMMON MUNITION COMPONENTS

(CARD TYPE #11/2)

COMP #	COMPONENT DESCRIPTION	MUNITION # DESCRIPTION	MUNITION # DESCRIPTION	MUNITION # DESCRIPTION
40	GUIDANCE & CONTROL	1 AIM-7E		
41	ROCKET MOTOR	1 AIM-7E		
42	WARHEAD	1 AIM-7E		
43	GUIDANCE & CONTROL	2 AIM-9P		
44	ROCKET MOTOR	2 AIM-9P		
45	WARHEAD	2 AIM-9P		
46	TARGET DETECTOR	2 AIM-9P		
47	CANARD	2 AIM-9P		
48	WING & ROLLERON	2 AIM-9P		
49	MK-78 MOTOR	4 AGM-45-9	5 AGM-45-10	6 AGM-45G-3
		7 AGM-45G-4	8 AGM-45G-6	
50	WARHEAD (WAU 9B)	4 AGM-45-9	5 AGM-45-10	6 AGM-45G-3
		7 AGM-45G-4	8 AGM-45G-6	
51	CONTROL SECTION	4 AGM-45-9	5 AGM-45-10	6 AGM-45G-3
		7 AGM-45G-4	8 AGM-45G-6	
52	GUIDANCE (MK-49-1/O)	4 AGM-45-9	5 AGM-45-10	6 AGM-45G-3
		7 AGM-45G-4	8 AGM-45G-6	
53	GUIDANCE (MK-50)	5 AGM-45-10		
54	GUIDANCE (MK-24)	6 AGM-45G-3		
55	GUIDANCE (MK-25)	7 AGM-45G-4		
56	GUIDANCE (MK-36)	8 AGM-45G-6		
57	ARMING WIRE	11 CBU-52	12 CBU-58	14 GBU-10HD
		15 GBU-10LD	19 MK-82HD	20 MK-82LD
		21 MK-84		
58	NOSE FUZE (MK-303 OR FMU-56)	11 CBU-52	12 CBU-58	
59	CBU-52 BOMB BODY/SUU 30	11 CBU-52		
60	CBU-58 BOMB BODY/SUU 30	12 CBU-58		
61	MK-84 BOMB BODY	14 GBU-10HD	15 GBU-10LD	16 GBU-15
		17 GBU-24	21 MK-84	
62	CCG MAU-169 & AFG MXU 651	14 GBU-10HD	15 GBU-10LD	
63	FUZE FMU-81	14 GBU-10HD	15 GBU-10LD	
64	BOOSTER & TAPE FZU 2/B	14 GBU-10HD	15 GBU-10LD	
65	ADAPTER BOOSTER M147TL	14 GBU-10HD	15 GBU-10LD	
66	DRIVE ASSEMBLY	14 GBU-10HD		
67	COUPLER MAU-870 & SHAFT MAU-86	14 GBU-10HD		
68	DELAYS	14 GBU-10HD		
69	TAIL FUZE (M-905)	14 GBU-10HD	19 MK-82HD	20 MK-82LD
		21 MK-84		
70	GUIDANCE ADAPTER	16 GBU-15		
71	CONTROL UNIT	16 GBU-15		
72	TARGET DETECTION DEVICE	16 GBU-15		
73	AIRFOIL GROUP	16 GBU-15		
74	RECEIVER TRANSMITTER	16 GBU-15		
75	FMU-124 A/B FUZE	16 GBU-15		
76	CCG	17 GBU-24		
77	AIRLERON	17 GBU-24		
78	FUZE	17 GBU-24		
79	MK-82 BOMB BODY	19 MK-82HD	20 MK-82LD	
80	FIN AMMO (MK-15) OR			
	FIN CHUTE (BSU-49)	19 MK-82HD		
81	NOSE FUZE (M-904)	19 MK-82HD	20 MK-82LD	21 MK-84
82	NOSE BOOSTER (XM-147)	19 MK-82HD	20 MK-82LD	21 MK-84
83	TAIL FUZE (FMU-54)	19 MK-82HD		
84	DELAY FUZE(FZU)	19 MK-82HD		
85	ARMING LANYARD	19 MK-82HD		
86	TAIL BOOSTER (XM-148)	19 MK-82HD	20 MK-82LD	21 MK-84
87	FIN (MAU-93)	20 MK-82LD		
88	DELAY (INST)	20 MK-82LD	21 MK-84	
89	FIN CONICAL (MK-84)	21 MK-84		

V AIRCRAFT CONFIGURATIONS

(CARD TYPE #14)

CONF#	DESCRIPTION	TRAP#	QUAN	PERSONNEL		AGE		TIME (MIN)	PER SUBST
				TYPE	#	#1	#2		
1	NO EXTRA TRAP	-	-	-	-	-	-	-	-

VI STANDARD COMBAT LOAD REQUIREMENTS

(CARD TYPE #13)

SCL#	CONF#	DESCRIPTION	SHOP ROD	MUN#	QUAN	PERSONNEL		AGE		TIME (MIN)	PER SUBST
						TYPE	#	#1	#2		
1	1	4 AIM-9 +	-	2	4	15	3	83	-	18	-
		4 AIM-120	-	3	4	15	3	83	-	36	-
2	1	4 AIM-9 +	-	2	4	15	3	83	-	18	-
		4 AIM-7	-	1	4	15	3	83	-	30	-

VII STANDARD COMBAT LOAD PREFERENCES

(CARD TYPE #12)

MISSION #1 - DEFENSIVE COUNTER AIR			
PRIORITY	SCL#	SCL DESCRIPTION	
1	1	4 AIM-9/4	AIM-120
2	2	4 AIM-9/4	AIM-7
3	-	-	-
4	-	-	-
5	-	-	-
6	-	-	-
7	-	-	-
8	-	-	-
9	-	-	-
10	-	-	-

VIII BASIC MUNITIONS

(CARD TYPES #15 AND #5)

BASIC MUNITIONS ARE ALWAYS LOADED ON THE AIRCRAFT REGARDLESS OF THE MISSION REQUIREMENTS.

MUN DESCRIPTION	MUN #	TASK #	QUAN	PERSONNEL		AGE		TIME (MIN)	PER SUBST
				TYPE	#	#1	#2		
20MM GUN	26	1175	1	15	3	76	-	9	1
EXTERNAL TANK	25	1176	1	15	3	83	-	6	1

IX MUNITION STOCK LEVELS

(CARD TYPE #24)

THESE QUANTITIES WERE CALCULATED USING THE FOLLOWING FORMULA:

STOCK LEVEL = NUMBER OF MUNITIONS X 3 SORTIES PER DAY X NUMBER OF DAYS

MUN #	DESCRIPTION	STOCK LEVEL	QUANTITY
1	AIM-7E (ASSEMBLED)	5 DAYS	60
2	AIM-9P (ASSEMBLED)	5 DAYS	60
3	AIM-120 (ASSEMBLED)	5 DAYS	60
25	EXTERNAL TANK (ASSEMBLED)	5 DAYS	15
26	GUN AMMO LOAD (ASSEMBLED)	30 DAYS	90
103	AIM-120 (UNASSEMBLED)	30 DAYS	360
125	EXTERNAL TANK (UNASSEMBLED)	30 DAYS	90

X MUNITION COMPONENT STOCK LEVELS

(CARD TYPE #24)

THESE QUANTITIES WERE CALCULATED USING THE FOLLOWING FORMULA:

STOCK LEVEL = NUMBER OF MUNITIONS X NUMBER OF COMPONENTS X 3 SORTIES PER DAY X NUMBER OF DAYS

MUN#	DESCRIPTION	COMP#	DESCRIPTION	STOCK LEVEL	QUANTITY
1	AIM-7E	40	GUIDANCE & CONTROL	30 DAYS	360
		41	ROCKET MOTOR	30 DAYS	360
		42	WARHEAD	30 DAYS	360
2	AIM-9P	43	GUIDANCE & CONTROL	30 DAYS	360
		44	ROCKET MOTOR	30 DAYS	360
		45	WARHEAD	30 DAYS	360
		46	TARGET DETECTOR	30 DAYS	360
		47	CANARD	30 DAYS	1440
		48	WING & ROLLERON	30 DAYS	1440

TSAR DATA BASE DOCUMENTATION
F-16 MUNITIONS DATA BASE SEGMENT

18 NOV 1986

PREPARED FOR
AIR FORCE CENTER FOR STUDIES AND ANALYSES
PENTAGON, WASHINGTON D.C. 20330-5420

PREPARED BY
ORLANDO TECHNOLOGY, INC.
P.O. BOX 855
SHALIMAR, FLORIDA 32579

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I MUNITIONS ASSEMBLY REQUIREMENTS

(CARD TYPE #11/1)

MUNITION DESCRIPTION	MUN#	QUAN	PERSONNEL		AGE		TIME (MIN)	ALT PROC	PER SUBST
			TYPE	#	#1	#2			
AIM-7E	1	6	22	3	56	-	180	36	-
AIM-9P	2	3	22	3	56	-	150	37	-
AIM-120	3	3	22	3	56	-	21	-	-
AGM-45-9	4	4	22	6	83	56	60	38	-
AGM-45-10	5	4	22	6	83	56	60	38	-
AGM-45G-3	6	4	22	6	83	56	60	38	-
AGM-45G-4	7	4	22	6	83	56	60	38	-
AGM-45G-6	8	4	22	6	83	56	60	38	-
AGM-83 (AUR)	9	2	22	2	56	-	9	-	-
AGM-88A (AUR)	10	2	22	2	56	-	9	-	-
CBU-52	11	9	30	15	55	58	24	-	-
CBU-58	12	9	30	15	55	58	24	-	-
CBU-87 (AUR)	13	6	30	5	58	-	12	-	-
GBU-10 HD	14	12	30	15	83	58	60	39	-
GBU-10 LD	15	12	30	15	83	58	60	39	-
GBU-15	16	12	30	15	83	58	45	40	-
GBU-24	17	12	30	15	83	58	45	40	-
MK-20 (AUR)	18	10	30	3	55	58	30	-	-
MK-82 HD	19	12	30	15	83	58	24	41	-
MK-82 LD	20	12	30	15	83	58	24	41	-
MK-84	21	12	30	15	83	58	18	42	-
DURANDAL (AUR)	22	9	30	2	83	-	30	-	-
ERAM (AUR)	23	9	30	2	83	-	30	-	-
SFW (AUR)	24	9	30	2	83	-	24	-	-
EXTERNAL TANK	25	5	23	2	-	-	60	-	-
GUN AMMO LOAD	26	-	-	-	84	-	-	-	-
ECM POD	27	-	-	-	-	-	-	-	-
PAVE PENNY POD	28	-	-	-	-	-	-	-	-
LANTIRN POD	29	-	-	-	-	-	-	-	-

