2.3.4.5 AM 1780/VRC Intercom Amplifier. The intercom, shown in Figure 2-25, is powered by the domelight harness. During simulation, the intercom functions just as it does during actual tank operation, allowing crew members to communicate with one another. The I/O can communicate, as well, with the tank crew from the IOS and hear the same sounds the crew hears. The following intercom controls function normally:

2.3.4.6 Loader's Domelight. The Loader's domelight is powered by a connection from the 24-Vdc domelight harness from the IOS. This provides the Loader the same light level and control available during normal operations.

Control/Indicator	Function
PWR CKT BRK Switch	ON position supplies power to the unit. OFF position removes power from the unit.
MAIN PWR Switch	Turns to select operating modes: NORM: Radio transmit (does not operate in this position). INT ONLY: Turns intercom on. Must be in this position during system operation. OFF: Turns intercom off.

2.3.4.7 Loader's Breech Switch Facade with Main Gun Status Indicator Lights. This switch, shown in Figure 2-26, is contained in a facade mounted on the base of the stub base deflector.

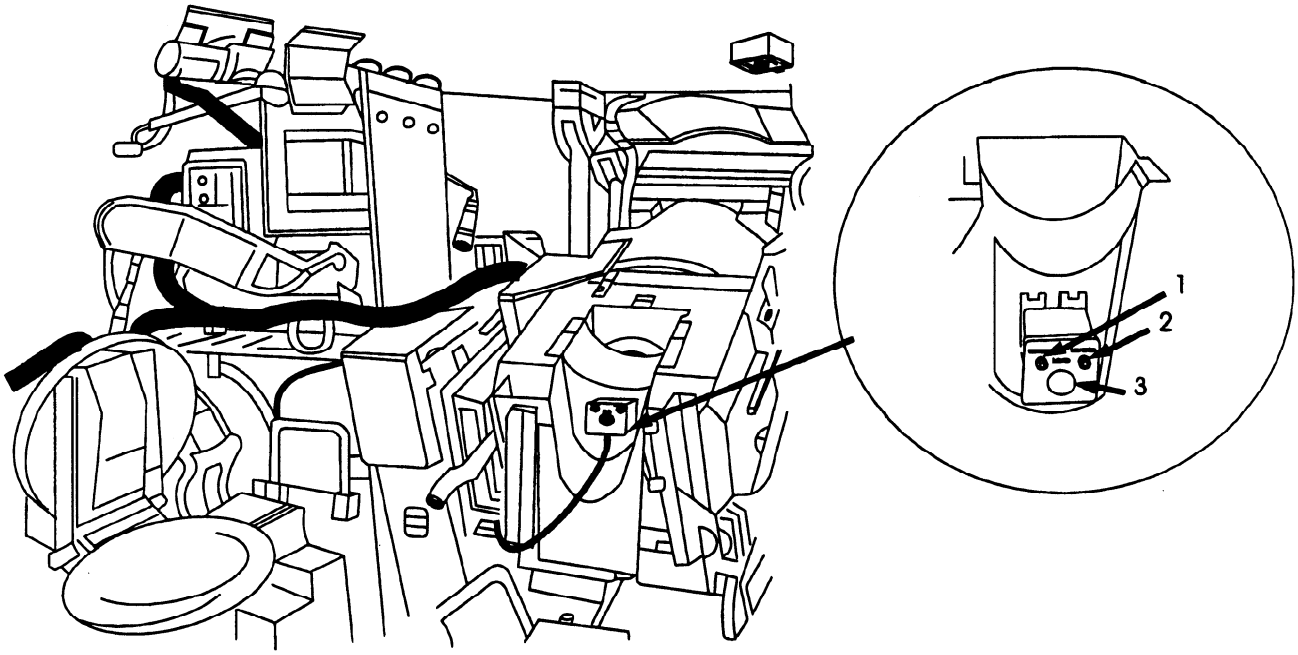

Figure 2-26. Loader's Breech Switch Facade with Main Gun Status Indicator Lights

Key	Control/Indicator	Function
1	READY Indicator Light	Lights 2 seconds (Ml) or 3 seconds (Ml Al) after Loader simulates retrieving a round and releases the Knee Switch.
2	LOADED Indicator Light	Lights if the Ejection Guard or SAFE/ARMED Handle is in the open/SAFE position and the LOAD button is depressed.
3	LOAD Button	Simulates loading of the main gun.

2.3.4.8 Turret EMERGENCY STOP button. The Turret EMERGENCY STOP button, shown in Figure 2-27, is attached magnetically to the ceiling of the turret, above the main gun breechblock and within reach of the Loader, Gunner, and TC, This control, connected to the domelight harness and mounted in a magnetic base, is an electrical push button switch. Pressing the switch will cut off all power to the entire AFIST trainer system. Activating the EMERGENCY STOP button may damage the system's database. When restarting the system after an emergency shutdown, follow normal start-up procedures. After restarting, check the database; if damaged, reload from the backup media. If the database was not damaged, proceed with training.

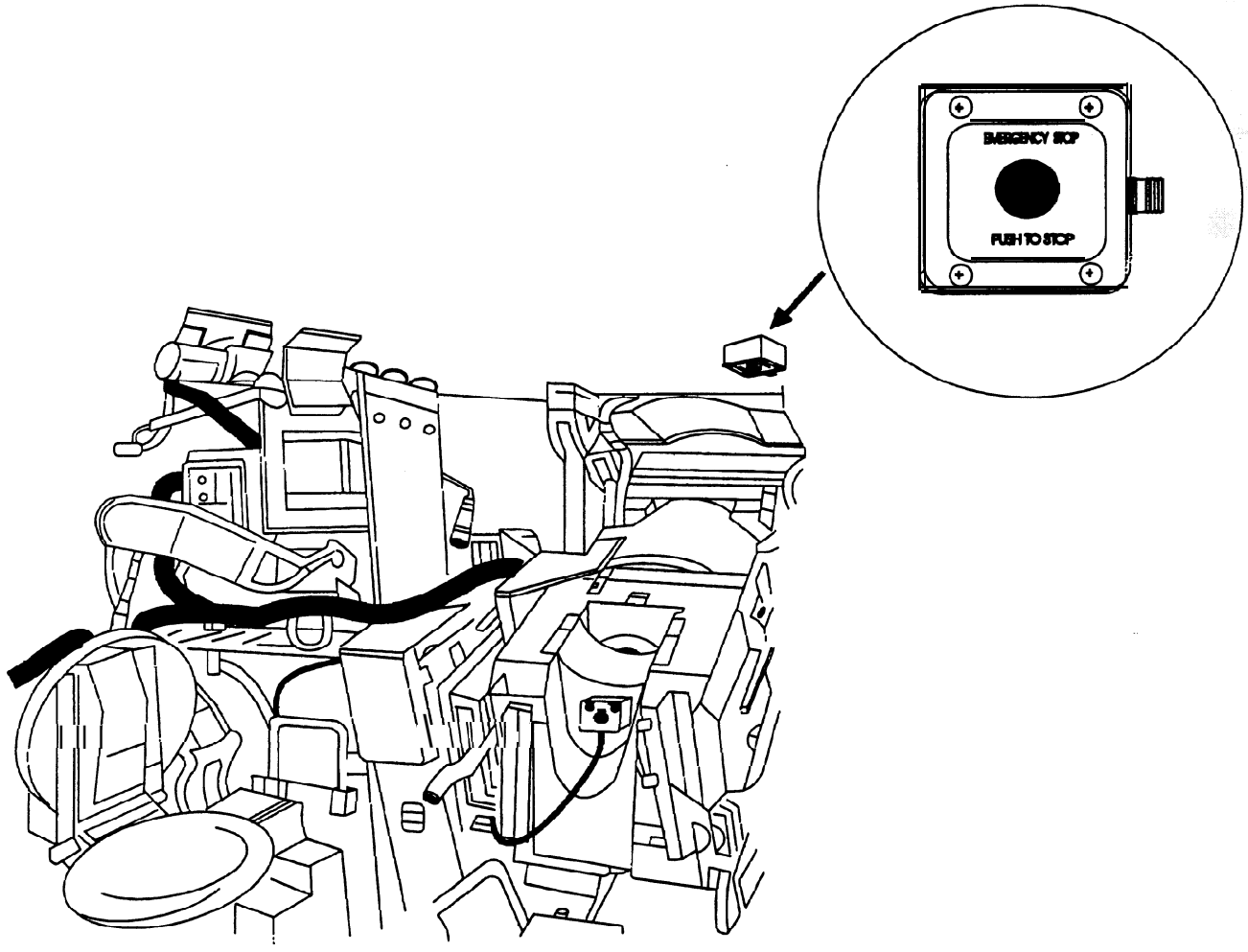

Figure 2-27. Turret EMERGENCY STOP Button

2.3.4.9 Speaker/Amplifier. The speaker/amplifier, shown in Figures 2-28 and 2-29, is connected to the Loader's Crew Station cable and projects tank sound effects into the tank. The following controls and indicators are on the speaker/amplifier.

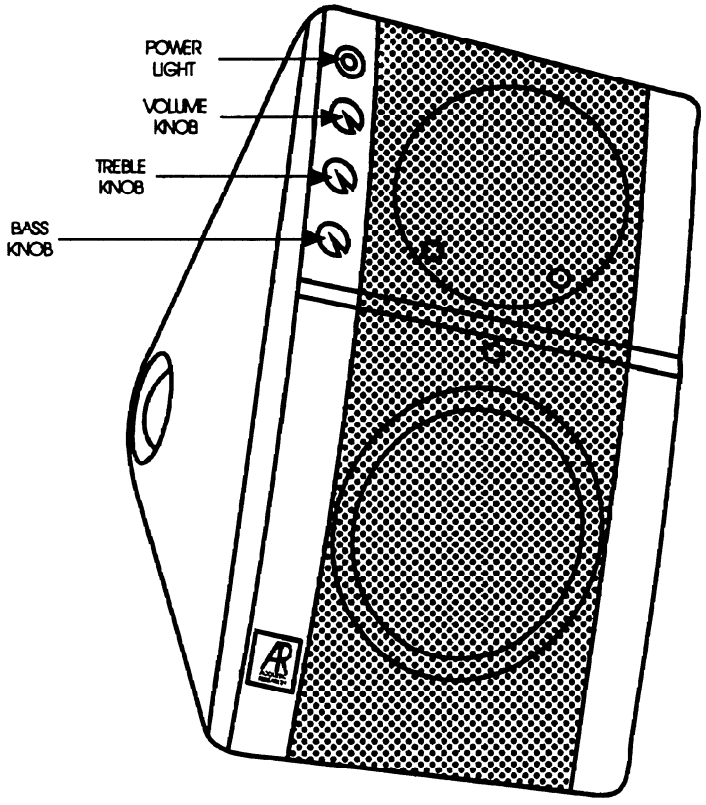

Figure 2-28, Speaker/Amplifier Controls and Indicators (Front)

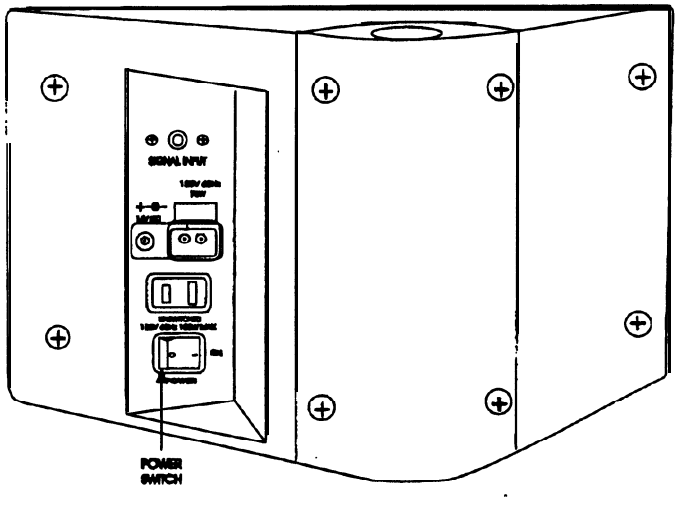

Figure 2-29. Speaker/Amplifier Controls and Indicators (Rear)

Control/Indicator	Function
Power Light	Lights when power applied to unit.
Volume Knob	Turns to adjust unit volume. For normal system operation, this should be fully clockwise.
Treble Knob	Turns to adjust unit treble level.
Bass Knob	Turns to adjust unit bass level.
Power Switch	Toggles power OFF and on (|) the unit.

