TM 11-5895-464-15

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

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

OPERATIONS CENTRAL, COMMUNICATIONS AN/MSC-32A

(NSN 5895-00-168-1571)

This copy is a reprint which includes current pages from Changes 1 through 5.

HEADQUARTERS, DEPARTMENT OF THE ARMY

APRIL 1968

WARNING

HIGH VOLTAGE

is used in this equipment

DEATH ON CONTACT

MAY RESULT IF SAFETY PRECAUTIONS ARE

NOT OBSERVED

Maintenance adjustments of this equipment are made with power applied. Be careful when working near the interior of the equipment or near the ac power distribution.

WARNING

VENTILATION IS ESSENTIAL

To prevent asphyxiation, ventilate the AN/MSC-32A at all times when occupied.

WARNING

Operator and maintenance personnel should be familiar with the requirements of TB SIG 291 before attempting installation or operation of the equipment covered in this manual Failure to follow requirements of TB SIG 291 could result in injury

or DEATH

Change
No. 5

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

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

OPERATIONS CENTRAL, COMMUNICATIONS AN/MSC-32A (NSN 5895-00-168-1571) AND OPERATIONS CENTRAL, COMMUNICATIONS AN/MSC-32B (NSN 5895-01-122-0663)

TM 11-5895-464-15, 30 April 1968, is changed as follows:

1. Remove old pages and insert new pages as indicated below. New or changed material is indicated by a vertical bar in the margin of the page. Added or revised illustrations are indicated by a vertical bar adjacent to the identification number.

Remove pages	*Insert pages*
i and ii	i and ii
1-1 through 1-6	1-1 through 1-6
2-3 through 2-6	2-3 through 2-6
A-1 through A-4	A-1 through A-4

2. File this change sheet in the front of the publication for reference purposes.

JOHN A. WICKHAM, JR.
General, United States Army
Chief of Staff

Official:

R.L. DILWORTH
Brigadier General, United States Army
The Adjutant General

DISTRIBUTION:
To be distributed in accordance with DA Form 12-51 literature requirements for AN/MSC-32A, -32B.

CHANGE
No. 4

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC, *25 May 1982*

Operator's, Organizational, Direct Support, General Support And Depot Maintenance Manual

OPERATIONS CENTRAL, COMMUNICATIONS AN/MSC-32A

(NSN 5895-00-168-1571)

AND

OPERATIONS CENTRAL, COMMUNICATIONS AN/MSC-32B

(NSN 5895-01-122-0663]

TM 11-5895-464-15,30 April 1968, is changed as follows:
1. Title of the manual is changed as shown above.
2. A vertical bar appears opposite new or changed material.
3. Remove old pages and insert new pages as indicated below:

Remove	*Insert*
None	a/(b blank)
i and ii	i and ii
1-1 through 1-16	1-1 through l-23
3-1 through 3-5	3-1 through 3-6
4-l through 4-6	4-l through 4-5
6-7 and 6-8	6-7and 6-8
A-l thru A-3	A-l thru A-4
C-l through C--5	C-1 through C-5

4. File this change sheet in the front of the manual for reference purposes.

By Order of the Secretary of the Army:

E. C. MEYER
General, United States Army
Chief of Staff

Official:

ROBERT M. JOYCE
Brigadier General, United States Army
The Adjutant General

DISTRIBUTION:

To be distributed in accordance with Special List.

WARNING

- All operations must conform to the requirements of TB 385-4, Safety Precautions for Maintenance of Electrical and Electronic Equipment. Review and observe the WARNINGS and CAUTIONS in the TM's for the equipment.

- Do not make internal connections or adjustments or work on the line power circuits alone. Be sure that there is another person present in case of an emergency.

- To be usable for cleaning, the compressed air source must limit the nozzle pressure to no more than 30 pounds per square inch gage (PSIG). Goggles must be warn at all times while cleaning with compressed air.

- Adequate ventilation should be provided while using TRICHLOROTRIFLUOROETHANE (Cleaning Compound, Freon, PCA, Type TF). Prolonged breathing of the fumes and vapor should be avoided. The solvent should not be used near heat or open flame) the products of decomposition are toxic and irritating. Since TRICHLOROTRIFLUOROETHANE dissolves natural oils, prolonged contact with the skin should be avoided. When necessary, use gloves which the solvent cannot penetrate. If the solvent is taken internally, consult a physician immediately,

- Avoid shock. Ground the instrument. Before switching on the equipment, be sure the protective equipment grounding conductor (green wire) in the power cord is grounded by connection to a grounded three-wire power outlet. Be sure the outlet has an earth ground. Do not by-pass the protective ground by using a two-wire or ungrounded extension cord. Improperly grounded equipment can result in hazardous voltages on the equipment case or chassis. Be sure that all equipments connected to this instrument are grounded to a common ground (preferably an earth ground).

- Do not apply paint to the bare metal surface directly under a ground terrninal, A clear, bare metal surface is needed for a good ground connection.

TECHNICAL MANUAL
No. 11-5895-464-15

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC, *30 April 1968*

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

OPERATIONS CENTRAL, COMMUNICATIONS AM/MSC-32A

(NSN 5895-00-168-1571)

AND

OPERATIONS CENTRAL, COMMUNICATIONS AN/MSC-32B

(NSN 5895-01-122-0663)

CHAPTER 1

INTRODUCTION

Section I. GENERAL

1-1. Scope

a. This manual describes Operations Central, Communications AN/MSC-32A (fig. 1-1 and 1-2) and AN/MSC-32B, The manual includes instructions for installing, operating, and maintaining the AN/MSC-32A and the AN/MSC-32B.

b. Throughout the manual, where applicable, references are made to other publications that cover the installation, operation, and maintenance of the equipment installed in the AN/MSC-32A and the AN/MSC-32B.

c. Appendix C is current as of 28 December 1981 and Appendix D is current as of 22 March 1968.

d. The AN/MSC-32B model is the result of the application of MWO 11-5895-464-40 to the shelter. This adapts Terminal, Communications AN/UGC-74A(V)3 in place of one of the teletypewiters TT-98C/FG to compose, edit, transmit, receive, print and store messages.

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

Refer to the latest issue of DA Pam 310-1 to determine 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. Report of Packaging and Handling Deficiencies. Fill out and forward SF 364 (Report of Discrepancy (ROD)) as prescribed in AR 735-11-2/DLAR4140.55/NAVMATINST 4355.73A/AFR 400-54/MCO 4430.3H.

c. *Discrepancy in Shipment Report (DISREP) (SF 361).* Fill out and forward Discrepancy in Shipment Report (DISREP) (SF 361) as prescribed in AR 55-38/NAVSUPINST 4610.33C/AFR 75/18MCO P4610.19D/DLAR 4500.15.

1-3.1 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 or DA Form 2028 (Recommended Changes to Publications and Blank Forms) direct to: commander. US Army Communications. Electronics Command and Fort Monmouth, ATTN: AMSEL-ME-MP. Fort Monmouth, NJ 07703-5007. In either case, a reply will be furnished direct to you.

1-3.2 Reporting Equipment Improvement Recommendations (EIR)

If your Operations Control, Communications AN/MSC-32A or AN/MSC-32B 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. Tell us why a procedure is hard to perform. Put it on an SF 368 (Quality Deficiency Report). Mail it to Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-PA-MA-D, Fort Monmouth, NJ 07703-5023. We'll send you a reply.

1-3.3 Administrative Storage

Administrative storage of equipment issued to and used by Army activities will have preventive maintenance performed in accordance with the PMCS charts before storing. When removing the equipment from storage, the PMCS should be performed to assure operational readiness. Disassembly and repacking of equipment is covered in chapter 2.

1-3.4. Destruction of Army Electronics Materiel

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

Section II. DESCRIPTION AND DATA

1-4. Purpose and Use

a Operations Central, Communications AN/MSC-32A (figs. 1-1, 1-2, and 1-3) or AN/MSC- 32B is an air-or land-transportable field communications operations office assemblage. It contains telephone switchboard, teletypewriter or AN/UGC-74A(V)3 terminal, local telephone circuits, and provisions for the optional installation of radio equipment (para 4-6). Display board facilities are provided for a Signal Operations Officer to plan, engineer, and control an area-type communications system.

b. The AN/MSC-32A or AN/MSC-32B is normally used with Operations Central, Communications AN/MSC-31A at corps and Army Signal centers.

1-5. Major Components of AN/MSC-32A and AN/MSC-32B

a Description. The major operating components consists of two Teletypewriters TT-98C/FG: (one TT-98C/FG and one AN/UGC-74A(V)3 in the AN/MSC-32B) Reperforator-Transmitter, Teletypewriter TT-76C/GGC; Intercommunication Station LS-147C/FI; Switchboard, Telephone, Manual SR-22APT; three Telephone Sets TA-312/PT: and three Terminals. Telegraph TH-22/TG. The items that comprise an operable AN/MSC-32A and AN/MSC-32B are Listed in paragraph **1-5.1.**

h. Optional** Equipment* Radio Set AN/VRC-47 and/or Radio Set AN/GRR-5 may be used when required, and the air conditioner may be removed and a second blower mounted in its place. Paragraph 1-5.2 identifies the optional items, Installation instructions for optional equipment are given in paragraph ***4-6.

1-5.1. 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 Agent y, etc.	
6895-00-999-2628	1 ea	operations Central AN/MSC-32A or AN/MSC-32B, consisting of:	
4120-00-542-4014	1 ea	Air Conditioner: F-9000-2; 94833	
5965-00-682-2769	1 ea	Handset, Headeet H-144/U	1-7
4520-00-224-7909	2 ea	Heater, Space, Electrical: SC-D-539485; 80063	5-1
5830-00-752-5357	l e a	Intercommunication Station LS- 147/FI	1-7
5815-00-503-2760	l e a	Reperforator-Transmitter, Teletypewriter T1-76( )/GGC	1-7
5815-00-503-2764	2 eaa	Teletypewriter TT-98( )/FG	1-7
5805-00-257-3602	l e a	Switchboard, Telephone, Manual SB-22( )/PT (Less cover) Consisting of:	1-7
5805-00-503-3337	12ea	Telephone Circuit, Line Jack TA-222/PT	
5805-00-715-6175	l e a	Telephone Circuit, Trunk Jack TA-326/PT	
5805-00-543-0012	4 e a	Telephone Set TA-312/PT	1-7
6805-00-907-8300	3 e a	Terminal, Telegraph TH-22/TG	1-7
5410-00-930-0886	2 e a	Shelter, Electrical Equipment S-372/MSC-32A (S-208B/G shelter modified)	
5110-00-293-2339	l e a	Axe: GGG-A-926, Type 1, Class 1	1-9
	1 ea	Basket, Distribution: SC-D-539453	5-1
7520-00-292-9493	2 e a	Basket, Wastepaper: RR-B- 181, Type II, Style B, gray: 81349	5-1
		NOTE Dry batteries listed are used with the equipment but are not considered part of the equipment. They will not be preshipped automatically, but are to be requisitioned in quantities necessary for the particular organization in accordance with SB 11-6.	
6135-00-120-1020	4 ea	Battery, Dry BA-30	
6135-00-850-3177	l e a	Battery, Dry 9V: Snap-on-type terminals, Burgees Part #2MN6 or equal (for clock)	

1-5.1. Items Comprising an Operable Equipment—Continued

NSN	QTY	Nomenclature, part No., and mfr code	Fig. No.
5940-00-223-5293	52 ea	Binding Post U-106/U; SC-DL-72389	
	1 ea	Blower Assembly: SC-D-539556	1-7
	1 ea	Box, Pencil: SC-D-539455	1-7
7920-00-178-8315	1 ea	Brush, Dusting: SC-C-539469	5-1
5995-00-823-2715	1 ea	Cable Assembly CX-4566A/G: 250 ft long mounted on Reel RC-435/U	1-12
5140-00-752-2435	1 ea	Cable Assembly CX-7453/U: 100 ft long, mounted on Reel RC-435/U	1-12
5995-00-752-2548	1 ea	Cable Assembly, Power Electrical CX-7705/U: 15 ft long, power stub	1-13
4940-00-752-2474	1 ea	Cable Assembly, Power, Electrical Line Cord: SM-D-350987: 80063	1-13
5995-00-935-2704	1 ea	Cable Assembly, Power Electrical: SC-D-543404: 80063 (For Air Conditioner)	1-10
5995-00-823-2620	1 ea	Cable Assembly, Special Purpose: F/headset: SM-C-382135: 80063	
5995-00-889-0803	1 ea	Cable Assembly, Telephone CX-4760A/U: 15 ft long stub	1-13
5995-00-752-2566	5 ea	Cable Assembly, Telephone: F/LS-147( )/FI and TA-312/PT: SM-D-383873-GR III: 4 ft long: 80063	1-13
5995-00-889-0923	1 ea	Cable Assembly, Telephone: F/SB-22( )/PT: SM-C-352715: 80063	
5995-00-823-3016	2 ea	Cable Assembly, Telephone: F/TTY; back plug; 6 ft long: SM-D-384145-GR I: 80063	1-13
5995-00-889-0608	2 ea	Cable Assembly, Telephone: F/TTY; red plug; 6 ft long: SM-D-384145-GR II: 80063	1-13
	1 ea	Cable Assembly, Telephone: 8 ft long: SC-D-543418	5-1
	1 ea	Cable, Special Purpose; SC-D-960025-002	1-15
	1 ea	Cable, Signal Assembly; SC-D-983141-005	1-15
	1 ea	Cable, Ac power; SC-D-983164	1-15
7105-00-943-3868	1 ea	Chair, Folding: SC-D-539471: 80063	
7110-00-273-8798	3 ea	Chair, Rotary (When replacing chair, remove and retain mounting bracket for installation on new chair): AA-C-293A, Type 2, Class 2, Style B: 81349	5-1 5-1
6645-00-800-7094	1 ea	Clock, Aircraft, Mechanical: SC-C-539475: 80063	
6605-00-892-5399	1 ea	Compass, Magnetic: MIL-C-10436: 81349	
5935-00-682-0381	2 ea	Connector Receptacle U-187( )/G	
5995-00-752-2516	3 ea	Cord Assembly, Electrical: 2 ft 6 in long; black; SM-D-352593-GR III: 80063	
5995-00-752-2515	3 ea	Cord Assembly, Electrical: 2 ft 6 in long; red; SM-D-352594-GR III: 80063	
5995-00-752-2594	3 ea	Cord Assembly, Electrical: 2 ft 6 in long; white; SM-D-352595-GR III: 80063	
5995-00-752-2593	4 ea	Cord Assembly, Electrical: 2 ft 6 in long; green; SM-D-352596-GR III: 80063	
5995-00-752-2597	1 ea	Cord Assembly, Electrical: 2 ft 6 in long; gray; SM-D-352597-GR III: 80063	
7210-00-753-3043	1 ea	Cushion, Chair: SM-C-350214: 80063	
6110-00-985-7574	1 ea	Distribution Box J-1077A/U: SC-DL-288038	5-1
4210-00-383-7129	1 ea	Extinguisher, Fire: 5 lb: SC-D-539482: 80063	5-1
6545-00-922-1200	1 ea	First Aid Kit: SC-D-539483: 80063	5-1
5120-00-776-9917	1 ea	Grip, Cable: SC-B-539592: 80063	1-13
5120-00-776-9918	2 ea	Grip, Cable: SC-B-539593: 80063	1-13
5410-00-752-2525	1 ea	Ground Strap Assembly: SC-B-539492: 80063	1-14
5120-00-251-4489	1 ea	Hammer, Sledge, 8 lb: SC-C-539505: 79796	5-1
2540-00-892-6243	1 ea	Ladder, Boarding, Vehicle MX-3391/G: SC-DL-108736	1-9
6240-00-152-2996	10 ea	Lamp, Fluorescent: SC-C-539495	5-1
6240-00-143-3070	2 ea	Lamp, Incandescent 50W/RS	1-13
6240-00-223-9100	7 ea	Lamp, Glow, MIL Type NE-51	1-13
6240-00-299-5876	1 ea	Lamp, Glow, MIL Type NE-34	1-13
6230-00-729-9614	1 ea	Lantern, Electrical: 2106-7: 32572	5-1
5410-00-752-2525	2 ea	Lead, Electrical: SM-B-539592: 80063	1-13
6230-00-615-5384	1 ea	Light, Extension: W-L-661, Type 1, Class 1: 81349	1-13
	1 ea	Mat, Rubber: SC-C-539500-1: 80063	5-1
7510-00-240-1526	1 Bx	Pencil, Spiral-paper form, china marking, black	
7510-00-436-5210	1 Bx	Pencil, Spiral-paper form, china marking, blue	
7510-00-275-7212	1 Bx	Pencil, Spiral-paper form, china marking, green	

1-5.1. Items Comprising an Operable Equipment—Continued

NSN	QTY	Nomenclature, part No. and mfr code	Fig. No.
7510-00-174-3205	1 Bx	Pencil, Spiral-paper form, china marking, red	
7510-00-264-4612	1 Bx	Pencil, Spiral-paper form, china marking, yellow	
5120-00-293-3603	1 ea	Pin Straightener, 7 & 9 pin: SC-B-539472	5-1
5120-00-293-2696	1 ea	Puller, Electron Tube: 7113: 95344	5-1
5120-00-293-2092	1 ea	Puller, Electron Tube: 9113: 95344	5-1
8130-00-656-1090	2 ea	Reel, Cable RC-435( )/U: SC-DL-69296: 80063	5-1
5935-00-064-5732	2 ea	Receptacle, Power U-238( )/G	
5975-00-224-5260	2 ea	Rod, Ground MX-148( )/G:SC-D-14158: 80063	5-1
7110-00-782-2819	1 ea	Safe, Single Drawer: Class 3 Size VII: 81349	1-8
5120-00-752-9675	1 ea	Screwdriver (flat blade): SC-C-539502-4	
5120-00-284-8913	1 ea	Screwdriver, Phillips type: GGG-S-121, Type VI, Class 1, Style 1, Point Size 2 4 in shank	
6130-00-076-3545	12 ea	Semiconductor Device, Diode: SC-C-141242: 80063	
6130-00-076-3546	6 ea	Semiconductor Device, Diode: SC-C-141343: 80063	
7520-00-162-6178	1 ea	Sharpener, Pencil: SC-C-539503: 80063	5-1
6250-00-298-2884	10 ea	Starter, Fluorescent: FS-2: 71183	5-1
5210-00-221-1882	1 ea	Tape, Measuring: SC-D-54697B: 80063	
5815-01-062-8194	1 ea	Terminal, Communications AN/UGC-74A(V)3	
9920-00-682-6747	1 ea	Tray, Ash: AA-A-701, Type III, Style A	

[a] One TT-98( )FG in AN/MSC-32B.

1-5.2. Optional Items Used With AN/MSC-32A or AN/MSC-32B

NSN	QTY	Nomenclature, part No., and mfr code
5895-00-935-5959	1	t, Installation: SC-DL-543399 8063 (For Radio Sets AN/VRC-47 and/or AN/GRR-5)
1110-00-012-1058	1	Kit, Installation, Blower: SC-DL-543454: 80063 (To be installed in lieu of air conditioner if required)
5965-00-876-2375	1	Loudspeaker, Permanent Magnet LS-454/U
6130-00-985-7899	1	Power Supply PP-2953/U
5820-00-248-3506	1	Radio Set AN/GRR-5
5820-00-892-0864	1	Radio Set AN/VRC-47

1-6. Technical Characteristics

a. Power Requirements.

Type ..... 115 volts ac ± 11.5, 50 to 60 cps, 3-wire, single phase

Consumption:
- Fluorescent lights (10) ..... 200 watts.
- Incandescent light ..... 50 watts.
- Power distribution panel and neon light ..... 4 wattts.
- Exhaust blowers (2) ..... 5 00 watts.
- Air conditioner ..... 480 watts.
- Heaters (2) ..... 3,000 watts
- LS-47C/F1 ..... 40 watts.
- TH-22/TG (3) ..... 60 watts.
- TT-76C/GGC ..... 150 watts.
- TT-98/FG (2). ..... 300 watts.
- AN/VRC-47 ..... 255 watts.
- AN/GRR-5 ..... 110 watts.
- Total ..... 5,149 watts.

b. Physical Characteristics.

Dimensions:
- Length ..... 147 inches
- Width ..... 87 inches.
- Height ..... 83 inches
- Weight ..... 3,080 pounds (approx).
- Volume ..... 614 cubic feet

c. Radio Signal Characteristics.

(1) *Receiving Set, Radio A N/GRR-5.*

- Type of signals ..... Voice, cw, and mcw
- Frequency range ..... 1.5 - 18.0 mc.
- Power Source ..... 115 volts ac, 50-60 cycles
- Antenna ..... Whip
- Weight (with accessories) ..... 76 pounds.

(2) *Radio Set AN/VRC-47.*

- Receiver-Transmitter, Radio. . RT-524/VRC
- Frequency range ..... 30.00 -75.95 mc
- Type of signals ..... Voice.
- Preset frequencies None.
- Range ..... 15 to 20 miles.
- Operation ..... Push-to-talk.
- Control ..... Local or remote.
- Antenna ..... Center-fed whip.
- Number of channels ..... 920.
- Squelch ..... Noise- and tone-operated

c.1. The technical characteristics of the AN/UGC-74A(V)3 are as follows: (AN/MSC-32B only).

Application . . . . . Used to compose, edit transmit, receive, print and store messages

Operational States operate as an intelligent communications terminal, a keyboard send/receive terminal, or a receive only terminal.

Type of Installation . . . . . Tactical: fixed or mobile, table, or relay rack mounted.

Operating Speeds:

Baud Rate	Code
1200	ASCII 10 unit (1 stop bit)
	ASCII 11 unit (2 stop bits)
600	ASCII 10 unit (1 stop bit)
	ASCII 11 unit (2 stop bits)
300	ASCII 10 unit (1 stop bit)
	ASCII 11 unit (2 stop bits)
150	ASCII 10 unit (1 stop bit)
	ASCII 11 unit (2 stop bits)
75	ASCII 10 unit (1 stop bit)
	ASCII 11 unit (2 stop bits)
	Baudot 7 unit (1 stop bit)
	Baudot 8 unit (2 stop bits)
60	Baudot 7 unit (1 stop bit)
	Baudot 8 unit (2 stop bits)
45.5	Baudot 7 unit (1 stop bit)
	Baudot 8 unit (2 stop bits)

System Interface . . . . Operates with MIL-STD-188-114 equipment (e.g KE-7, TH-22/TG MD-522) and the following COMSEC equiprnents: VINSON (TSEC/KY-57), KG-30 (TSEC/KY-30) and DLED (TSEC/KG-84}.

Keyboard . . . . . MIL-STD-1280 Type 1, Class 1 plus 4 special keys.

Printer:

Type . . . . . Drum

Print Rate . . . . . 60 characters per second, minimum.

Printed Characters . . . . Gothic: 63 characters of the ASCII subset and a diamond.

Printed Characters per line . . . . . Operator selectable form 40 to 80 character

Paper Type and Capacity. . . . . Single or multipy (3 ply-maximum) roll paper, 5 Inches in diameter by 8½ inches wide. Single or multi-ply (3 ply-maximum) fanfold.

Other Printer Features: Single of double line fed Paper low lamp, for roll paper only. Automatic shutdown of printing on physical paper outage (for roll paper only Automatic shutdown of print drum motor if there is no printing for between 2 and 4 minutes.

Power Requirement: 100 Watts, maximum.

Operating Voltages: 26 ± 4 Volts dc 115 Volts ac ± 15%, 50,60 or 400 Hz ± 5%, 230 Volts ac ± 15%, 50 6] or 400 Hz ± 5%.

Voltage and Transient Voltage Protection. . . Overvoltage 36 Volts d in put for 1-hour maximum. Over voltage transients, 100 Volts dc input, Under voltage transients, 15 Volts dc input.

Environmental Conditions:

Operating Temperature: -25F to + 125F (-32C to +52C) plus solar radiation,

Nonoperating Temperature: -65F to +155F (-54C to +68C)

Case Closed. . . . . Water and dust proof.f

Case Cover Removed. . . . . Spray proof.

Physical Characteristics

Total Weight . . . . . 100 pounds with case, cover and paper,

Dimensions . . . . . 21.75 inches long, 17.5 inches wide and 9.5 inches high.

Receiver, Radio, R-442/VRC:

Frequency range . . . . 30.00-75.95 mc.

Type of signals. . . . . Voice.

Preset frequencies. . . . . None.

Antenna . . . . . Noise-and tone-operated.

Number of channels. . . . . .920.

d. Teletypewriter Characteristics,

(1) Reperforator-Transmitter, Teletypewtiter TT-76C/GGC,

Keyboard Standard communications.

Type of characters English.

Method of recording . . . . . Printed and perforated o 7/8-inch wide paper tape.

Characters per line. . . . . ..76 maximum,

Type of feed . . . . . Sprocket.

Type of signals . . . . . Neutral or polar re-ceivlng, neutral sending.

Speed:

Operations per minute . . . .368.1. 404, 480, or 600 opm (send and receive),

Words per minute	60, 66, 75, or 100 wpm (send and receive).
Range	368.1 opm 25 miles, 600 opm 15 miles.
Tape capacity	5 hours, 20 minutes at 368.1 opm or 3 hours, 10 minutes at 600 opm.

(2) *Teletypewriter TT-98C/FG.*

Keyboard	Standard communications.
Type of characters	English.
Characters per line	Standard, 72; weather, 76.
Type of paper feed	Friction or sprocket.
Type of signals	Neutral (20 or 60 ma); polar (20 or 30 ma).
Speed	368.1, 404, 460, and 600 opm (send and receive); 615, 67.7, 75, and 100 wpm (send and receive).
Paper capacity	Adjustable to accommodate standard 1- through 6-copy roll, fanfold paper, or sprocket-fed forms, 8½ inches wide.

e. Terminal, Telegraph TH-22/TG.

Operational modes:	
Mode 1	60, 75, and 100 wpm.
Mode 2	200 wpm.
Type of modulation	Frequency shift.
Bandwidth	1,200 cps to 1,400 cps (approx).
Line requirements	Two-wire or four-wire.
Line impedance	Terminating impedance required at binding posts, 600 ohms.

f. Local Communication Facilities.

Intercommunication Station	LS-147C/FI.
Telephone Set	TA-312/PT.

g. Terminal Communications AN/UGC-74A(V)3(AN/MSC-32B only).

Operational states	
RO	Receive only.
KSR	Keyboard send/receive.
ICT	Intelligent Communication terminal.
Nonoperational states	
OFF	Power switch is OFF.
Cold Start	(Power applied to terminal).
System initiation	Operation Validation/ State Determination.
Battery Backup	Prime power removed.
Self test	System readiness test.

1-7. General Description (figs 1-1 and 1-2)

Shelter, Electrical Equipment S-372/MSC-32A is the shelter facility for AN/MSC-32A and AN/MSC-32B in which all other components (paras 1-8 and 1-9) are installed. The shelter is fully insulated and weatherproofed and can be transported by an air or ground vehicle. The AN/MSC-32A and AN/MSC-32B operating components are mounted on shelves and brackets that are secured to the shelter floor and walls. Storage areas are provided for running spares and accessory items. Mountings are provided for storing the antenna accessory kit bag, cable reels, and spare parts.

1-8. Description of Power, Signal, and Communications Components of AN/MSC-32A and AN/MSC-32B

a. Power and Signal Components. Watertight receptacles are provided in the power entrance box (fig. 1-4), on the AN/MSC-32A and AN/MSC-32B rear wall (fig. 1-1), for connection to an external power source. External ac power may be provided by a generator set or a central power source. Generator Set PU-615/M or PU-620/M is recommended as an alternate source of primary power. These generator sets are not supplied with the AN/MSC-32A or the AN/MSC-32B. If a generator set is selected as a power source, refer to the applicable generator set technical manual and TB 43-0125 for power connections on the generator set.

