

TM 5-6675-313-14

TECHNICAL MANUAL

**OPERATOR'S, ORGANIZATIONAL, DIRECT
SUPPORT AND GENERAL SUPPORT
MAINTENANCE MANUAL**

**TOPOGRAPHIC SUPPORT SYSTEM
OPERATIONS SECTION
MODEL ADC-TSS-1
NSN: 6675-01-105-5751**

THIS MANUAL SUPERSEDES TM 5-6675-313-14 DATED 15 JUNE 1983

HEADQUARTERS, DEPARTMENT OF THE ARMY

17 MAY 1985

CHANGE

NO. 3

HEADQUARTERS
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Operator's, Organizational, Direct Support and
General Support Maintenance Manual

**TOPOGRAPHIC SUPPORT SYSTEM
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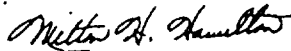
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Official:



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Operator's, Organizational, Direct Support and
General Support Maintenance Manual

TOPOGRAPHIC SUPPORT SYSTEM
OPERATIONS SECTION
MODEL ADC-TSS-1

NSN 6675-01-105-5751

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WASHINGTON, D.C., 29 August 1986

Operator's, Organizational, Direct Support and
General Support Maintenance Manual

TOPOGRAPHIC SUPPORT SYSTEM
OPERATIONS SECTION
MODEL ADC-TSS-1

NSN: 6675-01-105-5751

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C-17 through C-21/C-22	-----
D-1/D-2	D-1/D-2
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WARNING

HIGH VOLTAGE is used in this equipment. DEATH ON CONTACT or severe injury may result if personnel fail to observe safety precautions.

Do not be misled by the term LOW VOLTAGE. Low voltage can cause serious injury or death.

Test procedures requiring the operator or maintenance personnel to investigate equipment, or restore casualties with interlocks disconnected, or covers removed may result in DEATH ON CONTACT if personnel fail to observe safety precautions.

Voltages in switches and circuit breaker panels may result in DEATH ON CONTACT if personnel fail to observe safety precautions.

Failure to ground the section or equipment may result in DEATH ON CONTACT if personnel fail to observe safety procedures.

For Artificial Respiration refer to FM 21-11.

WARNING

Dry cleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Wear solvent impermeable gloves and eye/face protective equipment when using solvent. Do not use near open flame or excessive heat. Flash point of solvent is 100°F to 138°F (38°C to 59°C).

WARNING

Rotating and spinning equipment may snag loose clothing, hair, or jewelry resulting in SEVERE PERSONNEL INJURY.

WARNING

Attempting to move overweight or top-heavy equipment that is unsecured may result in SEVERE PERSONNEL INJURY. Always have sufficient personnel and equipment to accomplish the task.

TECHNICAL MANUAL
NO. 5-6675-313-14

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D. C., 17 May 1985

Operator's, Organizational, Direct Support and
General Support Maintenance Manual

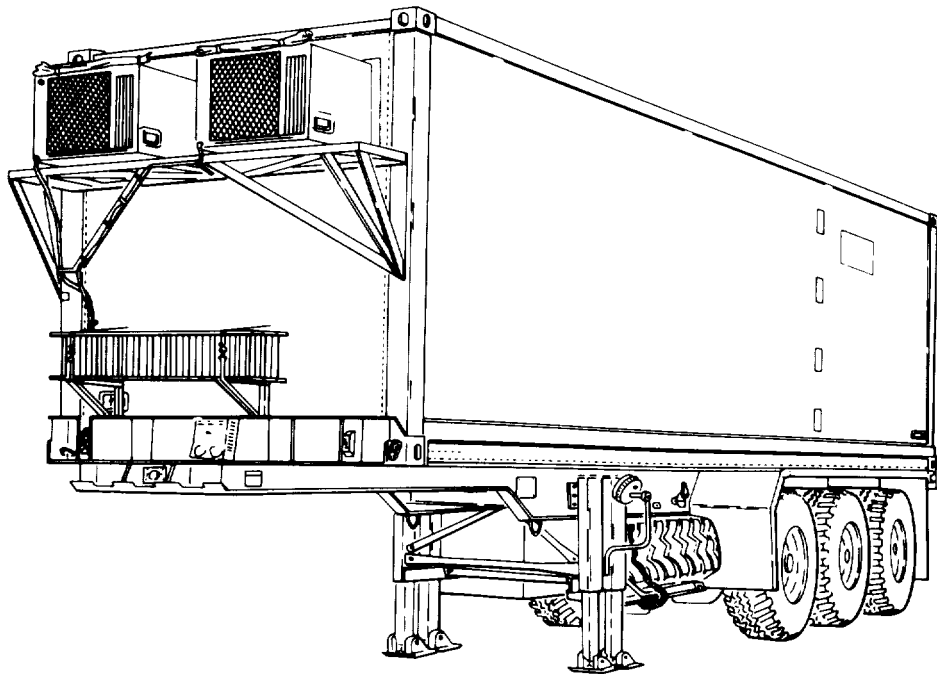
TOPOGRAPHIC SUPPORT SYSTEM
OPERATIONS SECTION
MODEL ADC-TSS-1
NSN: 6675-01-105-5751

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistake or if you know of away to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to: Commander, U. S. Army Troop Support Command, ATTN: AMSTS-MPS, 4300 Goodfellow Boulevard, St. Louis, MO 63120-1798. A reply will be furnished directly to you.

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CHAPTER 1

OPERATIONS SECTION

Section I INTRODUCTION

1-1. GENERAL INFORMATION.

1-1.1 Scope. This manual contains operating and maintenance instructions for the ADC-TSS-01, Operations Section, Topographic Support System (TSS). The purpose of the Operations Section is to provide a focal point for supervision of topographical operations. The trailer chassis is covered in TM 5-2330-305-14, Operator, Organizational, Direct Support and General Support Maintenance Manual, Topographic Support System, Chassis, Semi trailer, ISO Container Transporter. Repair parts and special tools are listed in TM 5-6675-313-24P, Organizational, Direct Support, and General Support Maintenance Repair Parts and Special Tools List, Operations Section, Topographic Support System. Lubrication instructions are contained in LO 5-6675-313-12, Lubrication Order, Operations Section, Topographic Support System. All authorized equipment, supplies, and their locations for transport are shown in Location and Description of Major Components of this manual.

1-1.2 Purpose of Equipment. To provide a transportable facility for centralized control, direction, and management for the overall functions of the TSS. This control includes processing external priorities, and managing operational activities within the TSS.

1-1.3 Maintenance Forms and Records. Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA Pam 738-750. The Army Maintenance Management System (TAMMS).

1-1.4 Reporting Equipment Improvements (EIR's). If the Operations Section needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you do not like about your equipment. Let us know why you do not like the design or performance. Put it on an SF 368 (Quality Deficiency Report). Mail it to us at: U.S. Army Troop Support Command, ATTN: AMSTR-QX, 4300 Goodfellow Blvd., St. Louis, MO 63120-1798. We will send you a reply

1-1.5 Destruction of Material to Prevent Enemy Use. For information on destruction of material to prevent enemy use, refer to TM 750-244-3, Procedures for Destruction of Equipment to Prevent Enemy Use.

1-1.6 Preparation for Storage or Shipment.

- a. Perform your preparation for movement procedures.
- b. For administrative storage of equipment, refer to TM 740-90-1.
- c. The chapters of this manual describe special shipping instructions for major components located in the section.
- d. In the event this equipment must be removed from the section for repair or replacement, contact your battalion for packing and shipping instructions.

1-2. EQUIPMENT DESCRIPTION.

1-2.1 Equipment Characteristics, Capabilities, and Features.

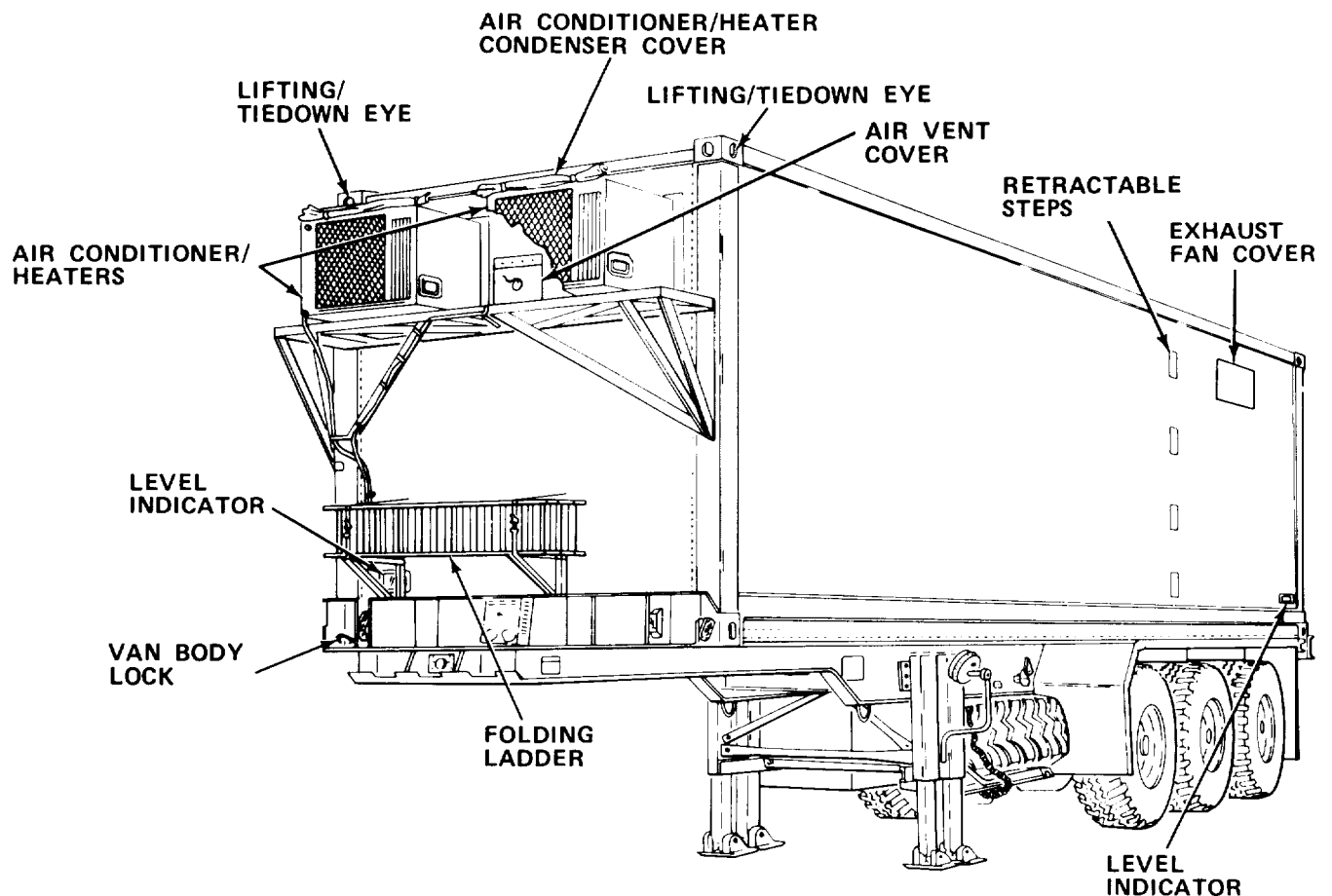
- a. Air and sea transportable.
- b. Transportable cross-country capability when mounted on trailer chassis.
- c. Controlled internal environment.

1-2.2 Special Considerations.

- a. Site must permit section to be leveled within $\pm 2^\circ$, be well drained, and provide adequate overhead concealment. Wooded areas and other obstacles must not impede movement of transporters.
- b. Dispersal of topographic sections is limited to the length of electric power transmission cable available for unit generators.
- c. During site selection, avoid overhead power transmission lines to prevent danger from electric shock or electromagnetic interference.
- d. Power is normally supplied by 15 kW generators. Commercial electric power should be used if it is compatible and available.
- e. Cross-country capability of sections and transporters is limited. Relocation should be accomplished over hard-surfaced, all-weather roads whenever possible.

1-2.3 Location and Description of Major Components.

a. Roadside Exterior.



VAN BODY LOCK. Locks van body to trailer chassis.

AIR CONDITIONERS/HEATERS. Two air conditioner/heater units for internal environmental control.

LIFTING/TIEDOWN EYES. Attachment point for lifting or tying down van body.

AIR CONDITIONER/HEATER CONDENSER COVER. Covers air conditioner/heater condenser to prevent water/air entering air conditioner/heater unit when in transport or storage.

AIR VENT COVER. Covers air vent opening.

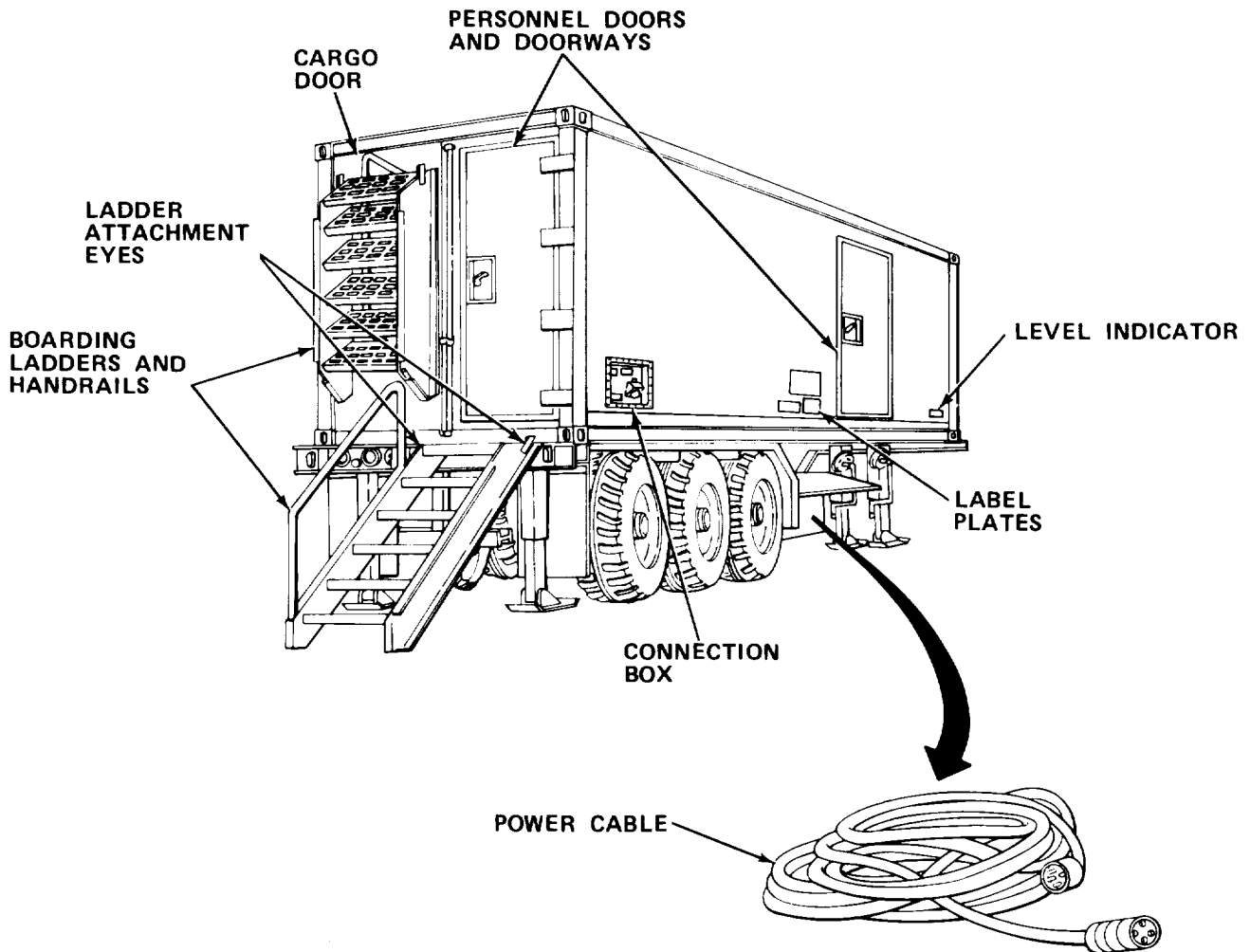
RETRACTABLE STEPS. Provide access to roof.

EXHAUST FAN COVER. Covers exhaust fan opening.

LEVEL INDICATOR. Indicates van body inclination.

FOLDING LADDER. Allows access to air conditioners and top of van.

b. Curbside Exterior.



CARGO DOOR. Access for equipment removal/installation.

PERSONNEL DOORS. Door is 35.75 in. (90.8 cm) wide by 86 in. (218.4 cm) high.

PERSONNEL DOORWAYS. Doorway is 30.75 in. (78.1 cm) wide by 78.5 in. (199.4 cm) high.

LABEL PLATES. Provide weight/moment data.

POWER CABLE. Power cable is in 50 ft (15.2 m) sections. (Stored in trailer chassis storage box.)

CONNECTION BOX. Contains terminals for ground cable, power cables, and telephone lines.

LADDER ATTACHMENT EYES. Attachment points for boarding ladder.

BOARDING LADDERS AND HANDRAILS. Provide access to section.

c. Interior.

PERSONNEL DOOR. Weatherproof fitted with blackout switch.

BLACKOUT SWITCH. Turns ceiling lights off when activated.

FIRE EXTINGUISHER. Dry chemical fire extinguisher.

FIRST AID KIT. Limited first aid supplies.

CARGO DOOR. Access for equipment removal/installation.

MAGNIFIER LAMP. Provides illumination and magnification for light table workstation.

FLUORESCENT CEILING LAMP. White, two-level (high/low) overhead light.

EXHAUST FAN. Provides ventilation. Fitted with lightproof louvers and weatherproof cover.

WALL STORAGE CABINET: Storage.

DOME LIGHT. White-lensed, 12 V dc light powered from external power source.

BLACKOUT LIGHT. Red-lensed, 12 V ac light actuated when blackout switch operates.

TELEPHONE LINE RECEPTACLE. Internal binding post for phone connection.

CORKBOARD. Vertical display board.

DESK. Work station.

FACSIMILE TRANSMISSION AND RECEIVING DEVICE. Transmits/receives graphics and text.

SECURITY FILING CABINET. Security storage.

AIR CONDITIONERS/HEATERS. Internal environmental control.

EMERGENCY LIGHTS. Battery-powered lighting actuated by power failure.

AIR VENT. Permits filtered make-up air to enter van body.

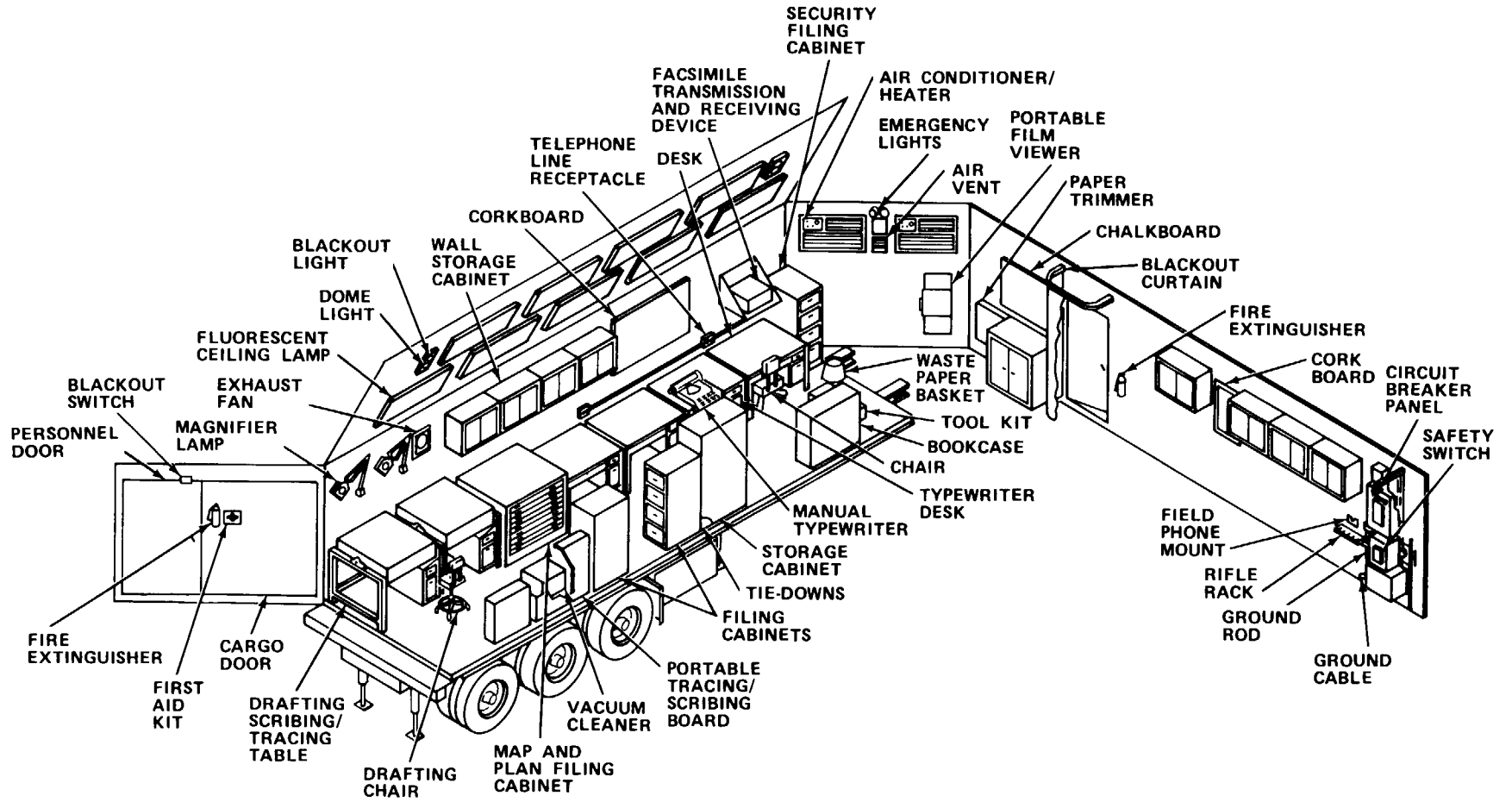
PORTABLE FILM VIEWER. Used to view aerial film.

PAPER TRIMMER. Trims sheet paper.

CHALKBOARD. Vertical display board. Swings out for briefings.

BLACKOUT CURTAIN. Lightproof cover for personnel door.

CIRCUIT BREAKER PANEL. Circuit breakers with phase test indicator.



SAFETY SWITCH. Main power safety disconnect switch.

GROUND CABLE. Used with ground rod.

GROUND ROD. Electrical ground for section.

RIFLE RACK. Weapon storage.

FIELD PHONE MOUNT. Mounting box for field phone.

WASTEPAPER BASKET. Storage for transport.

TOOL KITS.

BOOKCASE. Storage for publications.

CHAIR. Used at desk work station.

TYPEWRITER DESK. Work station.

MANUAL TYPEWRITER. Wide carriage.

STORAGE CABINET. Storage.

TIEDOWNS. Stored inside storage cabinet when not in use.

FILING CABINET. Storage.

PORTABLE TRACING/SCRIBING BOARD. Illuminated board for tracing/scrubbing.

VACUUM CLEANER. Cleaning equipment.

MAP AND PLAN FILING CABINET. Storage for maps/topographic products.

DRAFTING CHAIR. Adjustable-height chair.

DRAFTING, SCRIBING/TRACING TABLE. Illuminated tracing board. Turns over for drafting board.

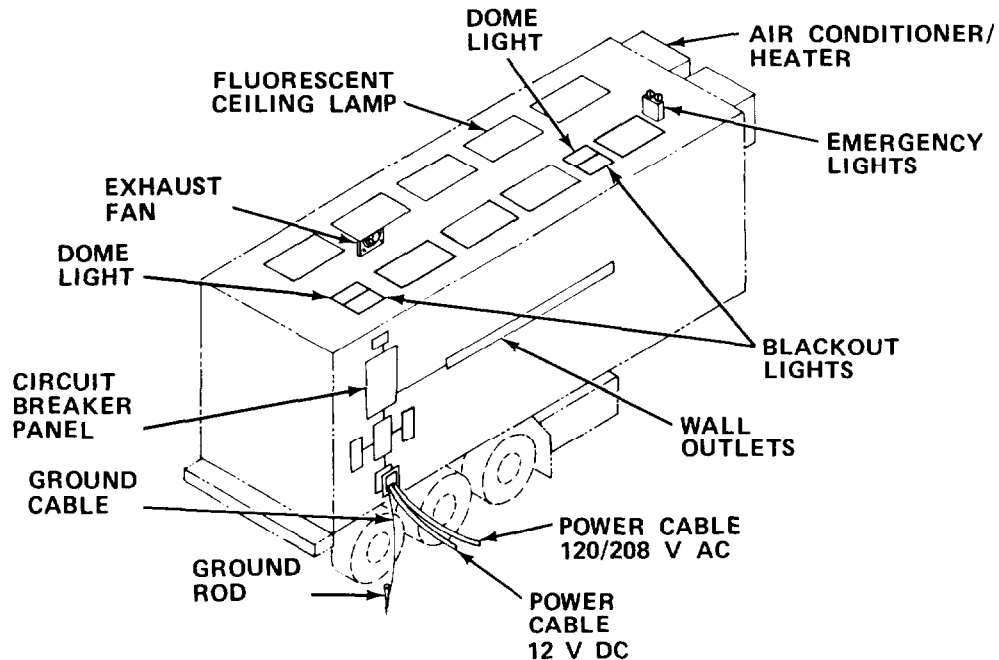
1-2.4 Equipment Data - ISO Container (Unmounted).

Dimensions	
Length	33.66 ft (10.26 m)
Width	8 ft (2.44m)
Height	8 ft (2.44m)
Cubage	2038 ft ³ (57.7 m ³)
Connections	
Telephones	One telephone (three-post) connection
Power	12.8 kW. One 120/208 V, three-phase, four-wire connection and one 12 V dc connection
Ground	Ground Lug
Air Conditioner/Heater (Two Units)	
Cooling	18,000 Btu/hr (5274 W) each
Heating	14,300 Btu/hr (4190 W) (Max) each
Power Requirements	208 V, 60 Hz, three-phase
Exhaust Fan	289 ft ³ /min (8.18 m ³ /min)
Air Vent	289 ft ³ /min (8.18 m ³ /min)
Weight	
Gross (Container and Chassis)	25,385 lbs (11,512.10 kg)
Tare (Container Only)	13,945 lbs (6324.10 kg)

1-3. TECHNICAL PRINCIPLES OF OPERATION.

1-3.1 General. The operation of major components located within the section is explained in the appropriate chapter for that equipment.

1-3.2 Electrical System.



GROUND ROD. Used to ground section.

GROUND CABLE. Used with ground rod.

CIRCUIT BREAKER PANEL. Contains voltage indicator, phase monitor, and circuit breakers.

DOMES LIGHTS. White-lensed, 12 V dc lights powered from external source. Separately switched and fused.

EXHAUST FAN. Plug-in fan. Separately fused.

FLUORESCENT CEILING LAMPS. Two-level (high/low) overhead lights with blackout override switches.

EMERGENCY LIGHTS. Battery powered. Activated by power loss.

AIR CONDITIONER/HEATER. Air conditioner and electrical heater powered by three-phase, 208 V, 30 amp current.

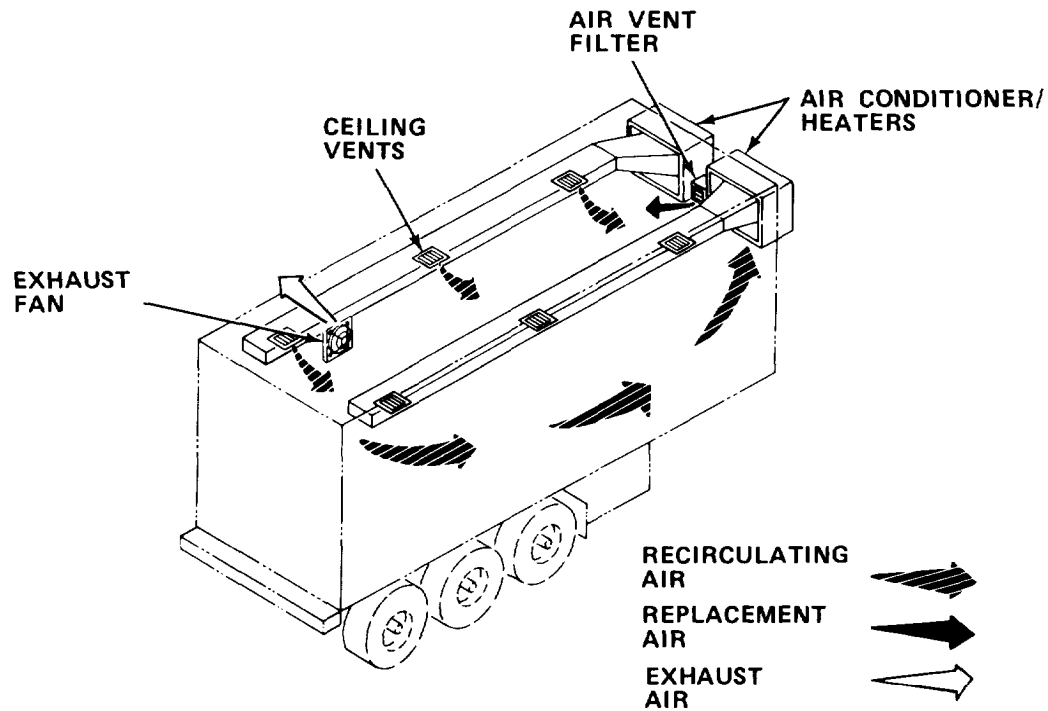
BLACKOUT LIGHTS. Red-lensed, 12 V ac lights actuated when blackout switch operates.

WALL OUTLETS. Provide grounded outlets for portable or plug-in equipment.

POWER CABLES. Power input (120/208 V ac and 12 V dc).

1-3.3 Wiring Diagram. A foldout wiring diagram is provided at the end of this manual .

1-3.4 Ventilation System.



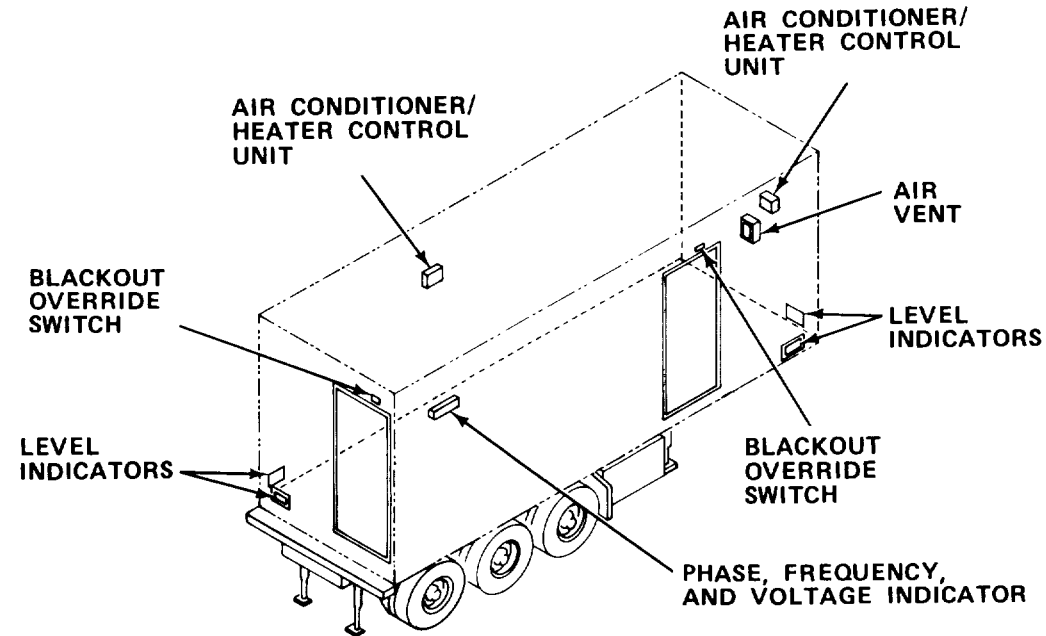
Exhaust fan exhausts air. Replacement air flows into the section through the air vent filter. Recirculating air is filtered as it enters the air conditioners/heaters. From the air conditioners/heaters, it flows through the ceiling vents and into the section.

NOTE

Detailed description of air conditioner/heater operation is contained in TM 5-4120-367-14, Operator, Organizational, Direct Support, and General Support Maintenance Manual, Air Conditioner, Horizontal, Compact, 18,000 Btu/hr Cooling, and TM 5-4120-367-24P, Organizational, Direct Support, and General Support Maintenance Repair Parts and Special Tools List (Including Depot Maintenance Repair) for Air Conditioner, Horizontal, Compact, 18,000 Btu/hr (5274W).

Section II OPERATING INSTRUCTIONS

1-4. DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND INDICATORS.



Control or Indicator	Function
Blackout Override Switches	Turn off illumination when doors are opened.
Air Vent	Permits make-up air to enter as required.
Air Conditioner/Heater Control Unit	Permits selection of air conditioner or heater mode of operation and temperature.
Phase, Frequency, and Voltage Indicator	Monitors electrical power, phase, frequency, and voltage.
Level Indicators	Used to level section.

1-5. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES.

Before You Operate. Always keep in mind the WARNINGS and CAUTIONS. Perform your before (B) PMCS.

b. While You Operate. Always keep in mind the WARNINGS and CAUTIONS. Perform your during (D) PMCS.

c. After You Operate. Be sure to perform your after (A) PMCS.

d. If Your Equipment Fails to Operate. Troubleshoot with proper equipment. Report any deficiencies using the proper forms. See DA Pam 738-750.

1-5.1 PMCS Procedures.

a. PMCS are designed to keep the equipment in good working condition by performing periodic service tasks.

b. Service intervals provide you, the operator, with time schedules that determine when to perform specified service tasks.

c. The "Equipment is Not Ready/Available If" column is used for identification of conditions that make the equipment not ready/available for readiness reporting purposes or denies use of the equipment until corrective maintenance is performed.

d. If your equipment fails to operate after PMCS is performed, immediately report this condition to your supervisor.

e. Perform weekly as well as before operation if you are the assigned operator and have not operated the item since the last weekly or if you are operating the item for the first time.

f. Item number column. Item numbers are assigned in chronological ascending sequence regardless of interval designation. These numbers are used for your "TM Number" column on DA Form 2404, Equipment Inspection and Maintenance Worksheet in recording results of PMCS.

g. Interval columns. This column determines the time period designated to perform your PMCS.

h. Item to be inspected and procedures column. This column lists functional groups and their respective assemblies and subassemblies as shown in the Maintenance Allocation Chart (Appendix B). The appropriate check or service procedure follows the specific item to be inspected.

i. Equipment is not ready/available if: column. This column indicates the reason or cause why your equipment is not ready/available to perform its primary mission.

j. List of tools and materials required for PMCS is as follows:

<u>Item</u>	<u>Quantity</u>
Wire Brush	1 ea
6 in. Adjustable Wrench	1 ea
Flat Tip Screwdriver	1 ea
Vacuum Cleaner	1 ea
Cheesecloth (Item 5, Appendix E)	ar
General Purpose Detergent (Item 7, Appendix E)	ar
Paint (Item 11, Appendix E)	ar
paint Brushes	ar

Table 1-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES

NOTE

If the equipment must be kept in continuous operation, check and service only those items that can be checked and serviced without disturbing operation. Make the complete checks and services when the equipment can be shut down.

B - Before
D - During
A - After

W - Weekly
M - Monthly
Q - Quarterly

AN - Annually
s - Semiannually
BI - Biennially

(Number) - Hundreds of Hours

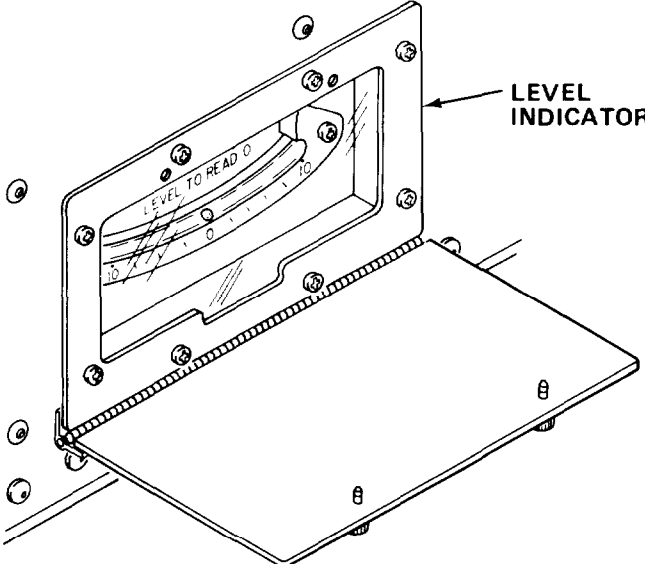
ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
1	B/W	<p><u>VAN BODY</u></p> <p><u>Inspect Exterior.</u></p> <p>1. Inspect surfaces for punctures, cracks, or open seams that could permit moisture to enter wall.</p>  <p>2. Inspect four level indicators for damage and to be sure section is level.</p>	<p>Punctures, cracks, or open seams are present.</p> <p>Indicators are broken.</p>

Table 1-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before
D - During
A - After

W - Weekly
M - Monthly
Q - Quarterly

AN - Annually
S - Semiannually
BI - Biennially

(Number) - Hundreds of Hours

ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
1		<p><u>VAN BODY - Cont</u></p> <p><u>Inspect Exterior - Cont</u></p> <p style="text-align: center;"><u>WARNING</u></p> <p>To prevent death or serious injury, do not handle or clean power cable or connectors when cable is connected to power source.</p> <p>3. Inspect power cable assembly for dirt or damaged connectors.</p> <p>a. Wipe cable insulation with clean, dry cloth to remove dirt.</p> <p>b. Clean corrosion from terminals.</p>	Connector damaged.
	B		

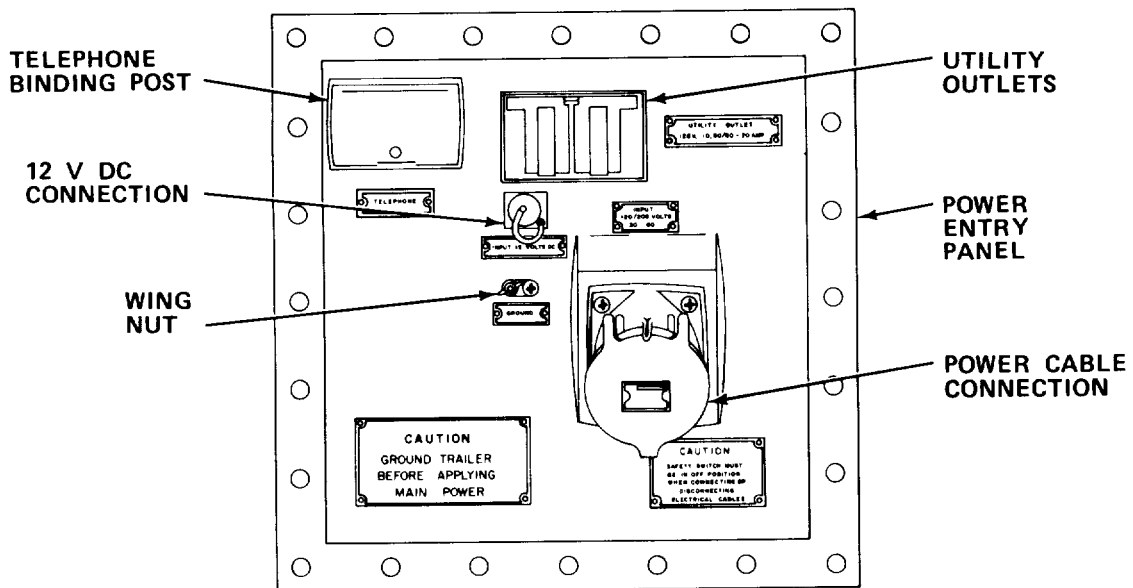


Table 1-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before
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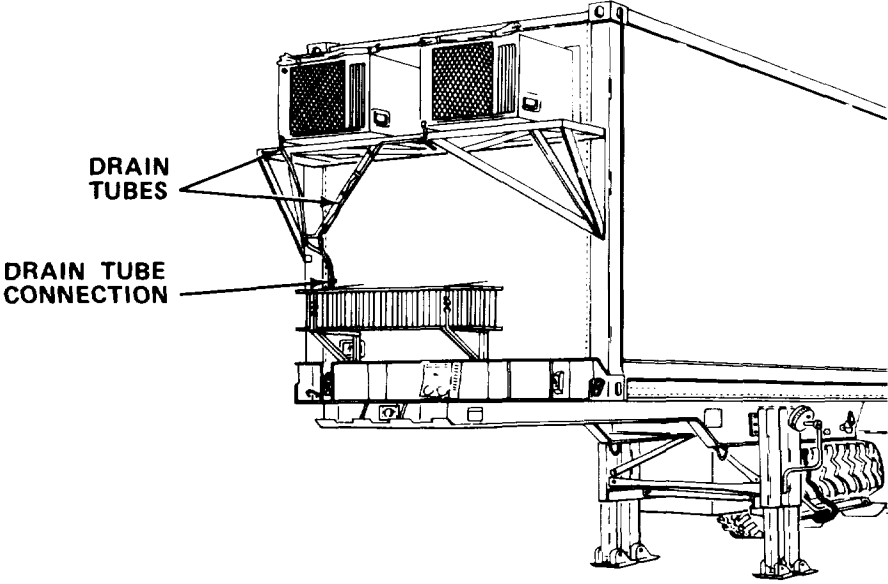
ITEM NO.	N- ER- /AL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
<u>VAN BODY - Cont</u>			
1		<u>Inspect Exterior - Cont</u>	
	B/W	4. Inspect power entry panel for accumulated dirt, water, or corrosion. Clean power entry panel.	
	B/W	5. Inspect power entry panel to be sure any unused receptacles are covered.	Missing covers.
			
	B/W	6. Inspect air conditioner/heater drain tube to be sure tube is positioned as shown. Check for breaks and crimps in hose and check connections for damage or leakage.	

Table 1-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before
D - During
A - After

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M - Monthly
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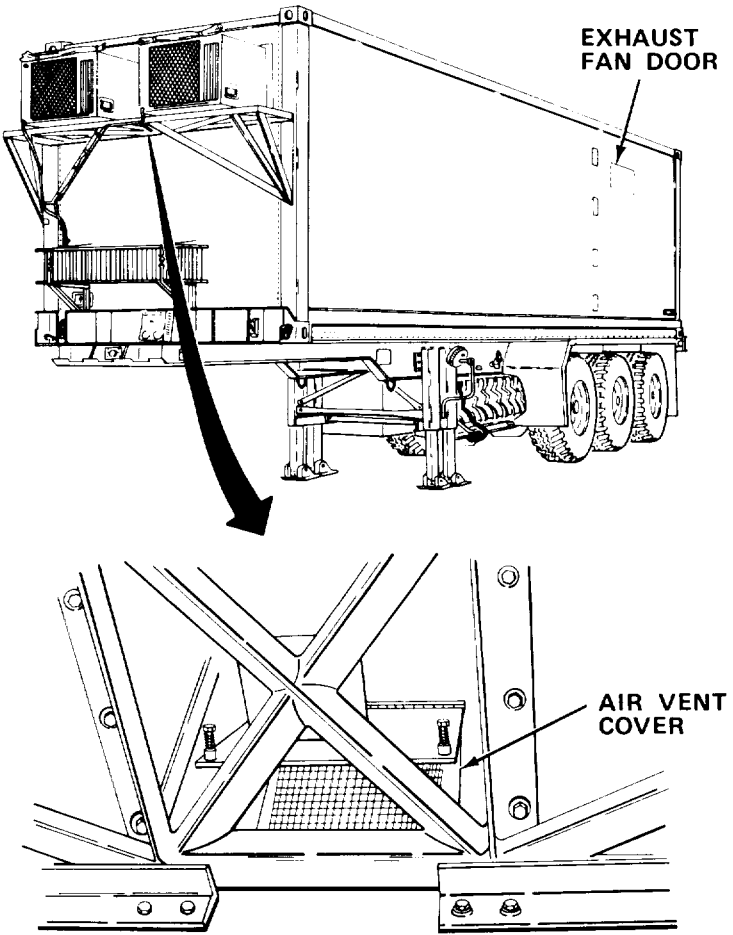
ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
1	B/W	<p><u>VAN BODY - Cont</u></p> <p><u>Inspect Exterior - Cont</u></p>  <p>7. Inspect exhaust fan door and air vent covers to be sure they are not blocked or clogged. Clean as required. Clean screen with vacuum cleaner as necessary.</p>	

Table 1-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before
 D - During
 A - After

W - Weekly
 M - Monthly
 Q - Quarterly

AN - Annually
 S - Semiannually
 BI - Biennially

(Number) - Hundreds of Hours

ITEM NO,	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
1		<u>VAN BODY - Cont</u>	
		<u>Inspect Exterior - Cont</u>	
	B/W	<p>8. Visually inspect ground connections to be sure ground cable is connected to terminal lug and ground rod. If necessary, clean:</p> <p style="text-align: center;"><u>WARNING</u></p> <p>Electrical shock hazard. Power cable must be de-energized before servicing entry panel connections. Death can result from failure to observe these safety precautions.</p> <p>a. Turn power off to cable. Disconnect from power source.</p> <p>b. Disconnect ground lug from ground rod.</p> <p>c. Clean lug, cable end, and rod with wire brush.</p> <p>d. Reconnect ground cable lug to rod.</p> <p>e. Disconnect ground cable end from entry panel.</p> <p>f. Clean terminal and cable end with wire brush.</p> <p>g. Reconnect ground cable to entry panel.</p> <p>h. Reconnect cable to power source. Turn power on.</p>	Ground connections are broken or missing.
B	<p>9. Inspect boarding ladders for:</p> <p>a. Secure attachment of handrails.</p> <p>b. Steps not broken.</p> <p>c. Locking pins in place.</p>	Steps are broken or will not lock in place.	
B/D/A	<p>10. Inspect front and rear van body locks to be sure locks are fully engaged.</p>	Lock disengaged.	

Table 1-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before
 D - During
 A - After

W - Weekly
 M - Monthly
 Q - Quarterly

AN - Annually
 S - Semiannually
 BI - Biennially

(Number) - Hundreds of Hours

ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting. Equipment Is Not Ready/ Available If:
<u>VAN BODY - Cont</u>			
1		<p><u>Inspect Exterior - Cont</u></p> <p>Q 11. Inspect gaskets on personnel doors for leaks or damage.</p> <p>W 11.1 Inspect hinges for proper placement of hinge pins.</p> <p>Q 12. Clean and paint blistered, pitted, or flaking areas and bare metal spots in accordance with instructions contained in TM 43-0139, Painting Instructions for Field Use.</p>	<p>Missing hinge pins.</p>
2		<p><u>Inspect Interior.</u></p> <p>B/D 1. Test emergency lights by pressing test button.</p> <p>W 2. Inspect power cords and cables to be sure wires are not kinked, cut, or cracked.</p> <p>W 3. Inspect plug connectors to be sure all plug connectors are tight and firmly seated. Tighten if necessary.</p> <p>D 4. Inspect for burned out light bulbs and fluorescent lamps. Replace as required.</p> <p>W 5. Inspect walls, ceiling, and floor for holes, open seams, or signs of seepage or leaks.</p> <p>D 6. Check storage cabinets for broken hinges, latches, and locks.</p> <p>B/M/A 7. Inspect fire extinguishers. Be sure security seals are not broken.</p>	<p>Emergency lights do not light.</p> <p>Wires or cables are cracked or cut.</p> <p>Leaks are present.</p> <p>Hinge, latch, or lock is broken.</p> <p>Fire extinguisher is missing or seals are broken.</p>

Table 1-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before
D - During
A - After

W - Weekly
M - Monthly
Q - Quarterly

AN Annually
S Semiannually
BI Biennially

(Number) - Hundreds of Hours

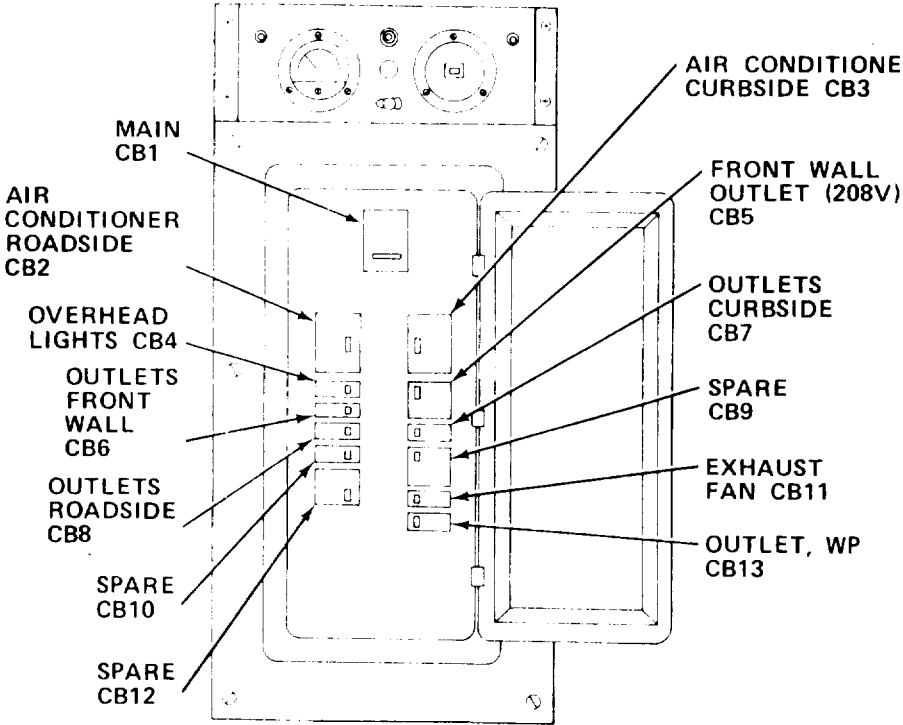
ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
2	Q	<p>VAN BODY - Cont</p> <p>Inspect Interior - Cont</p> <p>8. Inspect circuit breaker panel.</p> <p style="text-align: center;">NOTE</p> <p>Inspection is to be conducted on a not-to-interfere basis with work being conducted. Individual equipment will be inspected as directed by the appropriate chapter of this manual.</p>  <p>a. Set main circuit breaker to ON.</p> <p>b. Set each circuit breaker to OFF, then ON.</p>	Circuit breaker is defective.

Table 1-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before
D - During
A - After

W - Weekly
M - Monthly
Q - Quarterly

AN - Annually
S - Semiannually
BI - Biennially

(Number) - Hundreds of Hours

ITEM NO.	N-TER./AL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
2		<u>VAN BODY - Cont</u>	
		<u>Inspect Interior - Cont</u>	
	Q	9. Inspect light traps. <ul style="list-style-type: none"> a. Turn on fluorescent lamps (high level). b. Close entrance doors. Have exhaust fan and air vent open. Inspect for light leakage through vents. c. Place light switches ON; blackout override switches OFF. d. Open door and make sure internal lights go off. 	Light leaks are present.
	A	10. Inspect/clean interior. <p style="text-align: center;"><u>WARNING</u></p> Death or serious injury may occur if wet or damp cloth is used to wipe or clean energized equipment, power cords, or cables. <p style="text-align: center;">CAUTION</p> Do not sweep interior. Dislodged dirt or dust will ruin optical, electronic, and photographic equipment and supplies. <ul style="list-style-type: none"> a. Wipe vertical and horizontal painted surfaces with cleaning cloth moistened with solution of general purpose detergent and fresh water until soil is removed from painted surfaces. b. Dry vertical and horizontal painted surfaces with clean cloth. 	Blackout system is inoperable.

Table 1-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

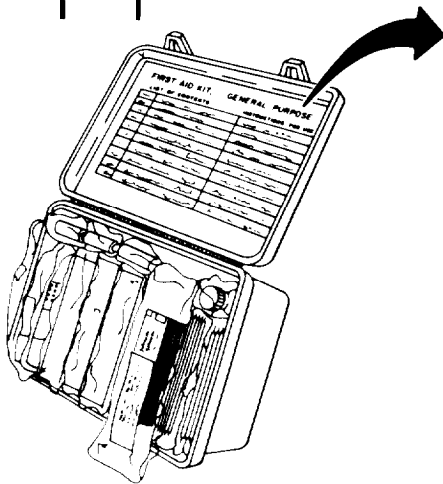
B - Before
D - During
A - After

W - ITEM
M - Monthly
Q - Quarterly

AN - Annually
S - Semiannually
BI - Biennially

(Number) - Hundreds of Hours

ITEM NO.	INTERVAL	ITEM TO BE INSPECTED	PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
2	S	<u>VAN BODY - Cont</u> <u>Inspect Interior - Cont</u> c. Vacuum interior of section to remove dirt and waste. Pay particular attention to work stations. 11. Inspect first aid kit.		



FIRST AID KIT, GENERAL PURPOSE		
LIST OF CONTENTS		INSTRUCTIONS FOR USE
3 ROLLS	ADHESIVE TAPE, SURGICAL, 1" X 1 1/2" YARDS	USE FOR MINOR CUTS AND CLOTHING REPAIR
18 EACH	BANDAGE, ADHESIVE, 1/2" X 3"	MINOR CUTS, AS REQUIRED
2 EACH	BANDAGE, GAUZE, COMPRESSED, CAMOUFLAGED, 3" X 6" YARDS	CUT IN LENGTHS AS REQUIRED FOR BANDAGE INJURIES
1 EACH	BANDAGE, MUSLIN, COMPRESSED, CAMOUFLAGED, 3 7/8" X 5 1/2" INCH	USE FOR SLING
1 PKG	BLADE, SURGICAL PREPARATION RAZOR, STRAIGHT, SINGLE EDGE, 5/8"	SHAVING HAIR AND OPENING WOUNDS AS REQUIRED
1 PKG	COMPRESS AND BANDAGE, CAMOUFLAGED, 2" X 2", 4s	FOR WOUNDS
2 EACH	DRESSING, FIRST AID, FIELD, 4X7 INCHES	FOR LARGE WOUNDS EXCESSIVE BLEEDING
1 EACH	FIRST AID KIT, EYE DRESSING	FOR EYE WOUNDS, SEE INSTRUCTIONS
1 PKG	GAUZE, PETROLATUM, 3" X 3 1/2", 2s	FOR BURNS, APPLY PAD OVER BURN
1 BTL	POVIDONE, IODINE SOLUTION, 1/2 OUNCE	AS DISINFECTANT AND CLEANSER OF CUTS AND WOUNDS, APPLY BEFORE BANDAGING
1 EACH	AMMONIA INHALANTS	CRUSH INHALANT BETWEEN FINGERS, HOLD A FEW INCHES FROM NOSE, HOLD CLOSER AS AMMONIA GETS WEAKER. WHEN TOO WEAK, USE FRESH INHALANT
1 EACH	INSTRUCTION BOOKLET AND FIRST AID EXPLANATIONS	

- a. Remove first aid kit from bracket.
- b. Remove contents.
- c. Inspect container for damage.
- d. Inspect contents for damage. Then use checklist to inventory contents.
- e. Replace damaged or missing items.
- f. Repack kit.
- g. Reinstall kit.

Table 1-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before W - Weekly AN - Annually (Number) - Hundreds of Hours
 D - During M - Monthly S - Semiannually
 A - After Q - Quarterly BI - Biennially

ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		<u>VAN BODY - Cont</u>	
2		<u>Inspect Interior - Cont</u>	
	B/W	12. Inspect blackout curtains. a. Inspect blackout curtains and valances for tears, missing hooks, or broken eyelets. b. Inspect nylon hook and pile tape on curtain and wall for security of attachment.	Curtains damaged.
3	B	<u>Inspect Air Conditioner/Heater.</u> Refer to TM 5-4120-6/-14 for preventive maintenance checks and services.	
4	M	<u>Service Power Cable.</u> <p style="text-align: center;"><u>WARNING</u></p> <p>Electrical shock hazard. Power cable must be de-energized before servicing. Death or serious injury may occur from failure to observe this safety precaution.</p> <ol style="list-style-type: none"> 1. Turn off safety switch. 2. Disconnect cable from power entry panel. 3. Wrap any cuts or abrasions in cable with electrical insulation tape. <p style="text-align: center;"><u>NOTE</u></p> <p>Check to be sure cable does not endanger personnel.</p> <ol style="list-style-type: none"> 4. Reconnect power cable to entry panel. 	

1-6. OPERATION UNDER USUAL CONDITIONS. Operation of the Operations Section consists of activation of power after the section has been located at the operation site and 12 V dc power disconnected.

1-6.1 Preparation for Use.

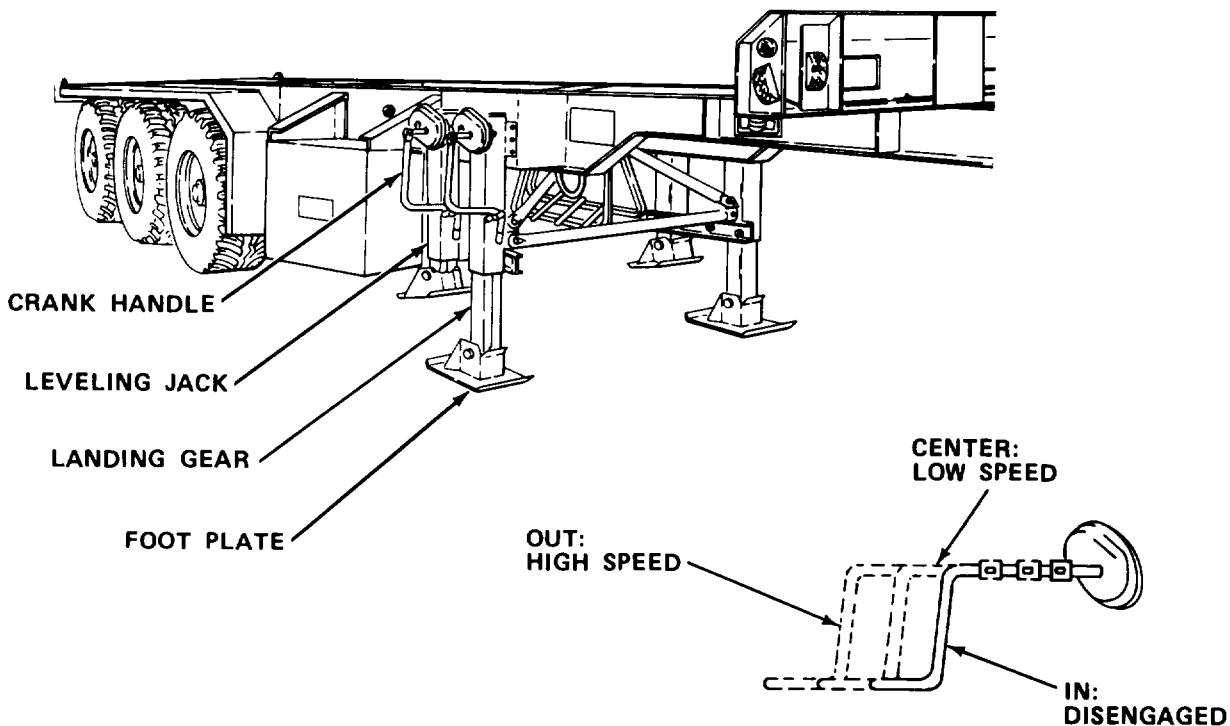
- a. Procedures for leveling.

CAUTION

Trailer-mounted section must be on surface that is approximately level to avoid unnecessary stress or twisting of chassis when section is leveled.

NOTE

- Snow or ice should be removed from under leveling foot plate before attempting to level section.
- Sand, soft ground, or mud requires that shoring or scrap material be placed under leveling foot plate to increase surface area and prevent sinking into surface.
- Be sure that air suspension is deflated as indicated in TM 5-2330-305-14.



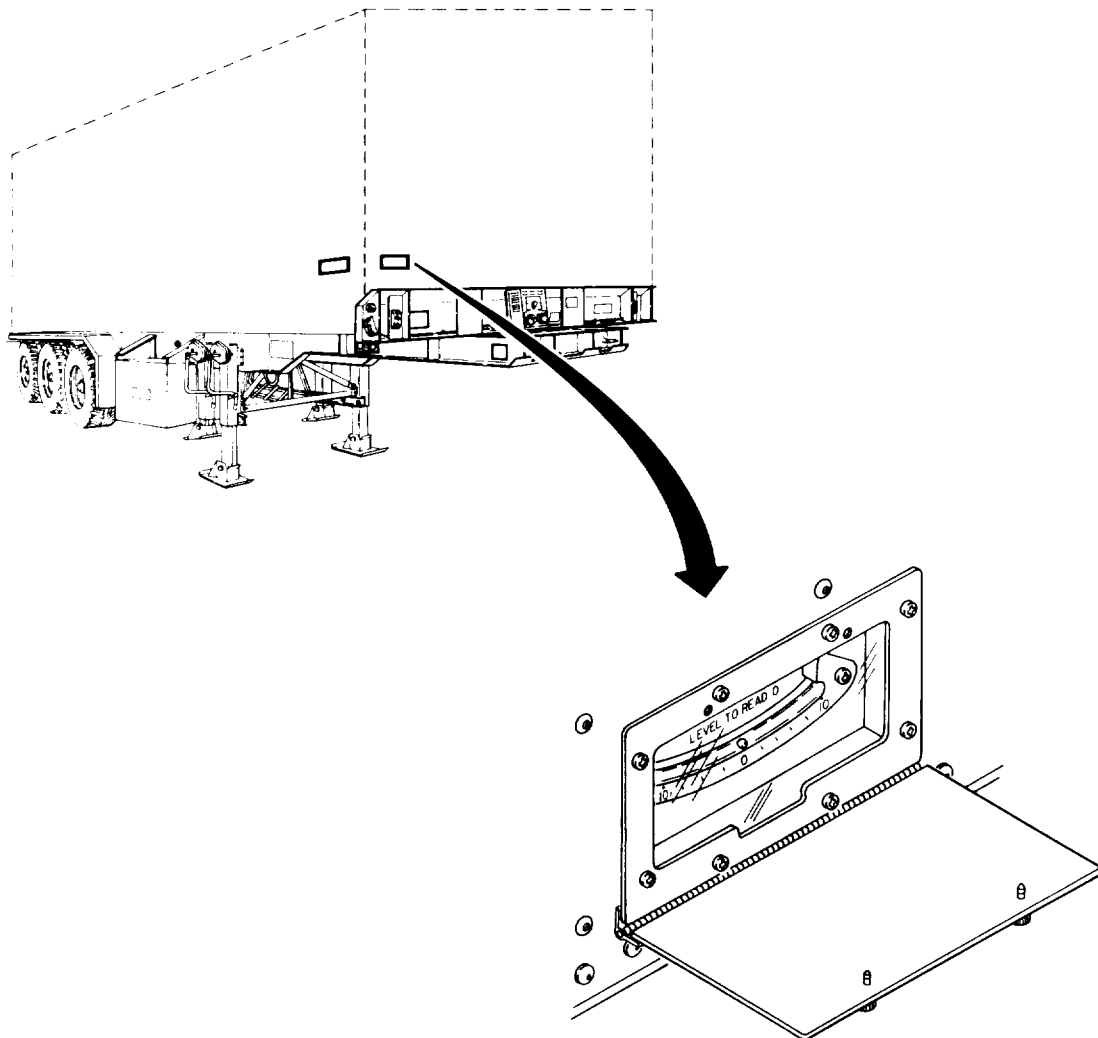
(1) Deflate air suspension in accordance with TM 5-2330-305-14.

(2) Approximately level trailer chassis by raising or lowering landing gear.

(3) Move handle from secured location and swing out.

(4) Pull crank handle on each leveling jack all the way out and engage. There are two positions when handle is engaged. Fully out is high speed. Partially out is low speed.

(5) Lower each leveling jack by turning crank to right at high speed until foot plate just contacts ground.

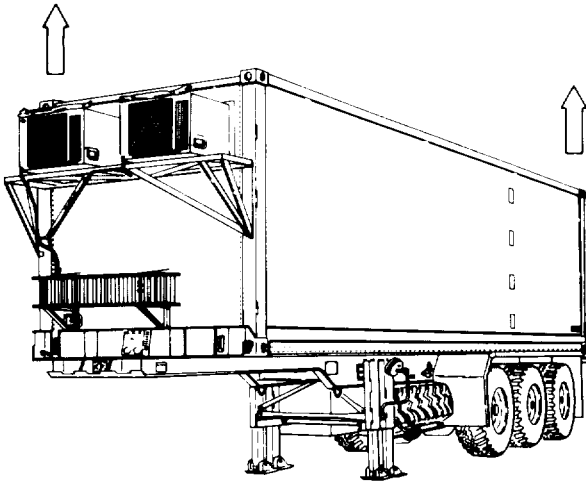


(6) Station personnel to have a clear view of level indicators at both front and rear of section.

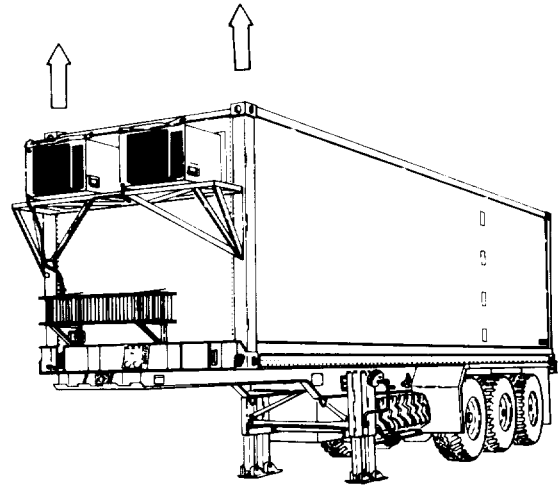
(7) Observe level indicators to determine which end and side must be raised.

CAUTION

Do not attempt to level section by lifting at diagonal corners or frame will be twisted.

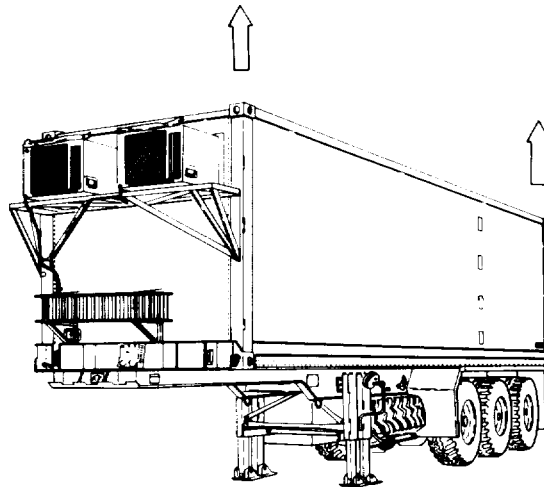


NO

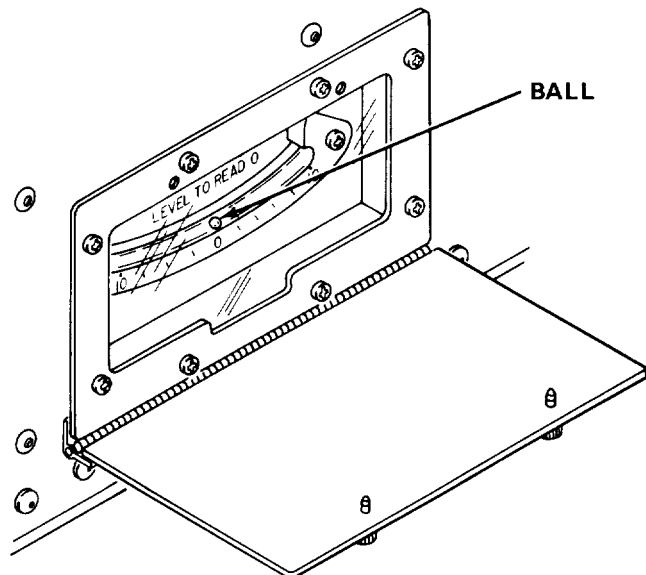


YES

(8) Raise low end by extending both leveling jacks at low end. Use low speed.



(9) Raise low side by extending both leveling jacks at low side.

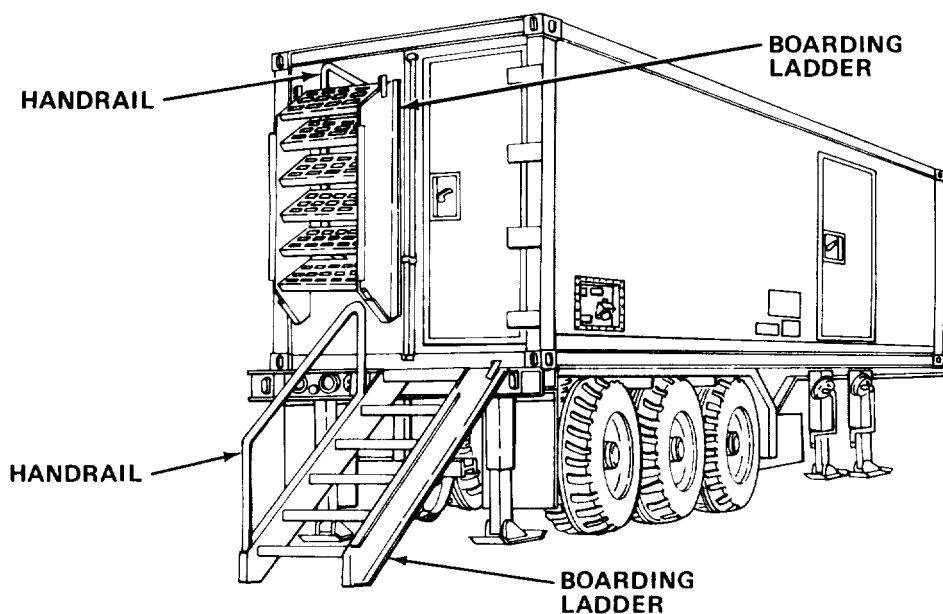


NOTE

Be sure ball is centered on all four level indicators $\pm 2^\circ$.

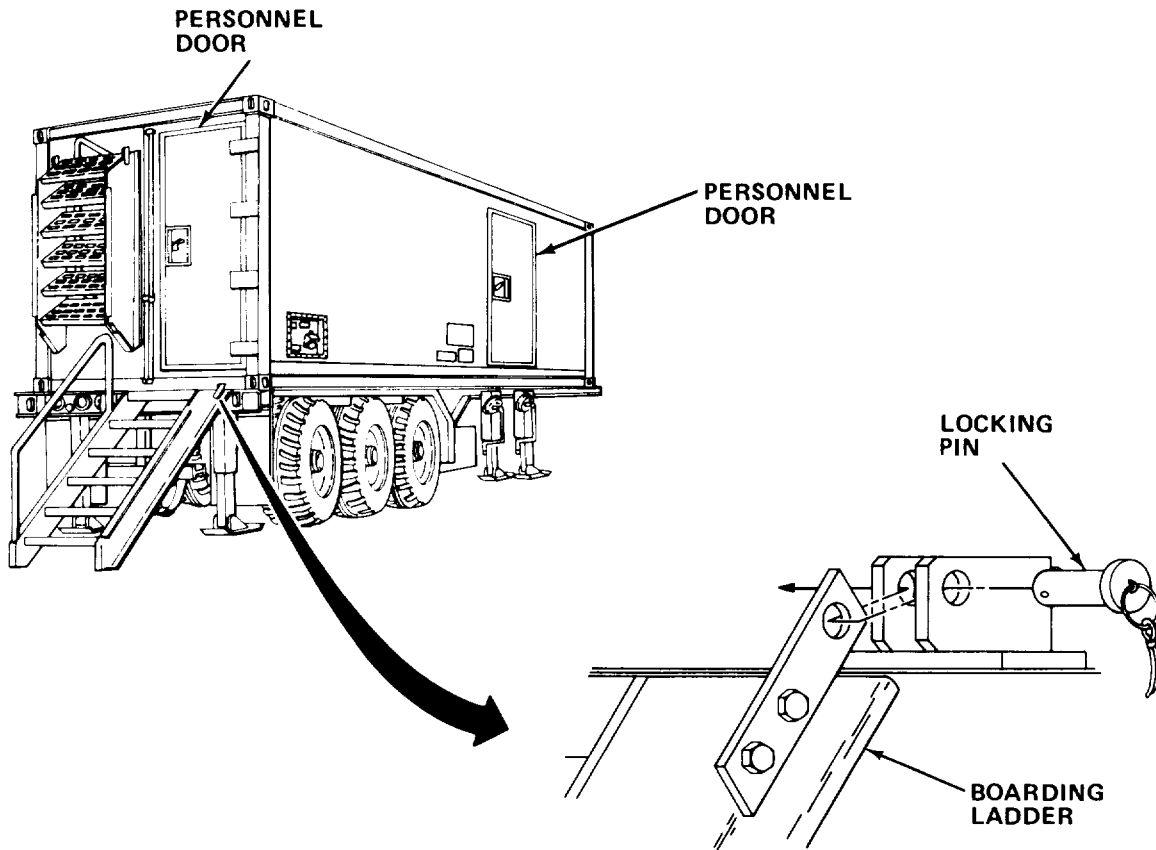
(10) Pull leveling crank handles away from trailer chassis: lower crank handle to stowed position.

b. Procedures to activate section.

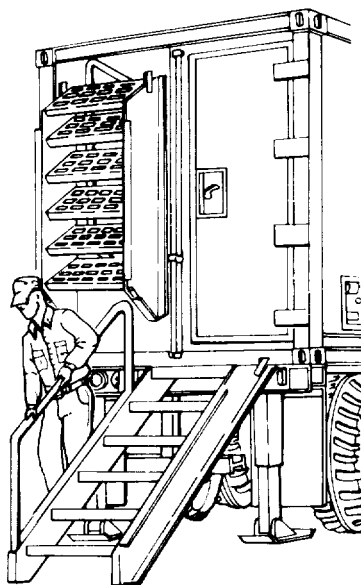


(1) Remove boarding ladders and handrails from rear of section.

(2) Remove handrails from ladders.



(3) Mount ladders at personnel doors and secure with locking pins.

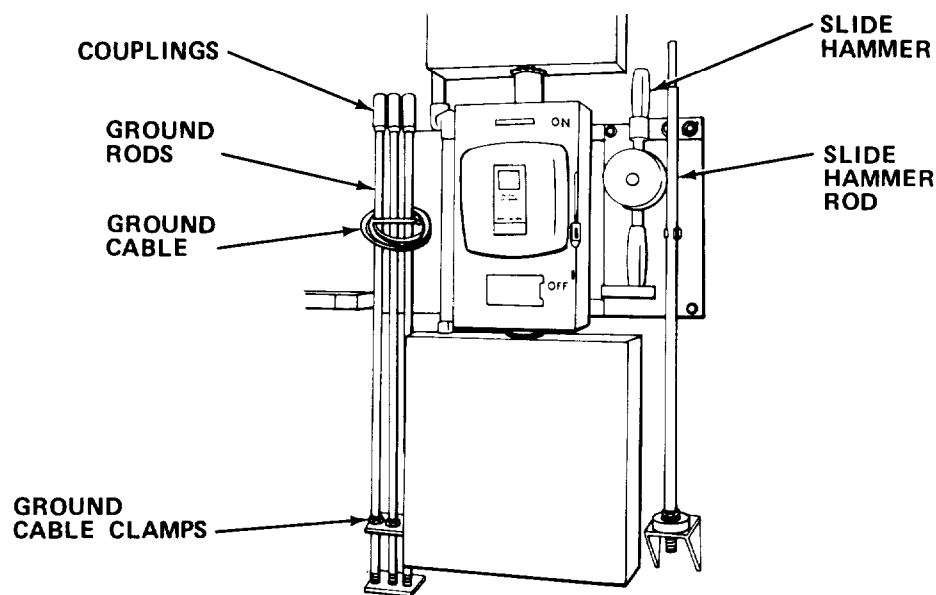


(4) Mount one handrail on each ladder.

(5) Enter section and be sure safety switch, main circuit breaker, and all equipment power supply switches are off.

WARNING

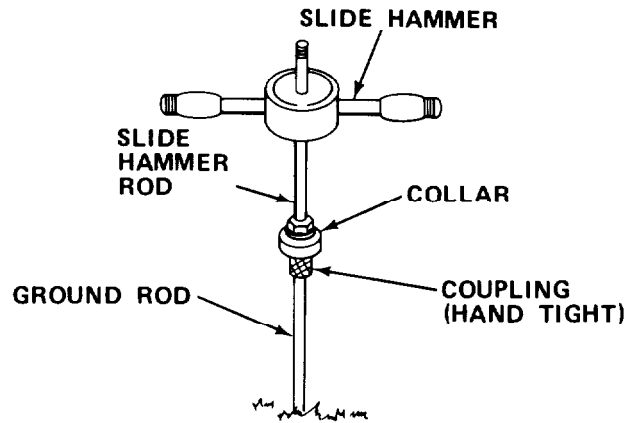
Death or serious injury may result from connecting power cable to section before grounding.



(6) Remove ground rod, slide hammer, and ground cable from section.

NOTE

- Apply a thin film of grease to threaded ends of rods before driving into ground. This will permit easy disassembly upon removal from ground.
- Bottom **ground rod** must be numbered or identified so that it will always be the first rod driven into the ground.
- These instructions supplement TC 11-6, Grounding Techniques.



(7) Select an area as close to power entry panel as possible to install ground rod. Then assemble the first ground rod and coupling to the slide hammer rod.

CAUTION

Do not allow ground rod to rotate when removing the slide hammer rod. Rods must be kept screwed together to make a good electrical ground.

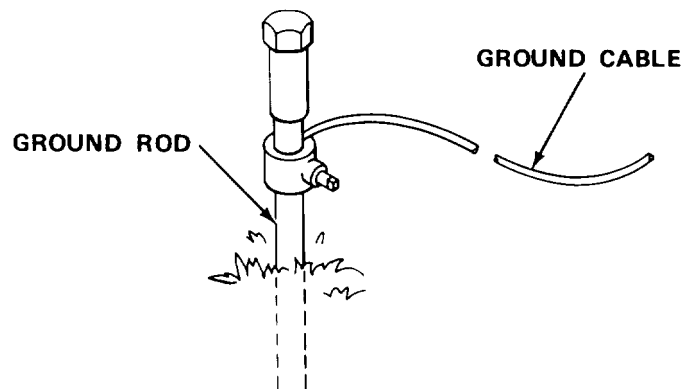
NOTE

Before driving ground rod be certain that rods meet inside coupling. Be sure collar is handtight against coupling.

(8) Place slide hammer on hammer rod end; drive ground rod into ground. Remove slide hammer rod. Attach slide hammer rod to a new section of ground rod; repeat procedure until only 12 in. (30.5 cm) of the third rod is above ground.

(9) Remove slide hammer and hammer rod, and place in section.

(10) Secure ground cable clamp and ground cable to ground rod.

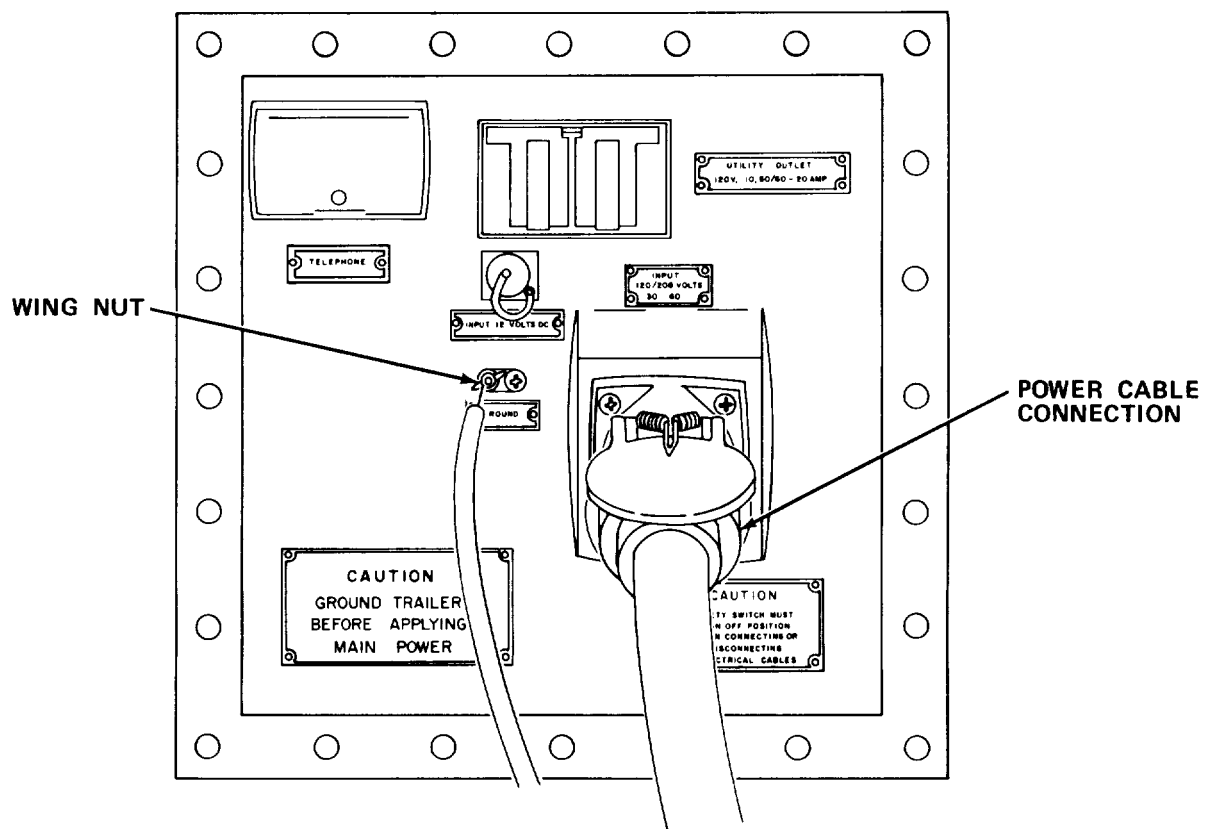


WARNING

To prevent death or serious injury, do not handle or clean power cable or connectors when cable is connected to power source.

NOTE

The section must be properly grounded before power is connected. If it is not possible to drive the three sections of ground rod fully into ground, the rods may each be driven into the ground separately and connected in series. If it is impossible to drive a ground rod, a suitable alternative ground must be found, such as a buried metal water pipe. See TC 11-6, Grounding Techniques for additional instructions.

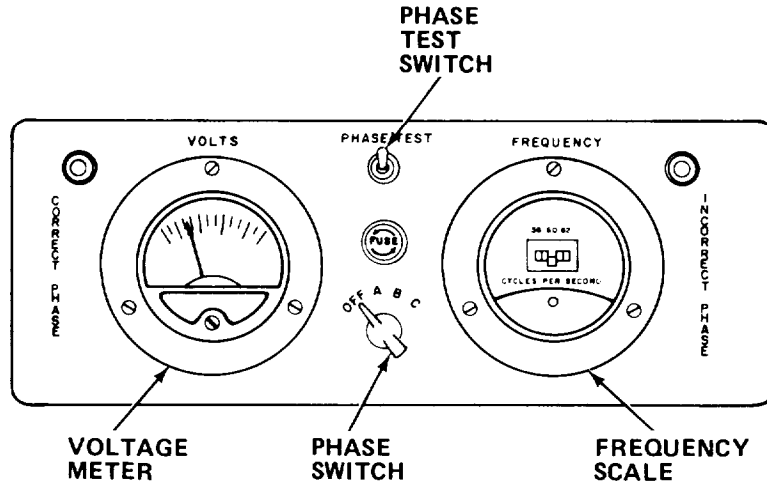


(11) Connect ground cable to ground lug with wing nut.