II ALTERNATE MUNITIONS ASSEMBLY REQUIREMENTS

(CARD TYPE #11/1)

TASK DESCRIPTION	TSAR#	QUAN	PERSONNEL		AGE		TIME (MIN)	ALT PROC	PER SUBST
			TYPE	#	#1	#2			
ALT AIM-7/AGE-57	36	6	22	3	57	-	180	-	-
ALT AIM-9/AGE-57	37	3	22	3	57	-	150	-	-
ALT AIM-120/AGE-57	38	4	22	6	83	57	60	-	-
ALT GBU/AGE-56	39	12	30	15	83	56	60	43	-
ALT GBU/AGE-56	40	12	30	15	83	56	45	44	-
ALT MK-82/AGE-56	41	12	30	15	83	56	24	45	-
ALT MK-84/AGE-56	42	12	30	15	83	56	18	46	-
ALT GBU/AGE-57	43	12	30	15	83	57	60	-	-
ALT GBU/AGE-57	44	12	30	15	83	57	45	-	-
ALT MK-82/AGE-57	45	12	30	15	83	57	24	-	-
ALT MK-84/AGE-57	46	12	30	15	83	57	18	-	-

III MUNITION COMPONENTS

(CARD TYPE #11/2)

III.1 MUNITION #1 - AIM-7E

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
40	GUIDANCE & CONTROL	1
41	ROCKET MOTOR	1
42	WARHEAD	1

III.2 MUNITION #2 - AIM-9P

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
43	GUIDANCE & CONTROL	1
44	ROCKET MOTOR	1
45	WARHEAD	1
46	TARGET DETECTOR	1
47	CANARD	4
48	WING & ROLLERON	4

III.3 MUNITION #3 - AIM-120

ALL UP ROUND (AUR) - NO COMPONENTS REPRESENTED

III.4 MUNITION #4 - AGM-45-9

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
49	MK-78 MOTOR	1
50	WARHEAD (WAU-9B)	1
51	CONTROL SECTION	1
52	GUIDANCE (MK-49-1/O)	1

III.5 MUNITION #5 - AGM-45-10

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
49	MK-78 MOTOR	1
50	WARHEAD (WAU-9B)	1
51	CONTROL SECTION	1
53	GUIDANCE (MK-50)	1

III.6 MUNITION #6 - AGM-45G-3

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
49	MK-78 MOTOR	1
50	WARHEAD (WAU-9B)	1
51	CONTROL SECTION	1
54	GUIDANCE (MK-24)	1

III.7 MUNITION #7 - AGM-45G-4

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
49	MK-78 MOTOR	1
50	WARHEAD (WAU-9B)	1
51	CONTROL SECTION	1
55	GUIDANCE (MK-25)	1

III.8 MUNITION #8 - AGM-45G-6

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
49	MK-78 MOTOR	1
50	WARHEAD (WAU-9B)	1
51	CONTROL SECTION	1
56	GUIDANCE (MK-36)	1

III.9 MUNITION #9 - AGM-65

ALL UP ROUND (AUR) - NO COMPONENTS REPRESENTED

III.10 MUNITION #10 - AGM-88A

ALL UP ROUND (AUR) - NO COMPONENTS REPRESENTED

III.11 MUNITION #11 - CBU-52

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
57	ARMING WIRE (13 FEET)	1
58	NOSE FUZE (MK-303 OR FMU-56)	1
59	CBU-52 BOMB BODY/SUU 30	1

III.12 MUNITION #12 - CBU-58

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
57	ARMING WIRE (13 FEET)	1
58	NOSE FUZE (MK-303 OR FMU-56)	1
60	CBU-58 BOMB BODY/SUU 30	1

III.13 MUNITION #13 - CBU-87

ALL UP ROUND (AUR) - NO COMPONENTS REPRESENTED

III.14 MUNITION #14 - GBU-10 HIGH DRAG

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
57	ARMING WIRE (13 FEET)	1
61	MK-84 BOMB BODY	1
62	CCG MAU-169 & AFG MXU 651	1
63	FUZE FMU-81	1
64	BOOSTER & TAPE FZU 2/B	4
65	ADAPTER BOOSTER M147TL	1
66	DRIVE ASSEMBLY	1
67	COUPLER MAU-870 & SHAFT MAU-86	1
68	DELAYS	1
69	TAIL FUZE (M-905)	1

III.15 MUNITION #15 - GBU-10 LOW DRAG

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
61	MK-84 BOMB BODY	1
62	CCG MAU-169 & AFG MXU 651	1
63	FUZE FMU-81	1
64	BOOSTER & TAPE FZU 2/B	5
65	ADAPTER BOOSTER M147TL	1

III.16 MUNITION #16 - GBU-15

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
61	MK-84 BOMB BODY	1
70	GUIDANCE ADAPTER	1
71	CONTROL UNIT	1
72	TARGET DETECTION DEVICE	1
73	AIRFOIL GROUP	1
74	RECEIVER TRANSMITTER	1
75	FMU-124 A/B FUZE	1

III.17 MUNITION #17 - GBU-24

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
61	MK-84 BOMB BODY	1
76	CCG	1
77	AIRLERON	1
78	FUZE	1

III.18 MUNITION #18 - MK-20

ALL UP ROUND (AUR) - NO COMPONENTS REPRESENTED

III.19 MUNITION #19 - MK-82 HIGH DRAG

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
57	ARMING WIRE (13 FEET)	1
69	TAIL FUZE (M-905)	1
79	MK-82 BOMB BODY	1
80	FIN AMMO (MK-15) OR FIN CHUTE (BSU-49)	1
81	NOSE FUZE (M-904)	1
82	NOSE BOOSTER (XM-147)	1
83	TAIL FUZE (FMU-54)	1
84	DELAY FUZE (FZU)	1
85	ARMING LANYARD	1
86	TAIL BOOSTER (XM-148)	1

III.20 MUNITION #20 - MK-82 LOW DRAG

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
57	ARMING WIRE (13 FEET)	1
69	TAIL FUZE (M-905)	1
79	MK-82 BOMB BODY	1
81	NOSE FUZE (M-904)	1
82	NOSE BOOSTER (XM-147)	1
86	TAIL BOOSTER (XM-148)	1
87	FIN (MAU-93)	1
88	DELAY (INST)	2

III.21 MUNITION #21 - MK-84

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
57	ARMING WIRE (13 FEET)	1
61	MK-84 BOMB BODY	1
69	TAIL FUZE (M-905)	1
81	NOSE FUZE (M-904)	1
82	NOSE BOOSTER (XM-147)	1
86	TAIL BOOSTER (XM-148)	1
88	DELAY (INST)	2
89	FIN CONICAL (MK-84)	1

III.22 MUNITIONS #22 THRU #29

ALL UP ROUND (AUR) - NO COMPONENTS REPRESENTED

IV COMMON MUNITION COMPONENTS

(CARD TYPE #11/2)

COMP #	COMPONENT DESCRIPTION	MUNITION # DESCRIPTION	MUNITION # DESCRIPTION	MUNITION # DESCRIPTION
40	GUIDANCE & CONTROL	1 AIM-7E		
41	ROCKET MOTOR	1 AIM-7E		
42	WARHEAD	1 AIM-7E		
43	GUIDANCE & CONTROL	2 AIM-9P		
44	ROCKET MOTOR	2 AIM-9P		
45	WARHEAD	2 AIM-9P		
46	TARGET DETECTOR	2 AIM-9P		
47	CANARD	2 AIM-9P		
48	WING & ROLLERON	2 AIM-9P		
49	MK-78 MOTOR	4 AGM-45-9	5 AGM-45-10	6 AGM-45G-3
		7 AGM-45G-4	8 AGM-45G-6	
50	WARHEAD (WAU 9B)	4 AGM-45-9	5 AGM-45-10	6 AGM-45G-3
		7 AGM-45G-4	8 AGM-45G-6	
51	CONTROL SECTION	4 AGM-45-9	5 AGM-45-10	6 AGM-45G-3
		7 AGM-45G-4	8 AGM-45G-6	
52	GUIDANCE (MK-49-1/O)	4 AGM-45-9	5 AGM-45-10	6 AGM-45G-3
		7 AGM-45G-4	8 AGM-45G-6	
53	GUIDANCE (MK-50)	5 AGM-45-10		
54	GUIDANCE (MK-24)	6 AGM-45G-3		
55	GUIDANCE (MK-25)	7 AGM-45G-4		
56	GUIDANCE (MK-36)	8 AGM-45G-6		
57	ARMING WIRE	11 CBU-52	12 CBU-58	14 GBU-10HD
		15 GBU-10LD	19 MK-82HD	20 MK-82LD
		21 MK-84		
58	NOSE FUZE (MK-303 OR FMU-56)	11 CBU-52	12 CBU-58	
59	CBU-52 BOMB BODY/SUU 30	11 CBU-52		
60	CBU-58 BOMB BODY/SUU 30	12 CBU-58		
61	MK-84 BOMB BODY	14 GBU-10HD	15 GBU-10LD	16 GBU-15
		17 GBU-24	21 MK-84	
62	CCG MAU-169 & AFG MXU 651	14 GBU-10HD	15 GBU-10LD	
63	FUZE FMU-81	14 GBU-10HD	15 GBU-10LD	
64	BOOSTER & TAPE FZU 2/B	14 GBU-10HD	15 GBU-10LD	
65	ADAPTER BOOSTER M147TL	14 GBU-10HD	15 GBU-10LD	
66	DRIVE ASSEMBLY	14 GBU-10HD		
67	COUPLER MAU-870 & SHAFT MAU-86	14 GBU-10HD		
68	DELAYS	14 GBU-10HD		
69	TAIL FUZE (M-905)	14 GBU-10HD	19 MK-82HD	20 MK-82LD
		21 MK-84		
70	GUIDANCE ADAPTER	16 GBU-15		
71	CONTROL UNIT	16 GBU-15		
72	TARGET DETECTION DEVICE	16 GBU-15		
73	AIRFOIL GROUP	16 GBU-15		
74	RECEIVER TRANSMITTER	16 GBU-15		
75	FMU-124 A/B FUZE	16 GBU-15		
76	CCG	17 GBU-24		
77	AIRLERON	17 GBU-24		
78	FUZE	17 GBU-24		
79	MK-82 BOMB BODY	19 MK-82HD	20 MK-82LD	
80	FIN AMMO (MK-15) OR FIN CHUTE (BSU-49)	19 MK-82HD		
81	NOSE FUZE (M-904)	19 MK-82HD	20 MK-82LD	21 MK-84
82	NOSE BOOSTER (XM-147)	19 MK-82HD	20 MK-82LD	21 MK-84
83	TAIL FUZE (FMU-54)	19 MK-82HD		
84	DELAY FUZE(FZU)	19 MK-82HD		
85	ARMING LANYARD	19 MK-82HD		
86	TAIL BOOSTER (XM-148)	19 MK-82HD	20 MK-82LD	21 MK-84
87	FIN (MAU-93)	20 MK-82LD		
88	DELAY (INST)	20 MK-82LD	21 MK-84	
89	FIN CONICAL (MK-84)	21 MK-84		