SECTION II. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

AFIST Preventive Maintenance Checks and Services (PMCS) is contained in Chapter 3, Section I of this operator's manual.

SECTION III. OPERATION

2.4 ASSEMBLY AND PREPARATION FOR USE.

2.4.1 Unpacking and Identifying Components. Before installing the AFIST, unpack it carefully from its shipping containers, use Appendix B to inventory it for completeness, and inspect it for condition in accordance with the PMCS table in Chapter 2, Section II. Unpacking requires at least two people. Many of the components require two people to lift; others are awkward to handle, particularly while being unpacked.

WARNING

The TD 17/162A IOS weighs 1,200 pounds and requires more than one person to move it. Case 1A5 of TD 17/162B weighs in excess of 330 lbs. and requires more than one person to move it. Use enough personnel when handling equipment to avoid personal injury from lifting and moving, and damaged equipment resulting from dropping components.

NOTE

The following procedures are approximate and may change depending on Training Device TD 17/162A or TD 17/162B shipping container configuration.

2.4.1.1 Unpacking the Driver's, CWS, GAS, and GPS Monitor Mounts Unpack the monitor mounts (see Figure 2-30 for a representative monitor mount) as follows:

WARNING

Two people are required to move and unpack the monitor mount cases. Always use two people to handle these cases to avoid personal injury from lifting and damaged equipment from dropping components.

b. Set the cases on the ground.

c. Open the cases.

d. Remove the optical assembly components.

e. Lay out the components for inventory and inspection. The following should be the total contents:

(1) Four monitor mounts (Driver's, CWS, GAS, and GPS) with attached adjustable mounting brackets.

(2) Four cloth light hoods.

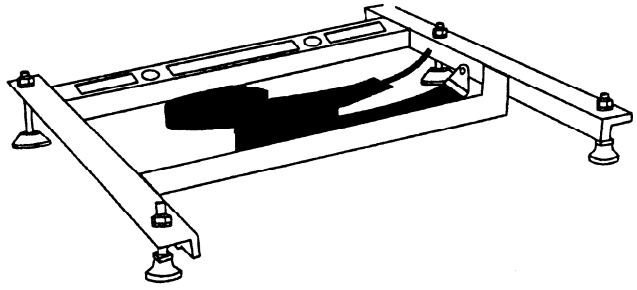

Figure 2-30. Representative Monitor Mount (GAS Monitor Mouht)

2.4.1.2 Unpacking the Monitors. Unpack the monitors from their cases as follows:

WARNING

Each of the monitors weighs over 24 pounds. To avoid personal injury or damage to equipment, do not attempt to unpack one alone.

a. Set the cases on the ground.

b. Open the cases.

c. Have two people lift each monitor from its case.

2.4.1.3 Unpacking the Sensors and Facades. Unpack the sensors and facades from their cases as follows:

a. Set the cases on the ground.

b. Open the cases.

c. Carefully lift the facades and sensors out of the boxes.

d. Remove any packing material from the sensors and facades.

2.4.1.4 Unpacking the Cables. Unpack the cables from their cases as follows:

a. Set the cases on the ground.

b. Open the cases.

c. Remove the individual cables from each case. Unroll the cables and lay them out straight; this will facilitate the installation process.

2.4.2 Inspecting Components. Inspecting individual system components after unpacking requires -the same inspection procedures used in PMCS procedures. Refer to the PMCS table in Chapter 3, Section I and follow the Before procedures in the table.

CAUTION

Connectors can be damaged by handling them roughly, carelessly dropping them on hard surfaces, or throwing cables. Take special care to ensure connectors are not damaged during handling.

2.4.3 Securing Connectors and Plugs. AFIST has a variety of standard connectors for the cables, sensors, monitors, Tank Interface Assembly, IOS, and IG. The methods for securing each type of connector are described in the following paragraphs.

CAUTION

Forcing connectors together with misaligned pins can damage cables and onboard tank components. Take care to align the keyways in plugs and connectors before pushing the connectors.

2.4.3.1 Five-Pin Connectors. A five-pin connector is used on the IOS headset. (Refer to Figure 2-31 for an illustration of a five-pin connector.) Secure this connector as follows:

Figure 2-31. Five-Pin Connector

a. Align the pins in the connector with the holes in the plug.

b. Insert the pin end of the connector into the plug end of the connector. Push until the pins slip into the plug and the locking lever clicks.

c. When disconnecting, depress the small lever on the top of the connector to release the connection.

2.4.3.2 Multiple-Pin Connectors with Thumbscrews. Multiple-pin connectors, shown in Figure 2-32, are used in video connections and on the printer cables. Secure these connectors as follows:

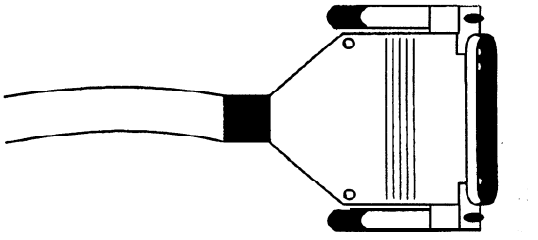

Figure 2-32. Multiple-Pin Connectors with Thumbscrews

a. Match the pin side of the connector with the plug side of the connector. The pins and plugs are configured so that the two longer sides are not equal in length. Match the longer side of the pin connector with the longer side of the plug connector.

b. Align the pins in the connector with the holes in the plug.

c. Insert the pin connector into the plug connector.

d. Secure the connector by tightening the thumbscrews finger-tight.

2.4.3.3 Military Connectors. Military connectors are on assemblies which replace onboard tank connections in the tank hull and turret, as well as on the Tank Interface Assembly and the IOS Interface Connector Panel on TD 17/162A. Military connectors are used on case 1A2, 1A4 & 1A5 of TD 17/162B. Some typical military connectors used in the system are shown in Figure 2-33. The system contains military connectors that are similar to those illustrated. All military connectors function in the same way. Secure these connectors as follows:

a. Ensure that the keys on the outer edge of the connector align with the corresponding slots in the inner edge of the receptacle.

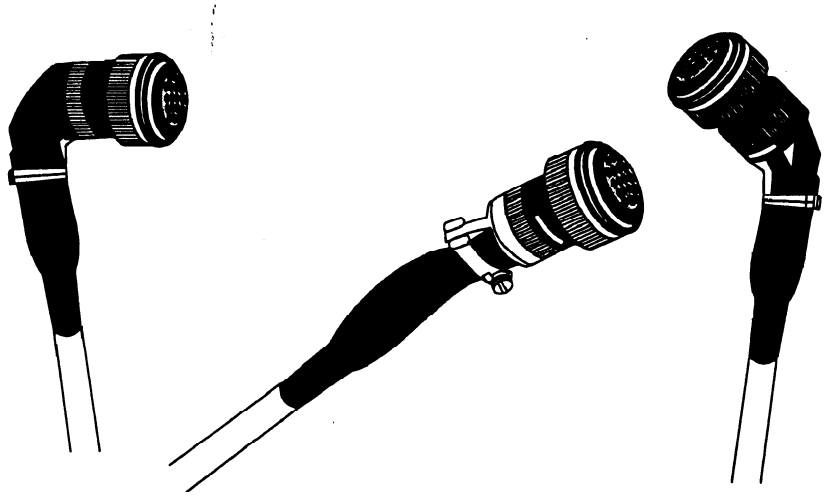

Figure 2-33. Military Connectors

b. Align the pins in the receptacle with the holes in the connector.

c. Push the connector carefully onto the receptacle and secure the connector by turning the knurled knob on the connector clockwise until it seats. Some connectors are "quarter-turn" connectors, which seat with a click after the knobs are turned 90° clockwise. Other connectors are "screw-on" connectors, which seat after two or three full (360°) clockwise turns. Tighten knobs on quarter-turn connectors until they click. Tighten knobs on screw-on connectors until they are firmly finger-tight. Then push the connectors together again and check tightness of the knurled knob.

2.4.3.4 Cable Connector Identification. Use the reference designator attached to each cable connector to identify connectors and make the proper connections in the installation procedures in 2.4.5 through 2.4.8. These designators identify each connector by cable number, as given in Appendix B, and plug number on that cable, as shown below. In the example in Figure 2-35, 2W1P1 is the first plug on cable 2W1 (Commander's Crew Station Cable).

NOTE

Cable numbers beginning with a "W" connect directly to the IOS. Cables beginning with "2W" are connected on or around the tank,

Figure 2-34. Cable Identification Example

Where helpful, the installation procedures also identify component receptacles by reference designator. These designators identify each component receptacle by component part number, as given in Appendix B, and jack number on that component, as shown below. In the example in Figure 2-35, 2CS1A3J1 is the first jack on component 2CS1A3 (TC's remote keypad),

Use component part numbers to identify component location, using the following scheme:

2CS1A3

2 = Location identification, where:

1 = IOS

2 = Tank-appended

CS1 = Crew station, where:

CS1 = TC's crew station

CS2 = Gunner's crew station

CS3 = Loader's crew station

CS4 = Driver's crew station

A3 = Assembly number

2.4.4 Preparing the Tank for AFIST Installation.

2.4.4.1 Tank Preparation. The following steps are required to prepare the tank prior to installation of the simulator trainer:

a. Using a turret mechanic (if available), perform an operational check of the vehicle using the operator's and maintenance manuals appropriate for the tank in use. The tank's fire control systems must be functioning properly before AFIST can be installed and operated.