CAUTION

Be sure safety switch is off before connecting power cable to avoid equipment damage.

(12) Firmly connect the power cable to the power receptacle.



(13) Turn on safety switch.

CAUTION

Do not energize section if incorrect phase lamp lights. Damage to equipment may result.

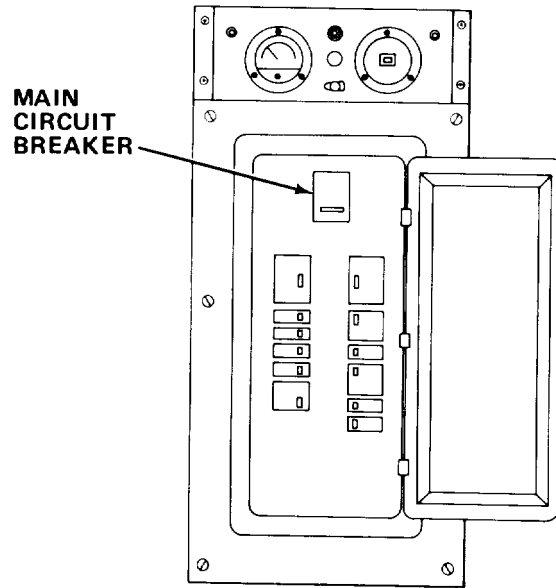
(14) Check voltage and frequency as follows:

- (a) Push phase test switch. Observe correct phase lamp lights.
- (b) Turn phase switch to A.

CAUTION

Voltage must be between 110 and 120, and frequency must be at 60 ± 1 Hz on each leg before turning on main circuit breaker or damage to equipment may result.

- (c) Read voltage on meter.
- (d) Read frequency on scale.
- (e) Repeat for positions B and C on phase switch.



(15) Set main circuit breaker ON.

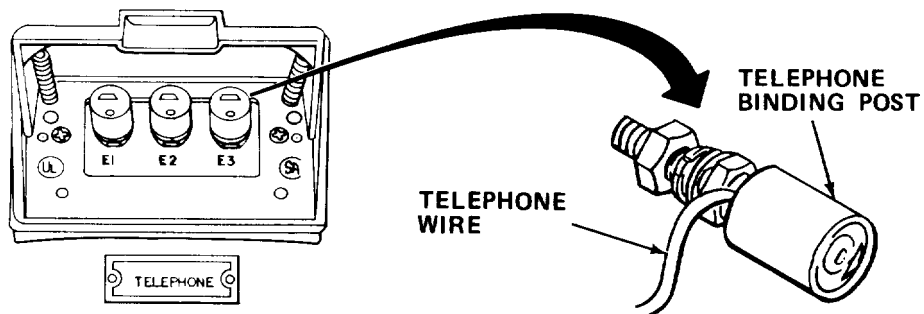
NOTE

This step must be accomplished if section is placed in operation in darkness, fog, mist, or under blackout conditions.

(16) Close blackout curtains, if required.

(17) Turn on circuit breakers in following order:

- (a) Individual lighting.
- (b) Curbside and roadside air conditioners/heaters.
- (c) Curbside and roadside receptacles.



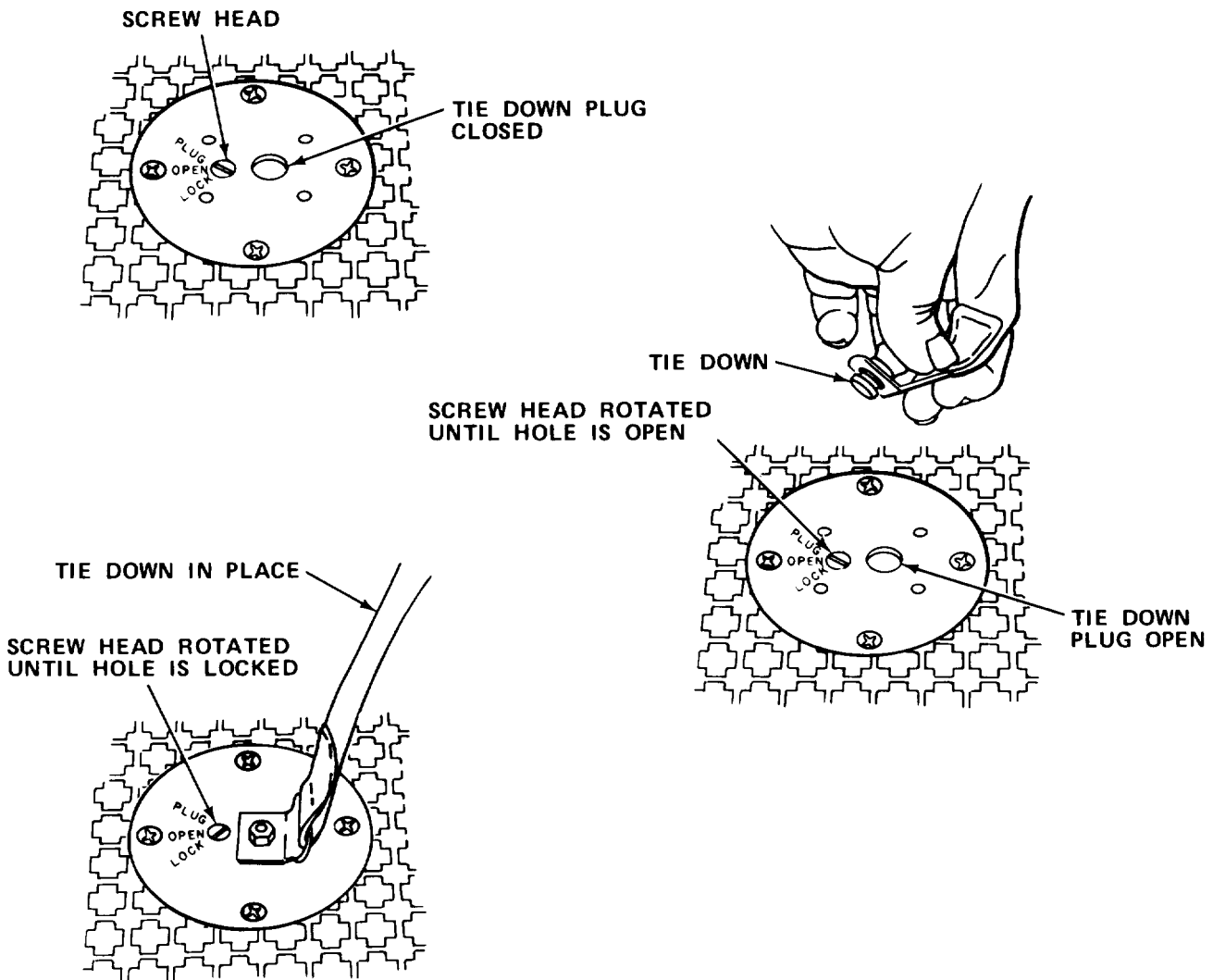
(18) Connect telephone lines to corresponding interior binding posts.

(19) Check blackout switches.

(20) Plug in emergency lighting and turn switch to READY.

1-6.2 Preparation for Movement.

- a. Inventory equipment and supplies.



- b. Install tiedowns in tiedown sockets.

- c. Secure authorized equipment in proper containers or as specified by appropriate chapters.

- d. Secure straps and remove slack from tiedowns.

WARNING

Death or serious injury may occur if power cable is disconnected while power is on.

- e. Turn equipment switches OFF.

- f. Turn main circuit breaker OFF.
- g. Turn safety switch OFF.
- h. Have power cable disconnected at power supply end. Disconnect power cable from receptacle. Put cable in storage box on trailer chassis.
- i. Turn emergency light switch OFF.
- j. Disconnect telephone cables from power entry panel.

CAUTION

To prevent loss of rod or thread damage, do not allow ground rod to rotate and unscrew when removing the slide hammer rod.

- k. Remove ground rod with slide hammer and put ground rods, couplings, and slide hammer inside section. Clean threads on each ground rod before storing.

NOTE

Be certain exhaust fan and air vent doors are securely closed.

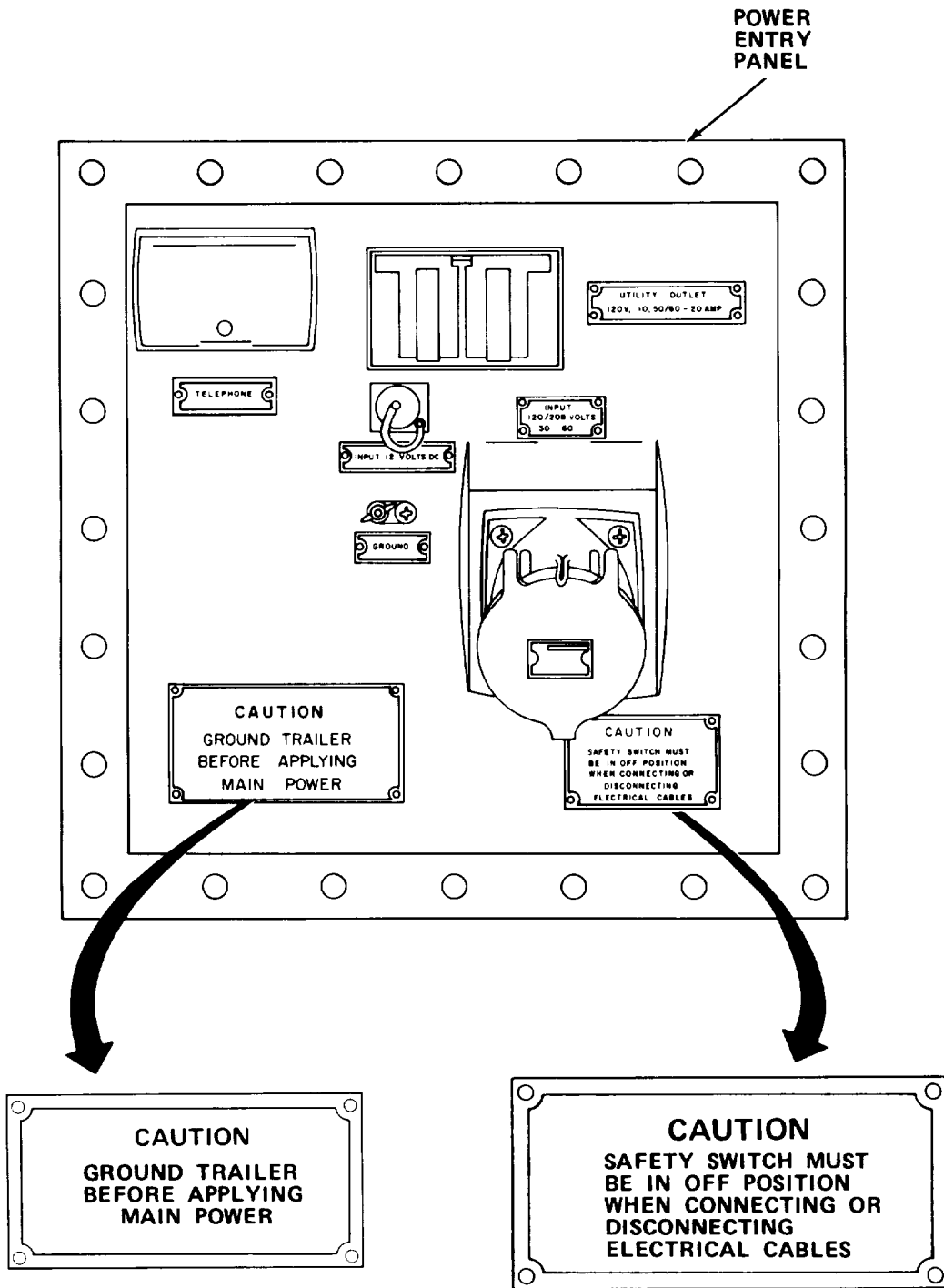
- l. Reinspect section interior for loose equipment and close all vents.
- m. Close section. Secure and lock all personnel doors and cargo door.

NOTE

Be sure air conditioner/heater covers are down and secured.

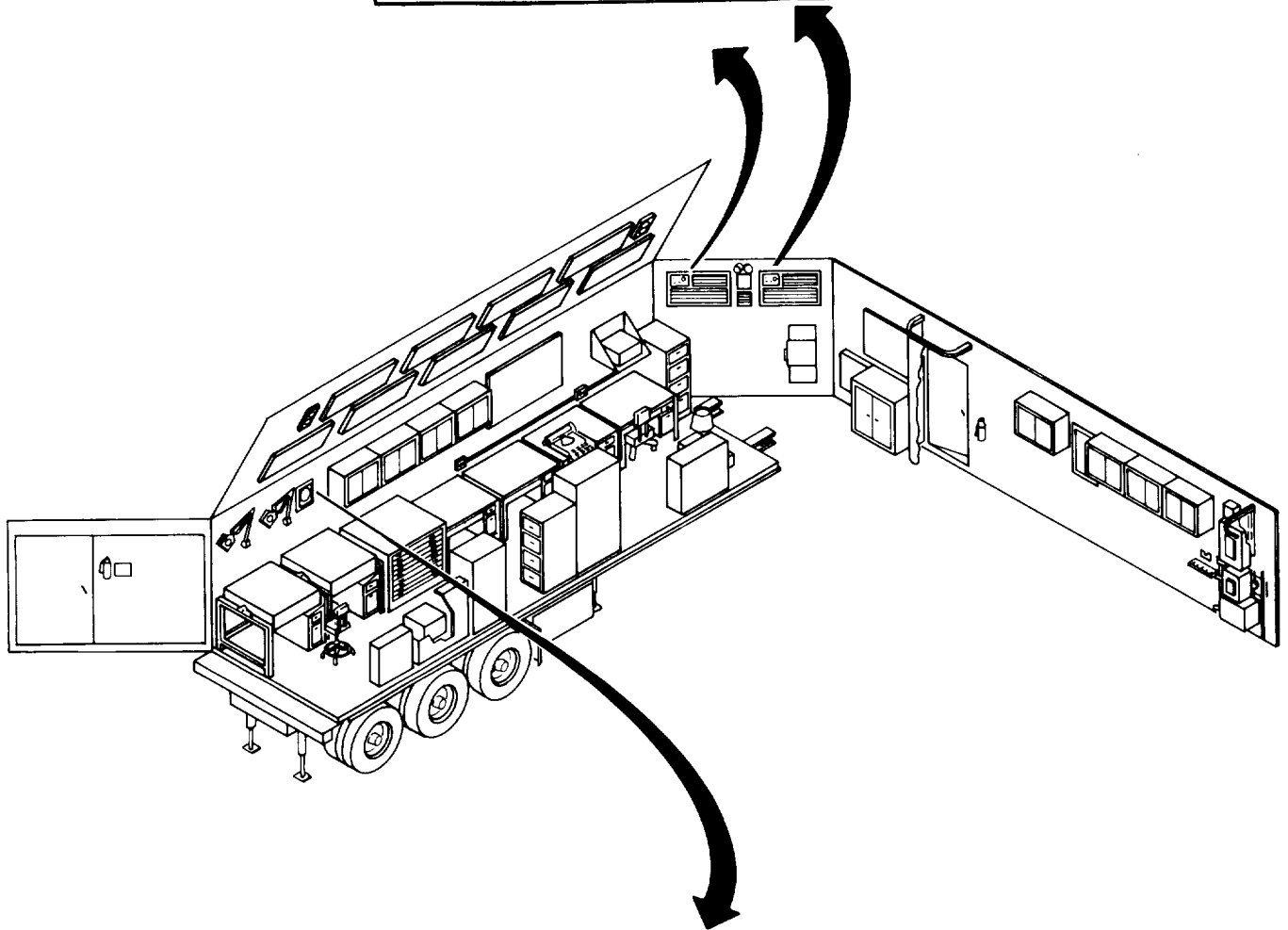
- n. Remove handrails from boarding ladders.
- o. Remove boarding ladders and insert handrails into back of ladders.
- p. Secure ladders to back of section.
- q. Fully extend landing gear.
- r. Retract leveling jacks.
- s. Visually inspect section exterior to be sure all equipment and covers are secured.

1-6.3 Operating Instructions on Decals and Instruction Plates.



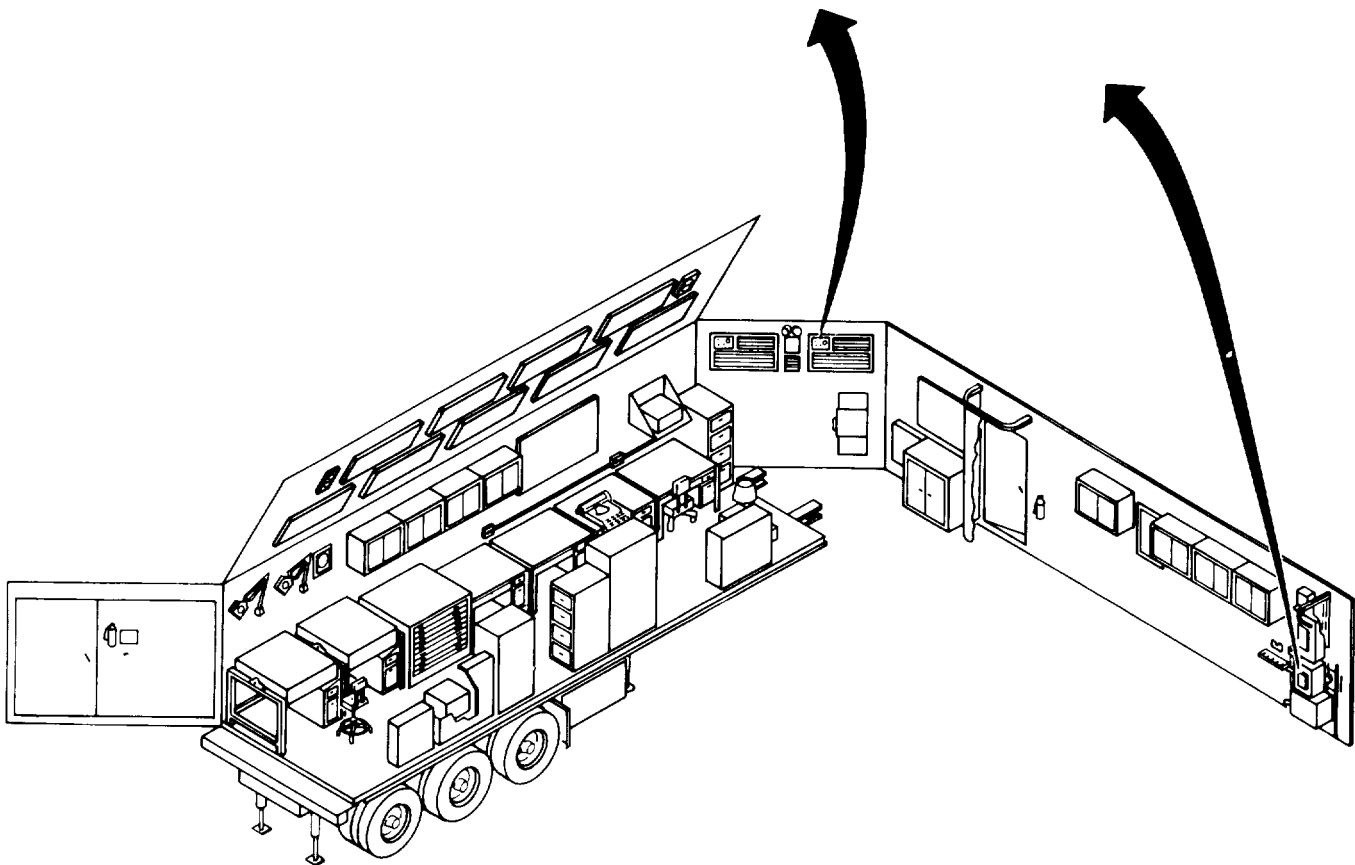
CAUTION
FOR SAFE OPERATION
SEE TM FOR PROPER
INTERNAL AND EXTERNAL
GROUNDING

CAUTION TO START UNIT ON "COOL"
MODE AT 0°F AMBIENT
JUMPER LACO SWITCH (S-5)

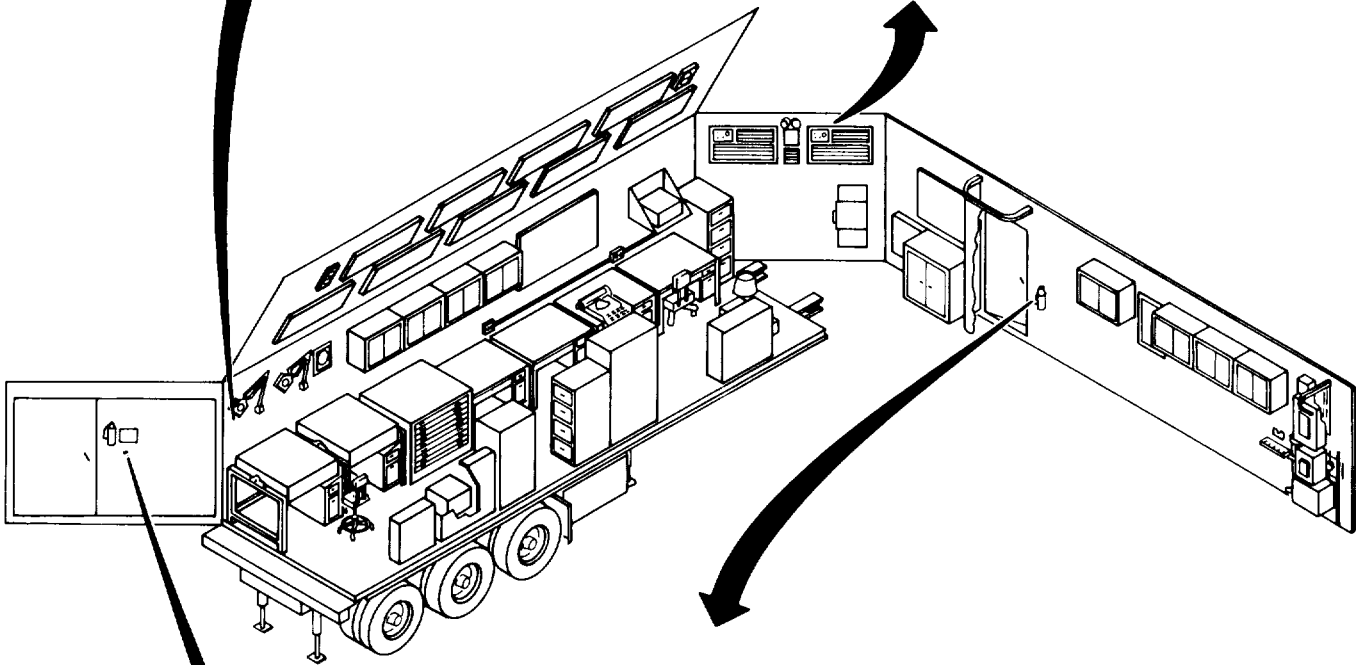


CAUTION
OPEN OUTSIDE VENT BEFORE
OPERATING FAN

CAUTION
EMERGENCY LIGHT SWITCH
MUST BE IN THE OFF POSITION
WHEN ELECTRICAL POWER
IS INTENTIONALLY DISCONNECTED
SWITCH MUST BE IN THE READY
POSITION FOR NORMAL EMERGENCY
LIGHT OPERATION



CAUTION
OPEN OUTSIDE FLAPS
PRIOR
TO OPERATING AIR COND



TO OPERATE

1. PULL RING PIN
2. POINT HORN CLOSE TO BASE OF FIRE
3. DEPRESS TRIGGER FOR DISCHARGE AND KEEP BASE OF FLAMES COVERED
4. AVOID BREATHING OF SMOKE
5. REMOVE VALVE AND HORN ASSEMBLY AND DISCARD USED CYLINDER

EXTINGUISHER, FIRE, CF₃BR, 2 3/4 LB

1-7. OPERATION UNDER UNUSUAL CONDITIONS

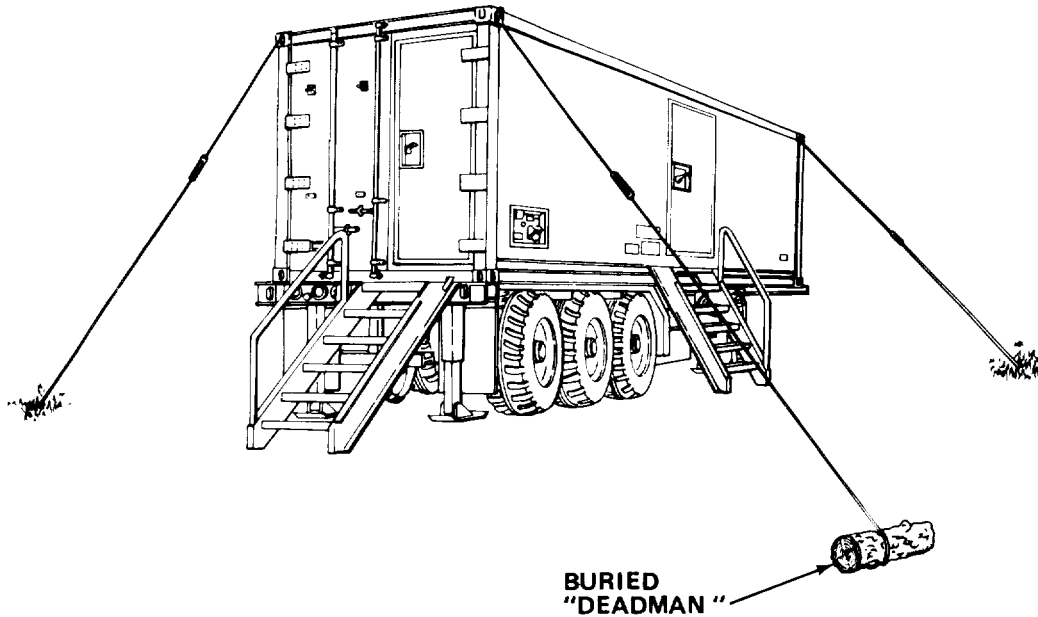
NOTE

Damage to container permitting light leaks, water, or dirt entry must be temporarily repaired using available material on hand. Maintenance personnel will conduct permanent repairs; however, crew must maintain operational capability of section.

1-7.1 Operation in High Wind or Storm Conditions.

- a. Relocate section if trees or structures present hazard.

SUGGESTED METHOD OF ANCHORING THE SECTION IN HIGH WINDS



- b. Secure section corners at lifting eyes to deadmen or substantial objects.
- c. Remove all loose objects from area.

1-7.2 Operation in Cold Weather.

- a. The operation of the internal equipment is performed within environmentally controlled conditions; however, in extreme cold, the main power supply cable and ground cable, will become hard, brittle, and difficult to handle. Be careful when connecting or disconnecting the cables so that kinks and unnecessary loops will not result in permanent damage.

b. Make certain that connections and cable receptacles on the outside of the section are free of frost, snow, and ice.

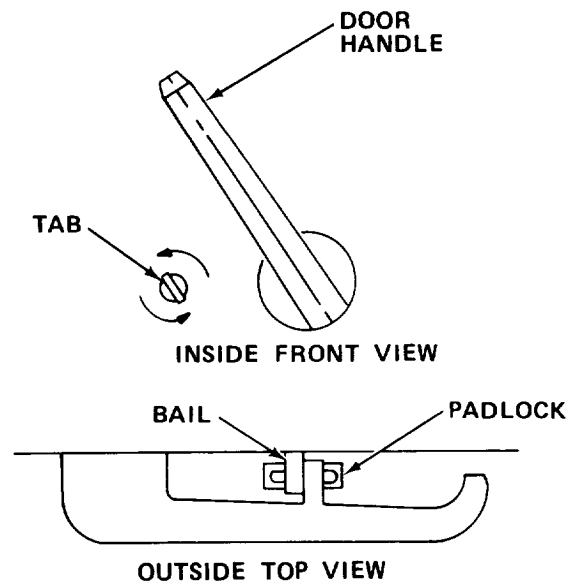
c. When section heaters are not operating or when the section is being transported, liquid consumable supplies may freeze, break their containers, then melt, and ruin equipment or documents. Store these items in an area to prevent equipment or document damage.

1-7.3 Operation in Extreme Heat. The operation of the internal equipment is performed within environmentally controlled conditions; however, during transportation or when air-conditioning units are not operating, consumable supplies may suffer reduced shelf life and internal components may have accelerated deterioration of gaskets, seals, or insulation.

1-7.4 Operation in Tropical Conditions. Fungi, mildew, or mold will form on and in equipment, documents, and supplies if internal environmental control equipment is not operating and outside heat and humidity are allowed to enter the section.

1-7.5 Operation in Desert Conditions. Dust, grit, and sand will ruin supplies, equipment, and documents. Extreme care must be taken to prevent dust, grit, and sand from entering into the section. Air filters will be changed whenever airflow is restricted and cleaning of section interior must be conducted more frequently than specified by PMCS schedules.

1-7.6 Emergency Procedures. There are no specific emergency procedures for operation of the section.



1-7.7 Emergency Means of Exit. In the event personnel are locked in the section, the tab may be turned to the left until the bail on the padlock falls free. The door handle is now free to turn.

Section III OPERATOR MAINTENANCE

1-8. LUBRICATION INSTRUCTIONS.

a. Lubrication instructions for the Operations Section are contained in LO 5-6675-313-12, Lubrication Order, Operations Section, Topographic Support System. The intervals and man-hours specified in the Lubrication Order are based on normal operations. During inactive periods, lubrication periods may be extended with adequate preservation.

b. Topographic equipment and all optical equipment require special care in lubrication. When a specified lubricant is called for, substitutions are not authorized. Minimum amounts of lubricant are to be used and all excess lubricant is to be immediately removed. Spray lubricants must not be used in the vicinity of optical equipment unless optics are completely protected. No lubricant is to be applied unless a thorough cleaning is conducted first to remove dirt, dust, or abrasive material.

c. Be sure that you refer to the appropriate chapter before any equipment is stored after use, that the temperature has stabilized, and that required lubrication after use is accomplished.

1-9. TROUBLESHOOTING PROCEDURES.

a. The table lists the common malfunctions which you may find during operation or maintenance of the Operations Section or its components. You should perform the test/inspections and corrective actions in the order listed.

b. This manual cannot list all malfunctions that may occur, nor all test or inspections and corrective actions. If a malfunction is not listed or is not corrected by listed corrective actions, notify your supervisor.

Table 1-2. TROUBLESHOOTING

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
-------------	--------------------	-------------------

1. NO ELECTRICAL POWER TO SECTION.

WARNING

Death or serious injury may result. Do not perform any electrical maintenance or make electrical connections or disconnections at main power receptacle when power cable is energized.

Step 1. Observe voltage and frequency for phases A, B, and C. Read 115 ± 5 V, 60 ± 1 Hz.

- (a) If voltage and frequency are correct, proceed to step 2.
- (b) If voltage and frequency are incorrect, notify power supply supervisor.

CAUTION

Do not energize section if voltage or frequency is not correct. Damage to equipment may result.

Step 2. Press phase test switch on power panel for A, B, and C.

- (a) If phases A, B, and C are correct, proceed to step 3.
- (b) If incorrect phase lamp lights, notify power supply supervisor.

CAUTION

Do not energize section if incorrect phase lamp lights. Damage to equipment may result.

Step 3. Check safety switch position.

- (a) If safety switch is ON, proceed to step 4.
- (b) If safety switch is OFF, turn ON.

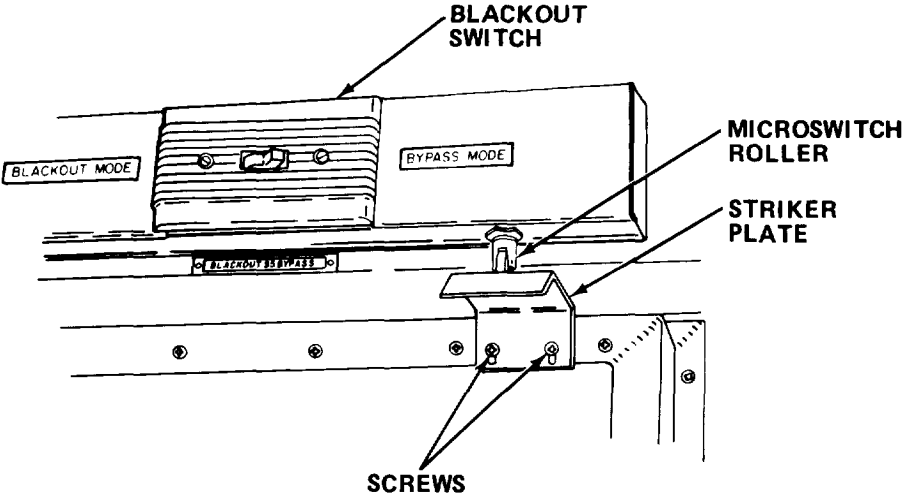
Table 1-2. TROUBLESHOOTING – Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
1. NO ELECTRICAL POWER TO SECTION - Cont	Step 4. Check main circuit breaker position.	<ul style="list-style-type: none"> (a) If circuit breaker is ON, refer to direct/general support maintenance. (b) If circuit breaker is OFF, turn ON. (c) If circuit breaker trips repeatedly, notify power supply supervisor.
2. NO ELECTRICAL POWER TO EQUIPMENT.	Step 1. Check equipment power switch.	<ul style="list-style-type: none"> (a) If power switch is ON, proceed to step 2. (b) If power switch is OFF, turn ON.
	Step 2. Check power cord.	<ul style="list-style-type: none"> (a) If power cord is plugged in, proceed to step 3. (b) If power cord is unplugged, plug in.
	Step 3. Inspect circuit breaker panel for breakers in OFF position.	<ul style="list-style-type: none"> (a) If all circuit breakers are ON, refer to direct/general support maintenance. (b) If any circuit breakers are OFF, turn ON.

Table 1-2. TROUBLESHOOTING – Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
-------------	--------------------	-------------------

3. BLACKOUT SWITCH DOES NOT OPERATE.



- Step 1. Check blackout switch position.
 - (a) If switch is ON, proceed to step 2.
 - (b) If switch is OFF, reset switch to BLACKOUT.
- Step 2. Check to see that striker plate contacts roller on microswitch.
 - (a) Loosen screws and move plate up or down until microswitch operates.
 - (b) If blackout switch still fails to operate, refer to organizational maintenance.

1-10. MAINTENANCE PROCEDURES.

a. This section contains instructions covering operator maintenance functions for the Operations Section. Personnel required are listed only if the task requires more than one.

b. After completing each maintenance procedure, perform operational check to be sure that equipment is properly functioning.

INDEX

PROCEDURE	PARAGRAPH
Replace Fluorescent Lamp	1-10.1
Service Ventilation Ducts.	1-10.2
Replace Blackout/Dome Light	1-10.3

1-10.1 Replace Fluorescent Lamp.

MOS: 81C, Cartographer

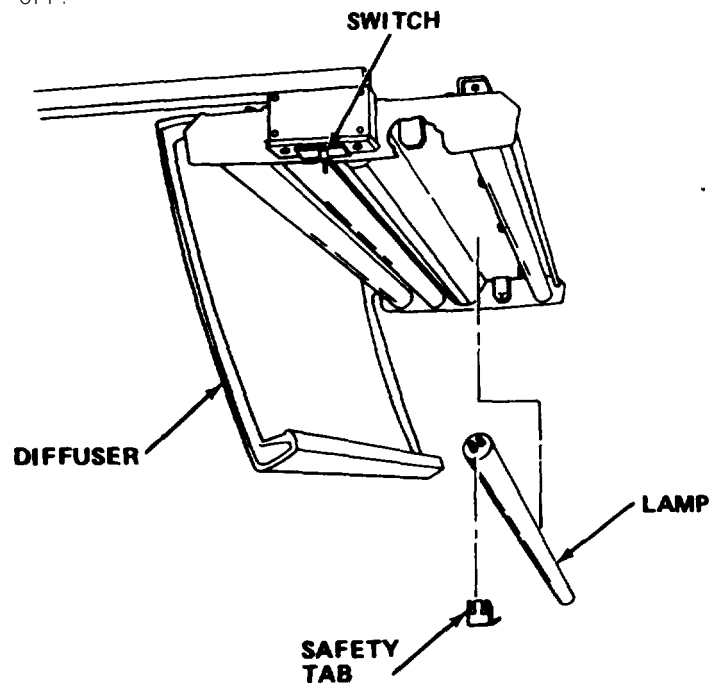
TOOLS: None

SUPPLIES: Fluorescent Lamp

WARNING

Death or serious injury may result if power is left on while servicing lamp.

- a. Turn switch OFF.



- b. Gently pull diffuser from light bracket and place diffuser out of the way to prevent damage.
- c. Remove safety tab from lamp-socket.
- d. Rotate defective lamp until prongs are free from slot and remove.
- e. Insert new lamp prongs into slot and rotate 90 degrees.
- f. Reinstall safety tab into lamp socket.
- g. Reinstall diffuser.
- h. Turn power ON.

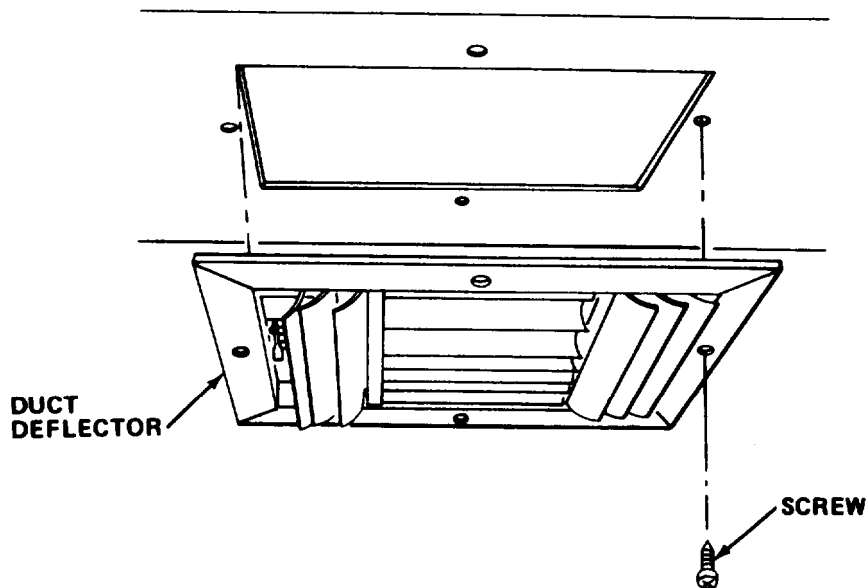
1-10.2 Service Ventilation Ducts.

MOS: 81C, Cartographer

TOOLS: Vacuum Cleaner
Flat Tip Screwdriver

SUPPLIES: None

- a. Cover equipment to prevent dust from entering equipment.
- b. Close all doors and cabinets.
- c. Remove any documents or other work that may be damaged by dirt/dust.



- d. Turn off air conditioner/heater.
- e. Remove four screws from each ventilation duct deflector.
- f. Remove all duct deflectors.
- g. Vacuum dirt or dust from deflector louvers.
- h. Insert vacuum cleaner probe into ventilation duct at each deflector hole and vacuum as far as probe will reach.
- i. Reinstall deflectors and secure with four screws.
- j. Turn on air conditioner/heater.
- k. Vacuum any dislodged dirt or dust from interior of section.
- l. Remove covers for operation.

1-10.3 Replace Blackout/Dome Light.

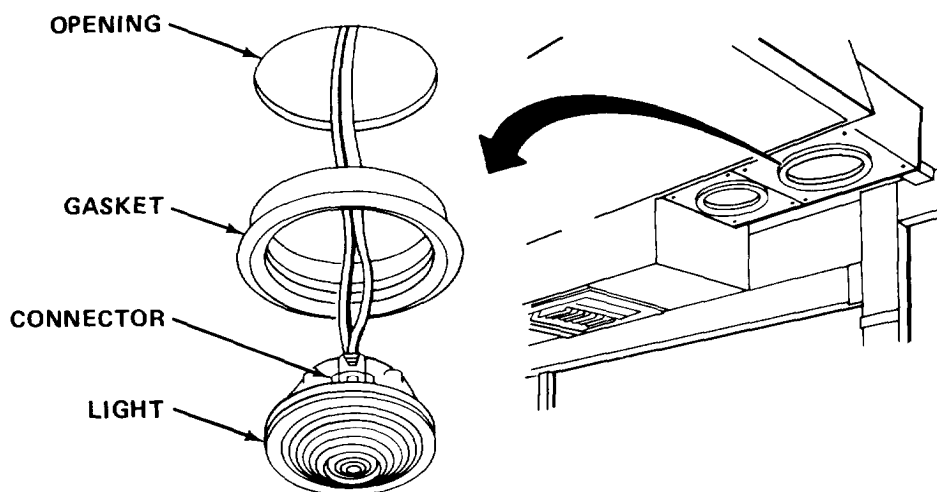
MOS: 81C, Cartographer

TOOLS: None

SUPPLIES: Lamp (12 V)
Silicone Spray (Item 19, Appendix E)

NOTE

Blackout light and dome light are sealed units. No bulb replacement is possible. Complete light must be replaced.



- a. Push light and gasket up into opening.
- b. Tilt and remove light and gasket from opening.
- c. Disconnect defective light from connector.
- d. Connect new light to connector.
- e. Reinstall gasket in opening.

NOTE

The use of silicone spray on the gasket will help to position light.

- f. Position light in gasket and push in.

Section IV ORGANIZATIONAL MAINTENANCE

1-11. LUBRICATION INSTRUCTIONS. This equipment does not require lubrication.

1-12. REPAIR PARTS; SPECIAL TOOLS; TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT; AND SUPPORT EQUIPMENT.

1-12.1 Common Tools and Equipment. For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

1-12.2 Special Tools; Test, Measurement, and Diagnostic Equipment; and Support Equipment. Special Tools, TMDE, and Support Equipment is listed in the applicable repair parts and special tools list and in Appendix B of this manual.

1-12.3 Repair Parts. Repair parts for this equipment are listed in the Repair Parts and Special Tools List, TM 5-6675-313-24P covering organizational maintenance for this equipment.

1-13. SERVICE UPON RECEIPT.

NOTE

The section may be received mounted on a chassis, or as a van body for mounting on an available transporter, or on site. Inspection of the chassis is covered in TM 5-2330-305-14. Inspection of the air conditioner/heater is covered in TM 5-4120-367-14.

1-13.1 Checking Unpacked Equipment.

a. Inspect the equipment for damage incurred during shipment. If the equipment has been damaged, report the damage on DD Form 6, Packing Improvement Report.

(1) Visually inspect the section exterior starting at the rear to cover rear, curbside, roadside, front, top, and bottom. Inspect for damage, tears, breaks, or corrosion.

(2) Enter section and inspect for broken equipment, tool boxes, chairs, or equipment loose and not secured.

(3) Close doors and vents to determine if light leaks exist.

(4) Inspect doors for damage, torn or rotted seals, and tightness of closure.

(5) Inspect interior for evidence of water damage, fungi, mildew, or corrosion.

(6) Report damage or discrepancies in accordance with AR 735-11 and AR 735-11-2.

b. Check the equipment against the packing list to see if shipment is complete. Report all discrepancies in accordance with the instructions of DA Pam 738-750.

(1) Inventory sections against Components of End Item and Basic Issue Items Lists (Appendix C).

(2) Inventory expendable supplies contained in section as shown in Appendix E.

(3) Conduct operational checks on equipment in accordance with the chapters in this manual when operators are available and power can be safely provided to the section.

c. Check to see whether the equipment has been modified.

1-14. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES.

a. PMCS are designed to keep the equipment in good working condition by performing certain tests, inspections, and services. The intervals provide you, the organizational technician, with time schedules that determine when to perform specified tasks.

b. Item number column. Item numbers are assigned in chronological ascending sequence regardless of interval designation. These numbers are used for your "TM Number" column on DA Form 2404, Equipment Inspection and Maintenance Worksheet, in recording the results of PMCS.

c. Interval columns. This column determines the time period designated to perform your PMCS.

d. Item to be inspected and procedures column. This column lists functional groups and their respective assemblies and subassemblies as shown in the Maintenance Allocation Chart (Appendix B). The appropriate check or service procedure follows the specific item to be inspected.

e. Preventive maintenance checks and services for the air conditioners/heaters are contained in TM 5-4120-367-14.

f. List of tools and materials required for PMCS is as follows:

<u>Item</u>	<u>Quantity</u>
Vacuum Cleaner	1 ea
8 in. Adjustable Wrench	1 ea
Cross Tip Screwdriver	1 ea
Flat Tip Screwdriver	1 ea
Spring Scale	1 ea
Padlock	1 ea
Flashlight	1 ea

Table 1-3. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES

B - Before
D - During
A - After

W - Weekly
M - Monthly
Q - Quarterly

AN - Annually
S - Semiannually
BI - Biennially

(Number) - Hundreds of Hours

ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE
<u>VAN BODY</u>		
1	M	Service Air Conditioner/Heater. Refer to TM 5-4120-367-14 for preventive maintenance checks and services that pertain to air conditioners/heaters.
2	M	<p data-bbox="261 670 569 702"><u>Service Lighting System.</u></p> <div data-bbox="239 723 1412 1361"> <p>The diagram shows a rectangular electrical control panel. At the top, there is a 'VOLTAGE METER' with two circular gauges. Below it is a 'CIRCUIT BREAKER OFF' switch. The main body of the panel contains several rows of smaller switches and indicators. To the right of the main panel is a separate 'SAFETY SWITCH OFF' which is a large rectangular switch with a handle and a lock mechanism. A hand icon points towards the voltage meter area.</p> </div> <p data-bbox="669 1649 801 1691"><u>WARNING</u></p> <p data-bbox="437 1723 1164 1862">Do not open circuit breaker panel or service electrical connections, cables, or switches until main power is off and voltage meter confirms circuit is not energized. Death may result from failure to observe these safety precautions.</p> <p data-bbox="289 1893 999 1925">1. Turn main circuit breaker OFF. Turn safety switch OFF.</p>

Table 1-3. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before
 D - During
 A - After

W - Weekly
 M - Monthly
 Q - Quarterly

AN - Annually
 S - Semiannually
 BI - Biennially

(Number) - Hundreds of Hours

ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE
<u>VAN BODY - Cont</u>		
2	M	<u>Service Lighting System - Cont</u> 2. Padlock safety switch. 3. Tighten all loose screws, bolts, and clamps. 4. Check which switches, switch plate outlets, receptacles, and posts require repair. 5. Check for loose screws and nuts on ceiling, console lights, circuit breaker panels, and conduits. 6. Remove padlock. 7. Turn power on.

Table 1-3. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before W - Weekly AN - Annually (Number) - Hundreds of Hours
 D - During M - Monthly S - Semiannually
 A - After Q - Quarterly BI - Biennially

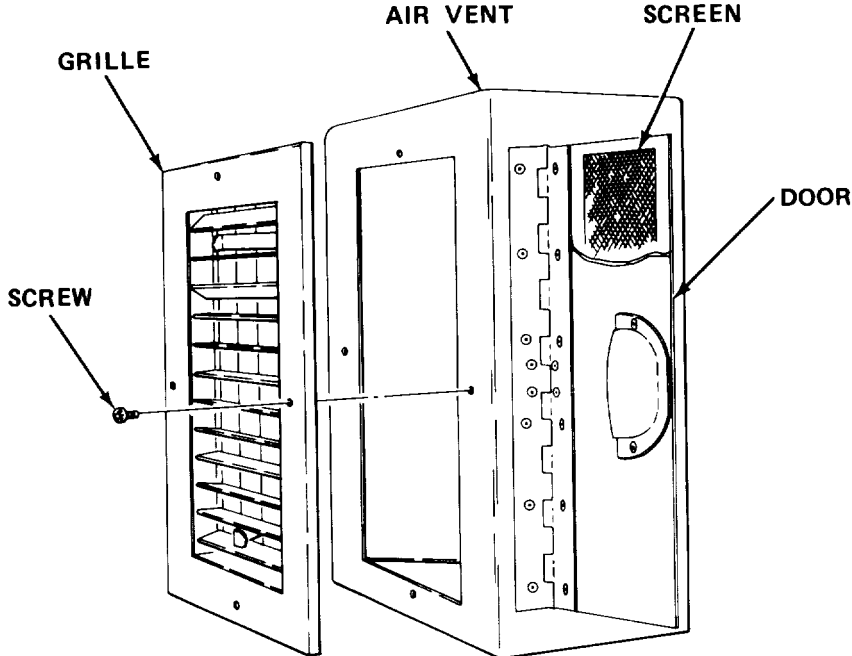
ITEM NO.	INTER-VAL	ITEM TO BE INSPECTED PROCEDURE
3	M	<p><u>VAN BODY - Cont</u></p> <p><u>Service Air Vent</u></p>  <ol style="list-style-type: none"> 1. Remove screws from front of grille. 2. Remove front grille. 3. Using vacuum cleaner, clean screens on side doors. Vacuum inside of air vent. 4. Reinstall grille and secure with screws.

Table 1-3. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before
D - During
A - After

W - Weekly
M - Monthly
Q - Quarterly

AN - Annually
S - Semiannually
BI - Biennially

(Number) - Hundreds of Hours

ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE
<u>VAN BODY - Cont</u>		
4	M	<p data-bbox="375 541 792 583"><u>Inspect Fire Extinguisher.</u></p> <div data-bbox="532 680 1500 1234" style="text-align: center;"> </div> <ol style="list-style-type: none"> <li data-bbox="375 1339 1230 1402">1. Remove from mounting bracket. Check free movement of bracket. <li data-bbox="375 1430 1182 1472">2. Inspect nozzle and adapter assembly for damage. <li data-bbox="375 1493 1068 1535">3. Inspect seal. Be sure it is not broken.
	S	<ol style="list-style-type: none"> <li data-bbox="375 1556 1198 1619">4. Weigh cylinder. Replace if gross weight has decreased by 6 oz (170 g) or more.

1-15. ORGANIZATIONAL TROUBLESHOOTING PROCEDURES.

a. Organizational troubleshooting procedures cover the most common malfunctions that may be repaired at the organizational level. Repair or adjustment requiring specialized equipment is not authorized unless such equipment is available. Troubleshooting procedures used by the operator should be conducted in addition to the organizational troubleshooting procedures.

b. This manual cannot list all the possible malfunctions or every possible test/inspection and corrective action. If a malfunction is not listed or corrected by a listed corrective action, notify your supervisor.

c. For unidentified malfunctions, use the facing schematic or the foldout located at the end of this manual for further fault analysis.

d. If any component of the Operations Section does not power up when turned on, verify that 120 V ac is present at the receptacle. If voltage is not present, plug equipment into receptacle with power available and proceed with equipment troubleshooting. Perform no-power troubleshooting procedures for dead receptacle (Table 1-4).

Table 1-4. ORGANIZATIONAL TROUBLESHOOTING

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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WARNING

Electrical shock hazard. Be sure power is off when checking continuity at troubleshooting points. Death or serious injury could result from failure to do so.

1. FLUORESCENT CEILING LAMP IS INOPERATIVE.

Step 1. Check for continuity of fluorescent lamp switch.

(a) If continuity exists, proceed to step 2.

(b) If continuity does not exist, replace switch (paragraph 1-16.3).

Table 1-4. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
1. FLUORESCENT CEILING LAMP IS INOPERATIVE - Cont	Step 2. Check for continuity of lamp ballast.	(a) If continuity exists, proceed to step 3. (b) If continuity does not exist, replace lamp ballast (paragraph 1-16.1).
	Step 3. Check for shorts in RF Filter.	Replace RF filter (paragraph 1-16.2).
2. VENTILATION FAN IS INOPERATIVE.	Check on/off switch for continuity.	(a) If continuity exists, replace fan (paragraph 1-16.9). (b) If continuity does not exist, replace switch (paragraph 1-16.4).
3. EMERGENCY LIGHTS ARE INOPERATIVE.	Press in test indicator.	If lamps do not light, replace emergency light assembly (paragraph 1-16.11).
4. NO POWER TO EQUIPMENT.	Step 1. Check circuit breaker ON/OFF position.	(a) If circuit breaker is ON, proceed to step 2. (b) If circuit breaker is OFF, turn ON. (c) If circuit breaker trips repeatedly, notify power supply supervisor.

Table 1-4. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
4. NO POWER TO EQUIPMENT - Cont	Step 2. Check circuit breaker input for 120 V ac.	(a) If input voltage is present, proceed to step 3. (b) If input voltage is not present, refer to direct/general support maintenance for repair or replacement of defective wiring.
	Step 3. Check circuit breaker output for 120 V ac.	(a) If output voltage is present, proceed to step 4. (b) If output voltage is not present, refer to direct/general support maintenance for circuit breaker replacement (paragraph 1-20.5).
	Step 4. Remove receptacle and check for 120 V ac input.	(a) If present, replace receptacle (paragraph 1-16.6). (b) If not present, refer to direct/general support maintenance for repair or replacement of defective wiring.

1-16. MAINTENANCE PROCEDURES.

a. This section contains instructions covering organizational maintenance functions for the Operations Section. Personnel required are listed only if the task requires more than one.

b. After completing each maintenance procedure, perform operational check to be sure that equipment is properly functioning.

I N D E X

PROCEDURE	PARAGRAPH
Repl ace Fl uorescent Lamp Ballast	1-16. 1
Repl ace Radi o Frequency (RF) Fil ter	1-16. 2
Repl ace Fl uorescent Lamp Swi tch	1-16. 3
Repl ace On/Off Swi tch.	1-16. 4
Repl ace Bl ackout/Dome Li ght Mi croswi tch	1-16. 5
Repl ace Receptacl e	1-16. 6
Repl ace Wi re Mol di ng	1-16. 7
Repai r Tel ephone Bi ndi ng Post Assembl y	1-16. 8
Repl ace Exhaust Fan	1-16. 9
Repl ace Exhaust Fan Cover	1-16. 10
Repl ace Emergency Li ght Assembl y	1-16. 11
Repai r Bl ackout Curtai n	1-16. 12
Repai r Van Body Ski n (Temporary)	1-16. 13
Repl ace Ti edown Socket	1-16. 14
Repl ace Level I ndi cator.	1-16. 15
Repl ace Ai r Vent Screen.	1-16. 16
Repl ace Ai r Vent Cover	1-16. 17
Repai r Personnel Ladder.	1-16. 18

1-16.1 Replace Fluorescent Lamp Ballast.

MOS: 35E, Special Electronic Devices Repairer

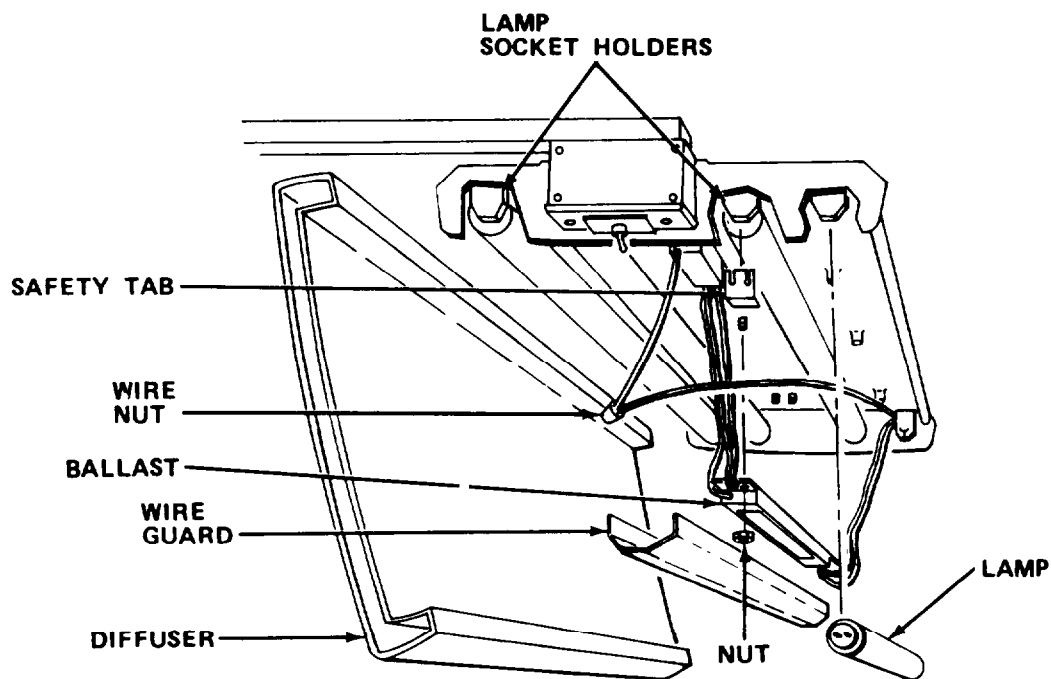
TOOLS: Flat Tip Screwdriver
1/4 in. Wrench
1/4 in. Drive Socket Set
Scribe

SUPPLIES: Lamp Ballast
Wire Ties

WARNING

Death or serious injury may occur unless overhead light circuit breaker and main circuit breaker are turned off before working on light fixture.

- a. Turn off overhead light circuit breaker and main circuit breaker.
- b. Remove diffuser from light fixture.
- c. Remove safety tabs and lamps. Place in diffuser.
- d. Squeeze light wiring guard and remove.
- e. Remove wire ties as required.



- f. Tag wires from ballast for reference.

- g. Disconnect ballast wire from wire nut connection.
- h. Pry out lamp socket holder with flat tip screwdriver.
- i. Using scribe, depress wire clips and disconnect ballast wiring.
- j. Remove nut and defective ballast.
- k. Install new ballast and connect wires to corresponding lamp socket holders.
- l. Secure with nut.
- m. Reconnect ballast wire to wire nut connection.
- n. Remove tags.
- o. Install new wire ties.

NOTE

Be sure wires are free of kinks and do not interfere with placement of wire guard.

- p. Reinstall wire guard.
- q. Reinstall lamp and safety tabs.
- r. Reinstall diffuser.
- s. Turn on overhead light circuit breaker and main circuit breaker.

1-16.2 Replace Radio Frequency (RF) Filter.

MOS: 35E, Special Electronic Devices Repairer

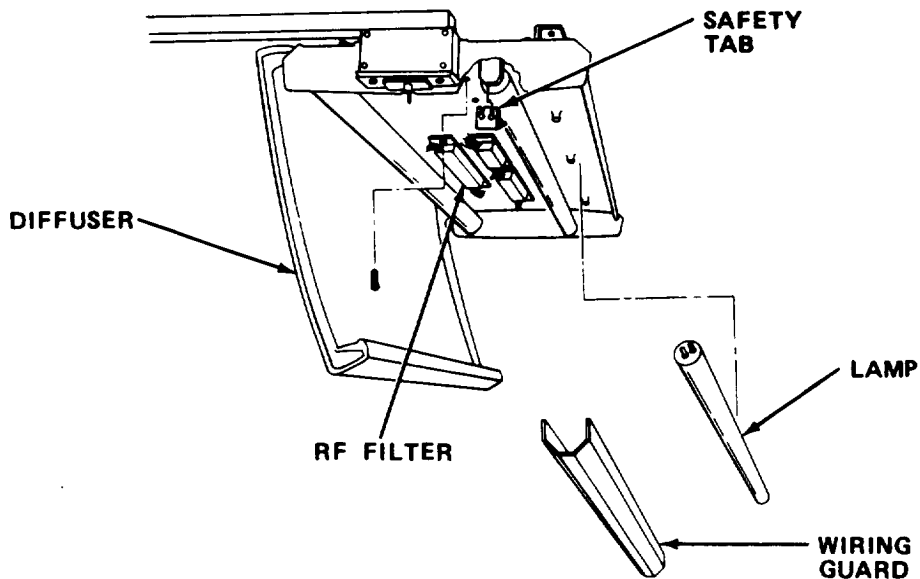
TOOLS: Flat Tip Screwdriver
1/4 in. Wrench
1/4 in. Drive socket set

SUPPLIES: RF Filter
Wire Ties

WARNING

Death or serious injury may occur unless overhead light switch is turned OFF before working on light fixture.

- a. Turn overhead light switch OFF.
- b. Remove diffuser from light fixture.
- c. Remove safety tabs and lamps. Place in diffuser.
- d. Squeeze light wiring guard and remove.
- e. Remove wire ties as required.



- f. Tag wires to filter.
- g. Remove wire nuts and disconnect filter wires.

- g. Disconnect ballast wire from wire nut connection.
- h. Pry out lamp socket holder with flat tip screwdriver.
- i. Using scribe, depress wire clips and disconnect ballast wiring.
- j. Remove nut and defective ballast.
- k. Install new ballast and connect wires to corresponding lamp socket holders.
- l. Secure with nut.
- m. Reconnect ballast wire to wire nut connection.
- n. Remove tags.
- o. Install new wire ties.

NOTE

Be sure wires are free of kinks and do not interfere with placement of wire guard.

- p. Reinstall wire guard.
- q. Reinstall lamp and safety tabs.
- r. Reinstall diffuser.
- s. Turn on overhead light circuit breaker and main circuit breaker.

1-16.2 Replace Radio Frequency (RF) Filter.

MOS: 35E, Special Electronic Devices Repairer

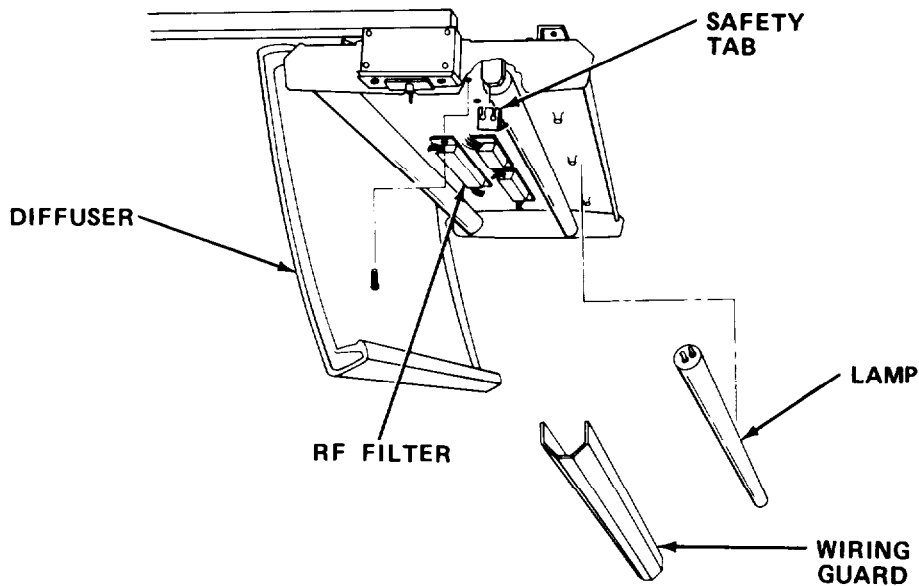
TOOLS: Flat Tip Screwdriver
1/4 in. Nut Driver
1/4 in. Drive Socket Set

SUPPLIES: RF Filter
Wire Ties

WARNING

Death or serious injury may occur unless overhead light switch is turned OFF before working on light fixture.

- a. Turn overhead light switch OFF.
- b. Remove diffuser from light fixture.
- c. Remove safety tabs and lamps. Place in diffuser.
- d. Squeeze light wiring guard and remove.
- e. Remove wire ties as required.



- f. Tag wires to filter.
- g. Remove wire nuts and disconnect filter wires.

- h. Remove nuts and defective filter.
- i. Install new filter. Secure with nuts.
- j. Reconnect filter wires and secure with wire nuts.
- k. Remove tags.
- l. Install new wire ties.

NOTE

Be sure wires are free of kinks and do not interfere with placement of wire guard.

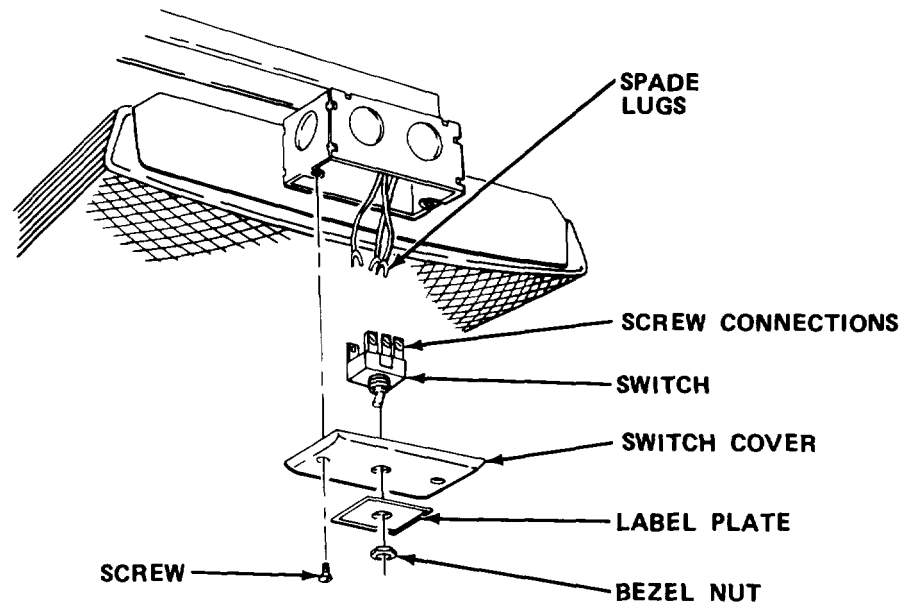
- m. Reinstall wire guard.
- n. Reinstall lamps and safety tabs.
- o. Reinstall diffuser.
- p. Turn on light switch.

1-16.3 Replace Fluorescent Lamp Switch.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Flat Tip Screwdriver
Needle Nose Pliers
Flashlight

SUPPLIES: Switch Assembly



WARNING

Death or serious injury may occur if lighting circuit breaker is not turned off before working on lamp assembly.

NOTE

Alternate lighting is required to perform this task.

- a. Turn circuit breaker OFF.
- b. Remove bezel nut.
- c. Note notch on label plate and remove label plate.
- d. Loosen screws.

NOTE

Note position of cover and reinstall as noted.

- e. Remove cover plate.
- f. Tag and disconnect wires from defective switch.
- g. Install new switch and connect wires.
- h. Insert switch through cover plate and label plate.

NOTE

Be sure label plate is in same direction as when removed. Secure with bezel nut.

- i. Align cover plate with holes and secure with screws.
- j. Turn circuit breaker ON.

1-16.4 Replace On/Off Switch.

MOS: 35E, Special Electronic Devices Repairer

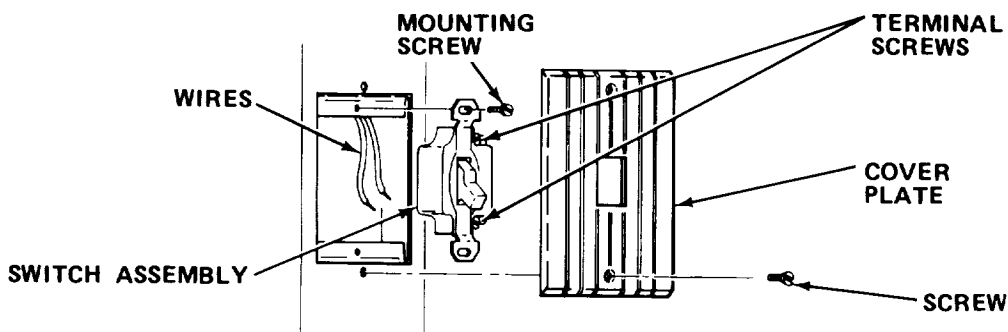
TOOLS: Flat Tip Screwdriver

SUPPLIES: Switch

WARNING

Death or serious injury may occur if switch circuit breaker is not turned off before working on switch.

- a. Turn off switch circuit breaker.



- b. Remove screws.
- c. Remove cover plate.
- d. Remove mounting screws.
- e. Pull switch assembly from wire guide to gain access to wires.
- f. Loosen terminal screws; then disconnect wires.
- g. Install new switch.
- h. Reconnect wires.
- i. Guide switch into wire guide, aligning holes.

NOTE

Be sure wires are not kinked or strained.

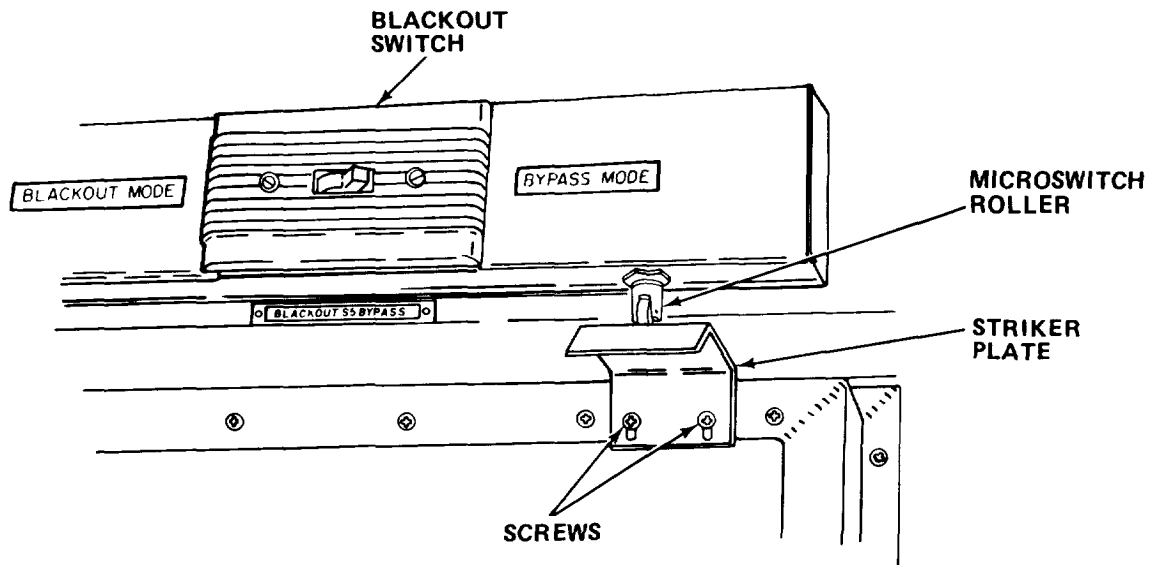
- j. Reinstall mounting screws.
- k. Reinstall cover plate and secure with screws.
- l. Turn on switch circuit breaker.

1-16.5 Replace Blackout/Dome Light Microswitch.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Flat Tip Screwdriver
6 in. Adjustable Wrench

SUPPLIES: Microswitch

WARNING

Death or serious injury may occur from electrical shock unless power is off before servicing.

- a. Turn off blackout/dome light circuit breaker.
- b. Remove conduit cover.
- c. Remove nut and pull out switch to expose wiring.
- d. Disconnect wires from defective switch.
- e. Connect wires to new switch.
- f. Install switch and secure with nut.
- g. Adjust striker plate until plate contacts rollers.
- h. Reinstall conduit cover.
- i. Turn on circuit breaker.

1-16.6 Replace Receptacle.

MOS: 83FJ6, Reproduction Equipment Repairer

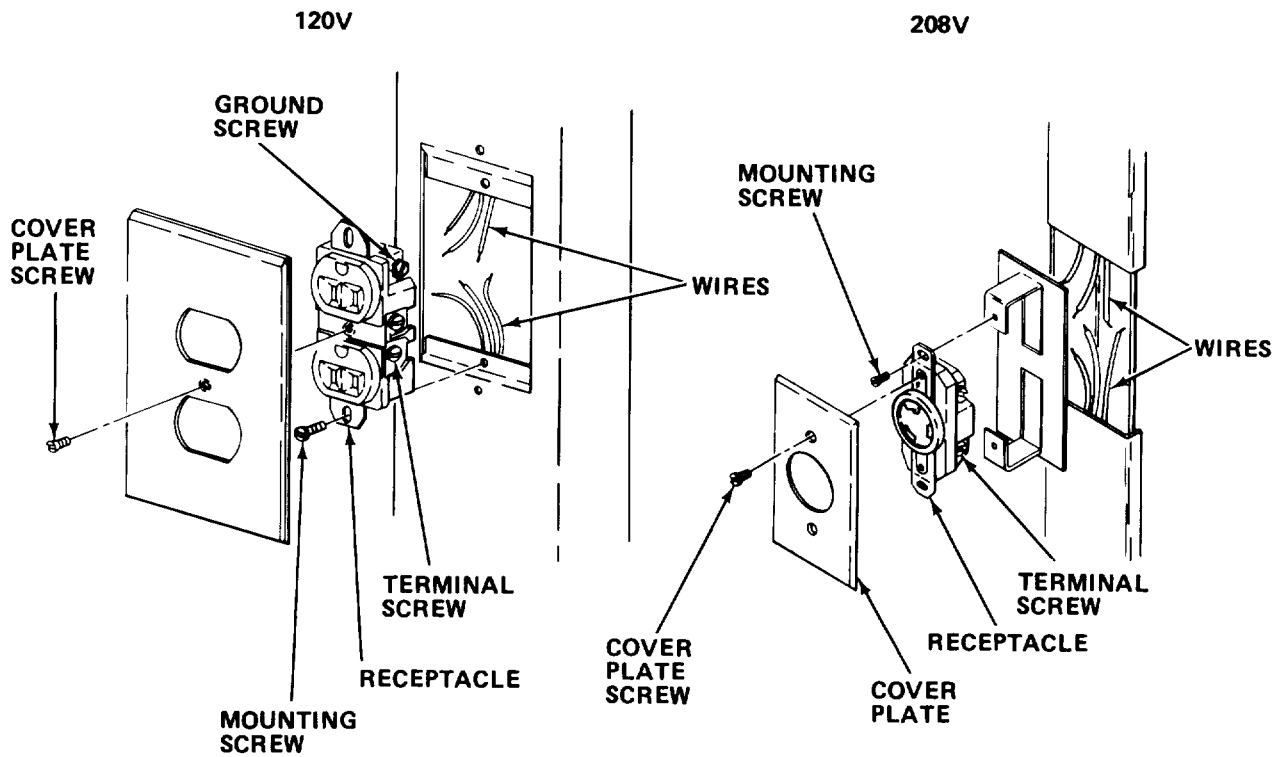
TOOLS : Flat Tip Screwdriver

SUPPLIES: Receptacle

WARNING

Death or serious injury may occur if receptacle circuit breaker is not turned off before working on receptacle.

- a. Turn off receptacle circuit breaker.



- b. Remove cover plate screws.
- c. Remove cover plate.
- d. Remove mounting screws.
- e. Withdraw receptacle to gain access to wires.

- f. Loosen terminal screws and ground screw; disconnect wires.
- g. Reconnect wires. Connect green (ground) wire first.
- h. Install new receptacle.
- i. Guide receptacle into wire guide.

NOTE

Be sure wires are not kinked or strained.

- j. Secure receptacle with screws.
- k. Reinstall cover plate. Secure with screws.
- l. Turn on receptacle circuit breaker.

1-16.7 Replace Wire Molding.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Flat Tip Screwdriver

Hacksaw

Flashlight

Paint Brush

Multimeter

Drill and Bits

File

Machinist Rule

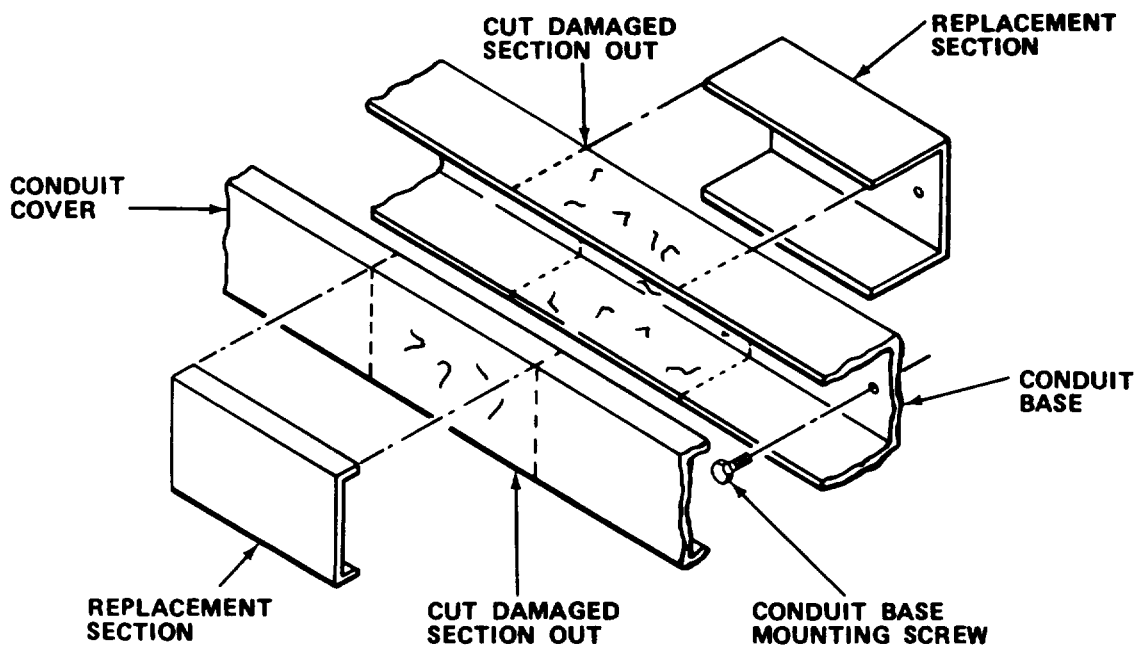
SUPPLIES: Paint (Item 12, Appendix E)

Cheesecloth (Item 5, Appendix E)

Conduit Base

Conduit Cover

Padlock



WARNING

Death or serious injury may occur from failure to turn off and padlock safety switch before repairing molding.

NOTE

Alternate lighting is required to perform this task.

- a. Turn off and padlock safety switch.

- b. Remove conduit cover.
- c. Inspect wires for damage.

NOTE

Refer to direct support maintenance for wiring repair if necessary.

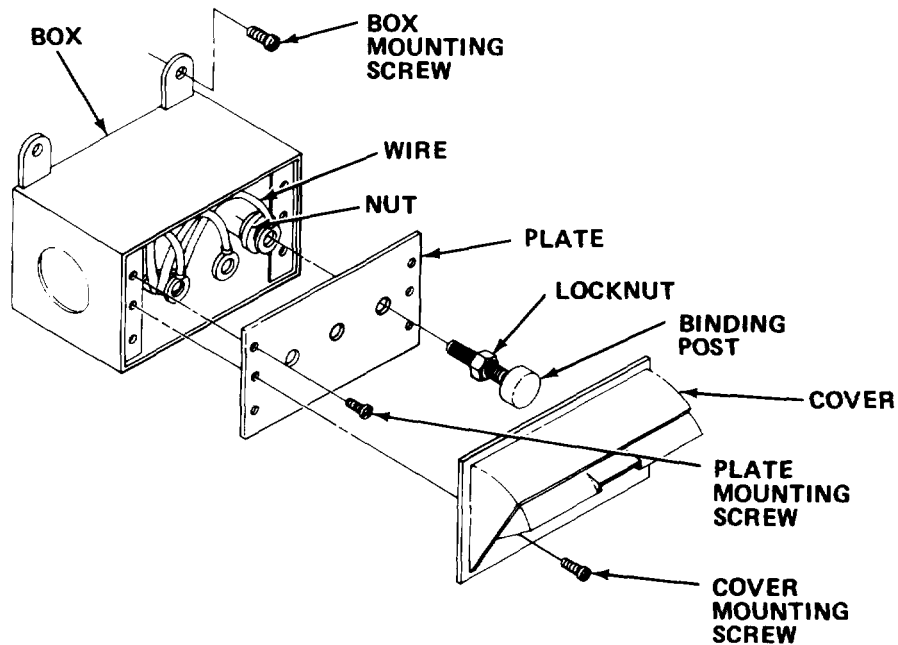
- d. Loosen wiring and carefully pull it from the entire base section.
- e. Remove screws and base from wall.
- f. Mark and measure damaged area on molding. Record measurement.
- g. Cut damaged area from molding.
- h. Cut section from new molding to the length recorded in step f.
- i. Using damaged area as a template, mark mounting holes on new piece.
- j. With a number 25 drill bit, drill holes in new molding.
- k. With file, remove all burred edges.
- l. Paint base section as required.
- m. Reinstall conduit base on wall with screws.
- n. Carefully place wiring back in conduit base.
- o. Reinstall cover on base.
- p. Test wiring for continuity between power wires and conduit. If there is continuity, determine and correct grounding fault.
- q. Test wiring with power on.

1-16.8 Replace Telephone Binding Post Assembly.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Cross Tip Screwdriver
1/2 in. Combination Wrench

SUPPLIES: Binding Post Box
Binding Posts



- a. Remove cover mounting screws. Remove cover.
- b. Remove plate mounting screws to gain access to back of plate.
- c. Tag wires for identification.
- d. Remove nuts and wires from binding posts.
- e. If required, remove box mounting screws and replace box.
- f. Replace any defective binding posts. Secure wires to new posts and remove tags.
- g. Reinstall box assembly and plate and secure plate with screws.
- h. Secure cover with screws.

1-16.9 Replace Exhaust Fan.

MOS: 83FJ6, Reproduction Equipment Repairer

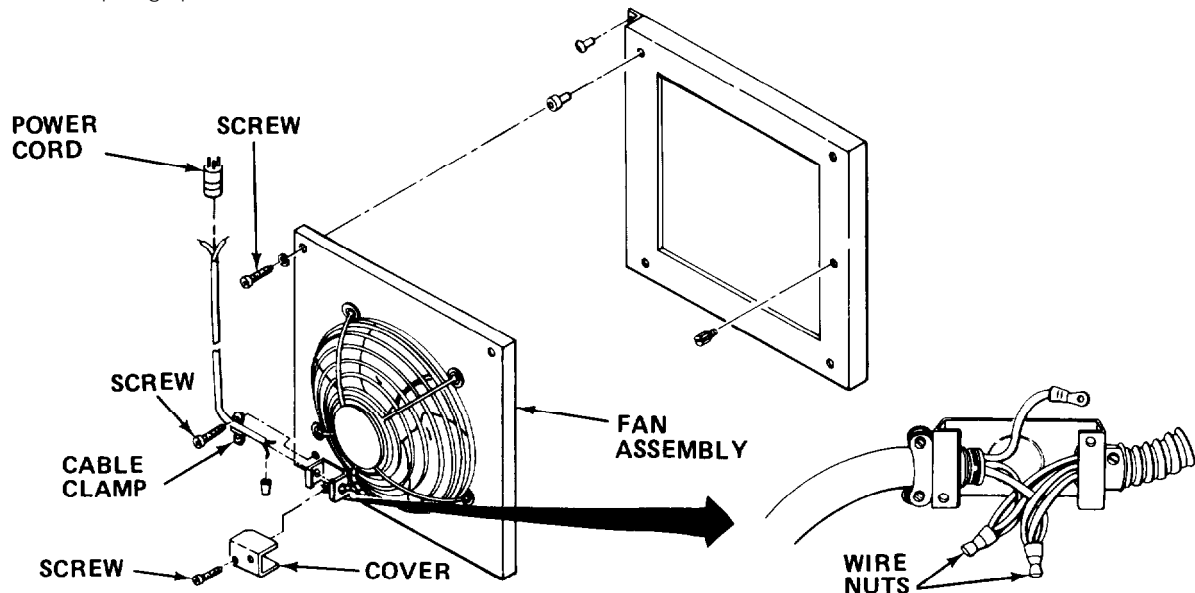
TOOLS: Flat Tip Screwdriver
Cross Tip Screwdriver
Wire Cutters

SUPPLIES: Fan Assembly
Wire Nuts
Power Cord

WARNING

Death or serious injury may occur if power is left on. Turn fan switch OFF and unplug power cord before working on ventilation fan.