(1) *Lighting.* Ten fluorescent light fixtures, installed in the ceiling (fig. 4-2), provide lighting for the shelter. One incandescent light is provided for use when cold weather prevents instant starting of the fluorescent fixtures.

(2) *Entrance boxes.* The power and signal entrance boxes (fig. 1-1) are mounted in the shelter exterior wall. Each entrance box is equipped with folding side panels for weather protection and is secured with captive-screw fasteners.

(a) The power entrance box (fig. 1-4) contains receptacles for connecting ac power to the shelter components. It also contains a duplex convenience outlet receptacle (115 volts ac) equipped with a spring-loaded watertight cover. Entrance to the rear of the power entrance box is provided on the interior rear wall when the power entrance panel is removed.

(b) The signal entrance box (fig. 1-5) contains the 26-pair cable receptacle and 26 pairs of binding posts for optional use in connecting signal circuits to the shelter components. Entrance to the rear of the signal entrance box is provided on the shelter interior rear wall when the signal entrance panel is removed.

(3) *Power distribution panel* (fig. 1-6). The power distribution panel contains metering and control circuits for the ac distribution circuits.

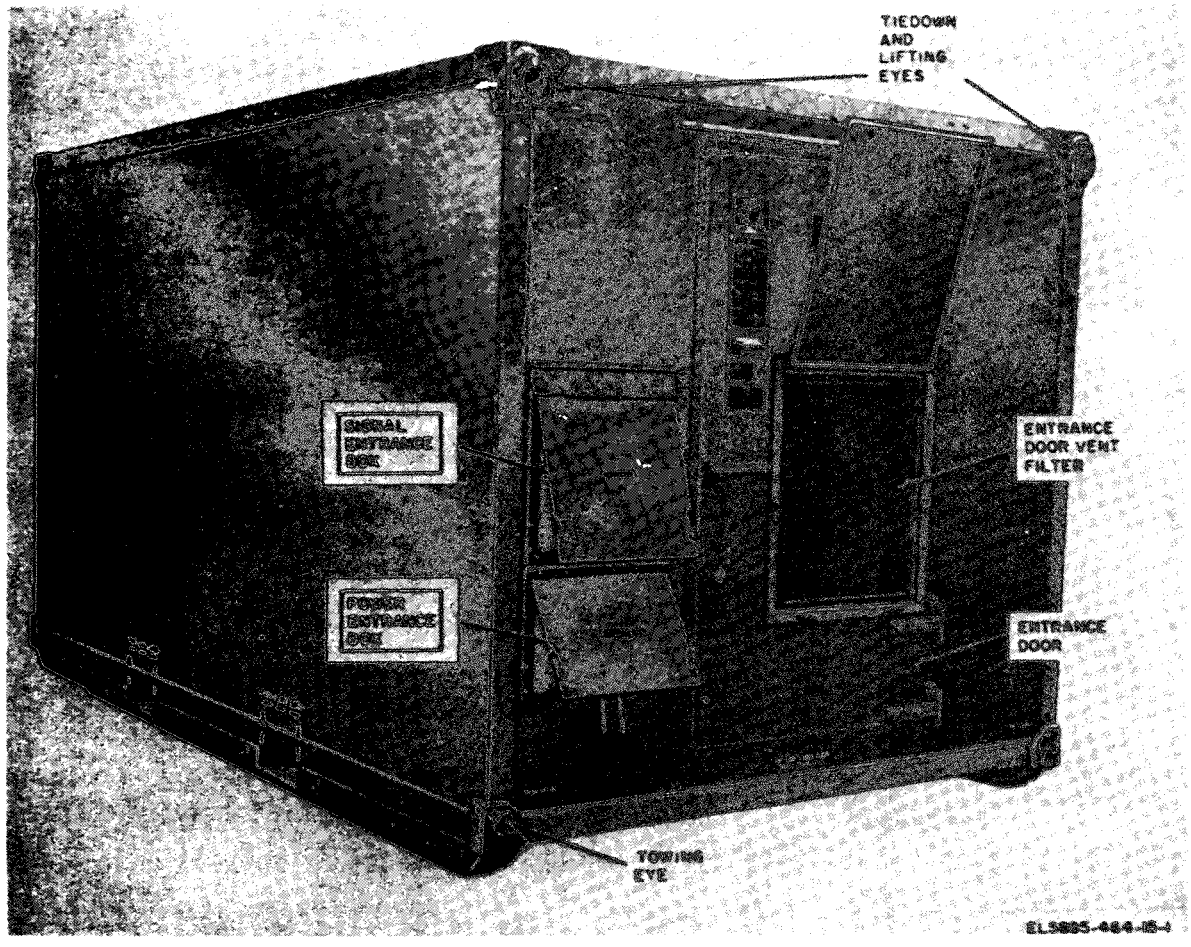


Figure 1-1. Operations Central Communications AN/MSC-32A, Rear Roadside View.

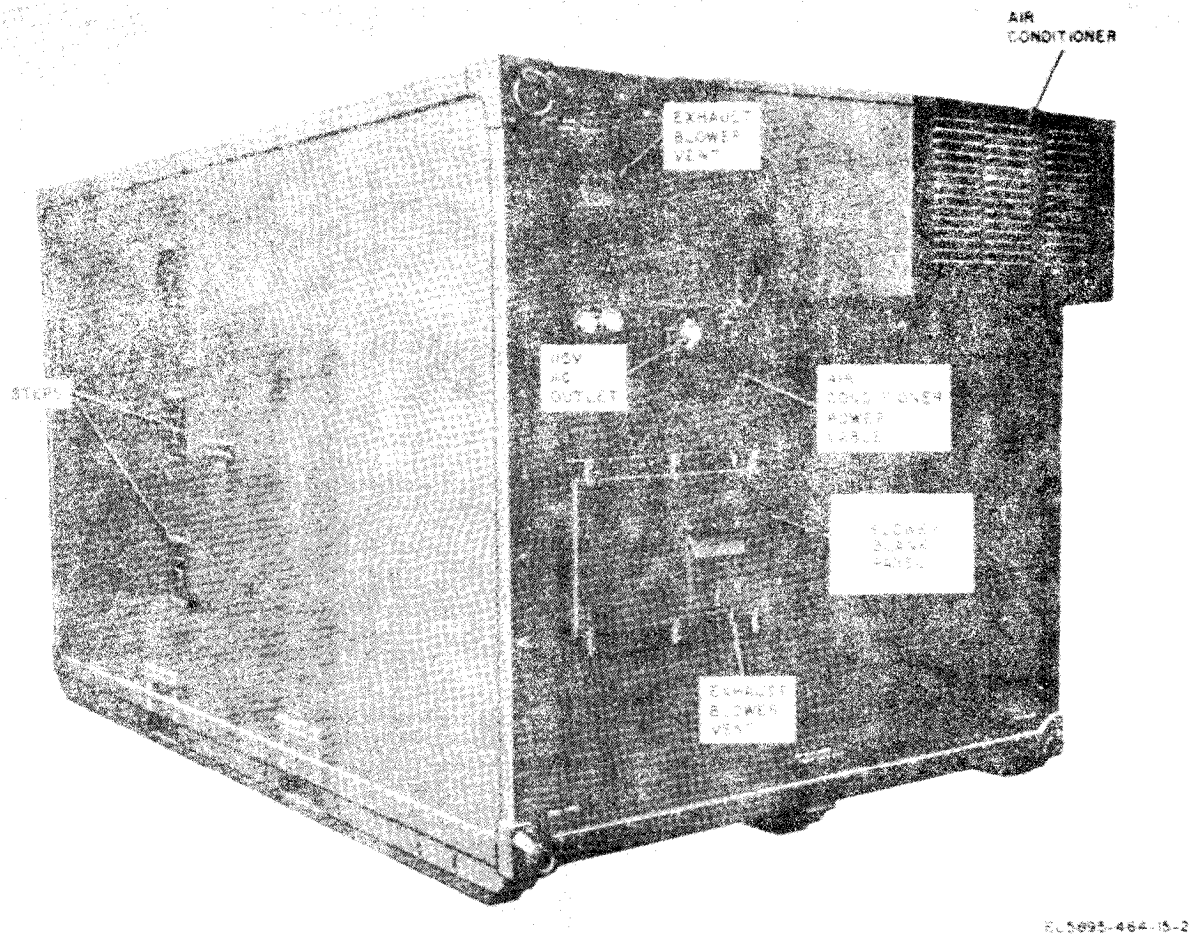


Figure 1-2. Operations Central Communications AN/MSC-32A, Front Curbside View.

(4) *Power and signal wiring.* Ac power wiring is routed through power (raceways) to the various ac power outlets. Signal wiring is routed through signal (raceways) to the various components.

b. Communications Components.

(1) *Switchboard, Telephone, Manual SB-22A/PT* (fig. 1-7). The SB-22A/PT (TM 11-5805-262-12) is a local, battery-powered telephone switchboard used to switch 12 telephones or voice frequency (vf) teletypewriter circuits.

(2) *Telephone Set TA-312/PT* (fig. 1-7). The TA-312/PT's (TM 11-5805-201-12) are used for local telephone communication. One TA-312/PT (less carrying case) is mounted on the curbside wall. Two TA-312/PT's are stored in a storage cabinet; when required for use, they are placed on the tabletop adjacent to a PHONE jack.

(3) Terminal, *Telegraph TH-22/TG* (fig. 1-7). The TH-222/TG's (TM 11-5805-356-12) are used to send and receive vf teletypewriter signals for the teletypewriters (e and f below).

(4) Teletypewriter *TT-98C/FG* (AN/MSC-32A) (fig. 1-7). The TT-98C/FG'S (TM 11-5815-200-12) are used to send (keyboard) and receive (printed page) direct current (dc)teletypewriter signals.

(4.1) Terminal, Communications *AN/UGC-74A(V) 3 (AN/MSC-32B). The* AN/UGC-74A(V)3 (TM 11-5815-602-12) is used for sending and receiving either standard teletype Baudot code or ASCII code for communicating with a computer terminal.

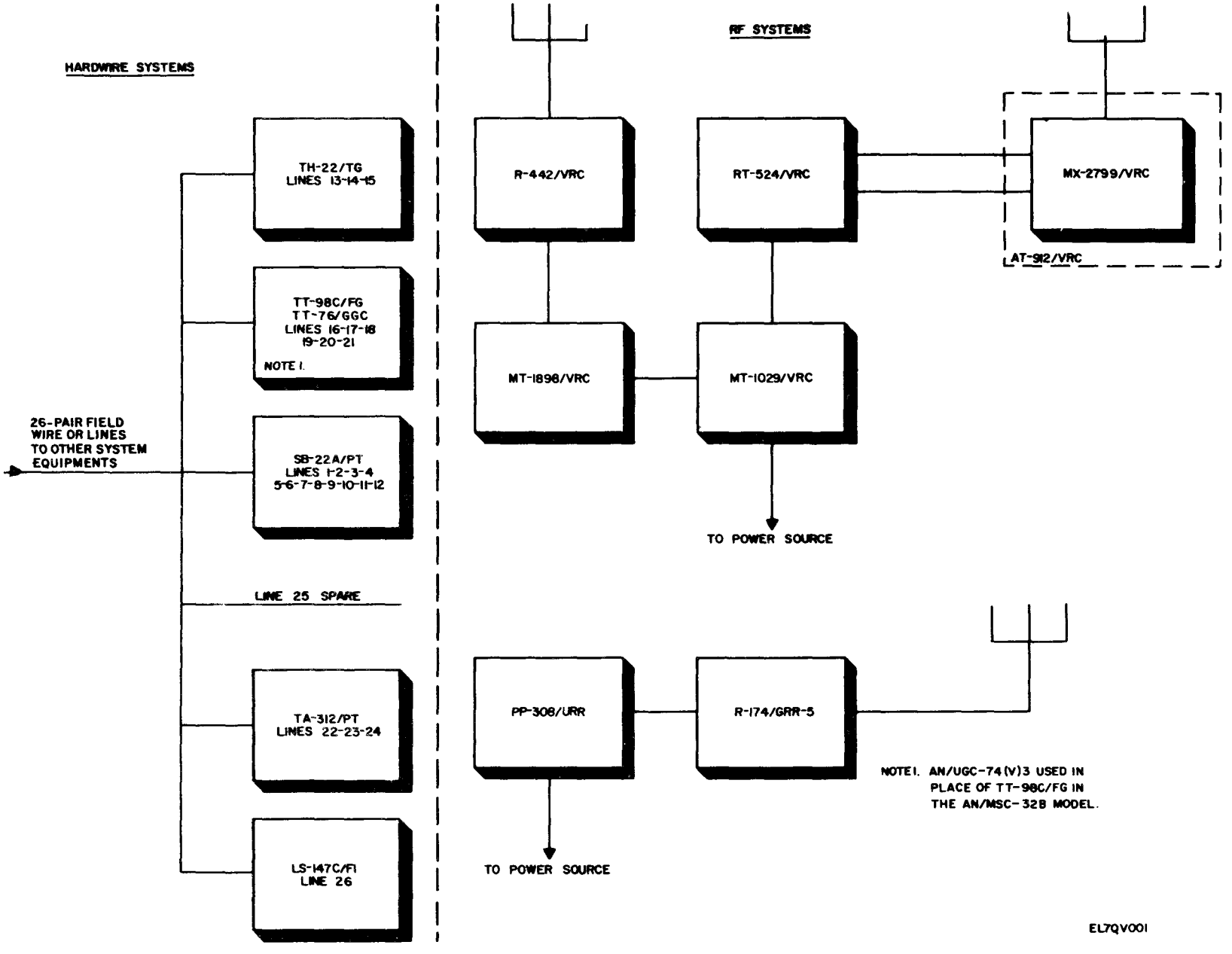


Figure 1-3. Operations Central, Communications AN/MSC-32A or AN/MSC-32B signal circuits, block diagram.

(5) *Reperforator-Transmitter, Teletypewriter TT-76C/GCC* (fig 1-7). The TT-76C/GGC (TM 11-5815-238-12) is used to send (keyboard or transmitter-distributor) and receive (tape) dc teletypewriter signals.

(6) *Intercommunication Station LS-147C/F1* (fig. 1-8). The LS-147C/F1. (TM 11-5830-221-12) provides two-way, nonprivate communication in a system that consist of other LS-147C/F1 's or equivalent equipment.

(7) *Radio Set AN/VRC-47* (fig. 1-7). The AN/VRC-47 (TM 11-5820-401-10) provides short-range, two-way, frequency-modulated (fm) radio-telephone communications between vehicles or crew-served weapons. The AN/VRC-47 radio set consists of Receiver-Transmitter, Radio RT-524/VRC and Receiver, Radio R-442/VRC, and Loudspeaker, Permanent Magnet LS-454/U. Power Supply PP-2953/U (fig. 1-8) is required to supply power to the AN/VRC-47)

(8) *Receiving Set, Radio AN/GRR-5.* (fig. 1-7). The AN/GRRR-5 (TN 11-5820-284-15) is a mobile amplitude modulated (am). receiver employed primarily to monitor warning broadcast nets. The AN/GRR–5 consists of Receiver R-174/GRR-5, Power Supply PP-308/URR, and accessories.

(9) *Distribution Box J-1077A/U. The J-1077A/U* (fig. 5-1) is a terminal box which can be used to connect field wires to a 26-pair cable connector.

(10) *Terminal Communications AN/UGC-74A(V)3.* Provides a full-duplex, asynchonous (ASCII or Baudot) communications capability with MIL-STD-188C and normal input keying (NIK) interfaces. The terminal is used to COmpose, edit, transmit, receive, store, and print messages. It is usable at signaling speeds of 45.5, 50, 75, 150, 300, 600, and 1200 baud (bits per second) utilizing the internal clock. Other rates may be used when an external clock is provided. The terminal is housed in a combination case (front cover and operating case). The operational portion of the case is secured to the terminal chassis with latches. The chassis itself is mounted on slides which are built into the combination case. The slides permit extension of the terminal from the case to enable easy access to the internal controls, paper supply, fuses, power supply and the electronics packages. The hinged door on the rear of the case permits access for connection of power and signal cables to the internal connector panel.

1-9. Descripticm of Miscellaneous Components

a. Electric Heaters (fig. 1-9). The heaters are secured in their mounting bases on the shelter floor (fig. 5-1). Each heater contains a 1.5-kilowatt heating element and a fan for air circulation. Horizontal louvers on the front of each heater are adjustable to deflect the airstream. Operating controls are located on the top of each heater.

b. Blowers. One blower is installed on the front roadside wall (fig. 1-7), and one blower is stored. The stored blower may be installed, if required, in place of the air conditioner (para 1-5b). The blowers are equipped with removable covers which muffle the sound. The blowers are used to exhaust air to the outside of the shelter.

c. Clock. An 8-day, luminous-dial, 24-hour clock is mounted on the shelter rear curbside wall (fig. 5-1). A knob on the left-hand side is used for winding and setting the clock.

d. Air Conditioner, Model F-9000-2 (FSN 4120-679-2669) (fig. 1-10). The Model F-9000-2 air conditioner is air-cooled, self-contained, base-mounted, and requires an external source of 115-volt, 60-cycle per second (cps), single phase, ac electrical power for operation. The Model F-9000-2 has a cooling capacity of 8.400 Btu/hr at 125°F ambient air temperature.

e. Patch Panel (fig. 1-11). The patch panel provides a means of selecting desired SB-22A/PT and TH-22TG circuits.

f. Teletypewriter Jacks (fig. 5-1). The teletypewriter jack' in the signal duct directly behind the teletypewriters provide a means for connecting the TT-98C/FG and the TT-76C/GGC teletypewriter circuits Jacks are provided for connecting AN/UGC-74A(V)3 in the AN/MSC-32B.

g. Ancillary Components.

(1) *Power cable assembly and reel* (fig. 1-12). Cable Assembly, Power, Electrical CX-7453A/U is wound on Reel RC-435/U which. during transport, is secured to the floor at the front of the shelter (fig. 1-9. It is a 100-foot, 3-conductor cable with a watertight power connector on each end.

(2) *Power cable stub.* Power Cable Stub CX-7705A/U is a 15-foot, 3-conductor cable with a watertight power connector on one end, and green,white, and black prepared leads on the other end. It is wound on the same reel used for the power cable assembly.

(3} *Cable Assembly, Telephone* CX-4566A/U and Reel *RC-435//U.* (fig. 1-12). The CX-4566A/U is 260 feet long and is equipped with a 26-pair cable connector on each end.

(4) *Cable Assembly, Telephone CX-4760A/U* (fig. 1-13). *The CX-4760A/U is a* 26-pair cable stub that is 15 feet long and is equipped with a 26 pair cable connector on one end and prepared leads on the other end.

(5) *SB-22A/PT cable stub* (fig. 1-7). The SB-22A/PT cable stub is equipped with a 26-pin connector on one end and prepared leads on the other end.

(5.1) *Cable Assembly, Special Purpose* (fig. 1-15). The special purpose cable is used in the AN/MSC-32B for connecting the AN/UGC-74A{V)3 to a standby battery BA-5598/U.

(5.2) Cable *Assembly, AC Power SC-D-983164* (fig. 1-15). The *ac* power cable is used in the AN/MSC-32B for connecting the AN/UGC-74 to ac power receptacle in raceway,

(5.3) *Cable Assembly, Signal SC-D-983141-005* (fig. 1-15). The signal cable is used in AN/MSC-32B to connect the send and receive signal output/input receptacles of the AN/UGC-74A(V)3 to send/receive jacks.

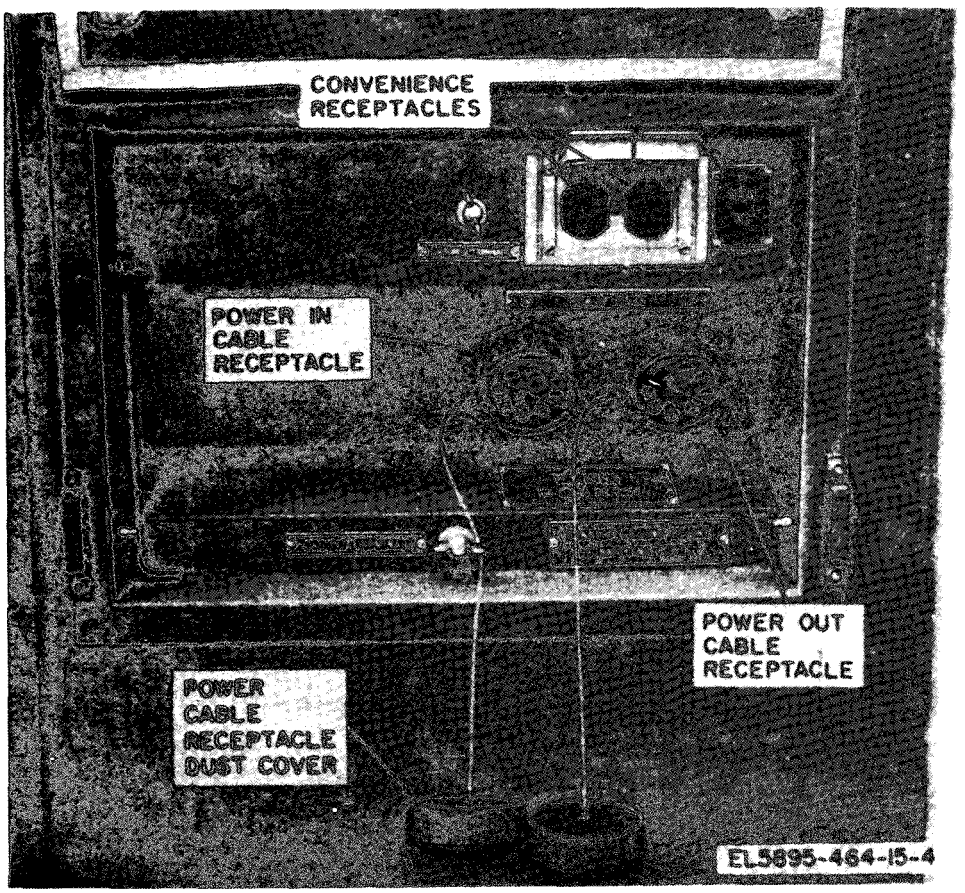


Figure 1-4. Power Entrance Box, Exterior Front View

(6) *Patch cords* (fig. 1-12). The patch cords are two-conductor cords, equipped with telephone plugs at each end.

(7) *Telephone and teletypewriter connecting cords* (fig. 1-13). The telephone (4 feet) and teletypewriter (6 feet) connecting cords are two-conductor cords equipped with telephone plugs on one end and prepared leads on the other end.

(8) *Running spares.* The running spares are shown in figure 1-14.

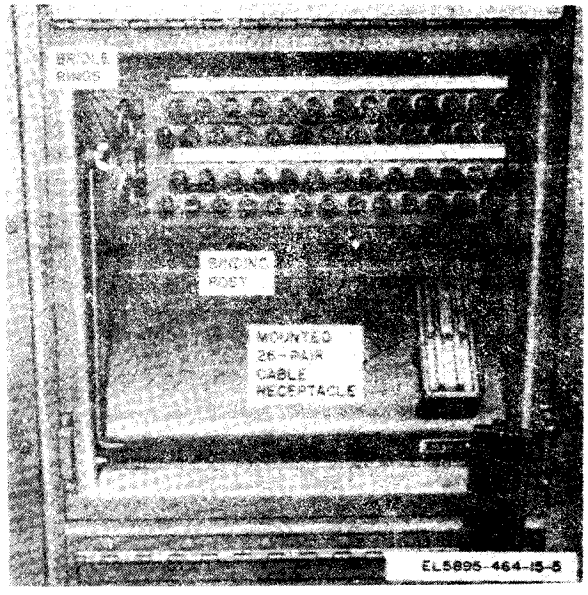


Figure 1-5. Signal Entrance Box, Exterior Front View.

1-10. Expendable Consumable Supplies and Material

Expendable consumable supplies and material are listed in table 1-1.

Table 1-1. Expendable Consumable Supplies and Material

The supplies and material listed in this table aree required for operation of this equipment and the authorized to be requisitioned by SB 700-50. The FSN 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 Government agency, etc., and is identified in SB 708-42.

Item	*Description*	*Ref. No. and FSCM*	*FSC*
1	Paper, Recording, Teletypewriter:	UU-P:547C, type1, class1; 81349	7530
2	Ribbon Printing, Teletypewriter:	DDD-R-311D, type 1, grade A, class 1; 81349	7510
3	Tape Teletypewriter:	UU-T-120; 81349	7530
4	Paper, Roll, 3 ply:	NSN 7530-00-285-5030	7530
5	Ribbon, Teletypewriter SM-B-765911 (80063):	NSN 7920-00-924-7500	7510
6	Cloth, Cleaning:		
7	Trichlorotrifluoroethane:	NSN 6850-00-105-3084	6800

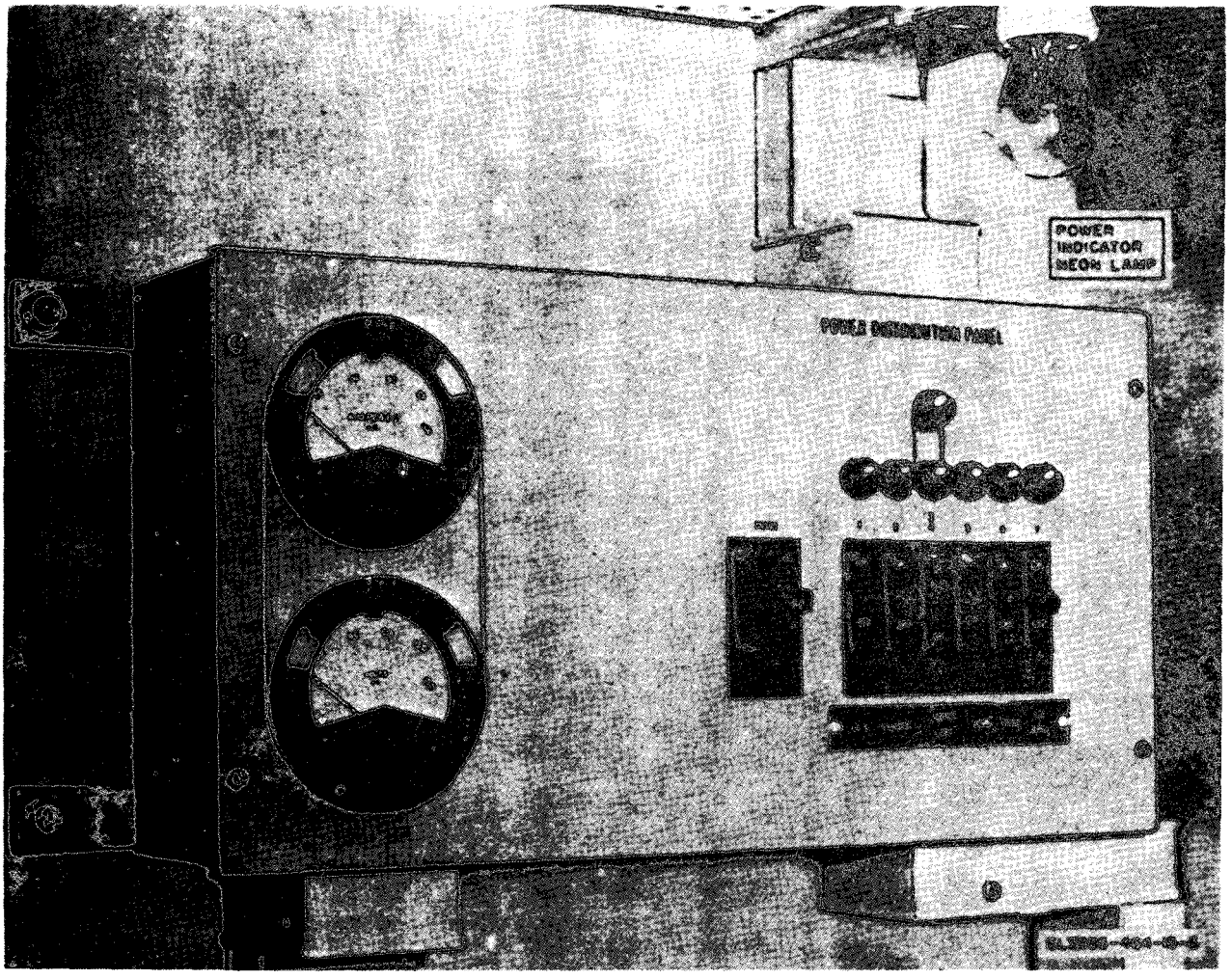


Figure 1-6. Power distribution panel, front view.