V AIRCRAFT CONFIGURATIONS

(CARD TYPE #14)

CONF#	DESCRIPTION	TRAP#	QUAN	PERSONNEL TYPE #	AGE #1 #2	TIME (MIN)	PER SUBST
1	NO EXTRA TRAP	-	-	-	-	-	-

VI STANDARD COMBAT LOAD REQUIREMENTS

(CARD TYPE #13)

SCL#	CONF#	DESCRIPTION	SHOP RQD	MUN#	QUAN	PERSONNEL TYPE #	AGE #1 #2	TIME (MIN)	PER SUBST
1	1	2 AIM-9 + 4 DURANDAL	- -	2 22	2 4	15 3 15 3	83 83	15 24	- -
2	1	2 AIM-9 + 2 MK-84	- -	2 21	2 2	15 3 15 3	83 83	15 12	- -
3	1	2 AIM-9 + 4 MK-20	- -	2 18	2 4	15 3 15 3	83 83	15 24	- -
4	1	2 AIM-9 + 4 CBU-87	- -	2 13	2 4	15 3 15 3	83 83	15 24	- -
5	1	2 AIM-9 + 4 CBU-52	- -	2 11	2 4	15 3 15 3	83 83	15 24	- -
6	1	2 AIM-9 + 4 CBU-58	- -	2 12	2 4	15 3 15 3	83 83	15 24	- -
7	1	2 AIM-9 + 6 MK-82HD	- -	2 19	2 6	15 3 15 3	83 83	15 30	- -
8	1	2 AIM-9 + 6 MK-82LD	- -	2 20	2 6	15 3 15 3	83 83	15 30	- -
9	1	2 AIM-9 + 2 AGM-65	- -	2 9	2 2	15 3 15 3	83 83	15 12	- -
10	1	2 AIM-9 + 2 SFW	- -	2 24	2 2	15 3 15 3	83 83	15 18	- -
11	1	2 AIM-9 + 4 AIM-120	- -	2 3	2 4	15 3 15 3	83 83	15 24	- -
12	1	2 AIM-9 + 4 AIM-9	- -	2 2	2 4	15 3 15 3	83 83	15 24	- -
13	1	2 AIM-9 + 2 GBU-24	- -	2 17	2 2	15 3 15 3	83 83	15 12	- -
14	1	2 AIM-9 + 2 GBU-10 HD	- -	2 14	2 2	15 3 15 3	83 83	15 12	- -
15	1	2 AIM-9 + 2 GBU-10 LD	- -	2 15	2 2	15 3 15 3	83 83	15 12	- -
16	1	2 AIM-9 + 2 ERAM	- -	2 23	2 2	15 3 15 3	83 83	15 18	- -

VII STANDARD COMBAT LOAD PREFERENCES

(CARD TYPE #12)

(NOTE: ALL SCLS EXCEPT SCL #12 INCLUDE 2 AIM-9 WEAPONS)

AIRCRAFT #1 - F-16

MISSION #1 - OCA-RUNWAYS/TAXIWAYS		
PRIORITY	SCL#	SCL DESCRIPTION
1	1	4 DURANDAL
2	2	2 MK-84
3	-	-
5	-	-
4	-	-
6	-	-
7	-	-
8	-	-
9	-	-
10	-	-

MISSION #2 - OCA-FACILITIES		
PRIORITY	SCL#	SCL DESCRIPTION
1	3	4 MK-20
2	4	4 CBU-87
3	5	4 CBU-52
4	6	4 CBU-58
5	7	4 MK-82HD
6	8	4 MK-82LD
7	9	2 AGM-65
8	-	-
9	-	-
10	-	-

MISSION #3 - CAS/INTERDICTION-MOBILE		
PRIORITY	SCL#	SCL DESCRIPTION
1	9	2 AGM-65
2	10	2 SFW
3	3	4 MK-20
4	4	4 CBU-87
5	6	4 CBU-58
6	5	4 CBU-52
7	-	-
8	-	-
9	-	-
10	-	-

STANDARD COMBAT LOAD PREFERENCES (CONTINUED)

AIRCRAFT #1 - F-16

MISSION #4 - INTERDICTION-FIXED		
PRIORITY	SCL#	SCL DESCRIPTION
1	2	2 MK-20
2	7	4 MK-82HD
3	8	4 MK-82LD
4	9	2 AGM-65
5	3	4 MK-20
6	4	4 CBU-87
7	5	4 CBU-52
8	6	4 CBU-58
9	-	-
10	-	-

MISSION #5 - DEFENSIVE COUNTER AIR		
PRIORITY	SCL#	SCL DESCRIPTION
1	11	2 AIM-120
2	12	6 AIM-9
3	-	-
4	-	-
5	-	-
6	-	-
7	-	-
8	-	-
9	-	-
10	-	-

AIRCRAFT #2 - F-16 LANTIRN

MISSION #1 - OCA-RUNWAYS/TAXIWAYS		
PRIORITY	SCL#	SCL DESCRIPTION
1	1	4 DURANDAL
2	13	2 GBU-24
3	14	2 GBU-10HD
4	15	2 GBU-10LD
5	2	2 MK-84
6	-	-
7	-	-
8	-	-
9	-	-
10	-	-

STANDARD COMBAT LOAD PREFERENCES (CONTINUED)

AIRCRAFT #2 - F-16 LANTIRN

MISSION #2 - OCA-FACILITIES		
PRIORITY	SCL#	SCL DESCRIPTION
1	13	2 GBU-24
2	14	2 GBU-10HD
3	15	2 GBU-10LD
4	7	4 MK-82HD
5	8	4 MK-82LD
6	3	4 MK-20
7	-	-
8	-	-
9	-	-
10	-	-

MISSION #3 - CAS/INTERDICTION-MOBILE		
PRIORITY	SCL#	SCL DESCRIPTION
1	9	2 AGM-65
2	10	2 SFW
3	16	2 ERAM
4	3	4 MK-20
5	4	4 CBU-87
6	5	4 CBU-52
7	6	4 CBU-58
8	7	4 MK-82HD
9	8	4 MK-82LD
10	-	-

MISSION #4 - INTERDICTION-FIXED		
PRIORITY	SCL#	SCL DESCRIPTION
1	13	2 GBU-24
2	14	2 GBU-10HD
3	15	2 GBU-10LD
4	-	-
5	-	-
6	-	-
7	-	-
8	-	-
9	-	-
10	-	-

VIII BASIC MUNITIONS

(CARD TYPES #15 AND #5)

BASIC MUNITIONS ARE ALWAYS LOADED ON THE AIRCRAFT REGARDLESS OF THE MISSION REQUIREMENTS.
2 AIM-9 SHOULD ALSO BE CONSIDERED "BASIC" MUNITIONS SINCE THEY ARE INCLUDED IN EACH SCL.

AIRCRAFT #1 - F-16

MUN DESCRIPTION	MUN #	TASK #	QUAN	PERSONNEL		AGE		TIME (MIN)	PER SUBST
				TYPE	#	#1	#2		
20MM GUN	26	860	1	15	3	84	-	9	1
2 EXTERNAL TANKS	25	861	2	15	3	83	-	12	1
ECM POD	27	862	1	15	3	83	-	6	1

AIRCRAFT #2 - F-16 LANTIRN

MUN DESCRIPTION	MUN #	TASK #	QUAN	PERSONNEL		AGE		TIME (MIN)	PER SUBST
				TYPE	#	#1	#2		
20MM GUN	26	860	1	15	3	84	-	9	1
2 EXTERNAL TANKS	25	861	2	15	3	83	-	12	1
2 LANTIRN POD	29	863	2	15	3	83	-	9	1

IX MUNITION STOCK LEVELS

(CARD TYPE #24)

THESE QUANTITIES WERE CALCULATED USING THE FOLLOWING FORMULA:

STOCK LEVEL = NUMBER OF MUNITIONS X 3 SORTIES PER DAY X NUMBER OF DAYS

MUN #	DESCRIPTION	STOCK LEVEL	QUANTITY
2	AIM-9P (ASSEMBLED)	5 DAYS	90
3	AIM-120 (ASSEMBLED)	5 DAYS	30
9	AGM-65 (ASSEMBLED)	5 DAYS	30
11	CBU-52 (ASSEMBLED)	5 DAYS	60
12	CBU-58 (ASSEMBLED)	5 DAYS	60
13	CBU-87 (ASSEMBLED)	5 DAYS	60
14	GBU-10 HD (ASSEMBLED)	5 DAYS	30
15	GBU-10 LD (ASSEMBLED)	5 DAYS	30
17	GBU-24 (ASSEMBLED)	5 DAYS	30
18	MK-20 (ASSEMBLED)	5 DAYS	30
19	MK-82 HD (ASSEMBLED)	5 DAYS	60
20	MK-82 LD (ASSEMBLED)	5 DAYS	60
21	MK-84 (ASSEMBLED)	5 DAYS	30
22	DURANDAL (ASSEMBLED)	5 DAYS	60
23	ERAM (ASSEMBLED)	5 DAYS	30
24	SFW (ASSEMBLED)	5 DAYS	30
25	EXTERNAL TANK (ASSEMBLED)	5 DAYS	30
26	GUN AMMO LOAD (ASSEMBLED)	30 DAYS	450
27	ECM POD (ASSEMBLED)	30 DAYS	450
29	LANTIRN POD (ASSEMBLED)	30 DAYS	450
103	AIM-120 (UNASSEMBLED)	30 DAYS	180
109	AGM-65 (UNASSEMBLED)	30 DAYS	180
113	CBU-87 (UNASSEMBLED)	30 DAYS	360
118	MK-20 (UNASSEMBLED)	30 DAYS	360
122	DURANDAL (UNASSEMBLED)	30 DAYS	360
123	ERAM (UNASSEMBLED)	30 DAYS	180
124	SFW (UNASSEMBLED)	30 DAYS	180
125	EXTERNAL TANK (UNASSEMBLED)	30 DAYS	180

