

C.1. General:

C.1.1 Several years ago, the U.S. Army executed the Armament Enhancement Initiative (AEI) Integration Program to upgrade fire control hardware. The Egyptian AEI effort will be very similar, but tailored to meet Egyptian Army requirements. This effort will also result in improved commonality with US Army hardware. These modifications will be applied to 555 Government of Egypt (GOE) M1A1 tanks and associated spares. The modifications will take place entirely in the country of Egypt at predetermined sites within the Cairo environs. The target application schedule for the Egyptian AEI Program is at Attachment 01 (AEI Retrofit Planning Schedule)

C.1.1.1 The subject modifications are as follows:

a) Computer Electronics Unit (CEU): the Programmable Memory Circuit Card (A3) will be reprogrammed using a government-furnished hardware kit, memory programming unit (MPU), and A3 Card containing the new software. The Sensor Input Card (A7) and Interconnection Assembly will be replaced, and the Wiring Harness Assembly in the CEU will also be modified and updated.

b) The Gunners Primary Sight (GPS) and GPS Lower Control Panel: will be modified utilizing government-furnished kit hardware.

c) The Computer Control Panel (CCP) The CCP will be upgraded by installing a government provided revised data plate reflecting additional ammunition selections

d) Ammunition Door: In order to strengthen the area near the ammunition door latch, application of hardware from the Contractor-Provided Kit 57K4104 (Attachment 03) is required. The contractor shall provide/install a new handle assembly pn 12472979 as part of kit 57K104, rather than rework the tank's existing handle.

C.1.1.2. The CEU, GPS, and CCP will have identification plates replaced with new plates reflecting the new part numbers and national stock numbers (NSN).

C.1.2. The Contractor shall provide technical services, supplies, packaging, and equipment to accomplish this integration on Egyptian M1A1 Tanks, and spare assemblies. The integration of the upgrade shall be in accordance with procedures in Manuals, MWOs, and drawings listed in C.1.2.2.f., as well as the Modification Work Order Fielding Plan (MWOFPP) at Attachment 02 which provides the basic program planning guidelines agreed to by the USG and the GOE.

C.1.2.1 The Contractor shall upgrade no less than an average of 16 tanks or spares per work week. All upgraded spare assemblies shall be repackaged to best commercial standards for prevention of damage to the items during in-country land transportation, handling, and return to storage. The re-packaging material is to be provided by the Contractor. The outer packaging shall be marked to identify the upgraded item's new p/n and NSN.

C.1.2.2 The requirements and procedures of these upgrades to the Egyptian M1A1 tank and spares will be accomplished by the recommended task guidelines identified as tasks 1 through 5 in paragraph C.1.3.

a. Order of tasks are numbered to facilitate ease of access and modification. Replace components in reverse order of removal.

b. Most tasks reference government drawings and technical manuals that illustrate and explain procedures in detail. The COR should be notified of any conflicts to ensure resolution and proper documentation.

c. All electronic components of the M1A1 fire control system are considered as Electrostatic Sensitive Devices (ESD). Care must be taken to ensure all ESD procedures are followed in accordance with best commercial practice.

d. The Contractor is responsible for pre- and post-retrofit functional checkouts of all components and tanks modified/ updated. The Contractor is not responsible to correct any vehicle or subcomponent deficiencies, including those that must be accomplished in order to properly complete the retrofit. When deficiencies that affect proper completion or checkout of the retrofit are discovered, the Contractor shall contact the GOE point of contact listed in the MWOFPP, and the GOE will have five days to correct the deficiency. If after five days, the deficiency is not corrected, the Contractor may proceed with the retrofit work as best as possible.

e. The following government property, removed from each M1A1 tank during upgrade, will be disposed of in accordance with COR direction.

- o CEU Circuit Card, A7, P/N 9376743.
- o CEU Circuit Card, Junction, P/N 12279633.

f. Following is a list of references that shall be used for removal and installation of procedures required in updating fire control components. The COR shall be notified of any other U.S. Government documents that may be required.

- Attachment 01 = Retrofit Planning Schedule
- Attachment 02 = MWO Fielding Plan (MWOFPP)
- Attachment 03-04 = Drawing-Modification Kit (Contractor Provided), Ammo Door Latch, P/N 57K4104
- Attachment 05 = Bulk Items List (Contractor Provided Consumables/Expendables)
- Attachment 06 = Drawing - Modification Kit, Gunners Primary Sight (GPS), Lower Panel, P/N 57K4103
- Attachment 07 = Drawing - Modification Kit, Computer Electronic Unit (CEU), P/N 12993556
- Attachment 08 = Drawing - Modification Kit, Computer Control Panel (CCP), P/N 12925909
- Attachment 09 = Drawing - Modification Kit, GPS Body Assembly, P/N 12931908
- Attachment 10 = Procedure Manual - M1A1-Armament Enhancement Initiative Program Fire Control System, Field Upgrade, 959561B
- Attachment 11 = Ammo door latch modification - related drawings (57K4104 Rev C, 57K4104 NORs, drawings: 12472979, 12472719, 9376885, 12282157, 12337003, 12387272, 12387307, 12472967, 12472976, 12472977, 12472979, MIL-DTL-45913C, MS51922E Notice 2, MS24665F Notice 2, NASM24665 Adoption Notice, NASM24665)
- Attachment 12-13 = Rework Drawing, Control Panel Assembly, P/N 12931811
- Attachment 14-17 = Rework Installation Drawing, Turret, P/N 12931907
- Attachment 18 = Rework Drawing, GPS Body Assembly, P/N 12931909
- Attachment 19 = MWO 9-1200-206-50-1, Computer Electronic Unit
- Attachment 20 = MWO 9-1200-206-50-2, Computer Control Panel