   AFIST can be operated on a tank that is not fully operational. To install and operate AFIST, the crew controls must be present and operational, the intercom and fire control systems must be operational, and the tank should not have any electrical malfunctions. Thus, the unit commander has the flexibility to use a tank which may not have fully operational automotive components, but which . . can still support simulated gunnery training with AFIST installed.

b. Park the tank in the desired location and set the parking brake.

c. Ensure the Driver's hatch is in the open position.

d. Place chock blocks at the tracks to prevent the tank from moving.

e. Remove one vision block from the Loader's hatch for the cables to pass through.

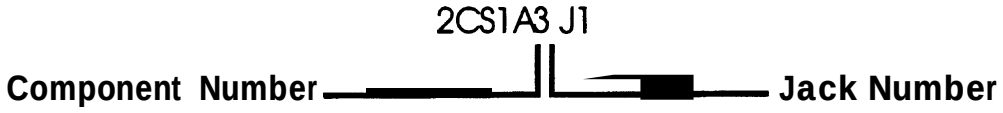

Figure 2-35. Component Identification Example

f. Lock the Loader's hatch in the open position.

g. Open the GPS and TIS ballistic doors and lock in position.

h. Remove the pin from the tank elevation lock and stow the lock and pin (M1A1).

i. Completely remove the tank elevation lock and stow it (M1).

j. Perform Muzzle Reference System (MRS) update:

(1) Power up the Gunner's station as outlined in the Operator's Manual appropriate for the tank in use, listed in Appendix A.

(2) If the tank engine is shut down, set the AUX HYDR POWER switch on the Commander's Panel to the ON position.

(3) Set the FCM switch to the NORMAL position and verify that the NORMAL light lights.

(4) Set the GUN/TURRET DRIVE switch on the Loader's Panel to the POWERED position.

(5) Traverse the main gun 90" left or right of hull.

(6) Set the MRS lever to the IN position.

WARNING

The main gun will move abruptly when the Gunner's Power Control Handles palm switches are pressed, which could cause personal injury.

CAUTION

Do not press the Gunner's Power Control Handles LRF buttons. The MRS will be damagedif the LRF is fired while the MRS is set to the IN position.

(7) Squeeze the Gunner's Power Control Handles palm switches for at least 5 seconds. The main gun moves to 0" elevation.

(8) Release the palm switches.

(9) Set the Muzzle Reference System (MRS) to the OUT position.

(10) Power down the turret.

(11) Power down the tank.

k. Rotate the CWS so the .50-caliber machine-gun mount points generally toward the right rear of the turret. Set the POWER/MANUAL lever in the POWER position to lock the CWS in place.

l. Lock the TC's hatch in either the closed or open-protected position.

m Remove the Loader's tray from the Loader's station and place it in the bustle rack or other out-of-the-way location (M1A1 tank). This will facilitate connecting the Loader's Crew Station cable.

n. Verify VEHICLE MASTER POWER switch is in the OFF position.

0. Go to step r (Ml tank).

p. Remove the aft cap stub base deflector from the breech (M1A1 tank).

(1) Lock the retaining pins in the open position.

(2) Lift the stub base deflector up until it is clear of the bracket.

4. Remove the five-pronged tray (the "Five Fingers of Death") from the breechblock (M1A1 tank).

(1) Using a small screwdriver, push down on the plungers on top of the tray.

(2) Using pliers, pull the tray from the breechblock.

r. Remove the lifting eye from the rear of the CWS (in front of the vision block the TC will be using to train). Place it in a secure out-of-the-way location.

s. Disconnect the tank's battery bus bar located in the battery compartment. Refer to the Operator's Manual appropriate for the tank model in use. Wrap free end of the disconnected cable with electrical tape.

WARNING

Do not allow free end of the disconnected cable to ground on the tank. Grounding this cable can cause personal injury from electric shock and damage the tank's electrical system.

t. Manually rotate the turret so the barrel of the main gun is over the fuel cap at the right-rear comer of the tank hull. Place the turret lock in the LOCKED position.

2.4.4.2 Verification Checklist. Immediately prior to beginning AFIST installation, verify the following:

a. The tank main battery bus bar is disconnected.

b. The VEHICLE MASTER POWER switch on the Driver's Master Control Panel or Commander's Panel is in the OFF position.

c. The TURRET POWER switch on the Commander's Panel is in the OFF position.

d. The AUX HYDR POWER switch on the Commander's Panel is in the OFF position.

2.4.5. Assembling TD 17/162B, Deployable AFIST. The IOS is contained in 5 transit cases. Case 9(Unit 1A1),Case 10 (Unit 1A2),Case ll(Unit 1A3),Case 12(Unit 1A4),& Case 13(Unit 1A5).

NOTE

TD 17/162A requires no assembly.

a. Setup IOS transit cases

(1) Remove front and rear covers from transit cases 10 and 12 (attach casters provided to the bottom of these cases).

(2) Place case #10 within 10 feet of the tank and place case #12, next to and to the right of case #10.

(3) Remove front and rear covers from transit cases 9 and 11 (both cases contain the IOS monitors).

(4) Using two people lift and place case #9 on top of . case #10, and place case #11 on top of case #12.

(5) Remove front and rear covers from transit case 13 (case is on wheels and contains the Image Generator) and place next to and to the right of transit cases 11 and 12.

b. Install ground cables 1W6 and 1W15. Both cables are shipped in Transit Case #5.

(1) Connect P1 end of 1W6 ground cable to rear of Unit lA2 Assembly 3 (A2A3E1) post and the P2 end to rear of Unit lA4, Assembly 4 (EARTH GROUND) post.

(2) Connect P1 end of 1W6 ground cable to the rear of Unit lA4, Assembly 4 (EARTH GROUND) post and place on top of the lW6 ground cable previously installed there. Connect the P2 end to the front of Unit 1A5.

c. **Install** cables **1W11, 1W13 and 1W14**. These cables are shipped in transit case #5.

(1) Connect P1 end of cable 1W11 to the rear of Unit 1A2, Assembly 4 (VIDEO AMP OUT 2) connector and the P2 end to the rear of Unit 1A4, Assembly 6 (RGBS IN) connector.

(2) Connect P1 end of cable **1W13** to the rear of Unit lA2, Assembly 4 (VGA) connector, and the P2 end to the rear of Unit **1A4,** Assembly 6 (VGA) connector.

(3) Connect P1 end of cable **1W14** to the rear of Unit **1A4,** Assembly 6 (ETHERNET) connector and the P2 end to the rear of Unit **1A5** Assembly 2 (ETHERNET) connector.

d. Install cables **IW3, 1W5, 1W9** and **1W10**. These cables are shipped in transit case **#5.**

(1) Connect P1 end of cable **1W3** to the rear of Unit lA2, Assembly 3 (AC POWER OUT) connector and the P2 end to the rear of Unit **1A4,** Assembly 5 (TANK MONAJTILITY PWR) connector.

(2) Connect P1 end of cable **1W5** to the rear of Unit **1A1,** Assembly 1 (MONITOR) and the P2 end to the rear of Unit lA2, Assembly'3 (OUTLET STRIPS) plug.

(3) Connect P1 end of cable **1W9** to the rear of Unit **1A2,** Assembly 4 (REMOTE) connector and the P2 end to the rear of Unit lA4, Assembly 5 (VIDEO SEL SW) connector.

(4) Connect P1 end of cable **1W10** to the rear of Unit **1A3,** Assembly 1 (MONITOR) and the P2 end to the rear of Unit **1A2,** Assembly 3 (UTILITY POWER) plug.

e. **Install** cables **1W1, 1W2, 1W4** and **1W12.** These cables are shipped in transit case **#6.**

(1) Connect P1 end of cable **1W1** to the rear of Unit lA2, Assembly 1 **(NTSC/AUDIO)** connector and P2 end to the rear of Unit **1A4,** Assembly 6 **(IOS** SPEAKER **NTSC/VCR** AUDIO OUT) connector.

(2) Connect P1 end of cable **1W2** to the rear of Unit **1A2,** Assembly 3 (DC PWIUCONTMD SEL SW) connector and the P2 end to the rear of Unit **1A4,** Assembly 5 (DC **PWR/CONTROL)** connector.

(3) Connect cable **1W4** to the rear of Unit **1A2,** Assembly 3 (AC POWER IN) connector and the P2 end to the rear of Unit **1A4,** Assembly 5 (FACILITY POWER 1) connector.

(4) Connect P1 end of cable **IW12** to the rear of Unit lA2, Assembly 4 (VIDEO IN) connector and the P2 end to the rear of Unit **1A5,** Assembly 2 **(TC/DRVR** VIDEO **3/4** GPS/GAS VIDEO **1/5)** connector.

f. Connect **IOS** Monitor Video Cables. One end of these cables are permanently attached to the monitors.

(1) Connect Unit **1A1's** monitor video cable to the back of Unit lA2, Assembly 4 (TC **DRVR/** MENU VIDEO OUT) connector.

(2) Connect Unit **1A3's** monitor video cable to the back of Unit **1A2,** Assembly **4(AMP** OUT 1) Connector.

g. Connect **IOS** Power Strips. One end of these cables are permanently attached to the power strips.

(1) Locate the power cord for Unit **1A4's** power strip, located at the rear of that Unit behind the top blank panel. Connect the cord to the rear of Unit **1A2,** Assembly 3 (UTILITY POWER) plug.

(2) Locate the power cord for Unit **1A2's** power strip, located at the rear of that Unit just inside the VIDEO DISTRIBUTION PANEL. Connect the cord to the (OUTLET STRIPS) plug located above the VIDEO DISTRIBUTION PANEL.

2.4.6 Positioning and Connecting Non-Tank-Appended Components (IOS).

WARNING

Ensure **all** doors are closed and secured before attempting to move the TD **17/16A IOS.** Swinging doors **may** cause personal injury and damage to equipment.

Before **installing** components into the IOS, position the **three-**rack unit or the five transit case unit within 10 feet of the tank and 15 feet of an earth ground.

After **initial installation, IOS** components remain installed on the **IOS** between training.

a. Keyboard

(1) Slide the keyboard drawer open.

(2) Remove the two black keyboard support trays.

(3) Install the narrow support tray by placing it across the drawer towards the rear. Lock the cut notches into place.

(4) Install the wide support tray directly in front of the narrow tray, and lock it into place.

(5) Place the keyboard on top of the long support tray.

b. IOS headset.

(1) Connect the headset cable into the headset plug on the Audio Preamp Mixer Unit.

(2) Slide open the writing surface drawer and place the headset on it.

2.4.7 Installing Tank-Appended Components.

NOTE

When more than two people are appending AFIST, the S/IO should coordinate actions inside and outside the tank. Certain components must be installed in sequence or actions will have to be repeated. Other installations actions can occur concurrently, but must be coordinated in this order:

a. Position the following AFIST cables and components on top of the tank:

NOTE

Refer to Appendix B, Section II, Components of End Item.

(1) Crew station cables (five).

(2) M1A1 adapter (M1A1).

(3) Domelight harness.