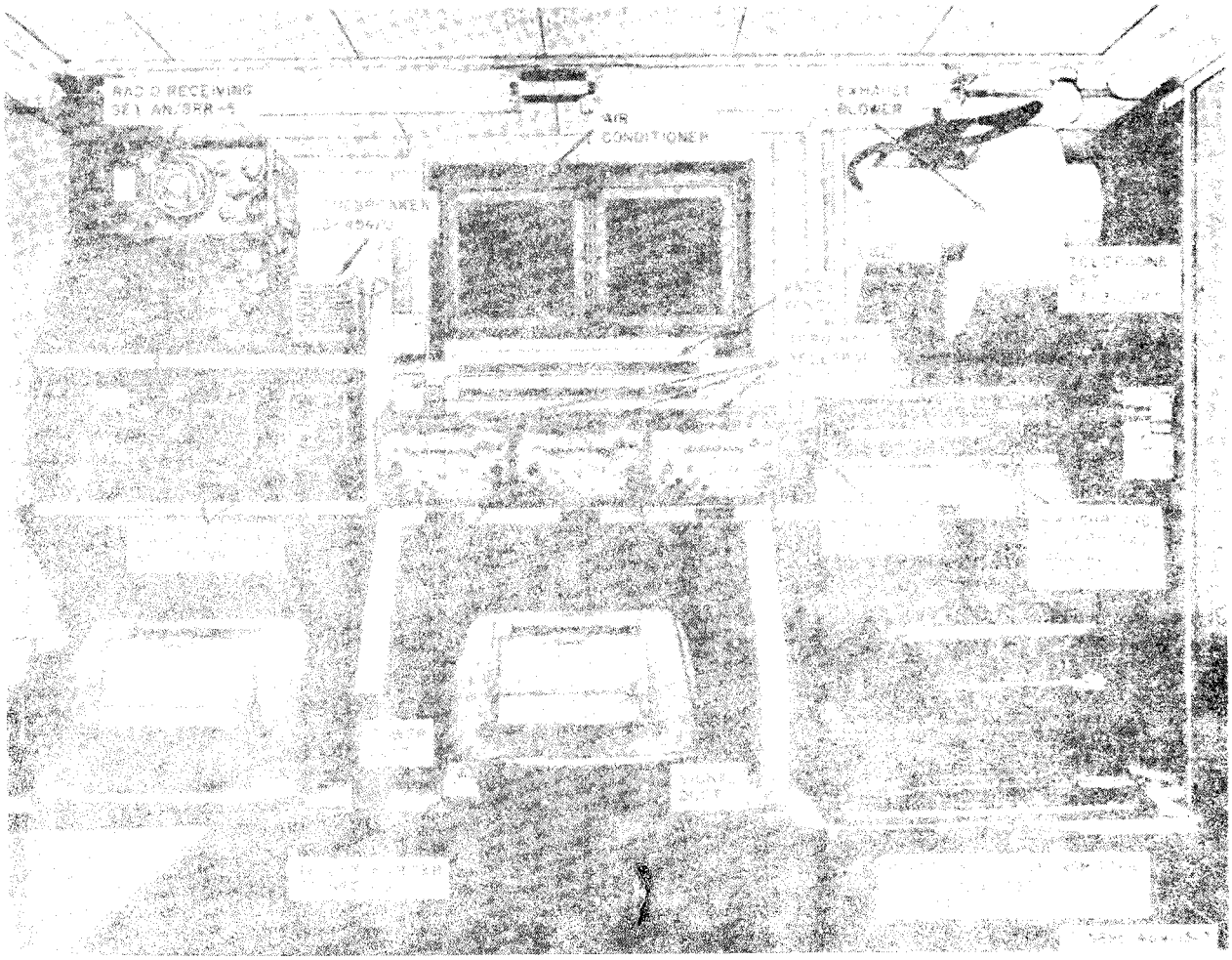


Figure 1-7. Operations Central, Communications AN/MSC-32A, interior front view.

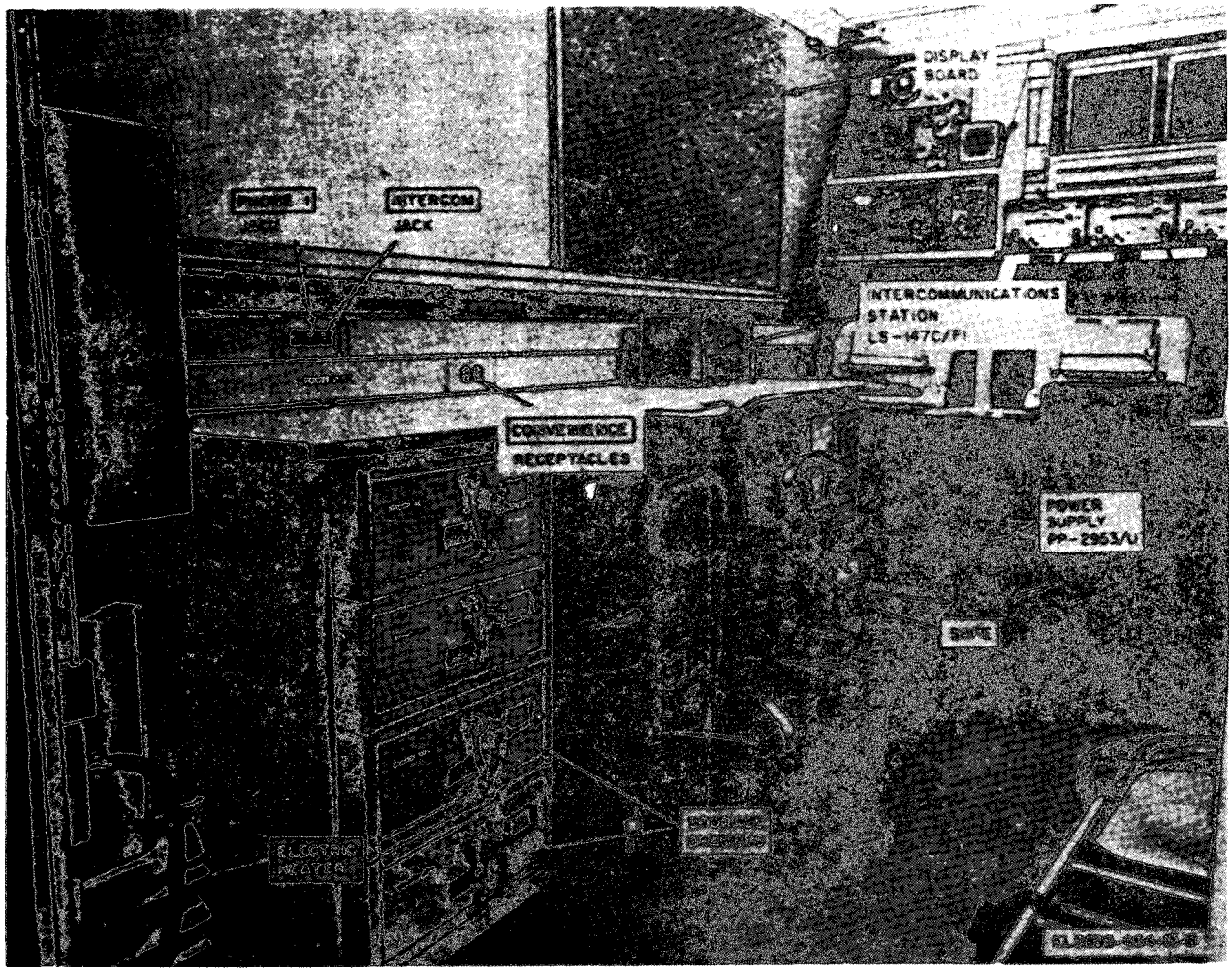


Figure 1–8. Operations Central, Communications AN/MSC–32A, interior roadside view.

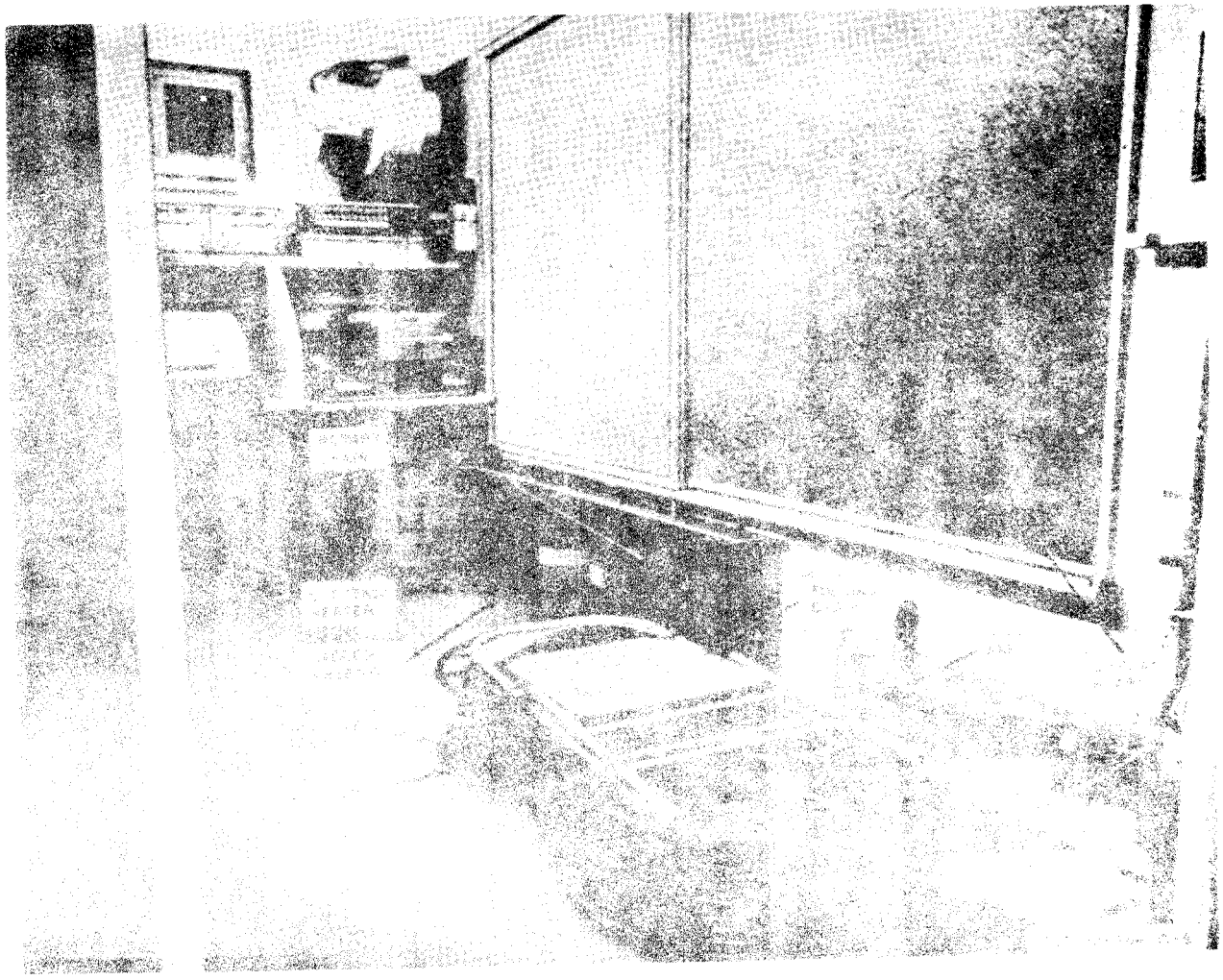


Figure 1–9. Operations Central, Communications AN/MSC–32A, interior curbside view.

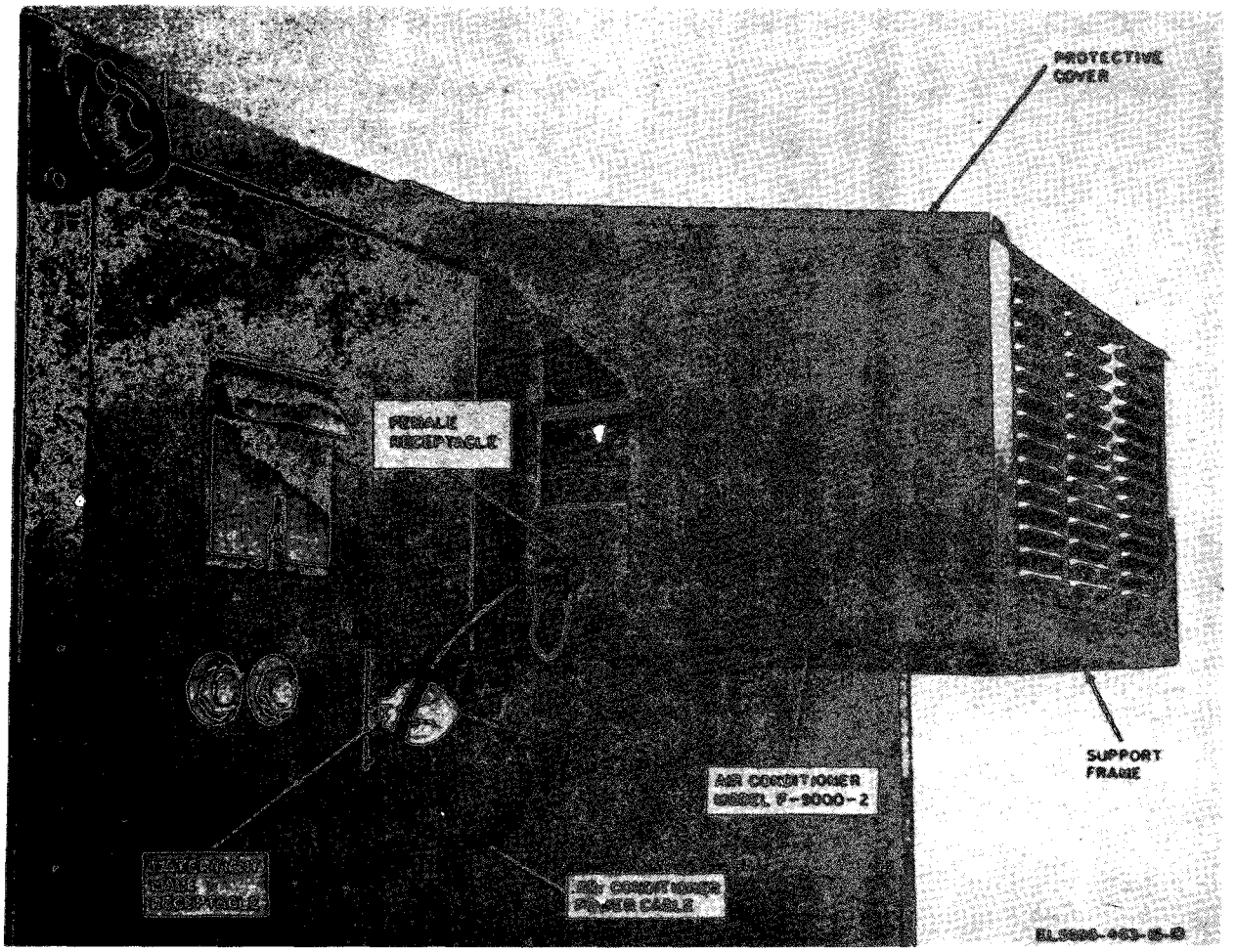


Figure 1-10. Air conditioner, model F-9000-B.

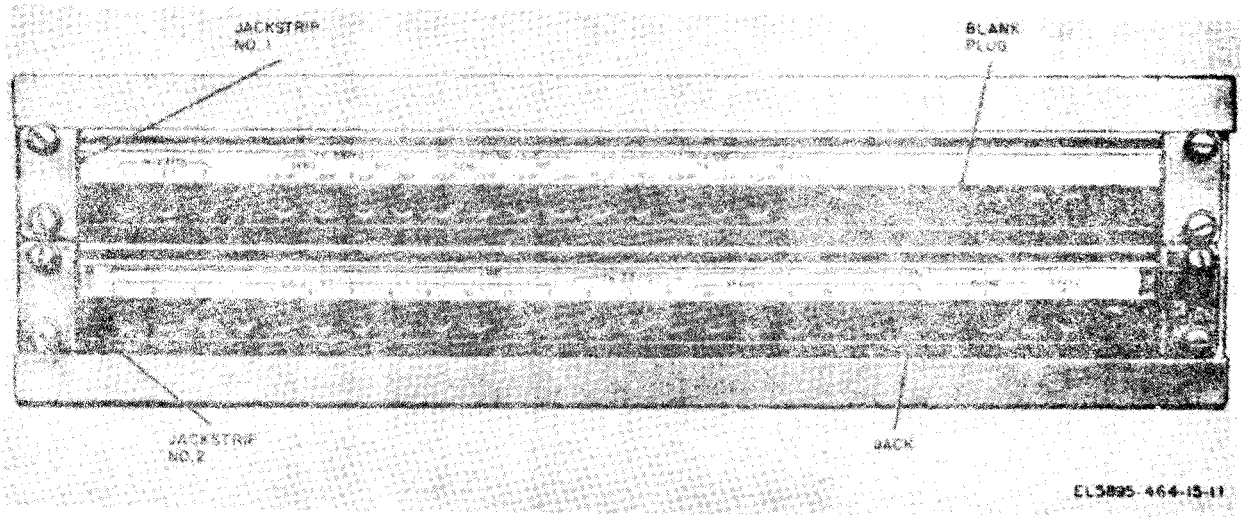


Figure 1-11. Patch panel, front view.

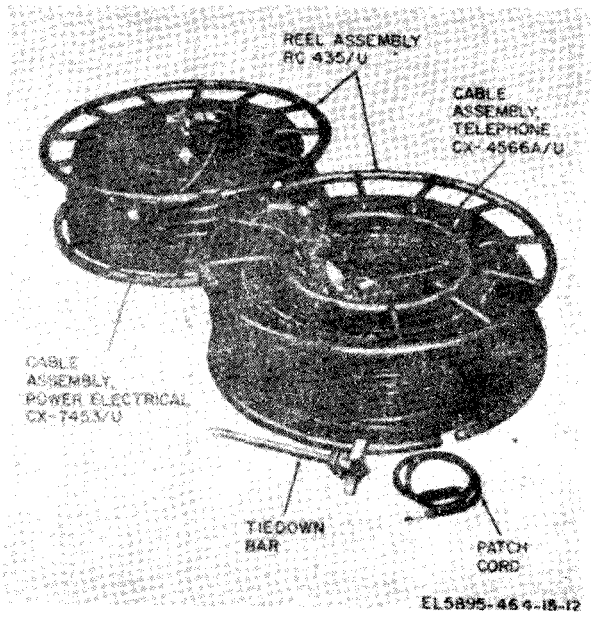


Figure 1-12. Shelter, Electrical Equipment, S-372/MSC-32A, cable assemblies, reels, and patch cards.

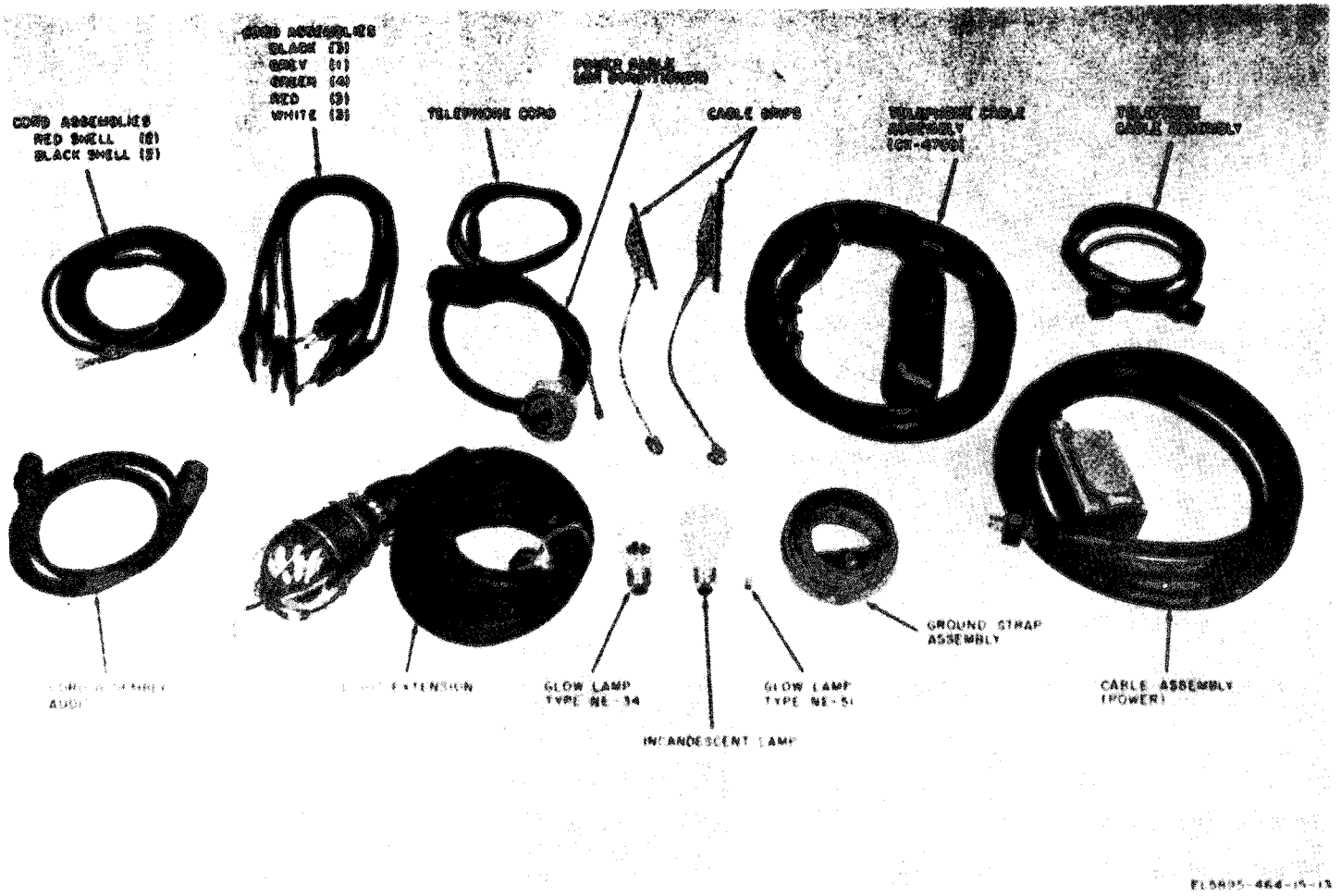


Figure 1-13. Shelter, Electrical Equipment, S-372/MSC-32A, Tools and Accessories.

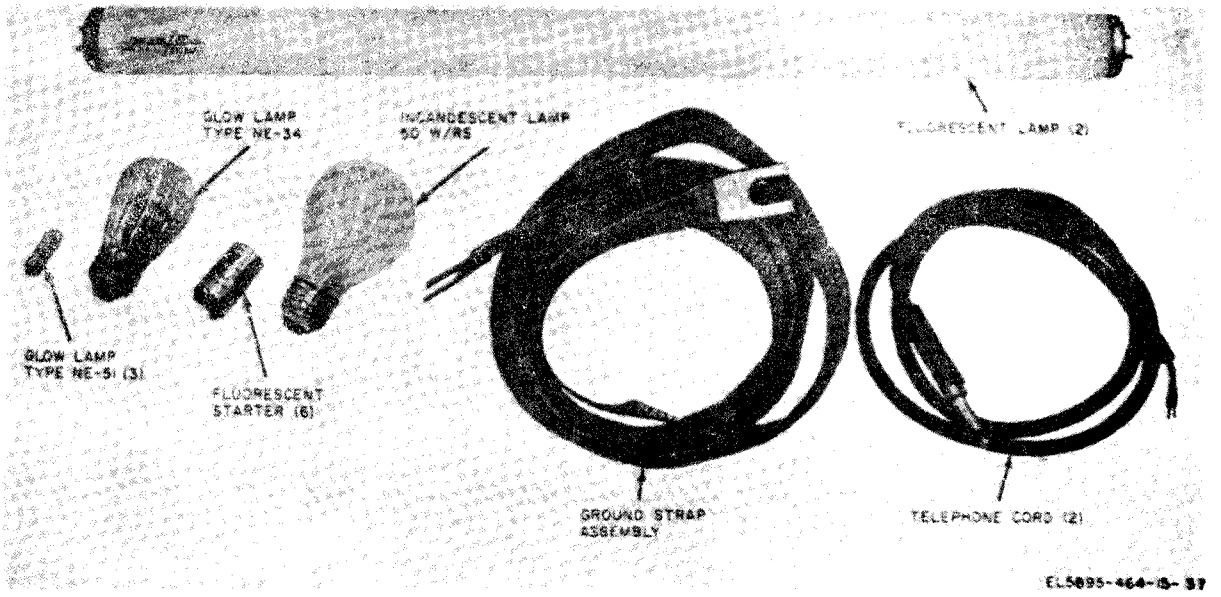
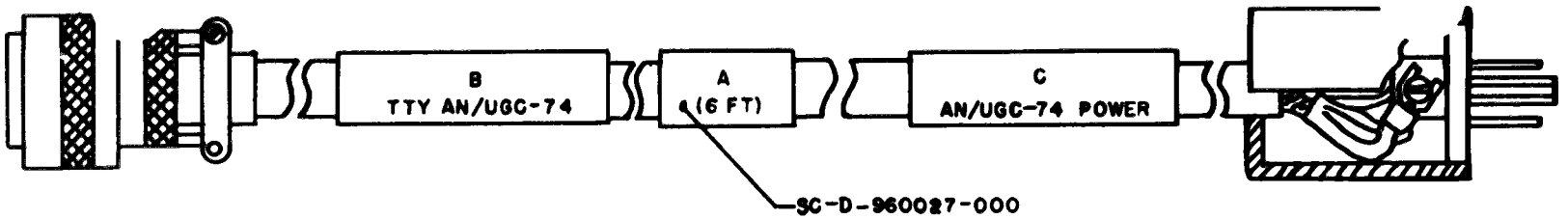
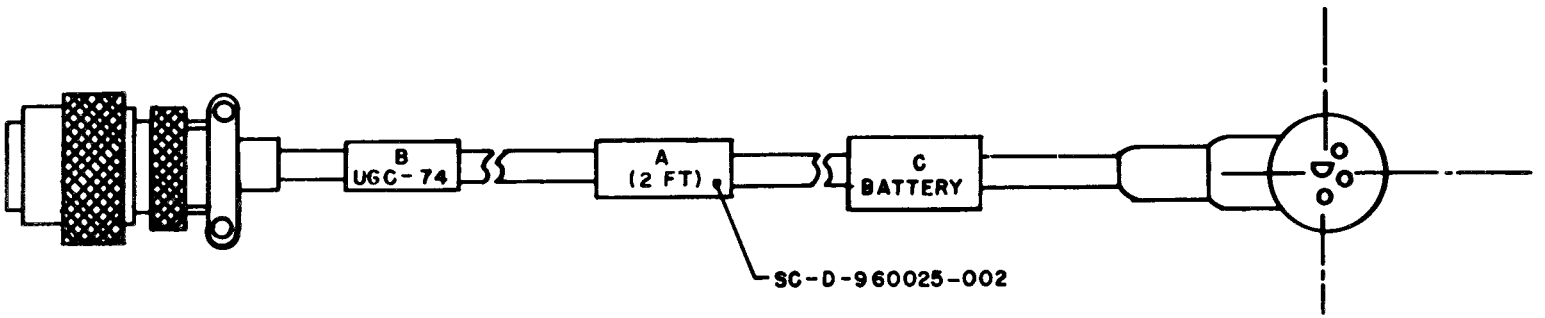


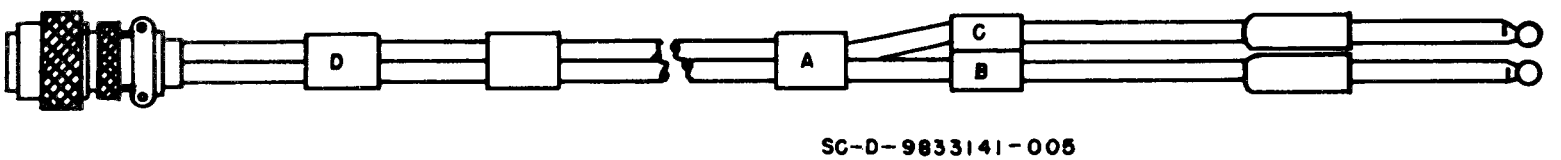
Figure 1-14. Shelter, Electrical Equipment, S-372/MSC-32A, Running Spares.



