TM 11-4940-209-15

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

OPERATOR, ORGANIZATIONAL, DS, GS, AND DEPOT MAINTENANCE MANUAL

ELECTRONIC SHOPS

SEMITRAILER MOUNTED, AN/ASM-189 AND AN/ASM-190

This copy is a reprint which includes current pages from Changes 1 and 2.

HEADQUARTERS, DEPARTMENT OF THE ARMY

JANUARY 1968

Change
No. 3

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, 1 September 1994

OPERATOR, ORGANIZATIONAL, DIRECT SUPPORT, GENERAL SUPPORT, AND DEPOT MAINTENANCE MANUAL

ELECTRONIC SHOPS, SEMITRAILER MOUNTED AN/ASM-189 (NSN 4940-00-877-8730) (EIC: JFG) AND AN/ASM-190 (NSN 4940-00-965-0317) (EIC: JFJ)

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1. The following change pages apply only to those systems that have MWO 11-5800-220-50-1 completed.

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Remove pages	*Insert pages*
A and B	A through D
i and ii	i and ii
1-1 and 1-2	1-1 and 1-2
2-1 and 2-2	2-1 and 2-2
3-1 and 3-2	3-1 and 3-2
4-1 and 4-2	4-1 and 4-2
5-1 and 5-2	5-1 and 5-2
A-1 and A-2	A-1 and A-2
C-1 through C-4	C-1 through C-6
D-1 through D-3	D-1 through D-3/(D-4 blank)
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Change
No. *2*

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, 15 June 1986

Operator, Organizational, Direct Support, General Support, and Depot Maintenance Manual

ELECTRONIC SHOPS, SEMITRAILER MOUNTED AN/ ASM-189 AND AN/ASM-190

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i and ii	i and ii
l-l and l-2	l-l and l-2
None	14.1/(14.2 blank)
l-5 Change 1-6	l-5 and l-6
1-11 and 1-12	1-11 and 1-12
l- 29 and l-30	l-29 and l-30
None	2-2.l and 2-2.2
2-3 and 2-4	2-3 and 2-4
None	2-8.1 /(2-8.2 blsnk)
3-5 and 3-6	3-5 and 3-6
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5 SAFETY STEPS TO FOLLOW IF SOMEONE IS THE VICTIM OF ELECTRICAL SHOCK

1 DO NOT TRY TO PULL OR GRAB THE INDIVIDUAL

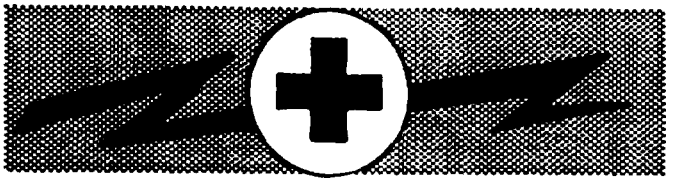
2 IF POSSIBLE, TURN OFF THE ELECTRICAL POWER

3 IF YOU CANNOT TURN OFF THE ELECTRICAL POWER, PULL, PUSH, OR LIFT THE PERSON TO SAFETY USING A DRY WOODEN POLE OR A DRY ROPE OR SOME OTHER INSULATING MATERIAL

4 SEND FOR HELP AS SOON AS POSSIBLE

5 AFTER THE INJURED PERSON IS FREE OF CONTACT WITH THE SOURCE OF ELECTRICAL SHOCK, MOVE THE PERSON A SHORT DISTANCE AWAY AND IMMEDIATELY START ARTIFICIAL RESUSCITATION

WARNING



HIGH VOLTAGE
is used in the operation of this equipment

DEATH ON CONTACT

may result if personnel fail to observe safety precautions

Never work on electronic equipment unless there is another person nearby who is familiar with the operation and hazards of the equipment and who is competent in administering first aid. When the technicians are aided by operators, they must be warned about dangerous areas.

Whenever possible, the power supply to the equipment must be shut off before beginning work on the equipment. Take particular care to ground every capacitor likely to hold a dangerous potential. When working inside the equipment, after the power has been turned off, always ground every part before touching it.

Be careful not to contact high-voltage connections or 115 volt ac input connections when installing or operating this equipment.

Whenever the nature of the operation permits, keep orie hand away from the equipment to reduce the hazard of current flowing through the body.

Warning: Do not be misled by the term “low voltage". Potentials as low as 50 volts may cause death under adverse condition.

For Artificial Respiration, refer to FM 21-11.

WARNING

HIGH VOLTAGE

is used within the vans

DEATH ON CONTACT

may result if operating personnel
fail to observe safety precautions

EXTREMELY DANGEROUS VOLTAGES

EXIST IN THE AC AND DC DISTRIBUTION POWER SYSTEMS.

Be careful when working on or
near the power connections.

VENTILATION IS ESSENTIAL

The vans must be ventilated at all times when occupied.

DON'T TAKE CHANCES!

Selenium and its compounds are toxic; their effects on the body resemble those of arsenic. Selenium fumes have an color resembling garlic or rotten eggs. When this odor is first noticed, power to the affected equipment should be switched off and the area evacuated. Prior to reentry, the area should be ventilated to disperse the times. Overheated selenium rectifiers should not be handled with bare hands, to avoid contact with toxic selenium compounds.

WARNING

Ensure that all power tools and appliances which utilize internal and external convenience receptacles on AN/ASM-189 and AN/ASM-190 are properly grounded and carry Underwriters Laboratories seal of approval, indicating that these tools and appliances comply with electrical safety standards.

WARNING

Do not connect pigtail conductors of 100-foot power cable to power source using national electrical code for wire colors Follow the instructions in this manual or TB 434125 for correct power connection. (Red is phase one, white is phase two, black is phase three and green is neutral.)

WARNING

Do not connect power cable pigtail wires to power source according to color codes in AR 385-30 or national electrical code. Use connection instructions in this manual. Damage to equipment will result from improper wire connections.

WARNING

Environmental Control Unit contains HCFC-22, a substance which harms public health and environment by destroying ozone in the upper atmosphere.

WARNING

Trichlorotrifluoroethane, trichloroethane and similiar chemical solvents will no longer be used for ordinary cleaning of equipment. These substances threaten public health and the environment by destroying ozone in the earth's upper atmosphere. Suitable nonhazardous cleaning materials will be used instead, such as a clean cloth, water and mild detergent.

TECHNICAL MANUAL
No. 11-4940-209-15

HEADQUARTERS
DEPARTMENT OF THE
ARMY
Washington, DC, *29 January 1968*

OPERATOR, ORGANIZATIONAL, DIRECT SUPPORT, GENERAL SUPPORT, AND DEPOT MAINTENANCE MANUAL

ELECTRONIC SHOPS, SEMITRAILER MOUNTED AN/ASM-189 (NSN 4940-00-877-8730) (EIC: JFG) AND AN/ASM-190 (NSN 4940-00-965-0317) (EIC: JFJ)

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), of DA Form 2028-2 located in back of this manual direct to Commander, U.S. Army Communications-Electronics Command and Fort Monmouth, ATTN AMSEL-LM-LT, Fort Monmouth, New Jersey 07703-5007

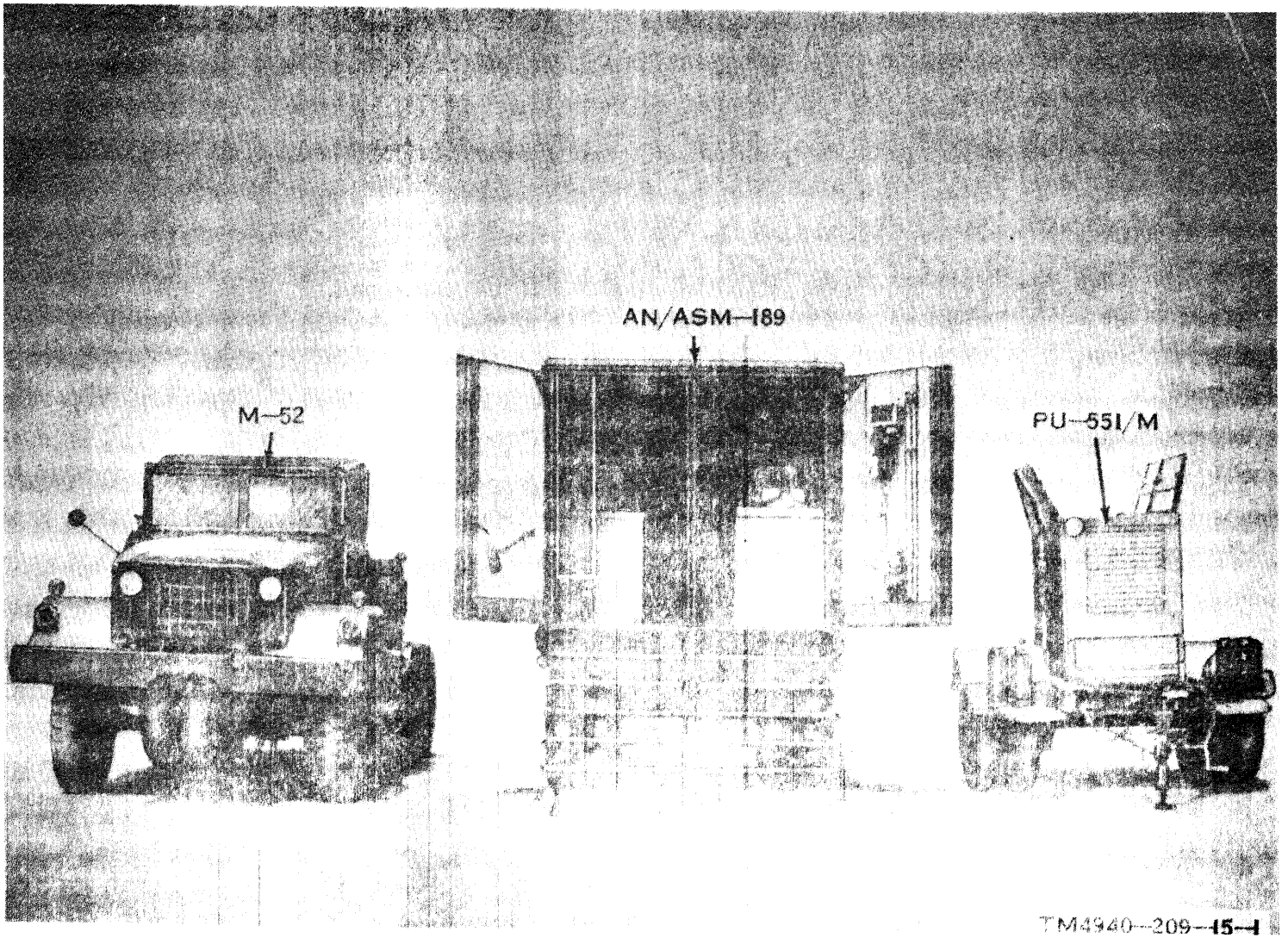


Figure 1-1. Typical repair van, with tractor and power unit.

CHAPTER 1
INTRODUCTION

Section I ENERAL

1-1. Scope

a. This manual describes Electronic Shops, Semitrailer Mounted AN/ASM-l89 (fig. 1) and AN/ASM–l90 and covers their installation, operation, and maintenance.

b. Throughout this manual references are made to other publications which contain instructions for installation, operation, and maintenance of equipment that is installed in, or used with, the AN/ASM-189 and AN/ASM–l90. A listing of applicable reference publications is provided in appendix A.

c. Change 3 applies only to those systems that have MWO 11–5800-220-50-1 completed.

d. For Electronic Shops, AN/ASM-189 and AS/ASM-l90, that have been modified by MWO 1l–5800-220-50-l, the air conditioner(s) were removed and replaced by an environmental control unit(s) (ECU). Other necessary electrical/power wiring changes, including upgrade to a five-wire electrical system, have been performed to only that portion of the van's electrical system directly affected by the addition of the ECU(S). For technical description and maintenance support documentation concerning configuration changes made to the AN/ASM–189 and AN/ASM–l90, as a result of application of MWO 11–5800-220-50-1, refer to APPENDIX F.

1-2. Consolidated Index of Army Publications and Blank Forms

Refer to the latest issue of DA Pam 25–30 to detemine whether there are new editions, changes, or additional publications pertaining to the equipment.

1-3. Maintenance Forms, Records, and Reports

a. Reports of Maintenance and Unsatisfactory Equipment. Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA Pam 738–750, as contained in Maintenance Management Update.

b. Reporting of Item and Packaging Discrepancies. Fill out and forward SF 364 (Report of Discrepancy (ROD)) as prescribed in AR 735–11-2/ DLAR 4140.55/SECNAVINST 4355. 18/AFR 400-54/ MCO 4430.3J.

c. *Transportation Discrepancy Report (TDR) SF 361)* Fill out and forward Transportation Discrepancy Report (TDR) (SF 361) as prescribed in AR 55-38/ NAVSUPINST 4610.33 C/AFR 75–1 8/MCO P4610. 19D/ DLAR 4500.15.

1-3.1. Reporting Equipment Improvement Recommendations (EIR)

If your AN/ASM–l89 or AN/ASM-l90 needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design or performance. Put it on an SF 368 (Product Quality Deficiency Report). Mail it to: Commander, US Army Communications–Electronics Command and Fort Monmouth, ATTN: AMSEL–LC–ED-CFO, Fort Monmouth, New Jersey 07703–5023. We'll send you a reply.

1-3.2. Administrative Storage

Administrative storage of equipment issued to and used by Army activities will have Preventive Maintenance Checks and Services (PMCS) performed before storing. When removing the equipment from administrative storage, the PMCS checks should be performed to assure operational readiness. Disassembly and repacking of equipment for shipment or limited storage are covered in paragraphs 5–1 and 5–2.

1-3.3. Destruction of Army Electronics Materiel

Destruction of Army electronics materiel to prevent enemy use shall be in accordance with TM 750-244-2.

14. Differences in Configurations

Information contained in this manual applies to all configurations unless otherwise indicated. This manual describes three configurations of Electronic Shops, Semitrailer Mounted AN/ASM-l89 and AN/ASM-l90 which are referred to, throughout the manual, as configurations A, B, and C. The serial numbers for the AN/ASM-189 configurations are listed in a below and the serial numbers for the AN/ASM-l90 are listed in *b* below.

a. Electronic Shops, Semitrailer Mounted AN/ASM-189

Configuration	*Serial Numbers*
A	
B	*201* through 204
C	*207* through 210

b. Electronic Shops, Semitrailer Mounted AN/ASM-190

Configuration	*Serial Numbers*
A	
B	..205 and 206
C	211vandv 212

Section II. DESCRIPTION AND DATA

1-5. Purpose and Use

a. Purpose, Electronic Shops, Semitrailer Mounted AN/ASM-189 and AN/ASM-190 are air or vehicular-transportable maintenance shops which provide mobile facilities for direct and general support bench testing, troubleshooting, alignment, and repair of electronic equipment's and their components. Repair tools and test equipment are installed in the maintenance shops to accomplish direct and general support maintenance functions. In addition to providing the bench test facilities, the maintenance shops contain storage space for maintenance float repair parts and electronic equipment components for support of the electronic equipment.

b. Use. Electronic Shops. Semitrailer Mounted AN/ASM-189 and AN/ASM-l90 are used by an Aerial Surveillance and Target Acquisition (ASTA) platoon to provide backup maintenance support for the electronic equipment components installed in aircraft that are assigned to the various operating elements that the platoon supports. The AN/ASM-189 and AN/ASM-l90 are used as follows:

(1) Electronic Shop; Semitrailer Mounted AN/ASM-l89 (repair van) is used as the repair or maintenance shop for accomplishing the maintenance function. The AN/ASM-189's are equipped as a general repair and maintenance vans, a radar equipped repair and maintenance van, and an infrared equipment repair and maintenance van.

(2) Electronic Shop, Semitrailer Mounted AN/ASM-190 (storage van) is used as the storage facility for the repair parts and electronic equipment major components maintenance float.

1-6. Technical Characteristics

a. General.

Voltage requirements (external primary power). . . . . 120/208 volts ac, 60 cps, three-phase, for-wire

vans:

Types used

	AN/ASM-189	*AN/ASM-190*
Configuration A	Semitrailer, V-79/G	Semitrailer, Van M348A2
Cofiguration Band C	Semitrailer, Van M373A2	Semitrailer, Van M348A2
Dimensions (approx):		
Length	30 ft	26 ft
Width	8 ft	8 ft
Height	11 ft	ll ft
Volume	2,640 cu ft	2,288 cu ft
Weight (less test equipment and Maintenance parts):		
Configuration A	15,500 lb	13,000 lb
Configuration B	16,300 lb	13,000 lb
Cofiguration C	l6.l50 lb	13,000 lb

Lighting facilities:

Normal . . . . . Fluorescent fixtures

Emergency . . . . . Incandescent dome lights (24 volts dc)

b. Electronic Shop, Semitrailer Mounted AN/ASM-189.

Power consumption:

Fluorescent lights	500 watts
Exhaust blowers (2 each at 150 watts)	300 watts
Electric heaters (4 each at 1,500 watts)	6,000 watts
Air compressor	200 watts
Air conditioners (2 each at 3,000 watts)	6,000 watts
Electric drill: (cofiguration A)	l50 watts
Intercommunications Station LS-147C/FI	32 watts
Frequency converter (cofiguration A)	3,000 watts
Motor-Generator PU-545/A: (cofigurations B and C)	2,000 watts

De power supply:
(configuration A) . . . . . 2,700 watts.
De power supply, 2 each:
(configuration B and C) . . . . . 10,800 watts
Total (less test equipment and equipment being maintained):
Configuration A . . . . . 18,882 watts.
Configuration B . . . . . 25,182 watts
Available power (at test benches):
Configuration A:
Alternating current:
Bench strip, single (16) . . . . . 115 volts, 60 cps, 50 amp.
Power duct, duplex (14) . . . . . 115 volts, 60 cps, 50 amp.
Outlets (8) . . . . . 115 volts, 400 cps, single-phase.
Outlets (8) . . . . . 115 volts, 400 cps, three-phase four-wire (wye).
Outlets (4) . . . . . 208 volts, 400 cps, three-phase (wye).
Direct current, binding post pairs (8) . . . . . 28 volts, 125 amp.
Configuration B:
Alternating current:
Power duct, duplex (16) . . . . . 115 volts, 60 cps, 50 amp.
Outlets (10) . . . . . 115 volts, 400 cps, single-phase.
Outlets (10) . . . . . 115 volts, 400 cps, three-phase four wire (wye).
Outlets (5) . . . . . 208 volts, 400 cps, three-phase (wye).
Direct current, binding post pairs (10) . . . . . 28 volts, 500 amp.
Configuration C:
Alternating current:
Power duct, duplex (15) . . . . . 115 volts, 60 cps, 50 amp.
Outlets (10) . . . . . 115 volts, 400 cps, single-phase.
Outlets (10) . . . . . 115 volts, 400 cps, three-phase four wire (wye).
Outlets (3) . . . . . 115 volts, 400 cps, three-phase (delta)
Outlets (3) . . . . . 26 volts, 400 cups, single-phase.
Outlets (5) . . . . . 208 Volts, 400 cps, three-phase (wye)
Direct curdrent, curret, post pair (10) . . . . . 208 volts, 400 volts, 500 amp
Power sources::
120/208 volts, 60 cps . . . . . Generator Set, disel engine, trailer Mounted PU-5e5/m
208 volts, 400 cps . . . . . Frequency converter (Sorensen (Model No. FCD 3P 2000) (configuration A).
Motor-Generators PU-545/A (configurations B and C), 2 ea.
28 volts, dc . . . . . Power Supply (Sorensen Model No. MA 28-125) (configuration A).
Power Supply (Sorensen Model No. MA 28-500) (configuration B), 2 ea.
Power Supply (Christie Model No. 1C36-500K24L) (configuration C), 2 ea.

NOTE. fFor technical characteristics of the generator set, frequency converter, and dc power supply, refer to the manufacturer's instruction manuals provided with the AN/ASM-189. Refer to TM 11-6125-240-15 for technical characteristics of the motor-generators.

c. Electronic Shop, Semitrailer Mounted AN/ASM-190.

Power consumption:
Air conditioners (2 ea at 3,000 watts) . . . . . 6,000 watts.
Fluorescent lights . . . . . 400 watts.
Exhaust blower . . . . . 150 watts.
Electric heaters (2 ea at 1,500 watts) . . . . . 3,000 watts.
Dehumidifier (configuration B only) . . . . . 1,200 watts.
Intercommunication Station (LS-147C/FI) . . . . . 32 watts.
Total:
Configurations A and C . . . . . 9,882 watts.
Configuration B . . . . . 11,082 watts.
Storage facilities:
Rack (configuration A), 147 in. x 78 in. x 30 in.) . . . . . 1.
Rack (configuration B), 147 in. x 61-1/2 in. x 28 in.). 1.
Rack (configuration A), (72 in. x 68-1/2 in. x 30 in.). 2

Rack (configurations B and C), 72 in. x 61-l/2 in. x 28 in.	2 (configuration B). 1 (configuration C).
Rack (configuration C), 110 in x 61-1/2 in. x 28 in	1.
File cabinet and card file	1.
Storage cabinet, with drawers (configuration A), 140 in x 78 in. x 24 in.	1.
Storage cabinet, with drawers (configuration B and C), 140 in. x 58 in x 22-l/2 in.	1.
Storage cabinet, with drawers (configuration C), 110 in. x 61-l/2 in x 22-1/2 in.	1. 2.
Duplex power duct receptacles (less heaters, fans, and refrigerator).	

1-7. Items Comprising an Operable Equipment

NSN	Qty	Nomenclature, part No, and mfr code	Fig. No.
		NOTE The part number is followed by the applicable 5-digit Federal supply code for manufacturers (FSCM) identified in SB 708-42 and used to identify manufacturer, distributor, or Government agency.	
		Electronic Shop, Semitrailer Mounted AN/ASM-189: LXAD; 4951A.	1-1
		Electronic Shop, Shop, Semitrailer Mounted AN/ASM-190: Storage Van; LXAD; 3224.	1-5
		Consisting of:	
4210-00-266-9074	2	Air Conditioner: Floor Mounted, Air Cooled, 18,000 btu (Installed in Equip)	1-7
5821-00-545-6235	1	Antenna AT-450/ARC	1-19
5821-00-543-0547	1	Antenna AT-454/ARC	1-19
	2	Antenna AS-580/ARN (Mounted in Equip)	1-19
5830-00-752-5357	1	Intercommunication Station LS-147C/FI	
		Kit, Tool Roll	
6230-00-803-7063	1	Lantern, Hand	
7490-00-844-1757	1	Machine, Embossing, Identification Tape: For 1/2 in tape	
	1	Meter, Frequency, 380 to 420 Hz	
	1	Meter Volt: 0-150 Vac, 400 Hz	
6125-00-958-6915	2	Motor Generator PU-545/A	
	2	Power Supply D.C.: MA28-500 (M5A22-2); 21457	1-21
	2	Power Supply D.C., 1C36-500K24L(2); 02294	1-21
	2	Power Supply D.C., MA-28-125(1); 21457	1-21
2330-00-287-8830	1	Semitrailer, Van Electronic: Type M373A-2	1-1
	1	Semitrailer, Type V-79/G	1-1
7520-00-162-6178	2	Sharpener, Pencil	
5805-00-543-0012	3	Telephone Set TA-312/PT'	1-9, 1-10
6685-00-911-6344	4	Thermostat: T473B1036;40981	1-23
	1	Vise	
	2	Voltmeter, 0-150 Volt; 331; 60741	
4210-00-266-9074	2	Air Conditioner: Floor Mounted, Air Cooled, 18,000 btu	1-7, 4-2
7520-00-753-4807	4	Basket, Waste: 36; 85838	
7920-00-178-8315	2	Brush, Dusting	
	1	Cabinet, Filing: 2 Drawer 8 x 5 Card Size	1-3
7110-00-281-4469	5	Chairs, Swivel	
6645-00-950-8120	4	Clock, 8 day	1-6
	6	Curtain, Blackout RH	
	2	Dehumidifier, ECS130001; 00527	
	3	Fan, Ventilation: Model 83; ILG	1-6, 4-1
6230-00-803-7063	1	Hand Lantern	1-12
4520-00-224-7909	6	Heater Electromode	
5830-007626367	1	Intercommunication Station LS-147C/FI	

NSN	Qty	Nomenclature, part No, and mfr code	Fig. No.
	1	Refrigerator: 14 Cub ft, Hotpoint mod CTF514: 04314	1-24
	1	Vacuum Cleaner	

1-7.1. Expendable Consumable Supplies and Materials

Expendable Consumable Supplies and Materials are listed in table 1-1.

Table 1-1. Expendable Consumable Supplies and Materials

The supplies and materials listed in this table are required for operation of this equipment and are authorized to be requisitioned by CTA 50-970. The NSN for the applicable unit of issue required can be found in appropriate supply catalogs. The FSCM is used as an element in item identification to designate manufacturer or distributor or GLovernment agency, etc, and is identified in LSB 708-42.

Item	*Description*	*Ref No. and FSCM*	*FSC*
1	Tape Embossing, Black	158-9; 24050	7510
2	Tape Embossing, Blue	158-6; 24050	7510
31	Tape Embossing, Gray	158-12; 24050	7510
4	Tape Embossing, Green	158-5; 24050	7510
5	Tape Embossing, Red	158-2; 24050	7510
6	Index Cards 5 x 8		7530

1-8. Description of Semitrailer Vans V-79/G, M373A2, M348A2C, and M348A2G

Components of the AN/ASM-189 are housed in Semitrailer Van V-79/G configuration A or M373A2 configuration B; components of the AN/ASM-l90 are housed in Semitrailer Van M348A2C or M348A2G. Each van is fully insulated and weatherproofed, and can be moved by tractor (fig. 1-1) or cargo aircraft. Entrance to the vans is usually provided through the rear curbside door; however, entrance is also provided through the curbside door of each van. The entrance doors are equipped with blackout curtains. All equipment test benches, racks, cabinets, mountings, and alternating current (at) and direct current (de) power wiring (as applicable) are installed in the vans. The vans are equipped with air conditioners, thermostats, and interior air distribution ducts. All vans are equipped with exhaust blowers (e below) and electric heaters *(f.* below). The AN/ASM-190 is sometimes equipped with a dehumidifier and a refrigerator. Some AN/ASM-190 vans have been modified to include a tailgate or platform assembly similar to that shown in figure 1-10.1 in TM 11-4940-246-14.

a. Lighting (figs 1-2 and 1-3;. Centrally located ceiling-mounted fluorescent lights provide general illumination throughout each van and at the equipment test benches. An incandescent dome light circuit provides emergency lighting from the tractor battery. Light switches are at the curbside door to control alternate lights in each *row* of fluorescent fixtures, as well as the dc dome lights. A blackout control switch is also provided which places all interior lighting under the control of the entrance door microswitch circuits. (Under blackout conditional all lights are extinguished when any entrance door is opened.)

b. Power and Wiring. Thee-phase ac power is connected to each van through watertight receptacles in the power entrance box (c below). The ac power is routed through a power distribution panel to wiring and duplex receptacles in the ac power ducts at the test benches and equipment racks. Refer to figures 5-1 through 5-6 for detailed power diagrams of the repair van and storage van.

c. Power Entrance Box (fig. 1–4). The power entrance box is on the exterior curbside wall near the front of each van. It contains the ac power receptacle, the van main ground terminal, and a weatherproof duplex convenience receptacle.

d. Binding Post Entrance Box (fig. 1-5). Each van is equipped with a binding post entrance box to facilitate connection of the van telephone and intercommunication (intercom) circuits to the area communication network. Each binding post pair is protected by lightning arresters.

e. Exhaust Blowers (fig. 1–6). Two exhaust blowers are mounted in the rear area of the repair van; one on the curbside wall and one on the roadside wall. One exhaust blower is in the storage van. Each exhaust blower is equipped with an exterior louvered vent to maintain blackout integrity.

f. Electric Heaters. Electric heaters (fig. 1-7) are provided in each van. The heaters contain a 1.5–kilowatt heating element and a fan for warm air circulation. Controls for heat regulation are on the top of the heater. The heaters can be removed from their transit mounting bases and positioned near any convenient HEATER power receptacle.

g. *Telephone Set TA-312 PT (TM 11–2155).* A TA–312/PT (fig. 1–8 and 1–9) (less carrying case) is mounted on the curbside wall of each van and used for communication between assemblages and installations within the local area. A TA–312/PT (and buzzer button) is also located outside, next to the door, on the curbside wall of the van (fig. 1–10) for communication between personnel inside and outside the van.

h. Intercommunication Station LS–147C FI (TM 11-5830-221-12). Each van is equipped with an L8-147C/FI (fig. 1–11) that provides for two-way nonprivate communication in an area system that consists of other LS-147C/ FI's, or equivalent equipment.

i. Miscellaneous Items. Each van is equipped with fire extinguishers, ground rods, sledge hammers, dust brushes, hand lanterns, first aid kit, chairs and bench stools, clocks, and wastebaskets that are either appropriately mounted or stored in the van.

1-9. Electronic Shop, Semitrailer Mounted AN/ ASM-l89

The interior view and floor plan view of the repair van are shown in figures 5-7, 5-8, and 5-9 (canfiguration A) and figures 5-10 and 5-11 (configuration B). Additional interior views are shown in figures 1–2, 1–12, 1–3, and 1–11. Component. descriptions are given in a through *n* below.

a. Power Distribution and Monitor Panels (Configurations A, B, and *C)* (figs. 1-13, 1–14, 1-15, and 1-16).

(1) The power distribution panel is the main distribution point for the 60-cycle-per-second (cps), ac input Power. This panel contains the main circuit breaker and tributary circuit breakers that control power to the individual circuits in the repair van.

(2) The power monitor panel contains a voltmeter, frequency meter, and phase selector switch. The phase selector switch is used to select the particular phase (phase 1, phase 2, or phase 3) of input power to be monitored, or to disconnect the meter circuits from the input power circuit.

b. Antenna Entrance and Patch Panels.

(1) The antenna entrance box (fig. 1-17) and antenna entrance panel (fig. 1–18) provide feedthrough (coaxial) facilities for the antenna cables connected to the antenna assembly (c below) mounted on the exterior of the van. The cables terminate at the antenna patch panel.

(2) The antenna patch panel (fig. 1-9 and 1–18) provides facilities for connecting the antenna connector located at each test bench to any desired antenna.

c. Antenna Mounting Assembly (fig. 1-19). The antenna mounting assembly is an open-ended, metal section that contains three permanently mounted antennas and a base mounting for a fourth antenna. The three permanently mounted antennas are Antenna AS-580/ARN, Antenna AT-450/ARC, and Antenna AT–701/AR; the fourth antenna consists of Antenna Base AB–340/ARC, Coupler, Antenna CU-361/ARC, and Antenna

Figure 1-2 deleted in its entirety.

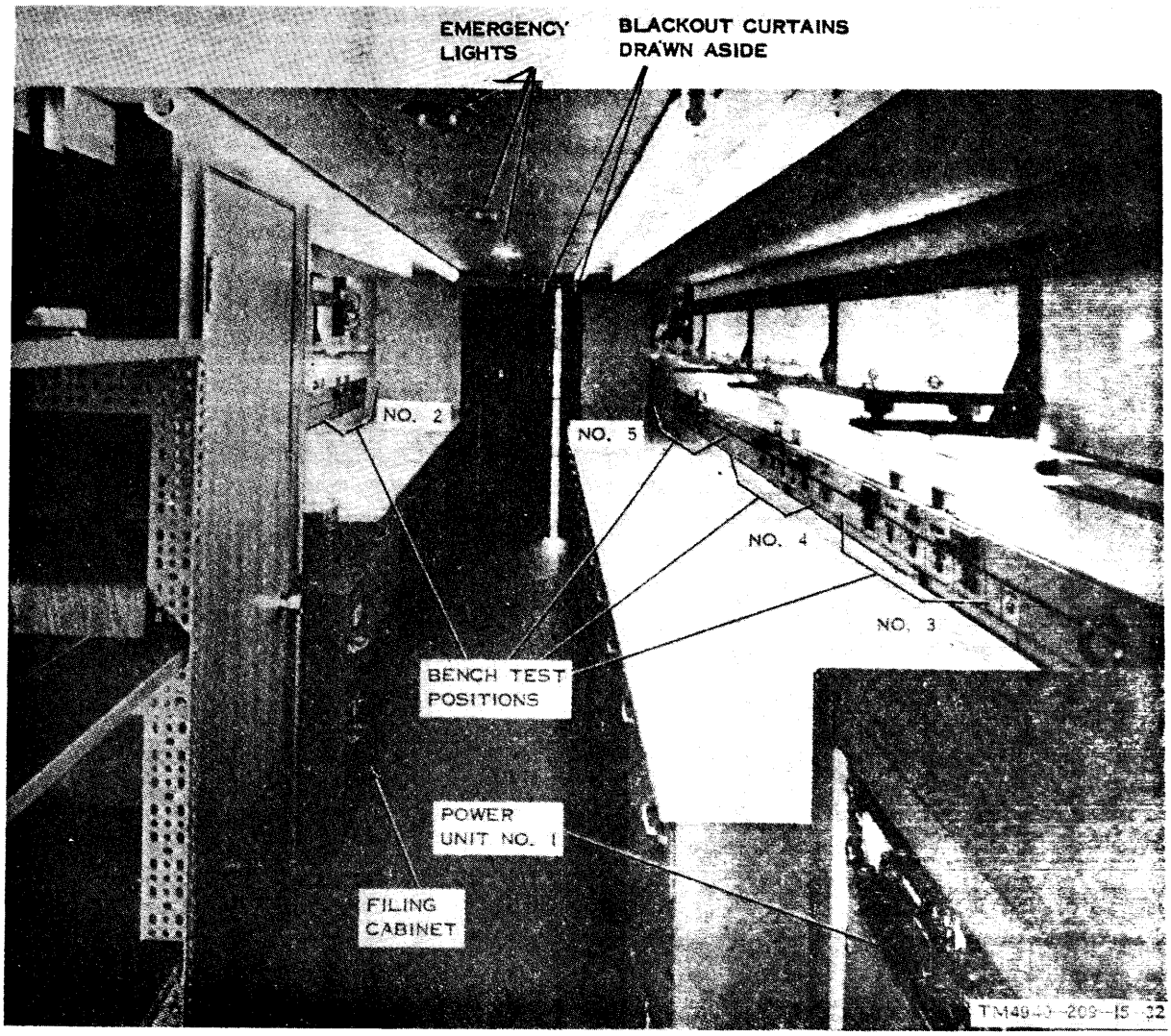


Figure 1-3. AN/ASM-189, configurations B and C, viewed from rear of van, blackout curtain open.

Element AT–454/ARC. The RG–58C/U type coaxial cables are attached to the bases of the antenna mounts. The coaxial cables are terminated with BNC-type coaxial connectors. The coaxial cables are identified by the appropriate antenna markings. The antenna assembly is mounted on the exterior curbside wall of the van (para 2–7).

d. Binding Post Entrance Box (fig. 1-5). The binding post entrance box contains three pairs of binding posts that are connected to the TA–312/PT (1 pair) and LS-147C/FI (two parallel-connected pairs) inside the van. The binding post entrance box is equipped with a hinged cover for weather protection.

e. Air *Compressor* (fig. 1-20). The air compressor is provided to clean the interior of equipment being maintained, and for paint spraying. The air compressor, a single-piston type with V-belt drive, is powered by an electric motor. The compressor is equipped with a combination safety and pressure relief valve (which may be adjusted for the , desired air pressure) and air gun and airhose. A spray gun with a paint container is also provided.

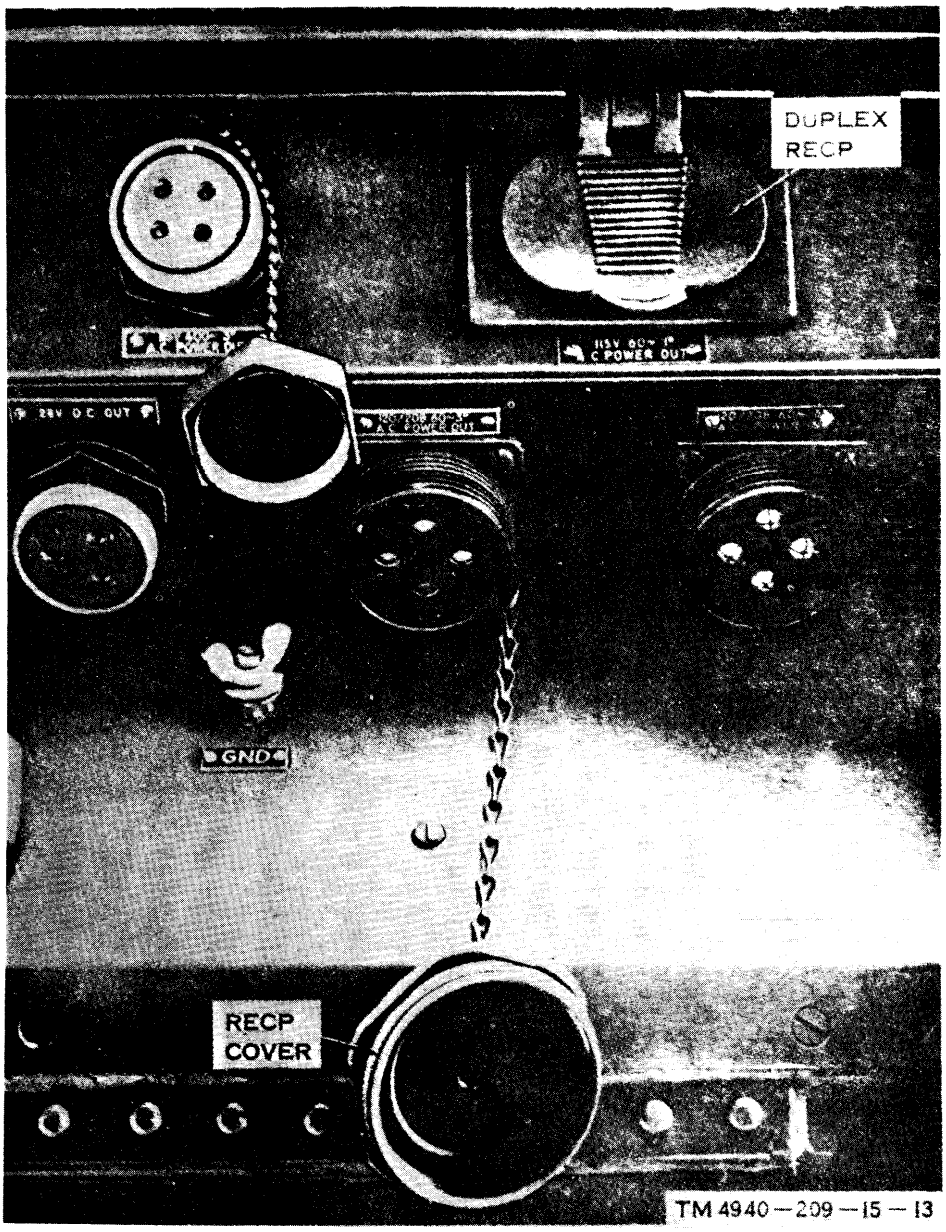


Figure 1-4. Repair van, power entrance box.

f. Electric Hand Drill and Stand (AN/ ASM-189 *Configuration A)* (fig. 1–2). An electric drill, equipped with a 3/8-inch geared chuck, drill stand, and complete set ‘of assorted drill bits, is provided in the repair van. The drill stand is used to convert the electric hand drill to a drill press.

g. Dc Power Supply. The dc power supply (Sorensen Model MA 28-125 (configuration A) and Model MA 28-500 (configuration B, fig. 1-21) and Christie Model 1C36-500K24L (configuration C)) converts the 115-volt, 60-cps single-phase primary power to 28-volt dc power. Dc power is available at the binding post panel at each test bench. Refer to the manufacturer’s instruction manual provided in the repair van for detailed information on the dc power supply.