Attachment 21 = CD ROM Containing Tech Manuals:

TM 9-E2350-264-10-1
TM 9-E2350-264-10-2
TM 9-2350-264-20-2-4
TM 9-2350-264-34-2-1
TM 9-2350-264-34-2-2
TM 9-1200-206-34-2

C.1.3 REWORK TASKS

Task 1. Remove and rework Gunners Primary Sight Lower Control Panel Assembly 12304703 into Control Panel Assembly 12931508 per Modification Kit 57K4103.

Task 2. Remove and rework Computer Electronics Unit 9376750 or 12925914 into Computer Electronics Unit 12925899 in accordance with Modification kit P/N 12993556.

Task 3. Remove and rework Computer Control Panel 12911212 or 12925916 or 12925904 into Computer Control Panel 12991274 in accordance with Modification Kit P/N 12925909.

Task 4. Rework GPS Body Assembly 12549761-2 into GPS Body Assembly 12549761-4 per Modification Kit P/N 12931908. The GPS Body in the tank shall not be removed, but upgraded in-place.

Task 5. Apply Ammo door latch Kit 57K4104.

C.2. Administration:

C.2.1 The contractor shall develop, prepare and submit monthly:

- a. Pre-retrofit vehicle/component inspection sheets
- b. Post-retrofit vehicle/component inspection sheets
- c. Progress Reports identifying all spare components and tanks upgraded in contractor format. At a minimum, the report should include retrofit location, retrofit date, and component/vehicle serial number modified.

C.2.2 Contractor Team Members shall undergo an HIV Test within one (1) week of arrival in Egypt. Team members may contact the Contracting Officers Representative (COR) to obtain a list of medical experts approved by the US Embassy to perform the test. Team members will not be given access to retrofit sites without a properly documented certificate of testing.

C.3. Implementation:

C.3.1. GOVERNMENT FURNISHED EQUIPMENT

Government Furnished Equipment is listed below:

QTY

- C.3.1.a. Fixture, Mech, Drill
P/N PE 3153 2
- C.3.1.b. Fixture, Elec, Test
P/N PE 3260 2
- C.3.1.c. Memory Programmers
P/N 150004.901 2
- C.3.1.d. CEU A3 Cards
(With updated software) 5

C.3.2. GOVERNMENT FURNISHED MATERIEL

Government Furnished Materiel are the Kits identified below:

	For Use On	TANKS	SPARES
C.3.2.a.	Kit, CEU P/N 12993556	555	56
C.3.2.b.	Kit, CCP P/N 12925909	555	35
C.3.2.c.	Kit, GPS P/N 57K4103	555	24
C.3.2.d.	Kit, GPS P/N 12931908	555	45

C.3.3 CONTRACTOR FURNISHED EQUIPMENT/MATERIAL

C.3.3.a All hardware listed in kit 57K4104 (Attachment 03-04) for retrofit on 555 M1A1 tanks.

C.3.3.b All consumable and expendable parts, and bulk items as listed in Attachment 05.

C.3.3.c Tools (including Electrostatic Sensitive Devices (ESD) handling and grounding equipment) listed in TMs, MWOs, or the Procedure Manual 959561B.

C.3.4 Excess GFE/GFM.

C.3.4.1 Inventory: Upon termination or completion of the contract, the Contractor shall perform a physical inventory, adequate for disposal purposes, of all GFE/GFM applicable to the contract.

C.3.4.2 Reporting: The COR will determine disposition.

C.3.5. A Start of Work Meeting will be conducted at the CMO in Sterling Heights, MI, 30 days after contract award. POC at the CMO is Ms. Sue Staggemeier, 586-795-2293.

C.4. Field Effort Responsibilities:

C.4.1 The Contractor will provide work crews and supplies as required to accomplish vehicle/spares upgrades at each location per the final negotiated schedule (Reference planning schedule at Attachment 01) The contractor shall provide protection from ESD in accordance with TM9-2350-264-34-2, to accomplish the upgrade to the Computer Electronic Unit. Once the upgrade team starts in a geographical area, that entire location will be upgraded before the team leaves

for the next location. If tanks and/or spares assigned to this area are not available during this period, the Contractor shall notify the government representative of the situation and request guidance to proceed in order to maintain schedule and ensure start of next unit/location on time.