- a. Unplug power cord.



- b. Remove screws and place fan assembly on work surface.
c. Loosen screws on cable clamp.
d. Remove screws and cover.
e. Tag wires and cut wire nuts from wires.
f. Remove power cord from defective fan assembly.
g. Install new fan.
h. Install new power cord.

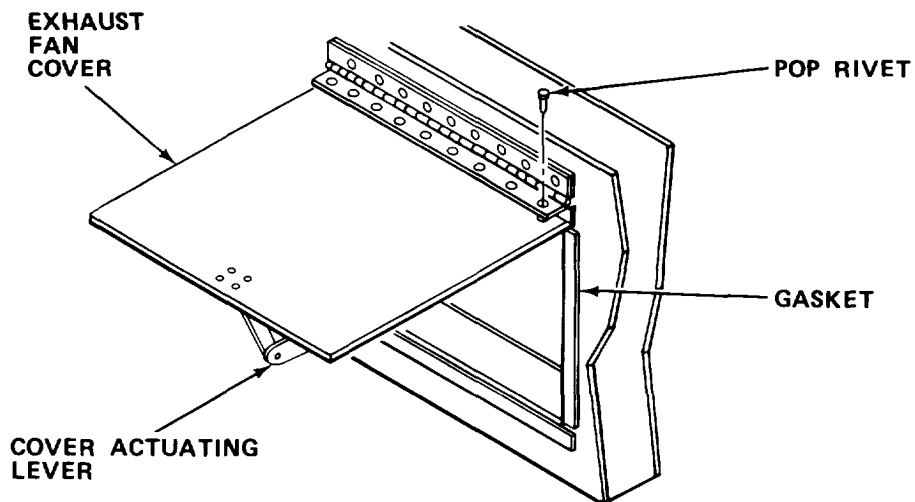
- i. Connect wires with wire nuts and remove tags.
- j. Tighten cable clamp screws.
- k. Reinstall cover. Secure with screws.
- l. Reinstall fan assembly. Secure with screws.
- m. Plug in power cord.

1-16.10 Replace Exhaust Fan Cover.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Drill and Bits
Pop Rivet Gun
Scraper

SUPPLIES: Pop Rivets
Ventilation Fan Cover
Gasket
Solvent P-D-680 (Item 18, Appendix E)
Adhesive (Item 1, Appendix E)
Cheesecloth (Item 5, Appendix E)
Impermeable Gloves
Goggles



- a. Drill pop rivets from hinged cover to remove vent cover.
- b. Remove defective vent cover and transfer mounted hardware to new cover.

WARNING

Dry cleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Wear solvent-impermeable gloves and eye/face protective equipment when using solvent. Do not use near open flame or excessive heat. Flash point of solvent is 100°F to 138°F (38°C to 59°C).

- c. Scrape gasket off section and clean area with solvent P-D-680.
- d. Secure new gasket to section with adhesive.
- e. Align ventilation fan vent cover and pop rivet to hinge.
- f. Test cover for tightness of closure.

1-16.11 Replace Emergency Light Assembly.

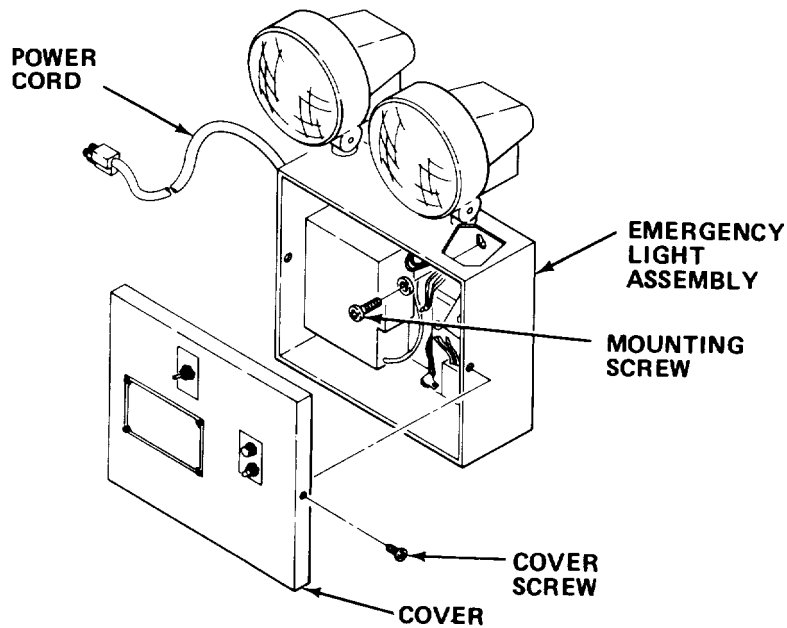
MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Cross Tip Screwdriver
Flat Tip Screwdriver

SUPPLIES: Emergency Light Assembly

WARNING

Death or serious injury may occur if power cord is not unplugged before servicing light.



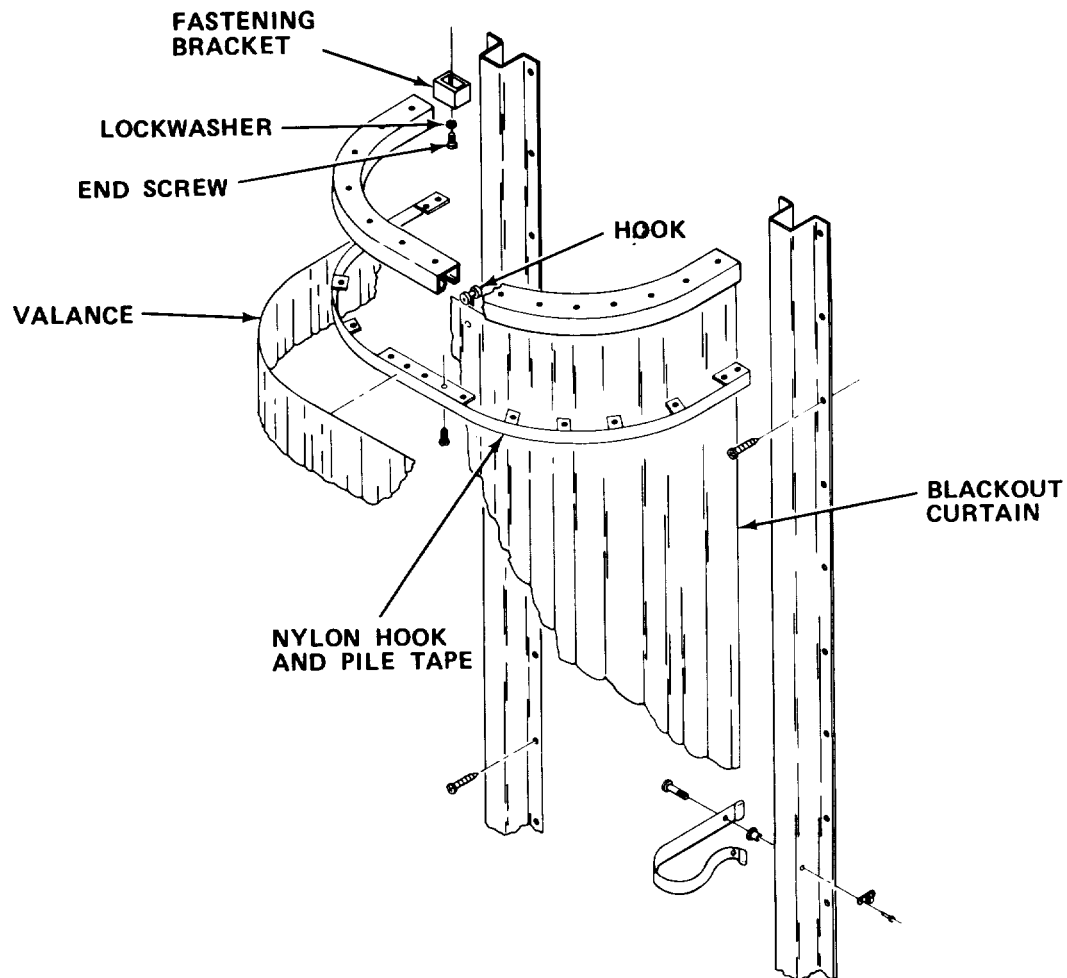
- a. Unplug power cord.
- b. Remove cover screws. Move cover out of way.
- c. Remove mounting screws.
- d. Remove emergency light assembly.
- e. Install new emergency light assembly. Secure with screws.
- f. Secure cover with screws.
- g. Plug in power cord.

1-16.12 Repair Blackout Curtain.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Cross Tip Screwdriver

SUPPLIES: Hooks
 Valance
 Curtain
 Nylon Hook and Pile Tape
 Adhesive (Item 1, Appendix E)



- a. Remove curtain from hooks.
- b. Pull curtain and valance from nylon hook and pile tape.
- c. Remove end screw, lockwasher, and fastening bracket from ceiling.
- d. Replace damaged hooks.

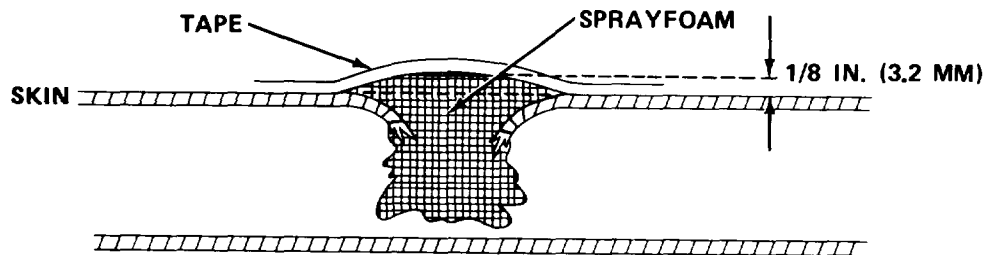
- e. Reinstall fastening bracket with hooks. Fasten with end screw and lockwasher.
- f. Glue loose nylon hook and pile tape to wall or bracket. Replace tape if worn out.
- g. Hook curtain to bracket.
- h. Attach valance.
- i. Check curtain for free movement.

1-16.13 Repair Van Body Skin (Temporary).

MOS: 52C, Utilities Equipment Repairer

TOOLS: Pliers
Ball Peen Hammer
Scissors or Utility Knife

SUPPLIES: Cloth Duct Sealing Tape (Item 21, Appendix E)
Silicone Sealant (Item 16, Appendix E)
Sprayfoam (Item 20, Appendix E)
Cheesecloth, (Item 5, Appendix E)



- a. Bend broken edges of punctured skin inward into puncture hole. Do not attempt to remove fragments of skin by bending or pulling outward. Bend skin inward only enough to put broken edges below surface of unbroken skin.
- b. Remove any loose fragments of foam which are not now held in place by bent broken skin. Removing small pieces of foam or dust is more important than removing chunks.
- c. Using cloth slightly dampened with water, wipe area around puncture to remove any dirt or mud and wipe dry.
- d. Inject sprayfoam into puncture. Mound sprayfoam to about 1/8 in. (3.2 mm) above surface of unbroken skin. Apply bead of sealant about 1/4 in. (6.4 mm) wide over all cuts in skin leading out from puncture. Do not smooth out sealant.

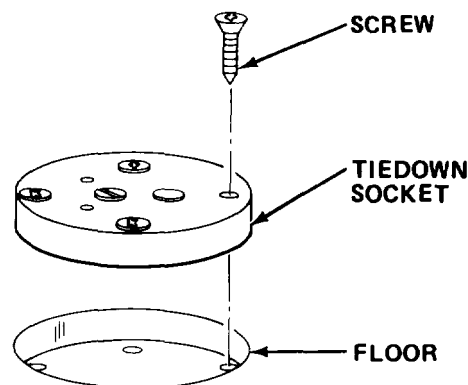
- e. Plan how puncture is to be covered with tape before applying any tape. Length and width of tape, number of tape strips, overlapping, and how tape is applied will affect sealing capability of repair. Each piece of tape should extend about 1-1/2 in. (3.81 cm) beyond sealant it will cover. If this will require more than one strip of tape, tape should overlap about 1/2 in. (12.7 mm). If three or more strips of tape are required, center strip should be applied first.
- f. Holding tape taut, apply it perpendicular to panel skin. Do not apply with rolling motion either end-to-end or center-to-ends. Do not rub each strip in place individually. Apply all strips lightly with proper overlap and rub into place.
- g. If necessary, damaged tape can be replaced; however, it should be removed with careful peeling motion to avoid damage to sealant. If sealant also peels back, new sealant should be applied. Complete removal of old sealant is not necessary. Permanent repair by direct support or higher category of maintenance, should be made as soon as possible.

1-16.14 Replace Tiedown Socket.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Cross Tip Screwdriver
Flat Tip Screwdriver

SUPPLIES: Tiedown Socket



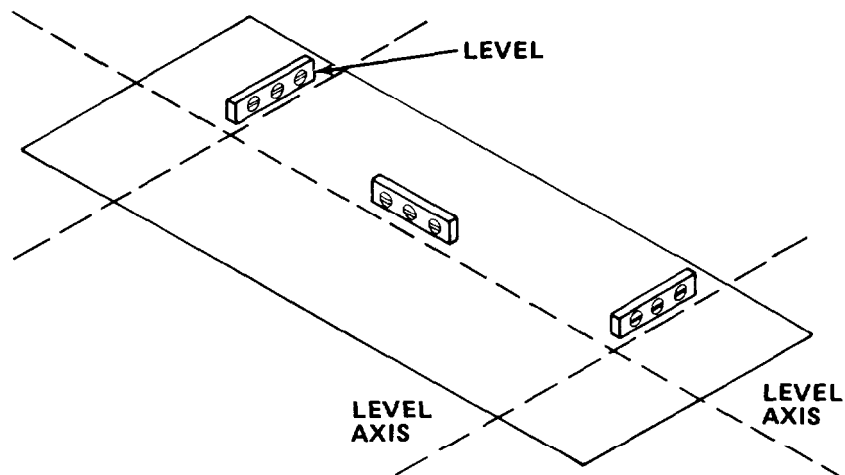
- a. Remove screws from tiedown socket.
- b. Pry defective socket from floor.
- c. Install new tiedown socket. Rotate new tiedown socket enough to avoid installing screws in old screw holes.
- d. Reinstall screws.

1-16.15 Replace Level Indicator.

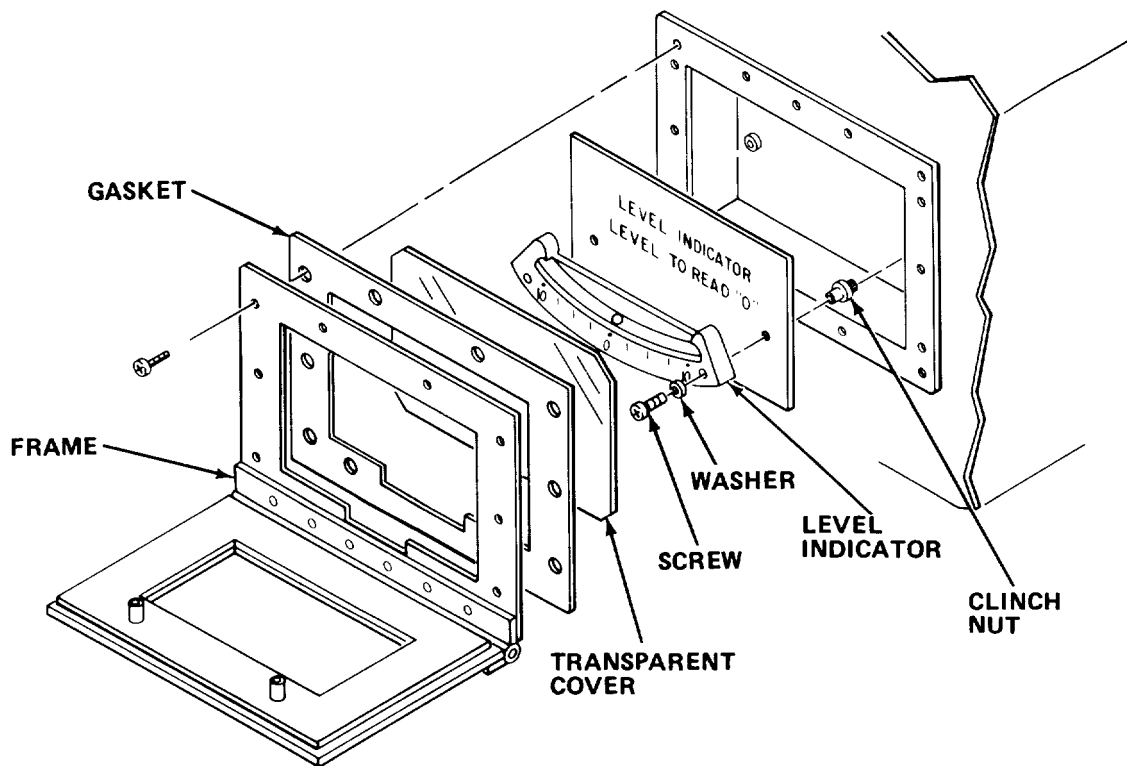
MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Carpenter's Level
Cross Tip Screwdriver
Knife, TL-29

SUPPLIES: Level Indicator
Gasket



- a. Level section using level indicators. Then confirm section is level by using carpenter's level on floor inside section.
- b. Adjust section leveling jacks until section is level as indicated by carpenter's level alignment at front-rear and left-right at each end as shown in illustration.



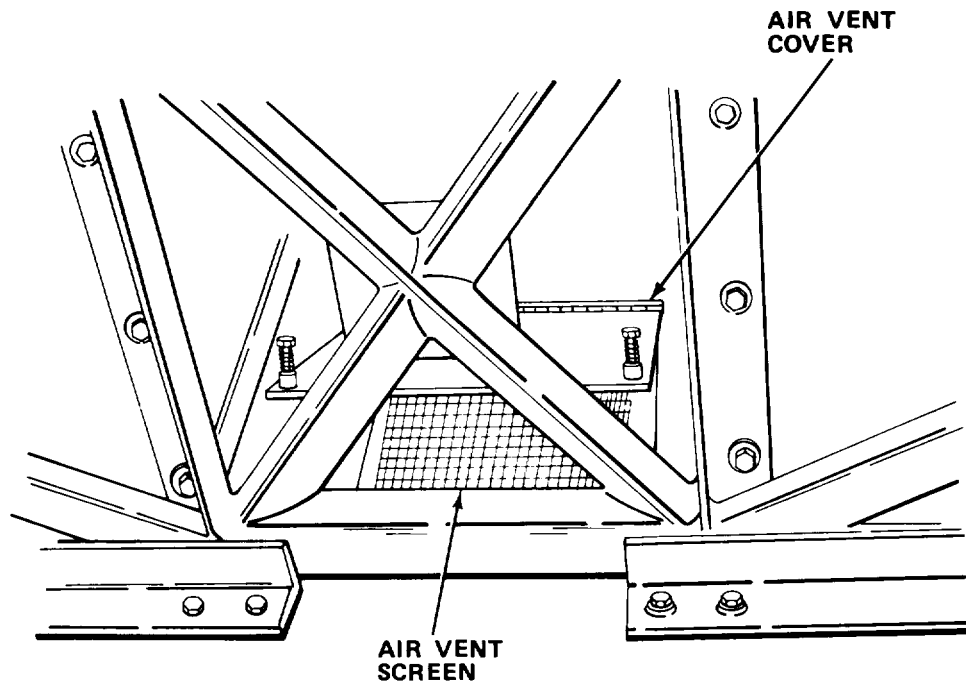
- c. Loosen knurled screws and move cover away from level assembly.
- d. Remove screws and washers to release frame and gasket.
- e. Remove transparent cover.
- f. Remove screws and washers to remove level indicator.
- g. Replace level assembly and secure with screws and washers.
- h. Reinstall transparent cover.
- i. Install new gasket.
- j. Reinstall frame and secure with screws and washers.

1-16.16 Replace Air Vent Screen.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Cross Tip Screwdriver
Scissors

SUPPLIES: Rubber Adhesive (Item 1, Appendix E)
Screen, Nylon (Item 15, Appendix E)



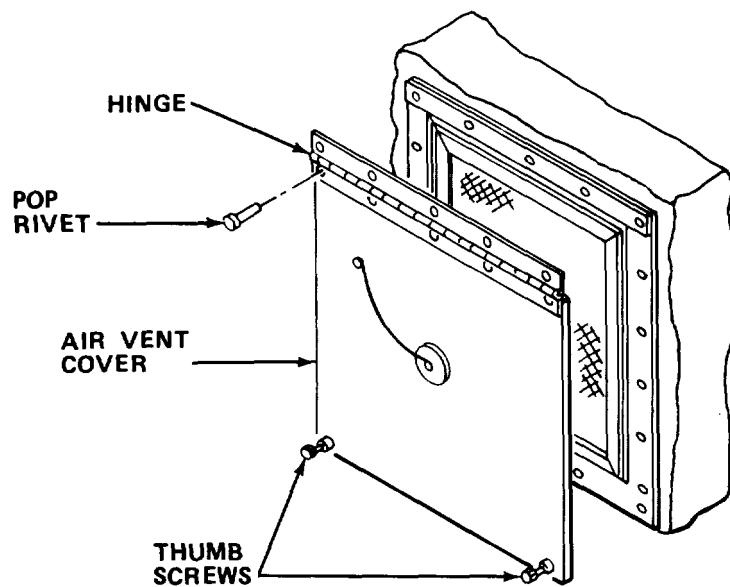
- a. Raise access cover and remove screws holding screen frame to section.
- b. Remove screen and frame.
- c. Clean all old screen material and adhesive from frame.
- d. Cut new screen material to size and attach to frame with adhesive.
- e. Reinstall frame to section and secure with screws. Lower cover.

1-16.17 Replace Air Vent Cover.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Drill and Bits
Pop Rivet Gun

SUPPLIES: Vent Cover
Pop Rivets



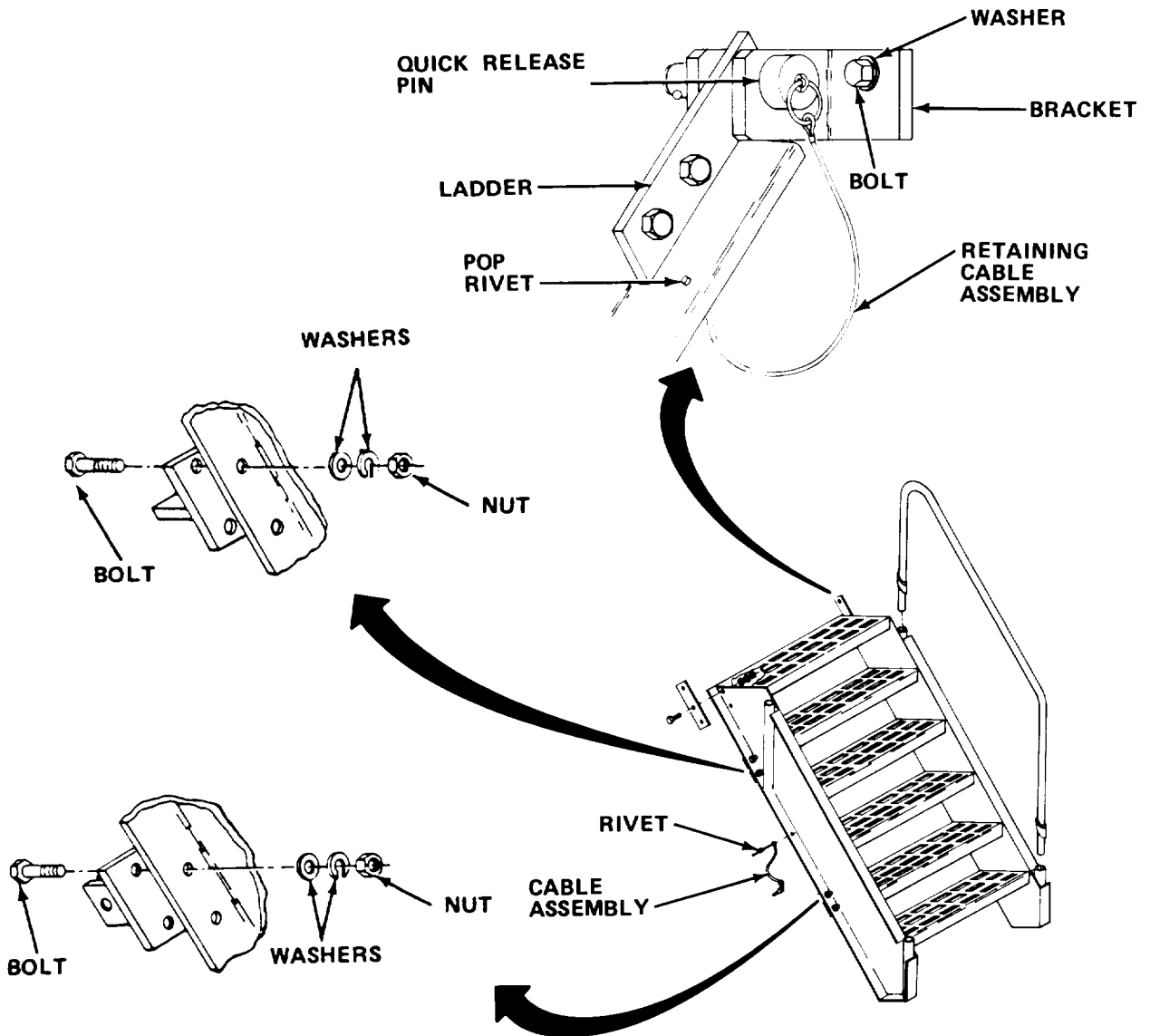
- a. Loosen thumbscrews.
- b. Drill pop rivets from hinge. Remove air vent cover.
- c. Align holes and pop rivet new air vent cover to section.
- d. Tighten thumbscrews.

1-16.18 Repair Personnel Ladder.

MOS: 63W, Wheel Vehicle Repairer

TOOLS: Drill and Bits
Pop Rivet Gun
9/16 in. Combination Wrench
8 in. Adjustable Wrench

SUPPLIES: Cable Assembly
Quick Release Pins
Pop Rivets
Mounting Brackets



a. Remove ladder from mounting bracket.

- b. Remove bolts, washers, and nuts securing damaged mounting brackets to ladder.
- c. Remove damaged cable assembly from ladder by drilling out rivet.
- d. Reinstall or install new mounting brackets. Secure with bolts, washers, and nuts.
- e. Rivet new cable assembly to ladder.

NOTE

Be sure ladder mounting brackets fit section on rear door and under personnel doors.

- f. Reinstall ladder on mounting bracket.

1-17. PREPARATION FOR STORAGE OR SHIPMENT.

a. Section may be stored or shipped either mounted on trailer chassis or unmounted. Preparation of trailer chassis is covered in TM 5-2330-305-14 and should be referred to when trailer-mounted section is prepared for storage and shipment. TM 5-4120-367-14 must be reviewed for instructions covering air conditioner/heater.

b. Remove consumable supplies that have limited shelf life or broken seals. Replace missing items and be sure that all remaining consumable supplies are at authorized levels. Be sure all major components are operational.

c. Remove all unauthorized or personal equipment from section.

d. Move all classified material or sensitive data to proper storage. Complete all accountability and/or transfer of documents.

e. Refer to Preparation for Movement (paragraph 1-6.2) and follow applicable steps and any additional steps directed by proper authority.

Section V DIRECT/GENERAL SUPPORT MAINTENANCE

1-18. REPAIR PARTS; SPECIAL TOOLS; TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT; AND SUPPORT EQUIPMENT

1-18.1 Common Tools and Equipment. For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

1-18.2 Special Tools; Test, Measurement, and Diagnostic Equipment; and Support Equipment. Special Tools, TMDE, and Support Equipment is listed in the applicable repair and special tools list and in Appendix B of this manual.

1-18.3 Repair Parts. Repair parts are listed and illustrated in the Repair Parts and Special Tools List, TM 5-6675-313-24P covering direct/general support maintenance for this equipment.

1-18.4 Electrical System. Direct/general support level of maintenance for the repair of the section's electrical system will consist of electrical wiring repair using standard electrical wiring repair procedures.

1-19. DIRECT/GENERAL SUPPORT TROUBLESHOOTING PROCEDURES.

a. Direct/general support troubleshooting procedures cover the most common malfunctions that may be repaired at the direct/general support level. Repair or adjustment requiring specialized equipment is not authorized unless such equipment is available. Troubleshooting procedures used by *lower* level maintenance should be conducted in addition to the direct/general support troubleshooting procedures.

b. This manual cannot list all the possible malfunctions or every possible test/inspection and corrective action. If a malfunction is not listed or corrected by a listed corrective action, notify your supervisor.

c. For unidentified malfunctions, use the facing schematic or the foldout located at the end of this manual for further fault analysis.

Table 1-5. DIRECT/GENERAL SUPPORT TROUBLESHOOTING

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
1. PERSONNEL/CARGO DOORS DO NOT CLOSE COMPLETELY.	<p>step 1. Check that latch rollers rotate freely.</p> <p>Replace latches (paragraph 1-20.2).</p> <p>Step 2. Check to see if latch rods are bent.</p> <p>Replace latch rods (paragraph 1-20.2).</p> <p>Step 3. Check to see if door gasket is torn or broken.</p> <p>Replace door gasket (paragraph 1-20.3)</p>	
2. PERSONNEL/CARGO DOORS DO NOT LATCH PROPERLY.	<p>Check door latch for missing or damaged components.</p> <p>Replace door latch (paragraph 1-20.2)</p>	
3. AIR OR WATER ENTERS SECTION AROUND DOOR.	<p>Check to see if door gasket if worn or broken.</p> <p>Replace door gasket (paragraph 1-20.3)</p>	
4. RECEPTACLES DO NOT OPERATE BUT CIRCUIT BREAKERS ARE ON.		

WARNING

Turn off main circuit breaker before inspecting or servicing circuit breakers or receptacles. Failure to do so may result in death or serious injury.

- Step 1. Check to see if power cable is firmly connected to power entry panel.
- Connect power cable.

Table 1-5. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

4. RECEPTACLES DO NOT OPERATE BUT CIRCUIT BREAKERS ARE ON - Cont

Step 2. Check to see if voltage meter and frequency scale and INCORRECT PHASE or CORRECT PHASE lamp indicate necessary power.

Notify your supervisor for service of power supply at source.

5. CIRCUIT BREAKERS TRIP CONTINUALLY.

WARNING

Turn off and padlock safety switch before inspecting or servicing circuit breakers or receptacles. Failure to do so may result in death or serious injury.

Step 1. Check to see if receptacles are overloaded.

Reconnect equipment to different receptacles.

Step 2. Check to see if receptacles are damaged.

Replace receptacles (paragraph 1-16.6)

1-20. MAINTENANCE PROCEDURES.

a. This section contains instructions covering direct/general support maintenance functions for the Operations Section. Personnel required are listed only if the task requires more than one.

b. After completing each maintenance procedure, perform operational check to be sure that equipment is properly functioning.

INDEX

PROCEDURE	PARAGRAPH
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Replace Cargo Door Latch Assembly	1-20. 2
Replace Personnel /Cargo Door Gasket	1-20. 3
Replace Personnel /Cargo Door	1-20. 4
Replace Circuit Breaker.	1-20. 5
Repair Floor Covering	1-20. 6
Repair Van Body Skin (Permanent)	1-20. 7
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Replace Air Conditioner Support Bracket	1-20. 9
Replace Ventilation Duct	1-20. 10

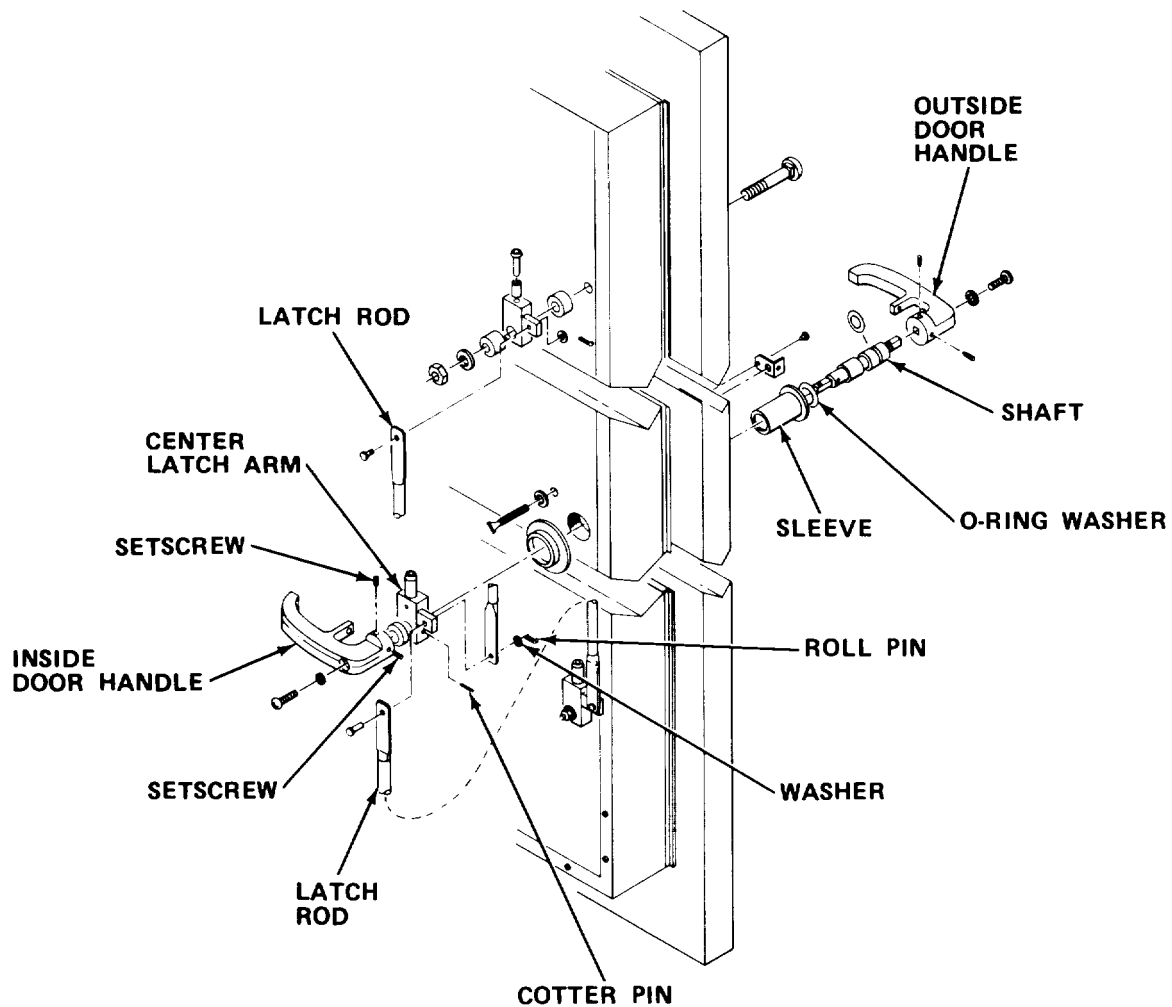
TM 5-6675-313-14

1-20.1 Repair Personnel Door Handle.

MOS: 63W, Wheel Vehicle Repairer

TOOLS: Cross Tip Screwdriver
Needle Nose Pliers
15/16 in. Combination Wrench
Hammer
Center Punch
1/8 in. Hex Head Key Wrench

SUPPLIES: O-Ring Washer
Sleeve
Roll Pin
Personnel Door Handle
Cheesecloth (Item 5, Appendix E)
Oil, Lubricating, General Purpose (Item 10, Appendix E)
Hand Oiler
Cotter Pin



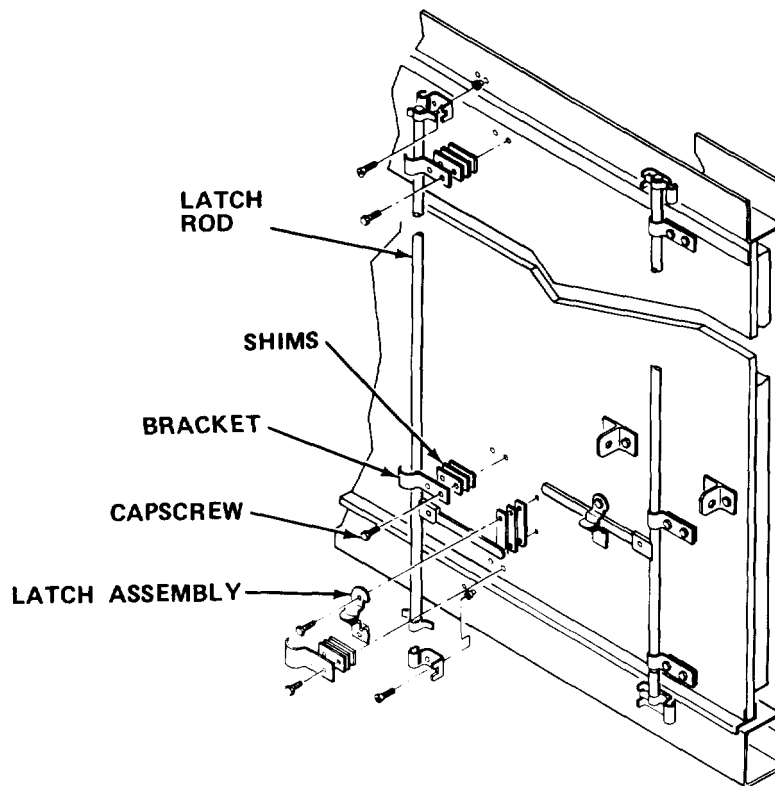
- a. Loosen screw and socket head setscrews. Remove defective inside door handle.
- b. Remove cotter pin and pins from center latch arm assembly.
- c. Move latch rods out of way.
- d. Punch roll pin from center latch arm assembly and pull latch arm assembly from shaft.
- e. Withdraw latch and defective outside door handle.
- f. Inspect all components for wear.
- g. Replace worn O-ring washer and sleeve.
- h. Replace other worn components as needed.
- i. Reinstall shaft and new outside door handle.
- j. Align center latch arm assembly on shaft. Secure with new roll pin.
- k. Align latch rods. Attach to latch arms with pins, washers, and new cotter pins.
- l. Reinstall new inside door handle.
- m. Lightly oil all moving parts. Wipe up surplus oil.

1-20.2 Replace Cargo Door Latch Assembly.

MOS: 63W, Wheel Vehicle Repairer

TOOLS: 9/16 in. Combination Wrench

SUPPLIES: Cargo Door Latch Assembly



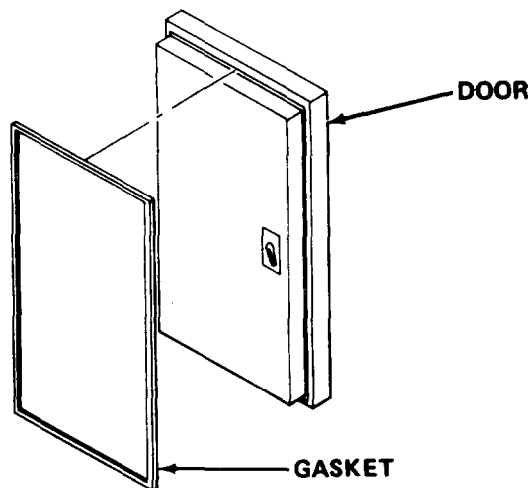
- a. Unlock latch.
- b. Remove capscrews and washers from brackets. Remove brackets and shims.
- c. Remove defective latch assembly and latch rod.
- d. Install new latch assembly and latch rod.
- e. Reinstall shims, brackets, washers, and capscrews.
- f. Check movement of latch rod and latch assembly. Lock latch.

1-20.3 Replace Personnel /Cargo Door Gasket.

Mos: 63W, Wheel Vehicle Repairer

TOOLS: Knife

SUPPLIES: Vinyl Gasket
 Adhesive (Item 1, Appendix E)
 Solvent P-D-680 (Item 18, Appendix E)
 Impermeable Gloves
 Goggles



- a. Open door completely and secure in open position.

WARNING

Dry cleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Wear solvent-impermeable gloves and eye/face protective equipment when using solvent. Do not use near open flame or excessive heat. Flash point of solvent is 100°F to 138°F (38°C to 59°C).

- b. Remove defective gasket by prying gasket from door. Scrape traces of gasket and adhesive from door. Wash with solvent P-D-680.
- c. Coat gasket area on door with adhesive.
- d. Firmly press new gasket onto door.
- e. Wipe excess adhesive from gasket.
- f. Close door and wipe excess adhesive from door and frame.
- g. Allow adhesive to dry before using door.

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1-20.4 Replace Personnel /Cargo Doors.

MOS: 63W, Wheel Vehicle Repairer

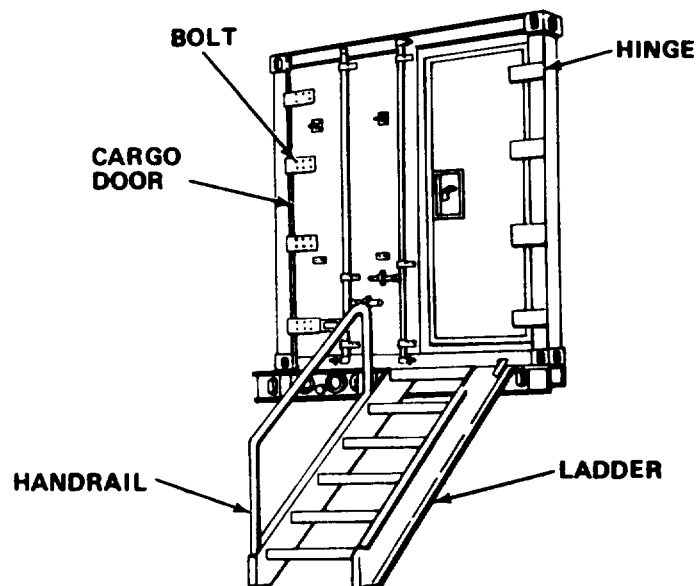
PERSONNEL: Two persons are required to perform this procedure.

TOOLS: Pop Rivet Gun
Electric Drill and Bits
Hoist
3/4 in. Combination Wrench
Paint Brush

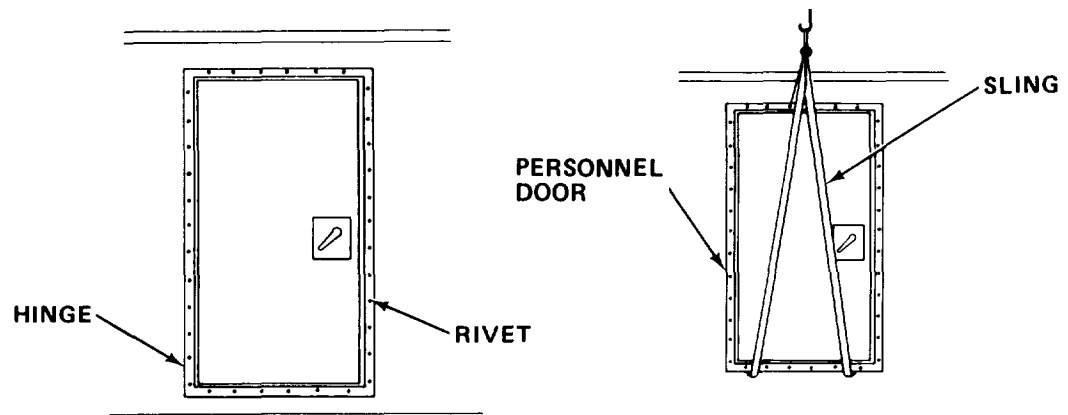
SUPPLIES: Personnel /Cargo Door
Pop Rivets
Vinyl Gasket
Paint (Items 11, 11A and 11B, Appendix E)
Adhesive (Item 1, Appendix E)
Cheesecloth (Item 5, Appendix E)

WARNING

To prevent personal injury or equipment damage, do not attempt to remove doors unless suitable lifting equipment and hoist are available.



- a. Remove handrails and ladders if rear cargo door is to be replaced.
- b. Unlock and open door to be replaced.



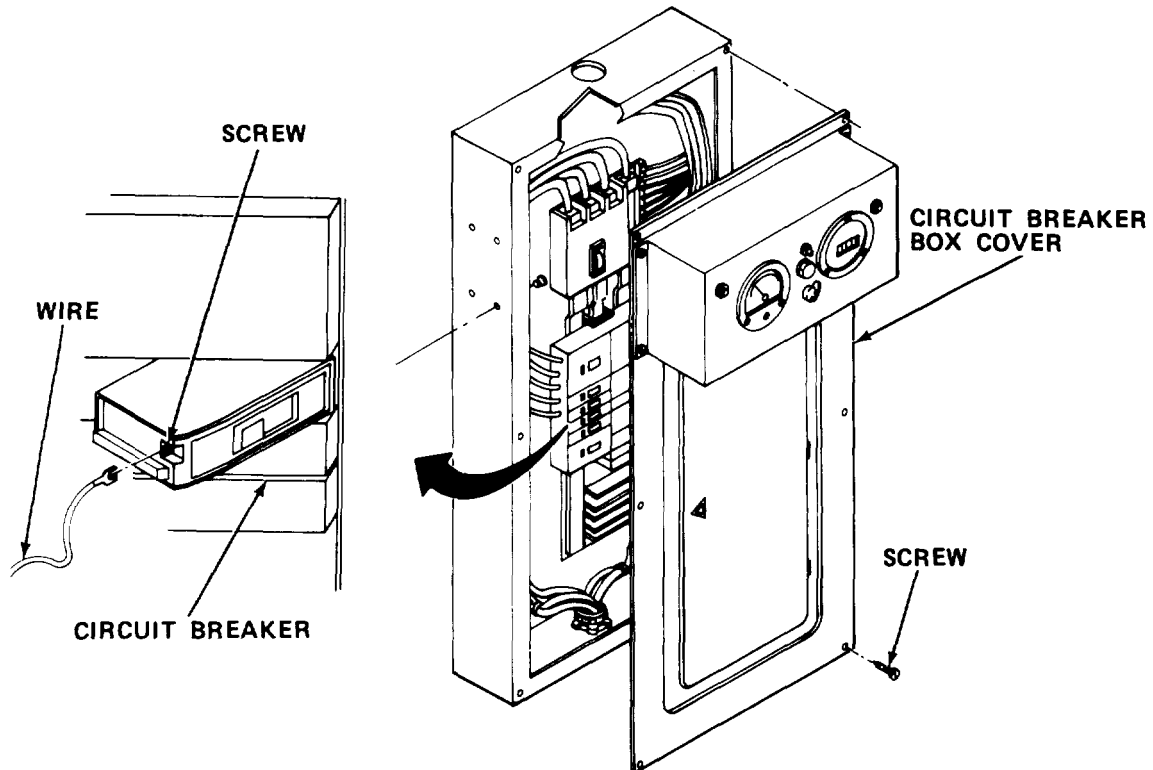
- c. Place sling around door and put a slight strain on hoist to remove weight from hinges.
- d. Remove bolts from hinges on rear personnel door. On side personnel door, drill out pop rivets from hinge. Remove hinges from door.
- e. Remove damaged door using hoist.
- f. Install new door using hoist.
- g. Reinstall hinges on rear personnel door. Secure with bolts. Reinstall hinges on side personnel door. Secure with pop rivets.
- h. Remove sling from door.
- i. Install new gaskets on door after it is mounted (paragraph 1-20.3).
- j. Repaint as needed.
- k. Close and lock door.

1-20.5 Replace Circuit Breaker.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Flat Tip Screwdriver
Multimeter

SUPPLIES: Circuit Breaker



WARNING

Turn off and padlock safety switch. Turn off individual circuit breakers before inspecting or servicing circuit breakers. Failure to do so may result in death or serious injury.

- a. Turn off and padlock safety switch. Turn off individual circuit breakers.
- b. Remove circuit breaker box cover.
- c. Use multimeter to make sure voltage is not present.
- d. Remove defective circuit breaker by pushing and snapping out of place.

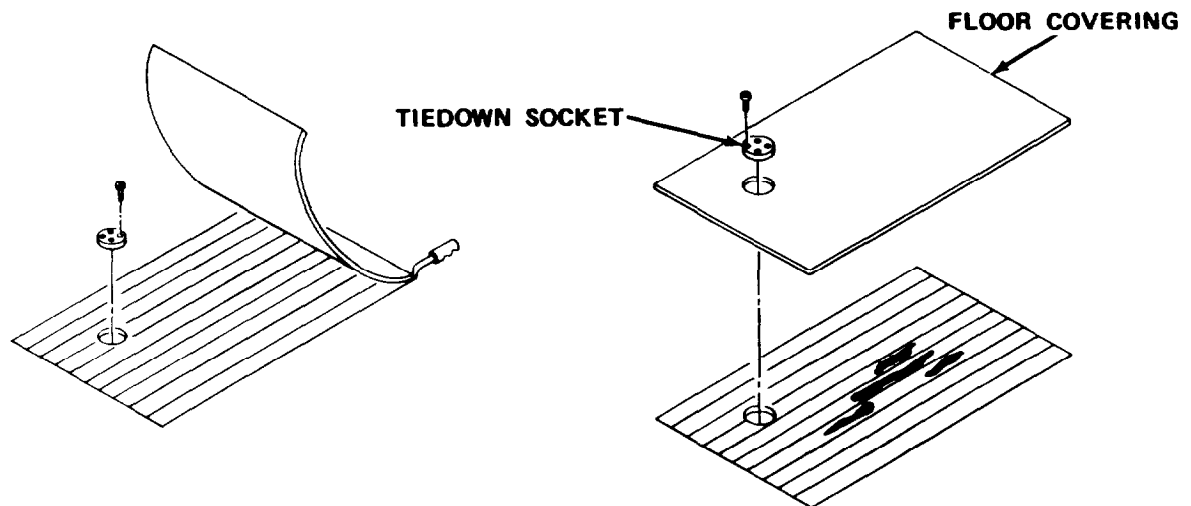
- e. Tag and remove wires from defective circuit breaker.
- f. Pull circuit breaker from panel.
- g. Reconnect wires to new circuit breaker. Secure wires with screws.
- h. Install new circuit breaker by pushing and snapping into place.
- i. Reinstall circuit breaker box cover.
- j. Remove padlock and turn on safety switch and individual circuit breakers.

1-20.6 Repair Floor Covering.

Mos: 52C, Utilities Equipment Repairer

TOOLS: Utility Knife
 Cross Tip Screwdriver
 Scraper
 Straightedge

SUPPLIES: Vinyl Floor Covering
 Epoxy Resin (Item 14, Appendix E)
 Floor Patch (Item 8, Appendix E)
 Cheesecloth (Item 5, Appendix E)
 Adhesive (Item 1, Appendix E)



- a. Cut a rectangular area from damaged floor covering.
- b. Remove tiedown socket. Remove damaged floor covering.
- c. Cut new floor covering to fit. Apply adhesive to floor. Press down new floor covering.
- d. Reinstall tiedown socket.

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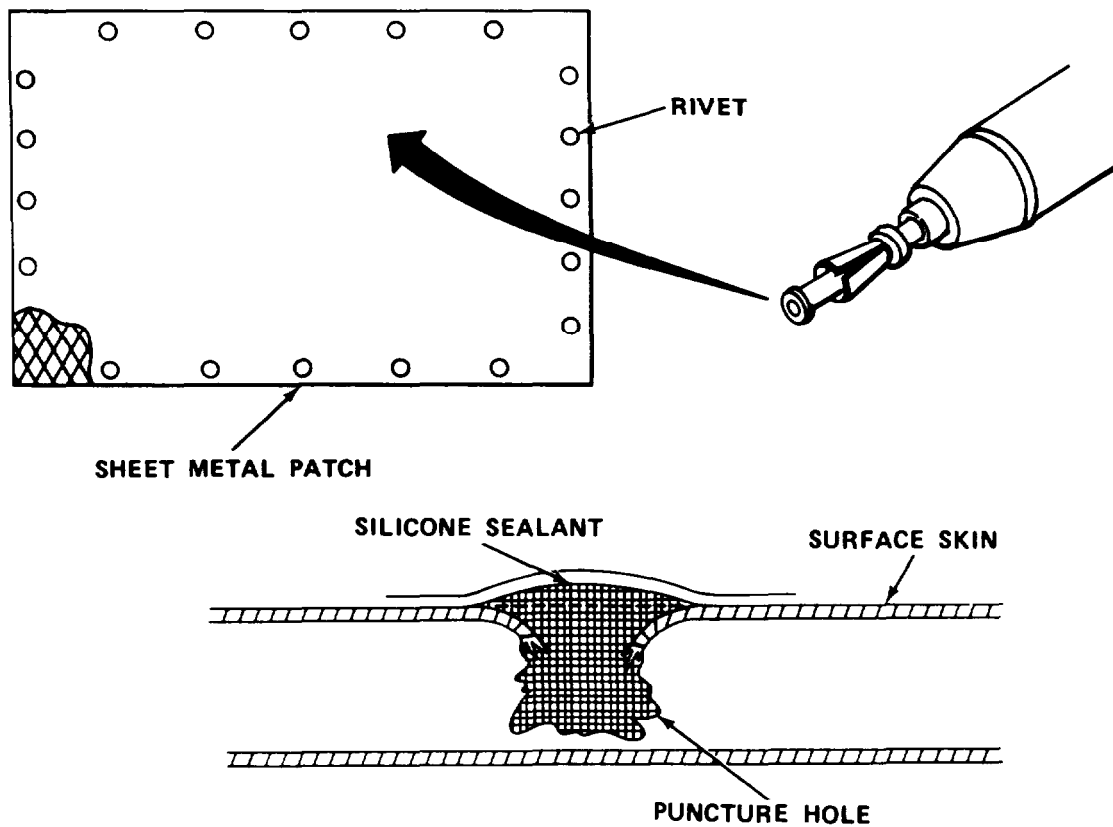
1-20.7 Repair Van Body Skin (Permanent).

MOS: 63W, Wheel Vehicle Repairer

TOOLS: Pop Rivet Gun
Electric Drill and Bits
Paint Brush

SUPPLIES: Pop Rivets
Sprayfoam (Item 20, Appendix E)
Silicone Sealant (Item 16, Appendix E)
Sheet Metal
Paint (Items 11, 11A and 11 B, Appendix E)
Cheesecloth (Item 5, Appendix E)

- Bend broken edges of skin inward into puncture hole. Do not attempt to remove fragments of skin by bending or pulling out.
- Remove any loose fragments of foam.
- Use cloth dampened with water to clean area around puncture. Wipe dry.
- Inject sprayfoam into puncture. Fill to 1/8 in. (3.2 mm) above surface of unbroken skin. Apply sealant to cracks leading to puncture.



- e. Prepare sheet metal patch large enough to cover damaged area with overlap.
- f. Place patch over damaged area and mark all around edges of patch.
- g. Drill holes 1 in. (25.4 mm) apart.
- h. Apply sealant to edges of patch.
- i. Apply patch to van body.
- j. Install pop rivets beginning at center of each side. Rivets should be placed 1 in. (25.4 mm) apart.
- k. Paint as needed.

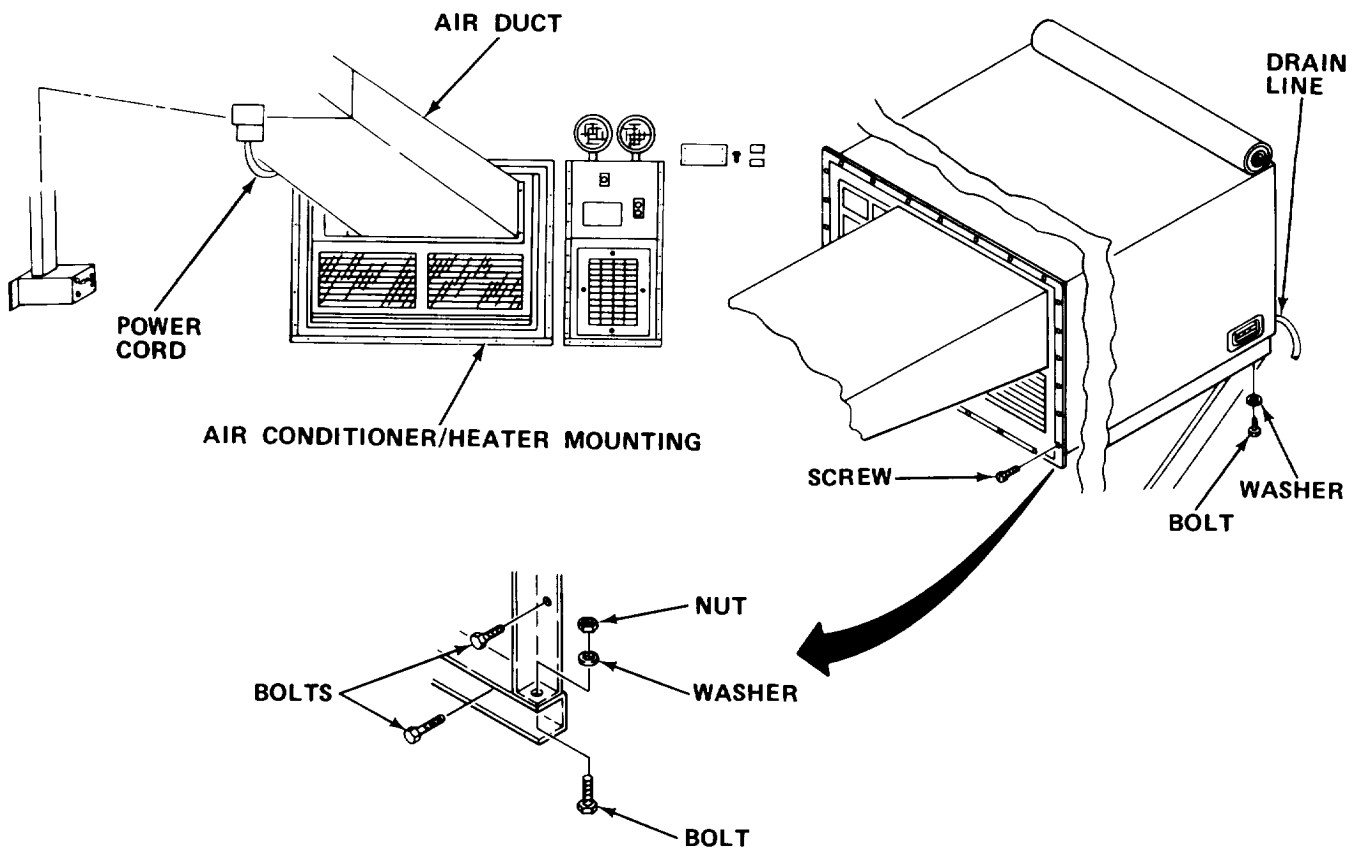
1-20.8 Replace Air Conditioner/Heater.

MOS: 63W, Wheel Vehicle Repairer

PERSONNEL: Two persons are required to perform this procedure.

TOOLS: Cross Tip Screwdriver
Lifting Equipment
8 in. Adjustable Wrench
7/16 in. Combination Wrench

SUPPLIES: Air Conditioner/Heater
Solvent P-D-680 (Item 18, Appendix E)
Gasket
Sealant (Item 16, Appendix E)
Adhesive (Item 1, Appendix E)



WARNING

- Use hoist or proper lifting equipment to replace air conditioner/heater. Failure to do so may result in death or serious injury.
- Turn off air conditioner/heater circuit breaker and unplug power cord. Failure to do so may result in death or serious injury.

- a. Turn off air conditioner/heater circuit breaker. Unplug or disconnect power cord as appropriate.
- b. Remove *screws* holding air duct to air conditioner/heater.
- c. Remove nut, washer, and screw from each corner of air conditioner/heater mounting. Remove screws securing mounting to section.
- d. Disconnect drain line from air conditioner/heater.
- e. Attach sling to lifting handles. Raise hoist enough to remove slack from sling.
- f. Remove mounting bolts and washers.
- g. Slide out air conditioner until other lifting handles are free. Attach sling to handles.
- h. Raise defective air conditioner/heater with hoist until unit is free from brackets and section.
- i. Place air conditioner/heater on flat-bed truck or pallet.

WARNING

Dry cleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Wear solvent-impermeable gloves and eye/face protective equipment when using solvent. Do not use near open flame or excessive heat. Flash point of solvent is 100°F to 138°F (38°C to 59°C).

- j. Clean sealant from opening using dry cleaning solvent P-D-680.
- k. Remove damaged gasket and replace with new gasket.
- l. Raise air conditioner/heater until it rests on air conditioner/heater brackets.
- m. Remove two sling hooks as unit is eased into hole until grille touches duct.
- n. Remove remaining sling.
- o. Reinstall washers and mounting bolts.
- p. Reconnect drain lines.
- q. Reinstall screws securing air conditioner/heater mounting to van wall. Reinstall screw, washer, and nut to each corner of mounting.
- r. Reinstall screws securing air duct to air conditioner/heater.
- s. Reconnect or plug in power cord. Turn on air conditioner/heater circuit breaker.

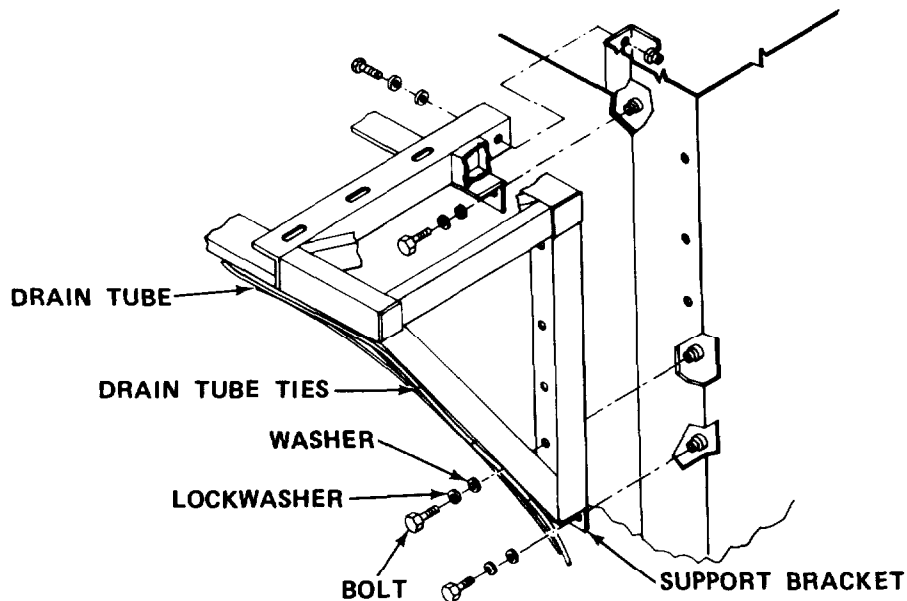
1-20.9 Replace Air Conditioner Support Bracket.

MOS: 63W, Wheel Vehicle Repairer

PERSONNEL: Two persons are required to perform this procedure.

TOOLS: 9/16 in. Combination Wrench
Lifting Equipment
Knife, TL-29

SUPPLIES: Air Conditioner Support Bracket
Drain Tube Ties



WARNING

Serious injury to personnel or damage to equipment may occur unless two or more personnel are used to remove and replace air conditioner/heater because of weight and balance of air conditioner/heater.

- a. Remove air conditioner/heater (paragraph 1-20.8).
- b. Cut drain tube ties and remove drain tube from support bracket.
- c. Remove bolts, lockwashers, and washers securing support bracket.
- d. Remove defective support bracket.
- e. Install new support bracket. Secure to section with bolts, lockwashers, and washers.
- f. Reinstall drain tube on support bracket and secure with new ties.
- g. Reinstall air conditioner/heater (paragraph 1-20.8).

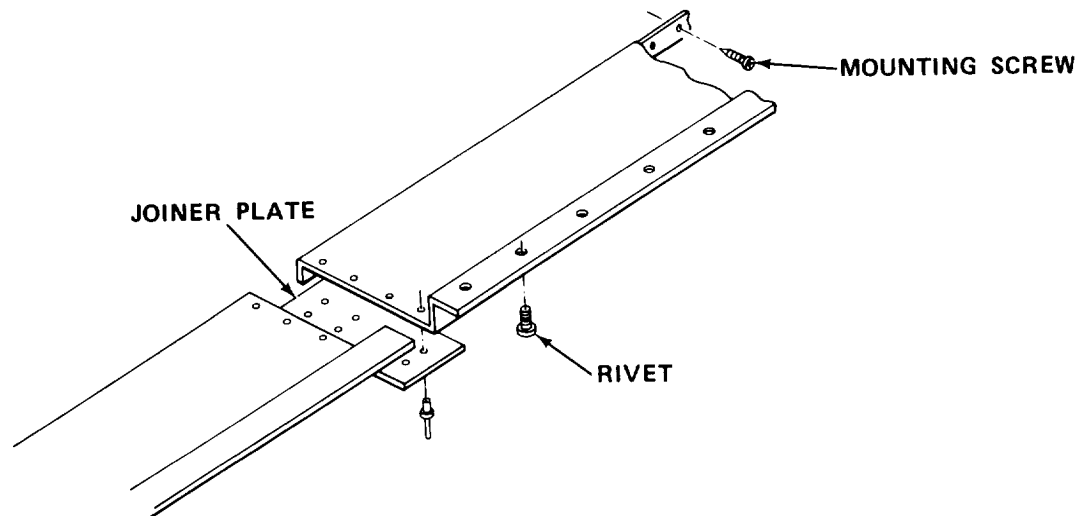
1-20. 10 Replace Ventilation Duct.

MOS: 52C, Utilities Equipment Repairer

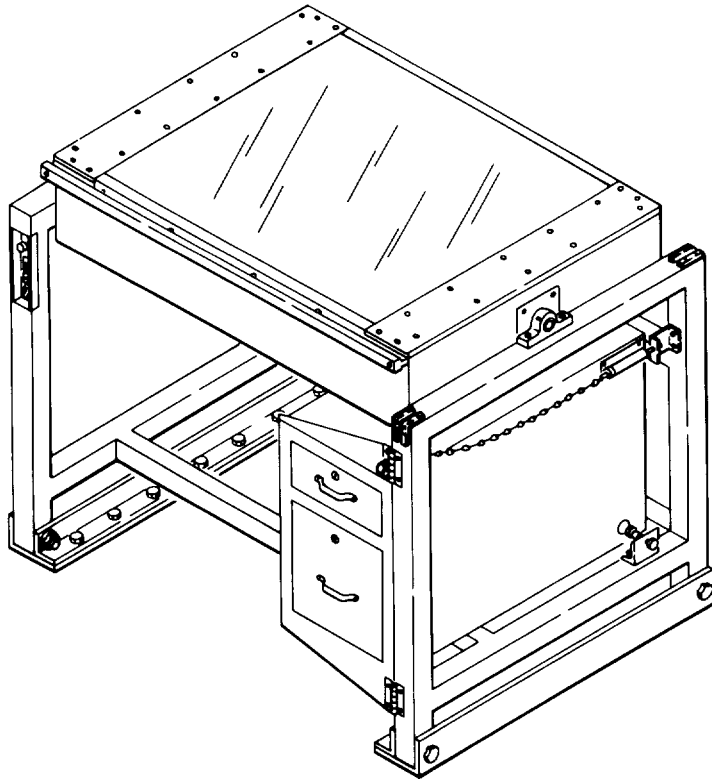
TOOLS: Hacksaw
 Electric Drill and Bits
 Ball Peen Hammer
 Pop Rivet Gun
 Paint Brush
 Cross Tip Screwdriver

SUPPLIES: Sealant (Item 16, Appendix E)
 Wood Block
 Pop Rivets
 Paint (Item 12, Appendix E)
 Cheesecloth (Item 5, Appendix E)
 Salvaged Ventilation Duct

- a. Turn off air conditioner/heater so air will not blow through duct.



- b. Drill rivets from damaged section of duct. Remove joiner plates.
- c. Remove mounting screws to remove damaged sections of duct.
- d. Straighten remaining sections of duct at edges using hammer and wood block.
- e. Place sealant on mounting edges.
- f. Install new duct section cut from salvaged duct. Secure with screws.
- g. Reinstall joiner plates. Install rivets to secure.
- h. Paint as necessary.
- i. Turn on air conditioner/heater.



CHAPTER 2

DRAFTING, SCRIBING/TRACING TABLE

Section I INTRODUCTION

2-1. GENERAL INFORMATION.

2-1.1 Scope.

a. Model Number and Equipment Name. Model 99-9933 Drafting, Scribing/Tracing Table.

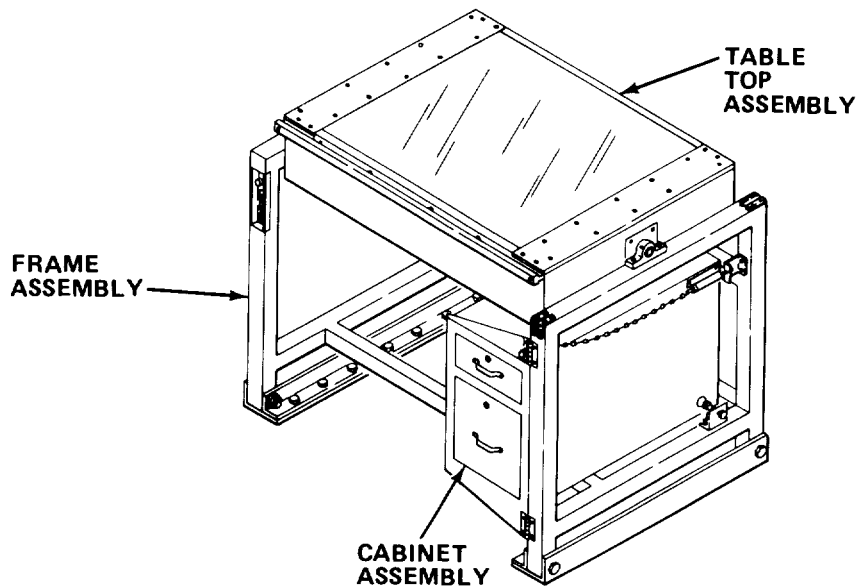
b. Purpose of Equipment. To provide user with drafting, scribing, or tracing table in compact unit.

2-2. EQUIPMENT DESCRIPTION.

2-2.1 Equipment Characteristics, Capabilities, and Features.

- a. Rapid work surface selection.
- b. Auxiliary electrical outlets.
- c. Two drawer storage.
- d. Tilting work surface (0, 5, and 10 degrees).
- e. Easy access to all controls.
- f. Diffused light source.
- g. Drawing guard on front edge of drafting, scribing/tracing table.
- h. Sturdy steel base.

2-2.2 Location and Description of Major Components.



FRAME ASSEMBLY. Supports table top assembly, drawer assembly, control panel, safety stops, and tilt lock.

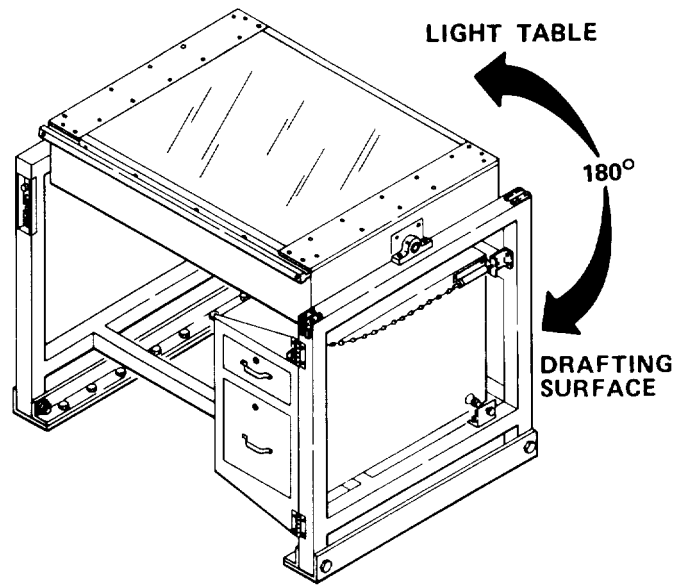
TABLE TOP ASSEMBLY. Consists of drafting board, light board, diffused lighting, and drawing guard.

CABINET ASSEMBLY. Consists of two drawers and drawer lock module.

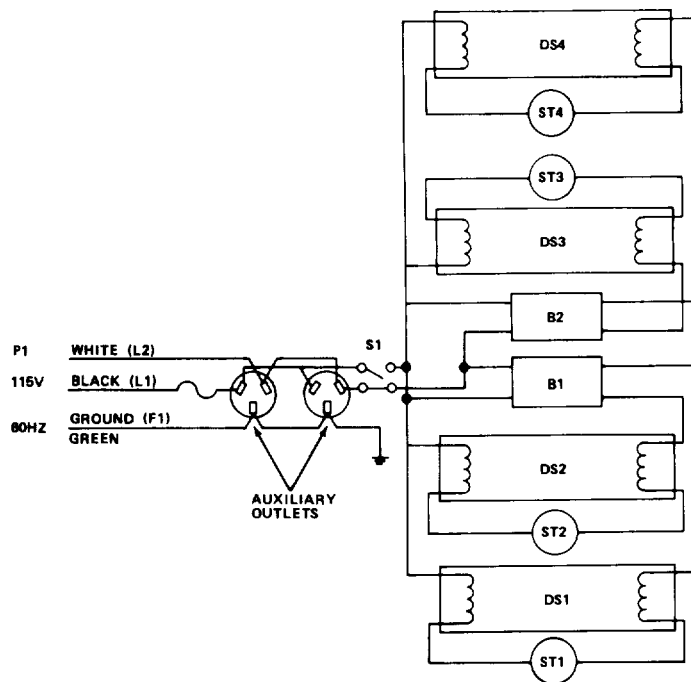
2-2.3 Equipment Data.

Power Requirements	115 V, 60 Hz, single-phase
Drafting Surface	42 in. X 31 in. (106.7 cm X 78.7 cm)
Light Table Surface	30 in. X 30 in. (76.2 cm X 76.2 cm)
Dimensions	
Width	47 in. (119.4 cm)
Depth	34 in. (86.4 cm)
Height (Table Flat)	42 in. (106.7 cm)

2-3. TECHNICAL PRINCIPLES OF OPERATION.



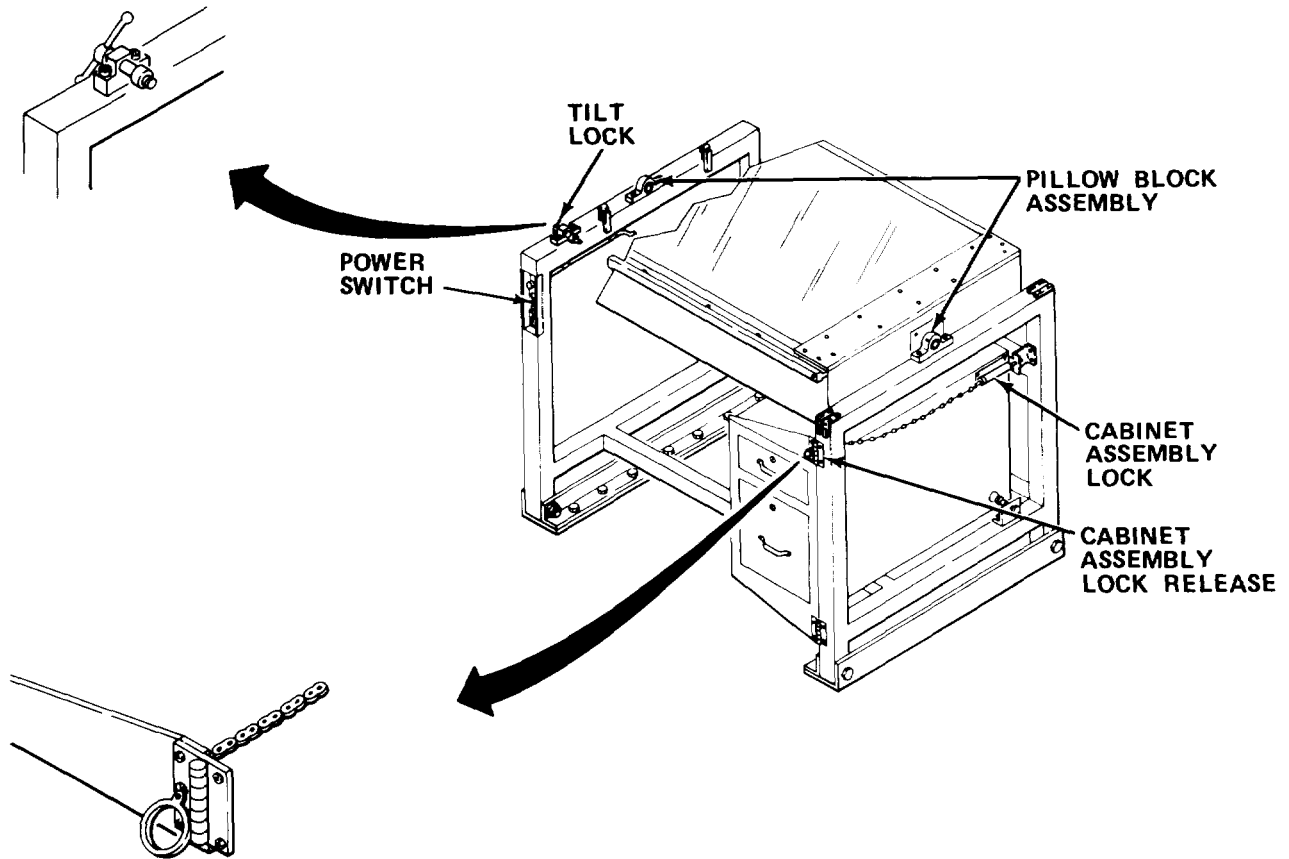
2-3.1 General. The movable top permits selection of drafting surface or light table. Has safety stops so that table top will turn only 180 degrees to prevent damage to electrical wiring. For drafting surface, rotate top away from operator. For light table, rotate top toward operator.



2-3.2 Electrical System. Provides power to the light table and two auxiliary outlets. The auxiliary outlets are located on the control panel. When plug P1 is connected, 120 V ac is applied to auxiliary outlets even if power switch S1 is off

Section II OPERATING INSTRUCTIONS

2-4. DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND INDICATORS.



Control or Indicator	Function
Tilt Lock	Used to change angle of work surface or to change work surface. Loosen tilt lock to change work surface. Tighten to secure in position.
Pillow Block Assembly	Houses the bearing which allows easy rotation of the work surface.

Control or Indicator	Function
Cabinet Assembly Lock and Cabinet Assembly Lock Release	Located at upper cabinet assembly hinge on right front table leg. To open cabinet assembly, pull cabinet assembly lock release and swing assembly out, so it is not under table.
Power Switch	Provides power to light table lamps only.

2-5. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES.

- a. Before You Operate. Always keep in mind the WARNINGS and CAUTIONS. Perform your before (B) PMCS.
- b. While You Operate. Always keep in mind the WARNINGS and CAUTIONS. Perform your during (D) PMCS.
- c. After You Operate. Be sure to perform your after (A) PMCS.
- d. If Your Equipment Fails to Operate. Troubleshoot with proper equipment. Report any deficiencies using the proper forms. See DA Pam 738-750.

2-5.1 PMCS Procedures.

- a. PMCS are designed to keep the equipment in good working condition by performing periodic service tasks.
- b. Service intervals provide you, the operator, with time schedules that determine when to perform specified service tasks.
- c. The "Equipment is Not Ready/Available If" column is used for identification of conditions that make the equipment not ready/available for readiness reporting purposes or denies use of the equipment until corrective maintenance is performed.
- d. If your equipment fails to operate after PMCS is performed, immediately report this condition to your supervisor.
- e. Perform weekly as well as before operation if you are the assigned operator and have not operated the item since the last weekly or if you are operating the item for the first time.

TM 5-6675-313-14

f. Item number column. Item numbers are assigned in chronological ascending sequence regardless of interval designation. These numbers are used for your "TM Number" column on DA Form 2404, Equipment Inspection and Maintenance Worksheet in recording results of PMCS.

Interval columns. This column determines the time period designated to perform your PMCS.

h. Item to be inspected and procedures column. This column lists functional groups and their respective assemblies and subassemblies as shown in the Maintenance Allocation chart (Appendix B). The appropriate check or service procedure follows the specific item to be inspected.

i. Equipment is not ready/available if: column. This column indicates the reason or cause why your equipment is not ready/available to perform its primary mission.

j. List of tools and materials required for PMCS is as follows:

<u>Item</u>	<u>Quantity</u>
Liquid Detergent (Item 7, Appendix E)	ar
Cheesecloth (Item 5, Appendix E)	ar

Table 2-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES

NOTE

If the equipment must be kept in continuous operation, check and service only those items that can be checked and serviced without disturbing operation. Make the complete checks and services when the equipment can be shut down.

B - Before
D - During
A - After

W - Weekly
M - Monthly
Q - Quarterly

AN - Annually
S - Semiannually
BI - Biennially

(Number) - Hundreds of Hours

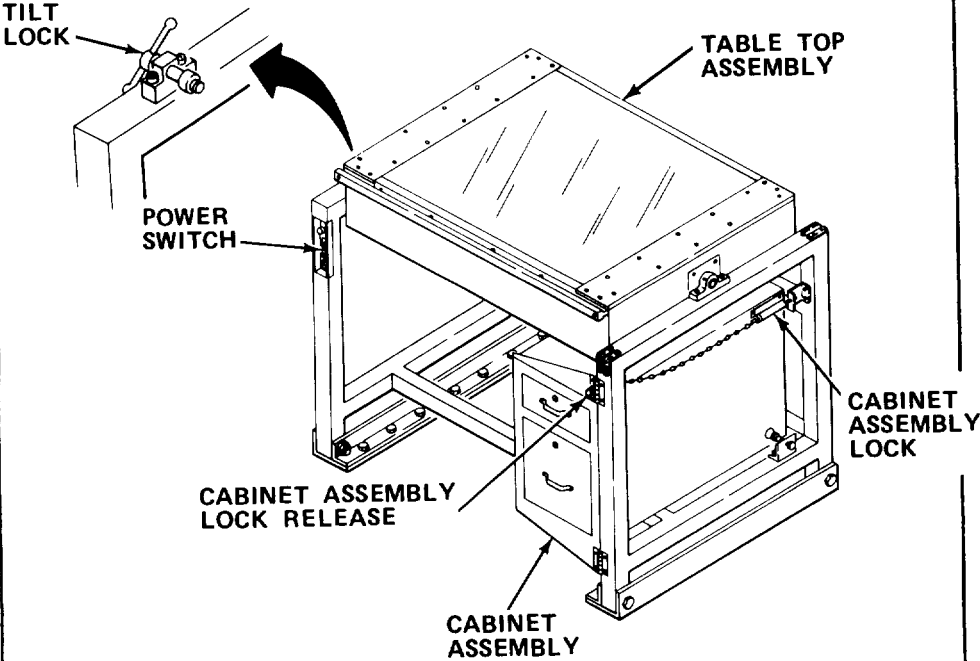
ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
1	B/A	<p><u>DRAFTING, SCRIBING/TRACING TABLE</u></p> <p><u>Inspect.</u></p> <p>1. Glass table surface.</p>  <p>2. Turn power switch OFF.</p>	Glass cracked or broken.