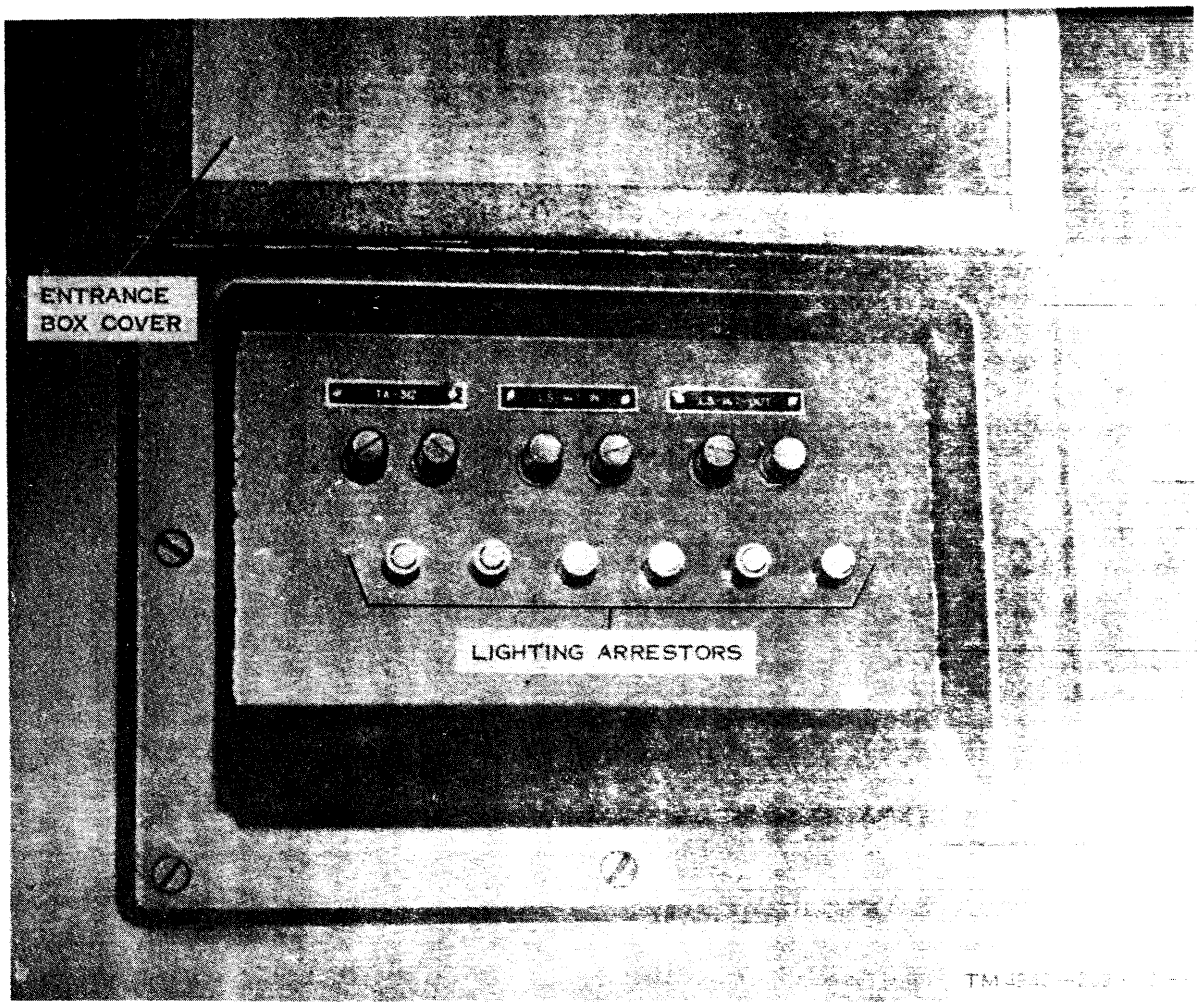


Figure 1-5. Repair van and storage van, binding post entrance box.

h. Frequency Converter (AN/ASM-189, *Configuration A).* The frequency converter (Sorensen Model FCD 3P-2000) changes 115-volt, 60-cps, single-phase primary power to 115-volt, 400-cps, single- and three-phase power. The three-phase output supplied by the frequency converter is four-wire, or wye-type output. The single-phase and three-phase 400-cps output can be obtained from appropriately marked receptacles in the power duct at the rear of each test bench. Refer to the manufacturer's instruction manual provided in the repair van for detailed information on the frequency converter.

i. Motor-Generator PU–545/A (AN/ASM-189, Configuration B) (fig. 1–22). Motor-Generators PU-545/A (inverters) change 28–volt dc power into 115–volt, 400–cps, single-phase or 208–volt, 400–cps, three-phase power. The three-phase output supplied by the inverter is a wye-type output. The single-phase and three-phase 400-cps output can be obtained from appropriately marked receptacles in the power duct at the rear of each test bench. A wye-to-delta conversion transformer is installed behind the DC and 400 CYCLE AC CONTROL panel in configuration C to make 115-volt, three-phase delta 400-cycle power available at the three roadside bench positions.

j. Maintenance Float and Repair Part Storage. Shelves and racks in the forward area of each van are for the storage of the maintenance

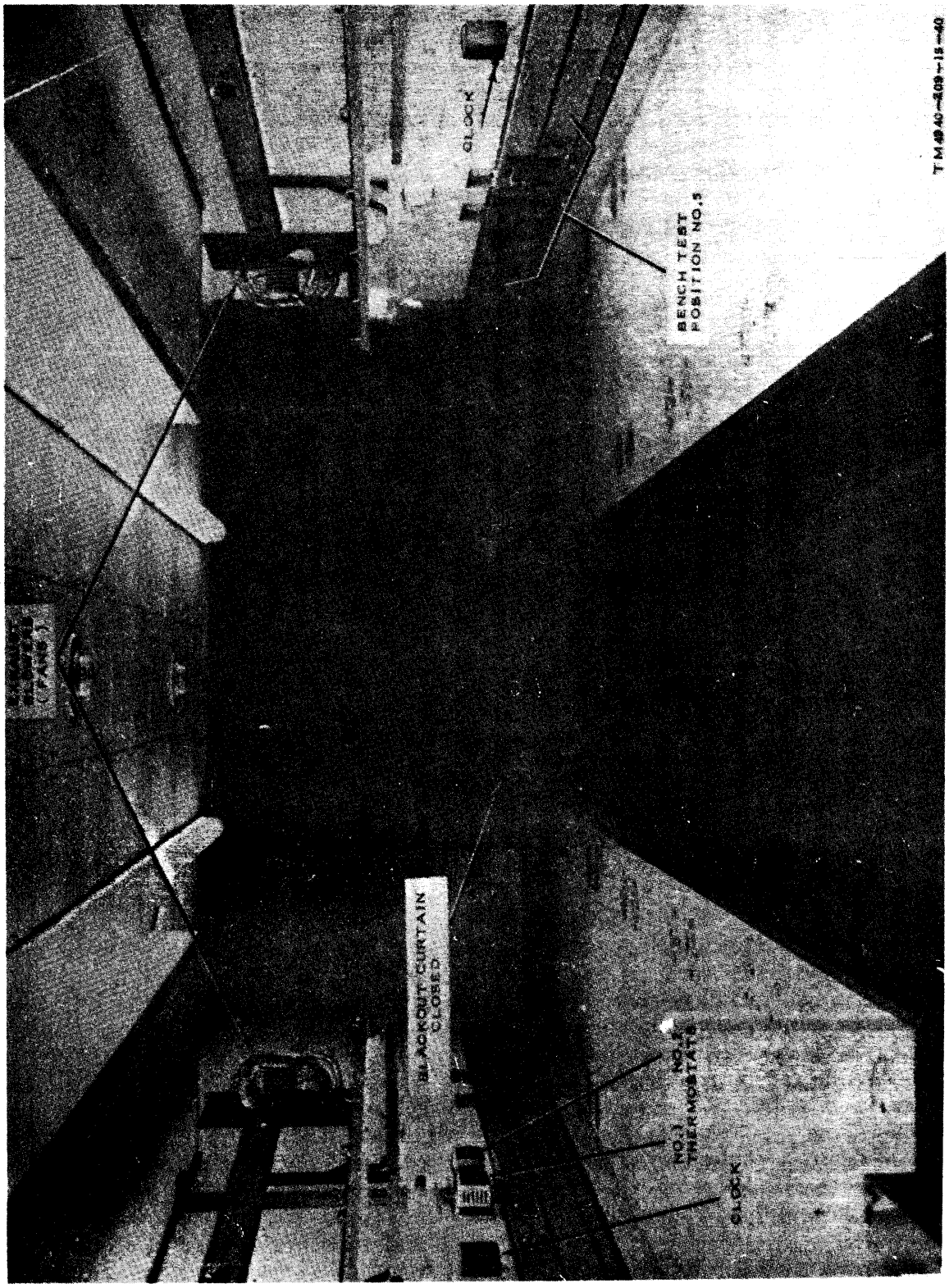


Figure 1.6. AN/ASM-189, configurations B and C, viewed from rear of van, blackout curtain closed.

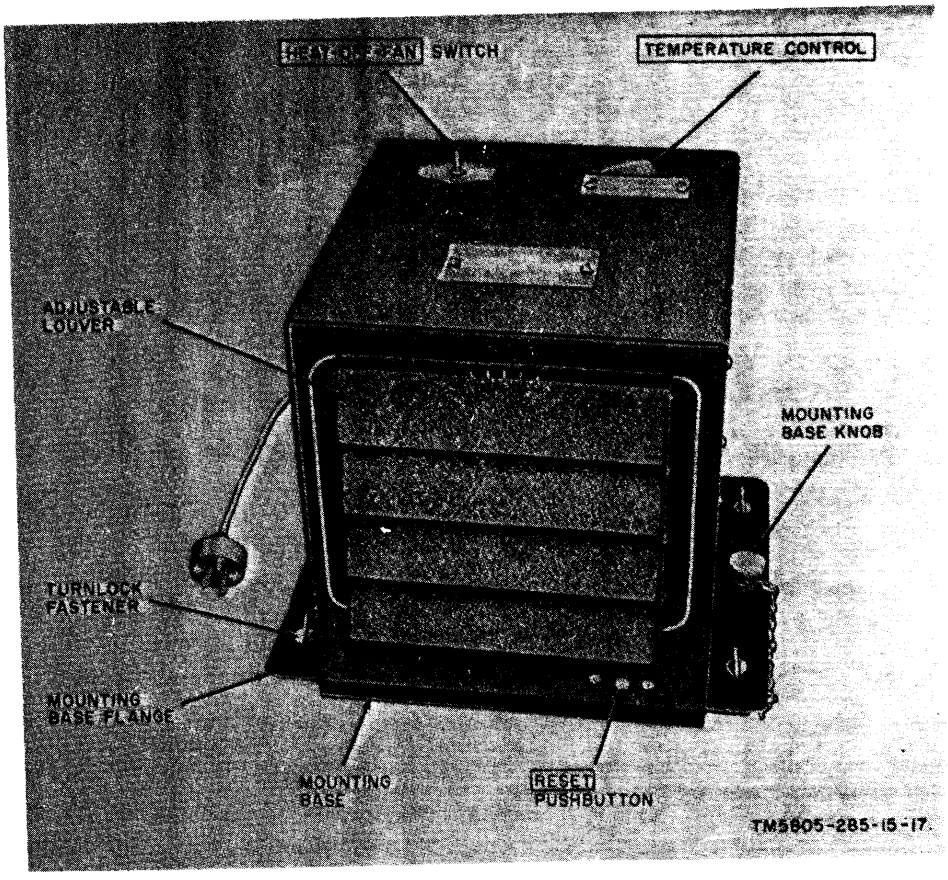


Figure 1-7. Electric heater.

float of equipment components and repair parts required to support the aircraft electronic equipment. The exact number and types of these items that are required will be determined by the quantity and types of electronic equipment and aircraft to be supported. Refer to the applicable manuals covering the repair parts and special tools required for the equipment being maintained.

k. Power Unit (AN/ASM-189, *Configuration A).* Primary ac power for the repair van is provided by the PU-551/M (fig. 1-1). The PU-551/M consists of a 45-kilowatt (kw) Diesel engine generator set (Consolidated Model 4150) mounted on 2-1/2-ton, two-wheel generator trailer chassis M200A1. Ancillary items, such as fuel cans, ground rods, power cables, and fire extinguishers are mounted on the trailer.

l. Radio Set Control Rack (fig. 1-12). The radio set control rack is a storage-mounting facility for the panel-mounted type radio set controls that are stored or maintained in the repair van.

m. Test Benches. Repair vans are equipped with four or five test bench areas (figs. 1-2, 1-3, and 1-11) for use by assigned personnel. Each test bench has a partitioned storage drawer and storage cabinet. A test equipment shelf is mounted on the wall above the roadside benches. Ac power of the appropriate frequency, dc power binding posts, and antenna connectors are accessible in the metal ducts on the wall at the rear of each test bench; ac power strips are mounted on the front end of the benches.

n. Power Entrance Box. The power entrance box is shown in figure 1-4. The 115V 400~

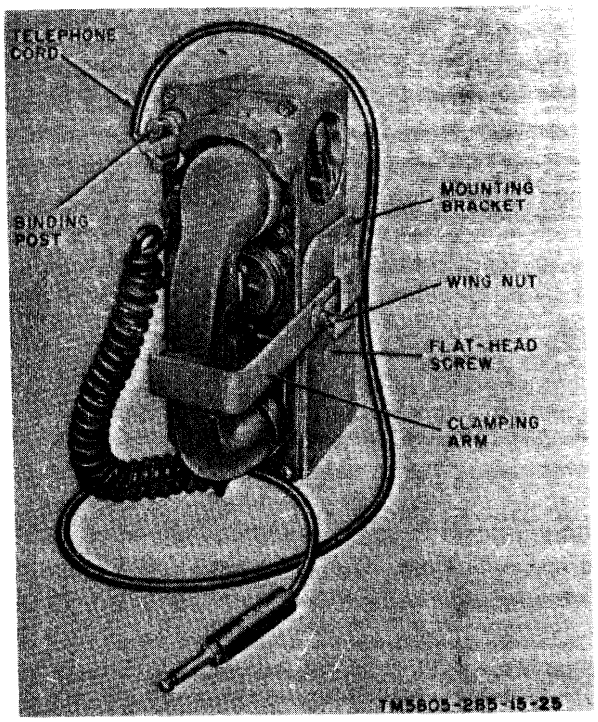


Figure 1-8. Telephone Set TA-312/PT installed in mounting braket.

30 A. C, POWER OUT and 28V D. C. OUT receptacles extend power from the van to an adjacent aircraft, if required. A 25-foot cable stub is provided for each receptacle.

1-10. Electronic Shop, Semitrailer Mounted AN/ASM-190

The interior view and plan view of the storage van are shown in figures 1-23, 1–24, and 1-25 (configuration A) and figures 5-12 and 5-13 (configuration C). Additional component descriptions are given in *a* through *f* below.

a. Liquid Nitrogen Plant (AN/ASM-190, Configuration A). A liquid nitrogen generating plant (GEECO Model G215), provided with the storage van, is installed and operated externally to the van. The plant generates the coolant required for Surveillance System, Infrared AN/UAS-4. Refer to the manufacturer's instruction manual for detailed information covering installation and operation.

b. Refrigerator. When required, a 14-cubic-foot refrigerator, mounted in the forward area (configuration A) and in the rear area (configurations B and C) of the van, is used for the storage of camera film and other heat-sensitive stock items.

c. Maintenance Float and Repair Parts. A maintenance f lost of electronic equipment major components and sufficient repair parts are provided in the van to support the aircraft and their applicable electronic equipment. The number and types of items provided are contained in the van packing list.

d. Equipment Shock Mountings. Equipment shock mountings, the same type used for installation of the equipment components in the aircraft, are provided with the storage van. These mountings must be secured to the storage shelves before the maintenance float equipment can be installed. Any equipment shock mountings not provided with the storage van, but required for securing the equipment, must be requisitioned through supply channels.

e. Binding Post Entrance Box. The binding post entrance box (fig. 1-5) is described in paragraph l-9d.

f. Power Entrance Box. The power entrance box (fig. 1-26) contains the van main ground terminal and ac input power connector. A power cable stub, stored in the van, is used for connection to the source of ac power.

1-11. Differences in Models

Differences that exist among the three equipment configurations are as follows:

a. Electronic Shop, Semitrailer Mounted AN/ASM–189.

Item	Configuration A	B	C
Semitrailer, van (type)	V-79/G	M373A-2	M373A-2
Weight (less test equipment and maintenance parts).	15,500	16,300	16,160
Battery charger	Sonotone PCA 130/230.	None	None
Drill press stand	1	None	None

Item	Configuration A	B	C
Power consumption (less test equipment).	18,882 watts	25,182 watts	
Power supply, 208 volts 400 CPS (wye).	Frequency Converter, Sorensen FCD 3P-2000.	Motor-Generator PU-545/A (2).	Motor-Generator PU-545/A (2).
Power supply, 120 volts 400 cps (delta) -------	None	None	Westinghouse transformer 8E-48.
Dc power supply (type) ----------	Sorensen MA-28-125 (1).	Sorensen MA-28-500 (2).	Christie lC36-500K24L (2).
Dc power supply (power consumption) ----------	2,700 watts	10,800 watts	
Number of test bench positions ----------	4	5	5
Available power (at test benches):			
Direct currant (28 volts):			
Binding post pairs ----------	8	10	10
Amperes ----------	125	600	600
Alternating current:			
26 volts, 1 phase, 400 cps ----------	None	None	3
116 volts, 1 phase, 60 cps:			
Power ducts (duplex) ----------	14	15	16
Bench strip (single) ----------	16	None	None
115 volts, 1 phase, 400 cps ----------	8	10	10
115 volts, 3 phase, 400 cps (delta) ----	None	None	3
208 volts, 3 phase, 400 cps (wye) -----	4	6	6
Dc power supply (dimensions) ----------	2 1-1/2 X 19-1/2 X 15-7/8	40-1/2x 25-1/2x 23	40-1/2 X 26-1/2 X 23
Power cable assembly ----------	100 ft	125 ft	126 ft
Frequency meter (monitor) ----------	1	2	2
Power distribution panel circuit breaker functions:			
1 ----------	Even lights	Odd lights	Odd lights
2 ----------	odd lights	Even lights	Even lights
6 ----------	28 VDC supply	Power supply No. 1	Power supply No. 1
6 ----------	400 cy, supply	Power supply No. 2	Power supply No. 2
7 ----------	Heater No. 1	*Conv* outlets pos No. L	Conv outlets pos No. 1.
8 ----------	Heater No. 2	Conv outlets pos No. 2.	Conv outlets pos No. 2.
9 ----------	Heater No. 3	Conv ontlets pos No. 3.	Conv outlets pos No. 3.
10 ----------	Heater No. 4	Conv outlets pos No. 4.	Conv outlets pos No. 4.
11 ----------	Test pos No. 4	Conv outlets pos No. 5.	Conv outlets pos No. 5.
12 ----------	Teat pos No. 3	Conv outlets (shelf curb).	Conv outlets (shelf Curb).
13 ----------	Test POS No. 2	Conv outlets (shelf road).	Conv outlets (shelf road).
14 ----------	Test pos no. 1	LS-147C/FI	LS-147C/FI
15 ----------	Bench outlets (curb).	Heater No. 1	Heater No. 1
16 ----------	Bench outlets (road).	Heater No. 2	Heater No. 2
17 ----------	Outside weatherproof outlet.	Heater No. 3	Heater No. 3
18 ----------	Drill press	Heater No. 4	Heater No. 4
19 ----------	Fans and air comp	Air compressor	Air compressor

	Configuration A	B	C
20	LS-147C/FI	Weatherproof outlet	Weathproof outlet.
21	Spare	Fans No. 1 and No. 2.	Fans No. 1 and No. 2.
22	Shelf outlets (road).	Security alarms	Security alarms
23	Not used	Drill press	Drill press
Dc and 400-cycle control panel	None	1	1
voltmeter	1	2	2
Ground Rod MX-148/G	1	2	2
Fluorescent lights (type)	F20T	F15T8/CW	F15T8/CW
Storage rack	2	1	1
Security buzzer	None	1	1
Stepdown transformer 120-26 volts ac	None	None	Freed model MCV 41254FM.

b. Electronic Shop, Scmitrailer Mounted AN/ASM-19O.

Item	Configuration A	B	C
Kardex	1	1	8
Dehumidifier	None	Westinghouse ECS 130001.	None
Battery charger	Sonotone PCA 130/230.	None	None
Liquid nitrogen plant	Gas Equipment Corp, G-215.	None	None
Heaters	2	2	2 (relocated)
Power consumption	9,882 watts	11,082 watts	9,882 watts
Weight (less test equipment)	13,000	13,000	
Circuit breaker functions:			
1	Odd lights	Even lights	Even lights
2	Even lights	Odd lights	Odd lights
10	Spare	Dehumidifier	Spare
Storage racks:			
147 x 78 x 30 inches	1		
147 x 61-1/2 x 28		1	
72 x 68-1/2 x 30	2		
72 x 61-1/2 x 28		2	1
l10 x 61-1/2 x 28			1
Storage drawer cabinets:			
140 x 78 x 24 inches	1		
140 x 68 x 22-1/2		1	1
l10 x 61-1/2 x 22-l/2			1
Security buzzer	None	None	1
Stepdown transformer 120-12.6 volts	None	None	1

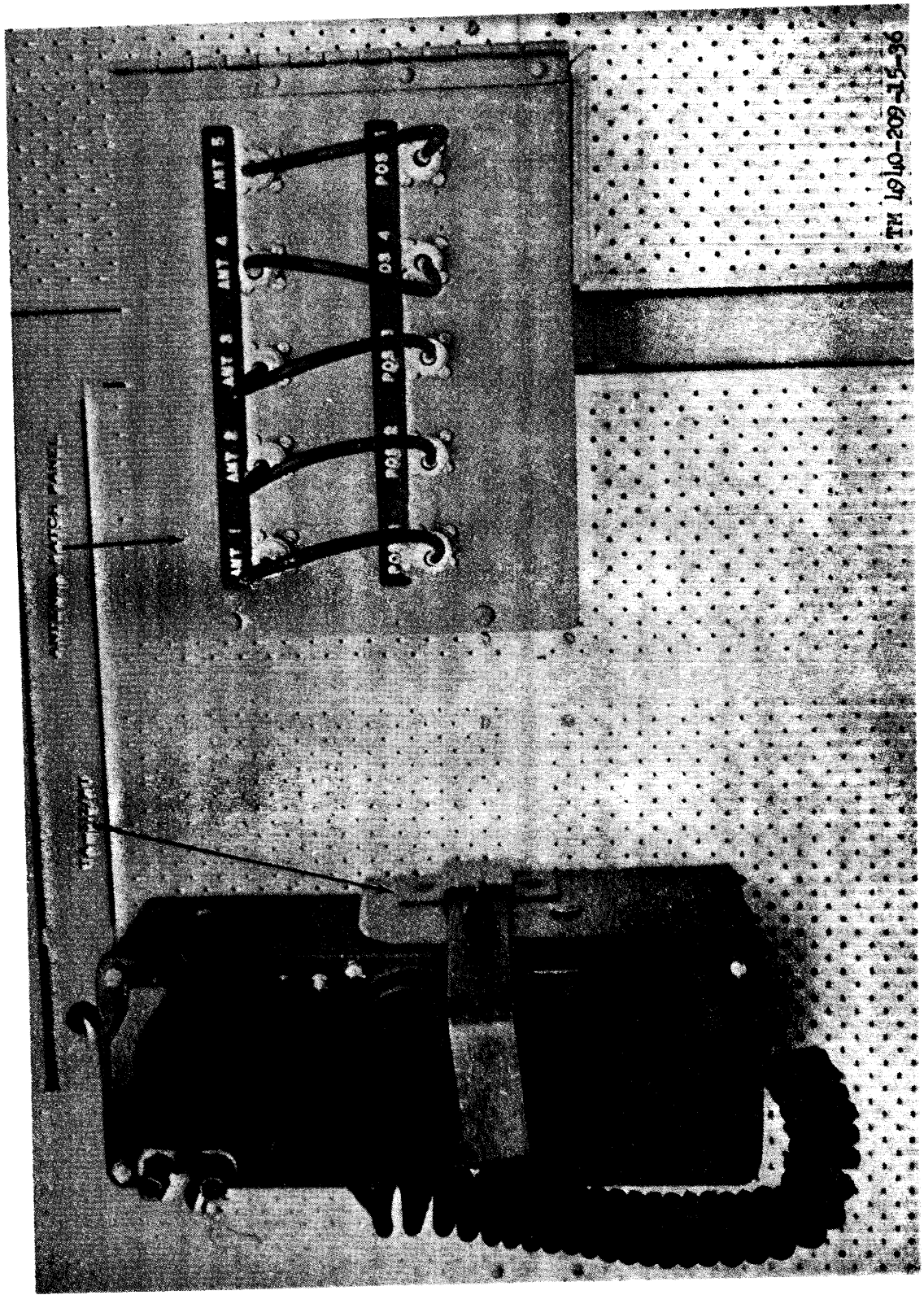


Figure 1-9. AN/ASM-189, configuration B, part of curbside wall.

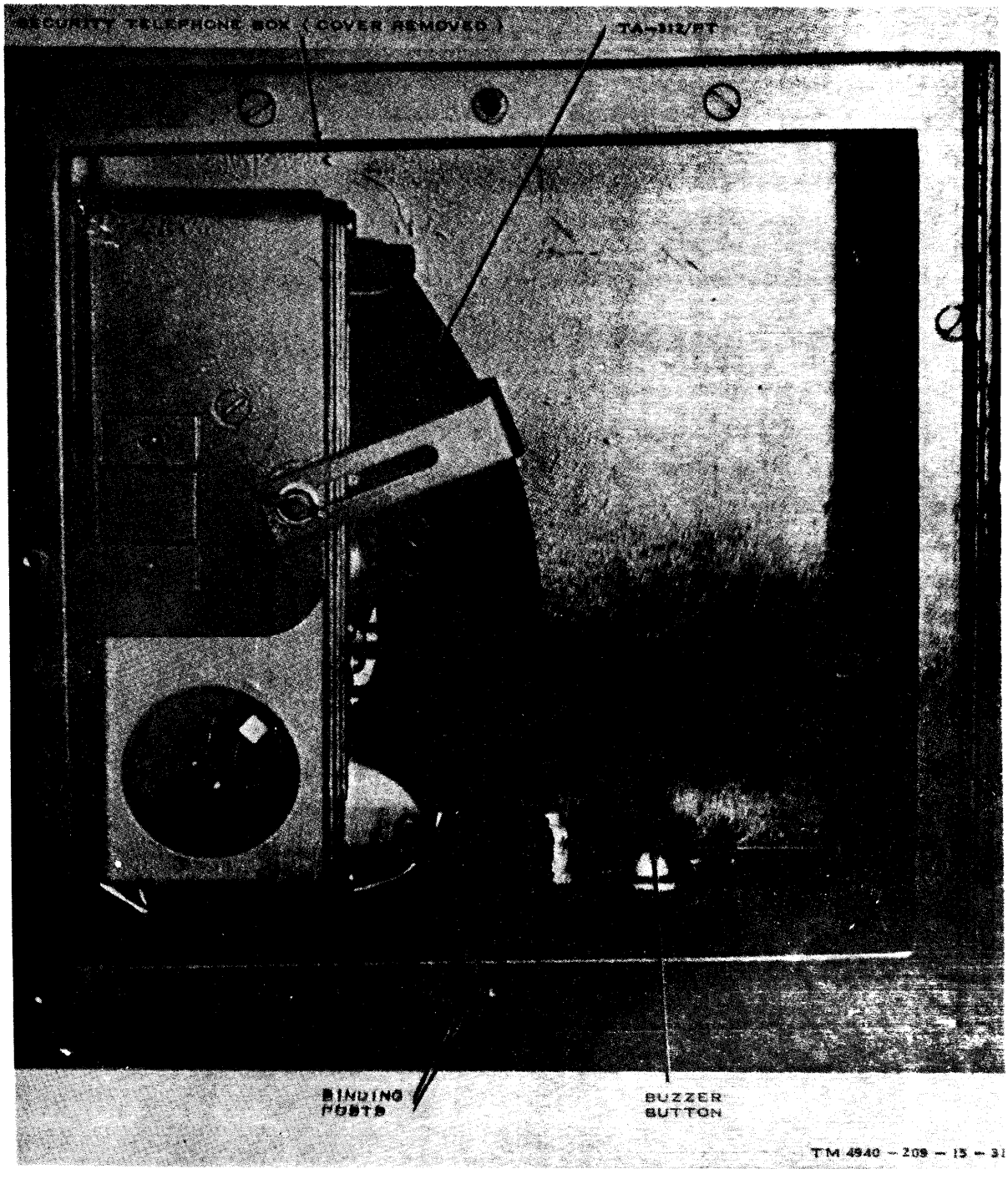


Figure 1-10. AN/ASM-189, configurations B and C, outside wall, Security telephone and buzzer.

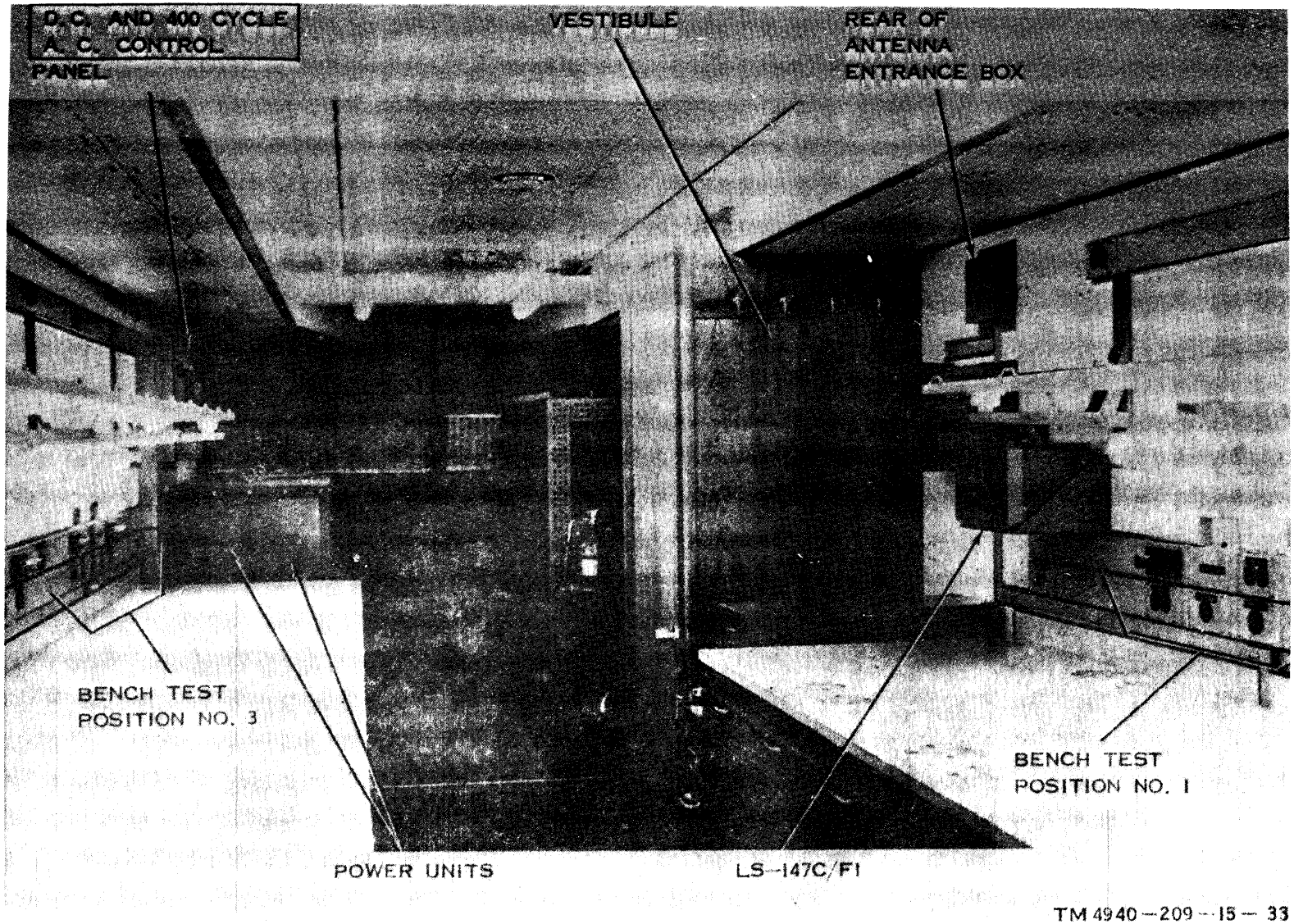


Figure 1-11. AN/ASM-189, configuration B, viewed from front of van.

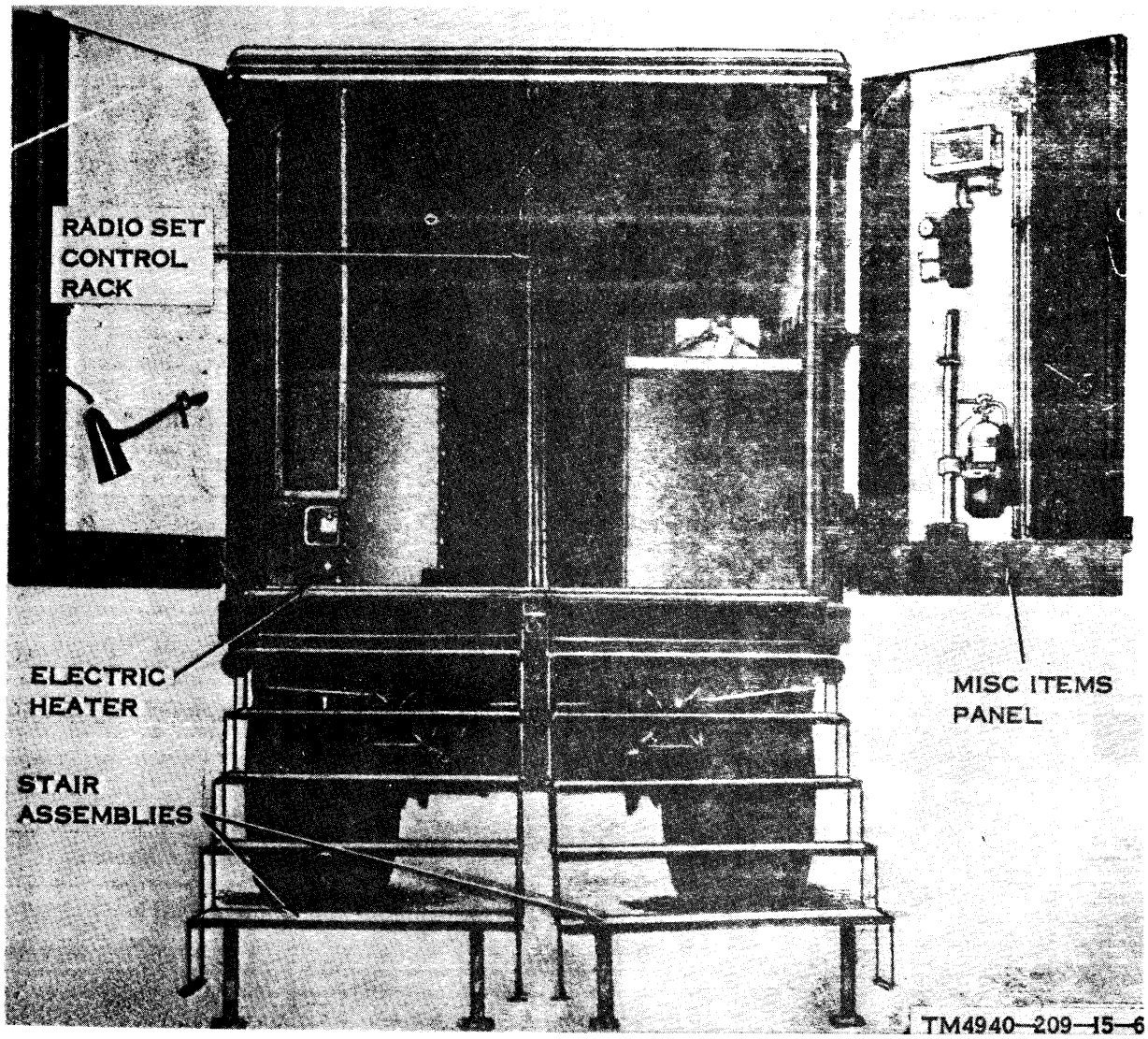


Figure 1-12. Repair van, configuration A, rear interior-exterior view.

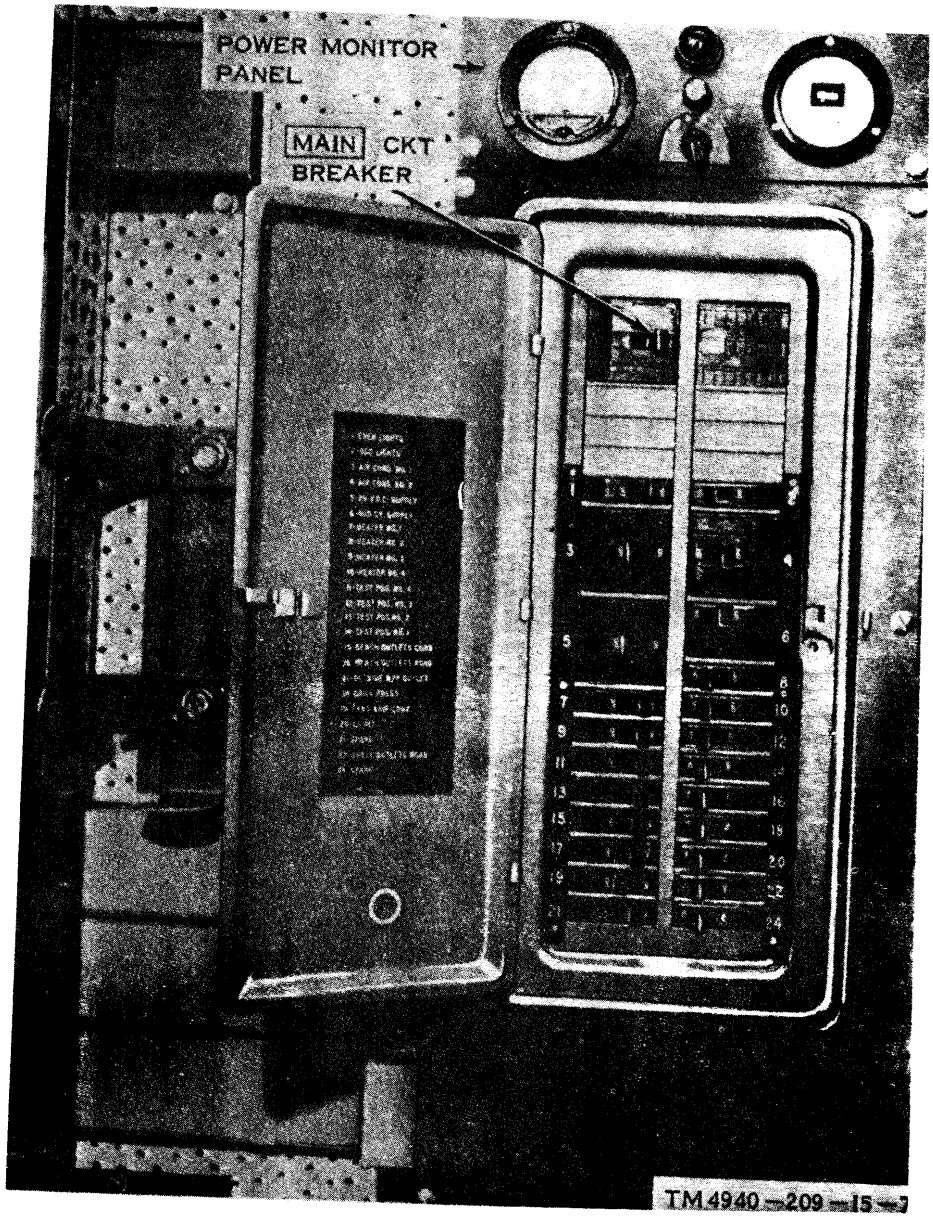


Figure 1-13. Repair van, configuration A, power distribution and monitor panels.