C.4.1.1 The contractor team will complete a Battalion or Squadron of tanks and Operational Readiness Float plus spares (ASL/PLL) at one time before moving to a different site. The retrofit schedule is based on an average of 16 tanks/spares being modified per work week. The ASL/PLL and any other spares will be upgraded first or concurrently to avoid "demoding" unit tanks after contractor upgrades.

C.4.1.2 Work will be performed on an 8 hour day, 1 shift, 40 hour week in accordance with local Egyptian work week. The Contractor will observe Egyptian, not U.S. holidays.

C.4.2 Vehicle inspection will be performed before retrofit to ensure that all necessary vehicle subsystems are operational. Any components that are affected by the retrofit that are not operational shall be identified and the inspection results will be provided to the COR immediately, not waiting for the monthly report submittal required by C.2.1.a. After the retrofit is complete, inspection to insure the upgrade is properly accomplished and functional within the tank shall be done by the Contractor and documented using the appropriate form in C.2.1.b

C.4.3 Acceptance shall be accomplished by the Contractor by submission of post-retrofit inspection sheets to the COR. The USG reserves the right to inspect any completed vehicles/components for compliance with the contract, and should such inspection indicate an item that has been accepted is non-conforming with applicable specifications, the contractor agrees to correct the non-conformance at no cost to the government.

C.5. Field Effort Procedures:

C.5.1. The upgrade effort will be performed in accordance with the MWOFPP (Attachment 02). Any deviation from the plan must be coordinated with the COR.

C.5.2. Vehicle/Component disassembly shall be limited to the extent necessary to accomplish the upgrade.

C.5.3. CEUs shall be tested after modification on DSESTS (if available) or installed in operational tank and BIT self test performed to assure operability.

END OF SECTION C

MODIFICATION WORK ORDER FIELDING PLAN (MWOFP)**Armament Enhancement Initiative (AEI) Field Upgrade
GDLU2239-C, Ammo Door Latch Pin Strengthening**

This document represents an agreement for application of the modifications described herein and for the necessary administrative and logistical support to accomplish the effort. Full agreement between representatives of the U.S. Government (USG) and the Government of Egypt (GOE) Land Forces is indicated by the signatures of their representatives at the close of this document.

1. MODIFICATION IDENTIFICATION:

a. **Modification Purpose:** The purpose of this modification effort is to upgrade Egyptian M1A1 tank fire control components, to make M1A1 fire control components common with U.S. Army components, to provide survivability enhancements to the ammunition door latch and to incorporate ballistic solutions for KE-W and KE-WA1 ammunition. After these modifications, these areas will be common with the Increment 7 configuration.

b. **Classification:** Routine

c. **MWOs applied prior to or concurrently:** Not applicable

d. **Approx. average man-hours required to modify one tank:** 8 man-hours

e. **Approx. Equipment Non-operational Time:** 8 hours

f. **Method of Application:** All kits will be applied by a USG contractor. Workshop facilities, as agreed upon herein, will be used to modify major LRUs and assemblies. So as to minimize down-time for the units, the contractor will arrive at the retrofit unit with modified major LRUs, will replace those major LRUs and perform other necessary tasks to complete the retrofit and take "unmoded" hardware back from the unit for later modification. After the major LRUs have been modified at Workshop facilities, the contractor team will visit the next retrofit unit. The team composition and size will be tailored to vehicle density and application schedule.

g. **Special Tools, Fixtures, and Test Equipment:** The USG or USG contractor will provide the necessary tools to apply the modifications at all retrofit locations.

1. Government Furnished Equipment (GFE):

- a. One Mechanical Drill Fixture, PN PE 3153
- b. One Electrical Test Fixture, PN PE 3260
- c. Two Memory Programming Units (MPUs)
- d. Two CEU A3 Cards

2. GOE Furnished Equipment:
 - a. DSESTS
 - b. Standard shop tool set/turret mechanic tool set
 - c. Welding equipment
 - d. 220 VAC/50-60 Hz electrical power
 - e. Environmentally protected workspace

h. Bulk and Consumable Materiel: The USG contractor will provide all necessary expendable materiel to apply the MWO.

2. EQUIPMENT AFFECTED BY MWO:

- a. END ITEM TO BE MODIFIED:

NOMENCLATURE

NSN

Tank, Combat, Full-Track
120 mm Gun, M1A1

2350-01-087-1095

Serial Number Range: LE001-LE555

New NSN After Modification: Not Applicable

b. MAJOR ASSEMBLIES TO BE MODIFIED: Gunners Primary Sight (GPS), Computer Electronics Unit (CEU), Computer Control Panel (CCP), Ammo Door Frame.