A. CABLE AC POWER



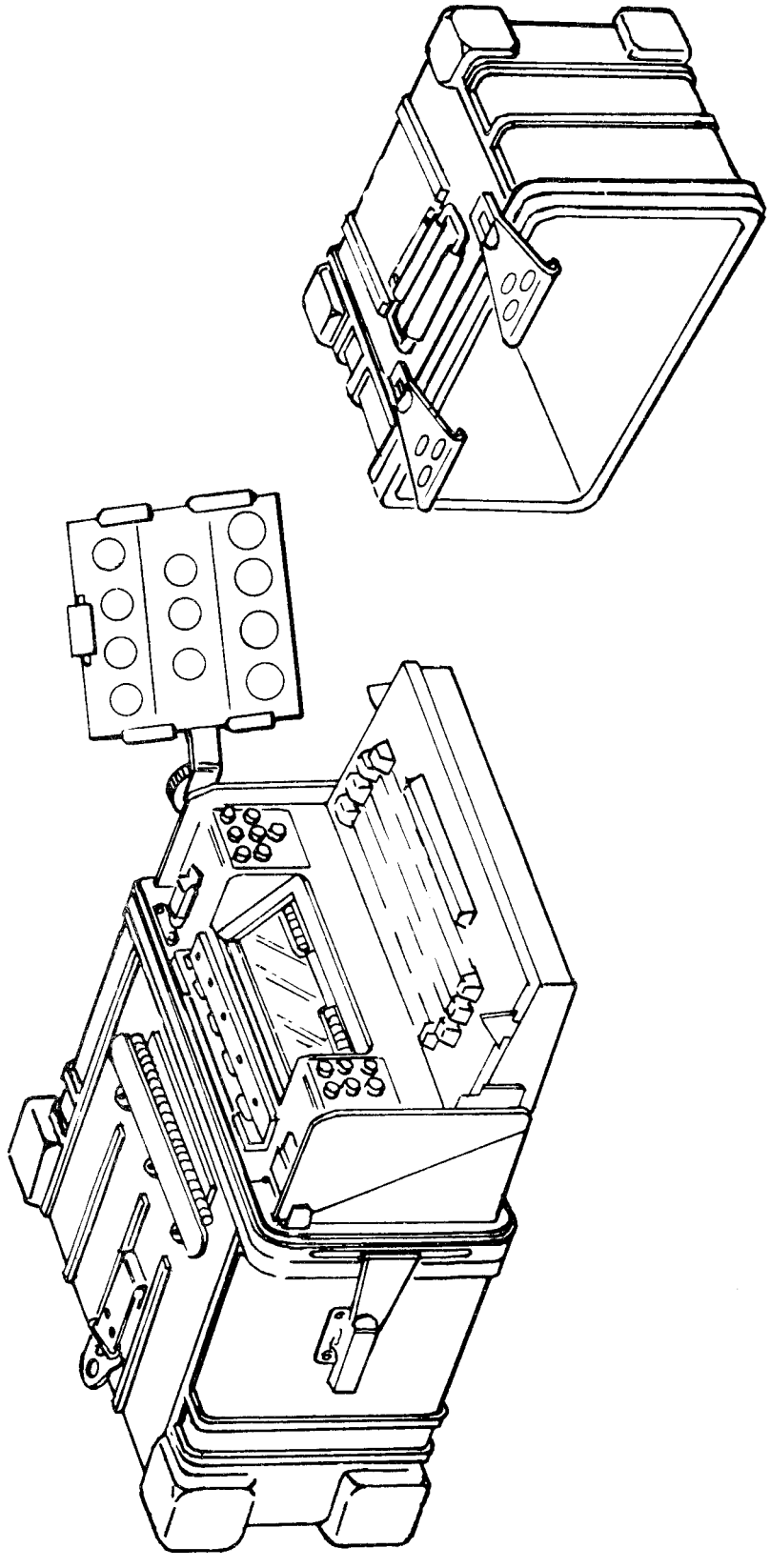
B. CABLE SPECIAL PURPOSE



C. CABLE SIGNAL ASSEMBLY

EL7QV002

Figure 1-15. Cable Assemblies for AN/UGC-74A(V)3.



EL7QV003

Figure 1-16. Terminal, Communications AN/UGC-74A(V)3.

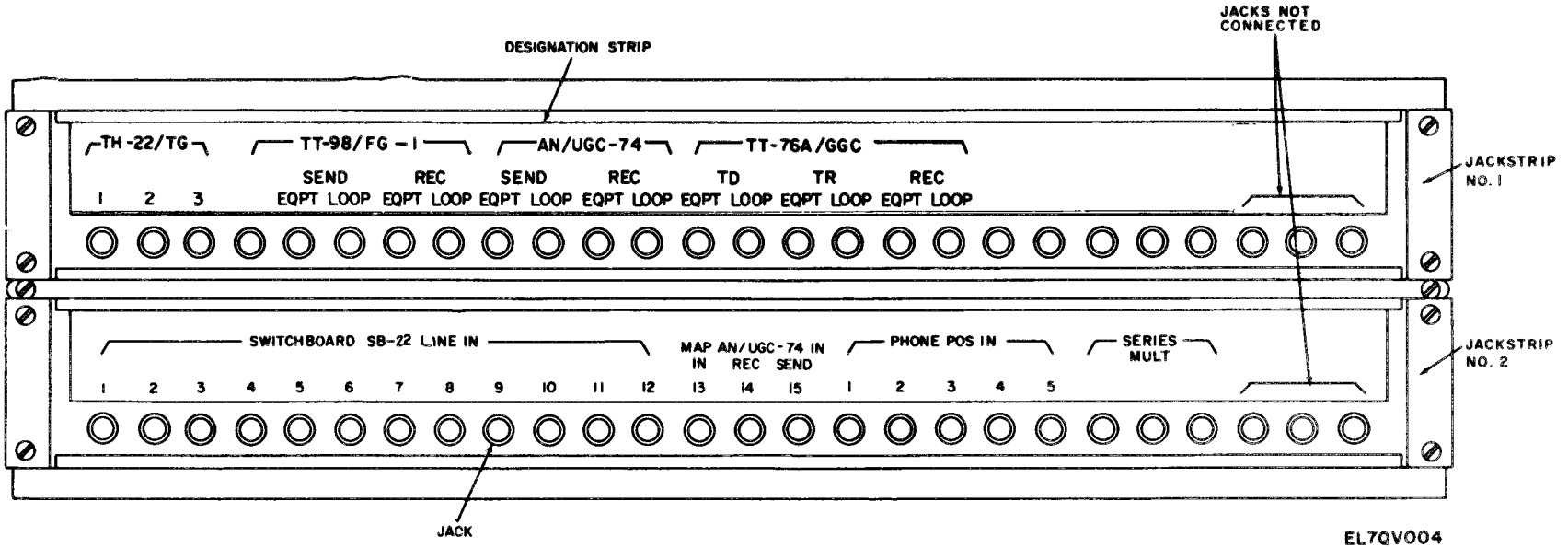


Figure 1-17. Jack Strips, AN/MSC-32B.

CHAPTER 2

INSTALLATION

2-1. Unpacking and Checking

a. Packaging Data. The AN/MSC–32A (fig. 2-1) is packed in a reusable wooden crate. The shelter, which houses the equipment, is anchored to eyebolts in the skid base of the crate. The skid base has entries for handling with a forklift. The dimensions of the crate are 155 by 93 by 94 inches. The volume is 874 cubic feet, and the weight of the crated AN/MSC-32A is approximately 3,600 pounds.

b. Removal of Contents.

Caution: Do not thrust any tools into the interior of any pack or package.

(1) Unfasten the lag bolts with wrenches and remove the top, front, rear, and side panels from the crate base (fig. 2-1).

(2) Detach the tiedowns from the eyebolts in the base of the crate.

(3) Remove the wooden blocking from the sides and ends of the shelter.

Caution: **Be careful when handling tools, because the aluminum skin of the shelter can be easily damaged.**

(4) Remove the shelter from the crate base. Use an overhead lifting device whenever available; if it is not available, remove the headers from the crate base, lift the shelter from either side with a forklift, or drag it from the base by the towing eyes.

Warning: The overhead lifting device or other lifting equipment must be capable of lifting or handling 3,600 pounds.

(5) Send the crate to a local storage area. for reuse.

c. Checking AN/MSC-32A Contents. Check the contents of the AN/MSC-32A against the packing list. If the packing list is not available, use the basic issue items list in appendix B of this manual.

Note. For unpacking and checking het major components, refer to the applicable technical manual (app. A).

2-2. Siting

The location of the AN/MSC-32A will depend upon the tactical situation, standard operating procedure (SOP) , and the location and arrangement of other equipment in the area communications network. The AN/MSC–32A may be either mobile (mounted on an M35 truck) or at a fixed ground location. It can be powered by a mobile power source or can use commercial or military powerlines. Consideration should be given to available power sources and telephone trunk line terminations.

a. Ground Installation. Position the AN/-MSC-32A in such a manner as to make both power and telephone connections as convenient as possible. Orientation of the AN/MSC–32A should take into consideration access to the shelter entrance and general topographic features of the terrain. Such factors as drainage and accessibility to the shelter by prime movers and loading equipment should also be considered in the placement of the shelter.

b. Truck Installation.

Note. Remove personnel carriers from the truck bed before installing the AN/MSC–32A on the truck.

(1) Using the sling hooks (nearest turnbuckle) to connect the sling assemblies to the lifting and tiedown eyes of the shelter (fig. 2-2). Connect the sling hooks, at the opposite ends of the cables, to the lifting ring, and place the liftfng ring over the lifting hook of the lifting device.

Warning: **To avoid injury to personnel, or damage to equipment, only personnel engaged in the actual loading operation should be permitted near the truck, lifting device, and shelter. To eliminate confusion, all instructions must come from the loading crew supervisor.**

(2) Loop a ½-inch rope (at least 15 feet long) to each rear towing eye.

(3) Lower the tailgate of the truck; make sure that all tools and equipment have been removed from the bed of the truck. Slowly lift the shelter high enough to clear the bed of the truck.

Note. The entrance door of the shelter must be at the rear of the truck, and the front end of the shelter must be flush against the front of the truck bed.

(4) Position a man at the free end of each of the ½-inch ropes to guide the shelter. Back the truck slowly into position under the shelter and slowly lower the shelter into the truck.

Warning: **All personnel must remain clear of the truck while the shelter is being lowered into the truck.**

(5) Remove the lifting ring from the lifting hook and disassemble the ring and the sling hooks. Remove the sling hooks from the lifting and tiedown eyes and the ½-inch ropes from the rear towing eyes. Raise and secure the truck tailgate.

(6) Install a tiedown ring assembly (part of the sling assembly) in the center support of each cargo bed side rail of the truck (fig. 2–3).

(7) At each side of the shelter, use the hook at the end farthest from the turnbuckle to hook each sling assembly to a lifting and tiedown eye of the shelter, secure the sling hooks at the opposite end of the cables to the tiedown ring (fig. 2–3).

(8) Tighten all turnbuckles evenly by hand, and then turn each turnbuckle an addition one-half turn with a bar or rod inserted into the slot of the turnbuckle.

Caution: **Do not overtighten the turnbuckles. Overtightening the turnbuckles will damage the shelter.**

(9) After the truck is driven to the operating site, lower the tailgate to the horizontal position; remove the ladder from the shelter and secure it to the left side of the tailgate.

c. Unloading Shelter. To unload the shelter from the truck, reverse the procedures given in *b* above.

2–3. Grounding

Warning: **The AN/MSC–32A must be** properly grounded before input power is connected.

Select a grounded site (within 6 feet Of the power and signal entrance boxes) that is low and damp. if possible, and that will not interfere with the entrance door, field wires, power, or signal cables.

a. Loosen and lift the power entrance box cover (fig. l-1).

b. Use the cover support to secure the cover in the open position.

c. Remove a ground rod and the sledge hammer from their mountings in the s-helter (fig. 5-1) .

d. Remove any dirt or grease from the ground rod.

e. Scoop out a small hole, about 6 inches deep, at the selected grounding site.

f. Drive the grounding rod into the hole until the top of the grounding rod is approximately 3 inches above the bottom of the hole.

g. Remove a 10-foot ground strap from the shelter storage area.

h. Connect one end of the ground strap to the ground rod and the other end to the lower GROUND TERMINAL in the power entrance box.

i. Saturate the ground around the rod with water to keep it moist.

j. If a motor-generator set is used to supply ac power, ground it the same way as the AN/MSC-32A.

2-4. Power Connections

***Caution:* Grounding connections (para 2-3) must be completed before power is connected to the AN/MSC-32A.**

a. Preliminary Procedures.

(1) Make sure that all circuit breakers and equipment power switches in the shelter are at OFF.

(2) Remove the power cable assembly and cable reel (fig. 5-1) from the shelter.

(3) Unwind the power cable assembly and power cable stub from the cable reel.

CAUTION

Power for the AN/MSC-32A is normally supplied through the IN POWER 115V AC connector. The POWER 115V AC OUT connector is provided to supply power to another shelter or to supply power to the AN/MSC-32A if the IN POWER 115V AC connector is damaged. When the POWER 115V AC OUT connector is used to supply power to another shelter, do not allow the total current drain to exceed 60 amperes (current rating of power cable assembly between the AN/MSC-32A and power source).

b. Connection to Generator Set (fig. 2-3.1).

If Generator Set PU-618/M is used to provide power to the AN/MSC-32A or the AN/MSC-32B, connect power between the generator and the shelter as shown in figure 2-3.1 and as described in steps (1) and (2) below. If a central power source is used to provide power, connect power as described in c below.

(1) Remove the cover from the IN POWER 115V AC receptacle in the power entrance box (fig. 1-4) and from the connector on one end of the power cable assembly. Connect the power cable assembly to the IN POWER 115V AC receptacle.

(2) If the generator set includes an output connector that is compatible with the connector on the power cable assembly, connect the power cable assembly to the generator set; otherwise, refer to the generator set technical manual and TB 43-0125 for proper power connections on the generator set.

NOTE

For Power Unit PU-619/M (if used) the line terminals are marked L2 and L3. These terminals are isolated from ground; therefore, it is important to ensure that the red or green power cable wire is connected to the white wire and to L2, the black wire to the other terminal L3. Connect wire from L2 to frame ground terminal of trailer.

c. Connection to Central Power Source.

WARNING

In two-wire, single-phase power distribution, one conductor must be made neutral by connectirlg a No. 6 electrical wire between the selected generator L(3) terminal and earth ground to avoid electrical shock.

CAUTION

Bef'ore connecting electrical power between Generator Set PU-618/M and the AN/MSC-32A or AN/MSC-32B, ensure that the generator selector switch, located behind the front panel of the generator set, is positioned to the 120 V 1 PH setting. Any other setting may result in damage to the equipment

NOTE

When making power connections on Generator Set PU-618/M, refer to the applicable generator set technical manual and TB 43-0125.

(1) Turn off or disconnect the central power source before making any connections.

(2) If the power source is a 120-volt, 50- to 60-cps, single-phase, two-wire source, connect the green and white wires of the power cable stub to the neutral terminal and the black wire of the power cable stub to the other terminal.

(3) If the power source is a 110/220-volt, 50- to 60cps, single-phase or 2-phase, 3-wire distribution system, connect the green and white wires of the power cable stub to the neutral terminal and the black wire to either of two other terminals.

(4) If the power source is a 110/220-volt, 50- to 60-cps, 3-phase, 4-wire distribution system, connect the green and white wires of the power cable stub to the neutral bus bar and the black wire of the power cable to the phase 1, phase 2, or phase 3 bus bar.

(5) Connect the power cable stub to one end of the power cable assembly. Connect the other end of the power cable assembly to the IN POWER 115V AC receptacle in the power entrance box (fig. 1-4) on the AN/MSC-32A.

2-5. Signal Connections

(fig. 4-1)

All telephone and intercommunication connections are made through the AN/MSC-32A signal entrance box.

a. Twenty-Six Pair Cable Connection Procedure.

(1) Unlock and remove the covers from the 26-pair cable assembly (A and B, 2-4) and on the 26-pair receptacle A, B, C, and D, (fig. 2-5) in the signal entrance box (fig. 1-5).

(2) Insert the connector into the receptacle and secure it by closing the locking collar (E, F, and G, fig. 2-5).

(3) If the required cable distance exceeds 250 feet, couple two 26-pair cable assemblies together.

NOTE

To avoid poor quality signals, do not connect more than six 26-pair cable assemblies together.

b. Field Wire Connection Procedure.

(1) Connect the field wires to the signal entrance box PHONE and INTERCOM binding posts (fig. 1-5).

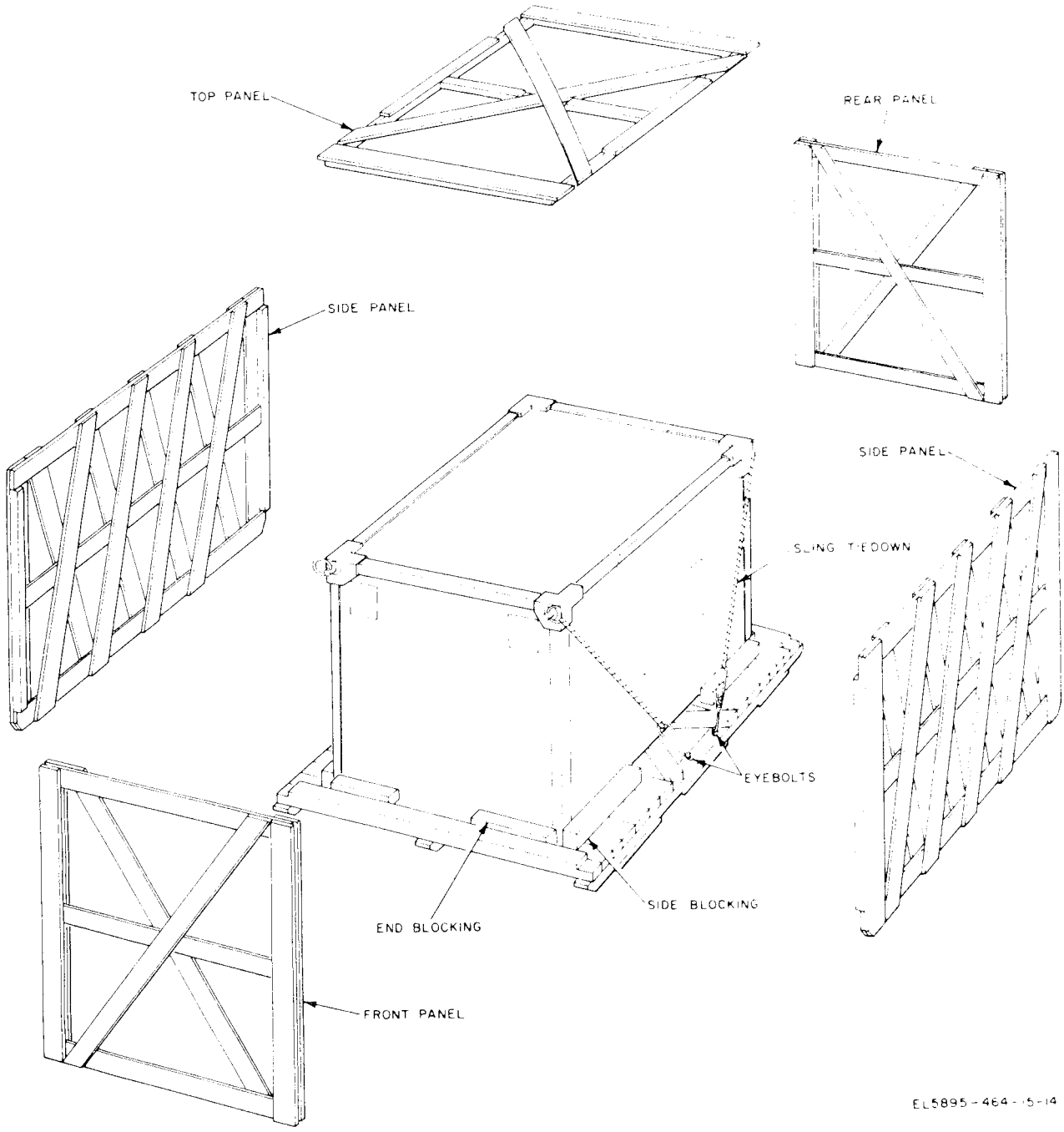
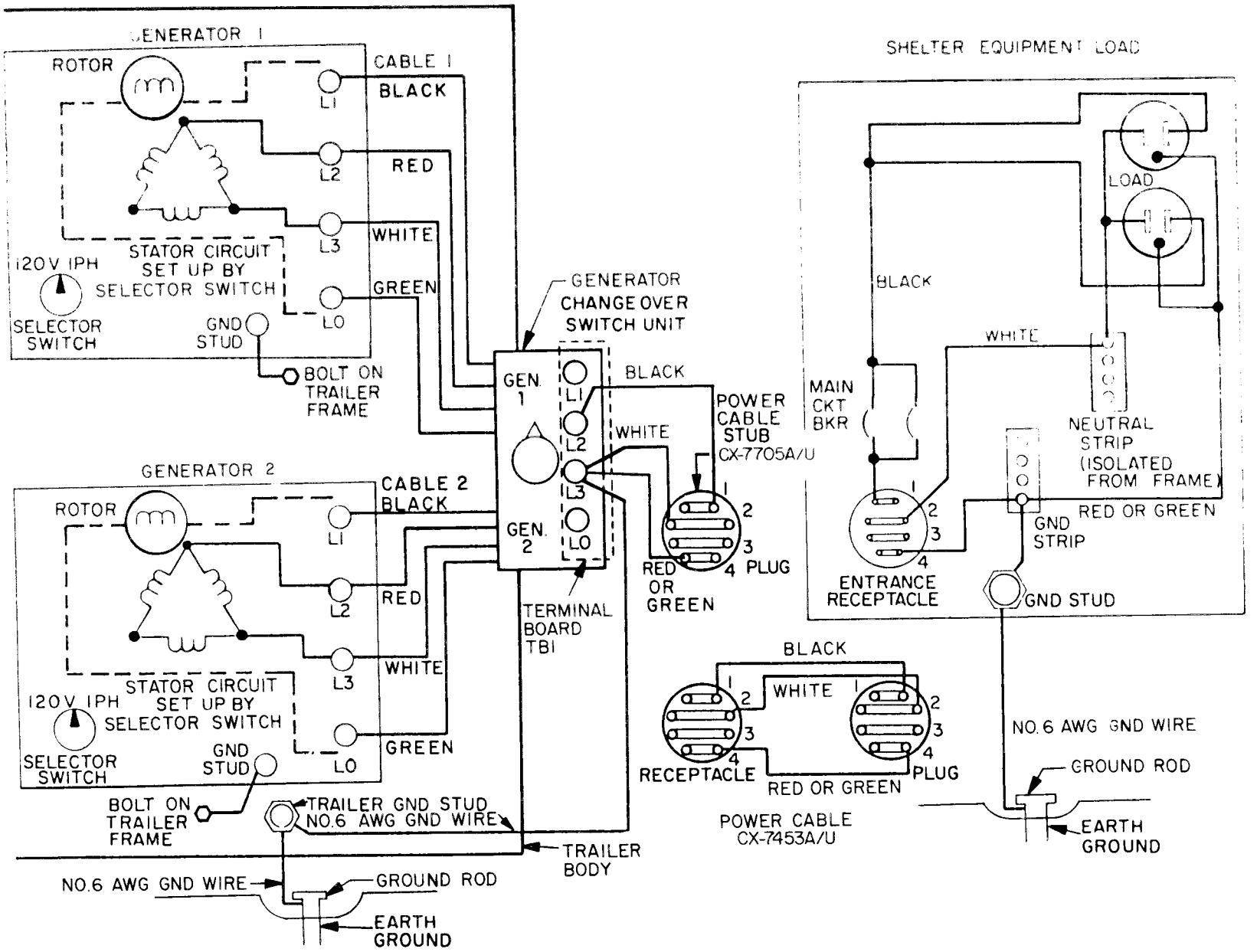


Figure. 2-1. Typical packaging diagram.



EL70D-001

Figure 2-3.1. Generator Set PU-618/M hookup: single generator unit, 120 volts, 60 Hz, single-phase ac (CX-7453/U Power Cable with CX-7705/U Stub).

(2) Loosen captive screws and lift the signal entrance box cover.

(3) Depress binding post to open wire slots. Place field wires in appropriate slots and release the binding posts.

(4) Distribute and retain the wires in the bridle rings associated with each row of binding posts.

c. *Installation of Kits and Optional Radio Equipment*. If equipment kits and optional radio equipment are to be installed in the field, refer to paragraph 4-6.