(4) Tank Interface Assembly.

(5) All facades.

(6) CWS, GPS, and GAS monitor mounts and monitors.

b. Position the following AFIST cables and components on the ground between the tank and the IOS.

(1) Tank Interface cables (two).

(2) CWS, GPS, GAS, and Driver's video cables and ac power cables.

(3) Three-outlet ac, SO-foot power cable (for CWS, GPS, and GAS

(4) Single-outlet, 50-foot ac power cable (for Driver's monitor).

c. Within each crew station, install all facades, sensors, or other assemblies first, then position and connect the crew station cable.

2.4.7.1 Organizing for Installation. The recommended method for installing the AFIST is to use a turret mechanic and the tank crew to assist the S/IO. The installation team should work together to move all components to the tank. When only two people are appending AFIST, the team should install inside components before installing outside components. When more than two people are appending AFIST, the team should organize to install components inside and outside the tank at the same time.

2.4.7.2 Tools Required for Installation. Tools required for installing tank-appended components are a 5/64-inch Allen wrench, a small flat-tip screwdriver, a short #0 Phillips screwdriver, and an 8-inch adjustable wrench.

NOTE

Installation is facilitated when an externally connected "drop light" is run into the turret during the installation process.

2.4.7.3 Domelight Harness W6 and Turret EMERGENCY STOP Button Installation. Use Figure 2-36 as a guide, and install the domelight harness W6 and the EMERGENCY STOP button as follows:

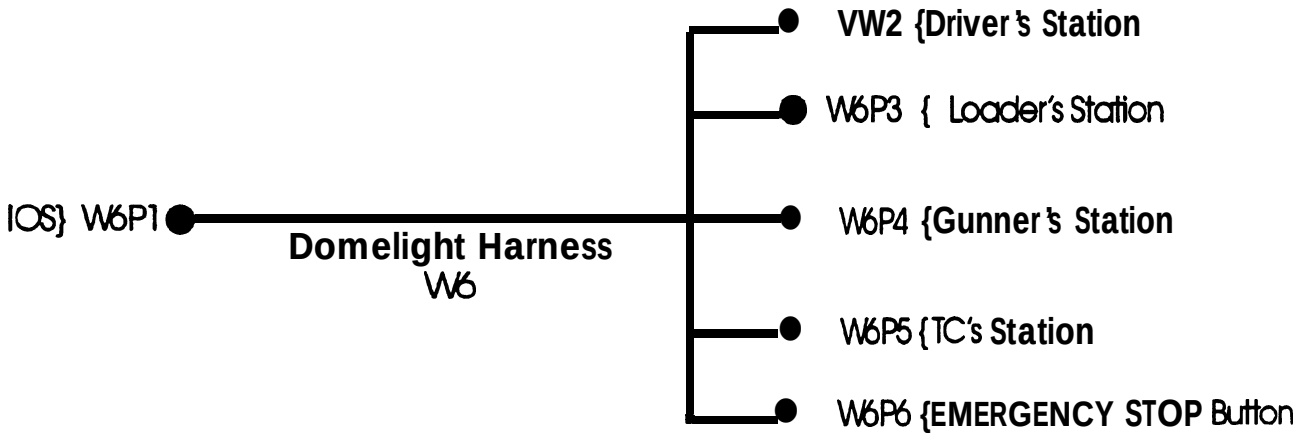

Figure 2-36. Domelight Harness Wire Diagram

a. Position cable and connect W6P1 (the end with the large plug) to the 24VDC TANK DOMELIGHT POWER receptacle on the IOS Interface Connector Panel. (Refer to Figure 2-37 and 2-37a.)

b. Route cable W6 through the open vision block the Loader's hatch and into the tank.

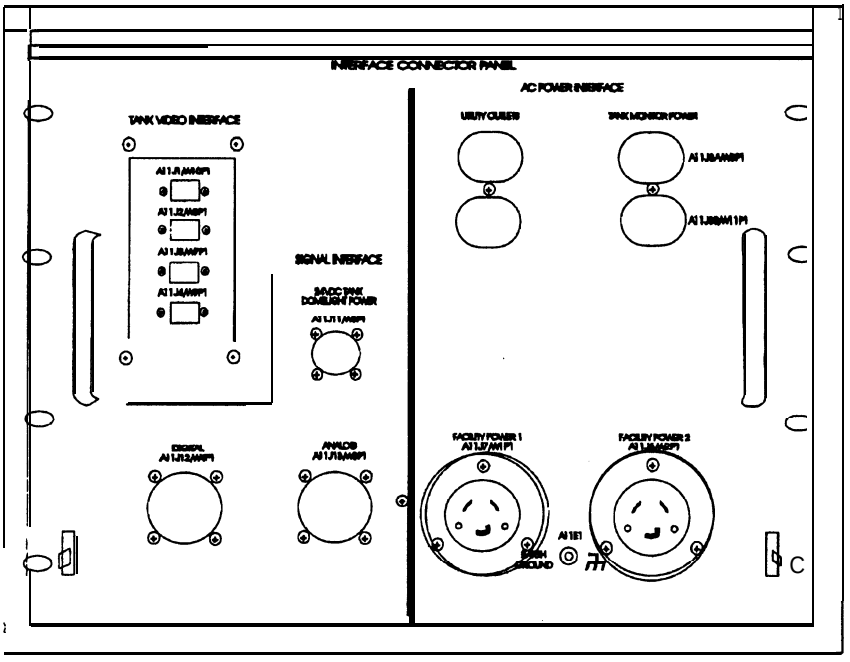

Figure 2-37. TD 17/162A IOS Interface Connector Panel

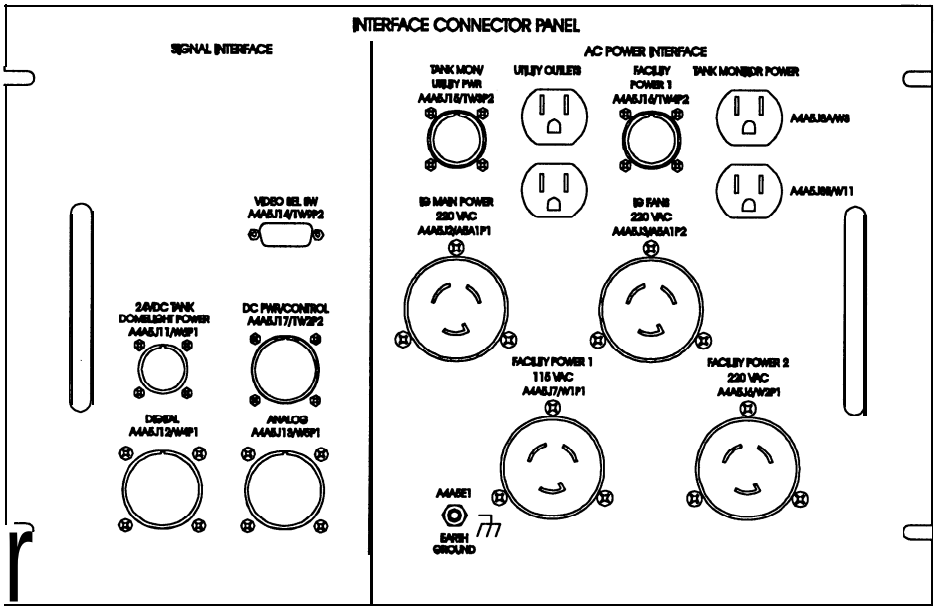

Figure 2-37a. TD 17/162B IOS Interface Connector Panel

c. Connect the Turret Emergency Power Off switch (shown in Figure 2-38) to cable connector W6P6 and attach it to the turret ceiling by the magnets in the base assembly.

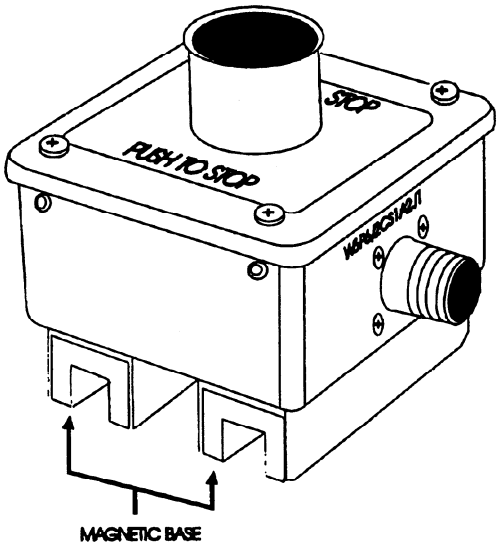

Figure 2-38. Turret EMERGENCY STOP Button

d. Route each of the remaining cables to its corresponding crew station domelight. Each of the four domelight harness cables is labeled with its location.

(1) Loader's station: cable connector W6P3.

(2) Driver's station: cable connector W6P2.

(3) TC's station: cable connector W6P5.

(4) Gunner's station: cable connector W6P4.

CAUTION

The fire sensor cables in the tank are fragile. Do not cover or wrap any fire sensor cables with the velcro straps used to secure AFIST cables.

NOTE

All cables that are installed in the turret are provided with velcro straps to secure the cables to existing tank hardware. The location of these straps on each cable can be adjusted.

e. At each domelight, disconnect the onboard power cable to the light, and connect the AFIST connector. This connection provides 24-Vdc power to the domelights.

f. Connect Facility Grounding wire W12 to IOS connector A11E1 on TD 17/162A , for TD 17/162B connect W12 Grounding wire to A4A5J6 connector. Connect the other end to an approved facility grounding destination.

g. Connect facility power cable connectors W1P1 and W2P1 to connector Al 1 J7/W1P1 and Al 1 J6/W2P1 respectively, on the Interface Control Panel of TD 17/162A, for TD 17/162B connect facility power cables W1P1 and W2P1 to connector A4A5J7 and A4A5J6 on the Interface Control Panel.

h. Connect Facility Power cable connectors W1P2 and W2P2 to facility power outlets.

i. At the I/O Control Panel on the front of the IOS:

(1) Place the MAIN POWER SWITCH to the ON (up) position.

(2) Insert the passkey in the Instructor/Operator passkey lock and turn the key to the ON (three o'clock) position. Ensure the 24V POWER SUPPLY STATUS and PASSKEY ENGAGED lights light.

(3) Place the DOMELIGHT POWER switch in the ON (up) position. Ensure the DOMELIGHT POWER light lights.

j. At each crew station in the tank, turn on the domelight. Ensure each domelight lights.

k. Complete this installation by securing each of the cables to the existing cable bundles in the tank using the velcro straps attached to the individual domelight cables.

2.4.7.4 Components Installed Inside the Tank. Install components inside the tank as outlined in the following paragraphs. Begin installation in any crew station. However, in each crew station, install all facade and sensor assemblies before positioning and connecting the crew station cable. Within each crew station, following the general order presented in the following paragraphs will ease installation.

To make installation easier, complete procedures in the following paragraphs to install all facades, position and connect the crew station cables, connect the cables to the Tank Interface Assembly, and position the Tank Interface Assembly under the main gun breechblock before manually elevating the main gun to its AFIST elevation lock position.

