DEPARTMENT OF THE ARMY TECHNICAL MANUAL

ORGANIZATIONAL MAINTENANCE MANUAL:

GUIDED MISSILE LAUNCHER HELICOPTER

ARMAMENT SUBSYSTEM M22

(USED ON UH-1B HELICOPTER)

This copy is a reprint which includes current pages from Changes 1 through 8.

H E A D Q U A R T E R S , D E P A R T M E N T O F T H E A R M Y
FEBRUARY 1965

TECHNICAL MANUAL
NO. 9-1400-461-20

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., *1 February 1965*

GUIDED MISSILE LAUNCHER HELICOPTER ARMAMENT SUBSYSTEM M22

(USED ON UH-1B HELICOPTER)

Figure 1. M22 armament subsystem.

CHAPTER 1

INTRODUCTION

Section I. GENERAL

1. Scope

a. This manual contains the organizational maintenance instructions for the M22 guided-missile-launcher armament subsystem used on the UH-1B helicopter. The instructions are based on the responsibilities assigned to organizational maintenance personnel by the maintenance allocation chart (appendix II) and on the allocation of repair parts and tools required to perform the assigned tasks. Refer to TM 91400-461-12P for the listing of repair parts and tools.

b. Since the M22 is a subsystem of the UH-1B, the operating instructions for the subsystem are contained in the helicopter manual, TM 55-1520-211-10. Refer to this manual for any information you need concerning the operation or operator's maintenance of the subsystem.

c. A cross-reference between the official nomenclature of tile equipment and the TM nomenclature is provided in table 1. The TM nomenclature is an abbreviated or layman's term used in place of the longer, and sometimes less descriptive, official nomenclature. The official nomenclature in table 1 is current as of the date of this manual. In case the official nomenclature changes, the table entry for it will be corrected by an official change to the manual; but the TM nomenclature will not be changed.

d. Reference material you may need is listed in appendix I. This listing includes technical and supply manuals, Army Regulations, etc., that apply to the M22 subsystem.

2. Forms, Records, and Reports

Most of the forms, records, and reports you are required to submit are explained in TM 38-750. Refer to this manual whenever you have any question about how to fill out the forms or what information should go on them.

3. Errors, Omissions, and Recommendations

The direct reporting of errors, omissions, and recommendations for improving this equipment manual by the individual user, is authorized and encouraged. DA Form 2028 will be used for reporting these improvements and may be completed using pencil, pen, or typewriter. DA Forms 2028 will be completed by the individual using the manual and forwarded to: Commanding General, U. S. Army Missile Command, Redstone Arsenal, Alabama 35809, ATTN: AMSMI-SMPT.

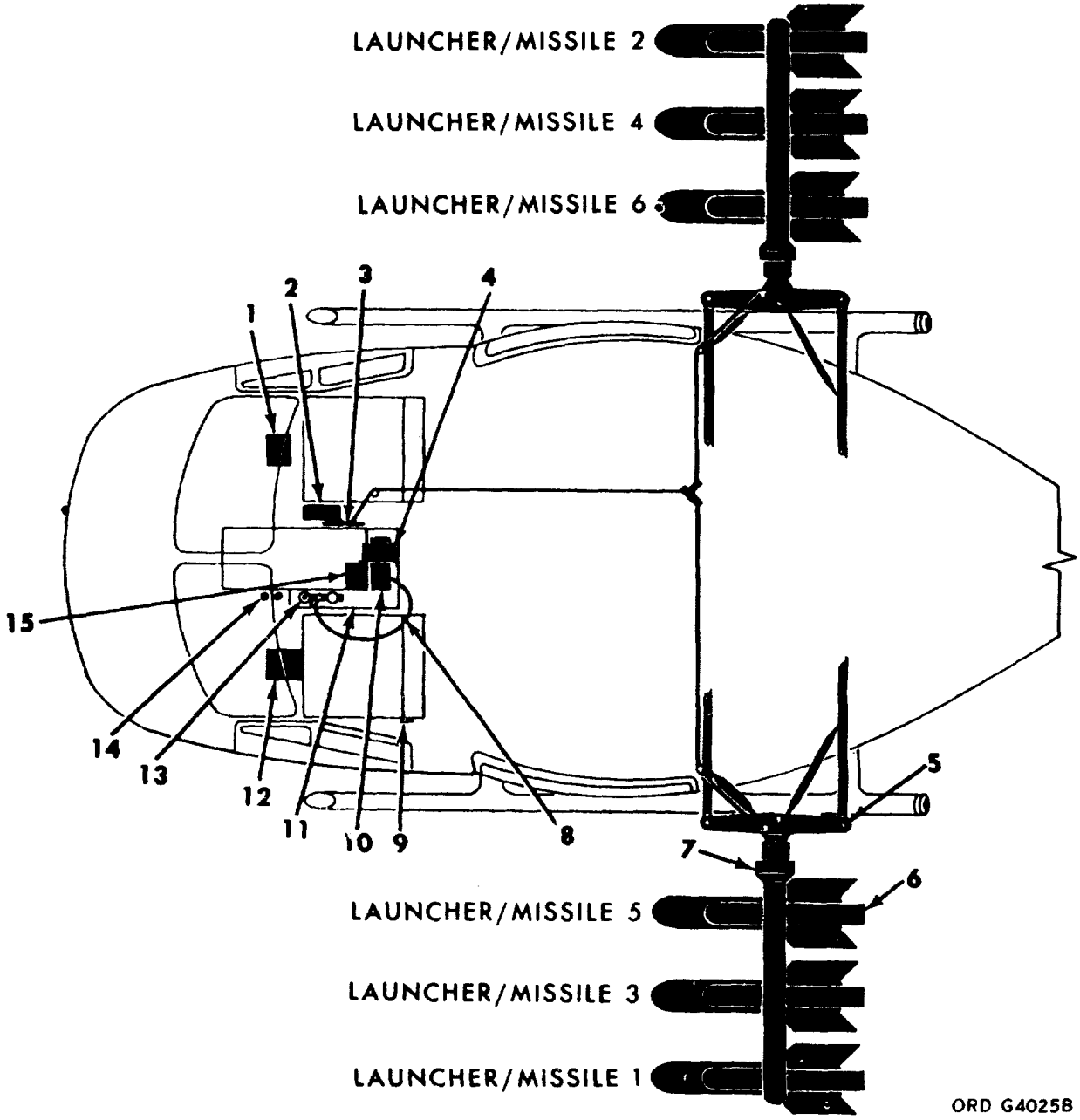
Section II. DESCRIPTION OF THE SYSTEM

4. General

The M22 is a helicopter-mounted guided-missile armament subsystem (fig. 1) that is designed to support front-line troops. It is primarily an antitank weapon, but can be used effectively against such targets as fortified gun emplacements and bunkers. A system consists of six AGM 22B missiles, which are transported on and fired from launcher assemblies attached to the helicopter. The gunner, sitting in the copilot's

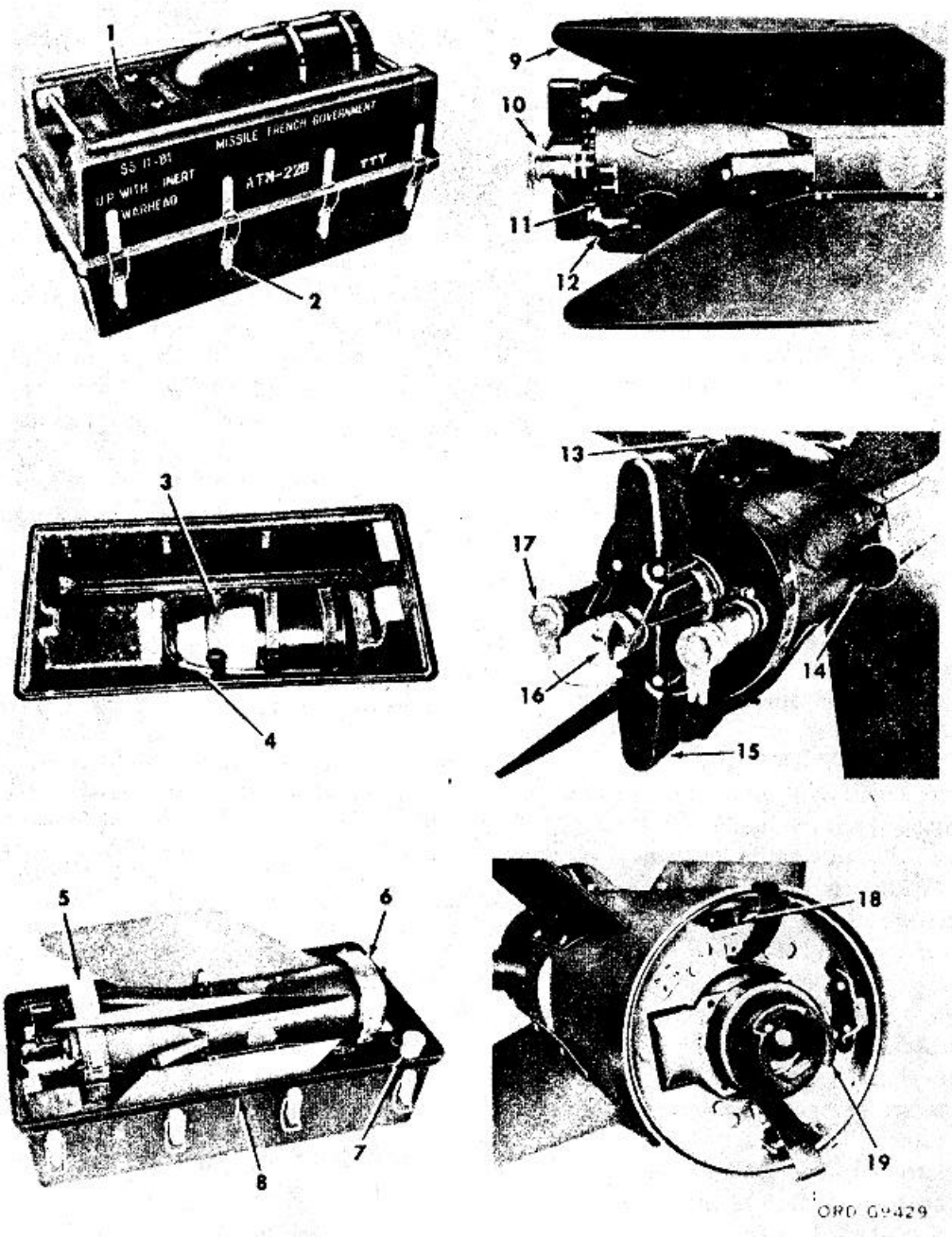
Table 1. Nomenclature Cross Reference

TM nomenclature	Approved nomenclature	Reference no.
GCU	GUIDANCE CONTROL UNIT	10172476
Test set	LAUNCHING AND GUIDANCE COMMANDS TEST SET	1430-956-4398
Control stick	MODIFIED CONTROL STICK	1430-936-0412
Pilot's sight	SIGHT: infinity reflex	8566351
Gunner's sight	SIGHT: anti-oscillation	8687675
Pilot's sight mount	MOUNT: sight-infinity, reflex	10511780
Gunner's sight support	SUPPORT ASSEMBLY: anti-oscillation sight	10511004
Test cable	CABLE ASSEMBLY: special purpose electrical, 10 meters long	1430-956-2769



1—Pilot's sight 8566351
2—Overhead circuit breaker panel
3—Mechanical jettison 10173291
4—Missile selection box 10172477
5—External stores
6—Fixed housings 10173278
7—Launcher support assemblies 803500-1-2
8—Manual firing cable 8934749
9—Seat adjustment
10—GCU 10172476
11—Floor mounting plate
12—Gunner's sight 8587675
13—Control stick 10172538
14—Floor plugs
15—Pilot's jettison panel 10173077

Figure 2. Component Location.



1-Attaching hardware box
2-Latches and pins
3-Straps
4-Warhead cushioning material
5-Aft clamp
6-Forward clamp
7-Cartridge holder
8-Container seal
9-Fins
10-Hooks
11-Rear cover
12-Guide-wire sleeves
13-Spool housing
14-Exhaust ports
15-Junction box
16-Junction box connector
17-Flares
18-Battery-electrical connector
19-Protector plug

Figure 3. Missile components.

seat, fires and guides the missiles by remote control. The basic guidance commands from the gunner's control stick are converted to coded guidance signals by an electronic coder. These signals travel to the missile through two wires that unwind from the missile \fs22 while it is in flight. After the signals reach the missile, they are decoded and routed to control devices that alter the in-flight missile.

5. The Missile
(fig. 3)

a. There are two types of missiles used with the M22 subsystem: the AGM-22B and the ATM-22B, identical in size, weight, and configuration. Functionally, however, there is a tremendous difference between the two.

(1) The AGM-22B is supplied with an explosive HEAT warhead, which is activated by an explosive detonator located on the missile section.

(2) The ATM-22B is supplied with an inert-loaded, nonexplosive warhead, containing an orange-colored powder to mark the spot of impact during practice firing. The missile body for the ATM-22B does not contain an explosive detonator as does the AGM-22B.

WARNING

The warheads shall not, under any circumstances, be interchanged. The HEAT warhead swill mate to the body section of the ATM-22B missile but would not function properly, since there is no explosive detonator on the ATM-22B.

NOTE

To identify the missiles by color-code and data markings, refer to the ammunition data chart in chapter 8.

b. Missiles are shipped disassembled in a two-section container. The top half of the container holds the warhead. The missile body section is stored in the bottom half of the container. The containers are also identified by' color-code and data markings to indicate their contents (chap 8).

c. The arming device on the missile body is a sleeved striker through which a piston is inserted and secured by two shear pins. It fits into a machined cavity in the front of the sustainer motor. In the safe position, lugs on the piston keep the striker from hitting the detonator.

WARNING

A portion of the piston protruding through the plastic plug on top of the arming device indicates an armed detonator. Look and feel carefully before you remove the missile body from the shipping container, or before mating the warhead. If the detonator is armed, call a specialist to remove the missile.

d. Four diagonally opposed wings provide lift for the missile and cause it to spin (luring its flight. The spin results from the way the wings are mounted slightly offset to the centerline of the missile. To balance the missile, each wing is weighed after mounting.

e. Two pyrotechnic flares, mounted on the rear of the missile, ignite when it is fired and help the gunner track its flight. The flares may be disconnected if the sustainer-motor exhaust flame is sufficient for tracking purposes.

f. The two batteries for the missile must be carefully checked before they are used. **Disregard the expiration date marked on the battery case, and consider the shelf life to be 14 months from the date of manufacture. Batteries may be used for an additional 6 months (20 months total) for training purposes in CONUS.** All batteries should be checked on the battery tester before installed on the missile. Replacement batteries should be on hand or available at all times. The batteries are shipped separately from the missile.

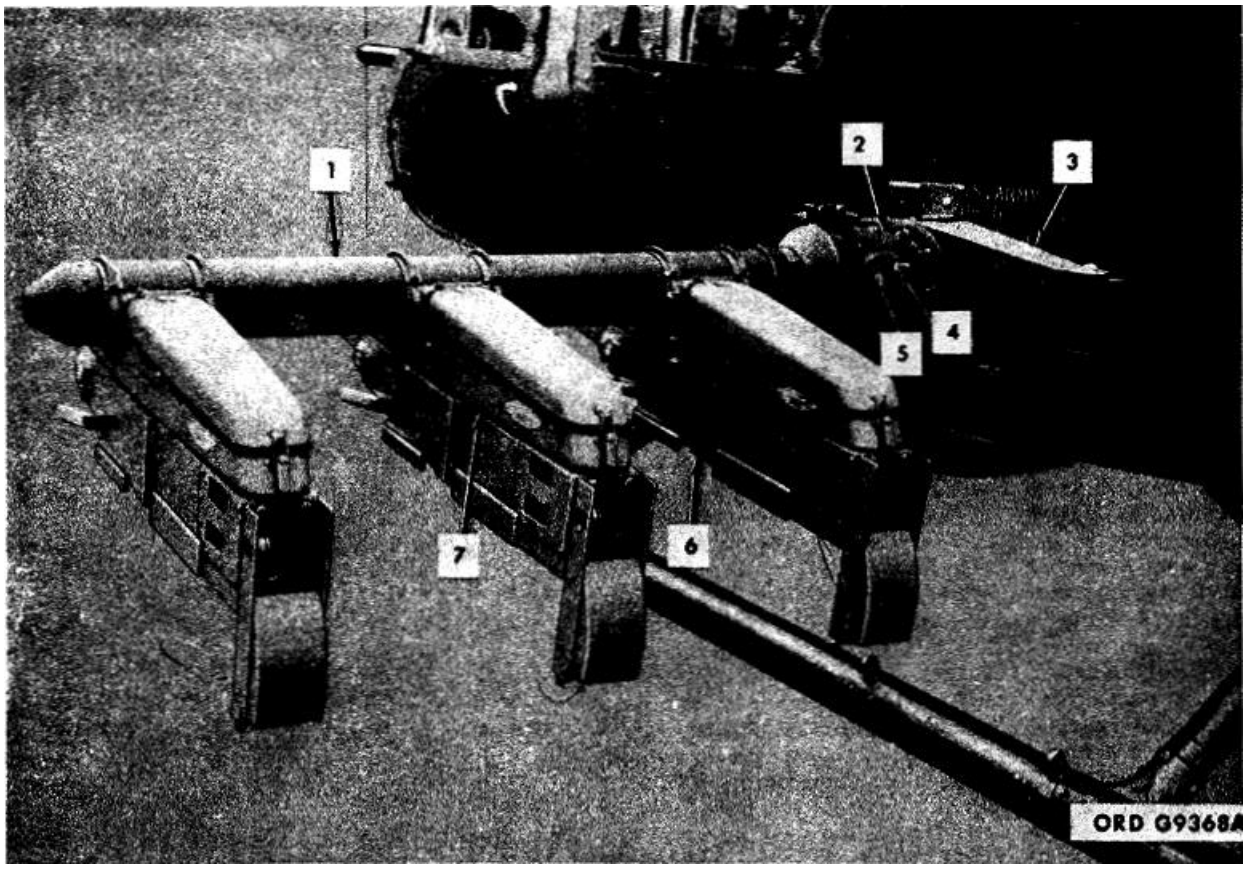
WARNING

Disassemble or repair of the AGM-22BR or the ATM-22B beyond that authorized in this manual is prohibited.

6. Launcher Support Assemblies
(fig. 4)

Housing assemblies connect to the external stores supports, and secure the launcher support assemblies to the helicopter. A spring-loaded hook in the housing catches a cross-bar on the end of the launcher support and holds it to the housing. The release mecha-

nism connects to a cable and pulley arrangement that makes it possible for the pilot to jettison both launcher support assemblies at the same time. (Quick-disconnect connectors inside the housings make the electrical connections for the launcher support assemblies.



1-Launcher support assembly
2-Housing assemblies
3-External stores
4-Actuator shaft latch
5-Actuator shaft bolt
6-Launcher
7-Fixed housing

Figure 4. External stores installed.

7. Fixed Housings (fig. 5)

Three fixed housings attach to each launcher support assembly. A launcher connects to each fixed housing, and is secured by an electrically activated explosive bolt (fig. 6). Electrical connections for the launcher and the explosive bolt are in the fixed housings.

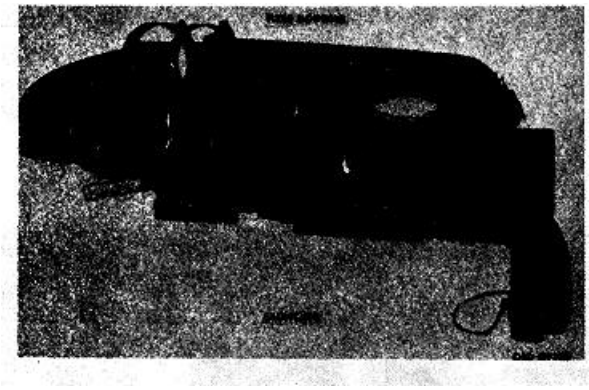


Figure 5. Fixed housing and launcher.

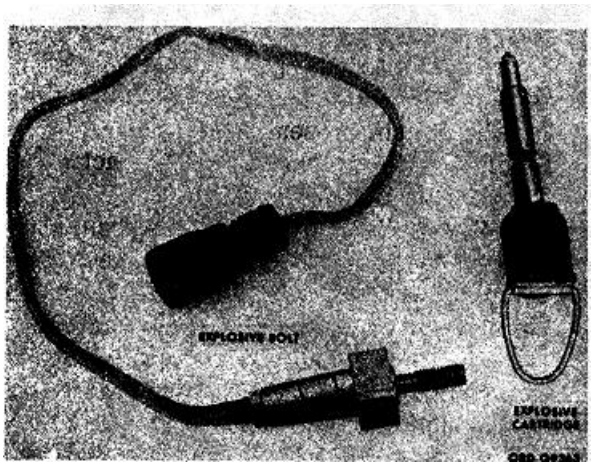


Figure 6. Explosive bolt and explosive cartridge.

8. Launcher (fig. 5)

The missile lugs fit into the guide rails on the launcher. To prevent the missile from slipping forward and possibly out of the launcher during transport, a spring-loaded hook is lowered and mated into a slot on the top-front of the missile. An explosive cartridge (fig. 6) holds and locks the spring-loaded hook. Firing the missile detonates the explosive cartridge, causing the spring to disengage the hook from the missile. This action also closes a microswitch in the launcher, allowing the firing current to reach the rocket motors in the missile. The motors can not fire until 'this microswitch closes. When the missile leaves the launcher, its junction box stays on the launcher. After the missile flight ends, the gunner activates detonating devices in the junction box to jettison the spent guidance wires.

9. Support Assemble

The support assembly is located to the rear of the pedestal. It holds the GCU, selection box, control stick, and attaching cable assemblies. The arm rest (2, fig. 7), attaches to the base plate and the pedestal. It supports the gunner's arm, and the control stick. The base plate (5, fig. 7), is secured to the helicopter floor and is used to attach the support assembly and arm rest assembly.

9.1. Pilot's Jettison Control Panel

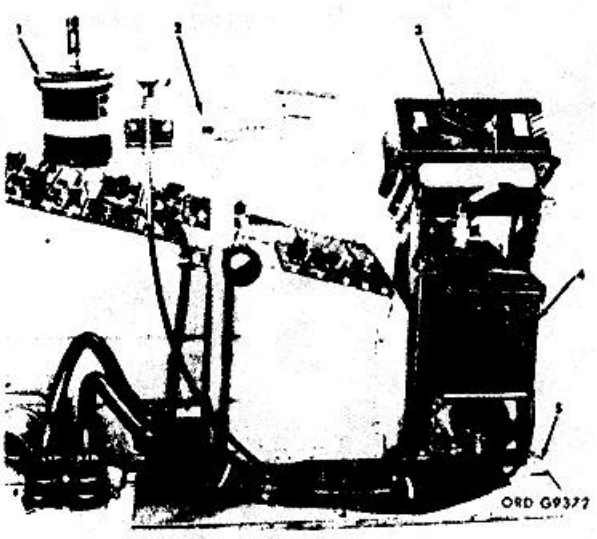
This is on the pedestal. To electrically jettison all missiles and launchers, place the switch in the JETTISON position.

9.2. Pilot's Sight Control Panel

Located on the pedestal, this panel has one control which varies the intensity of the pilot's sight lamp. A toggle switch on the panel is used to switch from one to the other of the lamp's two filaments. This prevents having to interrupt a mission to change lamps.

9.3. Manual Release

Located to the left of the pilot's seat, this release is used to mechanically jettison all the missiles, launchers, and launcher support assemblies.



1-Control stick
2-Arm rest support assembly
3-Selection box
4-Guidence control unit
5-Base plate

Figure 7. Guidance equipment on support assembly installed.

10. Missile Selection Box (3, fig. 7)

With the missile selection box, the gunner-operator applies the primary power for energizing the system, selects the missile to be fired, jettisons the guidance wires of .fired missiles, and jettisons either a single launcher and missile or all launchers and missiles. A key-operated safety switch applies the primary power to the selection box. A rotary selection switch chooses the missile to be fired or jettisoned. Hinged safety hoods over the wire jettison and launcher jettison switches prevent accidental closing.

11. GCU (4, fig. 7)

This box, located under the selection box, contains the electronic signals coder, which converts commands from the control stick to missile guidance signals. The spring-wound switching mechanism that controls the ignition and firing sequence of the missile is also part of this box. Meters and indicator lamps on the front panel show whether the box is operating or not. An adapter assembly, secured in the control stick opening, connects the stick to the signal coder. Because power for the unit is supplied by the aircraft battery, there is no battery in the GCU.

12. Control Stick (1, fig. 7)

This "joy stick" control originates the signals that guide the missile. Suppose that you want the missile to fly (yaw) to the left. Move the control stick to the left. The control stick is mounted on a platform that adjusts to your height and arm length.

Figure 8. (Deleted)

13. Fire Control Installation

a. Pilot's Sight (fig. 9). This aiming device is used by the pilot to keep the helicopter alined with the target while the missile is in flight. He views the target through a flat glass reflector plate. This sight doesn't magnify the target. Inside the sight body, and mounted above the reflector plate, is a lamp, a reticle, and a projection lens system which focuses an illuminated reticle pattern onto the surface of the reflector plate. Changing the voltage to the two-filament lamp changes the reticle pattern brightness.

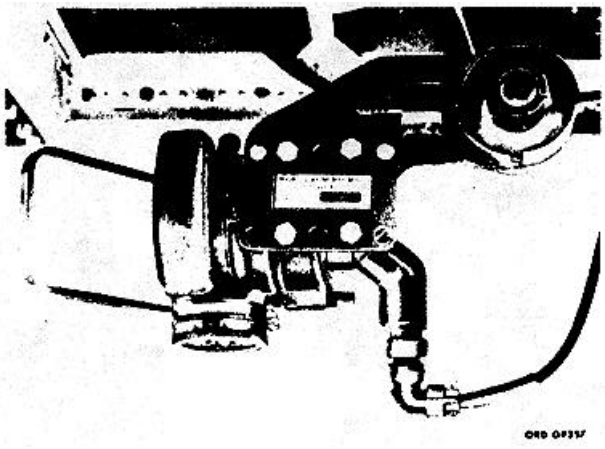


Figure 9. Pilot's sight (stowed position).

b. Gunner-Operator's Sight (fig. 10). This sight is mounted in front of, and above the copilot's seat. It provides an enlarged view of the target with minimum vibration. Eight-power binoculars magnify the target. To keep

vibrations to a minimum, these are mounted inside a metal housing with shock-mounted gimbals. An adjustable headrest gives additional steadiness by letting the gunner sight without touching the binoculars. When not using the sight, lock the gimbals with the locking pin, and stow the sight in the transport position.

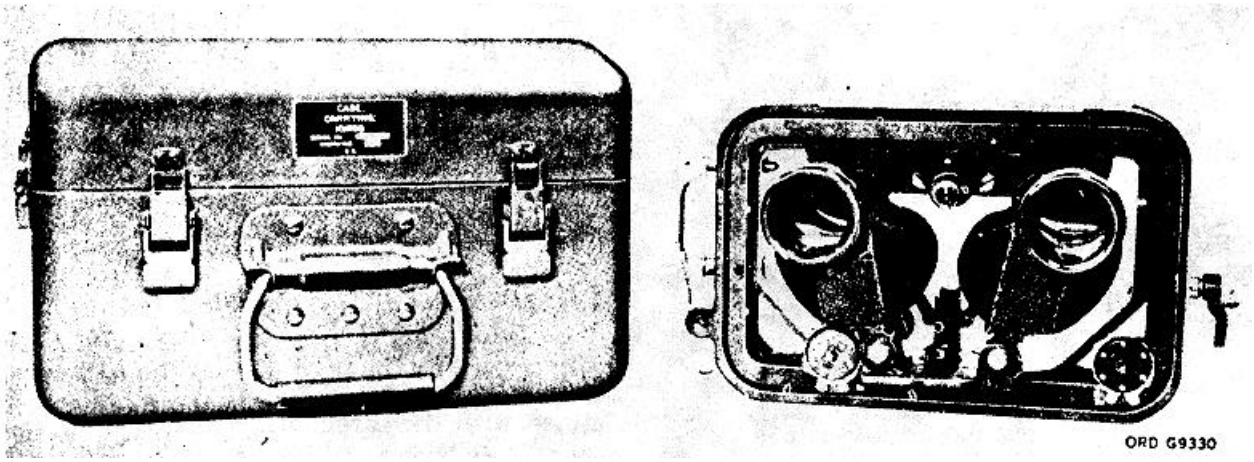


Figure 10. Gunner's sight.

CHAPTER 2

OVERALL FUNCTIONAL DESCRIPTION OF THE M22 ARMAMENT SUBSYSTEM

14. General

This chapter contains the operational theory of the M22 armament subsystem, and follows the normal sequence of operation: power source; missile selection; firing; guidance after firing; guide wire jettison; and emergency jettison. The cabling diagram is shown in figure 45.

15. Power Source (fig. 12)

Electrical power for operating the system is taken from the helicopter 28 vdc supply. Figure 12 shows the normal control power applied when the SS-11 MISSILE POWER circuit breaker is depressed and the key switch (S3) is placed in the ON position. Also, the jettison power is applied when the SS-11 JETTISON circuit breaker is depressed and the pilot's or gunner's jettison switch is closed.

16. Missile Selection

By rotating the missile selection switch on the missile selection box to the desired number (1-6), the operator selects the missile to be fired. No theory is included because the functional circuits connected by the switch are explained in the paragraphs on firing, guidance after firing, guide wire jettisoning and launcher jettisoning.

17. Firing (fig. 13)

Figure 13 shows the three firing circuits. The FIRING switch in the OFF (0) position and number 1 missile selected for firing, are shown in this figure. Actuation of the firing switch by the remote firing switch (located on the arm rest assembly) starts the firing sequence. The spring-loaded firing switch rotates through the IG, UG, FB, and F positions, applying 28 vdc.

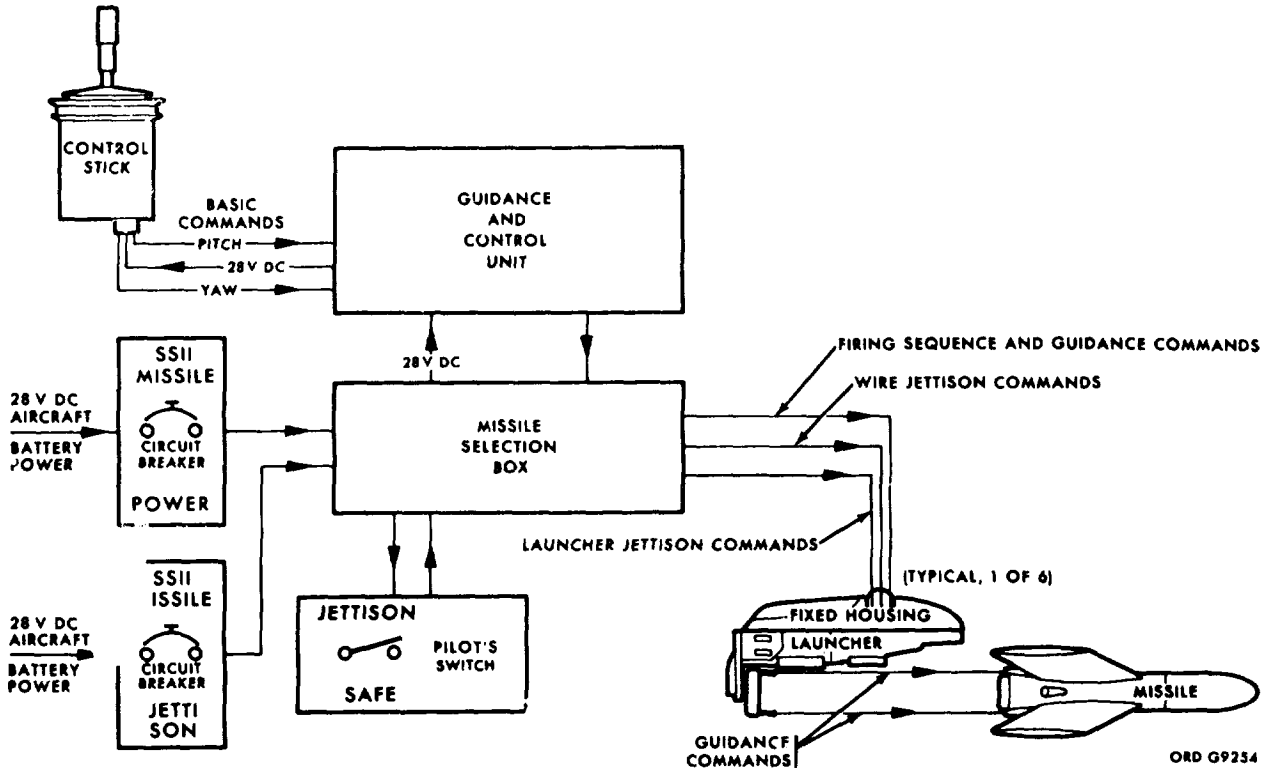


Figure 11. M22 armament subsystem, block diagram.

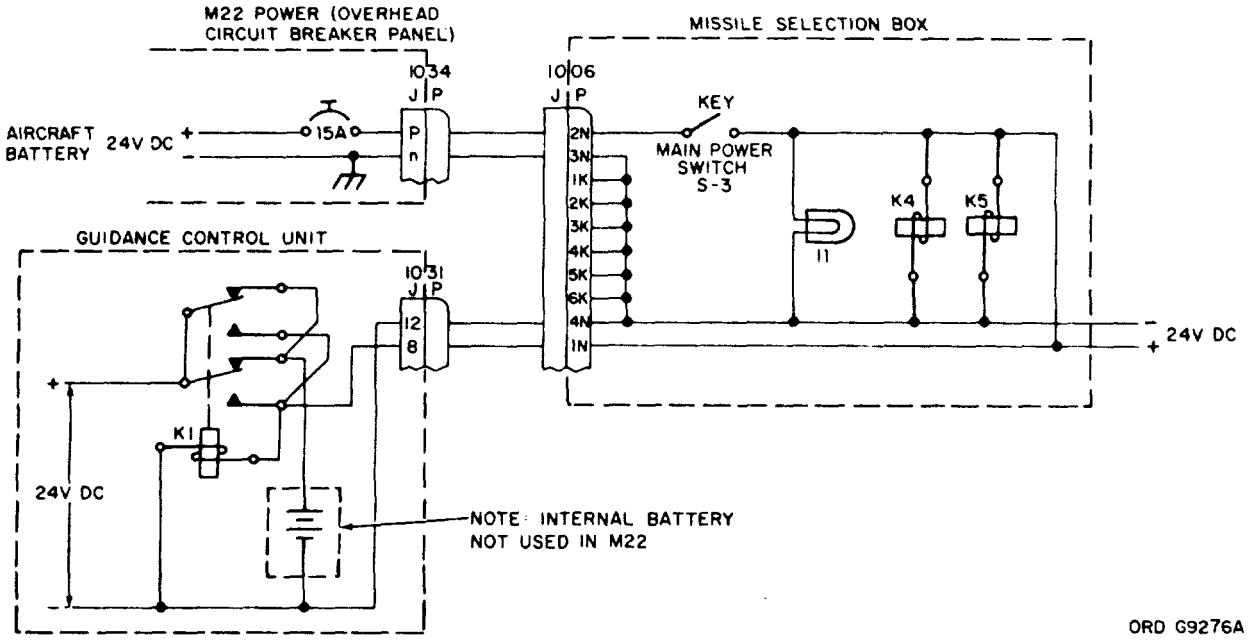


Figure 12. Power source (functional schematic).

a. In position IG the normal voltage is fed through the S1-1B segment of the firing switch to the missile selection switch in the missile selection box. Then, the normal voltage is fed through the missile selection box and interconnecting cables to the selected launcher. This voltage ignites the missile unlocking cartridge, which frees the launcher,/missile locking lever. This lever actuates the microswitch, permitting the voltage to ignite the gyro igniter in the missile, causing the gyro rotor to spin at the proper RPM.

b. In position UG normal voltage is fed through the S1-1 segment of the firing switch to the missile selector switch in the missile selection box. The voltage is then fed through the missile selection switch and interconnecting cables to the selected missile. This voltage energizes the gyro uncaging solenoid which frees the gyro gimbals and also applies missile battery voltage to the missile guidance circuits.

c. Position FB energizes the motor-tracer igniter circuit. Battery voltage is fed through the S1-1 segment of the firing switch to the missile selection switch in the missile selection box. Then, the voltage is fed through the missile selection switch and interconnecting cables to the selected missile. This voltage ignites the motor and tracer igniters, starting the missile's rocket motor and missile tracer.

d. In position F normal power is applied to K2. K2 energizes, removing the firing command signals. K2 remains energized until the firing switch is moved to the 0 position.