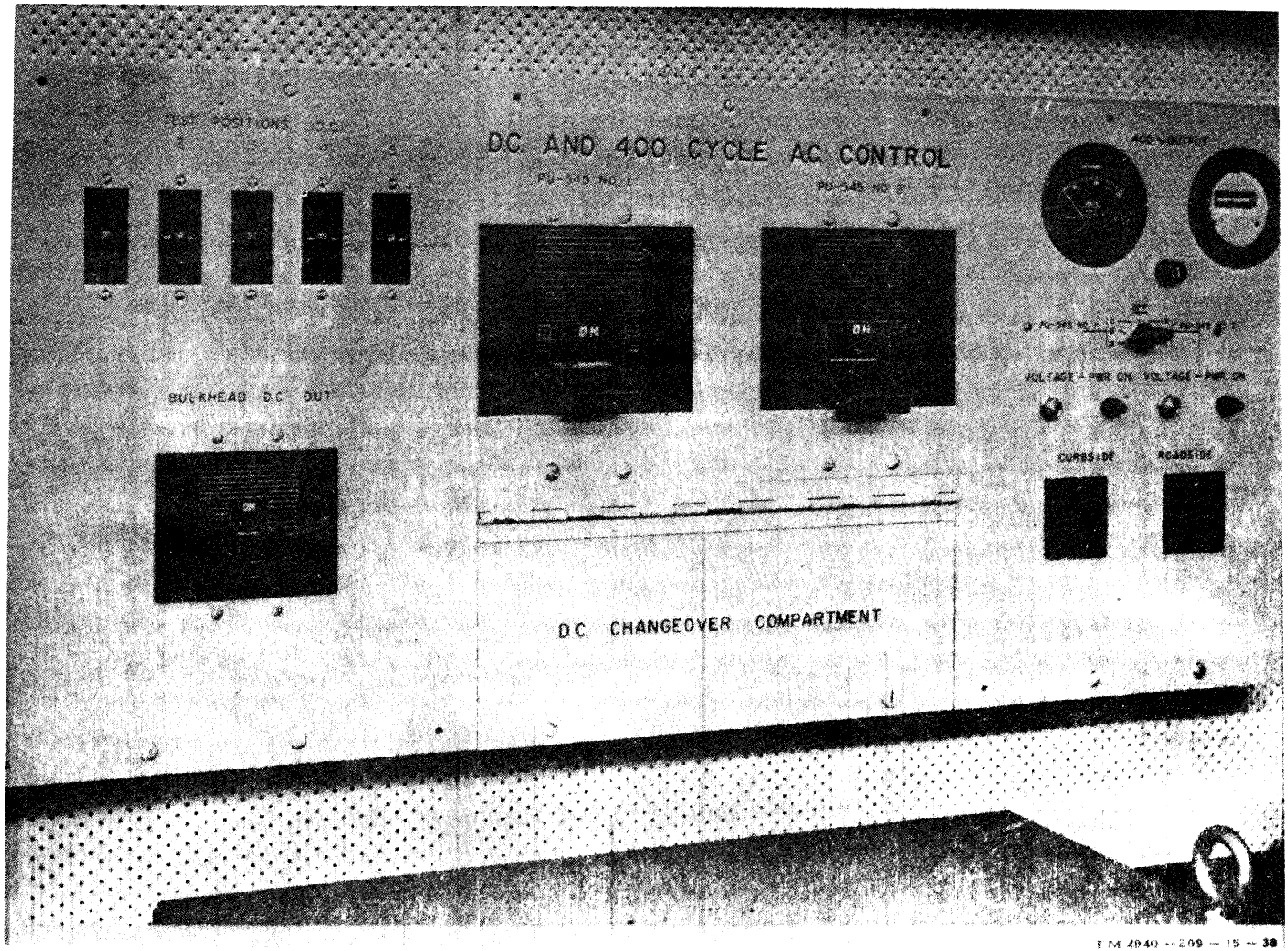


Figure 1-14. AN/ASM-189, configurations B and C, showing D.C. and 400 CYCLE A.C. CONTROL panel, roadside wall.

Figure 1-16. AN/ASM-189, configurations B and C, circuit breaker panel.

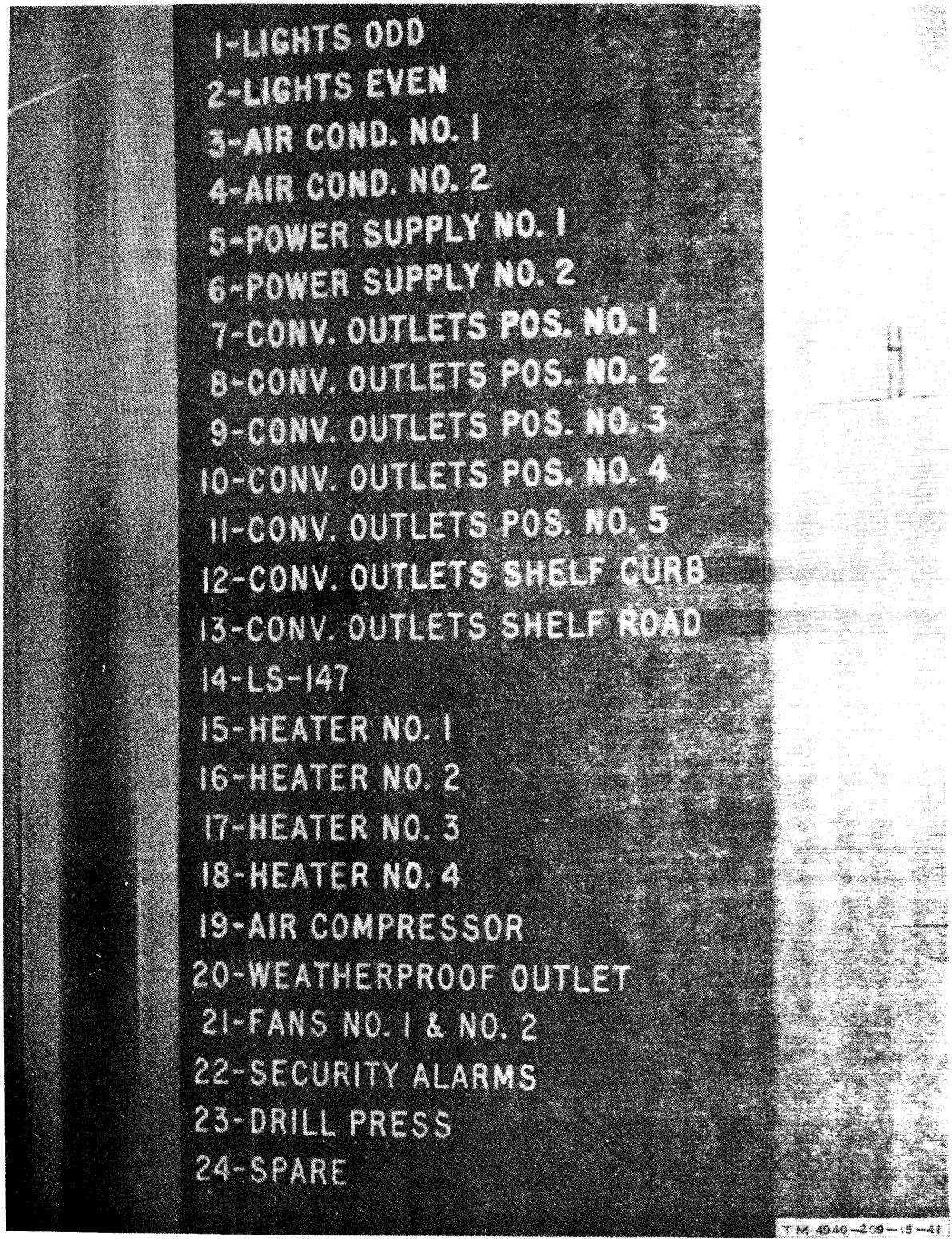


Figure 1-16. AN/ASM-189, configurations B and C, circuit breaker identification.

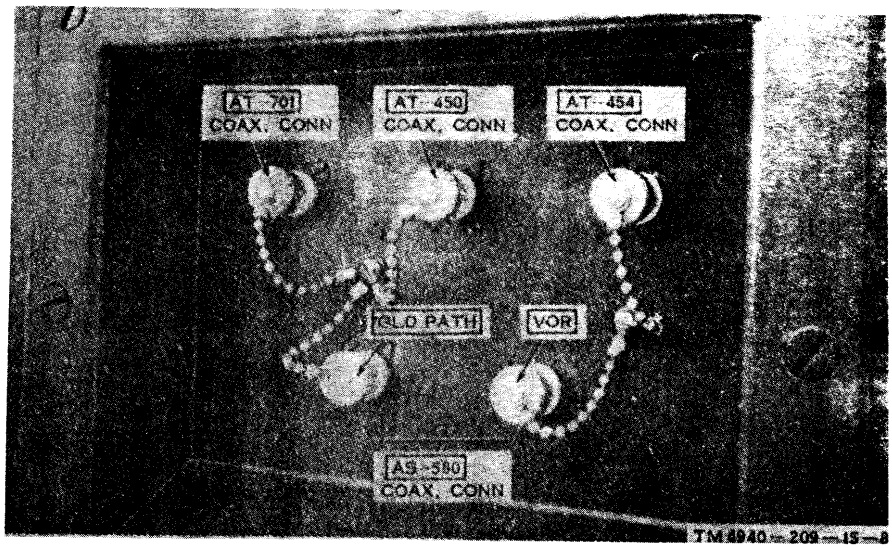


Figure 1-17. Antenna entrance box.

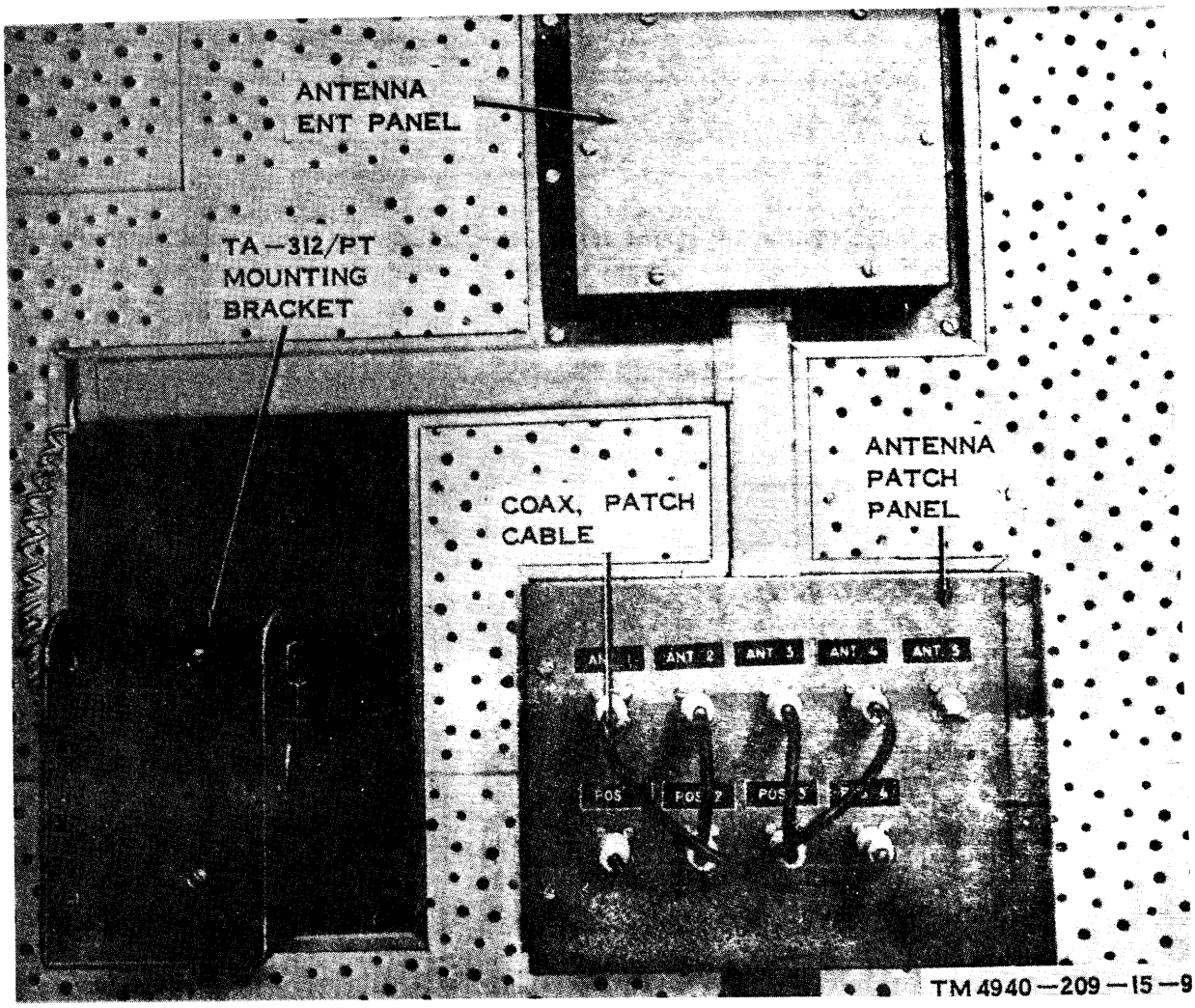


Figure 1-18. Repair van, configuration A, antenna patch panel and entrance panel.

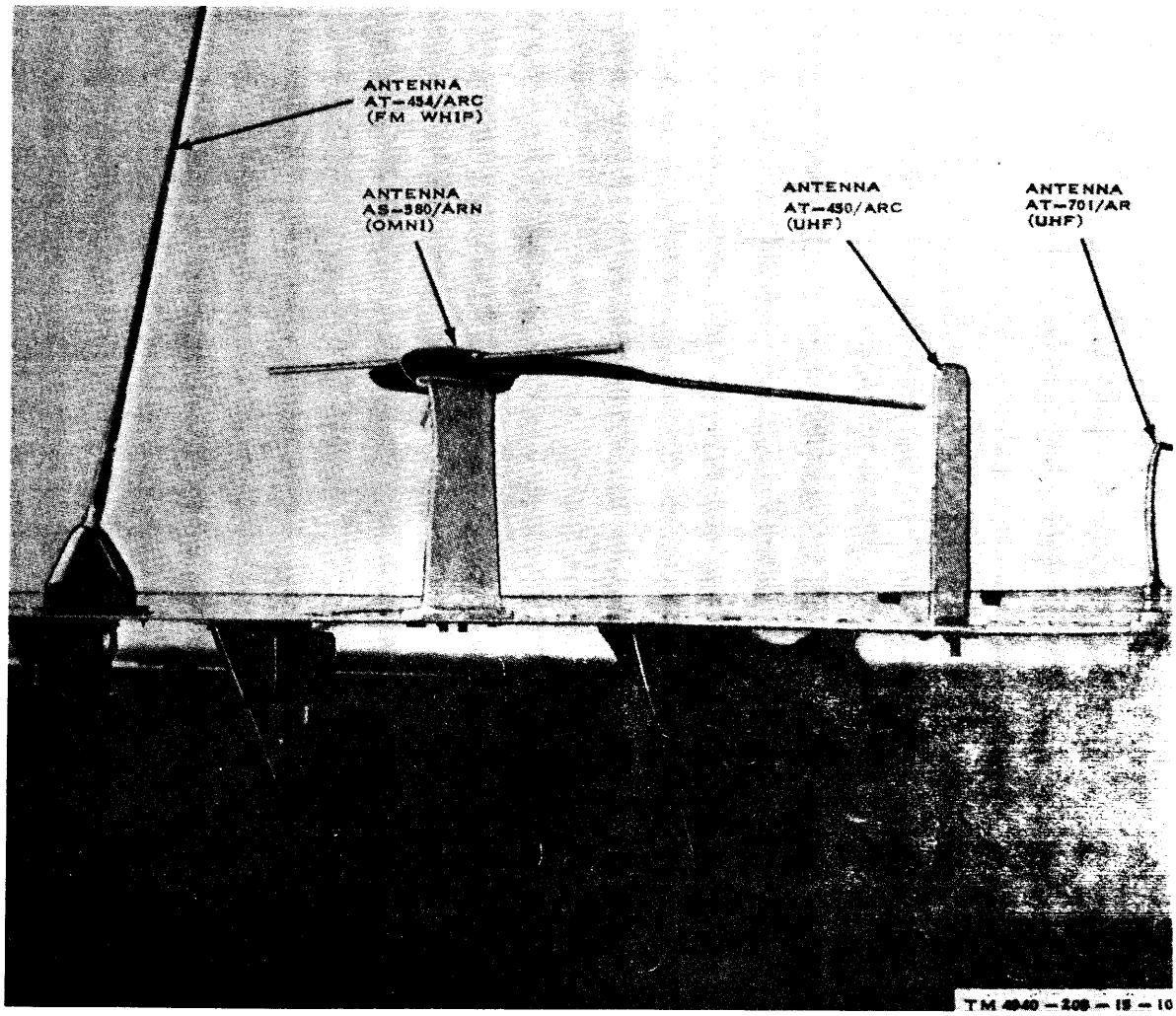


Figure 1-19. Antenna mounting assembly.

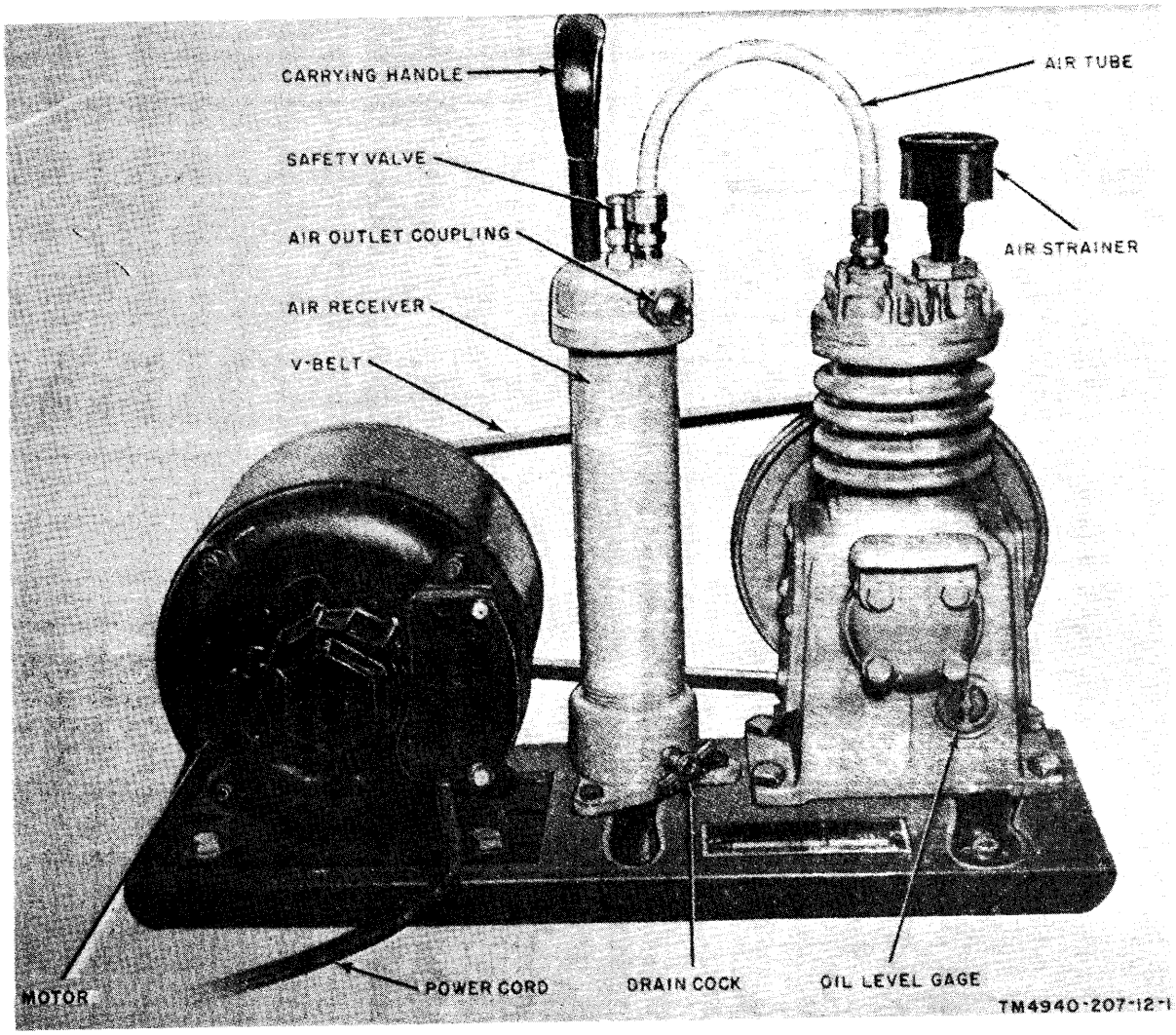


Figure 1-20. Air compressor.

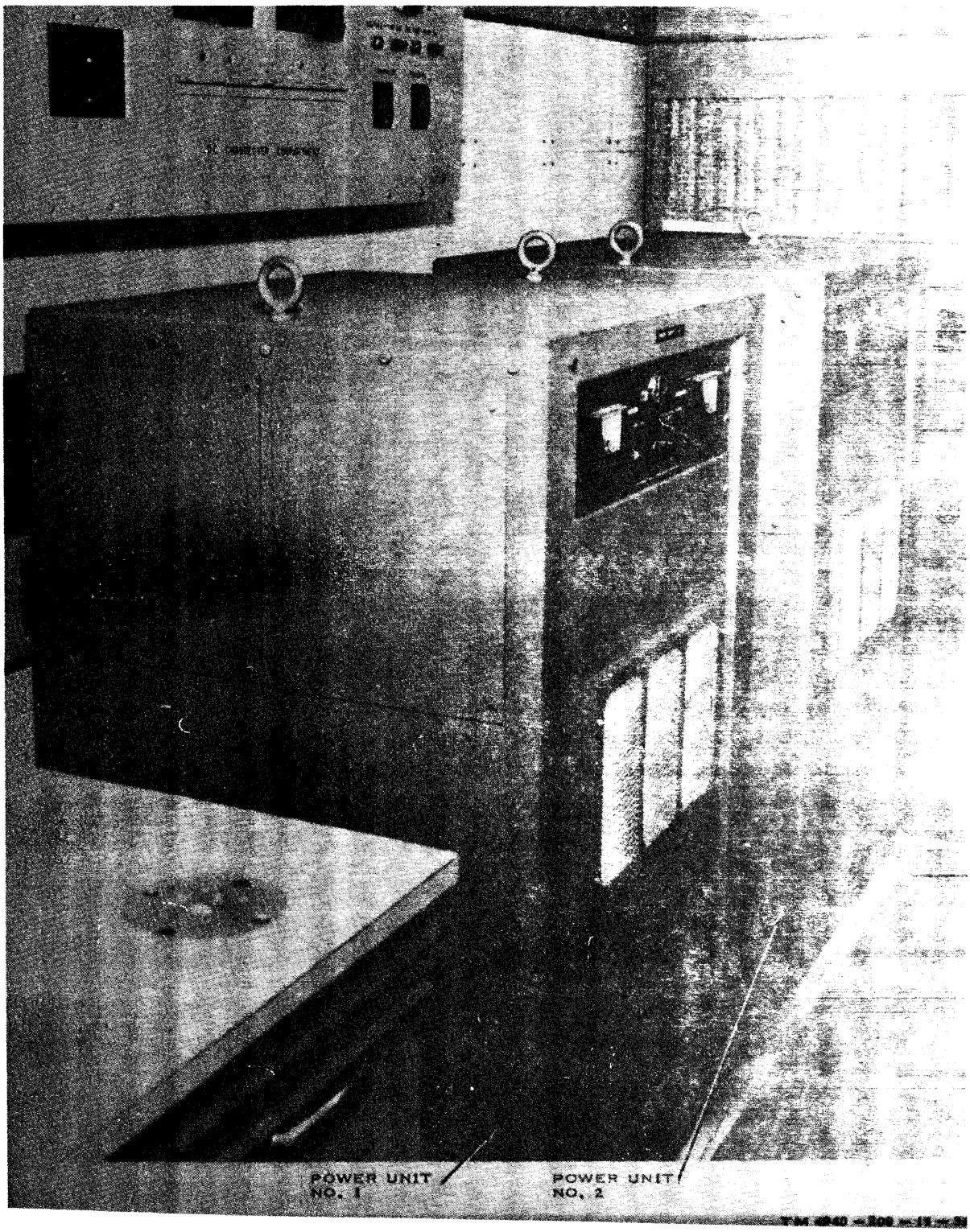


Figure 1-21. AN/ASM-189, configurations B and C, part of roadside Wall, including dc power units.

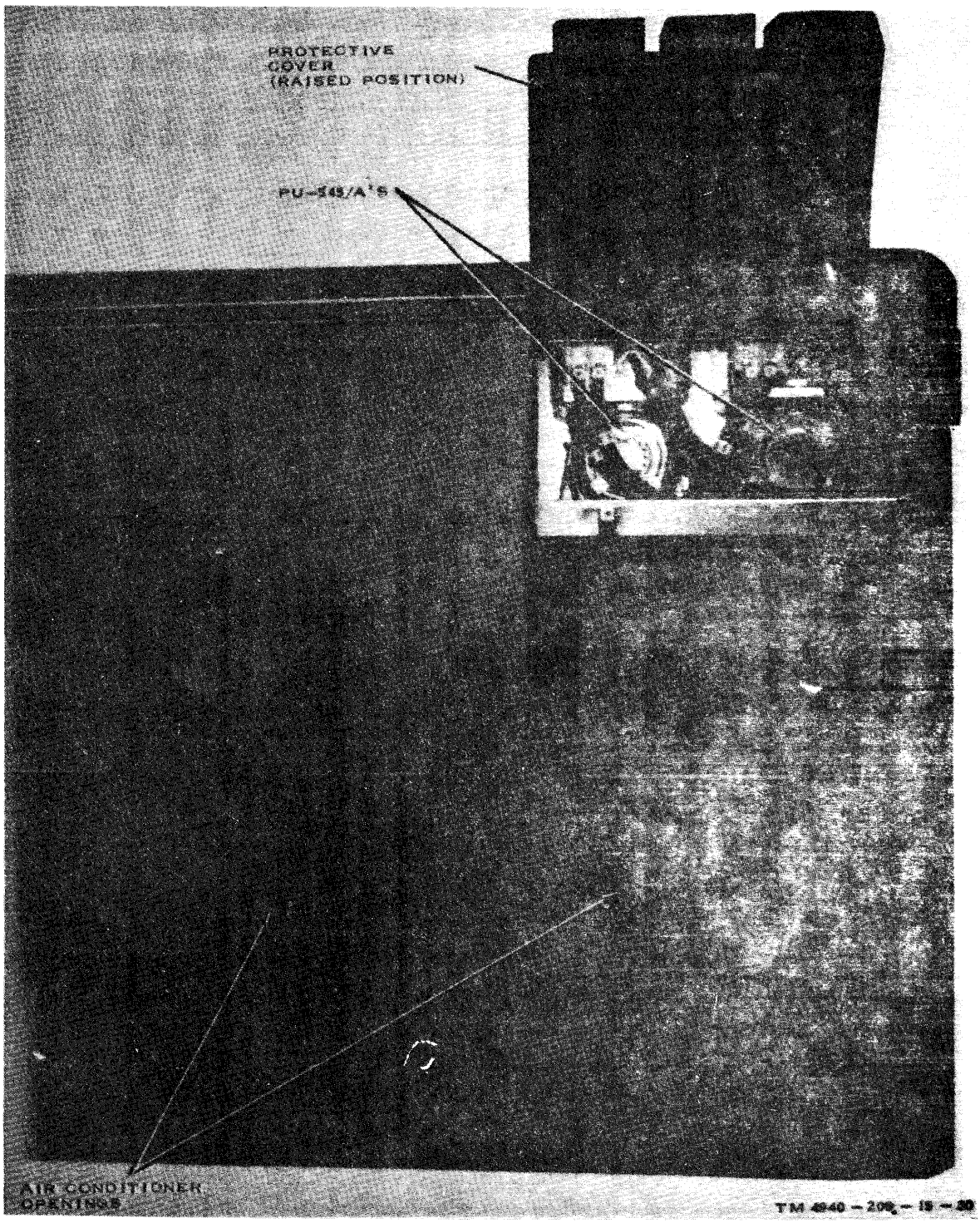


Figure 1-22. AN/ASM-189, configurations B and C, showing two PU-545/A's at upper front roadside corner of van.

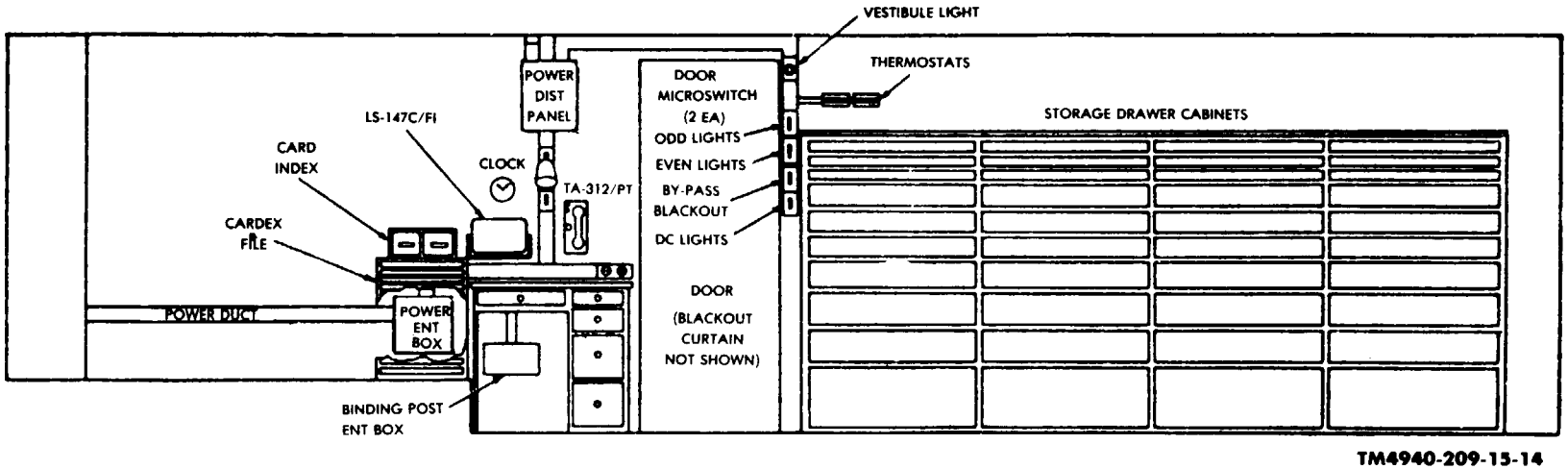


Figure 1-23. Storage van, configuration A, curbside wall.

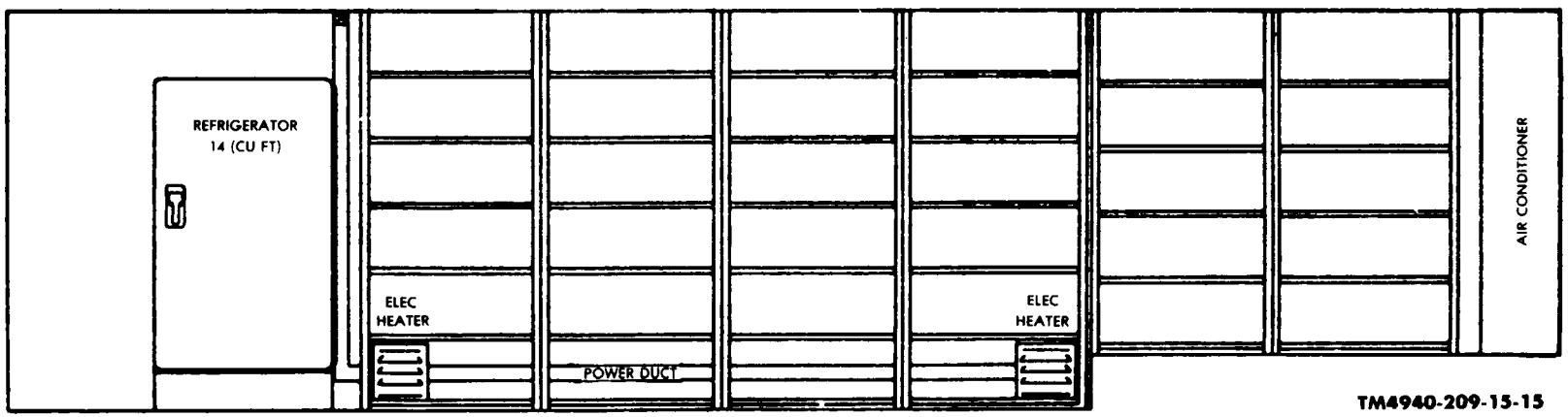


Figure 1-24. Storage van, configuration A, roadside wall.

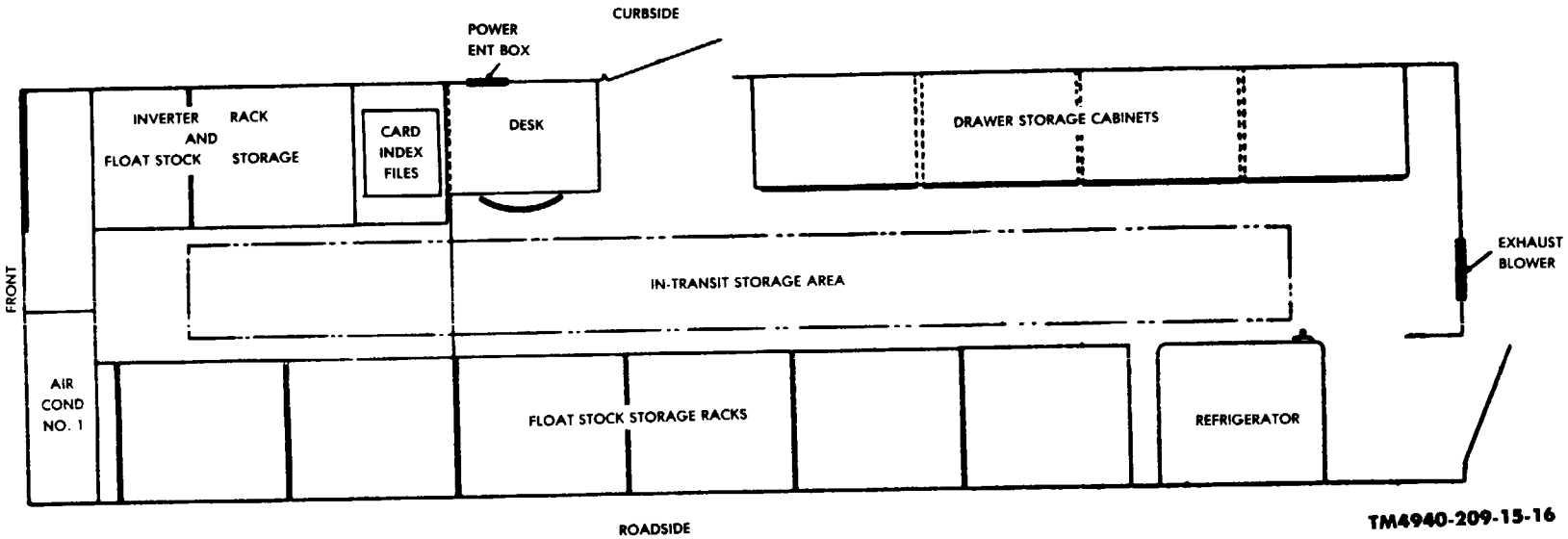


Figure 1-25. Storage van, configuration A, floor plan.

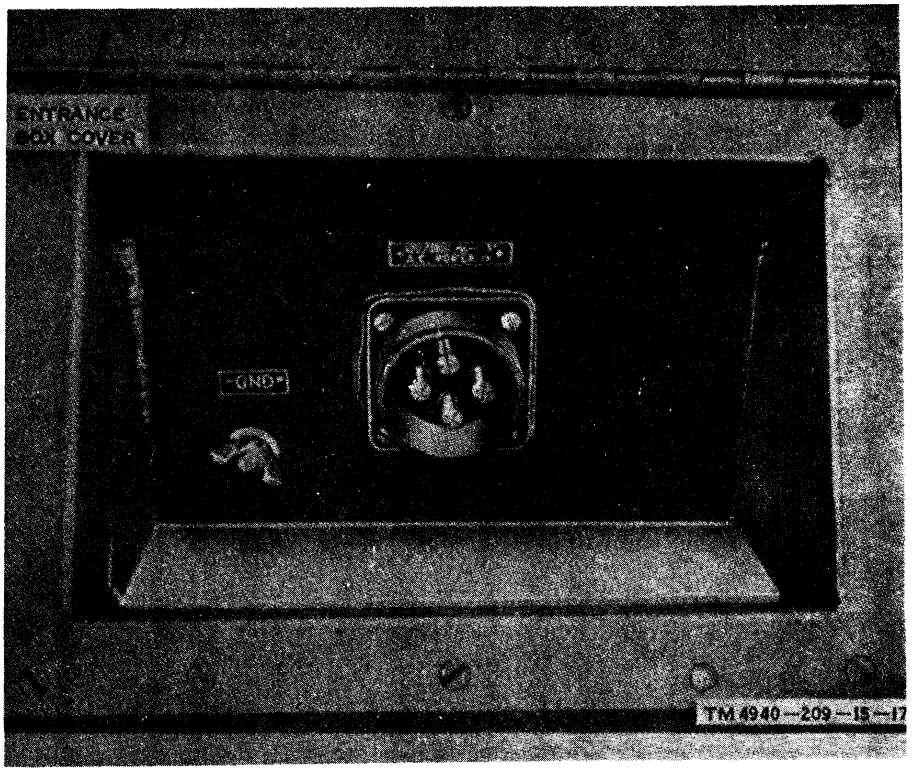


Figure 1-26. Storage van, power entrance box.

CHAPTER 2
INSTALLATION

Note: Unless otherwise indicated, information in this chapter applies to the repair van and storage van.

For Electronic Shops, AN/ASM-189 and AN/ASM-190, that have been modified by MWO 11-5800-220-50-1, the air conditioner(s) were removed and replaced by an environmental control unit(s) (ECU). Other necessary electrical/power wiring changes, including upgrade to a five-wire electrical system, have been performed to only that portion of the van's electrical system directly affected by the addition of the ECU(s). For technical description and maintenance support documentation concerning configuration changes made to the AN/ASM-189 and AN/ASM-l90, as a result of application of MWO 11-5800-220-50-1, refer to APPENDIX F.

2-1. Siting and Installation

a. General. The site selected for the repair van is primarily dependent on access to the equipment being maintained. The site selected for either the repair van or the supply van also depends on terrain, system planning, and physical considerations. Whenever possible, the van should be located on level, firm, and dry ground vith good drainage. Position the van to avoid the use of unnecessarily long length of power cables.

b. Uncoupling Van. Uncouple the van from the tractor as follows:

(1) Apply the van brakes by operating the airbrake controller in the tractor cab.

(2) Place the wheel chocks under the rear wheels of the van.

(3) Remove the landing gear cranks from their transit positions under the van.

(4) If bearing plates are provided to support the base of the landing gear, position the bearing plates as shown in figure 2-1. Supporting timbers or planks may also be used.

CAUTION

Do not place the landing gear on soft or wet soil. Locate the bearing plates or support timbers and planks so that the weight of the front of the van does not cause the landing gear to settle deeply into the earth.

(5) Insert a landing gear crank into each crankshaft (pushed in for high speed operation) and station a man at each crank.

(6) Turn the cranks simultaneously until the base of each landing gear rests on the bearing plate or support timbers and planks.

(7) Close the cutoff cocks on the tractor airbrake hoses.

(8) Disconnect both airbrake hoses from the van by raising each hose coupling until it is free. Disconnecting the airbrake hoses automatically sets the airbrakes on the van.

(9) Couple the tractor hoses together. Place the dust caps on the van couplings.

(l0) Disconnect the dc cable between the van and the tractor (if applicable) and close the hinged cover on the van receptacle.

(11) Move the coupler release (on the fifth wheel of the tractor) to the unlocked position.

(12) Drive the tractor forward slowly and allow the van coupler to slide down the ramp of the fifth wheel. Be sure to move the tractor forward slowly to minimize the impact when the weight of the van is transferred to the landing gear and bearing plates.

c. Leveling Van.

(1) Remove the clevis pins (as indicated by A and B, fig. 2-2) which secure the side support arm and the leveling jack in the retracted position. Allow the leveling jack assembly to swing downward.

(2) Position the free end of the side support arm into the leveling jack bracket and insert clevis pins A and B as shown.

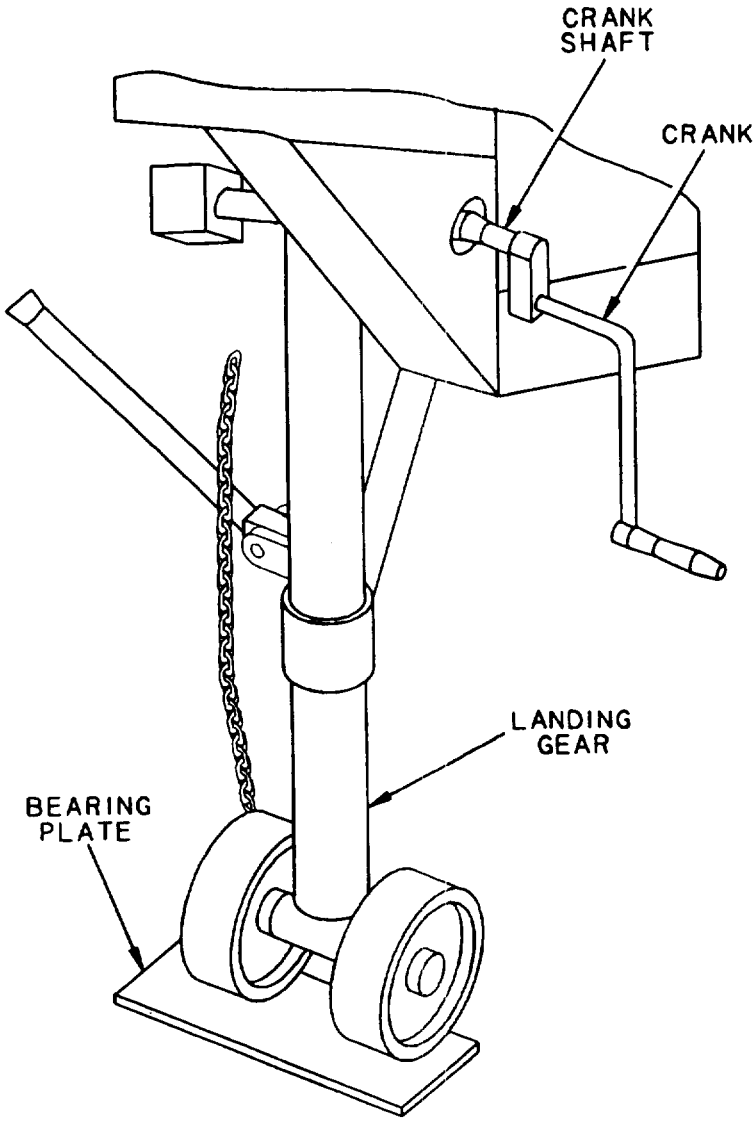


Figure 2-1. Van landing gear in extended position.