Table 2-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before
D - During
A - After

W - Weekly
M - Monthly
Q - Quarterly

AN - Annually
S - Semiannually
BI - Biennially

(Number) - Hundreds of Hours

ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
1	B/A	<u>DRAFTING, SCRIBING/TRACING TABLE - Cont</u>	
		<u>Inspect - Cont</u>	
		3. Pull cabinet assembly lock release ring and swing out cabinet assembly.	
		4. Loosen tilt lock until it clears table top assembly.	Tilt lock is damaged.
		5. Rotate table top 180°.	Table top does not rotate.
		6. Tighten tilt lock to secure table top assembly in position.	Table top will not lock in position.
		7. Inspect wooden table top.	Table top has gouges, dents, or cuts.
		8. Rotate table top 180° and tighten tilt lock.	
		9. Return cabinet assembly to its normal position under table.	
		10. Press firmly on cabinet assembly front until cabinet assembly lock clicks.	
		11. Turn power switch ON. Be sure all table lights are on. Check surface for cracks or breaks.	Table lights do not illuminate. Glass is broken. Power switch is broken.
		12. Turn power switch OFF.	

Table 2-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before
D - During
A - After

W - Weekly
M - Monthly
Q - Quarterly

AN - Annually
S - Semiannually
BI - Biennially

(Number) - Hundreds of Hours

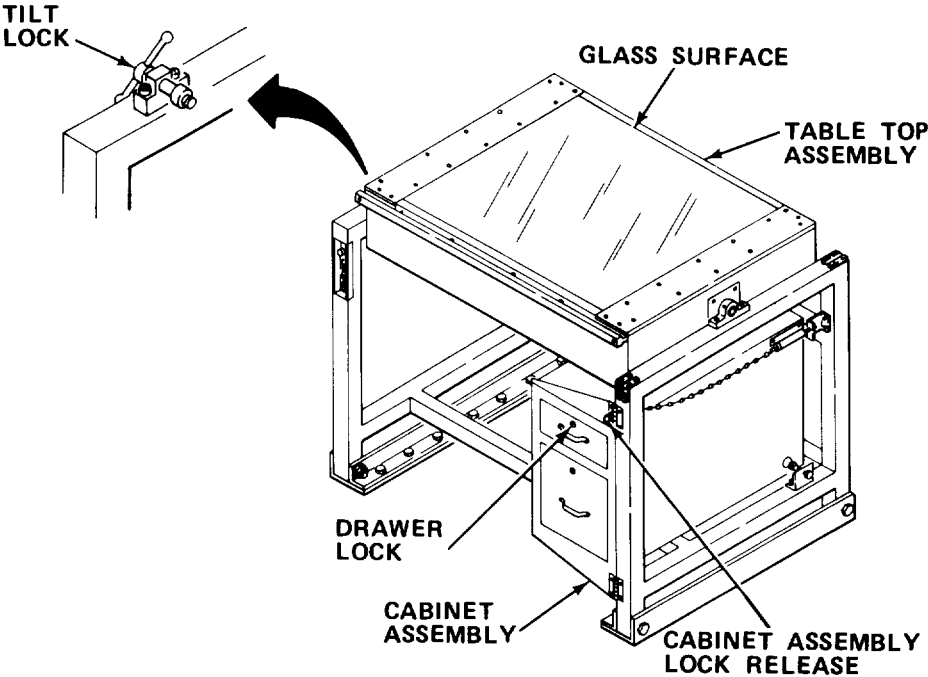
ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
2	B	<p><u>DRAFTING, SCRIBING/TRACING TABLE - Cont</u></p> <p><u>Service.</u></p>  <p style="text-align: center;"><u>WARNING</u></p> <p>Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.</p> <ol style="list-style-type: none"> 1. Unplug power cord. 2. Pull cabinet assembly lock release ring and swing out cabinet assembly. 3. Loosen tilt lock until it clears table top assembly. 	

Table 2-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before W - Weekly AN - Annually (Number) - Hundreds of Hours
 D - During M - Monthly S - Semiannually
 A - After Q - Quarterly BI - Biennially

ITEM NO.	INTER-VAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
2	B	<p><u>DRAFTING, SCRIBING/TRACING TABLE - Cont</u></p> <p><u>Service - Cont</u></p> <p>4. Rotate table top assembly until glass surface is on top.</p> <p>5. Tighten tilt lock to secure table top assembly in position.</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>Do not use abrasive cleaner on glass surface. Do not use running water or excessive water on cloth. Use moist cloth. Abrasive cleaner will scratch glass surface. Excessive water can cause equipment damage.</p> <p>6. Wipe glass surface with cheesecloth moistened in mild solution of detergent and water.</p> <p>7. Wipe glass surface with dry cheesecloth to remove streaks and smears.</p> <p>8. Swing cabinet assembly to its normal position under table.</p> <p>9. Plug in power cord.</p>	<p>Table top does not rotate.</p>

2-6. OPERATION UNDER USUAL CONDITIONS.

2-6.1 Assembly and Preparation for Use.

- a. Clean work surface.
- b. Plug power cord into electrical receptacle.
- c. Turn power switch on for light table use.

2-6.2 Operating Procedures.

- a. Changing Work Surface.

CAUTION

Safety stops have been included to prevent overtravel of table top and damage to electrical wiring. If drafting surface is in top position, swing front edge of table top down to change work surface. If light table is in top position, swing front edge up to change work surface. Table cannot be rotated until cabinet assembly is swung out.

- (1) Pull cabinet assembly lock release ring and swing out cabinet assembly.
- (2) Loosen tilt lock until it clears table top assembly.
- (3) Tighten tilt lock to secure table top assembly in position.
- (4) Return cabinet assembly to its normal position under table top assembly.
- (5) Press firmly on cabinet assembly front until cabinet assembly lock clicks.

2-6.3 Preparation for Movement.

- a. Turn off power.
- b. Unplug power cord. Coil power cord and tape to table.
- c. Rotate table top assembly, if necessary, to be sure glass surface faces upward.
- d. Tighten tilt lock to secure table top assembly.
- e. Press firmly on cabinet assembly front until cabinet assembly lock clicks.
- f. Check cabinet drawers for open containers and loose items. Seal containers and secure all loose items.
- g. Lock cabinet drawers.

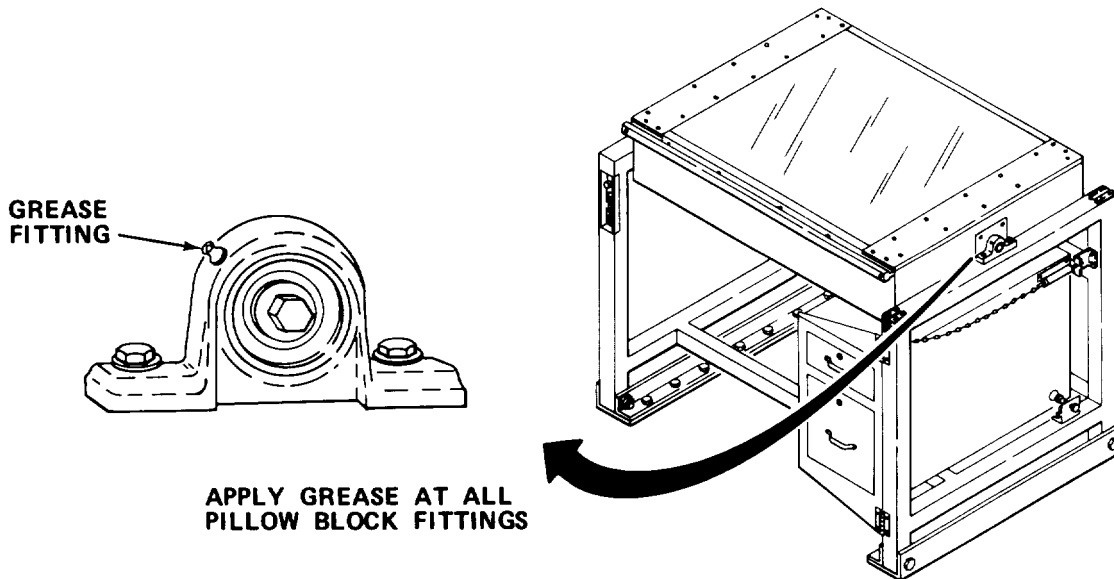
2-7. OPERATION UNDER UNUSUAL CONDITIONS. This equipment is designed for operation only in a controlled environment.

Section III OPERATOR MAINTENANCE

2-8. LUBRICATION INSTRUCTIONS.

NOTE

These lubrication instructions are mandatory.



2-8.1 Pillow Block Fittings. Apply ball and roller bearing grease (Item 9, Appendix E) to both pillow blocks annually.

- a. Apply grease sparingly using grease gun.
- b. Wipe grease fittings clean after application.

2-9. TROUBLESHOOTING PROCEDURES.

a. The table lists the common malfunctions which you may find during operation or maintenance of the drafting, scribing/tracing table, or its components. You should perform the test/inspections and corrective actions in the order listed.

b. This manual cannot list all malfunctions that may occur, nor all test or inspections and corrective actions. If a malfunction is not listed or is not corrected by listed corrective actions, notify your supervisor.

Table 2-2. TROUBLESHOOTING.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
1. LAMPS DO NOT LIGHT.		
	Step 1. Check that power switch is ON.	(a) If power switch is ON, proceed to step 2. (b) Turn on power switch.
	Step 2. Check that power cord is plugged in.	(a) If power cord is plugged in, proceed to step 3. (b) Plug in power cord.
	Step 3. Visually check fuse for broken filament.	(a) Replace fuse (paragraphs 2-10.1) (b) If filament is not broken, refer to organizational maintenance.
2. TABLE DOES NOT LOCK.		
	Check for loose tilt lock.	(a) If loose, tighten. (b) If tight, refer to organizational maintenance.

2-10. MAINTENANCE PROCEDURES.

- a. This section contains instructions covering operator/crew maintenance functions for the drafting, scribing/tracing table. Personnel required are listed only if the task requires more than one.
- b. After completing each maintenance procedure, perform operational check to be sure that equipment is properly functioning.

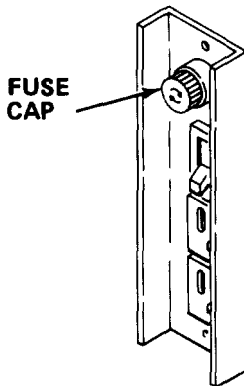
INDEX

PROCEDURE	PARAGRAPH
Replace Fuse	2-10.1

2-10.1 Replace Fuse.

MOS: 81C, Cartographer

SUPPLIES: Fuse



- a. Turn power switch OFF.

WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

- b. Unplug power cord.
- c. Push in on cap and turn left.
- d. Remove defective fuse.
- e. Install new fuse, push in, and turn right.
- f. Plug in power cord.

Section IV ORGANIZATIONAL MAINTENANCE

2-11. LUBRICATION INSTRUCTIONS.

2-11.1 Pillow Block Fittings. After replacement, apply ball and roller bearing grease (Item 9, Appendix E) to pillow blocks.

- a. Apply grease sparingly using grease gun.
- b. Wipe grease fittings clean after application.

2-12. REPAIR PARTS, SPECIAL TOOLS; TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE); AND SUPPORT EQUIPMENT.

2-12.1 Common Tools and Equipment. For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

2-12.2 Special Tools; Test, Measurement, and Diagnostic Equipment; and Support Equipment. Special Tools, TMDE, and Support Equipment is listed in the applicable repair parts and special tools list and in Appendix B of this manual.

2-12.3 Repair Parts. Repair parts are listed and illustrated in the Repair Parts and Special Tools List, TM 5-6675-313-24P covering organizational maintenance for this equipment.

2-13. SERVICE UPON RECEIPT. The drafting, scribing/tracing table may be received mounted in the section or in a shipping crate.

2-13.1 Checking Unpacked Equipment.

- a. Inspect the equipment for damage incurred during shipment. If equipment has been damaged, report the damage on DD Form 6, Packing Improvement Report.
- b. Check the equipment against the packing list to see if the shipment is complete. Report all discrepancies in accordance with the instructions of DA Pam 738-750.
- c. Check to see whether the equipment has been modified.

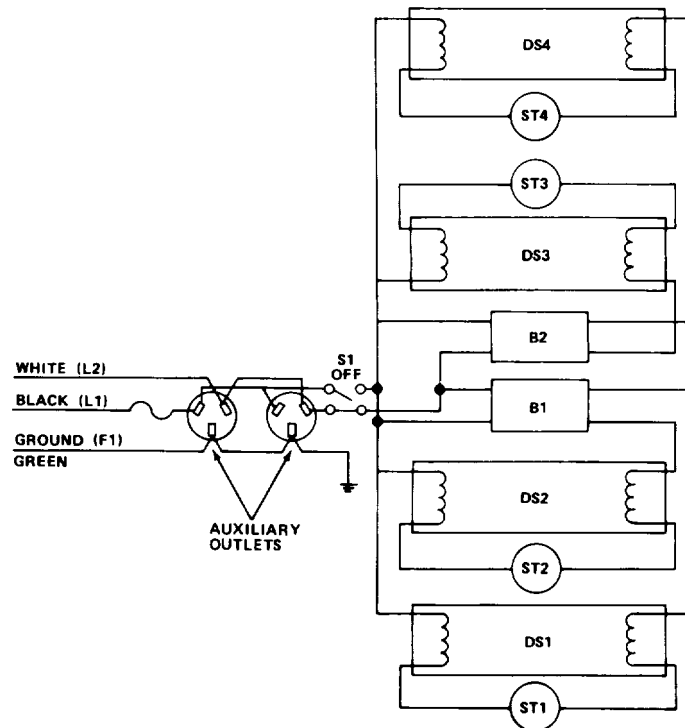
2-14. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES. There are no organizational PMCS procedures assigned for this equipment.

2-15. ORGANIZATIONAL TROUBLESHOOTING PROCEDURES.

a. Organizational troubleshooting procedures cover the most common malfunctions that may be repaired at the organizational level. Repair or adjustment requiring specialized equipment is not authorized unless such equipment is available. Troubleshooting procedures used by the operator should be conducted in addition to the organizational troubleshooting procedures.

b. This manual cannot list all the possible malfunctions or every possible test/inspection and corrective action. If a malfunction is not listed or corrected by a listed corrective action, notify your supervisor.

c. For unidentified malfunctions, use the following schematic or foldout located at the end of this manual for further fault analysis.



d. If the drafting, scribing/tracing table does not power-up when turned on, verify that 120 V ac is present at the receptacle. If voltage is not present, plug equipment into receptacle with power available and proceed with equipment troubleshooting. Perform no-power procedures for dead receptacle (Table 1-4).

Table 2-3. ORGANIZATIONAL TROUBLESHOOTING

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
1. LAMPS DO NOT LIGHT.	Step 1. Check continuity of power switch.	(a) If continuity exists, proceed to step 2. (b) If no continuity exists, replace power switch (paragraph 2-16.1).
	Step 2. Check continuity of power cord.	(a) If no continuity exists, replace power cord (paragraph 2-16.2). (b) If continuity exists, replace tube starter (paragraph 2-16.5). (c) If lamps still do not light, replace ballast (paragraph 2-16.4).
2. POWER RECEPTACLES DO NOT WORK.	Step 1. Check continuity of power cord.	(a) If continuity exists, proceed to step 2. (b) If no continuity exists, replace power cord (paragraph 2-16.2).
	Step 2. Check continuity of receptacle.	Repair receptacle (paragraph 2-16.3).
3. TABLE DOES NOT LOCK.	Step 1. Check for loose tilt lock.	(a) If tight, proceed to step 2. (b) Tighten tilt lock.

Table 2-3. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
<hr/>		
3. TABLE DOES NOT LOCK - Cont		
	Step 2. Check for defective tilt lock.	
		(a) If good, proceed to step 3.
		(b) If defective, replace (paragraph 2-16.6).
	Step 3. Check for loose tilt locking block.	
		(a) If tight, proceed to step 4.
		(b) If loose, tighten.
	Step 4. Check for defective tilt locking block.	
		(a) If good, proceed to step 5.
		(b) If defective, replace (paragraph 2-16.6).
	Step 5. Check for defective tilt lock plate.	
		If defective, replace (paragraph 2-16.6).

2-16. MAINTENANCE PROCEDURES.

a. This section contains instructions covering organizational maintenance functions for the drafting, scribing/tracing table. Personnel required are listed only if the task requires more than one.

b. After completing each maintenance procedure, perform operational check to be sure that equipment is properly functioning.

INDEX

PROCEDURES	PARAGRAPH
Replace Power Switch	2-16.1
Replace Power Cord	2-16.2
Replace Receptacle	2-16.3
Replace Lamp Ballast	2-16.4
Replace Lamp/Starter	2-16.5
Repair Tilt Lock	2-16.6
Replace Pillow Block Assembly	2-16.7
Remove/Install Drafting, Scribing/Tracing Table.	2-16.8

2-16.1 Replace Power Switch.

MOS: 83FJ6, Reproduction Equipment Repairer

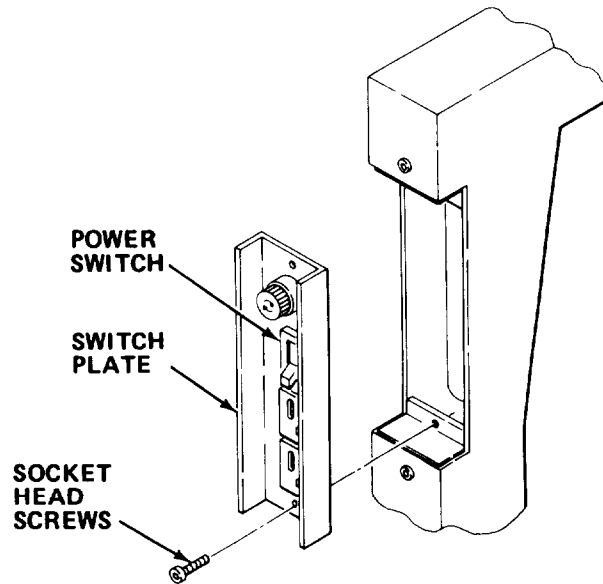
TOOLS: 5/64 in. Hex Head Key Wrench

SUPPLIES: Power Switch

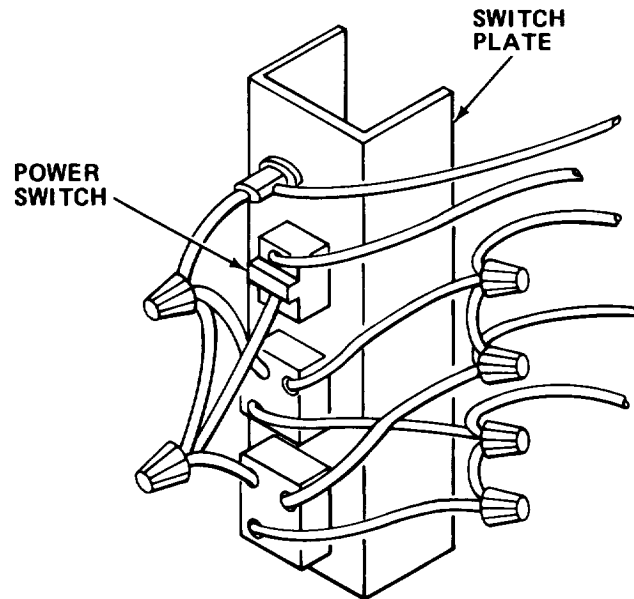
WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

- a. Turn power switch OFF.
- b. Unplug power cord.



- c. Remove socket head screws and pull switch plate out.



- d. Tag and disconnect wires from power switch.
- e. Remove defective power switch from front of switch plate.
- f. Install new power switch.
- g. Reconnect wires to power switch and remove tags.
- h. Reinstall switch plate and secure with socket head screws.
- i. Plug in power cord.

2-16.2 Replace Power Cord.

MOS: 83FJ6, Reproduction Equipment Repairer

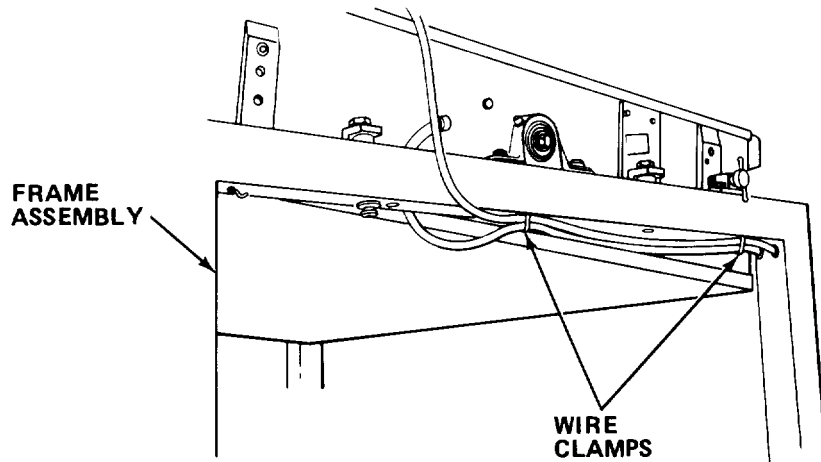
TOOLS: Flat Tip Screwdriver
Soldering Iron
5/64 in. Hex Head Key Wrench

SUPPLIES: Power Cord
Solder (Item 17, Appendix E)

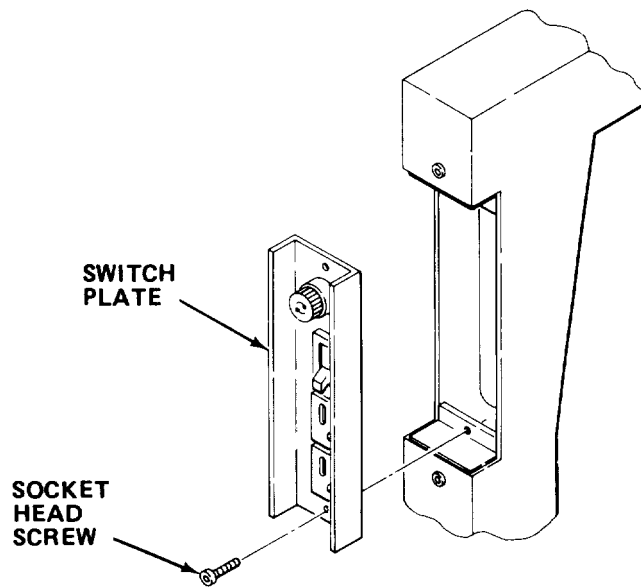
WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

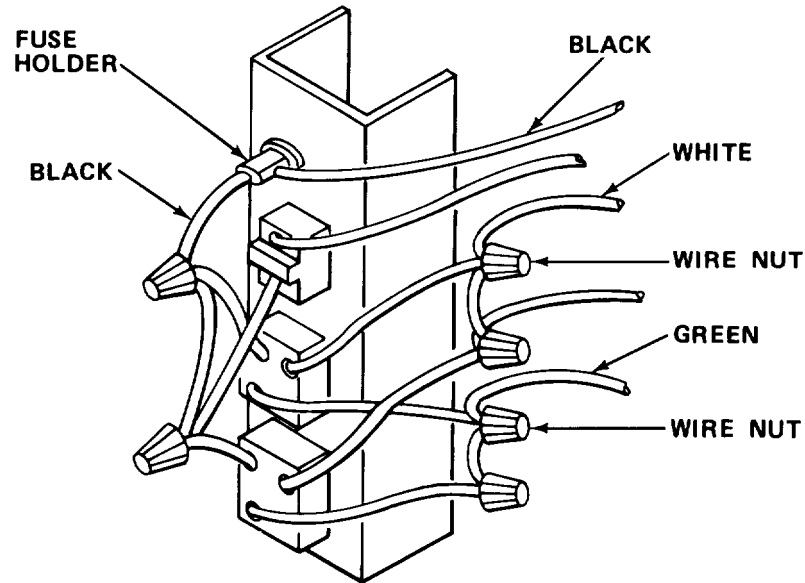
- a. Turn power switch OFF.
- b. Unplug power cord.



- c. Remove wire clamps located on frame assembly.



- d. Remove socket head screws and pull switch plate out.
- e. Tag wire connections for proper reconnection of wires.



- f. Desolder black power cord lead from fuse holder.
- g. Disconnect white lead and green ground at wire nuts.
- h. Remove power cord.
- i. Insert new power cord through hole in back of leg.
- j. Reconnect white lead and green ground; tighten wire nuts.
- k. Solder black lead to fuse holder.
- l. Reinstall wire clamps.
- m. Reinstall switch plate and secure with socket head screws.
- n. Plug in power cord.

2-16.3 Replace Receptacle.

MOS: 83FJ6, Reproduction Equipment Repairer

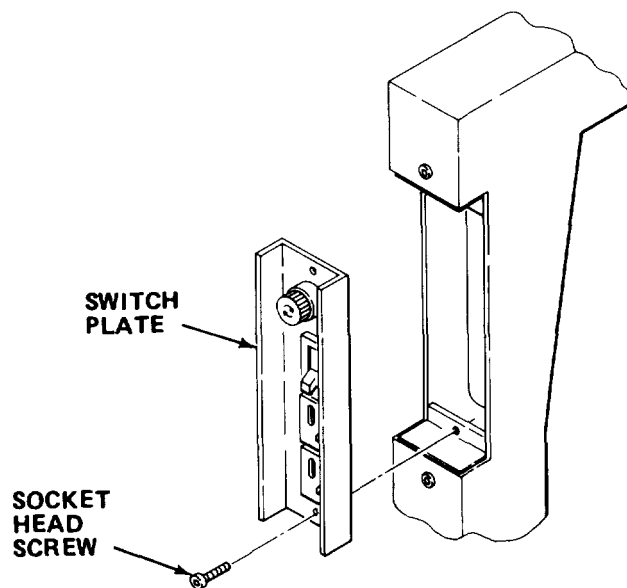
TOOLS: Flat Tip Screwdriver
5/64 in. Hex Head Key Wrench

SUPPLIES: Receptacle

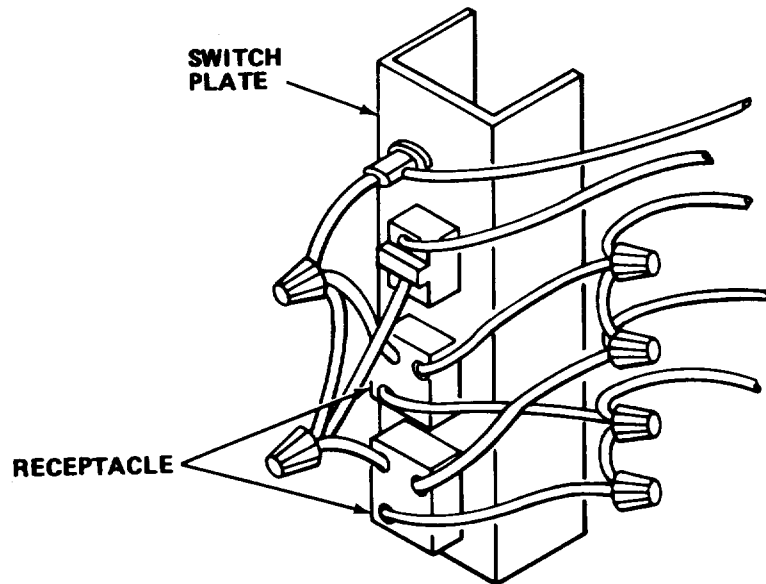
WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

- a. Turn power switch OFF.
- b. Unplug power cord.



- c. Remove socket head screws and pull switch plate out.



- d. Tag and disconnect wires from defective receptacle.
- e. Remove defective receptacle from switch assembly.
- f. Install new receptacle and reconnect wires.
- g. Reinstall switch plate and secure with socket head screws.
- h. Plug in power cord.

TM 5-6675-313-14

2-16.4 Replace Lamp Ballast.

MOS: 83FJ6, Reproduction Equipment Repairer

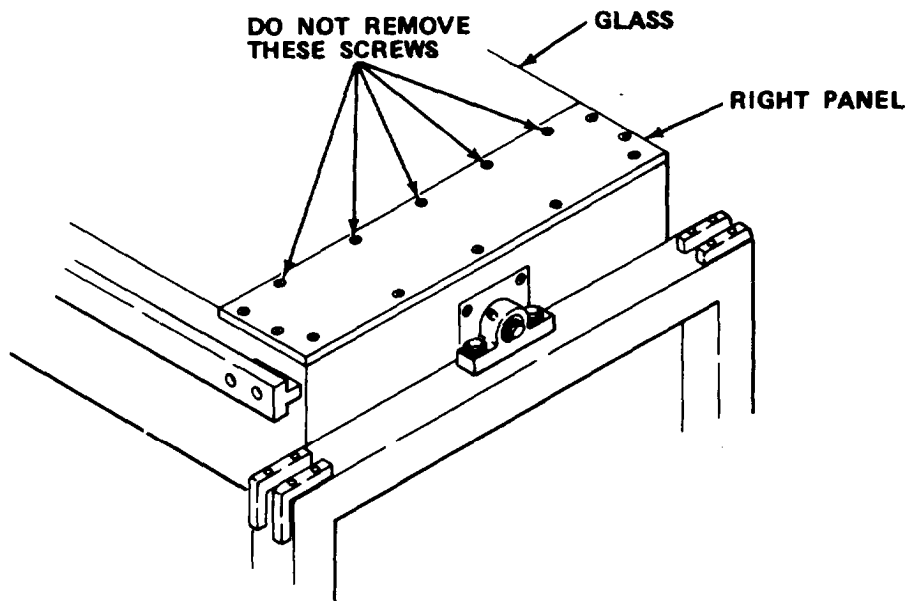
TOOLS: 3/32 in. Hex Head Key Wrench
1/8 in. Hex Head Key Wrench
1/4 in. Wrench
3/8 in. Socket, 1/4 in. Drive
1/4 in. Drive Ratchet

SUPPLIES: Lamp Ballast

WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

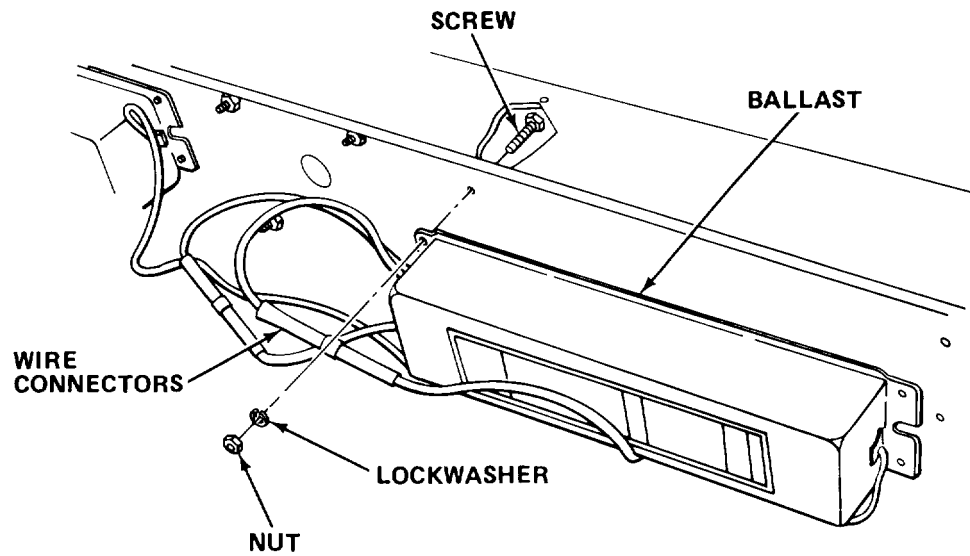
- a. Turn power switch OFF.
- b. Unplug power cord.



CAUTION

Removal of five socket head screws located closest to glass surface may result in damage to equipment.

- c. Remove nine socket head screws and right panel, but do not remove five socket head screws indicated in CAUTION and illustration.



- d. Remove socket head screws, lockwashers, and nuts that secure ballast.
- e. Lift ballast out of table to gain access to wire connectors.
- f. Tag and disconnect all wires.
- g. Install new ballast.

NOTE

Be sure wires are not kinked.

- h. Reconnect all wires.
- i. Secure ballast with nuts, lockwashers, and socket head screws.
- j. Reinstall right panel and secure with socket head screws.
- k. Plug in power cord.

2-16.5 Replace Fluorescent Lamp/Starter.

MOS: 83FJ6, Reproduction Equipment Repairer

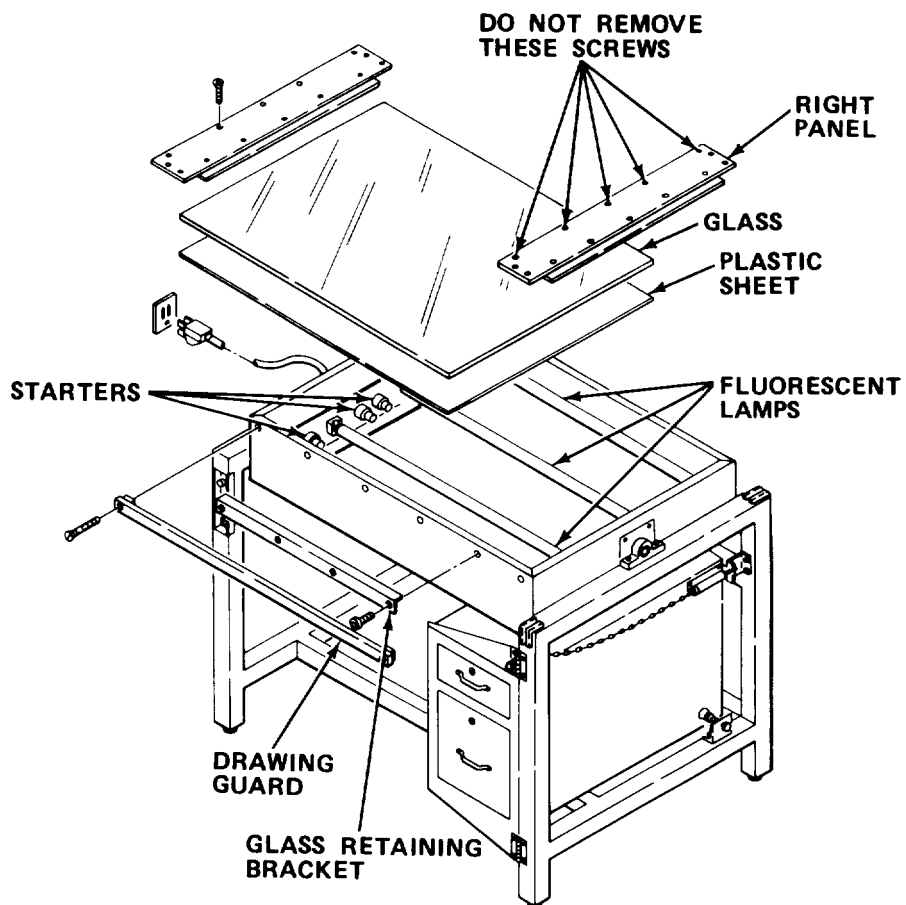
TOOLS: 3/32 in. Hex Head Key Wrench
Flat Tip Screwdriver.

SUPPLIES: Fluorescent Lamp/Starter

WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

- a. Place light surface up. Turn on power switch and note defective lamp.
- b. Turn off power switch and unplug power cord.



CAUTION

Removal of five socket head screws located closest to glass surface may result in equipment damage.

- c. Remove nine socket head screws and right panel, but do not remove five socket head screws indicated in CAUTION and illustration.
- d. Remove socket head screws and drawing guard.
- e. Remove socket head screws and glass retaining bracket.
- f. Carefully slide glass and plastic sheet from retaining glass bracket and left panel.
- g. Remove defective lamp/starter.
- h. Install new lamp/starter.
- i. Reinstall plastic sheet and glass.
- j. Reinstall right panel and secure with socket head screws.
- k. Reinstall glass retaining bracket and secure with socket head screws.
- l. Reinstall drawing guard and secure with socket head screws.
- m. Plug in power cord.

2-16.6 Repair Tilt Lock.

MOS: 83FJ6, Reproduction Equipment Repairer

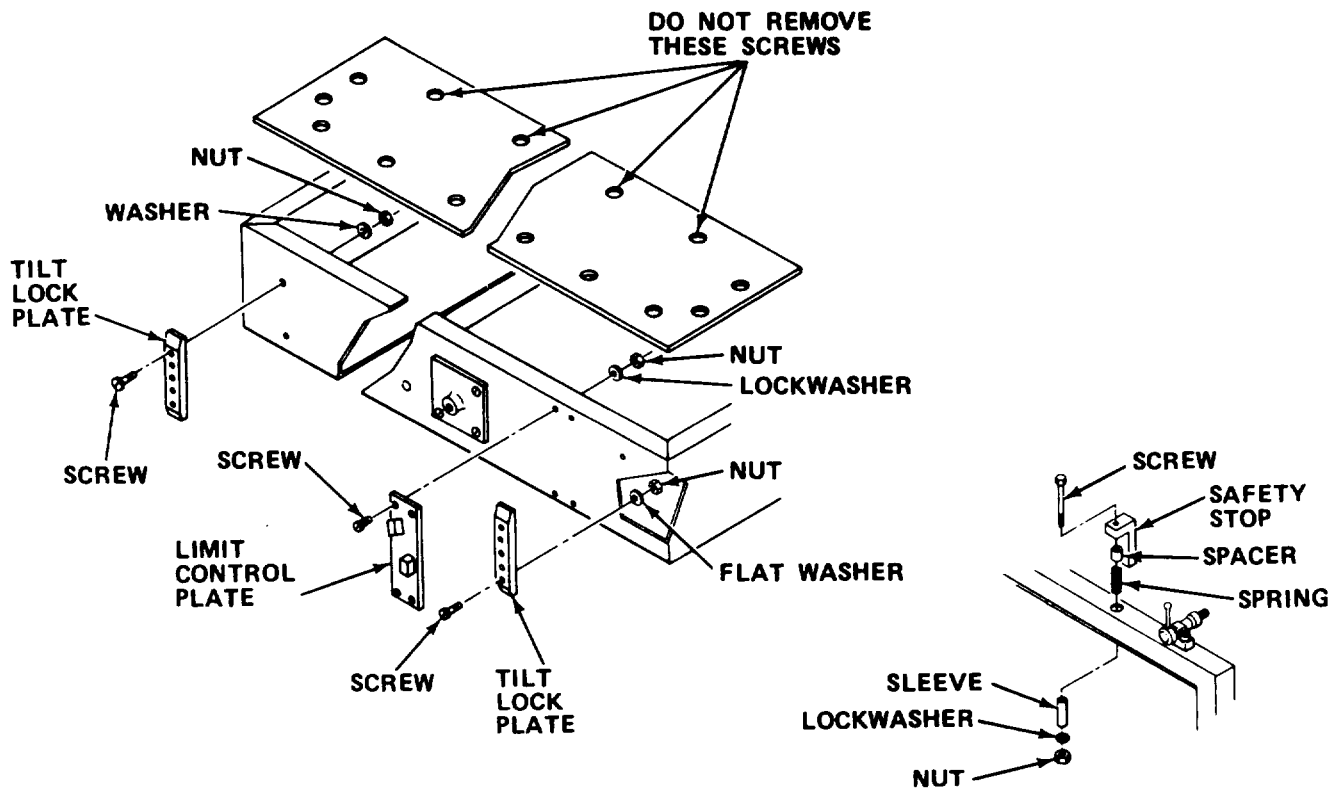
- TOOLS: Flat Tip Screwdriver
7/16 in. Combination Wrench
9 mm Wrench
3/32 in. Hex Head Key Wrench
3/16 in. Hex Head Key Wrench
5/32 in. Hex Head Key Wrench

- SUPPLIES: Tilt Lock Plate
Limit Control Plate
Safety Stop

WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

- a. Turn power switch OFF.
- b. Unplug power cord.



CAUTION

Removal of five socket head screws located closest to glass surface may result in damage to equipment.

- c. Remove nine socket head screws and left panel, but do not remove five socket head screws indicated in CAUTION and illustration.
- d. Pull cabinet assembly lock release and swing cabinet assembly out so that it is not under table.

NOTE

Tilt lock plates are not interchangeable and must be replaced in same positions.

- e. Remove upper screws, nuts, and washers from defective tilt lock plate.
- f. Tilt table top as necessary and remove defective tilt lock plate by removing lower screws, nuts, and washers.
- g. Install new tilt lock plate and secure with washers, nuts, and screws.
- h. Check position of tilt lock plate and readjust if required.
- i. Remove defective limit control plate by removing screws, washers, and nuts.
- j. Install new limit control plate. Secure with nuts, washers, and screws.
- k. Reinstall left panel and secure with nine socket head screws.

NOTE

Use care in disassembly of safety stop to prevent spring from falling inside frame.

- l. Remove defective safety stop by removing nut, lockwasher, sleeve, spring, spacer, and screw.
- m. Install new safety stop. Secure with screw, spacer, spring, sleeve, lockwasher, and nut.
- n. Swing cabinet assembly to its normal position under table.
- o. Plug in power cord.

2-16.7 Replace Pillow Block Assembly.

MOS: 83FJ6, Reproduction Equipment Repairer

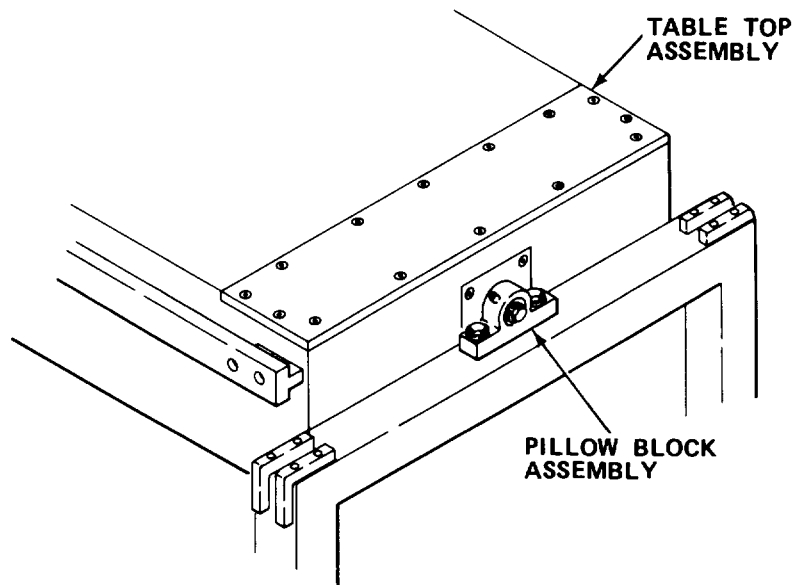
TOOLS: 1/8 in. Hex Head Key Wrench.
9/16 in. Combination Wrench
1/2 in. Combination Wrench
Grease Gun

SUPPLIES: Pillow Block Assembly
GAA Grease (Item 9, Appendix E)

WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

- a. Turn power switch OFF.
- b. Unplug power cord.

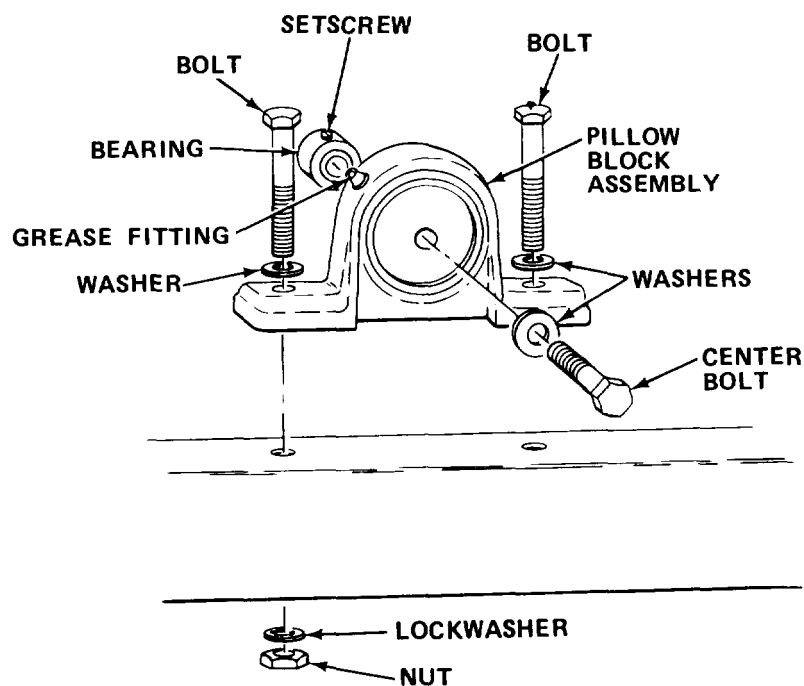


CAUTION

Table top assembly must be supported with drafting surface down to prevent table top from falling, causing equipment damage.

- c. Support table top assembly.

- d. Loosen, but do not remove socket head setscrew.



- e. Remove center bolt and washer.
- f. Remove bolts, washers, lockwashers, and nuts; remove defective pillow block assembly.
- g. Install new pillow block assembly and secure with nuts, lockwashers, washers, and bolts.
- h. Grease bearing (Paragraph 2-11.1).
- i. Reinstall washer and center bolt.
- j. Tighten socket head setscrew.
- k. Remove table top assembly supports.

2-16.8 Remove/Install Drafting, Scribing/Tracing Table.

MOS: 83FJ6, Reproduction Equipment Repairer

PERSONNEL: Two persons are required to perform this procedure.

TOOLS: 1/2 in. Combination Wrench

SUPPLIES: Drafting, Scribing/Tracing Table

WARNING

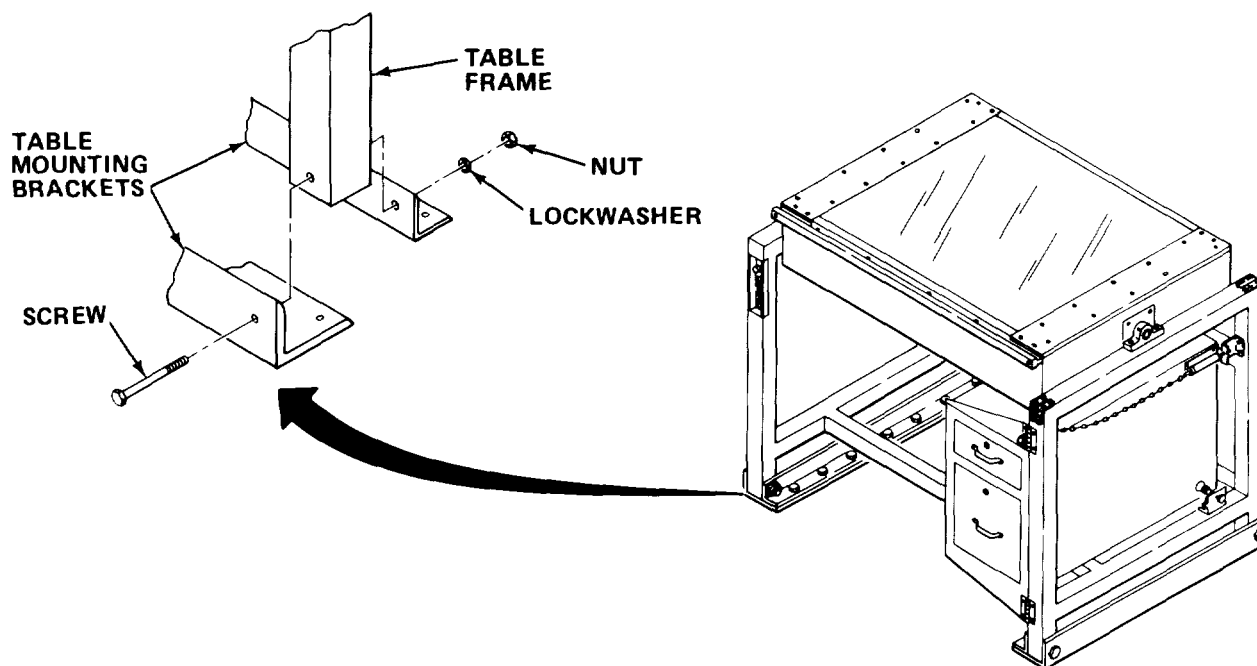
Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

- a. Unplug power cord.
- b. Remove socket head screws, lockwashers, and nuts from table mounting brackets.

WARNING

To prevent personal injury, two persons are required to move the drafting, scribing/tracing table.

- c. Carefully pull table away from wall until it clears table mounting brackets.

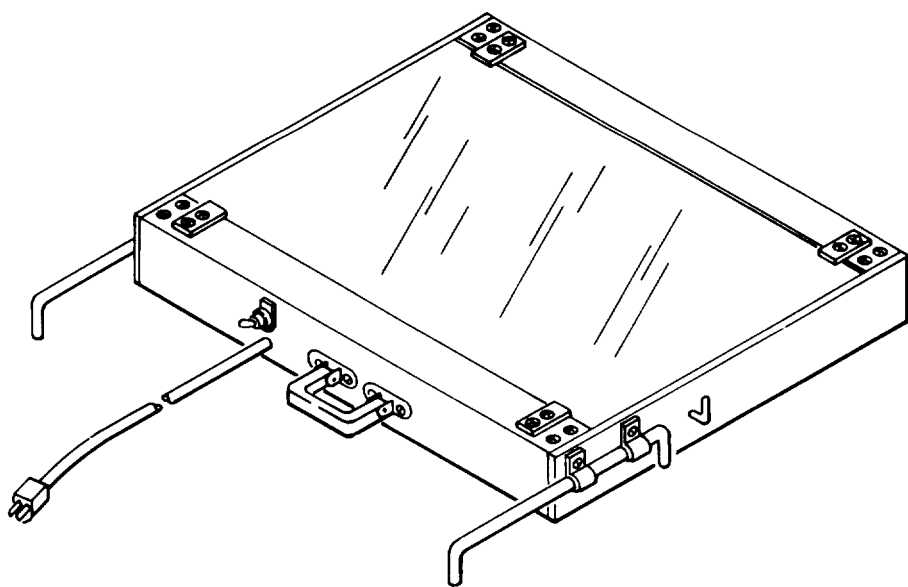


- d. Remove defective table from section.
- e. Position new drafting, scribing/tracing table in front of table mounting bracket.
- f. Slide table between table mounting brackets until holes in table frame are aligned with table mounting bracket holes.
- g. Reinstall socket head screws, lock washers, and nuts into table mounting brackets.
- h. Plug in power cord.

2-17. PREPARATION FOR STORAGE OR SHIPMENT. Contact your battalion for packing and shipping instructions.

Section V DIRECT/GENERAL SUPPORT MAINTENANCE

There are no direct/general support maintenance procedures assigned for this equipment.



CHAPTER 3

PORTABLE TRACING/SCRIBING BOARD

Section I INTRODUCTION

3-1. GENERAL INFORMATION.

3-1.1 Scope.

- a. Model Number and Equipment Name. Model 51J3 portable Tracing/Scribing Board.
- b. Purpose of Equipment. To provide illuminated work surface for tracing or scribing.

3-2. EQUIPMENT DESCRIPTION.

3-2.1 Equipment Characteristics, Capabilities, and Features. Provides lightweight, portable, and diffused light source. Used as work surface for tracing or scribing.

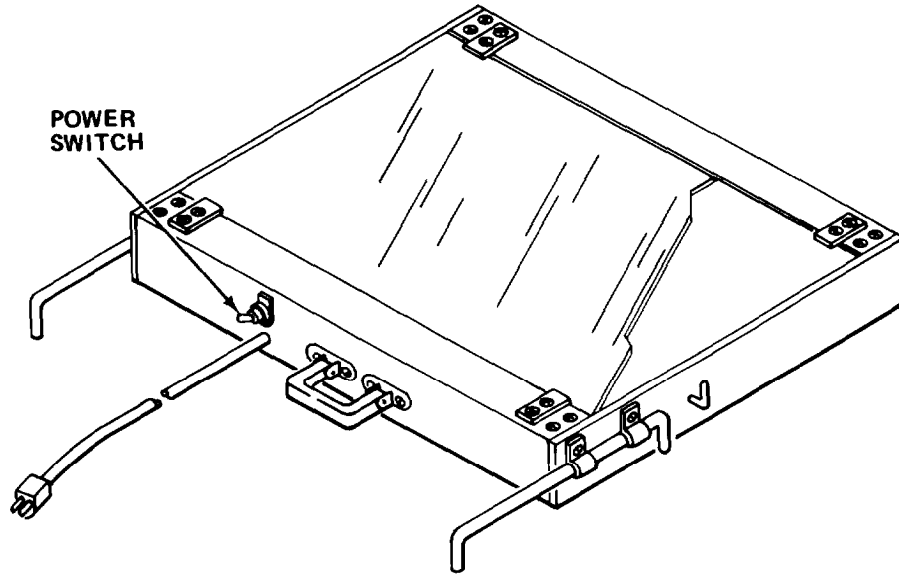
3-2.2 Equipment Data.

Power Requirements	110 V, 60 Hz
Illumination	Two 30 W fluorescent lamps.
Work Surface	36.0 in. X 23.5 in. (91.4 cm X 59.7 cm)

3-3. TECHNICAL PRINCIPALS OF OPERATION. Principles of operation are combined with operator's controls and indicators for this equipment.

Section II OPERATING INSTRUCTIONS

3-4. DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND INDICATORS.



Control or Indicator	Function
POWER SWITCH	Two-position toggle switch to control illumination.

3-5. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES.

- a. Before You Operate. Always keep in mind the WARNINGS and CAUTIONS. Perform your before (B) PMCS.
- b. While You Operate. Always keep in mind the WARNINGS and CAUTIONS. Perform your during (O) PMCS.
- c. After You Operate. Be sure to perform your after (A) PMCS.
- d. If your equipment fails to operate. Troubleshoot with proper equipment. Report any deficiencies using the proper forms. See DA Pam 738-750.

3-5.1 PMCS Procedures.

- a. PMCS are designed to keep the equipment in good working condition by performing periodic service tasks.
- b. Service intervals provide you, the operator, with time schedules that determine when to perform specified service tasks.
- c. The "Equipment is Not Ready/Available If" column is used for identification of conditions that make the equipment not ready/available for readiness reporting purposes or denies use of the equipment until corrective maintenance is performed.
- d. If your equipment fails to operate after PMCS is performed, immediately report this condition to your supervisor.
- e. Perform weekly as well as before operation if you are the assigned operator and have not operated the item since the last weekly or if you are operating the item for the first time.
- f. Item number column. Item numbers are assigned in chronological ascending sequence regardless of interval designation. These numbers are used for your "TM Number" column on DA Form 2404, Equipment Inspection and Maintenance Worksheet in recording results of PMCS.
- g. Interval columns. This column determines the time period designated to perform your PMCS.
- h. Item to be inspected and procedures column. This column lists functional groups and their respective assemblies and subassemblies as shown in the Maintenance Allocation Chart (Appendix B). The appropriate check or service procedure follows the specific item to be inspected.
- i. Equipment is not ready/available if: column. This column indicates the reason or cause why your equipment is not ready/available to perform its primary mission.
- j. List of tools and materials required for PMCS is as follows.

<u>Item</u>	<u>Quantity</u>
Cheesecloth (Item 5, Appendix E)	ar

Table 3-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES

NOTE

If the equipment must be kept in continuous operation, check and service only those items that can be checked and serviced without disturbing operation. Make complete checks and services when the equipment can be shut down.

B - Before
D - During
A - After

W - Weekly
M - Monthly
Q - Quarterly

AN - Annually
S - Semiannually
BI - Biennially

(Number) - Hundreds of Hours

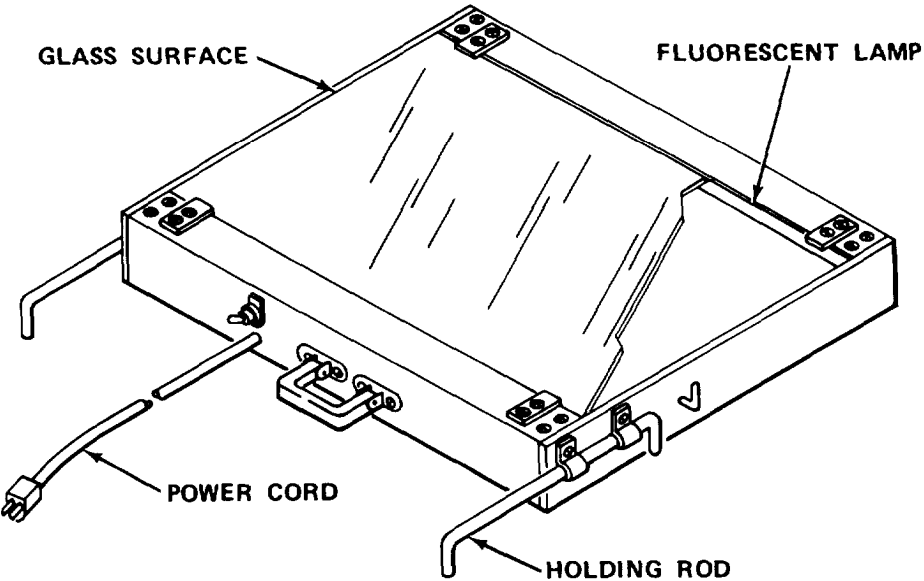
ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
1	B	<p><u>PORTABLE TRACING/SCRIBING BOARD</u></p>  <p><u>Inspect/Clean.</u></p> <p><u>WARNING</u></p> <p>Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.</p> <p>1. Rotate each holding rod to check for freedom of movement.</p>	

Table 3-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before
D - During
A - After

W - Weekly
M - Monthly
Q - Quarterly

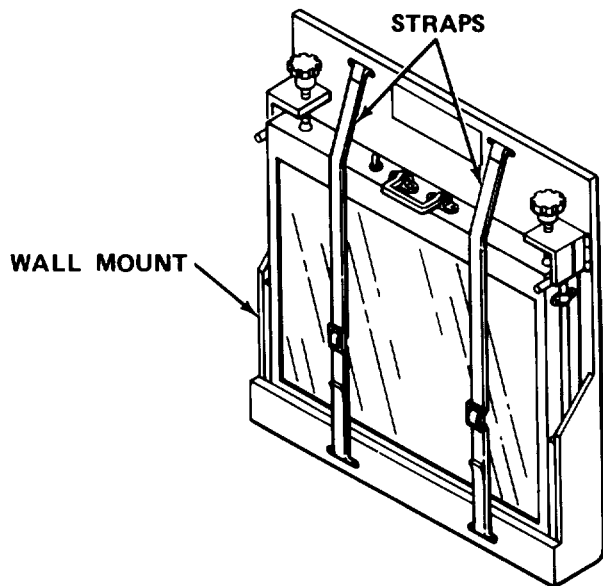
AN - Annually
S - Semiannually
BI - Biennially

(Number) - Hundreds of Hours

ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
1	B	<p><u>PORTABLE TRACING/SCRIBING BOARD - Cont</u></p> <p><u>Inspect/Clean - Cont</u></p> <ol style="list-style-type: none"> 2. Check power cord for kinks, frays, or burns. If power cord is defective, notify organizational maintenance. 3. Check fluorescent lamps for partial lighting. Replace as needed (paragraph 3-10.2). 4. Check glass surface for dust and dirt. Wipe glass surface with moistened cheesecloth. Wipe surface with clean dry cheesecloth to remove smears or streaks. Check glass surface for cracks or scratches. Replace as needed (paragraph 3-10.4). 	<p>Power cord is damaged.</p> <p>Fluorescent lamp is defective.</p> <p>Glass surface is cracked or scratched.</p>

3-6. OPERATION UNDER USUAL CONDITIONS.

3-6.1 Assembly and Preparation for Use.



a. Remove portable tracing/scribing board from wall mount by loosening straps. Place board on work surface.

b. Plug in power cord, and turn power switch ON.

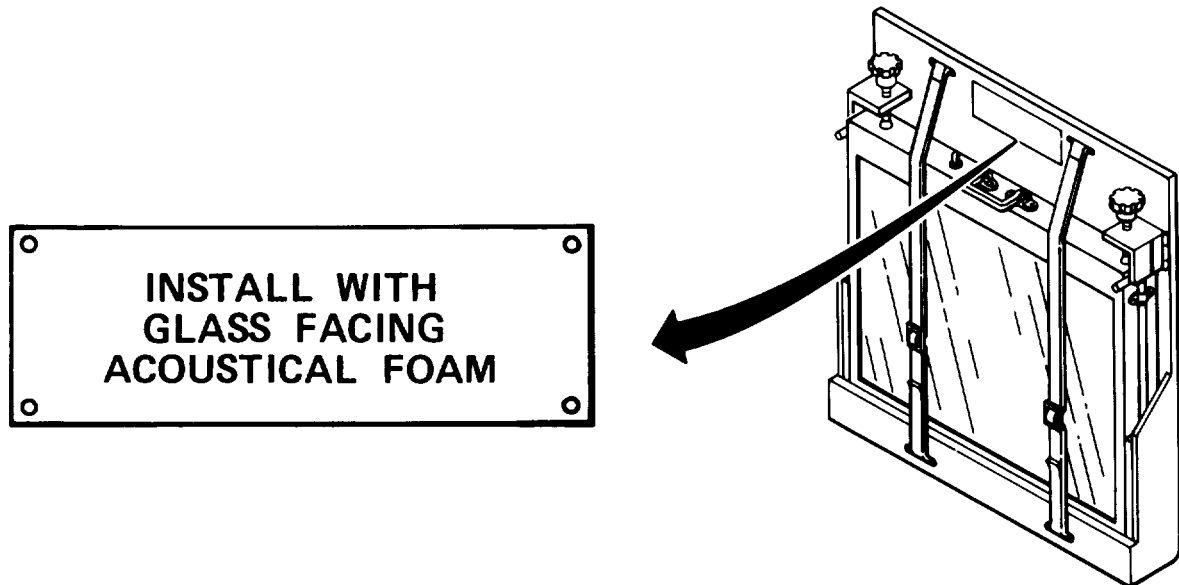
3-6.2 Preparation for Movement.

a. Turn power switch OFF, and unplug power cord.

b. Place board in wall mount with glass surface facing padded mount.

c. Secure board in wall mount with straps.

3-6.3 Operating Instructions on Decals and Instruction Plates.



3-7. OPERATION UNDER UNUSUAL CONDITIONS. This equipment is designed for operation only in a controlled environment.

Section III OPERATOR MAINTENANCE

3-8. LUBRICATION INSTRUCTIONS. This equipment does not require lubrication.

3-9. TROUBLESHOOTING PROCEDURES.

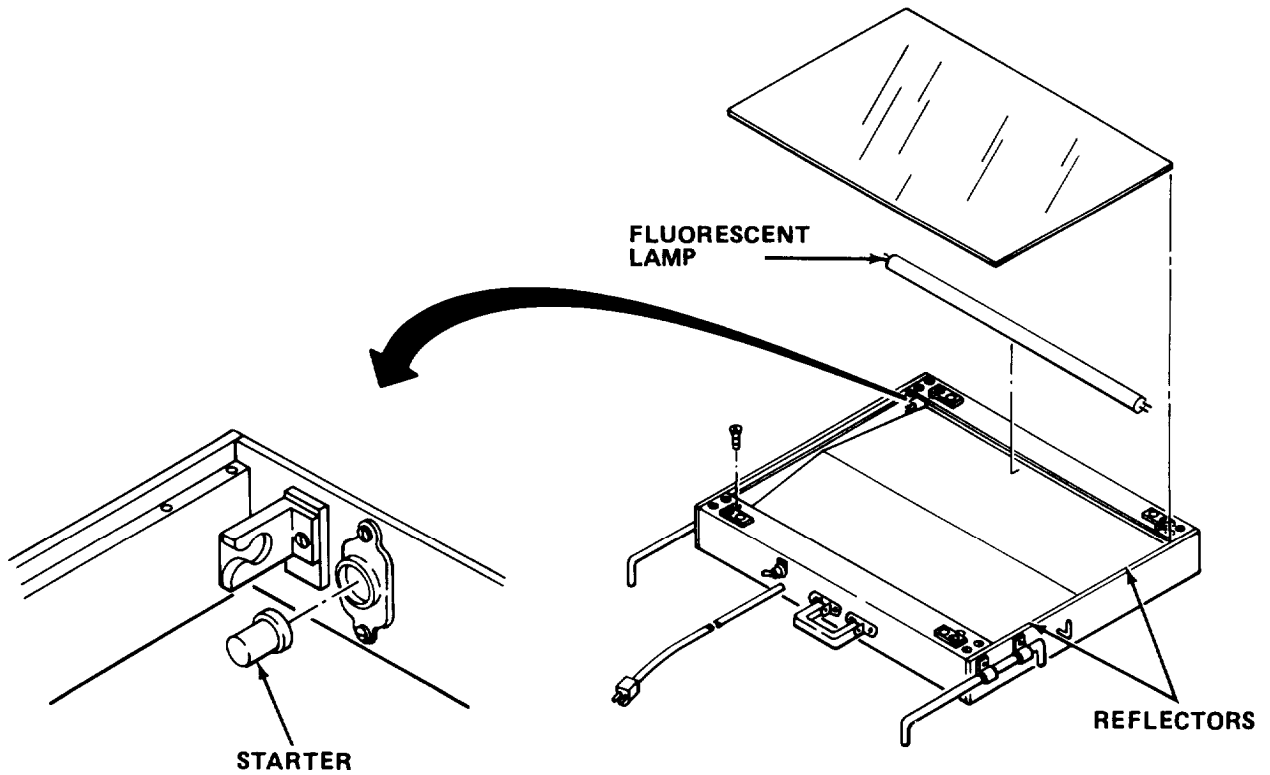
a. The table lists the common malfunctions which you may find during operation or maintenance of the portable tracing/scribing board, or its components. You should perform the test/inspections and corrective actions in the order listed.

b. This manual cannot list all malfunctions that may occur, nor all test or inspections and corrective actions. If a malfunction is not listed or is not corrected by listed corrective actions, notify your supervisor.

Table 3-2. TROUBLESHOOTING

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
-------------	--------------------	-------------------

1. ILLUMINATION UNEVEN.



WARNING

Use care when power is connected during inspections or corrective actions. Death or serious injury may result.

- Step 1. Check to see if reflector behind fluorescent lamps is dirty.
Clean reflector (paragraph 3-10.1).

Table 3-2. TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
1. ILLUMINATION UNEVEN - Cont	Step 2. Check to see if one fluorescent lamp is partially lighted or is dark.	Replace fluorescent lamp (paragraph 3-10.2).
	Step 3. Check to see if either fluorescent lamp is partially lighted.	Replace defective starter (paragraph 3-10.3).

3-10. MAINTENANCE PROCEDURES.

a. This section contains instructions covering operator maintenance functions for the portable tracing/scribing board. Personnel required are listed only if the task requires more than one.

b. After completing each maintenance procedure, perform operational check to be sure that equipment is properly functioning.

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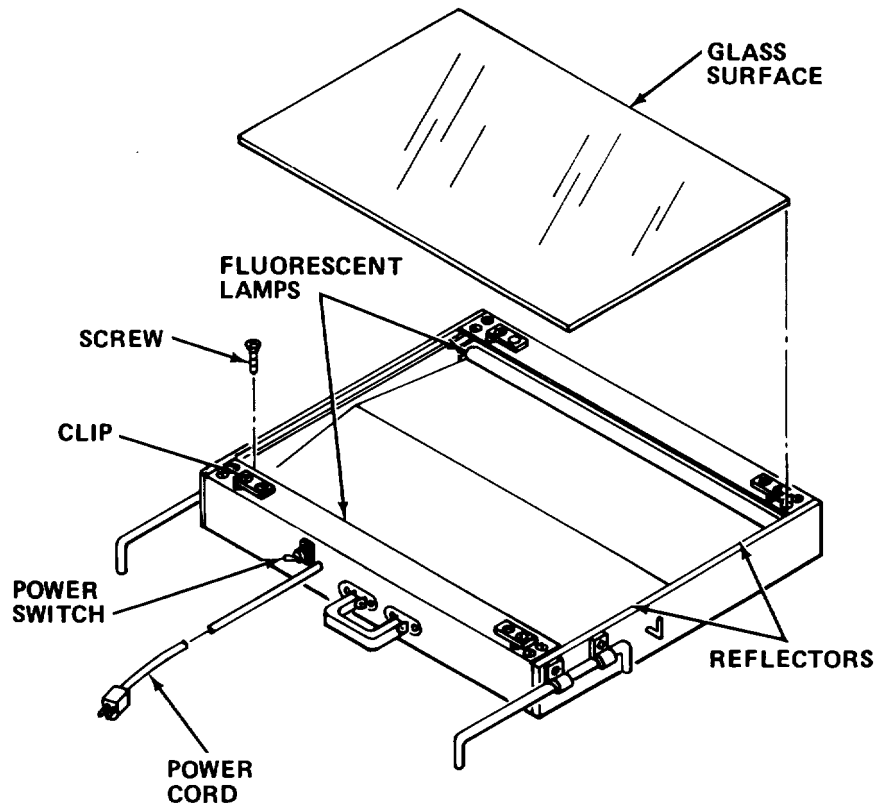
PROCEDURE	PARAGRAPH
Clean Reflector	3-10.1
Replace Fluorescent Lamp	3-10.2
Replace Starter	3-10.3
Replace Glass Surface	3-10.4

3-10.1 Clean Reflector.

MOS: 81C, Cartographer

TOOLS: Cross Tip Screwdriver
Vacuum Cleaner

SUPPLIES: Cheesecloth (Item 5, Appendix E)



WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

- a. Turn power switch OFF, and unplug power cord.
- b. Remove one screw from each of four clips. Loosen other screws.
- c. Turn clips 90° to right or left.

CAUTION

Glass surface must be handled with care to avoid chipping or breaking.

- d. Remove glass surface.
- e. Vacuum reflector surface and fluorescent lamps with brush attachment on vacuum cleaner.

NOTE

Be sure fluorescent lamps are secure in their sockets.

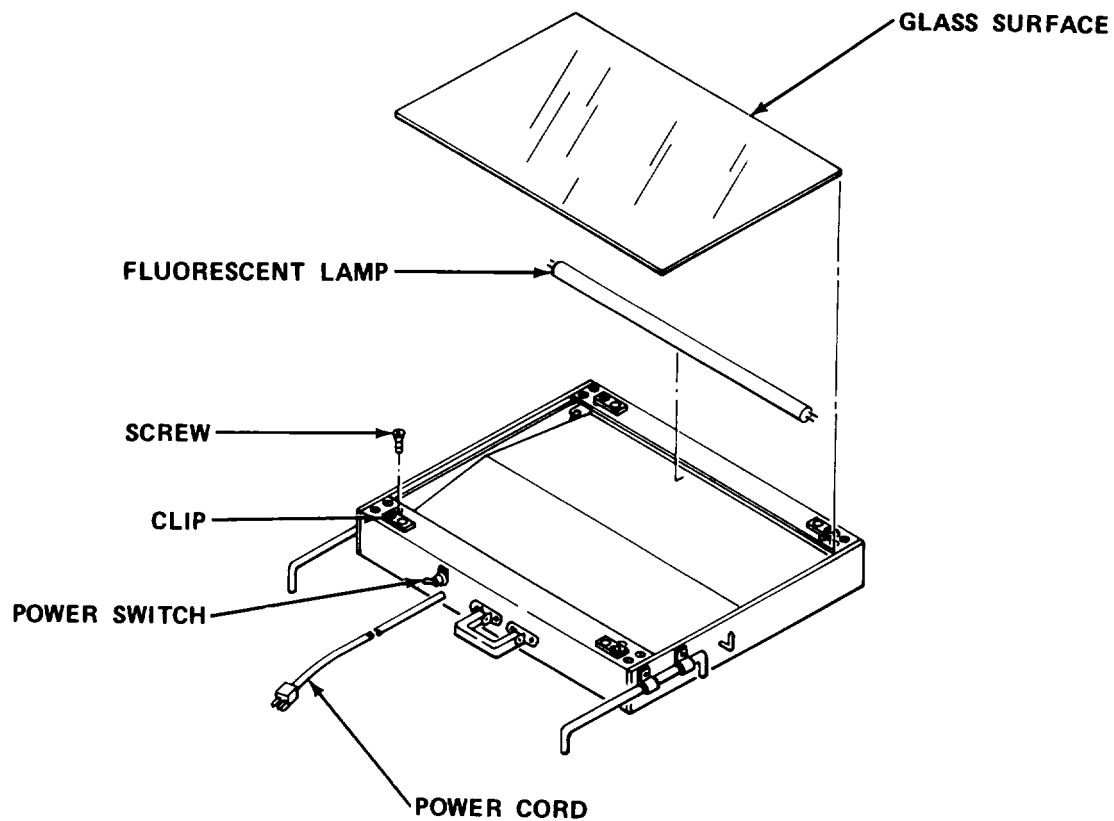
- f. Wipe reflector and lamps with moistened cheesecloth.
- g. Wipe or vacuum both sides of glass surface.
- h. Reinstall glass surface.
- i. Turn clips to secure glass surface. Align holes and reinstall screws. Tighten all screws.
- j. plug in power cord and turn power switch ON.

3-10.2 Replace Fluorescent Lamp.

MOS: 81C, Cartographer

TOOLS: Cross Tip Screwdriver

SUPPLIES: Fluorescent Lamp (30 W)



WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

- a. Turn power switch OFF and unplug power cord.
- b. Remove one screw from each of four clips. Loosen other screws.
- c. Turn clips 90° to right or left.

CAUTION

Glass surface must be handled with care to avoid chipping or breaking.

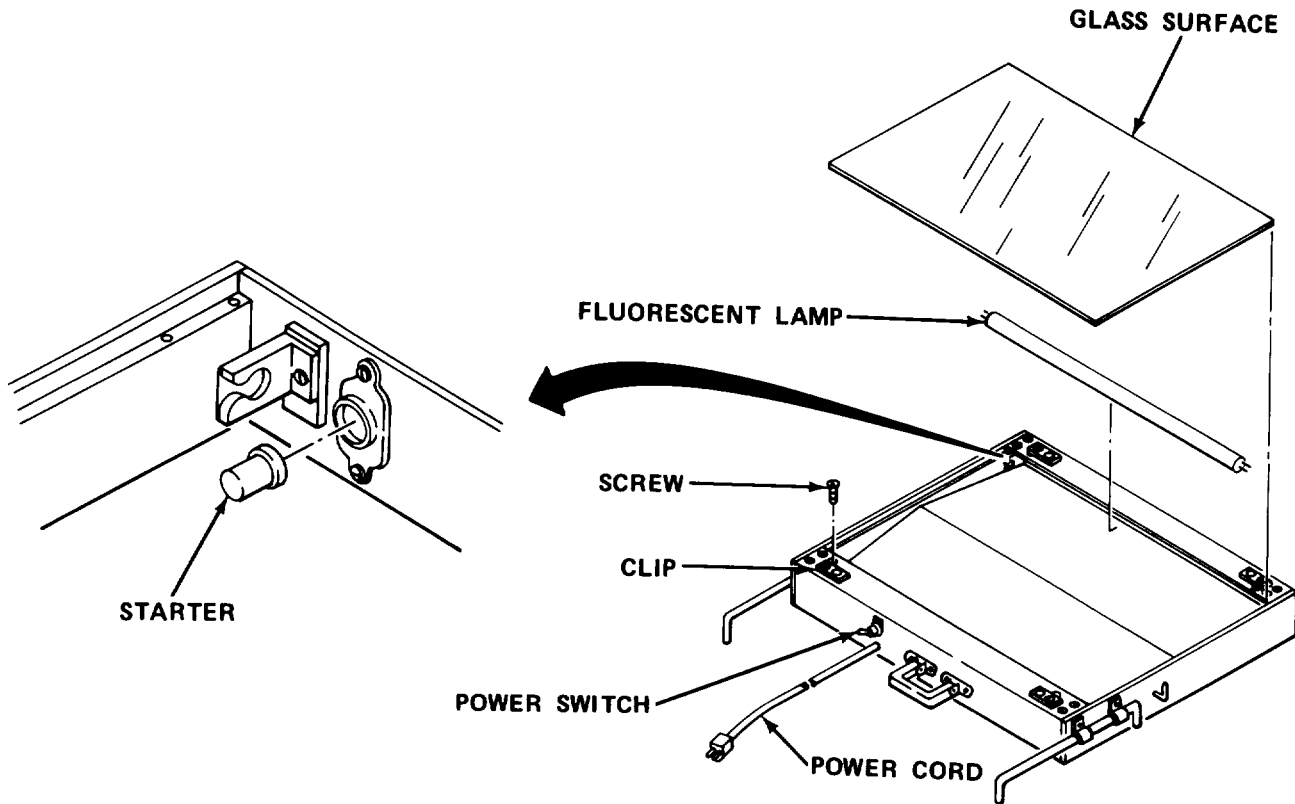
- d. Remove glass surface.
- e. Remove defective fluorescent lamp.
- f. Install new fluorescent lamp.
- g. Reinstall glass surface.
- h. Turn clips to secure glass surface. Align holes and reinstall screws. Tighten all screws.
- i. Plug in power cord and turn power switch ON.

3-10.3 Replace Starter.

MOS: 81C, Cartographer

TOOLS: Cross Tip Screwdriver

SUPPLIES: Starter



WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

- a. Turn power switch OFF and unplug power cord.
- b. Remove one screw from each of four clips. Loosen other screws.
- c. Turn clips 90° to right or left.

CAUTION

Glass surface must be handled with care to avoid chipping or breaking.

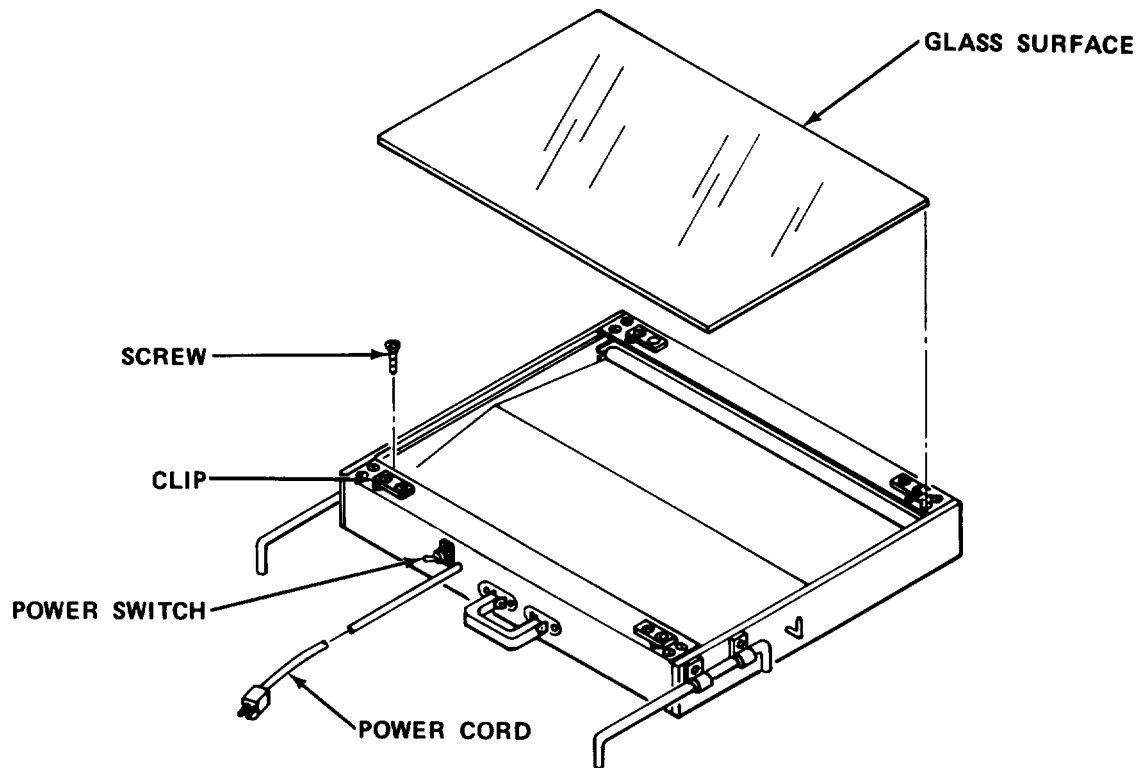
- d. Remove glass surface.
- e. Remove fluorescent lamp in front of starter.
- f. Remove starter by pushing in and turning left until free.
- g. Install new starter in socket by pushing in and turning right until locked.
- h. Reinstall fluorescent lamp.
- i. Reinstall glass surface.
- j. Turn clips to secure glass surface. Align holes and reinstall screws. Tighten all screws.
- k. Plug in power cord and turn power switch ON.

3-10.4 Replace Glass Surface.

MOS: 81C, Cartographer

TOOLS: Cross Tip Screwdriver

SUPPLIES: Glass Surface



WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

- a. Turn power switch OFF and unplug power cord.
- b. Remove one screw from each of four clips. Loosen other screws.
- c. Turn clips 90° to left or right.

WARNING

Use care when handling damaged glass. Failure to do so may result in serious cuts.

- d. Remove damaged glass surface.

CAUTION

Glass surface must be handled with care to avoid chipping or breaking.

- e. Install new glass surface.
- f. Turn clips to secure glass surface. Align holes and reinstall screws. Tighten all screws.
- g. Plug in power cord and turn power switch ON.

Section IV ORGANIZATIONAL MAINTENANCE

3-11. LUBRICATION INSTRUCTIONS. This equipment does not require lubrication.

3-12. REPAIR PARTS, SPECIAL TOOLS; TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT(TMDE); AND SUPPORT EQUIPMENT.

3-12.1 Common Tools and Equipment. For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to Your unit.

3-12.2 Special Tools; Test, Measurement, and Diagnostic Equipment; and Support Equipment. Special Tools, TMDE, and Support Equipment is listed in the applicable repair parts and special tools list and in Appendix B of this manual.

3-12.3 Repair Parts. Repair parts are listed and illustrated in the Repair Parts and Special Tools List, TM 5-6675-313-24P covering organizational maintenance for this equipment.

3-13. SERVICE UPON RECEIPT.

3-13.1 Checking Unpacked Equipment.

a. Inspect the equipment for damage incurred during shipment. If equipment has been damaged, report the damage on DD Form 6, Packing Improvement Report.

b. Check the equipment against the packing list to see if the shipment is complete. Report all discrepancies in accordance with the instructions of DA Pam 738-750.

c. Check to see whether the equipment has been modified.

3-14. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES. There are no organizational PMCS procedures assigned for this equipment.

3-15. ORGANIZATIONAL TROUBLESHOOTING PROCEDURES. There are no organizational troubleshooting procedures assigned for this equipment.

3-16. ORGANIZATIONAL MAINTENANCE PROCEDURES.

a. This section contains instructions covering organizational maintenance functions for the portable tracing/scribing board. Personnel required are listed only if the task requires more than one.

b. After completing each maintenance procedure, perform operational check to be sure that equipment is properly functioning.

NOTE

The maintenance procedures for the portable tracing/scribing board consist of replacing three different electrical components. A multimeter is needed to determine which component is defective and needs replacement.