3. MODIFICATION REQUIREMENTS:

- a. Quantity of Abrams M1A1 Tanks Requiring Modifications: 555
 - 25 Various Training Centers
 - 220 Division #1
 - 220 Division #2
 - 90 Egyptian Tank Plant (ETP)

- b. Quantity of Spare Subcomponents Requiring Modifications:

- 45 Gunners Primary Sights
- 35 Computer Control Panels
- 56 Computer Electronics Units
- 24 GPS Lower Panels
- 14 CEU A3 cards

4. MODIFICATION KIT INFORMATION:

- a. Each tank modification requires one (1) each of the following hardware:

- CEU Mod Kit, P/N 12993556
 - CCP Assy Mod Kit, P/N 12925909
 - GPS Panel Mod Kit, P/N 57K4103
 - GPS Body Assy Mod Kit, P/N 12931908
 - Ammo Door Latch Strengthening Kit, P/N 57K4104
- b. CEU A3 cards will require reprogramming for KE-WA1 ballistic solutions using GFE Memory Programming Unit (MPU).
- c. Hardware necessary for these modifications will be shipped from CONUS and stored at the Egypt Tank Plant (ETP) until they are required per the installation schedule. The ETP will make kits available to the retrofit contractor to support the retrofit schedule NLT 14 days in advance of need. The USG contractor will move kits to retrofit sites, and the GOE will ensure timely access of the kits to the retrofit sites.
5. INSTALLATION POCs
- a. The GOE has designated the Egyptian M1A1 TAFT as the focal point for MWOs. COL Emad, phone number 202-263-2539, is the central point of contact. LTC Tarek is the A&A POC, 010-667-2143 (cell) and 202-260-8285 (office).
- b. The Coproduction Field Office (CFO) will serve as the control USG agency. Steve Winters, phone number 012-317-7265, is the point of contact.
- c. The Coproduction Management Office (CMO) point of contact is Mr. Ken Seibel, 586-795-2294.
6. LOGISTICS SUPPORT REQUIREMENTS:
- a. GOE Responsibilities:
- Identify detailed retrofit schedule, including facilities and locations NLT 60 days before scheduled start of MWO application.
 - Ensure access to retrofit sites and work areas for USG contractors, USG personnel, drivers, vehicles, and kit hardware to support the retrofit schedule. Passes shall be granted at least 15 days prior to start at each retrofit location.
 - At each retrofit location, provide an enclosed, environmentally protected work area with 220VAC/50-60 HZ power and a secure location for storage of tools, parts, and components. At a minimum, the work area should be at Division level for fielded vehicles, at Workshop #1 for the training base tanks and at the ETP for tanks at the ETP.
 - Ensure that M1A1 tanks and spares that require retrofit are available, in working order, per the agreed upon retrofit schedule. Vehicles that have maintenance or repair problems prior to retrofit will be identified by the contractor and the GOE must repair the problems in five

working days, with technical assistance from full-time M1A1 FSRs. After five days, the USG contractor will begin/continue to apply the modifications. Upon completion, the USG will certify the modifications to the best of their ability.

- Ensure that Egyptian maintenance personnel are available to observe the retrofit and understand the procedures.
- Verify the retrofit by firing KE-WA1 rounds on randomly chosen tanks.
- A&A will collect at least 31 CEUs and 31 CCPs for an initial float of retrofit LRUs and provide them to ETP 15 days prior to the beginning of the retrofit effort.
- Each division will be responsible to collect all spare CEUs, CCPs, GPS', GPS Lower Panels, and CEU A3 cards and deliver them to the Division workshop one week prior to the beginning of that Division's retrofit.

b. USG responsibilities:

- CMO shall forward personal data for all USG contractor and USG personnel requiring access to each GOE retrofit location at least 45 days prior to start of work.
- CMO/CFO shall ensure that the retrofit contractor provides detailed reporting concerning the status of the retrofit, including data check sheets describing all related retrofit and quality assurance checks.
- CMO/CFO will ensure that the contractor maintains an accurate data base with timely reporting indicating which vehicles have the modifications applied.
- CMO will ensure that retrofit hardware is shipped to ETP in time for the retrofit team to begin work per the retrofit schedule.
- CMO/CFO will ensure that technical assistance is available to the USG contractor throughout the application period.
- Certify completion of the MWO applications.
- TAFT to witness firing of KE-WA1 ammunition on retrofitted tanks.

c. ETP responsibilities:

- Accept and store kit hardware until required for retrofit.
- Release kit hardware to support retrofit schedule.

d. Contractor responsibilities:

- Provide personal data on all personnel requiring access to retrofit locations at least 60 days prior to the start of work.
- Provide rental car and driver information to CMO 60 days prior to scheduled work at Egyptian Army units.
- All contractor personnel requiring access to retrofit locations shall obtain an HIV test within one week of arrival in Egypt.