(3) Remove the third clevis pin (as indicated by C, fig. 2-2) which secures the forward support arm to the underside of the van. Position the forward support arm on the leveling jack and insert clevis pin C as shown.

(4) Remove the leveling jack pads from their storage location and position a pad at each leveling jack. Be sure that the pads rest on firm, dry ground. If necessary, use planks to insure that the weight of the van does not cause the pads to settle deeply into the earth.

(5) Remove the lever bars from their transit location and insert a lever bar into the hole at the base of each leveling jack.

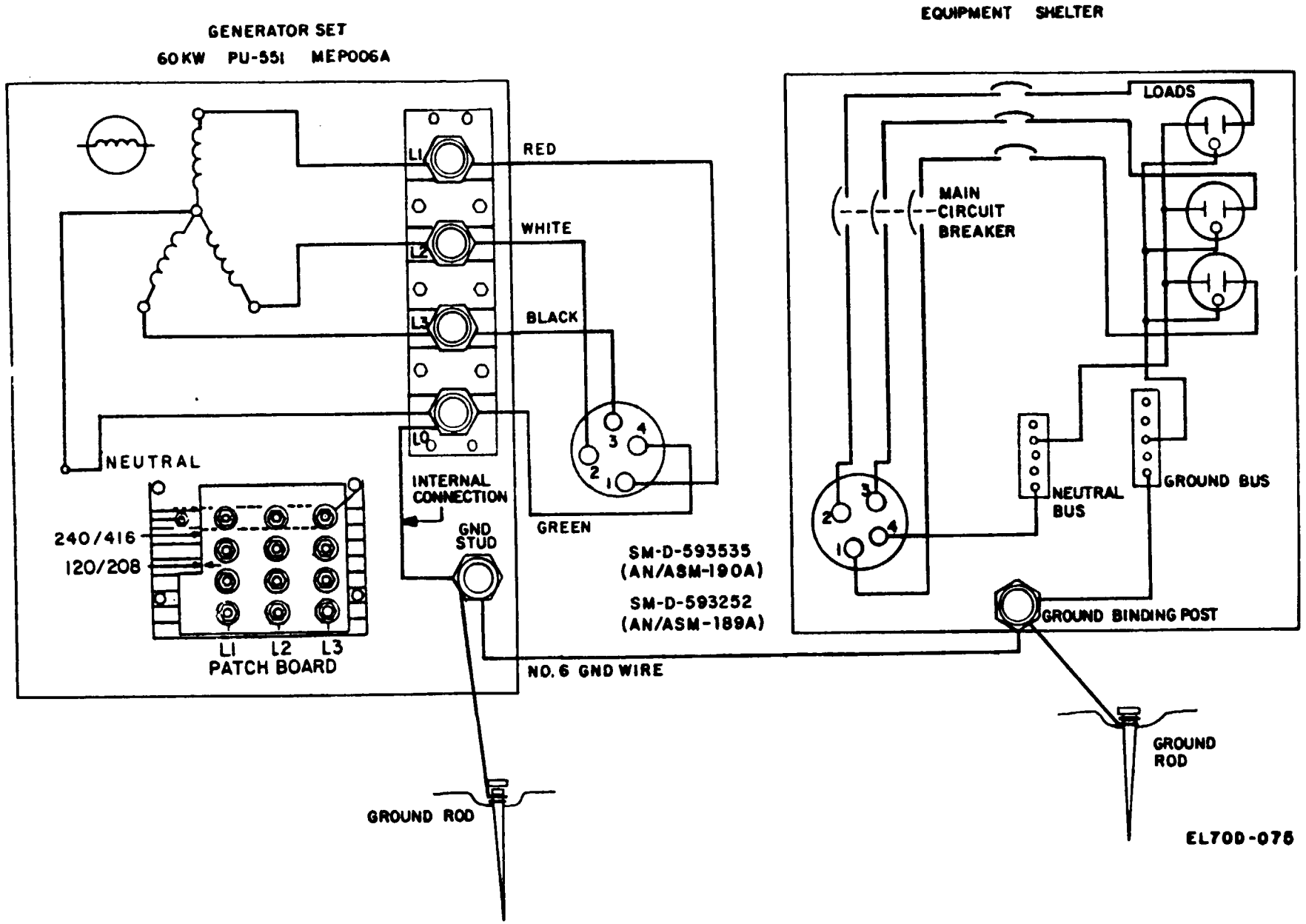


Figure 2-1.1. Generator Set PU-551/M Hookup: Single Generator Unit, 120/208 volts, A.C. 60 Hz, Three-Phase WYE(Y) split into three 120 volt Single-Phase Circuits .

(6) Turn the lever bar until the leveling jack is seated in the leveling jack pad.
(7) Turn the landing gear cranks and the leveling jack levers as necessary until the levels on the van indicate that the van is level.
(8) Remove the personnel ladders from their transit storage position under the van and install them at the rear and curbside doors.

d. Installing Stair Assembly (fig. 2-3).

(1) Remove the stair assembly from its storage location under the van.
(2) Open the stair assembly and extend it to its full length.
(3) Position the holes in the extension support bar over the studs at each side of each hinged step section.
(4) Secure the extension support bar lock at the top and bottom stair assembly studs.
(5) Position the holes in the mounting plates over the mounting bolt holes at the bottom of the entrance door; insert and secure the mounting bolts.
(6) Extend the support feet at each side of the bottom step and lock them in the extended position.

2-2. Grounding Procedures

Caution: The power unit, repair van, and storage van must be earth grounded, by the use of the ground stakes and ground straps provided, before the power unit is started. Select a grounding site that will not interfere with personnel movement or power cables. Ground the van as follows:

a. If possible, select a grounding site within 8 feet of the power entrance box. Scoop out a hole about 6 inches deep.

b. Drive a clean ground rod into the hole until the top of the ground rod is approximately 12 inches above the bottom of the hole. Saturate the ground around the rod with water.

c. Remove a ground strap from its storage drawer in the van. Connect one end of the strap to the ground rod, and the other end to the main ground (GND) terminal in the power entrance box.

2-3. Power Connations

Warning: Be sure to ground the van before connecting power at the receptacles in the power entrance box. Failure to do so may result in severe electrical shock.

a. Prparation.

(1) Remove the power cable assemblies (fig 2-4) and power cable stubs (as applicable) from inside the van. Remove the power cable from the reel.
(2) Check to be sure that all circuit breakers on the van power distribution panel are operated to OFF.
(3) Before connecting power to AN/ASM-189 and AN/ASM-l90, ensure that Patchboard on Generator Set PU-55l/M (fig. 2-1.1) is wired for 120/208 volts operation.

b. Connection to Generation to Generator Set PU-551/M (fig. 2-1.1)

Warning: In 5-wire, 3-phase power distribution, one conductor must be made neutral by connecting a No. 6 electrical wire between the selected generator L0 terminal and earth ground to avoid electrical shock.

NOTE: When making power connections on generator set PU-55l/M, refer to applicable generator and technical manual and TB 43-0125. When the PU-551/M is used as the source of ac power, connect the AN/ASM-189 as described in (1) through (6) below.

(1) Check to see that the power unit main circuit breaker is operated to OFF.

Note. If the power cable does not have prepared leads on one end, follow the procedures given in (2) and (3) below to connect the 25-foot (60-cps) power cable stub to the power unit; then connect the power cable stub to the power cable.

(2) Connect the green (neutral) lead on the power cable stub to the neutral L0 load terminal on the generator set.
(3) Connect the red, white and black leads on the power cable stub to L1 (phase 1), L2 (phase 2), and L3 (phase 3) load terminals respectively on the generator set.

Note. If the power cable has prepared leads, connect the green (neutral) lead, and the red, white and black leads on the power cable directly to L0, Ll, L2, and L3 load terminals respectively on the generator.

(4) Connect the receptacle end of the power cable to the 120/208 60~ 3 0 A. C. POWER IN connector in the repair van power entrance box.

(5) Start Generator Set PU-551/M as described in the applicable generator set technical manual (see Appendix A), and operate the generator set main circuit breaker to ON position.

(6) Place the repair van main circuit breaker on the power distribution panel to the ON position. Before placing any other circuit breaker on, check each phase of the three-phase power by the use of the power monitoring panel. The voltage for each phase (1, 2, and 3) should be 120 volts and the frequency meter should indicate 60 cps.

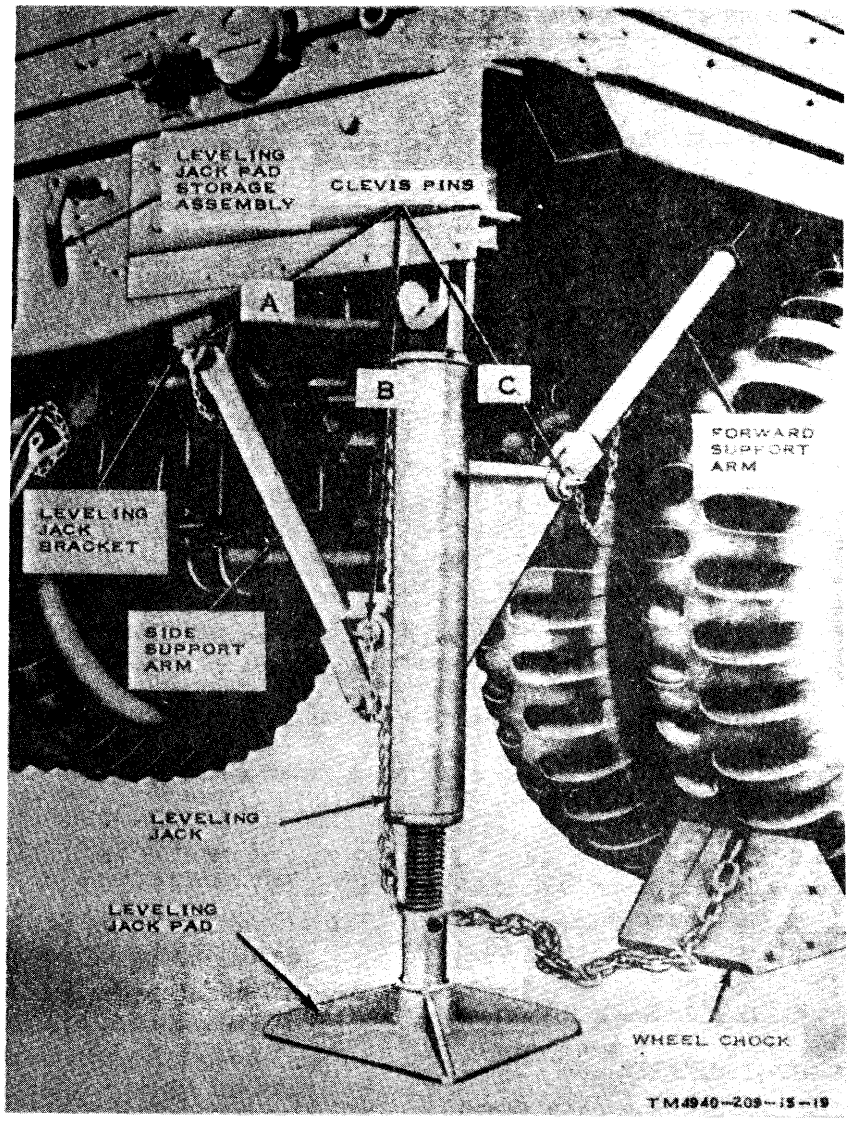


Figure 2-2. Van leveling jack in extended position.

c. Connecting Power to AN/ASM-190. Because the storage van is not provided with its own power unit, input power must be obtained from an adjacent repair van van adjacent assemblage possessing an adequate power source.

Caution: Insure that the power unit is off before installing the power cable between the repair van and the storage van. Before applying power to the equipment in the storage van, check the voltages of each phase at the power monitor panel in the repair van.

(1) Connect one end of the storage van power cable to the 120/208 60~ 30

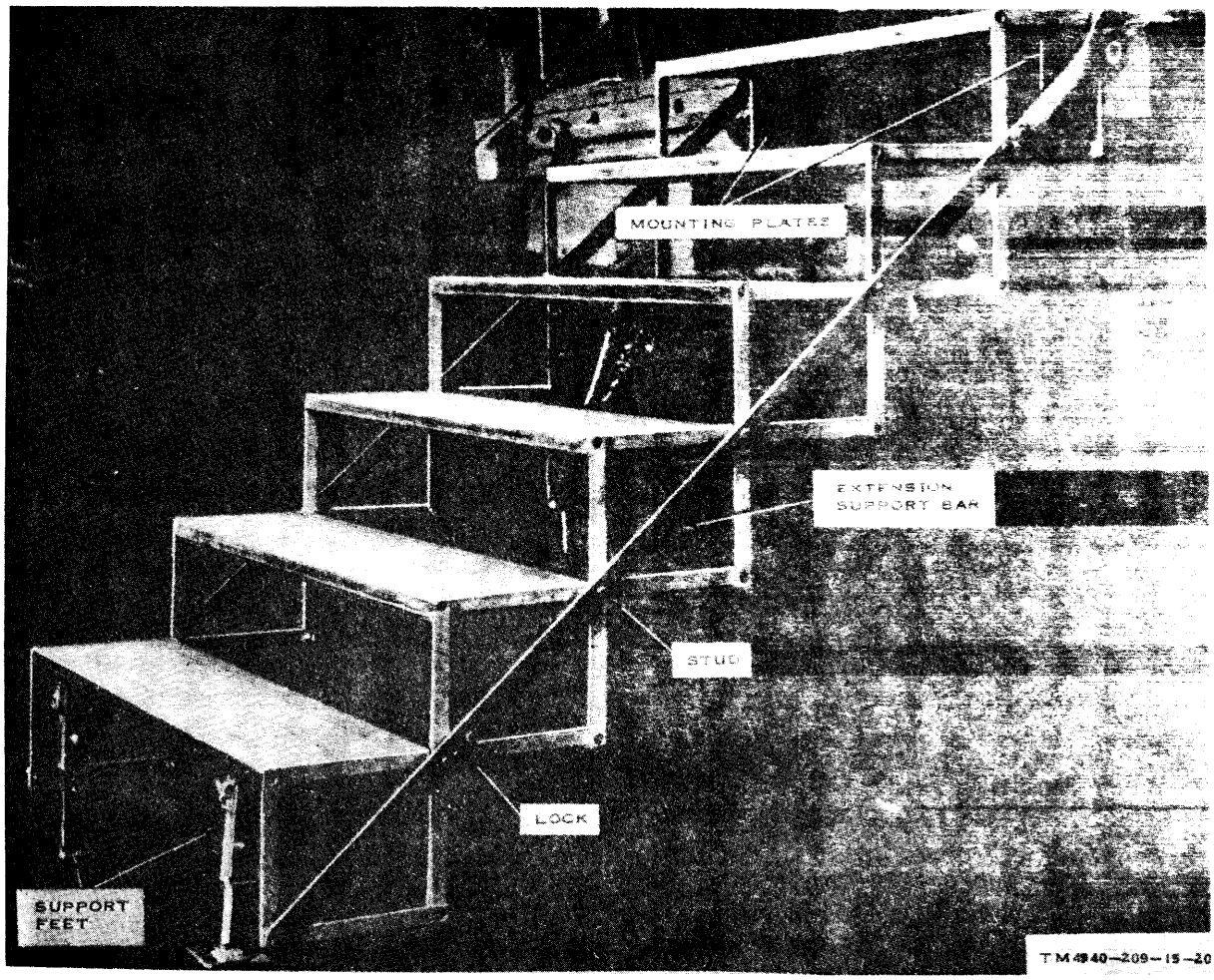


Figure 2-3. Folding stair assembly.

A. C. POWER OUT receptacle in the power entrance box of an adjacent repair van.

(2) Check to be sure that the MAIN circuit breaker on the storage van power distribution panel is operated to OFF (figs. 2-5 and 2-6).

(3) Connect the other end of the power cable to the 120/208 60~ 30 A. C. POWER IN receptacle in the power entrance box of the storage van.

2-4. Installation of AN/ASM-l89 Test Equipment

a. The equipment shelf, cabinets, and drawem are provided for storage of test equipments and accessories.

b. Install the test components on the equipment shelf as follows:

(1) Select J-hook assemblies of appropriate size from their storage location.

(2) Place the component on the equipment shelf, position the J-hook tiedown bars, and insert the J-hooks in the holes provided.

(3) Tighten the wingnuts until the component is firmly secured on the shelf.

Caution: Overtightening of the wingnuts may cause damage to the component case.

(4) Where tiedown straps are used, secure the strap in the shelf tiedown

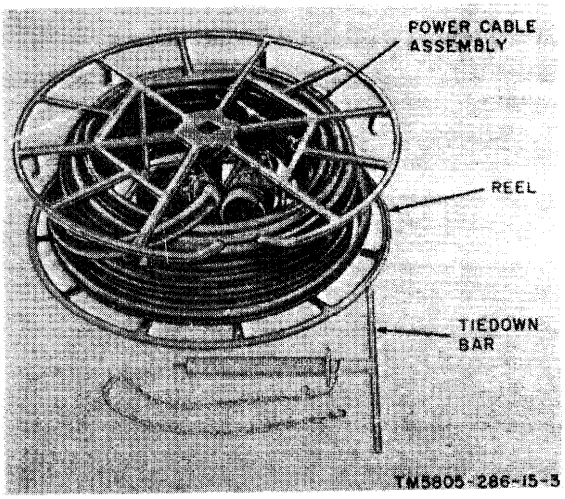


Figure 2-4. Power cable assembly and reel, with tiedown bar.

plate before adjusting and tightening the strap over the equipment.

2-5. Installation and Connection of Telephone Set TA-312/PT

Note. Arrange the TA-312/PT for local battery (LB) operation.

a. Loosen the wingnut on the side of the mounting bracket (fig. 1-8).

b. Rotate the clamping arm to obtain access to the flathead screw on the side of the mounting bracket. Tighten the wingnut.

c. Use a screwdriver to remove the flathead screw that secures the holding plate (inside the mounting bracket).

d. If required, remove the TA-312/PT from its carrying case and store the case.

e. Insert the holding plate into the buzzer recess in the side of the TA-312/PT.

f. Place the telephone in the mounting bracket and replace the flathead screw.

g. Connect the prepared leads of the telephone cord to the line binding posts of the TA-312/PT.

2-6. Checking AN/ASM-189 Air Compressor

Caution: Air compressors are usually shipped without oil. Do not operate the compressor unless the crankcase is filled with oil.

The air compressor is installed under the roadside wall test bench (fig. 5-8); it can be operated at this location or it may be moved for operation in any other location where it will receive adequate dry, clean airflow. Before using, fill the crankcase to the *oil level mark* on the oil gage with Lubricating Oil, Engine (Grade 10) stock number 9150-265-9425.

2-7. Installation of AN/ASM-189 Antenna Mounting Assembly

The antenna mounting assembly is installed on the exterior curbside wall of the van, to the left of the antenna entrance box.

a. Position the antenna mounting assembly at the edge of the van roof (fig. 1-19) so that it is aligned with the mounting boltholes.

b. Insert the six mounting bolts and secure the assembly to the side of the van.,

c. Connect the coaxial cables between the connectors at the base of the antenna mounts and the appropriately marked connector in the antenna entrance box.

d. Install the whip antenna elements as shown in figure 1-19.

2-8. Telephone and Intercommunication Circuit Connections

Connect field wire pairs to the applicable binding posts in the binding post entrance box and terminate the field wire at the distant system van or shelter. Check the connections of the intercom and telephone set inside the van. Insert batteries in the telephone; apply ac power to Intercommunication Station LS-147C/FI. Check for proper operation of each equipment by following the procedures given in the applicable technical manual.

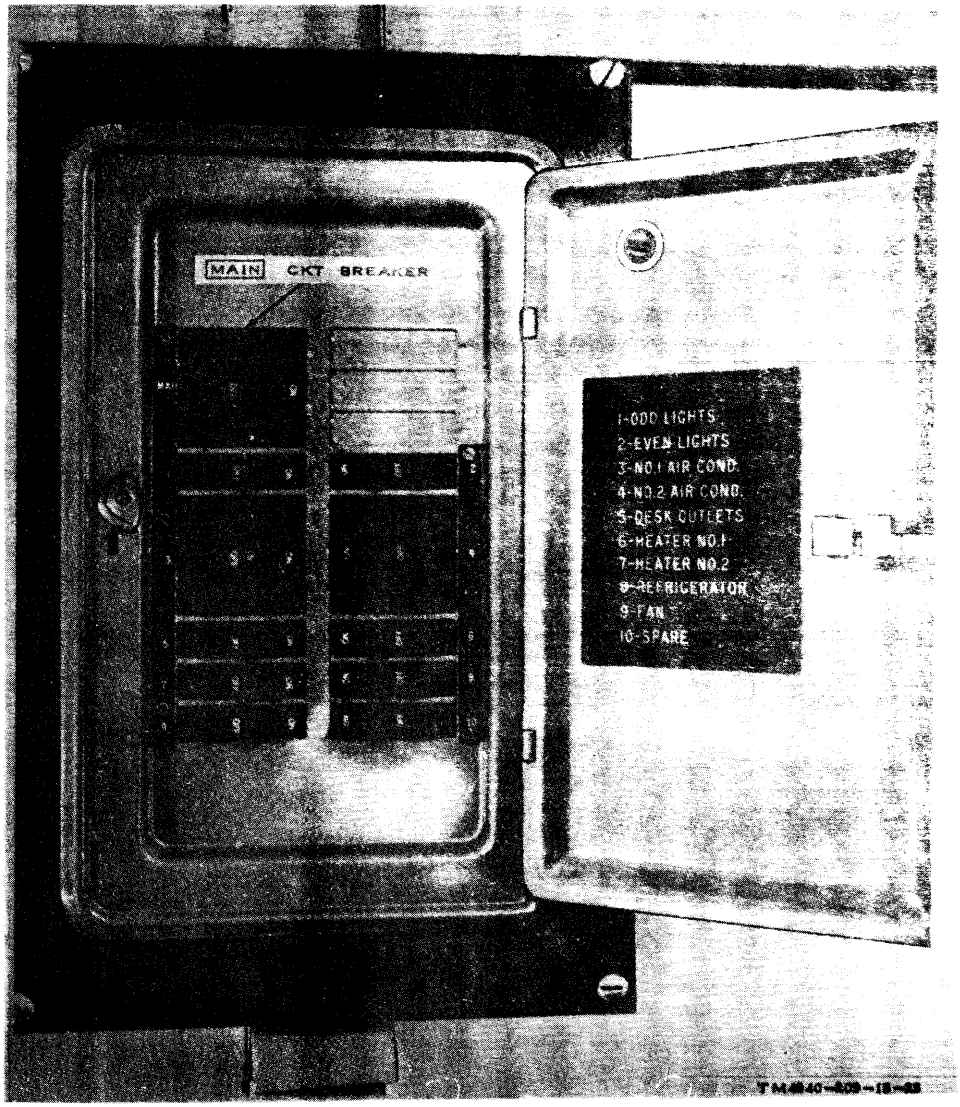


Figure 2-5. Storage van, configuration A, power distribution panel.

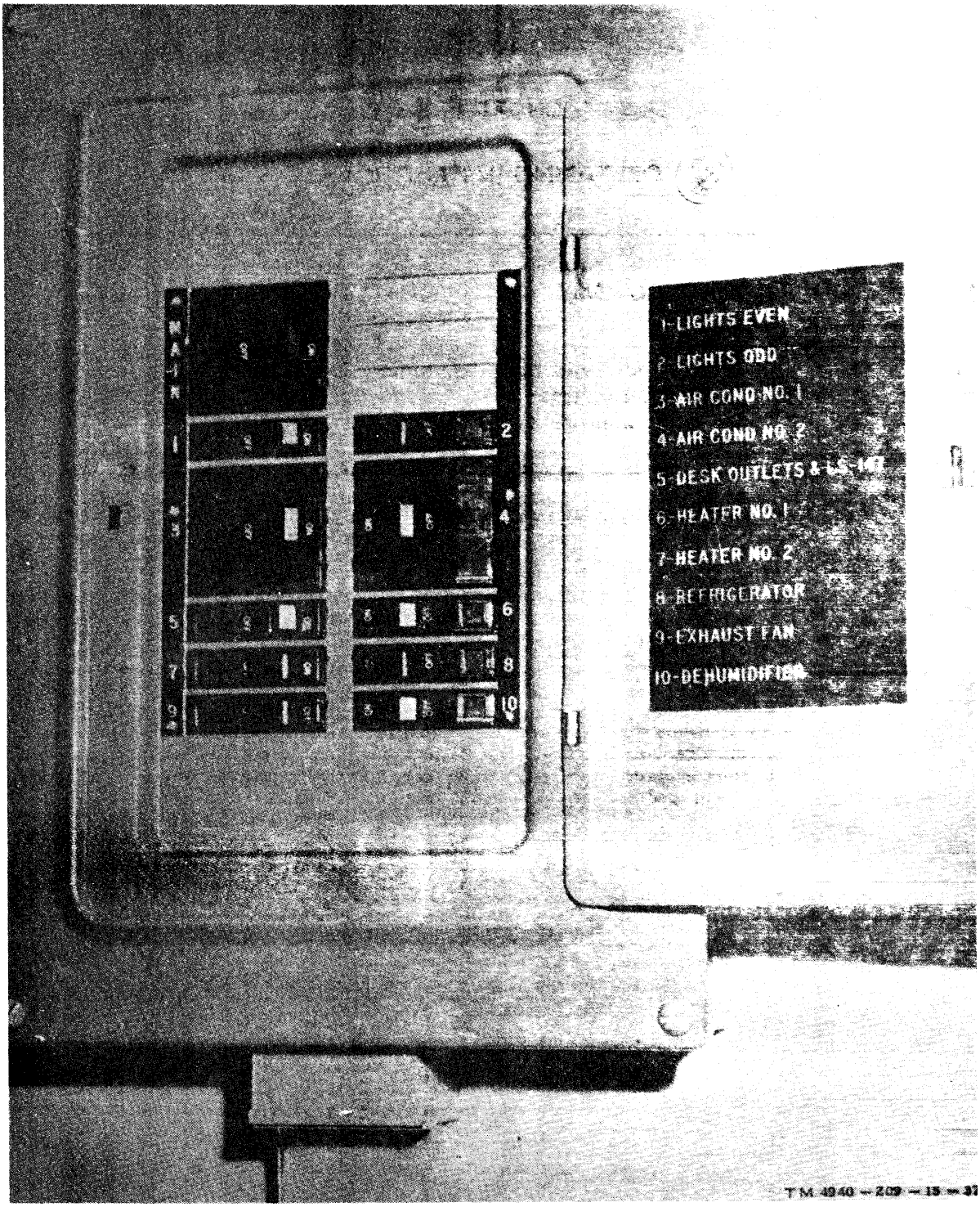


Figure 2–6. AN/ASM-190, configurations B and C, circuit breaker panel, curbeide wall.

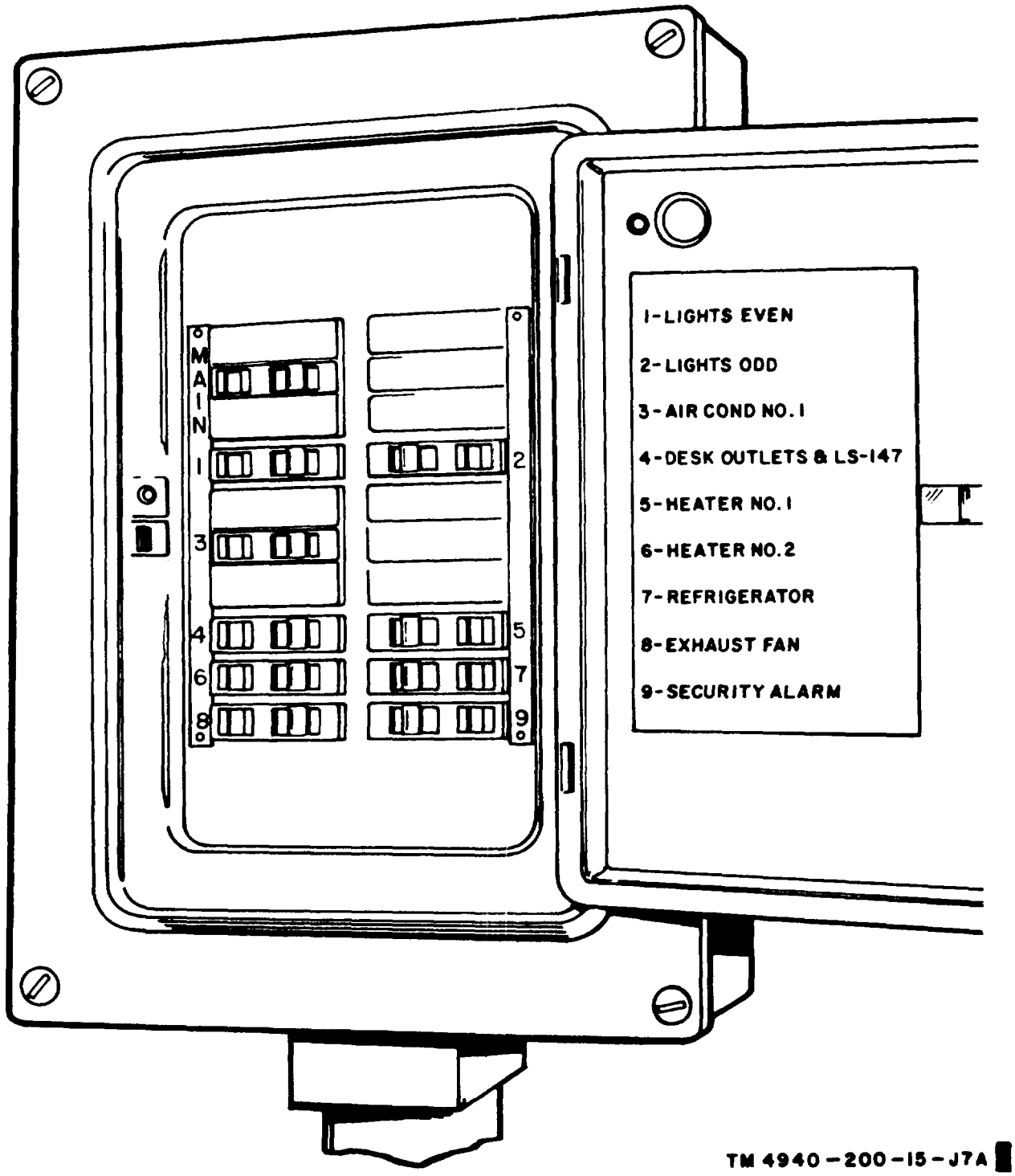


Figure 2-6.1. AN/ASM-190, configurationB (serial numbers 29 and above), circuit breaker curbside wall.

CHAPTER 3
OPERATING INSTRUCTIONS

For Electronic Shops, AN/ASM-189 and AN/ASM-190, that have been modified by MWO 11-5800-220-50-1, the air conditioner(s) were removed and replaced by an environmental control unit(s) (ECU). Other necessary electrical/power wiring changes, including upgrade to a five-wire electrical system have been performed to only that portion of the van's electrical system directly affected by the addition of the ECU(s). For technical description and maintenance support documentation concerning configuration changes made to the AN/ASM-189 and AN/ASM-l90, as a result of application of MWO 11-5800-220-50-1, refer to APPENDIX F.

3-1. Controls and Indicators, AN/ASM-189

This paragraph identifies and describes the function of each of the controls and indicators of the AN/ASM-189. Refer to the appropriate equipment technical manuals (appx A) for information concerning the controls and indicators of the power, test, and communications equipment components.

a. Power Distribution Panel, AN/ASM-189 Configuration A (fig. 1-13).

Control	Description and function
Main circuit breaker	Ganged 100-arnpere circuit breaker. Provides overload protection of ac power unit and control of ac power to individual power distribution circuit breakers.
Individual circuit breakers:	Provides on-off control and overload protection for following circuits:

Circuit breaker (CB) No.	Rating (amp)	Circuits
1	15	Even-numbered fluorescent lights.
2	15	Odd-numbered fluorescent lights.
3 (three ganged)	15 (es)	Air conditioner No. 1.
4 (three ganged)	15 (es)	Air conditioner No. 2.
5 (three ganged)	30 (es)	DC power supply.
6 (two ganged)	30 (es)	Frequency converter.
7	20	Electric heater No. 1.
8	20	Electric heater No. 2.
9	20	Electric heater No. 3.
10	20	Electric heater No. 4.
11	20	Test bench No. 4 duplex receptacles.
12	20	Test bench No. 3 duplex receptacles.
13	20	Test bench No. 2 duplex receptacles.
14	20	Test bench No. 1 duplex receptacles.
15	20	Curbside bench duct receptacles.
16	20	Roadside bench duct receptacles
17	20	Power entrance box duplex receptacles
18	15	Drill press position.
19	15	Blowers No. 1 and No. 2 and air compressor.
20	15	Intercommunication Station LS-147C/FI.
21	20	Spare.
22	20	Roadside receptacles (above test equipment shelf and fluorescent lights (below shelf.
24	20	Spare

b. Power Distribution Panel, AN/ASM-189 Confogurations B and C figs. 1-15 and 1-16).

Control	Description and function
MAIN circuit breaker	Ganged 200-ampere circuit breaker. Provides overload protection of ac power unit and control of ac power to individual power distribution circuit breakers.
lndividual circuit breakers:	Provides on-off control and overload protection for following circuits:

Circuit breaker (CB) No.	Rating (amp)	Circuits
1	15	Even-numbered fluorescent lights.
2	15	Odd-numbered fluorescent lights.
3 (three ganged)	15 (es)	Air conditioner No. 1.
4 (three ganged)	15 (ea)	Air conditioner No. 2.
5 (three ganged)	90 (es)	Dc power supply No. 1.
6 (three ganged)	90 (es)	Dc power supply No. 2.
7	20	60 cycles ac, bench test position No. 1.
8	20	60 cycles ac, bench test position No. 2.
9	20	60 cycles ac, bench test position No. 3.
10	20	60 cycles ac, bench test position No. 4.
11	20	60 cycles ac, bench test position No, 5.
12	20	60 cycles ac, curbside shelf, above lights.
13	2.0	60 cycles ac, roadside shelf, above lights
14	15	60 cycles ac, for LS-147C/FI.
15	20	Heater No. 1.
16	20	Heater No. 2.
17	20	Heater No. 3.
18	20	Heater No. 4.
19	15	Air compressor.
20	15	60 cycles ac, power entrance box.
21	15	Exhaust fans No. 1 and 2.
22	15	Security alarm (buzzer).
23	15	60 cycles ac, for drill press.
24	20	Spare.

c. Power Monitor Panel Configuration A (fig. 1-13).

Control	Description and function
Frequency meter	Indicates frequency of input power source (one phase at a time) as determined by phase selector switch.
Voltmeter	Indicates voltage of input power source (one phase at a time) as determined by phase selector switch.
Phase selector switch	Four-position rotary switch:

Position	Function
OFF	Discornnects power monitor panel from input power source.
A	Arranges meter circuits to monitor phase 1 of input power.
B	Arranges meter circuits to monitor phase 2 of input power.
C	Arranges meter circuits to monitor phase 3 of input power.

Lamp	Lights to indicate that voltage is present across phase 1, 2, or 3.

d. D.C. AND 400 CYCLE A.C. CONTROL Panel, Configuration B (fig. 1-14).

Control	Description and function
Individual circuit breakers:	Provide on-off control and overload protection for following circuits:

Circuit breaker (GE) No.	Rating (amp)	Circuits
PU-545 No. 1 (CB 1)	200	PU-545/A No. 1.
PU-545 No. 2 (CB 2)	200	PU-545/A No. 2
BULKHEAD D.C. OUT (CB 8)	100	28V D.C. OUT (power entrance box)
TEST POSITIONS (D,C.) 1 (CB 4).	80	Dc, bench test position No. 1.
TEST POSITIONS (D,C.) 2 (CB 5).	80	Dc, bench test position No. 2.
TEST POSITIONS (D,C.) 3 (CB 6).	80	Dc, bench test position No. 3.
TEST POSITIONS (D,C.) 4 (CB 7).	80	Dc, bench test position No 4.
TEST POSITIONS (D,C.) 5 (CB 8).	80	Dc, bench test position No. 5.
CURBSIDE (CB 9, 10, and 11 ganged).	30 (3 ea)	400 cycles ac, bench test positions No. 1 and 2.
BOADSIDE (CB 12, 13, and 14 ganged).	30 (3 ea)	400 cycles ac, bench teat posiitions No. 3, 4, and 5.

Frequency meter ---------- Indicates frequency of input power source (one phase at a time) as determined by phase select.or switch.

Voltmeter ---------- Indicates voltage of input power source (one phase at a time) as determined by phase selector switch.

Phase adder Ewitch ---------- Sewm-position rotary switch:

Position	Function
OFF	Disconnects voltmeter and frequency meter from input power source.
PU-545 NO. 1:	
A	Connects meters to monitor phase A of input power.
B	Connects meters to monitor phase B of input power.
C	Connects meters to monitor phase C of input power.
PU-545 NO. 2:	
A	Connects meters to monitor phase A of input power.
B	Connects meters to monitor phase B of input power.
C	Connects meters to monitor phase C of input power.

PU-545 NO. 2 VOLTAGE control — Adjust output voltage of PU-545 NO. 1.

PU-545 NO. 2 VOLTAGE control — Adjust output voltage of PU-545 NO. 2.

e. Lighting (fig. 6-1 and 5-3).

Control	Description and function
BLACKOUT BY-PASS switch ----------	Two position on-off switch. Controls van Lighting for blackout operation as follows : BY-PASS: permits ceiling fluorescent lights to be controlled by individual light switches. BLACKOUT: permits ceiling fluorescent lights to be controlled by entrance door microswitch.
Door microswitch ----------	Extinguishes celling fluorescent lights when entrance door is opened and BLACKOUT BY-PASS switch is in the BLACKOUT position.

Control	Description and function
ODD lights switch	Two-position on-off switch. Control odd-numbered lights in each row of ceiling lights.
EVEN lights switch	Two-position on-off switch. Controls even-numbered lights in each row of ceiling lights.
DC LIGHTS switch	Two-deposition on-off switch, Controls application of dc power to five dome lights.
Vestibule lights	Neon lamps. Provide light at van entrance doors; vestibule tights are extinguished only when BLACKOUT BY-PASS switch is operated to BLACKOUT and either van door is opened
Roadside bench lights switch	Two-position on-off switch. Controls fluorescet lights mounted under equipment shelf above roadside test positions.

f. Electric Heater (fig. 1-7).

Note. The method of procurement of heaters is such that it is possible to find a variety of heaters (make, model, manufacturer, etx) in the semitrailers. The chart below lists the controls, including description and function, of the type of heater most commonly used. If this chart does not apply to the heater in your semitrailer, disregard the chart. Usually, controls are marked so that no explanation is necessary.

Control	Description and function
HEAT-OFF-FAN switch	Three-position switch; permits operation of the unit as a heater with blower, or as an air circulating fan only.
TEMPERATURE CONTROL	Thermosta Regulates temperature provided by heater element.
RESET puahbutin	Pushbutton used to reset protective circuit breaker within electric heater.

g. Air Conditioner.

Control	Description and function
COOL-OFF-VENT switch	Three-position toggle switch. Controls operation of air conditioner as follows: COOL: Turns on compressor unit and blower to provide cool air output. OFF: Disconnects as power from air conditioner circuitry. VENT: provides fresh air circulation (blower only) throughout van.
COOLER control	Thermal control. Arranges air conditioner for maximum or minimum cooling capability.
Thermostat (remotely mounted)	Provides control of van interior temperature over a range of 66° to 94°.

h. Air Compressor (fig. 1-20).

Control	Description and function
Safety valve	Pressure adjusting valve. Counterclockwise rotation reduces (re1ease) air pressure. Clockwise rotation permits air pressure to increase.
Drain cock	Removes air pressure and moisture condensation from air receiver. Full counterclockwise rotation releases air pressure.
Adjusting screw (paint spray gun)	Regulates opening in spray gun headd to adjust spray pattern.

i. DC Power Supply. Refer to the applicable literature for complete information on the dc power supply controls and indicator.

j. Frequency Converter, AN/ASM-189 Configuration A. Refer to the applicable literature for complete information on the f requency converter controls and indicator.

k. Motor-Generator PU-545/A, AN/ASM -189 Configuration B and C. Refer to TM 11-6125-240-15 for complete information on the PU-545/A controls and indicators.

3-2. Controls and Indicators, AN/ASM-l90

This paragraph identifies and deacribes the function of each of the controls and indicators of the AN/ASM-190. Refer to paragraph 3. 1f and *g* for information concerning the electric heaters and air conditioners. Refer to the appropriate equipment technical manuals (appx A) for information concerning the controls and indicator of other components.

a. Power Distribution Panel (fig. 2-5). The information provided below refers to AN/ASM-190, configuration A only.