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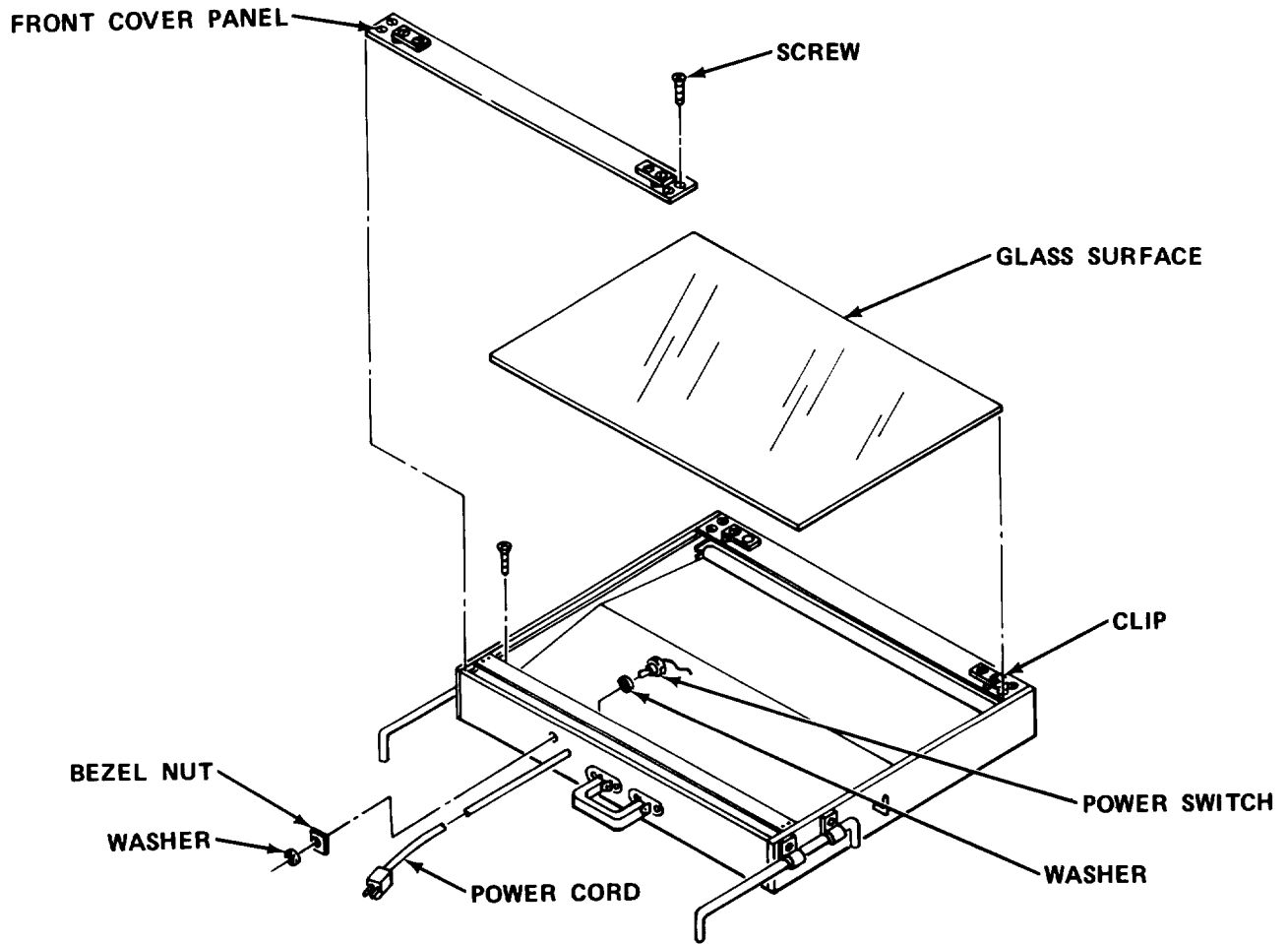
PROCEDURE	PARAGRAPH
Replace Power Switch.	3-16.1
Replace Power Cord.	3-16.2
Replace Ballast Transformer	3-16.3
Remove/Install Mounting Bracket	3-16.4

3-16.1 Replace Power Switch.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Multimeter
Cross Tip Screwdriver

SUPPLIES: Power Switch



WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

- a. Turn power switch OFF and unplug power cord.
- b. Remove one screw from each of four clips. Loosen other screws.

- c. Turn clips 90° to left or right.

CAUTION

Glass surface must be handled with care to avoid chipping or breaking.

- d. Remove glass surface and set aside.
- e. Remove screws and front cover panel.
- f. Remove washers and bezel nut from power switch.

NOTE

Ground wire is not connected to switch. Mark position for reinstallation.

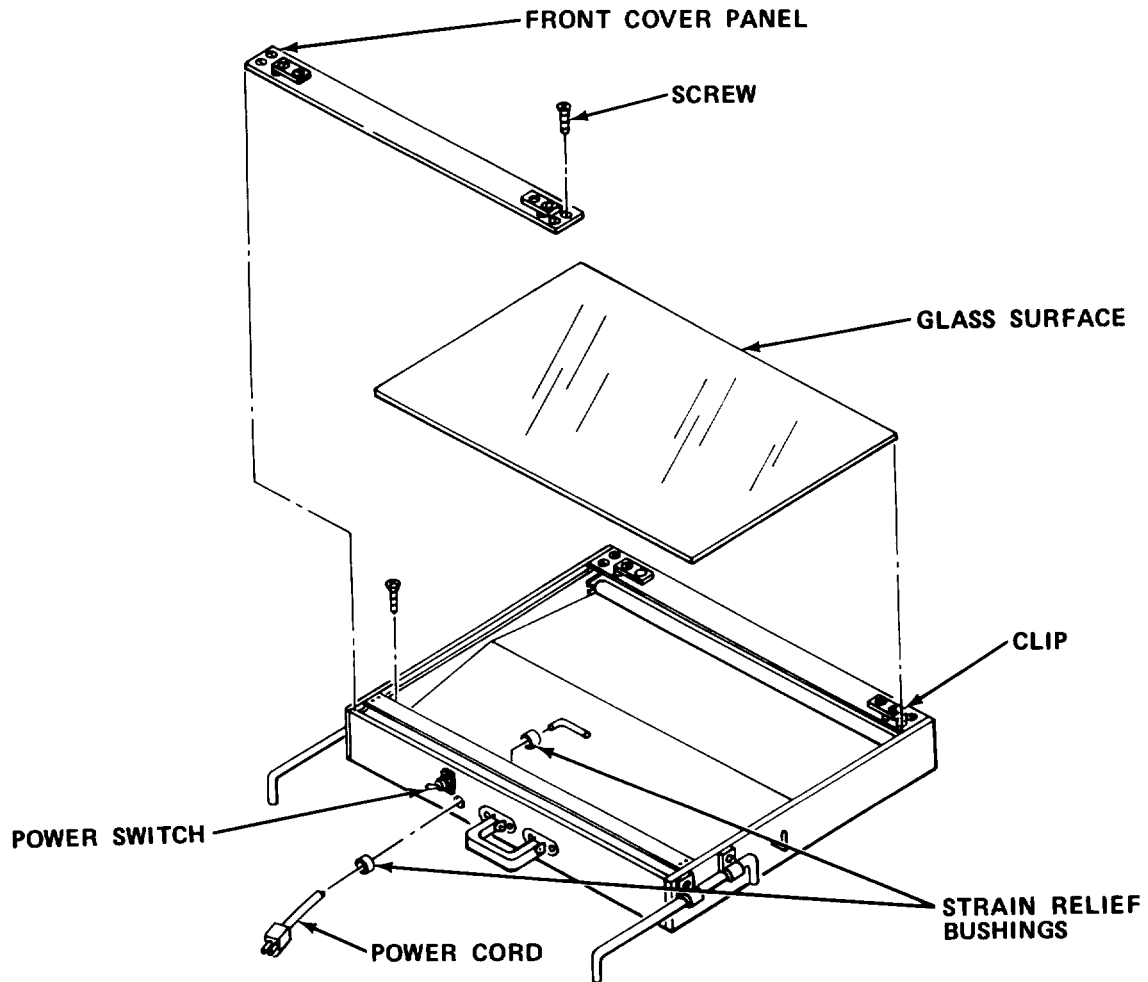
- g. To remove defective power switch, pull to inside of board. Tag and disconnect wires.
- h. Remove defective switch.
- i. Connect wiring to new power switch and remove tags.
- j. Reinstall washers and bezel nut. Adjust for proper positioning of power switch.
- k. Reinstall front cover panel and secure with screws.
- l. Reinstall glass surface.
- m. Turn clips 90° to secure glass surface.
- n. Reinstall screws on clips. Tighten all screws.
- o. Plug in power cord and turn power switch ON.

3-16.2 Replace Power Cord.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Cross Tip Screwdriver
Needle Nose Pliers

SUPPLIES: power Cord

WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

- a. Turn power switch OFF and unplug power cord.
- b. Remove one screw from each of four clips. Loosen other screws.

- c. Turn clips 90° to left or right.

CAUTION

Glass surface must be handled with care to avoid chipping or breaking.

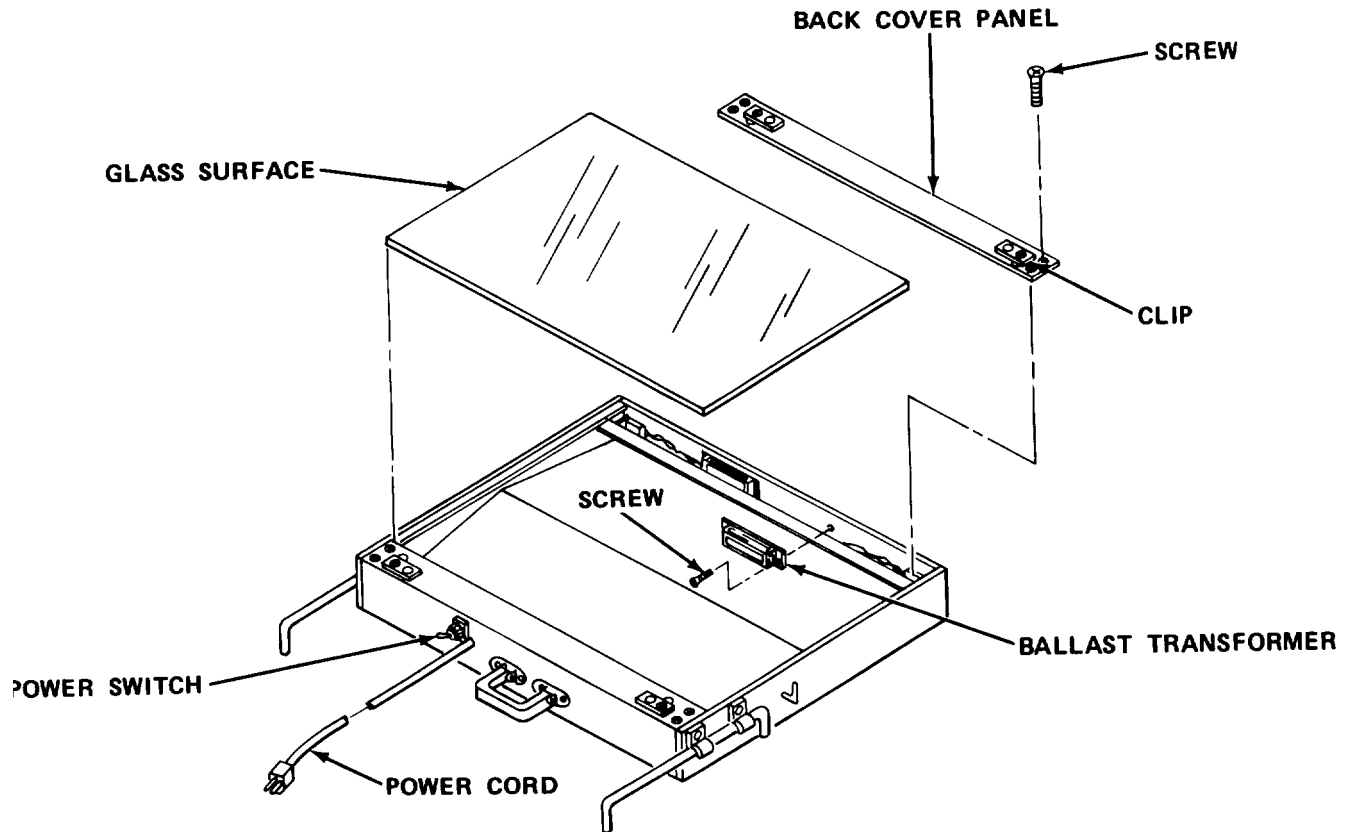
- d. Remove glass surface and set aside.
- e. Remove screws and front cover panel.
- f. Tag and disconnect wires.
- g. Remove inner and outer strain relief bushings and remove defective power cord.
- h. Reinstall inner and outer strain relief bushings on new power cord.
- i. To install, connect wires to power cord and remove tags.
- J. Reinstall front cover panel and secure with screws.
- k. Reinstall glass surface.
- l. Turn clips 90° to secure glass surface.
- m. Reinstall screws on clips. Tighten all screws.
- n. Plug in power cord and turn power switch ON.

3-16.3 Replace Ballast Transformer.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Cross Tip Screwdriver

SUPPLIES: Ballast Transformer

WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

- a. Turn power switch OFF and unplug power cord.
- b. Remove one screw from each of four clips. Loosen other screws.
- c. Turn clips 90° to left or right.

CAUTION

Glass surface must be handled with care to avoid chipping or breaking.

- d. Remove glass surface and set aside.
- e. Remove screws and back cover panel.
- f. Remove screws and defective ballast transformer.
- g. Disconnect and tag wires from ballast transformer.
- h. Connect wiring on new ballast transformer and remove tags.
- i. Install new ballast transformer and secure with screws.
- j. Reinstall back cover panel and secure with screws.
- k. Reinstall glass surface.
- l. Turn clips 90° to secure glass surface.
- m. Reinstall screws on clips. Tighten all screws.
- n. Plug in power cord and turn power Switch ON.

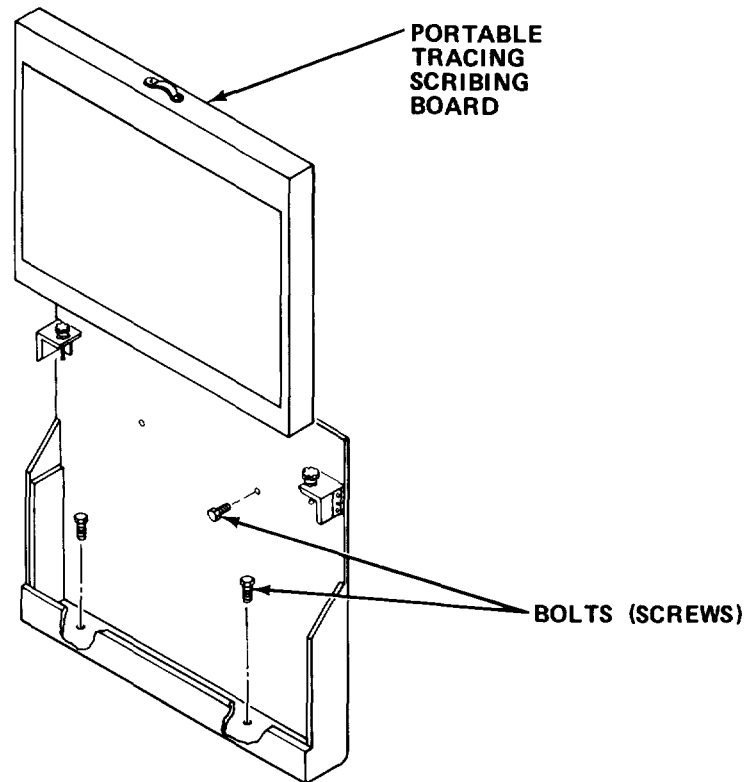
3-16.4 Remove/Install Mounting Bracket.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: 1/4 in. Socket Set/Cross Tip Screwdriver

SUPPLIES: Mounting Bracket

- a. Remove portable tracing/scribing board from mounting bracket.

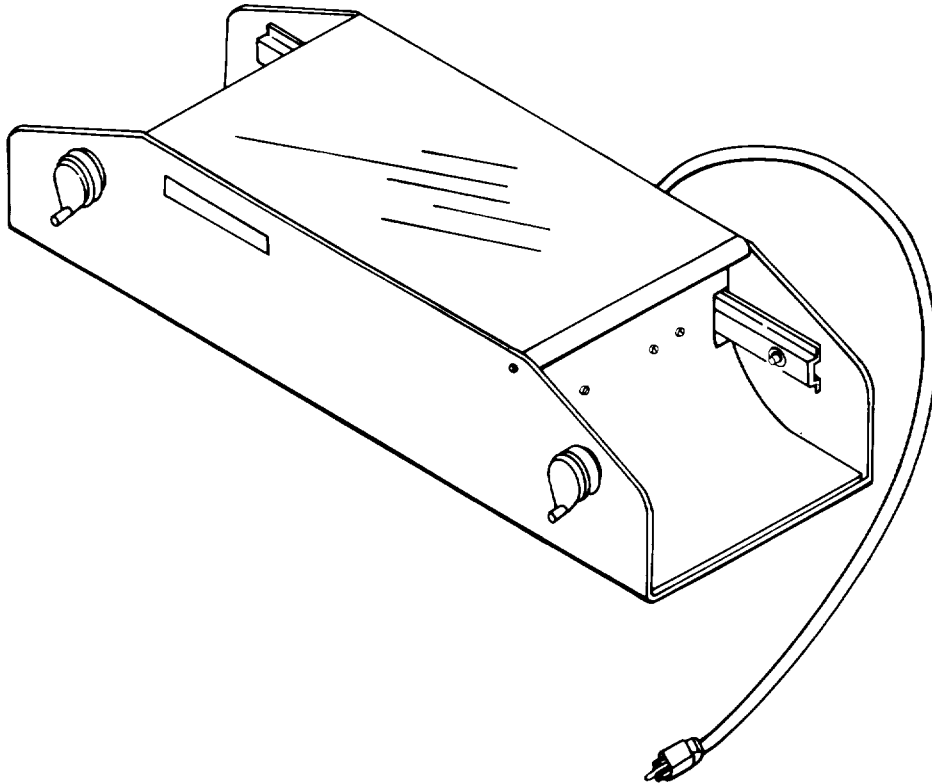


- b. Remove attaching hardware securing defective mounting bracket to wall.
- c. Remove attaching hardware securing defective mounting bracket to floor.
- d. Remove defective mounting bracket.
- e. Secure new mounting bracket to wall with attaching hardware.
- f. Secure new mounting bracket to floor with attaching hardware.
- g. Reinstall portable tracing/scribing board.

3-17. PREPARATION FOR STORAGE OR SHIPMENT. Contact your battalion for packing and shipping instructions.

Section V DIRECT/GENERAL SUPPORT MAINTENANCE

There are no direct/ general support maintenance procedures assigned for this equipment.



CHAPTER 4

PORTABLE FILM VIEWER

Section I INTRODUCTION

4-1. GENERAL INFORMATION.

4-1.1 Scope.

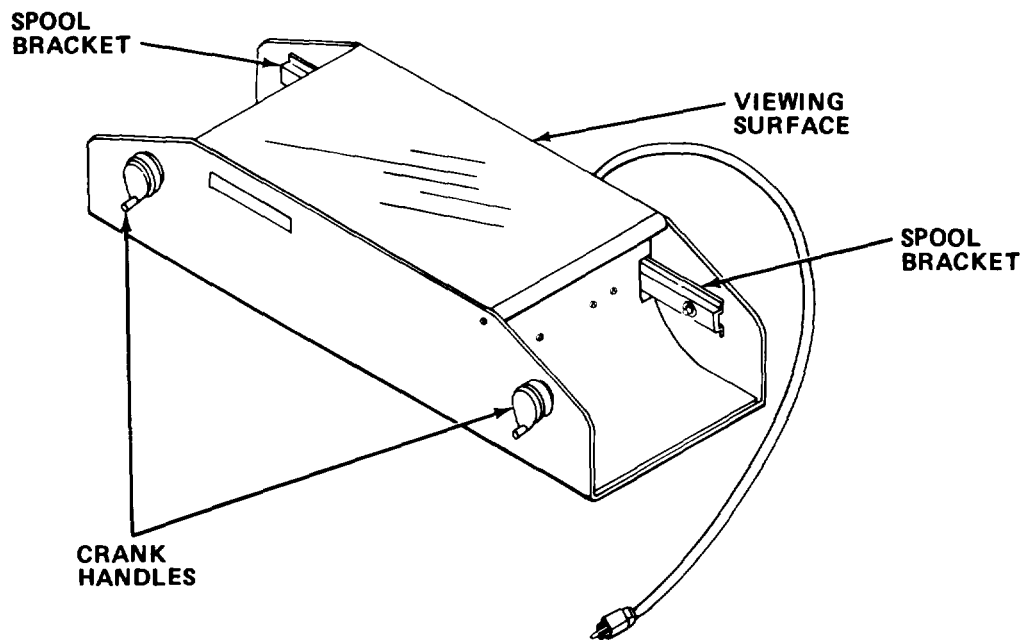
- a. Model Number and Equipment Name. Model 72-0210 Portable Film Viewer.
- b. Purpose of Equipment. To provide a lightweight, portable viewing surface for viewing roll or strip aerial film.

4-2. EQUIPMENT DESCRIPTION.

4-2.1 Equipment Characteristics, Capabilities, and Features.

- a. Lightweight.
- b. Portable.
- c. Viewing surface.

4-2.2 Location and Description of Major Components.



VIEWING SURFACE. Lighted surface to view film.

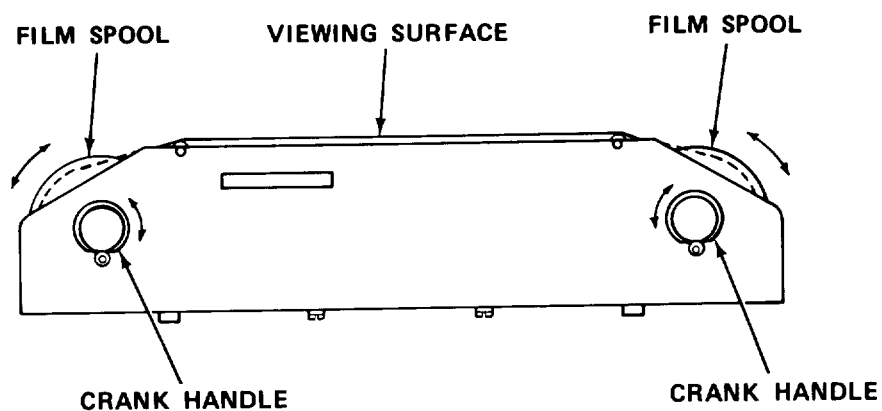
SPOOL BRACKETS. Holds film spools.

CRANK HANDLES. Used to move film spool.

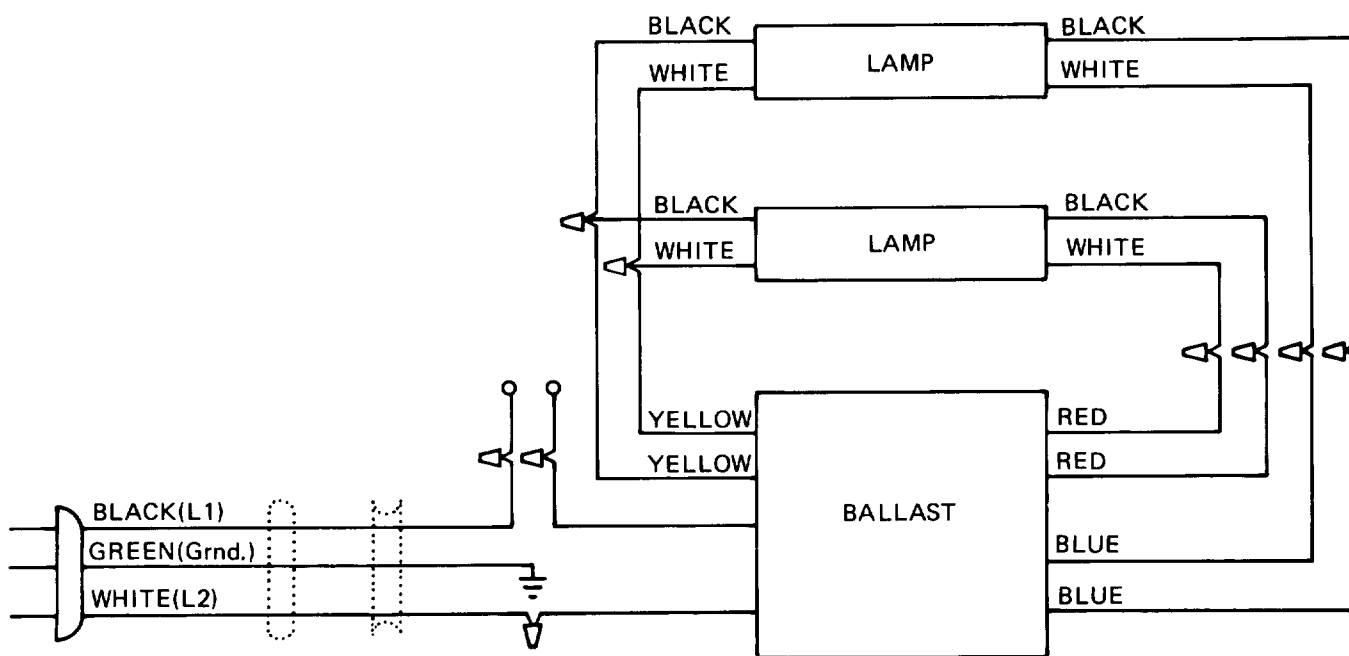
4-2.3 Equipment Data.

Power Requirements	110 V, 60 Hz
Viewing Area	11.0 in. X 19.0 in. (27.9 cm x 48.3 cm)
Film Size	
Width	9.5 in. (24.1 cm), max
Length	500 ft (152 m)
Weight	28.0 lbs (12.7 kg)

4-3. TECHNICAL PRINCIPLES OF OPERATION.



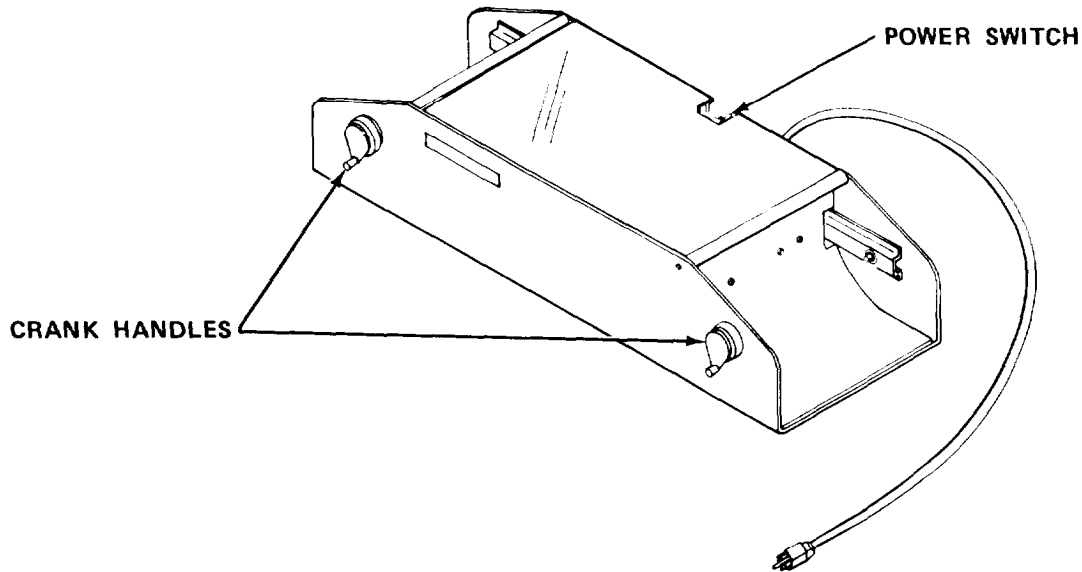
4-3.1 General. Operator manually moves roll of aerial film between film spools by turning crank handles. Film is viewed on lighted viewing surface.



4-3.2 Electrical System. Power switch controls 120 V, 60 Hz power for ballast transformer to light two fluorescent lamps.

Section II OPERATING INSTRUCTIONS

4-4. DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND INDICATORS.



Control or Indicator	Function
Power Switch	Controls power to fluorescent lamps.
Crank Handles	Spring-loaded to hold film spools. Rotated to move film over viewing surface.

4-5. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES.

- a. Before You Operate. Always keep in mind the WARNINGS and CAUTIONS. Perform your before (B) PMCS.
- b. While You Operate. Always keep in mind the WARNINGS and CAUTIONS. Perform your during (D) PMCS.
- c. After You Operate. Be sure to perform your after (A) PMCS.
- d. If Your Equipment Fails to Operate. Troubleshoot with proper equipment. Report any deficiencies using the proper forms. See DA Pam 738-750.

4-5.1 PMCS Procedures.

- a. PMCS are designed to keep the equipment in good working condition by performing periodic service tasks.
- b. Service intervals provide you, the operator, with time schedules that determine when to perform specified service tasks.
- c. The "Equipment is Not Ready/Available If" column is used for identification of conditions that make the equipment not ready/available for readiness reporting purposes or denies use of the equipment until corrective maintenance is performed.
- d. If your equipment fails to operate after PMCS is performed, immediately report this condition to your supervisor.
- e. Perform weekly as well as before operation if you are the assigned operator and have not operated the item since the last weekly or if you are operating the item for the first time.
- f. Item number column. Item numbers are assigned in chronological ascending sequence regardless of interval designation. These numbers are used for your "TM Number" Column on DA Form 2404, Equipment Inspection and Maintenance Worksheet in recording results of PMCS.
- g.** Interval columns. This column determines the time period designated to perform your PMCS.
- h. Item to be inspected and procedures column. This column lists functional groups and their respective assemblies and subassemblies as shown in the Maintenance Allocation Chart (Appendix B). The appropriate check or service procedure follows the specific item to be inspected.
- i. Equipment is not ready/available if: column. This column indicates the reason or cause why your equipment is not ready/available to perform its primary mission.
- j. List of tools and materials required for PMCS is as follows:

<u>Item</u>	<u>Quantity</u>
Cheesecloth (Item 5, Appendix E)	ar
Lens Cleaner (Item 4, Appendix E)	ar
Silicone Spray (Item 19, Appendix E)	ar

Table 4-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES

NOTE

If the equipment must be kept in continuous operation, check and service only those items that can safely be checked and serviced without disturbing operation. Make the complete checks and services when the equipment can be shut down.

B - Before
D - During
A - After

W - Weekly
M - Monthly
Q - Quarterly

AN - Annually
S - Semiannually
BI - Biennially

(Number) - Hundreds of Hours

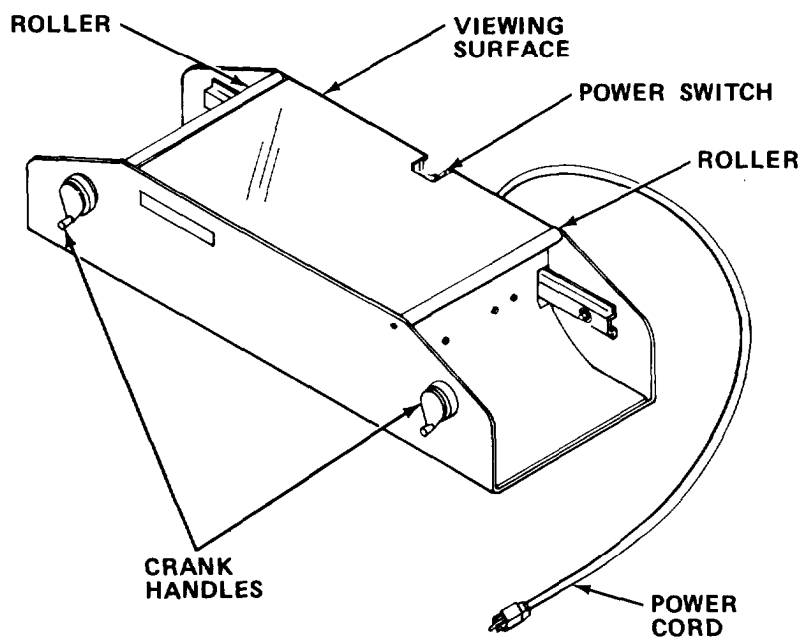
ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
1	B	<p><u>PORTABLE FILM VIEWER</u></p> <p><u>Inspect Viewer.</u></p>  <p>1. Inspect power cord for kinks, breaks, or burns.</p>	Defective power cord.

Table 4-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before
D - During
A - After

W - Weekly
M - Monthly
Q - Quarterly

AN - Annually
S - Semiannually
BI - Biennially

(Number) - Hundreds of Hours

ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
1	B	<p><u>PORTABLE FILM VIEWER - Cont</u></p> <p><u>Inspect Viewer - Cont</u></p> <p style="text-align: center;"><u>WARNING</u></p> <p>Death or serious injury may occur if portable film viewer is operated with defective power cord.</p> <ol style="list-style-type: none"> 2. Plug in power cord. 3. Turn power switch ON. 4. Observe even lighting of viewing surface. 5. Turn power switch OFF. 6. Unplug power cord. 7. Rotate crank handles to right and left. Observe free rotation. 8. Check rollers for free movement. 9. Pull crank handles away from viewer. Spring tension will return handles to original position when released. 10. Turn power switch OFF. 11. Unplug power cord. 	

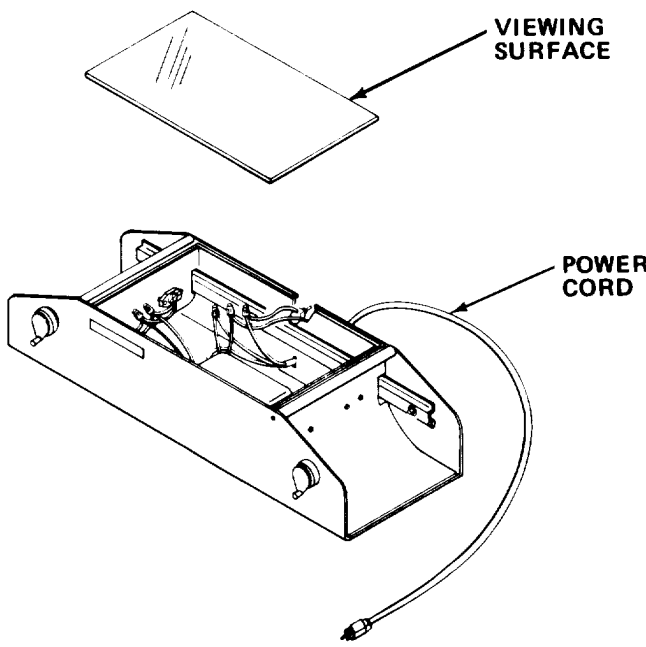
Table 4-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before
D - During
A - After

W - Weekly
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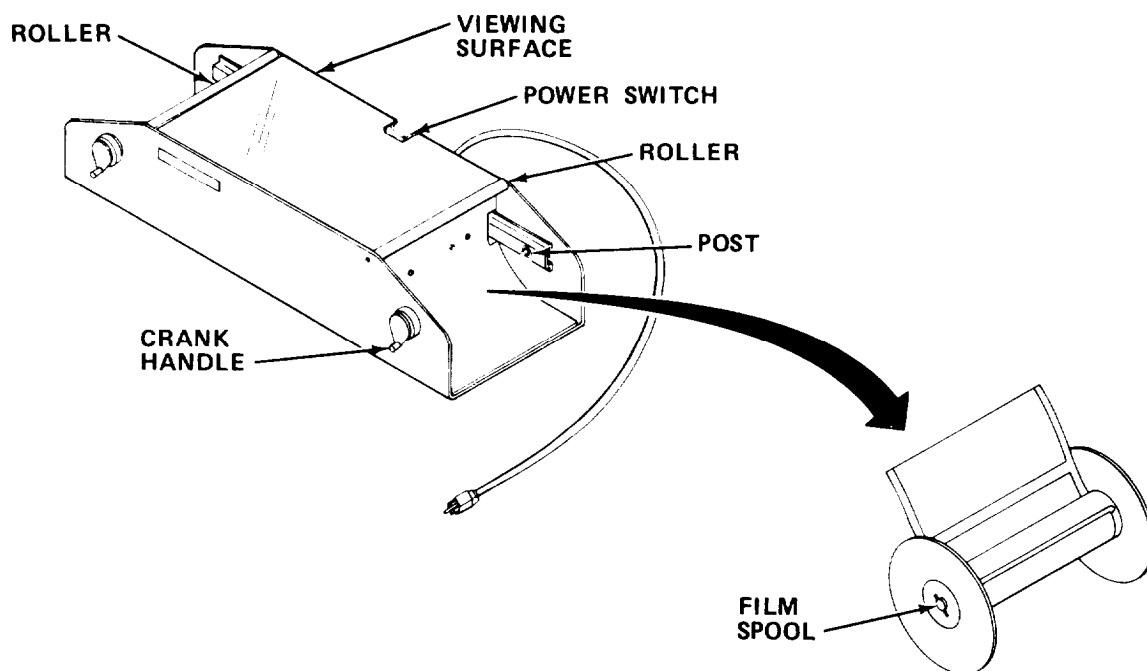
ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
2	B	<p><u>PORTABLE FILM VIEWER - Cont</u></p> <p><u>Clean Viewing Surface.</u></p> <p style="text-align: center;"><u>WARNING</u></p> <p>Death or serious injury may occur from electrical shock if power cord is not unplugged before servicing.</p>  <p>1. Unplug power cord.</p> <p>2. Lift viewing surface from viewer.</p> <p>3. Wipe viewing surface with cheesecloth dampened with lens cleaner.</p> <p>4. Dry viewing surface with dry cheesecloth.</p> <p>5. Reinstall viewing surface.</p>	

4-6. OPERATION UNDER USUAL CONDITIONS.

4-6.1 Operating Procedures.CAUTION

Hold viewing surface in place when viewer is removed from mounting bracket to prevent damage to viewing surface.

- a. Remove film viewer from mounting bracket and place film viewer on available work surface.
- b. Plug power cord into electrical receptacle.



- c. Pull crank handle away from viewer and insert film spool on post. Then release crank handle and engage film spool.

NOTE

Either left or right end of viewer may be used, depending on operator's preference and which film spool has film wound on it. Care must be taken to be certain film is not viewed from wrong side.

- d. Pull film from spool over rollers.

e. Thread film on empty film spool and rotate crank handles to draw film tightly over viewing surface.

NOTE

Film must be over rollers and tight to provide undistorted view.

- f. Turn power switch ON.
- g. Rotate crank handles to draw film in desired direction.
- h. On completion of task, rewind film.
- i. Turn power switch OFF.
- j. Remove film spool by pulling crank handles away from viewer and lifting spool free.
- k. Store film and spools.
- 1. Unplug power cord.

CAUTION

Hold viewer surface in place when viewer is placed in mounting bracket to prevent damage to viewing surface.

- m. Store viewer in mounting bracket.

4-6.2 Preparation for Movement.

- a. Turn power switch OFF.
- b. Unplug power cord.
- c. Wrap and tape power cord.

CAUTION

Hold viewing surface in place when viewer is placed in mounting bracket to prevent damage to viewing surface.

- d. Mount and secure viewer in mounting bracket.

4-7. OPERATION UNDER UNUSUAL CONDITIONS. This equipment is designed for operation only in a controlled environment.

Section III OPERATOR MAINTENANCE

4-8. LUBRICATION INSTRUCTIONS.

NOTE

These lubrication instructions are mandatory.

4-8.1 Rollers. Apply silicone spray (Item 19, Appendix E) monthly to roller cranks, handles, and shafts.

4-9. TROUBLESHOOTING PROCEDURES.

a. The table lists the common malfunctions which you may find during operation or maintenance of the portable film viewer or its components. You should perform the test/inspections and corrective actions in the order listed.

b. This manual cannot list all malfunctions that may occur, nor all test or inspections and corrective actions. If a malfunction is not listed or is not corrected by listed corrective actions, notify your supervisor.

Table 4-2. TROUBLESHOOTING

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
1. FLUORESCENT LAMP DIMS OR FLICKERS.		Raise cover to determine which fluorescent lamp is defective. Replace fluorescent lamp (paragraph 4-10.1).
2. FLUORESCENT LAMPS FLICKER.		Raise cover to gain access to defective fluorescent lamps. (a) Replace defective fluorescent lamps (paragraph 4-10.1). (b) If fluorescent lamps continue to flicker, refer to organizational maintenance.

Table 4-2. TROUBLESHOOTING - Cont

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

3. FLUORESCENT LAMPS DO NOT LIGHT.

Step 1. Check that power cord is plugged in.

- (a) If plugged in, proceed to step 2.
- (b) If unplugged, plug in.

Step 2. Check that power switch is ON.

- (a) If switch is OFF, turn ON.
- (b) If switch is ON, refer to organizational maintenance.

4-10. MAINTENANCE PROCEDURES.

a. This section contains instructions covering operator maintenance functions for the portable film viewer. Personnel required are listed only if the task requires more than one.

b. After completing each maintenance procedure, perform operational check to be sure that equipment is properly functioning.

INDEX

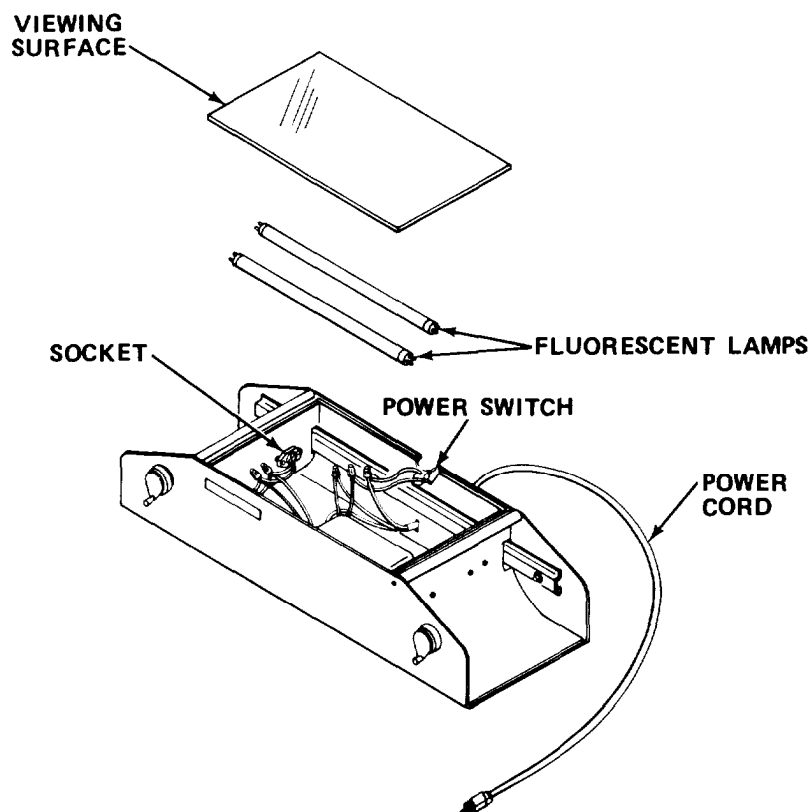
PROCEDURE	PARAGRAPH
Replace Fluorescent Lamp	4-10.1

4-10.1 Replace Fluorescent Lamp.

MOS: 81C, Cartographer

TOOLS: None

SUPPLIES: Fluorescent Lamp



WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

- a. Turn power switch OFF.
- b. Unplug power cord.
- c. Remove viewing surface and set aside.
- d. Remove defective fluorescent lamp by moving it toward spring-loaded socket until prongs clear larger socket. Then remove fluorescent lamp.

- e. Install new fluorescent lamp by inserting prongs in holes in spring-loaded socket. Push fluorescent lamp toward socket until prongs at other end are aligned with holes in larger socket. Release pressure to seat fluorescent lamp.
- f. Reinstall viewing surface.
- g. Plug in power cord.
- h. Turn power switch ON.

Section IV ORGANIZATIONAL MAINTENANCE

4-11. LUBRICATION INSTRUCTIONS. This equipment does not require lubrication at this maintenance level.

4-12. REPAIR PARTS, SPECIAL TOOLS; TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT; AND SUPPORT EQUIPMENT.

4-12.1 Common Tools and Equipment. For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

4-12.2 Special Tools; Test, Measurement, and Diagnostic Equipment; and Support Equipment. Special Tools, TMDE, and Support Equipment is listed in the applicable repair parts and special tools list and in Appendix B of this manual.

4-12.3 Repair Parts. Repair parts are listed and illustrated in the Repair Parts and Special Tools List, TM 5-6675-313-24P covering organizational maintenance for this equipment.

4-13. SERVICE UPON RECEIPT,

4-13.1 Checking Unpacked Equipment.

a. Inspect the equipment for damage incurred during shipment. If equipment has been damaged, report the damage on DD Form 6, Packing Improvement Report.

b. Check the equipment against the packing list to see if the shipment is complete. Report all discrepancies in accordance with the instructions of DA Pam 738-750.

c. Check to see whether the equipment has been modified.

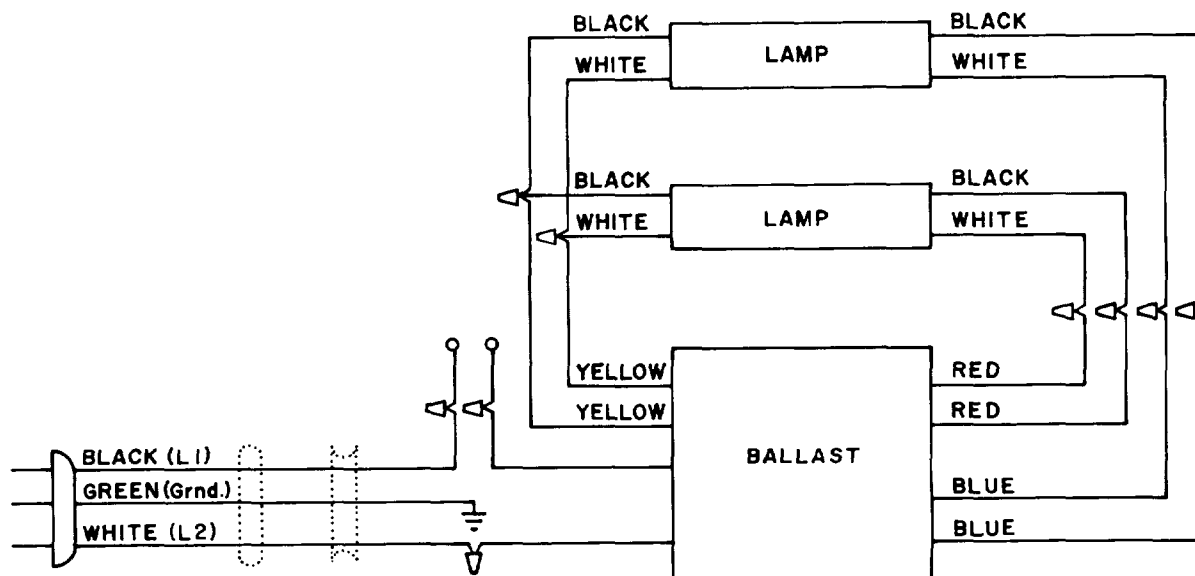
4-14. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES. There are no organizational PMCS procedures assigned for this equipment.

4-15. ORGANIZATIONAL TROUBLESHOOTING PROCEDURES.

a. Organizational troubleshooting procedures cover the most common malfunctions that may be repaired at the organizational level. Repair or adjustment requiring specialized equipment is not authorized unless such equipment is available. Troubleshooting procedures used by lower level maintenance should be conducted in addition to the organizational troubleshooting procedures.

b. This manual cannot list all the possible malfunctions or every possible test/inspection and corrective action. If a malfunction is not listed or corrected by a listed corrective action, notify your supervisor.

c. For unidentified malfunctions, use the following schematic or the foldout located at the end of this manual for further fault analysis.



d. If any component of the portable film viewer does not power-up when turned on, verify that 120 V ac is present at the receptacle. If voltage is not present, plug equipment into receptacle with power available and proceed with equipment troubleshooting. Perform no-power procedures for dead receptacle (Table 1-4).

Table 4-2. ORGANIZATIONAL TROUBLESHOOTING

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
		<hr/>
1. FLUORESCENT LAMPS FLICKER.		
		Raise cover to gain access to ballast transformer.
		Replace ballast transformer (paragraph 4-16.2).
2. FLUORESCENT LAMPS ARE NOT LIT.		
		Check continuity of power switch.
		(a) If continuity exists, replace ballast transformer (paragraph 4-16.2).
		(b) If no continuity exists, replace power switch (paragraph 4-16.1).

4-16. MAINTENANCE PROCEDURES.

a. This section contains instructions covering organizational maintenance functions for the portable film viewer. Personnel required are listed only if the task requires more than one.

b. After completing each maintenance procedure, perform operational check to be sure that equipment is properly functioning.

I N D E X

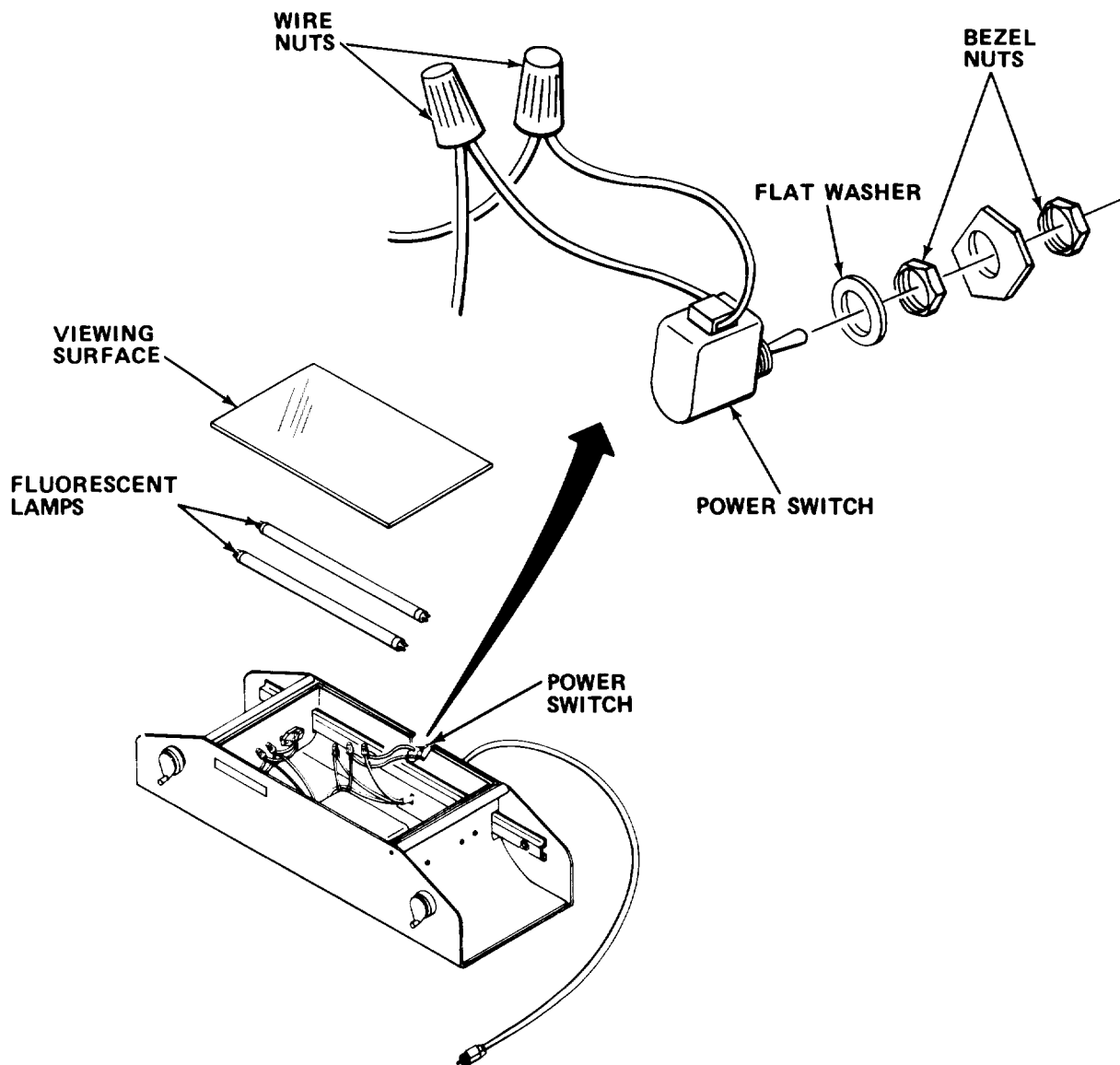
PROCEDURE	PARAGRAPH
Replace Power Switch	4-16.1
Replace Ballast Transformer	4-16.2
Remove/Install Portable Film Viewer Mounting Assembly	4-16.3

4-16.1 Replace Power Switch.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: 9/16 in. Combination Wrench

SUPPLIES: Power Switch



WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

- a. Turn power switch OFF.

- b. Unplug power cord.
- c. Lift viewing surface and set aside.
- d. Remove fluorescent lamps and set aside.
- e. Disconnect wiring at wire nuts.
- f. Remove outer bezel nut securing power switch to portable film viewer.
Remove power switch.
- g. Note position of inner bezel nut and remove from defective power switch.
Install inner bezel nut on new power switch close to the noted position.
- h. Insert new power switch through portable film viewer and secure with
outer bezel nut.
- i. Reconnect wiring.
- j. Reinstall fluorescent lamps.
- k. Reinstall viewing surface.
- l. Plug in power cord.
- m. Turn power switch ON.

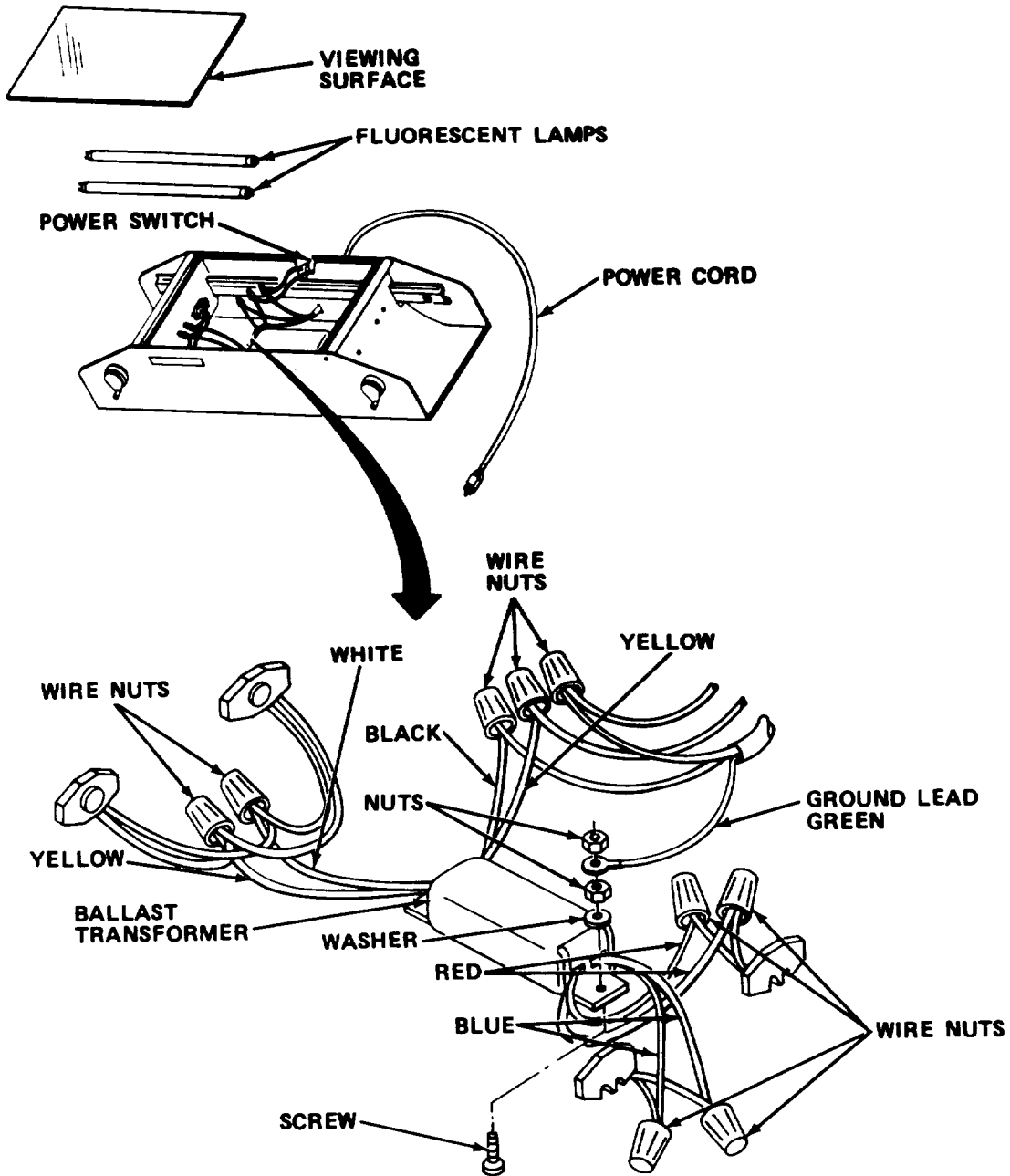
TM 5-6675-313-14

4-16.2 Replace Ballast Transformer.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Flat Tip Screwdriver
5/16 in. Wrench
9mm Combination Wrench

SUPPLIES: Ballast Transformer
Wire Ties
Wire Nuts



WARNING

Death or serious injury may occur from electrical shock unless power is unplugged before servicing.

- a. Turn power switch OFF.
- b. Unplug power cord.
- c. Lift viewing surface and set aside.
- d. Remove fluorescent lamps and set aside.
- e. Tag and disconnect wires at wire nuts.

NOTE

Before removing any wire nuts, make note of electrical lead colors and routing to wire nuts.

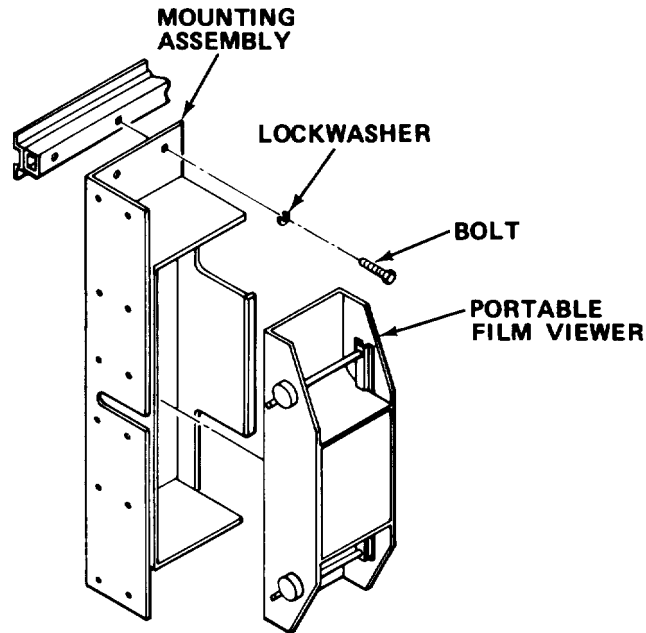
- f. Remove wire ties.
- g. Remove ground lead attaching nut from left side of ballast transformer bracket and remove lead.
- h. Remove screws, washers, and nuts from ballast transformer bracket and remove defective ballast transformer.
- i. Install new ballast transformer in correct position (noting wire colors), and secure brackets in place with nuts, washers, and screws.
- j. Reconnect ground lead to transformer bracket screw and secure with nut.
- k. Connect wires. Secure with wire nuts.
- l. Secure wire bundles with new wire ties.
- m. Reinstall fluorescent lamps.
- n. Reinstall viewing surface.
- o. Plug in power cord.
- p. Turn power switch ON.

4-16.3 Remove/Install Portable Film Viewer Mounting Assembly.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: 1/2 in. Socket, 1/4 in. Drive
1/4 in. Drive Ratchet

SUPPLIES: Portable Film Viewer Mounting Assembly

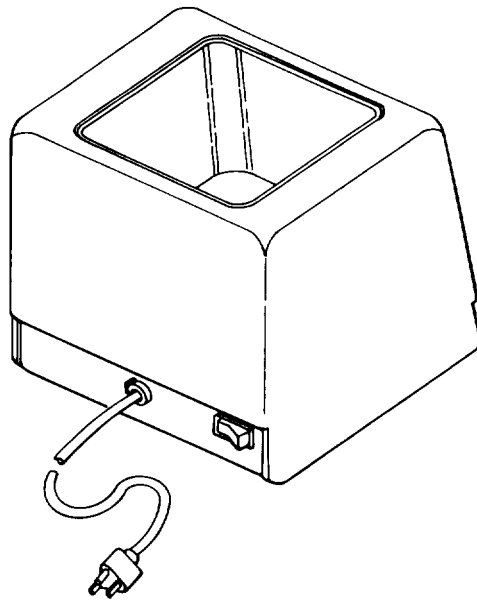


- a. Remove portable film viewer.
- b. Remove bolts and lockwashers holding defective mounting assembly to wall.
- c. Install new portable film viewer mounting assembly and secure with lockwashers and bolts.
- d. Reinstall portable film viewer in mounting assembly.

4-17. PREPARATION FOR STORAGE OR SHIPMENT. Contact your battalion for packing and shipping instructions.

Section V DIRECT/GENERAL SUPPORT MAINTENANCE

There are no direct/general support maintenance procedures assigned for this equipment.



CHAPTER 5

ULTRASONIC CLEANER

Section 1 INTRODUCTION

5-1. GENERAL INFORMATION.

5-1.1 Scope.

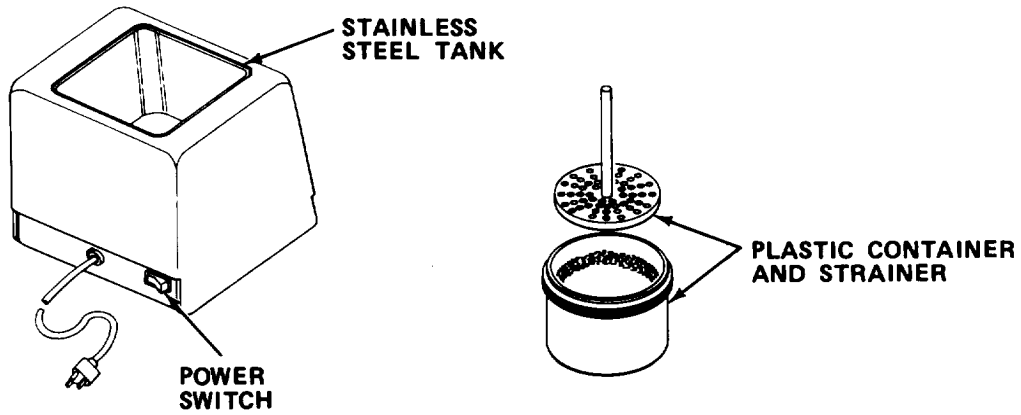
- a. Model Number and Equipment Name. Model 3069USC3 Ultrasonic Cleaner
- b. Purpose of Equipment. To clean drafting/drawing pens.

5-2. EQUIPMENT DESCRIPTION.

5-2.1 Equipment Characteristics, Capabilities, and Features.

- a. Cleans without disassembly.
- b. Removes dried ink.
- c. Portable.

5-2.2 Location and Description of Major Components.



STAINLESS STEEL TANK. Holds water.

PLASTIC CONTAINER AND STRAINER. Holds small parts in solution for cleaning.

POWER SWITCH. Turns machine ON or OFF.

5-2.3 Equipment Data.

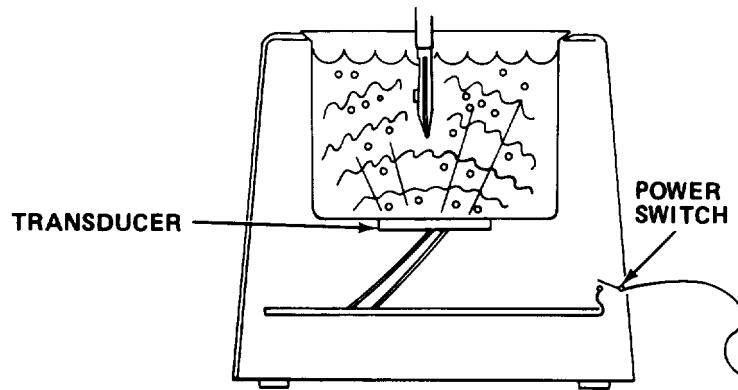
Weight

5.51 lbs (2.5 kg)

Power Requirements

115 V, 60 Hz,
60 W

5-3. TECHNICAL PRINCIPLES OF OPERATION.

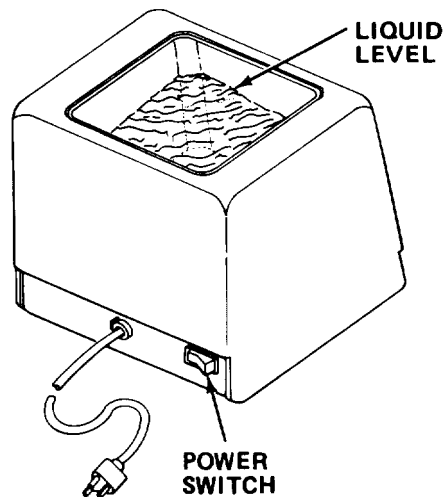


POWER SWITCH. When turned ON, provides power to the transducer.

TRANSDUCER. Generates ultrahigh frequency sound waves.

Section II OPERATING INSTRUCTIONS

5-4. DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND INDICATORS.



Control or Indicator	Function
Liquid Level	Level of liquid in stainless steel tank must be 1/3 full.
Power Switch	Turns power on or off.

TM 5-6675-313-14

5-5. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES.

- a. Before You Operate. Always keep in mind the WARNINGS and CAUTIONS. Perform your before (B) PMCS.
- b. While You Operate. Always keep in mind the WARNINGS and CAUTIONS. Perform your during (D) PMCS.
- c. After You Operate. Be sure to perform your after (A) PMCS.
- d. If Your Equipment Fails to Operate. Troubleshoot with proper equipment. Report any deficiencies using the proper forms. See DA Pam 738-750.

5-5.1 PMCS Procedures.

- a. PMCS are designed to keep the equipment in good working condition by performing periodic service tasks.
- b. Service intervals provide you, the operator, with time schedules that determine when to perform specified service tasks.
- c. The "Equipment is Not Ready/Available If" column is used for identification of conditions that make the equipment not ready/available for readiness reporting purposes or denies use of the equipment until corrective maintenance is performed.
- d. If your equipment fails to operate after PMCS is performed, immediately report this condition to your supervisor.
- e. Perform weekly as well as before operation if you are the assigned operator and have not operated the item since the last weekly or if you are operating the item for the first time.
- f. Item number column. Item numbers are assigned in chronological ascending sequence regardless of interval designation. These numbers are used for your "TM Number" Column on DA Form 2404, Equipment Inspection and Maintenance Worksheet in recording results of PMCS.
- g. Interval columns. This column determines the time period designated to perform your PMCS.
- h. Item to be inspected and procedures column. This column lists functional groups and their respective assemblies and subassemblies as shown in the Maintenance Allocation Chart (Appendix B). The appropriate check or service procedure follows the specific item to be inspected.
- i. Equipment is not ready/available if: column. This column indicates the reason or cause why your equipment is not ready/available to perform its primary mission.
- j. List of tools and materials required for PMCS is as follows:

<u>Item</u>	<u>Quantity</u>
Cheesecloth (Item 5, Appendix E)	ar

Table 5-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES

NOTE

If the equipment must be kept in continuous operation, check-and service only those items that can safely be checked and serviced without disturbing operation. Make the complete checks and services when the equipment can be shut down.

B - Before
D - During
A - After

W - Weekly
M - Monthly
Q - Quarterly

AN - Annually
S - Semiannually
BI - Biennially

(Number) - Hundreds of Hours

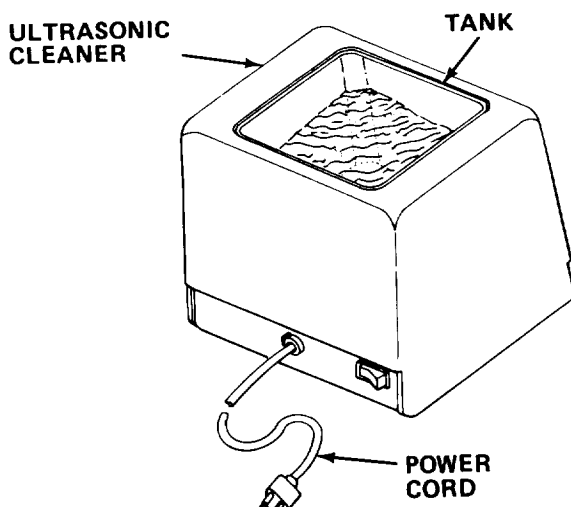
ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
1	B	<p><u>ULTRASONIC CLEANER</u></p> <p><u>Inspect Cleaner.</u></p> <p style="text-align: center;"><u>WARNING</u></p> <p>Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.</p> <div style="text-align: center;">  <p>The diagram shows a rectangular ultrasonic cleaner. A label 'ULTRASONIC CLEANER' points to the main unit. A label 'TANK' points to the open top of the unit, which contains a liquid. A label 'POWER CORD' points to the power cord and plug attached to the bottom of the unit.</p> </div>	

Table 5-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before
D - During
A - After

W - Weekly
M - Monthly
Q - Quarterly

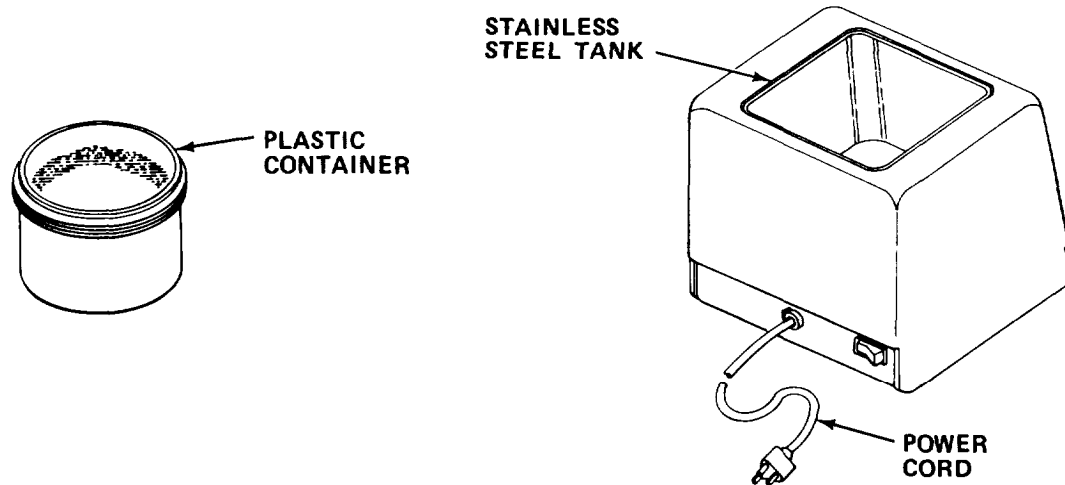
AN - Annually
S - Semiannually
BI - Biennially

(Number) - Hundreds of Hours

ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
1	B	<p><u>ULTRASONIC CLEANER - Cont</u></p> <p><u>Inspect Cleaner - Cont</u></p> <ol style="list-style-type: none"> 1. Check power cord for kinks, frays, or burns. If power cord is defective, notify organizational maintenance. 2. Check tank for dirt or chemical residue. Clean tank by wiping with cheesecloth moistened with water. 3. Check for agitation of water surface. 	<p>Power cord is damaged.</p> <p>Water surface is not agitating.</p>

5-6. OPERATION UNDER USUAL CONDITIONS.

5-6.1 Operating Procedure

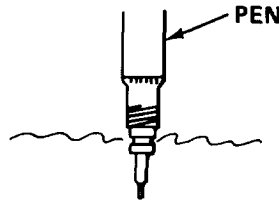


- a. Fill stainless steel tank 1/3 full with fresh, clean water. Fill plastic container with water to within 1/2 in. (12.7 mm) of top.
- b. Add .135 oz (4 ml) of cleaning solution to plastic container.
- c. Plug in power cord to 120 V, 60 Hz grounded outlet.
- d. Turn power on. Be sure water surface in stainless steel tank is agitating.

WARNING

Do not place fingers in stainless steel tank when ultrasonic cleaner is operating. Cleaning solution may be driven through skin or ultrasonic waves may cause injury to body tissue.

- e. Prepare cleaning solution by operating ultrasonic cleaner for one minute before cleaning pen tips.



CAUTION

Do not immerse pen beyond cap threads. Damage to pen may result.

- f. Dip pen about 3/4 in. (19 mm) in cleaning solution.
- g. Lift pen from cleaning solution. Keeping point downward, shake solution from pen onto cheesecloth (Item 5, Appendix E).
- h. Wipe pen.
- i. Draw pen over scrap paper until ink flows freely and shows uniform color.
- j. Turn power off. Unplug power cord.
- k. Dispose of cleaning solution when dirty.

CAUTION

Avoid getting water into body of ultrasonic cleaner. Damage to circuit board can result.

- l. Carefully rinse stainless steel tank.
- m. Wipe stainless steel tank dry with cheesecloth (Item 5, Appendix E).

5-7. OPERATION UNDER UNUSUAL CONDITIONS. This equipment is designed for operation only in a controlled environment.

Section III OPERATOR MAINTENANCE

5-8. LUBRICATION INSTRUCTIONS. This equipment does not require lubrication.

5-9. TROUBLESHOOTING PROCEDURES. There are no operator troubleshooting procedures assigned for this equipment.

5-10. MAINTENANCE PROCEDURES. Operator maintenance is limited to performance of regular preventive maintenance checks and services and replenishment of cleaning solution.

Section IV ORGANIZATIONAL MAINTENANCE

5-11. LUBRICATION INSTRUCTIONS. This equipment does not require lubrication.

5-12. REPAIR PARTS, SPECIAL TOOLS; TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT; AND SUPPORT EQUIPMENT

5-12.1 Common Tools and Equipment. For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

5-12.2 Special Tools; Test, Measurement, and Diagnostic Equipment; and Support Equipment. Special Tools, TMDE, and Support Equipment is listed in the applicable repair parts and special tools list and in Appendix B of this manual.

5-12.3 Repair Parts. Repair parts are listed and illustrated in the Repair Parts and Special Tools List, TM 5-6675-313-24P covering organizational maintenance for this equipment.

5-13. SERVICE UPON RECEIPT.

5-13.1 Checking Unpacked Equipment.

- a. Inspect the equipment for damage incurred during shipment. If equipment has been damaged, report the damage on DD Form 6, Packing Improvement Report.
- b. Check the equipment against the packing list to see if the shipment is complete. Report all discrepancies in accordance with the instructions of DA Pam 738-750.
- c. Check to see whether the equipment has been modified.

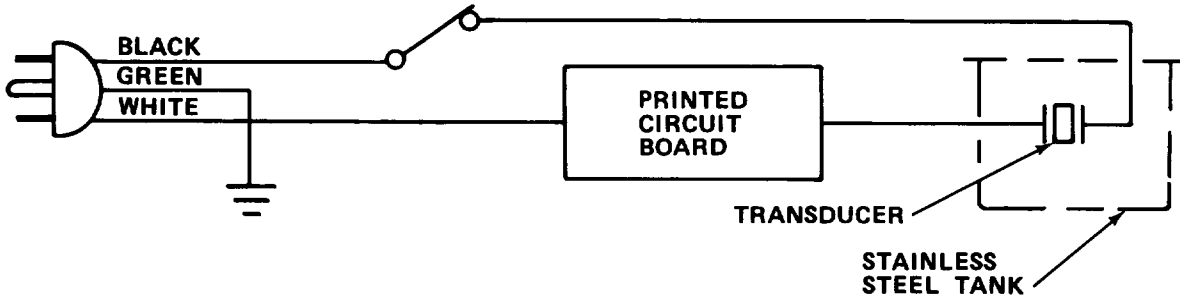
5-14. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES. There are no organizational PMCS procedures assigned for this equipment.

5-15. ORGANIZATIONAL TROUBLESHOOTING PROCEDURES.

- a. Organizational troubleshooting procedures cover the most common malfunctions that may be repaired at the organizational level. Repair or adjustment requiring specialized equipment is not authorized unless such equipment is available. Troubleshooting procedures used by the operator should be conducted *in addition* to the organizational troubleshooting procedures.

b. This manual cannot list all the possible malfunctions or every possible test/inspection and corrective action. If a malfunction is not listed or corrected by a listed corrective action, notify your supervisor.

c. For unidentified malfunctions, use the following schematic or the foldout located at the end of this manual for further fault analysis.



d. If the ultrasonic cleaner does not power up when turned on, verify that 120 V ac is present at the receptacle. If voltage is not present, plug equipment into receptacle with power available and proceed with equipment troubleshooting. Perform no-power procedure for dead receptacle (Table 1-4).

Table 5-2. ORGANIZATIONAL TROUBLESHOOTING

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION
1. NO CLEANING ACTION, WATER AGITATES.
Check cleaning action using fresh cleaning solution.
(a) If test was satisfactory, instruct operator to change cleaning solution when dirty.
(b) If test was not satisfactory, replace circuit board (paragraph 5-16.3).
2. NO WATER AGITATION.
Step 1. Using multimeter, check for continuity of power cord.
(a) If continuity exists, proceed to step 2.
(b) If continuity does not exist, replace power cord (paragraph 5-16.1).

Table 5-2. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
2. NO WATER AGITATION - Cont	Step 2. Check continuity of power switch.	(a) If continuity does not exist, replace power switch (paragraph 5-16.2). (b) If continuity does exist, replace circuit board (paragraph 5-16.3).

5-16. MAINTENANCE PROCEDURES.

a. This section contains instructions covering organizational maintenance functions for the ultrasonic cleaner. Personnel required are listed only if the task requires more than one.

b. After completing each maintenance procedure, perform operational check to be sure that equipment is properly functioning.

INDEX

PROCEDURE	PARAGRAPH
Replace Power Cord	5-16.1
Replace Power Switch	5-16.2
Replace Circuit Board	5-16.3

5-16.1 Replace Power Cord.

MOS: 41B, Topographic Instrument Repair Specialist

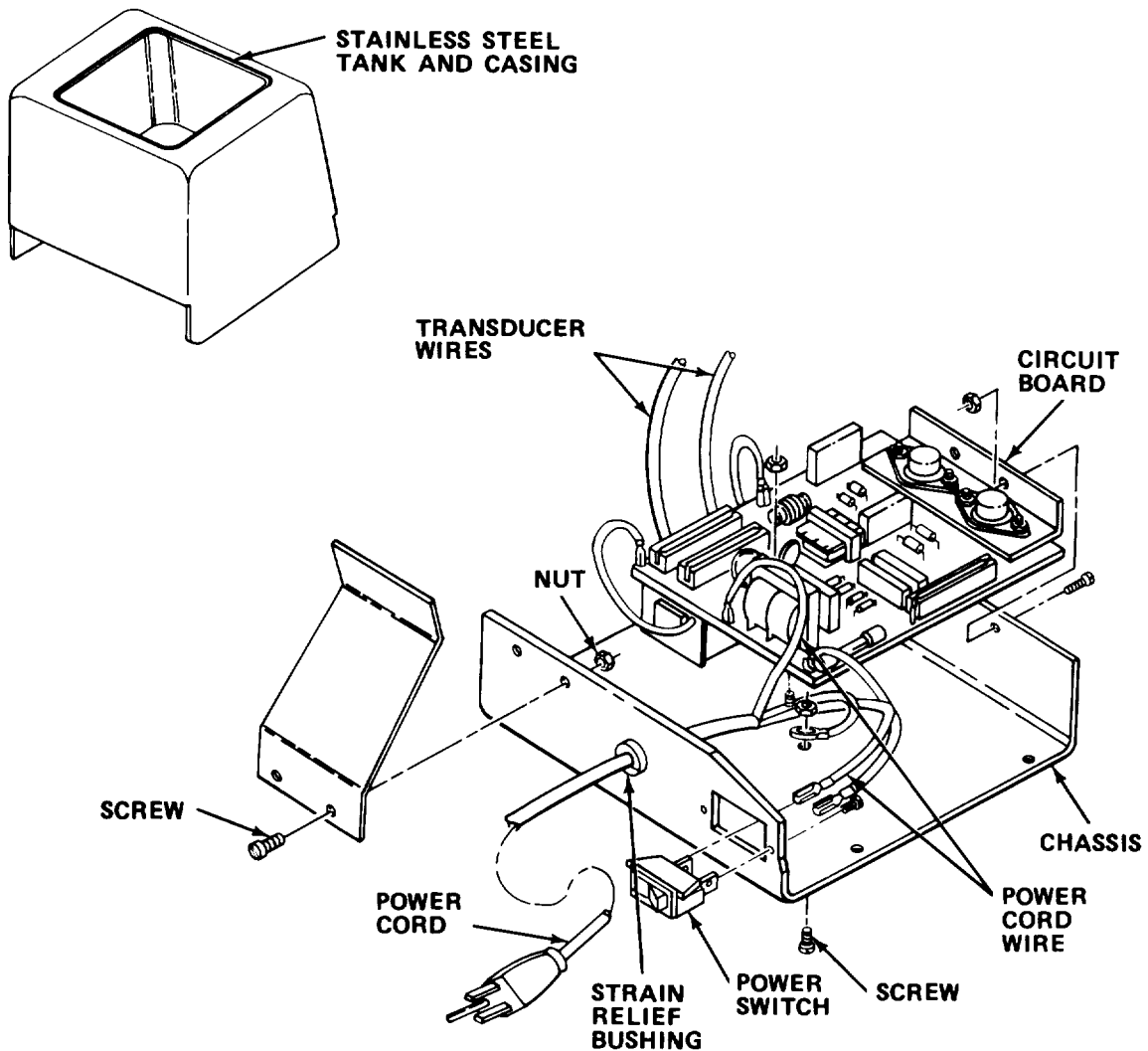
TOOLS: Flat Tip Screwdriver

SUPPLIES: Power Cord
Wire Clips

WARNING

Death or serious injury may occur if power cord is not unplugged before servicing.

- a. Turn power off. Unplug power cord.



- b. Remove screws and washers holding stainless steel tank and casing to chassis.
- c. Lift stainless steel tank and casing free. Set aside.

NOTE

Do not disconnect wires to transducer.

- d. Remove three screws, one nut, and one washer holding circuit board to chassis.
- e. Disconnect power cord wire from power switch, chassis ground, and circuit board.
- f. Loosen strain relief bushing from chassis and remove defective power cord.
- g. Install strain relief bushing on new power cord. Insert terminal ends of cord into chassis.
- h. Fit strain relief bushing into chassis.
- i. Reconnect power cord wire to circuit board, chassis, and power switch.
- j. Reinstall circuit board into chassis and secure with one washer, one nut, and three screws.
- k. Reinstall stainless steel tank and casing. Secure with screws and washers.
- l. Fill stainless steel tank 1/3 full with water.
- m. Plug in power cord and turn power on. Check that water surface agitates.

TM 5-6675-313-14

5-16.2 Replace Power Switch.