2.4.7.4.1 Gunner's Station.

2.4.7.4.1.1 GAS Proximity Sensor Installation. Install the GAS proximity sensor assembly (see Figure 2-39) as follows:

NOTE

Removing the browpad may ease installation.

a. Loosen the retaining knob on the GAS browpad.

b. Slide the mounting foot of the sensor under the retaining bracket beneath the retaining knob, so that the electrical connection for the sensor is positioned to the front of the turret, and the plastic face of the sensor is facing the Gunner's position.

c. Tighten the knob to secure the sensor in place.

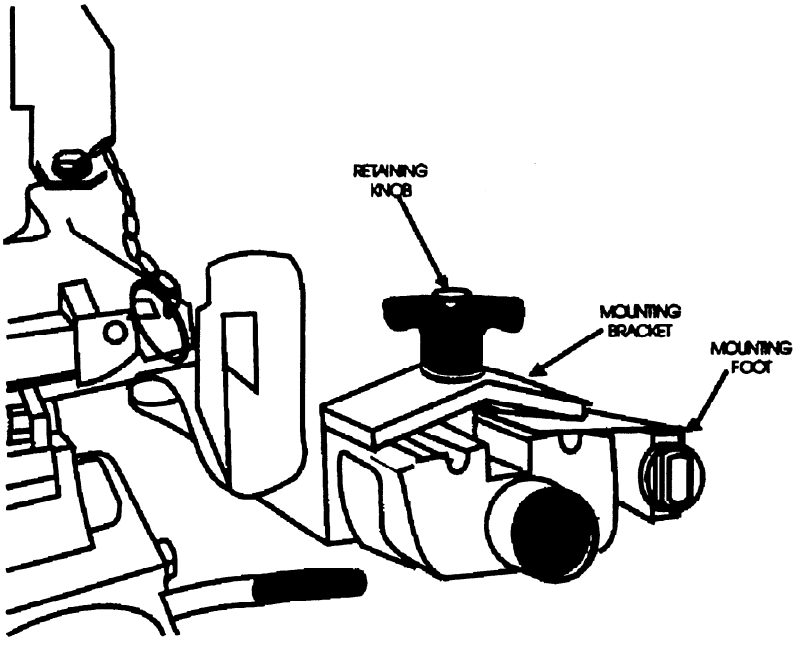

Figure 2-39. GAS Proximity Sensor

2.4.7.4.1.2 GPS MAGNIFICATION Lever Facade Installation. The GPS MAGNIFICATION lever facade is part of the GPS Control Panel facade, which also includes the GPS LRF switch, GPS FLTR/CLEAR/SHTR switch, and GPS Reticle Intensity knob facades. Install the GPS MAGNIFICATION Lever facade (see Figure 2-40) as follows:

a. Locate the GPS MAGNIFICATION Lever on the GPS Control Panel.

b. Locate the GPS MAGNIFICATION Lever facade. Position it so that the lever faces the Gunner and the side of the facade with the knurled knobs faces right.

c. Remove the cover over the facade magnification lever.

d. Remove the two screws on the GPS Control Panel to the left and right of the GPS MAGNIFICATION lever,

e. Place the actual lever in the 3X position (to the left). Place the facade below the actual lever and raise it up under the actual lever.

f. Seat the facade squarely and secure it by tightening the knurled knobs on the flange on the right side of the facade.

g. Align the hole in the facade supports with the openings for the removed control panel screws. Replace and tighten the two control panel screws to secure the facade in place.

h. Replace the facade cover over the actual lever.

i. Tighten the two facade screws above the facade lever to lock the cover in position.

2.4.7.4.1.3 GPS FLTR/CLEAR/SHTR Switch Facade Installation. The GPS FLTR/CLEAR/SHTR switch facade is part of the GPS Control Panel facade, which also includes the LRF switch, GPS MAGNIFICATION lever, and GPS Reticle

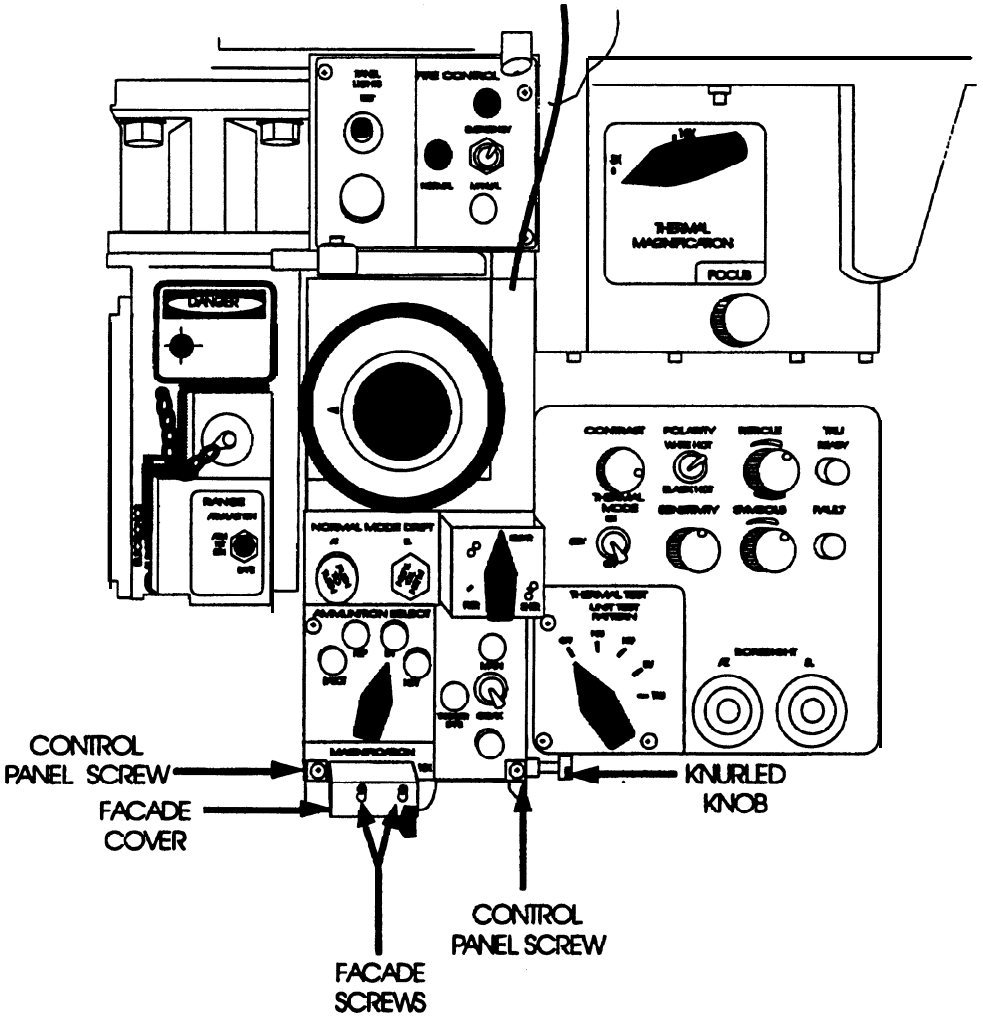

Figure 2-40. GPS Magnification Lever Facade

Intensity knob facades. Install the GPS FLTR/CLEAR/SHTR switch facade (see Figure 2-41) as follows:

a. Locate the GPS FLTR/CLEAR/SHTR knob on the GPS Control Panel. Ensure the knob is pointing to the CLEAR position.

b. Locate the setscrews on the right side and bottom of the knob. Using a 5/64-inch Allen wrench, loosen the setscrews and pull the knob off. Keep the knob and wrench available.

c. Using the appropriate type screwdriver, remove the two screws on the GPS Control Panel just above and below the FLTR/CLEAR/SHTR switch.

d. Position the GPS FLTR/CLEAR/SHTR switch facade over the actual switch shaft. Push the facade onto the switch shaft. Replace and tighten the two screws, ensuring that the facade is aligned vertically.

e. Place the knob on the switch shaft of the facade in the CLEAR position with the shaft cutout aligned with the bottom of the knob. Secure the knob by tightening the setscrews with the Allen wrench.

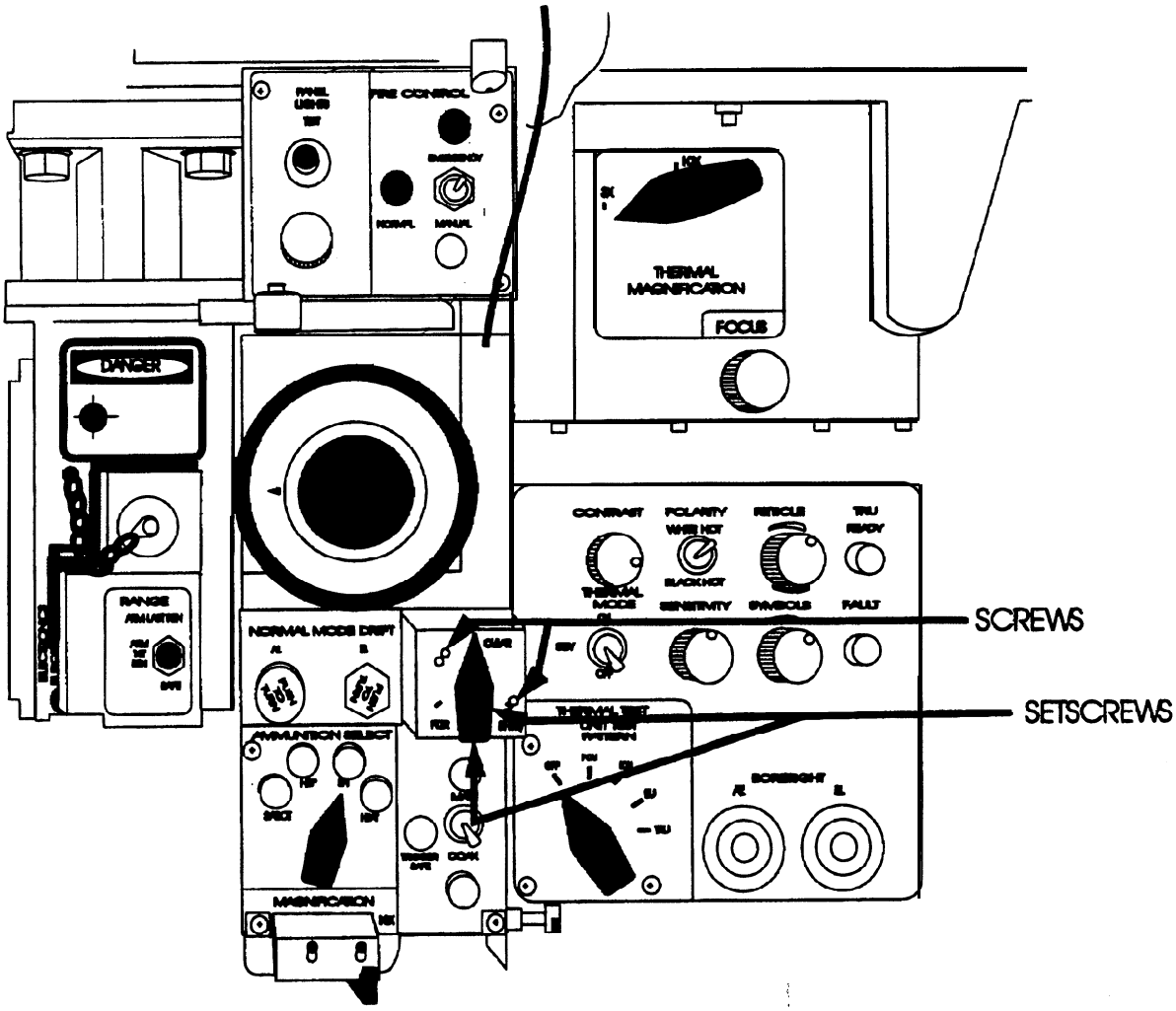

Figure 2-41. GPS FLTR/CLEAR/SHTR Switch Facade

2.4.7.4.1.4 Laser Range Finder Switch Facade Installation. The LRF switch facade is part of the GPS Control Panel facade, which also includes the GPS FLTR/CLEAR/SHTR, switch, GPS MAGNIFICATION lever, and GPS Reticle Intensity knob facades. Install the LRF switch facade (see Figure 2-42) as follows:

a. Locate the Laser Safety Guard installed over the Laser RANGE switch. Turn the protective cover cap over the guard counterclockwise and remove the cover cap. Do not remove the Laser Safety Guard.

WARNING

With the Guard removed, the laser is operational and can cause severe eye injury if fired.

b. Position the LRF switch facade over the Laser Safety Guard installed, aligning the large hole at the top of the facade with the connector at the top of the panel.

c. Replace the protective cover cap at the top of the facade. Turn it clockwise, locking it into place.

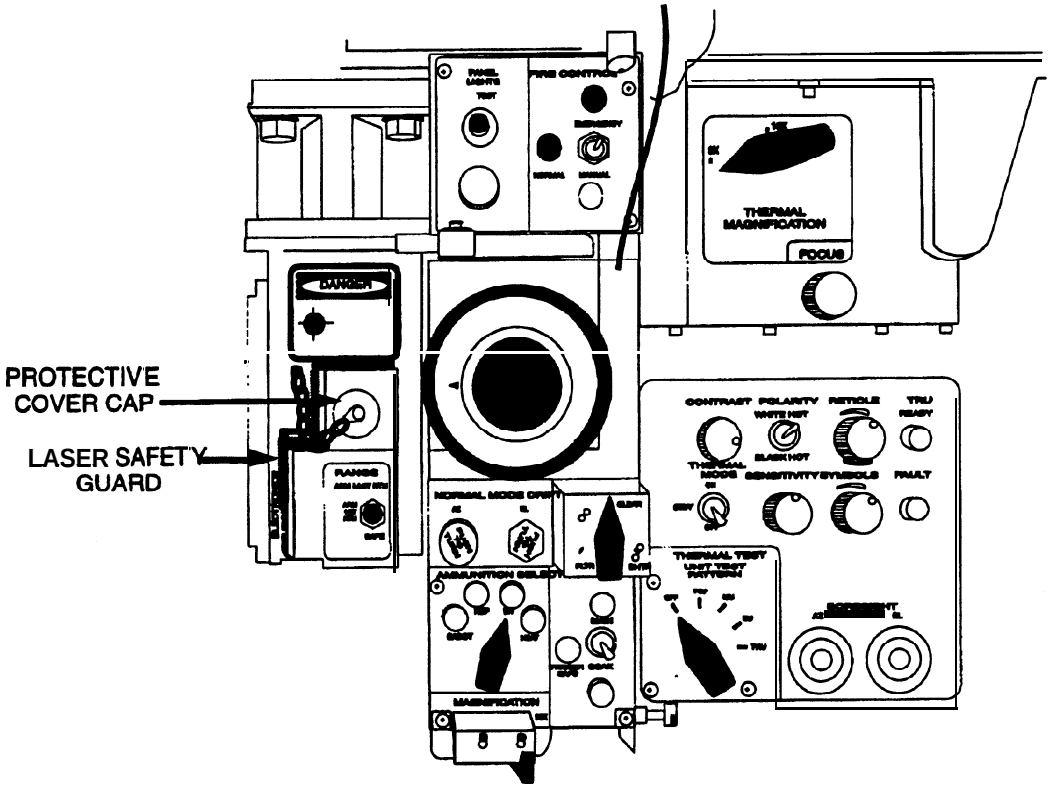

Figure 2-42. Laser Range Finder Switch Facade

2.4.7.4.1.5 GPS Reticle Intensity Knob Facade Installation. The GPS Reticle Intensity knob facade is part of the GPS Control Panel facade, which also includes the GPS MAGNIFICATION lever, GPS FLTR/CLEAR/SHTR switch, and GPS Magnification lever facades. Install the GPS Reticle Intensity knob facade (see Figure 2-43) as follows:

a. Using the appropriate type screwdriver, remove the two screws to the right of the GPS Reticle Intensity knob.

b. Aligning the GPS Reticle Intensity knob facade over the actual knob, slide the cutout mounting slots of the facade under the loosened screws.

c. Replace and tighten the two screws to secure the facade in position.

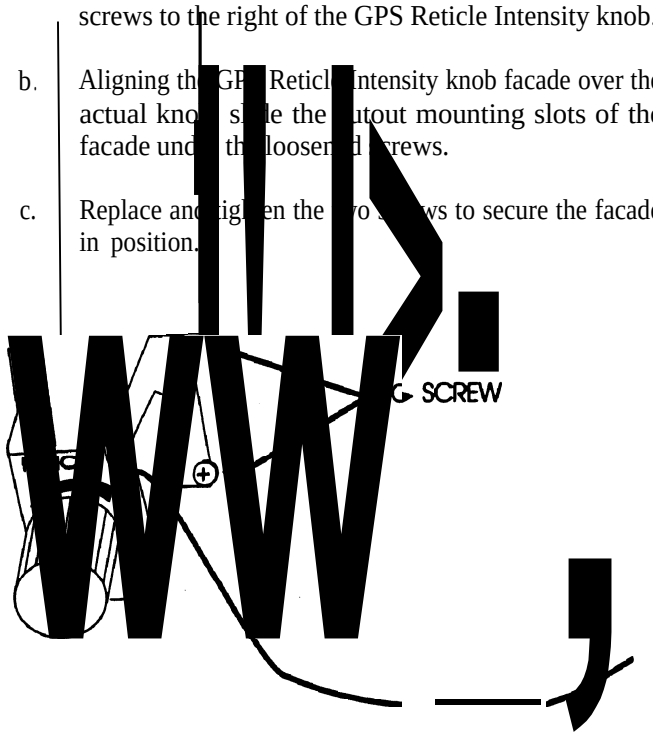

Figure 2-43. GPS Reticle Intensity Knob Facade

2.4.7.4.1.6 GAS Reticle Select Switch Facade Installation. Install the GAS Reticle Select switch facade (see Figure 2-44) as follows:

a. Locate the GAS Reticle Select switch on the GAS Control Panel. Ensure the knob is in the HEAT position.

b. Using a 5/64-inch Allen wrench, loosen the two setscrews on the bottom and right side of the knob and remove the GAS Reticle Select knob (upper knob) from the GAS Control Panel.

c. Using a small Phillips screwdriver, loosen the two screws to the left of the knob position, one above and one below it.

d. Use the 5/64-inch Allen wrench to loosen the setscrew on the shaft extension of the GAS Reticle Select switch facade.

e. With the setscrews at the seven and ten o'clock positions, align the flat part of the facade shaft extension with the flat part of the actual tank knob shaft and slide the facade shaft extension on the actual tank knob shaft. Tighten the setscrews to secure the shaft extension.

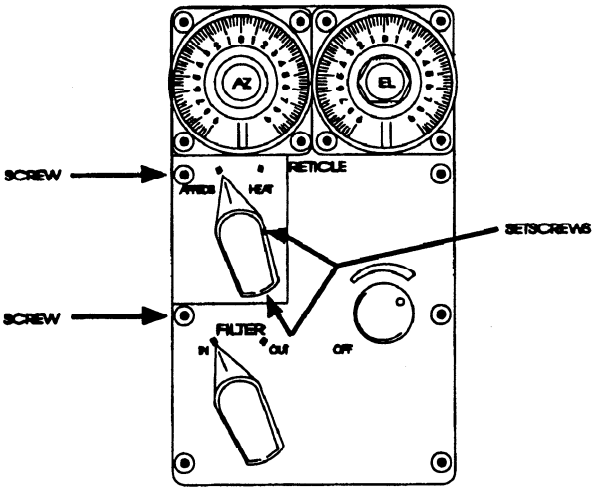

Figure 2-44. GAS Reticle Select Switch Facade

CAUTION

The microswitch on the facade is fragile. Take care when positioning the facade over the shaft extension to avoid damage to the microswitch.

f. Aligning the GAS Reticle Select knob facade over the actual knob, slide the cutout mounting slots of the facade under the loosened screws. Slide the facade to the right as far as possible.

g. Tighten the two screws to secure the facade in position.

h. Align the knob over the facade shaft with the shaft cutout toward the bottom of the knob, and tighten the setscrews to secure the knob.

i. Rotate the knob to ensure the knob operates the GAS reticle.

2.4.7.4.1.7 Gunner's Crew Station Cable 2W3 Initial Position. Position Gunner's Crew Station cable 2W3 to make the connections shown in Figure 2-45 as follows:

a. Locate the end of the Gunner's Crew Station cable 2W3P1 with the large, single connector and position this end of the cable beside the COAX mount.

b. Route the cable end under the main gun' and feed enough cable to reach the Tank Interface Assembly position (under the main gun breech).

2.4.7.4.1.8 Ejection Guard or SAFE/ARMED Handle Connection. Connect Gunner's Crew Station cable 2W3 to the connection for the Ejection Guard or SAFE/ARMED Handle as follows:

a. Locate connector 2W3P5 and its cable where it separates from Gunner's Crew Station cable 2W3, approximately 12 inches above the Tank Interface Assembly position.

b. Route the cable under the main gun breechblock directly to the Ejection Guard or SAFE/ARMED Handle connector (at the right-front comer of the breechblock, behind the Gunner's left knee guard).

c. Disconnect the actual cable and connect connector 2W3P5 to it.

2.4.7.4.1.9 Gunner's Power Control Handles Connection. Connect Gunner's Crew Station cable 2W3 to the Gunner's Power Control Handles as follows:

a. Locate connector 2W3P3 and its cable on Gunner's Crew Station cable 2W3. Route the cable so that it is under the control handle housing.

b. Remove the three bolts securing the Gunner's Power Control Handles and remove the handles.

c. Disconnect the actual tank cable and attach connector 2W3P3 on the Gunner's Crew Station cable to the receptacle on the Gunner's Power Control Handles housing.