X MUNITION COMPONENT STOCK LEVELS

(CARD TYPE #24)

THESE QUANTITIES WERE CALCULATED USING THE FOLLOWING FORMULA:

STOCK LEVEL = NUMBER OF MUNITIONS X NUMBER OF COMPONENTS X 3 SORTIES PER DAY X NUMBER OF DAYS

MUN#	DESCRIPTION	COMP#	DESCRIPTION	STOCK LEVEL	QUANTITY
2	AIM-9P	43	GUIDANCE & CONTROL	30 DAYS	540
		44	ROCKET MOTOR	30 DAYS	540
		45	WARHEAD	30 DAYS	540
		46	TARGET DETECTOR	30 DAYS	540
		47	CANARD	30 DAYS	2160
		48	WING & ROLLERON	30 DAYS	2160
11	CBU-52	57	ARMING WIRE	30 DAYS	360
		58	NOSE FUZE (MK-303 OR FMU-56)	30 DAYS	360
		59	CBU-52 BOMB BODY/SUU 30	30 DAYS	360
12	CBU-58	57	ARMING WIRE	30 DAYS	360
		58	NOSE FUZE (MK-303 OR FMU-56)	30 DAYS	360
		60	CBU-58 BOMB BODY/SUU 30	30 DAYS	360
14	GBU-10 HD	57	ARMING WIRE	30 DAYS	180
		61	MK-84 BOMB BODY	30 DAYS	180
		62	CCG MAU-169 & AFG MXU 651	30 DAYS	180
		63	FUZE FMU-81	30 DAYS	180
		64	BOOSTER & TAPE FZU 2/B	30 DAYS	720
		65	ADAPTER BOOSTER M147TL	30 DAYS	180
		66	DRIVE ASSEMBLY	30 DAYS	180
		67	COUPLER MAU-870/SHAFT MAU-86	30 DAYS	180
		68	DELAYS	30 DAYS	180
		69	TAIL FUZE (M-905)	30 DAYS	180
15	GBU-10 LD	61	MK-84 BOMB BODY	30 DAYS	180
		62	CCG MAU-169 & AFG MXU 651	30 DAYS	180
		63	FUZE FMU-81	30 DAYS	180
		64	BOOSTER & TAPE FZU 2/B	30 DAYS	720
		65	ADAPTER BOOSTER M147TL	30 DAYS	180
17	GBU-24	61	MK-84 BOMB BODY	30 DAYS	180
		76	CCG	30 DAYS	180
		77	AIRLERON	30 DAYS	180
		78	FUZE	30 DAYS	180

CONTINUED ON NEXT PAGE

MUNITION COMPONENT STOCK LEVELS (CONTINUED)

MUN#	DESCRIPTION	COMP#	DESCRIPTION	STOCK LEVEL	QUANTITY
19	MK-82 HD	57	ARMING WIRE	30 DAYS	360
		69	TAIL FUZE (M-905)	30 DAYS	360
		79	MK-82 BOMB BODY	30 DAYS	360
		80	FIN AMMO (MK-15) OR		
			FIN CHUTE (BSU-49)	30 DAYS	360
		81	NOSE FUZE (M-904)	30 DAYS	360
		82	NOSE BOOSTER (XM-147)	30 DAYS	360
		83	TAIL FUZE (FMU-54)	30 DAYS	360
		84	DELAY FUZE (FZU)	30 DAYS	360
		85	ARMING LANYARD	30 DAYS	360
		86	TAIL BOOSTER (XM-148)	30 DAYS	360
20	MK-82 LD	57	ARMING WIRE	30 DAYS	360
		69	TAIL FUZE (M-905)	30 DAYS	360
		79	MK-82 BOMB BODY	30 DAYS	360
		81	NOSE FUZE (M-904)	30 DAYS	360
		82	NOSE BOOSTER (XM-147)	30 DAYS	360
		86	TAIL BOOSTER (XM-148)	30 DAYS	360
		87	FIN (MAU-93)	30 DAYS	360
		88	DELAY (INST)	30 DAYS	720
21	MK-84	57	ARMING WIRE	30 DAYS	180
		61	MK-84 BOMB BODY	30 DAYS	180
		69	TAIL FUZE (M-905)	30 DAYS	180
		81	NOSE FUZE (M-904)	30 DAYS	180
		82	NOSE BOOSTER (XM-147)	30 DAYS	180
		86	TAIL BOOSTER (XM-148)	30 DAYS	180
		88	DELAY (INST)	30 DAYS	360
		89	FIN CONICAL (MK-84)	30 DAYS	180

TSAR DATA BASE DOCUMENTATION
A-10 MUNITIONS DATA BASE SEGMENT

18 NOV 1986

PREPARED FOR
AIR FORCE CENTER FOR STUDIES AND ANALYSES
PENTAGON, WASHINGTON D.C. 20330-5420

PREPARED BY
ORLANDO TECHNOLOGY, INC.
P.O. BOX 855
SHALIMAR, FLORIDA 32579

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I MUNITIONS ASSEMBLY REQUIREMENTS

(CARD TYPE #11/1)

MUNITION DESCRIPTION	MUN#	QUAN	PERSONNEL		AGE		TIME (MIN)	ALT PROC	PER SUBST
			TYPE	#	#1	#2			
AIM-7E	1	6	22	3	24	-	180	36	-
AIM-9P	2	3	22	3	24	-	150	37	-
AIM-120	3	3	22	3	24	-	21	-	-
AGM-45-9	4	4	22	6	23	24	60	38	-
AGM-45-10	5	4	22	6	23	24	60	38	-
AGM-45G-3	6	4	22	6	23	24	60	38	-
AGM-45G-4	7	4	22	6	23	24	60	38	-
AGM-45G-6	8	4	22	6	23	24	60	38	-
AGM-65 (AUR)	9	2	22	2	24	-	9	-	-
AGM-88A (AUR)	10	2	22	2	24	-	9	-	-
CBU-52	11	9	30	15	20	26	24	-	-
CBU-58	12	9	30	15	20	26	24	-	-
CBU-87 (AUR)	13	6	30	5	26	-	12	-	-
GBU-10 HD	14	12	30	15	23	26	60	39	-
GBU-10 LD	15	12	30	15	23	26	60	39	-
GBU-15	16	12	30	15	23	26	45	40	-
GBU-24	17	12	30	15	23	26	45	40	-
MK-20 (AUR)	18	10	30	3	20	26	30	-	-
MK-82 HD	19	12	30	15	23	26	24	41	-
MK-82 LD	20	12	30	15	23	26	24	41	-
MK-84	21	12	30	15	23	26	18	42	-
DURANDAL (AUR)	22	9	30	2	23	-	30	-	-
ERAM (AUR)	23	9	30	2	23	-	30	-	-
SFW (AUR)	24	9	30	2	23	-	24	-	-
EXTERNAL TANK	25	5	23	2	-	-	60	-	-
GUN AMMO LOAD	26	-	-	-	-	-	-	-	-
ECM POD	27	-	-	-	-	-	-	-	-
PAVE PENNY POD	28	-	-	-	-	-	-	-	-
LANTIRN POD	29	-	-	-	-	-	-	-	-

II ALTERNATE MUNITIONS ASSEMBLY REQUIREMENTS

(CARD TYPE #11/1)

TASK DESCRIPTION	TSAR#	QUAN	PERSONNEL		AGE		TIME (MIN)	ALT PROC	PER SUBST
			TYPE	#	#1	#2			
ALT AIM-7/AGE-25	36	6	22	3	25	-	180	-	-
ALT AIM-9/AGE-25	37	3	22	3	25	-	150	-	-
ALT AIM-120/AGE-25	38	4	22	6	23	25	60	-	-
ALT GBU/AGE-24	39	12	30	15	23	24	60	43	-
ALT GBU/AGE-24	40	12	30	15	23	24	45	44	-
ALT MK-82/AGE-24	41	12	30	15	23	24	24	45	-
ALT MK-84/AGE-24	42	12	30	15	23	24	18	46	-
ALT GBU/AGE-25	43	12	30	15	23	25	60	-	-
ALT GBU/AGE-25	44	12	30	15	23	25	45	-	-
ALT MK-82/AGE-25	45	12	30	15	23	25	24	-	-
ALT MK-84/AGE-25	46	12	30	15	23	25	18	-	-

III MUNITION COMPONENTS

(CARD TYPE #11/2)

III.1 MUNITION #1 - AIM-7E

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
40	GUIDANCE & CONTROL	1
41	ROCKET MOTOR	1
42	WARHEAD	1

III.2 MUNITION #2 - AIM-9P

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
43	GUIDANCE & CONTROL	1
44	ROCKET MOTOR	1
45	WARHEAD	1
46	TARGET DETECTOR	1
47	CANARD	4
48	WING & ROLLERON	4

III.3 MUNITION #3 - AIM-120

ALL UP ROUND (AUR) - NO COMPONENTS REPRESENTED

III.4 MUNITION #4 - AGM-45-9

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
49	MK-78 MOTOR	1
50	WARHEAD (WAU-9B)	1
51	CONTROL SECTION	1
52	GUIDANCE (MK-49-1/O)	1

III.5 MUNITION #5 - AGM-45-10

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
49	MK-78 MOTOR	1
50	WARHEAD (WAU-9B)	1
51	CONTROL SECTION	1
53	GUIDANCE (MK-50)	1

III.6 MUNITION #6 - AGM-45G-3

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
49	MK-78 MOTOR	1
50	WARHEAD (WAU-9B)	1
51	CONTROL SECTION	1
54	GUIDANCE (MK-24)	1

III.7 MUNITION #7 - AGM-45G-4

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
49	MK-78 MOTOR	1
50	WARHEAD (WAU-9B)	1
51	CONTROL SECTION	1
55	GUIDANCE (MK-25)	1