18. Guidance After Firing (fig. 14)

After firing a missile, the gunner controls it by moving the control-stick. Moving the control-stick to the left or right causes the missile to yaw in the desired direction. Moving the control-stick backward or forward causes the missile to pitch in the desire direction.

a. Control-stick move -cats vary the center tap of two variable resistors from which vdc outputs are fed, through interconnecting cables, to the GCU.

b. In the GCU the input voltages are applied to a signal generator module. The voltage is coupled to a switching circuit which produces square waves corresponding to the desired missile correction. The square wave output of the switching circuits is fed to a bridge modulator circuit. The bridge modulator output signals are fed through S1-2B and S1-1A segments of the firing switch to the missile selector box.

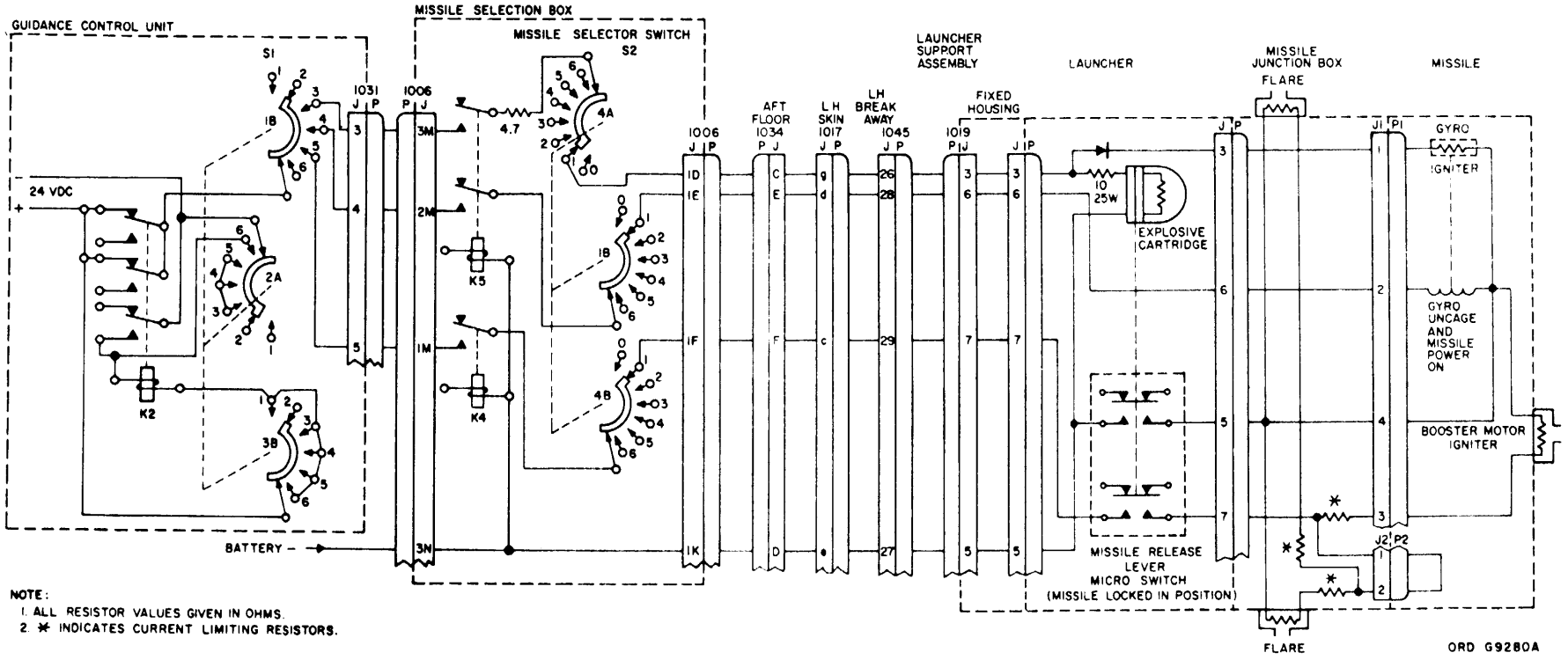


Figure 13. Firing sequence (functional schematic).

c. The signals are fed through the missile selector switch and interconnecting cables to the guidewire terminals on the launcher.

d. When the missile is in flight, the signals are fed through the trailing guide wires to the missile decoder, where they are analyzed. Correction signals are applied to the missile deflectors' electromagnet assembly, causing the missile to pitch and yaw.

19. Guide Wire Jettison (fig. 15)

After the missile reaches its target, the guide wires should be jettisoned. This is done by using the wires' jettison switch on the missile selection box. Closing this switch causes 28 vdc to flow through the missile selector switch in the missile selection box. The output voltage is fed through interconnecting cables to the missile junction box jettison igniter cartridges. When

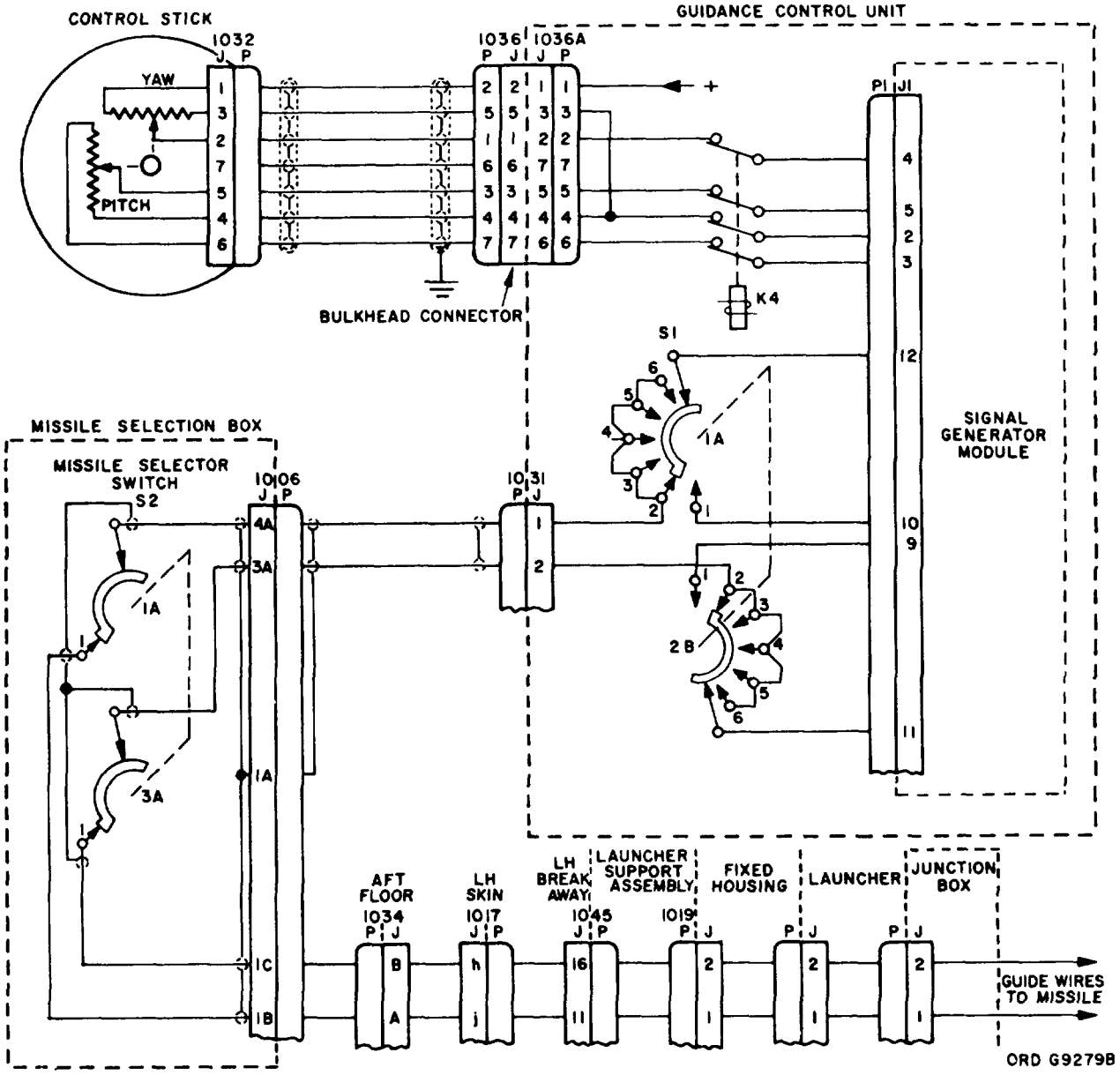


Figure 14. Guidance after firing (functional schematic).

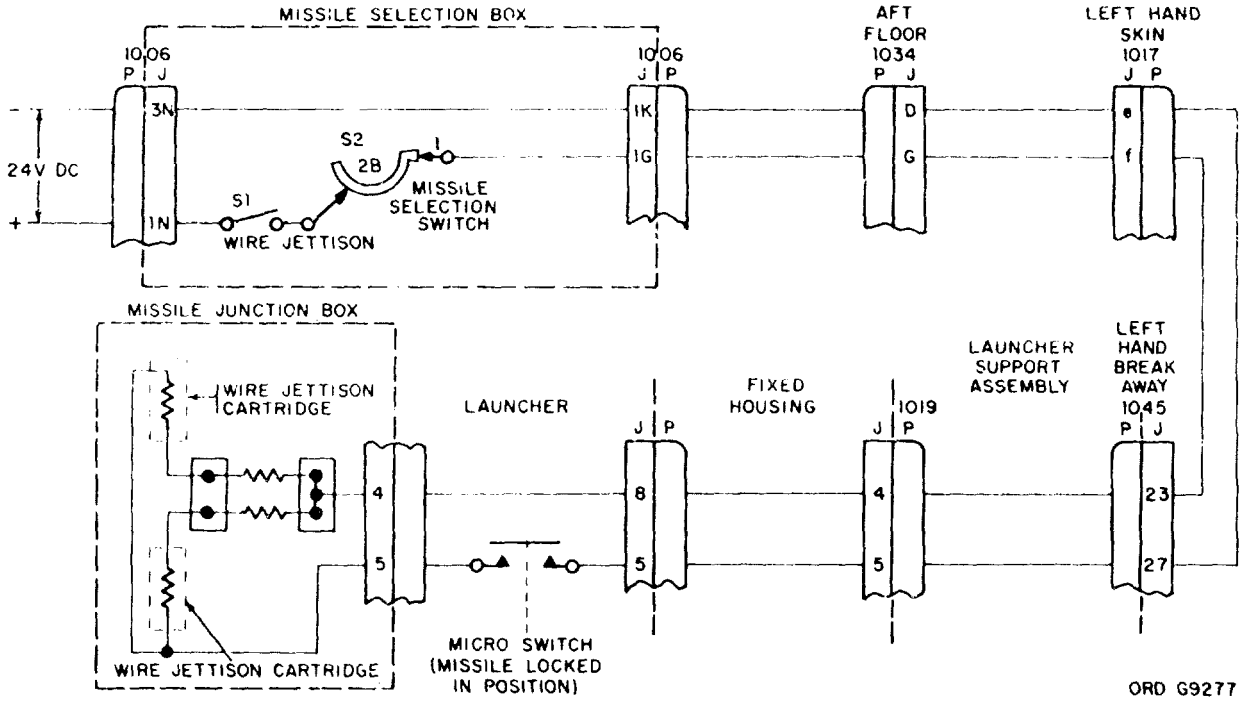


Figure 15. Guide-wire jettison (functional schematic).

voltage is applied the igniters eject the guide wires from the junction box.

20. Jettison (fig. 16)

This is accomplished either electrically or mechanically. Electrical jettison can be either single (one launcher and missile), or total (all launchers and unfired missiles). Mechanical jettison is a total jettison of the launcher support assembly housings, launchers, and missiles on both sides of the helicopter.

a. To achieve single jettisoning, first turn the missile selector switch to the launcher and missile to be jettisoned. Lift the cover from the JETTISON switch S4 and press the switch. This applies the jettison voltage through the JETTISON switch, missile selector switch, resistor, and the interconnecting cables to the explosive bolt that secures the launcher to the fixed housing. The explosive bolt ignites and disengages the launcher from the fixed housing.

b. Total jettisoning is accomplished by pressing the gunner's TOT switch (S5) or by placing the pilot's (JETTISON-SAFE) jettison switch to the JETTISON position. Closing either switch applies battery positive voltage through the switch to the energizing coils of relays K1, K2, and K3. The relays energize, connecting jettison voltage through the relay contacts, resistors, and interconnecting cables to all the explosive bolts that secure the launchers to the fixed housings. The explosive bolts are ignited when this voltage is applied, disengaging the launchers and missiles from the fixed housings.

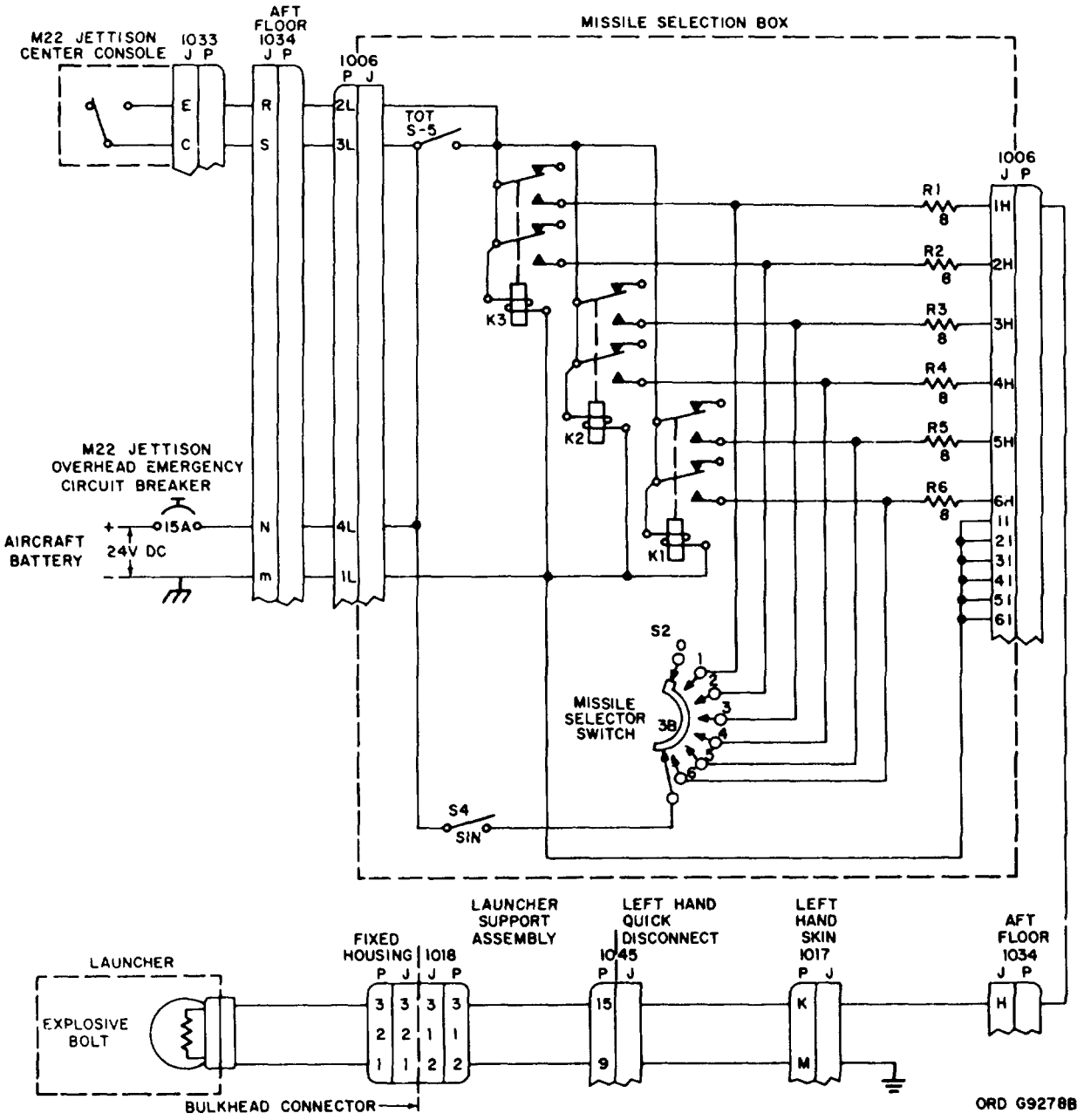


Figure 16. Emergency jettison (functional schematic).

CHAPTER 3

REPAIR PARTS, TOOLS, AND EQUIPMENT

21. General

Repair parts, tools, and equipment are issued to an organization for maintaining the materiel. Tools and equipment should not be used for purposes other than prescribed and should be stored when not in use.

22. Common Tools and Equipment

Standard and commonly used tools and equipment which may be used with this material are authorized for issue by tables of allowances and tables of organization and equipment.

23. Special Tools and Equipment

Special tools and equipment described in a through d below are authorized to organizational maintenance personnel. To requisition these items, refer to TM 9-1400-461-20P.

a. Test Set (fig. 17). The test set tests the M22 installation by measuring the stability and magnitude of the control signals from the GCU. It is also used to detect the presence or absence and sequence of ignition voltages from the GCU. Operating voltages for the test set are supplied by an internal 12-volt missile battery. Four indicator lamps and a meter indicate the condition of the ignition and control-signal circuits. All controls and indicators are located on the front panel.

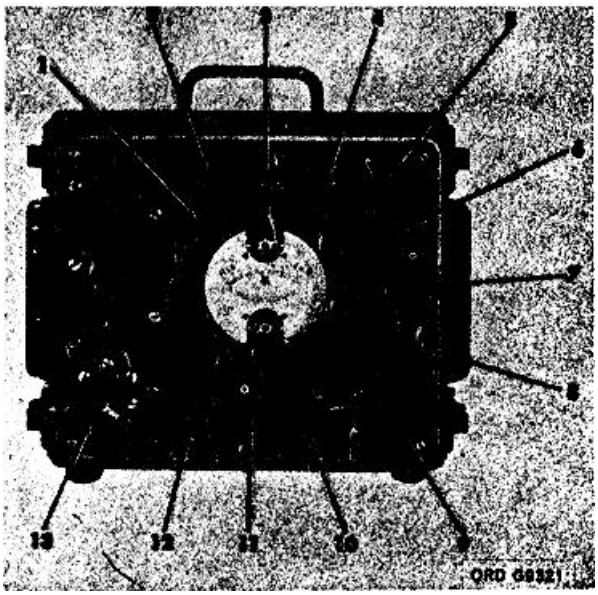


Figure 17. Test set.

Table 2. Launching and Guidance Test Set-Controls and Indicators (fig. 17)

KEY	CONTROL OR INDICATOR	TYPE	FUNCTION
1	Meter		Indicates battery voltage and control signal voltage, percentage, and frequency.
2	IG lamp	Indicating	Tests gyro ignition circuit.
3	UG lamp	Indicating	Tests gyro uncaging circuit.
4	IFB lamp	Indicating	Tests flares and booster ignition circuit.
5	WJ lamp	Indicating	Tests wires jettison circuit.
6	BAT TEST switch	Toggle	Connects battery voltage to meter for test.
7	(+)/(-) switch	Toggle	Used with Hi V/Lo V switch to check amplitude of control signal voltage.
8	(Hi V/Lo V)	Toggle	Used to select meter voltage range.
9	Function switch	6position rotary	Controls test set functions. Switch positions and corresponding functions are as follows: O–off; B-battery; P-permits testing of pitch control signals; Y-permits testing of yaw control signals; F-permits testing of signal frequency; V–checks the voltage amplitude of the signal.
10	SYMMETRY control	Adjustable resistor	Used to null meter.
11	Hi Le/Lo RI Switch	Toggle	Used to calibrate.
12	AMPLITUDE control	Adjustable resistor	Used to calibrate test set.

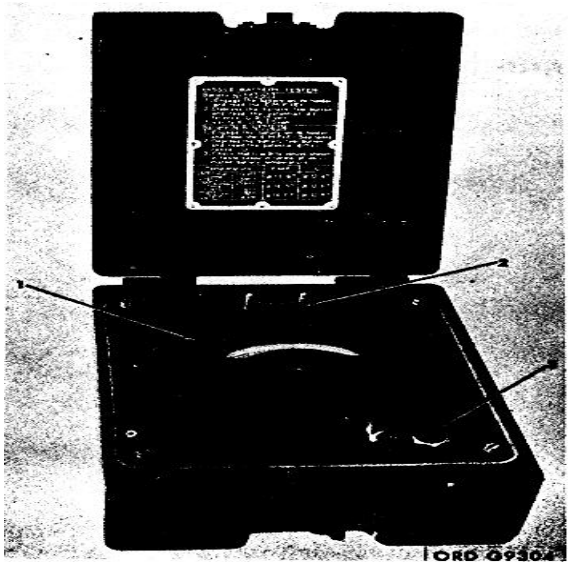


Figure 18. Missile battery tester.

b. Battery Tester (fig. 18). The battery tester checks the missile batteries in both no-load and full-load conditions. The tester consists of a voltmeter (0--15 volt range), a 56-ohm resistor, a 3-position switch, a connector, and an instruction plate.

c. *Explosive-Cartridge Circuit Tester* (fig. 19). The explosive-cartridge circuit tester tests the circuit that releases the missile locking lever. The tester plugs into the explosive-cartridge receptacle. A red indicator lamp on the tester glows when voltage is applied to the circuit.

d. Explosive-Bolt Circuit Tester (fig. 19). The explosive-bolt circuit tester tests the circuit for electrical launcher jettisoning. The tester connects to the explosive-bolt connector inside the fixed housing. A red indicator lamp on the tester glows when voltage is applied to the circuit.

e. Gunner's Quadrant (fig. 20). The gunner's quadrant is used in setting the launcher elevation, which must be set between 6 degrees and 12 degrees (106 mils to 213 mils).

Table 3. Battery Tester-Controls and Indicators (fig. 18)

Key	Control or indicator	Type	Function
1	Meter	Voltmeter	Indicates the voltage of the battery being tested.
2	Plug	6 pin	Provides connection between the battery and the tester.
3	Switch	Toggle	Change the battery load condition.

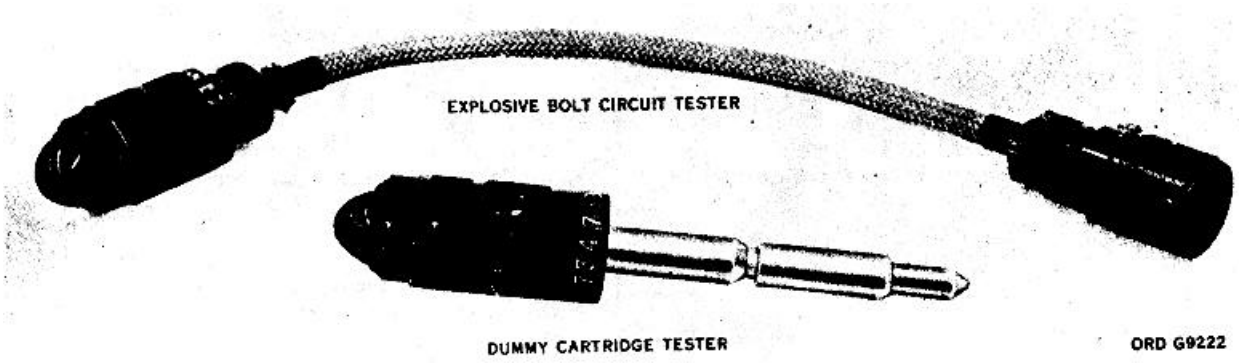


Figure 19. Explosive bolt and explosive cartridge tester.

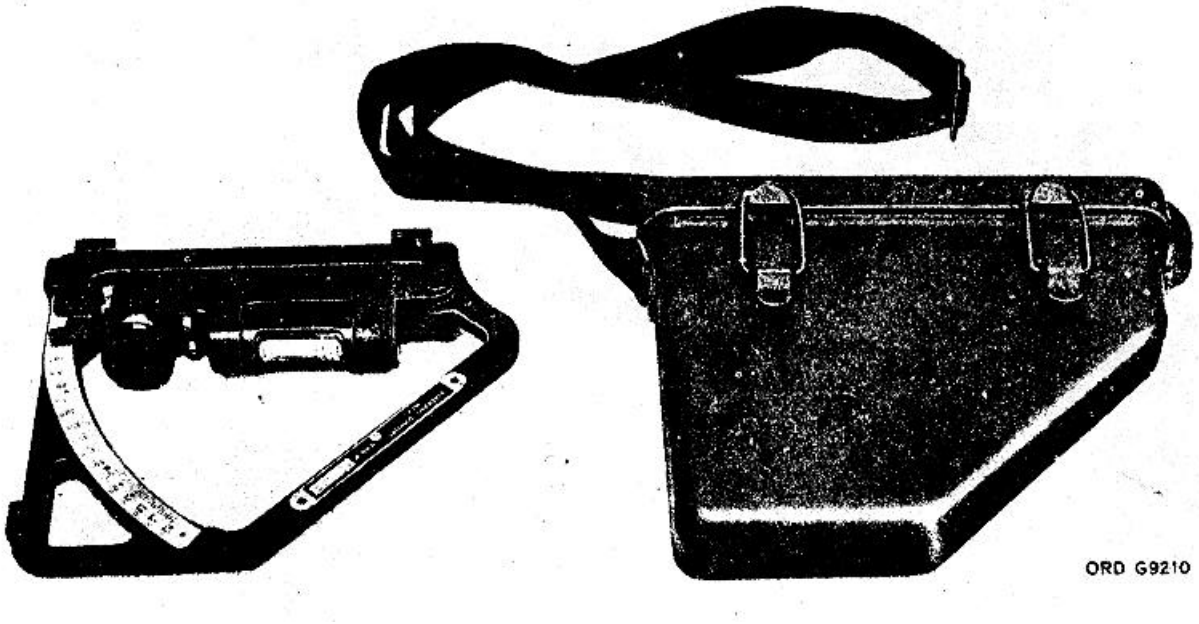


Figure 20. Gunner's quadrant.

CHAPTER 4

EQUIPMENT SERVICEABILITY CRITERIA

24. General

Equipment serviceability criteria enable users to determine whether their equipment can carry out its primary mission. Commanders are required to evaluate and rate their equipment in one of three categories:

a. Green. Combat equipment free of any condition that would prevent it from carrying out its primary mission is rated in the green category.

b. Amber. Combat equipment with conditions that make it only partly able to carry out its primary mission is rated in the amber category.

c. Red. Combat equipment that is unable to carry out its primary mission immediately, or that is unreliable, is rated in the red category.

25. Evaluation

Evaluate the M22 armament subsystem while making the operational checks contained in table 10.

a. If the subsystem passes all operational checks it should be rated in the green category.

b. If only three to five launchers are operational, the subsystem should be rated in the amber category.

c. If fewer than three launchers are operational, the subsystem should be rated in the red category.

26. Records Record the results of the evaluation on DA Form 2404 according to the instructions contained in TM 38-750.

CHAPTER 5

INSTALLATION OF THE SUBSYSTEM

27. Responsibilities

Organizational maintenance personnel are responsible for installing, checking out, and preparing the subsystem for operation. Installation procedures are contained in this chapter; subsystem checkout, preflight and postflight procedures are in chapter 6.

28. Procedures Prior to Installation

a. Before attempting to install the subsystem, make certain the serial number of the UH-1B is 62-1997 or above and that the helicopter has been modified to accept the M22 equipment. Check with the aircraft crew for the serial number and to see that MWO's 551520-211-20/6, 55-1520-211-20/15, and 551520-211-20/30 have been applied to the helicopter. Repeat, these MWO's must have been applied to the helicopter (serial number 62 1997 or subsequent) before the M22 can be installed.

Note. If the M22 subsystem includes the XM-58 sighting system, MWO 55-1520-211-30/9 must also have been applied to the UH-1B.

b. Also, make certain that all of the equipment, mounting hardware, etc. is present before starting the installation procedure. Inventory the equipment received against the packing list that comes with the equipment.

Note. The explosive bolts are ammunition items and will be stored at the ammunition supply point (ASP).

29. Assemble and Install the Release Cable Assemblies

Since the procedures for installing the release cable assemblies on the left-hand (L.H.) and the right-hand (R.H.) side of the helicopter are essentially the same, the steps below can be used for either side. There are certain parts that can be used only on the left side or the right side. These are identified in the legend of figure 21 by (L.H.) or (R.H.) after the part number. All key-numbered callouts below refer to figure 21 unless otherwise specified.

Note. The left or right side of the helicopter is keyed to the direction of forward flight.

a. *Assemble and Install the Two-Pulley Bracket Assembly*.

(1) Install two pulleys (17) in the two pulley bracket (16) with two bolts (12), washers (13), nuts (14), and cotter pins (15).

(2) There is a 1/2-inch hole under one pulley in the bracket (16); route the threaded end of the release cable (63) over both pulleys in the bracket and down through the 1/2-inch hole.

(3) Insert pins (11 and 18) in the bracket.

(4) Run the clevis end (20) of the release cable through the 1/2-inch hole (center of crossbeam) and the threaded end through the other 1/2-inch hole (forward of center on crossbeam).

(5) Fasten bracket (16) to crossbeam with four screws (10) and washers (9).

b. *Assemble the Aft Pulley Bracket.*

Note. The aft bracket (45) has three mounting holes.

(1) Install a pulley (same as 17, fig. 21) in the aft bracket (45) with a bolt (46), washer (47), nut (48), and a cotter pin (49).

(2) Place a clamp (41) on one end of the 5/8-inch guard tube (58).

(3) Fasten the clamp (and tube) to the bracket so that the guard tube is inline with the pulley. Use screw (38), washer (43), and nut (42).

(4) Place a clamp (66) over one end of the 3/4-inch guard tube (59).

(5) Fasten the clip (6) to the clamp (e6) with a screw (5), washer (64), and nut (65).

(6) Slide the end (opposite the clamp) of the 3/4-inch guard tube over the 5/8inch guard tube.

(7) Insert pin (44) in the bracket.

c. Assemble the Forward Pulley Bracket.

(1) Position the bracket (51) so that the pulley bolt hole is on your left and the hole for pin (53) on your right.

(2) Put the release cable in the bracket so that the threaded end (60) is on the right and the ball-end (56) on the left.

(3) Secure pulley (same part as 17, fig. 21) in the bracket with bolt, washer, nut, and cotter pin (same parts as 46, 47, 48, and 49, fig. 21).

(4) Insert pin (53) in bracket making certain cable is between the pulley and the pin.

d. Install the Forward and Aft Pulley Brackets.

(1) From the forward side, run the threaded end of the release cable through the cable clearance hole in the forward support beam.

(2) Aline the forward pulley bracket over four mounting holes in the support beam so that the exposed portion of the pulley is pointing slightly up and toward the small hole in the side of the helicopter.

Note. Assure that screws (39) and (40), used to secure the forward and aft brackets to the beam, are installed front to rear with washers and nuts on aft side of beam.

(3) Fasten the bracket to the support beam by using screws (39), washers (55), and nuts (54) in the two bottom holes of the bracket.

(4) On the aft side of the support beam, route the threaded end of the release cable over the pulley in the aft bracket (45), into, and through the guard tube. To do this, it will be necessary to remove the pulley temporarily from bracket (45).

Note. In step (5) below, two of the screws will secure both the forward and the aft bracket to the support beam.

(5) Aline the aft bracket over three mounting holes in the support beam and secure it with three screws (39), washers (55), and nuts (54).

e. Connect the Cable Assemblies.

(1) Connect the threaded ends of the release cables (60 and 63) with the turnbuckle body (62).

(2) Remove the access plate(s) from the helicopter to gain access to the trulock on the helicopter cable.

(3) Insert the ball end of the release cable through the grommet hole on the side of the helicopter and connect the cables together with the tru-lock.

(4) Pull release cable taut by pulling on the clevis end (20).

(5) Extend the 3/4-inch guard tube and aline clip (6) with the mounting hole in the crossbeam.

(6) Check to see that the cable runs through both guard tubes without binding. If the cable does bind, reposition the tubes as required.

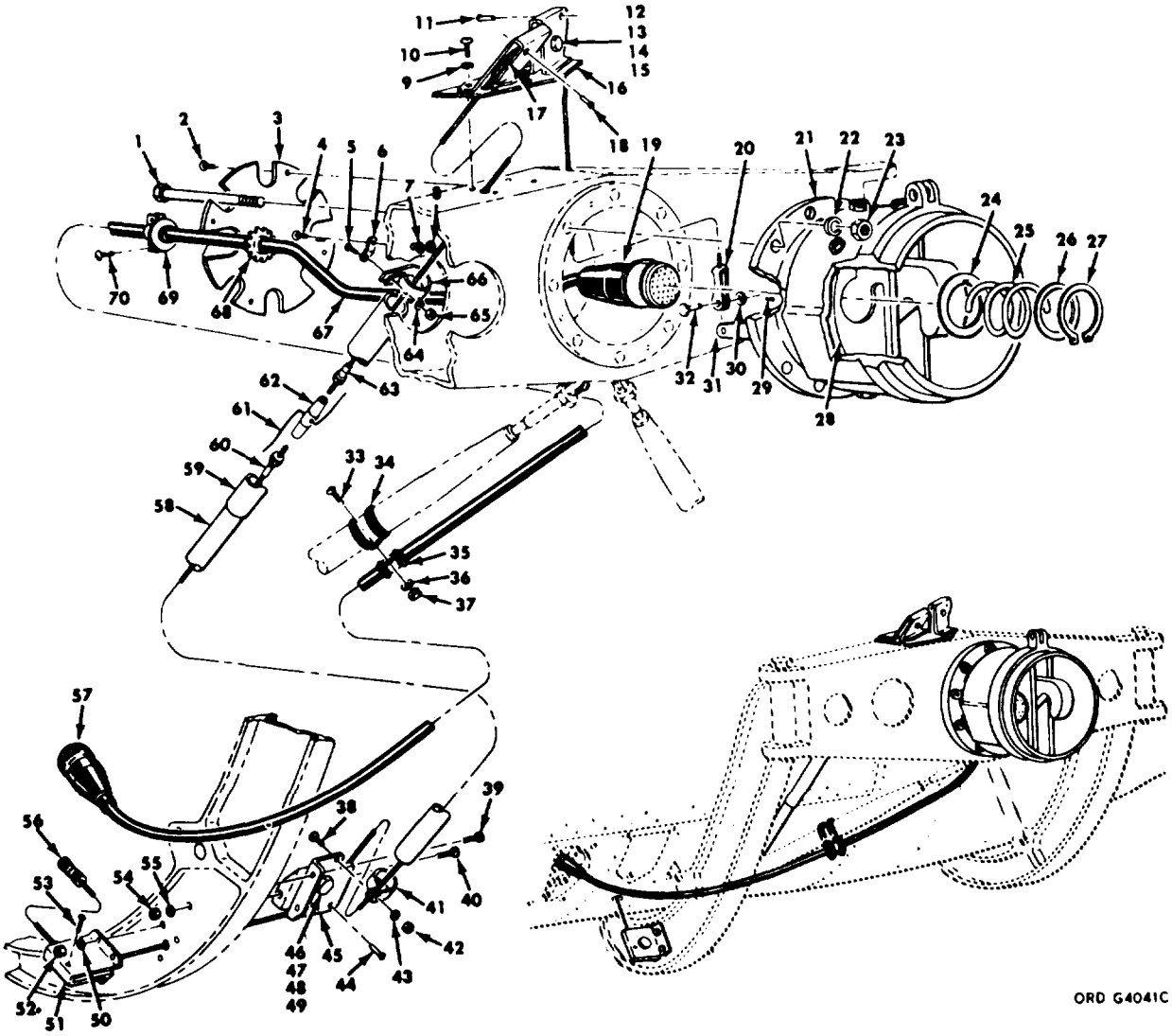
30. Install the Housing Assemblies

Note. The procedures below may be used to install the housing assemblies on either side of the helicopter. Some of the parts are for one side only and are so indicated by (L.H.) or (R.H.) in the legend for figure 2;. All callouts below refer to figure 21 unless otherwise specified.

a. Remove the rear access cover from the crossbeam.