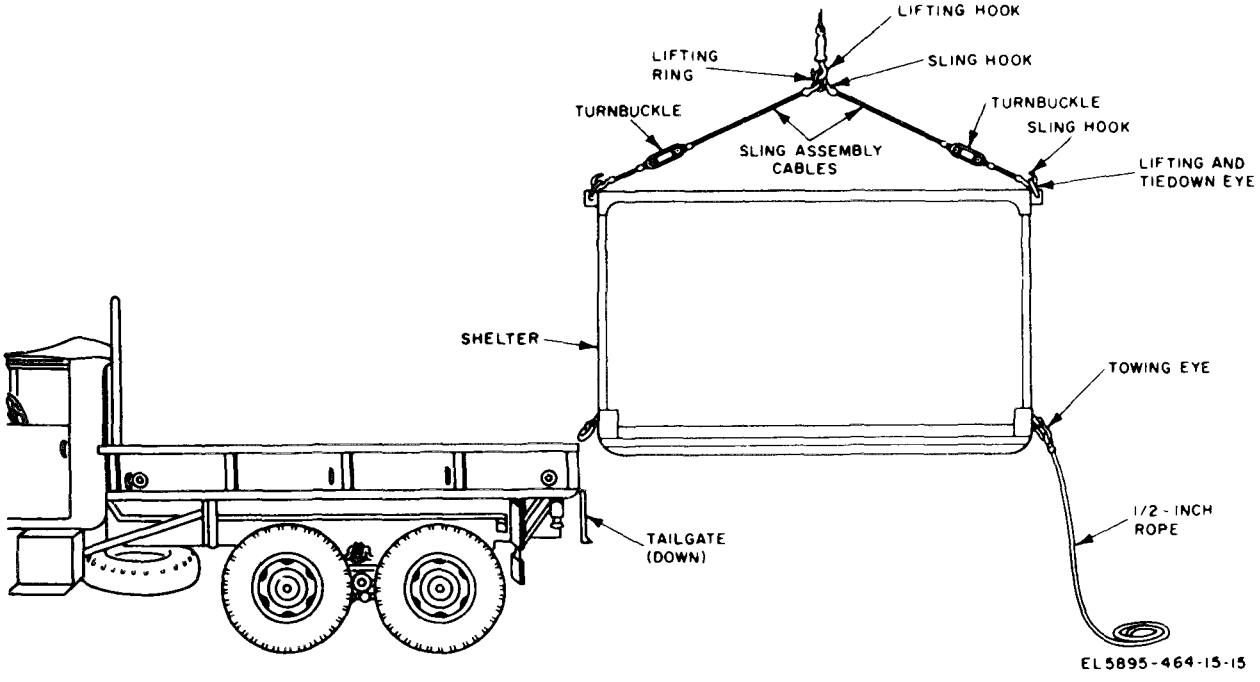


Figure 2-2. Lifting and loading AN/MSC-32A on truck.

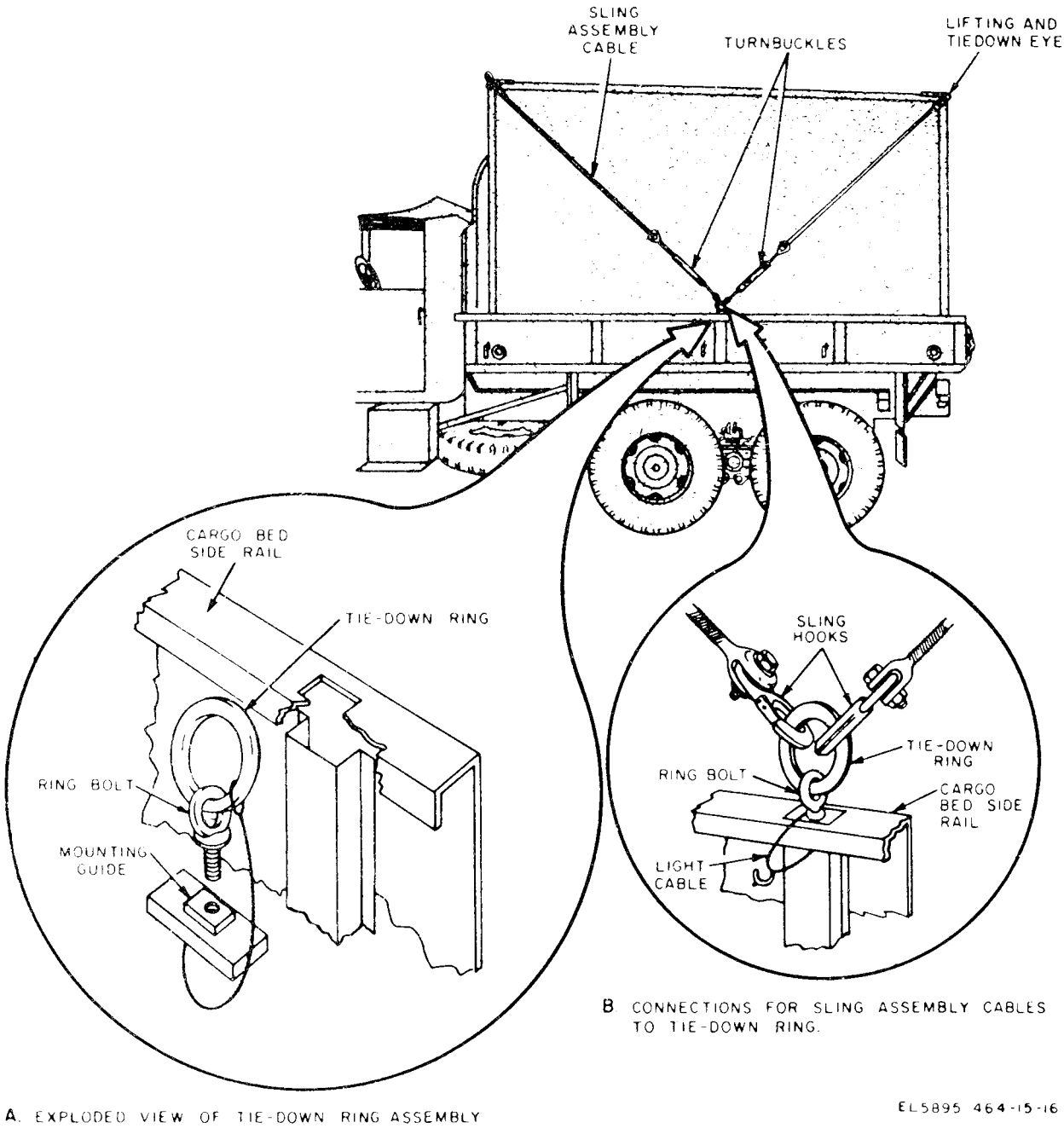


Figure 2–3. Securing AN/MSC–32A on truck.

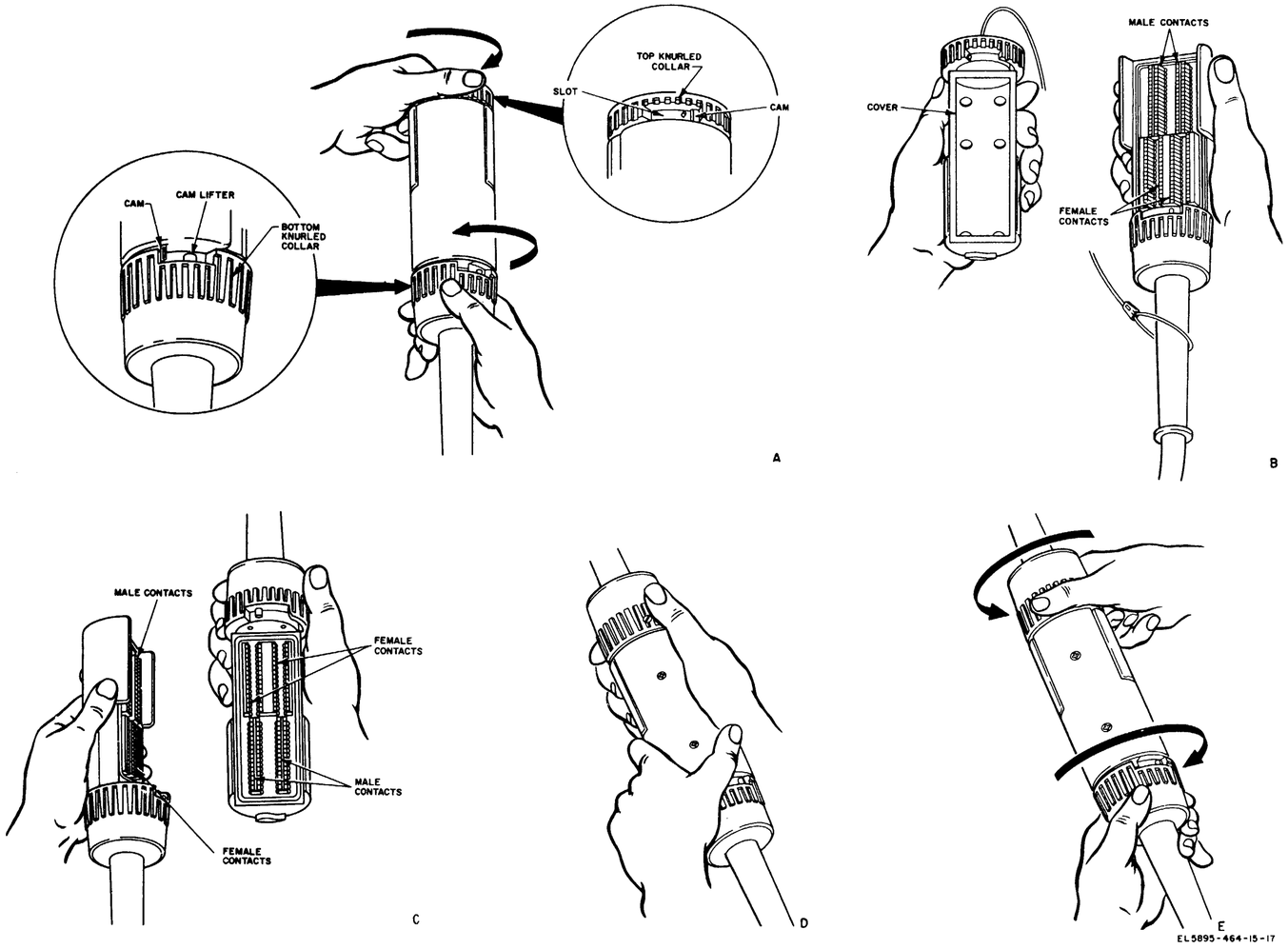


Figure 2-4. Coupling 26-pair connectors.

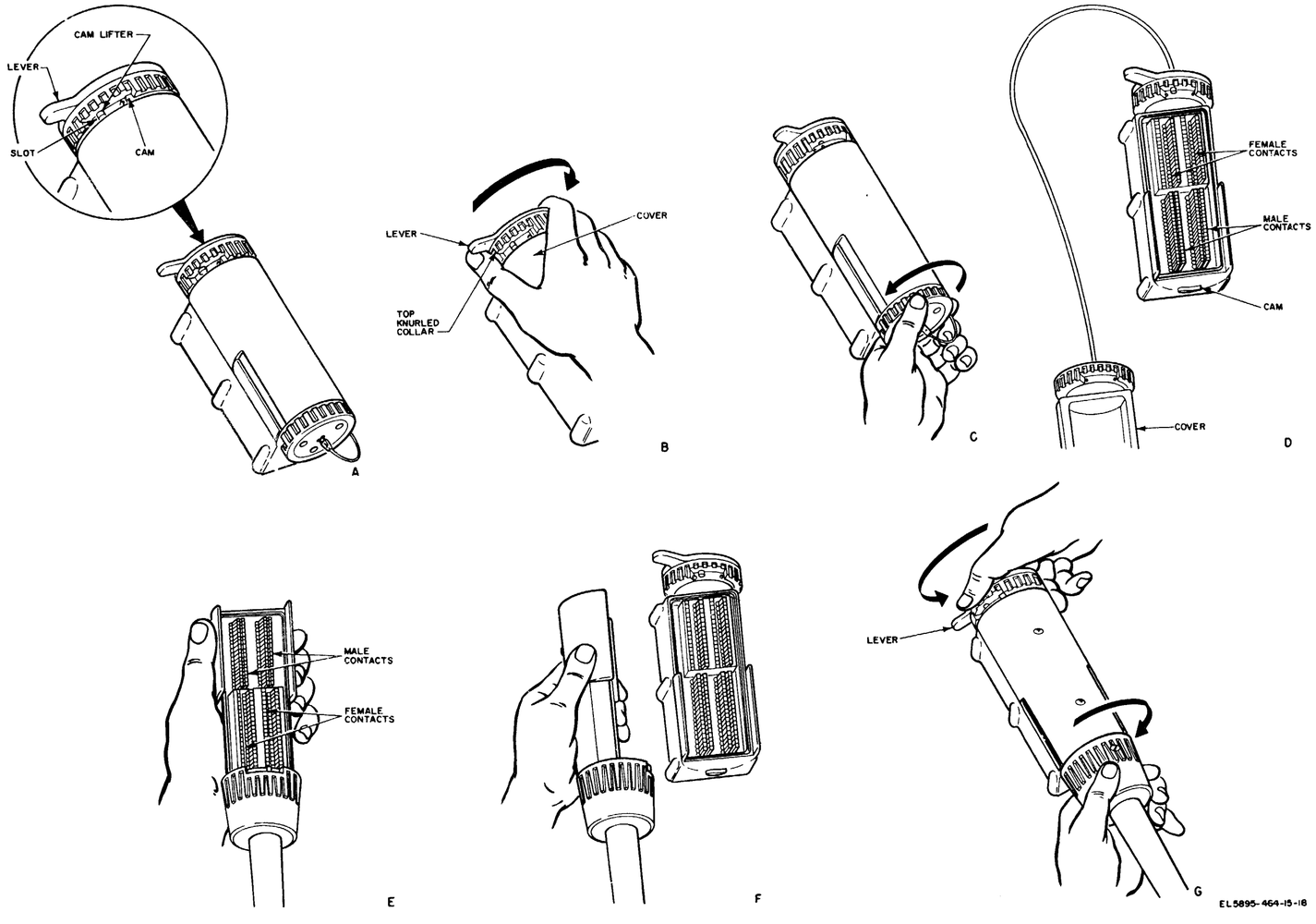


Figure 2-5. Connecting 26–pair connector to the 26–pair receptacle.

CHAPTER 3

OPERATING INSTRUCTIONS

3-1. General

The following are the descriptions of the controls and indicators of the shelter components. For information concerning the controls and indicators of the major communications components, refer to the applicable technical manuals listed in appendix A.

a. Power Distribution Panel (fig. 1-6).

Control, indicator, or instrument	Description and function
MAIN circuit breaker switch CBS	Sixty amperes circuit breaker. Provides overload protection for 115-volt, ac input source and ON-OFF control of ac power to individual circuit breaker switches.
Individual circuit breaker switches	Provides ON-OFF control and overload protection for individual circuits as follows:
1 LIGHTS	15 . . . . . Fluorescent lights.
2 BLOWERS	15 . . . . . Blower No. 1 and No. 2 receptacles.
3 HEATER 1	20 . . . . . Electric heater power receptacle HEATER 1 (fig. 1-6).
4 HEATER 2	20 . . . . . Electric Heater power receptacle HEATER 2 (fig. 1-6).
5 CONV...	20 . . . . . Convenience receptacles.
6 EQUIP	20 . . . . . Major communication equipment receptacles.
7 AIR CONDITIONER	20 . . . . . Air conditioner receptacle.
Voltmeter	Ac voltmeter with 0- to 150-volt scale. Indicates ac input voltage from external power source.
Ammeter	Ac ammeter with 0- to 010-ampere scale. Indicates total current drain from external power source by AN/MSC-32A components in use.
Glowlamp (8)	Neon lamp. Glows when associated circuit breaker switch is on.

b. Lighting (fig. 5-1).

Control, indicator, instrument	Description and function
BLACKOUT BYPASS SWitCh (fig. 5-1).	Two-position ON-OFF switch. Controls lighting in the AN/MSC-32A for blackout operation as follows SW pon — Function ON . . . . . Permits fluorescent lights to be controlled by individual light witches. OFF . . . . . Permit fluorescent lights to be controlled by door microswitch.
POWER INDICATOR NEON LAMP	Lights when sc power is connected to the AN/MSC-32A.
Door microswitch	Extinguishes fluorescent lights when shelter door is opened. (BLACKOUT BYPASS switch at OFF.)
LIGHT 1 switch	Two-position ON-OFF switch. Controls four fluorescent lights in each row end one fluorescent light in front area (fig. 5-1).
LIGHT 2 switch	Two-position ON-OFF switch. Controls four fluorescent lights in eech row and one fluorescent light in front area (fig. 5-1).

c. Blowers (fig. 5-1).

Control	Description and function
BLOWER 1 switch (fig. 5-1)	Two-position ON-OFF switch. Controls operation of BLOWER 1.
BLOWER 2 switch	Two-position ON-OFF switch. Controls operation of BLOWER 2.

d. Electric Heaters (fig. 5-1).

Control, indicator, instrument	Description and function
HEAT-OFF-FAN switch	Three–position toggle switch. Sw *pos* — Function HEAT . . . ----- Applies ac power to heater element and fan motor. OFF . . . . . Disconnects ac power from heater element and fan motor. FAN ------- Applies ac power to fan motor.
TEMPERATURE CONTROL	Themostat control. Regulates the temperature provided by the heating element.
RESET pushbutton	Pushbutton which resets the protective circuit breaker within heater.

e. Patch Panel (fig. 1-11), (AN/MSC-32A)

(1) Jackstrip No. 1.

Jack	Function
TH-22/TG: 1, 2, and 3	*Cutoff jacks*. Used to patch the 2-wire line output of the indicated line (normally connected to line pairs 13, 14, and 15, respectively) to another line or shelter.
TT-98C/FG 1:	
SEND	*Terminating jack*. Used to patch the TT–98C/FG No. 1 send circuit to a TH-22/TG SEND jack or line circuit.
REC.	*Terminating jack*. Used to patch the TT–98C/FG No. 1 receive circuit to a TH-22/TG REC. jack or line circuit.
TT-98C/FG 2:	
SEND	*Terminating jack*. Used to patch the TT-98C/FG No. 2 send circuit to a TH-22/TG SEND jack or line circuit
REC.	*Terminating jack*. Used to patch the TT-98C/FG No. 2 receive circuit to a TH-22/TG REC. jack or line circuit.
TT-76/GGC:	
TD	*Terminating jack*. Used to patch the TT-76/GGC transmitter-distributor circuit to a TH–22/TG SEND jack or line circuit.
TR	*Terminating jack*. Used to patch the TT-76/GGC keyboard circuit to a TH-22/TG SEND jack or line circuit.
REC.	*Terminating jack*. Used to patch the TT-76/GGC receive circuit to a TH-22/TG REC. jack or line circuit.

e.1. Patch Panel (fig. 1-17). (Used on AN/MSC-32B only).

(1) *Jackstrip NO. 1.*

Jack	Function
TH-22/TG: 1, 2, and 3	Cutoff *jacks. Used* to patch the 2-wire line output of the indicated line (normally connected to line pairs 13, 14, and 15, respectively) to another line or shelter.
TT-98C/FG-1:	
SEND	*Terminating jack.* Used to patch the TT-98C/FG No. 1 send circuit to a TH-22/TG SEND jack or line circuit.
REC.	*Terminating jack.* Used to patch the TT-98C/FG No. 1 receive circuit to a TH-22/TG REC. jack or line circuit.
AN/UGC-74:	
SEND	*Terminating jack.* Used to patch the AN/UGC-74 send circuit to a TH-22/TG SEND jack or line circuit.
REC.	*Terminating jack.* Used to patch the AN/UGC-74 receive circuit to a TH-22/TG REC. jack or line circuit.
TT-76/GGC:	
TAD	*Terminating jack.* Used to patch the TT-76/GGC transmitter-distributor circuit to a TH-22/TG SEND jack or line circuit.
TA R	*Terminating jack.* Used to patch the TT-76/GGC keyboard circuit to a T'H-22/TG SEND jack or line circuit.
REC.	*Terminating jack.* Used to patch the TT-76/GGC receive circuit to a TH-22/TG REC. jack or line circuit.
SPARE	*Terminating jack.* Dead-ended at J51 in signal duct.

f. TeletypewriterJacks (fig. 5-1). (AN/MSC-32A)

Jack	Function
TT-98C/FG l and TT-98C/FG 2 SEND and REC	Terminating *jacks.* Used to connect send and receive circuits of the indicated TT-98C/FG to similarly marked jacke at the patch panel.
TT-76: TD, TR, and REC	*Terminating jacks.* Used to connect the tranemitter-distributor, keyboard, and receive circuit, respectively, of the TT-76C/GGC to similarly marked jacks at the patch panel.

f.1. Teletypewriter Jacks (AN/MSC-32B).

Jack	Function.
TT-98C/FG and AN/UGC-74 SEND and REC.	*Terminating jacks.* Used to connect send and receive circuits of the indicated TT-98C/FG and AN/UGC-74 to similarly marked jacks at the patch panel.
TT-76: TD, TR,and REC	*Terminating jacks.* Used to connect. the transmitter-dietributor, keyboard, and receive circuit, respectively, of the TT-76C/GGC to similarly marked jacks at the patch panel.

g. *Phone and Intercommunication Jacks* (fig. 5-1).

Jack	Function
PHONE l,PHONE 2,and PHONE 3	Terminating jacks. Used to connect the LINE circuit of the TA-312/PT (fig. 1-7) to similarly marked jacks at tbe patch panel andtolinecircuits.
INTERCOM	Terminating jacks *connected in parallel.* Used to connect LS-47C/F1 to intercom line between shelters.

h. *Air Conditioner* (fig. 3-1).

Control, indicator, or instrument	Description and function	
	Sw pos	Function
ON-FAN-COOL selector switch	OFF	Disconnects ac power from compressor motor and fan.
Control, indicator, or instrument	Description and function	
	FAN	Applies ac power to fan motor.
	COOL	Applies ac power to compressor motor.
THERMOSTAT	Thermoetat control. Regulates the temperature provided by SELECTOR switch setting.	
FRESH AIR control	Controls intake of fresh air to the interior of shelter.	

3-2. Energizing Ac Circuits

WARNING

To prevent asphyxiation, the AN/MSC-32A must be ventilated at all times when Occupied.

Prepare the AN/MSC-32A for full operation as follows:

a. Connect the AN/MSC-32A to the available power source (paras. 2-3 and 2-4); the power indicator lamp (fig. 5-1) will light.

b. Operate the power distribution panel MAIN circuit, breaker switch (fig. 1-6) to ON.

c. Operate the BLACKOUT BYPASS switch (fig. 5-1) to ON. When blackout conditions are required, operate the switch to OFF.

d. Operate circuit breaker switch No. 1 (LIGHTS) tO ON.

e. Operate LIGHT 1 and LIGHT 2 switches (fig. 5-1) to ON. Operate the incandescent light switch (fig. 5-1) to ON.

f. Check to see that the voltmeter (fig. 1-6) indicates 105 to 125 volts ac. If indicated voltage is outside these limits, follow procedures outlined in paragraph 4-5.

g. Cheek to see that the ammeter (fig. 1-6) indicates approximately 0 ampere. If a higher current reading is obtained, verify that circuit breakers 2 through 7 are at OFF. If current breakers are at OFF, refer to paragraph 4-5.

h. Operate circuit breakers 2 through 7 to ON.

3-3. Operating Procedures

NOTE

Refer to the applicable technical manuals (app. A) for operating procedures of major communications components. Refer to paragraphs 3-1, 3-2, and this paragraph for descriptions and functions of controls and indicators of AN/MSC-32A components.

WARNING

To prevent asphyxiation, the AN/MSC-32A must be ventilated at all times when occupied.

a. Electric Heater (fig. 5-1), Insert the power connector cord plug into the appropriate HEATER receptacle (fig 5-1) and pate the HEAT–OFF–FAN switch to the desired position.

NOTE

If the HEAT–OFF–FAN switch is operated to HEAT, set the TEMPERATURE CONTROL to the desired setting,

b. *Exhaust Blower.* Insert the power cord connector plug into the appropriate blower receptacle (fig. 5-1.) and operate the blower switch to ON.

CAUTION

Open the air vent cover cm the shelter door (fig. 1-1) and the exhaust blower vent cover on the front of the shelter (fig. 1-2) before operating the blower.

c. Air Conditioner.

(1) Operate refrigerant service valves to proper position (TM 11-4120-282-13).

CAUTION

Both refrigerant service values must be operated before operating air-conditioning unit.

(2) Remove the power cable from the storage cabinet. Connect the female receptacle to the mating "twistlock" receptacle on the unit. Twist to lock in place. Connect the male connector to the exterior, weatherproof receptacle mounted on the upper front roadside of the shelter (fig. 1-10).

(3) Turn selector switch to COOL.

(4) Turn thermostat knob to extreme right (in the direction of the arrow) until compressor starts. Readjust thermostat as required to satisfy cooling requirements.

(5) Turn fresh air control to OPEN if outside air is desired.

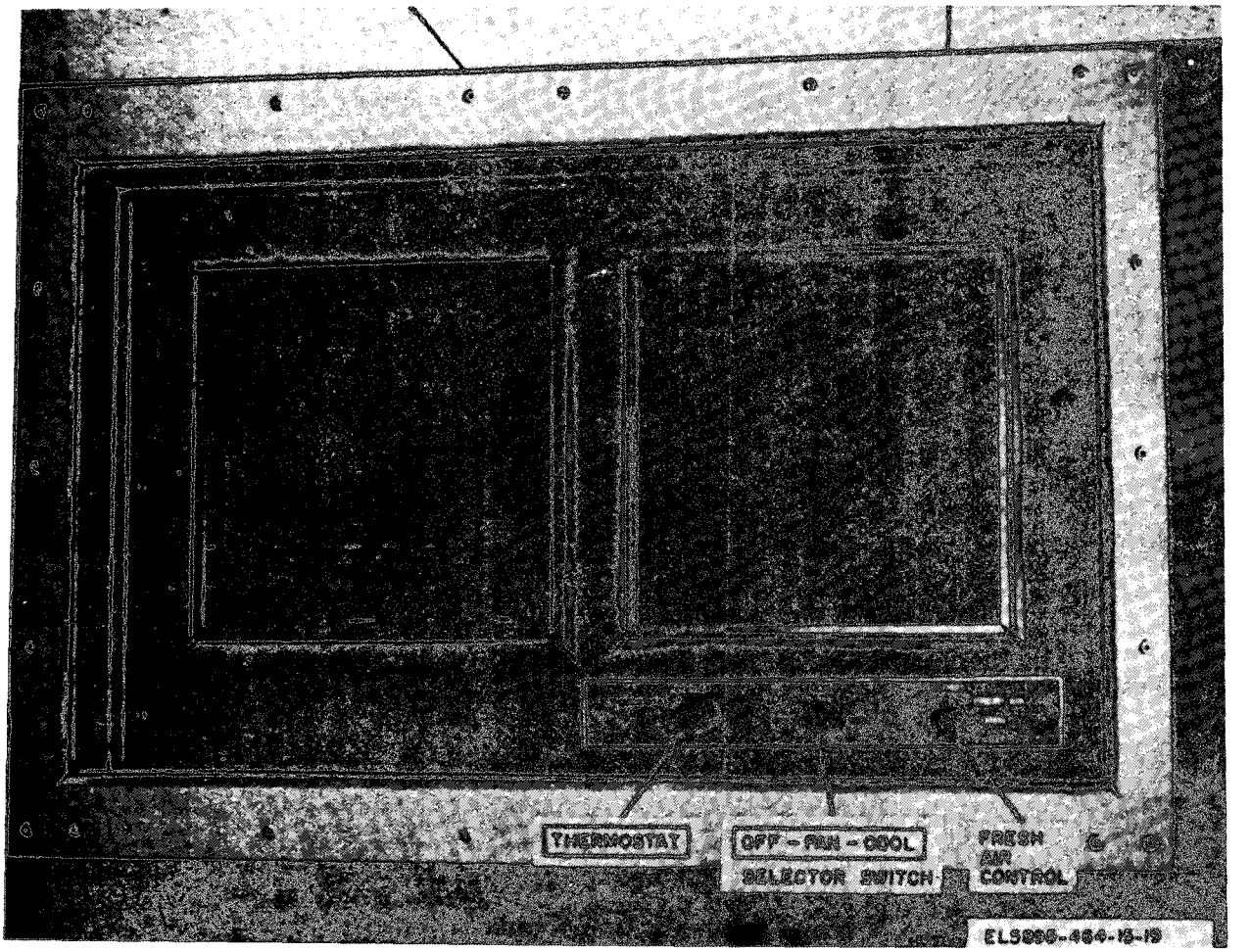


Figure 3-1. Air Conditioner Control Panel

3-4. Operating Under Adverse Climatic Conditions

The AN/MSC-32A can be Operated in extremely cold or hot climates. The shelter offers protection from the elements for personnel and equipment. However, when the entrance boxes are exposed to adverse conditions, the following precautions are necessary:

a. Cold Climates. Extreme cold causes the cables and wires to become hard, brittle, and difficult to handle. Be careful when handling the cables and when connecting them to the AN/MSC-32A so that kinks and unnecessary loops will not result in permanent damage. Make sure that the binding posts and cable receptacles on the outside of the AN/MSC-32A are free of frost, snow, and ice by replacing the covers on the receptacles and closing the covers on the entrance boxes when they are not in use. Lower and secure the folding side panels when the entrance box covers are open. Replace the connector covers as soon as the connectors are disconnected from the equipment; never drag or place an open connector in snow or on the ground.

b. Hot, Dry Climates. In hot, dry climates, the connectors, receptacles, and binding posts are subject to damage from dirt and dust. Lower and secure the folding side panels when the entrance box covers are open. Close the covers on the entrance boxes when they are not in use, and replace the covers on the cable connectors.

