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T.O. 21M-HGM25A-2-5-3

**TECHNICAL MANUAL**

**OPERATION AND ORGANIZATIONAL  
MAINTENANCE**

USAF MODEL

**HGM-25A**

MISSILE WEAPON SYSTEM

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**RE-ENTRY VEHICLE SYSTEM**

**JOB MANUAL**

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TOTAL NUMBER OF PAGES IN THIS PUBLICATION IS 151 CONSISTING OF THE FOLLOWING:

Page No.	Issue	Page No.	Issue
*Title . . . . .	3 Aug 64	6-30 thru 6-31. . . . .	30 Aug 63
*A . . . . .	3 Aug 64	6-32 thru 6-46. . . . .	23 Aug 63
i . . . . .	Original	GLOSSARY-1. . . . .	Original
ii. . . . .	27 May 64	INDEX-1 . . . . .	5 Nov 63
iii . . . . .	12 May 64	INDEX-2 thru INDEX-3. . .	Original
iiiA. . . . .	31 Jan 64		
iv. . . . .	Original		
*v . . . . .	3 Aug 64		
vi. . . . .	12 May 64		
1-1 thru 1-3. . . . .	Original		
1-4 . . . . .	5 Nov 63		
2-1 thru 2-9. . . . .	Original		
2-10 thru 2-11. . . . .	7 Jan 64		
2-12 thru 2-19. . . . .	Original		
2-20. . . . .	27 May 64		
2-20A Added . . . . .	27 May 64		
2-21 thru 2-45. . . . .	Original		
*3-1 . . . . .	3 Aug 64		
4-1 . . . . .	12 May 64		
4-1A Added. . . . .	12 May 64		
4-2 . . . . .	12 May 64		
4-2A Added. . . . .	5 Nov 63		
4-3 . . . . .	Original		
4-3A Deleted. . . . .	12 May 64		
4-4 thru 4-6. . . . .	Original		
4-7 . . . . .	12 May 64		
4-8 thru 4-9. . . . .	Original		
4-10. . . . .	15 Apr 64		
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4-18. . . . .	27 May 64		
4-18A Added . . . . .	27 May 64		
4-19 thru 4-36. . . . .	Original		
5-1 . . . . .	Original		
*5-2 . . . . .	3 Aug 64		
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6-28. . . . .	30 Aug 63		
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USAF

Changed 3 Aug 1964

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LIST OF RELATED MANUALS

- |                   |  |
|-------------------|--|
| T.O. 11N-RV4A-1   | Missile Weapon System, Re-Entry Vehicle, Function Manual (SM68A)     |
| T.O. 11N-RV4A-2   | Mark 4 Re-Entry Vehicle; Job Manual; Handling, Servicing, and Repair |
| T.O. 11N-RV4A-2-2 | Mark 4 Re-Entry Vehicle, Job Manual, Checkout and Trouble Analysis   |
| T.O. 11N-20-1001  | Emergency Recovery Procedures for Re-Entry Vehicle                   |

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## INTRODUCTION

This manual is one in a series of manuals covering operation and organizational maintenance of the HGM-25A missile weapon system.

This manual is intended to cover all phases of R/V handling at the launch area. The operations contained in this manual are adequate to initially emplace on R/V, remove an R/V, or recycle an R/V. A number of procedures performed during the operation are similar. To eliminate duplication, they are cited by reference only. Also contained in this manual are instructions for pre-installation and post-installation checkouts, and for maintenance of the R/V in readiness condition.

Section I contains safety precautions applicable to the functions described in this manual. Section II contains complete checkout procedures. Section III contains the instructions necessary for trouble analysis. Section IV contains R/V removal and installation procedures. Section V contains emergency procedures for warhead and AFS safety fault conditions with reference to the applicable sections for detail operations. Section VI contains the diagrams for the re-entry vehicle system.

Before each day's use, determine that AGE to be used is in serviceable condition; also determine that the hydra set pre-operational check has been performed.

The associated Re-Entry Vehicle System Manual, T.O. 11N-RV4A-1, provides sufficient background information for Air Force personnel to understand the principles of operation and the organizational maintenance required for the re-entry vehicle system.

The Time Compliance Technical Orders applicable to this Technical Order are as follows:

T.O. NUMBER	DATE	T.O. NUMBER	DATE
21M-HGM25A-519	9 August 1962	31X3-10-11-529	14 February 1962
21M-HGM25A-829	18 September 1963	31X3-10-11-530	3 January 1962
11N-RV4-526	31 December 1962	31X3-10-11-531	7 March 1962
31X3-10-11-521	24 January 1962	31X3-10-11-534	25 September 1962
31X3-10-11-523	19 January 1962	31X3-10-11-536	19 January 1962
31X3-10-11-524	9 February 1962	31X3-10-11-567	7 August 1962
31X3-10-11-527	17 January 1962	31X3-10-11-605	23 March 1962
31X3-10-11-528	23 May 1962	31X3-10-11-625	26 February 1963

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## SECTION I

### SAFETY PRECAUTIONS

#### 1-1. GENERAL.

1-2. This section contains a description of the major hazards that affect personnel and equipment safety and are directly related to the performance of the procedures outlined in this manual. Figure 1-1 lists these hazards, the safeguards, and corrective actions.