Note. It may be necessary to temporarily disconnect the release cables at the turnbuckle to perform step b below.

b. Pull the cable end (20) out enough to connect it to the release arm (31) of the housing assembly (21). Use pin (32), washer (30), and cotter pin (29) to make the connection.



1—Bolt AN5-46A (top)
AN5-47A (middle)
AN5-50A (bottom)
2—Screw MS35234-60
3—Plate 8035032
4—Screw AN525-10R8
5—Screw AN525-10R6
6—Clip 10173297
7—Washer AN960PD10L
8—Nut NAS679A3
9—Washer AN960PD10L
10—Screw AN525-10R6
11—Pin NAS427K9
12—Bolt NAS464-4-9
13—Washer AN960PD416
14—Nut AN320-4
15—Pin MS24665-153
16—Pulley bracket 10173296 (L.H.)
10173295 (R.H)
17—Pulley MS20219A2
18—Pin NAS427K9
19—Female connector of cable 8035033
20—Clevis end of upper release cable NAS312C27-0213
21—Housing assembly 8035008-1 (L.H.)
8035008-2 (R.H.)
22—Washer AN960-516L
23—Nut NAS679C5M
24—Washer 8035043
25—Spring
26—Washer } Part of cable 8035033
27—Snap ring
28—Support plate
29—Cotter pin MS24665-153 or MS24665-149
30—Washer AN960C10L
31—Release arm
32—Pin MS20392-2C11
33—Screw MS35207-267
34—Clamp MS21919G13

Figure 21. Mechanical jettison equipment.

35—Clamp MS21919G18
36—Washer AN960PD10L
37—Nut NAS679A3
38—Screw AN525-10R6
39—Screw AN525-10R11
40—Screw AN525-10R11
41—Clamp MS21919G10 or AN742D10
42—Nut NAS679A3
43—Washer AN960PD10L
44—Pin NAS427K9
45—Aft pulley bracket 10173301 (L.H.)
Aft pulley bracket 10173300 (R.H.)
46—Bolt NAS464-4-9
47—Washer AN960PD416
48—Nut AN320-4
49—Pin MS24665-153
50—Washer AN960PD10L
51—Forward pulley bracket 10173293 (L.H.)
Forward pulley bracket 10173302 (R.H.)
52—Nut NAS679A3
53—Pin NAS427K9
54—Nut NAS679A3
55—Washer AN960PD10L
56—Ball end of lower release cable 10173294
57—Male connector-cable 8035033
58—Lower 5/8-inch guard tube 10173298
59—Upper 3/4-inch guard tube 10173299
60—Threaded end of lower release cable 10173294
61—Lockwire AN995C20 or MS20995-C32
62—Turnbuckle body AN155-8S or MS21251-2S
63—Threaded end of upper release cable NAS312C27-0213
64—Washer AN960PD10L
65—Nut NAS679A3
66—Clamp MS21919DG12 or AN742D12
67—Cable 8035033
68—Locknut)
69—Clamp) Issued with item 67
70—Screw)

Figure 21-Continued.

c. Bolt the housing assembly (21) to the crossbeam with bolts (1), washers (22), and nuts (23).

Note. If available, use three bolts AN5-46A in the top three holes, two bolts AN5-47A in the middle holes on each side, and three bolts AN5-50A in the three bottom holes. If the three types of bolts are not available, use AN6-50A's all around and fill-in with washers (22).

d. Remove snap ring (27), washer (26), spring (25), and keyed washer (24) from the) connector (19) on cable (67).

e. Route the cable connector (19) through the rear of the support assembly and through the cutaway notch in the support plate (28) in the housing assembly.

f. Replace the keyed washer (24), and spring (25), the flat washer (26), and the snap ring (27) on the cable connector.

g. Plug the cable connector (57) to the receptacle on the side of the helicopter.

h. Clamp the cable to the external stores sway brace as shown in figure 21 using the hardware specified by callouts 33 through 37.

31. Install and Lock the Launcher Support Assemblies

Note. The following procedures may be used to install and lock both launcher support assemblies. Both assemblies must be installed and locked before adjusting the mechanical release mechanism (para. 32).

a. Pull the pilot's mechanical jettison lever (fig. 22) up to the release position and install the jettison lever locking pin in the lever and lever support.

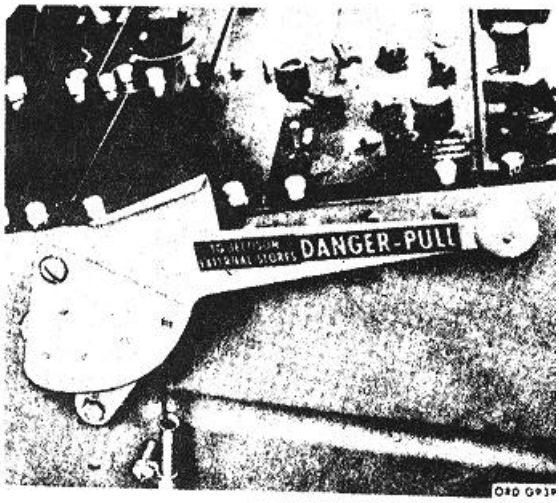


Figure 22. Mechanical jettison lever (locked position).

b. Turn the actuator shaft nut on the side of the housing assembly (21, fig. 21) until the arrow on the nut points to the OPEN position.

c. Lift the hook (part of housing assembly) until it engages and is held up by the spring clamp above the hook.

Note. If there is too much tension and the hook won't stay up, loosen the turnbuckle body (62, fig. 21) slightly. Check the spring clamp to see if it is sprung open.

d. Lift the launcher support assembly (11, fig. 23) up to the housing assembly and connect the cable connector (19, fig. 21) to the electrical connector in the end of the launcher support assembly.

e. Being careful not to break the cable connection, push (pull) the cable back into the housing and at the same time, guide the launcher support assembly into position against the housing assembly.

f. Secure the launcher support assembly to the housing with the red-tagged locking pin (5, fig. 23).

g. Slide clamp (69, fig. 21) up the cable close to the crossbeam, then loosen the locknut (68, fig. 21). Place the rear access plate (3, fig. 21) to the clamp and determine which slot in the plate is to be inserted between the clamp and the locknut (69 and 68, fig. 21) to allow the cable to run straight through the housing assembly.

h. After deciding, place that slot between the clamp and the locknut and tighten the locknut to the clamp. Slide the plate (and clamp) up against the crossbeam and secure the plate with four screws (2, fig. 21).

i. Tighten the clamp to the cable with screws (70, fig. 21).

j. Remove the locking pin and push the pilot's mechanical jettison lever (fig. 22) down to the locked position.

k. Work (jiggle) the launcher support assembly until you hear the hook in the housing assembly drop down.

l. At the housing assembly, turn the actuator shaft bolthead (6, fig. 4) clockwise until the mating surfaces of the launcher support assembly and the housing assembly fit tightly against each other, but do not turn the bolthead past the CLOSED position.

m. Install the actuator-shaft latch (7, fig. 4) and secure it with the flat washer, lockwasher, and nut provided.

32. Adjust the Mechanical Release Mechanism

***Caution*: Both launcher support assemblies must be installed (para. 31) and secured with the locking pin (5, fig. 23) before making the following adjustments Also, the turnbuckles (62, fig. 21) must be adjusted to take up all slack in the release cables.**

a. Pull the pilot's mechanical jettison lever up to the release position and listen for the hooks in the housing assemblies to release. Both hooks should release at the same time (one click). Check to see that both hooks did release. Hold up the launcher support assemblies and remove the locking pins. If the hooks released, the support assemblies will fall free.

b. If the hooks DID release at the same time, do this.

(1) Push the pilot's jettison lever down to the locked position.

(2) Remove the actuator shaft latch from the housing assemblies.

(3) Turn the bolthead of the actuator shaft to the OPEN position.

(4) Work (jiggle) the launcher support assemblies until you hear the hooks drop.

(5) Turn the bolthead of the actuator shaft until the mating surfaces of the launcher support assemblies and the housing assemblies fit tightly, but do not turn past the CLOSED position.

(6) Safety wire the turnbuckle bodies (62, fig. 21) with lockwire (61, fig. 21).

(7) Extend the 3/4-inch guard tube and attach clip (6) with screw (4), washer (7), and nut (8) as shown in figure 21.

c. If the hooks DID NOT release at the same time, do the following:

(1) Perform (1) through (5) of step *b* above.

(2) Adjust the appropriate turnbuckle bodies (62, fig. 21) in an effort to make the hooks release at the same time.

(3) Repeat step a and steps (1) and (2) above until the hooks do release at the same time.

(4) After the turnbuckle, bodies have been adjusted so that the hooks release at the same time, perform all of the procedures in step b above.

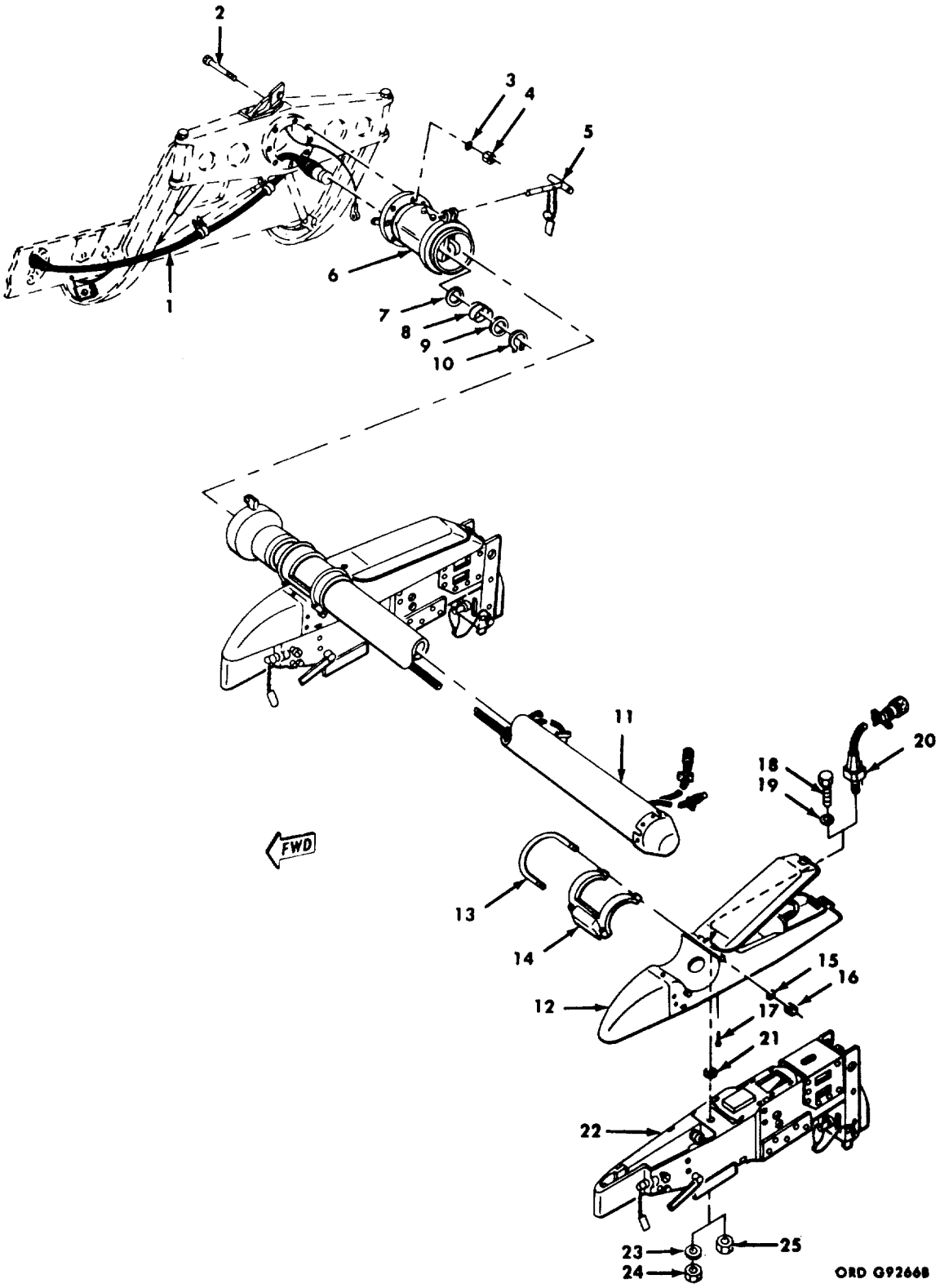


Figure 23. Launching equipment, exploded view.

1—Cable assembly 8035033
2—Bolt AN5-46A
AN5-47A
AN5-50A
3—Washer AN960-516L
4—Nut NAS679C5M
5—Locking pin 8035019
6—Housing assembly 8035008-1 (L.H.)
8035008-2 (R.H.)
7—Washer 8035043
8—Spring
9—Washer
10—Snap ring
11—Support assembly 8035001-1 (L.H.)
8035001-2 (R.H.)
12—Fixed housing 10173278
13—U-bolt 8035031
14—Strap 10173282
15—Washer AN960-516
16—Nut NAS679C5M
17—Screw 10173281 (used with item 20)
18—Machine bolt MS35292-139
19—Washer MS15795-220 (used with item 18)
20—Explosive bolt with nut 10022224
21—Laminated washer 10173308 (used with item 20)
22—Launcher 10173277
23—Washer MS35337-49 (used with item 18)
24—Nut MS35690-922
25—Nut (issued with item 20)

Figure 23-Continued.

33. Installation of the Fixed Housings (fig. 23)

a. Position the fixed housing (12) under the launcher support assembly (11), with the long end of the housing pointing toward the rear of the helicopter.

b. Route the 7-pin cable to the left of the explosive-bolt well (fig. 24) and the 3-pin cable to the right of the well.

c. Attach the fixed housing to the launcher support assembly, loosely, with U-bolts (13), strap (14), washers (15), and nuts (16).

d. Connect the 3-pin and the 7-pin cable connectors to the 3-pin and 7-pin receptacles inside the fixed housings.

34. Installation of the Launchers

Note. The launcher may be installed with the explosive bolt (20, fig. 23) as explained in paragraph a below or with a machine bolt (18, fig. 23) as explained in paragraph b below. Install the explosive bolts when the helicopter is to be flown with the "AGM-22B or ATM-22B" missiles installed.

Warning: The explosive bolt Should be removed and replaced with the machine bolt when the subsystem is not in a readiness condition or when stored in an area where explosives are prohibited.

a. Using the Explosive Bolt.

Warning: The explosive bolt is sensitive to shock and stray electrical currents handle it carefully. Keep the shorting plug connected to the bolt's cable while installing the launcher to the support assemblies. The shorting plug places a short between pins 1 and 3 of the bolt cable to minimize the possibility of accidentally activating the bolt.

(1) Remove (and keep) the nut (25, fig. 23) from the explosive bolt (20, fig. 23) and carefully insert the explosive bolt (threaded end down) into the explosive bolt well (fig. 24) in the fixed housing. Secure the bolt with four screws (17, fig. 23).

Note. Retain the packing container for the explosive bolts for use when the bolts are removed and returned to storage.

***Warning*: Accidents happen - do not get directly under the explosive bolt when attaching it to the fixed housing.**

(2) Without disconnecting the! shorting plug from the explosive bolt cable, secure the shorting plug (fig. 24) into the SHORTING-PLUG hole in the fixed housing with four screws, lockwashers, and nuts.

(3) Locate the' hole in the top side of the launcher that the explosive bolt goes through (just forward of the electrical plug). Place laminated washer (5, fig. 25) over the hole.

(4) Remove the dust cover from the plug on the launcher and position the launcher up under the fixed housing. Install the nut (25, fig. 23), retained in (1) above, on the explosive bolt.

(5) Start torquing the nut while' observing the mating lugs (2, fig. 25) on both the fixed housing and on the launcher. Tighten the nut until these surfaces meet but **do not torque more than 132 ±9 pound-inches**. If the mating lugs do not meet before the torque limit is reached, remove the

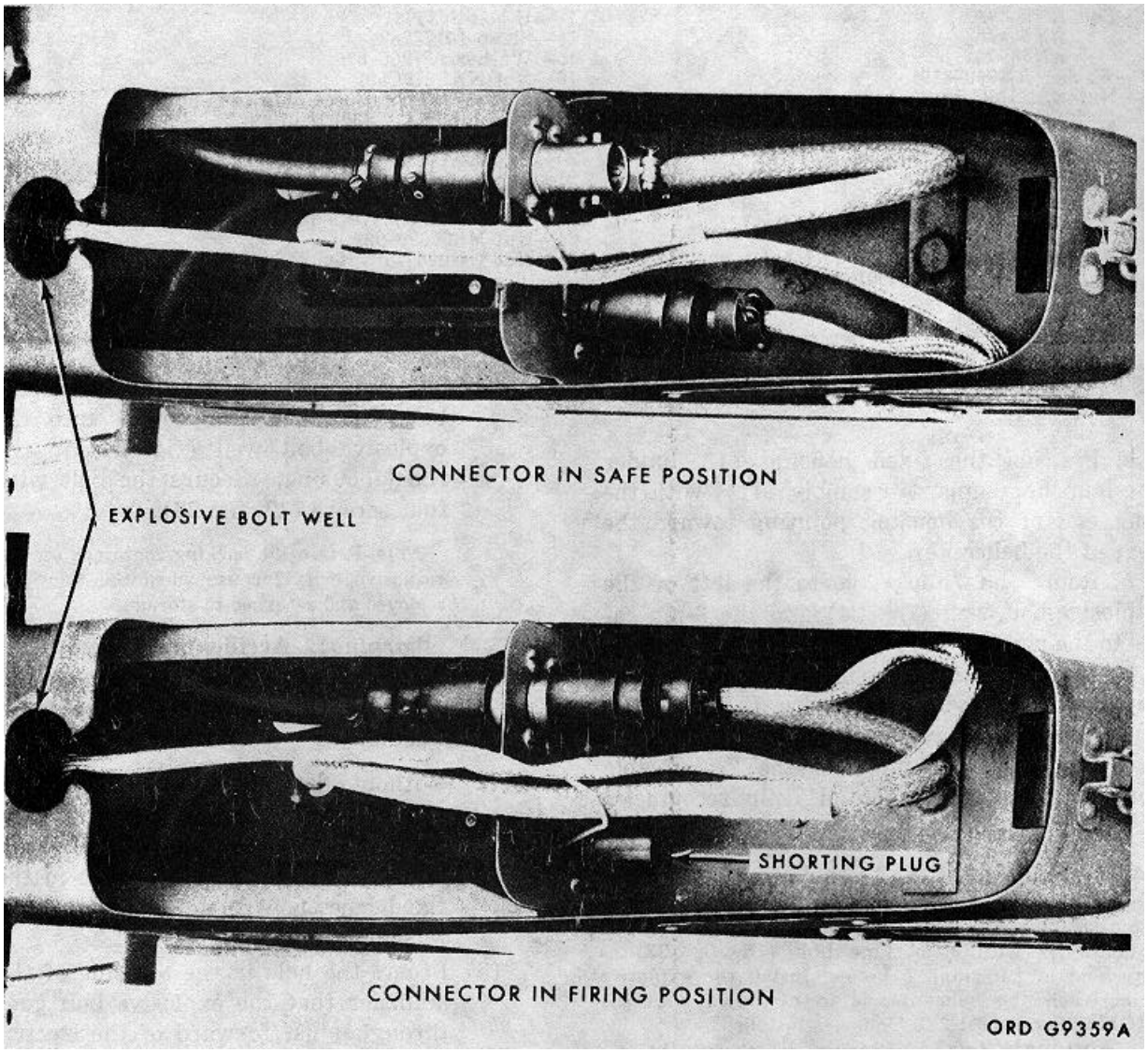


Figure 24. Explosive bolt cable connections.

launcher and peel off a few layers of the laminated washer. Repeat steps (4) and (5) until the mating surfaces meet and the bolt is torqued to 132 ± 9 pound-inches.

b. Using the Machine Bolt.

(1) Insert machine bolt with washer (18 and 19, fig. 23) into the explosive bolt well.

(2) Remove dust cover from electrical plug on top of launcher; then fit launcher up under the fixed housing.

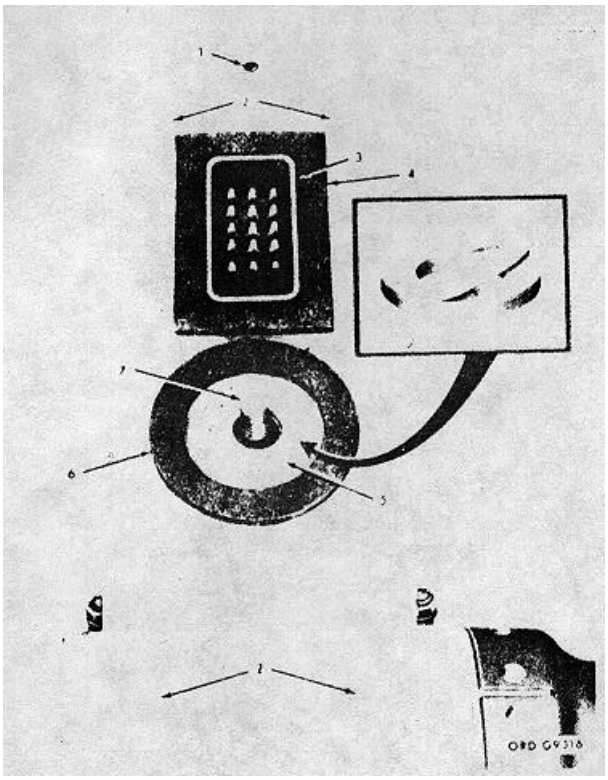
(3) Fasten the launcher to the fixed housing with a lockwasher and nut (23 and 24, fig. 23).

35. Setting the Launcher Elevation (fig. 26)

The launcher elevation must be set between 106.5 and 213 mils.

a. Using gunner's quadrant M1A1, determine the helicopter's elevation as follows:

(1) Place the quadrant on the helicopter leveling plate (left side of the passenger's seat).



1-Alinemnent hole
2-Mating lugs
3-Connector
4-Gasket
5-Laminated washer
6-Gasket
7-Explosive bolt

Figure 25. Bottom view of fixed housing.

(2) Move the leveling arm on the quadrant until the bubble indicates a level.

Note. If the helicopter is nose high, the elevation is called positive. If the tail is high, the elevation is called negative.

(3) Record the mil reading set on the quadrant when the bubble is at level.

b. If the reading taken in a above was positive, add that reading to the desired launcher elevation (106.5 to 213 mils) and set the quadrant to the resultant value. If the reading was negative, subtract it from the desired elevation and set the quadrant to the resultant value.

c. Holding the quadrant against the vertical plate on the launcher as indicated in figure 26,

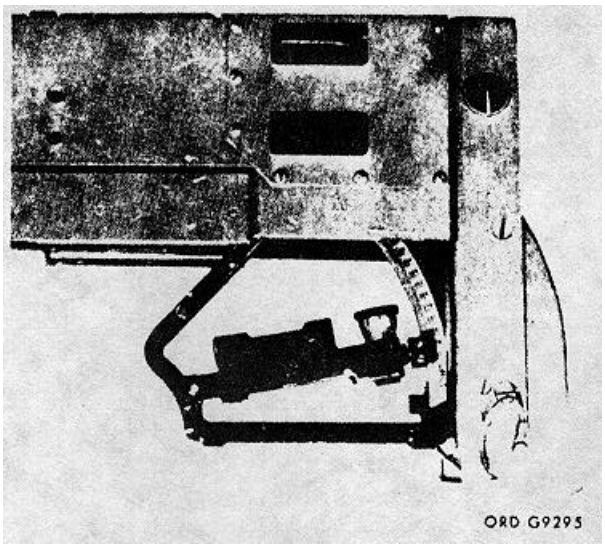


Figure 26. Setting the launcher elevation.

adjust the fixed housing until the bubble on the leveling arm vial indicates level.

d. Being careful not to change the level, tighten the two U-bolts that secure the fixed housing to the launcher support assembly, and torque the bolts to 190-200 pound-inches.

36. Assemble and Install the G and C Support Equipment

Note. Unless otherwise specified, all callouts below refer to figure 27.

a. Assembly. Assemble the equipment outside the helicopter as follows:

(1) Secure the support stand (18) to the floor mounting plate (29) with bolts (14) and washers (4). Don't install a bolt in the center holes on each side of the support stand. Bolts (15) are required here and will be installed later.

(2) Assemble and secure the arm rest (1) and bracket (40) to the guide assembly (19) with clamps (20), washers (21), and thumbscrews (22). Secure bracket (40) to the arm rest column (38) with bolt (39), washer (4), and nut (2).

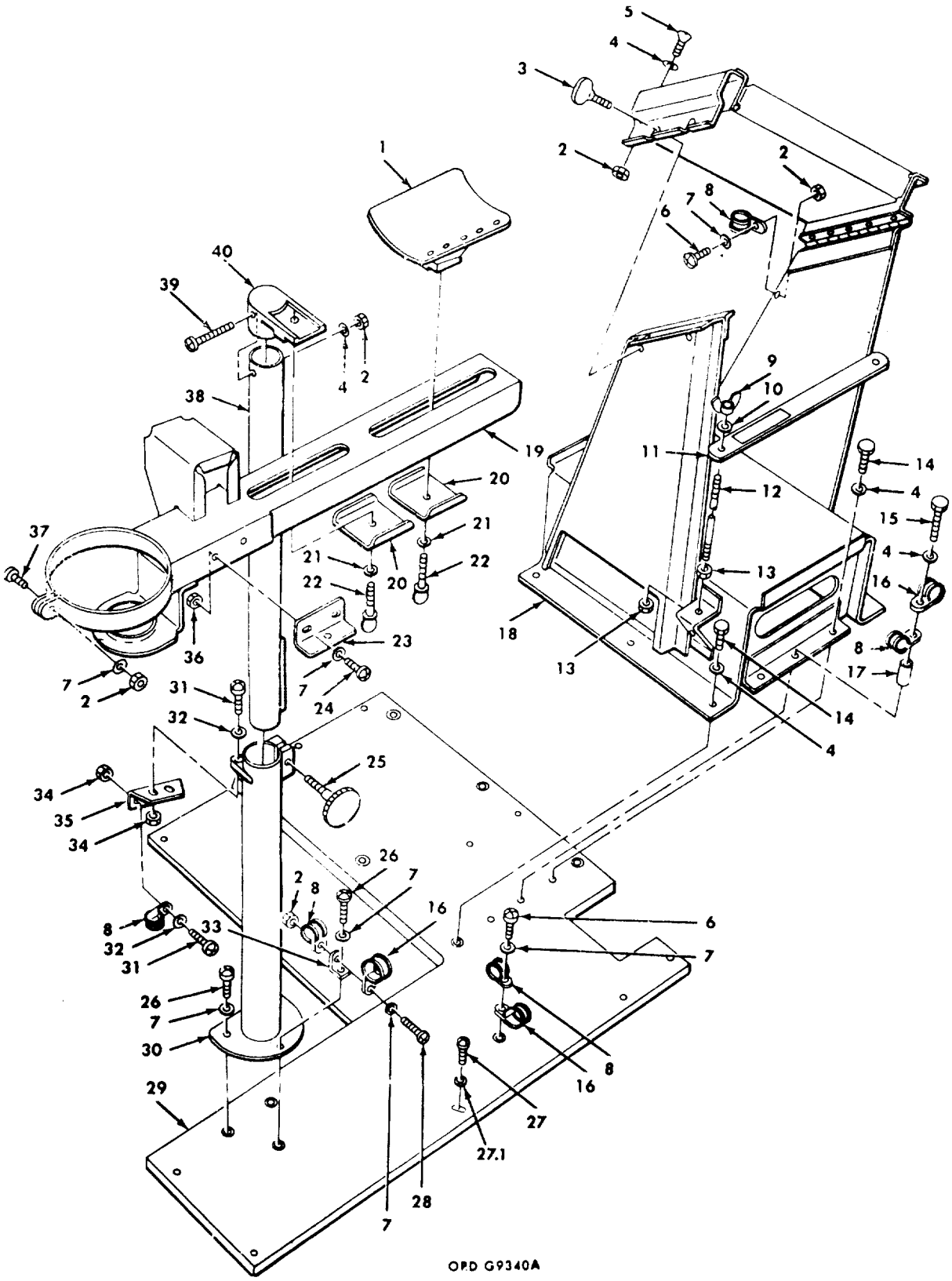


Figure 27. Assembly of G & G support equipment.

1—Arm rest 10173089
2—Nut NAS679A3
3—Thumbscrew 10173087
4—Washer AN960PD10
5—Screw AN509–10R12
6—Screw AN525–10R6
7—Washer AN960PD10L
8—Clamp MS21919DG6
9—Nut MS35426–14
10—Washer MS35338–44
11—Strap 10173078
12—Stud 10173079
13—Nut AN316–4
14—Bolt AN3–3A
15—Bolt AN3–12A
16—Clamp MS21919DG18
17—Spacer NAS43DD3–48
18—Support stand 10173080
19—Guide assembly 10173100
20—Clamp 10173090
21—Lockwasher MS35338–43
22—Thumbscrew MS21316–27
23—Bracket 8035049
24—Screw MS35267–43
25—Knob 10173085
26—Bolt AN3–3A
27—Screw AN525–416R18
27.1—Washer AN960PD416
28—Screw AN525–10R10
29—Floor mounting plate 10173081
30—Support 10173083
31—Screw AN520–8R8
32—Washer AN960PD8L
33—Bracket AN743–12
34—Nut NAS679A08
35—Bracket 10173082
36—Nut MS21045–08
37—Bolt AN3–4A
38—Arm rest column 10173099
39—Bolt AN3–17A
40—Bracket 10173088

Figure 27-Continued.

(3) Insert the upper support column (38) into the lower support column (30). Install and tighten knob (25).

(4) Bolt the support column (30) to the floor mounting plate (29) with bolt (26) and washer (7). Secure a bracket (33) under one screw at the location indicated in figure 27.

(5) Remove the cover and rubber gasket from the selection box connector plate (fig. 28). Turn the plate so the connector pins are facing up, then secure the plate to the support (18) with screw (5), washer (4), and nuts (2). Fasten the hinged portion of the support stand with thumbscrews (3).

(6) Route the long branched-end cable (16 fig. 29), attached to the connector plate, through the support stand and out through tht slot on the other side.

Note. In step (7), position strap (11) so that the decal can be read from the co-pilot's seat.

(7) Strap the guidance control unit (GCU) (11, fig. 29) onto the support stand (18) with metal strap (11), studs (12), nuts (13), washers (10), and wingnuts (9).

(8) Connect the 19-pin cable connector (cable attached to connector plate) to the 19-pin receptacle on the GCU.

(9) Connect the control stick cable (17, fig. 29), the end with the attached

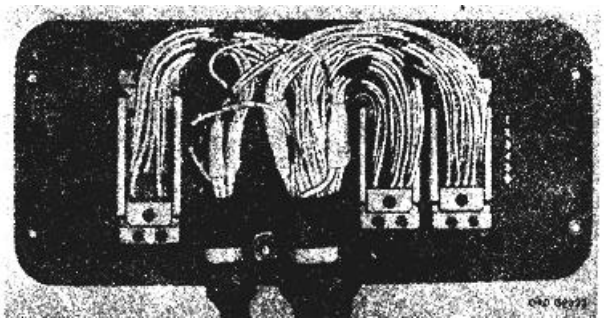


Figure 28. Selection box connector plate.

grounding wire, to the receptacle on the GCU (fig. 29). Remove the screw (that holds the leash on the protective cap) for the control stick connector to the GCU. Secure both the cap leash and the lug (with two wires connected) on the grounding strip with this screw.

(10) Attach the control stick cable (17, fig. 29) to the support stand (18) with clamp (8), screw (6), washer (7), and nut (2).

(11) Run the control stick cable through the support stand alongside the other cable.

(12) Attach clamp (8 and 16) to the cables and fasten them to the support stand and the floor mounting plate with

spacer (17), washer (4), and bolt (15). Do this on both sides of the support stand.

(13) Route both cables forward along the floor plate and secure them with clamps (8 and 16), washer (7), and screw (6).

(14) Fasten the cables to bracket (33) with clamps (8 and 16), screw (28), washer (7), and nut (2).

(15) Secure bracket (35) to the support column (30) with screws (31), washers (.2), and nuts (34).

(16) Clamp the control stick cable to the bracket (35) with clamp (8), screw (31), washer (32), and nut (34).

(17) Fasten the control stick (1, fig. 29) onto the arm rest assembly with screw (37), washer (7), and nut (2).

(18) Connect the control stick cable (17, fig. 29) to the receptacle on the bottom of the control stick.

(19) Remove the protective cover from the bottom of the missile selection box (6, fig. 29). Retain the attaching hardware.

(20) Mate the selection box onto the connector plate being careful not to bend the connector pins in the process. Secure the selection box to the plate with the hardware retained in step (19).

(21) Fasten bracket (23) (issued with the remote fire switch assembly 8934749) to the arm rest assembly with screws (24), washers (7), and nuts (36). (See figure 29.) (22) Remove and retain four screws and lockwashers from the circular mounting surface or the top of the GCU.

(23) Fit tht triggering arm end 8934746 of the remote firing switch cable underneath the safety switch on the GCU.

(24) Place the plate 8934745 over the triggering arm so that the arm fits under the ridge on the plate. Fasten the plate to the GCU with the screws and lockwashers retained in step (22).

(25) Install clamp (8, fig. 29) on the remote firing switch cable. The clamp should be about 3 inches from the end where the cable and the triggering arm mate.

(26) Hold the cable (and clamp) against the side of the GCU. Locate a screw that would, if used, allow the cable to be clamped down so that the cable would run almost straight up the side of the GCU.

(27) Remove the screw chosen step 82.

Clamp the cable to this spot with screw and washer (9 and 10, fig. 29).

(28) Test the operation of the triggering mechanism by pushing down ,on the firing cable knob (2, fig. 29). Check to see that the clamp on the side of the GCU holds the cable in place when the knob is pressed. If the triggering arm doesn't lift the swift switch high enough for it to clear the stop lug, bend the triggering arm and/ or file off the top of the lug and try again.