Control	Description and function
MAIN cirecult breaker	Ganed 100-ampre circuit breaker. Provides over protection of ac power unit and control of ac power to individual power distribution circuit breakers.
Individual circuit breakers:	Provide on-off control and overload protection for following Circuits:

Circuit breakers (CB) No.	Rating (amp)	Circuits
1	15	Odd, fluorescent lights.
2	15	Even, fluorescent lights.
3 (the *ganged)*	15 (ea)	Air conditioner No. 1.
4 (three ganged)	15 (ea)	Air conditioner No. 2.
5	20	Desk convenience receptacles.
6	20	Electric heater No. 1
7	20	Electric heater No. 2.
8	15	Refrigerator
9	15	Exhaust fan.
10	15	Spare.

b. Lighting (fig. 5-2).

Control	Description and function
BLACKOUT BY-PASS switch	Two-position on-off switch. Controls van lighting for blackout operation as follows: BY-PASS-permits ceiling fluorescent lights to be controlled by individual light switches BLACKOUT—permits ceiling fluorescent lights to be controlled by entrance door micro-switch.
Door microswitch	Extinguishes ceiling fluorescent lights when entrance door is opened and BLACKOUT BY-PASS switch is in the BLACKOUT position.
ODD LIGHTS switch	Two-position on-off switch. Controls odd-numbered Lights in each row of ceiling lights.
EVEN LIGHTS switch	Two -posiition on-off switch. Controls even numbered lights in each row of ceiling lights.
DC LIGHTS switch	Two-position on-off switch. Controls application of dc power to five dome lights
Vestibule lights	Neon lamps. Provide light at van entrance doors; vestibule lights are extinguished only when BLACKOUT BY-PASS switch is operated to BLACKOUT and either van door is opened.

c. Power Distribution Panel (fig. 2-6). The information listed below refers to AN/A SM-190, configuration B only.

Control	Description and function
MAIN circuit breaker	Ganged 100-ampere circuit breaker. Provides overoad protection of ac power unit and control of ac power to individual power distribution circuit breakers.
Individual circuit breakers:	Provide on-off control and overload protection for following circuits:

Circuit breaker (CB) No.	Rating (amp)	circuits
1	15	Even, fluorescent lights, and desklight
2	15	Odd, fluorescent lights, and vestibule.
3 (three ganged)	20 (ea)	Air conditioner No. L
4		
5	20	Desk convenience receptacles.
6	20	Electric heater No. 1.
7	20	Electric heater No. 2.
8	15	Refrigerator
9	15	Exhaust blower
	15	Security alarm

3-3. Starting Procedures

The following starting procedures are performed to prepare the repair van and storage van for operation.

a. Check to see that the power connections are correctly and securely made at the power entrance box para 2–3).

b. Check the installation of the ground rod and the connection of the ground strap (para 2-2) .

c. Place the emergency light switches in the appropriate positions to light the dc dome lights.

d. Check to see that all power distribution pane] circuit breakers are placed in the OFF position. In addition, on the AN/ASM–189 configurations B and C, check to see that all panel circuit breakers on the D. C. AND 400 CYCLE A. C. CONTROL panel are at OFF.

e. Start the PU–551/M (AN/ASM–189 only). Refer to the appropriate manual for starting instructions.

f. Place the power distribution panel MAIN circuit breaker at ON.

g. Use the power monitor panel to check the voltage and frequency of each phase of the input power.

h. Place circuit breakers 1 and 2 at ON. Place the ODD and the EVEN light switches at ON.

i. Place the BLACKOUT BY-PASS switch at BY-PASS; if blackout conditions are required, place the switch at BLACKOUT.

j. Place the air conditioner or electric heater circuit breakers at ON, as appropriate.

Caution: If circuit breaker CB 19 (AN/ASM-189 only) is to be placed at ON, disconnect the air compressor power cord on the AN/ASM-189 (configuration A) and place the air compressor switch (fig. 5-8) at OFF on the AN/ASM-189 (configurations B and C). Check to be sure that the exhaust blower vent covers on the outside of the van are open.

k. Place all remaining power distribution panel circuit breakers at ON.

l. Perform the following procedures on the D. C. AND 400 CYCLE A. C, CONTROL panel (AN/ASM–189 configurations B and C):

(1) Place the PU-545/A No. 1 and the PU–545/A No. 2 circuit breakers at ON.

(2) Set the CURBSIDE and the ROADSIDE switches to ON; check to see that both VOLTAGE-PWR ON indicators light.

(3) Use the switch, voltmeter, and frequency meters to check each phase of the 400-cycle input power from the PU–545/A No. 1 and No. 2. Adjust the VOLTAGE control to obtain 110 volts on each phase.

(4) Set the TEST POSITIONS (D. C.) circuit breakers 1 through 5 to ON.

(5) Two dc power supplies are provided in the van. Only one power supply is used at any given time. To change from one power supply to the other, shut down the dc power supply (CB 5 and CB 6 on the power distribution panel set to OFF), open the D. C. CHANGEOVER COMPARTMENT door, remove the hexagonal nuts from all three terminals, and lift the link off the one terminal stud and place it on the vacant terminal stud.

m. Remove all equipment and drawer tiedown bars and clamps that are used to secure the components during transit.

3-4. Operoting Procedures

Except for the electric heater and the air conditioner, the following procedures apply to the components of the repair van:

Note. The heaters in vans vary; typical operating procedures are given in a below.

a. Electric Heater. Operate the HEAT-OFF-FAN switch to the desired position. When the switch is operated to HEAT, both the heating element and the fan will operate; adjust the INCREASE TEMP to the appropriate position. operate the switch to FAN for air circulation only.

b. Electric Drill (AN/ASM-189, Configuration A Only). After the drill has been mounted on the drill stand (if desired), insert the electric drill power cord into the adjacent 115-volt, 60-cps convenience receptacle. Press the trigger switch to operate the drill. The trigger switch may be locked in the operated position.

c. Air Compressor. Turn the knurled cap on the safety valve 4 or 5 turns to the left (counterclockwise). This is the open position which allows the air compressor to start without a load. Check to see that the drain cock at the bottom of the air receiver is turned fully clockwise. On the AN/ASM–189, configuration A, insert the power cord into the adjacent 115-volt, 60-cps convenience receptacle to start the compressor. On AN/ASM–189 configurations B and C, set the air compressor switch to ON to start the compressor. Turn the knurled cap on the safety valve to the right (clockwise) to increase the air pressure.

Note. The air compressor may be moved and operated outside the repair van by loosening the four wingnuts that secure it to the floor. If a power extension cord of 25 feet or longer is required, use a power cord or cable with No. 14 gage wire. Do not use an extension cord over 50 feet long.

Caution: Open all vent covers on the outside of the van before operating the air conditioner.

d. Air Conditioner. When fresh air circulation only is desired, operate the COOL-OFF VENT switch to VENT. For air conditioning, operate the switch to COOL and the COOLER control to the maximum (setting 5) position. Set each thermostat to the desired temperature range position.

e. Dc Power Supply (AN/ASM-189, Configuration A). Refer to the manufacturer's instruction manual for operating procedures.

f. Frequency Converter (AN/ASM-189, Configuration A). Refer to the manufacturer's instruction manual for operating procedures.

3-5. Operation Under Adverse Climatic Conditions

The repair van and the storage van have been designed to meet conditions of extremely cold or hot climates. The vans offer complete protection from the elements for personnel and equipment; however, the precautions given in a, b, and c below should be observed.

a. Operation in Cold Climates.

(1) Extreme cold causes the power cables, antenna cables, and field wires to become hard, brittle, and difficult to handle. Be careful when handling the cables and field wires during connecting procedures so that kinks and unnecessary loops will not result in permanent damage.

(2) Be sure that the binding posts and cable receptacles on the outside of the van are free of frost, snow, and ice by replacing the receptacle covers and securing the covers on the entrance boxes when these items are not being used.

(3) Replace all power cable connector covers as soon as the cables are disconnected from the van. Never drag or place an uncovered cable connector in the snow. If possible, provide shelter or protective cover for the power units. Observe all low-temperature operating procedures given in the applicable technical manual.

b. Operation in Hot Climates.

(1) In hot, dry climates, the connectors, receptacles, and binding posts are subject to damage from dirt and dust. Close the covers on the entrance boxes and replace the covers on the cable connectors and receptacles when these items are not being used. Never drag or place an uncovered cable connector on the ground.

(2) Be careful that the air conditioner intake and exhaust vents on the exterior of the van do not become clogged with sand and dust. Remove and clean the air filters periodically to be sure that they are serviceable.

c. Operation in Warm, Damp Climates.

(1) In warm, damp climates, the equip ment is subject to damage from moisture and fungi. Wipe all moisture and fungi from the exterior of the equipment with a clean, dry cloth.

(2) The air conditioner and the heaters in the repair van should be used alternately, whenever possible, to reduce the humidity in the van and to dry out the van interior.

(3) All electrical contact surfaces are susceptible to corrosion which will cause a high resistance contact area. Wipe all electrical contact surfaces with a clean, dry cloth before performing any connecting procedures.

(4) On the AN/ASM-190 configuration B, operate the dehumidifier to reduce moisture.

3-6. Stopping Procedures

Note. To remove power in an emergency (repair van and storage van), place the MAIN circuit breaker or the power distribution panel in the OFF position.

a. Except in an emergency, remove power from all equipment that is equipped with individual power switches before placing the associated circuit breaker on the power distribution panel (all configurations) and the associated circuit breaker on the D. C. AND 400 CYCLE A. C. CONTROL panel (AN/ASM-189 configurations B and C) in the OFF position.

b. On the AN/ASM-189 configuration A, remove the air compressor power cord from the ac power receptacle.

CHAPTER 4
MAINTENANCE INSTRUCTIONS

Section I. OPERATOR'S AND ORGANIZATIONAL MAINTENANCE

For Electronic Shops, AN/ASM-189 and AN/ASM-190, that have been modified by MWO 11-5800-220-50-1, the air conditioner(s) were removed and replaced by an environmental control unit(s) (ECU). Other necessary electrical/power wiring changes, including upgrade 10 a five-wire electrical system, have been performed to only that portion of the van's electrical system directly affected by the addition of the ECU(S), For technical description and maintenance support documentation concerning configuration changes made to the AN/ASM-189 and AN/ASM-l90, as a result of application of MWO 11-5800-220-50-1, refer to APPENDIX F.

4-1. Scope of Operator's and Organizational Maintenance

a. Operator's maintenance consists of preventive maintenance, checking equipment (para 4-3), and removal and replacement of parts (paras 4-8 through 4-13). Preventive maintenance is the systematic care, servicing, and inspection of equipment to prevent the occurrence of trouble, to reduce downtime, and to maintain equipment in combat serviceable condition. Operator's preventive maintenance is performed daily; specific procedures are provided in paragraph 4-3.

b. Organizational maintenance consists of higher category preventive maintenance and replacement of authorized repair parts (appx B). Organizational preventive maintenance is performed on a monthly and quarterly basis; specific procedures are provided in paragraphs 4-4 and 4-5.

c. The preventive maintenance checks and services provided in paragraphs 4-3, 4-4, and 4-5 outline inspections to be made at the indicated intervals. They are designed to help maintain equipment in combat serviceable condition. They indicate what items are to be checked and how they should be checked. Also included are procedures for authorized repairs, and references to text, illustrations, and other manuals that contain supplementary information.

d. Defects that cannot be corrected must be reported to higher category maintenance personnel. Records and reports of repair and preventive maintenance must be made in accordance with procedures given in TM 38-750.

4-2. Tools, Test Equipment, and Material Required

a. Tools and Test Equipment. The tools and test equipment required for maintenance of the equipment supported by the van are listed in the applicable equipment technical manuals and in the packing lists. For the performance of the van maintenance, use the appropriate tools from the toolkits supplied with the van and a multimeter (such as Multimeter ANA-USM-223, or Multimeter TS-352B/U until Multimeter AN/USM-223 is available.

b. Materials

Item	Federal Stock No.
Sandpaper, fine #0000	5350-27l-7939
Cloth, lint-free,	8305-267-3015
Orangestick	5120-408-4036
Electrical insulation tape, cotton.	5870-184-2003
Cleaning Compound.	7930-305-9542
Grease, Graphite	9150-223-4001
Lubricating Oil, General Purpose, (PL-Special).	9150-273-2389
Lubricating Oil, Engine, Grade 10	9150-265-9425
Lubricating Oil, General Purpose	9l50-23l-6640
Abrasive sheet, Grade No. 0	5350-192-5048
Brush, oval, size No. 2	8020-239-4956

4-3. Operator's Daily Preventive Maintenance Checks and Services Chart

Sequence No.	Item to be inspected	Procedure	References
		EXTERIOR	
1	Shelter skin	Check to see that there are not skin punctures, tears, or open seams that would permit moisture to enter shelter wall, Inspect van for light tightness.	
2	Grounding system	Check to see that grounding system is properly installed. Tighten loose ground lead connections.	Para 2-2.
3	Power and signal entrance boxes	Remove dirt, grease, and moisture from around binding posts and receptacles. Put dust covers and receptacles covers on all unused cable receptacles.	Fig. 1-4 and 1-5.
4	Power and signal cable assemblies	Remove grease, oil, and dirt from cable insulation and connectors. Tighten all locking rings so that cable is securely attached to its receptacle. Adjust cable grips to relieve strain of cable weight. Put connector covers and dust caps on unused cables.	
5	Trailer (part of PU-551/M)	Remove dirt, refuse, grease, oil, and gasoline from trailer floor and around generator sets. Check to see that required lubrication and preventive maintenance are performed.	
6	Generator sets (part of PU-551/M)	Remove dirt, grease, oil, and gasoline. Tighten loose connections on power cables, grounding cables, and if used, auxiliary fuel lines, Check to see that required daily preventive maintenance is performed.	
		INTERIOR	
7	Signal, power cables, and wires	Tighten loose connections of all plugs and connectors to their receptacles and jacks. Check to see that insulation is not cut. Remove all kinks and strain.	
8	Lighting system	Replace defective lamps and starters (use spares).	Para 4-9
9	Walls, ceilings, and floor.	Check for holes, open seams, or signs of leaks or water seepage,	
10	Wastebaskets	Empty and clean wastebaskets.	
11	Cabinet drawers	Remove refuse and articles not assigned to cabinet drawers.	

Sequence No.	Item to be inspected	Procedure	References
12	Batteries and hand lantern.	Replace batteries or lamp if flashlight or hand lantern fails to light.	Para 4-8.
13	Clock	Wind and set to correct times, if necessary.	
14	Power distribution panel.	Check to see that voltmeter indicates approximately 115 volts ac, and ammeter indication is normal. Replace neon lamps that fail to light,	Fig. 1-18.
16	Equipment operation	Check to see that all equipment performs Satisfactorily.	Para 3-l-3-3
		Report operational failure of any equipment or circuit.	TM 88-760.
		Replace defective items for which authorized spare parts axe plovided.	Para through 4-l3.

4-4. Organizational Monthly Preventive Maintenance Checks and Services Chart

Sequence No.	Item to be inspected	Procedure	References
		EXTERIOR	
1	Shelter skin and hardware.	Use touchup painting where paint is blistered, pitted, or flaking, and on bare spots (such as steps, power and signal entrance box covers, skids, etc) .	TB SIG 354.
2	Groundings system	Clean ground lug connect	Para 2-2.
3	Movable parts and door.	Clean and paint bare metal parts.	Para 4-7.
		Tighten loose screws and bolts	None.
		Lubricate	TB SIG 354.
		Clean air vent filter	Fig. 1-22.
		Apply gasket cement on loose gaskets.	
4	Power and signal entrance boxes.	Remove corrosion from binding ports.	Figs 1-4, 1-5.
		Repair insulation cuts and abrasions with electrical insulation tape.	
		Inspect layout of cables and relocate if necessary to prevent damage by or hazard to vehicles and pedestrians.	
5	Trailer (part of PU-551/M).	*a.* Tighten mounting bolts that hold generator sets, bracket assemblies for gasoline cans and ground rods.	
		b. Check to see that required lubrication is performed.	
6	Generator sets (part of PU-551/Ml).	Check to see that required lubrication and preventive maintenance are performed.	

Sequence No.	Item to be inspected	Procedure	References
		INTERIOR	
7	Signal and power cables, cords, and wires.	Tighten screws and clamps that secure wires to terminals.	
		Repair insulation cuts and abrasions with electrical insulation tape.	
		Cover unconnected bare wire with electrical insulation tape.	
		Polish metal plugs on patching cords, telephone cords, etc.	
8	Signal, power, and lighting system ducts.	Tighten loose screws, bolts, and clips. Repair or replace defective switches, switchplates, outlets, receptacles, and circuit breakers.	Paras 4-16, 4-19.
9	Lighting system ----------	Tighten screws and nuts that secure lighting fixtures, lights and parts on power distribution panels.	
		Replace defective or missing parts in lighting system and power distribution panels.	Para 4-20.
10	Walls, ceiling, and floor.	Clean and paint bare metal spots.	Para 4-7.
		Check for skin punctures and crocked seams.	TB SIG 864.
11	Cabinets ----------	Repair or replace broken doors and latches.	
12	Equipment mountings ----------	Tighten all loose bolts, nuts, screws, and clamps that secure equipment, racks, frames, shelves, braces, clamps, and mounting hardware. Replace missing bolts, nuts, etc.	
		Check to see that equipment mounting racks, frames, shelves, braces, and clamps are not bent, broken, or out of shape to endanger equipment or personnel.	
13	Meter and control panels -----	Repair or replace defective parts.	
14	Exhaust blowers ----------	Lubricate motor with oil (PL-Special or Grade 10).	
		Clean motor and fan housing ---------	Para 4-11.
		Repair or replace defective part ------	Pam 4-18.
15	Blackout curtain ----------	*a.* Tighten screws that secure track fixture to ceiling.	*a.* None.
		b. Repair or replace if torn, ripped, or frayed.	*b.* None.
16	Electric heater ----------	Clean inside and outside of case.	Para 4-10.
		Repair or replace defective parts -----	Pam 4-17.

Sequence No.	Item to be Inspected	Procedure	References
17	Equipment performance	Check out the operation of all equipment.	Paras 3-3, 3-4
		Replace and/or repair any defective or inoperative part.	Paras 4-7 through 4-22

Note. In addition to the preventive maintenance checks and Services for the items listed in the chart above perform the preventive maintenance required for the components of the AN/ASM-l69 and AN/ASM-l90 which are covered separate technical manuals (appx A).

4-5. Organizational Quarterly Preventive Maintenance Checks and Services Chart

Sequences No.	Item to be inspected	Procedure	References
		GENERAL	
1	Camponents:		
	Inventory	Inventory equipment; requisition any missing components and running spares.	*a.* Appx C.
	Location of components.	Check to see that all components are mounted or stowed in assigned place except. those that are being used.	*b.* Figs. 1-1, 1-2, para 2-4.
	Publications	Requisition all maintenance manuals and parts manuals, covering AN/ASM-l89 and AN/ASM-190 and their components that are not on hand and in usable condition (including all current Changes publications).	*e.* DA Pam 810-4
2	Modification work orders.	Check to see whether any MWO's are required for AN/ASM-189 and AN/ASM-190 and their components. (See DA Pam 310-7.) Check equipment to see if applicable MWO'S have been applied and MWO number is stamped as required. Modify or request modification of those equipments that require application of MWO.	See applicable MWO.
		EXTERIOR	
3	Shelter akin arid hardware.	Repair skin punctures, cracks, or open seams that would permit moisture to enter shelter wall.	TB SIG 354 and para 4–22.
4	Grounding system	Replace ground rod if ground lead lug carnnot be securely tightened	
		Replace ground lead if it is cut, corroded, or broken.	

Sequence No.	Item to be inspected	References	References
5	Shelter door	Check to see that rubber gaskets are not missing or loose, and that they provide watertight seal; replace broken hings and door handl-	
6	Power and signal entrance box.	Carefully remove sand, moisture, and dirt from among contacts of cable receptacle-s.	
		Tighten locknuts, screws, and bolts that hold receptacles and binding posts.	
		Replace all defective parts (such as cover gaskets, cover assemblies, binding poats, rubber cape on binding posts, cable receptacles, etc).	
7	Power and signal cables	Repair or replace cables in which wiring, insulation, or connectors are defective	
		INTERIOR	
8	Signal and power cables, cords, and wires.	Dress all cabling, wires, and cords neatly; use cable and cord clamps provided in shelter or electrical insulation tape and twine.	
		Repair or replace defective cables, cords, wires, and cords.	
9	Walls, ceiling, and floor.	Use touchup painting where paint is blistered, pitted, or flaking, and on bare metal spots.	Para 4-7.
10	Fire extinguisher	Refill if weight of contents is leas than required or seal is broken.	Appropriate personnel.
		Replace if valve assembly is damaged.	
11	First aid kit	Replace kit if it is broken or damaged. Replace parts that have been used (see parts list. inside cover of kit).	
12	shop stools	Repair or replace if parts are bent or broken, or if unsafe for use.	
18	Axe and sledge hammer	Replace if handle is broken, split or does not fit head tightly.	
14	Ladder	Use touchup painting where paint is blistered, pitted, or flaking, and cm bare metal spots.	Para 4-7.
		Repair or replace if steps, frame, or parts are bent or broken, or if it is unsafe for use.	None.

4-6. Troubleshooting Chart

Item No	Symptom	Probable trouble	Corrective action
1	No sc power in van ----------	*a*. Main circuit breaker tripped to OFF position.	*a* Operate MAIN circuit breaker on the power distribution panel to the ON position.
		b. External power source inoperative.	*b.* Check external power source.
		e. Defective power cable or connections.	*c.* Check power cable and connections; replace defective components.
2	Inoperative shelter components, i.e., heaters, exhaust blowers, air conditioners, air compressor, refrigerator.	*a.* Circuit breaker tripped OFF.	*a.* Make visual and electrical checks for shorts in equipment. Operate appropriate circuit breaker to ON.
		b. Faulty component in equipment.	*b.* Refer to appropriate manufacturer's or technical manual for troubleshooting information. For major repair, refer to appropriate MOS and category of maintenance.
3	Inoperative organizational equipments, i.e., dc power supply, frequency converters, and motor-generators.	*a.* Circuit breaker tripped OFF.	*a.* Make visual and electrical checks for short circuits before operating appropriate circuit breaker to ON.
		b. Faulty component in equipment.	*b.* Refer to appropriate manufacturer's or technical manual for troubleshooting information.
4	Inoperative communications equipment.		
	a. Intercommunications Station LS-147/ FL	*a.* Circuit breaker tripped OFF.	*a.* Make visual and electrical checks for short circuit before operating circuit breaker to ON.
		b. Faulty component in equipment.	*b.* Follow troubleshooting procedures in TM 11-6880-221-12.
	b. Telephone Set TA-312/PT.	*a.* Weak or dead batteries _____	*a.* Replace batteries in telephone.
		b. Faulty component in equipment.	*b.* Follow troubleshooting procedures given in TM 11-2165.

4-7. Preventive Maintenance Procedures

a. Cleaning.

Warning: Prolonged breathing of cleaning compound is dangerous; make sure that adequate ventilation is provided. Cleaning compound is flammable; do not use near a flame. Avoid contact with the skin; wash off any that spills on your hands.

(1) Use a dry, clean, lint-free cloth or brush to remove dust and dirt. If necessary, moisten the cloth or brush with Cleaning Compound (Federal stock No. 7930-395-9542) to remove grease, oil, dirt, and dust. After cleaning, wipe dry with a cloth.

Warning: Compressed air is dangerous and can cause serious bodily harm. It can also cause mechanical damage to the equipment. Do not use compressed air to dry parts where cleaning compound has been used.

(2) Dry compressed air, not to exceed 60 pounds per square inch, may be used to remove dirt and dust from inaccessible places.

b. Touchup Painting. Remove rust and corrosion from metal surfaces by lightly sanding them with fine sandpaper. Brush two thin coats of the proper paint on bare metal to protect it from further corrosion. Refer to applicable cleaning and refinishing practices specified in TM 9-213 and TB SIG 364.

c. Replacing Oil in Air Compressor (fig. 1-20) .

(1) Remove the air compressor from its mounting base (para 4-13).

(2) Place a support under the motor end of the air compressor and place a drain pan under the oil drain plug

(3) Remove the oil drain plug, drain the oil, and replace the drain plug.

(4) Remove the support ((2) above)

(5) Remove the oil level gage and fill the crankcase to the oil level mark. Use the appropriate grade oil according to the temperature range in which the air compressor will be used as outlined below:

Temperature	Use Iubricating oil,
32° F to 100° F	Grade 10
100° F and above	2190

(6) Replace the oil level gage.

4-8. Replacement of Hand lantern Batteries and Bulb

The hand lantern requires four Batteries BA-30 which are not supplied with the lantern. A spare bulb is stored inside the reflector case.

a. Replacing Batteries.

(1) Pull the battery case latch forward and raise the battery case cover.

(2) Insert four batteries in the case with the center brass caps up.

(3) Snap the battery case cover shut.

b. Replacing Bulb.

(1) Press the button on the bottom of the reflector case and lift out the reflector.

(2) Unscrew the brass cap at the rear of the bulb and remove the bulb and spring.

(3) Remove the spare bulb from inside the reflector case. Insert the bulb and spring in the. reflector and tighten the brass cap.

(4) Replace the reflector in the reflector case and snap it securely in position.

4-9. Removal and Replacement of lamps and Fluorescent lamp Starters

a. Flourescent Lamp.

(1) Pull gently to remove the light shield from the flourescent light fixture.

(2) Rotate the lamp in its sockets one-quarter turn and remove it from the fixture.

(3) Remove the spare lamp from its storage brackets.

(4) Align the lamp with the slots in the fixture sockets.

(5) Press in and rotate the lamp one-quarter turn to seat the pins firmly.

(6) Replace the light shield on the fluorescent light fixture.

b. Fluorescent Lamp Starter.

(1) Remove the light shield and lamp (a(l) and (2) above) to expose the starter.

(2) Press in and twist the starter one-quarter turn counterclockwise and withdraw it.

(3) Remove the spare starter from its storage bracket. Insert the new starter, press in, and turn it clockwise until it seats.

(4) Replace the lamp and light shield (a(4) through (6) above).

c. Neon and Incandescent Lamps. To remove a defective neon or incandescent lamp, unscrew it from its socket.

4-10. Removal and Replacement of Electric Heater
(fig. 1-7)

a. Removal.

(1) Operate the HEAT-OFF-FAN switch to OFF.
(2) Remove the power cord connector plug from the heater receptacle (fig. 1-7 and 4-2).
(3) Loosen the four turnlock fasteners that secure the heater to the mounting base.
(4) Remove the mounting base knob.
(5) Slide the heater to the right until it clears the flange on the mounting base and lift out the heater.

b . Replacement.

(1) Slide the heater onto the mounting base so that it engages the flanges.
(2) Tighten the four turnlock fasteners.
(3) Replace and tighten the mounting base knob.

4-11. Removal and Replacement of Exhaust Blower Cover

a. Operate the blower switch to OFF (fig. 4-1).

b. Remove the power cord connector plug from its receptacle.

c. Remove the 10 screws that secure the cover to the front wall and lift off the cover.

d. Replace the cover by following the procedures in the reverse order of removal (c through a above).

4-12. Removal and Replacement of TA-312/PT
(fig. 1-8)

a. Remove the telephone cord leads from the TA-312/PT binding posts.

b. Remove the flathead screw on the side of the mounting bracket.

c. Lift the TA–312/PT out of the mounting bracket and remove the holding plate from the buzzer recess on the side of the TA-312/PT,

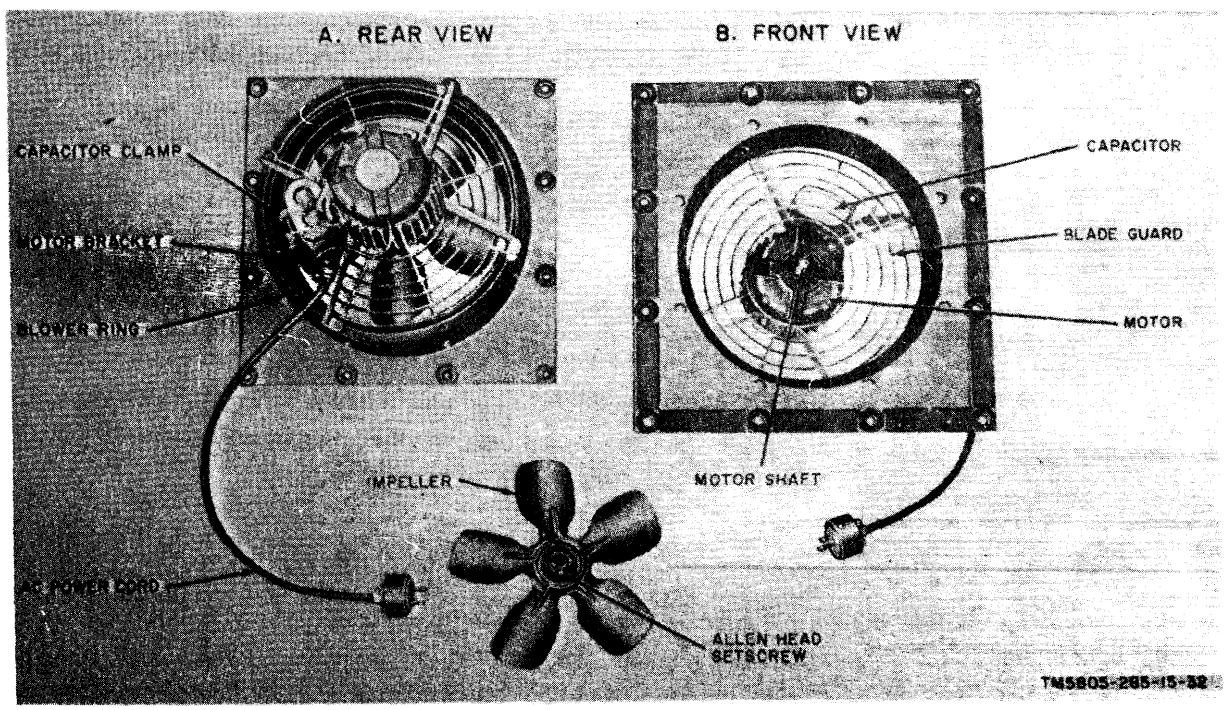


Figure 4-1. Exhaust blower, disassembled.

d. Remove the batteries from the TA-812/PT (TM 11-5805-201-12) .

e. Replace the TA-312/PT by following the procedures in the reverse order of removal (d through a above).

4-13. Removal and Replacement of Air Compressor

(fig. 1-20)

a. Remove the power cord connector plug from its receptacle in the power duct.

b. Loosen the wingnuts on the retaining bar.

c. Slide the air compressor forward, grasp the carrying handle, and lift it from its mounting base.

d. Replace the air compressor by following the procedures in the reverse order of removal (*c* through *a* above).

Section II. DS, GS, AND DEPOT MAINTENANCE

4-14. Troubleshooting Information

a. Procedures for localizing troubles within the AN/ASM-189 and AN/ASM-190 are given in the troubleshooting chart (para 4-6).

b. Procedures for troubleshooting components, parts, and wiring of the vans are given in paragraph 4-16 through 4-22.

c. Procedures for troubleshooting the organizational equipment of the AN/ASM–189 and AN/ASM–190 are given in the applicable technical manuals.

4-15. Troubleshooting and Repair Procedures

Warning: Be extremely careful when performing the troubleshooting procedures; dangerous voltages are present in the equipment.

Isolate defective components, parts, or wiring of the vans by making appropriate voltage, resistance, or continuity tests with Multimeter TS-352B/U. Refer to figures 5-1 and 5-2 when isolating trouble in the power circuits of configuration A and to figures 2-6, 5-3, 5-4, 5-5, and 5-6 when isolating trouble in the power circuits of configurations B and C. Repair or replace components, parts, or wiring.

4-16. Circuit Breaker Replacement

Warning: Disconnect the power input cable from the appropriate power receptacle in the power entrance box before replating the circuit breakers.

a. Remove the screws from the cover of the power distribution panel or the D. C. AND 400 CYCLE AC. C. CONTROL panel, as required and remove the cover.

b. Grasp the defective circuit breaker and pull it out of the power distribution panel; tag and disconnect the attached wires.

c. Attach the wires removed (b above) and plug in the new circuit breaker. Check to be sure that the replacement circuit breaker is in the OFF position.

d. Replace the cover on the approriate panel with the cover screws.

e. Operate the replacement circuit breaker to ON.

4-17. Electric Heater Repairs

(fig. 4-2)

a. Preliminary Procedures. Before performing the repair procedures given in b through *g* below, remove the heater from its mounting base (para 4-10) and remove the backplate and bottom plate as follows:

(1) Remove the four screws that secure the bottom plate to the heater.
(2) Remove the two screws that secure the backplate to the bottom plate, and remove the bottom plate.
(3) Loosen the power cord clamp on the backplate.
(4) Remove the four screws that secure the backplate to the heater and remove the backplate.

b. Removal and Replacement of Power Cord.

(1) Loosen the screws that secure the power cord leads to terminal board TB1 (fig. 4-2).
(2) Pull the power cord out of the clamp in the backplate.

(3) Insert a new power cord through the clamp in the backplate.
(4) Connect the leads to terminal board TB1.

c. Removal and Replacement of Temperature Control Unit.

(1) Loosen the screws that connect the two wires to the temperature control unit.
(2) Remove the two screws that secure the unit to the cabinet and remove the unit.
(3) Insert the TEMPERATURE CONTROL switch on the replacement unit through the slot in the cabinet. Replace and tighten the screws.
(4) Connect the two wires to the temperature control unit.

d. Removal and Replacement of HEAT-OFF-FAN Switch.

(1) Tag and unsolder the three wires and strap connected to the switch.
(2) Remove the ringnut that secures the switch through the top of the cabinet and remove the switch.
(3) Solder the strap and the three wires to the replacement switch.
(4) Position the switch and tighten the ringnut.

e. Removal and Replacement of Reset Circuit Breaker.

(1) Loosen the screws that secure the two insulated wires to the circuit breaker, Loosen the bolt that secures the bare copper wire to the heating element,
(2) Remove the mounting screws that fasten the circuit breaker to the cabinet and remove the circuit breaker.
(3) Connect the two insulated wires ((1) above) to the replacement circuit breaker. Connect the bare copper wire to the heating element.

Caution: Do not alter the shape or length of the bare copper wire.

(4) Position the circuit breaker and replace and tighten the mounting screws.

f. Removal and Replacement of Motor and Impeller.

(1) Remove the four screws that secure the motor bracket to the cabinet and lift out the motor and bracket.
(2) Tag and disconnect the motor leads at the HEAT-OFF-FAN switch and at the taped splice in the heating element cable.
(3) Remove the three screws that secure the motor to the bracket.
(4) Unscrew the metal fastener that secures the impeller to the motor shaft and remove the impeller.
(5) Position and secure a replacement motor in the bracket. Slide the impeller onto the motor shaft and tighten the fastener.
(6) Replace the motor bracket in the cabinet and connect the motor leads ((2) above).

g. Removal and Replacement of Heating Element.

(1) Remove the four screws that secure the rector bracket to the cabinet. Remove the motor bracket.
(2) Loosen the bolt that secures the bare copper wire from the circuit breaker to the heating element and remove the wire.

Caution: Be extremely careful when removing this lead. Do not alter the length or shape of the bare copper wire.

(3) Tag and remove the wire connections from the plug-in terminals on the heating element.
(4) Remove the screws that secure the heating element to the cabinet. Be careful not to bend the louvers on the front of the cabinet during the removal procedure.
(5) Position the replacement element and replace and tighten the screws.
(6) Connect the wires to the plug-in terminals of the heating element.
(7) Replace the bare wire connected from the circuit breaker ((2) above).
(8) Position the motor bracket in the cabinet and replace and tighten the screws.

4-18. Exhaust Blower Repairs
(fig. 4-1).

a. Preliminary Procedures. Before performing the repair procedures given in *b*

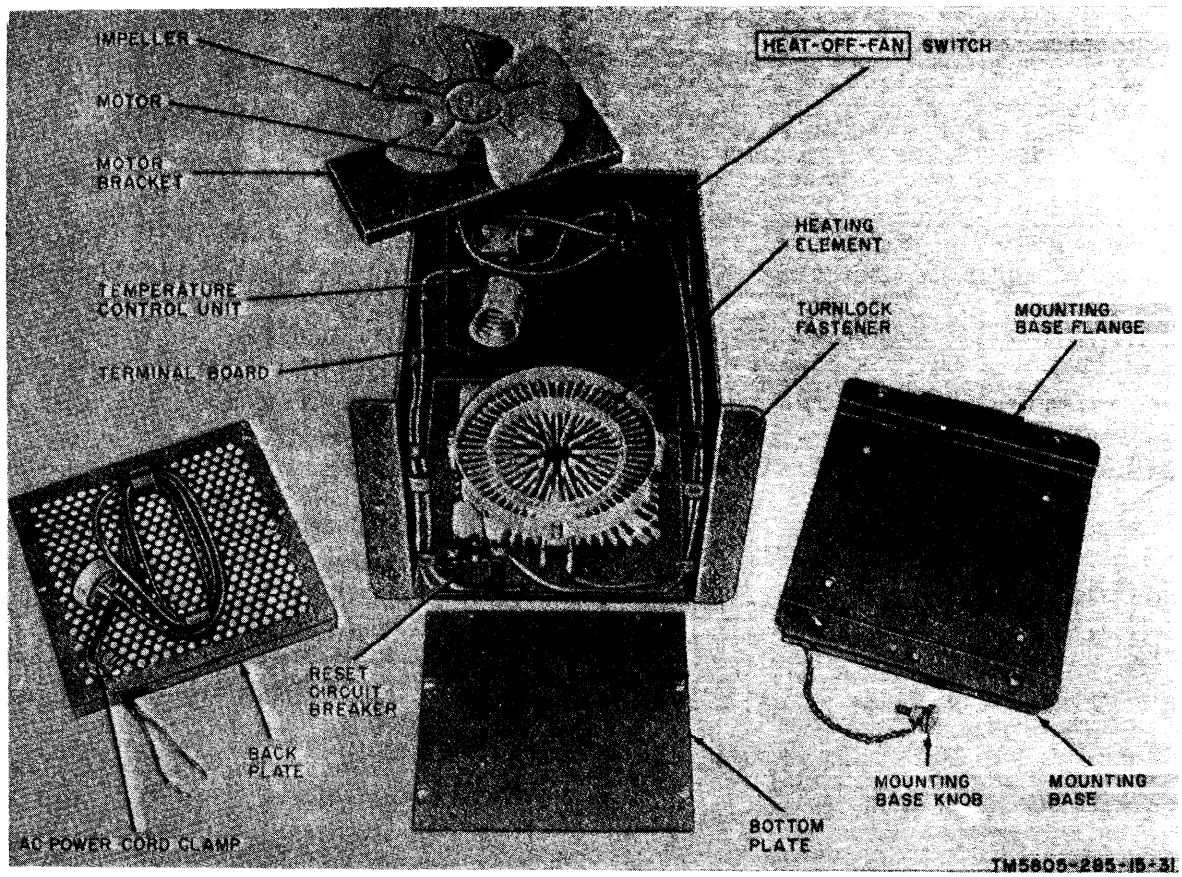


Figure 4-2. Electric heater, disassembled.

through d below, remove the exhaust blower cover and remove the power cord connector plug from its receptacle.

b. Removal and Replucement of capacitor.

(1) Loosen the capacitor clamp screw.
(2) Remove the power cord clamp from the motor bracket.
(3) Slide the capacitor out of the clamp.
(4) Tag and disconnect the motor leads and the power cord from the capacitor terminals.
(5) Connect the motor leads and the power cord to the replacement capacitor (fig. 4-1).
(6) Slide the capacitor into the clamp and tighten the screw.
(7) Replace the power cord clamp.

c. Removal and Replacement of Power Cord.

(1) Remove the capacitor from the clamp (b(2) through (4) above).
(2) Disconnect the power cord leads from the capacitor and motor leads.
(3) Connect the new power cord to the capacitor and motor leads (fig. 4-1).
(4) Slide the capacitor into the clamp and tighten the screw.
(5) Replace the power cord clamp.

d. Removal and Replacement of Motor and Impeller.

(1) Remove the two screws from the bottom edge of the plate that holds the exhaust blower to the front wall.
(2) Lift the exhaust blower away from the wall.
(3) Remove the four bolts that secure the blade guard and motor brackets to the blower ring.
(4) Tag and disconnect the motor from the capacitor and power cord.