7. .APPLICATION SCHEDULE: The application is targeted to begin in June 2003 and complete by June 2004

8. CALIBRATION REQUIREMENTS: Not Applicable
9. TRAINING: Not Impacted.
10. LOGISTICS SUPPORT: A CSP list for AEI changes will be recommended by the CMO before 31 Dec 02. Spare parts for the repair of this modification are available in the U.S. Army supply system. Technical manual support will be provided thru Increment 7 TMs and U.S. Army common TMs.
11. REVIEW AND TERMINATION: This MWOFP will be reviewed by CFO, OMC and the GOE to insure orderly resource planning. This MWOFP will remain in effect until termination by mutual agreement.

MG FAIZ AGGOUR
BASSETT Assistant Director
Armament and Ammunition Department

BG MOHAMED ABDUL
Assistant Director, Armament
Armor Department

ENGINEER NABIL MAAZ
Chairman, Factory 200-ETP

ROBERT C. FAILLE
Colonel, U.S. Army
Chief, Land Forces Division

RAMKI KRISHNAN
Chief, M1A1 CFO
Abrams Tank System

SPECIAL PACKAGING INSTRUCTION

Form Approved -AR
OMB No. 0704-0188

The public reporting burden for this collection of information is estimated to average 30 days per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0704-0188), 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. PLEASE DO NOT RETURN YOUR FORM TO THIS ADDRESS

1. PART OR DRAWING NO. (CAGE) NOMENCLATURE 57K4104 MOD KIT,AMMO DOOR L			2. CODE IDENT 19200		3. SPI NO. (AM) P57K4104	
4. NATIONAL STOCK NUMBER ---			5. DATE OF DRAWING 020628		6. REVISION -	
7. QUP 1 EA	8. ICQ SEE NOTE F	9. UNIT PACK WT. (LB) 0.4	10. UNIT PACK CU (CU FT) 0.012		11. UNIT PACK SIZE (INCHES) 5.5 X 3.3 X 1.1	
12. MILITARY PRESERVATION (METHOD) MIL-STD-2073-1, SEE BLOCK 17		18. STEPS 1D	19. REQ'D 1	20. DESCRIPTION CUSHIONING: A-A-59135, CLASS 1, GRADE A,		
13. CLEANING MIL-STD-2073-1		2D	1	BAG: MIL-DTL-117, TYPE III, CLASS B, STYLE 2.		
14. DRYING MIL-STD-2073-1						
15. PACKING						
a. LEVEL A MIL-STD-2073-1 AND NOTE H						
b. LEVEL B MIL-STD-2073-1 AND NOTE H						
16. MARKING MIL-STD-129 AND NOTE C						

17. NOTES / DRAWING

- A. REFER TO THE STEPS FOR REFERENCED ITEM NUMBERS ON THE ACCOMPANYING PAGE.
- B. THIS KIT, AS SHOWN ON THE INITIAL RELEASE OF DRAWING, P/N 57K4104, CONSISTS OF THE FOLLOWING 2 PARTS CONSOLIDATED INTO 1 SEGREGATED PACKAGE.

SEGREGATED PACKAGE NO.	PART NUMBER	CAGE	NOMENCLATURE	QTY.	METHOD OF PRESERVATION
1	12472967	19207	BLOCK, LATCH	1	10
	12387307-76	19207	SETSCREW	1	10

- C. MARKING.
 1. MARK EACH SEGREGATED PACKAGE WITH THE SEGREGATED PACKAGE NUMBER.
 2. MARK UNIT CONTAINER IN ACCORDANCE WITH MIL-STD-129. IN ADDITION, ATTACH A PACKING LIST TO THE UNIT CONTAINER IN ACCORDANCE WITH MIL-STD-129. ON THE PACKING LIST, IDENTIFY THE ITEMS WITHIN EACH SEGREGATED PACKAGE TOGETHER WITH THEIR SEGREGATED PACKAGE NUMBER.
- D. PREPARE SEGREGATED PACKAGE 1 AS DESCRIBED BELOW:

PART NUMBER	NOMENCLATURE	QTY.
12472967	BLOCK, LATCH	1
12387307-76	SETSCREW	1

 1. WRAP BOTH PARTS TOGETHER WITH WRAP, STEP 1D, AND SECURE WITH TAPE.
- E. PLACE SEGREGATED PACKAGE 1 IN BAG, STEP 2D, AND HEAT SEAL TO FORM A METHOD 31 PACKAGE.
- F. THE INTERMEDIATE CONTAINER SHALL CONFORM TO TYPE CF AND CLASS WR OF ASTM-D5118. CLOSE CONTAINER IN ACCORDANCE WITH ASTM-D1974, CLOSURE METHOD 2B3 OR 2B4. INTERMEDIATE CONTAINER QUANTITY SHALL BE 100.