***Caution*: Always lift the safety switch before returning it to the 0 position; otherwise the switch could hit and bend the triggering arm. If this happens take the plate off and straighten the arm.**

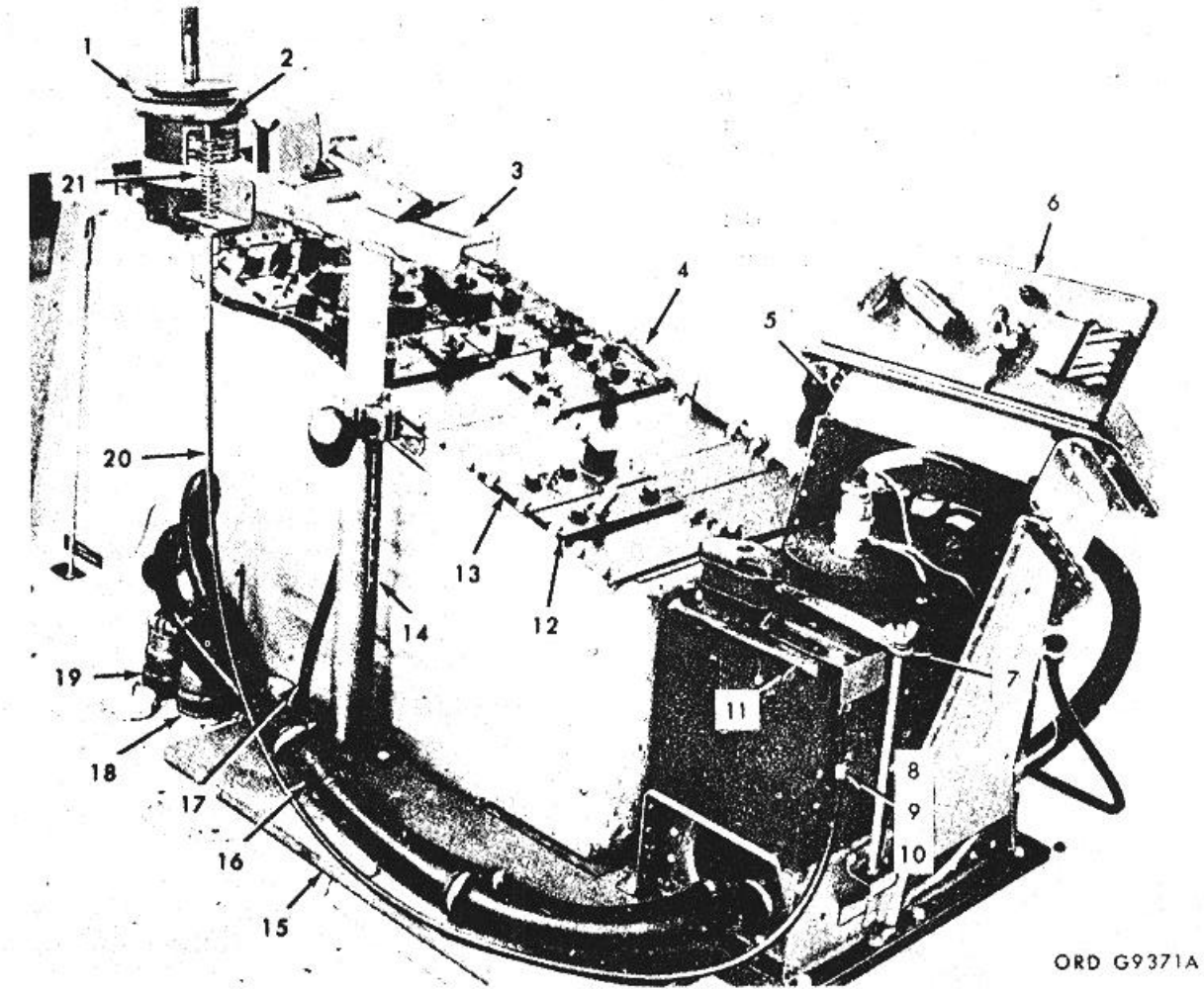
b. Installation. Install the equipment in the helicopter as follows:

(1) First, make some working space by removing the copilot's seat belt fitting on the cabin floor.

(2) Get the G & C equipment inside the helicopter and then line up behind the pedestal as shown in figure 29.

(3) Position the floor mounting plate (15, fig. 29) so that the five holes around the edge of the floor plate are alined over the existing screws in the cabin floor. Identify the screws by any appropriate method.

(4) Pull the floor plate away from the pedestal. Remove, tag, and retain the five screws identified in step (3). Remove a sixth screw located behind and near the center of the pedestal on the cabin floor.



1-Control stick 10172538
2-Remote fire switch knob
3-Guide assembly 10173100
4-Emergency jettison release lever
5-Shield 10173086
6-Missile selection box 10172477
7-Strap 10173078
8-Clamp MS9025-02
9-Screw 8035043-2
10-Washer MS36333-71
11-Guidance control unit 10172476
12-Pilot's jettison control panel 10173077
13-Pilot's sight control panel 10173076
14-Support 10173088
15-Plate 10173081
16--Cable assembly 8094911
17-Cable assembly 8034872
18-Connector
19-Connector
20-Cable 8035047
21-Spring 8934747

Figure 29. G & C equipment installed.

(5) Slide the floor plate up behind the pedestal. Aline the holes in the floor mounting plate over the screw holes in the cabin floor.

(6) Fasten the plate to the cabin floor by starting at the forward-most hole on the right side of the pedestal. Use one of the screws removed in step (4) above and a washer AN960PD416 in this hole. Use screws and washers (27 and 27.1, fig. 27) in the remaining holes.

Note. The grounding strap on the control stick cable must be secured with one of the screws used in step (6). Use the most convenient screw. Place the lug on the ground strip between the screw head and the washer.

(7) Replace the seat belt fitting removed in step (1).

(8) Remove one or two of the panels on tht top-left side of the pedestal next to the support column.

(9) Fasten the bracket (35) on the support column to the side of the pedestal with screws (31), washers (32), and nut (84). The cable clamp (8) is also fastened at this point.

(10) Replace the panels removed in step (8) above.

(11) Connect the branched-cable connectors to the receptacles (18and 19, fig. 29) in the floor of the helicopter.

37. Install the M55 Gunner's Sight

a. Install the Outboard Side Support.

(1) Locate the screw at the intersection of waterline 72.11 and station 45.88 on the copilot's side of the helicopter as shown in figure 30.

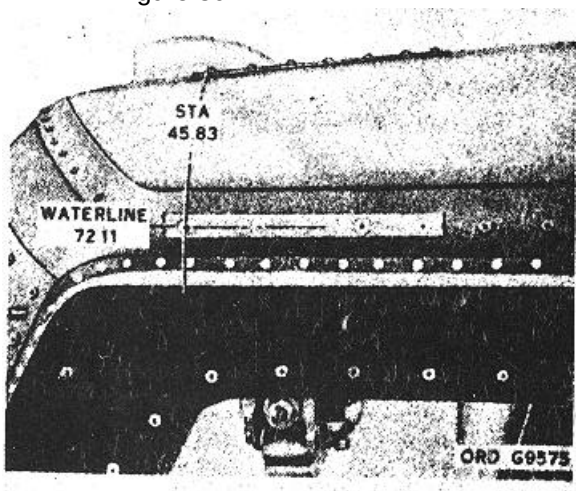


Figure 30. Location of waterline 72.11 and station 45.83.

(2) Remove this screw and the next four aft of it. Retain all screws.

(3) Fasten the outboard support (1, fig. 31) to the helicopter roof with the attachment hardware shown in figure 81.

b. Install the Inboard Side Support.

(1) Locate the screw at station 45.83 (fig.
30) on roof of the helicopter.

(2) Remove this screw and the next six aft of it. Retain all screws.

(3) Fasten the inboard support (8, fig.
31) to the helicopter roof with the attachment hardware shown in figure 81.

c. Install the Sight Support Assembly.

(1) Fasten the support assembly (fig. 31.1) to the side supports with "C" clamps (fig. 31.2).

(2) Make sure the forward edges of the support assembly and the inboard side support mate and that the flat mating surfaces of the outboard side support and the support assembly fit flush.

***Caution*: Tighten the "C" clamps securely.**

d. Install the Sight on the Support Assembly.

(1) Remove the M55 sight from its carrying case (fig. 10).

(2) Back off the locking lever (7, fig. 31.3) until it contacts the retaining nut.

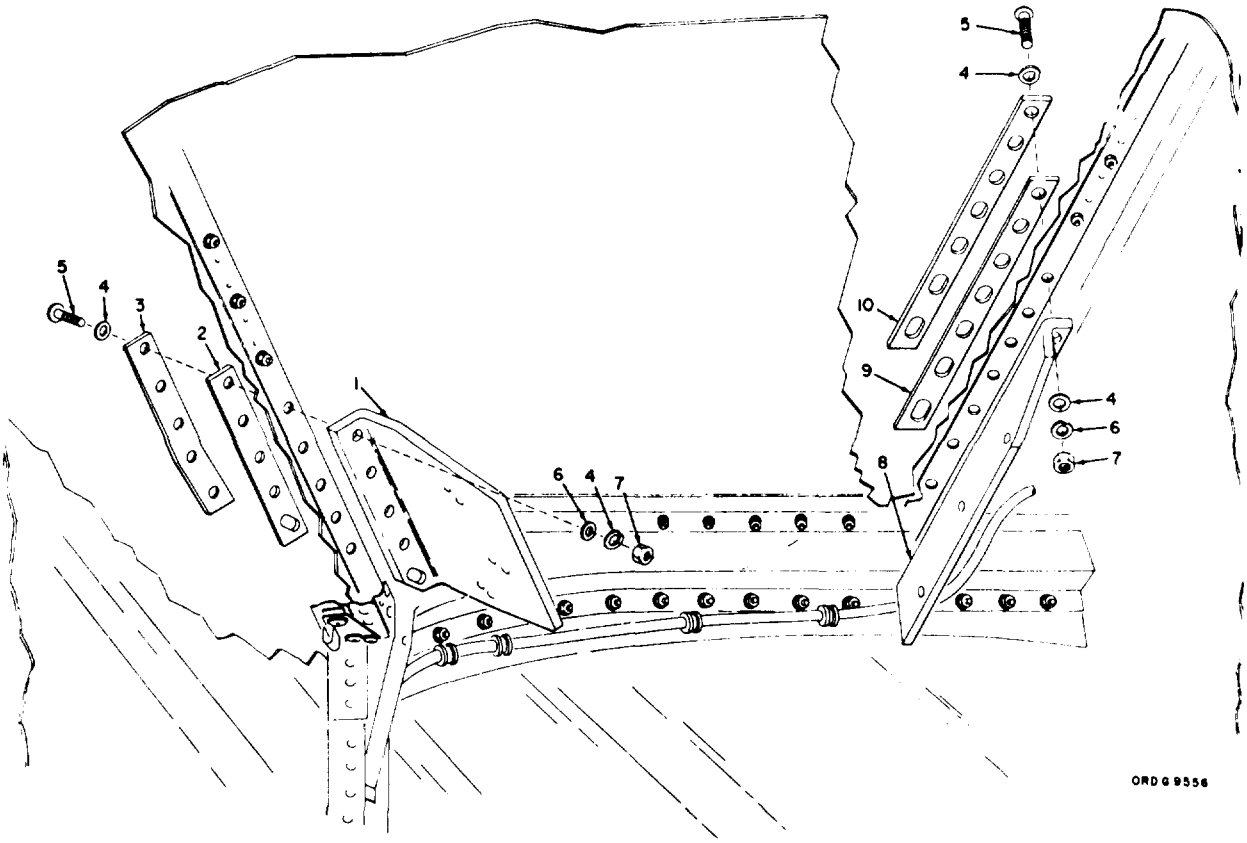
(3) Loosen the locking screw (6, fig. 31.3) on the right side of the support assembly to its limit.

(4) Pull the gimbal-locking pip pin (5, fig. 31.3) out of the sight (5) Hold the sight in a horizontal position with the locking lever on your left and the headrest of the sight pointing down.

(6) With the sight in this position, slide the pivots of the sight all the way into the mounting slots on the support assembly.

(7) Turn the sight slowly until the head rest in facing .you. Then replace the gimbal locking pin and tighten the locking lever and the locking screw (5, 6, and 7, fig. 31.3).

(8) Check to see that the sight is level enough for comfortable viewing (not canted up to one side). If the sight is not level, loosen the "C" clamps



1—Outboard side support 10511054
2—Rubber gasket 10511064
3—Gasket 10511065
4—Lockwasher MS35337–81
5—Screw MS35234–68
6—Washer MS15795–309
7—Nut MS35650–104
8—Inboard side support 10511055
9—Rubber gasket 10511066
10—Gasket 10511065

Figure 31. Installation of inboard and outboard side supports.

slightly and readjust the support assembly on the side supports. Retighten the clamps.

(9) Swing the sight up into the transport position (fig. 31.4). Check to see that the sight does not touch the windshield wiper housing. If it does touch, readjust the support assembly on the side supports and repeat steps (8) and (9).

e. Remove the Sight from the Support Assembly.

(1) Lower the sight to the in-use position.

(2) Remove the gimbal-locking pip pin and loosen the locking lever and the locking screw.

(3) Get a firm grip on the sight and turn the sight in the mounting slots until the headrest is pointing down.

(4) Lower the sight out of the mounting slots and return the sight to its carrying case.

f. Prepare Sight Support Assembly for Permanent Installation.

(1) Scribe the mounting holes of the support assembly onto the side supports (fig. 31.2).

(2) Remove the support assembly and both side supports from the helicopter. Retain all of the mounting hardware.

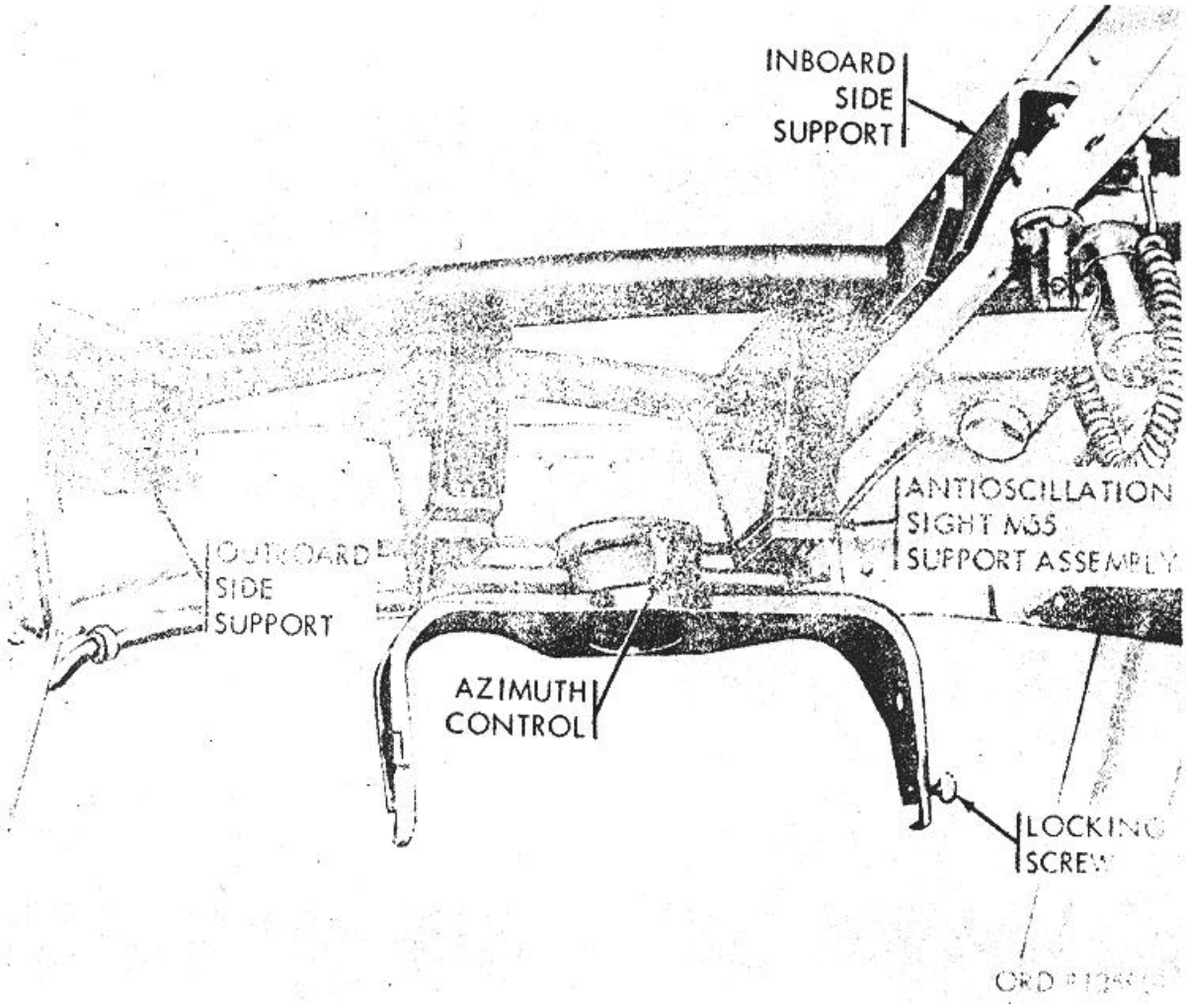


Figure 8A1.1. Sight support assembly fitted to side supports.

(3) Drill a 0.213-inch hole, using a No. 3 drill, in the center of the scribed holes on each side support. Remove burs from the holes.

g. Install Side Supports, Sight Support Assembly, and Sight.

(1) Install the side supports according to the procedures in step a and *b* above.

(2) Mount the sight support assembly to the side supports and secure it with the hardware shown in figure 31.3.

(3) Install the M55 sight as outlined in step *d*(1) through (7) above.

38. Install the Pilot's Sight

a. Install Cable Assembly 8643708.

Note. If the cable has already been installed, do ,not change it just to conform with the following procedures:

(1) Unfasten connector P1048 from its stowed position behind the instrument panel near station 12.

(2) Connect cable (1, fig. 31.5) to P1048 and lockwire it using the double-twist method explained in TM 5-405-3. Attach the connectors to the wire harness at the rear of the OMNI indicator.

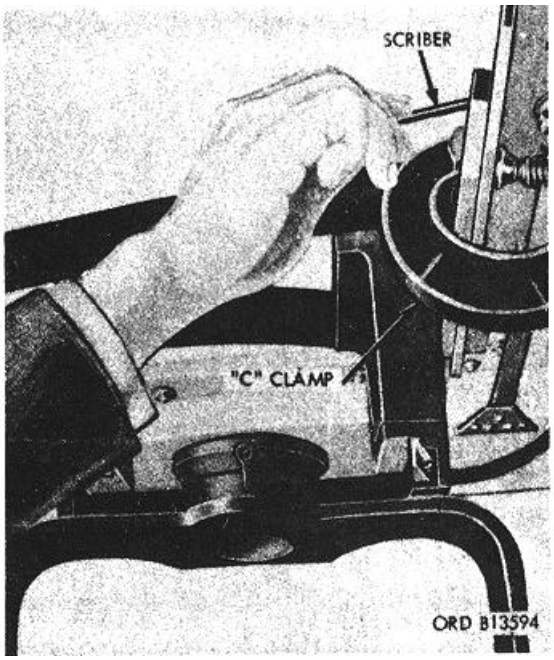


Figure 31.2. Use of "C" clamp and scriber-typical.

(3) Route the cable assembly to the right along the bottom of the pilot's windshield, up the corner post, and left over the windshield wiper guard assembly.

(4) Remove the screw (6, fig. 31.5) from the top-right side of the wiper guard assembly. Install an angle bracket (4, fig. 31.5) to the guard assembly with the screw just removed.

(5) Fasten the cable to bracket with clamp (3, fig. 31.5), screw (6, fig. 31.5), existing washer AN960PD10L, and nut (7, fig. 31.5). Allow 15 inches of slack between the connector on the cable and the clamp.

(6) Starting at the top right-side corner of the windshield, remove and retain the second, ninth, sixteenth, and twenty-second screws. Retain all washers AN960PD10L.

(7) Secure the cable to the aircraft at these four locations with the hardware specified in step (5) above.

Note. The holes referenced in step (8) should exist if MWO 61520-211-20/30 has been applied to the helicopter.

(8) Secure the cable with the hardware specified in step (5) above to the helicopter at the following locations:

(*a*) A hole drilled near F.S. 28.00 and W. L. 84.10.

(*b*) A hole drilled 2-inches aft of F.S. 17.28 at W.L. 34.10.

(*c*) A hole drilled 2-inches aft of F.S. 12.00 at W.L. 34.10.

(*d*) A hole drilled 2-inches above W.L. 34.10 at F.S. 12.00.

Note. At location (d), place the clamp on the forward side of the vertical brace and make sure the cable does not touch the brace.

b. Install the Sight Mount.

(1) Remove and retain the second and third screws from the left side of the windshield wiper guard assembly.

(2) Aline the two holes in the sight mount over these holes step (1) above and locate the screw that lines up with the slot in the mount brace. Remove and retain this screw.

(3) Secure the sight mount and brace to the roof of the helicopter with the hardware called out in figure 81.6.

Note. Items 1, 2, 3, 4, 6, 6, and 7 of figure 81.6 go on the outside of the helicopter.

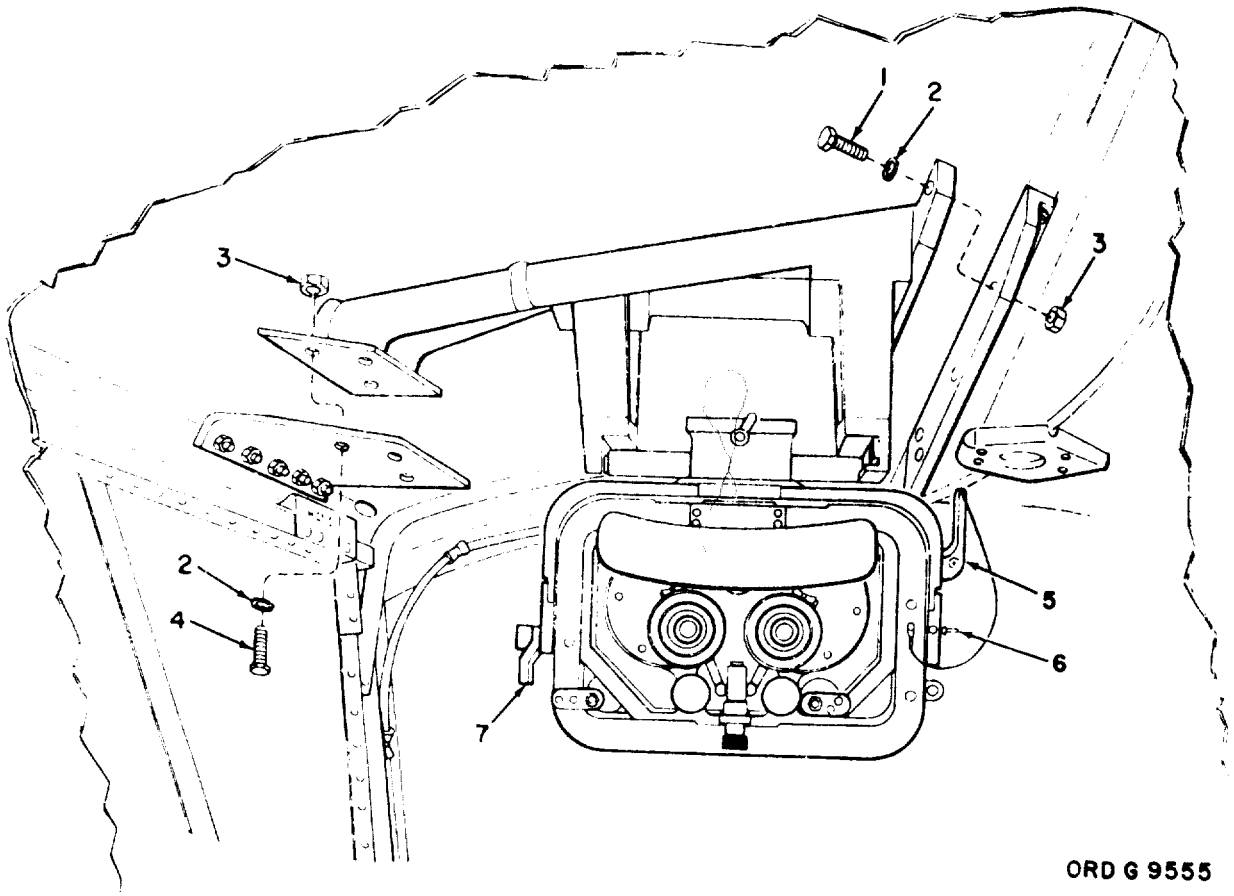
c. Install the Sight.

Note. If the sight is received disassembled perform (1) through (6); if it is received assembled perform (4) through (6) only.

(1) Insert the 3 wedge screws in the sleeve of the upper sight.

(2) Insert the sight into the collar.

***Caution*: Do not tighten the wedge screws too much, this could damage the clamping surface.**



1—Screw MS35234-67
2—Washer MS35337-81
3—Nut MS35650-104
4—Screw MS35234-66
5—Gimbal lock pin
6—Locking screw
7—Locking lever

Figure 31.3. Installation of M55 sight.

(3) Carefully tighten the wedge screws.
(4) Secure the sight to the mount with four bolts and nuts (9 and 10, fig. 31.6).
(5) Install the lamp housing.
(6) Connect the cable assembly to the lamp housing.

39. Install the Pilot's Sight Control Panel and Jettison Control Panel

a. Remove and retain the two blank panels from the pedestal where the sight control and jettison control panel are to be installed (12 and 13, fig. 29).

b. Locate connector P1047 in the pedestal and connect it to J1047 on the sight control panel.

c. Locate connector P1033 in the pedestal and connect it to J1033 on the jettison panel.

d. Secure the panels to the pedestal with the captive screws.

40. Aline the Pilots Sight with the Helicopter

Note. For this procedure, the helicopter must be on a fairly level surface where at least 80 feet of clear area will be available in front of the helicopter.

a. Level the helicopter, using-leveling jacks and a plumb bob.

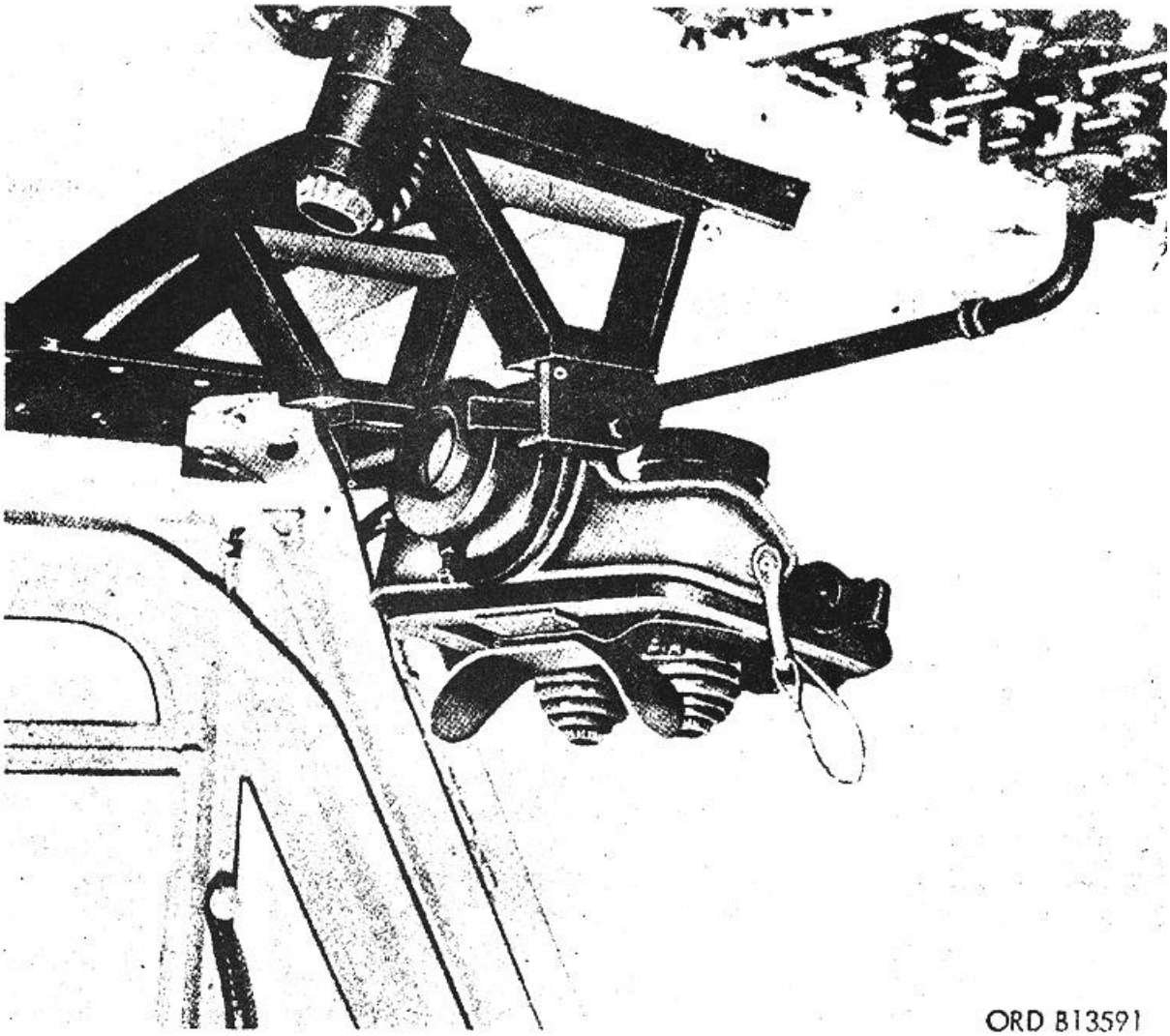


Figure 31.4. M55 sight in transport position.

***Caution*: Personnel will be allowed in the helicopter while it is on jacks only if it is stabilized as instructed below.**

b. Stabilize the helicopter by placing wooden blocks under the skids where the cross-tubes attach (four positions). The blocks must be at least four inches wide and must present a firm, flat surface to both the ground and the skid.

c. Establish the centerline of the helicopter as follows:

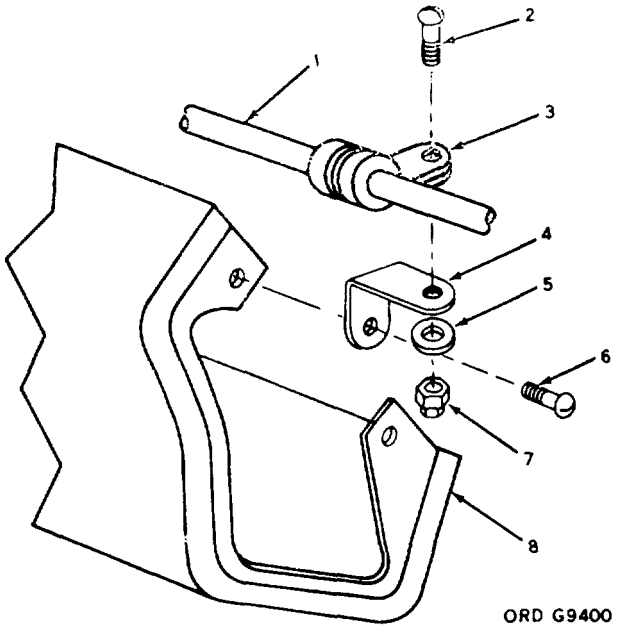
(1) Attach a 25-foot piece of non-stretch string or wire to the right-hand skid jacking point.

(2) Tie a piece of chalk (anything that will mark or scratch) to the other end of the string.

(3) Pull the string taut and mark (scribe) an arc on the ground near the centerline of the helicopter. Refer to figure 31.7 for a diagram of the procedure.

(4) Attach the string to the left-hand skid jacking point and repeat step (3) above.

(5) Repeat steps (1) through (4) above using a 55-foot piece of non-stretch string or wire.



1—Cable assembly 8643708
2—Screw 8643712
3—Clamp MS21919DG4
4—Bracket 8643711
5—Washer 8643713
6—Screw AN525D10R8
7—Nut MS20364D1032
8—Windshield-wiper guard

Figure 31.5. Securing cable to windshield-wiper guard.

(6) You should now have two crosspoints in front of the helicopter as shown in figure 31.7.

(7) Esral3.is! the centerline of the helicopter by either snapping a chalk like or staking a piece of string between the two crosspoints.

d. Aline tile sight approximately parallel to the centerline of the helicopter by loosening the clamp screws and adjusting the azimuth boresight adjustment nuts.

c. Adjust the sight until both leveling vials show level.

f. Illuminate the sight reticle by pushing in the MARK VIII PWR circuit breaker on the overhead circuit breaker panel; then rotate the OFF/MED/BRT control on the sight control panel until the reticle image' can be seen.

g. Adjust the sight reflector through its range of travel and observe whether the center of the reticle pattern travels parallel to the chalk line' established in step c(7) above. Adjust the sight in azimuth as required.

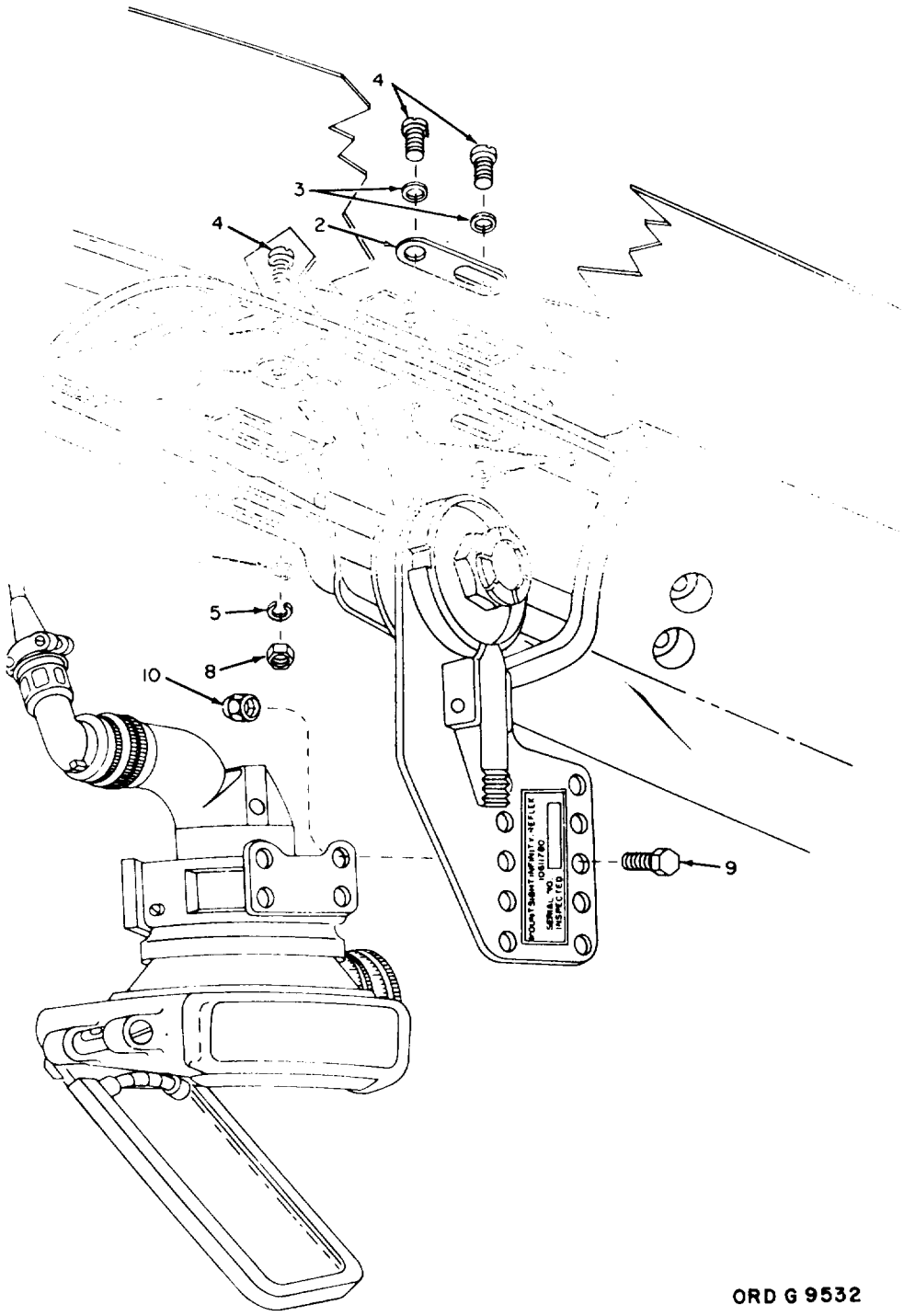
h. Take the helicopter off the jacks.