(5) Remove the power cord clamp.
(6) Remove the four screws that secure the motor mounting bracket to the motor.
(7) Loosen the two Allen-head setscrews that secure the impeller to the motor shaft and remove the impeller.
(8) Slide the impeller (setscrews toward the motor) onto the shaft of the new motor and tighten the setscrews.
(9) Secure the motor bracket to the new motor.
(l0) Connect the motor leads to the capacitor and power cord (fig. 4-1).
(11) Replace the power cord clamp.
(12) Position the motor bracket and blade guard on the blower ring.
(13) Replace and tighten the bolts that secure the motor bracket and blade guard to the blower.
(14) Replace the exhaust blower by following the procedures in the reverse order of removal ((1) and (2) above).
(15) Replace the exhaust blower cover.

4-19. Removal and Replacement of Switches

a. Operate the associated circuit breaker switch to OFF.

b. Remove the screws from the brackets at each end of the switch. Remove the two brackets and the switchplate.

c. Remove the switch mounting screws and the switch.

d. Tag and remove the wires from the switch and connect them to the replacement switch.

e. Replace the switch by following the procedures in reverse order of removal *(d* through *a* above).

4-20. Removal and Replacement of Fluorescent light Fixture Components

Note. The flourescent light fixtures are fabricated as part of the power duct. The radiofrequency filters are sealed units; they are not repairable and are replaced as a complete unit.

a. Operate the associated LIGHT switch to OFF; remove the light shield and the fluorescent lamp (para 4-9a).

b. Carefully pry off the associated power duct cover.

c. Tag and disconnect the wires from the defective component and remove the defective component from the power duct.

d. Secure the replacement component in the power duct.

e. Connect the wires to the replacement component.

f. Replace the cover on the power duct.

g. Replace the fluorescent lamp and light shield (para 4-9a).

4-21. Air Compressor Repairs (fig. 1-20)

Remove the air compressor from its mounting base (para 4-13) to perform the repairs given in a through e below.

a. Removal and Replacement of Power Cord.
(1) Loosen the two screws which secure the plate that covers the power cord connections to the motor.
(2) Tag and disconnect the power cord leads from the terminals on the motor.
(3) Remove the ac power cord from its clamp.
(4) Insert the replacement power cord in the clamp.
(5) Connect the leads to the motor terminals.

b. Removal and Replacement of V-Belt and Motor.
(1) Loosen the four mounting bolts on the base of the motor to replace the V-belt; remove the bolts to replace the motor.
(2) Slide the motor toward the air receiver to provide enough slack to remove and replace the belt.
(3) Replace the belt and take up the slack by sliding the motor away from the air receiver.

Caution: Tighten sufficiently to prevent belt from slipping. Overtightening will cause overheating and excessive bearing and belt wear.

(4) Tighten the bolts on the base of the motor.

c. Removal and Replacement of Air Outlet Coupling and Safety Valve.

(1) Select the proper size wrench and remove the air outlet coupling or the safety valve by turning the wrench counterclockwise.
(2) Seat and tighten the replacement item in place.

d. Removal and Replacement of Head Gasket.

(1) Loosen the coupling which secures the air tube to the compressor head and remove the air tube from the head.
(2) Remove the head bolts and remove the head.
(3) Remove the defective gasket and clean the surfaces between the head and the compressor cylinder.
(4) Position the replacement gasket on the compressor cylinder and position the head on the gasket.
(5) Replace and tighten the head bolts a little at a time to maintain an even pressure on all parts of the head. Do not tighten any one of the bolts all the way at one time.
(6) Seat the air tube and secure the air tube coupling to the compressor head.

e. Removal and Replacement of Components of Compressor Assembly.

(1) Remove the V-belt (b above).
(2) Remove the flywheel by loosening the flywheel setscrew.
(3) Remove the end plate by removing the bolts.
(4) Remove the inspection plate by removing the screws.
(5) Remove the inspection plate gasket.
(6) Remove the rod and cap assembly by removing the hexagonal capscrew and lockwasher.
(7) Remove the screw and washer below the crankshaft.
(8) Remove the crankshaft ring.
(9) Remove the crankshaft and oil cap assembly.
(10) Remove the ball bearing (flywheel side).
(11) Remove the rod and piston assembly through the inspection plate opening.
(12) Release the snapring and remove the wristpin and connecting rod.
(13) Reassemble the compressor assembly by following the procedures in the reverse order of assembly ((12) through (1) above).

4-22. Van Maintenance

a. The maintenance or replacement of the shelter racks, frames, brackets, and assorted hardware is accomplished by removing and replacing screws or bolts. When any exterior component of the shelter is replaced, be sure that the gasket is adequately sealed to the shelter to prevent leakage. The responsibilities for shelter maintenance are listed in the maintenance allocation chart (appx B).

b. The exterior skin of the shelter is susceptible to puncturing or gouging during the loading and transportation procedures. Use Patch Kit, Shelter, Electrical Equipment (Federal stock No. 5410–783–6250) to repair the roof or sides of the shelter as described in the instructions provided with the patch kit and given below.

(1) Use emery cloth, sandpaper, a knife, or scraper, and remove all paint or foreign matter within a 3–inch radius around the hole to be patched. Do not touch the cleaned area with hands or dirty rags.
(2) If the insulation has been gouged out, fill the hole with clean noncombustible material, if possible. Do not use the glass cloth for this purpose.
(3) Cut out a piece of glass cloth that will extend 2 inches beyond the edges of the hole to be repaired.

Warning: Resin No. 797 and curing agent No. 237 are harmful to the skin. Wash thoroughly with water any area of the body that may have come in contact with the liquid resin or curing agent.

(4) Pour 3 ounces of resin No. 797 for each square foot of surface area to be

covered into the mixing cup provided. Shake the can thoroughly" before pouring the resin. Temperature and climate will determine the quantity of curing agent and cold weather promoter to be added to the resin. Use the eye dropper and prepare the mixture as follows:

(a) For ternpeatures above 65° F, fill the eye dropper to the redline with curing agent No. 237. Add the curing agent to the resin and mix thoroughly.

(b) For temperatures between 20° and 55° F, fill the eye dropper to the redline with curing agent No. 237. Fill the eye dropper to the halfway mark with cold weather promoter No. 347. Add the coldweather promoter to the combined curing agent and resin and mix thoroughly.

(c) For temperatures below 20° F, fill the eye dropper to the redline with curing agent No. 237; add the curing agent to the resin and mix thoroughly. Fill the eye dropper to the redline with cold weather promoter No. 347. Add the cold weather promoter to the combined curing agent and resin and mix thoroughly.

(5) Use the spatula (or the brush in hard-to-reach areas or when the temperature is above 55° F) and spread a liberal coating of the prepared mixture over the surface to be patched. Place the glass cloth ((3) above) over the coating and press it lightly with the applicator. Spread a second liberal coating of the mixture over the glass cloth; work from the center of the patch towards the edges.

(6) Examine the patch to see that the edges are flat and firmly embedded in the mixture. Be sure that the patch is completely covered by the mixture. Prepare and apply an additional mixture, if necessary.

Note. To accelerate curing during cold weather, heat the patch with warm, dry air or radiant heat. Do not use an open flame.

(7) Depending on the temperature and drying conditions, the patched surface may be sanded and painted within 4 to 24 hours after application of the patch. After the mixture in the cap and on the spatula has hardened, flex the cup and the spatula to crack the mixture. Clean the cup and spatiula and store them for future use. Discard the used brush; recap and store the containers.

Caution: Shelf-life is severely limited by heat; recap the containers tightly and store them in a cool dry place.

CHAPTER 5
LIMITED STORAGE AND TRANSIT AND DEMOLITION TO PREVENT ENEMY USE

Section I. OPERATOR'S AND ORGANIZATIONAL MAINTENANCE

For Electronic Shops, AN/ASM-189 and AN/ASM-l90. that have been modified by MWO 11-5800-220-50-1, the air conditioner(s) were removed and replaced by an environmental control unit(s) (ECU). Other necessary electrical/power wiring changes, including upgrade to a five-wire electrical system, have been performed to only that portion of the van's electrical system directly affected by the addition of the ECU(s). For technical description and maintenance support documentation concerning, configuration changes made to the AN/ASM-189 and AN/ASM-l90, as a result of application of MWO 11-5800-220-50-1, refer to APPENDIX F.

5-1. Preparation for Transit and Limited Storage

Perform the following procedures when the repair van or storage van is to be moved to another location or placed in limited storage.

a. Perform the stopping procedures for components as specified in the applicable technical manuals.

b. Perform the stopping procedures for the air conditioner and heater, as applicable.

c. Place all circuit breakers in the power distribution panel (all configurations) and the associated circuit breaker on the D. C. AND 400 CYCLE A. C. CONTROL panel (AN/ASM-189 conjurations B and C) in the OFF position. Check to see that the emergency lights switch is in the ON position.

d. Stop the power unit or remove power from the source terminals. Disconnect the power cable and ground strap from the power entrance box. Replace the covers on all connectors and receptacles and close the power entrance box cover.

e. Secure all equipments for transit.

f. Disconnect all power cables and field wire connections from the entrance boxes,

g. Replace the covers on all cable connectors and receptacles.

h. Close and secure the covers on all exterior vents and entrance boxes.

i. Wrap the cables on their respective reels and secure the reels for transit.

j. Remove the ground strap from the ground rod and remove the ground rod. Store the ground rod and strap in their storage locations.

k. Disconnect the power cable from the power source. Wrap the power cable on its reel (fig. 2-4); store and secure the power cable reel.

l. Secure the personnel ladder and all miscellaneous items in their storage and transit racks; secure all items of equipment in their cabinets, holders, and mounting facilities.

m. Recheck the area for any loose items, Be sure that all items are properly stored and that the van and site area have been policed.

n. Place the emergency lights switch in the OFF position.

CAUTION

When the van is to be placed in limited storage, open the air filter vent to insure adequate circulation during storage.

c. Prepare the power units for transit or storage, as applicable.

p. Close and secure the van door.

5-2. Transportation

The vans can be transported by vehicle or cargo aircraft. Follow the steps and procedures given in paragraph 2-1 in the reverse order of installation to couple the van to the tractor. Prepare the power units for transport as described in the applicable technical manual.

CAUTION

When the vans are be transported by cargo aircraft, open all wall vents to insure equalization of interior air pressure during transport.

Section II. DEMOLITION OF MATERIEL TO PREVENT ENEMY USE

5-3. Authority for Demolition

Demolition of the vans and equipment will be accomplished only upon the order of the commander. The destruction procedures outlined in paragraph 5-5 will be used to prevent further use of the equipment.

5-4. Methods of Destruction

Use any of the following methods to destroy the equipment.

WARNING

Disconnect or remove all power before proceeding.

a. *Smash.* Smash the entrance panels, distribution boxes, switches, connectors, and meters; use sledges, axes, hammers, or crowbars.

b. *Cut.* Cut all cables and cords; use axes, handaxes, or machetes.

WARNING

Be extremely careful with explosives and incendiary devices. Use these items only when the need is urgent.

c. *Burn.* Burn cables, cords, and technical manuals; use gasoline, kerosene, oil, or incendiary grenades. Burn the van interiors and stored equipment; use oil, kerosene, or incendiay grendes. Open all van doors and vents. Pour several gallons of oil or kerosene in the vans. Throw incendiary grenades or ignited oil-soaked rags into the vans.

d. Explode. If the use of explosives is necessary, use firearms, grenades, or TNT.

e. Dispose. If time permits, bury or scatter the destroyed parts in slit trenches, foxholes, or throw them into streams.

APPENDIX A
REFERENCES

AR 735-11-2	Reporting of Transportation Discrepancies in Shipment.
DA Pam 25-30	Consolidated Index of Army Publications and Blank Forms.
DA Pam 738-750	The Army Maintenance Management System (TAMMS).
TB SIG 364	Field Instructions for: Painting and Preserving Electronics Command Equipment Including Camouflage Pattern Painting of Electrical Equipment Shelters.
TB 43-0125	Installation of Communications-Electronic Equipment; Hookup of Electrical Cables to Mobile Generator Sets on Fielded Equipment to Meet Electrical Safety Standards.
TM 5-4120-379-14	Operator's Organizational, Direct Support and General Support Maintenance Manual for Air Conditioner, Horizontal Compact 18,000 btu/hr 208-volt, 3-phase, 50/60 Hertz, NSN 4120-01-136-9836.
TM 5-4120-384-14	Operator's Organizational, Direct Support and General Support Maintenance Manual for Air Conditioner, Horizontal Compact: 18,000 BTU, 208 V, 3 Phase, 50/60 Hz, Model F18H-3S (NSN 4120-01-165-1125), MDL: F18H3SA (4120-01-237-0663); MDL: F18H-3SB (4120-01-268-445 1) and 230 V, Single Phase, 60 Hz, MDL: F18H-lS (4120-01-268-4450)
TM 5-6115-365-15	Operator, Organizational, Direct Support, General Support and Depot Maintenance Manual (Including Repair Parts and Special Tools List): Generator Sets, Gasoline and Diesel Engine Driven, Trailer Mounted PU-236A/G, PU-236/G (NSN 6115-00-393-1709), PU-236B/G (NSN 6115-00-738-6334); PU-253A/U, PU-253/U (6115-00-497-2402); PU-304C/MPQ4 (6115-00-056-8421); PU-332/G (6115-00-577-8471); PU-332A/G (6115-00-738-8336); PU-375A/G, PU-375/G (6115-00-753-2231); PU-375B/G (6115-00-931-6789); PU-40l/M (6115-00-823-2217); PU-402/M (6115-00-722-3760); PU-406/M (6115-00-738-6342); PU-409/M (6115-00-702-3343); PU-409A/M (6116-430-738-6338); PU-495/G (6115-00-823-2218); PU-551/G (6115-00-889-1307); PU-564A/G (6115-00-728-6341); PU-564B/G (6115-00-179-2789); PU-617/M (6115-00-738-6335); PU-618/M (6115-00-738-4337); PU-619/M (6115-00-738-6339); PU-620/M (6115-00-738-6340); PU-625/G (6115-00-873-3915); PU-628/G (6115-00-087-0873); PU-629/G (6115-00-937-5555); PU-63l/G (6115-00-059-5172); PU-656/G (6115-00-989-3296) and PU-650B/G (6115-00-258-1622).
TM 5-6115-545-12	operator's and Organizational Maintenance Manual: Generator Set, Diesel Engine Driven, Tactical Skid Mtd., 60kW, 3 Phase, 4 Wire, 120/208 and 240/416 V (DOD Models MEP-006A) Utility Class, 50/60 Hz (NSN 6115-00-118-1243), (Model MEP-105A) Precise Class, 50/60 Hz (6115-00-118-1252) and (Model MEP 115A) Precise Class, 400 Hz (6115-00-118-1243) (TO 35C2-3-444-l; NAVFAC-P-8-626-12; TM-00038G-12) (Reprinted w/basic Incl C1-8).
TM 5-6115-632-14&P	Operator's, Unit, Intermediate Direct Support and Intermediate General Support Maintenance Manual (Including Repair Parts and Special Tools Lists) Power Unit PU-753-M (NSN 6115-00-033-1389) MEP-003A 10 kW 60 Hz Generator Set Ml16A2 2-Wheel, 2-Tire, Modified Trailer.

TM 9-2330-246-14	Operator's, Organizational, Direct Support and General Support Maintenance Manual Including Repair Parts and Special Tools Lists for Semitrailer, Van Electronic, 6-Ton, 2-Wheel, M348A2 (2330-00-678-3838), M348A2C (2330-00-690-7724), M348A2D (2330-00-690-7725), M348A2F (2330-00-690-7726), M348A2G (2330-00-797-7405), M348A2H (2330-00-973-1262), M348A2K (2330-00-740-2322), M348A2N (2330-00-740-2329), M373A2 (2330-00-705-8932), M373A2C (2330-672-00-7496), M373A2D (2330-00-738-5869), M373A2E6 (2330-00-134-4672), M373A2E7 (2330-00-134-4671), M373A3 (2330-00-937-4518), M373A4 (2330-00-937-4519), M373A5 (2330-00-781-7755), XM1005 (2330-01-107-5728), and XM1007 (2330-01-109-5961).
TM 11-5805-201-12	Operator's and Unit Maintenance Manual for Telephone Sets, TA-312/PT (NSN 5805-00-543-0012) and TA-312A/PT (NSN 5805-01-217-7310) (TO 31W1-2PT-291).
TM 11-5805-201-23P	Organizational and Direct Support Maintenance Repair Parts and Special Tools Lists for Telephone Sets, TA-312/PT (NSN 5805-00-543-0012) and TA-312A/PT (NSN 5805-01-217-7310) (TO 31W1-2PT-291).
TM 11-5805-201-35	Direct Support, General Support. and Depot Maintenance Manual for Telephone Sets, TA-312/PT (NSN 5805-00-543-0012) and TA-312A/PT (NSN 5805-01-217-7310) (TO 31W1-3PT-292).
TM 11-5830-221-12	Operator's and Organizational Maintenance Manual: Intercommunication Stations LS-147A/FI, LS-147B/FI, LS-147C/FI, and LS-147D/FI (NSN 5830-00-752-5357).
TM 11-5830-221-24P	Organizational, Direct Support, and General Support Maintenance Repair Parts and Special Tools List for Intercommunication Stations LS-147A/FI LS-147B/FI, LS-147C/FI, and LS-147D/FI.
TM 11-5830-221-35	Field and Depot Maintenance Manual: Intercommunication Stations LS-147A/FI, LS-147B/FI, LS-147C/FI, and LS-147D/FI.
TM 11-6125-240-12	Operator's and Organizational Maintenance Manual for Motor-Generator PU-545/A (NSN 6125-00-958-6915).
TM 11-6125-240-34	Direct Support and General Support Maintenance Manual for Motor-Generator PU-545/A (NSN 6125-00-958-6915).
TM 11-6125-240-34P	Direct Support and General Support Maintenance Repair Parts and Special Tools List (including Depot Maintenance Repair Parts and Special Tools) for Motor-Generator, PU-545/A (NSN 6125-00-958-6915).

APPENDIX B
BASIC ISSUE ITEMS LIST (BIIL) AND ITEMS TROOP INSTALLED OR AUTHORIZED LIST (ITIAL)

Section I. INTRODUCTION

B-l. Scope

This appendix lists only basic issue items required by the crew/operator for installation, operation, and maintenance of the Electronic Shops, Semi-trailer Mounted AN/ASM-189 and AN/ASM-190.

B-2. General

This Basic Issue Items and Items Troop Installed or Authorized List is divided into the following sections:

a. Basic Issue Items List – Section II. A list, in alphabetical sequence, of items which are furnished with, and which must be turned in with the end item.

b. Items Troop Installed or Authorized List - Section III. Not applicable.

53. Explanation of Columns

The following provides an explanation of columns found in the tabular listings:

a. Illustration. This column is divided as follows:

(1) *Figure number.* Indicates the figure number of the illustration in which the item is shown.

(2) *Item number.* Not applicable.

b. National Stock Number. Indicates the National stock number assigned to the item and will be used for requisitioning purposes.

c. Description. Indicates the National item name and a minimum description required to identify the item.

(1) *Part number.* Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications standards, and inspection requirements, to identify an item or range of items.

(2) *Federal supply code for manufacturer (FSCM).* The FSCM is a 5-digit numeric code used to identify the manufacturer, distributor, or Government agency, etc., and is identified in SB 708-42.

d. Unit of Measure (U/M). Indicates the standard of basic quantity of the listed item as used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation, (e.g., ea, in., pr, etc.). When the unit of measure differs from the unit of issue, the lowest unit of issue that will satisfy the required units of measure will be requisitioned.

e. Quantity Furnished with Equipment (Basic Issue Iterm Onlp). Indicates the quantity of the basic issue item furnished with the equipment.

Section II
BASIC ISSUE ITEMS LIST

(1) Illustration		(2) National stock number	(3) Part number & FSCM / Usable on code	(4) Qty furn with equip
(A) Fig. No.	(B) Item No.			
		4120-00-727-8111	AXE. FIRE	2
5-7		4210-00-270-4512	Extinguisher, 5 lbs, CO^3	3
		5120-00-251-4489	HAMMER, HAND: 8 lb sledge	1
			PADLOCK AND KEYS	2
			PADLOCK COMBINATION: MASTER 1,500; C1180; 39428	1
		5975-00-224-5260	ROD, GROUND MX-148/G	4
			HANDLE, HAMMER	1
			STRAP, GROUND 1 in braid	1
			FIRST AID KIT	2

APPENDIX C
MAINTENANCE ALLOCATION

Section I. INTRODUCTION

C-1 . GENERAL

This appendix provides a summary of the maintenance operations for AN/ASM-189 and AN/ASM-190. It authorizes levels of maintenance for specific maintenance functions on repairable items and components and the tools and equipment required to perform each function. This appendix may be used as an aid in planning maintenance operation.

C-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.

b. Test. To verify serviceability and to detect incipient failure by measuring the mechanical 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 (decontaminate), to preserve, to drain, to paint, or to replenish fuel, lubricants, hydraulic fluids, or compressed air supplies.

d. Adjust. To maintain, within prescribed limits, by bringing into proper or exact position, or by setting the operating characteristics to the 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 discrepant in the accuracy of the instrument being compared.

g. Install. The act of emplacing, seating, or fixing into position an item, part, module (component or assembly) in a manner to allow the proper functioning of the equipment or system.

h. Replace. The act of substituting a serviceable like type part, subassembly, or module (component or assembly) for an unserviceable counterpart.

i. Repair. The application of maintenance services (inspect, test, service, adjust, align, calibrate, replace) or other maintenance actions (welding, grinding, riveting, straightening, facing, remachining, or resurfacing) to 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) necessary to restore an item to a completely Serviceable/operational condition as prescribed by maintenance standards (i.e., DMWR) in appropriate technical publications. 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 materiel maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours, miles, etc.) considered in classifing Army equipments/components.

C-3. EXPLANATION OF COLUMNS

(Section II)

a. Column 1, Group Number. Column 1 lists group numbers which identify components, assemblies, subassemblies, and modules with the next higher assembly.

b. Column 2, Component/Assembly. Column 2 contains the noun names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

c. Column 3, Maintenance Functions. Column 3 lists the functions to be performed on the item listed in column 2. When items are listed without maintenance functions, it is solely for the purpose of having the group numbers in the MAC and RPSTL coincide.

d. Column 4, Maintenance Level. Column 4 specifies, by the listing of a work time figure in the appropriate subcolumn(s), the lowest level 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 level of maintenance. If the number or complexity of the tasks within the listed maintenance function vary at different maintenance levels, appropriate work time figures will be shown for each level. The number of task-hours specified by 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 operating conditions. This time includes preparation time, troubleshooting 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. Subcolumns of column 4 are:

UNIT

C - Operator/Crew
O - Organizational

DIRECT SUPPORT

F - Direct Support

GENERAL SUPPORT

H - General Support

DEPOT

D - Depot

e. Column 5, Tools and Equipment. Column 5 specifies by code those common tool sets (not individual tools) and special tools, test, and support equipment required to perform the designated function.

f. Column 6, Remarks. Column 6 contains an alphabetical code that leads to a remark in Section IV REMARKS, which is pertinent to the item opposite the particular code.

C-4. TOOL AND TEST EQUIPMENT REQUIREMENTS (Section Ill)

a. Tool or Test Equipment Reference Code. The numbers in this column coincide with the numbers used in the tools and equipment column of the MAC. The numbers indicate the applicable tool or test equipment for the maintenance functions.

b. Maintenance Level. The codes in this column indicate the maintenance level allocated the tool or test equipment.

c. Nomenclature. This column lists the noun name and nomenclature of the tools and test equipment required to perform the maintenance functions.

d. National/NATO Stock Number. This column lists the National/NATO stock number of the specified tool or test equipment.

e. Tool Number. This column lists the manufacturer's part number of the tool followed by the 5-digit Commercial and Government Entity (CAGE) code in parentheses.

C-5. REMARKS (Section IV)

Reference Code. This code refers to the appropriate item in Section II, column 6.

b. Remarks. This column provides the required explanatory information necessary to clarify items appearing in Section II.

Section II. MAINTENANCE ALLOCATION CHART (MAC)
FOR
ELECTRIC SHOP, SEMITRAILER MOUNTED AN/ASM-189 & AN/ASM-190

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINT FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQUIPMENT	(6) REMARKS
00	ELECTRONIC SHOPS, SEMITRAILER MOUNTED AN/ASM-189 AND AN/ASM-190	INSPECT		0.5					A
		TEST		1.0				2	
		REPAIR			3.0			2, 3	
		REBUILD					400.0	2, 3	
01	SEMITRAILER VAN FACILITY M373A2 AND M348A2	REPAIR							B
02	ANTENNAS AT-454A/ARC	REPAIR							C
03	AT-701/AR	REPAIR							D
04	AT-450/ARC	REPAIR							E
05	AS-580/ARN	REPAIR							F
06	CABLE ASSEMBLIES	INSPECT		0.1					G
		TEST		0.2				2	H
		REPLACE		1.0				1	
		REPAIR			2.0			1, 2, 3	Q
07	CONDUIT ASSEMBLIES	INSPECT							G
		TEST		0.2				2	I
		TEST			0.4			2	
		REPLACE		0.3				1	
		REPAIR			1.0			3	
08	COMPRESSOR ASSEMBLY, AIR COMPRESSOR, RECIPROCAL	REPLACE		1.0				1	G
		OVERHAUL					40.0	2, 3	
09	ECU	INSPECT		1.0					J
10	FAN, VENTILATING	REPLACE		0.5				1	
		REPAIR			1.0			3	
11	HEATER, SPACE, ELECTRICAL	INSPECT		1.0					K
		REPLACE		2.0				1	
		REPAIR			3.0			3	L
		REPAIR				0.5		3	
		OVERHAUL					24.0	2, 3	
12	INTERCOMMUNICATION STATION LS-147A, B, C, D/FI	REPAIR							M

Section II. MAINTENANCE ALLOCATION CHART (MAC)
FOR
ELECTRIC SHOP, SEMITRAILER MOUNTED AN/ASM-189 & AN/ASM-190

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINT FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQUIPMENT	(6) REMARKS
13	PANEL, POWER DISTRIBUTION	INSPECT		1.0					
		TEST		0.2				2	
		TEST			0.3			2	
		REPLACE		1.0				1	
		REPAIR			0.5			3	
		OVERHAUL					5.0	2, 3	
14	LIGHTING	INSPECT		0.1					
		TEST		0.1				2	
		SERVICE		0.2				1	
		REPLACE		0.2				1	
15	POWER MONITOR PANEL	INSPECT		0.1					
		TEST		0.2				2	
		REPAIR			0.5			2, 3	
		REPLACE			0.5			3	
16	DC & 400 Hz AC CONTROL PANEL	INSPECT		0.5					
		TEST		1.0				2	
		REPAIR			2.0			3	
		REPLACE			3.0			3	
17	MOTOR GENERATOR, PU-545/A	REPAIR							N
18	POWER SUPPLY, DC	INSPECT		0.2					
		TEST		0.3				2	
		TEST			0.4			2	
		ALIGN			0.5			3	
		REPLACE		0.5				1	O
		REPAIR			1.0			3	
		OVERHAUL					24.0	2, 3	
19	TELEPHONE SET, TA-312/PT	REPAIR							P

SECTION III. TOOL AND TEST EQUIPMENT REQUIREMENTS
FOR
Electronic Shop, Semitrailer Mounted AN/ASM-189 and AN/ASM-190

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE CATEGORY	NOMENCLATURE	NATIONAL/NATO STOCK NUMBER	TOOL NUMBER
1	O	Tool Kit, Electronic Equipment TK-101/G	5180-00-064-5178	
2	O, F, H, D	AN/PSM-45	6625-01-139-2512	
3	F, H, D	Tool Kit, Electronic Equipment TK-100/G	5180-00-605-0079	

SECTION IV. REMARKS

REFERENCE CODE	REMARKS
A	Visually inspect unit/assembly for damage, cracks, corrosion, touch-up paint, and lubrication.
B	See MAC in TM 9-2330-246-14.
C	See MAC in TM 11-5821-204-12.
D	See MAC in TM 11-5821-205-12.
E	See MAC in TM 11-5821-231-15P.
F	See MAC in TM 11-5826-207-12P.
G	Visual inspection.
H	Perform continuity test.
I	Testing of lamps and fixtures.
J	See MAC in TM 5-4120-379-14.
K	Applies to AN/ASM-190 only.
L	Replacement of switches.
M	See MAC in TM 11-5830-221-12.
N	See MAC in TM 11-6125-240-12.
0	Replacement of fuses and knobs.
P	See MAC in TM 11-5805-201-12.
Q	Repair in accordance with TM 55-1500-323-24.

APPENDIX D
COMPONENTS OF ELECTRONIC SHOP, SEMITRAILER MOUNTED AN/ASM-189

The chart below lists the components of the AN/ASM-189. Not included in the chart are the specific items of test equipment, shock mountings, and maintenance parts installed in or used with the repair van.

Quantity (ea)	Item	Federal Stock No	Dimensions (in) Height	Width	Depth	Unit Weight (lb)
1	Semitrailer Van Electronic, 6-ton, 2-wheel V-79/G (conf A model) and M373A2 (conf B and C)	2330-00-287-8830	135	95-1/2	363	15,500
2	Motor-Generator PU-545/A (conf B and C)	6125-00-985-7949	11-1/4	14	8	45
1	Air Compressor, with applicable accessories	4310-00-765-1877	15-1/8	11-3/8	17	57
†† 2	Air Conditioner, floor-mounted, air-cooled. 18,000 BTU	4210-00-266-9074	68	42	14	495
† 2	ECU, 18,000 BTU	4120-01-136-9863				
† 2	Cable Assembly, ECU Power (P/N A3188203)					
1	Axe, pickhead	4210-00-727-8111	24 (lg)	3	1	2-314
1 pr	Blackout Curtain Assembly	5410-00-792-6339	70	35		
1 pr	Blackout Curtain Assembly	5410-00-792-6341	70	88		
1	Brush, dusting, bench	7920-00-173-8315	14-1/2	9	3	
1	Buzzer, 12 vac	6350-00-912-0417				
1	Cabinet, Kardex 6 slides, 8x5 card size, 420 card capacity		10-1/2	10-1/2	23-1/2	
1	Cabinet File, 2-drawer	7110-00-551-5487	23-1/2	15	28	30
2	Storage rack (conf A)		68-1/2	72	30	688
1	Storage Rack (conf B)		61-1/2	147	28	
4	Chair, swivel	7110-00-281-4469	34	22	21	30
1	Meter, Frequency (59-63 cps)	6625-00-351-5937				
2	Voltmeter, 0-150 volt, Triplett 331					
2	Clock 8-day	6645-00-303-4950	7 (dia)		2-5/8	
1	Drill Stand, Thor Electric, Graybar NO. 8 conf A Only)		18	8-5/16	13	30
1	Electric Hand Drill, 3/8-in, Black and Decker (conf A only)	5130-00-889-9001	8	6	2-1/2	3-3/4
2	Exhaust Fan, ILG Model 83		12	12	4-1/2	12
2	Fire Extinguisher, 5-lb, CO2	4210-00-270-4512	15-1/2	5-7/32	7-3/8	

Quantity (ea)	Item	Federal Stock No	Dimensions (in) Height	Width	Depth	Unit Weight (lb)
2	Bracket, fire extinguisher	6545-00-288-3166				
1	First Aid Kit	6545-00-922-1200	10-1/2	13-1/2	2-3/4	
1	Hand Lantern	6230-00-803-7063	9	2-7/8	1-7/8	
26	Fluorescent lights, F15T8/CW 20 watts	6240-00-152-2982	24 (lg)	1-1/2 dia		
2	Ground Rod MX-148/G	5975-00-224-5260	72	3/4	3/4	
1	Ground Strap, l-in braid	4940-00-752-2525	120 (lg)	1	1/4	
2	Padlock, with keys	5340-00-802-7406	2-1/2	1-1/2	3/4	
1	Hammer, hand 8-lb, spare handle	5120-00-251-4489	30	5-1/4	1-7/8	
1	Pencil Sharpener	7520-00-162-6178	4-3/4	4	2-1/2	
1	Padlock, combination	5340-00-909-0546	2-1/2	1-1/2	3/4	
1	Kit tool roll	5180-00-752-9778	6	10	4	3
2	Wastebasket	7520-00-753-4807	12	7-1/2	11	8
1	Sweeper, Hoover tank model No 86	7910-00-264-4636	10	7	23 (lg)	28
	Vise, 3-in jaw, 3-in opening	5120-00-222-1119	6	11	5	10
††4	Heater, Electromode	4520-00-224-7909	12	12	12	30
1	Stair Assembly, folding, 2-section, aluminum		51	82	61	100
2	Thermostat, Honeywell No. T473B1036	6685-00-911-6344	3	5	1-1/2	
††1	Power Cable Assembly	6145-00-913-0472	125 fi lg	1.7 dia		200
††1	Power Cable Assembly, stub, ac, 60-cps		25 ft lg	1.27 dia		50
1	Power Cable Assembly, dc		25 ft lg	1.08 dia		50
1	Power Cable Assembly, ac, 400-cps		25 fl lg	0.99 dia		50
† 1	Power Cable Assembly (P/N SC-D-883964GRP17-4)		50 ft lg			
† 1	Special Purpose Cable Assembly (P/N SM-D-994198)		25 ft lg			
1	Power Distribution Panel		30-1/2	12	4	25
1	Power Monitor Panel					
1	Power Entrance Box					
1	Frequency Converter, Sorensen Model FCD 3P-2000 (conf A)		72	22	18	600
1	DC Power Supply, Sorensen Model MA 28-125 (conf A)		21-1/2	19-1/2	15-7/8	225
2	DC Power Supply, Sorensen Model MA 28-500 (conf B)		40-1/2	25-1/2	23	600

Quantity (ea)	Item	Federal Stock No	Dimensions (in) Height	Width	Depth	Unit Weight (lb)
2	DC Power Supply, Christie Model 1C36-500K24L (conf C)					
1	Rack, radio set control mounting		60	15	12	80
2	Exhaust Fan Housing		12	12	6	
1	Antenna Entrance Box		8-1/2	2-1/2	7	
1	Battery Charger, Sonetone Model No PCA 130/230 (conf A)		10	13	2-1/4	
1	Intercommunication Station LS-147C/FI	5830-00-752-5357				
1	Telephone Set TA-312/FT	5805-00-543-0012				
1	Transformer, power 400-cycle wye to delta (conf C)	5950-00-543-1103				
1	Frequency Meter, 380 to 420 cps (conf B and C)	6625-00-351-5944				
1	Voltmeter, 0-150 vat, 400 cps (conf B and C)	6625-00468-9269				
1	DC and 400 cps ac control panel (conf B and C)	6625-00-668-9269				
1	Stepdown Transformer, FREED MCV41254FM (conf C)					

† Used only on systems that have MWO 11-5800-220-50-1 completed

†† Used only on systems with 5 stack air conditioners

APPENDIX E
COMPONENTS OF ELECTRONIC SHOP, SEMITRAILER MOUNTED AN/ASM-190

The chart below lists the components of the AN/ASM-190. Not included in the chart are the specific items of test equipment, shock mountings, and maintenance parts installed in or used with the repair van.

Quantity (ea)	Item	Federal Stock No	Dimensions (in) Height	Width	Depth	Unit Weight (lb)
1	Semitrailer Van, Electronic, 6-ton, 2-wheel M348A2	2330-00-797-7405	132	96	319 lg	13,000
1	Axe, pickhead	4210-00-727-8111	24 (lg)	3	1	2-3/4
†† 2	Air Conditioner, floor-mounted, air-cooled, 18,000 BTU	4210-00-266-9074	68	42	14	495
† 1	ECU, 18,000 BTU	4120-01-136-9863				
† 1	Cable Assembly, ECU Power (P/N A3188203)					
2 pr	Blackout Curtain Assembly	5410-00-792-6339	70	35		
1	Brush dusting, bench	7920-00-285-9816	13-1/2	2	2-3/4	
1	Cabinet, Kardex, 20 slides, 8x5 card size, 1,008 card capacity		30	10-1/2	23-1/2	
1	Cabinet, File, 2-drawer	7110-00-551-5487	23-1/2	15	28	30
1	Storage rack (conf A)		78	147	30	1,490
1	Storage Rack (conf B)		68-1/2	147	28	
2	Storage rack (conf A)		68-1/2	72	30	688
2	Storage Rack (conf B)		61-1/2	72	28	
1	Chair, swivel	7110-00-281-4469	34	22	21	30
2	Clock, 8-day	6645-00-303-4950	7 (dia)		2-5/8	
3	Exhaust Fan, ILG Model 83		12	12	4-1/2	18
2	Fire Extinguisher, 5-lb, CO2	4210-00-270-4512	15-1/2	5-7/32	7-3/8	
2	Bracket fire extinguisher	6545-00-288-3166				
1	First Aid Kit	6545-00-922-1200	10-1/2	13-1/2	2-3/4	
1	Broom, house					
1	Hand Lantern	6230-00-803-7063	9	2-7/8	1-7/8	
24	Fluorescent lights, F15T8/CW 20 watts	6240-00-152-2982	24 (lg)	1-1/2 dia		
2	Ground Rod, MX-148/G	5975-00-224-5260	72	3/4	3/4	
1	Ground Strap, l-in braid	4940-00-752-2525	120	1	1/4	

Quantity (ea)	Item	Federal Stock No	Dimensions (in) Height	Width	Depth	Unit Weight (lb)
2	Padlock, with keys	5340-00-715-7944	2-1/2	1-1/2	3/4	
1	Hammer, hand 8-lb, spare handle	5120-00-251-4489	30	5-1/4	1-7/8	
1	Pencil Sharpener	7520-00-1624178	4-3/4	4	2-1/2	
2	Thermostat, Honeywell No. T473B1036	6685-00-911-6344	3	5	1-1/2	
1	Kit, tool roll	5180-00-752-9778	6	10	4	3
	Wastebasket	7520-00-753-4807	12	7-1/2	11	8
†† 4	Heater, Electromode	4520-00-224-7909	12	12	12	30
1	Stair Assembly, folding, 2-section, aluminum		51	82	61	100
†† 1	Power Cable Assembly		100 ft lg	99 dia		100
† 1	Power Cable Assembly (P/N SC-D-883964GRP9-3)		50 ft lg			
1	Extension Cord		100 ft			25
1	Power Distribution Panel		14	12	4	25
1	Power Entrance Box		14	17-1/2	4	10
1	Dehumidifier, Electric, Westinghouse ECA1300 (conf B)		22-1/2	13	12-1/2	17-1/2
2	Exhaust Fan Housing		12	12	6	16
1	Signal Entrance Box		10	13	2-1/45	
1	Battery Charger, Sonetone Model No PCA 130/230 (conf A)					
1	Cabinet, Filing, 2-drawer, 8x5 card size	7110-00-273-8776	7-1/2	18-1/2	16	
1,000	Index Cards, 8x5 white (unruled)	7530-00-243-9436				
1	Refrigerator, Hotpoint Model CTF 514, 14-cu ft (some models)		64	34	24	300
1	Storage Cabinet, with drawers (conf A)		78	140 lg	24	900
1	Storage Cabinet, with drawers (conf B)		58	140 lg	22-1/2	
1	Desk, wood		32	30	24	50
1	Intercommunication Station LS-147C/FI	5830-00-752-5357				
1	Telephone Set TA-312/PT	5805-00-543-0012				
1	Liquid Nitrogen Plant, Gas Equipment Corp, Model G-215 (conf A)					

† Used only on systems that have MWO 11-5800-220-50-1 completed

†† Used only on systems with 5 stack air conditioners

APPENDIX F
SYSTEM CHANGES

F-1. General

This appendix describes the changes to Electronic Shops, Semitrailer Mounted AN/ASM-189 and AN/ASM-190. The changes to the systems are a result of MWO 11-5800-220-50-1 being applied. The modification consists of removal of the air conditioner(s) and replaced by an environmental control unit(s), two on the AN/ASM-189 and one on the AN/ASM-190. Heaters are also removed from the AN/ASM-189. One additional heater was added to the AN/ASM-l90 for a total of three heaters. Other electrical/power wiring changes, include upgrading to a five-wire system. The following information gives a brief description of the changes. Refer to Figures F-7 and F-8 for exterior views of the modified systems.

F-2. ECU Operation

For ECU operation see TM 5-4120-379-14.

F-3. AN/ASM-189 Controls, Indicators, and Connectors

a. Power Distribution Panel (fig. F-l).