III.8 MUNITION #8 - AGM-45G-6

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
49	MK-78 MOTOR	1
50	WARHEAD (WAU-9B)	1
51	CONTROL SECTION	1
56	GUIDANCE (MK-36)	1

III.9 MUNITION #9 - AGM-65

ALL UP ROUND (AUR) - NO COMPONENTS REPRESENTED

III.10 MUNITION #10 - AGM-88A

ALL UP ROUND (AUR) - NO COMPONENTS REPRESENTED

III.11 MUNITION #11 - CBU-52

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
57	ARMING WIRE (13 FEET)	1
58	NOSE FUZE (MK-303 OR FMU-56)	1
59	CBU-52 BOMB BODY/SUU 30	1

III.12 MUNITION #12 - CBU-58

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
57	ARMING WIRE (13 FEET)	1
58	NOSE FUZE (MK-303 OR FMU-56)	1
60	CBU-58 BOMB BODY/SUU 30	1

III.13 MUNITION #13 - CBU-87

ALL UP ROUND (AUR) - NO COMPONENTS REPRESENTED

III.14 MUNITION #14 - GBU-10 HIGH DRAG

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
57	ARMING WIRE (13 FEET)	1
61	MK-84 BOMB BODY	1
62	CCG MAU-169 & AFG MXU 651	1
63	FUZE FMU-81	1
64	BOOSTER & TAPE FZU 2/B	4
65	ADAPTER BOOSTER M147TL	1
66	DRIVE ASSEMBLY	1
67	COUPLER MAU-870 & SHAFT MAU-86	1
68	DELAYS	1
69	TAIL FUZE (M-905)	1

III.15 MUNITION #15 - GBU-10 LOW DRAG

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
61	MK-84 BOMB BODY	1
62	CCG MAU-169 & AFG MXU 651	1
63	FUZE FMU-81	1
64	BOOSTER & TAPE FZU 2/B	5
65	ADAPTER BOOSTER M147TL	1

III.16 MUNITION #16 - GBU-15

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
61	MK-84 BOMB BODY	1
70	GUIDANCE ADAPTER	1
71	CONTROL UNIT	1
72	TARGET DETECTION DEVICE	1
73	AIRFOIL GROUP	1
74	RECEIVER TRANSMITTER	1
75	FMU-124 A/B FUZE	1

III.17 MUNITION #17 - GBU-24

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
61	MK-84 BOMB BODY	1
76	CCG	1
77	AIRLERON	1
78	FUZE	1

III.18 MUNITION #18 - MK-20

ALL UP ROUND (AUR) - NO COMPONENTS REPRESENTED

III.19 MUNITION #19 - MK-82 HIGH DRAG

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
57	ARMING WIRE (13 FEET)	1
69	TAIL FUZE (M-905)	1
79	MK-82 BOMB BODY	1
80	FIN AMMO (MK-15) OR FIN CHUTE (BSU-49)	1
81	NOSE FUZE (M-904)	1
82	NOSE BOOSTER (XM-147)	1
83	TAIL FUZE (FMU-54)	1
84	DELAY FUZE (FZU)	1
85	ARMING LANYARD	1
86	TAIL BOOSTER (XM-148)	1

III.20 MUNITION #20 - MK-82 LOW DRAG

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
57	ARMING WIRE (13 FEET)	1
69	TAIL FUZE (M-905)	1
79	MK-82 BOMB BODY	1
81	NOSE FUZE (M-904)	1
82	NOSE BOOSTER (XM-147)	1
86	TAIL BOOSTER (XM-148)	1
87	FIN (MAU-93)	1
88	DELAY (INST)	2

III.21 MUNITION #21 - MK-84

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
57	ARMING WIRE (13 FEET)	1
61	MK-84 BOMB BODY	1
69	TAIL FUZE (M-905)	1
81	NOSE FUZE (M-904)	1
82	NOSE BOOSTER (XM-147)	1
86	TAIL BOOSTER (XM-148)	1
88	DELAY (INST)	2
89	FIN CONICAL (MK-84)	1

III.22 MUNITIONS #22 THRU #29

ALL UP ROUND (AUR) - NO COMPONENTS REPRESENTED

IV COMMON MUNITION COMPONENTS

(CARD TYPE #11/2)

COMP #	COMPONENT DESCRIPTION	MUNITION # DESCRIPTION	MUNITION # DESCRIPTION	MUNITION # DESCRIPTION
40	GUIDANCE & CONTROL	1 AIM-7E		
41	ROCKET MOTOR	1 AIM-7E		
42	WARHEAD	1 AIM-7E		
43	GUIDANCE & CONTROL	2 AIM-9P		
44	ROCKET MOTOR	2 AIM-9P		
45	WARHEAD	2 AIM-9P		
46	TARGET DETECTOR	2 AIM-9P		
47	CANARD	2 AIM-9P		
48	WING & ROLLERON	2 AIM-9P		
49	MK-78 MOTOR	4 AGM-45-9	5 AGM-45-10	6 AGM-45G-3
		7 AGM-45G-4	8 AGM-45G-6	
50	WARHEAD (WAU 9B)	4 AGM-45-9	5 AGM-45-10	6 AGM-45G-3
		7 AGM-45G-4	8 AGM-45G-6	
51	CONTROL SECTION	4 AGM-45-9	5 AGM-45-10	6 AGM-45G-3
		7 AGM-45G-4	8 AGM-45G-6	
52	GUIDANCE (MK-49-1/O)	4 AGM-45-9	5 AGM-45-10	6 AGM-45G-3
		7 AGM-45G-4	8 AGM-45G-6	
53	GUIDANCE (MK-50)	5 AGM-45-10		
54	GUIDANCE (MK-24)	6 AGM-45G-3		
55	GUIDANCE (MK-25)	7 AGM-45G-4		
56	GUIDANCE (MK-36)	8 AGM-45G-6		
57	ARMING WIRE	11 CBU-52	12 CBU-58	14 GBU-10HD
		15 GBU-10LD	19 MK-82HD	20 MK-82LD
		21 MK-84		
58	NOSE FUZE (MK-303 OR FMU-56)	11 CBU-52	12 CBU-58	
59	CBU-52 BOMB BODY/SUU 30	11 CBU-52		
60	CBU-58 BOMB BODY/SUU 30	12 CBU-58		
61	MK-84 BOMB BODY	14 GBU-10HD	15 GBU-10LD	16 GBU-15
		17 GBU-24	21 MK-84	
62	CCG MAU-169 & AFG MXU 651	14 GBU-10HD	15 GBU-10LD	
63	FUZE FMU-81	14 GBU-10HD	15 GBU-10LD	
64	BOOSTER & TAPE FZU 2/B	14 GBU-10HD	15 GBU-10LD	
65	ADAPTER BOOSTER M147TL	14 GBU-10HD	15 GBU-10LD	
66	DRIVE ASSEMBLY	14 GBU-10HD		
67	COUPLER MAU-870 & SHAFT MAU-86	14 GBU-10HD		
68	DELAYS	14 GBU-10HD		
69	TAIL FUZE (M-905)	14 GBU-10HD	19 MK-82HD	20 MK-82LD
		21 MK-84		
70	GUIDANCE ADAPTER	16 GBU-15		
71	CONTROL UNIT	16 GBU-15		
72	TARGET DETECTION DEVICE	16 GBU-15		
73	AIRFOIL GROUP	16 GBU-15		
74	RECEIVER TRANSMITTER	16 GBU-15		
75	FMU-124 A/B FUZE	16 GBU-15		
76	CCG	17 GBU-24		
77	AIRLERON	17 GBU-24		
78	FUZE	17 GBU-24		
79	MK-82 BOMB BODY	19 MK-82HD	20 MK-82LD	
80	FIN AMMO (MK-15) OR			
	FIN CHUTE (BSU-49)	19 MK-82HD		
81	NOSE FUZE (M-904)	19 MK-82HD	20 MK-82LD	21 MK-84
82	NOSE BOOSTER (XM-147)	19 MK-82HD	20 MK-82LD	21 MK-84
83	TAIL FUZE (FMU-54)	19 MK-82HD		
84	DELAY FUZE (FZU)	19 MK-82HD		
85	ARMING LANYARD	19 MK-82HD		
86	TAIL BOOSTER (XM-148)	19 MK-82HD	20 MK-82LD	21 MK-84
87	FIN (MAU-93)	20 MK-82LD		
88	DELAY (INST)	20 MK-82LD	21 MK-84	
89	FIN CONICAL (MK-84)	21 MK-84		

V AIRCRAFT CONFIGURATIONS

(CARD TYPE #14)

CONF#	DESCRIPTION	TRAP#	QUAN	PERSONNEL		AGE		TIME (MIN)	PER SUBST
				TYPE	#	#1	#2		
1	NO EXTRA TRAP	-	-	-	-	-	-	-	-
2	LAU-117	6	2	29	2	20	-	18	-
3	MER	7	2	29	2	-	-	12	-

VI STANDARD COMBAT LOAD REQUIREMENTS

(CARD TYPE #13)

SCL#	CONF#	DESCRIPTION	SHOP RQD	MUN#	QUAN	PERSONNEL		AGE		TIME (MIN)	PER SUBST
						TYPE	#	#1	#2		
1	1	30MM GUN	-	26	1	28	3	21	-	15	-
2	2	30MM GUN +	-	26	1	28	3	21	-	15	-
		2 AGM-65	-	9	2	28	3	20	-	12	-
3	3	30MM GUN +	-	26	1	28	3	21	-	15	-
		6 MK-82 HD	-	19	6	28	3	20	-	24	-
4	3	30MM GUN +	-	26	1	28	3	21	-	15	-
		10 MK-82 LD	-	20	10	28	3	20	-	36	-
5	3	30MM GUN +	-	26	1	28	3	21	-	15	-
		6 MK-20	-	18	6	28	3	20	-	24	-
6	3	30MM GUN +	-	26	1	28	3	21	-	15	-
		6 CBU-58	-	12	6	28	3	20	-	24	-

VII STANDARD COMBAT LOAD PREFERENCES

(CARD TYPE #12)

MISSION #1 - HIGH THREAT (SA-6/SA-8)
 PRIORITY SCL# SCL DESCRIPTION

1	2	2 AGM-65
2	1	30MM ONLY
3	-	-
4	-	-
5	-	-
6	-	-
7	-	-
8	-	-
9	-	-
10	-	-

MISSION #2 - HIGH THREAT (SA-2/SA-3)
 PRIORITY SCL# SCL DESCRIPTION

1	2	2 AGM-65
2	3	6 MK-82HD
3	1	30MM ONLY
4	-	-
5	-	-
6	-	-
7	-	-
8	-	-
9	-	-
10	-	-

MISSION #3 - LOW THREAT (HARD TARGETS)
 PRIORITY SCL# SCL DESCRIPTION

1	2	2 AGM-65
2	4	10 MK-82LD
3	5	6 MK-20
4	1	30MM ONLY
5	-	-
6	-	-
7	-	-
8	-	-
9	-	-
10	-	-

MISSION #4 - LOW THREAT (SOFT TARGETS)		
PRIORITY	SCL#	SCL DESCRIPTION
1	5	6 MK-20
2	6	6 CBH-58
3	3	6 MK-82HD
4	1	30 MM ONLY
5	-	-
6	-	-
7	-	-
8	-	-
9	-	-
10	-	-

VIII BASIC MUNITIONS

(CARD TYPES #15 AND #5)
 BASIC MUNITIONS ARE ALWAYS LOADED ON THE AIRCRAFT REGARDLESS OF THE MISSION REQUIREMENTS.
 30MM GUN SHOULD ALSO BE CONSIDERED "BASIC" MUNITIONS SINCE THEY ARE INCLUDED IN EACH SCL.