41. Aline the M55 Gunner's Sight to the Pilot's Sight

a. Position the helicopter so that a distant aiming point (1200 to 1500 meters away) is centered in the reticle pattern of the pilot's sight.

b. Adjust the M55 gunners sight in azimuth and elevation until the distant aiming point is in the center of the gunner's sight field of view.

c. Deenergize the pilot's sight.



1—Rubber gasket 10511792
2—Washer 10511797
3—Washer MS15795-309
4—Screw MS35234-67
5—Washer MS35337-81
6—Rubber gasket 10511791
7—Washer 10511796
8—Nut MS35650-104
9—Bolt MS35308-333
10—Nut

Figure 31.6 Installing the pilot's sight mount.

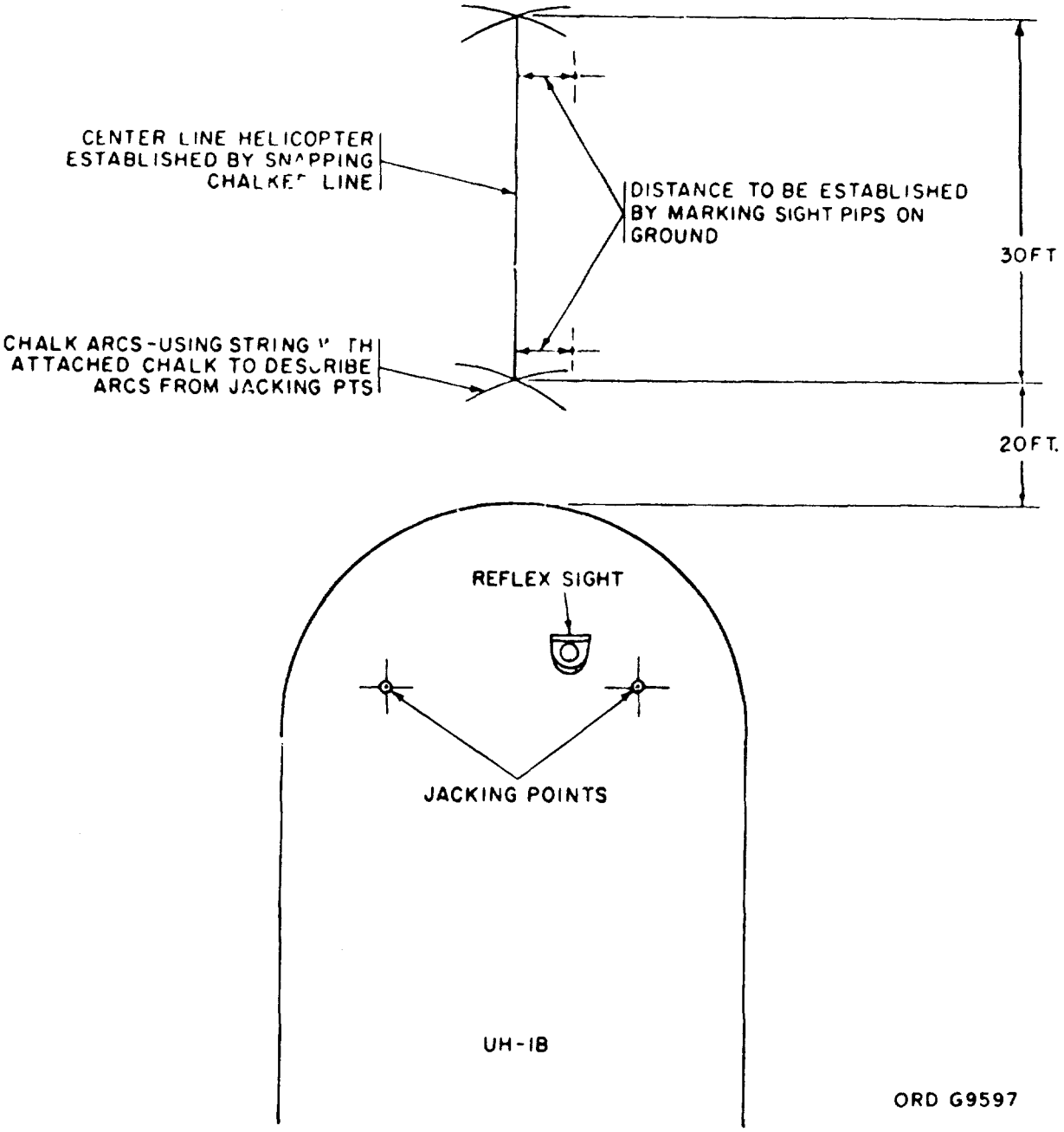


Figure 31.7. Alinement of pilot's sight.

41.1. Install the XM58 Sighting System

a. Prepare the Aircraft.

Note. Retain all hardware removed in steps (1) through (5) below.

(1) Locate and prepare area, station 66.45 and right B.L. 8.03 for electronic control amplifier base plate by removing existing fasteners in cabin floor.

(2) Locate cutout in pilot's instrument panel for the line of sight indicator (LOSI). Assure that LOSI fits into cutout and all screw holes aline.

(3) Locate and prepare areas for the roof mount by removing 10 screws on outboard side over co-pilot's door, and 14 screws at left B.L. 14.00 on the roof of the aircraft.

(4) Convert ASW-12 circuit breaker to XM58 POWER. If AW-STAB wire is installed, remove and stow. Cover ASW-12 decal with white tape embossed XM58 POWER.

(5) Remove cover from center post between the windshields. Place cover and attaching hardware in nearby convenient location.

b. Install the Roof Mount (fig. 31.8).

(1) Apply sealing compound to underside of strap (1). Place strap at left B.L. 14. (outer roof of aircraft), alining strap holes with the 14 vacant screw holes (para. *a*(3) above). The man inside the aircraft alines inboard bracket (2) holes and holds bracket in alined position. Apply sealing compound to underside of the head of 14 bolts (3) and install bolts through strap, aircraft roof, and into bracket. Tighten bolts enough to hold bracket but do not torque.

(2) Apply sealing compound to under side of angle (4). Attach angle to outer outboard area over co-pilot's door using five bolts (5) (sealing compound under head), five washers (6), and five nuts (7) in the four aft and first forward bolt holes. Tighten nuts enough to hold angle but do not torque.

(3) Aline bolt holes in bracket (8) with remaining vacant holes in angle (4) and the aircraft. Attach bracket using five bolts (9) (sealing compound under head). Tighten bolts enough to hold bracket but do not torque.

c. Install the Sight Assembly Group (fig. 31.9).

(1) Remove the two screws securing the sight assembly group to packing support (18).

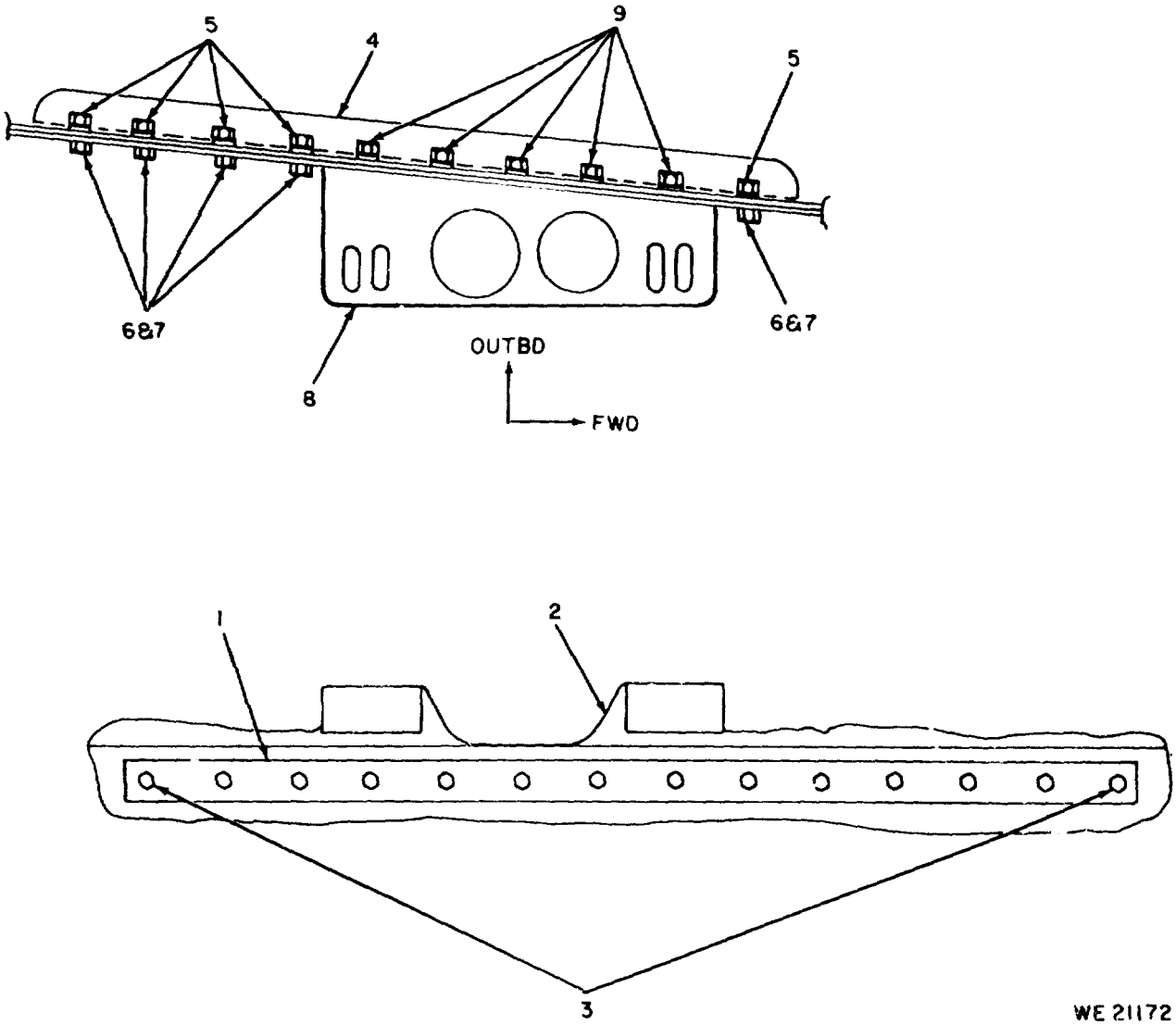
(2) Attach one block (10) under the outboard end of each support tube. Line up screw holes in the block with slots in support tube and install one screw (11) with flat washer and lockwasher (12 and 13) through each slot into screw hole in block (two screws required for each block). Tighten screws enough to hold but do not torque.

Note. The key numbers in parentheses below refer to figure 31.10.

(3) Remove and retain screw (1) and washer (2) from inboard side of control box. Lift sight assembly group from packing support and place in the hands of a man in the co-pilot's position. Raise the group up into position, pushing the support tubes as far outboard as they will go. Jockey the inboard ends of support tubes into the socket-like recesses in the inboard bracket. Let the outboard ends come to rest on outboard bracket.

(4) Install one washer and screw (4 and 5) through inboard bracket and into the end of each support tube (3). Tighten screws enough to hold but do not torque.

(5) Aline the remaining vacant screw holes in block adjustments (6) with slots in outboard bracket. Install one screw (7) with flat washer (8) and lockwasher (9) through each slot into block (two screws required for each block). Tighten screws enough to hold but do not torque.



1-Inboard strap, 10527488
2-Inboaid roof bracket, 10527330
3-No. 10-32 x 518 machine bolt, (AN3C10A), 5305-776-7956 (14)
4-Outboard angle, 10527487
5-No. 10-32 x 5/32 machine bolt, (AN3C3A), 5306-156-2336 (5)
6-No. 10 split lockwasher, (MS35337-1), 5310-058-29561 (5)
7-No. 10-32 plain hexagon nut, (MS35650-104), 5310-270-8810 (5)
8-Outboard roof bracket, 10527486
9-No. 10-32 x 13/32 machine bolts', (AN3C7A), 5306-156-2328 (5)

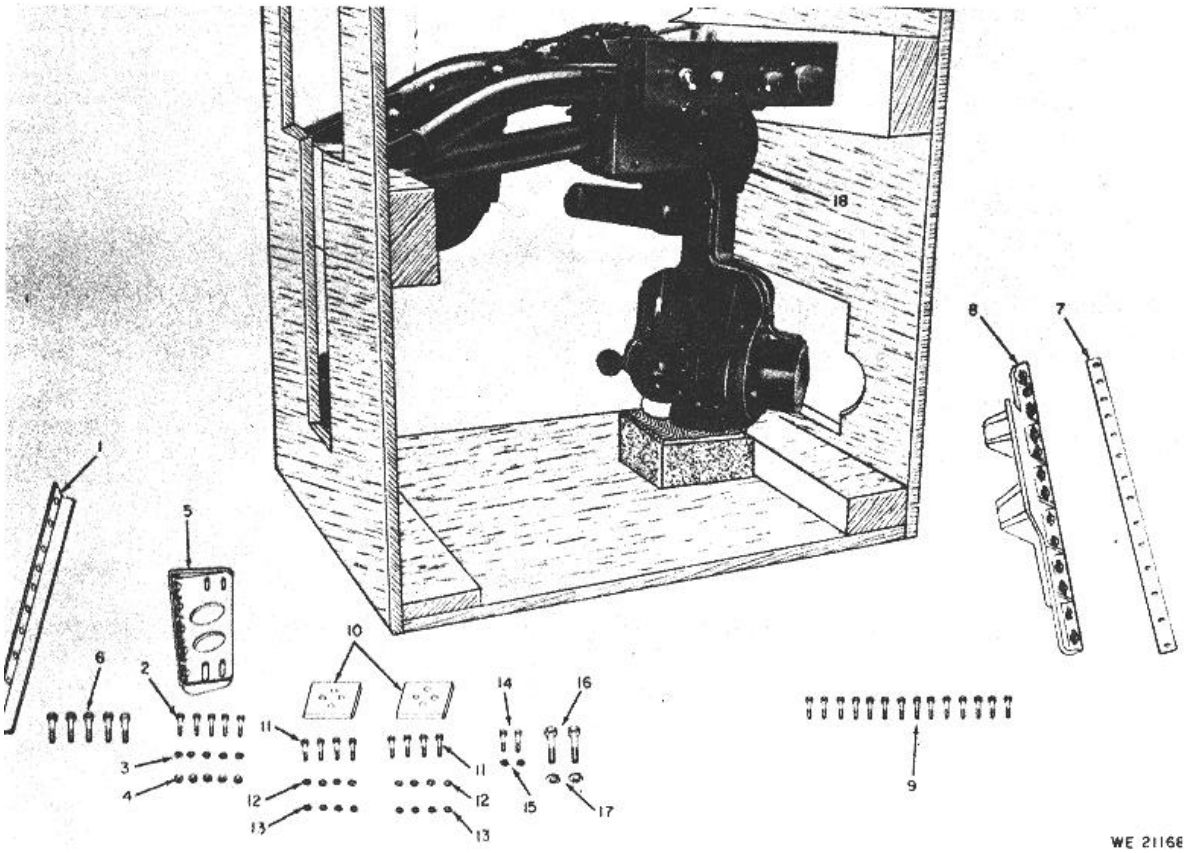
Figure 31.8. Roof mount installation.

(6) Install one screw (10) with washer (11) through each support tube into inboard bracket. Replace screw (1) and washer (2).

(7) Tighten and torque all bolts, nuts and screws installed in b and c above leaving screws (7) until last to compensate for any misalinement.

d. Install the Power Cable Assembly. The general routing of power cable is shown in figure 31.11; and details are shown in figures 31.12 and 31.13. Installation should start at the J2 connector on the control box (sight assembly group) and end at-the aircraft circuit breaker now marked XM58 POWER.

(1) Install blind rivet nut, NAS1329S3K80,



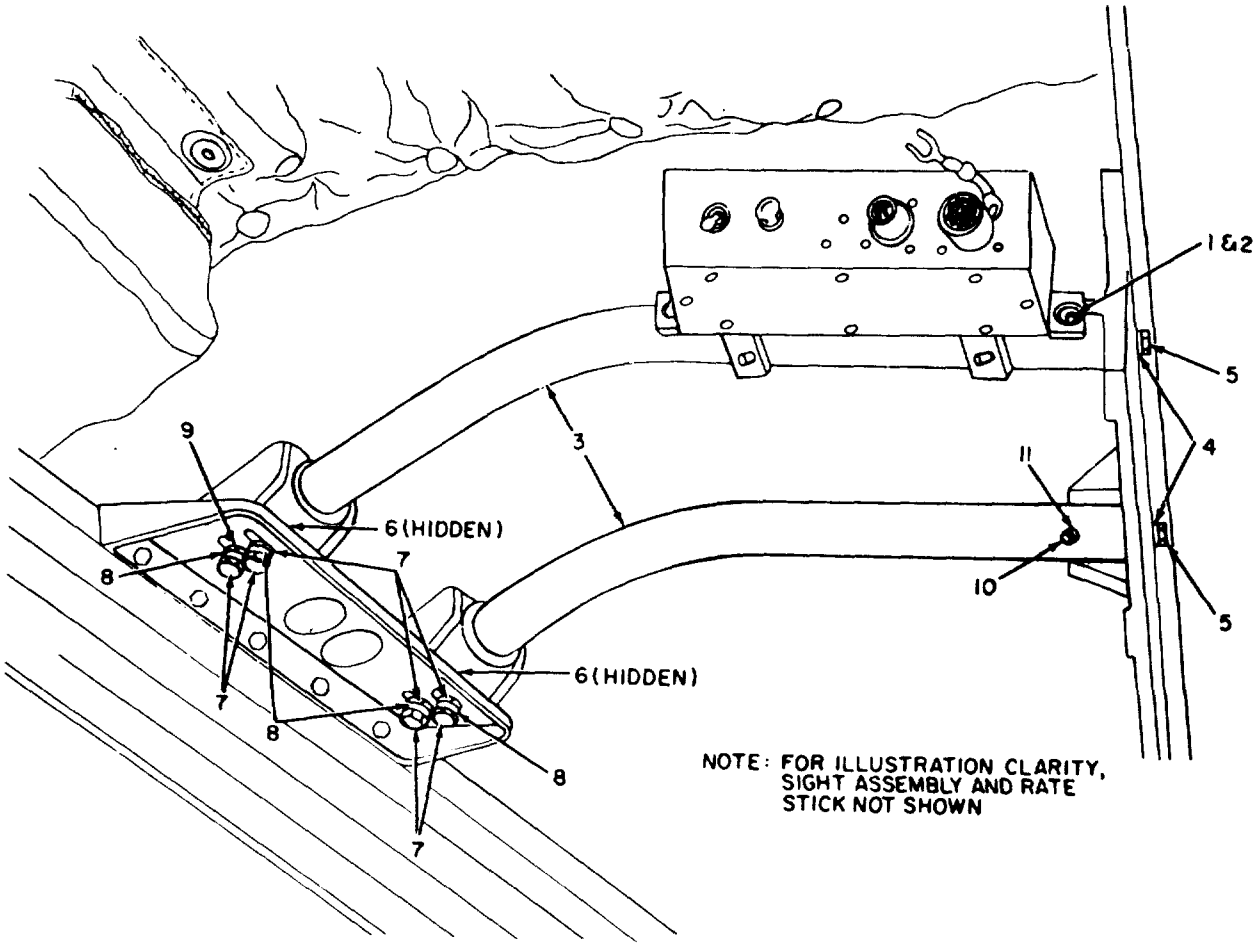
1-Outboard angle, 10527487
2-No. 10-32 x 5/32 machine bolt, (AN3C3A), 5306-156-2336 (5)
3-No. 10 split lockwasher, (MS:35337-81), 5310-058-2951 (5)
4-No. 10-32 plain hexagon nut, (MS35650-104). 5310-270-8810 (5)
5-Outbroaid roof bracket, 10527486
6-No. 10-32 x 13/32 machine bolt, (AN3C7A), 5306-156-2328 (5)
7-Inboard strap, 10527488
8-Inboard roof bracket, 10527330
9-No. 10-32 x 5/8 machine bolt, (AN3C1OA), 5305-776-7956 (14)
10-Block adjustment, (10527352), 1270-999-2720 (2)
11-1/4-20 x 5/8 cap screw, (MS90728-5), 5305-068-7837 (8)
12-1/4 flat washer, (MS15795-810), 5310-880-5983 (8)
13-1/4 split lockwasher, (MS35337-82), 5310-043-5862 (8)
14-1/4-20 x 3/4 cap screw, (MS16995-50), 5305-988-7614 (2)
15-1/4 split lockwasher, (MS35337-82), 5310-043-5862 (2)
16-1/4 20 x 2 cap screw, (MS90728-14), 5305-071-2511 (2)
17-1/ 4 split lockwasher, (MS35337-82), 5310-043-5862 (2)
18-Sight assembly group, (5801013), 1270-910-4440, (in packing support)

Figure 31.9. Equipment for roof installation.

in the 1/4-inch hole in frame, 204-030-379 (fig. 31.12).

(2) Connect power cable to J2 on control box. Six inches from connector, install clamp MS21919-DG2 on cable and using screw, AN525-10R8, and washer, AN960-PD10OL, secure clamp to frame, turning the screw into blind rivet nut, NAS1329S3K80. Run the cable along frame, 204-030-379, to frame, 204-030-617. Secure cable to frame, 204-030-617, using existing clamp.

(3) Separate the hot and ground leads. Run the ground lead through existing clamps to grounding lug of co-pilot's overhead map lamp. See figure 31.12. Attach the number 10 stud size terminal to ground



1—No. 8-32 x 2-1/4 cap screw, AN515C8R36
2—No. 8 split lockwasher, (MS35337-80), 5310-042-9067
3—Support tube
4—1/4 split lockwasher, (MS35337-82) 5310-043-5862 (2)
5—1/4-20 x 3/4 cap screw, (MS16995-50) 5305-988-7614 (2)
6—Block adjustment, (10527352) 1270-999-2720 (2)
7—1/4-20 x 5/8 cap screw, (MS90728-5) 5305-068-7837 (4)
8—1/4 flat washer, (MS15795-810) 5310-880-5983 (4)
9—1/4 split lockwasher, (MS35337-82) 5310-043-5862 (4)
10—1/4-20 x 2 cap screw, (MS90728-14) 5305-071-2511 (2)
11—1/4 split lockwasher, (MS35337-82) 5310-043-5862 (2)

Figure 31.10. Sight assembly group installation, (5801013, 1270-910-4440).

lead. Using existing hardware, secure terminal to ground stud.

(4) Run the hot lead through existing grommets; along existing cable; tying to existing cable with type P, class II twine; and then to XM58 POWER circuit breaker. See figure 31.13. Attach the No. 8 stud size terminal to hot lead. Use existing hardware to secure terminal to circuit breaker.

e. Install the Interconnecting Cable (fig. 31.11).

(1) Connect cable P1 to J1 on the control

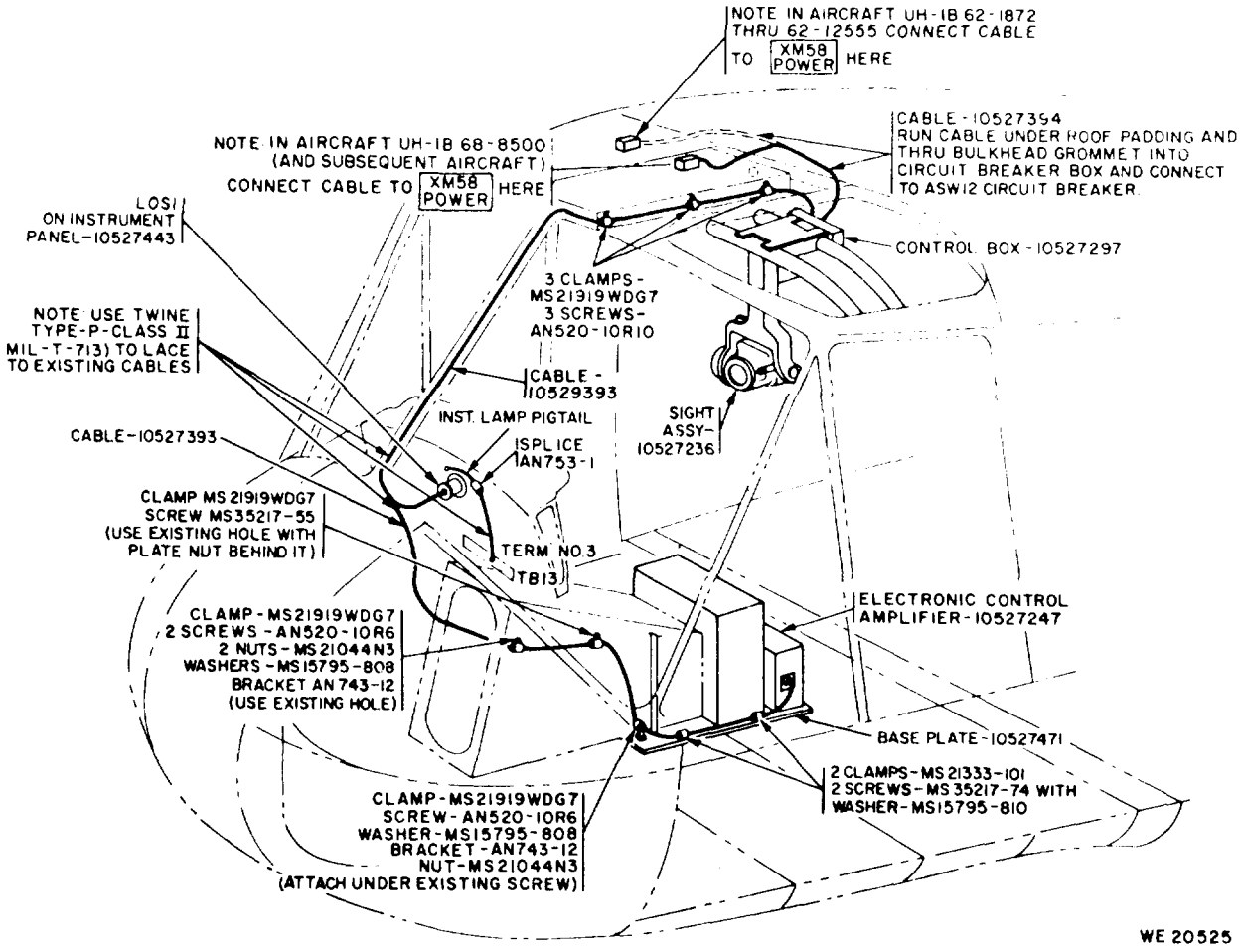


Figure 31.11. Cable routing.

box (sight assembly group). Run cable along co-pilot's side of the overhead console. Remove the three existing screws. Use three clamps with screws to secure the cable.

(2) Route cable down center post channel, tying to existing cable with type P, class II twine. Work the wiring well into the channel. Replace center post cover.

(3) Run cable behind pilot's instrument panel letting it emerge on the copilot's side of floor console just below the ashtray. Secure cable to console using clamp two screws, two washers, two nuts, and bracket to make the attachment.

Note. The bracket is attached to an existing hole in the flange of the console.

(4) Run the four wires, that break off from main cable, to LOSI cutout and pull them through the cutout. Tie the main cable to existing cabling behind instrument panel.

(5) Route main cable aft-near the top of the console-securing it with a clamp and screw, using the existing hole with a plate-nut behind it, which is located part way back on the console.

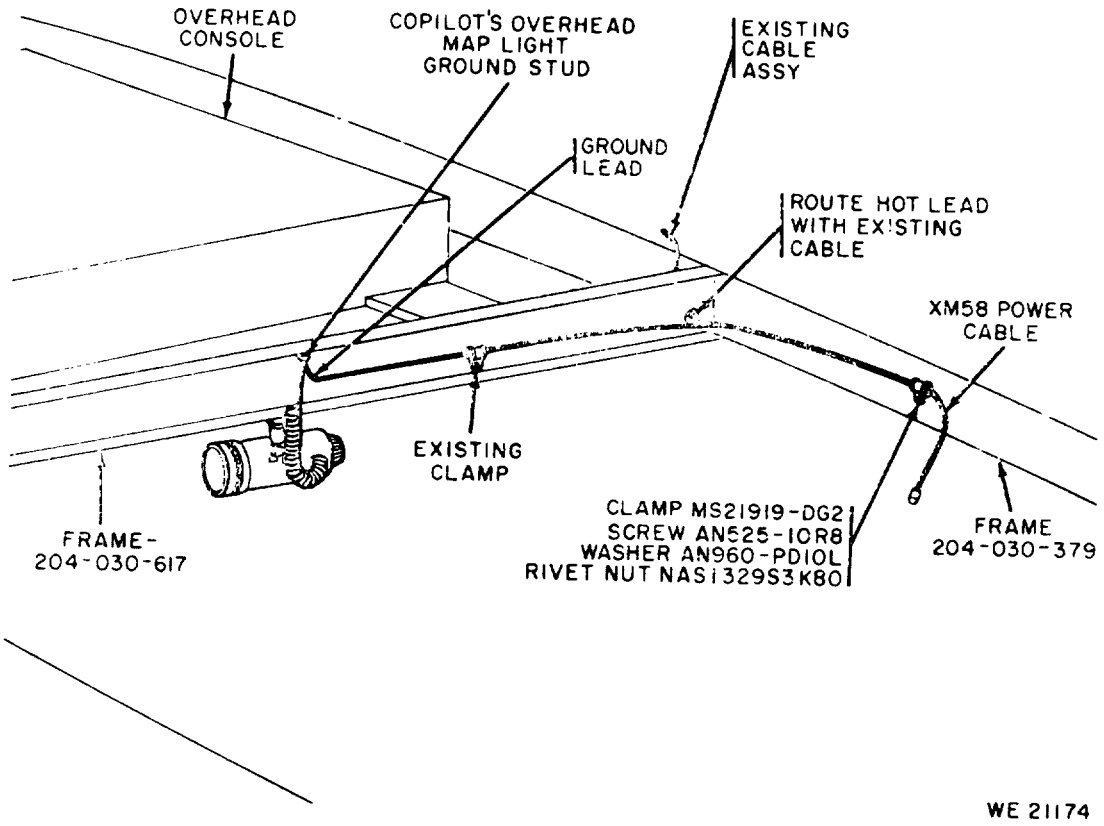


Figure 31.12. Power cable installation (ground lead).

(6) Run cable downward and attach to one of the mounting screws holding the missile control stick pedestal to the honeycomb base. Use clamp, screw, washer, nut, and bracket to attach.

(7) Remove the two 1/4-inch screws holding honeycomb base to cabin floor and attach cable at each of these points. Use clamp, washer, and screw for forward slotted hole, use clamp and screw for aft hole.

f. Install the Line of Sight Indicator (LOSI).

(1) Disassemble holder lamp assembly as shown in figure 31.14. Connect terminal of splice (1) to terminal 3 on terminal board 13 (at the rear of copilot's instrument panel). Push pigtail of lamp housing (4) through the 0.125 diameter hole to upper right of LOSI 38.14 cutout. Connect pigtail and splice behind panel.

Note. Access to the back of the instrument panel is gained through the access door in the nose of the aircraft.

Note. Items 1 through 5 (fig. 31.14) are integral components of holder lamp assembly 6256999-2721, and are not stocked or issued as separate items.

(2) Connect the four wires from the interconnecting cable to the four post terminals at base of LOSI matching wire identification to terminal identification.

(3) Refer to figure 31.15. Set LOSI in cutout and install the two lower screws and anchor them on the rear of instrument panel with the two spring nuts.

(4) Position mounting plate (5, fig. 31.14) around top of LOSI, alining screw

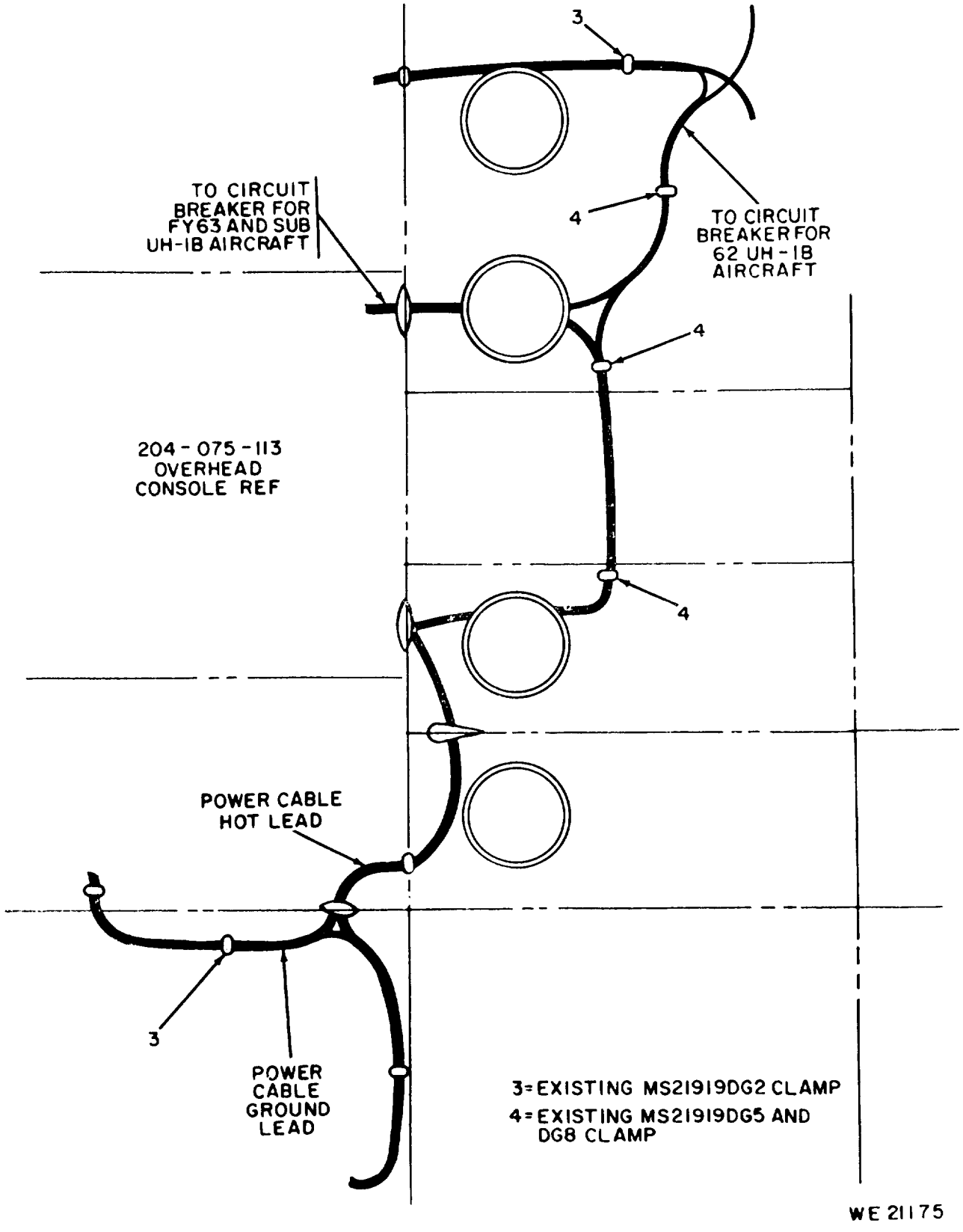


Figure 31.13. Power (cable installation (hot lead).