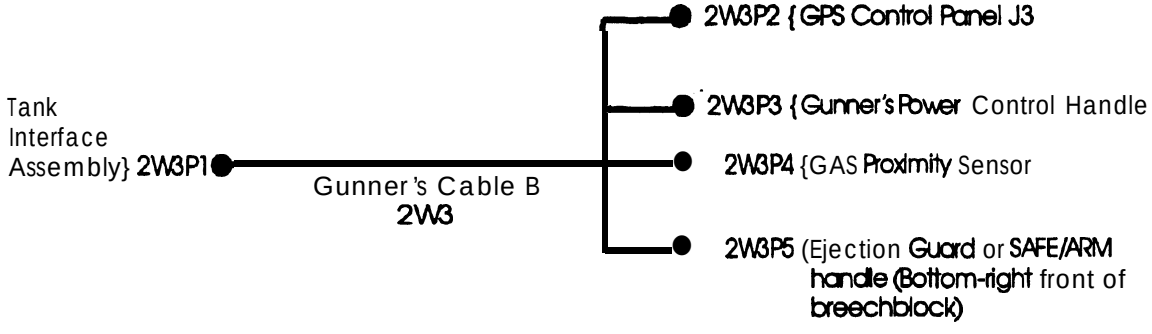

Figure 2-45. Gunner's Crew Station Cable 2W3 Wire Diagram

d. Replace the Gunner's Power Control Handles and secure with the three bolts.

2.4.7.4.1.10 GAS Proximity Sensor Connection.

a. Locate connector 2W3P4 and its cable from the Gunner's Crew Station cable. Route the 'cable between the COAX spent brass box and the Gunner's knee guard.

b. Find connector 2CS2A6J1/2W3P4 at the end of the cable on the proximity sensor. Screw connector 2W3P4 into this connector.

2.4.7.4.1.11 GPS Control Panel Connection. Connect the Gunner's Crew Station cable to the GPS Control Panel as follows:

a. Locate the GPS Control Panel.

b. On the left side of the GPS Control Panel, locate connector J3, the single electrical connector. Disconnect this connector and push it forward.

c. Locate connector 2W3P2 on Gunner's Crew Station cable 2W3. Plug this connector into the J3 receptacle on the side of the GPS Control Panel.

2.4.7.4.1.12 Gunner's Crew Station Cable 2W2 Initial Position. Position the Gunner's Crew Station cable 2W2 to make the connections shown in Figure 2-46 as follows:

a. Route cable 2W2P1 from the same point as Gunner's Crew Station cable 2W3. (Refer to 2.4.7.4.1.7.)

b. Route the cable over the manual firing device and under the GPS Control Panel.

2.4.7.4.1.13 GPS Magnification Lever Facade Connection. Connect the GPS Magnification Lever Switch Facade as follows:

a. Locate connector 2W2P4 and its cable from Gunner's Crew Station cable 2W2. Route the cable around the left side of the manual accumulator and along the right side of the GPS Magnification Lever facade.

b. Locate electrical receptacle 2CS2J1/2W2P4 on the right side of the GPS Magnification Lever facade and connect connector 2W2P4 to this.

2.4.7.4.1.14 GAS Reticle Select Switch Facade Connection. Connect the GAS Reticle Select Switch Facade as follows:

a. Locate connector 2W2P5 on Gunner's Crew Station cable 2W2.

b. Connect this to receptacle 2CS2A4J1/2W2P5 on the facade side.

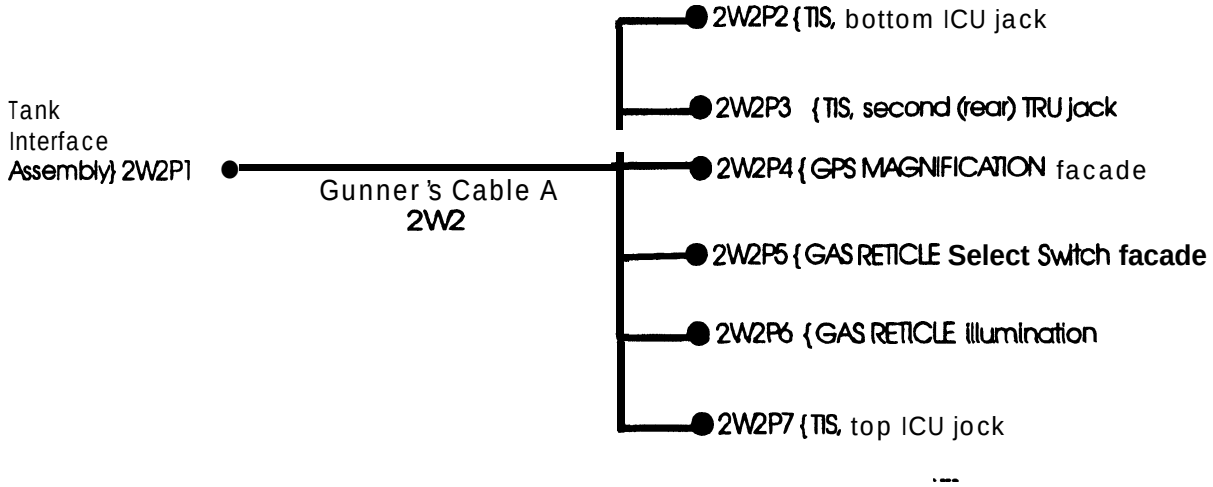

Figure 2-46. Gunner's Crew Station Cable 2W2 Wire Diagram

2.4.7.4.1.15 **GAS** Reticle Illumination Knob Connection. Connect the Gunner's Crew Station cable to the GAS Reticle Illumination knob connector as follows:

a. Disconnect the GAS from the front mounting brace and lower the sight. (step optional)

b. Disconnect the actual tank connector J1 on the far forward right side of the GAS telescope. (See Figure 2-47.)

c Connect connector 2W2P6 on the Gunner's Crew Station cable to receptacle J1 on the right side of the telescope.

d. Ensure the cable exits the connector at the 12 o'clock position.

e. If disconnected in step a, reconnect the GAS to the front mounting brace.

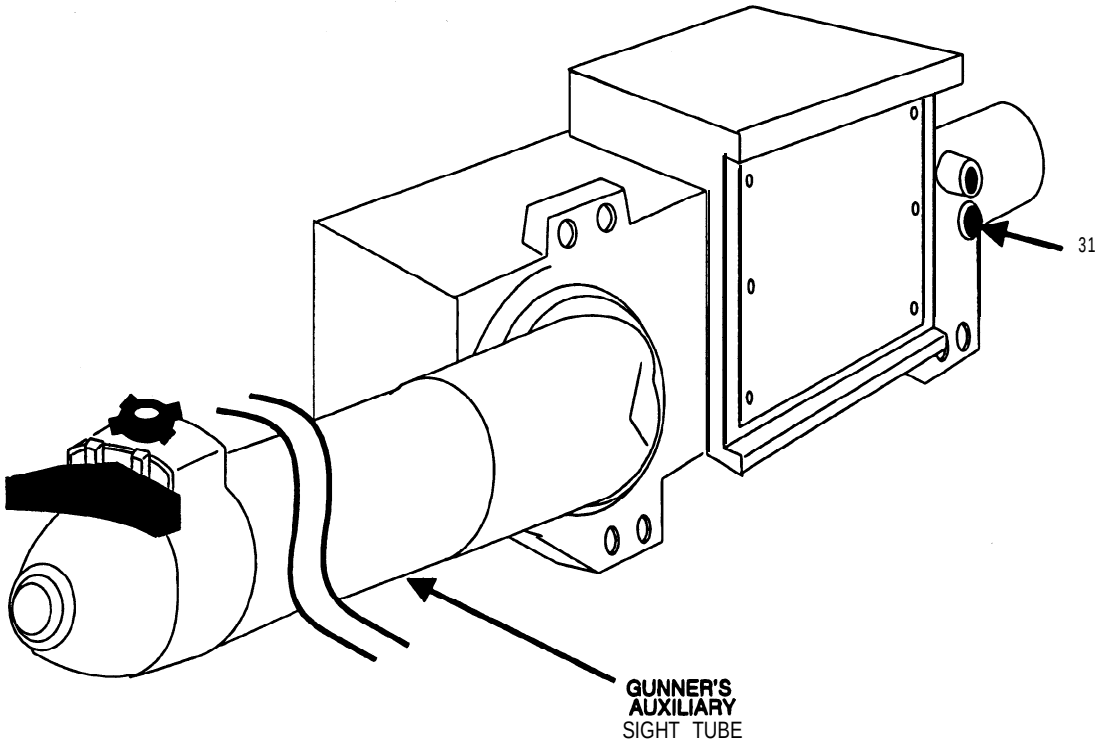

Figure 2-47. GAS Reticle Illumination Knob Connection

2.4.7.4.1.16 TIS Connections. Connect the Gunner's Crew Station cable to the TIS as follows:

CAUTION

Forcing connectors together with misaligned pins can damage cables and onboard tank components. Take care to align the keyways in plugs and connectors before pushing the connectors.

a. Locate connectors 2W2P2 and 2W2P3 on Gunner's Crew Station cable 2W2. Connector 2W2P2 is attached to the cable at a 90-degree angle. Connector 2W3P3 is attached to the cable at a 45-degree angle.

b. Locate the corresponding electrical connector on the right side of the Thermal Receiver Unit (TRU) (the back connector on the unit) and the two connectors on the lower panel of the Image Control Unit (ICU). (See Figure 2-48.) Unplug these connectors.

c. Connect 2W2P3 to the receptacle at the top of the TRU (the second connector on the TIS upper panel, on top of the unit and farthest away from the Gunner's position).

d. Connect 2W2P2 to the lower receptacle on the ICU lower panel.

e. Connect 2W2P7 to the top receptacle on the ICU lower panel.