WSC: JE ITEM SIZE: 1.6 X 1.3 X 0.6 ITEM WT: 0.3 APPROVED: CARL MORRISON

SPECIAL PACKAGING INSTRUCTION

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1. PART OR DRAWING NO. (CAGE) NOMENCLATURE 57K4104 MOD KIT,AMMO DOOR L	2. CODE IDENT 19200	3. SPI NO (AM) P57K4104
4. NATIONAL STOCK NUMBER ---	5. DATE OF DRAWING -	6. REVISION -

- G. INSPECT THE PRESERVATION (SEE NOTE B), THE SEGREGATED PACKAGES, UNIT PACK AND PACKING IN ACCORDANCE WITH MIL-STD-2073-1D AND THE APPLICABLE CONTAINER SPECIFICATION.
- H. LEVEL A: PACKING SHALL BE ACCOMPLISHED USING A CLEATED PLYWOOD BOX, CONFORMING TO ASTM-D6251, TYPE III, CLASS 1.
LEVEL B: THE UNIT CONTAINER IS AN ACCEPTABLE LEVEL B SHIPPING CONTAINER WHEN SEALED AND REINFORCED IN ACCORDANCE WITH ASTM-D1974, SEALING METHOD C OR D.
FOR BOTH LEVEL A AND LEVEL B, WHEN THE TOTAL QUANTITY TO BE SHIPPED TO THE SAME DESTINATION EXCEEDS 125 POUNDS, EXTERIOR PACKS WITHOUT SKIDS SHALL BE PALLETIZED.
MIL-HDBK-774 MAY BE USED FOR GUIDANCE.

CONTRACTOR PROVIDED**BULK ITEMS, EXPENDABLES/CONSUMABLES**

<u>Nomenclature</u>	<u>NSN</u>	<u>Part Number</u>	<u>Quantity</u>
Wire		12273949-1 (19207)	As Required
Rubber Tubing		MIL-R-46846	As Required
Ink, White, Type I	7510-00-224-6732	TT-I-1795 9802440	As Required
Methyl-Ethyl-Ketone	6810-00-281-2762	TT-M-261	As Required
Solder, Resin Core	3439-00-896-8746	QQ-S-571 (81348)	As Required
Solder Wick		Any Type	As Required
Cotton Swab	1005-00-288-3565	5019315 (19204)	As Required
Trichloroethylene	6810-00-678-4418	O-T-634 (81348)	As Required
Sealing, Compound Class A-2	8030-00-723-5343	Mil-S-8802, Type II	As Required
Acetone	6810-00-223-2739	O-A-51 (81348)	As Required
Brush, Acid Swabbing	7920-00-514-2417	H-B-643 (81348)	As Required
Tape Lacing	4020-00-753-6555	MIL-T-43435 (81348)	As Required
Packing Material	Commercial Standard		As Required

959561 B

*Attachment 10
Front Matter*

May 2002

REVISION STATUS

Number- Rev	Date	Comments	Approval Signature
959561	21 June 1993	Preliminary Release.	
959561 B	20 April 1995	Revised due to extensive comments and in accordance with SCN 001 (27 October 1993).	
959561 B	23 May 2002	Tailored for Egyptian M1A1 Upgrade	

WARNING

RADIOACTIVE MATERIAL



HANDLE CAREFULLY

RADIOACTIVE

The M1A1 Series Collimator Muzzle Reference Sensor (MRS) used to compensate for gun tube bend contains the radioactive isotope "tritium".

The radioactive material is completely encased within the unit and poses no external radiation threat unless the radioactive vial is damaged.

Turret of the M1A1 tank contains Depleted Uranium (DU) armor. DU is completely encased within turret and poses no external or internal radiation threat unless turret armor is damaged. Damage can result in contamination with DU dust.

There is no exposure to radiation in the crew compartment from the DU armor.

The antireflective coating on all infrared optics contains thorium fluoride which is slightly radioactive. The only potential hazard involves ingestion (swallowing or inhaling) of the material.

RADIATION HAZARD

RULES AND REGULATIONS

Copies of the following rules and regulations are maintained at HQ, U.S. Armament and Chemical Acquisition Logistic Activity (ACALA), Rock Island, IL 612996000. Copies may be requested, or information pertinent to these rules and regulations obtained, by contacting the ACALA Radiological Protection Officer (RPO), AUTOVON 793-2965/2966/2964, Commercial (309) 782-2965/2966/2964. DU armor licensee is the U.S. Army, Tank-Automotive Command (TACOM), Warren, MI, 48397-5000. Radiation safety support may be obtained from the TACOM Safety Office at AV 786-6121/8529 or Commercial (313) 574-6121/8529.

RULES AND REGULATIONS - Continued

10CFR Part 19 - Notices, Instructions, and Reports to Workers; Inspections.

10CFR Part 20 - Standards for Protection Against Radiation.

10CFT Part 21 - Reporting of Defects and Noncompliance.