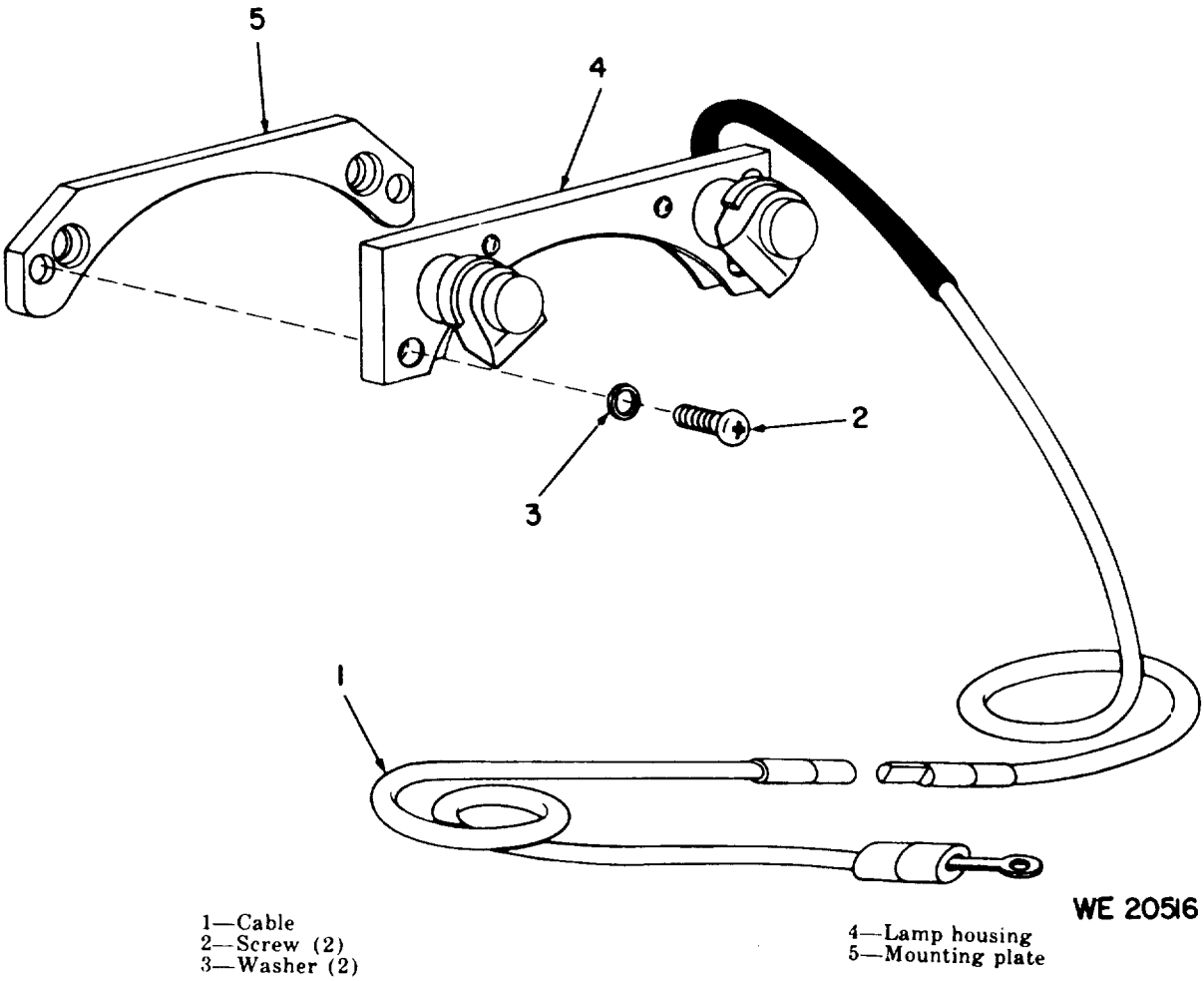


Figure 31.14. Holder lamp assembly-partial exploded view.

holes. Install the two upper screws through plate and LOSI, anchoring them on the rear of panel with the two spring nuts.

(5) Position lamp housing (4, fig. 31.14) on mounting plate with screw holes alined. Install washers and screws (3 and 2, fig. 31.14).

(6) Tie peripheral lighting wire to existing wiring behind instrument panel so it will not vibrate independently and cause failure.

g. Install the Electronic Control Amplifier (fig. 31.16).

(1) Attach electronic control amplifier to base plate in the position shown in figure 31.16.

(2) Install amplifier and base plate assembly.

(3) Connect P2 of interconnecting cable to J1 connector.

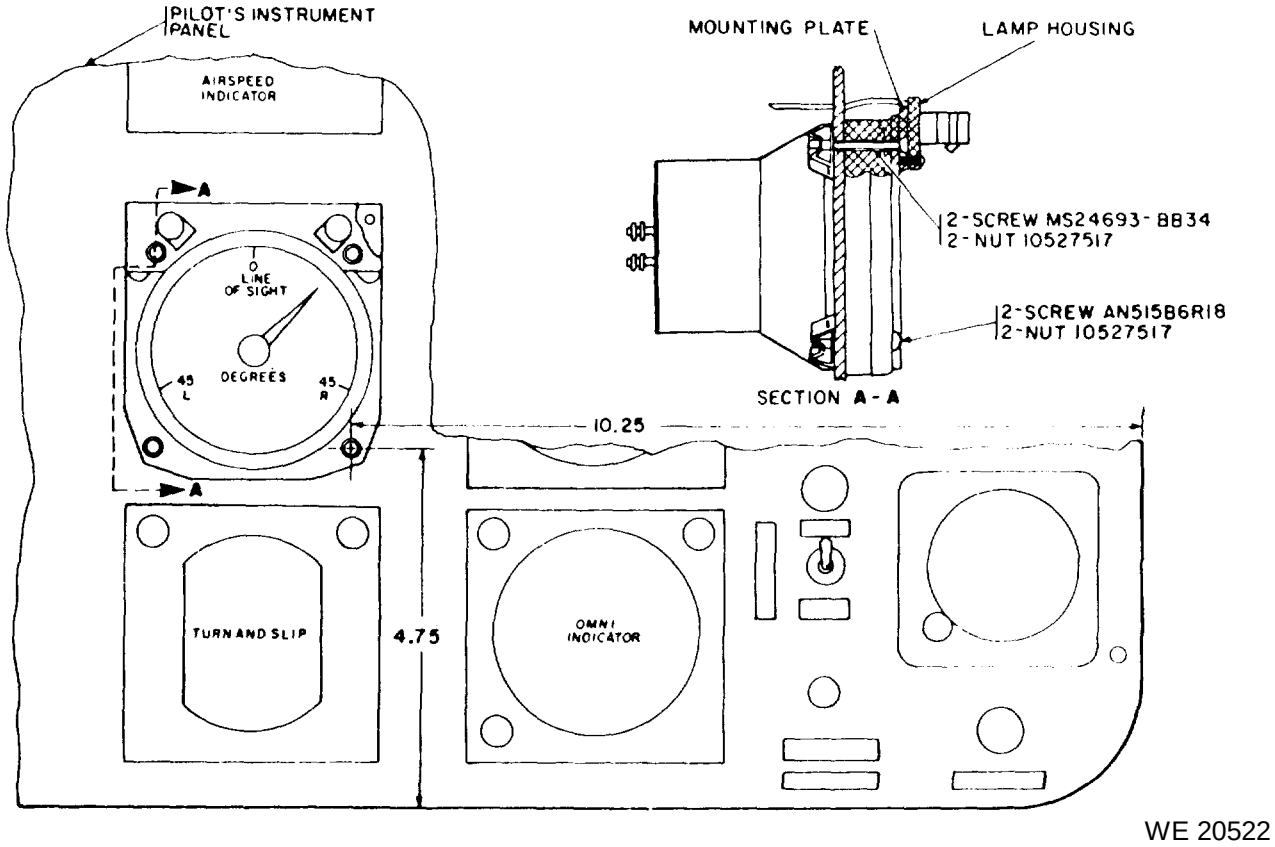


Figure 31.15. LOSI installation.

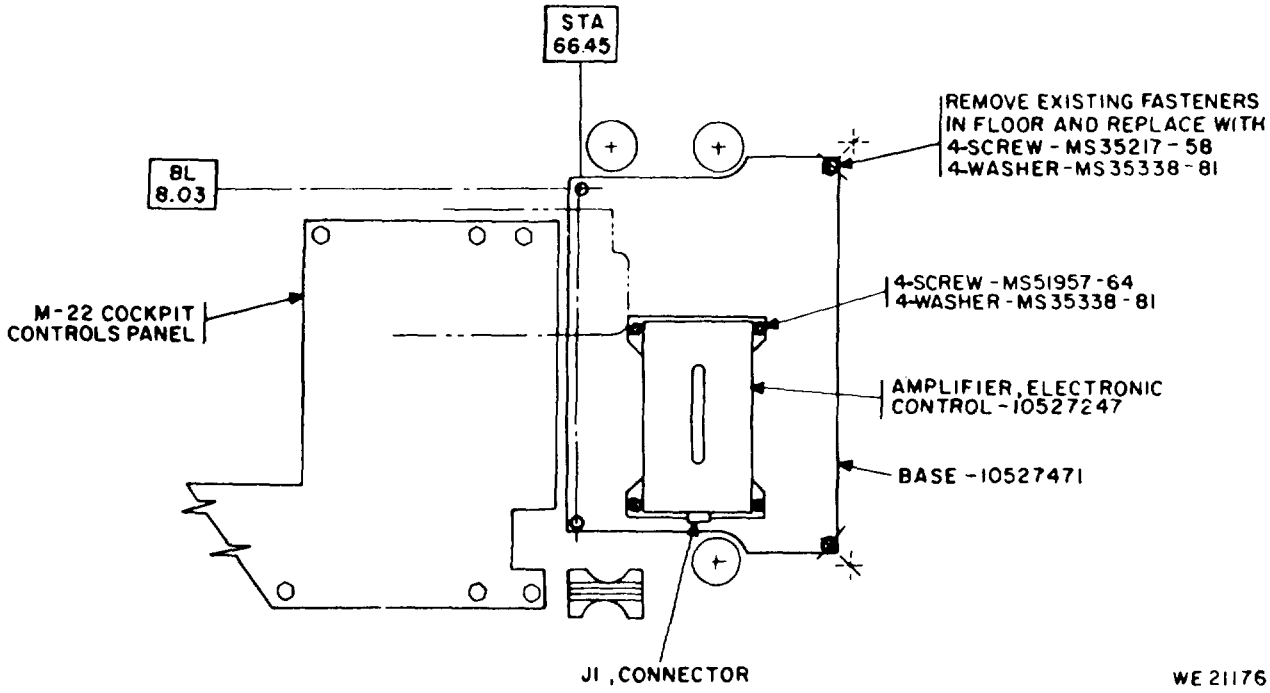


Figure 31.16. Electronic control amplifier installation.

CHAPTER 6

PREFLIGHT AND POSTFLIGHT PROCEDURES FOR ORGANIZATIONAL MAINTENANCE

Section I. CONTROLS AND INDICATORS

42. General

This chapter contains the daily operational checks, controls and indicators for the equipment, installation and checkout of the missile, and the removal and postflight procedures. Also, instructions for removal of the subsystem are included, if you need to repair the subsystem after flight.

43. Controls and Indicators

Tables 4 through 9 contain the controls and indicators needed to perform the necessary checks and adjustments that will determine if the subsystem will operate properly.

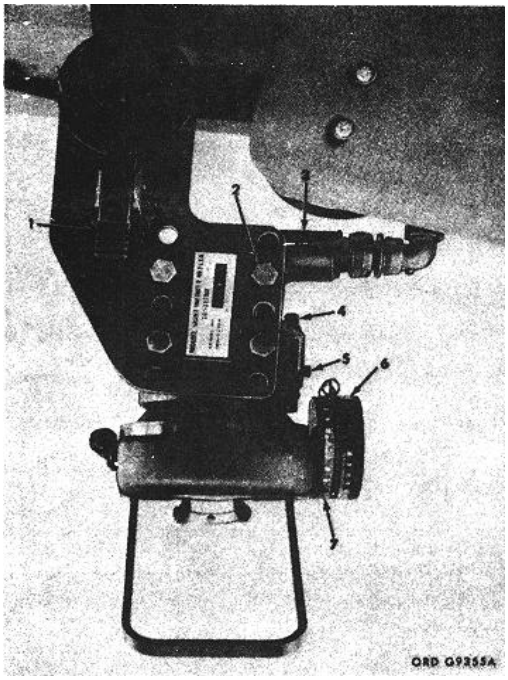


Figure 32. Pilot's sight.

Table 4. Pilot's Sight--Controls and Indicators (fig. 32)

Key	Control or Indicator	Type	Function
1	Locking clamp	Spring	Locks the sight in the opened or stowed position
2	Mounting bolts	screw type	Secures the sight of the mount.
3	Lamp housing	Tubular	Contains the lamp for lighting the reflector.
4	Boresight adjustment nut	Screw type	Allows fine adjustment of the sight in the horizontal and vertical planes.
5	Boresight adjustment clamp screw	Screw	Locks the boresight adjustment nuts.
6	Adjustable knob	Knob	Controls the position of the reflector.
7	Fixed scale		Not used for M22 subsystem.

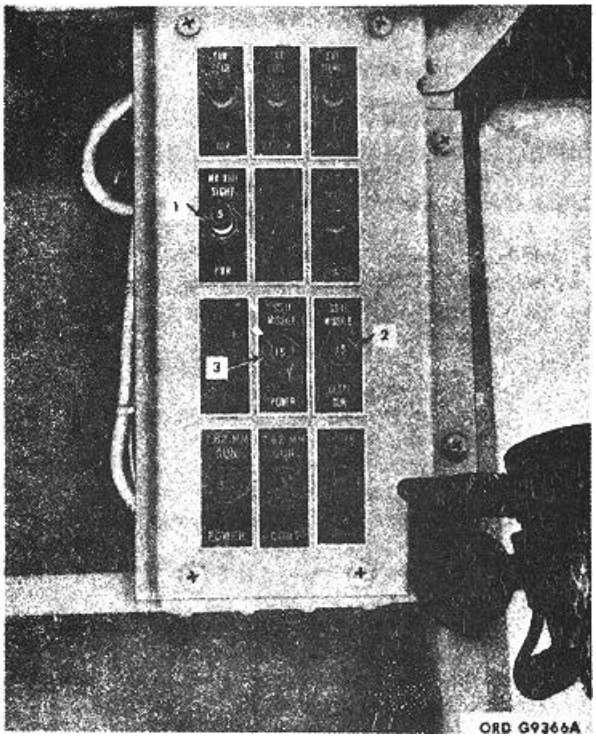


Figure 33. Circuit breaker, controls and indicators.

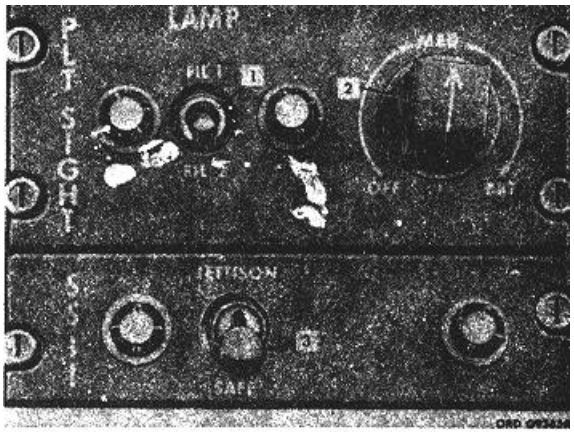


Figure 34. Center console, controls and indicators.

Table 5. Overhead Circuit Breaker Panel-Controls and Indicators (fig. 33)

Key	Control Or Indicator	Type	Function
1	MK VIII SIGHT PWR	Circuit breaker	Energizes the pilot's sight lamp.
2	SS-11 MISSILE JETTISON	Circuit breaker	Applies power to the explosive bolt circuitry.
3	SS 11 MISSILE POWER	Circuit breaker	Applies power to the armament subsystem.

Table 6. Center Console-Controls and Indicators (fig. 34)

Key	Control Or Indicator	Type	Function
	Mechanical jettison lever (fig. 22)	Lever	Enables the pilot to mechanically jettison both launcher support assemblies.
1	Pilot JETTISON SAFE switch	Toggle	Enables the pilot to jettison electrically all missiles and launchers.
2	Pilot-sight-lamp rheostat (OFF-MED-BRT)	Rotary	Controls the intensity of illumination of the reticle in the pilot's sight.
3	FIL-1/FIL-2 lamp	2-position toggle	Applies power to one of the filaments in the two-filament reticle lamp in the pilot's sight.

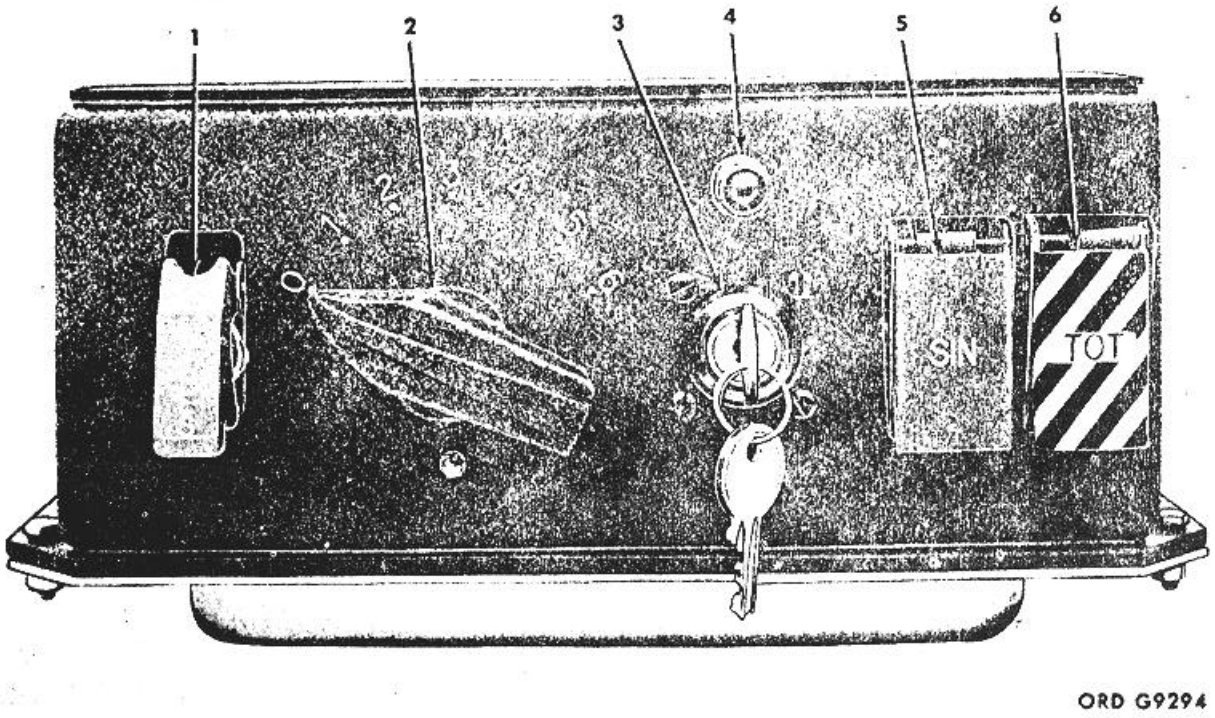


Figure 35. Missile selection box, controls and indicators.

Table 7. Missile Selection Box-controls and Indicators (fig. 35)

Key	Control Or Indicator	Type	Function
1	WIRES switch (under cover)	Spring-loaded toggle	Applies voltage to wire-jettison cartridges in missile junction box.
2	Missile selection switch	Seven-position rotary	Connects firing, guidance wire-jettison and individual jettison circuits to missiles and launchers. 0 position is off; positions 1 through 6 correspond to missiles or launchers 1 through 6.
3	Key switch	Ignition type, key operated	Connects voltage from helicopter supply to missile subsystem.
4	Power lamp	Indicating (adjustable blackout)	Glows when key switch is turned on, indicates that voltage from helicopter supply is applied to missile subsystem.
5	SIN jettison switch (under protective hood)	Spring-loaded pushbutton	Applies voltage to the explosive bolt for one launcher, which is selected by the missile selection switch.
6	TOT jettison switch (under protective hood)	Spring-loaded pushbutton	Applies voltage to the explosive bolts securing the launchers to the fixed housings. Jettisoning all launchers simultaneously. ***Warning:*** **The TOT switch activates the explosive bolts regardless of the position of the KEY switch.**

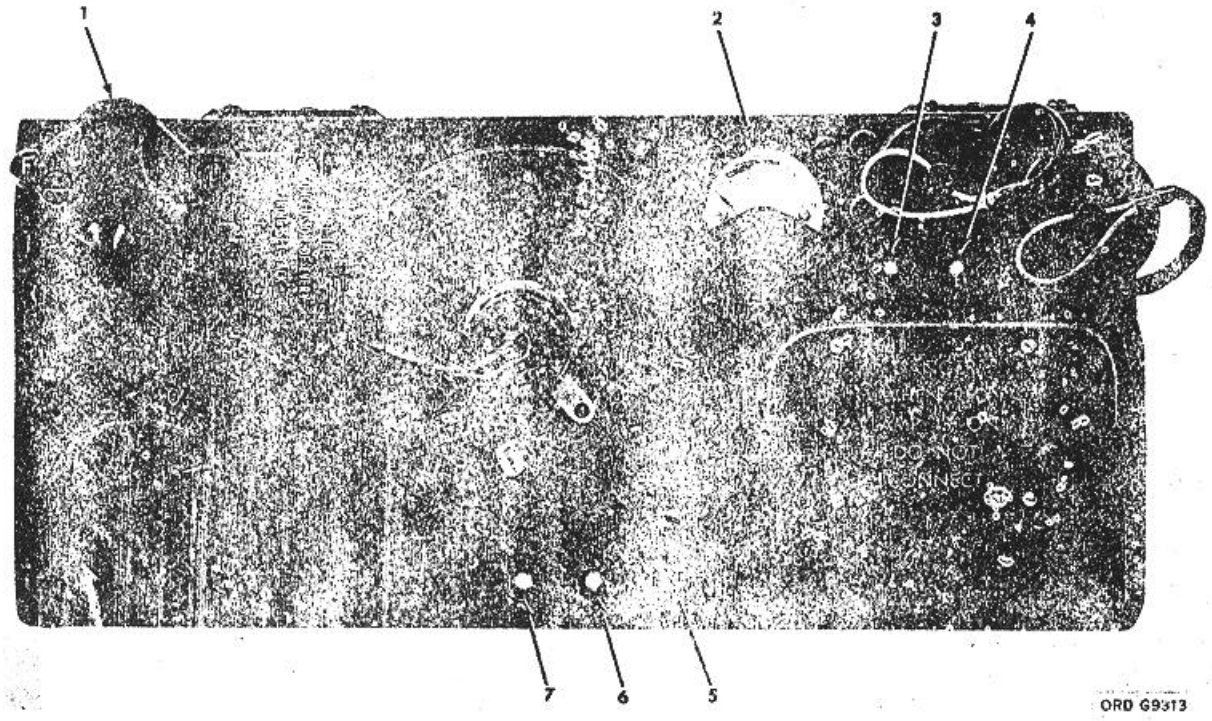


Figure 36. GCU, controls and indicators.

Table 8. Guidance Control Unit-Controls and Indicators (fig. 36)

Key	Control Or Indicator	Type	Function
1	Firing switch	Spring-wound clock mechanism type; held at off (0) position by mechanical stop	Permits testing of the input voltage and the pitch and yaw signals output of the coder when held counterclockwise in the C (test) position. When switch is lifted and released, automatic spring action turns the switch clockwise through IG, UG, FB, and F positions.
2	Voltmeter		Indicates voltages input to subsystem box from helicopter supply.
3	Firing lamp	Indicating (red)	Glows when safety firing switch is at IG, UG, or FB positions, indicating that power is applied to the ignition circuits of the missiles and launchers.
4	Safety lamp	Indicating (green)	Glows when firing switch is at position F and continues to glow until switch is reset to the 0 position. Indicates that ignition and firing circuits are disconnected.
5	FF/VF switch	Two-position toggle	Controls frequency of guidance signals produced by signal generator module. At VF position, module produces a signal increasing from 10 to 16.5 cycles per second.
6	Yaw test lamp	Indicating (orange)	Oscillates on and off to indicate yaw command output of signals coder.
7	Pitch test lamp	Indicating (white)	Oscillates on and off to indicate pitch command output of signal generator module.

43.1. Controls and Indicators for XM58 Sighting System

Controls and indicators for the XM58 sighting system are shown on figures 36.1 and 36.2.

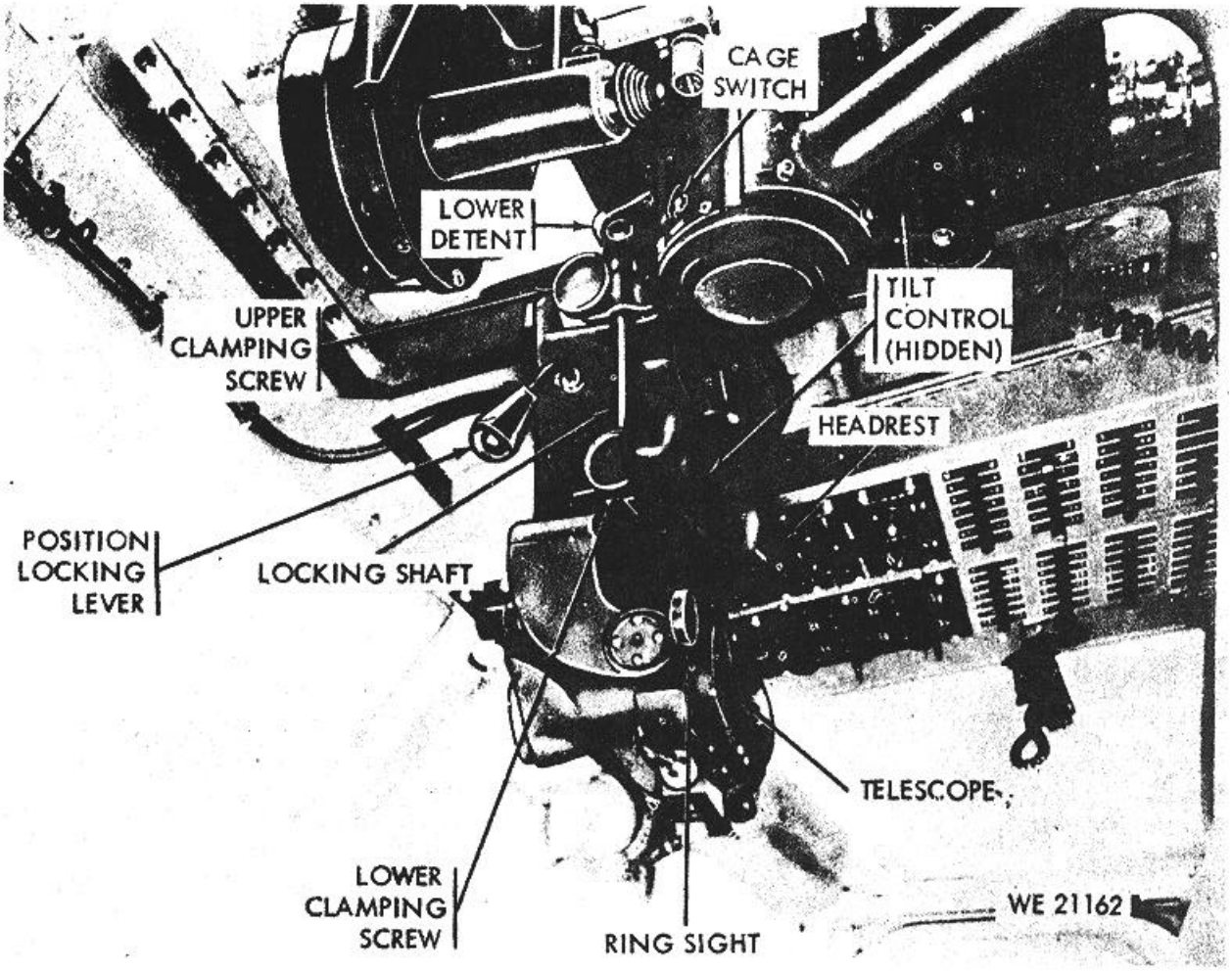


Figure 36.1. XM58 sight.

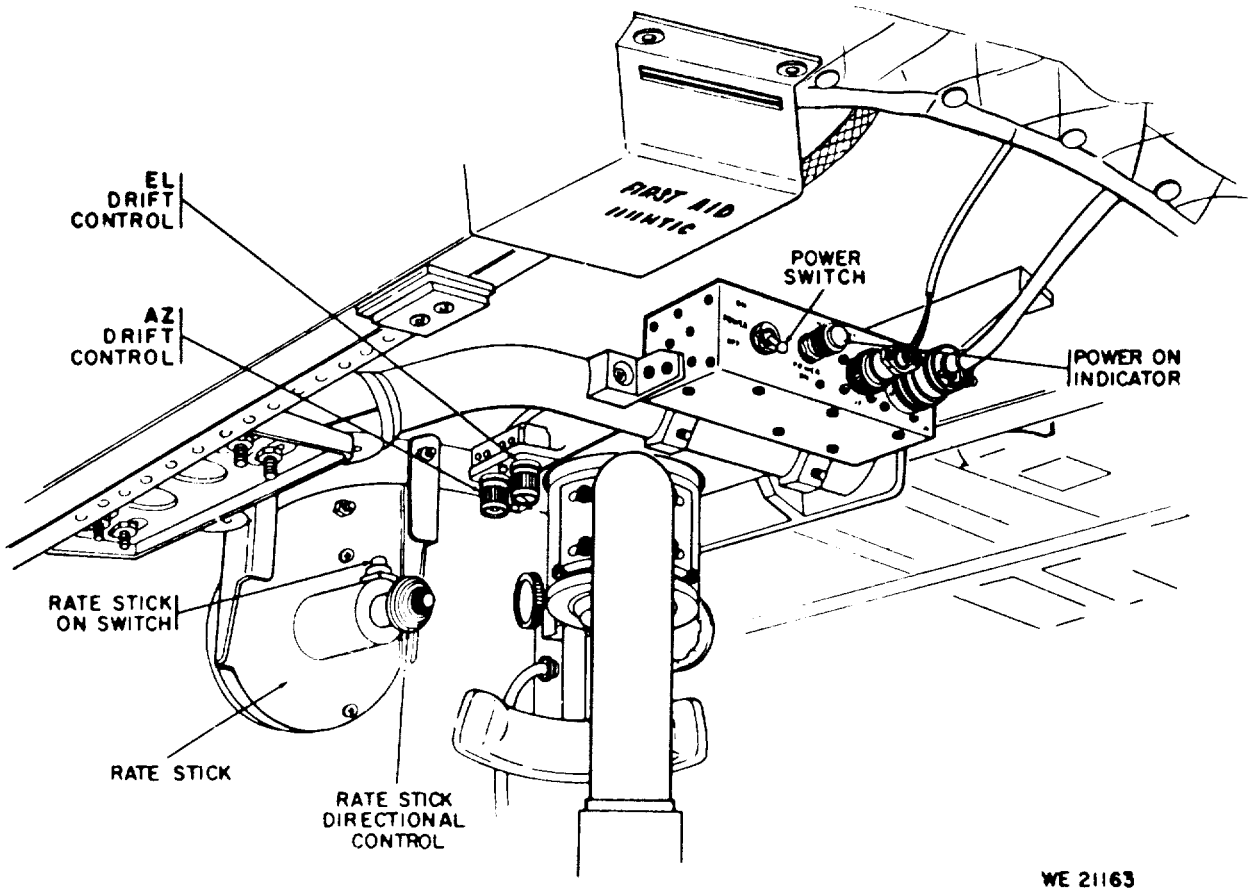


Figure 36.2 XM58 sight (line drawing).

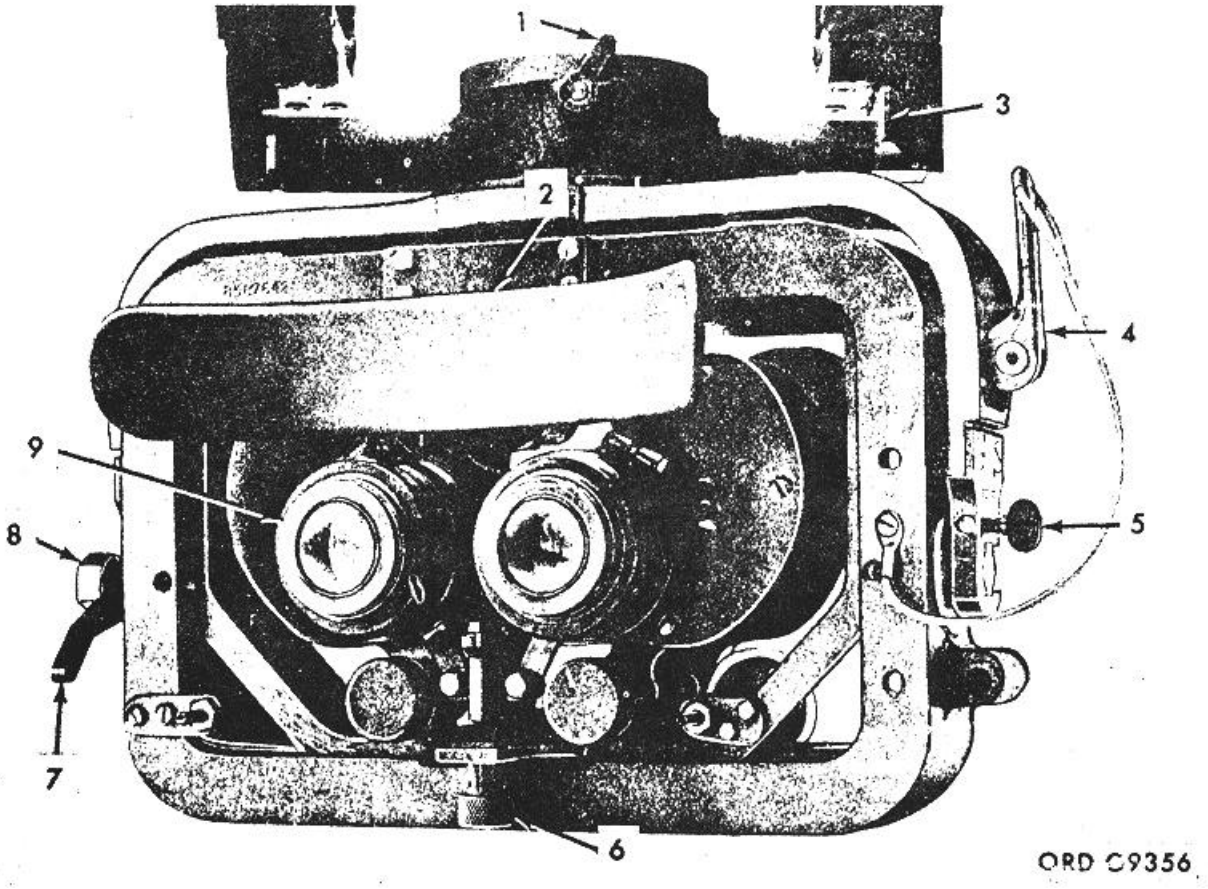


Figure 37. Gunner's sight.

Table 9. Gunner's Sight Controls and Indicators (fig. 37)

Key	Control Or Indicator	Type	Function
1	Azimuth locking lever	Screw clamp	Allows adjustment of gunner's sight in azimuth.
2	Headrest locking lever	Lever	Releases the headrest so that the headrest can be adjusted to the gunner.
3	Spring lock	Spring	Secures the sight in the operating or stowed position.
4	Gimbal locking pin	Pin	Locks components of the sight and support when not in use.
5	Elevation locking thumbscrew	Screw	Secures the sight in the pitch or elevation altitude.
6	Interpupilary adjusting knob	Screw	Adjust the distance between the two eyepieces.
7	Locking lever	Friction clamp	Secures or releases the sight so that the sight rotates about the horizontal axis.
8	Retaining nut	Screw	Secures the locking lever on shaft.

Section II. DAILY OPERATIONAL CHECKS AND SERVICES

44. Operational Checks Perform these checks before operation or after the armament subsystem has been repaired. Also, perform the maintenance serviceability evaluation as indicated in chapter 4. When any assembly has been replaced because of a malfunction, refer it to a field maintenance team.