MOS: 41B, Topographic Instrument Repair Specialist

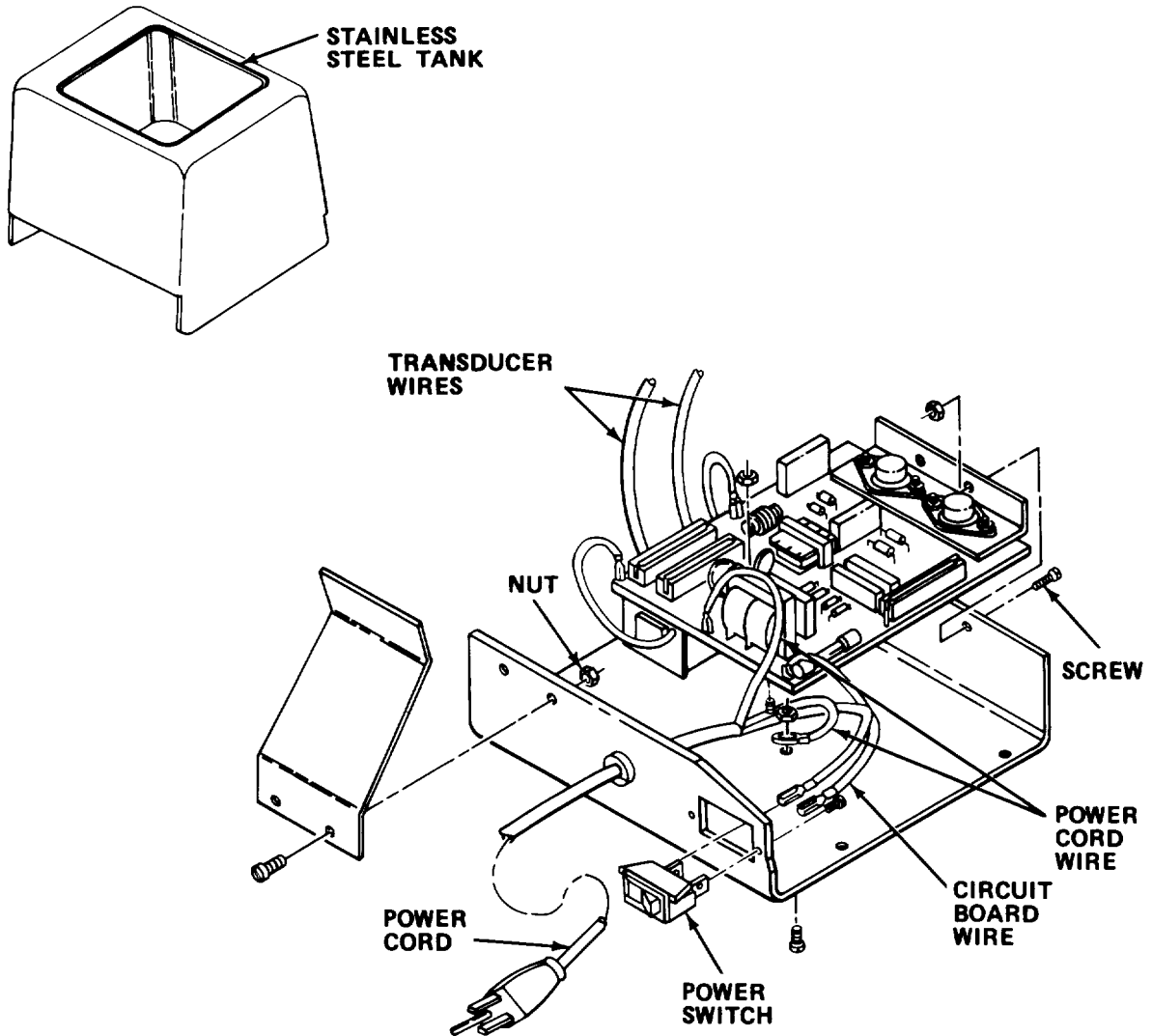
TOOLS: Flat Tip Screwdriver

SUPPLIES: Switch

WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

- a. Turn power off and unplug power cord.



- b. Remove screws and washers holding stainless steel tank and casing to chassis.
- c. Lift stainless steel tank and casing free. Set aside.

NOTE

Do not disconnect wires to transducer.

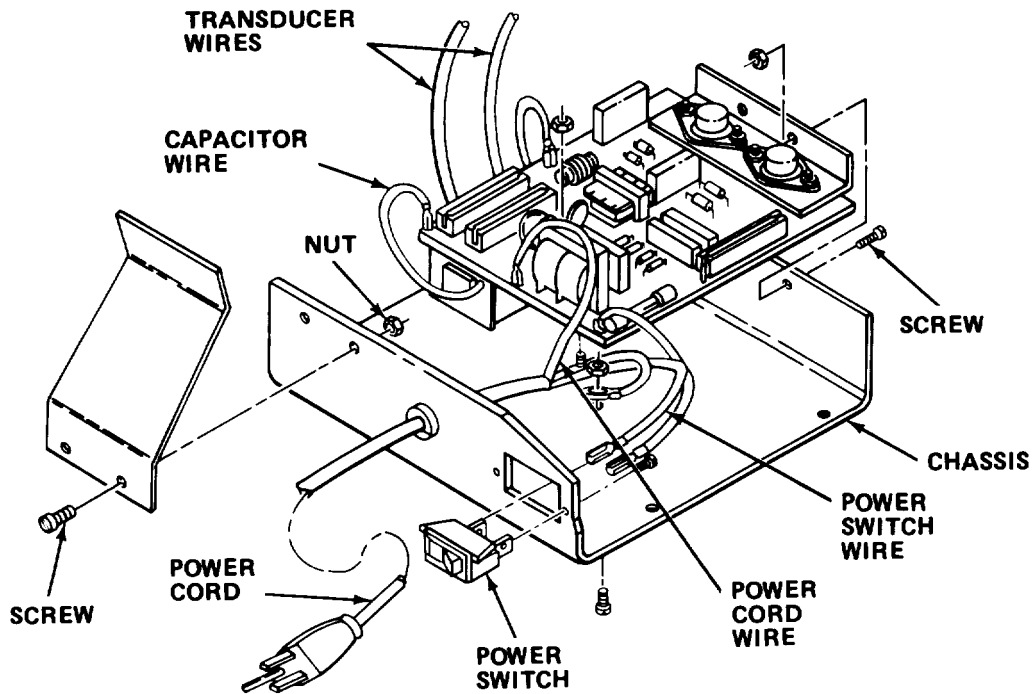
- d. Tag and disconnect power cord wire from power switch.
- e. Press sides of defective power switch and remove from chassis.
- f. Install new power switch in chassis. Push power switch until tabs lock into hole.
- g. Reconnect power cord wires to power switch.
- h. Reinstall stainless steel tank and casing. Secure with screws and washers.
- i. Fill stainless steel tank 1/3 full with water.
- j. Plug in power cord and turn power on. Check that water surface agitates.

5-16.3 Replace Circuit Board.

MOS: 41B, Topographic Instrument Repair Specialist

TOOLS: Flat Tip Screwdriver

SUPPLIES: Circuit Board



WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

- a. Turn power off and unplug power cord.
- b. Remove screws and washers holding stainless steel tank and casing to chassis.
- c. Lift stainless steel tank and casing free. Set aside.

NOTE

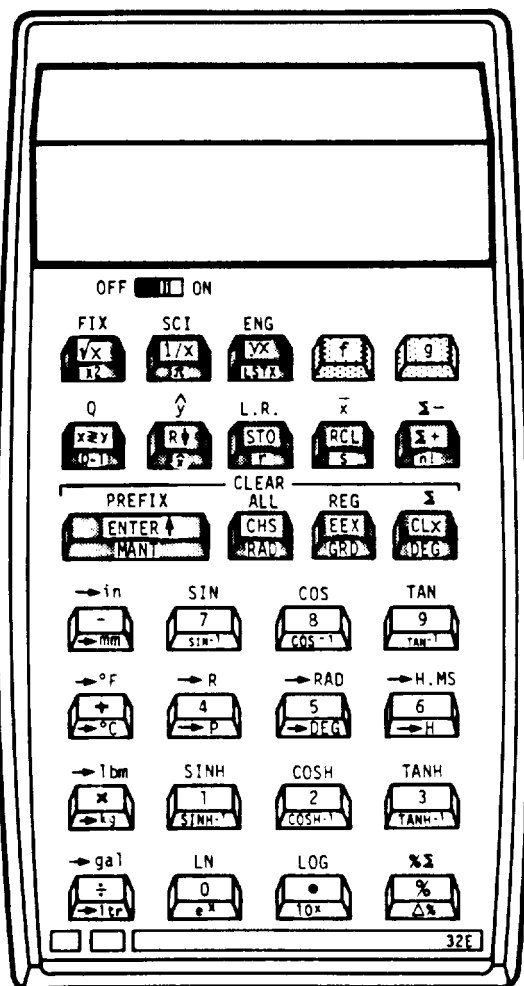
Do not disconnect wires to transducer.

- d. Remove three screws, one nut, and one washer holding circuit board to chassis.
- e. Tag and disconnect power cord wires and power switch wires from circuit board.
- f. Disconnect capacitor wires from circuit board.
- g. Tag and disconnect two transducer wires from circuit board.
- h. Remove defective circuit board.
- i. Install new circuit board.
- j. Reconnect two transducer wires to circuit board.
- k. Reconnect capacitor wires to circuit board.
- l. Reconnect power switch wires and power cord wires to circuit board.
- m. Reinstall one washer, one nut, and three screws holding circuit board to chassis.
- n. Reinstall stainless steel tank and casing. Secure with screws and washers.
- o. Fill stainless steel tank 1/3 full with water.
- p. Plug in power cord and turn power on. Check that water surface agitates.

5-17. PREPARATION FOR STORAGE OR SHIPMENT. Contact your battalion for packing and shipping instructions.

Section V DIRECT/GENERAL SUPPORT MAINTENANCE

There are no direct/general support maintenance procedures assigned for this equipment.



CHAPTER 6**POCKET CALCULATOR****Section I INTRODUCTION****6-1. GENERAL INFORMATION.**6-1.1 Scope.

- a. Model Number and Equipment Name. Model HP-32E Pocket Calculator.
- b. Purpose of Equipment. To perform mathematical calculations.

6-2. EQUIPMENT DESCRIPTION.

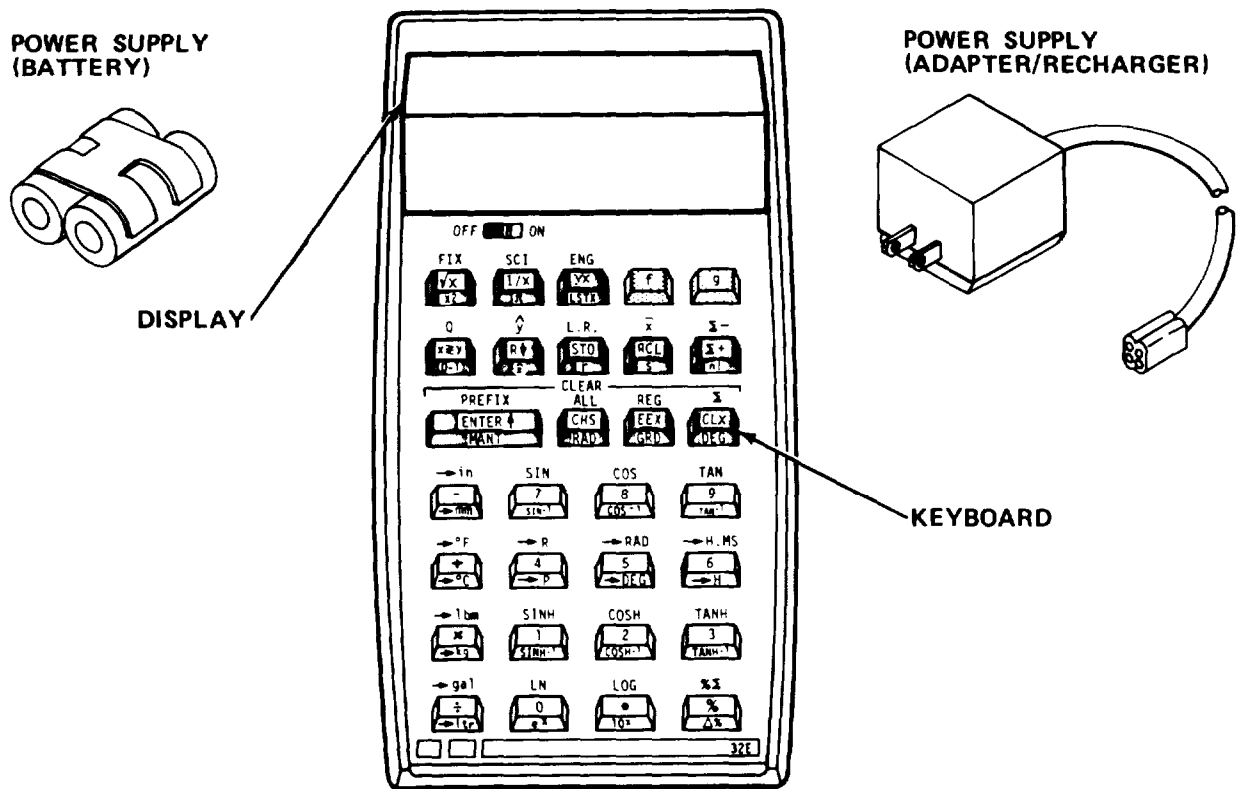
6-2.1 Equipment Characteristics, Capabilities, and Features. Performs mathematical calculations with the following capabilities and features.

- a. Rechargeable battery pack.
- b. AC operation.
- c. Trigonometric functions.
- d. Ten-digit display.
- e. Automatic memory stack.
- f. Fifteen storage registers.
- g. Scientific notation.
- h. Logarithmic functions.
- i. Square root.
- j. Fixed-point display.
- k. Engineering display.
- l. Automatic overflow and underflow.
- m. Error display.
- n. Key-selected metric conversions.
- o. Self-Check.

6-2.2 Equipment Data.

Power Requirements	120 V, 60 Hz
Battery Pack:	
Recharge Time	9 hrs, maximum (calculator off)
	17 hrs, minimum (calculator on)
Operating Time	3 hrs, maximum

6-3. TECHNICAL PRINCIPLES OF OPERATION. The purpose of the HP-32E Calculator is to assist its user in the performance of complex or simple mathematics equations and consists of the following functional parts:



POWER SUPPLY. Power is provided to the calculator from either the battery pack or ac adapter/recharger. The battery pack consists of two rechargeable nickel cadmium batteries which give the calculator full portability. The adapter/recharger also provides power to the calculator when plugged into a power outlet. When battery pack is in need of recharging, raised decimal is turned on at the far left of the display. When raised decimal is displayed, there are 1 to 25 minutes of operating time left.

KEYBOARD. The keyboard is used to select functions and input numbers into the calculator. All keys, except **f** and **g** keys, perform three functions.

One function is indicated by the symbol on the flat surface of the key, a second by the symbol on the slanted key face, and a third by the symbol written above the key on the calculator case. Function printed on the flat face of the key is selected by pressing the key. Function printed above the key is selected by first pressing prefix key **f** and then the function key. The function printed on the slanted face of the key is selected by first pressing prefix key **g** and then the function key.

DISPLAY. The display is the X-register of the automatic memory stack and provides a visual readout of latest numeric entry, operation result, or error messages.

MEMORY. Memory is divided into two parts; storage registers and automatic memory stack.

a. **Storage registers.** Storage registers are used to set aside numbers for recall in later calculations. Numbers are stored by first pressing **STO** followed by a number **0** thru **8** or a decimal point and a number **0** thru **5**. The number in displayed X-register is then copied into the selected register. Recalling a number is accomplished by first pressing **RCL** followed by a number **0** thru **8** or a decimal point and a number **0** thru **5**. The number that is in the selected register will be copied into the displayed X-register without any change to contents of that register. Storage registers R.0 through R.5 are used for accumulation of statistical data. Turning calculator off will clear (place zeros in) all storage registers.

b. **Automatic memory stack.** The automatic memory stack is used to store intermediate results during calculations. The stack consists of four registers designated X, Y, Z and T. The contents of X-register are constantly shown on the calculator display. Numbers are manually entered into the memory stack by pressing **ENTER**. During chain calculations (long equations), intermediate answers are automatically entered in the memory stack. Each new entry into the stack is first entered in the X-register and, with each additional entry, the stack rolls up one and the contents that were in the T-register before roll-up, are lost. The contents of the stack can be viewed by pressing **RCL** key four times. The contents of T-register are not lost because the stack forms a continuous loop, i.e., the contents of T-register are shifted to the Z-register; Z-register to Y-register; Y-register to X-register; and X-register to T-register. With intermediate answers stored in the stack, operations can be performed with these numbers by pressing the key of the desired operation.

Example: To calculate $(3 \times 5) + 2$, press:

3 (3 enters X-register.)

ENTER (3 is copied to Y-register.)

5 (5 is entered in X-register; 3 stays in Y-register.)

x (5 is multiplied by 3; result, 15, is placed in X-register; Y-register becomes 0.)

2 (15 moves to Y-register; 2 enters X-register.)

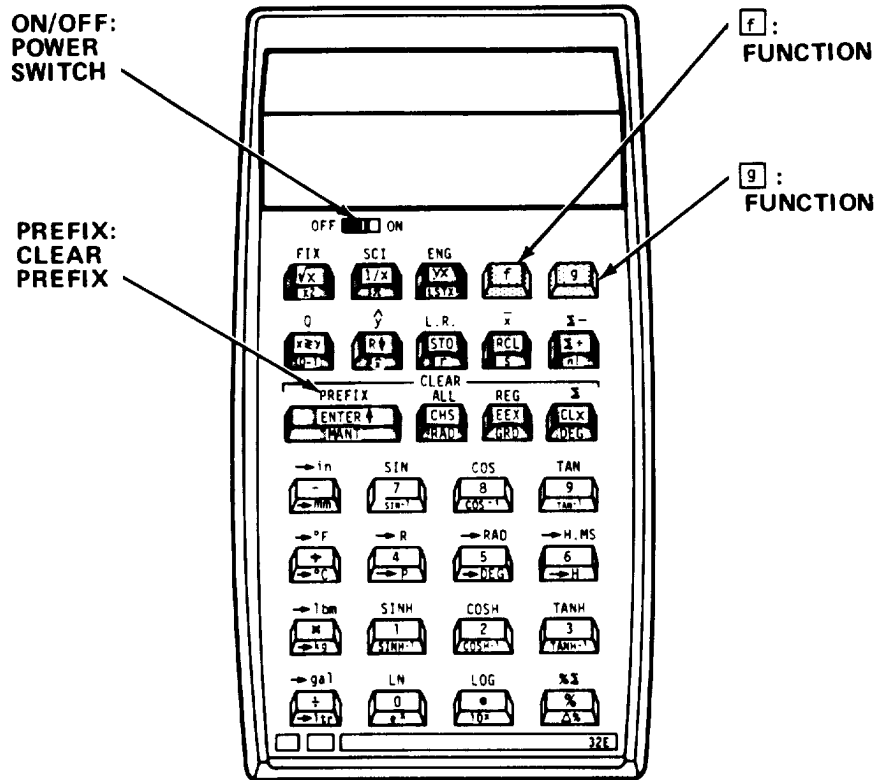
+ (2 is added to 15; result, 17, is placed in X-register; Y-register becomes 0.)

Section II OPERATING INSTRUCTIONS

6-4. DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND INDICATORS.

NOTE

Symbols on flat surface and slanted surface of keys are boxed. Symbols over keys are not boxed.



Key	Control or Indicator	Function
OFF ON	Power Switch	Turns power on or off.
f	Function	Pressed before another key, it selects function printed above key.
g	Function	Pressed before another key, it selects function printed on slanted face of key.

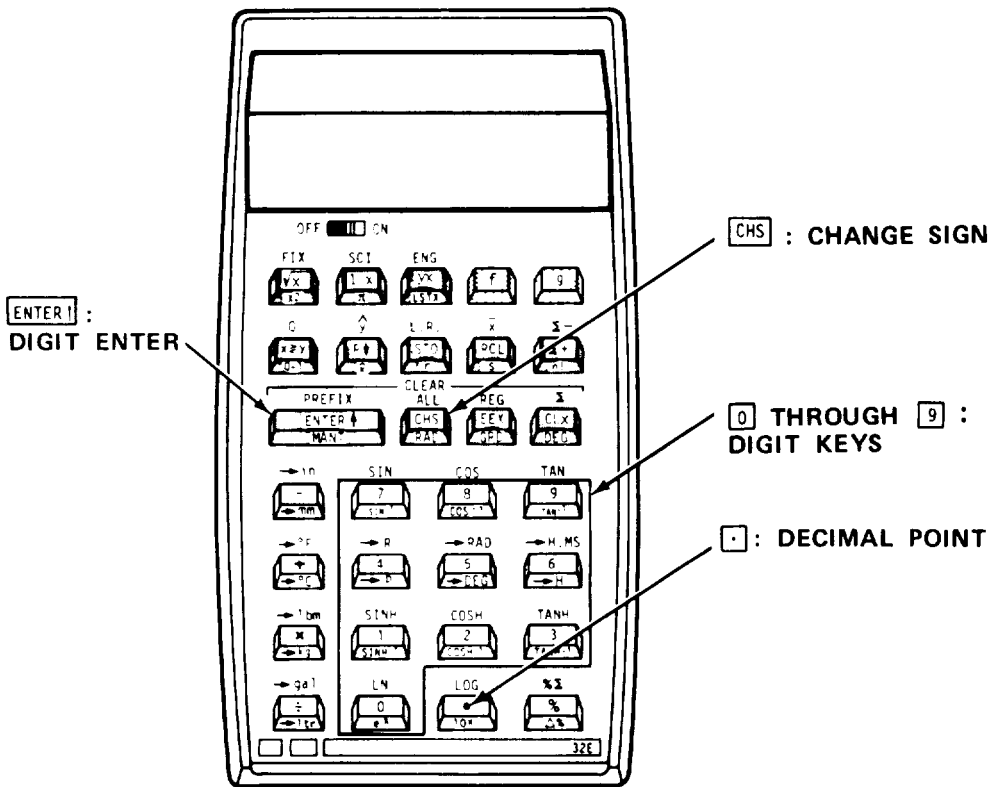
Key	Control or Indicator	Function
-----	----------------------	----------

PREFIX

Clear Prefix

Cancels the following key strokes or sequence of key strokes when pressed after each one:

f , g , STO , RCL ,
 STO , $.$, RCL , $.$,
 STO , $+$, STO , $-$,
 STO , x , STO , \div ,
 STO , $+$, $.$,
 STO , $-$, $.$,
 STO , x , $.$,
 STO , \div , $.$,
 FIX , SCI , ENG .



Digit Entry

0 thru 9

Digit Keys

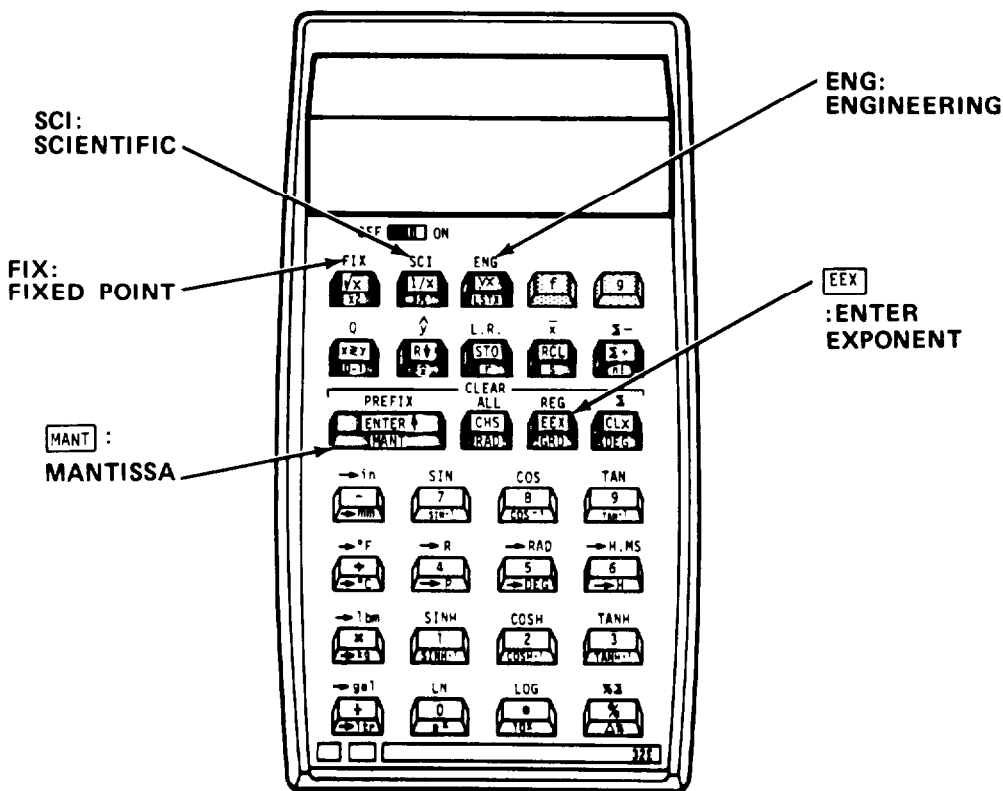
Enters digits.

.

Decimal Point

Enters decimal point.

Key	Control or Indicator	Function
ENTER	Digit ENTER	Enters copy of number displayed in X-register into Y-register of automatic memory stack. Pressing key also causes contents of Y-register to be shifted to Z-register and Z-register to the T-register. Contents of T-register are lost.
CHS	Change Sign	Changes sign of mantissa or exponent in display (X-register).



Display Control

Enter Exponent

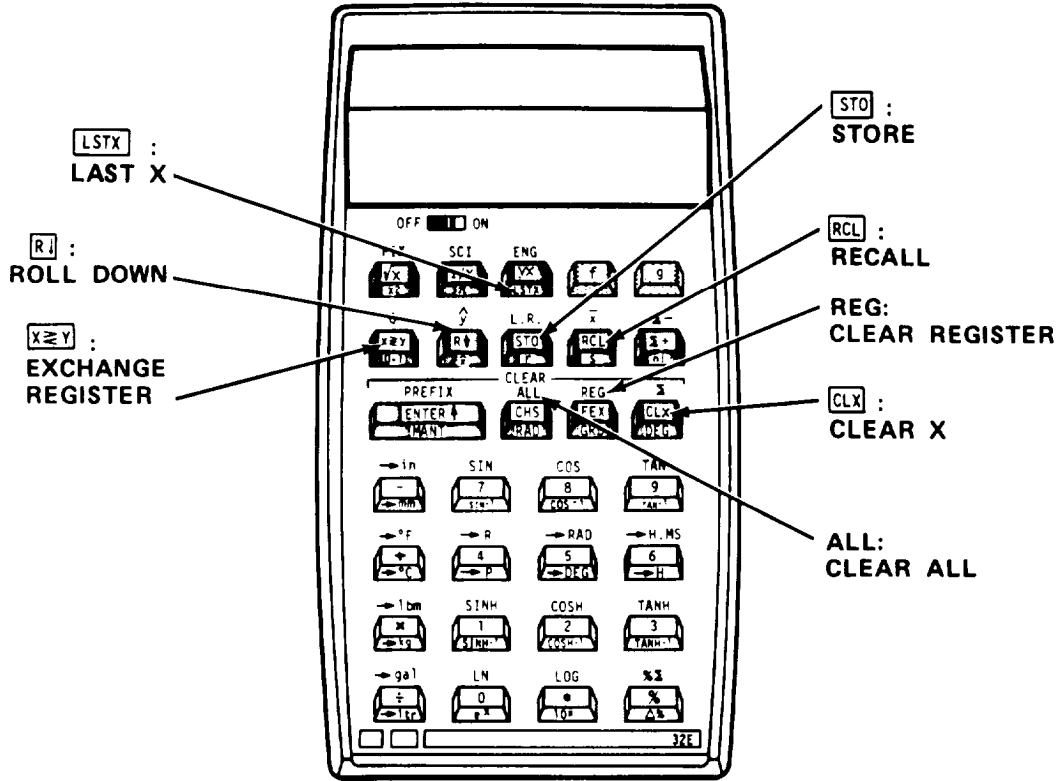
After pressing, next numbers keyed in are exponents of 10.

Key	Control or Indicator	Function
FIX	Fixed Point	Followed by digit key, selects fixed point notation display. Digit entry designates number of digits to be displayed to the right of decimal point.
SCI	Scientific	Followed by the number key that specifies the number of decimal places the display will be rounded to.
ENG	Engineering	Followed by digit key, selects engineering notation display. Digit key specifies number of digits to be displayed to right of decimal point.
	Mantissa	Temporarily displays all 10 digits of mantissa of number in X-register.

Key

Control or Indicator

Function



Number Manipulation



Exchange Register

Interchanges contents of X and Y-registers.



Roll Down

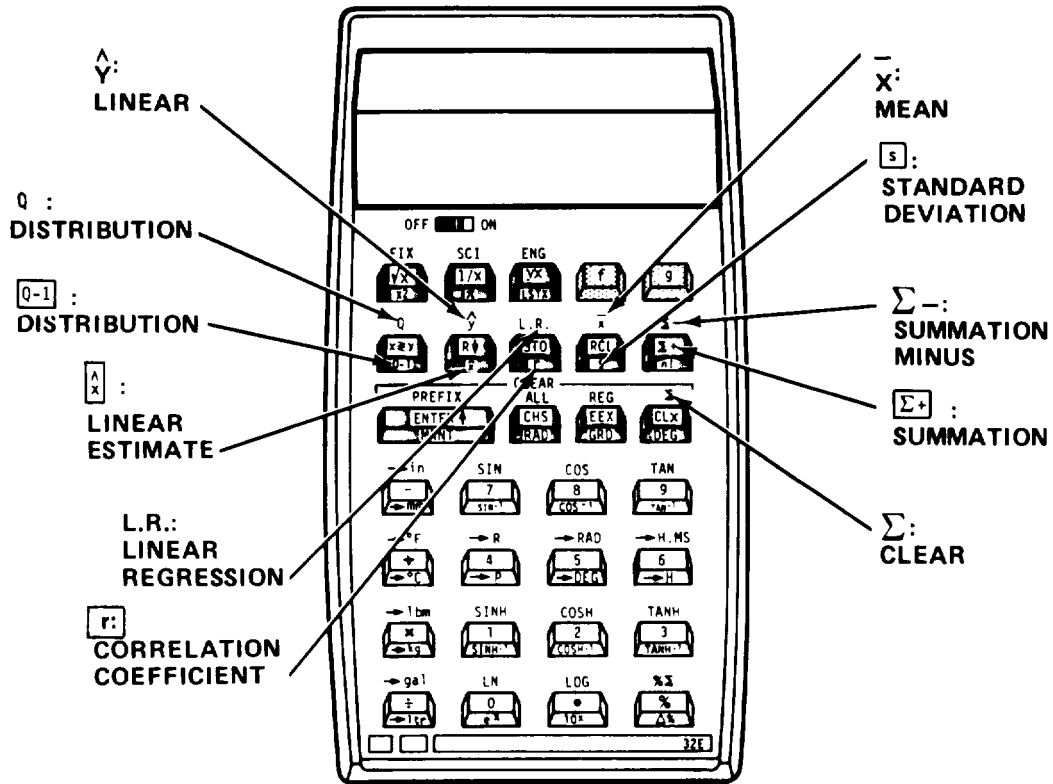
Rolls down contents of automatic memory stack for viewing in X-register without loss of data. When pressed, contents of X-register is shifted to T-register, T-register shifts to Z-register, Z-register shifts to Y-register, and Y-register advances to X-register for viewing.

CLEAR X

Clears contents of displayed X-register.

Key	Control or Indicator	Function
ALL	CLEAR ALL	Clears contents of memory stack and all storage registers.
STO	Store	Followed by digit key 0 through 8 or by a decimal point and a key 0 through 5 , stores displayed number in that specified location. Also used to perform storage register arithmetic.
RCL	Recall	Followed by digit key 0 thru 8 or by a decimal point and a digit key 0 thru 5 , recalls value from specified storage register into the displayed X-register.
REG	CLEAR Register	Clears contents of storage registers R ₀ through R ₈ . Contents of registers R ₀ thru R ₅ are unaffected.
LSTX	LAST X	Recalls number displayed before previous operation back into displayed X-register.

Key	Control or Indicator	Function
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Statistical

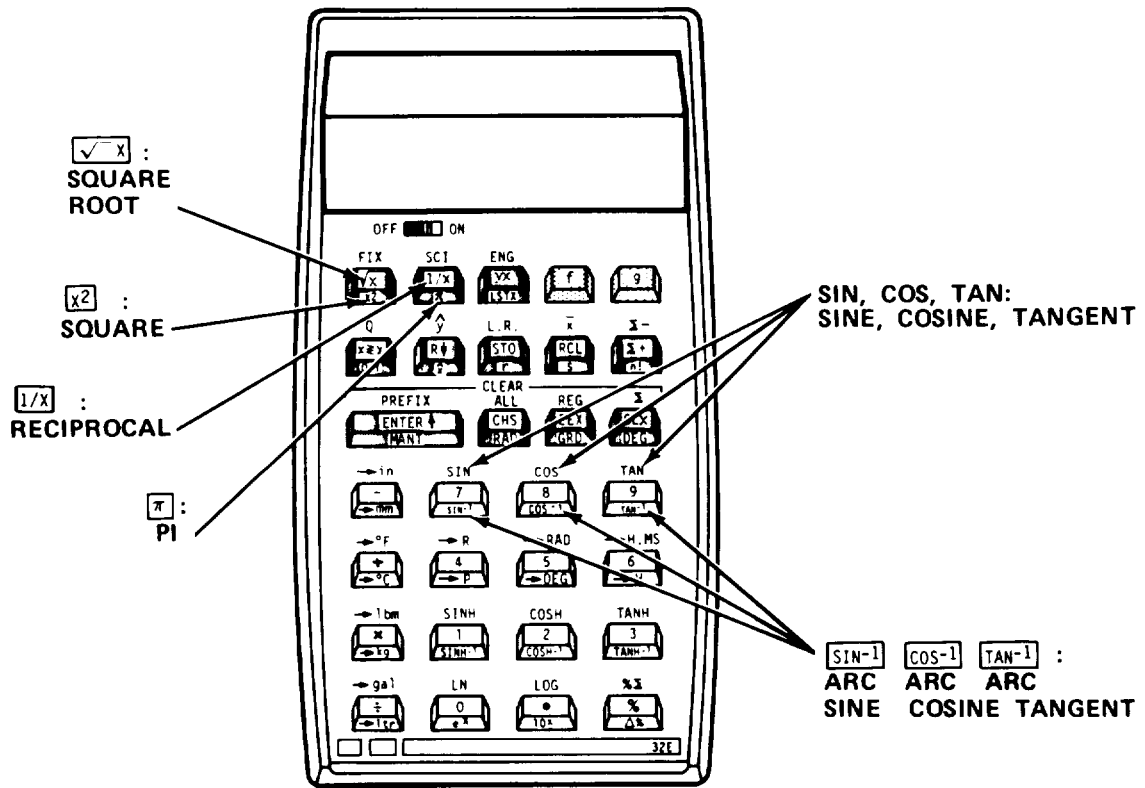
Q	Distribution	Computes area under standard normal distribution curve to left of X.
Q-1	Distribution	Computes X, given area under standard normal distribution curve to left of x.
\hat{Y}	Linear Estimate	Computes estimated value of Y for a given value of x.
\hat{X}	Linear Estimate	Computes estimated value of X for a given value of Y.

Key	Control or Indicator	Function
L.R.	Linear Regression	Computes Y-intercept and slope for linear function approximated by X and Y values accumulated using Σ^+ . Value of slope is placed in Y-register.
r	Correlation Coefficient	Computes goodness of fit between X and Y values accumulated using Σ^+ and linear function which they approximate.
\bar{X}	MEAN	Computes mean (average) of X and Y values accumulated using Σ^+ .
S	Standard Deviation	Computes standard deviations of X and Y values accumulated using Σ^+ .
Σ^+	Summation	Accumulates statistical data in storage registers R.0 thru R.5 using numbers in X- and Y-registers.
Σ^-	Summation Minus	Subtracts from statistical data in storage registers R.0 thru R.5 using numbers in X- and Y-registers.
Σ	CLEAR	Clears statistical storage registers R.0 thru R.5.

Key

Control or Indicator

Function



Mathematical

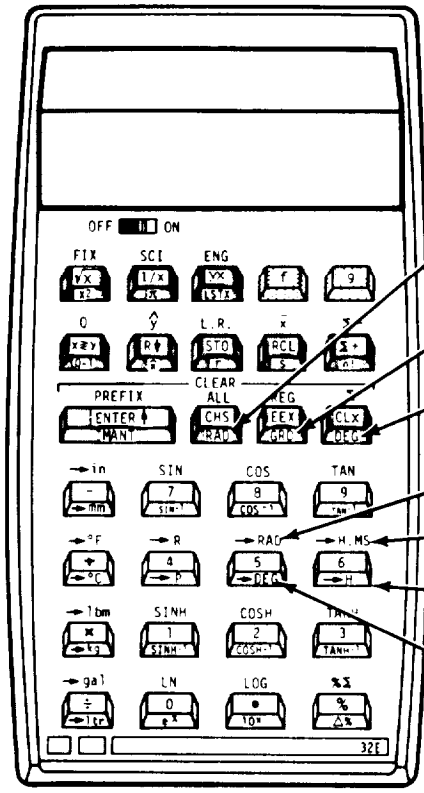
\sqrt{x}	Square Root	Computes square root of number in displayed X-register.
x^2	Square	Computes square of number in displayed X-register.
$1/x$	Reciprocal	Computes reciprocal of number in displayed X-register.
π	pi	Places value of pi (3.141592654) into X-register.
SIN, COS, TAN	Sine, Cosine, Tangent	Computes sine, cosine, or tangent of number in displayed X-register.

Key	Control or Indicator	Function
-----	----------------------	----------


SIN⁻¹ , **COS⁻¹** ,
TAN⁻¹

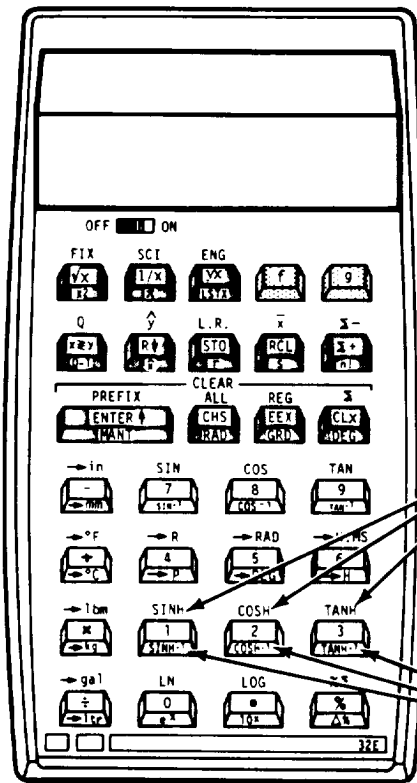
Arc Sine, Arc Cosine,
Arc Tangent

Computes arc sine, arc cosine, or arc tangent of number in displayed X-register.



RAD	Radians	Sets radians mode for all trigonometric functions.
GRD	Grads	Sets grads mode for all trigonometric functions.
DEG	Degree	Sets decimal degrees mode for all trigonometric functions.
→RAD	To Radians	Converts decimal degrees to radians.
→DEG	To Degrees	Converts radians to decimal degrees.

Key	Control or Indicator	Function
→H.MS	Hours. Minutes Seconds	Converts decimal hours or degrees to hours, minutes, seconds or degrees, minutes, seconds.
	To Decimal Hours or Degrees	Converts hours, minutes, seconds, or degrees, minutes, seconds to decimal hours or degrees.



**SINH, COSH, TANH:
HYPERBOLIC SINE,
COSINE, AND TANGENT**

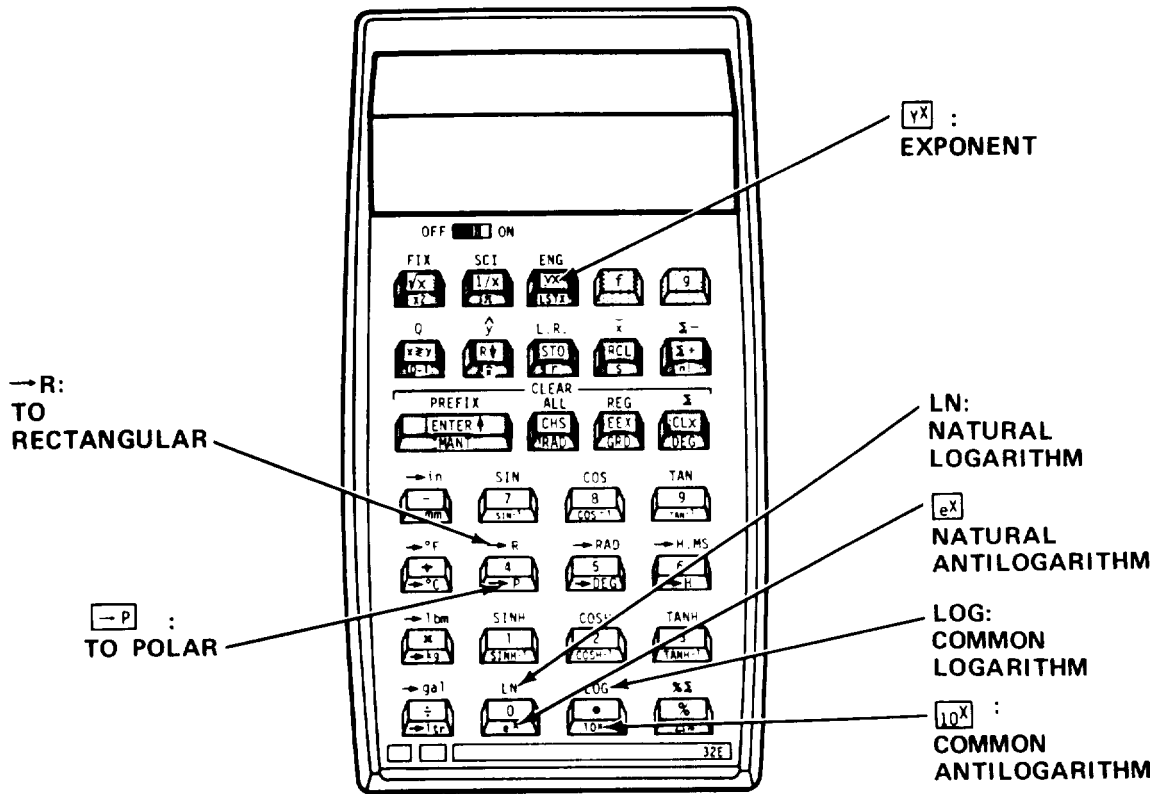
**SINH-1 COSH-1 TANH-1
INVERSE HYPERBOLIC SINE,
COSINE, TANGENT**

Key	Control or Indicator	Function
Hyperbolic		
SINH, COSH, TANH	Hyperbolic Sine, Cosine, and Tangent	Computes hyperbolic sine, hyperbolic cosine, or hyperbolic tangent of number in displayed X- register.
<div style="border: 1px solid black; padding: 2px; display: inline-block;">SINH-1</div> , <div style="border: 1px solid black; padding: 2px; display: inline-block;">COSH-1</div> , <div style="border: 1px solid black; padding: 2px; display: inline-block;">TANH-1</div>	Inverse Hyperbolic Sine, Cosine, Tangent	Computes inverse hyper- bolic sine, inverse hyperbolic cosine, or inverse hyperbolic tangent of number in di s- played X-register.

Key

Control or Indicator

Function



Logarithmic and Exponential

Exponent

Raises number in Y-register to power of number in displayed X-register.

Natural Logarithm

Computes natural logarithm (base e) of number in displayed X-register.

Natural Antilogarithm

Raises e to power of number in displayed X-register.

Common Logarithm

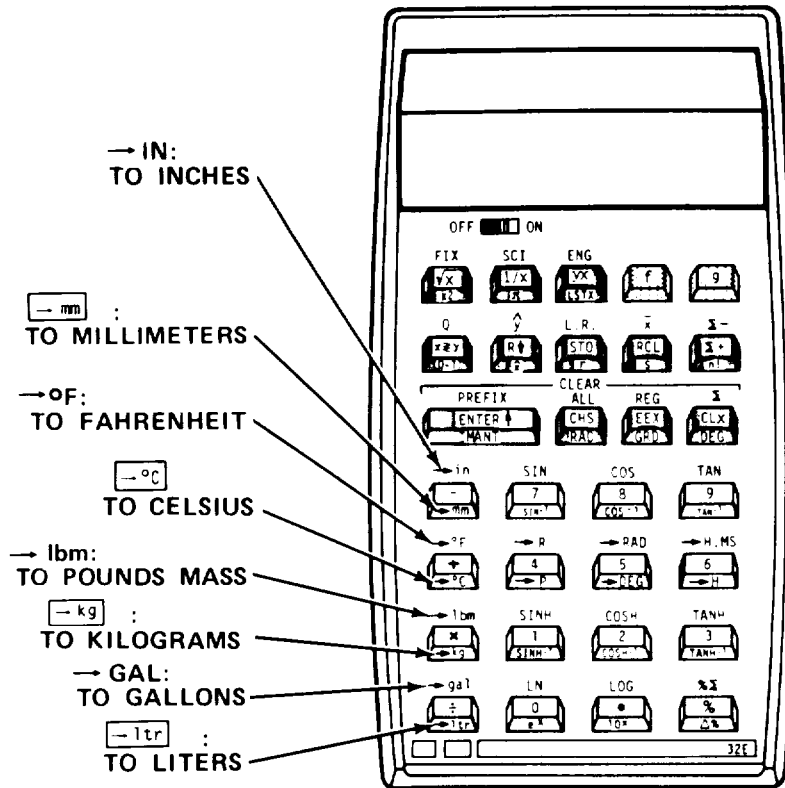
Computes common logarithm (base 10) of number in displayed X-register.

Key	Control or Indicator	Function
10^x	Common Antilogarithm	Raises 10 to power of number in displayed X-register.
$\rightarrow P$	To Polar	Converts rectangular (X, Y) or coordinates in X- and Y- registers into polar (R, θ) coordinates. Angle θ stored in Y-register.
$\rightarrow R$	To Rectangular	Converts polar (R, θ) coordinates in X- and Y- registers into rectangular (X, Y) coordinates.

Key

Control or Indicator

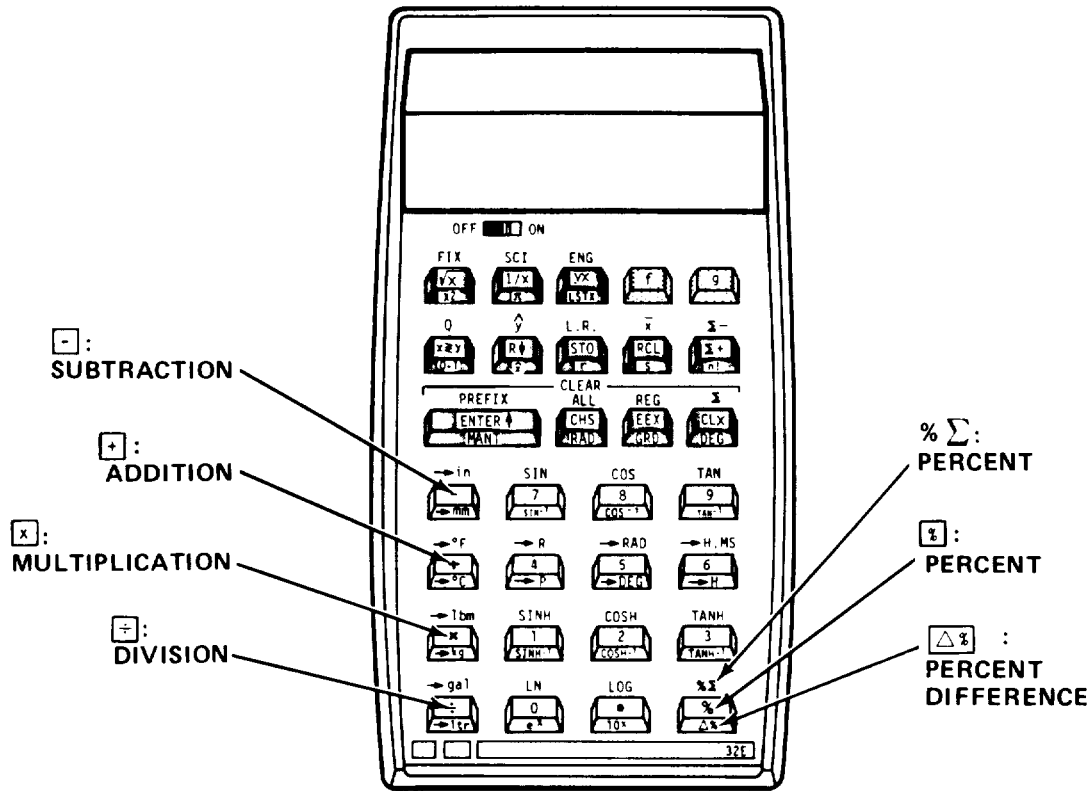
Function



Metric Conversions

→in	To Inches	Converts millimeters to inches.
mm	To Millimeters	Converts inches to millimeters.
→°F	To Fahrenheit	Converts degrees Celsius to degrees Fahrenheit.
→°C	To Celsius	Converts degrees Fahrenheit to degrees Celsius.
→lbm	To Pounds Mass	Converts kilograms to pounds mass.
kg	To Kilograms	Converts pounds mass to kilograms.

Key	Control or Indicator	Function
→gal	To Gallons	Converts liters to gallons (U.S.).
	To Liters	Converts gallons (U.S.) to liters.



Percentage

Percent

Computes X-percent of Y.

Percent Difference

Computes percent difference between number in Y-register and number in X-register.

Percent

Computes percent that X is of the number ($\sum X$) in storage register R.1.

Arithmetic Functions

- +
-
- x
- ÷

Addition
Subtraction
Multiplication
Division

Arithmetic functions

6-5. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES.

- a. Before You Operate. Always keep in mind the WARNINGS and CAUTIONS. Perform your before (B) PMCS.
- b. While You Operate. Always keep in mind the WARNINGS and CAUTIONS. Perform your during (D) PMCS.
- c. After You Operate. Be sure to perform your after (A) PMCS.
- d. If Your Equipment Fails to Operate. Troubleshoot with proper equipment. Report any deficiencies using the proper forms. See DA Pam 738-750.

6-5.1 PMCS Procedures.

- a. PMCS are designed to keep the equipment in good working condition by performing periodic service tasks.
- b. Service intervals provide you, the operator, with time schedules that determine when to perform specified service tasks.
- c. The "Equipment is Not Ready/Available If" column is used for identification of conditions that make the equipment not ready/available for readiness reporting purposes or denies use of the equipment until corrective maintenance is performed.
- d. If your equipment fails to operate after PMCS is performed, immediately report this condition to your supervisor.
- e. Perform weekly as well as before operation if you are the assigned operator and have not operated the item since the last weekly or if you are operating the item for the first time.
- f. Item number column. Item numbers are assigned in chronological ascending sequence regardless of interval designation. These numbers are used for your "TM Number" column on DA Form 2404, Equipment Inspection and Maintenance Worksheet in recording results of PMCS.
- g. Interval columns. This column determines the time period designated to perform your PMCS.
- h. Item to be inspected and procedures column. This column lists functional groups and their respective assemblies and subassemblies as shown in the Maintenance Allocation Chart (Appendix B). The appropriate check or service procedure follows the specific item to be inspected.
- i. Equipment is not ready/available if: column. This column indicates the reason or cause why your equipment is not ready/available to perform its primary mission.

j. List of tools and materials required for PMCS is as follows.

<u>Item</u>	<u>Quantity</u>
Cheesecloth (Item 5, Appendix E)	ar

Table 6-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES

NOTE

If the equipment must be kept in continuous operation, check and service only those items that can be checked and serviced without disturbing operation. Make the complete checks and services when the equipment can be shut down.

B - Before
D - During
A - After
W - Weekly
M - Monthly
Q - Quarterly
AN - Annually
S - Semiannually
BI - Biennially
(Number) - Hundreds of Hours

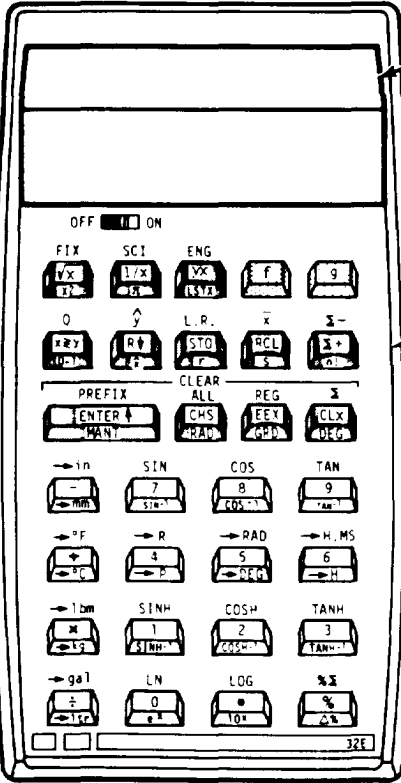
ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
	B	<p>POCKET CALCULATOR</p> <p>INSPECT.</p>  <p>1. Check keyboard, display, and casing for cracks or breaks. Replace calculator if casing or display is cracked or broken.</p>	<p>Calculator keyboard, display, or casing is damaged.</p>

Table 6-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

		B - Before D - During A After	W - Weekly M - Monthly Q - Quarterly	AN - Annually S - Semiannually BI - Biennially	(Number) - Hundreds of Hours
ITEM NO,	IN-TER-VAL	ITEM TO BE INSPECTED			For Readiness Reporting, Equipment Is Not Ready/ Available If:
		PROCEDURE			
1	B	POCKET CALCULATOR - Cont			
		<p>INSPECT - Cent</p> <p>2. Connect ac adapter/recharger to calculator and plug in. Turn calculator on. Press [STO] and [ENTER] Display should indicate -8, 8, 8, 8, 8, 8, 8, 8, 8, 8.</p> <p>3. With battery pack in calculator, check operation to be sure calculator turns on. Remove battery pack and check for clean contacts. Wipe clean. Reinstall battery pack.</p> <p>4. Check power cord for kinks, frays or burns.</p>			

6-6. OPERATION UNDER USUAL CONDITIONS.

6-6.1 Operating Procedure.

- a. Selecting a function.

NOTE

Most keys on the keyboard perform three functions. One function is indicated by symbol on top of key, second is above key, and third is on slanted face of key.

(1) To select a function printed on the key, press the key.

(2) To select a function printed above the key, press key **[f]**, then function key.

Example: To use LOG in calculation, enter number, **[f]** then LOG.

(3) To select a function printed on slanted face of key, press **[g]** then function key.

Example: To use **[x²]** in calculations, enter number, **[g]** then **[x²]**.

b. Keying in numbers.

(1) Press keys corresponding to digits and decimal point in the order that they appear, reading from left to right.

(2) If needed, press **CHS** to make number negative.

c. One-number functions.

(1) Key in number on which operation is to be performed.

(2) Select desired function. Press key.

Example: To calculate square root of 5, press **5** and **\sqrt{x}** .

Answer is 2.2361.

d. Two-number functions.

(1) Key in first number.

(2) Press **ENTER** to separate first number from second number.

(3) Key in second number.

(4) Select desired function. Press key.

Example: To calculate 5 percent of 35, press **3**, **5**, **ENTER**, **5**, and **%**.

Answer is 1.75.

e. Exponent key **y^x** .

NOTE

Exponent key is two-number function.

(1) Key in number for Y. Press **CHS** if it is negative.

(2) Press **ENTER** to send number to Y register in automatic memory stack.

(3) Key in number for X (exponent for Y).

(4) Press **y^x** key.

Example: To calculate 5^3 , press **5**, **ENTER**, **3**, and **y^x** .

Answer is 125.

f. Chain calculations.

NOTE

Calculator uses reverse polar notation (RPN) logic for chain calculations.

(1) If equation has parenthetical expressions, key in numbers and perform function in first parenthesis. Key in first number, press **ENTER**, key in second number, and press function key for that operation.

(2) Key in numbers and perform function in second parenthesis. Key in first number, press **ENTER**, key in second number, then press function key for that operation.

(3) Press function key for operation indicated between parentheses.

Example: To calculate $(3 \times 4) \times (5 + 6)$, press

3, **ENTER**, **4**, and **x**
5, **m**, **6**, and **+**
x; answer is 132.

g. Operations with powers of 10.

(1) Key in number being multiplied by power of 10. Press **CHS** if number is negative.

(2) Press **EEX**.

(3) Key in exponent (power) of 10. Press **CHS** if exponent is negative.

(4) Press **ENTER**, and key in exponent.

(5) Press **x**.

Example: To multiply 15.6×10^{12} by 25 press

1, **5**, **.**, **6**, **EEX**, and **12**
ENTER, **25**, and **x**; answer is 3.9000×10^{14} .

h. Storage (memory) register arithmetic.

NOTE

This procedure performs two-number arithmetic functions on number stored in storage register. The displayed X-register is the second number.

(1) Press **STO**.

(2) Press appropriate function key **+**, **-**, **x**, or **÷**.

(3) Press **0** through **8** or, **00** through **05**, indicating on which register function will be performed.

Example: Pressing $\boxed{\text{STO}}$, $\boxed{\times}$, and $\boxed{1}$ multiplies value of (displayed) X-register by contents of storage (memory) register 1. The answer is placed into storage (memory) register 1.

NOTE

Value of X-register will not be changed.

i. Clearing storage (memory) register.

(1) To clear single storage (memory) register, press $\boxed{0}$, $\boxed{\text{STO}}$, and location of register to be cleared.

Example: To clear register 2, press $\boxed{0}$, $\boxed{\text{STO}}$, and $\boxed{2}$.

(2) To clear registers 0 through 8, press $\boxed{\text{f}}$ and REG. To clear registers 0 through 5, press $\boxed{\text{f}}$ and $\boxed{\cdot}$ $\boxed{\cdot}$ to clear all registers (including the automatic memory stack) press $\boxed{\text{f}}$ and ALL.

j. Trigonometric functions.

(1) Enter or calculate value of X, number on which trigonometric function is to be performed.

(2) Press \boxed{g} key.

(3) Press $\boxed{\text{DEG}}$, $\boxed{\text{RAD}}$, or $\boxed{\text{GRD}}$ to select measurement for answer (degrees, radians, or grads).

(4) Press $\boxed{\text{f}}$ key.

(5) Press needed function (SIN, COS, TAN) key.

Example: To calculate sine 35 , press $\boxed{3}$, $\boxed{5}$, \boxed{g} , $\boxed{\text{DEG}}$, $\boxed{\text{f}}$ and SIN . Answer is 0.5736.

k. Polar/rectangular coordinate conversion.

(1) Convert from rectangular (X, Y) to polar coordinates.

NOTE

Value for Y is always keyed in first.

(a) Key in value of Y.

(b) Press $\boxed{\text{ENTER}}$.

(c) Key in value of X.

(d) Press $\boxed{9}$ then key in $\boxed{\text{DEG}}$, $\boxed{\text{RAD}}$, or $\boxed{\text{GRD}}$ to select measurement for answer (degrees, radians, or grads).

(e) Press $\boxed{9}$ and $\boxed{-P}$ to get R (magnitude). Press $\boxed{X\leq Y}$ to get angle in radians.

Example: To convert rectangular coordinates 4, 3 to polar with angle in radians, press

$\boxed{3}$, $\boxed{\text{ENTER}}$, and $\boxed{4}$
 $\boxed{9}$ and $\boxed{\text{RAD}}$.
 $\boxed{9}$ and $\boxed{-P}$; answer is 5.
 $\boxed{X\leq Y}$; answer is .64.

(2) Convert from polar to rectangular coordinates.

(a) Key in angle in radians.

(b) Press $\boxed{\text{ENTER}}$.

(c) Key in value of R (magnitude).

(d) Press $\boxed{9}$ then key in $\boxed{\text{DEG}}$, $\boxed{\text{RAD}}$, or $\boxed{\text{GRD}}$ to select measurement of angle (degrees, radians, or grads).

(e) Press $\boxed{9}$, R to get X. Press $\boxed{X\leq Y}$ to get Y.

Example: To convert polar coordinates 5 and .64 to rectangular, press

$\boxed{-}$, $\boxed{6}$, $\boxed{4}$, $\boxed{\text{ENTER}}$, and $\boxed{5}$
 $\boxed{9}$ and $\boxed{\text{RAD}}$
 $\boxed{9}$ and $\boxed{-R}$: answer is 4.01.
 $\boxed{X\leq Y}$: answer is 2.986.

1. Statistical functions.

(1) Accumulations.

(a) Pressing $\boxed{\Sigma+}$ key computes sums and products of the values in the X- and Y-registers. Results are automatically accumulated in storage registers **R** through **R** . Before starting to calculate accumulations with a new set of x and y values, clear registers by pressing \boxed{f} **REG** .

Key y value into X-register.

Press $\boxed{\text{ENTER}}$ to raise y value into Y-register.

Key x value into X-register.

Press $\boxed{\Sigma+}$.

(b). If statistical problem involves only one variable (x), clear storage registers R.0 through R.5 and Y-register. press \boxed{f} , Σ , and $\boxed{\text{ENTER}}$.

Key number into X-register.

Press $\boxed{\Sigma+}$.

NOTE

Unlike storage register arithmetic, the accumulation operation allows overflows (i.e., number whose magnitudes are greater than $9.99999999 \times 10^{99}$) in storage registers R.0 through R.5 without indicating Error 1 in the display.

(c). To use any of the accumulations, recall contents of desired storage register into displayed X-register by pressing $\boxed{\text{RCL}}$ $\boxed{\square}$ followed by the number of the register. If this is done immediately after pressing $\boxed{\Sigma+}$ or $\Sigma-$, the accumulation recalled is written over the number of data pair entries (n) in the display. To use both Σx and Σy , press $\boxed{\text{RCL}}$ $\boxed{\Sigma+}$. This simultaneously copies Σx from R.1 into displayed X-register and copies Σy from R.3 into Y-register. If this is done immediately after pressing $\Sigma+$, $\Sigma-$, $\boxed{\text{CLX}}$ or $\boxed{\text{ENTER}}$, the number in the Y-register is first lifted into the Z-register. Otherwise, the numbers in the X- and Y-registers are first lifted into Z- and T-registers, respectively.

Example: To find Σx , Σx^2 , Σy , Σy^2 , and Σxy for the paired values of x and y listed below, press

y	7	5	9
x	5	3	8

Keystrokes	Display	
\boxed{f} CLEAR Σ	0.0000	Clear statistical storage registers. (Display shown assumes no results remain from previous calculations.)
$\boxed{7}$ $\boxed{\text{ENTER}}$	7.0000	
$\boxed{5}$ $\boxed{\Sigma+}$	1.0000	First pair is accumulated: n=1
$\boxed{5}$ $\boxed{\text{ENTER}}$	5.0000	
$\boxed{3}$ $\boxed{\Sigma+}$	200000	Second pair is accumulated: n=2
$\boxed{9}$ $\boxed{\text{ENTER}}$	9.0000	
$\boxed{8}$ $\boxed{\Sigma+}$	3.0000	Third pair is accumulated: n=3

<u>Keystrokes</u>	<u>Di spl ay</u>	
RCL . 1	16.0000	Sum of x values from register R. 1.
RCL . 2	98.0000	Sum of squares of x values from register R. 2.
RCL . 3	21.0000	Sum of y values from register R. 3.
RCL . 4	155.0000	Sum of squares of y values from register R. 4.
RCL . 5	122.0000	Sum of products of x and y values from register R. 5.
RCL . 0	3.0000	Number of entries (n=3) from register R. 0.

(2) Deleting and correcting data.

(a) If an incorrect value is keyed in and Σ^+ has not yet been pressed, press CLX and key in correct value.

(b) To change one of the values, or if after pressing Σ^+ one of the values was erroneous, correct the accumulations by using Σ^- (summation minus) key as follows:

Key in incorrect data pair into X- and Y-registers.
 LSTX can be used to return a single incorrect data value to displayed X-register.

Press $\text{f} \Sigma^-$ to delete incorrect data.

Key in correct values for x and y. If one value of an (x, y) data pair is incorrect, both values must be deleted and reentered.
 press Σ^+ .

Example: If last data pair (8, 9) in previous example should have been (8, 6), correct the accumulation as follows, press

<u>Keystrokes</u>	<u>Di spl ay</u>	
9 ENTER	9.0000	Incorrect y value is entered again.
8	8.	Correct x value is entered again.
f Σ^-	2.0000	Number of entries (n) is now two.

<u>Keystrokes</u>	<u>Display</u>	
6 ENTER	6.0000	Correct y value is entered.
8	8.	x value is entered again.
Σ+	3.0000	Number of entries is again three.

(3) Mean. Pressing **⌘** computes the arithmetic mean (average) of x and y values accumulated in registers **R.1** and **R.3** respectively.

Pressing **f** **⌘** causes the following operations to be performed.

The contents of the stack registers are lifted just as they are when pressing **RCL**.

The mean of the x values (\hat{x}) is calculated using data accumulated in registers **R1** (Σx) and **R.0** (n). The resulting value for x appears in displayed X-register.

The mean of y values (\hat{y}) is calculated using data accumulated in registers **R.3** (Σy) and **R.0** (n).

The resulting value for y is available in Y-register of stack.

Example: Below is a chart of daily high and low temperatures for a winter week.

	Sun	Mon	Tues	Wed	Thurs	Fri	Sat
High	6	11	14	12	5	-2	-9
Low	-22	-17	-15	-9	-24	-29	-35

To find average high and low temperatures for week selected, press;

<u>Keystrokes</u>	<u>Display</u>	
f CLEAR Σ+	0.0000	Statistical registers cleared. (Display shown assumes no results remain from previous calculations.)
6 ENTER	22	22.
CHS Σ+	1.0000	Number of data pairs (n) is now 1.
11 ENTER	17	17.
CHS Σ+	2.0000	Number of data pairs (n) is now 2.
14 ENTER	15	15.

$\boxed{\text{CHS}}$	$\boxed{\Sigma+}$	3.0000	
12	$\boxed{\text{ENTER}}$	$\boxed{9}$	9.
$\boxed{\text{CHS}}$	$\boxed{\Sigma+}$	4.0000	
$\boxed{5}$	$\boxed{\text{ENTER}}$	24	24.
$\boxed{\text{CHS}}$	$\boxed{\Sigma+}$	5.0000	
$\boxed{2}$	$\boxed{\text{CHS}}$	$\boxed{\text{ENTER}}$	-2.0000
29	$\boxed{\text{CHS}}$	$\boxed{\Sigma+}$	6.0000
$\boxed{9}$	$\boxed{\text{CHS}}$	$\boxed{\text{ENTER}}$	-9.0000
35	$\boxed{\text{CHS}}$	$\boxed{\Sigma+}$	7.0000
			Number of data pairs (n) is now 7.
\boxed{f}	$\boxed{\overset{A}{x}}$	-21.5714	Average low temperature.
$\boxed{x \geq y}$		5.2857	Average high temperature.

(4) Standard deviation.

(a) Pressing \boxed{s} computes the standard deviation (a measure of dispersion around the mean) of accumulated data.

(b) When $\boxed{g} \boxed{s}$ is pressed:

The contents of stack registers are lifted just as they are when pressing $\boxed{\text{RCL}} \boxed{\Sigma+}$.

The standard deviation of x values (s_x) is calculated using data accumulated in registers R.2 (2), R.1 (Σ), and R.0 (n). The result appears in displayed X-register.

The standard deviation of y values (s_y) is calculated using data accumulated in registers R.4 (y^2), R.3 (Y), and R.0 (n). The result appears in Y-register.

Example: To determine the standard deviation of the following test scores: 79, 94, 68, 86, 82, 78, 83, and 89, press

<u>Keystrokes</u>	<u>Display</u>	
\boxed{f} CLEAR ALL	0.0000	Clear statistical registers and Y-register for new, one-variable problem.

<u>Keystrokes</u>	<u>Di splay</u>	
79 Σ^+	1.0000	First score is entered. Since this problem involves only one variable, y-value does not have to be entered into Y-register using the ENTER key.
94 Σ^+	2.0000	Display shows number of scores entered so far.
68 Σ^+	3.0000	
86 Σ^+	4.0000	
82 Σ^+	5.0000	
78 Σ^+	6.0000	
83 Σ^+	7.0000	
89 Σ^+	8.0000	Last score in sample.
\square \square	7.8365	Standard deviation of test scores.

(5) Linear regression. Linear regression is a statistical method for finding a straight line that best fits a set of data points, thus providing a relationship between two variables.

(a) To use the linear regression function, first key in a series of data points using the Σ^+ key. Then press **f** L. R.

(b) When **f** L. R. if pressed:

The contents of the stack registers are lifted just as they are when you press **RCL** Σ^+ .

The slope (A) of the least squares line of the data is available in the Y-register of the stack.

The y-intercept (B) of the least squares line of the data appears in the displayed X-register of the stack.

(c) To use value for A or to bring it into displayed X-register, simply shift stack contents with the $X \leftrightarrow Y$ key.

Example: An oil company wishes to know the slope and y-intercept of a least squares line for the consumption of motor fuel in the United States against time since 1945. It knows the data given in the table.

Motor Fuel Demand (Millions of Barrels)	696	994	1330	1512	1750	2162	2243	2382	2484
--	-----	-----	------	------	------	------	------	------	------

Year	1945	1950	1955	1960	1965	1970	1971	1972	1973
------	------	------	------	------	------	------	------	------	------

Solution: Key the data into the calculator using the Σ^+ key, then press f L. R.

Keystrokes	Display
------------	---------

f CLEAR Σ^+	0.0000
----------------------	--------

Clear statistical storage registers. (Display shown assumes no results remain from previous calculations).

696 ENTER	696.0000
--------------------	----------

1945 Σ^+	1.0000
-----------------	--------

994 ENTER	994.0000
--------------------	----------

1950 Σ^+	2.0000
-----------------	--------

1330 ENTER	1,330.0000
---------------------	------------

1955 Σ^+	3.0000
-----------------	--------

1512 ENTER	1,512.0000
---------------------	------------

1960 Σ^+	4.0000
-----------------	--------

1750 ENTER	1,750.0000
---------------------	------------

1965 Σ^+	5.0000
-----------------	--------

2162 ENTER	2,162.0000
---------------------	------------

1970 Σ^+	6.0000
-----------------	--------

2243 ENTER	2,243.0000
---------------------	------------

1971 Σ^+	7.0000
-----------------	--------

2382 ENTER	2,382.0000
---------------------	------------

1972 Σ^+	8.0000
-----------------	--------

2484 ENTER	2,484.0000
---------------------	------------

1973 Σ^+	9.0000
-----------------	--------

All data pairs have been keyed in.

<u>Keystrokes</u>	<u>Di spl ay</u>	
\boxed{f} L. R.	-118,290.6295	The y-intercept of the line.
$\boxed{x \rightleftharpoons y}$	61.1612	Slope of the line.

(6) Linear estimation. With data accumulated in registers R.0 through R.5 a predicted value for y (denoted \hat{y}) can be calculated by keying in a new value for x and pressing $\boxed{f} \hat{y}$. A predicted value for x (denoted \hat{x}) can be calculated by keying in a new value for y and pressing $\boxed{g} \hat{x}$.

Example: With data intact from previous example in registers R.0 through R.5 to predict demand for motor fuel for the years 1980 and 2000, key in new x values and-press $\boxed{f} \hat{y}$. To determine the year that the demand for-motor fuel is expected to pass 3,500 million barrels, key in 3,500 (new value for y) and press $\boxed{g} \hat{x}$.

<u>Keystroke</u>	<u>Di spl ay</u>	
1980 $\boxed{f} \hat{y}$	2,808.6264	Predicted demand in millions of barrels for the year 1980.
2000 $\boxed{f} \hat{y}$	4,031.8512	Predicted demand in millions of barrels for the year 2000.
35 $\boxed{g} \hat{x}$	1,991.3041	The demand is expected to pass 3,500 million barrels during 1992.

(7) Correlation coefficient. Both linear regression and linear estimation presume that the relationship between x and y data values can be approximated, to some degree, by a linear function (a straight line). \boxed{r} (correlation coefficient) can be used to determine how closely the data "fits" a straight line. The correlation coefficient can range from $r = +1$ to $r = -1$. At $r = +1$, data falls exactly onto a straight line with positive slope. While at $r = -1$, data falls exactly onto a straight line with negative slope. At $r = 0$, data cannot be approximated by a straight line.

Example: To calculate the correlation coefficient for previous example press:

<u>Keystrokes</u>	<u>Di spl ay</u>	
$\boxed{g} \boxed{r}$	0.9931	The data very closely approximates a straight line.

6-7. OPERATION UNDER UNUSUAL CONDITIONS. This equipment is designed for operation only in a controlled environment.

Section III OPERATOR MAINTENANCE

6-8. LUBRICATION INSTRUCTIONS. This equipment does not require lubrication.

6-9. TROUBLESHOOTING PROCEDURES.

a. The table lists the common malfunctions which you may find during the operation or maintenance of the pocket calculator or its components. You should perform the tests/inspections and corrective actions in the order listed.

b. This manual cannot list all malfunctions that may occur, nor all tests and corrective actions. If a malfunction is not listed or is not corrected by listed corrective actions, notify your supervisor.

Table 6-2. TROUBLESHOOTING

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
1. CALCULATOR DISPLAY IS BLANK.	<p>Step 1. Plug in ac adapter/recharger. Turn calculator on.</p> <p>(a) If display of zeros comes on, proceed to step 2.</p> <p>(b) If display is blank, replace adapter/recharger.</p> <p>(c) If problem remains, replace calculator.</p> <p>Step 2. Check for raised decimal point at far left corner of display. Indicates low power condition.</p> <p>(a) If indicator is on, proceed to step 3.</p> <p>(b) If indicator is off, recharge battery pack.</p> <p>Step 3. Check to see if contacts are dirty.</p> <p>(a) Clean contacts on inside of calculator and battery pack with cotton swab (Item 6, Appendix E) moistened with alcohol (Item 3, Appendix E).</p> <p>(b) Replace battery pack. Open battery pack door. Remove defective battery pack. Install new battery pack. Reinstall battery pack door.</p>	

Table 6-2. TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
-------------	--------------------	-------------------

2. CALCULATIONS OR DISPLAY ERRATIC.

Step 1. Check for raised decimal point at far left corner of display. Indicates low power condition.

- (a) Recharge battery pack.
- (b) Replace battery pack.
- (c) Replace calculator.

Step 2. Press **[STO]** and **[ENTER]** to see if display shows -8, 8, 8, 8, 8, 8, 8, 8, not ERROR 9.

If ERROR 9 is displayed, replace calculator.

NOTE

For error conditions refer to operator's instructions for the HP-32E provided with equipment.

6-10. MAINTENANCE PROCEDURES. There are no operator maintenance procedures assigned for this equipment.

Section IV ORGANIZATIONAL MAINTENANCE

6-11. LUBRICATION INSTRUCTIONS. This equipment does not require lubrication.

6-12. REPAIR PARTS; SPECIAL TOOLS; TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT; AND SUPPORT EQUIPMENT. These items are not required at the organizational level of maintenance.

6-13. SERVICE UPON RECEIPT,

6-13.1 Checking Unpacked Equipment.

a. Inspect the equipment for damage incurred during shipment. If equipment has been damaged, report the damage on DD Form 6, Packing Improvement Report.

b. Check the equipment against the packing list to see if the shipment is complete. Report all discrepancies in accordance with the instructions of DA Pam 738-750.

c. Check to see whether the equipment has been modified.

6-14. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES. There are no organizational PMCS procedures assigned for this equipment.

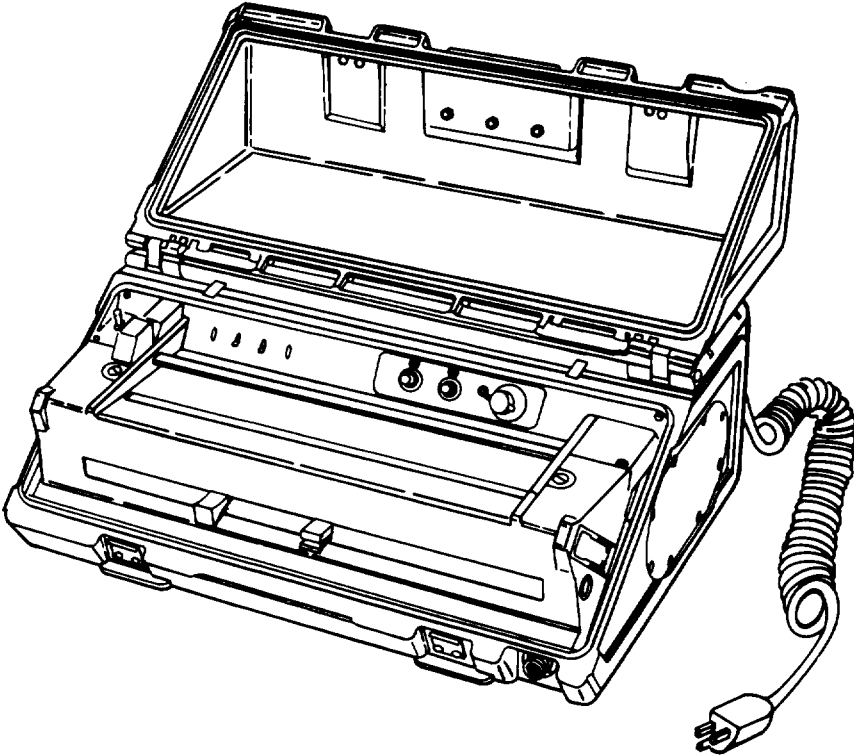
6-15. ORGANIZATIONAL TROUBLESHOOTING PROCEDURES. There are no organizational troubleshooting procedures assigned for this equipment.

6-16. MAINTENANCE PROCEDURES. There are no organizational maintenance procedures assigned for this equipment.

6-17. PREPARATION FOR STORAGE OR SHIPMENT. Contact your battalion for packing and shipping instructions.

Section V DIRECT/GENERAL SUPPORT MAINTENANCE

There are no direct/general support maintenance procedures assigned for this equipment.



CHAPTER 7

FACSIMILE TRANSMISSION AND RECEIVING DEVICE

7-1. GENERAL INFORMATION.

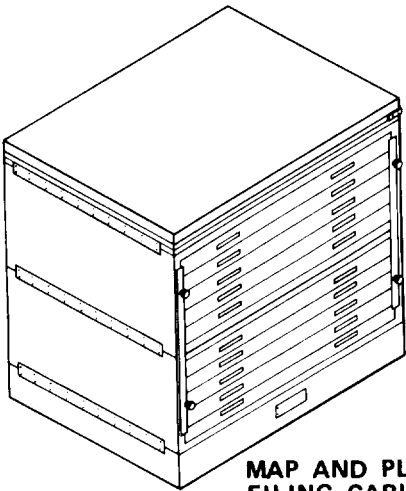
7-1.1 Scope.

a. Model Number and Equipment Name. Model AN/GXC-7A Facsimile Transmission and Receiving Device.

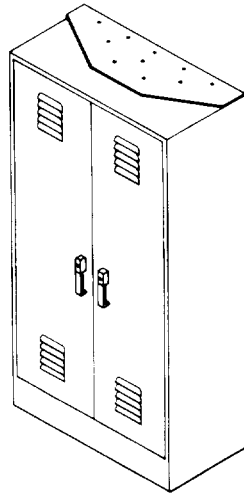
b. Purpose of Equipment. Used to transmit graphic material from one point to another by-electrical means. Graphic material may consist of maps, photographs, line drawings, printed or typed material, or handwritten messages.

7-1.2 Reference Information.

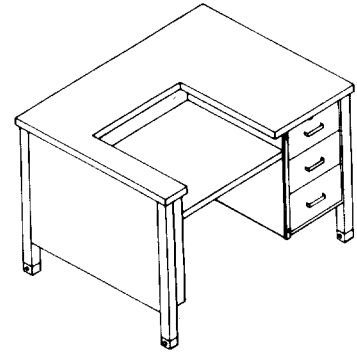
TM 08104A-14/1, TM 11-5895-1079-14, Operator, Organizational, Direct Support, General Support, and Field Maintenance, Facsimile Transceiver AN/GXC-7A, contains the information applicable to this equipment.



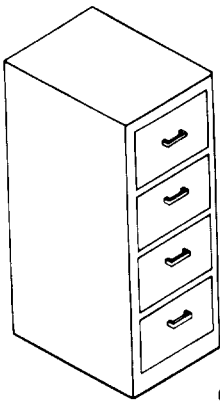
**MAP AND PLAN
FILING CABINET**



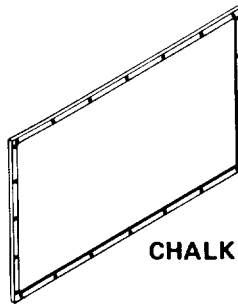
**TWO-DOOR
STORAGE
CABINET**



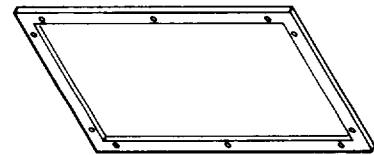
TYPEWRITER DESK



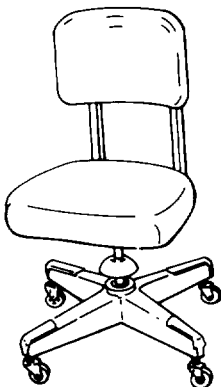
**FILING
CABINET**



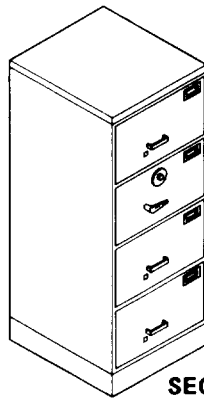
CHALKBOARD



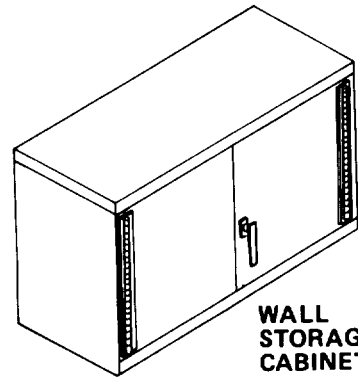
CORKBOARD



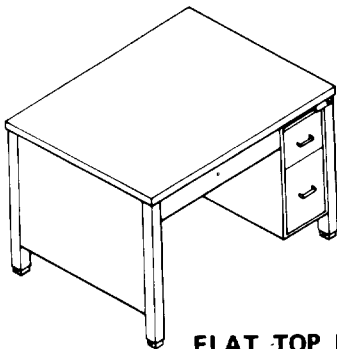
**ROTARY
DESK CHAIR**



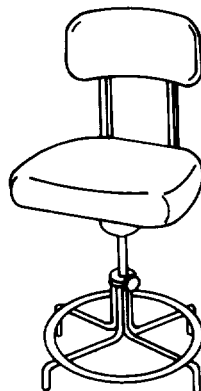
**SECURITY
FILING
CABINET**



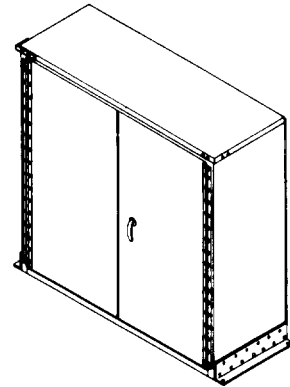
**WALL
STORAGE
CABINET**



FLAT TOP DESK



**ROTARY
DRAFTING
CHAIR**



**DOUBLE DOOR
BOOKCASE**

CHAPTER 8

FURNITURE AND CABINETS

Section I INTRODUCTION

8-1. GENERAL INFORMATION.

8-1.1 Scope. This chapter contains the description of all furniture and cabinets contained in this section.