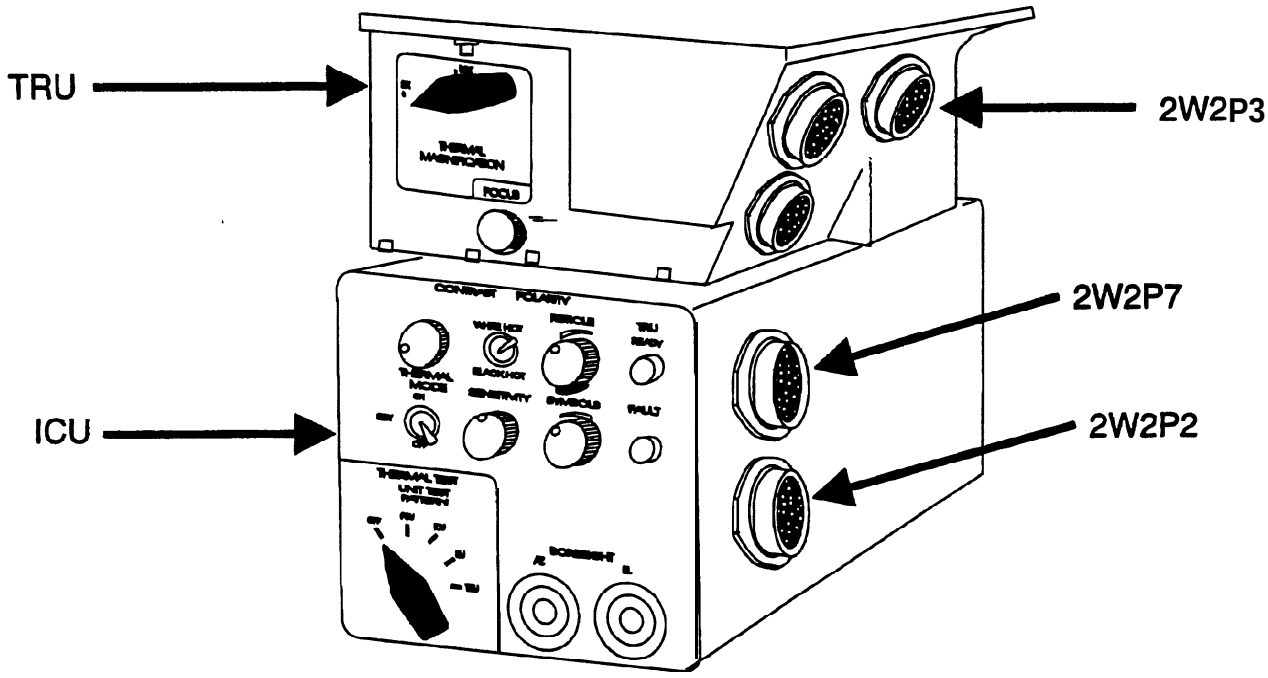

Figure 2-48. TIS Connections

2.4.7.4.2 Loader's Station.

2.4.7.4.2.1 AMMUNITION SELECT Switch Facade Installation. Mount the AMMUNITION SELECT switch facade (see **Figure 2-**49.) on the ready ammunition bustle door as follows:

a. Ensure that the adjustable end of the mounting bar allows the assembly to be placed across the ammo door.

b. With the lights and buttons of the facade facing the turret, position the assembly so that the fixed end of the mounting assembly is resting approximately 6 inches above the door track.

c. Expand the adjustable end of the mounting assembly, tightening it against the opposing door support. Use a wrench to tighten the jamb nuts on the adjustable end to secure the assembly in position.

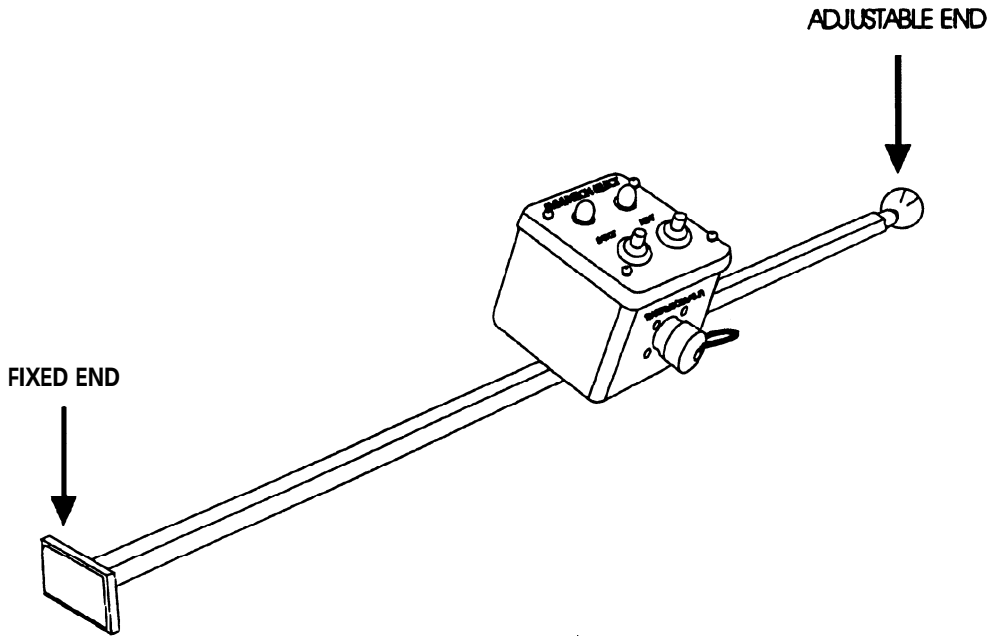

Figure 2-49. **AMMUNITION SELECT Switch Facade**

2.4.7.4.2.2 Loader's Breech Switch Installation. The Loader's Breech Switch assembly (see Figure 2-50.) mounts magnetically on the rear face of the breechblock as follows:

a. Make sure that the main gun breechblock is fully closed.

b. With the electrical connector facing downward, place the Loader's Breech switch at the bottom of the breechblock. Allow the magnetic base of the Loader's Breech Switch to secure the device to the breechblock so that the device is held firmly in place.

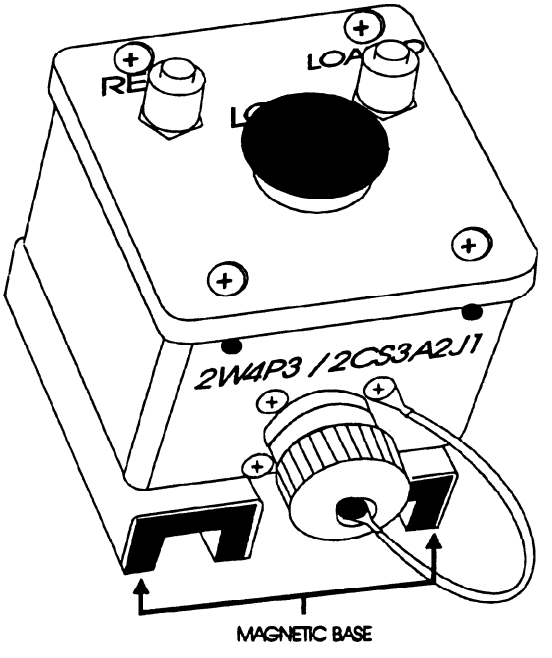

Figure 2-50. Loader's Breech Switch

2.4.7.4.2.3 Loader's Crew Station Cable 2W4 Initial Position. Position Loader's Crew Station cable 2W4 to make the connections shown in Figure 2-51 as follows:

a. Feed the end of the Loader's Crew Station cable with the single plug 2W4P1 up behind Loader's seat, through the radio rack, straight down, then behind the COAX ready ammunition box, and then under the main gun breech block.

b. Secure the cable to the existing turret cabling by using the prepositioned cable ties on Loader's Crew Station cable.

2.4.7.4.2.4 Loader's AMMUNITION SELECT Switch Facade Connection. Connect the Loader's Crew Station cable to the AMMUNITION SELECT switch facade as follows:

a. Locate cable 2W4P2 and route it below the AM 1780/VRC Intercom Amplifier toward the ammunition door.

b. Connect 2W4P2 to AMMUNITION SELECT switch facade connector 2W4P2/2CS3A1J1.

2.4.7.4.2.5 Loader's Breech Switch Facade Connection. Connect the Loader's Crew Station cable to the Loader's Breech Switch as follows:

a. Locate Breech Switch cable 2W4P3.

b. Route the cable directly under the main gun breechblock to Loader's Breech Switch receptacle 2W4P3/2CS3A2J1.

c. Plug the connector into the receptacle on the Breech switch and tighten the connector.

2.4.7.4.2.6 Loader's Control Panel Connection. Connect the Loader's Control Panel as follows:

a. Locate connector 2W4P4 and its cable in the Loader's Crew Station cable. Route the cable around the radio mount and to the left of the Loader's Panel.

b. Locate connector J1 on the left of the Loader's Panel and disconnect the cable.

c. Plug connector 2W4P4 into the receptacle on the Loader's Panel.

2.4.7.4.2.7 Loader's Knee Switch Connection. Connect the Loader's Crew Station cable to the Loader's Knee Switch as follows:

a. Locate Knee Switch cable 2W4P5.

b. Locate quick-disconnect-type connector J1 against the turret wall behind and below the AM 1780/VRC Intercom Amplifier. Trace the cable back to the Knee Switch to verify that this is the correct cable.

c. Unscrew the actual tank connector and connect connector 2W4P5 in its place.

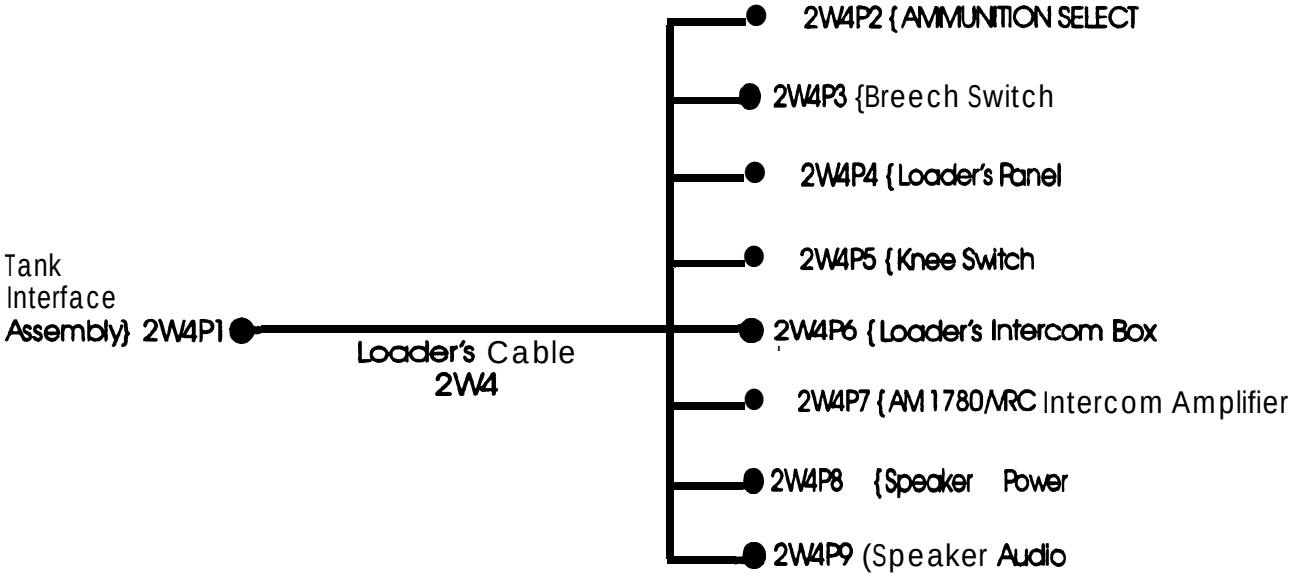

Figure 2-51. Loader's Crew Station Cable 2W4 Wire Diagram