MUN	DESCRIPTION	MUN #	TASK #	QUAN	PERSONNEL		AGE		TIME (MIN)	PER SUBST
					TYPE	#	#1	#2		
2	AIM-9	2	710	2	28	3	20	-	12	1
	ECM POD	27	711	1	28	3	20	-	6	1
	PAVE PENNY POD	28	712	1	28	3	20	-	6	1

IX MUNITION STOCK LEVELS

(CARD TYPE #24)
 THESE QUANTITIES WERE CALCULATED USING THE FOLLOWING FORMULA:
 STOCK LEVEL = NUMBER OF MUNITIONS X 4 SORTIES PER DAY X NUMBER OF DAYS

MUN #	DESCRIPTION	STOCK LEVEL	QUANTITY
2	AIM-9P (ASSEMBLED)	5 DAYS	40
12	CBU-58 (ASSEMBLED)	5 DAYS	120
18	MK-20 (ASSEMBLED)	5 DAYS	120
19	MK-82 HD (ASSEMBLED)	5 DAYS	120
20	MK-82 LD (ASSEMBLED)	5 DAYS	200
26	GUN AMMO LOAD (ASSEMBLED)	30 DAYS	120
27	ECM POD (ASSEMBLED)	30 DAYS	120
28	PAVE PENNY POD (ASSEMBLED)	30 DAYS	120
118	MK-20 (UNASSEMBLED)	30 DAYS	720

X MUNITION COMPONENT STOCK LEVELS

(CARD TYPE #24)

THESE QUANTITIES WERE CALCULATED USING THE FOLLOWING FORMULA:

STOCK LEVEL = NUMBER OF MUNITIONS X NUMBER OF COMPONENTS X 4 SORTIES PER DAY X NUMBER OF DAYS

MUN#	DESCRIPTION	COMP#	DESCRIPTION	STOCK LEVEL	QUANTITY
2	AIM-9P	43	GUIDANCE & CONTROL	30 DAYS	240
		44	ROCKET MOTOR	30 DAYS	240
		45	WARHEAD	30 DAYS	240
		46	TARGET DETECTOR	30 DAYS	240
		47	CANARD	30 DAYS	960
12	CBU-58	48	WING & ROLLERON	30 DAYS	960
		57	ARMING WIRE	30 DAYS	720
		58	NOSE FUZE (MK-303 OR FMU-56)	30 DAYS	720
		60	CBU-58 BOMB BODY/SUU 30	30 DAYS	720
19	MK-82 HD	57	ARMING WIRE	30 DAYS	720
		69	TAIL FUZE (M-905)	30 DAYS	720
		79	MK-82 BOMB BODY	30 DAYS	720
		80	FIN AMMO (MK-15) OR FIN CHUTE (BSU-49)	30 DAYS	720
		81	NOSE FUZE (M-904)	30 DAYS	720
		82	NOSE BOOSTER (XM-147)	30 DAYS	720
		83	TAIL FUZE (FMU-54)	30 DAYS	720
		84	DELAY FUZE (FZU)	30 DAYS	720
		85	ARMING LANYARD	30 DAYS	720
		86	TAIL BOOSTER (XM-148)	30 DAYS	720
20	MK-82 LD	57	ARMING WIRE	30 DAYS	1200
		69	TAIL FUZE (M-905)	30 DAYS	1200
		79	MK-82 BOMB BODY	30 DAYS	1200
		81	NOSE FUZE (M-904)	30 DAYS	1200
		82	NOSE BOOSTER (XM-147)	30 DAYS	1200
		86	TAIL BOOSTER (XM-148)	30 DAYS	1200
		87	FIN (MAU-93)	30 DAYS	1200
		88	DELAY (INST)	30 DAYS	2400

TSAR DATA BASE DOCUMENTATION
F-4E MUNITIONS DATA BASE SEGMENT

18 NOV 1986

PREPARED FOR
AIR FORCE CENTER FOR STUDIES AND ANALYSES
PENTAGON, WASHINGTON D.C. 20330-5420

PREPARED BY
ORLANDO TECHNOLOGY, INC.
P.O. BOX 855
SHALIMAR, FLORIDA 32579

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I MUNITIONS ASSEMBLY REQUIREMENTS

(CARD TYPE #11/1)

MUNITION DESCRIPTION	MUN#	QUAN	PERSONNEL		AGE		TIME (MIN)	ALT PROC	PER SUBST
			TYPE	#	#1	#2			
AIM-7E	1	6	22	3	76	-	180	36	-
AIM-9P	2	3	22	3	76	-	150	37	-
AIM-120	3	3	22	3	76	-	21	-	-
AGM-45-9	4	4	22	6	65	76	60	38	-
AGM-45-10	5	4	22	6	65	76	60	38	-
AGM-45G-3	6	4	22	6	65	76	60	38	-
AGM-45G-4	7	4	22	6	65	76	60	38	-
AGM-45G-6	8	4	22	6	65	76	60	38	-
AGM-65 (AUR)	9	2	22	2	76	-	9	-	-
AGM-88A (AUR)	10	2	22	2	76	-	9	-	-
CBU-52	11	9	30	15	66	78	24	-	-
CBU-58	12	9	30	15	66	78	24	-	-
CBU-87 (AUR)	13	6	30	5	78	-	12	-	-
GBU-10 HD	14	12	30	15	65	78	60	39	-
GBU-10 LD	15	12	30	15	65	78	60	39	-
GBU-15	16	12	30	15	65	78	45	40	-
GBU-24	17	12	30	15	65	78	45	40	-
MK-20 (AUR)	18	10	30	3	66	78	30	-	-
MK-82 HD	19	12	30	15	65	78	24	41	-
MK-82 LD	20	12	30	15	65	78	24	41	-
MK-84	21	12	30	15	65	78	18	42	-
DURANDAL (AUR)	22	9	30	2	65	-	30	-	-
ERAM (AUR)	23	9	30	2	65	-	30	-	-
SFW (AUR)	24	9	30	2	65	-	24	-	-
EXTERNAL TANK	25	5	23	2	-	-	60	-	-
GUN AMMO LOAD	26	-	-	-	-	-	-	-	-
ECM POD	27	-	-	-	-	-	-	-	-
PAVE PENNY POD	28	-	-	-	-	-	-	-	-
LANTIRN POD	29	-	-	-	-	-	-	-	-

II ALTERNATE MUNITIONS ASSEMBLY REQUIREMENTS

(CARD TYPE #11/1)

TASK DESCRIPTION	TSAR#	QUAN	PERSONNEL		AGE		TIME (MIN)	ALT PROC	PER SUBST
			TYPE	#	#1	#2			
ALT AIM-7/AGE-77	36	6	22	3	77	-	180	-	-
ALT AIM-9/AGE-77	37	3	22	3	77	-	150	-	-
ALT AIM-120/AGE-77	38	4	22	6	65	77	60	-	-
ALT GBU/AGE-76	39	12	30	15	65	76	60	43	-
ALT GBU/AGE-76	40	12	30	15	65	76	45	44	-
ALT MK-82/AGE-76	41	12	30	15	65	76	24	45	-
ALT MK-84/AGE-76	42	12	30	15	65	76	18	46	-
ALT GBU/AGE-77	43	12	30	15	65	77	60	-	-
ALT GBU/AGE-77	44	12	30	15	65	77	45	-	-
ALT MK-82/AGE-77	45	12	30	15	65	77	24	-	-
ALT MK-84/AGE-77	46	12	30	15	65	77	18	-	-

III MUNITION COMPONENTS

(CARD TYPE #11/2)

III.1 MUNITION #1 - AIM-7E

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
40	GUIDANCE & CONTROL	1
41	ROCKET MOTOR	1
42	WARHEAD	1

III.2 MUNITION #2 - AIM-9P

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
43	GUIDANCE & CONTROL	1
44	ROCKET MOTOR	1
45	WARHEAD	1
46	TARGET DETECTOR	1
47	CANARD	4
48	WING & ROLLERON	4

III.3 MUNITION #3 - AIM-120

ALL UP ROUND (AUR) - NO COMPONENTS REPRESENTED

III.4 MUNITION #4 - AGM-45-9

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
49	MK-78 MOTOR	1
50	WARHEAD (WAU-9B)	1
51	CONTROL SECTION	1
52	GUIDANCE (MK-49-1/O)	1

III.5 MUNITION #5 - AGM-45-10

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
49	MK-78 MOTOR	1
50	WARHEAD (WAU-9B)	1
51	CONTROL SECTION	1
53	GUIDANCE (MK-50)	1

III.6 MUNITION #6 - AGM-45G-3

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
49	MK-78 MOTOR	1
50	WARHEAD (WAW-9B)	1
51	CONTROL SECTION	1
54	GUIDANCE (MK-24)	1

III.7 MUNITION #7 - AGM-45G-4

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
49	MK-78 MOTOR	1
50	WARHEAD (WAW-9B)	1
51	CONTROL SECTION	1
55	GUIDANCE (MK-25)	1

III.8 MUNITION #8 - AGM-45G-6

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
49	MK-78 MOTOR	1
50	WARHEAD (WAW-9B)	1
51	CONTROL SECTION	1
56	GUIDANCE (MK-36)	1