Control	*Description and Function*
MAIN circuit breaker	Ganged 200-ampere circuit breaker. Provides overload protection of ac power to individual power distribution circuit breakers
Individual circuit breakers:	Provides on-off control and overload protection for following circuits:

Circuit Breaker (CB) No.	*Rating (amp)*	*Circuits*
1	15	Odd-numbered fluorescent lights (LIGHTS)
2	15	Even-numbered fluorescent (LIGHTS)
3,5, & 7 (three ganged)	30	ECU No. 1
4,6, & 8 (three ganged)	30	ECU No. 2
15	20	60 cycles ac, bench test position No. 1 (CONV. POS. NO. 1)
16	20	60 cycles ac, bench test position No. 2 (CONV. POS. NO. 2)
17	20	60 cycles ac, bench test position No. 3 (CONV. POS. NO. 3)
18	20	60 cycles ac, bench test position No. 4 (CONV. POS. NO. 4)
19	20	60 cycles ac, bench test position No. 5 (CONV. POS. NO. 5)
20	20	60 cycles ac, curbside conv outlets (CONV. 3 EA. CURB)
21	20	60 cycles ac, roadside conv outlets (CONV. 3 EA. ROAD)
22	15	AIR COMPRESSOR
23	20	Power entrance box duplex outlets (WEATHERPROOF CONV.)
24	15	EXHAUST FANS No. 1 and No. 2
25	15	SECURITY ALARM (buzzer)
26	15	60 cycles ac (DRILL PRESS)
27	20	INVERTER
28	20	SPARE

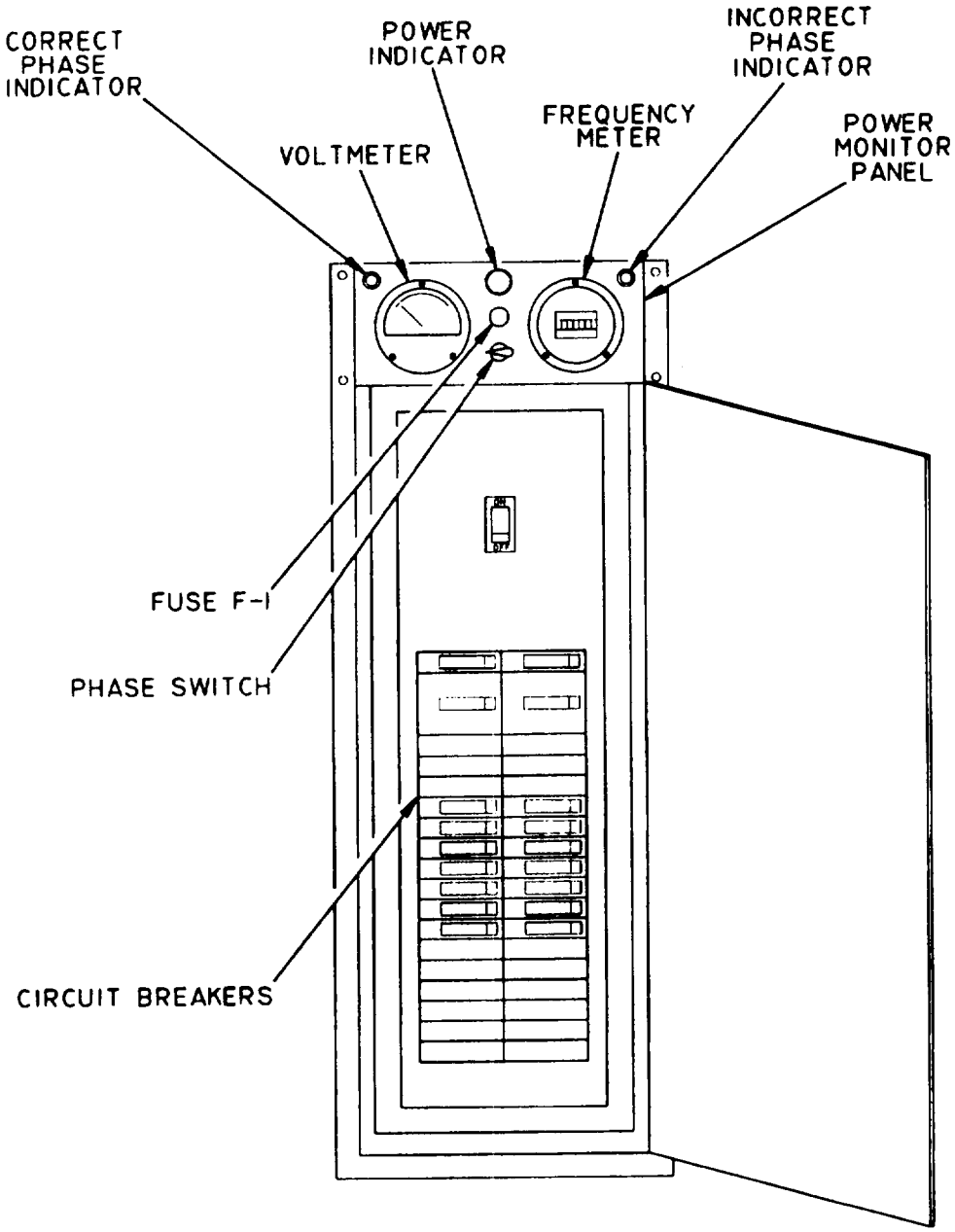


Figure F-1. AN/ASM-189 power distribution panel and power monitor panel.

b. Power Monitor Panel (fig. F-1)

Control or Indicator	*Function*
CORRECT PHASE INDICATOR	Lights when the ac power applied to the van is properly connected to the power source
INCORRECT PHASE INDICATOR	Lights when the ac power applied to the van is NOT properly connected to the power source
POWER INDICATOR	Lights when ac power is applied to the van POWER ENTMNCE BOX
PHASE SWITCH	Connects each power phase (A, B, & C) to the VOLTS and FREQUENCY meters. Four position switch
VOLTMETER	Indicates the voltage of the ac power phase that the PHASE switch is set to (A, B, or C)
FREQUENCY METER	Indicates the frequency of the power phase that the PHASE switch is set to (A, B, or C)

c. Power Entrance Box Connectors and Receptacle (fig. F-2):

Connector or Switch	*Function*
120 V, 3 PHASE, 400 Hz, POWER OUTPUT TO EXTERNAL LOAD	Provides connection to 400 Hz 3 phase ac power outside the van.
120 V, 60 Hz CONVENIENCE GFCI OUTLET	Provides connection to 60 Hz single phase ac power outside the van.
28 VDC OUT	Provides connection to 28 volts dc power outside the van
120 V, 3 PHASE, 60 Hz, POWER INPUT TO SHELTER	Provides connection of a power source to the van.
GROUND STUD	Provides ground connection for van.

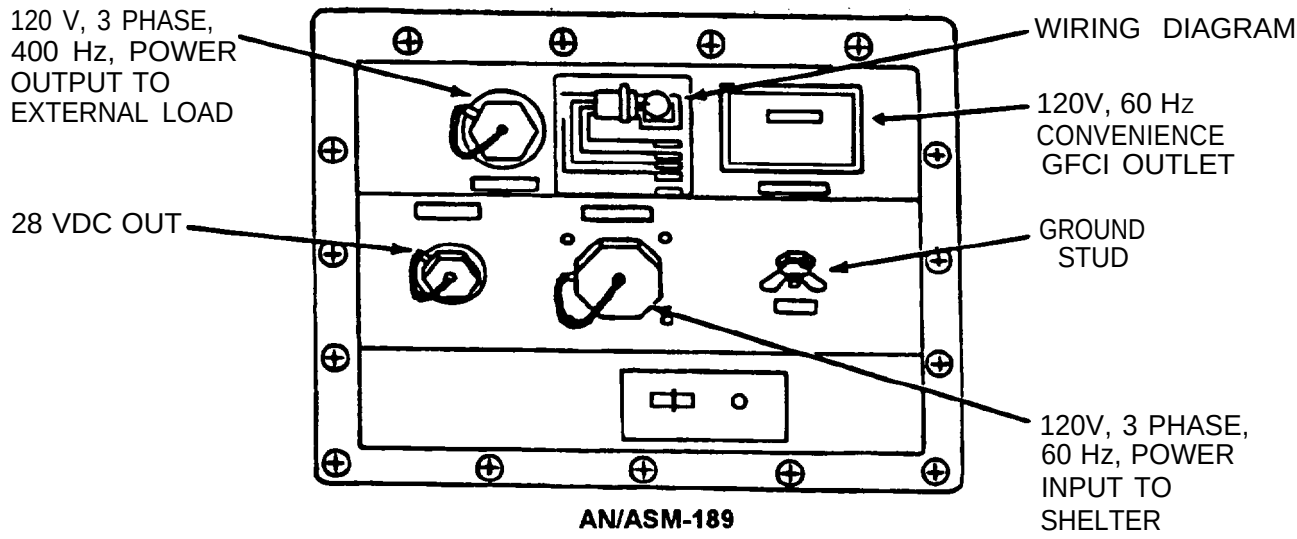


Figure F-2. AN/ASM-189 Power Entrance Box.

F-4. AN/ASM-l90 Controls, Indicators, and Connectors

The fictions of controls, indicators, and connectors not similar to those in the AN/ASM-189 are given below.

Power Distribution Panel (fig. F-3),

Control or Indicator	*Description and Function*
CORRECT PHASE indicator (amber)	Lights when the ac power applied to the van is properly connected to the power source.
INCORRECT PHASE indicator (red)	Lights when the ac power applied to the van is NOT properly connected to the power source.
MAIN circuit breaker (CB-1)	Ganged 100-ampere circuit breaker. Provides overload protection of ac power to individual power distribution circuit breakers.
Individual circuit breakers:	Provide on-off control and overload protection for following circuits:

Circuit breaker (CB) No.	***R*** *(amp)*	*Circuits*
7	*15*	ODD, numbered fluorescent lights.
8	*15*	EVEN, numbered fluorescent lights, desk light and vestibule.
9, 11, & 13 (three ganged)	30	E C U
10	20	HEATER 1
12	20	HEATER 2
14	20	HEATER 3
15	20	DESK OUTLETS
16	15	REFRIGERATOR
17	15	EXHAUST FAN
18	15	SECURITY ALARM

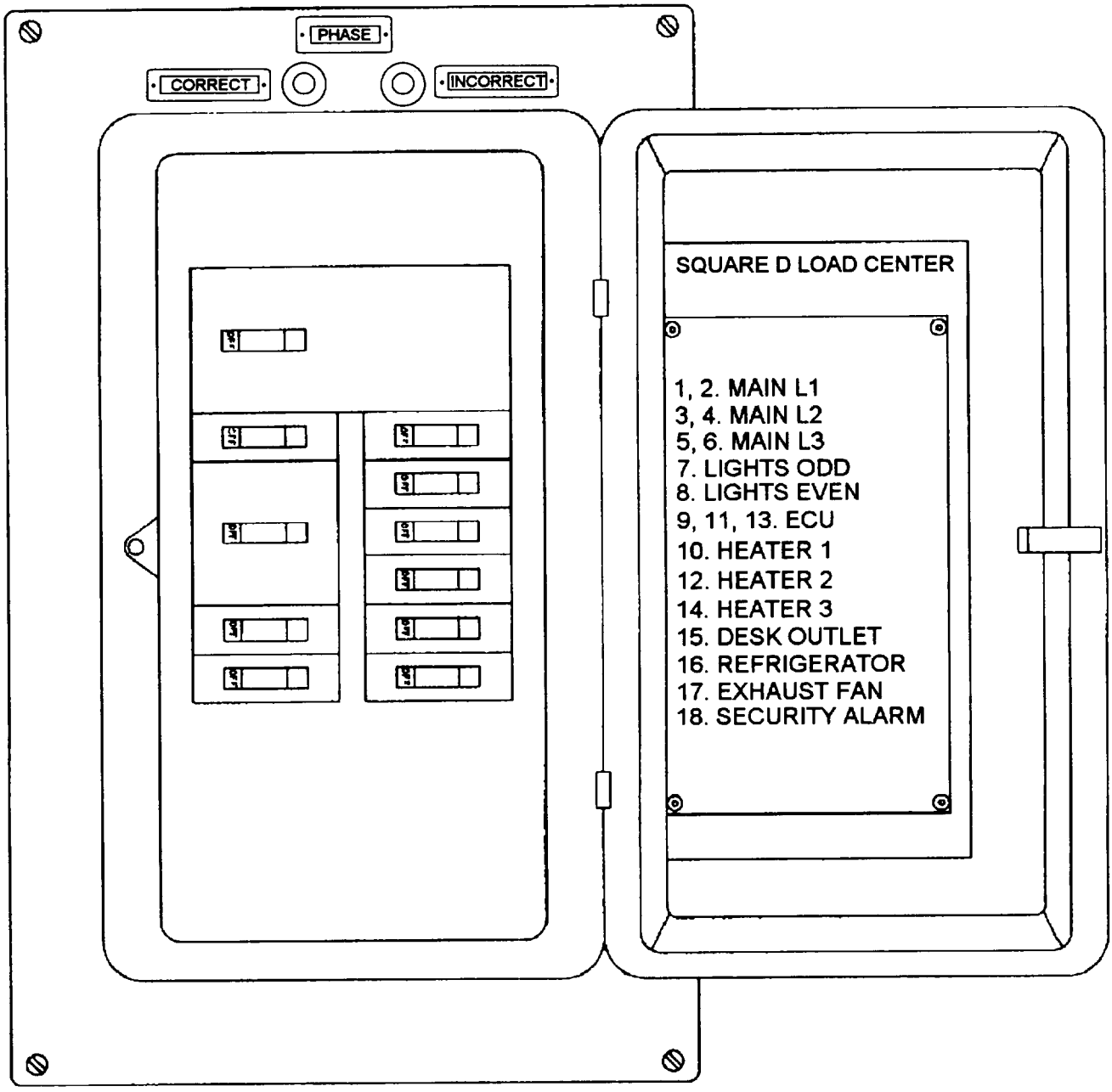


Figure F-3. AN/ASM-190 power distribution panel.

F-5. Power Consumption

a. AN/ASM-189

ECU (2 ea at 4600 watts)	9200 watts

b. AN/ASM-190

ECU	*4600* watts

F-6. Power Sources

a. AN/ASM-189. The requirement for the *AN/ASM-189* is an output of 45 kilowatts of 120/208 volt, three phase, five wire, 60 Hertz, wye power. The PU-55l/M generator set is recommended.

b. AN/ASM-190. The requirement for the AN/ASM-190 is an output of 6 kilowatts of 120/208 volt, three phase, five wire, 60 Hertz, wye power. The PU-753/M generator set is recommended.

F-7. AC Power Distribution

a. AN/ASM-189 AC Input Power. The output of the ac power source (120/208 vat, 3 phase wye, 5 wire, 50-62 Hz) is connected to connector J-1 at the POWER ENTRANCE BOX and applied to the main power distribution panel. Each of the 3-phase leads are connected to bus bars L-1, L-2, and L-3 through the main circuit breaker which consists of three individual 200 ampere circuit breakers ganged together. The neutral wire is connected directly to bus bar L-0. A ground lug is used to ground the frame of the van to the ground rod driven into the earth,

b. AN/ASM-190 AC Input Power. The power is applied to the van through the 120/208 vat, 3 phase wye, 5 wire AC POWER IN connector in the POWER ENTRANCE BOX. This power is feed through a three section (100 ampere) MAIN circuit breaker CB1, CB3, and CB5 to bus bars in the power distribution panel.

c. AN/ASM-189 ECU Power. Three phase, 208 VAC power is applied to each ECU through a 3 pole 30 ampere circuit breaker. Power for ECU No. 1 is through CB3, CB5, and CB7, Power for ECU NO. 2 is through CB4, CB6, and CBS. Ground is applied directly from bus bar. For ECU operation, see TM 5-4120-379-14.

d. AN/ASM-190 ECU Power. Three phase, 208 VAC power is applied to the ECU through a 3 pole 30 ampere circuit breaker CB9, CB11, and CB13. Ground is applied directly from bus bar. For ECU operation, see TM 54120-379-14.

e. AN/ASM-190 Heaters. Three phase 208 VAC power is applied to heater circuits through three 20 ampere circuit breakers, CB10, CB12, and CB14.

F-8. AN/ASM-l89, 400 Cycle AC Power Distribution

The output of each PU-545( )/A generator is 400 cycles, three phase, five wire, wye, ac power.

F-9. External Power Connections AN/ASM-189 (fig. F-4)

WARNING

Be careful when connecting equipment to the power connectors in the power entrance box. Serious injury or death may result from contact with these connections.

a. A 25-foot dc power cable and a 25-foot 400 cycle power cable are provided for connection of power from the van to equipment outside the van. Connect power to equipment as follows:

(1) Earth ground the equipment to be powered. One of the ground rods and straps supplied with van may be used.

(2) Connect the pigtail leads of the cable to the equipment observing polarity.

(a) 28 VDC:
White lead to negative
Black lead to positive

(b) 400 cycle AC:
Black lead to phase 1 or L-1
Red lead to phase 2 or L-2
Blue lead to phase 3 or L-3
White lead to common or L-0
GREEN lead to ground

(3) Connect the connector to the appropriate connector on the power entrance box (fig. F-2).

WARNING

Serious injury or death may result from contact with these connections.

b. A 50-foot 60 cycle ac power cable is provided for connection of power from a generator or commercial power source to the van. Connect power to the generator/commercial source as follows:

(1) Earth ground the generator. One of the ground rods and straps supplied with van may be used.

(2) Connect the pigtail leads of the power cable to the power source observing polarity.

Black lead to phase 1 or L-1
Red lead to phase 2 or L-2
Blue lead to phase 3 or L-3
White lead to common or L-O
GREEN lead to ground

(3) Connect the connector to the power entrance box (fig. F-2).

NOTE

To connect power from Generator Set PU-551/M to the AN/ASM-189 (repair van), use electrical power cable assembly SM-D-883964GRP17-3, (50 foot).

F-10. External Power Connections AN/ASM-190

A 50-foot 60 cycle ac power cable is provided for connection of power from a generator or commercial power source to the van. Connect power to the generator/commercial source as follows:

a. Earth ground the generator. One of the ground rods and straps supplied with van may be used.

b. Connect the pigtail leads of the power cable to the power source observing polarity.

Black lead to phase 1 or L-1
Red lead to phase 2 or L-2
Blue lead to phase 3 or L-3
White lead to common or L-0
GREEN lead to ground

c. Connect the connector to the power entrance box.

NOTE

To connect power from Generator Set PU-753/M to the AN/ASM-190 (storage van), use electrical power cable assembly SM-D-883964GRP9-3, (50 foot).

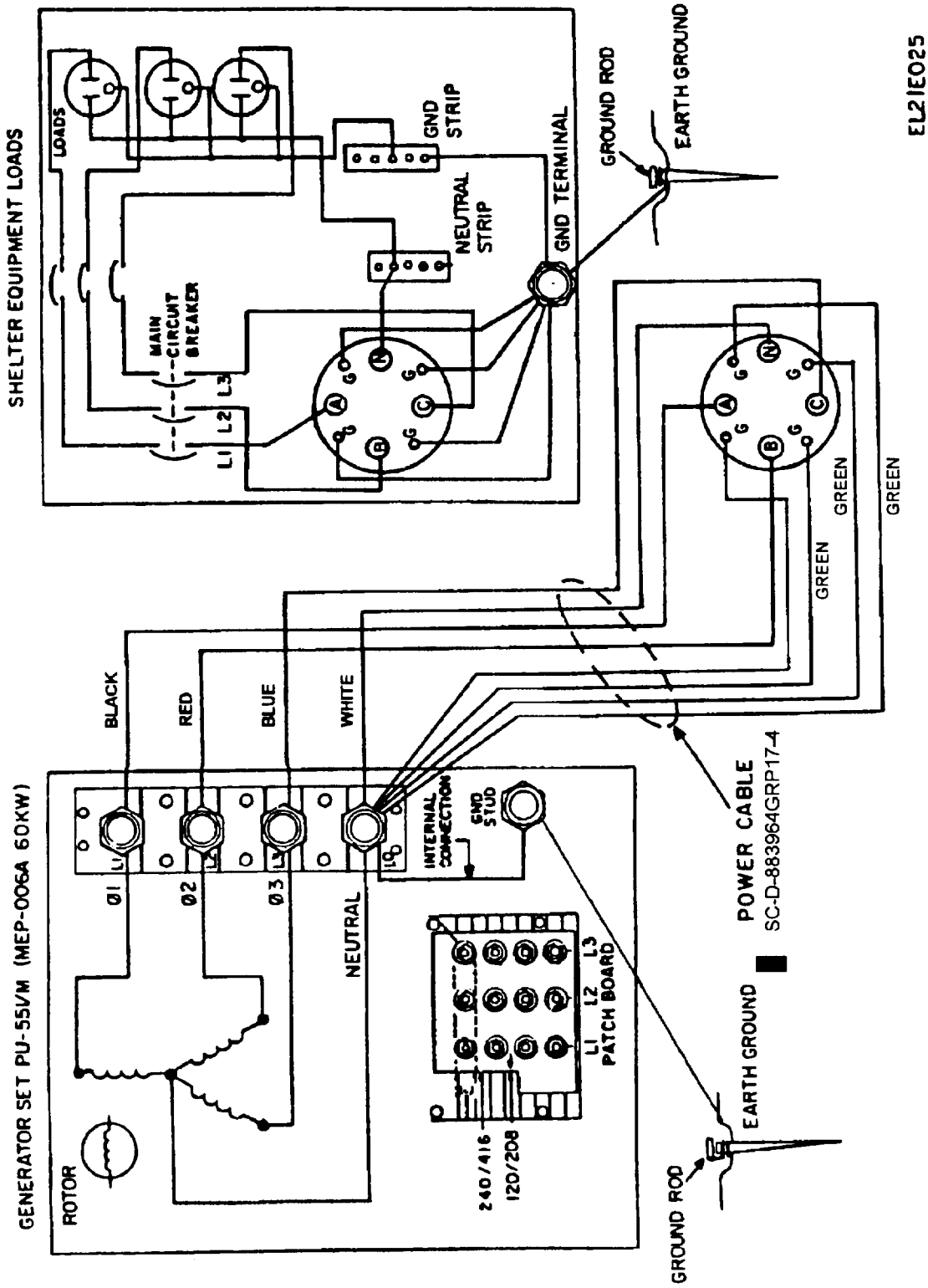


Figure F-4. Generator Set PU-551/M hookup: single generator unit, 120/208 volt, ac 60 Hz (AN/ASM-189),

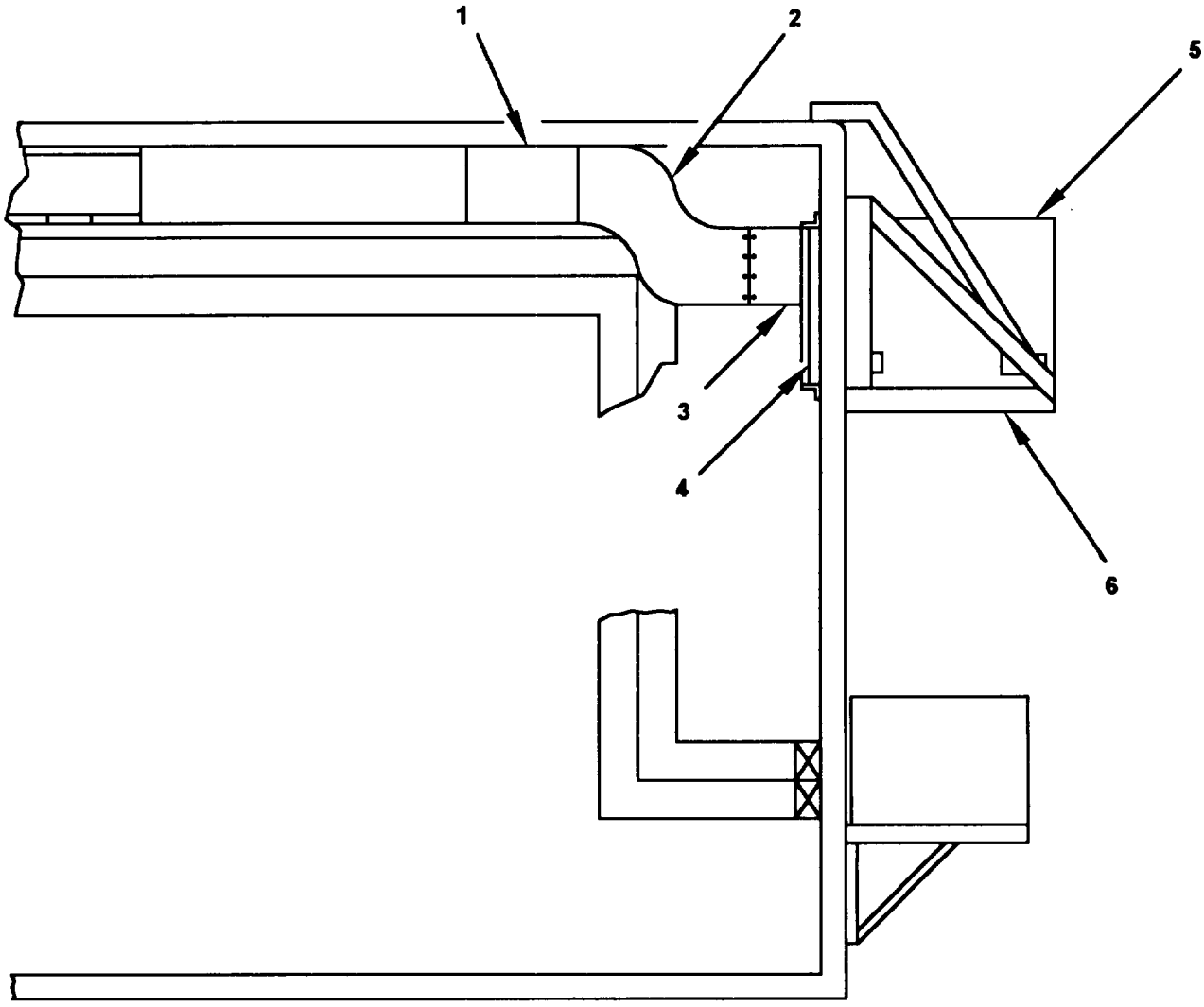


Figure F-5. ECU Removal and Replacement.

F-11. Removal and Replacement of ECU from Shelter

If any components of the ECU need to be removed, replaced, or repaired, see TM 5-4120-379-14. To remove the ECU from the shelter, see Figure F-5 and perform the following:

a. Removal.

(1) From the interior of the shelter, remove trunk line assembly (1) and transition assembly (2) using attaching hardware.

(2) Remove eight screws that attach duct section assembly (3) to the front of the ECU (4).

(3) Remove grill and filter from the duct section assembly.

(4) Install filter and grill in original location on front of ECU.

(5) From the exterior of the shelter, remove the ECU cover assembly (5) using attaching hardware.

(6) Remove four bolts securing the ECU to the mounts (6) and remove the ECU.

b. Replacement. To replace the ECU on the shelter, perform steps (1) thru (5) above in reverse order,

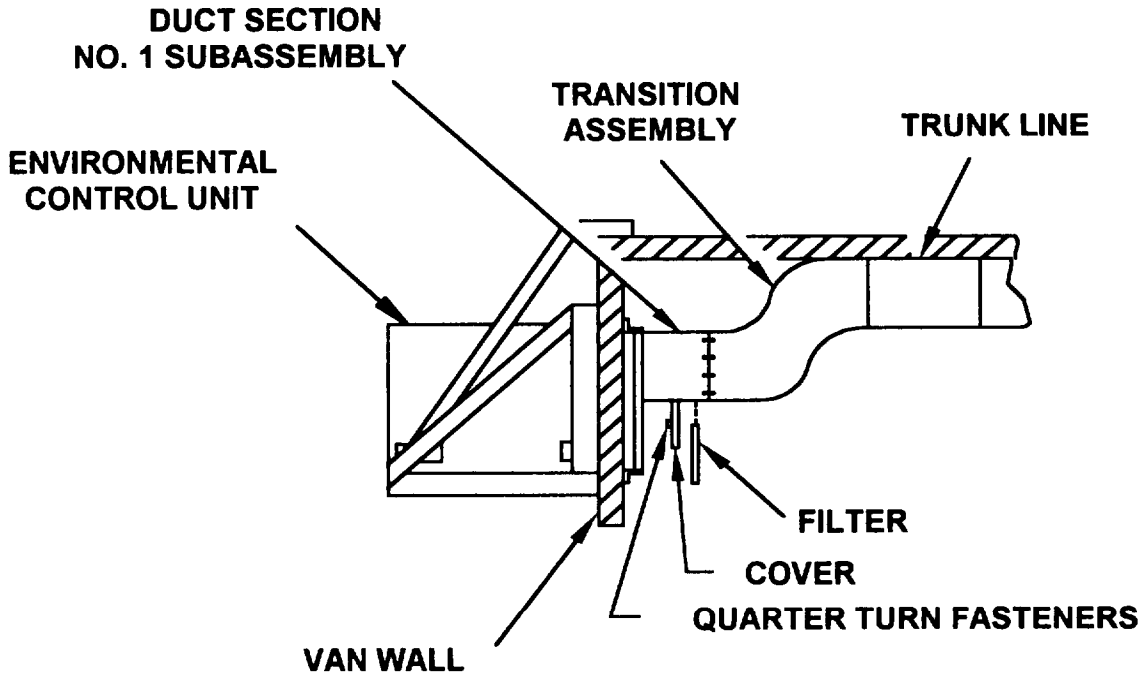


Figure F-6. ECU Filter location (AN/ASM-189 and AN/ASM-190).

F-12. Removal and Replacement of ECU Filters (fig. F-6)

When an ECU filter must be removed for cleaning or replacement (TM 5-4120-379- 14) perform the following:

a. Removal.

(1) Loosen the three quarter-turn fasteners located on the cover under the air duct near the ECU.

(2) Open cover and slide filter out of the duct.

b. Replacement.

(1) Slide filter into guides inside duct.

(2) Close cover and secure three quarter-turn fasteners.

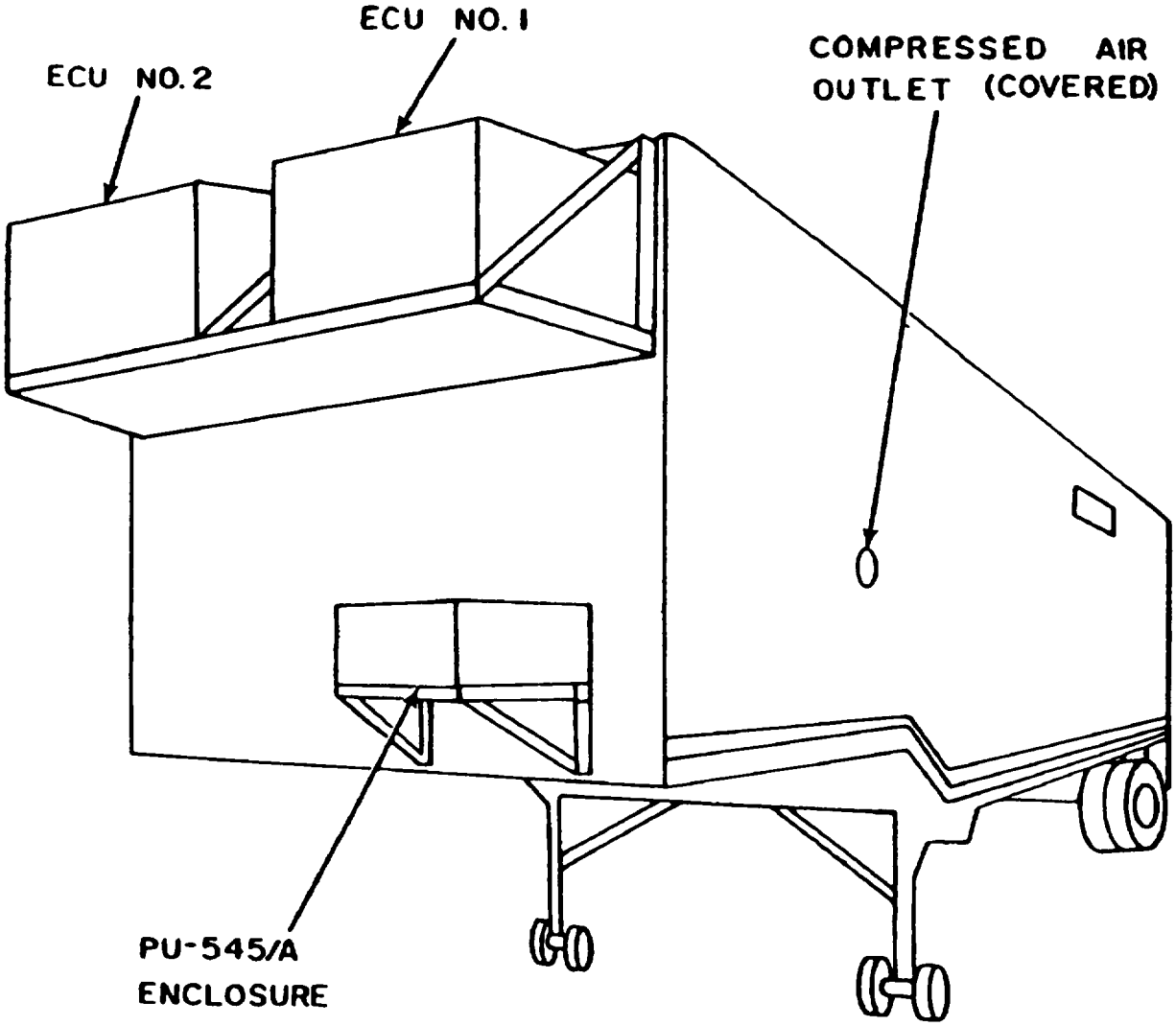


Figure F-7. AN/ASM-189, front and roadside, exterior view.

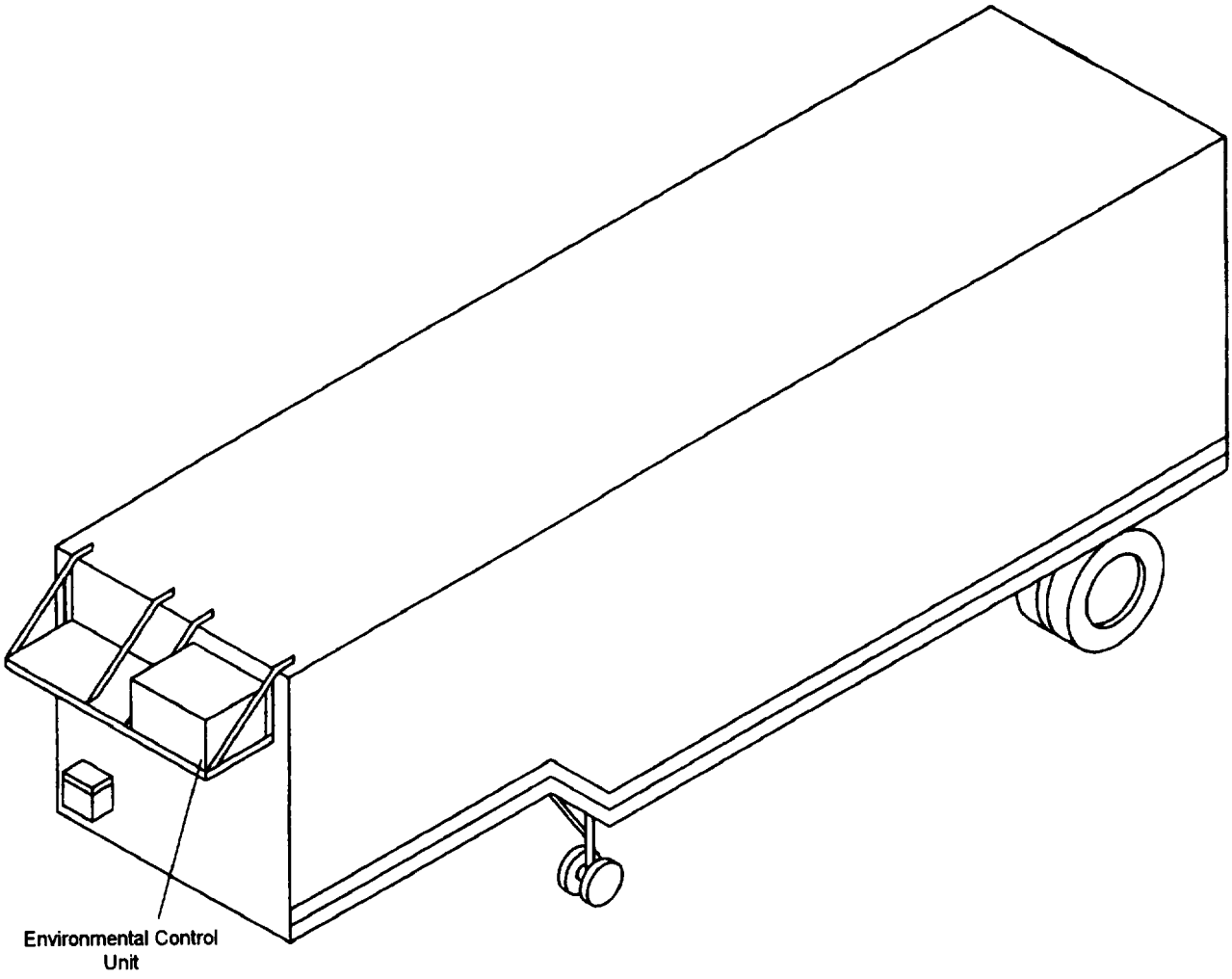


Figure F-8. AN/ASM-190, front and roadside, exterior view.

APPENDIX G
SALE GROUNDING OF COMMUNICATIONS-ELECTRONICS EQUIPMENT IN THE FIELD

G-1. PURPOSE AND SCOPE

This appendix describes earth ground systems and how to install them. Grounding helps protect personnel and equipment from faulty power systems and from lightning strikes. Grounding also reduces circuit noise and other transmission interference in communications systems. These instructions will help you set up a safe ground system for your equipment or shelter.

G-2. THE EARTH GROUNDING SYSTEM

a. Theory. An earth grounding system helps keep the electrical potential on metal surfaces at the same level as the surrounding earth. Earth grounding also provides a discharge path for externally generated electrical surges, including lightning. An earth ground is made by electrically connecting a generator, shelter or structure to a buried metal conductor which is in contact with moist subsoil or reaches into the underground water table. The type of ground conductor and method of installation you use depends on the climate and soil conditions of the site.

b. Ground rods and plates. A ground rod is generally the most effective conductor. You may get a good ground by connecting to a buried metal object already at the site, such as a metal pipe or a steel building frame. In the desert or other places where ground conductivity is poor, a ground plate or a group of ground rods electrically connected together will be more effective than a single ground rod.

c. Soils. Some types of soil provide better electrical grounds than others. Use the type of ground conductor that works best for the soil in your location. Here is a summary of soil types, grounding quality and suggested type of ground conductor.

TYPE OF SOIL	QUALITY OF GROUND	GROUND CONDUCTOR
Fine sand with high moisture content	Very good	Ground rod
Clay, loam or shale	Good	Ground rod or ground plate
Clay, loam or shale mixed with gravel or sand; or gravel, sand or stone	Poor and Very poor	Buried metal object, or a ground plate, or several ground rods electrically connected together

Under very poor or poor conditions, take special steps to establish and maintain electrical conductivity, as explained in paragraphs G-5, G-7 and G-8.

G-3. SELECTING A GROUND ROD

a. Moist Soil Conditions. In moist soil, use either the 8-foot ground rod NSN 5975-00-296-5324 or the 6-foot ground rod NSN 5975-00-224-5260. Both are single-section rods with a built-in driving head and a thumbscrew coupling for connecting a ground strap, as shown in figure G-1.

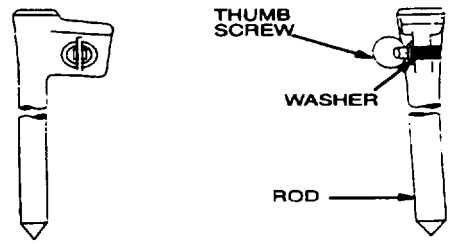
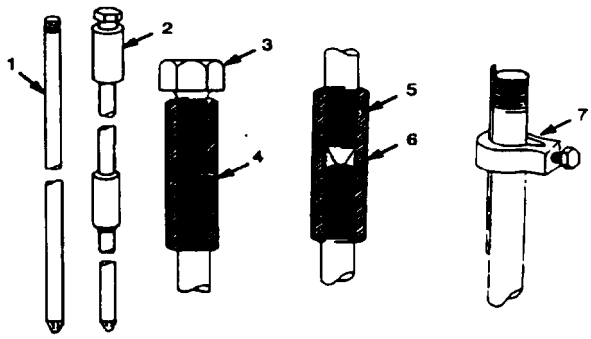


Figure G-1.

b. Dry Soil Conditions. In dry soil, use a multiple-section rod, such as NSN 5975-00-627-1552 or NSN 5975-00-878-4868, as shown in figure G-2. Drive the rod deep enough to reach moist subsoil. If there is no moist subsoil or the soil won't allow deep penetration, drive the rod as deeply as you can, then add salt and water as described in paragraph G-5.



1. GROUND ROD
2. MULTIPLE SECTION ROD WITH DRIVING BOLT
3. DRIVING BOLT
4. DRIVING BOLT TIGHT AGAINST LOWER ROD
5. COUPLING SLEEVE
6. TOP SECTION TIGHT AGAINST LOWER ROD
7. GROUND ROD CLAMP REPLACES COUPLING SLEEVE AND DRIVING BOLT

Figure G-2.

G-4 HOW TO INSTALL GROUND RODS

a. Clean the rod to remove all grease, oil or paint. Wear gloves to protect your hands from sharp metal.

b. Dig a hole at least *12* inches deep and 36 inches across.

c. Drive the rod through to moist subsoil. To install a multiple-section ground rod, use a driving hammer as shown in figure G-3. Allow about 3 inches of the rod to protrude above the bottom of the hole.