Table 10. Daily Operational Checks and Services

Preparation for test:

a. Equipment required:

(1) Test set
(2) Test cable
(3) Explosive-cartridge circuit tester
(4) Explosive-bolt circuit tester
(5) Gunner's quadrant

b. All optical, guidance, jettisoning, and launching equipment must be installed and all cables connected. Don't connect a missile or an explosive cartridge to the system. Connect all explosive-bolt cables connectors to the shorting plugs in the fixed housings (fig. 24).

c. Make all daily preventive maintenance checks (table 11) before you begin the operational check.

Step	Operation and normal indication	Corrective action
1	**Perform the preliminary procedures prior to application of power.** *a.* At the helicopter overhead circuit breaker panel, pull out the SS-11 POWER and SS-11 JETTISON circuit breakers. *b.* At the aircraft pedestal panel, set the SS-11 JETTISON/SAFE switch to SAFE. *c.* At the missile selection box, turn the key switch to off and set the missile selection switch to 0. *d.* At each launcher, check to see that the explosive cartridge is removed.	
2	**Energize the system.**	
Note. Always use external power (APU), when available, to conserve the aircraft battery.		
	a. At the helicopter overhead circuit-breaker panel, set the BAT ON/OFF switch to OFF (when using APU) or to ON (when using the battery). Set the NON-ESS BUS switch to MANUAL ON. *b.* Set the VM selector switch on the overhead panel to the NON-ESS BUS position and observe the volts, DC meter on the instrument panel. **The meter indicates between 23 and 30 volts.**	Report to aircraft maintenance personnel.

Step	Operation and normal indication	Corrective action
	c. At the helicopter overhead circuit-breaker panel, press in the SS-11 POWER and SS-11 JETTISON circuit breakers.	
	d. At the missile selection box, turn the key switch to the ON position.	
	The power lamp glows.	Replace the lamp.
	e. At the GCU set and hold the safety switch on position C (test). Observe the voltmeter indication.	
	The voltmeter on the GCU indicates in the red band.	Check helicopter DC volt meter. Replace the GCU.
3	**Perform gunner's guidance command check.**	
	a. Hold the firing switch on the GCU to the C (test) position.	
	b. With the control stick in the neutral position, observe the pitch and yaw test lamps on the GCU.	
	Yaw test lamp (orange) should be indicating medium intensity (oscillating on and off) and the pitch test lamp (white) should be indicating dim intensity (oscillating on and off).	Replace GCU, control stick or control stick cable.
	c. Position the control stick in the maximum pitch up position and observe the GCU pitch test lamp.	
	Pitch test lamp should be off.	Same as above.
	d. Position the control stick in the maximum pitch down position and observe the GCU pitch test lamp.	
	Pitch test lamp should be indicating medium intensity (oscillating on and off).	Same as above.
	e. Position the control stick in the maximum yaw left position and observe the GC(U yaw test lamp.	
	Yaw test lamp should be indicating bright intensity (on all the time).	Same as above.
	f. Position the control stick in the maximum yaw right position and observe the GCU yaw test lamp.	
	Yaw test lamp should be off.	Same as above.
4	**Check the missile-release explosive cartridge circuit.**	
	a. Insert the explosive cartridge circuit tester into the receptacle on launcher No. 1.	
	b. Lift, turn, and hold the GCU firing switch to the IG position; then rotate the selection switch on the missile selection box to position 0 through position 6. Stop at each switch position and observe the lamp on the explosive cartridge circuit tester.	
	The lamp on the explosive cartridge circuit tester glows only when the selection switch is in position 1.	**Replace launcher.**
	The lamp does not glow in any other position.	**Replace missile selection box.**
	c. Reset the firing switch on the GCU to the 0 position.	

Step	Operation and normal indication	Corrective action
5	**Check the launcher jettison circuit.** ***Warning:*** **All explosive-bolt cables must be connected to the shorting plugs.** *a.* Connect the explosive bolt circuit tester to the explosive bolt receptacle in fixed housing No. 1. *b.* Set the JETTISON SAFE switch on the pilot's jettison control panel to the JETTISON position and observe the lamp on the explosive bolt circuit tester. **The lamp on the circuit tester glows.** *c.* Return the JETTISON/SAFE switch on the pilot's jettison control panel to the SAFE position and press the TOT switch on the missile selection box while observing the explosive bolt circuit tester lamps. **The lamp on the circuit tester glows.** *d.* Rotate the selection switch on the missile selection box to each position while pressing the SIN switch and observing the explosive bolt circuit tester lamp. **The lamp on the circuit tester glows only when selection switch is in position 1**.	 Replace missile selection box. Replace missile selection box. Replace missile selection box.
6	**Connect the 10 meter test cable between the test set and launcher No. 1.**	
7	**Check the ignition and firing circuits.** *a*. Set the selection switch on the missile selection box to position 1. *b.* Hold the launcher No. 1 missile locking lever in the down position with the explosive cartridge circuit tester installed. c. Lift and hold the firing switch on the GCU to the IG position and observe lamp on the explosive cartridge circuit tester and the IG lamp on the test set. **The explosive cartridge circuit tester lamp glows.** **The IG lamp on the test set does not glow.** d. Release the firing switch and let it rotate through positions UG and IFB and observe the UG and IFB lamps on the test set. **The UG and IFB lamps on the test set do not glow.** *e.* Release the missile locking lever and let it snap up, closing the microswitch. *f.* Reset, then lift and release the firing switch on the GCU and let it rotate through position IG, UG, FB and stop at position F while observing the test set lamps.	 Replace launcher, GCU, or missile selection box. Replace launcher. Replace launcher.

Step	Operation and normal indication	Corrective action
	The lamps on the test set illuminate in the following sequence: IG, UG, and IFB.	Replace GCU.
Note.	The lamp glows then goes out; they do not glow continuously.	
8	**Check the wires jettison circuit.**	
	Press the WIRES switch on the missile selection box and observe the WJ lamp on the test set.	
	The WJ lamp glows.	
9	Check and balance the meter on the test set.	
	a. Set the function switch on the test set to the B position.	
	Observe the voltage reading on the 0-20 scale.	
	b. Position the BATT TEST switch to either the, left or the right position and observe the meter on the test set.	
	The meter indication must not be less than 12.5v and the difference between this reading and that obtained in (*a*) above should be 1.5 volts or less.	Replace battery.
	c. Return the function switch on the test set to the 0 position.	
Note.	If steps *d* and *e* below give the normal indication, skip step *f* and *g*. If the normal indication is not obtained in *d* and *e* proceed with step *f*.	
	d. Hold the Hi Le/Lo Ri switch to the Hi Le position and observe the meter on the test set.	
	The meter indicates 100 (left of zero).	
	e. Hold the Hi Le/Lo Ri switch to the Lo Ri position and observe the meter on the test set.	
	The meter indicates 100 (right of zero).	
	f. Balance the test set meter as follows:	
	(1) Rotate the AMPLITUDE and SYMMETRY lock and spring up into the engaged position.	
	(2) Alternately set the Hi Le/Lo Ri switch to the Hi Le and the Lo Ri positions and adjust the AMPLITUDE and SYMMETRY controls while observing the meter.	
	When the Hi Le/Lo Ri switch is in the Hi Le position the meter indicates 100% to the left of zero and when the switch is in the Lo Ri position the meter indicates 100% to the right of zero.	Replace test set.
	(3) Carefully press the AMPLITUDE and SYM-METRY controls straight down and turn them fully clockwise.	
	(4) Recheck the balance of the meter by setting the Hi Le/Lo Ri switch to Hi Le; then to Lo Ri position.	

Step	Operation and normal indication	Corrective action
10	**Check the percentages of the guidance signals.**	
	a. Check the pitch percentage as follows:	
	(1) Set the function switch on the test set to the P position.	
	(2) With the control stick in the neutral position, observe the test set meter.	
	The meter indicates 25 to 35 percent (left of zero).	Replace control stick or GCU.
	(3) With the control stick in the maximum pitch up position, observe the test set meter.	
	The meter indicates 87 to 100 percent (left of zero).	Replace control stick or GCU.
	(4) While observing the meter, slowly move the control stick from the maximum pitch up to the maximum pitch down position.	
	The meter deflects smoothly from the indication in c above to 13 to 33 percent (right of zero).	Replace control stick or GCU.
Note.	A steady quiver of the meter pointer is normal.	
	b. Check the yaw percentage as follows:	
	(1) Set the function switch on the test set to the Y position.	
	(2) With the control stick in the neutral position, observe the test set meter.	
	The meter indicates 0 ±10 percent.	Replace control stick or GCU. If no continuity is obtained check the circuitry.
	(3) With the control stick in the maximum yaw left position, observe the test set meter.	
	The meter indicates 83 to 100 percent (left of zero).	Replace control stick or GCU.
	(4) While observing the test set meter slowly move the control stick from the maximum yaw left to the maximum yaw right position.	
	The meter deflects smoothly from the indication in *c* above to 83 to 100 percent (right of zero).	Replace control stick or GCU.
11	**Check the amplitude of the guidance signals.**	
	a. Set the function switch on the test set to the V position, and the Hi V/Lo V switch to the Hi V position.	
	b. Set the +/- switch to the (+) position and position the control stick in the maximum yaw left position and observe the meter.	
	The test set meter indicates 17.25 to 19.75 volts on the 0-20 scale.	Replace control stick or GCU.
	c. Set the - /- switch to the (-) position and position the control stick in maximum yaw left position and observe the meter.	

Table 10. Daily Operation Checks and Services - continued

Step	Operation and normal indication	Corrective action
	The test set meter indicates 17.25 to 19.75 volts on the 0-20 scale.	Replace control stick or GCU.
	d. Set the Hi V/Lo V switch to the Lo V position.	
	e. Set the + /- switch to the (+) position; position the control stick in maximum yaw right position; and observe the meter.	Replace control stick or GCU.
	The test set meter indicates 5.75 to 6.75 volts on the 0-8 scale.	Replace control stick or GCU.
	f. Set the +/- switch to the ( ) position; position the control stick in maximum yaw right position: and observe the meter.	
	The test set meter indicator 5.75 to 6.75 volts on the 0-8 scale.	Replace control stick or GCU.
12	**Check the frequency of the guidance signal.**	
	a. Reset the firing switch on the GCU to the 0 position; and set the FF/VF switch on the GCU to the VF position.	
	b. Set the function switch on the test set to the F position.	
	c. Lift and release the firing switch on the GCU, and observe the test set meter.	
	When the firing switch on the GCU reaches the F position, the test set meter indicates 10 cps on the 0 to 20 scale. The meter indication slowly rises until it reaches 16.5 cps within 21 to 23 seconds after the firing switch reaches the F position.	Replace GCU.
	d. Reset the GCU firing switch to the 0 position	
13	**Check the remaining launchers.**	
	Repeat steps 4 through 10 for each of the remaining launchers (2 through 6), substituting the position being checked for the position 1 called out in the above procedure.	
14	**Deenergize the subsystem.**	
	a. Set the selection switch on the missile selection box to the 0 position and the key switch to the off position.	
	b. Pull out the MARK VIII PWR, SS-11 POWER, and SS-11 JETTISON circuit breakers on the overhead circuit breaker panel.	
	c. At the overhead circuit breaker panel set the NONESS BUS switch to the NORMAL ON position and the BAT ON/OFF switch to the OFF position.	
	d. Disconnect the 10-meter cable assembly from the launcher.	
15	**Check the elevation of the launchers.**	
	Refer to paragraph 35.	
16	**Check the launchers for looseness.**	

Table 10.1. Daily, Operational Checks and Services (Fire Control)

Step	Operation and normal indication	Corrective action
1	Apply aircraft power.	
	Note. Always use external power (APU), when available, to conserve aircraft battery.	
	a. At the helicopter overhead circuit-breaker panel, set the BAT ON/OFF switch to OFF (when using APU) or to ON (when using the battery). Set the NON-ESS BUS switch to MANUAL ON.	
	b. Set the VM selector switch on the overhead panel to the NON-ESS BUS position and observe the volts dc meter on the instrument panel.	
	The meter indicates between 23 and 30 volts.	Report to aircraft maintenance crew.
	XM58 Sighting System	
2	**Check the sight assembly support arm.**	
	Turn position locking lever and swing arm down to operating position; release lever and check that arm is secure.	
	Arm swings down easily with slight force.	Replace sight assembly group.
3	**Check the headrest and locking shaft.**	
	Loosen upper clamping screw. Lower locking shaft from detent making certain top end of shaft clears AZ drift control. Loosen lower clamping screw and using the tilt control adjust headrest for eye placement and comfortable pressure on helmet. Tighten both clamping screws.	
	Locking shaft lowers easily. Headrest adjusts easily and locks in adjusted position.	Replace sight assembly group. Replace headrest.
4	**Check the telescope definition.**	
	Looking through telescope, grasp counterweight at telescope eyepiece and guide telescope in azimuth and elevation to acquire a distant target of opportunity in the center of the field of view.[1]	
	Image is sharp and clear.	Clean external optical surfaces
	Replace telescope.	
5	**Check the telescope gimbal action.**	
	Manually position the telescope through full excursion in azimuth and elevation.[2]	
	Telescope swings freely between stops. Telescope provides 85° to 95° range in azimuth. Telescope provides 27° to 33° range in elevation.	Replace sight assembly group.
6	**Energize the system.**	
	a. Close the XM58 POWER circuit breaker.	
	b. Set POWER switch to ON.	
	Note. Wait 30 seconds before performing step 7.	
7	**Check the telescope gimbal action.**	
	Manually position the telescope through full excursion in azimuth and elevation.	
	Gimbal action has "stiffened" and some force is required to swing telescope through both ranges.	Replace power supply. Replace electronic control amplifier. Replace sight assembly group.

See footnotes at end of table

Table 10.1. Daily, Operational Checks and Services (Fire Control)- Continued

Step	Operation and normal indication	Corrective action
8	**Check the LOSI.**	
	a. Manually position telescope to center target [3] in field of view; observe L.OSI dial.	
	LOSI indicates -2.5° to +2.5.°	Replace LOSI. Replace sight assembly group.
	b. Turn on aircraft lights; observe both lamps and both masks.	
	Both lamps light.	Replace lamp(s).
	Both lamps glow softly (no glare).	Replace lampholder assembly.
9	**Check the AZ drift control.**	
	a. Observe target through telescope and turn AZ drift control ccw.	
	Telescope field of view moves to the left.	Replace sight assembly group.
	b. Turn AZ drift control cw.	
	Telescope field of view moves to the right.	Same as *a* above.
	c. Observe target through telescope and turn AZ drift control until target remains stationary in azimuth during one minute observations.	
	Azimuth drift is quickly and easily nulled out.	Same as *a* above.
10	**Check the EL drift control.**	
	a. Observe target through telescope and turn EL drift control ccw.	
	Telescope field of view moves up.	Replace sight assembly group.
	b. Turn El, drift control cw.	
	Telescope field of view moves down.	Same as *a* above.
	c. Observe target through telescope and turn EL drift control until target remains stationary in elevation during one minute observations.	
	Elevation drift is quickly and easily nulled out.	Same as *a* above.
11	**Check the rate stick.**	
	a. Observe target through telescope, actuate rate stick "on" switch and press downward on directional control.'	
	Telescope field of view moves up.	Replace stabilization amplifier board (section 1).
	b. Observe target through telescope, actuate rate stick "on" switch and press upward on directional control.	
	Telescope field of view moves down.	Same as *a* above.
	c. Observe target through telescope, actuate rate stick "on" switch and press to the right on directional control.	
	Telescope field of view moves to the right.	Same as *a* above.
	d. Observe target through telescope, actuate rate stick "on" switch and press to the left on directional control.	
	Telescope field of view moves to the left.	Same as *a* above.

See footnotes at end of table.

Table 10.1. Daily, Operational Checks and Services (Fire Control)-Continued

Step	Operation and normal indication	Corrective action
	e. Observe target through telescope, actuate rate stick "on" switch and press directional control as required to center target in field of view.	
12	**Check target lock-on.**	
	a. While observing target in center of telescope field of view, raise and lower the tail of the aircraft several times at varying rates.	
	Target remains essentially centered in telescope field of view.	Adjust drift control.[6] Replace Stabilization amplifier boards (section 1 or 2). Replace electronic control amplifier. Replace sight assembly group.
	Image stays sharp and clear.	Replace sight assembly group.
	b. While observing target in center of telescope field of view, swing tail of aircraft 25° to 45° right and left.	
	Target remains essentially centered in telescope field of view.	Same as *a* above.
	c. Position telescope to center target in field of view.	
13	**Check the LOSI.**	
	a. Position telescope at extreme left limit in azimuth and observe LOSI dial.	
	LOSI indicates -42.5° to -47.5°.	Replace sight assembly group. Replace LOSI.
	b. Set CAGE switch to ON; observe target through telescope; observe LOSI dial.	
	Target is centered (azimuth) in telescope field of view. LOSI indicates -2.5° to +2.5° azimuth angle.	Same as *a* above.
	c. Set the CAGE switch to OFF.	
	d. Position telescope at extreme right limit in azimuth; observe LOSI dial.	
	LOSI indicates +42.5° to 47.5°.	Same as *a* above.
	e. Repeat steps *b* and *c* above.	
14	**Check the infinity reflex sight.**	
	a. Energize the sight and, if required, aline to longitudinal axis of aircraft.	
	b. Maneuver aircraft to center distant target of opportunity in reflex sight reticle (0 elevation).	
	c. Set CAGE switch to ON.	
	d. Look through the XM58 telescope.	
	Target of opportunity (step *b*) is centered azimuth-wise in field of view.	Replace telescope. Repeat steps 9 and 10 above.
	e. Observe the LOSI dial.	
	LOSI indicates -2.5° to +2.5°.	Replace sight assembly group. Replace LOSI.

See footnotes at end of table.

Table 10.1. Daily, Operational Checks and Services (Fire Control)-Continued

Step	Operation and normal indication	Corrective action
	f. Repeat steps *b* through *e* above a minimum of six times, selecting three targets of opportunity to the left and three to the right of original selected in step h.	
15	**Deenergize the system.**	
	a. Set the POWER switch to OFF.	
	b. Open the XM58 POWER circuit breaker.	
	c. Stow the sight assembly support arm (ground position).	
	d. Remove aircraft power (APU or battery).	
	M55 Sighting System	
16	**Apply aircraft power.**	
	Perform the procedures contained in step 1.	
17	**Check the fire control installation.**	
	a. View an object at a range of 1000 to 2000 meters through the M55 sight.	
	Image is clear and there is no visual obstruction within the binoculars.	Replace the M55 sight.
	b. Remove the M55 gimbal locking pin and check the binoculars for free floating action.	
	Vibrations of the support are isolated.	
	c. Operate the infinity reflex sight reflector elevation control.	
	Reflector elevation varies smoothly.	Replace infinity reflex sight.
	d. Push the MARK VIII PWR circuit breaker in on the helicopter overhead circuit breaker panel, and set the FIL 1/FIL 2 switch to FIL 1. Set the OFF/MED/BRT control on the infinity reflex sight control panel to the BRT position, while observing the sight reflector.	
	The reticle image is visible on the sight reflector.	Replace lamp or control panel, or sight.
	e. Set the FIL 1/FIL 2 switch to the FIL 2 position and observe the sight reflector.	
	The reticle image is visible on the sight reflector.	Replace lamp.
	f. Aline the M55 sight with the infinity reflex sight.	
	(1) Position the helicopter so that an object at a range of 1000 to 2000 meters is centered in the infinity reflex sight reticle.	
	(2) Loosen the azimuth and elevation controls on the M55 sight.	
	(3) Adjust the M55 sight in azimuth and elevation.	
	The object selected in step (1) above is centered in the M55 sight field of view.	Replace M55 sight.
	(4) Tighten the M55 sight azimuth and elevation controls and recheck the alinement.	
	The object remains centered in the field of view.	Replace M55 sight.

See footnotes at end of table.

Table 10.1. Daily, Operational Checks and Services (Fire Control)-Continued

Step	Operation and normal indication	Corrective action
18	**Deenergize the system.** *a.* Pull out the MARK VIII PWR circuit breaker. *b*. Remove aircraft power (APU or battery).	

[1] Both the elevation and azimuth gimbal mechanisms respond to guiding force applied to telescope eyepiece. Hereafter, this method of positioning the telescope field of view will be referred to as manual positioning.

[2] Excursion may be measured by using a protractor on telescope eyepiece or by observing targets at predetermined angles.

[3] Target may be well defined object located on longitudinal axis (center line) of aircraft at minimum of 200 yards distance. This target is the zero azimuth angle for telescope line of sight.

[4] Rate of movement is directly proportional to the force applied to the directional control.

[5] Occasional fine adjustments on AZ and EL drift controls are normal, However, frequent or continuous adjustment indicates trouble in the corresponding servo loop.

Section III. RECEIPT, CHECKOUT, AND INSTALLATION OF MISSILES

45. Precautions

Warning: **The following precautions must be observed when handling missiles.**

a. Missiles shall not be installed on the helicopter until the daily operational checks have been successfully completed.

b. Missiles shall not be mounted until the helicopter has been fueled, checked out, and is ready for takeoff.

c. The person in charge of installing the missiles shall have the missile selection box key in his possession.

d. Always approach or move away from missiles at a right angle to the line-of-fire for a minimum distance of 15 feet.

e. The helicopter should be in an open area and positioned so that the missiles are pointing toward a safe, uninhabited area.

f. The explosive-bolt cables shall be connected to their shorting plugs until just before helicopter takeoff.

g. Never assemble missiles within 300 meters of a radio or radar installation that has more than 100-kw of peak power.

46. Check the Batteries

a. Place the battery, rounded-side forward, on the connector of the battery tester. The voltmeter on the tester should indicate between 12 and 15 volts.

b. Press the toggle switch on the tester in either direction and hold. The voltmeter indication should not differ more than 1.5 volts from the indication obtained in a above, and voltage should not be less than 12 volts.

c. Repeat steps a and b for all batteries.

47. Open the Shipping Container

a. Press and turn the two turnlock fasteners securing the battery compartment cover.

b. Remove the compartment cover and the special wrench.

c. Remove the spring clips that hold the toggle fasteners.

d. Using the special wrench, release the eight toggle fasteners holding the container-halves together.

e. Lift the top-half of the container and place it upside-down on the ground.

48. Inspect the Warhead Arming Device

Warning:

If the warhead arming device is found armed, do not move the missile. Evacuate the area and call for demolition specialists.

a. Inspect the condition of the warhead arming device. The top of the arming piston must not protrude above the surface of the rim.

b. Remove the protective cap from the warhead detonator.

c. Figure 38 indicates an armed device.

49. Remove the Missile Body from the Container

a. Lift and release the two clamps which hold the missile body in the container.

Caution:

Never lift the missile body by the junction box.

b. Lift the missile body from the container; and position across the container.

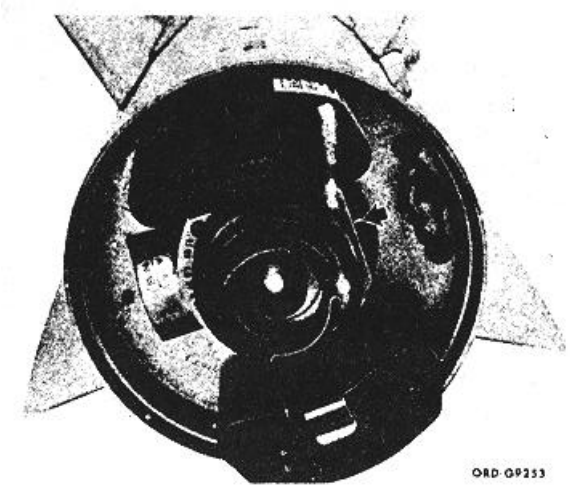


Figure 38. Arming device and piston.

50. Install the Missiles on the Launchers

Warning:

Before attempting to install the missile, all persons not actively engaged in installing the missiles shall remain at least 100 meters behind the launchers and clear of the flight path of the missile.

a. At the overhead circuit-breaker panel, the SS-11 POWER and SS-11 JETTISON circuit breakers are in the OFF position (pulled out).

b. At the aircraft pedestal console, the SS-11 JETTISON SAFE switch is set to the SAFE position.

c. At the missile selection box, the selection switch is at the 0 position and the key, switch is set to the OFF position. Remove the key from the switch.

d. At the GCU, the firing switch is set to the O position.

e. At each launcher, the explosive-bolt cable is connected to the shorting plug.

f. The front and rear guiderails on each launcher are not damaged or obstructed.

Note.

Two men are required to handle the missiles. Do not grasp the wings or the junction box. Install the inboard missiles first, then work toward the outside.

g. Remove the dust covers from the missile junction box and launcher connectors.

h. Aline the hooks on top of the missile with the guiderails underneath the launcher. Slide the missile to the rear, engaging the connector on the rear of the junction box with the connector on the launcher.

i. Remove the explosive-cartridge from the shipping container. Remove and retain the shorting plug.

j. Pull the locking-lever handle upward until the locking lever engages the hole on the top of the missile body.

k. While holding the locking-level handle upward, install the missile-release explosive cartridge. Release the handle slowly. The cartridge must be properly seated and the locking-lever must not disengage when the handle is released.

51. Install the Batteries

Plug the batteries into the battery sockets and secure them with the spring clamps.

52. Install the Warhead

a. Remove the three straps securing the warhead in the container.

Warning:

Do not strike the detonator with the warhead.

b. Install the warhead in the missile and tighten it until it fits snugly.

c. Seat the warhead by unscrewing it a half-turn, then twisting it sharply to the right.

d. Remove the test-socket cap located under the left-hand booster nozzle.

e. Insert a screwdriver tip into the test socket and short circuit the two contacts. If the battery circuit is complete, a sharp click will be heard as the electro-magnets of the jet deflectors activate. If no click is heard, check the installation of the batteries and short the contacts again. If no indication is obtained, there is an open circuit in the missile. Remove the missile and refer it to field maintenance personnel.

53. Installation of Missiles

Repeat the steps as outlined in paragraphs 45 through 52 for each missile that is to be installed.

Section IV. REMOVAL OF THE MISSILES AND POSTFLIGHT PROCEDURES

Warning:

Before attempting to remove the missiles, all persons not actively engaged in removing the missiles shall remain at least 100 meters behind the launchers and clear of the flight path of the missile.

54. Removal of the Warhead

Note.

Remove the outboard warheads and missiles first and work toward the inboard warheads and missiles. Two people are required to remove the missiles.

a. Insure all power is OFF.

Note.

Insure that the shorting wire, connecting pins 1 and 3, in the rear of the shorting plug is properly seated.

b. Open the access cover on the fixed housings. Disconnect the explosive-bolt connector (fig. 24), and connect it to the shorting plug (fig. 24). Close the access cover.

c. Remove the warhead and place it in the fiberglass warhead container.

d. Place the warhead container in the warhead cradle of the shipping container.

55. Removal of Missile Body

a. Remove the missile batteries.

b. Install the detonator-protector cap over the detonator.

c. Pull the locking-lever handle upward and hold it. Pull the spring-loaded locking pin out and remove the explosive cartridge. Release the handle carefully.

d. Install the shorting plug on the explosive cartridge and insert it in the plastic container.

e. Place the explosive cartridge in the shipping container.

Caution:

Do not disengage the junction box from the missile during removal.

f. Push the junction box latch up, unlocking the junction box. Slide the missile forward by pushing against the junction box disengaging the launcher connector from the junction box.

g. Remove the missile body and install the connector dust cover.

h. Place the missile body in the proper serial numbered shipping container and secure it with the two clamping straps.

i. Secure the two halves of the shipping container together with the eight toggle fasteners and insert the spring slips.

j. Return the complete round to the proper storage area.

k. Replace the dust cover on the launcher.

Section V. REMOVAL AND DISASSEMBLY OF THE SUBSYSTEM

56. Removal of the Pilot's Sight and Jettison Control Panels

a. Loosen the captive screws securing each panel to the pedestal.

b. Disconnect the electrical cables from the connectors inside the pedestal.

c. Install the two blank panels removed in paragraph 39.

57. Removal of the Floor Mounting Plate and Guidance Equipment

a. Disconnect the cable connectors (18 and 19, fig. 29).

b. Remove the screws from the edge of the floor mounting plate that holds the plate to the cabin floor.

c. Remove! the pilot's sight and jettison control panels (par. 56).

d. While holding the nuts inside the pedestal, remove the screws that secure the bracket to the pedestal.

e. Slide the floor mounting plate back until it clears the pedestal.

f. Remove the equipment from the helicopter.

g. Install six screws AN525-416R8, retained in paragraph 36b(4), in the cabin floor.

58. Removal of the Guidance Equipment

No special procedure's are required to remove any of the guidance equipment.

58.1. Disassembly of the Support Equipment (Fig. 27)

No special procedure is required to disassemble the support equipment, however, each item should be tagged or identified so that it will be used in the proper place when the equipment is reassembled. Use figure 27 to identify each item.

58.2 Removal of the Pilot's Sight

a. Disconnect the cable from the sight lamp housing.

b. Remove and tag the hardware securing the sight and mount to the helicopter roof (fig. 31.6).

c. Remove the sight and sight mount from the helicopter.

d. Replace the screws and washers retained in paragraph 38b.

e. Behind the instrument panel, disconnect the cable from P1048.

f. Remove and tag the securing hardware holding the cable to the helicopter frame.

g. Remove the cable from the helicopter.

h. Replace the screws and washers retained in paragraph 38a.

58.3. Removal of the XM55 Gunner's Sight

a. Remove the sight from the support assembly (paragraph 37e) and place the sight in its carrying case.

b. Remove and tag the hardware securing the support assembly to the side supports (fig. 31.3). Remove the support assembly.

c. Remove and tag the hardware securing the side supports to the helicopter roof (fig. 31). Remove the side supports.

d. Replace the screws retained in paragraph 37a and b.

58.4. Removal of the Launchers

a. Raise the lid on the fixed housing.

b. Connect the explosive bolt cable to the SHORTING PLUG connector in the fixed housing.

c. While holding the launcher, remove the nut from the explosive bolt.

d. Carefully free the launcher from the fixed housing.

e. Replace the laminated washer and the nut on the explosive bolt.

58.5. Removal of the Explosive Bolt from the Fixed Housing

a. Remove the launcher from the fixed housing (par. 58.4).

b. Remove the nut and laminated washer from the explosive bolt.

c. Remove the screws securing the explosive bolt to the fixed housing.

d. Pull the bolt out of the fixed housing and replace the laminated washer and nut.

e. Without disconnecting the SHORTING PLUG from the explosive bolt cable, remove the screws securing the SHORTING PLUG in the fixed housing and remove the explosive bolt (SHORTING PLUG attached) from the fixed housing.

f. Repack the bolts in their container (retained in par. 34) and return them to the ASP.

58.6. Removal of the Fixed Housings

a. Remove the explosive bolt from the fixed housing (par. 58.5).

b. Disconnect the two cables (the ones leading out of the launcher support assemblies) from the connectors in the fixed housings.

c. Remove the two U-bolts securing the fixed housing to the launcher support assembly.

d. Remove the fixed housing from the launcher support assembly.

58.7. Removal of the Launcher Support Assemblies

a. Insert the locking pins to secure the launcher support assemblies to the housings.

b. Pull the emergency jettison lever up, releasing both launcher support assemblies.

Note.

Two people are required to remove the launcher support assemblies. Remove them one at a time.

c. Pull out the locking pin and disconnect the launcher support assembly from the housing. Repeat for the remaining assembly.

58.8 Removal or Disassembly of the Mechanical Jettison Equipment

No special procedure is required to remove or disassemble this equipment. The hardware should be tagged or labeled so that it can be identified when the mechanical jettison equipment is reinstalled. Refer to the legend of figure 21 to identify the hardware as it is removed.

58.9. Removal of the XM58 Sighting System

a. Remove and tag the hardware securing the sight assembly group to the roof mount (fig.

31.). Remove the sight assembly group.

b. Remove and tag the hardware securing the roof mount (fig. 31.8). Remove the roof mount and replace hardware removed in paragraph 41.1a.

c. Remove and tag the hardware securing the power cable assembly (figs. 31.11, 31.12, and 31.13). Remove the power cable assembly.

d. Remove and tag the hardware securing the interconnecting cable (fig. 31.11). Remove the cable.

e. Remove and tag the hardware securing the LOSI (fig. 31.14). Remove the LOSI.

f. Remove and tag hardware securing the electronic control amplifier to the base plate (fig. 31.16). Remove the electronic control amplifier. Remove and tag hardware securing base plate to cabin floor (fig. 31.16). Remove base plate and replace hardware removed in paragraph 41.1a.

CHAPTER 7

PREVENTIVE MAINTENANCE PROCEDURES

59. Lubrication

Use GL-grease, aircraft and instrument (MIL-G-3278) at the following points:

a. Pivot of missile locking lever (2, fig. 40).
b. Locking lever shaft (fig. 40).
c. Guiderails (3, fig. 39).
d. Explosive cartridge pin.
e. Junction box locking latch.
f. Launcher support bearing.
g. Housing assembly release assembly.
h. Manual release pulley assemblies.
i. Armrest assembly.
j. Remote firing switch assembly.
k. Gunner's sight.
l. Pilot's sight.

60. Cleaning and Care

a. Precautions in Cleaning.

(1) Don't use denatured alcohol near an open flame. Use it only in well-ventilated places, and always have a fire extinguisher handy.

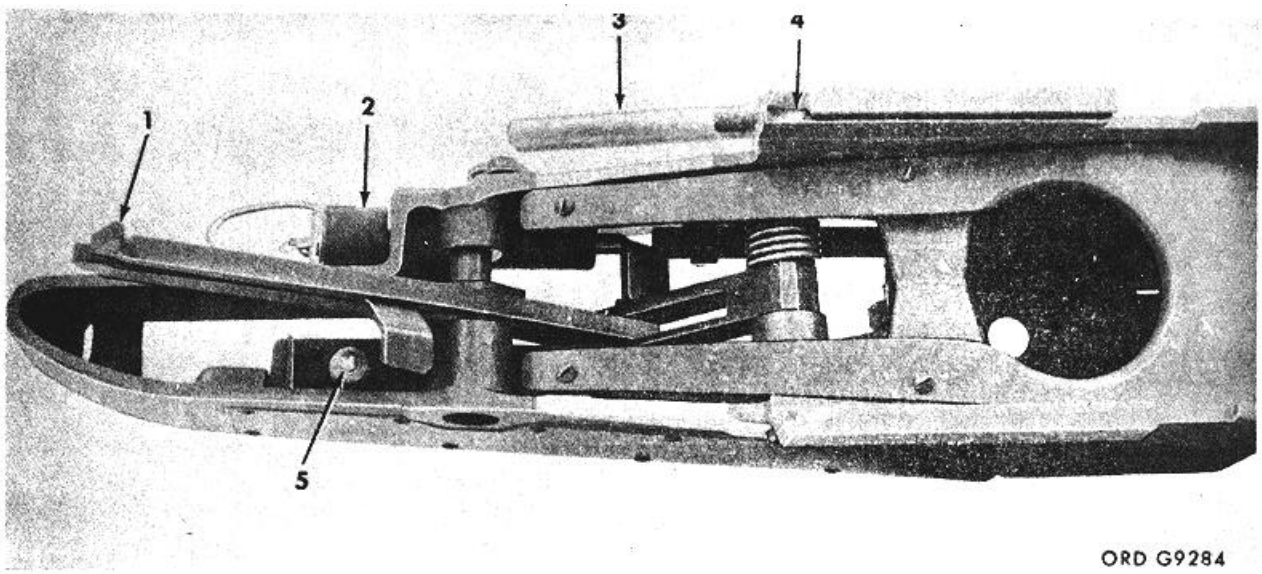
(2) Wear rubber gloves when you use alcohol for cleaning. This protects your skin from burning or cracking.

b. Clean.

(1) Metal parts with denatured alcohol.
(2) Rubber parts with soap and water.
(3) Glass surfaces with lens tissue or a soft cloth.