C. *Warm Damp Climates. In* warm, damp

climates, the equipment, is subject to damage from moisture and fungi. Wipe moisture and fungi from the exterior of the equipment with a lint, free cloth.

3-5. Stopping Procedures

NOTE

To turn off the power in an emergency, operate the MAIN circuit breaker switch to OFF.

a. Stopping Procedures. Stopping procedures are not required for the SB–22A PT or the TA-312/PT. Refer to the applicable technical manuals (app. A) for stopping procedures on the major communications components. Refer to paragraphs 5-1 through 5-4 for procedures to be performed for storage or transit of the AN/MSC-32A.

b. AN/MSC-32A Components.

(1) Electric heaters. Operate the TEMPERATURE CONTROL to its lowest setting and the HEAT—OFF—FAN switch to OFF.

NOTE

After the other AN/MSC-32A components have been turned off, allow the exhaust blower to remain in operation for at least 10 minutes to evacuate all smoke and fumes before completing the stopping procedures and closing the shelter door.

(2) *Blowers.* Operate the BLOWER switches to OFF. Secure the vents.

(3) *Air conditioner* (fig. 3-1).

(a) Operate the selector switch to OFF.

(b) Operate the fresh air control to CLOSED.

c. Circuit *Breaker and Light Switches.* Operate all circuit breaker and light switches to OFF.

d. Door and Entrance Box Covers. Secure door and entrance box covers.

CHAPTER 4

MAINTENANCE

Section I. OPERATOR/CREW AND ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES

4-1. General

NOTE

Refer to TM 750-244-2 for proper procedures for destruction of this equipment to prevent enemy use.

a. Operator/Crew preventive maintenance is the systematic care, servicing and inspection of quipment to prevent the occurence of trouble, to reduce dowtime, and to maintain equipment in serviceable condition. To be sure that your operations central is always ready for your mission, you must do scheduled preventive maintenance checks and services (PMCS).

(1) BEFORE OPERATION, perfom your B PMCS to be sue that your equipment is ready to go.

(2) DURING OPERATION, prform your D PMCS. This should help you to Spot small troubles before they become big problems.

(3) AFTER OPERATION , perform your A PMCS. This should help you to keep your equipment in top shape.

(4) WEEKLY AND MONTHLY PMCS are *important checks to keep serious problems from suddenly happening.* Perform WEEKLY as well as BEFORE OPERATION PMCS if:

(a) You are the assigned operator and have not operated the item since the last WEEKLY.

(b) You are operating the item for the first time.

(5) When an item of equipment is reinstalled after removal, for any reason, perform the necessary B PMCS (para 4-1) to be sure the item meets the readiness reporting criteria.

(6) Use the ITEM NO. column in the PMCS table to get the number to be used in the TM ITEM NO. column on DA Form 2404 (equipment Inspection and Maintenance Worksheet when you fill out the form.

b. Orgatizational preventive maintenance procedures are designed to help maintenance equipment in serviceable condition. They include items to be checked and how to check them. These Checks and services, described in paragrph 4-3, outline inspections that are to be made a specific weekly (W), monthly (M), quaterly (Q) and Semianuual (S) intervals.

c. Routine checks like CLEANING, DUSTING, WASHING, CHECKING FORI FRAYED CABLES, STOWING ITEMS NOT IN USE, COVERING UNUSED RECEPTACLES, AND CHECKING FOR LOOSE NUTS AND BOLTS are not listed as PMCS checks. They are things that you should do any time you see they must be done. If you find a routine check like one of those listed in your PMCS, it is because other operators reported problems with this item.

NOTE

When you are doing any PMCS or routine checks, keep in mind the warnings and cautions.

WARNINGS

- Never operate the generator or shelter until it has been properly grounded. Electrical defects in the load lines or equipment can cause death by electrocution when contact is made with an ungrounded system.
- Adequate ventilation should be provided while using TRICHLORO-

TRIFLUOROETHANE. Prolonged breathing of vapor should be avoided. The solvent should not be used near heat or open flame; the products of decomposition are toxic and irritating. Since TRICHLOROTRIFLUOROETHANE dissolves natural oils, prolonged contact with skin should be avoided. When necessary, use gloves which the solvent cannot penetrate. If the solvent is taken internally, consult a physician immediately.

* Compressed air is dangerous and can cause serious bodily harm if protective means or methods are not observed to prevent a chip or particle (of whatever size) from being blown into the eyes or unbroken skin of the operator or other personnel. Goggles must be worn at all times while cleaning with compressed air. Compressed air shall not be used for cleaning purposes except where reduced to less than 29 pounds per square inch gage (psig) and then only with effective chip guarding and personnel protective equipment. Do not use compressed air to dry parts when trichlorotrifluoroethane has been used.

NOTES

The PROCEDURES column in your PMCS charts instruct how to perform the required checks and services. Carefully follow these instructions and, if tools are needed or the chart so instructs, get organizational maintenance to do the necessary work.

If your equipment must be in operation all the time, check those items that can be checked and serviced without disturbing operation. Make the complete checks and services when the equipment can be shut down.

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

4-2. Operator/Crew Preventive Maintenance Checks and Services

Perform weekly as well as before operation PMCS if:

a. You are the assigned operator and have not operated the item since the last weekly.

b. You are operating the item for the first time.

NOTE

The checks in the interval column are to be performed in the order listed.

B—Before A—After M—Monthly
D—During W—Weekly

Item No.	Interval B	D	A	W	M	Item to be inspected	Procedure	Equipment is not ready/available if:
1				•		Grounding	Inspect ground rods and grounding connections to ensure clean tight connections.	If personnel experience electric shock from bodily contact with shelter frame or equipment.
2		•				Ensure that cables and wiring are secured with the necessary cable grips and that no fire or electrical safety hazard exists.		
3						Fire extinguisher	Check tag on fire extinguisher to ensure that proper inspection has been made.	

4-2. Operator/Crew Preventive Maintenance Checks and Services—Continued

Item No.	Interval B	D	A	W	M	Item to be inspected	Procedure	Equipment is not ready/available if
4				*		Dry cells	Test dry cells to check for deterioration.	
5	*					Teletypewriter TT-76 ( )/GGC and Terminal, Telegraph TH-5/TG or TH-22/TG.	Perform operational checks as described in parapaph 3-3.	Teletypewriter fails to print error-free copy.
6	*					Telephone Set TA-312/PT.	Perform operational checks as described in paragraph 6-4.	Telephone set fails to provide intelligible communications.
7	*					Teletypewriter TT-98/FG	Perform operational check as described in paragraph 6-5.	Teletypewriters cannot communicate.
8[a]	*					Terminal, Communication AN/UGC-74A(V)3	Perform operational check as as described in TM 11-5815-602-12 and para 6-7.1.	Teletype TT-98/FG and AN/UGC-74A(V)3 cannot communicate.
9					*	Urgent MWO's if an Urgent MWO has not been applied. You must check with C-E ORG Maintenance to make cure all Urgent MWO'S have been applied.	Do not operate the equipment	Urgent MWO not applied.
10						Teletypewriter TT-76 ( )/GGC, TH-5 or TH-22 system.	Perform PMCS as outlined in TM 11 5815-238-12 and TM 11-5805-246-10 (or TM 11-5805-356-12).	See subsystem TM for readiness criteria.
11						Telephone Set TA-312/PT system.	Perform PMCS as outlined in TM 11-5805-201-12.	See eubeyetem TM fo readiness criteria.
12						AN/UGC-74A(V)3 subsystem.	Perform PMCS as outlined in TM 11-5815-602-12	See subsystem TM fo readiness criteria.

*] Do this check before each deployment to a mission location. This will permit any existing problems to be corrected before th mission starts. The check does not need to be done again until redeployment,

[a]AN/MSC-32B only.

4-3. Organizational Preventive Maintenance Checks and Services

NOTE

The checks in the interval column are to be performed in the order listed.

W—Weekly M—Monthly Q—Quarterly

Item No.	Interval W	Interval M	Interval Q	Item to be inspected	Procedures
1		*		Teletypewriter TT-76( )/GGC and Terminal, Telegraph TH-22/TG.	Perform bias and end-distortion tests on teletypewriter. Send equipment for repair and/or adjustment if bias end-distortion test parameters cannot be met.
2		*		Teletypewriter TT-98/FG, and Terminal, Telegraph TN-22/TG.	Perform bias and end-distortion tests on Teletypewriter. Send equipment for repair and/or adjustment if bias end-distortion parameters cannot be met.
3		*		Communications terminal AN&UGC-74A(V)3.	Perform equipment tests as outlined in TM 11-5815-602-12, paragraph 5-9. Send equipment for repair and/or adjustment if these tests should fail.

4-4. Equipment Shelter Environmental Control Equipment and Clerical Equipment Maintenance

Heaters, air conditioners, power distribution facilities, tools and equipment used to maintain the site, and clerical equipment are maintained on an as-needed basis. No formal maintenance schedule is required.

4-5. Shelter Facility Troubleshooting

a. General. Replacement and repair of components and parts for the AN/MSC-32A and AN/MSC-32B are authorized for the various categories of maintenance personnel as indicated in section II of the maintenance allocation chart (app. C). The tools and test equipment required are listed in section III of the maintenance allocation chart. Troubleshooting information in the troubleshooting chart (*b* below) is based on symptoms that would be obtained while performing the operator's daily preventive maintenance checks and services (para 4-2) and organizational monthly preventive maintenance checks and services (para 4-3). For signal line and power line troubleshooting information, refer to the signal schematic-wiring diagram (fig. 4-1 and 4-1.1) and the power schematic wiring diagram (fig. 4-2 and 4-2.1). When an abnormal symptom is obtained, locate the symptom in the troubleshooting chart and perform the corrective measure indicated, as authorized in the maintenance allocation chart. If the corrective measure does not correct the problem, refer to higher category maintenance. For troubleshooting procedures for the major components, refer to the applicable technical manual listed in appendix A.

b. Troubleshooting.

Item No.	Symptom	Probable trouble	Corrective measure
1	POWER INDICATOR NEON LAMP fails to glow when power is applied to AN/MSC:32A.	a. Defective clamp	a. Replace lamp.
		b. Defective power cable.	b. Check and repair or replace as required.
		c. Defective IN POWER 115V AC receptacle. Note: If immediate operation is required, and POWER 115V OUT receptacle is not used to power another assemblage, use POWER 115V AC OUT receptacle for input power.	c. Same as above.
2	VOLTS AC meter indicates 0 volt when power is applied and MAIN circuit breaker is operated to ON.	a. Defective MAIN circuit breaker	a Replace circuit breaker.
		b. Defective VOLTS AC meter.	b. Replace meter.
		c. Defective power cable	c. Repair or replace cable.
3	Neon lamp fails to glow when associated circuit breaker ie operatad to ON.	a Defective neon lamp	a. Replace neon lamp.
		b. Defective circuit breaker on power distribution panel.	b. Replace circuit breaker.
4	Fluorescent ceiling lights do not operate when fluorescent lights switch is operated to ON.	a. Defective BLACKOUT BYPASS switch.	a. Replace switch.
		b. Defective LIGHTS circuit breakers on power distribution panel.	b. Replace circuit breaker.
		c. Defective fight	c. Replace light.
5	Incandescent ceiling lamp does not light when incandescent COLD START fight switch is operated to ON.	a Defective incandescent cold light ewitch.	a. Replace defective fight switch.
		b. Defective fiiture or wiring..	b. Check and repair or replace as required.
		c. Defective lamp	c. Replace lamp.

Item No.	Symptom	Probable trouble	Corrective measure
6	Ceiling lights are not extinguished when door is opened and BLACKOUT BYPASS switch is at OFF.	a. Defective door microswitch.	a. Replace switch.
		b. Defective BLACKOUT BYPASS switch.	b. Replace switch.
7	Exhaust blower fails to operate when BLOWER switch is operated to ON.	a. Defective exhaust' blower.	a. Check and repair or replace as required.
		b. Defective BLOWER switch or receptacle.	b. Check and replace as required.
8	Heater fails to operate properly.	a. Defective heater receptacle.	a. Check and replace as required.
		b. Defective heater.	b. Check and replace as required.
		c. Defective heater. Circuit breaker on power distribution panel.	c. Check and replace as required.
		d. Defective ac wiring.	d. Check and repair as required.
9	No ac power available from any convenience receptacle.	Defective CONV circuit breaker on power distribution panel.	Replace circuit breaker.
10	No ac power to air conditioner.	a. Defective air conditioner receptacle.	a. Check and replace as required.
		b. Defective air conditioner circuit breaker on power distribution panel.	b. Check and replace as required.
		c. Defective ac wiring	c. Check and repair as required.
11	No ac power to equipment.	a. Defective equipment receptacle.	a. Check and replace as required.
		b. Defective equipment circuit breaker on power distribution panel.	b. Check and replace as required.
		c. Defective ac wiring	c. Check and repair as required.
12	Local communications not available with LS-147C/F1.	a. Defective LS-147C/F1.	a. Cheek and repair or replace as required.
		b. Defective wiring in signal duct.	b. Check anti repair or replace as required.
		c. Defective connector.	c. Repair or replace as required.
13	Local communications not available with TA-312/PT.	a. Defective TA-312/PT,	a. Check and repair or replace as required.
		c. Defective connector wiring in signal duct.	b. Check and repair or replace as required.
		c. Defective connector.	c. Repair and replace as required.
		Note. For trouble shooting procedures of major components refer to applicable technical manual (app. A).	
14	Ammeter indicates current flow when circuit breakers 2 through 7 are at OFF.	a. Defective circuit breakers (fig. 4-10).	a. Repair or replace as required.
		b. Defective ac wiring,	b. Disconnect all ac input' power and check for grounded or shorted wiring.
		c. Defective ammeter	c. Repair or replace as required.

Section II. ORGANIZATIONAL REPAIR PROCEDURES

4–6. Kit and Optional Radio Equipment Installation and Removal

a. Blower Kit Installation.

(1) *Removal of air conditioner* (fig. 4–3).

(*a*) Turn air-conditioner circuit breaker to OFF (fig. 1–6).

(*b*) Turn air-conditioner OFF–FAN–COOL selector switch to OFF.

(*c*) Disconnect air-conditioner power cable (fig. 1–10).

(*d*) Remove the 14 sheet metal screws that secure the air-conditioner protective cover. Remove the protective cover.

(*e*) Remove the four hexagonal-head studs that secure the air-conditioner to the mounting bracket.

(*f*) Lift and slide the air-conditioner forward, and remove it from the mounting bracket.

Warning: **The weight of the air conditioner is approximately 200 pounds sufficient personnel must be available to remove the air conditioner.**

(*g*) Remove the 17 hexagonal-head studs that secure the air-conditioner mounting bracket to the shelter. Remove the mounting bracket.

(2) *Installation of blower blank panel* (fig. 4–3).

(*a*) Remove the six slot-head captive screws that secure the blower blank panel to the exterior front curbside of the shelter. Remove the blower blank panel.

(*b*) Place the blower blank panel in the air-conditioner opening.

(*c*) Align and secure the blower blank panel with the six slot-head captive screws.

(*d*) Adjust and tighten the wing brackets on each side of the interior of the blower blank panel.

(3) *Removal of blower blank panel.* To remove the blower blank panel, reverse the procedure given in (2) above.

(4) *Installation of blower* (fig. 4–4).

(*a*) Unpack the blower kit and check contents in accordance with packaging list.

(*b*) Atttach the support assembly to the shelter support bracket; use hexagonal-head studs with lockwashers and flat washers.

(*c*) Install the bracket assembly; use four hexagonal-head studs, lockwashers, and flat washers.

(*d*) Install the rubber sleeve on the blower-assembly exhaust flange and secure with one blower sleeve clamp assembly.

(*e*) Position the blower shock mount on the bracket assembly and align with the blower mounting holes in the bracket assembly.

(*f*) Position the blower, motor base down, on top of the shock mount on the bracket assembly.

(*g*) Insert the blower shade in the sleeve and align the blower assembly mounting holes.

(*h*) Secure the blower to the bracket assembly, use four hexagonal-head studs, lockwashers, and flat washers.

Note. The support assembly and welded bracket assembly mounting holes are slotted to permit proper alignment of the blower assembly.

(*i*) Secure the rubber sleeve to the blower vent, using a second blower sleeve clamp assembly.

(*j*) Operate BLOWER 2 switch to OFF (fig. 5-1) .

(*k*) Connect the blower power plug to the BLOWER 2 receptacle.

(*l*) Open the exterior blower vent on the front of the blower blank panel.

(*m*) Operate the BLOWER 2 switch to ON and check the blower for proper operation.

(5) Removal of blower. To remove the blower, reverse the procedure given in (4) above.

b. Radio Kit Installation (fig. 4-5).

(1) Installation of mounting hardware.

(*a*) Unpack the radio kit and check contents in accordance with packaging list.

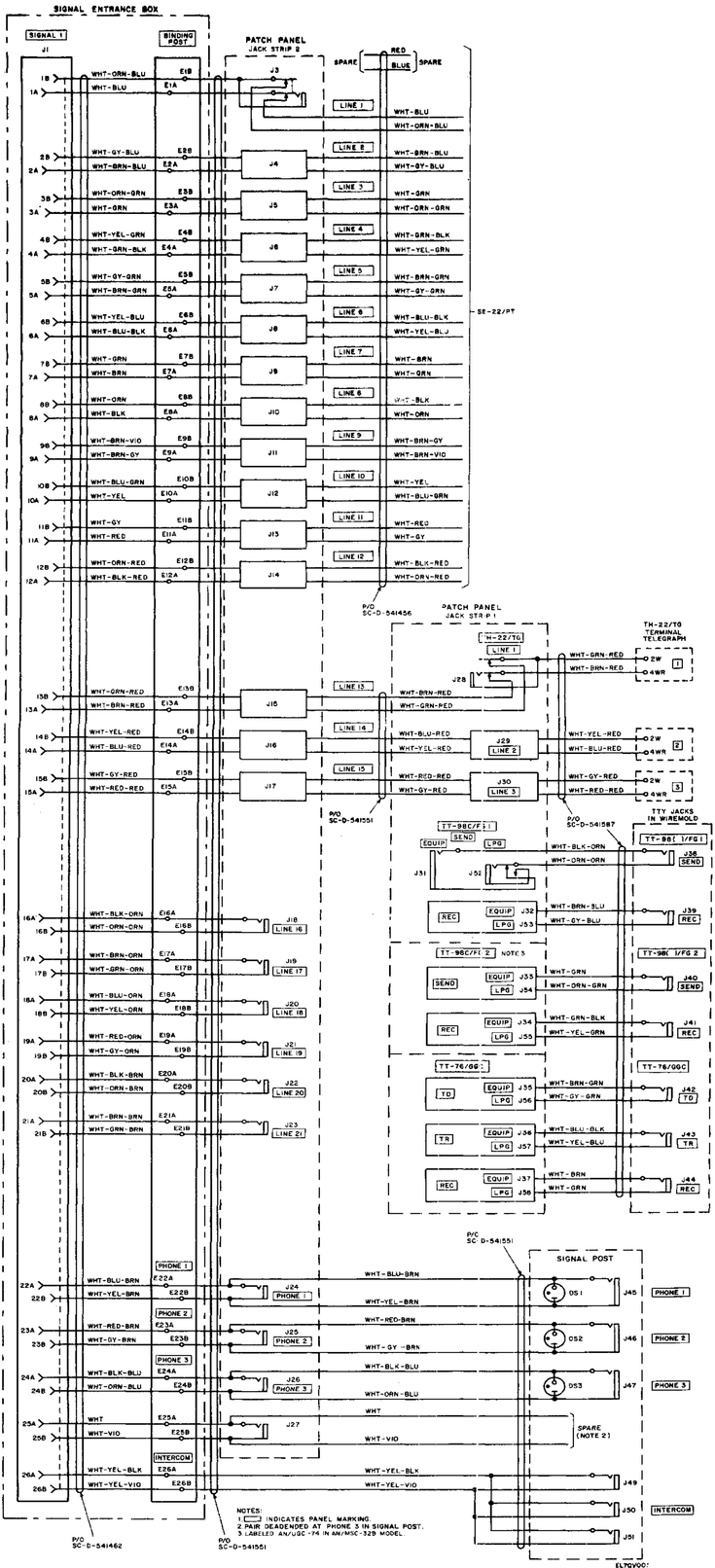


Figure 4-1. Signal schematic diagram.

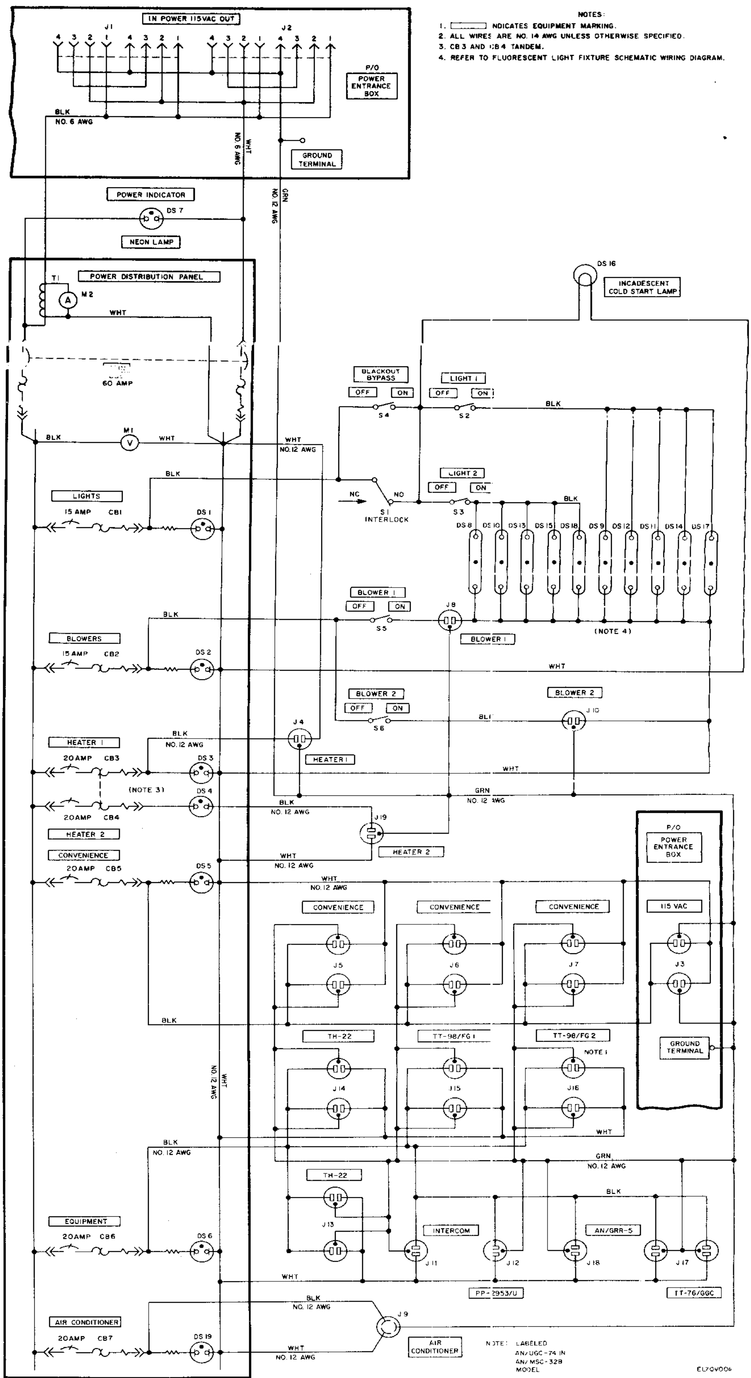


Figure 4-2. Power schematic wiring diagram.

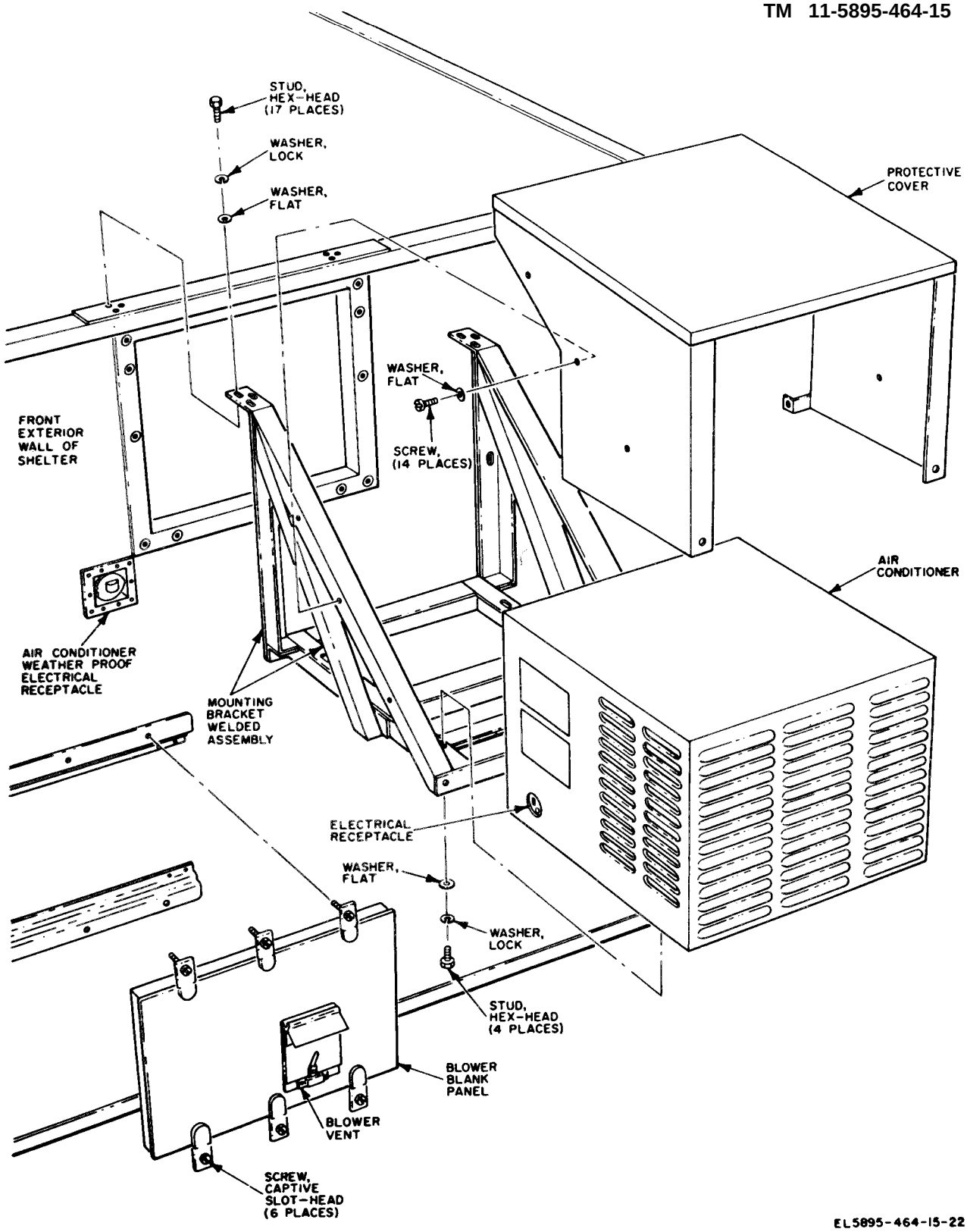


Figure 4-3. Removal of air conditioner and installation of blower blank panel.