III.9 MUNITION #9 - AGM-65

ALL UP ROUND (AUR) - NO COMPONENTS REPRESENTED

III.10 MUNITION #10 - AGM-88A

ALL UP ROUND (AUR) - NO COMPONENTS REPRESENTED

III.11 MUNITION #11 - CBU-52

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
57	ARMING WIRE (13 FEET)	1
58	NOSE FUZE (MK-303 OR FMU-56)	1
59	CBU-52 BOMB BODY/SUU 30	1

III.12 MUNITION #12 - CBU-58

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
57	ARMING WIRE (13 FEET)	1
58	NOSE FUZE (MK-303 OR FMU-56)	1
60	CBU-58 BOMB BODY/SUU 30	1

III.13 MUNITION #13 - CBU-87

ALL UP ROUND (AUR) - NO COMPONENTS REPRESENTED

III.14 MUNITION #14 - GBU-10 HIGH DRAG

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
57	ARMING WIRE (13 FEET)	1
61	MK-84 BOMB BODY	1
62	CCG MAU-169 & AFG MXU 651	1
63	FUZE FMU-81	1
64	BOOSTER & TAPE FZU 2/B	4
65	ADAPTER BOOSTER M147TL	1
66	DRIVE ASSEMBLY	1
67	COUPLER MAU-870 & SHAFT MAU-86	1
68	DELAYS	1
69	TAIL FUZE (M-905)	1

III.15 MUNITION #15 - GBU-10 LOW DRAG

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
61	MK-84 BOMB BODY	1
62	CCG MAU-169 & AFG MXU 651	1
63	FUZE FMU-81	1
64	BOOSTER & TAPE FZU 2/B	5
65	ADAPTER BOOSTER M147TL	1

III.16 MUNITION #16 - GBU-15

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
61	MK-84 BOMB BODY	1
70	GUIDANCE ADAPTER	1
71	CONTROL UNIT	1
72	TARGET DETECTION DEVICE	1
73	AIRFOIL GROUP	1
74	RECEIVER TRANSMITTER	1
75	FMU-124 A/B FUZE	1

III.17 MUNITION #17 - GBU-24

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
61	MK-84 BOMB BODY	1
76	CCG	1
77	AIRLERON	1
78	FUZE	1

III.18 MUNITION #18 - MK-20

ALL UP ROUND (AUR) - NO COMPONENTS REPRESENTED

III.19 MUNITION #19 - MK-82 HIGH DRAG

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
57	ARMING WIRE (13 FEET)	1
69	TAIL FUZE (M-905)	1
79	MK-82 BOMB BODY	1
80	FIN AMMO (MK-15) OR FIN CHUTE (BSU-49)	1
81	NOSE FUZE (M-904)	1
82	NOSE BOOSTER (XM-147)	1
83	TAIL FUZE (FMU-54)	1
84	DELAY FUZE(FZU)	1
85	ARMING LANYARD	1
86	TAIL BOOSTER (XM-148)	1

III.20 MUNITION #20 - MK-82 LOW DRAG

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
57	ARMING WIRE (13 FEET)	1
69	TAIL FUZE (M-905)	1
79	MK-82 BOMB BODY	1
81	NOSE FUZE (M-904)	1
82	NOSE BOOSTER (XM-147)	1
86	TAIL BOOSTER (XM-148)	1
87	FIN (MAU-93)	1
88	DELAY (INST)	2

III.21 MUNITION #21 - MK-84

COMPONENT #	COMPONENT DESCRIPTION	QUANTITY
57	ARMING WIRE (13 FEET)	1
61	MK-84 BOMB BODY	1
69	TAIL FUZE (M-905)	1
81	NOSE FUZE (M-904)	1
82	NOSE BOOSTER (XM-147)	1
86	TAIL BOOSTER (XM-148)	1
88	DELAY (INST)	2
89	FIN CONICAL (MK-84)	1

III.22 MUNITIONS #22 THRU #29

ALL UP ROUND (AUR) - NO COMPONENTS REPRESENTED

IV COMMON MUNITION COMPONENTS

(CARD TYPE #11/2)

COMP #	COMPONENT DESCRIPTION	MUNITION # DESCRIPTION	MUNITION # DESCRIPTION	MUNITION # DESCRIPTION
40	GUIDANCE & CONTROL	1 AIM-7E		
41	ROCKET MOTOR	1 AIM-7E		
42	WARHEAD	1 AIM-7E		
43	GUIDANCE & CONTROL	2 AIM-9P		
44	ROCKET MOTOR	2 AIM-9P		
45	WARHEAD	2 AIM-9P		
46	TARGET DETECTOR	2 AIM-9P		
47	CANARD	2 AIM-9P		
48	WING & ROLLERON	2 AIM-9P		
49	MK-78 MOTOR	4 AGM-45-9	5 AGM-45-10	6 AGM-45G-3
		7 AGM-45G-4	8 AGM-45G-6	
50	WARHEAD (WAU 9B)	4 AGM-45-9	5 AGM-45-10	6 AGM-45G-3
		7 AGM-45G-4	8 AGM-45G-6	
51	CONTROL SECTION	4 AGM-45-9	5 AGM-45-10	6 AGM-45G-3
		7 AGM-45G-4	8 AGM-45G-6	
52	GUIDANCE (MK-49-1/O)	4 AGM-45-9	5 AGM-45-10	6 AGM-45G-3
		7 AGM-45G-4	8 AGM-45G-6	
53	GUIDANCE (MK-50)	5 AGM-45-10		
54	GUIDANCE (MK-24)	6 AGM-45G-3		
55	GUIDANCE (MK-25)	7 AGM-45G-4		
56	GUIDANCE (MK-36)	8 AGM-45G-6		
57	ARMING WIRE	11 CBU-52	12 CBU-58	14 GBU-10HD
		15 GBU-10LD	19 MK-82HD	20 MK-82LD
		21 MK-84		
58	NOSE FUZE (MK-303 OR FMU-56)	11 CBU-52	12 CBU-58	
59	CBU-52 BOMB BODY/SUU 30	11 CBU-52		
60	CBU-58 BOMB BODY/SUU 30	12 CBU-58		
61	MK-84 BOMB BODY	14 GBU-10HD	15 GBU-10LD	16 GBU-15
		17 GBU-24	21 MK-84	
62	CCG MAU-169 & AFG MXU 651	14 GBU-10HD	15 GBU-10LD	
63	FUZE FMU-81	14 GBU-10HD	15 GBU-10LD	
64	BOOSTER & TAPE FZU 2/B	14 GBU-10HD	15 GBU-10LD	
65	ADAPTER BOOSTER M147TL	14 GBU-10HD	15 GBU-10LD	
66	DRIVE ASSEMBLY	14 GBU-10HD		
67	COUPLER MAU-870 & SHAFT MAU-86	14 GBU-10HD		
68	DELAYS	14 GBU-10HD		
69	TAIL FUZE (M-905)	14 GBU-10HD	19 MK-82HD	20 MK-82LD
		21 MK-84		
70	GUIDANCE ADAPTER	16 GBU-15		
71	CONTROL UNIT	16 GBU-15		
72	TARGET DETECTION DEVICE	16 GBU-15		
73	AIRFOIL GROUP	16 GBU-15		
74	RECEIVER TRANSMITTER	16 GBU-15		
75	FMU-124 A/B FUZE	16 GBU-15		
76	CCG	17 GBU-24		
77	AIRLERON	17 GBU-24		
78	FUZE	17 GBU-24		
79	MK-82 BOMB BODY	19 MK-82HD	20 MK-82LD	
80	FIN AMMO (MK-15) OR			
	FIN CHUTE (BSU-49)	19 MK-82HD		
81	NOSE FUZE (M-904)	19 MK-82HD	20 MK-82LD	21 MK-84
82	NOSE BOOSTER (XM-147)	19 MK-82HD	20 MK-82LD	21 MK-84
83	TAIL FUZE (FMU-54)	19 MK-82HD		
84	DELAY FUZE(FZU)	19 MK-82HD		
85	ARMING LANYARD	19 MK-82HD		
86	TAIL BOOSTER (XM-148)	19 MK-82HD	20 MK-82LD	21 MK-84
87	FIN (MAU-93)	20 MK-82LD		
88	DELAY (INST)	20 MK-82LD	21 MK-84	
89	FIN CONICAL (MK-84)	21 MK-84		

V AIRCRAFT CONFIGURATIONS

(CARD TYPE #14)

CONF#	DESCRIPTION	TRAP#	QUAN	PERSONNEL TYPE #	AGE #1 #2	TIME (MIN)	PER SUBST
1	NO EXTRA TRAP	-	-	-	-	-	-
2	LAU-88	2	1	28 2	20 -	18	-
3	MER	3	2	28 2	- -	12	-

VI STANDARD COMBAT LOAD REQUIREMENTS

(CARD TYPE #13)

SCL#	CONF#	DESCRIPTION	SHOP RQD	MUN#	QUAN	PERSONNEL TYPE #	AGE #1 #2	TIME (MIN)	PER SUBST
1	1	2 AIM-9 + 4 DURANDAL	- -	2 22	2 4	28 3 28 3	65 - 65 -	15 24	- -
2	1	2 AIM-9 + 2 GBU-15	- -	2 16	2 2	28 3 28 3	65 - 65 -	15 12	- -
3	1	2 AIM-9 + 2 GBU-24	- -	2 17	2 2	28 3 28 3	65 - 65 -	15 12	- -
4	1	2 AIM-9 + 2 GBU-10 HD	- -	2 14	2 2	28 3 28 3	65 - 65 -	15 12	- -
5	1	2 AIM-9 + 2 GBU-10 LD	- -	2 15	2 2	28 3 28 3	65 - 65 -	15 12	- -
6	3	2 AIM-9 + 12 MK-82HD	- -	2 19	2 12	28 3 28 3	65 - 65 -	15 36	- -
7	3	2 AIM-9 + 12 MK-82LD	- -	2 20	2 12	28 3 28 3	65 - 65 -	15 36	- -
8	3	2 AIM-9 + 6 MK-20	- -	2 18	2 6	28 3 28 3	65 - 65 -	15 30	- -
9	3	2 AIM-9 + 8 CBU-52	- -	2 11	2 8	28 3 28 3	65 - 65 -	15 36	- -
10	3	2 AIM-9 + 8 CBU-58	- -	2 12	2 8	28 3 28 3	65 - 65 -	15 36	- -
11	3	2 AIM-9 + 8 CBU-87	- -	2 13	2 8	28 3 28 3	65 - 65 -	15 36	- -
12	2	2 AIM-9 + 3 AGM-65	- -	2 9	2 3	28 3 28 3	65 - 65 -	15 24	- -
13	1	4 AIM-9 + 1 AIM-7	- -	2 1	4 1	28 3 28 3	65 - 65 -	21 6	- -