8-2. EQUIPMENT DESCRIPTION.

a. Map and Plan Filing Cabinet. Used for flat, horizontal storage of maps, blueprints, charts, and plans of various sizes. The drawers are held shut by two locking bars located on either side of the front of the cabinet. A portable drawing board is rigidly mounted to the top of the cabinet for use as a work space. Dimensions:

Width	40.75 in. (103.50 cm)
Depth	28.62 in. (72.69 cm)
Height	41.68 in. (105.87 cm)

b. Flat Top Desk. Provides work space. It has three drawers that can be locked. Dimensions:

Width	45.0 in. (114.3 cm)
Depth	34.0 in. (86.4 cm)
Height	30.5 in. (77.5 cm)

c. Typewriter Desk. Provides a typing area and general work space for clerical personnel. The typewriter mounts on a recessed section of the desk top. There are three drawers which can be secured by a locking bar. Dimensions:

Width	45.0 in. (114.3 cm)
Depth	34.0 in. (86.4 cm)
Height	30.5 in. (77.5 cm)

d. Double door Bookcase. Used for the storage of books and manuals. There are three shelves within the bookcase. Dimensions:

Width	36.0 in. (91.4 cm)
Depth	13.06 in. (33.17 cm)
Height	36.0 in. (91.4 cm)

e. Filing Cabinet. Used for the storage of legal-sized documents, correspondence, and office supplies. There are four drawers. Dimensions:

Width	18.25 in. (46.36 cm)
Depth	26.63 in. (67.64 cm)
Height	52 in. (132.1 cm)

f. Security Filing Cabinet. Used for secure storage of classified documents. It has four drawers locked by a latch and combination lock located on the second drawer. Dimensions:

Width	20.75 in. (52.71 cm)
Depth	28.0 in. (71.1 cm)
Height	52.0 in. (132.1 cm)

g. Two-Door Storage Cabinet. Used for storage of miscellaneous large, bulky items. There are six shelves within the cabinet. It has two doors secured by handle type latches with a built-in lock. Dimensions:

Width	36.0 in. (91.4 cm)
Depth	18.0 in. (45.7 cm)
Height	68.75 in. (174.63 cm)

h. Wall Storage Cabinet. Used for miscellaneous storage. The two doors are held shut by a handle type latch. Dimensions:

Width	30.0 in. (76.2 cm)
Depth	12.0 in. (30.5 cm)
Height	18.0 in. (45.7 cm)

i. Rotary Drafting Chair. Provides seating for drafting personnel. It has adjustable seat height and back position. Dimensions:

Width	17.12 in. (43.48 cm)
Depth	17.12 in. (43.48 cm)
Height	42.0 in. (106.7 cm), Max 36.0 in. (91.4 cm), Min

j. Rotary Desk Chair. Provides seating for personnel working at desks. It has a 3.75 in. (9.53 cm) seat height adjustment, ball bearing casters, tilt movement tension adjustment, and adjustable back height. Dimensions:

Width	20.0 in. (50.8 cm)
Depth	21.0 in. (53.3 cm)
Height	32.0 in. (81.3 cm)

k. Chalkboard. Wall mounted. Hinged to swing out for briefings. Dimensions:

Width	48.0 in. (122.0 cm)
Height	36.0 in. (91.4 cm)

1. Corkboards. Wall mounted. Dimensions:

Width	60.0 in. (152.4 cm)
Height	36.0 in. (91.4 cm)
Width	18.0 in. (45.7 cm)
Height	30.0 in. (76.2 cm)

8-3. TECHNICAL PRINCIPLES OF OPERATION. There are no specific principles of operation for this equipment.

Section II OPERATING INSTRUCTIONS

8-4. DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND INDICATORS. This equipment has no operator's controls or indicators.

8-5. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES. There are no operator PMCS procedures assigned for this equipment.

8-6. OPERATION UNDER USUAL CONDITIONS.

8-6.1 Preparation for Movement. Ensure that portable equipment is properly secured with provided tiedowns.

8-7. OPERATION UNDER UNUSUAL CONDITIONS. There are no specific requirements for operation under unusual conditions.

Section III OPERATOR MAINTENANCE

8-8. LUBRICATION INSTRUCTIONS. This equipment does not require lubrication.

8-9. TROUBLESHOOTING PROCEDURES. There are no operator troubleshooting procedures assigned for this equipment.

8-10. MAINTENANCE PROCEDURES.

a. This section contains instructions covering operator maintenance functions for the furniture and cabinets. Personnel required are listed only if the task requires more than one.

b. After completing each maintenance procedure, perform operational check to be sure that equipment is properly functioning.

8-10.1 Inspect Cabinets and Furniture. Inspect furniture and cabinets for structural damage, rust, and proper operation of all latches, hinges, drawer slides, and adjustment mechanisms.

Section IV ORGANIZATIONAL MAINTENANCE

8-11. LUBRICATION INSTRUCTIONS. This equipment does not require lubrication.

8-12. REPAIR PARTS, SPECIAL TOOLS; TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE); AND SUPPORT EQUIPMENT.

8-12.1 Common Tools and Equipment. For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

8-12.2 Special Tools; Test, Measurement, and Diagnostic Equipment; and Support Equipment. Special Tools, TMDE, and Support Equipment is listed in the applicable repair parts and special tools list and in Appendix B of this manual.

8-12.3 Repair Parts. Repair parts are listed and illustrated in the Repair Parts and Special Tools List, TM 5-6676-313-24P covering organizational maintenance for this equipment.

8-13. SERVICE UPON RECEIPT.

8-13.1 Checking Unpacked Equipment.

a. Inspect the equipment for damage incurred during shipment. If the equipment has been damaged, report the damage on DD Form 6, Packing Improvement Report.

b. Check the equipment against the packing list to see if the shipment is complete. Report all discrepancies in accordance with the instructions of DA Pam 738-750.

c. Check to see whether the equipment has *been* modified.

8-14. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES. There are no organizational PMCS procedures assigned for this equipment.

8-15. ORGANIZATIONAL TROUBLESHOOTING PROCEDURES. There are no organizational troubleshooting procedures assigned for this equipment.

8-16. MAINTENANCE PROCEDURES.

a. This section contains instructions covering organizational maintenance functions for the furniture and cabinets. Personnel required are listed only if the task requires more than one.

b. After completing each maintenance procedure, perform operational check to be sure that equipment is properly functioning.

I N D E X

PROCEDURE	PARAGRAPH
Repl ace Door Hi nge (Pi ano Hi nge)	8-16. 1
Repl ace Door Latch (Wal l Storage Cabi net)	8-16. 2
Remove/Instal l Wal l Storage Cabi net	8-16. 3
Remove/Instal l Map and Pl an Fi lli ng Cabi net/Portabl e Drawi ng Board Assembl y	8-16. 4
Remove/Instal l Typewri ter Desk	8-16. 5
Remove/Instal l Fl at Top Desk	8-16. 6
Remove/Instal l Two-Door Storage Cabi net	8-16. 7
Remove/Instal l Fi lli ng Cabi net.	8-16. 8
Remove/Instal l Securi ty Fi lli ng Cabi net	8-16. 9
Remove/Instal l Double Door Bookcase	8-16. 10
Remove/Instal l Corkboard	8-16. 11
Remove/Instal l Chal kboard.	8-16. 12

8-16.1 Replace Door Hinge (Piano Hinge).

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: 1/4 in. Electric Drill
5/32 in. Twist Drill
Pop Rivet Gun

SUPPLIES: Piano Hinge
5/32 in. Pop Rivets
8-32 x 1/2 in. Screws (4 required)
8-32 Nuts (4 required)

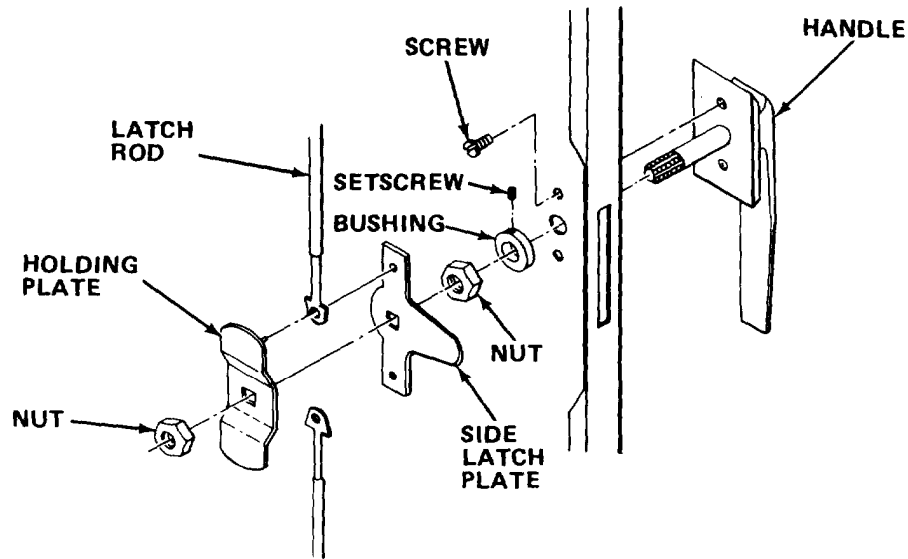
- a. Drill out rivets holding hinge to cabinet and remove hinge.
- b. Install new hinge and temporarily secure with four 8-32 screws and nuts.
- c. Close and latch cabinet door and install pop rivets.
- d. Remove temporarily installed screws and nuts and install remaining pop rivets.

8-16.2 Replace Door Latch (Wall Storage Cabinet).

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: 9/16 in. Combination Wrench
Flat Tip Screwdriver

SUPPLIES: Handle Type Latch

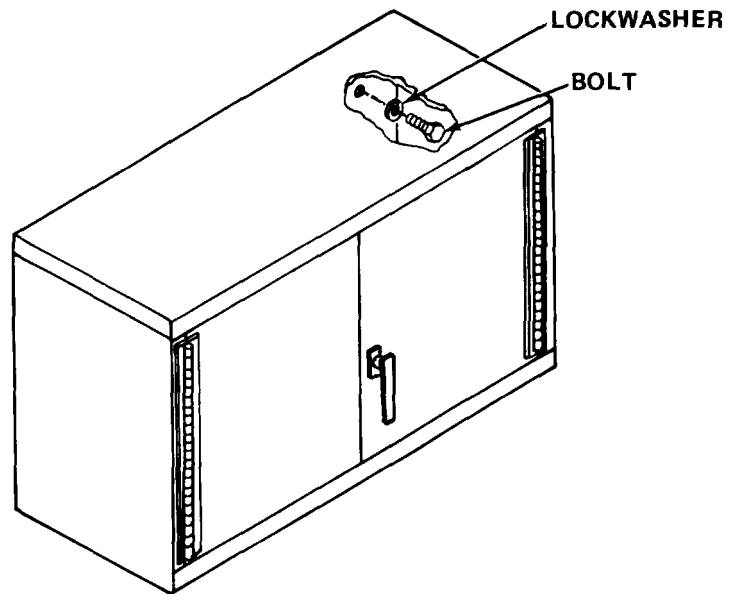


- a. Remove holding plate retaining nut.
- b. Remove holding plate and latch rods.
- c. Remove side latch plate.
- d. Remove handle retaining nut.
- e. Loosen setscrew and remove bushing from handle shaft.
- f. Remove handle retaining screws and remove handle.
- g. Install new handle and secure with screws.
- h. Reinstall bushing on handle shaft and tighten setscrew.
- i. Reinstall handle retaining nut.
- j. Install side latch plate.
- k. Reinstall latch rod holding plate and latch rods.
- l. Reinstall holding plate retaining nut.

8-16.3 Remove/Install Wall Storage Cabinet.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: 1/2 in. Drive Ratchet
2 in. Socket Extension, 1/2 in. Drive
1/2 in. Socket, 1/2 in. Drive



- a. Remove bolts and lockwashers which secure defective cabinet to wall.
- b. Remove defective cabinet.
- c. Install new cabinet and secure to wall with lockwashers and bolts.

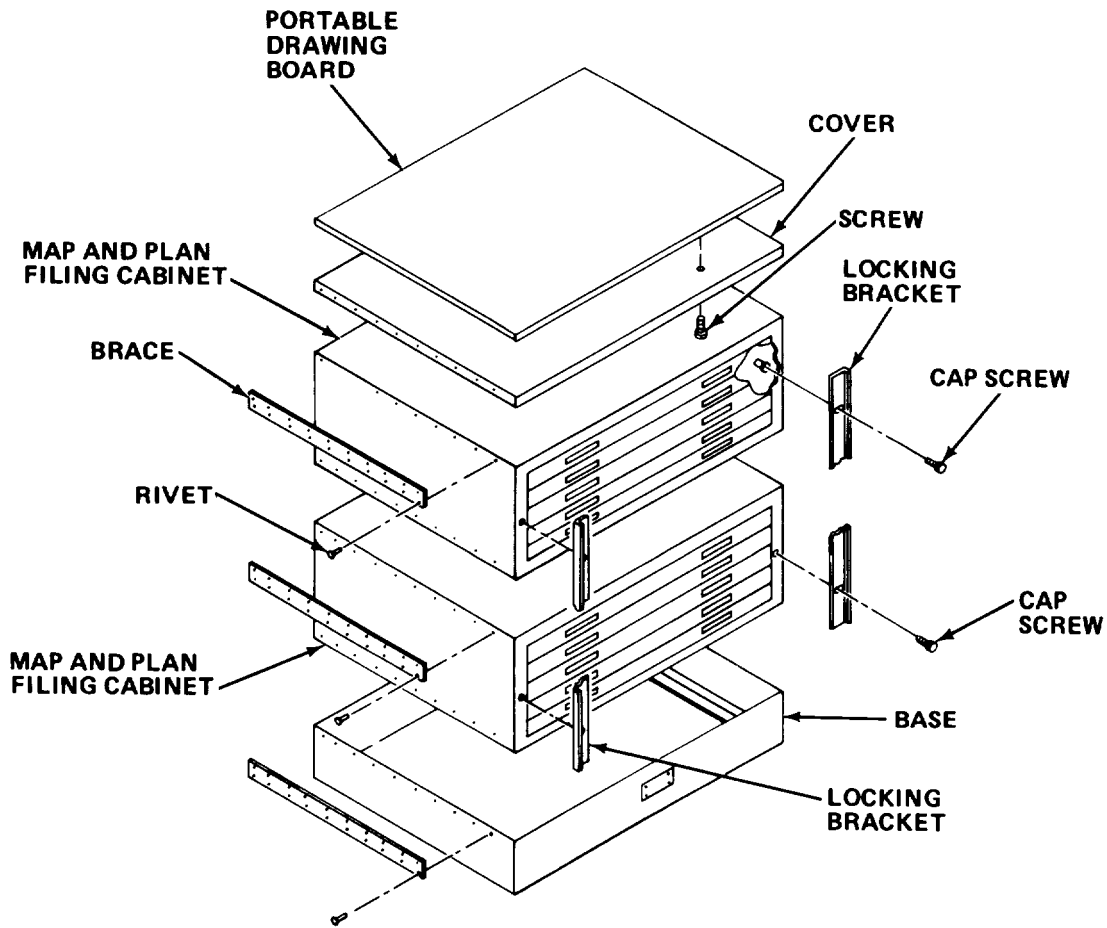
8-16.4 Remove/Install Map and Filing Cabinet/Portable Drawing Board Assembly.

MOS: 83FJ6, Reproduction Equipment Repairer

PERSONNEL: Two persons are required to perform this procedure.

TOOLS: Pop Rivet Gun
Drill and Bits
Flat Tip Screwdriver

SUPPLIES: Portable Drawing Board
Map and Plan Filing Cabinet
Pop Rivets



- a. Drill pop rivets from braces and remove braces.
- b. Remove map and plan filing cabinet cover; turn cover over and unscrew portable drawing board from cover. Retain screws for reuse.
- c. Remove knurled screws from locking brackets on each side of front. Remove locking brackets.

WARNING

Serious personal injury can result if an inadequate number of personnel are used to move the map and plan filing cabinet.

- d. Lift top and bottom sections free from base.
- e. Unscrew base from floor. Retain screws for reuse.
- f. Install new base, top or bottom, map and plan filing cabinet, or drawing board as required.
- g. Screw base to floor through inside mounting brackets.
- h. Pop rivet bottom section to base through braces.
- i. Pop rivet top section to bottom section through braces.
- j. Screw portable drawing board to top.
- k. Pop rivet top to top section.
- l. Reinstall locking brackets and secure with knurled screws.

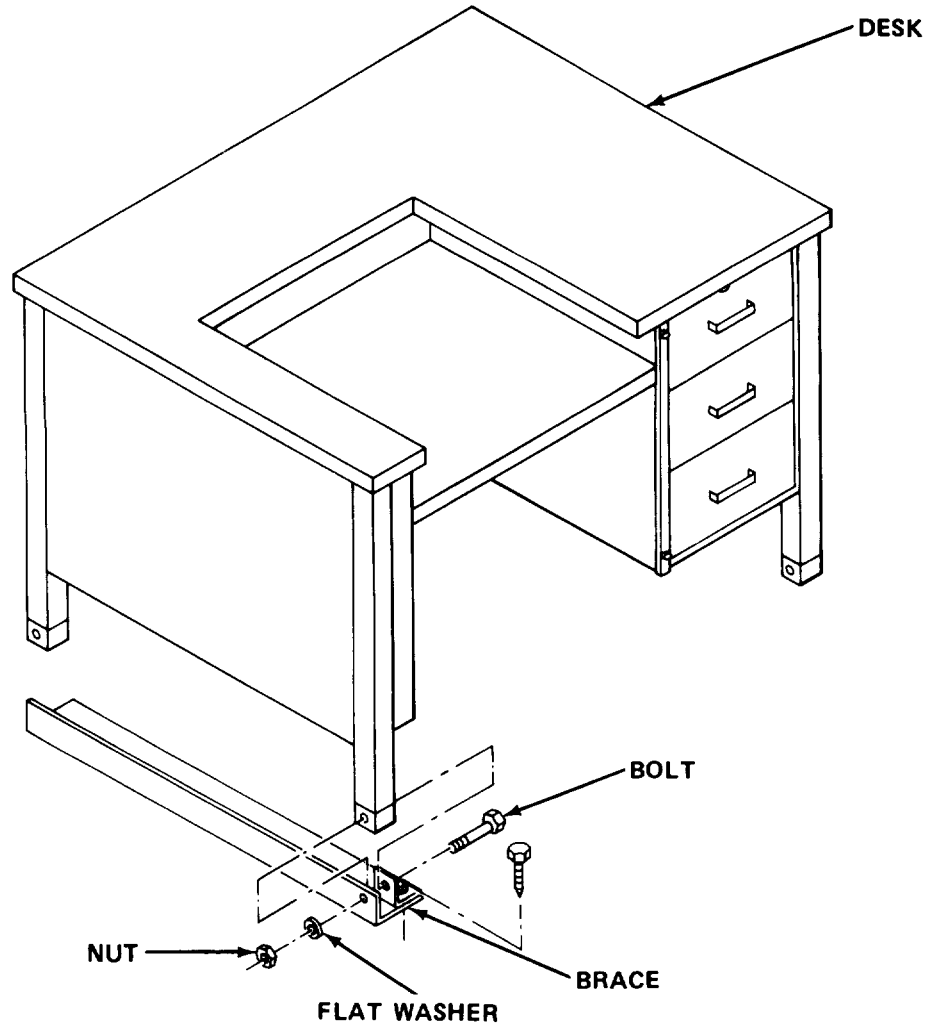
8-16.5 Remove/Install Typewriter Desk

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: 1/4 in. Drive Ratchet
1/2 in. Socket, 1/4 in. Drive
3 in. Extension, 1/4 in. Drive

SUPPLIES: Typewriter Desk

a. Remove typewriter (paragraph 9-16.2).



b. Remove bolts, flat washers, nuts, and braces from desk legs.

c. Remove defective desk.

d. Position new desk and align holes with mounting brackets.

e. Secure desk with braces, nuts, flat washers, and bolts.

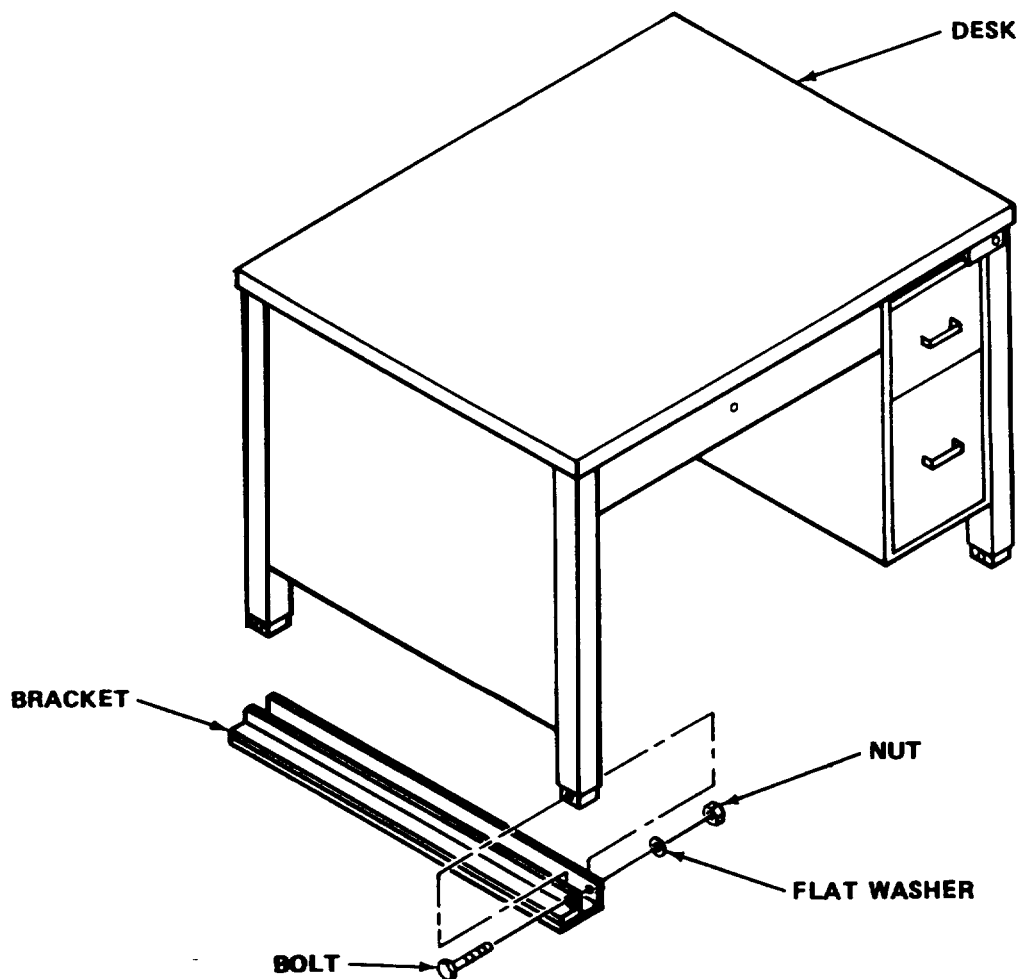
8-16.6 Remove/Install Flat Top Desk.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: 1/4 in. Drive Ratchet
 1/2 in. Socket, 1/4 in. Drive
 3 in. Extension, 1/4 in. Drive

SUPPLIES: Flat Top Desk

- a. Remove **material from drawers.** Lock drawers and tape key to desk.



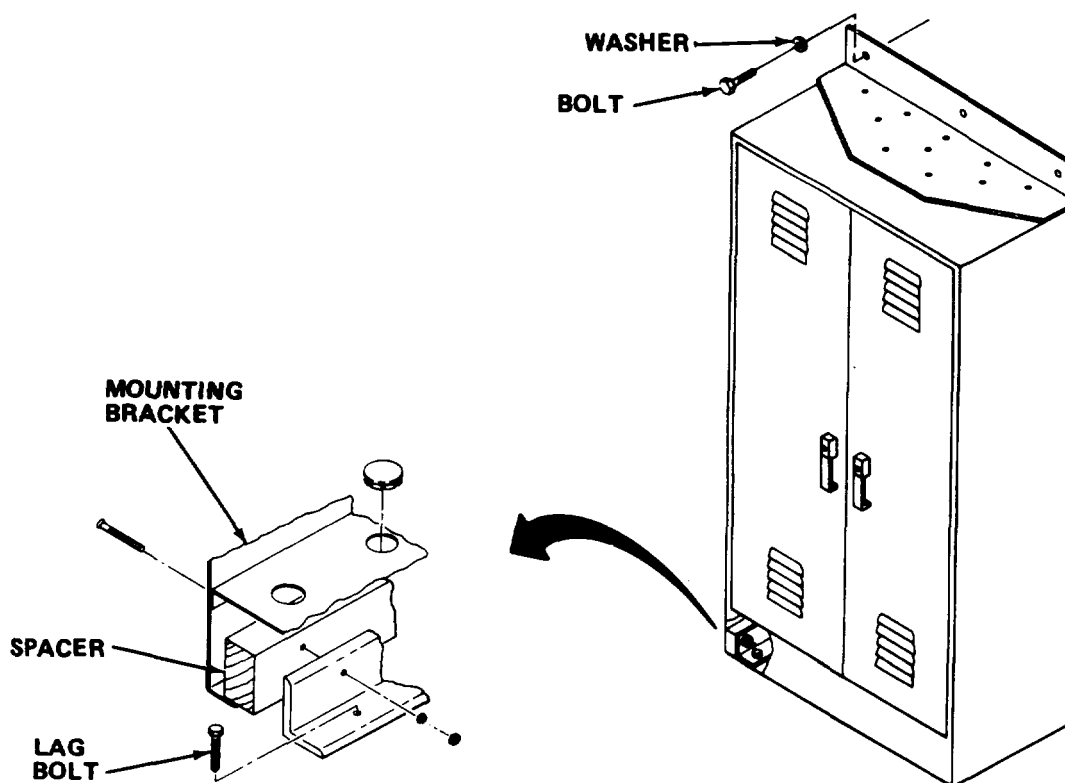
- b. Remove bolts, flat washers, and nuts from legs.
- c. Remove defective desk.
- d. Position new desk and align holes in legs with bracket holes.
- e. Secure desk with nuts, flat washers, and bolts.

8-16.7 Remove/Install Two-Door Storage Cabinet.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: 1/4 in. Drive Socket Set
6 in. Extension, 1/4 in. Drive
11/32 in. Combination Wrench
Flat Tip Screwdriver
Cross Tip Screwdriver

SUPPLIES: Storage Cabinet



- Remove bolts and flat washers holding cabinet to wall.
- Remove caps and lag bolts holding mounting bracket to floor; remove defective cabinet.
- Remove bolts, lockwashers, nuts mounting brackets, and spacers from cabinet. Retain mounting brackets and spacers for use on new cabinet.
- Position spacers and mounting brackets on new cabinet and install, but do not tighten nuts, lockwashers, and bolts.

- e. Place new cabinet in position and install but do not tighten lag bolts.
- f. Secure cabinet to wall with flat washers and bolts.
- g. Tighten bracket retaining bolts and nuts.
- h. Tighten bolts holding the mounting brackets to floor and install the caps.

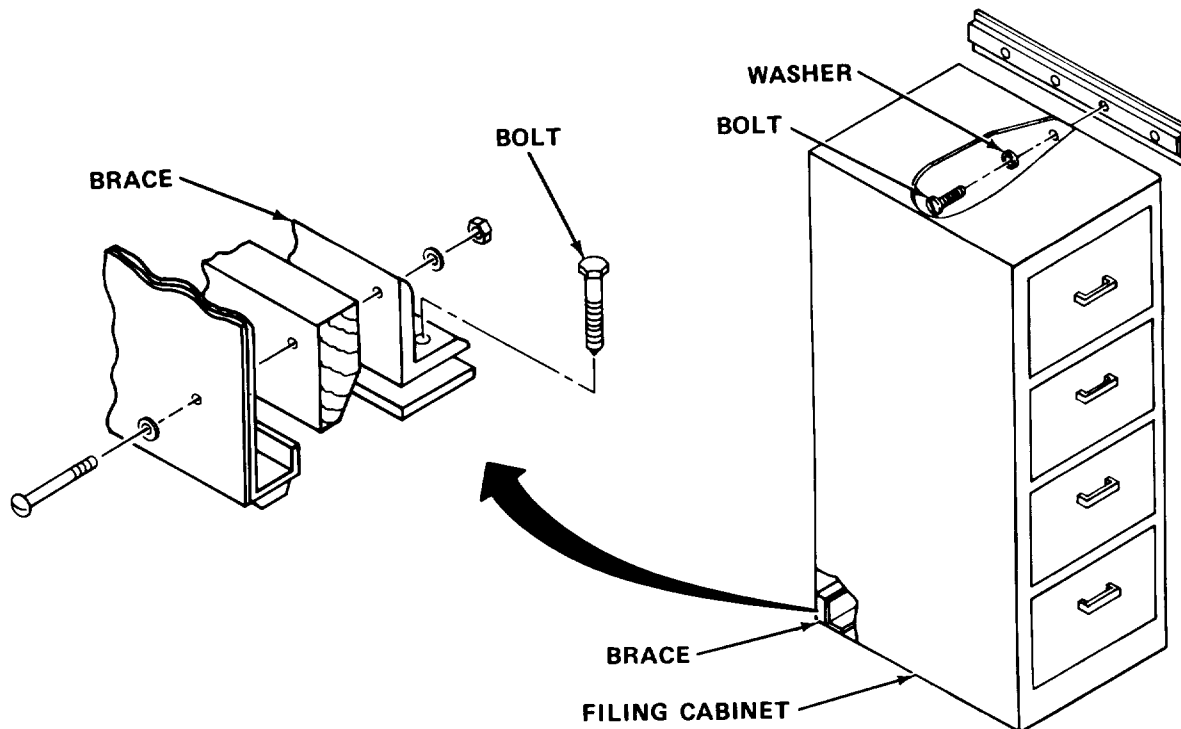
8-16.8 Remove/Install Filing Cabinet.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS : Flat Tip Screwdriver
1/2 in. Socket, 1/4 in. Drive
1/4 in. Drive Ratchet

SUPPLIES: Filing Cabinet

- a. Remove drawers from defective filing cabinet.



- b. Remove bolts and washers securing cabinet to wall.
- c. Remove bolts securing braces to floor.
- d. Remove defective cabinet.
- e. Remove braces from defective filing cabinet.
- f. Remove drawers from new cabinet.
- g. Install braces on new cabinet.
- h. Secure cabinet to floor.
- i. Secure cabinet to wall.
- j. Reinstall drawers in cabinet.

8-16.9 Remove/Install Security Filing Cabinet.

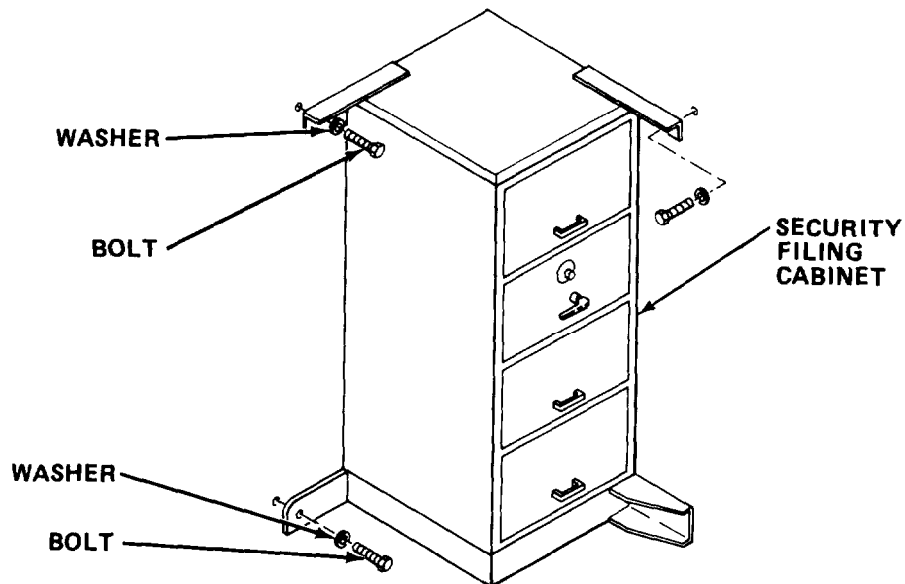
MOS: 83FJ6, Reproduction Equipment Repairer

PERSONNEL: Two persons are required to perform this procedure.

TOOLS: 1/4 in. Drive Ratchet
 1/2 in. Socket, 1/4 in. Drive
 9/16 in. Socket, 1/4 in. Drive
 3 in. Extension, 1/4 in. Drive

SUPPLIES: Security Filing Cabinet

- a. Open cabinet and move material to secure storage.
- b. Tape lock combination to outside of defective cabinet.



- c. Remove bolts and washers.

WARNING

Severe personal injury may occur when loading/unloading the cabinet due to cabinet's weight. Use special care and use only approved lifting equipment.

- d. Move defective cabinet to door with hand truck; remove from section with hoist.
- e. Position new cabinet in section, align mounting holes, and secure with washers and bolts.
- f. Change combination before storing material in new security filing cabinet.

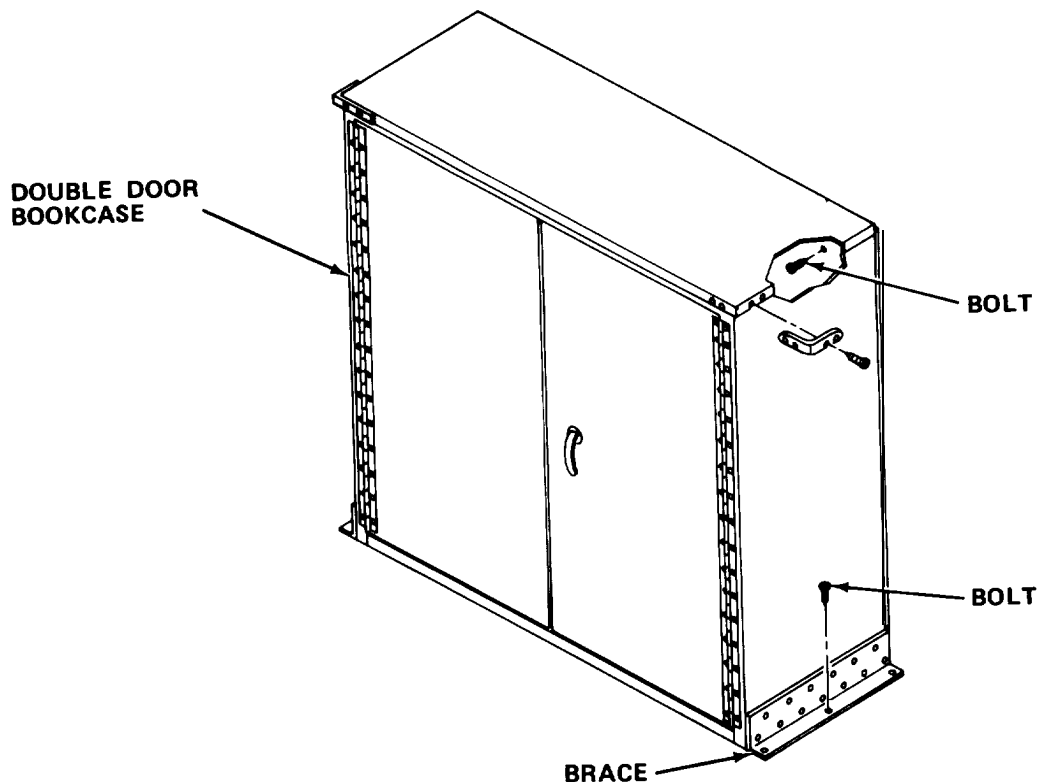
8-16.10 Remove/Install Double Door Bookcase

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: **Pop Rivet Gun**
1/2 in. Drive Ratchet
1/2 in. Socket, 1/2 in. Drive

SUPPLIES: Double Door Bookcase
Pop rivets

- a. Remove contents from bookcase



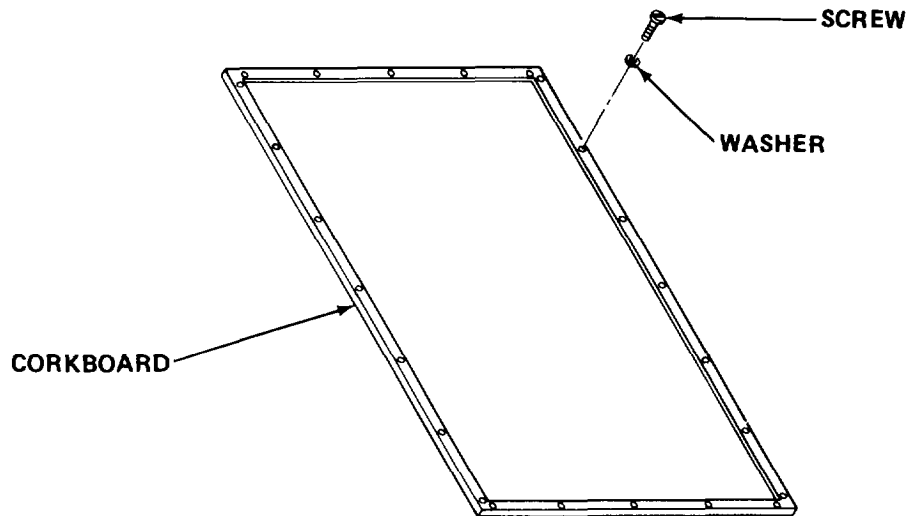
- b. Remove bolts and lockwashers securing bookcase to wall bracket.
- c. Remove bolts securing braces to floor.
- d. Remove braces from defective bookcase.
- e. Install braces on new bookcase.
- f. Position new bookcase and align mounting holes with wall bracket.
- g. Secure with lockwashers and bolts.

8-16.11 Remove/Install Corkboard.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Cross Tip Screwdriver

SUPPLIES: Corkboard



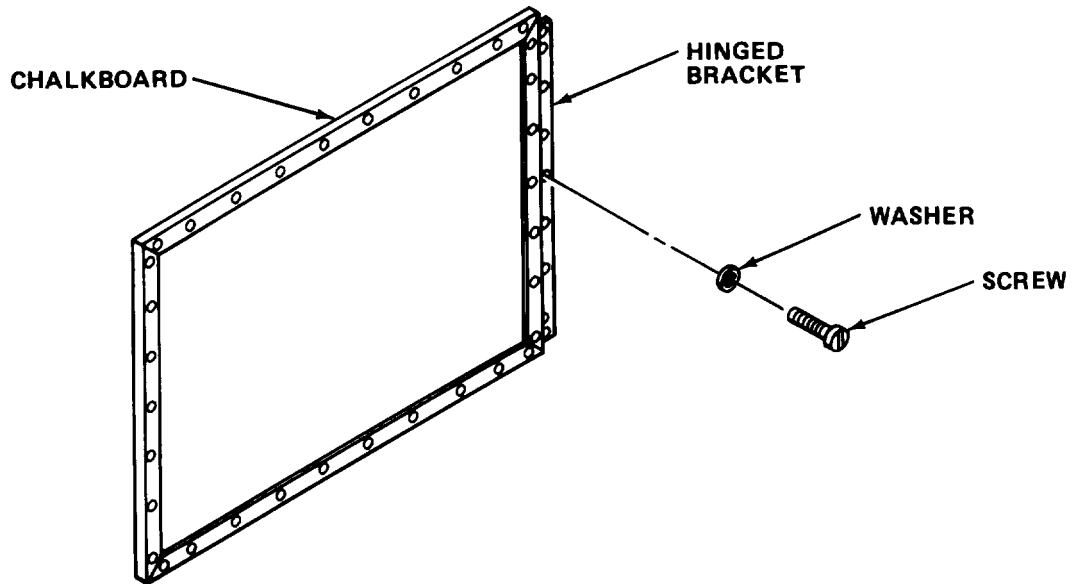
- a. Remove screws and washers.
- b. Remove corkboard.
- c. Position new corkboard and align mounting holes.
- d. Secure with screws and washers.

8-16.12 Remove/Install Chalkboard.

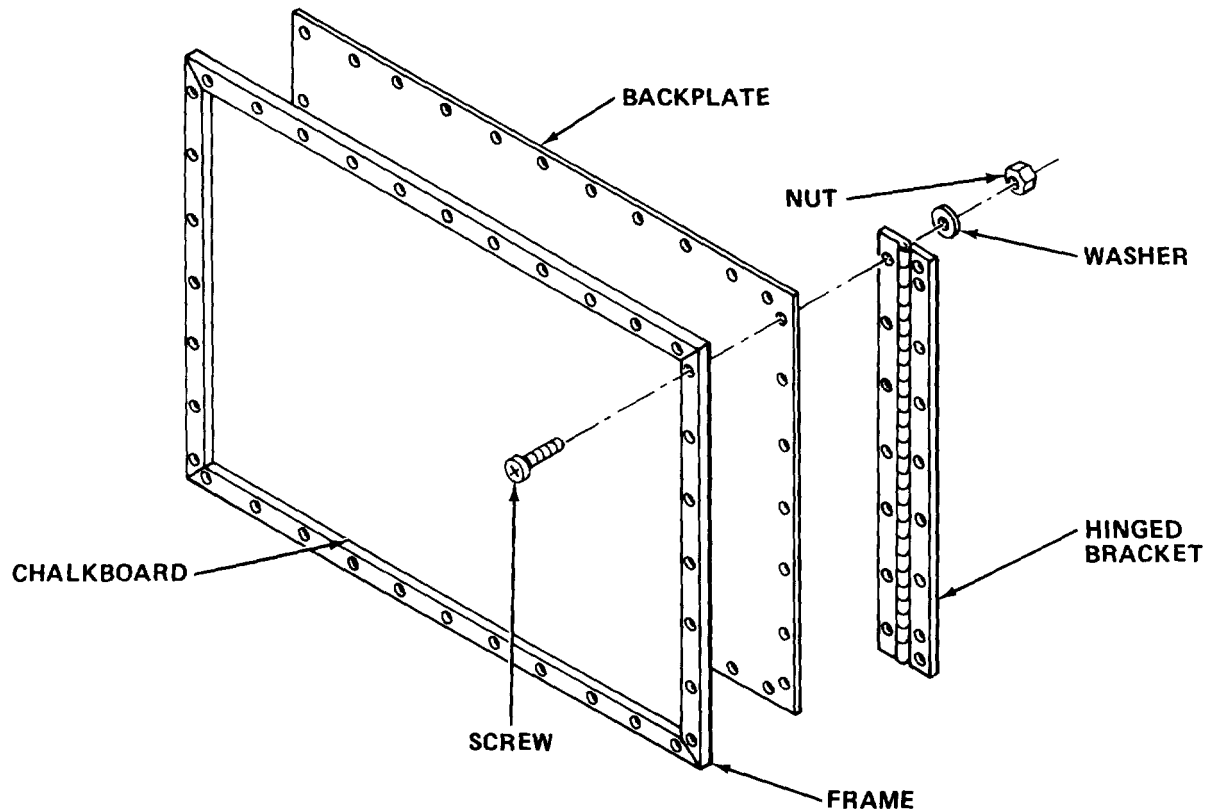
MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Cross Tip Screwdriver

SUPPLIES: Chalkboard



- a. Remove screws and washers from hinged bracket and remove defective chalkboard from wall.

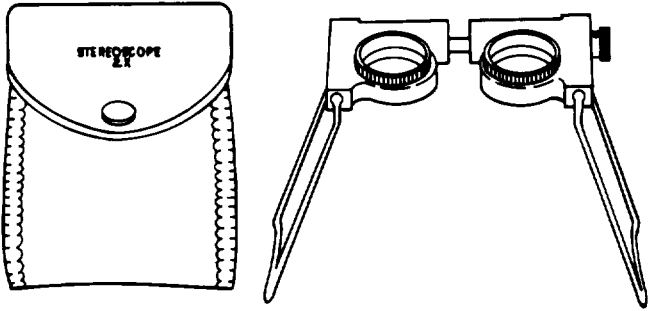


- b. Remove screws, washers, nuts, frame, and backplate from defective chalkboard.
- c. Install frame and backplate on new chalkboard using nuts, washers and screws.
- d. Position new chalkboard and align mounting holes with hinged bracket holes.
- e. Secure with screws and washers.

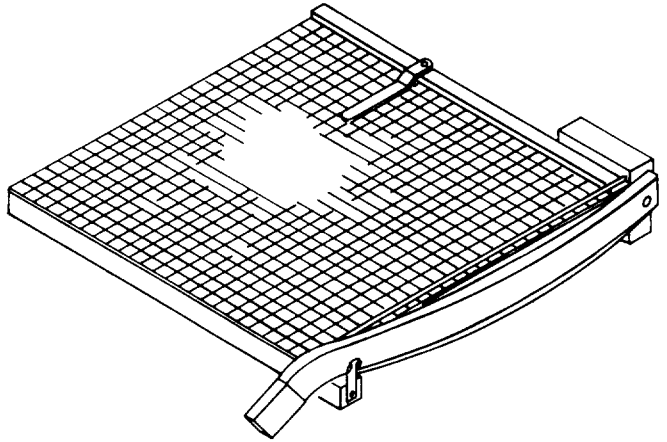
8-17. PREPARATION FOR STORAGE OR SHIPMENT, Contact your battalion for packing and shipping instructions.

Section V DIRECT/GENERAL SUPPORT MAINTENANCE

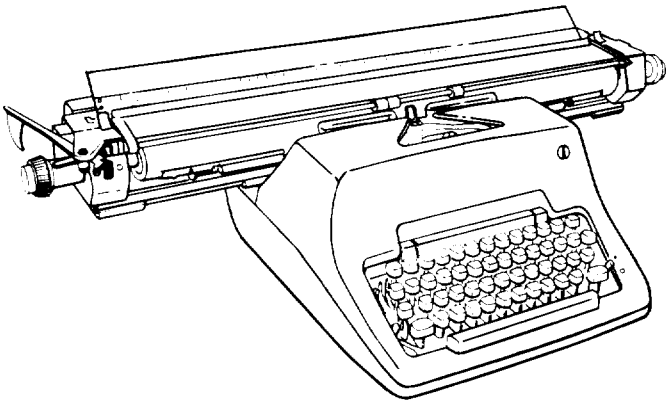
There are no direct/general support maintenance procedures assigned for this equipment.



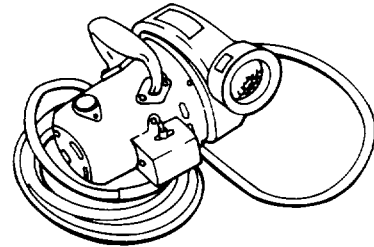
POCKET STEREOSCOPE



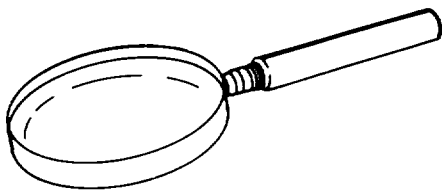
PAPER TRIMMER



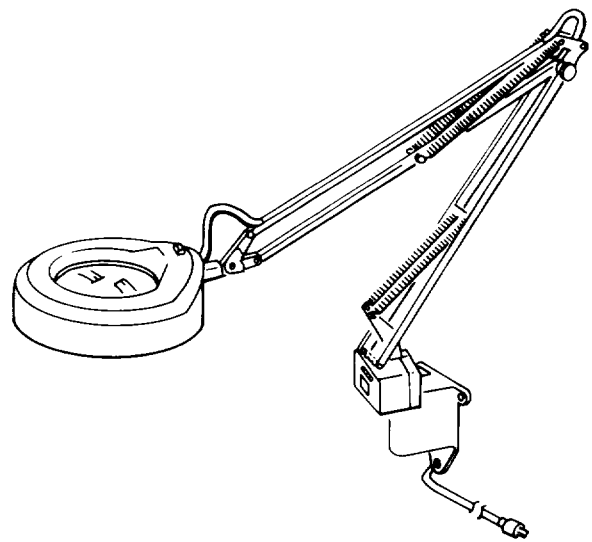
MANUAL TYPEWRITER



VACUUM CLEANER



MONOCULAR MAGNIFIER



MAGNIFIER LAMP

CHAPTER 9

SUPPORT ITEMS

Section I INTRODUCTION

9-1. GENERAL INFORMATION.

9-1.1 Scope. This chapter covers the support items contained in this section. The support items consist of the following equipment:

- a. Model LFMI BX5 Magnifier Lamp
- b. Model P/N 12070C Monocular Magnifier
- c. Model FED-99-T-678 Paper Trimmer
- d. Type 1 Pocket 2X Stereoscope
- e. Model SG3B Manual Typewriter
- f. Model 3400 Vacuum Cleaner

9-2. EQUIPMENT DESCRIPTION.

9-2.1 Equipment Characteristics, Capabilities, and Features.

- a. Magnifier Lamp. Adjustable for accurate positioning to provide illuminated magnification of precision work. Provision for both wall and bench mounting.
- b. Monocular Magnifier. Hand held magnifier.
- c. Paper Trimmer. Cuts paper up to 24 in. wide.
- d. Pocket Stereoscope. Optically matches and gives operator an apparent single image of two maps or photographs.
- e. Manual Typewriter. Refer to operator's manual supplied with the typewriter for characteristics, capabilities, and features.
- f. Vacuum Cleaner. High speed, heavy duty. Used for general cleaning.

9-2.2 Equipment Data.

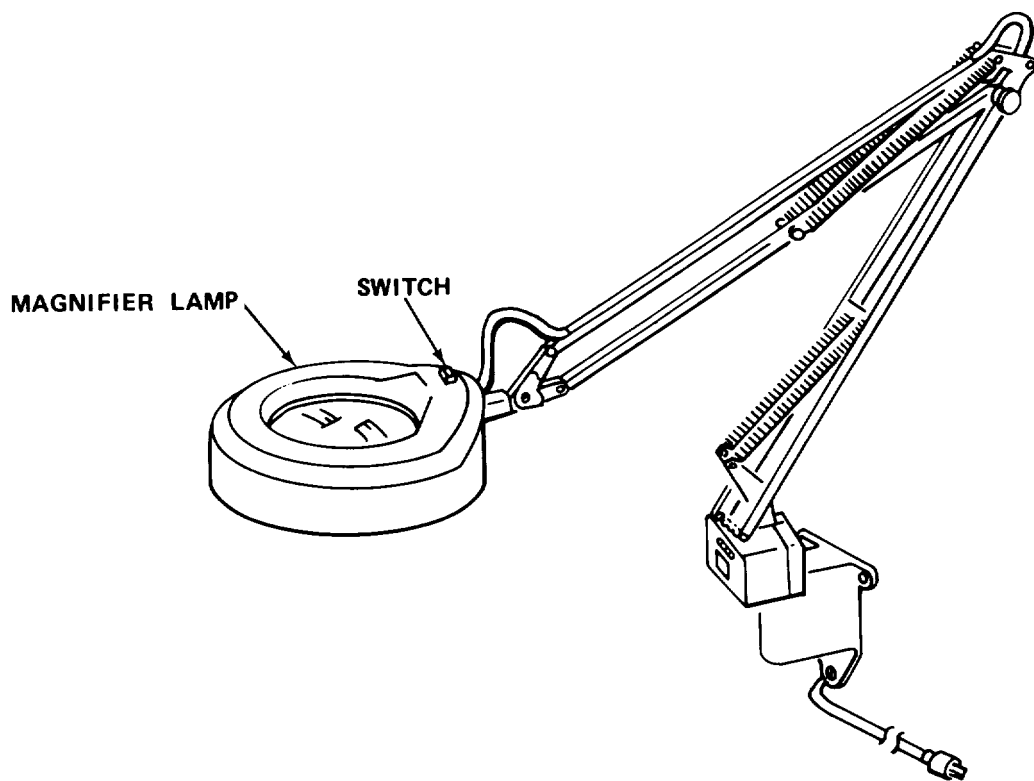
- a. Magnifier Lamp. Replaceable 115 V ac lamp and diffuser.
- b. Vacuum Cleaner. Packed in storage box containing hose, various vacuum and blowing attachments, liquid spray attachments, and motor repair kit containing motor bearings and brushes.
- c. Manual Typewriter. Refer to operator's manual supplied with the typewriter for equipment data.

9-3. TECHNICAL PRINCIPLES OF OPERATION. Principles of operation are combined with operator's controls and indicators.

Section II OPERATING INSTRUCTIONS

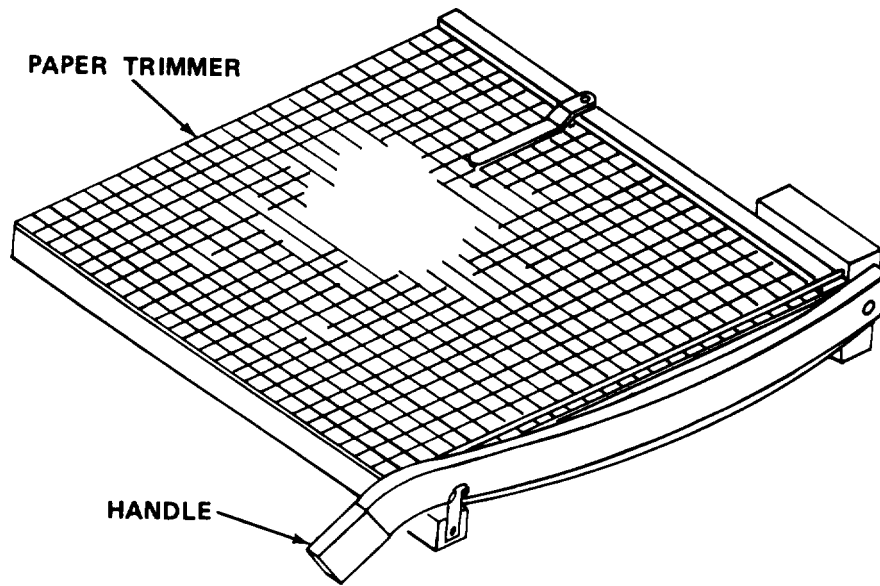
9-4. DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND INDICATORS.

9.4.1 Magnifier Lamp.



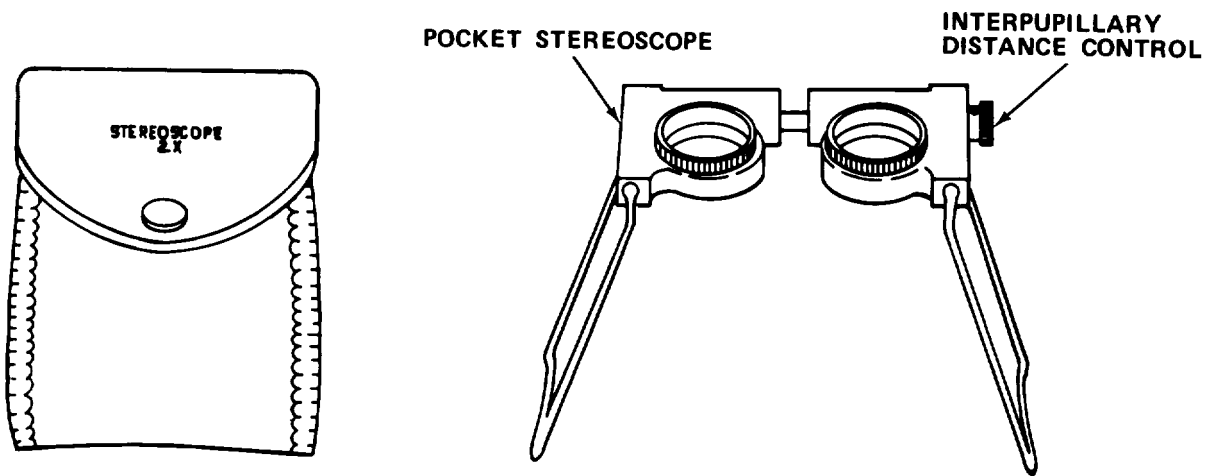
Control or Indicator	Function
Switch	Turns lamp on/off.

9-4.2 Paper Trimmer.



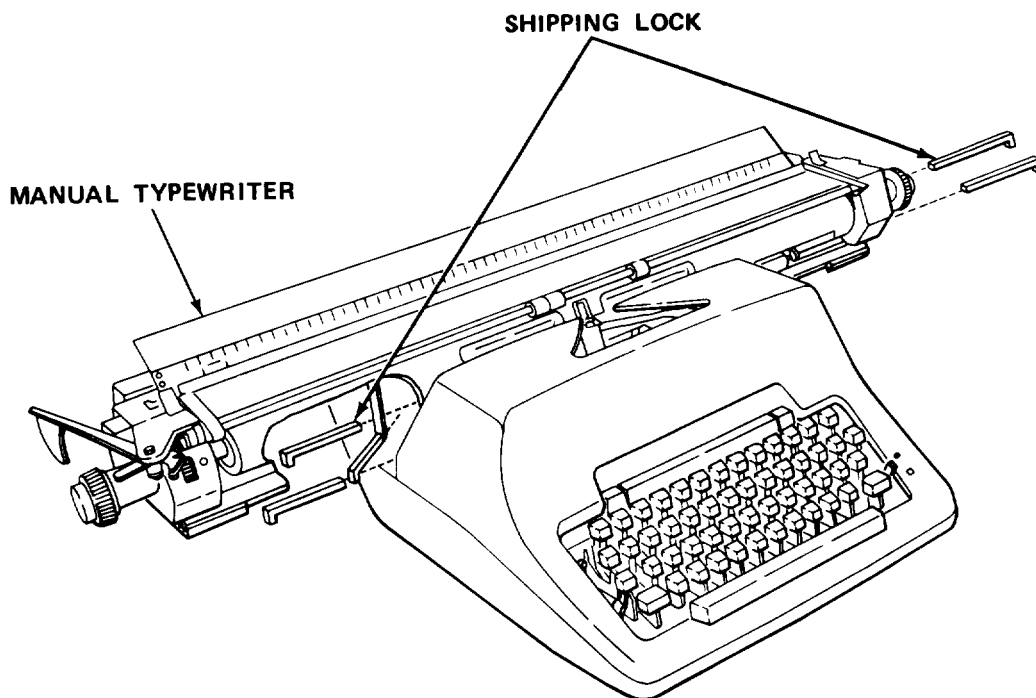
Control or Indicator	Function
Handle	Operates cutter

9-4.3 Pocket Stereoscope.



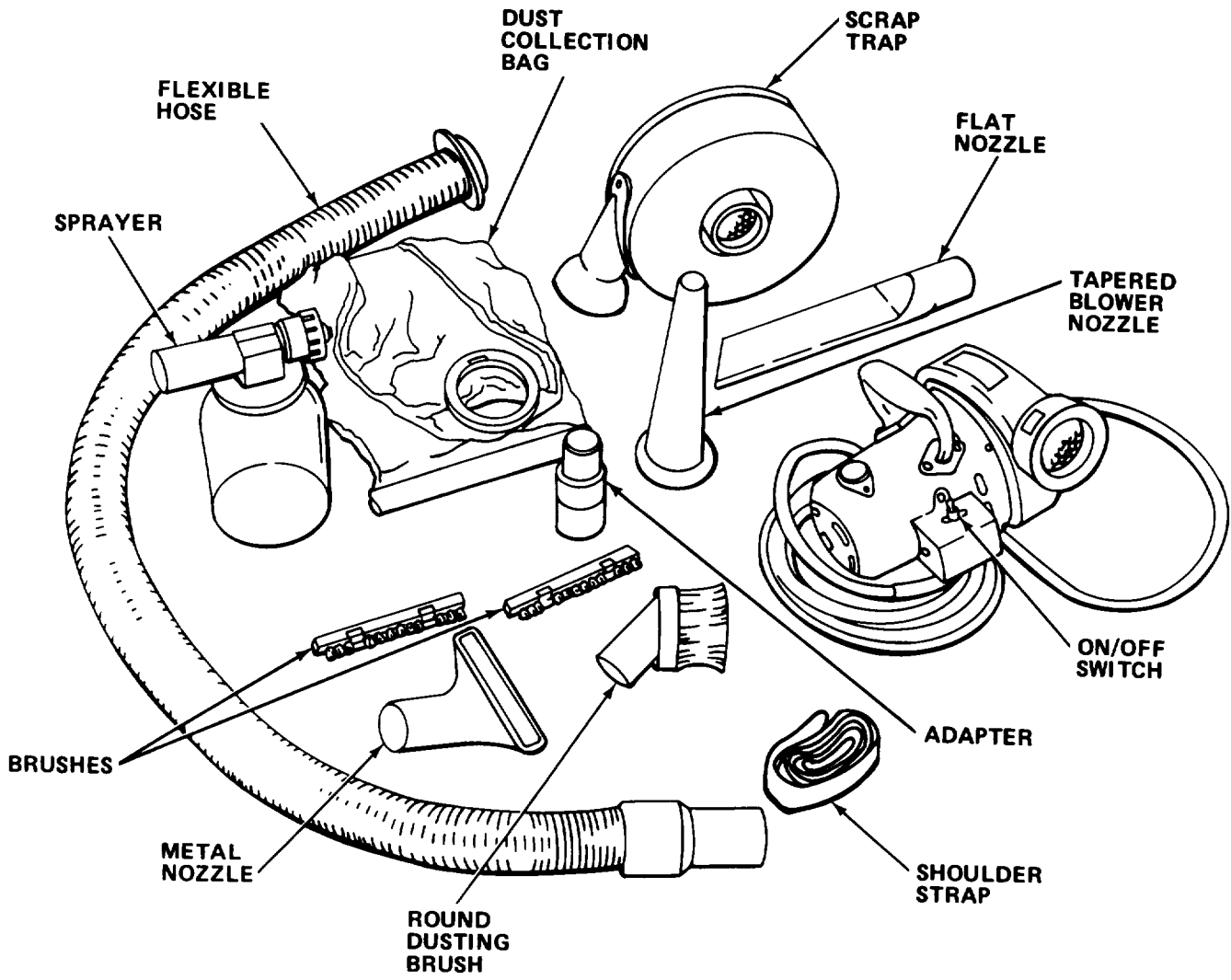
Control or Indicator	Function
Interpupillary Distance Control	Adjusts interpupillary distance of lenses to match that of viewer.

9-4.4 Manual Typewriter. Refer to the operator's manual supplied with the typewriter for the controls and indicators not shown.



Control or Indicator	Function
Shipping Lock	Locks carriage when typewriter is being transported.

9-4.5 Vacuum Cleaner.



Control or Indicator

Function

Sprayer

Sprays liquids when hooked to blower side of vacuum cleaner.

Flexible Hose

Directs airflow in hard-to-reach areas.

Dust Collection Bag

Collects and holds dust and dirt.

Scrap Trap

Traps large particles before they enter fan.

Control or Indicator	Function
Flat Nozzle	Used for hard-to-reach areas.
Tapered Blower Nozzle	Directs airflow.
ON/OFF Switch	Turns power on or off.
Shoulder Strap	Attaches to vacuum cleaner for easier carrying.
Round Dusting Brush	Used for light dust and dirt.
Metal Nozzle	Used for large, flat surfaces.
Brushes	Used on metal nozzle.
Adapter	Connects various attachments to hose.

9-5. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES.

- a. Before You Operate. Always keep in mind the WARNINGS and CAUTIONS. Perform your before (B) PMCS.
- b. While You Operate. Always keep in mind the WARNINGS and CAUTIONS. Perform your during (D) PMCS.
- c. After You Operate. Be sure to perform your after (A) PMCS.
- d. If Your Equipment Fails To Operate. Troubleshoot with proper equipment. Report any deficiencies using the proper forms. See DA Pam 738-750.

9-5.1 PMCS Procedures.

- a. PMCS are designed to keep the equipment in good working condition by performing periodic service tasks.
- b. Service intervals provide you, the operator, with time schedules that determine when to perform specified service tasks.
- c. The "Equipment is Not Ready/Available If" column is used for identification of conditions that make the equipment not ready/available for readiness reporting purposes or denies use of the equipment until corrective maintenance is performed.
- d. If your equipment fails to operate after PMCS is performed, immediately report this condition to your supervisor.
- e. Perform weekly as well as before operation if you are the assigned operator and have not operated the item since the last weekly or if you are operating the item for the first time.
- f. Item number column. Item numbers are assigned in chronological ascending sequence regardless of interval designation. These numbers are used for your "TM Number" Column on DA Form 2404, Equipment Inspection and Maintenance Worksheet in recording results of PMCS.
- g. Interval columns. This column determines the time period designated to perform your PMCS.
- h. Item to be inspected and procedures column. This column lists functional groups and their respective assemblies and subassemblies as shown in the Maintenance Allocation Chart (Appendix B). The appropriate check or service procedure follows the specific item to be inspected.
- i. Equipment is not ready/available if: column. This column indicates the reason or cause why your equipment is not ready/available to perform its primary mission.
- j. List of tools and materials required for PMCS is as follows:

<u>Equipment</u>	<u>Items</u>	<u>Quantity</u>
Magnifier Lamp	Liquid Lens Cleaner (Item 4, Appendix E)	ar
	Cheesecloth (Item 5, Appendix E)	ar
Monocular Magnifier	Lens Tissue (Item 23, Appendix E)	ar
Pocket Stereoscope	Lens Tissue (Item 23, Appendix E)	ar
Manual Typewriter	Typewriter Ribbon	1 ea

Table 9-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES

NOTE

If the equipment must be kept in continuous operation, check and service only those items that can safely be checked and serviced without disturbing operation. Make the complete checks and services when the equipment can be shut down.

B - Before
D - During
A - After

W - Weekly
M - Monthly
Q - Quarterly

AN - Annually
S - Semiannually
BI - Biennially

(Number) - Hundreds of Hours

ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
<u>SUPPORT ITEMS</u>			
1	B	<u>Magnifier Lamp.</u> 1. Inspect lens for cracks, breaks, or dirt. Clean as required. 2. Inspect arms and base for cracks or breaks.	Lens cracked or broken. Base or arms are cracked or broken.
2	B	<u>Service Magnifier Lamp.</u> 1. Turn off magnifier lamp. 2. Apply small amount of liquid lens cleaner to lens and wipe clean with cheesecloth. 3. Turn on magnifier lamp.	
3	B	<u>Inspect Monocular Magnifier.</u> 1. Inspect lens for cracks or breaks. 2. Clean lenses with tissue paper.	Lens cracked or broken.
4	B	<u>Service Monocular Magnifier.</u> Wipe surface of lens with lens paper to remove dust and dirt.	

Table 9-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before
D - During
A - After

W - Weekly
M - Monthly
Q - Quarterly

AN - Annually
S - Semiannually
BI - Biennially

(Number) - Hundreds of Hours

ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
<u>SUPPORT ITEMS - Cont</u>			
5	B	<u>Paper Trimmer.</u> Inspect paper trimmer for structural damage and proper operation of blade.	Blade will not operate.
6	B	<u>Clean Pocket Stereoscope.</u> 1. Inspect lenses for dust, dirt, cracks, or breaks. 2. Clean lenses with tissue paper. 3. Inspect housing and legs for cracks or breaks.	

Table 9-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before
D - During
A - After

W - Weekly
M - Monthly
Q - Quarterly

AN - Annually
S - Semiannually
Bi - Biennially

(Number) - Hundreds of Hours

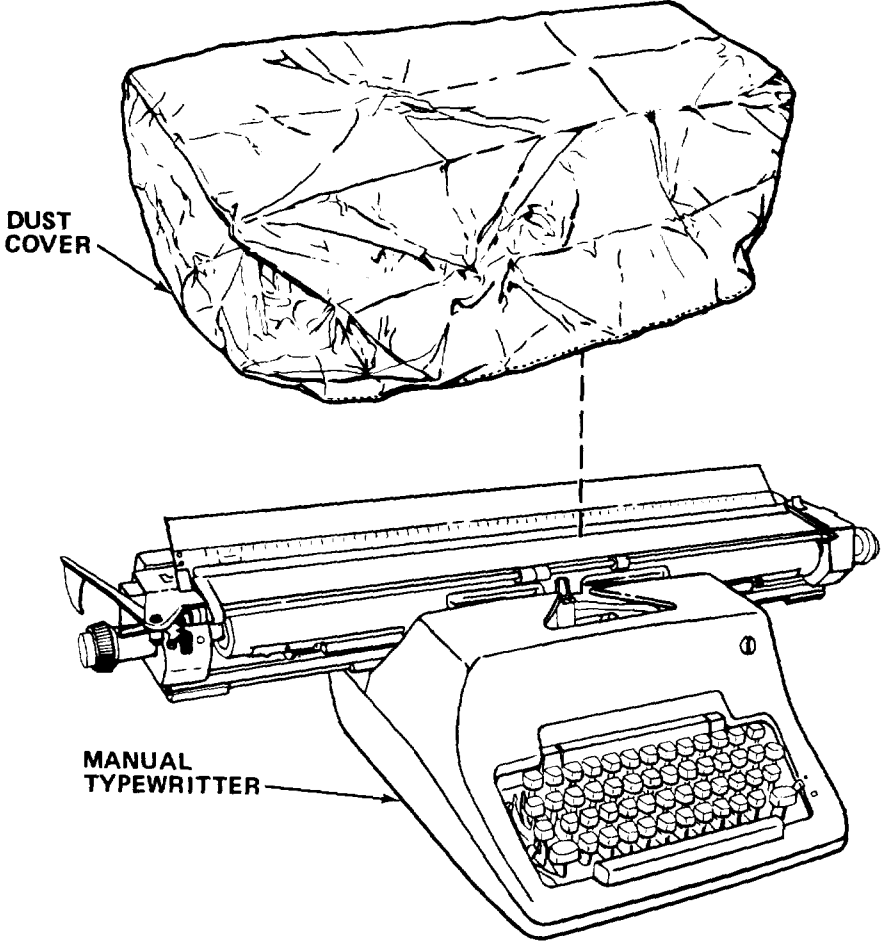
ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
7	W	<p><u>SUPPORT ITEMS - Cont</u></p> <p><u>Manual Typewriter.</u></p>  <ol style="list-style-type: none"> 1. Remove dust cover. 2. Check that typewriter is mounted securely. 3. Check that typewriter ribbon is installed. 4. Replace dust cover. 	

Table 8-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before
D - During
A - After

W - Weekly
M - Monthly
Q - Quarterly

AN - Annually
S - Semiannually
BI - Biennially

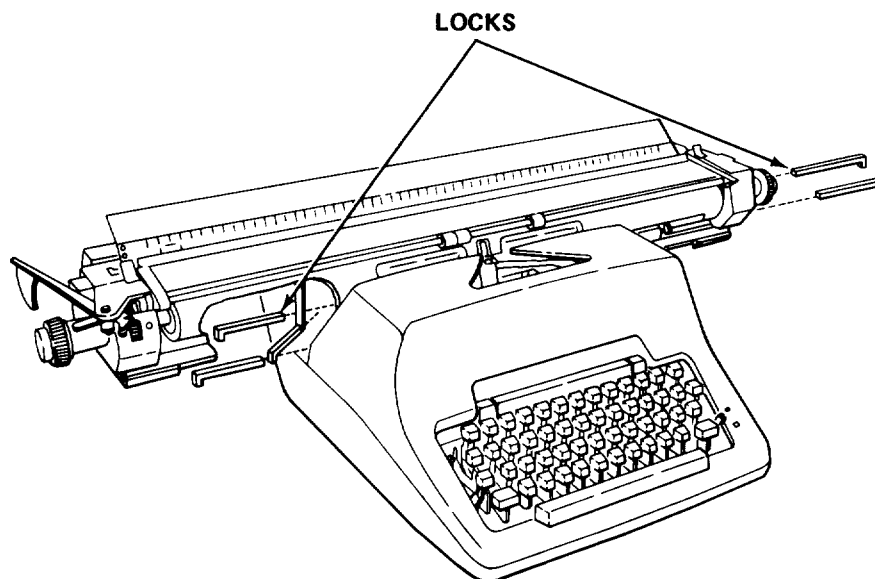
(Number) - Hundreds of Hours

ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
<u>SUPPORT ITEMS - Cont</u>			
8	S	Replace Typewriter Ribbon on Manual Typewriter. Refer to your operator's manual for replacement of ribbon.	
9	Q	Vacuum Cleaner. Inspect vacuum cleaner for damage to housing, frayed or worn power cord, and proper operation of motor.	Housing is broken. Power cord or plug is frayed, worn, or damaged. Motor operation is noisy or improper.

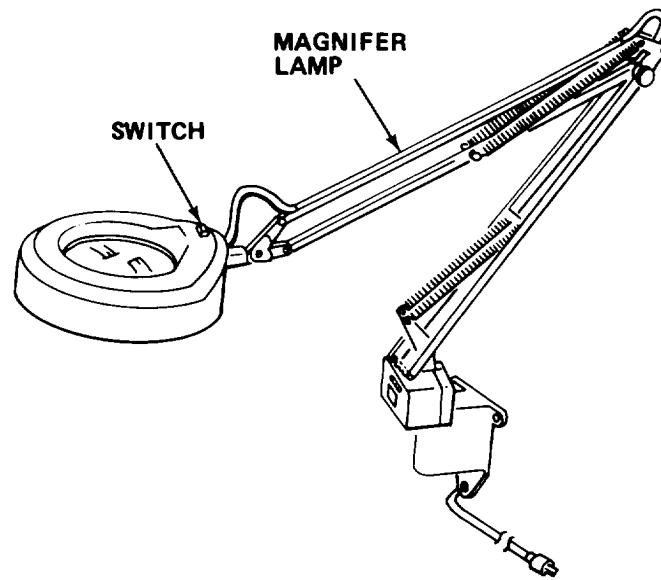
9-6. OPERATION UNDER USUAL CONDITIONS.

9-6.1 Assembly and Preparation for Use.

9-6.1.1 Manual Typewriter.



- a. Remove dust cover.
- b. Remove locks.



9-6.2 Operating Procedures.

a. Magnifier Lamp.

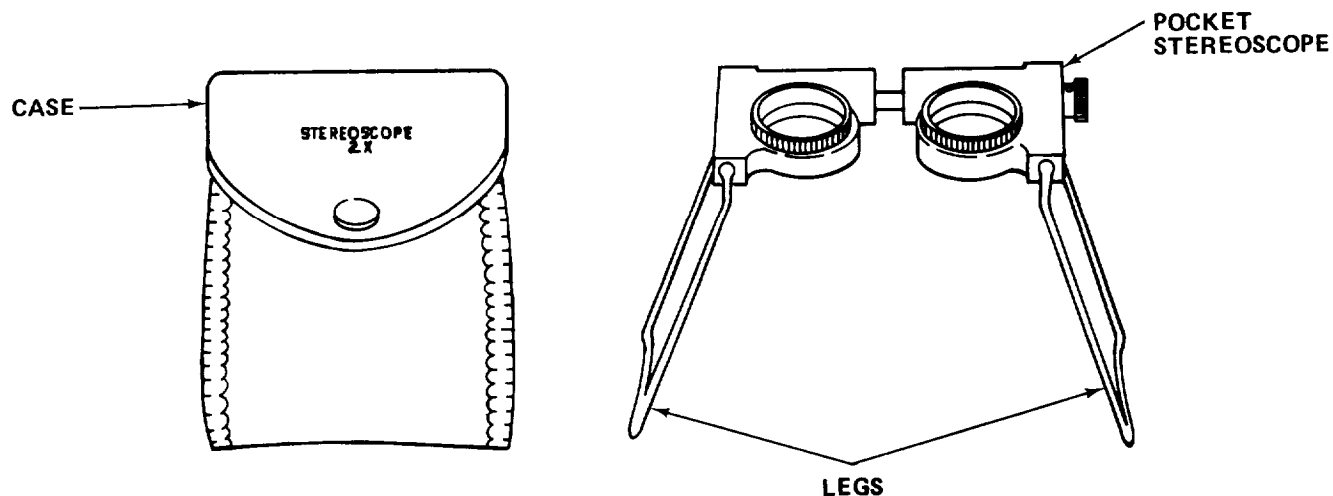
- (1) Move magnifier lamp from mounting bracket.
- (2) Plug in power cord.
- (3) Turn on fluorescent lamp.
- (4) Position magnifier lamp over object.
- (5) Examine object through lens.

b. Monocular magnifier.

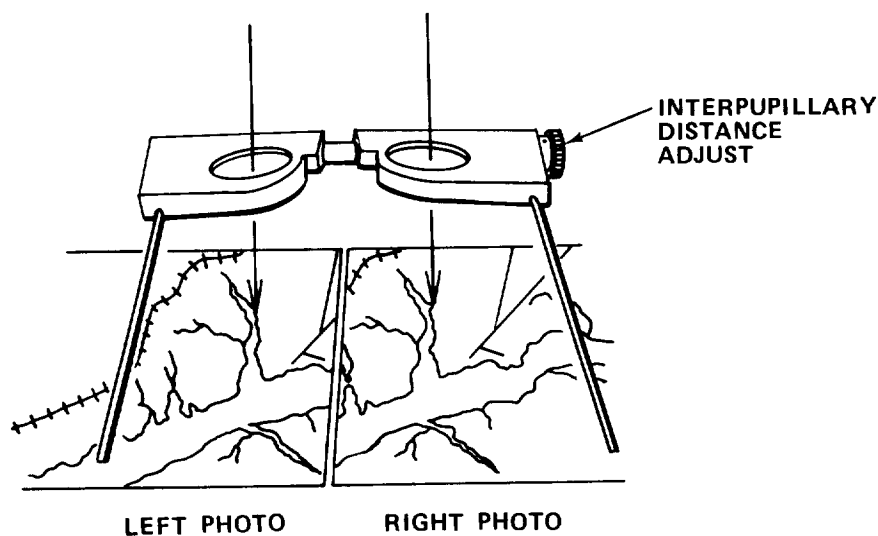
- (1) Hold lens a few inches from viewing eye.
- (2) Move magnifier toward and away from object until it comes into focus.

c. Pocket stereoscope.

(1) Position photographs in preparation for viewing in stereo.



(2) Remove pocket stereoscope from case and unfold legs.



(3) Set pocket stereoscope on photographs so that left lens is over left photograph and right lens is over right photograph.

(4) Adjust interpupillary distance between lenses until it matches that of viewer.

(5) Locate detail to be viewed on left photograph and center left lens over it.

(6) Move right photograph until the same detail is centered under right lens. When viewed simultaneously, two details should merge into one. Adjust photographs until this effect is achieved.

d. Vacuum cleaner.

(1) Using as vacuum.

- (a) Attach dust collection bag to air discharge opening.
- (b) Remove protective screen lock from air intake opening and attach scrap trap to that opening.
- (c) Attach swivel end of hose to scrap trap by turning lock to right until secure.
- (d) Attach tool required to other end of hose.
- (e) Insert plug into 120 V ac wall outlet and position ON/OFF switch to

ON.

(2) Using as blower.

- (a) Attach tapered rubber nozzle to discharge opening.
- (b) Attach protective screen lock to air intake opening.
- (c) Insert plug into 120 V ac wall outlet and position ON/OFF switch to

ON.

(3) Using as sprayer.

- (a) Attach protective screen lock to air intake opening.
- (b) Attach swivel end of hose to air discharge opening by turning lock to right until secure.
- (c) Attach sprayer to other end of hose.

NOTE

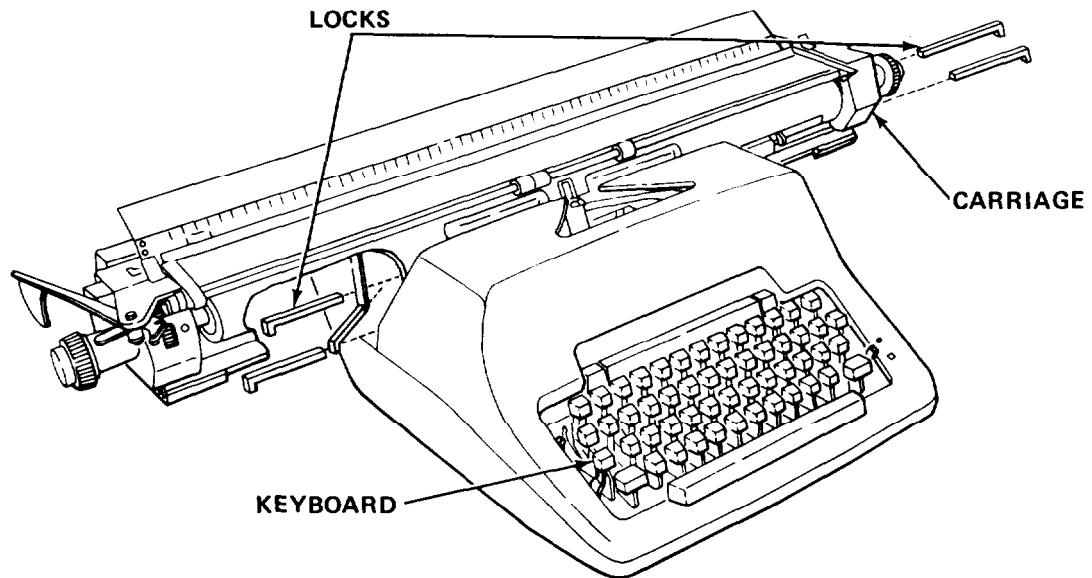
Size of spray pattern is determined by adjusting screw located on top of sprayer.

- (d) Insert plug into 120 V ac wall outlet and position ON/OFF switch to

ON.

9-6.3 Preparation For Movement.

9-6.3.1 Manual Typewriter.



- a. Install locks on carriage and keyboard.
- b. Replace dust cover.

9-7. OPERATION UNDER UNUSUAL CONDITIONS. There are no specific requirements for operation under unusual conditions.

Section III OPERATOR MAINTENANCE

9-8. LUBRICATION INSTRUCTIONS. This equipment does not require lubrication.

9-9. TROUBLESHOOTING PROCEDURES.

a. The table lists the common malfunctions which you may find during the operation or maintenance of the magnifier lamp or its components. You should perform the test/inspections and corrective actions in the order listed.

b. This manual cannot list all malfunctions that may occur, nor all test or inspections and corrective actions. If a malfunction is not listed or is not corrected by listed corrective actions, notify your supervisor.

Table 9-2. TROUBLESHOOTING

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

1. FLUORESCENT LAMP WILL NOT WORK.

Check that magnifier lamp is plugged into active power outlet. Press switch off, then on.

- (a) If lamp still does not light, replace lamp (paragraph 9-10.1).
- (b) If new lamp does not light, refer to organizational maintenance.

2. VACUUM CLEANER MOTOR DOES NOT OPERATE.

Step 1. Check power cord.

- (a) If plugged in, proceed to step 2.
- (b) Plug in power cord.

Step 2. Check position of power switch.

- (a) If turned ON, proceed to step 3.
- (b) Turn power switch ON.

Step 3. Check circuit breaker position in circuit breaker box.

- (a) If turned OFF or tripped, turn circuit breaker ON.
 - (b) If turned ON, refer to organizational maintenance.
-

9-10. MAINTENANCE PROCEDURES.

a. This section contains instructions covering operator maintenance functions for the support items. Personnel are listed only if the task requires more than one.

b. After completing each maintenance procedure, perform operational check to be sure that equipment is properly functioning.

I N D E X

PROCEDURE	PARAGRAPH
Replace Lamp in Magnifier Lamp Assembly	9-10.1

9-10.1 Replace Lamp in Magnifier Lamp Assembly.