Figure G-3.

d. Connect the rod to the equipment or shilter using a ground strap. If you don't have a ground strap, use a piece of the heaviest gauge wire you can find, #6 AWG or larger, preferably copper.

e. Connect the ground strap to the ground rod.

(1) Use the terminal screw on the ground rod. If it is missing or broken, connect the ground strap (or heavy wire substitute) with a tight-fitting clamp as shown in figure G-4.

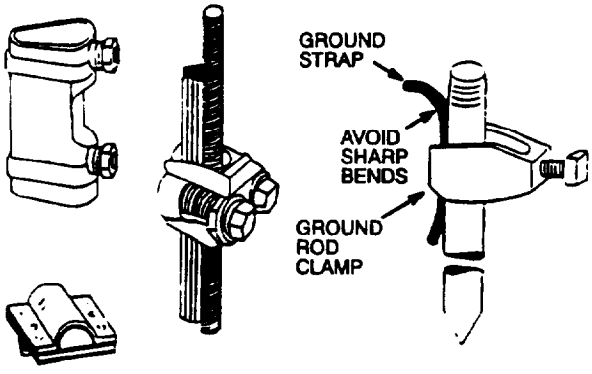


Figure G-4.

(2) If you can't find a clamp. bind the ground strap (or heavy wire substitute) to the ground rod with at least 24 turns of stripped elephone wire or other bare wire as shown in figure G-5. Tightly twist the ends of the wire togerher. Tape the connection to block moisture.

NOTE

DO NOT TIE the ground strap (or heavy wire substitute) to the rod or loop it around the rod. A knot or loop will greatly reduce the effectiveness of the ground. The strap must be connected by the terminal screw, a clamp or bound with wire to the rod.

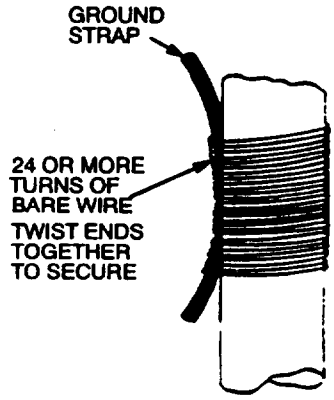


Figure G-5.

f. After you connect the ground strap (or heavy wire substitute) to the ground rod, connect the other end to the ground lug on the shelter or equipment. Keep the strap or wire as short and straight as possible, with no loops or knots. Make sure all connections are clean and tight. Figure G-6 shows a complete earth ground system.

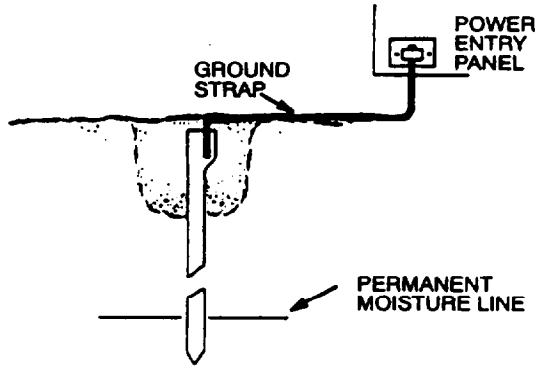


Figure G-6.

g. Fill the hole with water and let it soak in. Then till the hole with soil. Add water as needed to keep the soil moist around the ground rod, at least once a day if it doesn't rain.

h. Check the ground strap every day, Make sure the wire connections are clean and tight.

G-5. IMPROVING SOIL CONDUCTIVITY

Increase soil conductivity by adding salt and water as shown in figure G-7. Use one pound of salt per gallon of water. Replace salt that leaches into the soil by mixing salt with the water at least once per week for the first four weeks of use. Then add the mixture at least once per month.

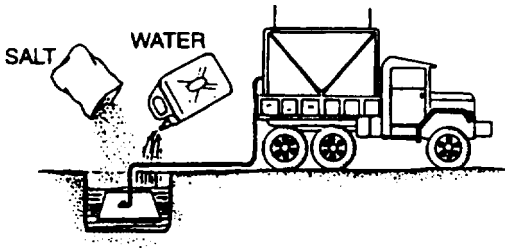


Figure G-7.

G-6. GROUNDING WITH UNDERGROUND OBJECTS

WARNING

Do not attach ground to any pipe or container used for gasoline or other flammable gasses or liquids.

Metal objects buried at least six feet underground, such as pipes, steel building frames, metal poles and storage tanks, provide excellent grounding. Connect the ground strap to the underground metal object with a clean, solid connection. Do not wrap or tie it on; avoid sharp bends. Figure G-8 shows examples of good connections to buried objects.

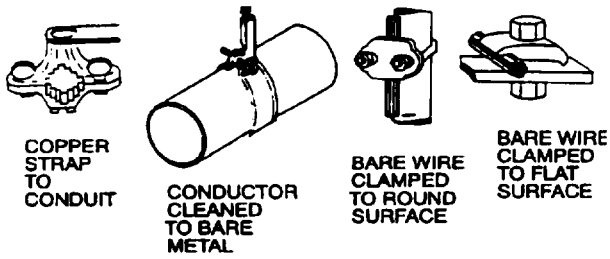


Figure G-8.

G-7. GROUNDING IN POOR SOIL

When your site does not have fine topsoil, clay, loam or shale, you must compensate for poor electrical conductivity as described in paragraphs G-5, G-7a through G-7e below, and G-8.

a. Desert.

(1) In the desert, a ground plate may work better than a ground rod. Use a clean, bare metal plate or sheet at least 3 feet square and at least 1/8 inch thick. Select a metal bolt, nut and lockwasher, then drill a hole in the center of the plate just large enough for the bolt. Fasten a ground strap to the plate as shown in figure G-9. Make sure the connection is clean and tight. Bury the plate at least four feet underground. Apply salt and water as described in paragraph G-5.

(2) Make a clean, tight connection to your equipment or shelter and check it every day.

(3) If necessary, install several rods or ground plates and connect them together as described in paragraph G-8.

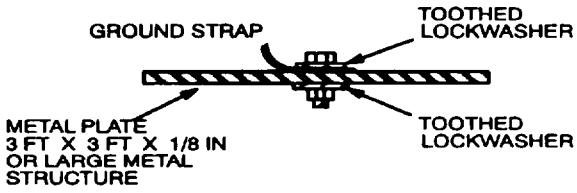


Figure G-9.

b. Sandy soils, gravel, stones and soils mixed with gravel or sand. For ground rods, dig a hole 1 foot deep and 36 inches in diameter. For ground plates, dig the hole at least 4 feet deep, large enough to install the plate horizontally. Install the rod or plate as described in paragraphs G-4 and G-7a. Keep the soil around the rod or plate moist and use salt to improve conductivity as described in paragraph G-5.

c. Mountains. It may be impossible to penetrate to moist soil or a water table in many mountainous areas. To properly ground your equipment, you must find a site where a ground rod can be installed. Stream beds are usually the best locations. (See figure G-10.) If you cannot drive a rod to its full length, install additional rods as described in paragraph G-8.

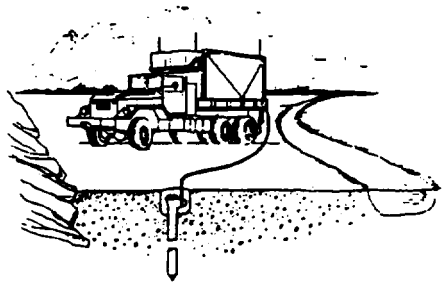


Figure G-10.

a. Tropics. Install the ground rod as in paragraph G-4. Because of the humidity, take care to keep the strap connections clean and dry. Cover the connection to the ground rod with waterproof tape and check it every day.

e. Arctic. Try to connect to a buried metal object such as an underground pipe or a building frame. Otherwise, drive in several ground rods as deeply as possible. Space them at least two rod lengths apart and connect them with #6 AWG or larger bare copper cable or braid. Connect the ground lug on the power entry panel of the shelter to the closest ground rod. Treat the soil with salt and water as described in paragraph G-5. Figure G-11 shows several ground rod layouts.

G-8. HOW TO IMPROVE YOUR GROUND

When a single ground rod provides a poor ground, drive in extra rods as shown in figure G-11. If you can, use 8 or more rods, The more rods you use, the better the electrical connection to the earth. Install rods around the perimeter of your shelter or equipment spaced 2 rod lengths apart. Connect all rods together and connect the closest rod to the shelter's power entry panel ground connector using the heaviest wire you can find, preferably #6 AWG or larger bare copper cable. If possible, connect other perimeter rods to other points on the shelter, Treat the soil around each ground rod with salt and water as explained in paragraph G-5.

If a perimeter installation is impractical, install the rods in one of the other layouts shown. Connect the center rod to the shelter and treat the soil with salt and water as explained in paragraph G-5.

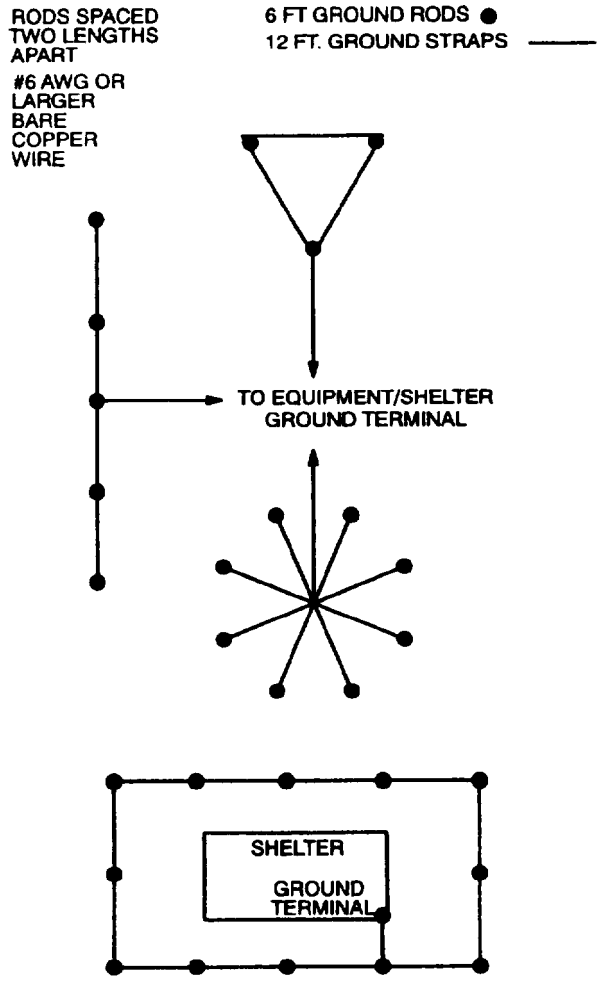


Figure G-11.

G-9. SHELTERS AND NEARBY EQUIPMENT

WARNING

During thunderstorms, lightning flashover or arcing can cccur between two or more unconnected or poorly connected adjacent metal structures. Flashover can cause lethal voltage on the ground in the vicinity of these objects. To avoid lightning flashover, separate equipment shelters, antenna masts, and other metal structures by at least 6 feet or connect them with heavy copper cable. Cables should be as short and straight as possible. Connect all structures and objects located within 25 feet of each other to a common ground as shown in figure G-12. This will help prevent dangerous voltages between shelters and reduce signal interference from stray (or common mode) ground currents.

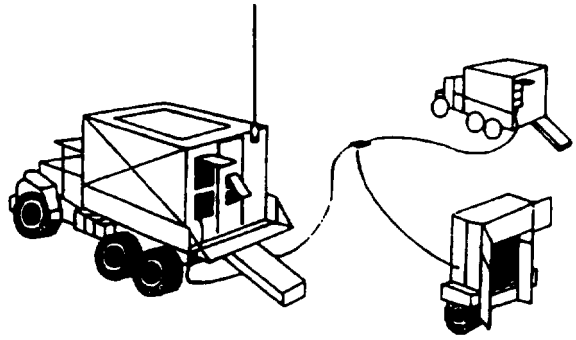


Figure G-12.

WARNING

Lightning Caution For Stand-Alone Equipment

When thunderstorms threaten, disconnect power from stand alone equipment that is not sheltered by a separate lightning protection system. Then separate all such equipment by at least 6 feet or bond them together with heavy copper cable.

NEED MORE INFORMATION?

See FM 11-487-4 and MIL-HDBK-419A, Vol. II. For help, contact your local safety office or your CECOM Logistics Assistance Representative or the CECOM Safety Office. You may call CECOM Safety at DSN 992-0084 or (908) 532-0084, or write to:

Commander,
U.S. Army CECOM
ATTN: AMSEL-SF-SE
Fort Monmouth, NJ 07703-5024

APPENDIX H
ADDITIONAL AUTHORIZATION LIST

Section I. INTRODUCTION

H-1. Scope

This appendix lists additional items authorized for the support of the AN/ASM-189 and AN/ASM-190.

H-2. General

This list identities items that do not have to accompany the AN/ASM-189 or the ANASM-190 and do not have to be turned in with them. These items are all authorized to you by CTA MTOE, TDL or JTA.

H-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	(3) U/M AUTH	(4) QTY
	CABLE ASSEMBLY, POWER ELECTRICAL, AC, 60 HZ, (25 FW O IN), SM-D-883964 GRP17-2 (ANASM-189)	EA	1
	CABLE ASSEMBLY, POWER, ELECTRICAL, AC, 60 HZ, (50 FT O IN), SM-D-883964 GRP9-3 (AN/ASM-190)	EA	1
	CABLE ASSEMBLY, POWER, ELECTRICAL, (50 FT O IN), SM-D-883964 GRP17-3 (AN/ASM-189)	EA	
	GENERATOR SET, PU-551/M	EA	
	GENERATOR SET, PU-753/M	EA	

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TOAD (14)
LEAD (7)
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Sig Sec Gen Deps (Pac) (5)
Sig Dep (Pac) (12)
Sig FLDMS (Pac) (2)
AMS (1)
USAERDAA (2)
USAERDAW (13)
USACRREL (2)
MAAG (2)
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11-500 (AA-AC)
11-587
11-592
11-697
29-134
29-206
29-500
55-457
55-458

NG: State AG (3)

USAR: None

For explanation of sbbreviations used, see AR 320-50.

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Figure 5-1. Repair van, configuration A, power wiring diagram.

Figure 5-2. Storage van, power diagram.

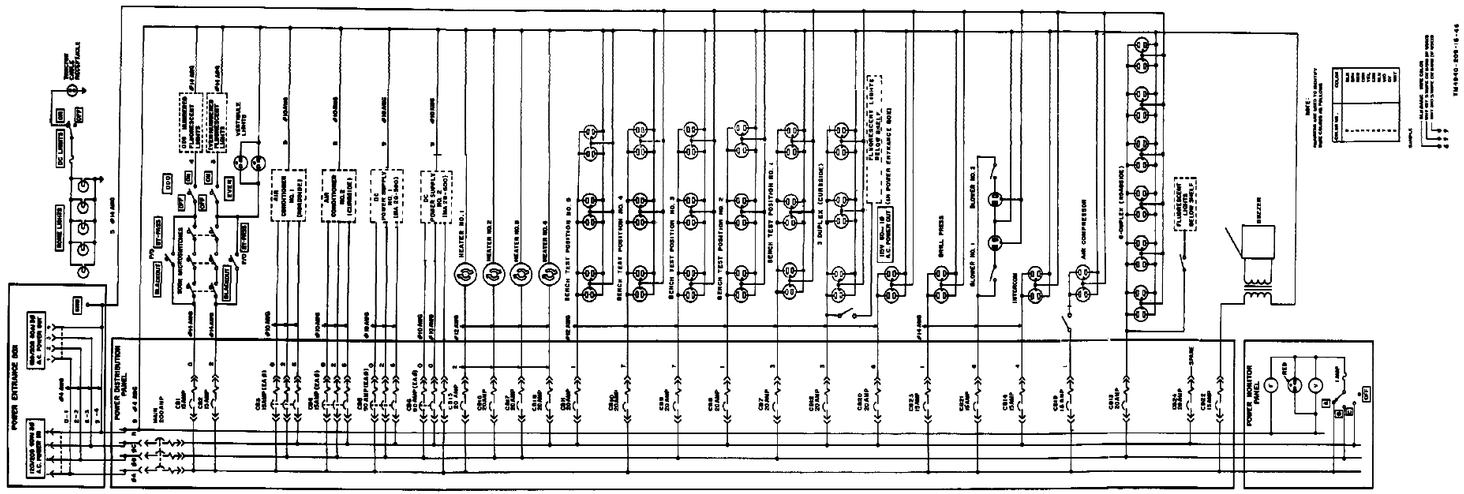

Figure 5-3. AN/ASM-189, configurations B and C, wiring diagram.

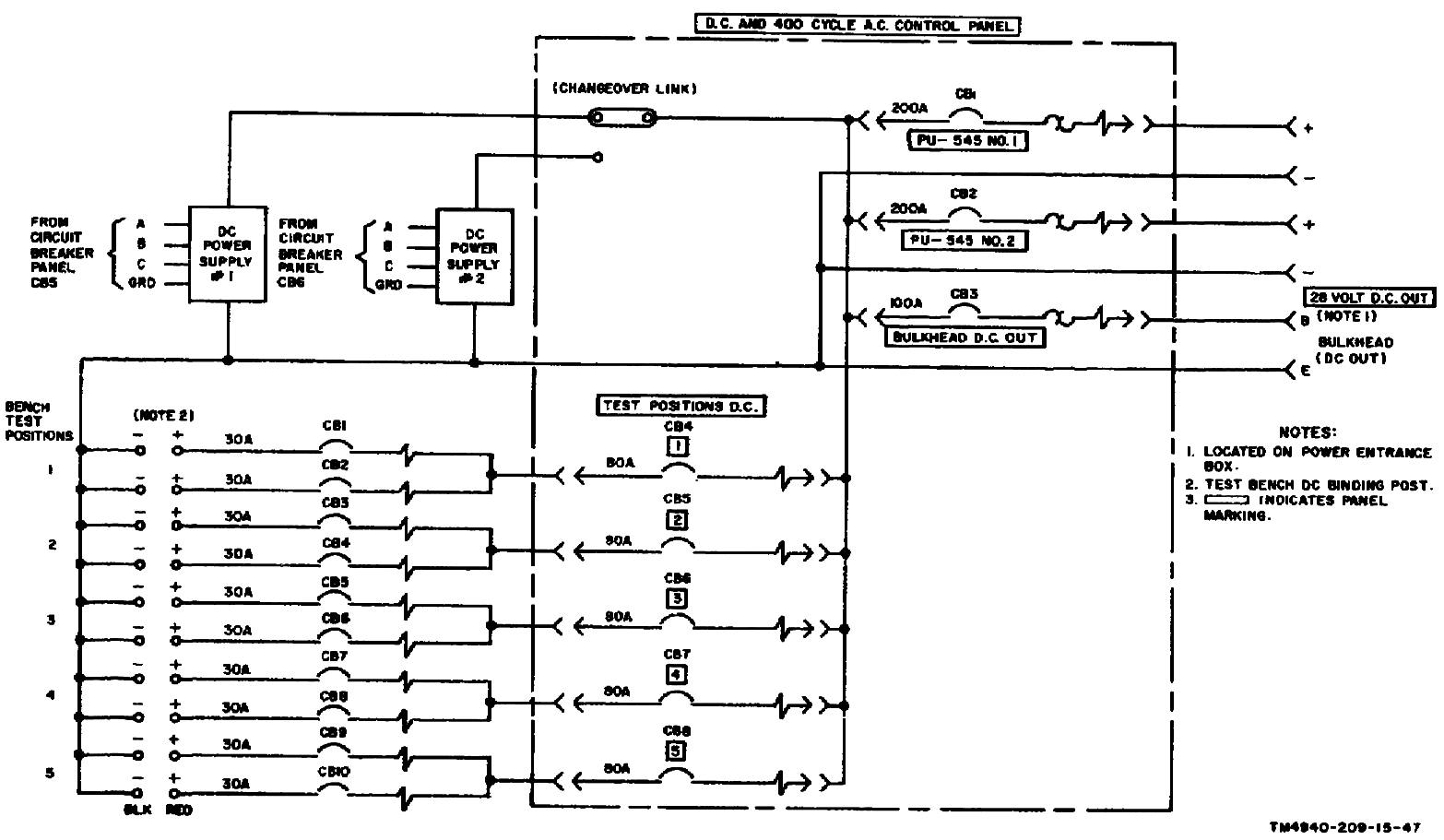

Figure 5-4. AN/ASM-189, configurations B and C, dc power diagram.

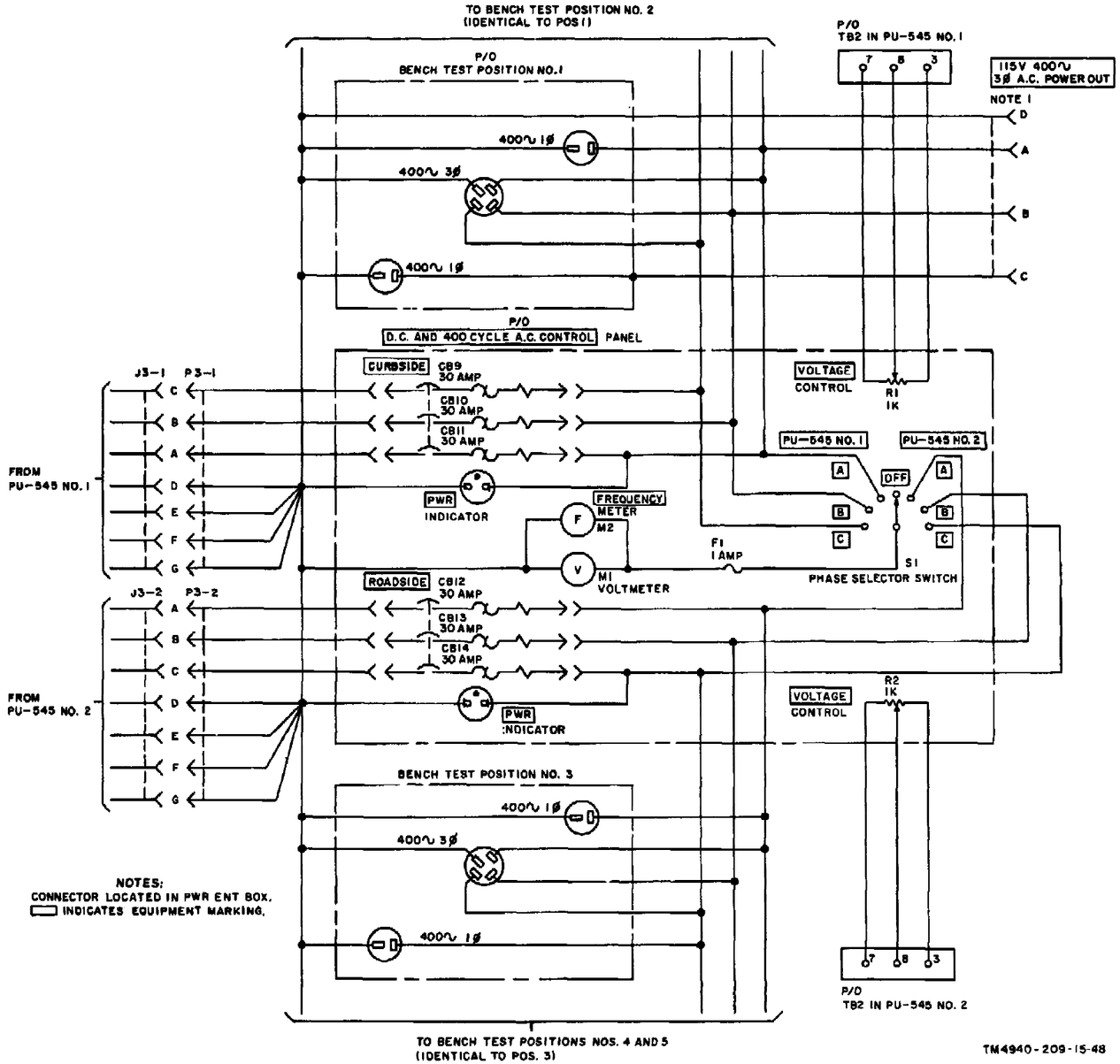

Figure 5-5. AN/ASM-189, configurations B and C, 400-cps power diagram.

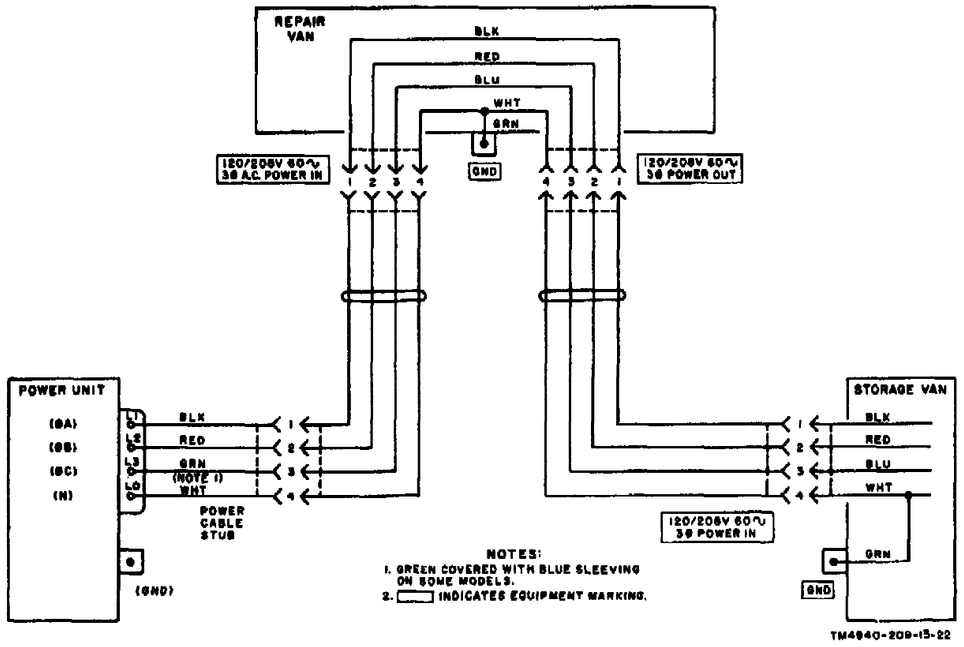

Figure 5-6. Interunit 60-cycle power distribution.

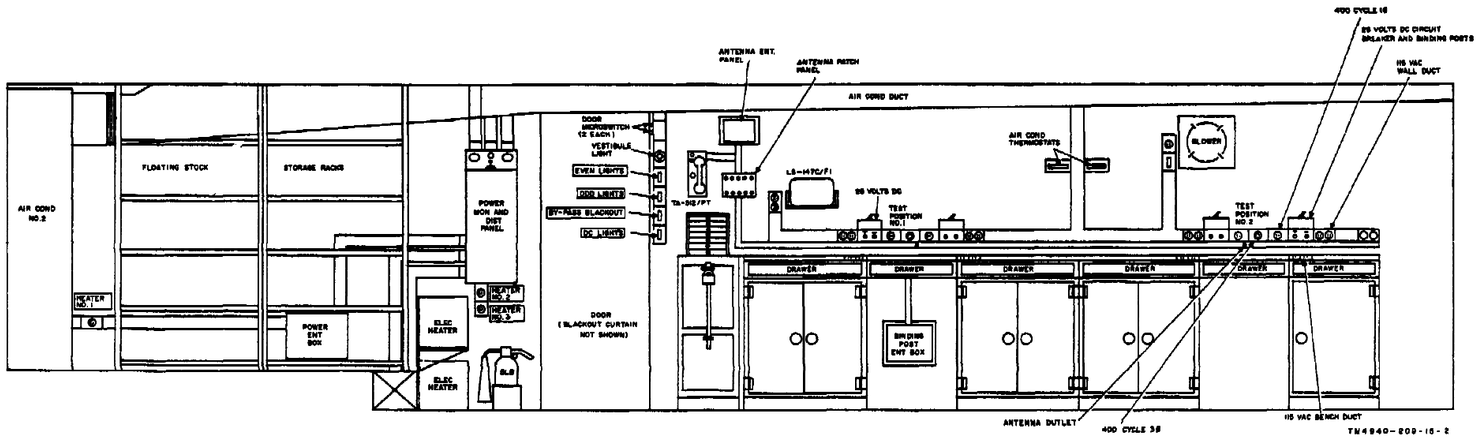

Figure 5-7. Repair van, configuration A, curbside wall.

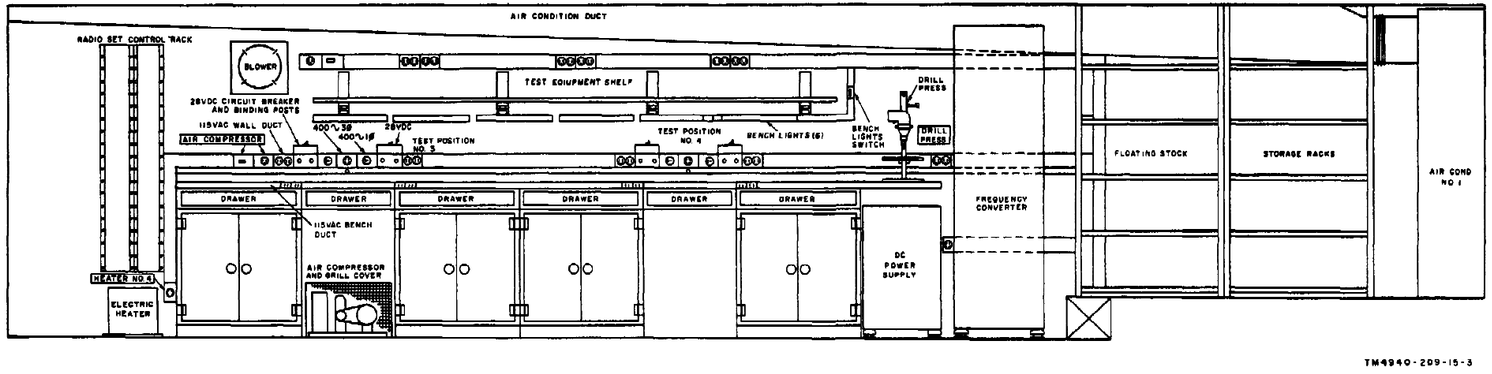

Figure 5-8. Repair van, configuration A, roadside wall.

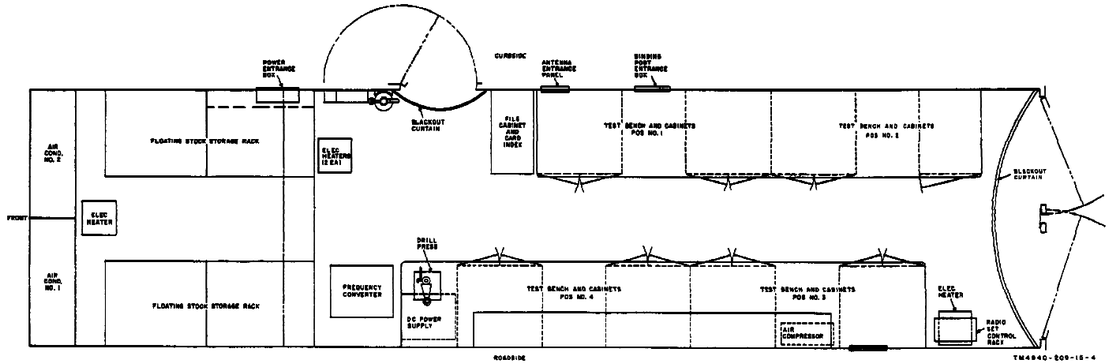

Figure 5-9. Repair van, configuration A, floor plan.

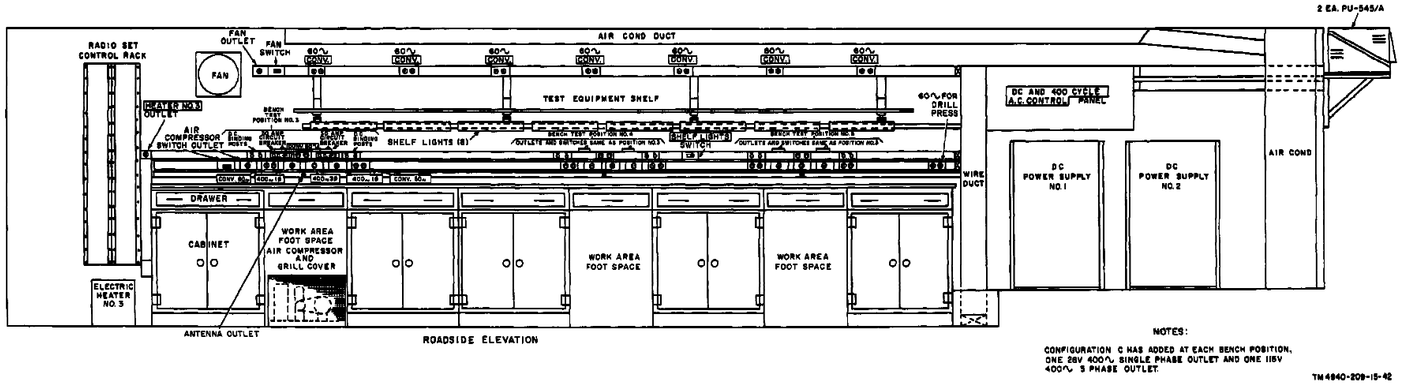

Figure 5-10. AN/ASM-189, configuration B, roadside elevation.

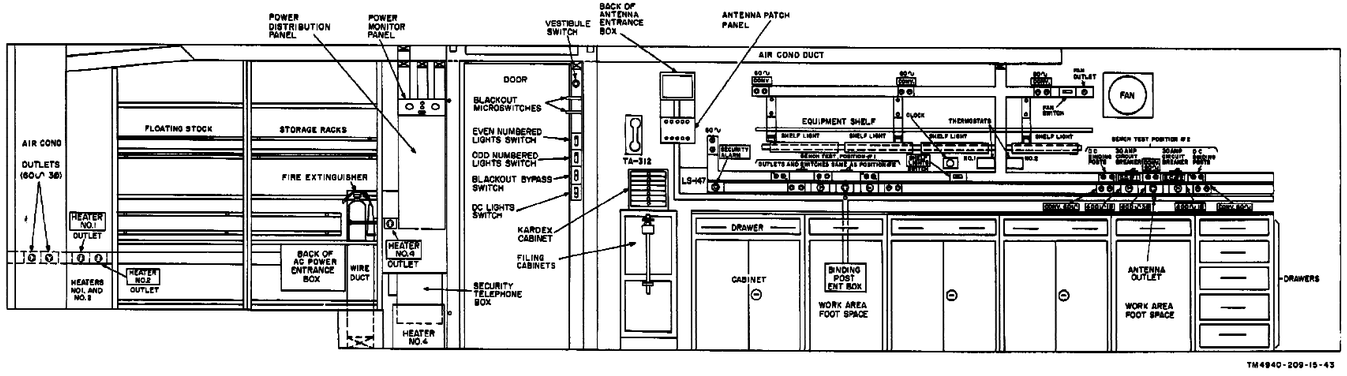

Figure 5-11. AN/ASM-189, configuration B, curbside elevation.

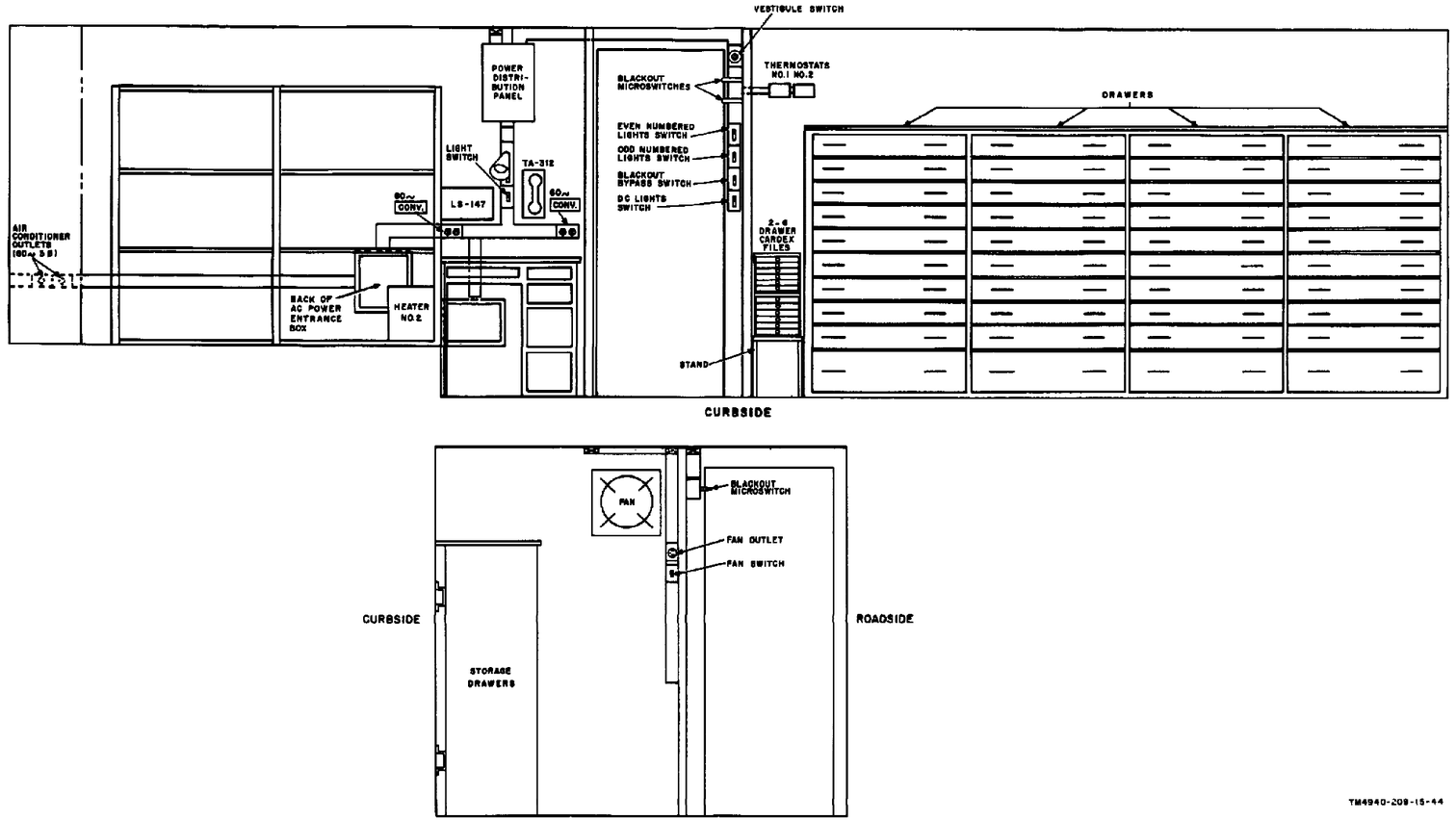

Figure 5-12. AN/ASM-190, configuration C, curbside and rear elevation.

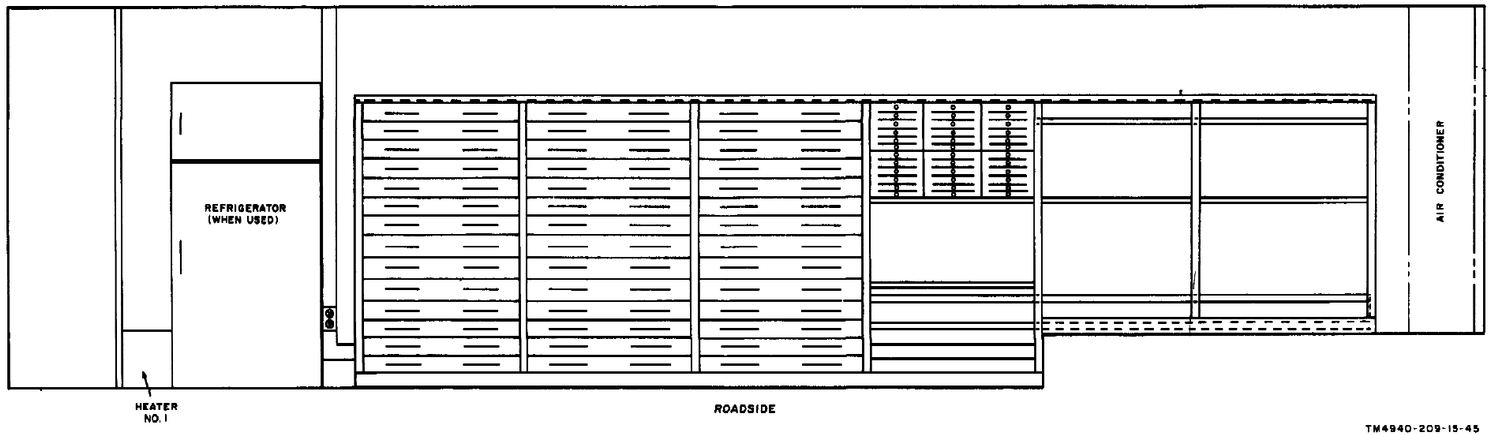

Figure 5-13. AN/ASM-190, configuration C, roadside elevation.

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