VII STANDARD COMBAT LOAD PREFERENCES

(CARD TYPE #12)

(NOTE: ALL SCLS EXCEPT SCL #13 INCLUDE 2 AIM-9 WEAPONS)

MISSION #1 - DCA-RUNWAYS/TAXIWAYS

PRIORITY	SCL#	SCL DESCRIPTION
1	1	4 DURANDAL
2	-	-
3	-	-
4	-	-
5	-	-
6	-	-
7	-	-
8	-	-
9	-	-
10	-	-

MISSION #2 - DCA-FACILITIES

PRIORITY	SCL#	SCL DESCRIPTION
1	2	2 GBU-15
2	3	2 GBU-24
3	4	2 GBU-10HD
4	5	2 GBU-10LD
5	6	12 MK-82HD
6	7	12 MK-82LD
7	8	6 MK-20
8	9	8 CBU-52
9	10	8 CBU-58
10	11	8 CBU-87

MISSION #3 - INTERDICTION-FIXED

PRIORITY	SCL#	SCL DESCRIPTION
1	2	2 GBU-15
2	3	2 GBU-24
3	4	2 GBU-10HD
4	5	2 GBU-10LD
5	6	12 MK-82HD
6	7	12 MK-82LD
7	12	3 AGM-65
8	-	-
9	-	-
10	-	-

STANDARD COMBAT LOAD PREFERENCES (CONTINUED)

MISSION #4 - INTERDICTION-MOBILE
PRIORITY SCL# SCL DESCRIPTION

1	12	3 AGM-65
2	8	6 MK-20
3	9	8 CBU-52
4	10	8 CBU-58
5	11	8 CBU-87
6	-	-
7	-	-
8	-	-
9	-	-
10	-	-

MISSION #5 - COMBAT AIR SUPPORT
PRIORITY SCL# SCL DESCRIPTION

1	11	8 CBU-87
2	12	3 AGM-65
3	8	6 MK-20
4	9	8 CBU-52
5	10	8 CBU-58
6	6	12 MK-82HD
7	7	12 MK-82LD
8	-	-
9	-	-
10	-	-

MISSION #6 - DEFENSE SUPPRESSION
PRIORITY SCL# SCL DESCRIPTION

1	8	6 MK-20
2	9	8 CBU-52
3	10	8 CBU-58
4	11	8 CBU-87
5	12	3 AGM-65
6	6	12 MK-82HD
7	7	12 MK-82LD
8	-	-
9	-	-
10	-	-

MISSION #7 - DEFENSIVE COUNTER AIR
PRIORITY SCL# SCL DESCRIPTION

1	13	4 AIM-9/3 AIM-7
2	-	-
3	-	-
4	-	-
5	-	-
6	-	-
7	-	-
8	-	-
9	-	-
10	-	-

VIII BASIC MUNITIONS

(CARD TYPES #15 AND #5)

BASIC MUNITIONS ARE ALWAYS LOADED ON THE AIRCRAFT REGARDLESS OF THE MISSION REQUIREMENTS.
2 AIM-9 SHOULD ALSO BE CONSIDERED "BASIC" MUNITIONS SINCE THEY ARE INCLUDED IN EACH SCL.

MUNITION DESCRIPTION	MUN #	TASK #	QUAN	PERSONNEL		AGE		TIME (MIN)	PER SUBST
				TYPE	#	#1	#2		
2 AIM-7	1	1407	2	28	3	65	-	12	1
20MM GUN	26	1408	1	28	3	46	-	9	1
2 EXTERNAL TANKS	25	1409	2	28	3	65	-	12	1

IX MUNITION STOCK LEVELS

(CARD TYPE #24)

THESE QUANTITIES WERE CALCULATED USING THE FOLLOWING FORMULA:

STOCK LEVEL = NUMBER OF MUNITIONS X 2 SORTIES PER DAY X NUMBER OF DAYS

MUN #	DESCRIPTION	STOCK LEVEL	QUANTITY
1	AIM-7E (ASSEMBLED)	5 DAYS	30
2	AIM-9P (ASSEMBLED)	5 DAYS	40
9	AGM-65 (ASSEMBLED)	5 DAYS	80
11	CBU-52 (ASSEMBLED)	5 DAYS	80
12	CBU-58 (ASSEMBLED)	5 DAYS	80
13	CBU-87 (ASSEMBLED)	5 DAYS	80
14	GBU-10 HD (ASSEMBLED)	5 DAYS	20
15	GBU-10 LD (ASSEMBLED)	5 DAYS	20
16	GBU-15 (ASSEMBLED)	5 DAYS	20
17	GBU-24 (ASSEMBLED)	5 DAYS	20
18	MK-20 (ASSEMBLED)	5 DAYS	60
19	MK-82 HD (ASSEMBLED)	5 DAYS	120
20	MK-82 LD (ASSEMBLED)	5 DAYS	120
22	DURANDAL (ASSEMBLED)	5 DAYS	40
25	EXTERNAL TANK (ASSEMBLED)	5 DAYS	20
26	GUN AMMO LOAD (ASSEMBLED)	30 DAYS	60
109	AGM-65 (UNASSEMBLED)	30 DAYS	480
113	CBU-87 (UNASSEMBLED)	30 DAYS	480
118	MK-20 (UNASSEMBLED)	30 DAYS	360
122	DURANDAL (UNASSEMBLED)	30 DAYS	240
125	EXTERNAL TANK (UNASSEMBLED)	30 DAYS	120

X MUNITION COMPONENT STOCK LEVELS

(CARD TYPE #24)

THESE QUANTITIES WERE CALCULATED USING THE FOLLOWING FORMULA:

STOCK LEVEL = NUMBER OF MUNITIONS X NUMBER OF COMPONENTS X 2 SORTIES PER DAY X NUMBER OF DAYS

MUN#	DESCRIPTION	COMP#	DESCRIPTION	STOCK LEVEL	QUANTITY
1	AIM-7E	40	GUIDANCE & CONTROL	30 DAYS	180
		41	ROCKET MOTOR	30 DAYS	180
		42	WARHEAD	30 DAYS	180
2	AIM-9P	43	GUIDANCE & CONTROL	30 DAYS	240
		44	ROCKET MOTOR	30 DAYS	240
		45	WARHEAD	30 DAYS	240
		46	TARGET DETECTOR	30 DAYS	240
		47	CANARD	30 DAYS	960
		48	WING & ROLLERON	30 DAYS	960
11	CBU-52	57	ARMING WIRE	30 DAYS	480
		58	NOSE FUZE (MK-303 OR FMU-56)	30 DAYS	480
		59	CBU-52 BOMB BODY/SUU 30	30 DAYS	480
12	CBU-58	57	ARMING WIRE	30 DAYS	480
		58	NOSE FUZE (MK-303 OR FMU-56)	30 DAYS	480
		60	CBU-58 BOMB BODY/SUU 30	30 DAYS	480
14	GBU-10 HD	57	ARMING WIRE	30 DAYS	120
		61	MK-84 BOMB BODY	30 DAYS	120
		62	CCG MAU-169 & AFG MXU 651	30 DAYS	120
		63	FUZE FMU-81	30 DAYS	120
		64	BOOSTER & TAPE FZU 2/B	30 DAYS	480
		65	ADAPTER BOOSTER M147TL	30 DAYS	120
		66	DRIVE ASSEMBLY	30 DAYS	120
		67	COUPLER MAU-870/SHAFT MAU-86	30 DAYS	120
		68	DELAYS	30 DAYS	120
		69	TAIL FUZE (M-905)	30 DAYS	120
15	GBU-10 LD	61	MK-84 BOMB BODY	30 DAYS	120
		62	CCG MAU-169 & AFG MXU 651	30 DAYS	120
		63	FUZE FMU-81	30 DAYS	120
		64	BOOSTER & TAPE FZU 2/B	30 DAYS	600
		65	ADAPTER BOOSTER M147TL	30 DAYS	120
16	GBU-15	61	MK-84 BOMB BODY	30 DAYS	120
		70	GUIDANCE ADAPTER	30 DAYS	120
		71	CONTROL UNIT	30 DAYS	120
		72	TARGET DETECTION DEVICE	30 DAYS	120
		73	AIRFOIL GROUP	30 DAYS	120
		74	RECEIVER TRANSMITTER	30 DAYS	120
		75	FMU-124 A/B FUZE	30 DAYS	120
17	GBU-24	61	MK-84 BOMB BODY	30 DAYS	120
		77	AIRLERON	30 DAYS	120
		78	FUZE	30 DAYS	120

CONTINUED ON NEXT PAGE

MUNITION COMPONENT STOCK LEVELS (CONTINUED)

MUN#	DESCRIPTION	COMP#	DESCRIPTION	STOCK LEVEL	QUANTITY
19	MK-82 HD	57	ARMING WIRE	30 DAYS	720
		69	TAIL FUZE (M-905)	30 DAYS	720
		79	MK-82 BOMB BODY	30 DAYS	720
		80	FIN AMMO (MK-15) OR		
			FIN CHUTE (BSU-49)	30 DAYS	720
		81	NOSE FUZE (M-904)	30 DAYS	720
		82	NOSE BOOSTER (XM-147)	30 DAYS	720
		83	TAIL FUZE (FMU-54)	30 DAYS	720
		84	DELAY FUZE(FZU)	30 DAYS	720
		85	ARMING LANYARD	30 DAYS	720
		86	TAIL BOOSTER (XM-148)	30 DAYS	720
		57	ARMING WIRE	30 DAYS	720
		69	TAIL FUZE (M-905)	30 DAYS	720
		79	MK-82 BOMB BODY	30 DAYS	720
20	MK-82 LD	81	NOSE FUZE (M-904)	30 DAYS	720
		82	NOSE BOOSTER (XM-147)	30 DAYS	720
		86	TAIL BOOSTER (XM-148)	30 DAYS	720
		87	FIN (MAU-93)	30 DAYS	720
		88	DELAY (INST)	30 DAYS	1440

END

3-87

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