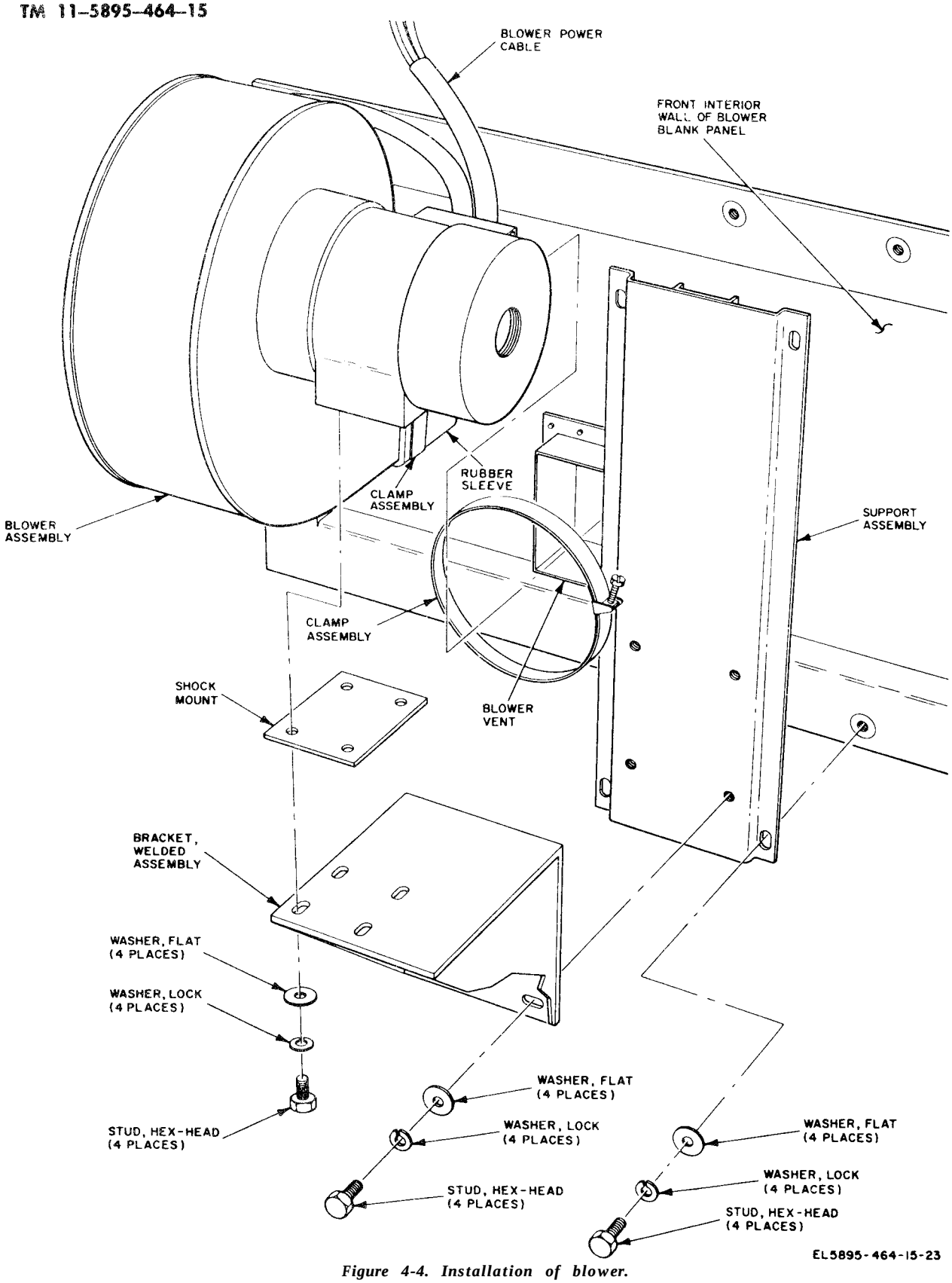


Figure 4-4. Installation of blower.

(b) Unpack the major radio equipment and check in accordance with the procedures given in applicable technical manuals (app. A).

(c) Remove the cable entrance blind plugs located below the top bracket on the shelter interior front wall (fig. 5-1) .

(d) Install the upper feedthrough assembly with its length of W-128 antenna wire extending approximately 18 inches to the shelter exterior. Tighten the locknuts on the feedthrough assembly.

(e.) Install the rubber grommet and compression nut on the feedthrough assembly exterior. Tighten the compression nut to insure an adequate water seal.

(f) Install the lower feedthrough assembly and antenna cable R–442/VRC GPI with the WHIP ANTENNA band identification to the shelter exterior. Tighten the locknuts and compression nut on the feedthrough assembly.

(g) Align the shelf assembly above the teletypewriter shelf and with the horizontal support brackets.

(h) Place the installed antenna wire and cable through the two holes in back of the shelf assembly.

(i) Carefully slide the shelf assembly against the support brackets, align the mounting holes and secure with 16 hexagonal-head studs and lockwashers.

(2) *Removal of mounting hardware. To* remove radio mounting hardware, reverse the procedure given in (1) above.

(3) *Installation of radio equipment.*

(a) Mount AN/GRR-5 Shock Mounting Base Plate MT-768/URR on the top shelf and secure from beneath with the mounting hardware provided.

(b) Install Loudspeaker, Permanent Magnet LS-454/U on the rubber shock mount spacer adjacent to the AN/GRR-5.

(c) Position the antenna cable and wire to the left and move them forward to permit installation of the AN/GRR-5 without binding or abraiding the antenna cables.

(d) Slide the AN/GRR-5 into position on the MT–768/URR and secure it with the two thumbscrews on the front of the mount.

(e) Mount the RT-524/VRC Shock Mounting Base Hate MT-1029/VRC on the bottom shelf at the left side and secure from beneath with the mounting hardware provided.

(f') Mount the R–442/VRC Shock Mounting Base Plate MT-1898/URC to the right of the MT–1029/VRC and secure from beneath with the mounting hardware provided.

(g) Slide the RT-524/VRC into position on the MT–1029/VRC; use extreme care to engage the guide pins and connector. Seat the RT–524/VRC firmly and secure with the thumb fasteners on the front of the MT-1029/VRC.

(h) Slide the R-442/VRC into position on the MT–1898/VRC; use extreme care to engage the guide pins and connector. Seat the R–442/VRC firmly and secure with the thumb fasteners on the front of the MT-1898/VRC.

(i) Install the right and left mounting brackets on the shelter floor beneath the roadside TT–98C/FG teletypewriter. Secure with hexagonal-head studs and lockwashers (fig. 4-5) .

(j) Install the PP-2953/U power supply on these brackets and secure with hexagonal-head studs and Iockwashers.

(k) Remove the cable extrance blind plugs on the front curbside wall beneath blower No. 1.

(l) Install the feedthrough assembly and RT–524/VRC GPII antenna cable nearest the curbside wall with the WHIP ANTENNA band identification to the exterior of the shelter. Tighten the feedthrough assembly locknuts. Feed approximately 18 inches of the antenna cable to the shelter exterior and tighten the compression nut.

(m) Install the RT-524/VRC control cable assembly adjacent to the RT–524/VRC GPII antenna cable with the RT-524/VRC CONTROL identification band to the interior of the shelter. Tighten the feedthrough assembly locknuts. Feed approximately 18 inches of the cable to the shelter exterior and tighten the compression nut.

(4) *Removal of radio equipment. To* remove the radlio equipment, reverse the procedure given in (3) above.

c. Antenna Kit Installation (fig. 4-6)

(1) *Installation of antenna mounting brackets.*

(a) Remove the assembled bracket assemby and antenna mounting bracket for Antenna Matching Unit-Base MX-6707/VRC from the radio kit packaging container.

(b) Mount the assembled bracket assembly and antenna mounting bracket on the shelter exterior upper curbside wall with four hexagonal-head screws and lockwashers.

(c) Remove the two remaining antenna mounting brackets and bracket assemblies from the radio kit packaging container.

(d) Install the antenna mounting brackets on the bracket assemblies; use four hexagonal-head screws, flat washers, lockwashers, and nuts for each assembly.

(e) Mount the two assembled bracket assemblies and antenna mounting brackets on the shelter exterior upper front roadside wall with the four hexagonal-head screws and lockwashers provided for each.

(2) *Removal of antenna mounting brackets.* To remove the antenna mounting brackets, reverse the procedure given in (1) above.

(3) *Installation of antenna mast bases and antennas (fig. 4-6).*

(a) Remove Antenna Matching Unit-Base MX–6707/VRC from the packaging container.

(b) Mount the MX-6707/VRC on the antenna mounting bracket assembly located on the shelter exterior upper front *curbside wall* with four hexagonal-head screws and four hexagonal-head nuts with four flatwashers and four lockwashers.

(c) Remove Antenna Elements AS-1730/VRC and AS-1095/VRC from the antenna bag assembly stored on the shelter interior curbside wall.

(d) Insert element AS–1095/VRC into upper screw-fit slot in element AS-1730/VRC and tighten by turning the AS-1095/VRC element clockwise.

(e) Install the antenna assembly On MX–6707/VRC Antenna Matching Unit-Base and tighten by turning the antenna assembly clock-wise.

(f) Remove two Mast Bases AB-l5/GR from the packaging containers.

(g) Mount the AB-15/GR with the *binding post connector* on the antenna bracket assembly located on the shelter right exterior upper front roadside wall (fig. 4-6).

(h) Mount the AB-15/GR with the UG-273/U *adaptor on* the shelter left exterior upper front roadside wall (fig. 4-6).

(i) Remove Whip Antenna Mast Sections MS–116A, MS-117A, and MS-118A from the antenna bag assembly stored on the shelter interior curbside wall.

(j) Assemble the three antenna mast sections in numerical sequence.

(k) Install the two antenna mast section assemblies on the two AB–15/GR mast bases and tighten by turning the mast sections clockwise.

(4) *Removal of antenna mast bases and antennas.* To remove antenna mast bases and antennas, reverse the procedure given in (3) above.

d. Intercommunication of Radio Kit Cable and Wire Assemblies (fig. 4-7).

(1) Power cable connections.

(a) Connect Power Cable Assembly CX–1358/U to POWER INPUT receptacle JI03 on Power Supply PP–308/URR.

(b) Connect the other end of Power Cable Assembly CX-1358/U to the AN/GRR-5 power receptacle in the ceiling power duct directly above the radio set (fig. 5-1).

(c) Connect one Electrical Power Cable Assembly CX-4721/U to power receptacle J23 on Receiver-Transmitter, Radio RT–524/VRC.

(d) Connect the other end of Electrical Power Cable Assembly CX–4721/U to power receptacle J11 on Receiver, Radio R–442/VRC.

(e) Connect another Electrical Power Supply Cable CX-4721/VRC to power receptacle J21 on Receiver-Transmitter, Radio RT–524/VRC (fig. 4-7).

(*f*) Connect the other end of Electrical Power Cable Assembly CX–4721/VRC to POWER OUT receptacle J3 on Power Supply PP–2953/U.

(g) Connect Electrical Power Cable Assembly CX–4524/U to AC POWER receptacle J1 on Power Supply PP–2953/U.

(*h*) Connect the other end of Electrical Power Cable Assembly CX–4524/U to the PP–2953/U power receptacle in the power duct on the shelter lower front wall (fig. 5–1).

(2) *Antenna and loudspeaker connections* (fig. 4-7).

(a) Connect Antenna Wire W-128 to binding post terminal A on Receiving Set, Radio AN/GRR-5.

(b) Connect the other end of Antenna Wire W-128 to the binding post an Antenna Base AB-15/GA mounted on the shelter right exterior upper front roadside wall (fig. 4-7).

(c) Connect antenna cable R-442/VRC GPI connector to the ANT receptacle on Receiver, Radio R–442/VRC.

(d) Connect the other end of antenna cable R–442/VRC GPI to Antenna Base AB–15/GR (with the UG–273/U adapter) on the shelter left exterior upper front roadside wall (fig. 4-7).

(e) Connect antenna cable RT-524/VRC GPII connector to the ANT receptacle on Receiver-Transmitter RT-524/VRC.

(f) Connect the other end of antenna cable RT-524/VRC GPII to J1 on Antenna Matching Unit-Base MX-6707/VRC that is located on the shelter exterior upper front curbside wall (fig. 4-7).

(g) Connect control cable assembly RT–524/VRC to ANT CONT receptacle on Receiver-Transmitter Radio RT-524/VRC.

(h) Connect the other end of control cable assembly RT–524/VRC to connector J2 on Matching Unit-Base MX-6707/VRC.

(i) Connect the loudspeaker LS-454/U cable to AUDIO receptacle J13 on Receiver, Radio R-442/VRC.

(3) *Disconnection of radio kit cables and wire assemblies. To* disconnect the radio kit cables and wire assemblies, reverse the procedure given in (d) above.

(4) *Preoperational checks.* Perform preoperational checks on radio equipment in accordance with applicable technical manuals (app. A).

4-7. Repair of Fluorescent Fixtures and Wiring

Note. The fluorescent light fixtures are fabricated as part of the power duct. The radio frequency 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.

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 (fig. 4-8).

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.

h. Operate the associated LIGHT switch to ON.

4-8. Removal and Replacement of Electric Heater

(fig. 1-9)

a. Removal.

(1) Operate the HEATER-OFF-FAN switch to OFF.

(2) Remove the heater power cord connector plug from the twist-lock HEATER receptacle (fig. 5-1).

(3) Loosen the four turnlock fasteners that secure the heater to the mounting base.

(4) Lift out the heater.

b. Replacement.

(1) Place the heater on the mounting base

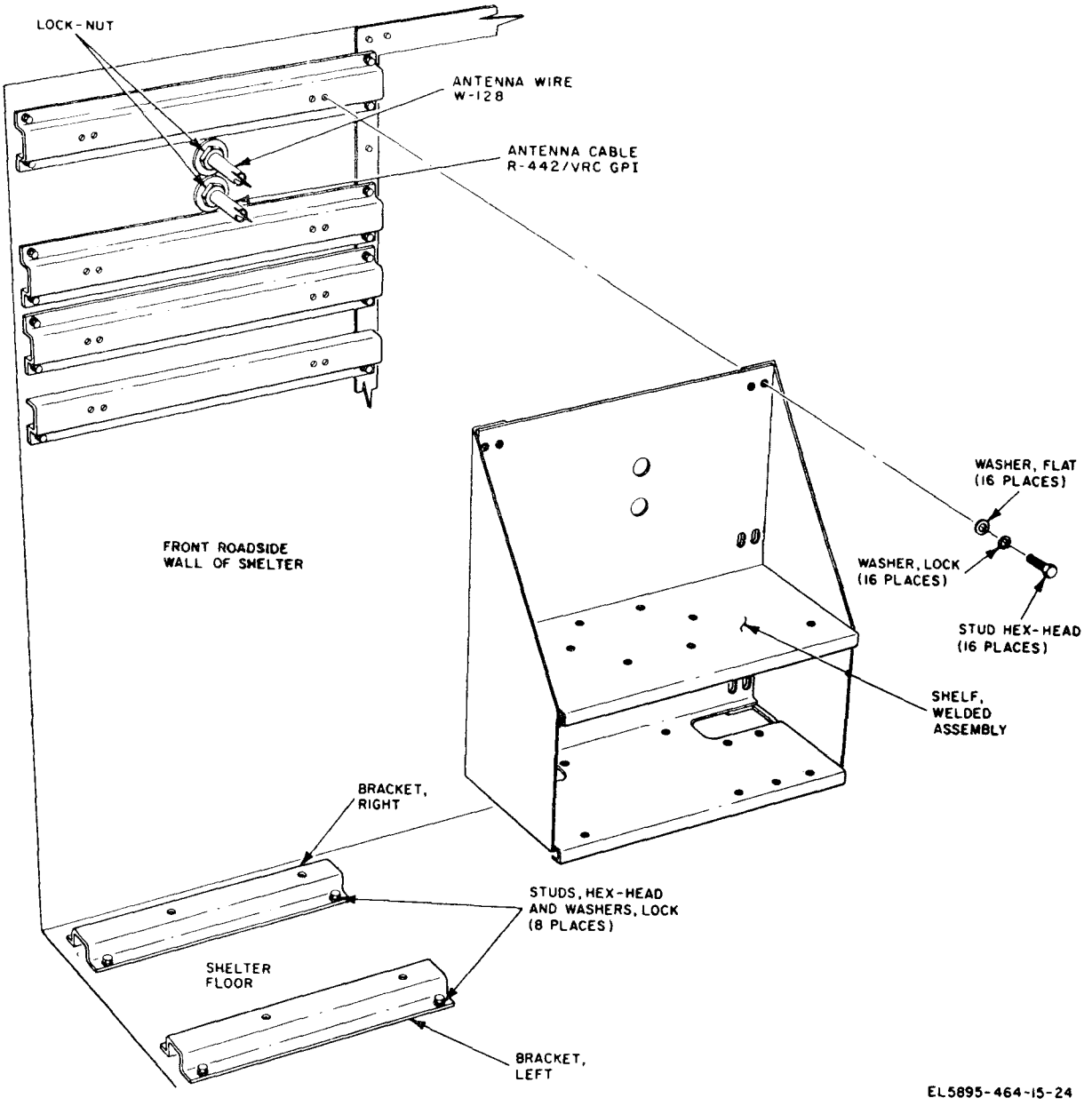


Figure 4–5. Radio kit installation.

so that the turnlock fasteners are aligned with the holes in the mounting base.

(2) Tighten the four turnlock fasteners.

(3) Align the power cord connector plug contacts with the HEATER receptacle (fig. 5–1). Insert the connector plug contacts in the receptacle and twist clockwise until contacts are seated.

4–9. Exhaust Blower Repairs

(fig. 4–9)

Organizational repair of blowers is restricted to replacement of ac power cords and the blower motor and impeller.

a. Operate the BLOWER sw[illegible] OFF.

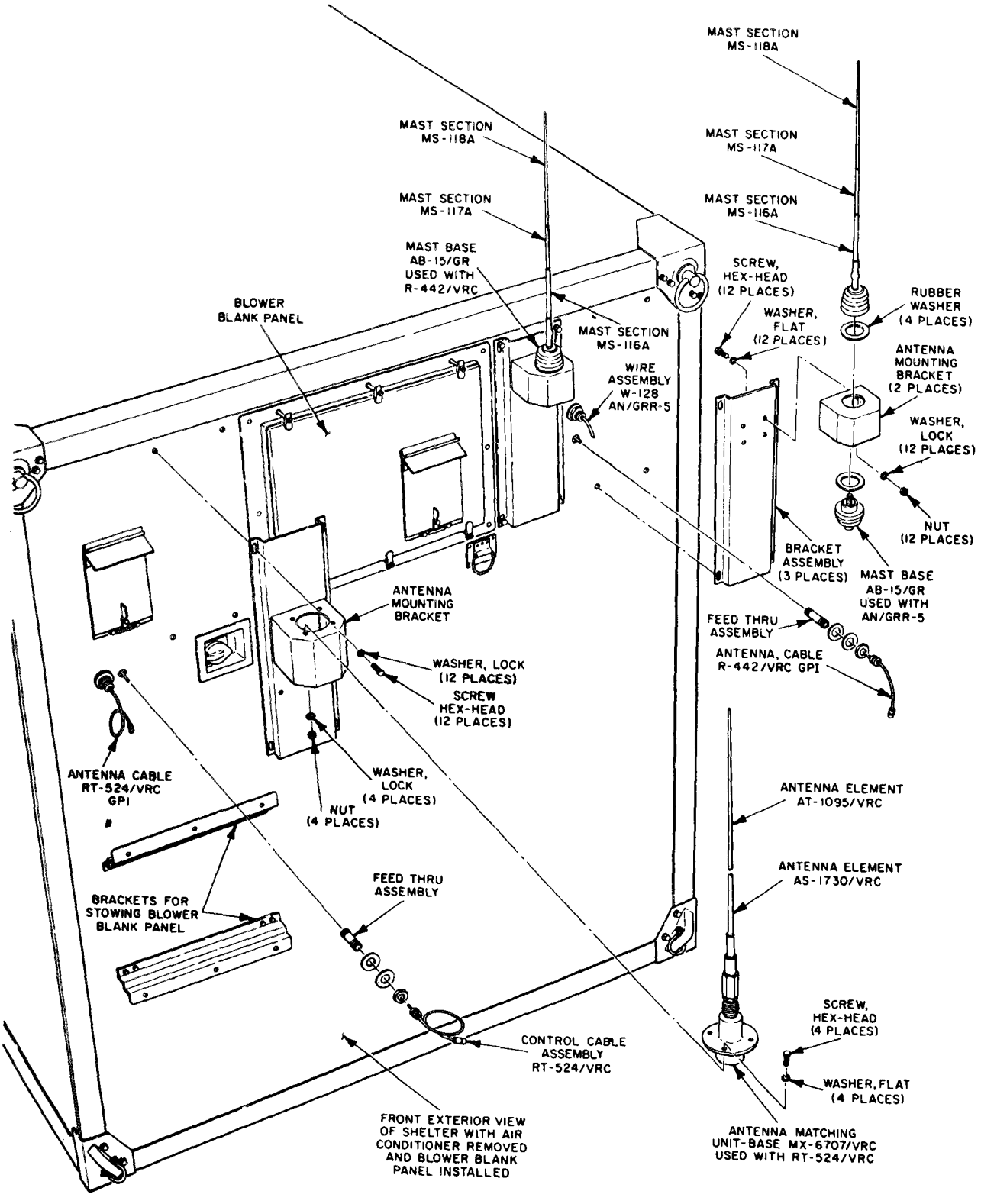


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Figure 4–6. Antenna kit installation.

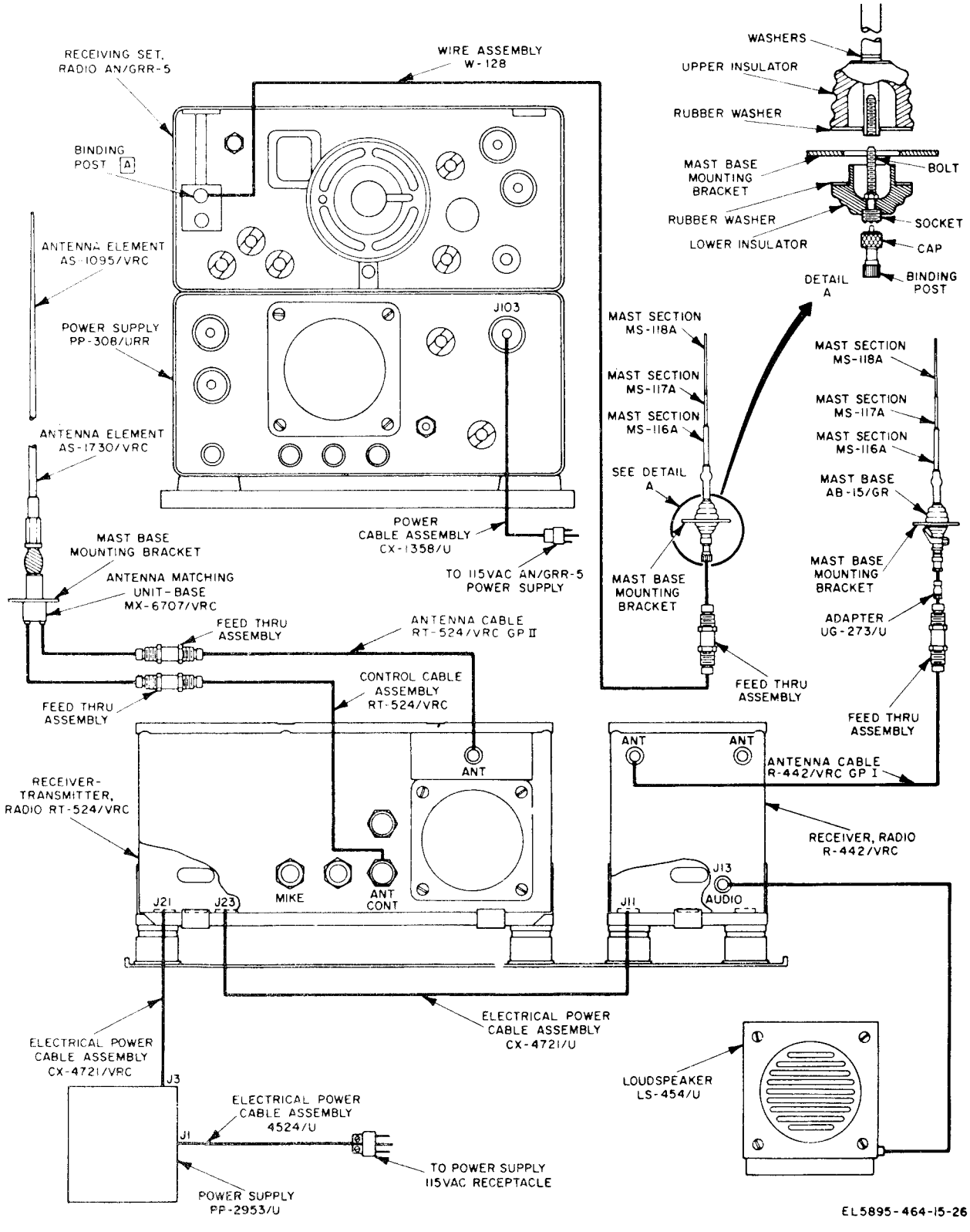


Figure 4-7. Interconnection of radio kit cable and wire.

b. Remove the defective power cord, blower motor, or impeller.

c. Refer to figure 4-9 to determine the correct connections for the required motor rotation and the required position of the impeller. Be sure that the concave portion of the impeller faces the air exhaust outlet as indicated.

Note. If the replacement motor has two mounting sides, install the motor so that the capacitor side is facing the shelter front wall.

4-10. Power Distribution Panel Repairs

(fig. 4-10)

Warning: **Before performing any power distribution panel repairs, disconnect the power cable from the power entrance box IN POWER 115V AC receptacle.**

a. Preliminary Procedures. Remove the screws that secure the cover to the power distribution panel and remove the cover.

b. Removal and Replacement of Circuit Breaker.

(1) Grasp the defective circuit breaker and pull it straight out from the panel (fig. 4-10).

(2) Disconnect the wires connected to the circuit breaker.

(3) Connect the wires to the appropriate terminals of the replacement circuit breaker.

(4) Position the circuit breaker in the power distribution panel and firmly press it in place.

c. Removal and Replacement of Current Transformer.