NRC license, license conditions, and license application.

SAFETY PRECAUTIONS

The Collimator (Muzzle Reference Sensor) is an instrument that uses a radioactive gas, tritium, for night time illumination. The tritium is sealed in a borosilicate glass capsule source. The source is in turn, bedded in a shock absorbing material within a steel cell forming the cell assembly. The source is well-protected and poses no significant hazard as long as it is intact. Tampering with or removal of the sources in the field is prohibited by Federal law. In the event there is no illumination, notify the local Radiological Protection Officer. Do not attempt to repair or replace the source in the field. If skin contact is made with any area contaminated with tritium, immediately wash with nonabrasive soap and water.

IDENTIFICATION

Radioactive self-luminous sources are identified by means of radioactive warning labels (on previous page). These labels should not be defaced or removed, and should be replaced immediately when necessary. Refer to local RPO or the ACALA RPO for instructions on handling, storage, or disposal.

STORAGE

All radioactively illuminated instruments which are defective will be evacuated to a depot maintenance activity. These items must be placed in a plastic bag and packaged in the shipping container from which the replacement was taken before evacuation to a higher echelon is made. Spare equipment must be stored in the shipping container, as received, until installed on the weapon. Storage of these items is recommended to be in an outdoor shed-type storage or unoccupied building.



WARNING

You can be blinded if you look into a laser beam when you are not wearing laser safety goggles. Never aim the Laser Range Finder (LRF) at personnel.

If the laser beam reflects from a flat, mirror-like surface it can blind you unless you are wearing laser safety goggles.

Treat the laser range finder as a direct-fire weapon, with hazardous range of 8000 meters (8752 yds). Observe the following precautions when the laser range finder is being used:

1. Never fire the LRF at a target less than 10 meters (11 yds) away.
2. Never fire the LRF at flat glass or mirror-like targets.
3. Never fire the LRF if Gunner's Primary Sight (GPS) window is cracked.
4. Fire the LRF only at approved laser targets on an approved laser-firing range.
5. Report through the chain of command if:
 - (a) An unprotected person may have been in the beam path and closer than 8000 meters (8752 yds) when the LRF was fired.
 - (b) An unprotected person was looking at a flat glass or mirror-like surface when the laser range finder was fired at it.
6. Make sure you get laser safety training before you work near an operating laser.

WARNING

HIGH VOLTAGE

Is used in the operation of this equipment.

DEATH ON CONTACT

May result if personnel fail to observe safety precautions.

Never work on electronic equipment unless there is another person nearby who is familiar with the operation and hazards of the equipment. That person should also be competent in giving first aid. Ask maintenance personnel about extremely hazardous areas of the tank prior to doing any maintenance.

Whenever possible, vehicle master power must be shut off before performing any maintenance. Use extreme caution around any electronic components of the tank. Some components store energy that can injure personnel even with vehicle master power turned off.

Be careful not to touch high voltage connections when removing, installing, or operating this equipment.

Whenever possible, keep one hand away from the equipment to reduce hazard of current flowing through vital organs of the body.

Do not be misled by the term low voltage. Voltages as low as 50 volts may cause death.

WARNING

GUN/TURRET MOVEMENT



DO NOT PLACE ANY PART OF THE BODY THROUGH THE OPENING BETWEEN DRIVER'S STATION AND TURRET UNLESS TURRET LOCK IS LOCKED AND TURRET POWER IS OFF.

DO NOT PLACE ANY PART OF THE BODY ABOVE/BELOW THE MAIN GUN BREECH UNLESS MAIN GUN ELEVATION TRAVEL LOCK IS LOCKED AND TURRET POWER IS OFF.

Alert crew and make sure all areas around turret, main gun, and breech are cleared before operating main gun or turret, or before operating palm switches. Injury or death could result if turret is traversed while body parts are extended between turret and hull or if main gun is moved while body parts are near breech or gun tube.

Keeps hands away from operating breech.

GUN TURRET DRIVE switch must be in MANUAL or EL UNCPL and main gun status SAFE light lit before servicing the coaxial machine gun.

When palm switches are depressed, main gun or turret can move suddenly if any of the following conditions exist:

- **MRS lever is in the IN position.**
- **GUN/TURRET DRIVE switch on loader's panel is in POWERED position and FIRE CONTROL MODE switch on GPS is in NORMAL or EMERGENCY position.**
- **GUN/TURRET DRIVE switch on loader's panel is moved to or from EL UNCPL position.**
- **FIRE CONTROL MODE switch is in NORMAL or EMERGENCY position and main gun is over rear deck and is below 0 degrees elevation.**
- **AMMO SELECT switch is moved from one ammo position to another.**
- **TARGET RANGE is changed.**

WARNING

CARBON MONOXIDE (EXHAUST GAS) CAN KILL YOU

Carbon monoxide is without color or smell but can kill you. Breathing air with carbon monoxide produces symptoms of headache, dizziness, loss of muscular control, a sleepy feeling, and coma. Brain damage or death can result from heavy exposure. Carbon monoxide occurs in the exhaust fumes of fuel-burning heaters, internal combustion engines, and in fumes caused by firing. Carbon monoxide can become dangerously concentrated under conditions of no air movement. Precautions must be followed to insure crew safety when firing and when the personnel heater or main or auxiliary engine of any vehicle is operated for any purpose.