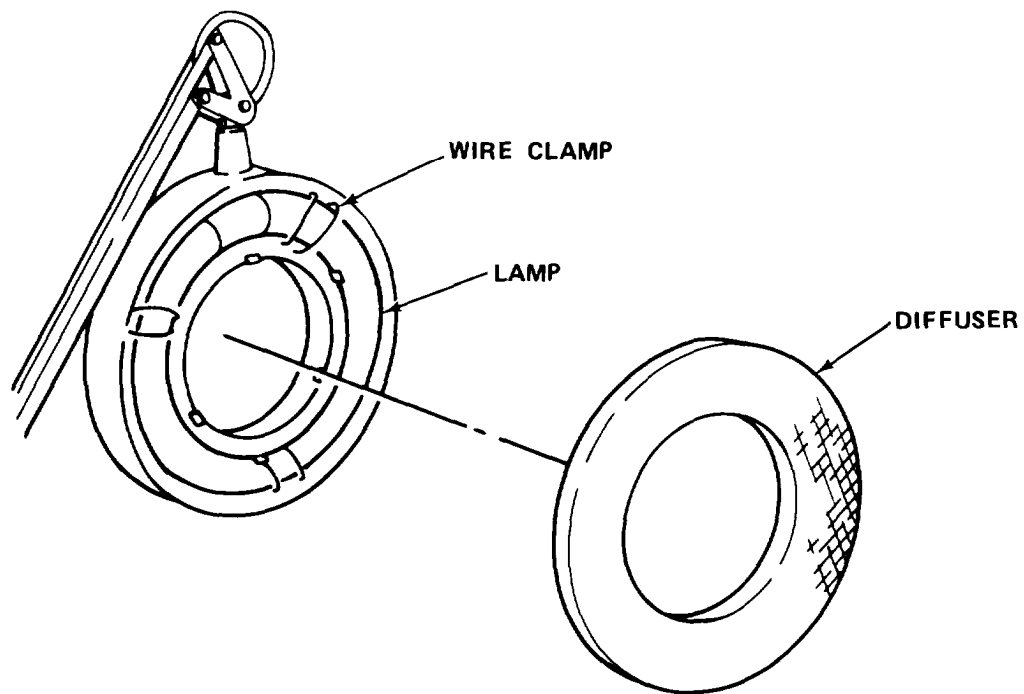
MOS: 81C, Cartographer

SUPPLIES: Fluorescent Lamp (22 W)

WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

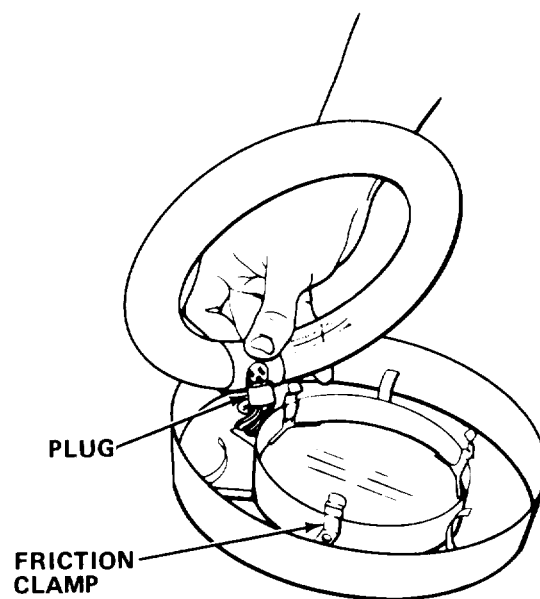
- a. Unplug magnifier lamp and remove diffuser.



NOTE

On some magnifier lamp models, lamp is held in place with friction clamps.

- b. Release wire clamps, pull out lamp, and disconnect plug from lamp.



- c. Connect plug to new lamp and retain lamp with wire clamps.
- d. Reinstall diffuser.

Section IV ORGANIZATIONAL MAINTENANCE

9-11. LUBRICATION INSTRUCTIONS. This equipment does not require lubrication.

9-12. REPAIR PARTS, SPECIAL TOOLS; TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT; AND SUPPORT EQUIPMENT.

9-12.1 Common Tools and Equipment. For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

9-12.2 Special Tools; Test, Measurement, and Diagnostic Equipment; and Support Equipment. Special Tools, TMDE, and Support Equipment is listed in the applicable repair parts and special tools list and in Appendix B of this manual.

9-12.3 Repair Parts. Repair parts are listed and illustrated in the Repair Parts and Special Tools List, TM 5-6675-313-24P covering organizational maintenance for this equipment.

9-13. SERVICE UPON RECEIPT.

9-13.1 Checking Unpacked Equipment.

a. Inspect the equipment for damage incurred during shipment. If equipment has been damaged, report the damage on DD Form 6, Packing Improvement Report.

b. Check the equipment against the packing list to see if the shipment is complete. Report all discrepancies in accordance with the instructions of DA Pam 738-750.

c. Check to see whether the equipment has been modified.

9-14. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES. There are no organizational PMCS procedures assigned for this equipment.

9-15. ORGANIZATIONAL TROUBLESHOOTING PROCEDURES.

a. Organizational troubleshooting procedures cover the most common malfunctions that may be repaired at the organizational level. Repair or adjustment requiring specialized equipment is not authorized unless such equipment is available. Troubleshooting procedures used by lower level maintenance should be conducted in addition to the organizational troubleshooting procedures.

b. This manual cannot list all the possible malfunctions or every possible test/inspection and corrective action. If a malfunction is not listed or corrected by a listed corrective action, notify your supervisor.

c. If any component of the support items does not power up when turned on, verify that 120 V ac is present at the receptacle. If voltage is not present, plug equipment into receptacle with power available and proceed with equipment troubleshooting. Perform no-power procedure for dead receptacle (Table 1-4).

Table 9-3. ORGANIZATIONAL TROUBLESHOOTING

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

1. VACUUM CLEANER MOTOR DOES NOT OPERATE.

Check that the vacuum cleaner is plugged into active outlet. Turn switch ON. If motor does not operate, replace vacuum cleaner.

2. MAGNIFIER LAMP WILL NOT LIGHT.

Step 1. Check that magnifier lamp is plugged into active power outlet.

(a) Press switch off, then on.

(b) If lamp still does not light, replace magnifier lamp assembly (paragraph 9-16.1).

9-16. MAINTENANCE PROCEDURES.

a. This section contains instructions covering organizational maintenance functions for the support items. Personnel required are listed only if the task requires more than one.

b. After completing each maintenance procedure, perform operational check to be sure that equipment is properly functioning.

INDEX

PROCEDURE	PARAGRAPH
Replace Magnifier Lamp Assembly	9-16.1
Remove/Install Manual Typewriter	9-16.2

9-16.1 Replace Magnifier Lamp Assembly.

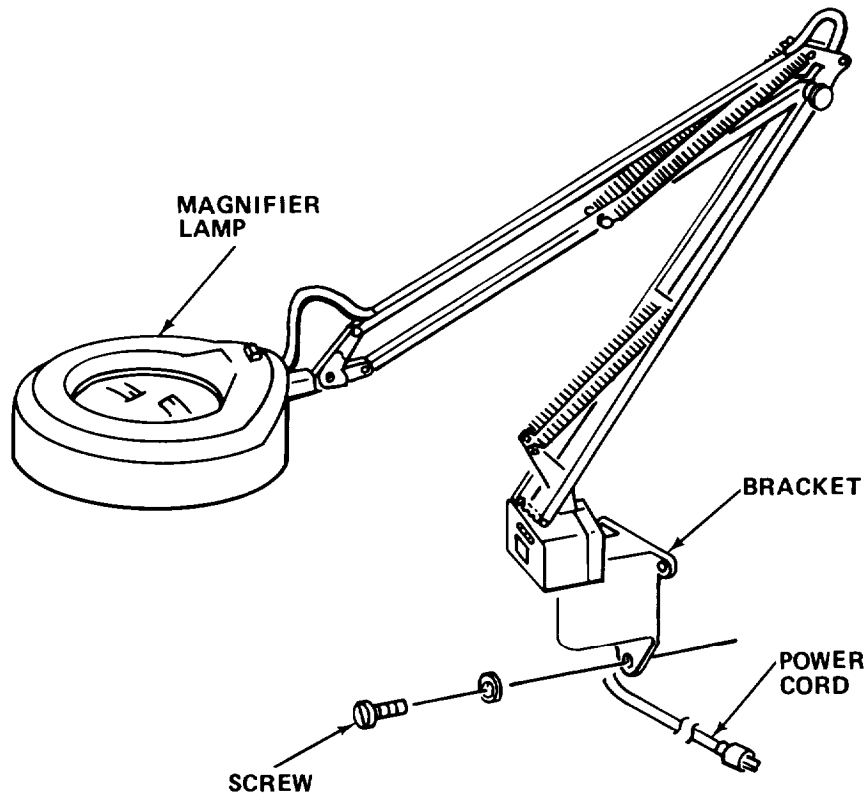
MOS: 81C, Cartographer

TOOLS: Flat Tip Screwdriver

SUPPLIES: Magnifier Lamp Assembly

WARNING

Death or serious injury may occur from electrical shock if power cord is not unplugged before servicing.



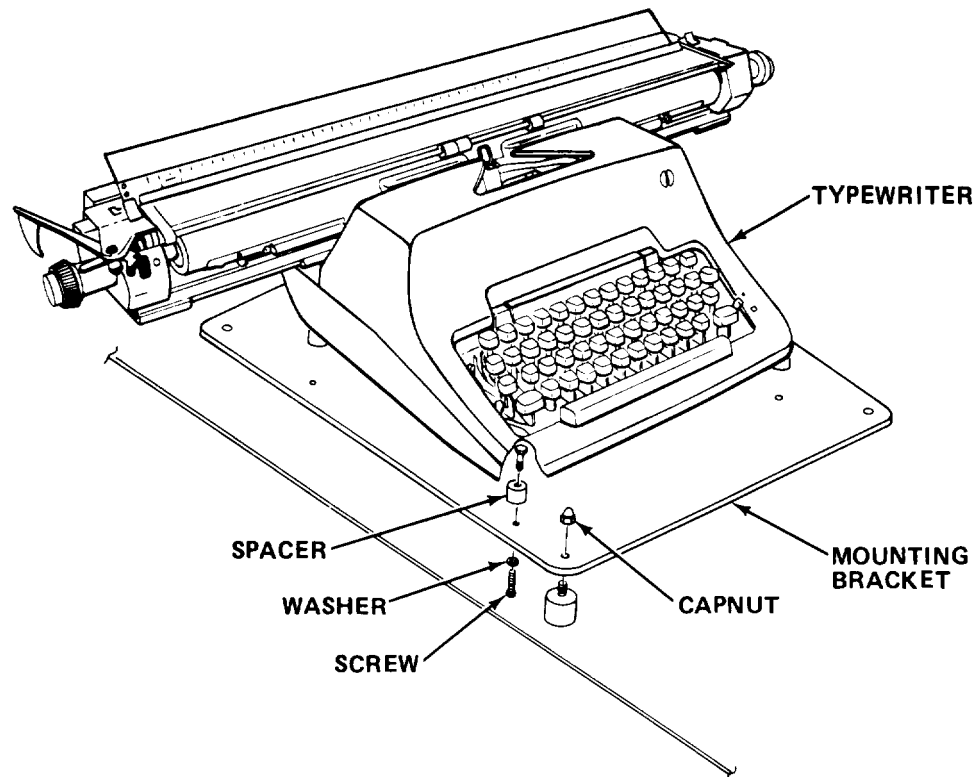
- a. Unplug power cord and remove magnifier lamp assembly from bracket.
- b. Remove screws to release bracket from wall.
- c. Install new bracket and secure with screws.
- d. Install new magnifier lamp assembly on bracket and plug in power cord.

9-16.2 Replace Manual Typewriter.

MOS: 81C, Cartographer

TOOLS: Flat Tip Screwdriver
8 in. Adjustable Wrench

SUPPLIES: Typewriter



- a. Remove capnuts from mounting bracket.
- b. Remove typewriter and mounting bracket.
- c. Remove screws, washers, and spacers securing typewriter to mounting bracket.
- d. Remove defective typewriter.
- e. Secure new typewriter to mounting bracket with spacers, washers, and screws.
- f. Install new typewriter and bracket.
- g. Secure mounting bracket with capnuts.

9-17. PREPARATION FOR STORAGE OR SHIPMENT. Contact your battalion for packing and shipping instructions.

Section V DIRECT/GENERAL SUPPORT MAINTENANCE

There are no direct/general support maintenance procedures assigned for this equipment.

APPENDIX A

REFERENCES

A-1. SCOPE.

This appendix lists all forms, field manuals, technical manuals, and miscellaneous publications referenced in this manual.

A-2. FORMS.

Recommended Changes to Publications and Blank Forms DA Form 2028
 Recommended Changes to Equipment Technical Publications DA Form 2028-2
 Equipment Inspection and Maintenance Worksheet DA Form 2404
 The Army Maintenance Management System (TAMMS) DA Pam 738-750
 Quality Deficiency Report SF 368

A-3. FIELD MANUALS.

Camouflage FM 5-20
 Nuclear, Biological, and Chemical (NBC)
 Defense (Reprinted w/Basic Incl C1) FM 21-40
 Basic Cold Weather Manual FM 31-70
 Northern Operations FM 31-71
 Metal Body Repair and Related Operations FM 43-2
 First Aid for Soldiers FM 21-11

A-4. TECHNICAL MANUALS.

Administrative Storage of Equipment TM 740-90-1
 Chemical, Biological, and Radiological (CBR)
 Decontamination TM 3-220
 Operator, Organizational, Direct Support, and General
 Support Maintenance Manual: Air Conditioner, Horizontal,
 Compact, 208-Volt, 3-Phase, 18,000 Btu Cooling, 12,000
 Btu Heating TM 5-4120-367-14

Operator, Organizational, Direct Support, and General Support Maintenance Manual for Facsimile Transmitting and Receiving Device, Magnavox Model AN/GXC-7A TM 11-5895-1079-14

Operator, Organizational, Direct Support, and General Support Maintenance Manual for Chassis, Semi-Trailer, Container Transporter (ADCOR) TM 5-2330-305-14

Organizational, Direct Support, and General Support Maintenance Repair Parts and Special Tools List (Including Depot Maintenance Repair Parts and Special Tools) for Air Conditioner/Heater TM 5-4120-367-24P

Organizational, Direct Support, and General Support Maintenance Repair Parts and Special Tools List (Including Depot Maintenance Repair Parts and Special Tools) for Chassis, Semi-Trailer, Container Transporter (ADCOR) TM 5-2330-305-24P

Organizational, Direct Support, and General Support Maintenance Repair Parts and Special Tools List (RPSTL) (Including Depot Maintenance Repair Parts and Special Tools) for Operations Section TM 5-6675-313-24P

Organizational, Direct Support, and General Support Maintenance Repair Parts and Special Tools List (Including Depot Maintenance Repair Parts and Special Tools) for Facsimile Receiver TM 11-5895-1079-24P

Painting Instructions for Field Use TM 43-0139

Procedure for the Destruction of Equipment to Prevent Enemy Use TM 750-244-3

Use and Care of Hand Tools and Measuring Tools TM 9-243

A-5. MISCELLANEOUS PUBLICATIONS.

Lubrication Order: Topographic Support Operations Section, Model ADC-TSS-1 LO 5-6675-313-12

Lubrication Order: Topographic Support System Chassis, Semi-Trailer, Container Transporter (ADCOR) LO 5-2330-305-12

APPENDIX B

MAINTENANCE ALLOCATION CHART

Section I INTRODUCTION

B-1. GENERAL.

a. This section provides a general explanation of all maintenance and repair functions authorized at various maintenance categories.

b. The Maintenance Allocation Chart (MAC) in Section II designates overall responsibility for the performance of maintenance functions on the identified end item or component. The application of the maintenance functions to the end item or component will be consistent with the capacities and capabilities of the designated maintenance categories.

c. Section III lists the tools and test equipment (both special tools and common tool sets) required for each maintenance function as referenced from Section II.

d. Section IV contains supplemental instructions and explanatory notes for a particular maintenance function.

B-2. MAINTENANCE FUNCTIONS. Maintenance functions will be limited to and defined as follows:

a. Inspect. To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination (e.g., by sight, sound, or feel).

b. Test. To verify serviceability by measuring the mechanical, pneumatic, hydraulic, or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. Service. Operations required periodically to keep an item in proper operating condition, i.e., to clean (includes decontaminate, when required), to preserve, to drain, to paint, or to replenish fuel, lubricants, chemical fluids, or gases.

d. Adjust. To maintain or regulate, within prescribed limits, by bringing into proper or exact position or by setting the operating characteristics to specified parameters.

e. Align. To adjust specified variable elements of an item to bring about optimum or desired performance.

f. Calibrate. To determine and cause corrections to be made or to be adjusted on instruments or test, measuring, and diagnostic equipment used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

g. Remove/Install. To remove and install the same item when required to perform service or other maintenance functions. Install may be the act of emplacing, seating, or fixing into position a spare, repair part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.

h. Replace. To remove an unserviceable item and install a serviceable counterpart in its place. "Replace" is authorized by the MAC and is shown as the 3d position code of the SMR code.

i. Repair. The application of maintenance services¹, including fault location/troubleshooting², removal/installation, and disassembly/assembly³ procedures, and maintenance actions⁴ to identify troubles and restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

j. Overhaul. That maintenance effort (service/action) prescribed to restore an item to a completely serviceable/operational condition as required by maintenance standards in appropriate technical publications (i.e., DMWR). Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

k. Rebuild. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of material maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours/miles, etc.) considered in classifying Army equipment/components.

B-3. EXPLANATION OF COLUMNS IN THE MAC, SECTION II.

a. Column 1, Group Number. Column 1 lists functional group code numbers, the purpose of which is to identify maintenance significant components, assemblies, subassemblies, and modules with the next higher assembly. End item group number shall be "00."

b. Column 2, Component/Assembly. Column 2 contains the names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

c. Column 3, Maintenance Function. Column 3 lists the functions to be performed on the item listed in Column 2. (For detailed explanation of these functions, see paragraph B-2.)

¹Services - Inspect, test, service, adjust, align, calibrate, and/or replace.

²Fault locate/troubleshoot - The process of investigating and detecting the cause of equipment malfunctioning; the act of isolating a fault within a system or unit under test (UUT).

³Disassemble/assemble - Encompasses the step-by-step taking apart (or breakdown) of a spare/functional group coded item to the level of its least componenty identified as maintenance significant (i.e., assigned an SMR code) for the category of maintenance under consideration.

⁴Actions - welding, grinding, riveting, straightening, facing, remachining, and/or resurfacing.

d. Column 4, Maintenance Category. Column 4 specifies, by the listing of a work time figure in the appropriate subcolumn(s), the category of maintenance authorized to perform the function listed in Column 3. This figure represents the active time required to perform that maintenance function at the indicated category of maintenance: If the number or complexity of the tasks within the listed maintenance function varies at different maintenance categories, appropriate work time figures will be shown for each category. The work time figure represents the average time required to restore an item (assembly, subassembly, component, module, end item, or system) to a serviceable condition under typical field operation conditions. This time includes preparation time (including any necessary disassembly/assembly time), troubleshooting/fault location time, and quality assurance/quality control time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the Maintenance Allocation Chart. The symbol designations for the various maintenance categories are as follows:

- C Operator or Crew
- O Organizational Maintenance
- F Direct Support Maintenance
- H General Support Maintenance
- L Specialized Repair Activity ⁵
- D Depot Maintenance

e. Column 5, Tools and Equipment. Column 5 specifies by code, those common tool sets (not individual tools') and special tools, TMDE and support equipment required to perform the designated function

f. Column 6, Remarks. This column shall when applicable, contain a letter code, in alphabetical order, which shall be keyed to the remarks contained in Section IV.

⁵This maintenance category is not included in Section II, column (4) of the Maintenance Allocation Chart. To identify functions to this category of maintenance, enter a work time figure in the "H" column of Section II, column (4), and use an associated reference code in the Remarks column (6). Key the code to Section IV, Remarks, and explain the SRA complete repair application there. The explanatory remark(s) shall reference the specific Repair Parts and Special Tools List (RPSTL) TM which contains additional SRA criteria and the authorized spare/repair parts.

B-4. EXPLANATION OF COLUMNS IN TOOL AND TEST EQUIPMENT REQUIREMENTS, SECTION III.

- a. Column 1, Reference Code. The tool and test equipment reference code correlates with a code used in the MAC, Section II, Column 5.
- b. Column 2, Maintenance Category. The lowest category of maintenance authorized to use the tool or test equipment.
- c. Column 3, Nomenclature. Name or identification of the tool or test equipment.
- d. Column 4, National Stock Number. The National stock number of the tool or test equipment.
- e. Column 5, Tool Number. The manufacturer's part number.

B-5. EXPLANATION OF COLUMNS IN REMARKS, SECTION IV.

- a. Column 1, Reference Code. The code recorded in Column 6, Section II.
- b. Column 2, Remarks. This column lists information pertinent to the maintenance function being performed as indicated in the MAC, Section II.

Section II. MAINTENANCE ALLOCATION CHART

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Cat.					(5) Tools and Eqpt	(6) Remarks
			C	O	F	H	D		
00	OPERATIONS SECTION	Overhaul						**	
01	VAN BODY (ISO CONTAINER)	Inspect	0.8					5,7,8,10, 11	
		Service Repair	0.9	0.5 1.0	1.5	2.0		1,4 1,3,11	B
	FLUORESCENT LIGHT ASSY	Repair	0.1	0.7				1,4	
	BLACKOUT/DOME LIGHT ASSY	Repair	0.2						
	EXHAUST FAN ASSEMBLY	Repair		0.5				1	B
	AIR CONDITIONER/ HEATER ASSY	Replace				2.0		1	A
	ELECTRICAL ASSY	Inspect Repair		0.5 0.9	1.0			1,3,4	
	TELEPHONE BINDING POST ASSY	Repair		0.7				4	
	EMERGENCY LIGHT ASSY	Replace		0.3				4	
	TIEDOWN SOCKET ASSY	Replace		0.3				4	
	LEVEL INDICATOR ASSY	Repair		0.6				2,3	
	BLACKOUT CURTAIN ASSY	Repair		1.0				4	
	PERSONNEL LADDER ASSY	Repair		0.8				4,11	

**Depot will determine work time.

Section II. MAINTENANCE ALLOCATION CHART - Cont

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Cat.					(5) Tools and Eqpt	(6) Remarks
			C	O	F	H	D		
02	PERSONNEL/CARGO DOOR ASSEMBLY	Replace Repair			1.5 2.0			4 4	
	DRAFTING, SCRIBING, TRACING TABLE	Inspect Service Remove/ Install	0.2 0.4					9 1	
	ELECTRICAL SYSTEM	Repair	0.2	0.6				1	
	TABLE TOP TILT LOCKING ASSEMBLY	Repair		0.7				1	
	PILLOW BLOCK ASSEMBLY	Replace		0.5				1	
03	PORTABLE, TRACING/ SCRIBING BOARD	Inspect Service Repair	0.17 0.17 0.33					1,3,6	
04	PORTABLE FILM VIEWER	Inspect Service Repair	0.17 0.17		0.33			1,3	
05	ULTRASONIC CLEANER	Inspect Repair	0.2					1	
	CIRCUIT BOARD	Replace		0.6				1	
06	POCKET CALCULATOR	Inspect Repair	0.3 0.2						
07	FACSIMILE TRANSCEIVER								B
08	FURNITURE AND CABINETS	Inspect Remove/ Install	0.5					1,3,4	
		Repair		0.9 0.7				1,3	
09	SUPPORT ITEMS	Inspect	0.8						
		Service	0.5					4	
		Repair	0.3						

Section III TOOL AND TEST EQUIPMENT REQUIREMENTS

(1) Reference Code	(2) Maintenance Category	(3) Nomenclature	(4) National/NATO Stock Number	(5) Tool Number
1	O	Shop Kit, Automotive Maintenance and Repair Common #1 Plus Metric Option	4910-00-754-0654	
2	O	Tool Kit, Carpenters, Engineer Squad	5180-00-293-2875	
3	O	Tool Kit, General Mechanic's Automotive Plus Metric Option	5180-00-177-7033	
4	O,F,H	Tool Kit, Light Machine Repair	5180-00-596-1540	
5	C	Brush, Wire	7920-00-291-5815	
6	C	Screwdriver, Cross-tip No. 2	5120-00-234-8913	
7	C	Screwdriver, Flat-tip	5120-00-234-8910	
8	C	Wrench, Adjustable	5120-00-264-3795	
9	C	Grease, Gun	4930-00-965-0288	
10	O	Spring Scale	6670-00-238-9777	
11	O,F,H	Rivet Gun	5120-00-017-2849	

Section IV. REMARKS

Reference Code	Remarks
A	See TM 5-4120-367-14 for maintenance procedures
B	Maintenance personnel and TSS section 7 maintenance van (which carries the required tools) are authorized by HHC TOE 05336 H600.

APPENDIX C

COMPONENTS OF END ITEM AND BASIC ISSUE ITEMS LISTS

Section I INTRODUCTION

C-1 . SCOPE.

This appendix lists components of end item and basic issue items for the Operations Section to help you inventory items required for safe and efficient operation.

C-2. GENERAL.

The Components of End Item and Basic Issue Items Lists are divided into the following sections:

a. Section II: Components of End Item. This listing is for informational purposes only, and is not authority to requisition replacements. As part of the end item, these items must be with the end item whenever it is issued or transferred between property accounts. Illustrations are furnished to assist you in identifying the items.

b. Section III: Basic Issue Items. These are the minimum essential items required to place the Operations Section in operation, to operate it, and to perform emergency repairs. BII must be with the Operations Section during operation and whenever it is transferred between property accounts. The illustrations will assist you with hard-to-identify items. This manual is your authority to request/requisition replacement BII based on TOE/MTOE authorization of the end item.

C-3. EXPLANATION OF COLUMNS.

The following provides an explanation of columns found in the tubular listings:

a. Column (1): Illustration Number (Illus Number). This column indicates the number of the illustration in which the item is shown.

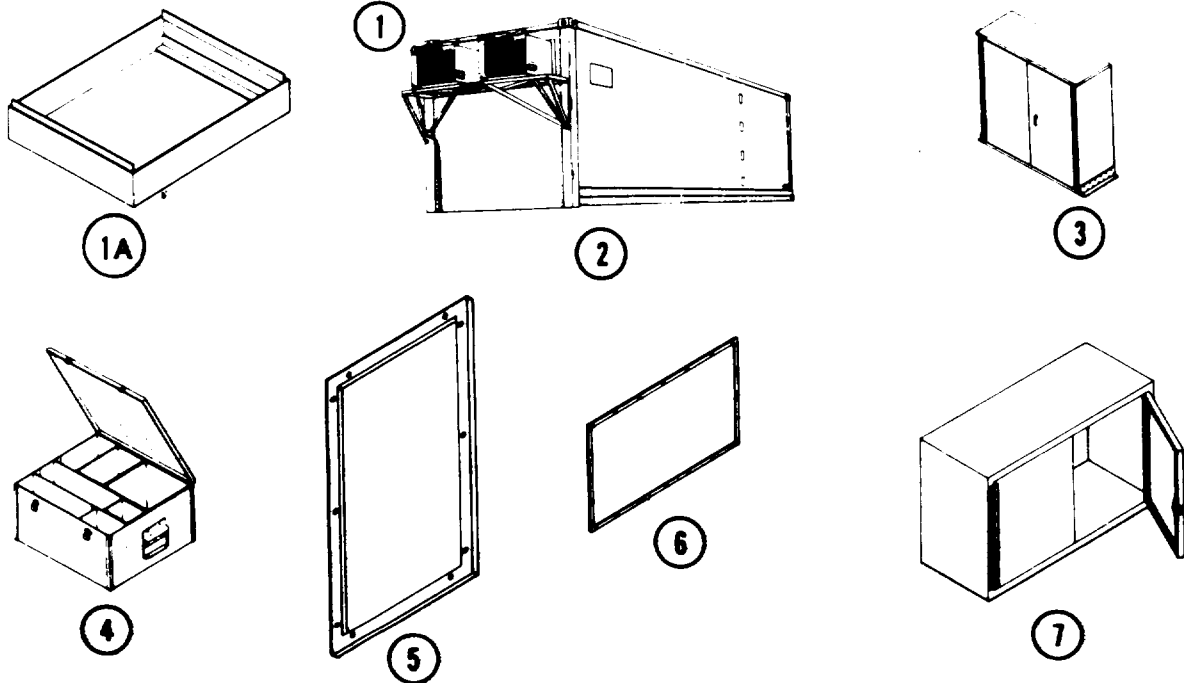
b. Column (2): National Stock Number. Indicates the National stock number assigned to the item and will be used for requisitioning purposes.

c. Column (3): Description. Indicates the Federal item name and, if required, a minimum description to identify and locate the item. The last line for each item indicates the FSCM (in parentheses) followed by the part number.

d. Column (4): Unit of Measure (U/M). Indicates the measure used in performing the actual operational/maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pr).

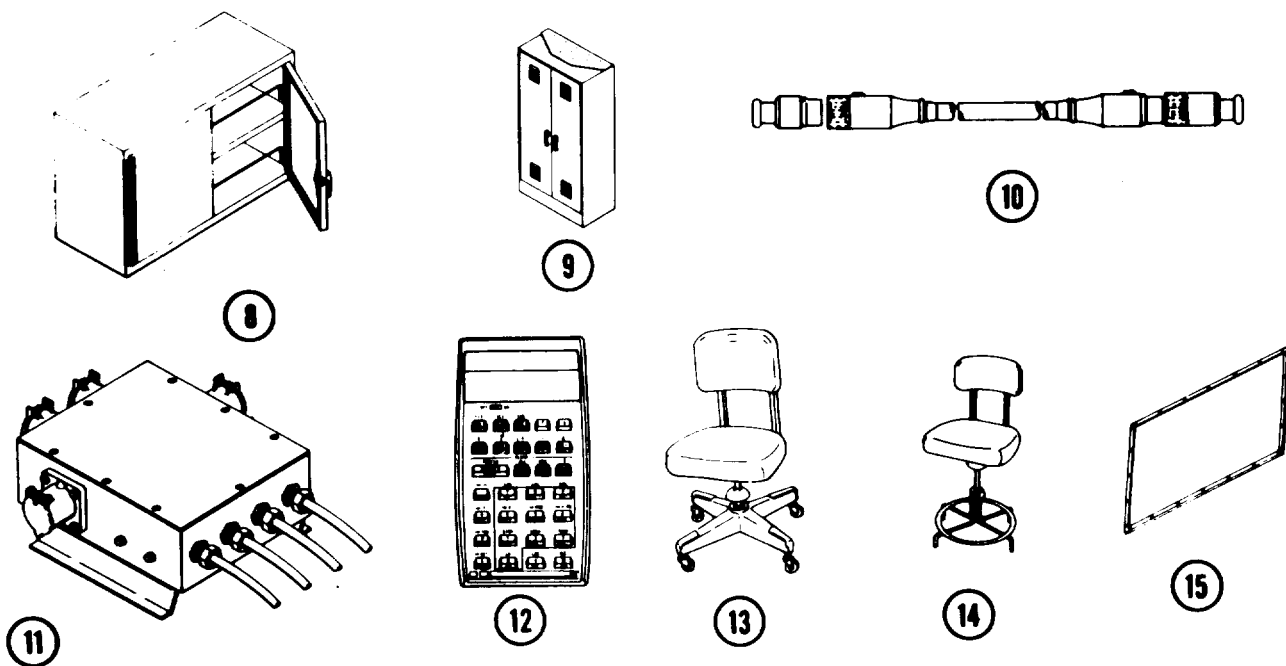
e. Column (5): Quantify Required (Qty Rqr). Indicates the quantity of the item authorized to be used with/on the equipment.

Section II COMPONENTS OF END ITEM



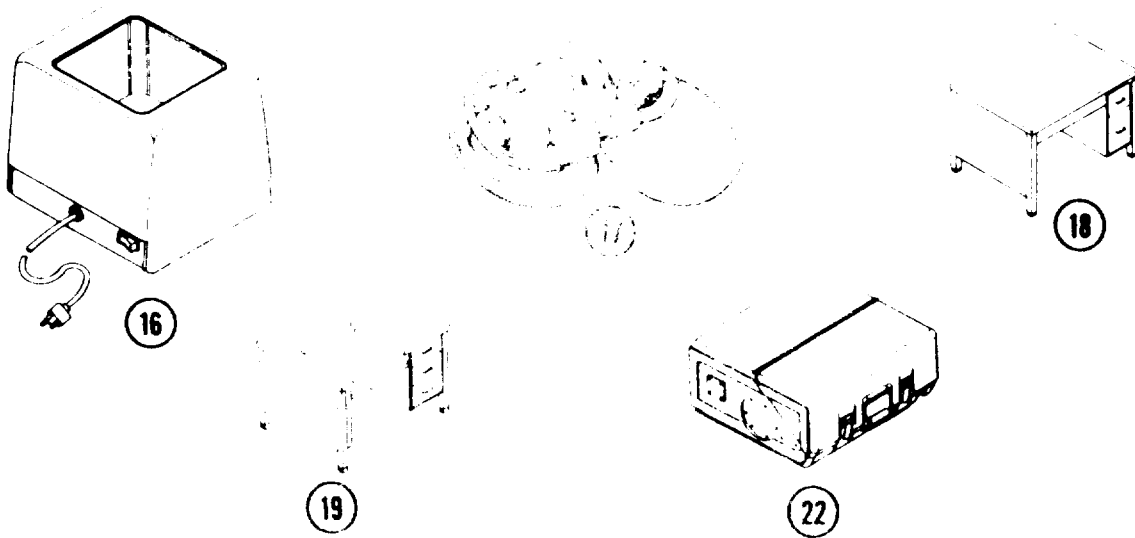
(1) Illus Number	(2) National Stock Number	(3) Description FSCM and Part Number	(4) U/M	(5) Qty Rqr
1	4120-00-974-7206	AIR CONDITIONER (81349) MIL-A-52767	ea	2
1A		BASE, FILING CABINET: (88915) S4634	ea	1
2	6675-01-215-4779	VAN ASSEMBLY - MODIFIED (97403) 13225E3026	ea	1
3	6675-00-724-9974	BOOKCASE, VEHICULAR MOUNTING: (81349) MIL-C-40060/20, Type XX	ea	1
4		BOX, VEHICULAR ACCESSORIES FOR CLEANER, VACUUM: (97403) 13225E3490	ea	1
5	7195-00-105-7941	BULLETIN BOARD, CORK: (79819) T5-2302	ea	1
6	7195-00-105-7940	BULLETIN BOARD, CORK: (79819) T5-2305	ea	1
7		CABINET, STORAGE: TECH MANUAL (97403) 13225E4648	ea	1

Section II COMPONENTS OF END ITEM-Cont



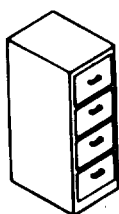
(1) Illus Number	(2) National Stock Number	(3) Description FSCM and Part Number	(4) U/M	(5) Qty Rqr
8	7125-00-286-5259	CABINET, STORAGE: WALL (81349) MIL-C-40060/1, Type I	ea	7
9	7125-00-764-5744	CABINET, STORAGE: SUPPLY (97403) 13225E3540	ea	1
10	6150-01-134-0847	CABLE ASSEMBLY, POWER ELECTRICAL: (90129) RC1736-5	ea	3
11	6150-01-081-9264	CABLE TERMINAL BOX ASSEMBLY, ELECTRICAL, SPECIAL PURPOSE: (51745) TL/TA 13222E6250	ea	1
12	7420-01-139-7441	CALCULATING MACHINE: (51174) HP-32E	ea	1
13	7110-00-273-8791	CHAIR, ROTARY: (8D190) UC-S-17	ea	4
14	7110-00-281-4472	CHAIR, ROTARY: (8D190) UC-D42-L	ea	3
15	7110-00-250-8578	CHALKBOARD: (06608) 5552102	ea	1

Section II COMPONENTS OF END ITEM - Cont



(1) Illus Number	(2) National Stock Number	(3) Description FSCM and Part Number	(4) U/M	(5) Qty Rqr
16	4940-01-118-1890	CLEANER, ULTRASONIC: (79815) HN-7113	ea	1
17	7910-00-205-3400	CLEANER, VACUUM, ELECTRIC: (79815) HN-7113	ea	1
18	7110-00-143-0830	DESK, FLAT TOP: (79815) HN-7113	ea	3
19	7110-00-143-0833	DESK, FLAT TOP: (7296) AA-0191 (79815) HN-7113	ea	1
20	DELETED			
21	DELETED			
22	5815-01-067-4655	FACSIMILE SET: (7296) AA-0191 (79815) HN-7113	ea	1

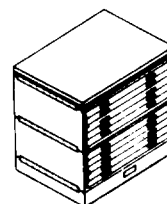
Section II COMPONENTS OF END ITEM - Cont



23 24



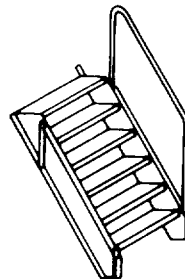
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26



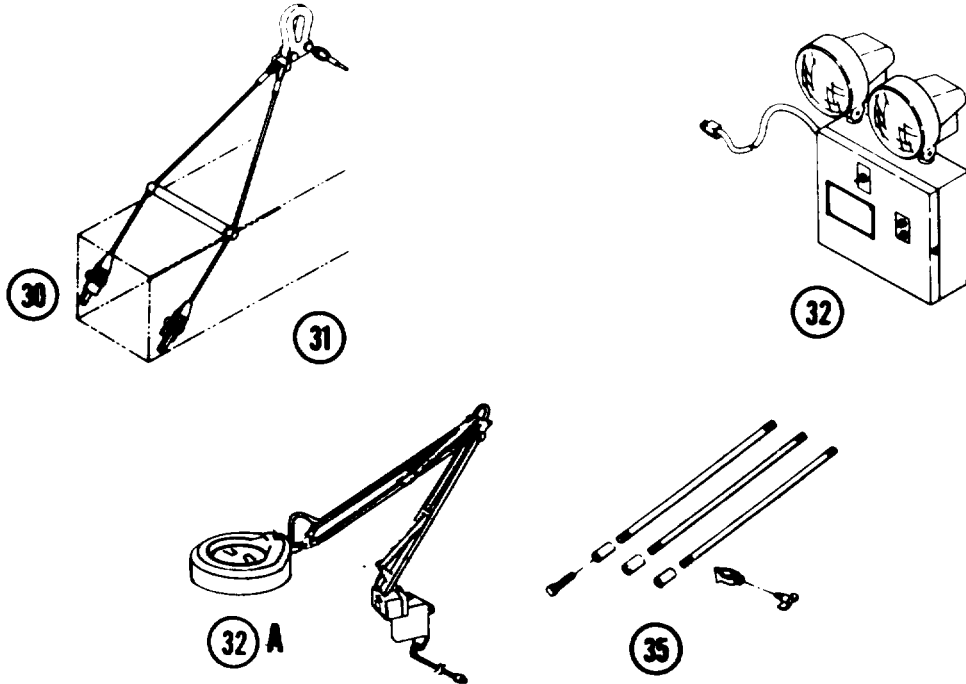
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29

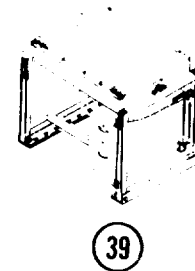
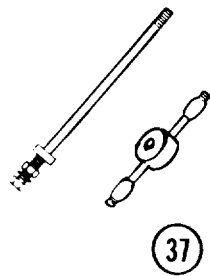
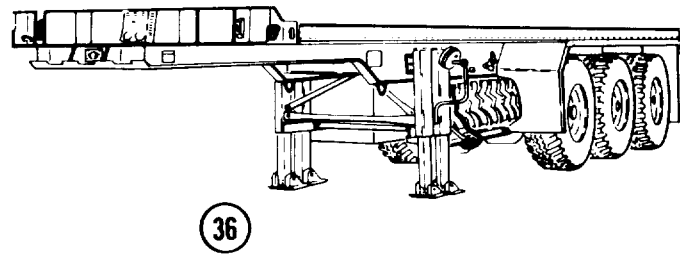
(1) Illus Number	(2) National Stock Number	(3) Description FSCM and Part Number	(4) U/M	(5) Qty Rqr
23		FILING CABINET: 4 DRAWER, RH MOUNTED (97403) 13225E3590	ea	1
24		FILING CABINET: 4 DRAWER, LH MOUNTED (97403) 13225E3591	ea	1
25	7110-00-920-9320	FILING CABINET: SECURITY (54427) AA-F-358, Class 6, size 3, 28 in. deep, 52 in. high, 20.813 in. wide	ea	1
26		FILING ASSEMBLY, MAP AND PLAN: (97403) 13225E3138	ea	1
27	DELETED			
28	5440-01-152-7751	LADDER, EXTENSION-FOLDING: (39428) 8028T16	ea	1
29	2540-01-133-9726	LADDER, VEHICLE BOARDING: (97403) 13225E3074	ea	2

Section II COMPONENTS OF END ITEM - Cont



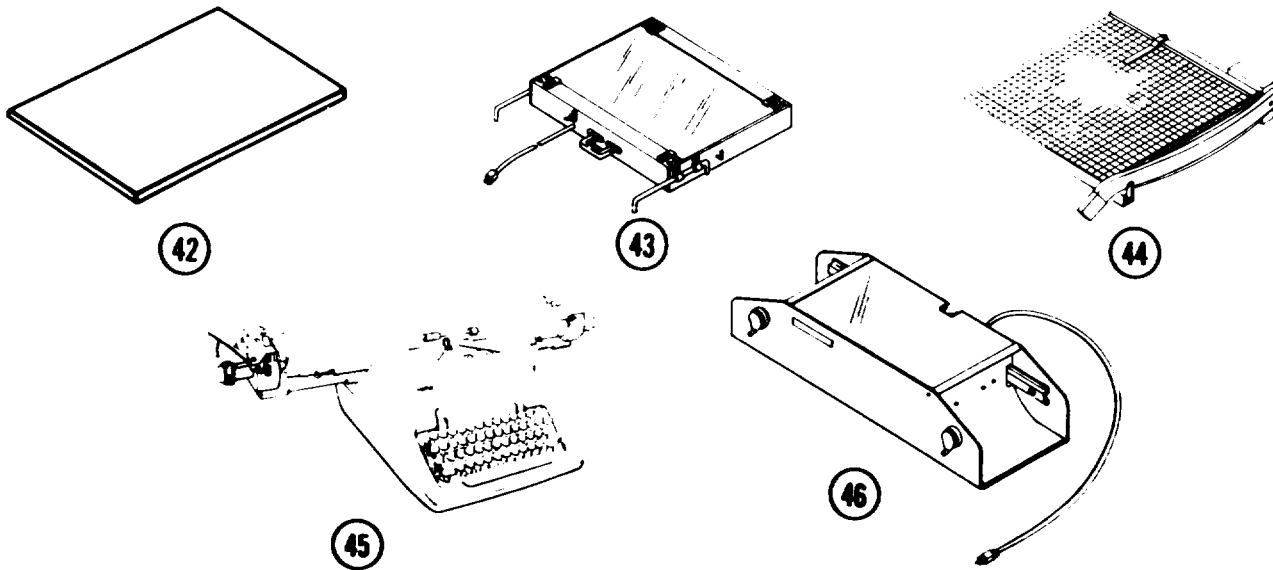
(1) Illus Number	(2) National Stock Number	(3) Description FSCM and Part Number	(4) U/M	(5) Qty Rqr
30		LIFTING AND TIEDOWN DEVICE, TRANSPORTABLE SHELTER: left-hand (52555) 1390-4	ea	2
31		LIFTING AND TIEDOWN DEVICE, TRANSPORTABLE SHELTER: right-hand (52555) 1390-3	ea	2
32		LIGHT, EMERGENCY: (97403) 13225E3396	ea	1
32A	6650-00-477-9613	MAGNIFIER: Monocular, lamp type (15607) KFM-1/B5D	ea	2
33	DELETED			
34	DELETED			
35	5975-00-878-3791	ROD, GROUND: (82370) A104	ea	1

Section II COMPONENTS OF END ITEM - Cont



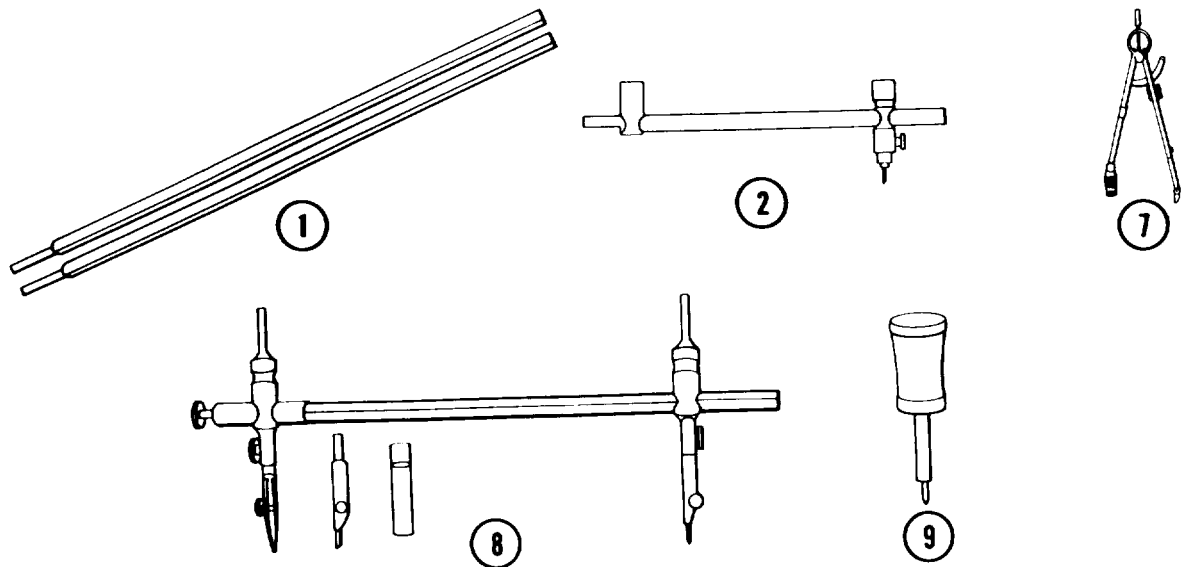
(1) Illus Number	(2) National Stock Number	(3) Description FSCM and Part Number	(4) U/M	(5) Qty Rqr
36	2330-01-076-4797	SEMITRAILER, FLATBED: (97403) TL/MIL-B-13207, para. 3.11, fig. 12, tables III and IV	ea	1
37	5120-01-013-1676	SLIDE HAMMER, GROUND ROD EMPLACEMENT: (45225) P74-144	ea	1
38	DELETED			
39	6675-01-203-1049	TABLE, SCRIBING, TRACING DRAFTING: (33363) 99-9933	ea	2
40	DELETED			

Section II COMPONENTS OF END ITEM-Cont



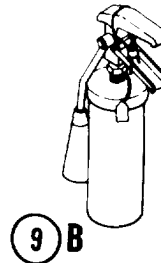
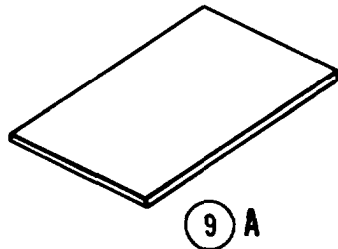
(1) Illus Number	(2) National Stock Number	(3) Description FSCM and Part Number	(4) U/M	(5) Qty Rqr
41	DELETED			
42		TOP, FILING CABINET: (88915) T3445	ea	1
43	6675-00-221-7121	TRACING BOARD: (26954) 51J3	ea	1
44	7520-00-224-7621	TRIMMER, PAPER, DROP KNIFE: (81348) GG-T-678-Type-1, Class 5	ea	1
45	7430-00-663-9102	TYPEWRITER: (61634) S27	ea	1
46	6675-01-033-7750	VIEWER, STEREOSCOPIC CONTINUOUS STRIP, PHOTOGRAPHIC INTER- PRETATION: (33363) 72-0210	ea	1

Section III BASIC ISSUE ITEMS



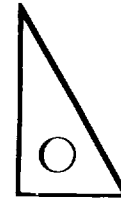
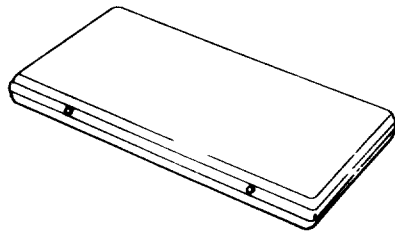
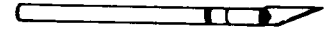
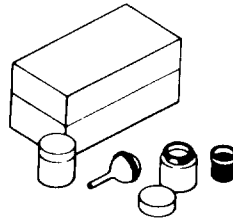
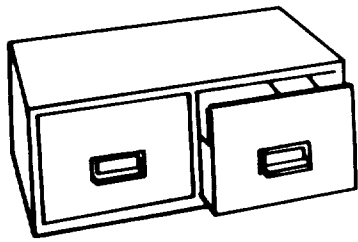
(1) Illus Number	(2) National Stock Number	(3) Description FSCM and Part Number	(4) U/M	(5) Qty Rqr
1	6675-01-114-7226	BAR, EXTENSION, BEAM COMPASS: (33363) 55-1818	ea	2
2	6675-01-071-8913	BEAM, ATTACHMENT, DRAFTING COMPASS: (79819) 3175BN	ea	2
3 thru 6	DELETED			
	7920-00-291-5815	BRUSH, WIRE, SCRATCH (39428) 7187T2	ea	1
7	6675-00-459-8935	COMPASS, DRAFTING BEAM: (79819) 3175-N	ea	2
8	6675-00-904-1947	COMPASS, DRAFTING BEAM: (33363) 55-1806	ea	2
9	6675-01-071-8912	COMPASS, DRAFTING LEAD ATTACHMENT: (79819) 3175LA	ea	2

Section III BASIC ISSUE ITEMS - Cont



(1) Illus Number	(2) National Stock Number	(3) Description FSCM and Part Number	(4) U/M	(5) Qty Rqr
		COVER, WORKING SURFACE, BOARD DRAFTING: (33363) 99-9970	ea	1
	6675-00-250-2508	CURVE, DRAFTING, IRREGULAR: French type (79819) 8255-A	ea	4
	6675-00-250-2509	CURVE, DRAFTING, IRREGULAR: Ship type (17866) 2217-107	ea	4
	6675-00-641-3512	DIVIDERS, DRAFTING: Plain (33363) 55-1794	ea	4
	6675-00-240-2049	DIVIDERS, DRAFTING: Proportional (33363) 55-1860	ea	2
	6675-00-599-8880	DIVIDERS, EQUAL SPACING, 6.000 in.: (39428) 1995D11, 6 in.	ea	1
	6675-00-599-8879	DIVIDERS, EQUAL SPACING, 12.000 in.: (39428) 1995D12, 12 in.	ea	1
9A		DRAWING BOARD: (33363) 64-1189	ea	1
9B	4210-00-555-8837	EXTINGUISHER, FIRE, MONOBROMOTRIFLUOROMETHANE (33525) T2	ea	2

Section III BASIC ISSUE ITEMS - Cont



12

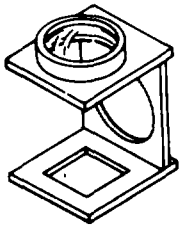
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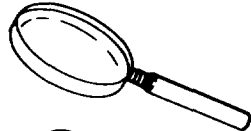
13

(1) Illus Number	(2) National Stock Number	(3) Description FSCM and Part Number	(4) U/M	(5) Qty Rqr
9C	7110-00-273-8774	FILING CABINET: (8D190) H4-F3352	ea	6
9D	6545-00-922-1200	FIRST AID KIT, GENERAL PURPOSE (89875) SC C-6545-IL vol 2	ea	1
10	7510-00-927-8685	KIT, PEN CLEANING: (33363) 61-3115	kit	3
11	5110-00-595-8400	KNIFE, CRAFTSMAN'S (99941) 3001	ea	4
	7520-01-008-7640	LEAD REPOINTER PENCIL: (79819) 992WB	ea	2
12	6675-00-551-0785	LETTERING SET:	ea	1
13	6675-00-190-5854	LINE GUIDE, LETTERING, NONADJUSTABLE: (17866) 2030B6	ea	6

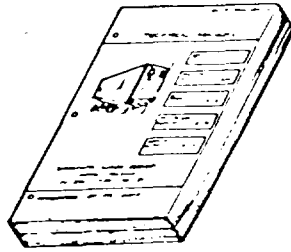
Section III BASIC ISSUE ITEMS - Cont



15



16



16 A



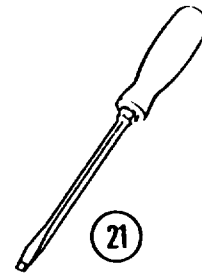
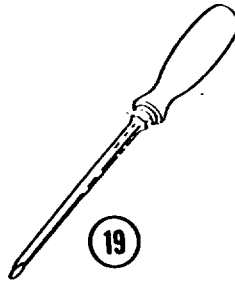
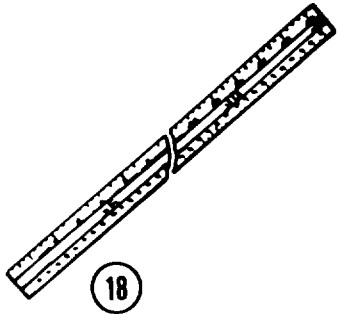
16 B



16 C

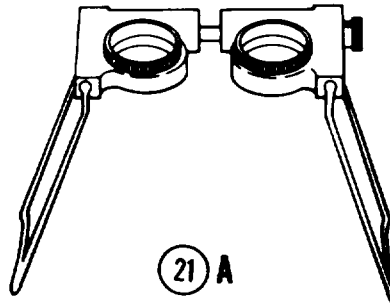
(1) Illus Number	(2) National Stock Number	(3) Description FSCM and Part Number	(4) U/M	(5) Qty Rqr
14	DELETED			
15	6650-00-255-8268	MAGNIFIER: Monocular, linen tester (79819) Q8-9518	ea	4
16	6650-01-139-9533	MAGNIFIER: Monocular, round shape (22527) 12-070C	ea	2
16A		MANUALS, TECHNICAL TM 5-6675-313-14 OPERATOR'S ORGANIZATIONAL, DIRECT SUPPORT AND GENERAL SUPPORT, TSS, OPERATIONS SECTION TM 5-6675-313-24P REPAIR PARTS AND SPECIAL TOOLS LIST, TSS, OPERATIONS SECTION LO 5-6675-313-12 LUBRICATION ORDER, TSS, OPERATIONS SECTION	ea	1
16B	6675-00-222-2542	MEASURER, MAP: (33363) 62-0300	ea	2
16C	5340-00-682-1505	PADLOCK SET: (77765) MS21313-52	se	1

Section III BASIC ISSUE ITEMS - Cont



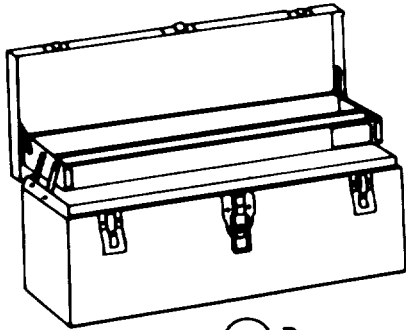
(1) Illus Number	(2) National Stock Number	(3) Description FSCM and Part Number	(4) U/M	(5) Qty Rqr
17	DELETED			
	7510-01-030-7427	PEN POINT ASSORTMENT AND PENHOLDER: (79819) 3165-JDCS9	se	4
18	5210-00-273-1965	RULE, STEEL, MACHINIST'S: (57163) CME600	ea	1
	6675-00-641-5727	SCALE, DRAFTING: (33363) 56-3280	ea	4
	6675-00-283-0035	SCALE, PLOTTING: (17866) GG-S-161/8	ea	4
	6675-00-283-0027	SCALE, PLOTTING: (23366) 28/YD, 10 in.	ea	4
	6675-00-283-0037	SCALE, PLOTTING: (23366) 28/MR, 12 in.	ea	4
	6675-00-580-5077	SCALE, PLOTTING: (97403) TL/MIL-S-20197	ea	1
19	5120-00-234-8913	SCREWDRIVER, CROSS TIP: Size 2 (81348) GGG-S-121	ea	1
20	DELETED			
21	5120-00-234-8910	SCREWDRIVER, FLAT TIP: (78525) 1006	ea	1

Section III BASIC ISSUE ITEMS - Cont

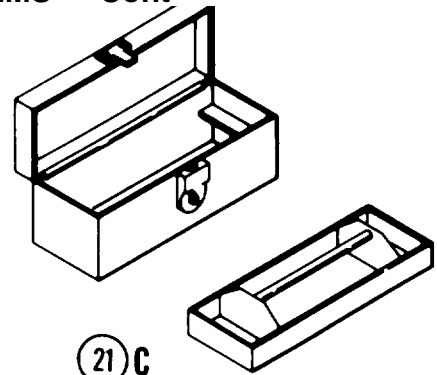


(1) Illus umber	(2) National Stock Number	(3) Description FSCM and Part Number	(4) U/M	(5) Qty Rqr
21A	7510-00-224-7242	SHIELD, ERASING: (79819) 03-605	dz	1
	6675-00-641-3561	STEREOSCOPE, LENS, AERIAL PHOTOGRAPH INTERPRETATION: Abrams Model SV-1 (7D560) 51034	ea	4
		STRAIGHTEDGE: (33363) 56-4150	ea	1
		STRAP ASSEMBLY, BUCKLE-END: 6.0 in. (82820) 1844-104	ea	5
		STRAP ASSEMBLY, BUCKLE-END: 8.0 in. (82820) 1844-101	ea	4
		STRAP ASSEMBLY, TIP-END: 8.0 in. (82820) 1845-107	ea	4
		STRAP ASSEMBLY, TIP-END: 36.0 in. (82820) 1845-106	ea	1
		STRAP ASSEMBLY, TIP-END: 40.0 in. (82820) 1845-101	ea	10
STRAP ASSEMBLY, WEBBING: 29.00 in. (98313) 13225E3695-13	ea	2		

Section III BASIC ISSUE ITEMS - Cont



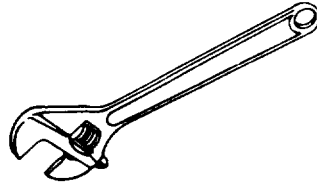
21 B



21 C

(1) Illus Number	(2) National Stock Number	(3) Description FSCM and Part Number	(4) U/M	(5) Qty Rqr
		STRAP ASSEMBLY, WEBBING: 30.00 in. (98313) 13225E3695-8	ea	3
		STRAP ASSEMBLY, WEBBING: 45.00 in. (98313) 13225E3695-3	ea	4
		STRAP ASSEMBLY, WEBBING": 55.00 in. (98313) 13225E3695-6	ea	7
	6675-00-253-5501	TEMPLATE, DRAFTING: (79819) 830140	ea	4
21 B	5140-00-331-5496	TOOL BOX, PORTABLE: 1 fixed hinged tray (75206) CS 19	ea	4
21 c	5140-00-315-2747	TOOL BOX, PORTABLE: 1 removable tray (75206) CS 16	ea	1
	6675-00-190-5863	TRIANGLE, DRAFTING 245 degs: (33363) 57-0292, size 10	ea	4
	6675-00-190-5867	TRIANGLE, DRAFTING 130 degs, 160 degs: (33363) 57-0220, size 10	ea	4

Section III BASIC ISSUE ITEMS - Cont



23

(1) Illus Number	(2) National Stock Number	(3) Description FSCM and Part Number	(4) U/M	(5) Qty Rqr
	6675-00-183-8487	T-SQUARE: (81 562) 8088E	ea	2
	5120-00-224-7271	WISE, PIN: (18037) PVDE	ea	3
22	DELETED			
23	5120-00-284-3795	WRENCH, ADJUSTABLE: (80244) GGG-W-831-TY1 CL1	ea	1

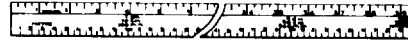
Section III BASIC ISSUE ITEMS - Cont

(1) Illus Number	(2) National Stock Number	(3) Description FSCM and Part Number	(4) U/M	(5) Qty Rqr
	5675-01-098-1219	PEN POINTS: Rapidometric, 0.18 mm, lavender (79819) 72DJ, 0.18 mm	ea	2
	5675-01-098-1220	PEN POINTS: Rapidometric, 0.25 mm beige (79819) 72DJ, 0.25 mm	ea	2
	6675-01-107-9679	PEN POINTS: Rapidometric, 0.35 mm grey (79819) 72DJ, 0.35 mm	ea	2
	6675-01-098-1221	PEN POINTS: Rapidometric, 0.50 mm red (79819) 72DJ, 0.50 mm	ea	2
	6675-01-099-3440	PEN POINTS: Rapidometric, 0.70 mm light blue (79819) 72DJ, 0.70 mm	ea	2
	6675-01-098-0308	PEN POINTS: Rapidometric, 1.00 mm orange (79819) 72DJ, 1.00 mm	ea	2
	6675-01-098-1222	PEN POINTS: Rapidometric, 1.40 mm cordovan brown (79819) 72DJ, 1.40 mm	ea	2
	6675-01-097-4516	PEN POINTS: Rapidometric, 2.00 mm cerise red (79819) 72DJ, 2.00 mm	ea	2
		PIN, REGISTER: Round (25042) 04250110	ea	4
		PIN, REGISTER: Oblong (25042) 04325110	ea	8
	7510-00-174-7343	PIN, STRAIGHT, OFFICE: (8D190) P3-780C	bx	1
		PLASTIC SHEET: Clear surface for ink (33363) 44-1037, 24 x 30 in.	pg	1
		PLASTIC SHEET: Matte one side (33363) 44-1057, 24 x 30 in.	pg	1

Section III BASIC ISSUE ITEMS – Cont



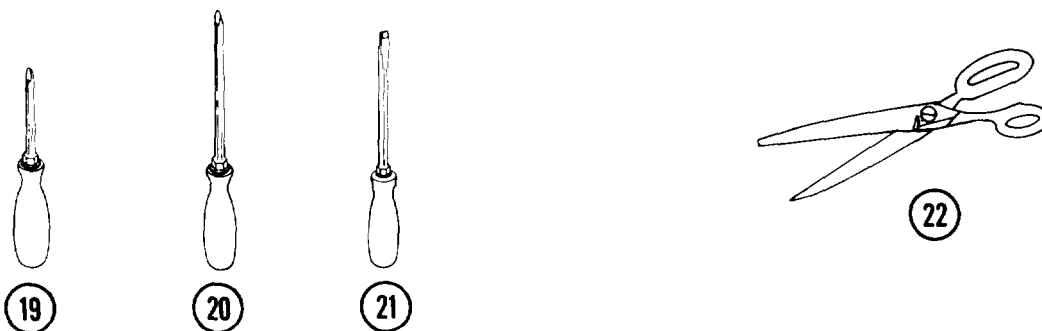
17



18

(1) III us Number	(2) National Stock Number	(3) Description FSCM and Part Number	(4) U/M	(5) Qty Rqr
17	5120-00-223-7396	PLIERS, SLIP JOINT: (93389) 276	ea	1
	6675-00-222-2535	PUSHPIN: (79819) V6-3-100	hd	1
	7510-00-543-6792	REFILL, BALL POINT PEN: (79819) VER-4	dz	1
	7510-00-926-9146	RIBBON, TYPEWRITER: (6 P460) 451-8183	ea	10
	7510-00-255-4560	RUBBER BAND ASSORTMENT: (8D190) N1-8366-54	bx	1
18	5210-00-273-1965	RULE, STEEL, MACHINIST'S: (57163) CME600	ea	1
	6675-00-641-5727	SCALE, DRAFTING: (33363) 56-3280	ea	4
	6675-00-283-0035	SCALE, PLOTTING: (17866) GG-S-161/8	ea	4
	6675-00-283-0027	SCALE, PLOTTING: (23366) 28/YD, 10 in.	ea	4
	6675-00-283-0037	SCALE, PLOTTING: (23366) 28/MR, 12 in.	ea	4
	6675-00-580-5077	SCALE, PLOTTING: [97403) TL/MIL-S-20197	ea	1

Section III BASIC ISSUE ITEMS - Cont

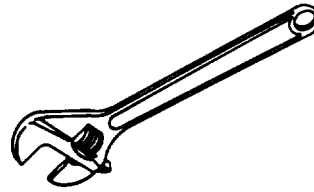


(1) Illus Number	(2) National Stock Number	(3) Description FSCM and Part Number	(4) U/M	(5) Qty Rqr
19	5120-00-764-8080	SCREWDRIVER, CROSS TIP: Size 1 (52346) AA3B077	ea	1
20	5120-00-764-8102	SCREWDRIVER, CROSS TIP: Size 3 (52346) AA3B083	ea	1
21	5120-00-234-8910	SCREWDRIVER, FLAT TIP: (78525) 1006	ea	1
22	5110-00-162-2207	SHEARS, STRAIGHT TRIMMERS: (79819) Q9-3762	ea	4
	7510-00-224-7242	SHIELD, ERASING: (79819) 03-605	dz	1
	7520-00-281-5985	STAPLER, PAPER FASTENING, OFFICE: (8D190) X8-27, grey	ea	2
	7510-00-272-9662	STAPLES, PAPER FASTENING, OFFICE TYPE: (8D190) 8-SF4-5M	bx	2
	5345-00-265-3126	STONE, SHARPENING: (10670) 3501-3517	ea	1
		STRAIGHTEDGE: (33363) 56-4150	ea	1
		STRAP ASSEMBLY, BUCKLE-END: 6.0 in. (82820) 1844-104	ea	5

Section III BASIC ISSUE ITEMS – Cont

(1) Illus Number	(2) National Stock Number	(3) Description FSCM and Part Number	(4) U / M	(5) Qty Rqr
		STRAP ASSEMBLY, BUCKLE-END: 8.0 in. (82820) 1844-101	ea	4
		STRAP ASSEMBLY, TIP-END: 8.0 in. (82820) 1845-107	ea	4
		STRAP ASSEMBLY, TIP-END: 36.0 in. (82820) 1845-106	ea	1
		STRAP ASSEMBLY, TIP-END: 40.0 in. (82820) 1845-101	ea	10
		STRAP ASSEMBLY, WEBBING: 30.00 in. (98313) 13225 E3695-8	ea	3
		STRAP ASSEMBLY, WEBBING: 45.00 in. (98313) 13225 E3695-3	ea	4
		STRAP ASSEMBLY, WEBBING: 55.00 in. (98313) 13225 E3695-6	ea	7
		STRAP ASSEMBLY, WEBBING: 29.00 in. (98313) 13225 E3695-13	ea	2
	7510-00-634-1549	TAPE, PRESSURE SENSITIVE ADHESIVE: Cotton or linen, clear color, adhesive both sides, 1.0 in. wide (76381) 666, 1.0 in.	ro	1
	7510-00-550-7126	TAPE, PRESSURE SENSITIVE, ADHESIVE: Plastic, transparent, red color, adhesive one side, 0.50 in. wide (99742) P45	ro	2
	7510-00-234-7960	TAPE, PRESSURE SENSITIVE, ADHESIVE: Plastic, transparent, clear adhesive one side, 2.0 in. wide	ro	3
	7510-00-551-9824	TAPE, PRESSURE SENSITIVE, ADHESIVE: Plastic, transparent, clear color, adhesive one side, 0.750 in. wide (76381) 810	ro	3

Section III BASIC ISSUE ITEMS - Cont



23

(1) Illustration Number	(2) National Stock Number	(3) Description SCM and Part Number	(4) U/M	(5) Quantity
	7510-00-198-5831	TAPE, PRESSURE SENSITIVE, ADHESIVE: Paper opaque, adhesive one side 1.0 in. wide [76381) 230	ro	5
	6675-00-253-5501	TEMPLATE, DRAFTING: (79819) 830140	ea	4
	7510-00-272-6887	THUMB TACK: (79819) V6-53	hd	1
	6675-00-190-5863	TRIANGLE, DRAFTING, 2 45 degs: (33363) 57-0292, size 10	ea	4
	6675-00-190-5867	TRIANGLE, DRAFTING, 1 30 deg, 1 60 deg: (33363) 57-0220, size 10	ea	4
	6675-00-183-6487	T-SQUARE: (81562) 8068E	ea	2
	4020-00-242-4074	TWINE, FIBROUS: (79819) S9-9	lb	1
	5120-00-224-7271	VISE, PIN: (18037) PVDE	ea	3
	6145-00-643-0956	WI RE, ELECTRICAL: (03363) 6	lb	1
23	5120-00-240-5328	WRENCH, ADJUSTABLE: (92878) 1500559	ea	1

**APPENDIX D
ADDITIONAL AUTHORIZATION LIST**

Section I INTRODUCTION

D-1 . SCOPE.

This appendix lists additional items you are authorized for the support of the Operations Section.

D-2. GENERAL.

This list identifies items that do not have to accompany the Operations Section and that do not have to be turned in with it. These items are all authorized to you by CTA, MTOE, TDA or JTA.

D-3. EXPLANATION OF LISTING.

National stock numbers, descriptions and quantities are provided to help you identify and request the additional items you require to support this equipment. The items are listed in alphabetical sequence by item name under the type document (i.e., CTA, MTOE, TDA, or JTA) which authorizes the item(s) to you.

Section II **ADDITIONAL AUTHORIZATION LIST**

(1) National Stock Number	(2) Description FSCM and Part Number	(3) U/M	(4) Qty Auth
	<u>TOE AUTHORIZED ITEMS</u>		
5805-00-229-5417	Converter, Telephone Signal	ea	1
6115-00-394-9577	Generator, 15 kW	ea	1
5805-0071\$6171	Switchboard, Telephone, Manual, SB-22/PT	ea	1
5605-00-543-0012	Telephone Set: TA-312/PT	ea	1

APPENDIX E

EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

Section I INTRODUCTION

E-1 . SCOPE.

This appendix lists expendable supplies and materials you will need to operate and maintain the Operations Section. This listing is for information purposes only and is not authority to requisition the listed items. These items are authorized to you by CTA 50-970, Expendable/Durable Items (except Medical, Class V, Repair Parts and Heraldic Items), or CTA 8-100, Army Medical Department Expendable/Durable Items.

E-2. EXPLANATION OF COLUMNS

a. **Column (1) - Item Number.** This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material (e.g., "Use cleaning compound, Item 5, Appendix E.").

b. **Column (2) - Level.** This column identifies the lowest level of maintenance that requires the listed item.

C - Operator/Crew

0- Organizational Maintenance

F - Direct Support Maintenance

H - General Support Maintenance

c. **Column (3) - National Stock Number.** This is the National stock number assigned to the item; use it to request or requisition the item.

d. **Column (4) - Description.** Indicates the Federal item name and, if required, a description to identify the item. The last line for each item indicates the part number followed by Federal Supply Code for Manufacturer (FSCM) in parentheses followed by the part number.

e. **Column (5) - Unit of Measure (U/M).** Indicates the measure used in performing the actual maintenance function. This measure is expressed by two-character alphabetical abbreviations (e.g., ea, in, pr). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

Section II EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
1	O	8040-00-174-2610	Adhesive	cn
2	F	8040-00-152-0063	Adhesive, Waterproof	cn
3	C	6810-00-205-6786	Alcohol, Denatured	qt
	C	6510-01-097-3905	Ball, Absorbent Cotton	pg
	C	7520-00-935-7136	Ball Point Pen: black	dz
	C	7520-00-281-5911	Basket, Wastepaper	ea
	C	7510-00-616-7471	Binder and Filler, Loose Leaf	ea
	C	5110-00-359-6478	Blade, Craftsman Knife: beveled	pg
	C	5110-00-542-2043	Blade, Craftsman Knife: curved	pg
	C	5110-00-542-2044	Blade, Craftsman Knife: square	pg
	C	5110-00-765-4144	Blade, Craftsman Knife: stencil	pg
	C	8125-01-088-3553	Bottle, Adhesive Dispenser	ea
	C	7920-00-291-5812	Brush, Dusting, Draftsman's	ea
	C	7510-00-223-6702	Chalk, Marking: blue	gr
	C	7510-00-223-6705	Chalk, Marking: red	gr
	C	7510-00-223-6706	Chalk, Marking: white	gr
	C	7510-00-223-6707	Chalk, Marking: yellow	gr
	C	8330-00965-1722	Chamois Leather, Sheepskin	ea
4	C	6650-00-592-3283	Cleaner, Lens	bk
		6850-01-007-6073	Cleaning Concentrate	bt
	C	7510-00-161-4291	Clip, Paper	bx
5	C	830500-222-2423	Cloth, Cheesecloth	yd
	C	8320-00-299-8625	Cotton, Nonsterile	pg
6	C	6515-00-303-6250	Cotton Swabs	bg
7	C	7930-00-530-8067	Detergent, General Purpose	gl

Section II EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST-Cont

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
	C	7520-00-285-1772	Dispenser, Pressure Sensitive Adhesive Tape	ea
	C	7530-00-268-3994	Envelope, Wallet	bx
	C	7510-01-099-3953	Eraser	bt
	C	7510-01-019-7892	Eraser, Blackboard	ea
	C	7510-01-034-1278	Eraser, Film	bx
	C	7510-01-035-1317	Eraser Kit	kt
	C	7510-00-634-5034	Eraser, Rubber	dz
8	F	5610-00-618-0258	Floor Patch	gl
9	O	9150-00-190-0904	Grease, GAA	lb
	C	7510-01-028-2877	Ink, Drawing	bt
	C	7510-01-070-8947	Ink, Drawing	bt
	C	7510-01-039-5075	Ink, Drawing: Carmine red	bt
	C	7510-01-035-8133	Ink, Drawing: Blue	bt
	C	7510-01-035-8131	Ink, Drawing: Brown	bt
	C	7510-01-035-8132	Ink, Drawing: Green	bt
	C	7510-01-036-3726	Ink, Drawing: Orange	bt
	C	7510-01-080-1481	Ink, Drawing: Red	bt
	C	7510-01-036-3725	Ink, Drawing: Violet	bt
	C	7510-01-035-8130	Ink, Drawing: Yellow	bt
	C	7510-00-285-5865	Lead, Pencil, Graphite: General purpose, F	pg
	C	7510-00-285-5866	Lead, Pencil, Graphite: General purpose, H	pg
	C	7510-00-281-2143	Lead, Pencil, Graphite: General purpose, HB	bx
	C	7510-00-285-5863	Lead, Pencil, Graphite: General purpose, 2H	pg
	C	7510-00-272-9820	Lead, Pencil, Graphite: General purpose, 3H	pg

Section II EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST - Cont

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
	C	7510-00-285-5864	Lead, Pencil, Graphite: General purpose, 4H	pg
	C	7510-00-285-5862	Lead, Pencil, Graphite: General writing type, HB	pg
	C	7510-00-285-5847	Lead, Pencil, Graphite: General writing type, 2H	pg
10	F	9150-00-273-2389	Oil, Lubricating, General purpose	cn
	C	7530-00-285-3083	Pad, Writing Paper	pg
11	O	8010-01-131-6254	Paint, Black	kt
11A	O	8010-01-160-6745	Paint, Brown	kt
11B	O	8010-01-162-5578	Paint, Green	kt
12	O	8010-00-298-3859	Paint, Light Green, INT	gl
13	C	5350-00-619-9166	Paper, Abrasive	pk
	C	7530-00-871-8310	Paper, Drawing	pg
	C		Paper, Graph: Cross section ruling (33363) 48-5094,50 yds x 22 in.	ro
	C		Paper, Graph: Profile ruling (33363) 48-6020,50 yds x 22 in.	ro
	C	6640-00-597-6745	Paper, Lens	bk
	C		Paper, Tracing (33363) 11-3155, 30 x 24 in.	pg
	C	7510-00-286-6985	Paperweight	ea
	C	7510-00-233-2027	Pencil, Colored: Blue	dz
	C	7510-00-264-4610	Pencil, Colored: Green	dz
	C	7510-00-233-2021	Pencil, Colored: Red	dz
	C	7510-00-264-4608	Pencil, Colored: Yellow	dz
	C	7510-00-240-1526	Pencil: Glazed, surface marking, black	dz
	C	7510-00-436-5210	Pencil: Glazed, surface marking, blue	dz
	C	7510-00-275-7212	Pencil: Glazed, surface marking, green	dz

Section II EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST - Cont

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
	C	7510-00-174-3205	Pencil: Glazed, surface marking, red	dz
	C	7520-00-161-5664	Pencil, Mechanical	ea
	C	7520-01-083-6734	Pencil, Mechanical	ea
	C	6675-01-107-9678	Pen Points: Rapidometric, 0.13 mm, pink	ea
	C	6675-01-098-1219	Pen Points: Rapidometric, 0.18 mm, lavender	ea
	C	6675-01-098-1220	Pen Points: Rapidometric, 0.25 mm, beige	ea
	C	6675-01-107-9679	Pen Points: Rapidometric, 0.35 mm, grey	ea
	C	6675-01-098-1221	Pen Points: Rapidometric, 0.50 mm, red	ea
	C	6675-01-099-3440	Pen Points: Rapidometric, 0.70 mm, light blue	ea
	C	6675-01-098-0308	Pen Points: Rapidometric, 1.00 mm, orange	ea
	C	6675-01-098-1222	Pen Points: Rapidometric, 1.40 mm cordovan brown	ea
	C	6675-01-097-4516	Pen Points: Rapidometric, 2.00 mm, cerise red	ea
	C		Pin, Register: round (25042) 04250110	ea
	C		Pin, Register, Oblong (25042) 04325110	ea
	C	7510-00-174-7343	Pin, Straight, Office	bx
			Plastic Sheet: Clear surface for ink (33363) 44-1037, 24 x 30 in.	pg
			Plastic Sheet: Matte one side (33363) 44-1057, 24 x 30 in.	pg
	O	8010-01-193-0520	Primer	kt
	C	6675-00-222-2535	Pushpin	hd
	C	7510-00-543-6792	Refill, Ball Point Pen	dz
14	F	6010-01-030-7254	Resin, Epoxy	kt

Section II EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST - Cont

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
	C	7510-00-926-9146	Ribbon, Typewriter	ea
	C	7510-00-255-4560	Rubber Band Assortment	bx
15	O		Screen, Nylon (39428) 101 7A31	ro
16	O		Sealant, Silicone	tu
	C	5110-00-162-2207	Shears, Straight Trimmers	ea
17	O	3439-00-273-3722	Solder, Rosin Core	sl
18	O	6850-00-274-5421	Solvent, P-D-680	cn
19	C	6850-00-880-1013	Spray, Silicone	cn
20	O		Sprayfoam Sealant (39428) 7627T1	cn
	C	7520-00-281-5985	Stapler, Paper Fastening, Office	ea
	C	7510-00-272-9662	Staples, Paper Fastening, Office Type	BX
	C	5345-00-265-3126	Stone, Sharpening	ea
21	O	5640-00-103-2254	Tape, Cloth, Duct Sealing, 2 in.	ro
22	C	5970-00-926-7218	Tape, Insulating, Electrical	ro
	C	7510-00-634-1549	Tape, Pressure Sensitive Adhesive Cotton or linen, clear color, adhesive both sides, 1.0 in. wide	ro
	C	7510-00-550-7126	Tape, Pressure Sensitive, Adhesive Plastic, transparent, red color, adhesive one side, 0.50 in. wide	ro
	C	7510-00-234-7960	Tape, Pressure Sensitive, Adhesive Plastic, transparent, clear adhesive one side, 2.0 in. wide	ro
	C	7510-00-551-9824	Tape, Pressure Sensitive, Adhesive Plastic, transparent, clear color, adhesive one side, 0.750 in. wide	ro
	C	7510-00-198-583	Tape, Pressure Sensitive, Adhesive Paper opaque, adhesive one side 1.0 in. wide	ro

Section II EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST - Cont

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
23	C	7510-00-272-6887	Thumbtack	hd
	C	654000-597-6745	Tissue, Lens Cleaning	bk
	C	402000-2424074	Twine, Fibrous	lb
			6145-00-643-0956	Wire, Electrical

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6

2-1
a

B1

4-3

125

line 20

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

In line 6 of paragraph 2-1a the manual states the engine has 6 cylinders. The engine on my set only has 4 cylinders. Change the manual to show 4 cylinders.

Callout 16 on figure 4-3 is pointing at a bolt. In key: to figure 4-3, item 16 is called a shim - Please correct one or the other.

I ordered a gasket, item 19 on figure B-16 by NSN 2 910-00-762-3001. I got a gasket but it doesn't fit. Supply says I got what I ordered, so the NSN is wrong. Please give me a good NSN

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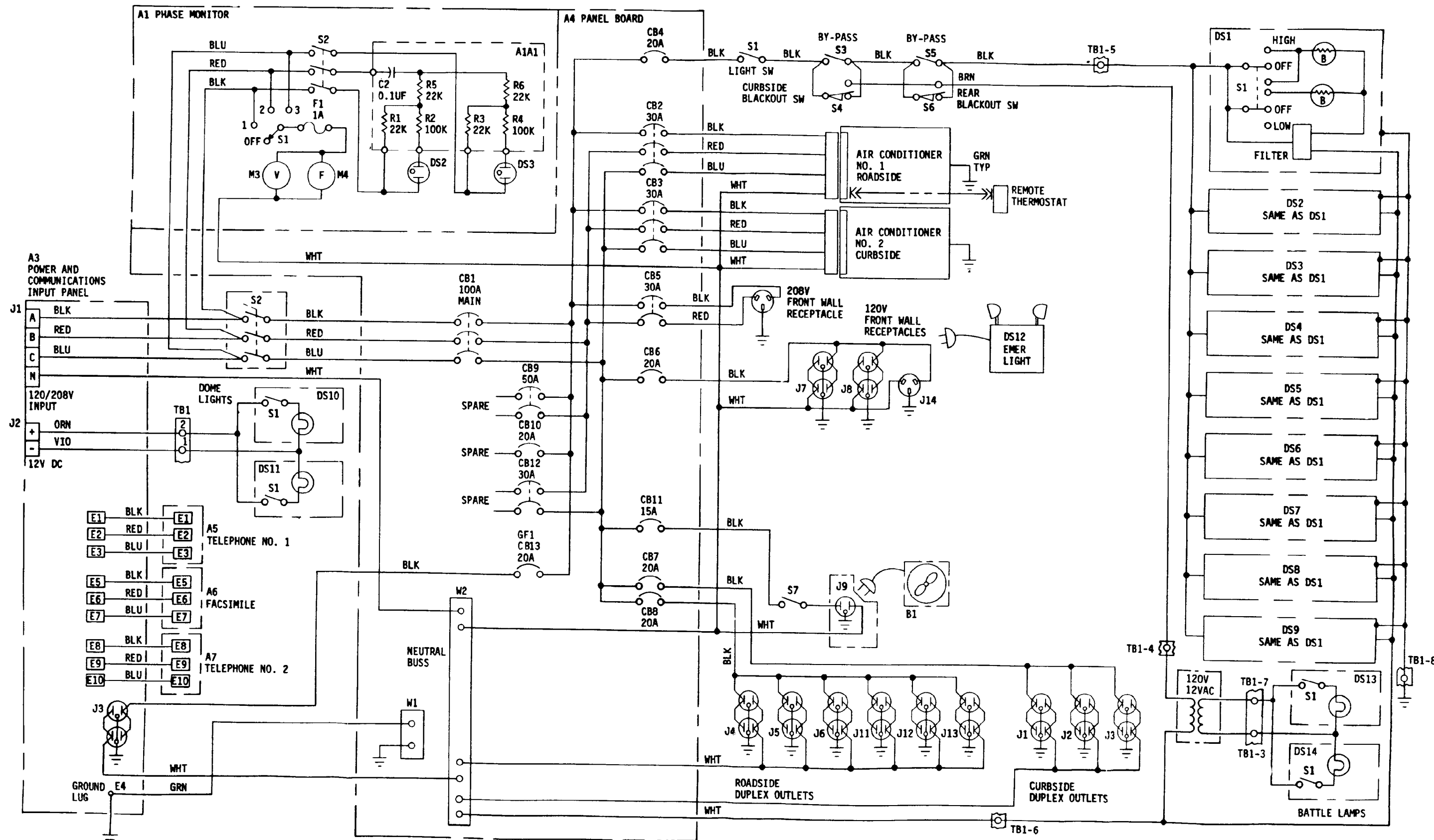
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FO-1. Operations Section Electrical Schematic

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 decigrams = .035 ounce
 1 dekagram = 10 grams = .35 ounce
 1 hectogram = 10 dekagrams = 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 milliliters = .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	square kilometers	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	grams	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
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