1-3. Warnings and cautions used in this manual have the following significance:

#### WARNING

Indicates a hazardous condition that could result in injury or death.

#### CAUTION

Indicates a hazardous condition that could result in damage to equipment.

#### 1-4. ARMING AND FUZING SYSTEM COMPONENT ASSEMBLY.

1-5. The arming and fuzing component assembly (arming and fuzing package), in the R/V nose, incorporates two lockout switch initiators, each of which contains a radioactive source of approximately 450 millicuries of krypton-85. The use of krypton-85 necessitates following safety precautions during the handling of the package. (See figure 1-1.) These precautions apply when working on an assembled R/V, on a nose containing an arming and fuzing package, or on an exposed arming and fuzing package. The work area is considered a radiation area as defined in AFR 160-32 and will receive health physics support from the Medical Service.

1-6. The possibility of an individual absorbing a significant body burden of krypton-85 through inhalation is negligible. The accidental destruction of an initiator presents only a minor contamination problem because the gas diffuses and dilutes rapidly in the atmosphere. Krypton-85 is an inert gas and absorption is temporary, with no permanent deposition.

1-7. The major personnel hazard from the initiators is secondary radiation, which is always present due to the nature of the devices. Temporary overexposure to this radiation can occur externally unless safety precautions are carefully followed. Specific control methods have been set up for this type of exposure. Personnel entering the radiation area shall wear personnel monitoring devices when declared necessary by the Medical Service. The devices shall be breast pocket film badges and, when required, wrist film badges. The film badges will detect any external radiation and measure the amount of exposure. Consequently, by wearing the film badges, the external radiation exposure problem can be controlled and limited.

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1-8. PERSONNEL MONITORING.

1-9. All personnel working on any assemblies containing radioactive krypton-85 will be governed by the precautions in figure 1-1 and any procedures directly related to radiation exposure. The hands and body will be near the arming and fuzing package only as long as necessary to accomplish a particular task. Film badges will be worn as determined by the Medical Service and will be processed per AFR 160-134.

1-10. MAXIMUM PERMISSIBLE WIND VELOCITY DURING R/V REMOVAL AND INSTALLATION.

1-11. Removal or installation will not be attempted if the wind velocity is such that it is deemed a safety hazard by the missile safety officer. The recommended maximum wind velocity is 20 knots.

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AREA	HAZARD		SAFEGUARDS	CORRECTIVE ACTION
	CONDITION	RESULT		
1. Missile silo, level 1.	Squib explosion from stray voltage.	Burns, cuts.	Ground electrical equipment and tools. Avoid unnecessary metal-to-metal contact.  Use stud to back out insert.	Give first aid and secure medical attention.  Replace receptacle.
	Using screwdriver to back out insert during replacement of access door.	Damage to stressed panel.		
2. Equipment terminal.	Low voltage.	Electrical shock and burns.	Be careful when working with electrical equipment. Do not touch terminals.  The following safeguards are mandatory: 1. Wear personnel monitoring devices (film, badges, etc.) as determined necessary by the Medical Service when working near the R/V. 2. Issue film badges when determined necessary by the Medical Service to all personnel coming into the area. Keep all other persons at least 5 feet from R/V.	Shut off power and give first aid. Secure medical attention.  Provide medical attention for personnel suspected of radiation exposure.
	Arming and fuzing package in R/V nose, contains lock out switch initiators that use radioactive batteries.	1. External exposure to gamma radiation. 2. Internal absorption of gas in the event of leakage.		

Figure 1-1. Safety Precautions (Sheet 1 of 2)

AREA	HAZARD		SAFEGUARDS	CORRECTIVE ACTION
	CONDITION	RESULT		
4. S & I Launch.	Hand tools dropped.	Damage to missile and or components.	When the R/V trailer is parked, chock one wheel fore and aft.	
5. Missile interface at silo level 1.			Use extreme care when working at missile interface with hand tools. Use wrist lanyards whenever practical.	
6. All areas.	Provide maximum safety consistent with operational requirements.		Air Force personnel shall comply with applicable weapon safety rules contained in AFR-122-39.	

Figure 1-1. Safety Precautions (Sheet 2 of 2)