1. DO NOT operate personnel heater or engine of vehicle in a closed place unless the place is well-ventilated.
2. DO NOT idle engine for long periods without either Nuclear Biological, Chemical (NBC) main system on or TURRET BLOWER switch on. If tactical situation permits, open hatches.
3. DO NOT operate NBC system or use M25A1 mask to protect against carbon monoxide. They will only get rid of odors which would normally indicate the presence of carbon monoxide.
4. DO NOT drive any vehicle with inspection plates, cover plates, or engine compartment doors removed unless necessary for maintenance purposes.
5. DO NOT fire main gun or coaxial machine gun without NBC main system on or commander's and loader's hatches open.
6. BE ALERT at all times during vehicle operation for exhaust odors and exposure symptoms. If either are present, IMMEDIATELY VENTILATE personnel compartments. If symptoms persist, remove affected crew to fresh air; keep warm; DO NOT PERMIT PHYSICAL EXERCISE; if necessary, give artificial respiration and get immediate medical attention.

**THE BEST DEFENSE AGAINST CARBON MONOXIDE
POISONING IS GOOD VENTILATION.**



SINGLE HEARING PROTECTION REQUIRED

Wear hearing protection during engine operation. Consult diagram below to determine where hearing protection is required. Single hearing protection includes earplugs, earmuffs, attenuating Combat Vehicle Crewman (CVC) helmet, or headset. Failure to wear hearing protection can result in hearing damage.



DOUBLE HEARING PROTECTION REQUIRED

Noise levels during ground hop support system operation exceed allowable limits. Wear double hearing protection during operation of this system. Double hearing protection consists of wearing earplugs or earmuffs, with either an attenuating CVC helmet or headset. Failure to wear double hearing protection can result in hearing damage.

SUMMARY WARNINGS**WARNING**

- M1A1 hatches seal tightly when closed. The oxygen supply inside the tank can rapidly become depleted (during non-firing, closed operations with the NBC system off). To avoid possible death through suffocation, ventilate tank by opening hatches or turning on NBC MAIN system at least once per hour for approximately 5 minutes.
- Remove rings, bracelets, wristwatches, and neck chains before working around the tank. Jewelry can catch on equipment and cause injury, or may short across an electrical circuit and cause severe burns or electrical shock.
- Do not place any part of body through opening between drivers station and turret unless turret traverse lock is locked.
- Do not permit personnel between tanks during slave starting or towing.
- When slave starting tank do not short slave cable connector ends.
- Rear grille doors and pintle may be hot enough to burn bare hands.
- Make sure area around turret, main gun, and breech are clear before moving turret or gun.
- Do not put feet through turret basket when on loader's platform. You could be badly injured if turret moves.
- Main gun may move abruptly when GUN/TURRET DRIVE switch is moved from or to EL UNCLP position.
- Keep hands away from operating breech.
- Do not touch transmit antenna on left rear of turret when radio is transmitting.
- Keep loader's knee switch in stowed (up 3 position and latched when not in use).
- When on top of tank, always maintain three points of contact (for example, two feet and one hand).
- FRH hydraulic fluid may contain tricresyl phosphate which, if taken internally, can produce paralysis. Hydraulic fluid may be absorbed through the skin. Wear long sleeves, gloves, goggles, and face shield. If FRH gets in eyes, wash them immediately and get medical aid immediately. If FRH gets on skin, thoroughly wash with soap and water. Wash hands thoroughly prior to eating or smoking. Application of these measures is considered an effective control of the hazard.
- Engine lubricating oils (MIL-L-23699 and MIL-L-7808) may contain tricresyl phosphate which, if taken internally, can produce paralysis. Lubricating oil may be absorbed through the skin. Wear long sleeves, gloves, goggles, and face shield. If lubricating oil gets in eyes, wash them immediately and get medical aid immediately. If lubricating oil gets on skin, thoroughly wash with soap and water. Wash hands thoroughly prior to eating or smoking. Application of these measures is considered an effective control of the hazard.

SUMMARY WARNINGS - Continued**WARNING**

- Before traversing turret, alert crew and make sure all personnel are clear of turret. Crew members can be injured or killed if turret is traversed while body parts are extended between turret and hull.

- Ensure all hatches are in open-lock position, if possible, before evacuating. An unlocked open hatch can fall, causing injury or death.
- Turret lock must be locked if crew members pass between hull and turret during evacuation. Turret/hull could move, causing injury or death to crew members.

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