61. Preventive Maintenance Services

Preventive maintenance, an important part of maintaining equipment in a combat-ready condition, is the responsibility of the organizational maintenance personnel. If the PM services are performed according to the instructions in table 11, they will prevent minor deficiencies from developing into major malfunctions. For normal operation, we suggest the intervals of maintenance listed in the table; but the unit commanders should schedule PM to correspond to the local environment of the equipment and its frequency of use.



1-Hook
2-Explosive cartridge
3-Locking lever
4-Guide rail
5-Microswitch

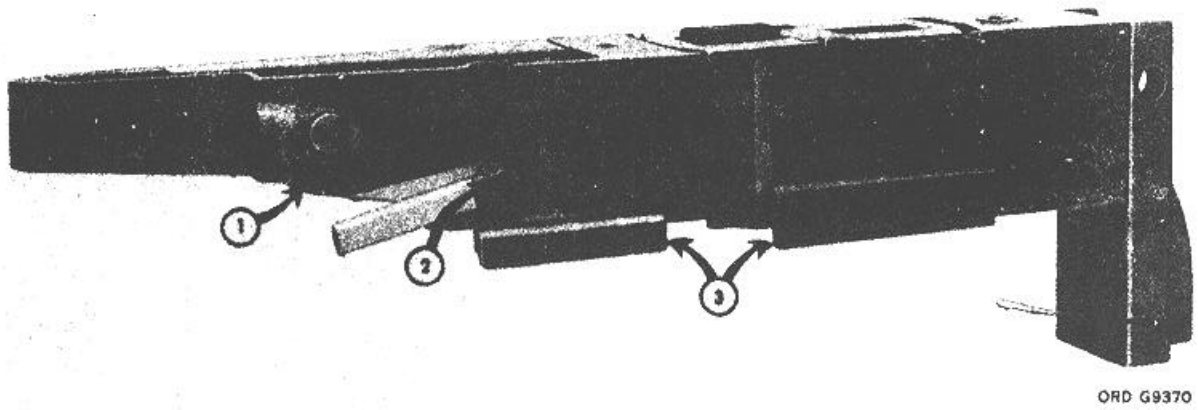
Figure 39. Launcher.

Table 11. M22 Preventive Maintenance Services

Sequence no.	Item to be inspected	Operation	Reference	Daily	25 Hrs
1	Control stick	*a.* Clean	Para 60	X	X
		b. Replace any deteriorated rubber dust cover	Para 60	X	X
2	Cables	Repair frayed or broken shielding	Para 6	X	
3	Gunner's & pilot's sight	*a.* Clean	Para 60	X	
		b. Lubricate	Para 59		X
4	Launchers	*a.* Clean	Para 60	X	X
		b. Check moving parts for serviceability	Para 59	X	
		c. Lubricate	Para 59		X
		d. Repair as necessary to insure normal operation	Para 33		X
5	Selection box	*a.* Clean	Para 60	X	X
		b. Replace defective indicator lamps		X	X
		c. Tighten cable connections	Para 35	X	
		d. Tighten loose knobs and switches	Para 61		X
6	Launcher support assembly	*a.* Clean	Para 60	X	X
		b. Adjust, keep assembly tight	Para 31	X	
		c. Lubricate	Para 59		X
		d. Repair as necessary	Para 33		X
7	Test Set	*a.* Clean	Para 60	X	X
		b. Replace defective indicator lamps	Para 61	X	X
		c. Inspect battery	Para 46	X	
		d. Tighten knobs	Para 61	X	X
		e. Clean battery well	Para 60	X	X
		f. Replace damaged connectors	Para 61		X
		g. Test the test set for proper operation	Para 23		X
8	GCU	*a.* Clean	Para 60	X	X
		b. Replace defective indicator lamps	Para 61	X	
		Check all controls and switches normal operation		X	
		d. Tighten all knobs and switches	Para 61		X
		e. Tighten loose nuts and bolts	Para 61		X
9	Battery tester	*a.* Clean	Para 60	X	X
		b. Replace broken meter glass, damaged hinges, handles, and rubber feet	Para 61		X
10	Pilot's sight & jettison control panel	*a.* Clean	Para 60	X	X
		b. Replace defective indicator lamps	Para 61	X	X
		c. Insure proper operation of switches and rheostats	Para 60		X
11	Fixed housings & housing assembly	*a.* Clean	Para 60	X	X
		b. Replace frayed wiring harness		X	
		c. Replace unserviceable connectors		X	
		d. Lubricate release assembly	Para 59		X

Table 11. M22 Preventive Maintenance Services - Continued

Sequence no.	Item to be inspected	Operation	Reference	Daily	25 Hrs
12	Arm rest assembly	*a.* Clean	Para 60	X	X
		b. Lubricate	Para 59		X
		c. Tighten loose nuts and bolts	Para 61		X
13	Manual release jettison	*a.* Clean	Para 60	X	
		b. Lubricate	Para 59		X
		c. Adjust tension of the cables	Para 31		X
14	Explosive-bolt	*a.* Replace cables that at			
14	Explosive bolt	*a.* Replace cables that are frayed or have broken shielding	Para 33		X
		b. Insure that the laminated washer does not prevent the four lugs on the launcher and housing assembly from mating	Para 33		X



1 - Release
2 - Locking lever shaft
3 - Guide rails

Figure 40. Launcher.

CHAPTER 8

AMMUNITION

Section I. DESCRIPTION OF EXPLOSIVE COMPONENTS

62. General

The missile consists of a warhead and body, issued in a fiberglass shipping and storage container. Batteries are shipped, stored, and issued in a separate package. These are assembled prior to use. Instructions about the care, handling, preservation, and destruction of ammunition items are in TM 9-1300-206, follow them.

62.1. Ammunition Malfunctions

Report ammunition malfunctions in accordance with AR 700-1300-8. Address the report to: Commanding General, U. S. Army Missile Command, ATTENTION: AM3MI-SM, Redstone Arsenal, Alabama 35809.

63. Warhead Section (fig. 41)

a. HEAT Warhead. The HEAT (high explosive antitank) warhead contains a conical-shaped explosive which produces the armor-piercing effect upon detonation. This warhead is identified by both color code and data markings as given in table 13. This warhead is to be used only with the AGM-22B missile and shall not be mated to the body section of the ATM-22B missile.

b. Inert-loaded Warhead. This warhead is identical in weight and shape to the HEAT warhead but contains no explosives. It does have an orange-colored nonexplosive powder used to mark the spot of impact. This warhead is for the ATM-22B missile only and shall not be mated to the AGM-22B. Table 13 contains the identifying color code and data marking information for this warhead.

64. Missile Body Section (fig. 41)

The body consists of the on-board guidance package, the booster and sustainer motors, and the warhead fuzing system.

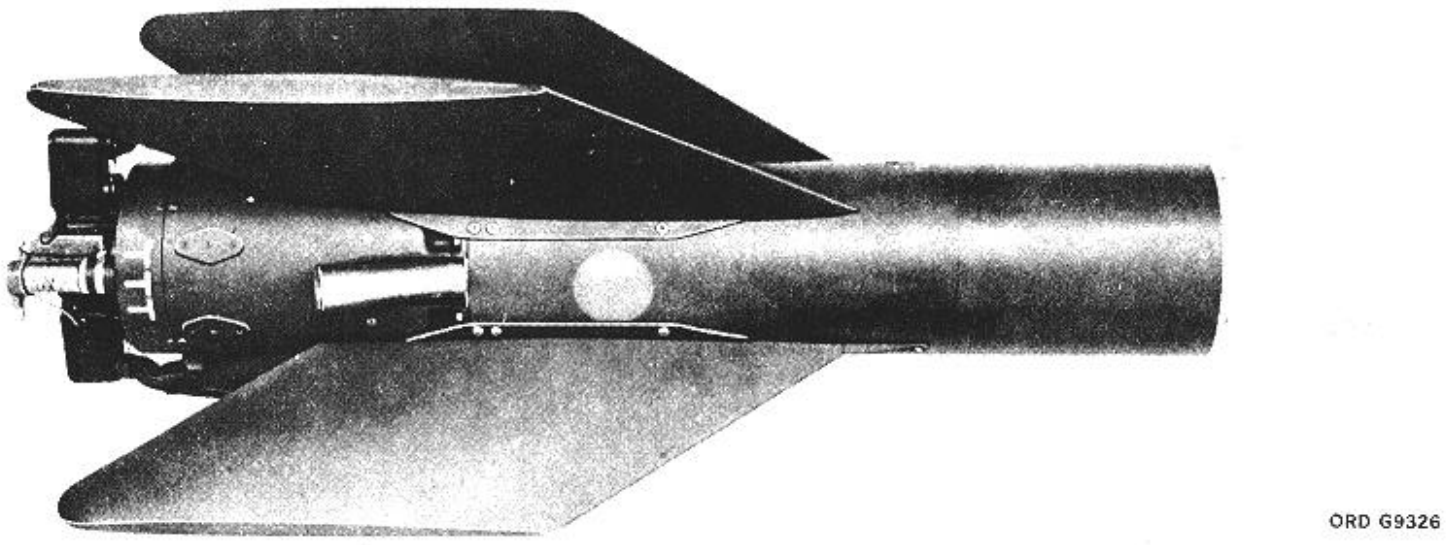


Figure 41. M22 missile.

65. Warhead Fuze

The warhead fuze forms the forward end of the body section and contains the mechanical and explosive elements that arm the warhead. In live warheads, the explosive detonator screws into the front side of the fuze body.

Warning:

The device is armed if a portion of the piston protrudes above the surface of the warhead arming device rim. Check this carefully before removing the missile body from the shipping container or mating the warhead. If the arming device is armed, call a qualified ammunition specialist to remove it (fig. 38).

66. Explosive Bolt (fig. 42)

This bolt secures the missile launcher to the fixed housing, and is energized from the pilot's or gunner's position for emergency jettisoning of the launcher and missile. The service life of the bolt is one year when mounted on an aircraft, or a combined storage and service life totaling six years.

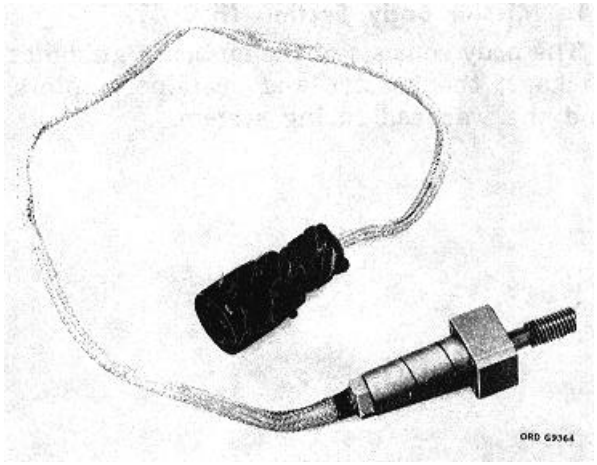


Figure 42. Explosive bolt.

67. Explosive Cartridge (fig. 43)

The explosive cartridge is used to hold the locking lever in place. The locking lever locks the missile on the missile launcher during flight. The explosive cartridge is shipped one each in the missile shipping container.

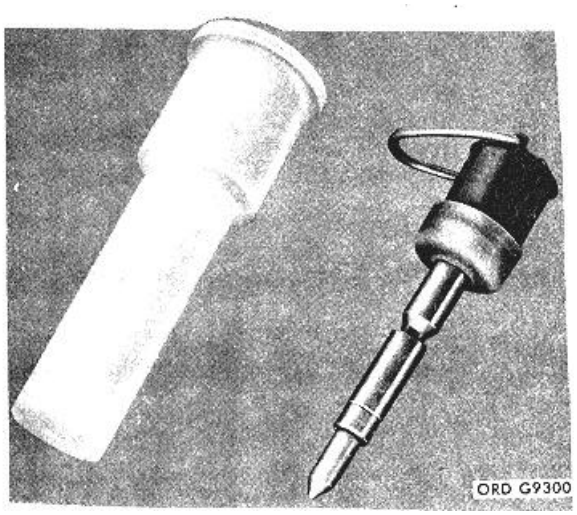


Figure 43. Explosive cartridge and case.

Section II. GENERAL PRECAUTIONS

68. General

a. To insure that M22 ammunition items will be in a serviceable condition when required for use and to provide the highest possible protection to personnel and material, the precautions outlined in this section should be observed by personnel responsible for handling and storing the ammunition items.

b. Ammunition items are easily damaged, and mishandling or dropping could cause a malfunction during use. Damaged ammunition items should not be used.

69. Precautions in Handling

a. M22 ammunition items should be handled and maintained under the direct supervision of trained personnel who thoroughly understand the hazards and risk involved. Personnel handling ammunition should be advised that their safety, as well as that of others, depends upon the care exercised by themselves and their fellow workers.

b. Personnel handling M22 ammunition items should not tamper with them. Do not attempt to disassemble any ammunition items unless specifically authorized. Ammunition items are dangerous, and serious accidents may be the result of unauthorized disassembly or tampering with them.

c. The handling of M22 ammunition items must always be conducted so as to limit exposed personnel to as small a number as possible, and to limit the hazardous material to as small a quantity as is practical.

d. The lifting and stacking of containers should be closely supervised to prevent possible damage. The missile body and warhead, packaged or unpacked, should be handled carefully.

e. The electrical connections that are made during missile assembly and testing must be secure.

70. Fire Protection

It is the duty of all personnel handling and storing M22 explosive items to be familiar with the causes of fires and with the methods of preventing them.

Section III. IDENTIFICATION AND MARKINGS

71. General

This section contains information pertaining to identification and marking.

72. Identification and Markings

a. Marking on the missiles and missile shipping and storage containers are required to identify the contents and to provide essential data for handling, storage, loading and issue (fig. 44 and table 13).

b. When repainting and remarking containers become necessary, original colors and markings will be used in accordance with pertinent drawings and specifications, unless otherwise directed.

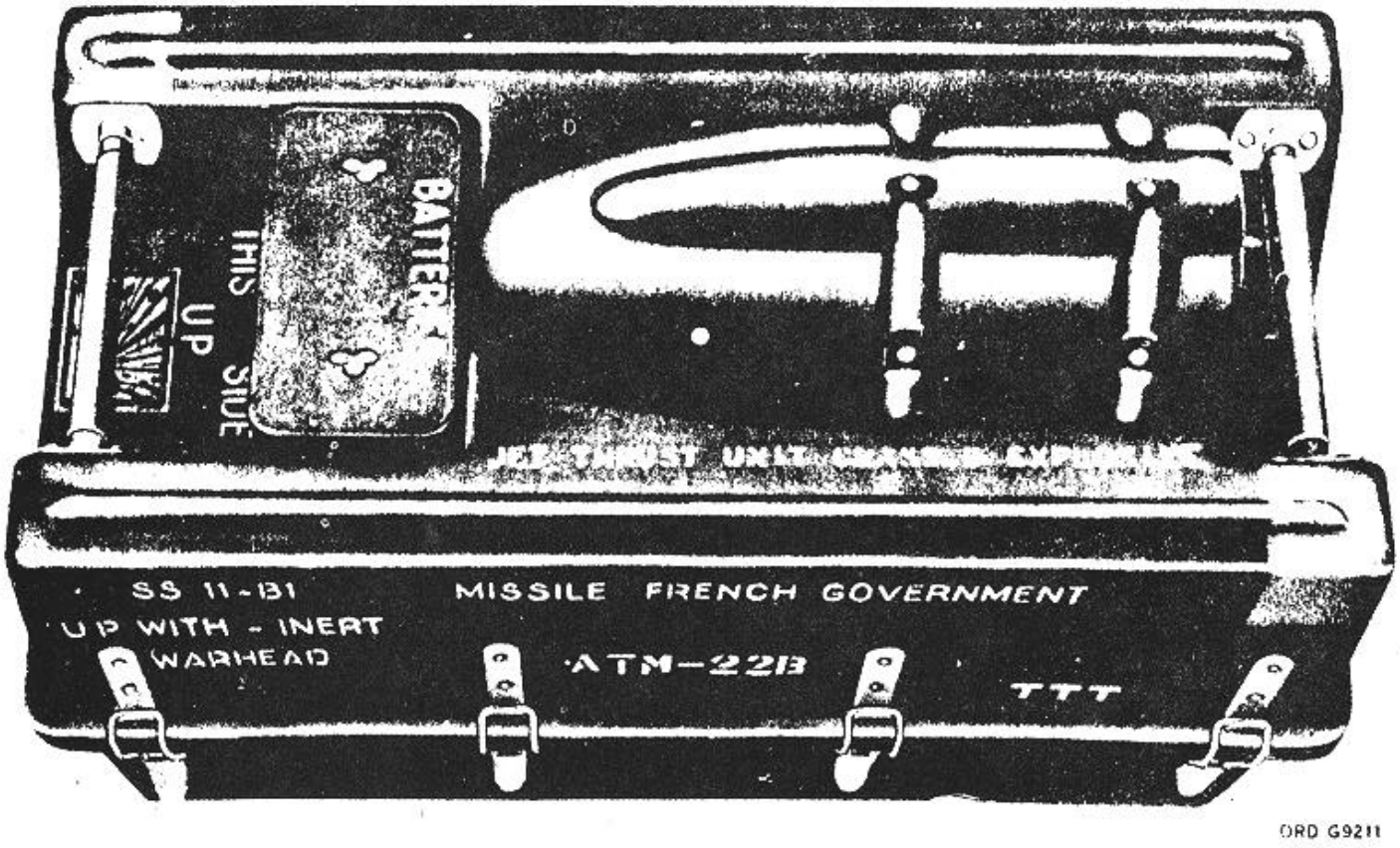


Figure 44. M22 shipping container.

Table 13. Ammunition Color Coding for M22 Missiles

Nomenclature	Guided missile w/HEAT warhead AGM-22B	Guided missile w/INERT warhead live motor ATM-22B	Guided missile. training. SS-11B w/simulated weight
FSN	1410-987-9432	1410-957-3625	1410-017-9281
Basic color:			
Missile	Olive drab	Olive drab	Blue
Warhead	Olive drab	Olive drab	Blue
Color of Data Markings:			
Missile	Yellow	White	White
Warhead	Yellow	White	White
Color of warhead nose tip	Yellow	Blue	None
Container color data			
Basic color	Olive drab	Olive drab	Olive drab
Data markings	Yellow	White	White
4" sq on corners	Yellow	Brown	Blue
ICC markings on containers	ROCKET AMMUNI-TION with EXPLOSIVE PROJECTILE	ROCKET AMMUNI-TION with INERT-LOADED PROJECTILE	None
Quantity-distance classification	7	5	None
Compatibility group	F	F	None
Explosive hazard classification	Class A explosive	Class B explosive	None

Notes 1. Missiles with live motors will have four 2” brown squares or disks 90 degrees part.
2. Container corner markings are diagonally opposite.

CHAPTER 9

SHIPMENT, STORAGE, AND DESTRUCTION TO PREVENT ENEMY USE

Section I. SHIPMENT AND STORAGE

73. General

This section pertains to shipment and storage of the missile and other system explosive items.
Commanders are responsible for insuring that all material issued or assigned to their command is maintained in a serviceable condition and properly cared for, and that personnel under their command comply with technical instructions. The provisions set forth in TM 9-1903 should be followed for shipment and storage of explosive items.

74. Shipment

Preservation and other protective measures taken in the preparation of the material for shipment must be sufficient to protect them against deterioration and physical damage during shipment.

75. Storage Precautions in storing.

a. Ammunition items should be stored separately and should not be stored with nonexplosive items.

b. The ammunition items should be stored in magazines or igloos designed and designated for the specific purpose of storing ammunition. Explosives and ammunition should not be stored in magazines used for other purposes. When specially constructed magazines are not available, the building used should afford adequate protection against moisture and dampness, and should be sufficiently ventilated.

c. Outside storage may be used only when suitable buildings are not available. The methods used should afford good protection against moisture and provide adequate circulation of air and should be covered with paulins or other suitable covering. The cover should allow free circulation of air about the containers. Suitable trenches should be dug to prevent water from running under the stacks during inclement weather.

d. The storage temperature limits of -22° to 122° F should not exceed 6 hours for any one period.

Note.

For correct Quantity-Distance Classification and Compatibility Groupings see Table 13.

Section II. DESTRUCTION OF UNSERVICEABLE MATERIEL

76. Destruction of Unserviceable Ammunition

Whenever it becomes apparent that M22 ammunition items have become unserviceable such information should be submitted to the appropriate support unit.

77. Instructions for Destruction of Ammunition Constituting an Immediate Hazard to Life or Property

When M22 ammunition items constitute an immediate danger to life or property, the local commanding officer may order immediate destruction.

Section III. DESTRUCTION OF MATERIEL TO PREVENT ENEMY USE

78. General

a. Destruction of the missile within a combat zone to prevent enemy capture or use will be accomplished only upon orders of the appropriate unit commander.

Note.

Safety precautions to be used in the destruction of ammunition to prevent enemy use are outlined in TM 9-1903 and changes thereto.

b. In general, first priority should be given to those items which will render the equipment inoperable. Further steps should be performed as time and available manpower permit. Each step in the sequence of destruction must be planned in order to accomplish the most effective damage in the minimum time.

c. The following information is for guidance only. The conditions distating destruction of missiles are command decisions and may vary with the tactical situation.

d. When destruction becomes necessary, missiles and components should be so thoroughly wrecked that they cannot be restored to a serviceable condition in the combat zone. It is important that the same essential components in each missile be destroyed, to prevent the enemy from assembling complete missiles by cannibalization of usable components.

e. During destruction procedures, due consideration should be given to:

(1) Destroying items in a manner that hinders the enemy in every way possible without endangering materiel or friendly troops.

(2) Taking proper safety precautions to prevent injury or death of personnel involved in destruction work.

79. Destruction Plan

A general plan for the destruction of the missiles should be prepared for areas where it is stored or used. Each area where the missiles are maintained, stored, or handled should have a standing operating procedure (SOP) for destruction of these items. The SOP should include methods of destruction, and quantities of explosives required, with instructions for placement and use of demolition material. This plan should be flexible enough to be adaptable to any situation. All instructions and procedures should be planned so that maximum destruction can be accomplished in minimum time. Plans for destruction should be so written that each succeeding step adds to the damage in such a way as to render the item completely irreparable. Plans should also be made to use whatever means are available if standard demolition or other means of destruction are unavailable.

80. Demolition Materials

a. For information on demolition blocks, chargers, equipment, sets, and kits, refer to TM 9-1946.

b. Explosives: The use of explosive charges to destroy the complete round missile, or its ammunition components is the most effective means of destruction, but is utilized only when adequate time and explosives are available. This type of destruction requires careful consideration, especially when high-explosive warheads or rocket motors are involved, since large quantities of explosives may produce many high-velocity fragments. Precautions should be taken to protect operational personnel and friendly troops from both fragments and blast. All personnel must be familiar with the pertinent provisions of FM 5-25 to insure the observance of all safety precautions as well as the successful execution of the demolition of materiel by using explosives. The following procedures should be used when destroying the missile or its components by explosive charges.

(1) *Missile body*. When it is necessary to destroy a missile, destruction can best be achieved by one of the following methods.

(*a*) If sufficient time exists, the missile body should be removed from its container and a one-pound block of TNT (or equivalent) will be positioned on the missile between the wings.

(*b*) If there is not adequate time for removal of the missile from its container before destruction, the following plan for destruction of the missile within the container may be carried out. Remove the container lid and place a one-pound block of TNT (or equivalent) on the missile between the wings and detonate the charge. This detonation can be accomplished electrically or by the use of safety fuze. The resulting blast will insure adequate destruction of the missile body section and rocket motor.

(2) *Warhead*. If time permits, the warhead should be removed from the container before attempting to destroy it. In order to avoid damage to surrounding territory from blast and jet stream, the warhead should be positioned nose down in a pit, if sufficient time exists.

A one-pound block of TNT (or equivalent) can be strapped on the base of the warhead and then detonated by electrical means or by safety fuze. If lack of time eliminates the possibility of removing the warhead from its container, the warheads in the containers should be positioned together facing the enemy or a hill, and three one-pound blocks of TNT (or equivalent) strapped to one of the warheads on the outside of the stack. Delay-type explosive devices may be utilized to provide time for safe evacuation of personnel.

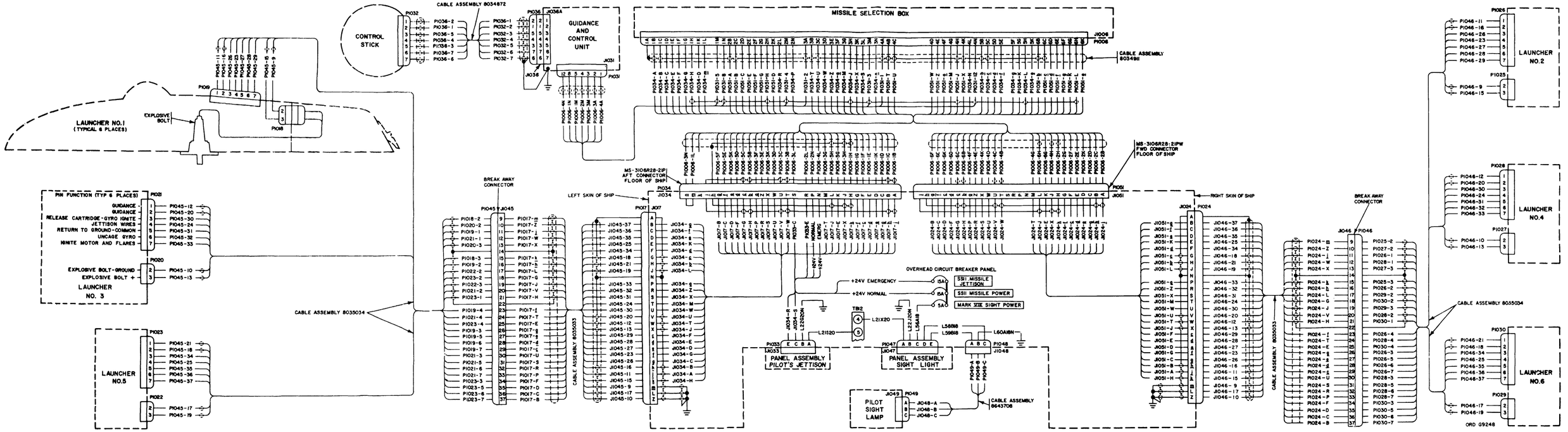


Figure 45. Cabling diagrams

APPENDIX I

REFERENCES

1. Publications Indexes

Consult the following indexes frequently for latest changes or revisions of references given in this appendix and for new publications relating to materiel covered in this technical manual.

Military Publications:	
Index of Blank Forms	DA Pam 310-2
Index of Tables of Organization and Equipment, Tables of Organization, Type Tables of Distribution, and Tables of Allowances	DA Pam 310-7
Index of Technical Manuals, Technical Bulletins, Supply Bulletins, Lubrication Orders, and Modification Work Orders	DA Pam 3104
Index of Supply Manuals, Ordnance Corps	DA Pam 310-29

2. Related Technical Manuals

Operator, Organizational, Direct Support, General Support, and Depot Maintenance Manual: Truck-Mounted Maintenance Equipment (Guided Missile Helicopter-Armament Subsystem M22)	TM 9-4935-461-15/1
Operator's and Crew Member's Manual, Army Models UH-1A & UH-1B Helicopters	TM 55-1520-211-10

3. Supply Manuals

The following manuals of the Department of the Army Supply Manual pertain to this materiel:

a. General.

Introduction	ORD 1
Ordnance Major Items and Major Combinations and Pertinent Publications	SB 9-1
Requisitioning of Repair Parts and Assemblies Added by Modification Work Orders	SB 9-150

b. Inspection and Repair.

Command Maintenance Inspection	AR 750-8
Crystal Rectifiers	TB SIG 162
Electrical Wiring	TM 5-760
Inspection of Ordnance Materiel in Hands of Troops	TM 9-1100
Inspection Procedure for Repaired Electrical Indicating Instruments	TB SIG 24
Protection of Coaxial Cable Assemblies Against Corrosion	TM SIG 276

c. Instruction Guides.

Maintenance Responsibility and Shop Operation	AR 750-5
Operation in the Arctic	FM 31-71
Ordnance Maintenance: Materials Used for Cleaning, Preserving, Abrading, and Cementing Ordnance Materiel, and Related Materials Including Chemicals, Lubricants, Indicators, and Hydraulic Fluids	TM 9-1007
Painting Instructions for Field Use	TM 9-213
Solder and Soldering	TB SIG 222
Varnish, Moisture and Fungus Resistant, for the Treatment of Communication, Electronic, and Associated Electrical Equipment	MIL-V-173A

d. System Supply Manuals.

Direct Support, General Support, and Depot Maintenance Repair Parts and Special Tool Lists for Helicopter Guided Missile Launcher Armament Subsystem M22 (Used on UH-1B Helicopter)	TM 9-1400-461-35P

Direct Support, General Support, and Depot Maintenance Repair Parts and Special Tool Lists for Truck-Mounted Maintenance Equipment (Guided Missile Helicopter-Armament Subsystem M22)	TM 9-4935-461-35P
Organizational Maintenance, Repair Parts and Special Tool Lists for Helicopter Guided Missile Launcher Armament Subsystem M22 (Used on UH-1B Helicopter)	TM 9-1400-461-20P

4. Forms

The following forms pertain to this materiel:

Exchange Part or Unit Identification Tag	DA Form 9-81
Guided Missile Component Evaluation Data Report	DA Form 9-110
Maintenance Request and Register	DA Form 811
Materiel Inspection Tag	DA Form 9-1
Organizational Equipment File	DA Form 478
Parts Requisition	DA Form 9-79
Preventive Maintenance Schedule and Record	DA Form 460
Recommended Changes to DA Technical Manuals, Parts Lists, or Supply Manuals 7, 8, or 9	DA Form 2028
Report of Damaged or Improper Shipment	DD Form 6
Request for Issue or Turn-In	DA Form 1546

5. Other Publications

The following explanatory publications control information pertinent to this materiel and associated equipment:

a. Decontamination.

Decontamination	TM 3-220
Defense Against CBR Attack	FM 21-40

b. Electronics.

Basic Theory and Application of Transistors	TM 11-690
Electrical Fundamentals (Direct Current)	TM 11-661
Theory and Use of Electronic Test Equipment	TM 11-664
Transients and Waveforms	TM 11-669

c. General.

Accident Reporting and Records	AR 385-40
Dictionary of United States Army Terms	AR-320-5-1
Electronic Failure Report	AR 700-39
Inspection of Ordnance Materiel in Hands of Troops	TM 9-1100
Military Symbols	FM 21-30
Ordnance Direct Support Service	FM 93
Ordnance General and Depot Support Service	FM 9-4
Ordnance Service in the Field	FM 9-5
Safety: Accident Reporting and Records	AR 385-40
Special Operations, Northern Operations	FM 31-71
Unsatisfactory Equipment Report	AR 70038

d. Shipment and Limited Storage.

Ordnance Operational List of Specifications and Instructions for Packaging and Processing General Supplies	SB 9-156
Preservation, Packaging, and Packing of Military Supplies and Equipment	TM 38-250
Preservation, Packaging, and Packing Materials, Supplies, and Equipment Used by the Army	SB 38-100

Protection of Ordnance General Supplies in Open Storage	TB ORD 379
Report of Damaged or Improper Shipment	AR 700-58
Storage and Materiel Handling	TM 743-200
Storage and Army Supplies and Equipment in Shed and Open Storage	SB 38-8-1
Painting and Marking of Guided Missiles and Rockets	TB 74692-1

APPENDIX II

MAINTENANCE ALLOCATION CHART (MAC)

ARMAMENT SUBSYSTEM, HELICOPTER, GUIDED MISSILE LAUNCHER: M-22 10172475
1 March 1965

			MAINTENANCE OPERATION															
	NOMENCLATURE	PART NO.	A SERVICE	B CLEAN	C INSP & TEST	D LUBRICATE	E ADJUST	F ALIGN	G PAINT	H REPLACE	I REPAIR	J OVERHAUL	K REBUILD	L RECOVERABLE	M STOCKAGE	N TOOLS RQD	P REMARKS
1	Modified Control Stick	10172538		2	2		3		2	2	3				3		
2	Cable Assembly	8034872		2	2					2	3				5		
3	Guidance Control Unit	10172476		2	2		3	3		2	3				3		
4	Missile Selection Box	10172477		2	2					2	3				3		
5	Cable Assembly	8034911		2	2					2	3				5		
6	Fire Control Installation	5800994	2	2	2					2							
7	Mount, Infinity Reflex	10511780	2	2	2					2	3				3		
8	Sight, Infinity Reflex	8566351	2	2	2					2	5	5			3		
9	Cable Assembly, Special Purpose	8643708	2	2	2					2	3				3		
10	Support Assembly, Anti-Osc Sight	1051104	'2	2	2					2	3				3		
11	Sight, Anti-Oscillation w/case	5800995	2	2	2					2	5	5			3		
12	Adapter Kit UH-1B/M22	10173075			2					2	2						
13	Control Panel, Pilot's Jettison	10173077			2					2	3				5		
14	Control Panel, Pilot's Sight	10173076			2					2	3				5		
15	Manual Release Assembly LH	10173291		2	2	2	2	2		2	2						
16	Manual Release Assembly RH	10173291		2	2	2	2	2		2	2						
17	Launcher Assembly	8035000		2	2		2	2	2	2	2		5				
18	Housing Assembly LH	8035008-1		2	2	2				2	4				4		
19	Housing Assembly RH	8035008-2		2	2	2				2	4				4		
20	Latch, Actuator Shaft	8035014		2	2					2					2		
21	Cable Assembly	8035033			2					2	2				3		
22	Support Assembly LH	8035001-1		2	2	2	2		2	2	5		5		3		
23	Support Assembly RH	8035001-2		2	2	2	2		2	2	5		5		3		
24	Launcher B1	10173277		2	2	2			2	2	2				3		
25	Fixed Housing and Plug	10173278			2	2		2	2	2	2				3		
26	Bolt Explosive	10022224			2					2					3		
27	Battery Tester	10172480		2	2				2	2	3				3		
28	Remote Fire Switch Assembly	8934749	2	2	2					2	2				3		

INDEX

By Order of the Secretary of the Army:

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Chief of Staff.

Official:
J. C. LAMBERT
Major General, United States Army,
The Adjutant General.

Distribution:
To be distributed in accordance with DA Form 12-31, requirements for Organizational Maintenance instructions for G.M.L. -- M22.

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PREVIOUS EDITIONS ARE OBSOLETE.

P.S.--IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS.

The Metric System and Equivalents

Linear Measure

1 centimeter = 10 millimeters = .39 inch
1 decimeter = 10 centimeters = 3.94 inches
1 meter = 10 decimeters = 39.37 inches
1 dekameter = 10 meters = 32.8 feet
1 hectometer = 10 dekameters = 328.08 feet
1 kilometer = 10 hectometers = 3,280.8 feet

Weights

1 centigram = 10 milligrams = .15 grain
1 decigram = 10 centigrams = 1.54 grains
1 gram = 10 decigram = .035 ounce
1 decagram = 10 grams = .35 ounce
1 hectogram = 10 decagrams = 3.52 ounces
1 kilogram = 10 hectograms = 2.2 pounds
1 quintal = 100 kilograms = 220.46 pounds
1 metric ton = 10 quintals = 1.1 short tons

Liquid Measure

1 centiliter = 10 milliters = .34 fl. ounce
1 deciliter = 10 centiliters = 3.38 fl. ounces
1 liter = 10 deciliters = 33.81 fl. ounces
1 dekaliter = 10 liters = 2.64 gallons
1 hectoliter = 10 dekaliters = 26.42 gallons
1 kiloliter = 10 hectoliters = 264.18 gallons

Square Measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch
1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches
1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

Approximate Conversion Factors

To change	*To*	*Multiply by*	*To change*	*To*	*Multiply by*
inches	centimeters	2.540	ounce-inches	Newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29,573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	Newton-meters	1.356	metric tons	short tons	1.102
pound-inches	Newton-meters	.11296			

Temperature (Exact)

°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

PIN: 022840-000