(1) Tag and disconnect the black and white ammeter leads from the transformer terminals.

(2) Remove the nuts and washers that secure the current transformer inside the panel, and remove the current transformer (fig. 4-10) .

Note. Count the number of turns of heavy black wire through the center hole of the current transformer before proceeding to the next step

(3) Disconnect the black wire wound around the current transformer from the MAIN circuit breaker and carefully unwind the wire.

Caution: **Be sure that the number of turns around the replacement transformer is the same as that on the original transformer.**

(4) Wind the black wire around the replacement current transformer.

(5) Reconnect the black wire to the MAIN circuit breaker.

(6) Position the current transformer inside the panel and secure it with the original nuts and washer.

(7) Connect the black and white ammeter leads to the appropriate transformer terminals.

d. Removal and Replacement of Meters.

(1) Tag the color connections and remove the leads from the meter terminals.

(2) Remove the bolts that secure the meter to the panel and lift the meter out (fig. 4-10) .

(3) Position the replacement meter in the panel and secure it with the original bolts.

(4) Connect the leads to the appropriate terminals of the replacement meter.

4-11. Removal and Replacement of Power Cable and Entrance Box Connectors

a. Power Receptacles.

(1) Disconnect the power cable from the power entrance box IN POWER 115V AC receptacle (fig. 1-4).

(2) Remove the power entrance box interior cover, disconnect the wires from the appropriate receptacle, and remove the receptacle (fig. 4-11).

(3) Install the replacement receptacle, connect the wires to the proper terminals of the receptacle, and replace the power entrance box cover.

b. Power Cable Connectors. Refer to figures 4-12 and 4-13 for details of construction necessary for disassembly and removal.

Section III. DIRECT SUPPORT, GENERAL SUPPORT, AND DEPOT MAINTENANCE

4-12. Scope of Direct Support and General Suppert Maintenance

a. General. Direct and general support maintenance consists entirely of corrective maintenance procedures as indicated in the maintenance allocation chart (app. C).

b. Tools and Test Equipment Required. The tools and test equipment required for direct and general support maintenance of the AN/MSC–32A are listed in section III of the maintenance allocation chart (app. C).

4-13. Direct Support Repair Procedures

a. Radio frequency and Direct Line Communications Equipment Repair. Refer to the applicable technical manual (app. A) for instructions in performing direct support maintenance of the TA–312/PT, SB–22APT, LS-147C/F1, TT-76C/GGC, TT-98C/FG, AN/VRC-47, AN/GRR–5, TH–22/TG, and Air Conditioner, Model F-9000-2.

b. Shelter, Electrical Equipment S–372/MSC–32A Repairs. Direct support repair of the S–372/MSC–32A includes the following:

(1) Emergency repairs of holes and minor structural damage to the shelter.

(2) Removal and replacement of the door handle and latchbolt assemblies, entrance door filter, cover assemblies, and gaskets for the blower vent, door, and the entrance boxes.

Note. Refer to TB SIG 354 for additional information on direct support maintenance of the shelter.

4-14. General Support Repair Procedures

a. Radio frequency and Direct Line Communications Equipment Repair. Refer to the applicable technical manual (app. A) for instructions on performing general support maintenance on the communications equipment in the assemblage.

b. Shelter, Electrical Equipment S–372/MSG-32A Repair. General support maintenance of the S–372/MSC–32A includes replacement of doors and skids, and permanent repair of holes and major structural damage to shelter. Refer to TB SIG 354 for further information on general support maintenance of the shelter facility.

c. Removal of Signal Entrance Box 26-Pair Receptacle (fig. 4-14).

(1) Remove the screws that secure the cover to the rear of the signal entrance box (fig. 4-15).

(2) Remove the cover from the defective 26-pair receptacle.

(3) Remove the mounting screws that secure the insert clip to the housing.

(4) Unfasten the cable clip that secures the cable form.

Caution: **Be extremely careful when connecting and soldering wires to the receptacle insert. Excessive heat or pressure will damage the receptacle insert.**

(5) Lift the receptacle insert out of the housing; tag and unsolder the wires.

(6) Remove the mounting screws and remove the housing.

d. Replacement of Signal Entrance Box 26-Pair Receptacle (fig. 4-9).

(1) Position the housing and secure it to the signal entrance box.

Caution: **Be extremely careful when connecting and soldering wires to the receptacle insert. Excessive heat or pressure will damage the receptacle insert.**

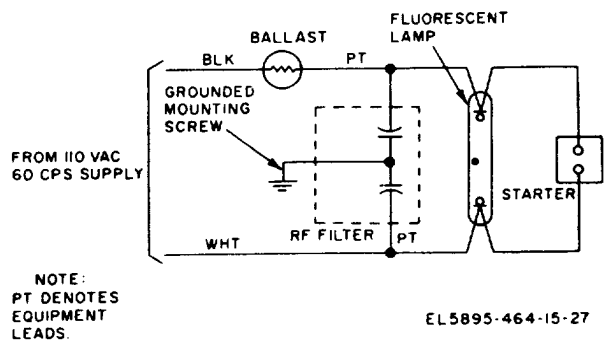


Figure 4-8. Fluorescent light fixture, schematic wiring diagram.

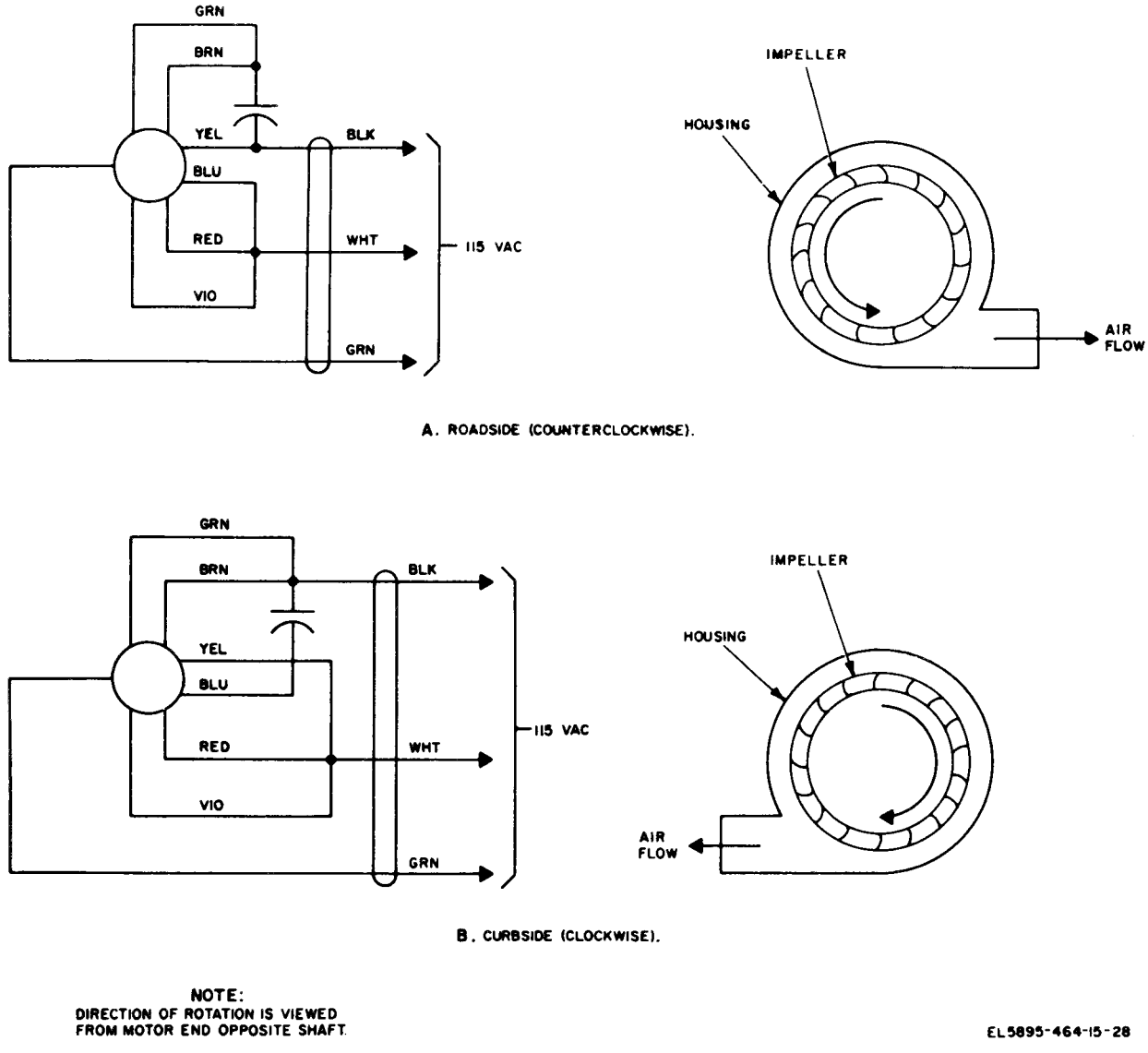


Figure 4-9. Blower motor connections and impeller installation diagram.

(2) Slide the end of the cable form out through the housing and connect the wires to the receptacle insert.

Caution: **Be careful not to damage the wires when replacing the receptacle insert mounting screws.**

(3) Secure the cable form by fastening the cable clip.

(4) Install the cover on the housing.

(5) Position and secure the rear cover on the signal entrance box.

e. Removal of 26-Pair Cable Connectors (fig. 4-16) .

(1) Loosen the setscrew and slide the locking ring back on the cable.

(2) Remove the clamping bolts and clamp nuts from the cable clamp.

(3) Remove the retaining bolts and both sections of the cable clamp.

(4) Slide the enforcement and nylon insulator back on the cable.

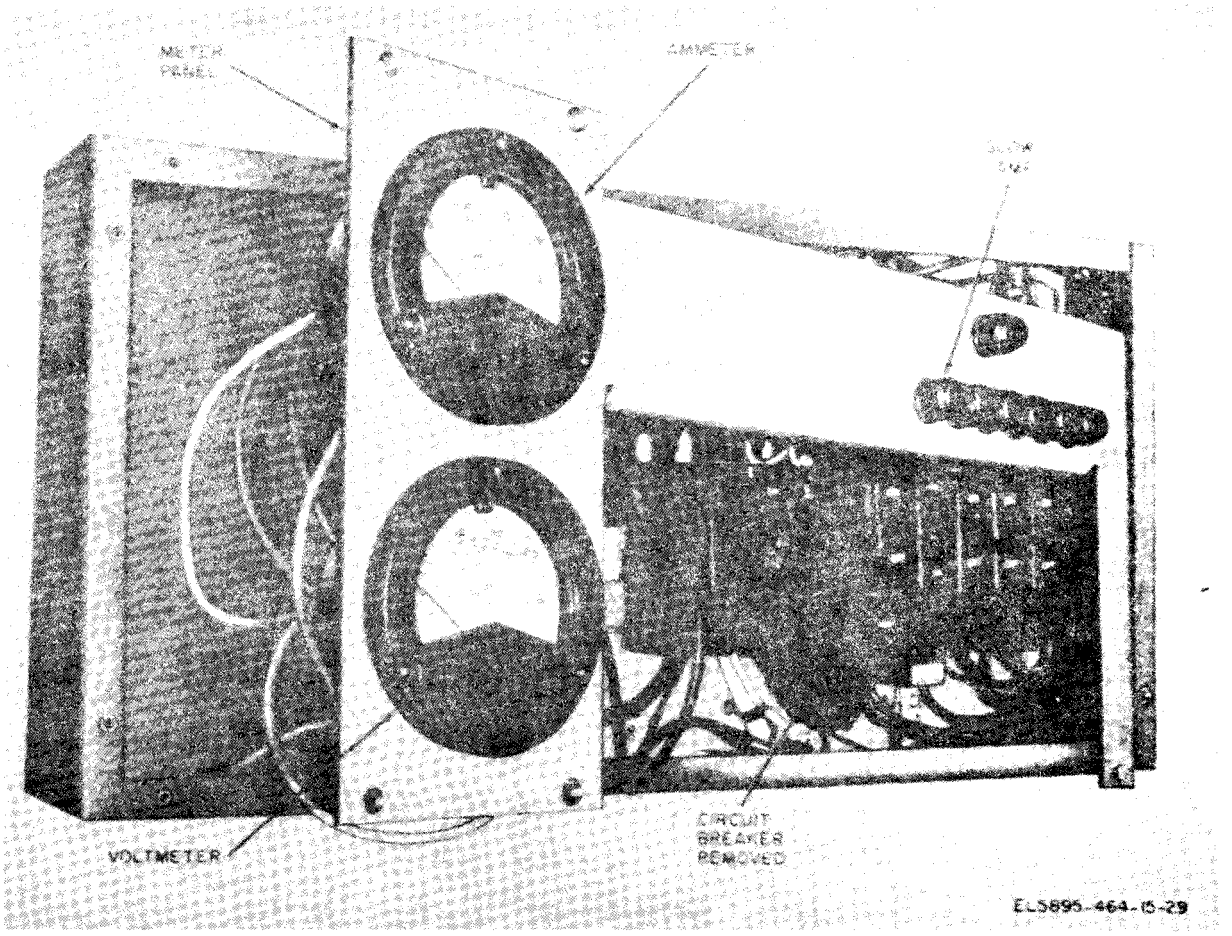


Figure 4-10. Power distribution panel, meter panel, and circuit breaker switch removed.

(5) Remove the contact assembly retaining screws.

(6) Work the cable into the housing and lift the contact assembly out of the housing.

(7) Slide the separator away from the contact assembly.

(8) Tag and disconnect the leads.

(9) Remove the separator and slide the housing off the cable.

(10) Slide the nylon insulator, enforcement, locking ring, and cover off the cable.

f. Replacement of 26-Pair Cable Connectors (fig. 4-16).

(1) Slide the cover, locking ring, enforcement, and nylon insulator on the cable. Be sure the flange on the enforcement and nylon insulator is toward the cable end.

(2) Slide the housing on the cable.

(3) Install the separator with the leads properly positioned.

(4) Position the contact assembly near the housing and connect the leads.

(5) Replace the contact assembly in the housing. If necessary, work the cable out of the housing to provide clearance for the contact assembly.

(6) Be sure that the contact assembly is properly seated and secure it to the housing with the contact assembly retaining screws.

(7) Slide the nylon insulator forward until its flange is flush against the housing.

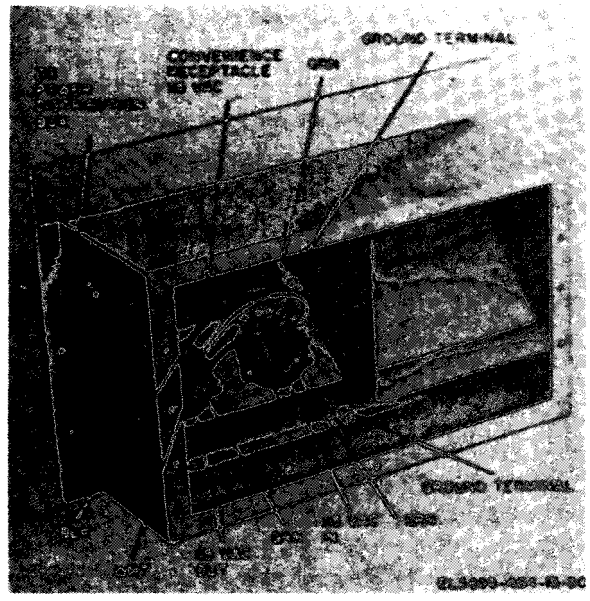


Figure 4–11. Power entrance box, rear view.

(8) Slide the enforcement forward until its flange is flush against the nylon insulator.

(9) Replace the sections of the cable clamp and secure them with the retaining bolts.

(10) Replace the clamping bolts and nuts, and tighten them securely.

(11) Slide the locking ring into position on the housing and secure it with the setscrew.

(12) Replace the cover.

4-15. Depot Maintenance

Depot maintenance of the AN/MSC-32A includes major repair and overhaul of the equipment components and the shelter facility. Refer to the applicable technical manual for the individual equipment components for depot overhaul standards and procedures.

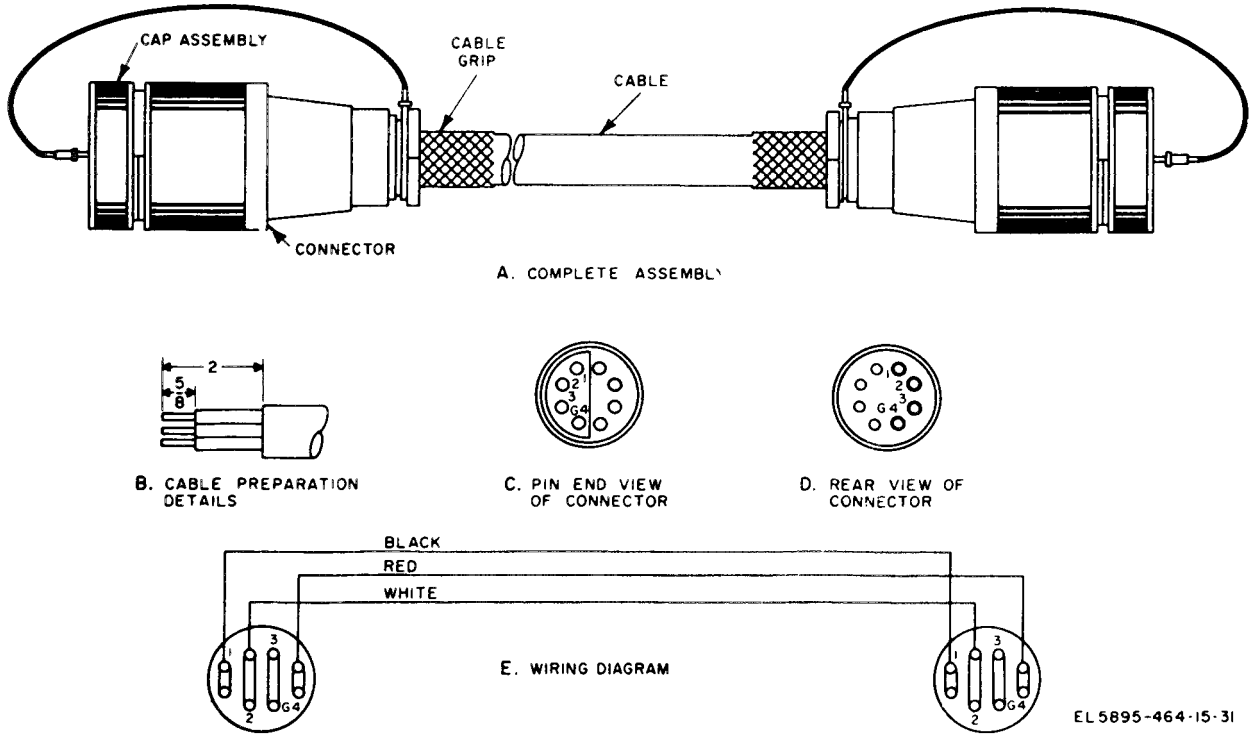


Figure 4–12. Power cable repair details.

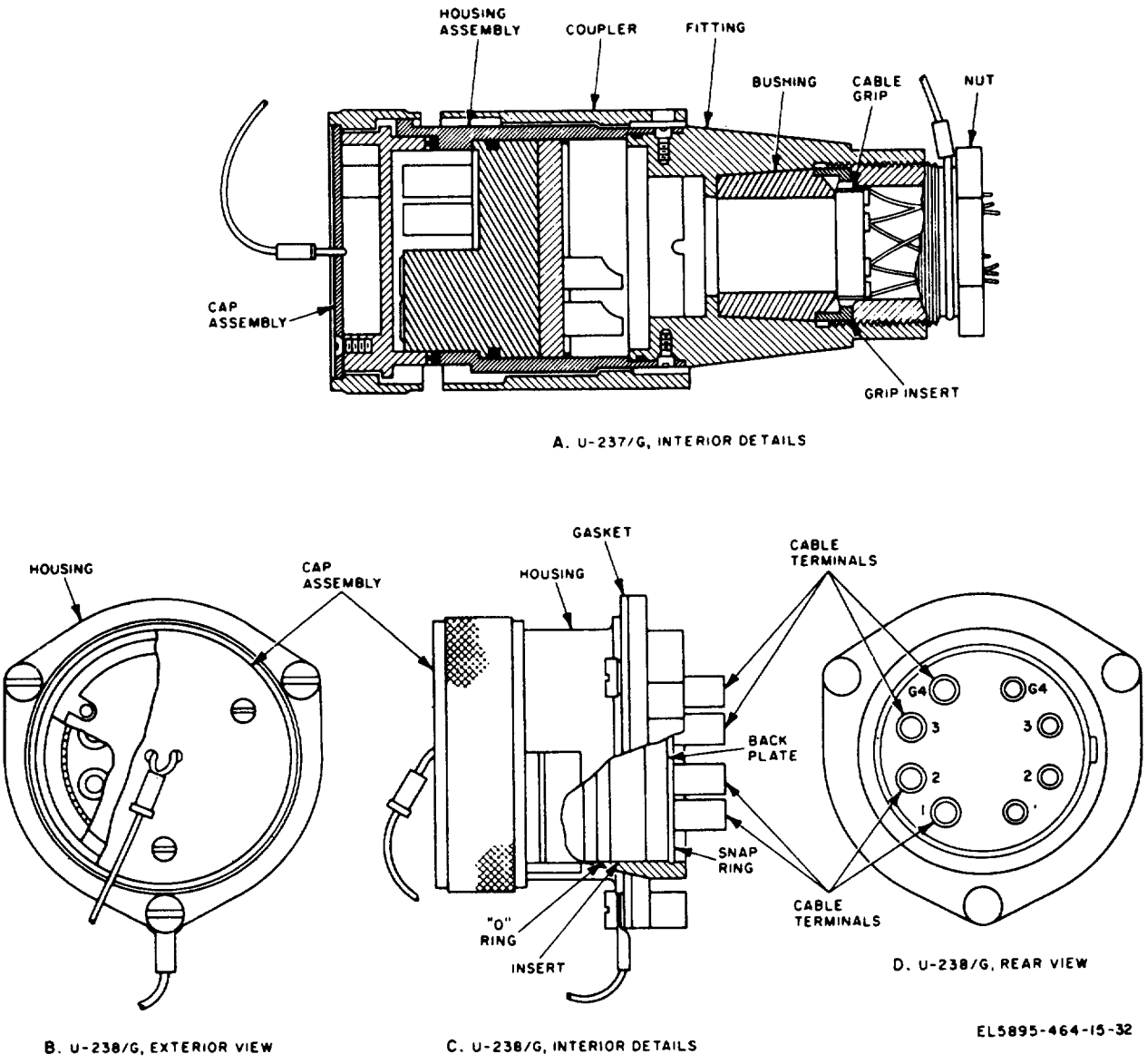


Figure 4-13. Power cable connector and power receptacle assembly details.

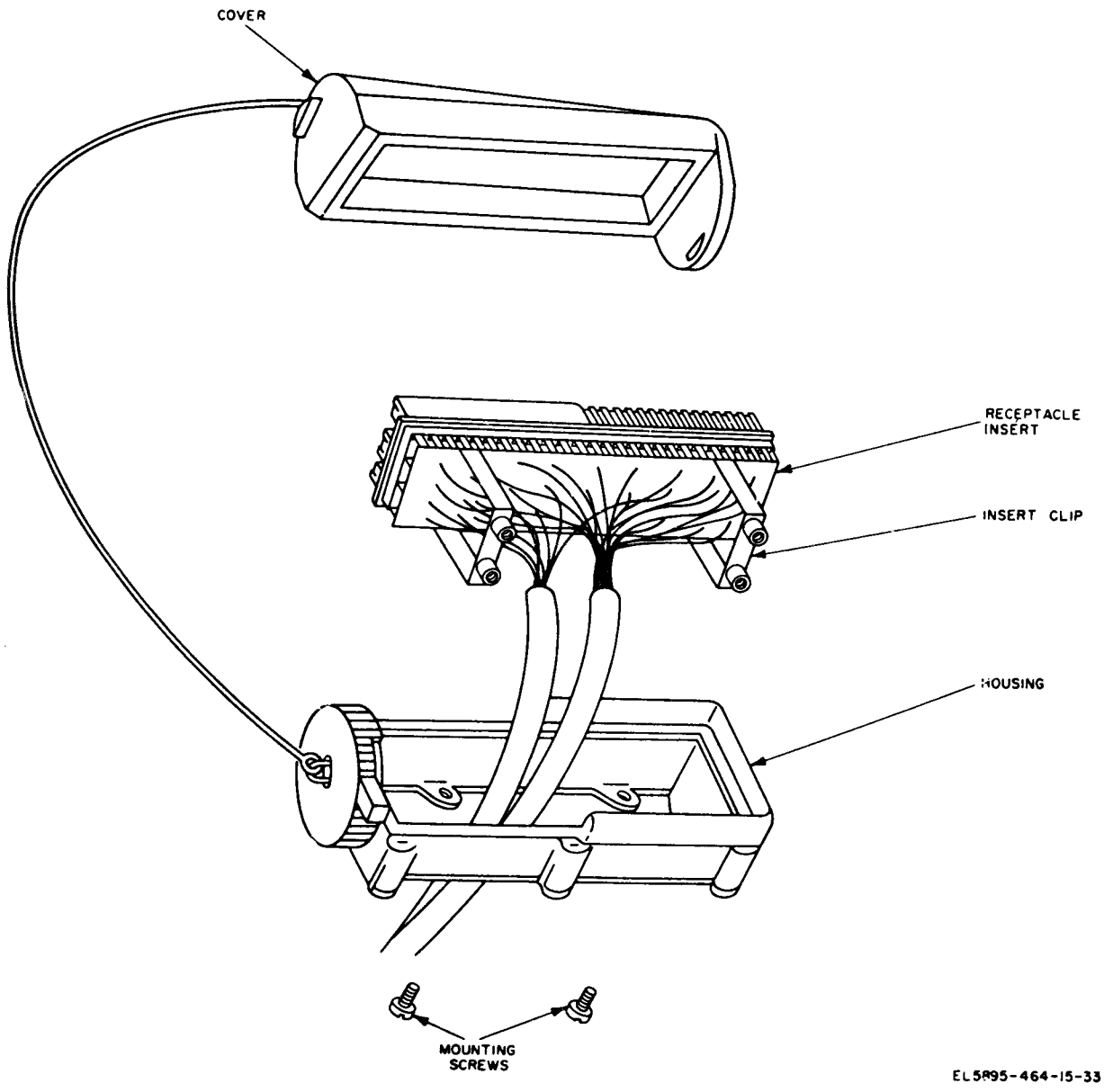


Figure 4-14. Signal entrance box 26-pair receptacle, exploded view.

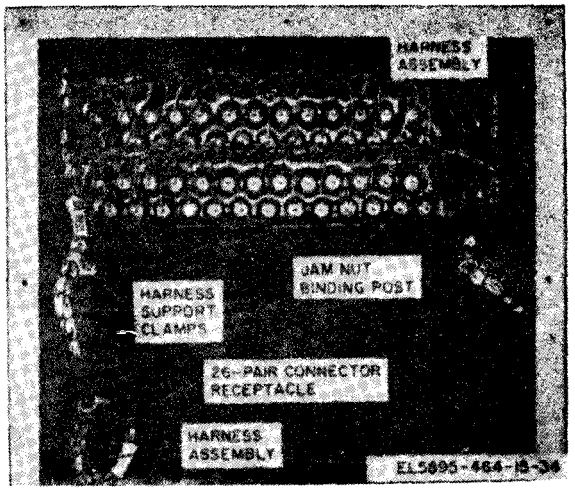


Figure 4-15. Signal entrance box, rear view.

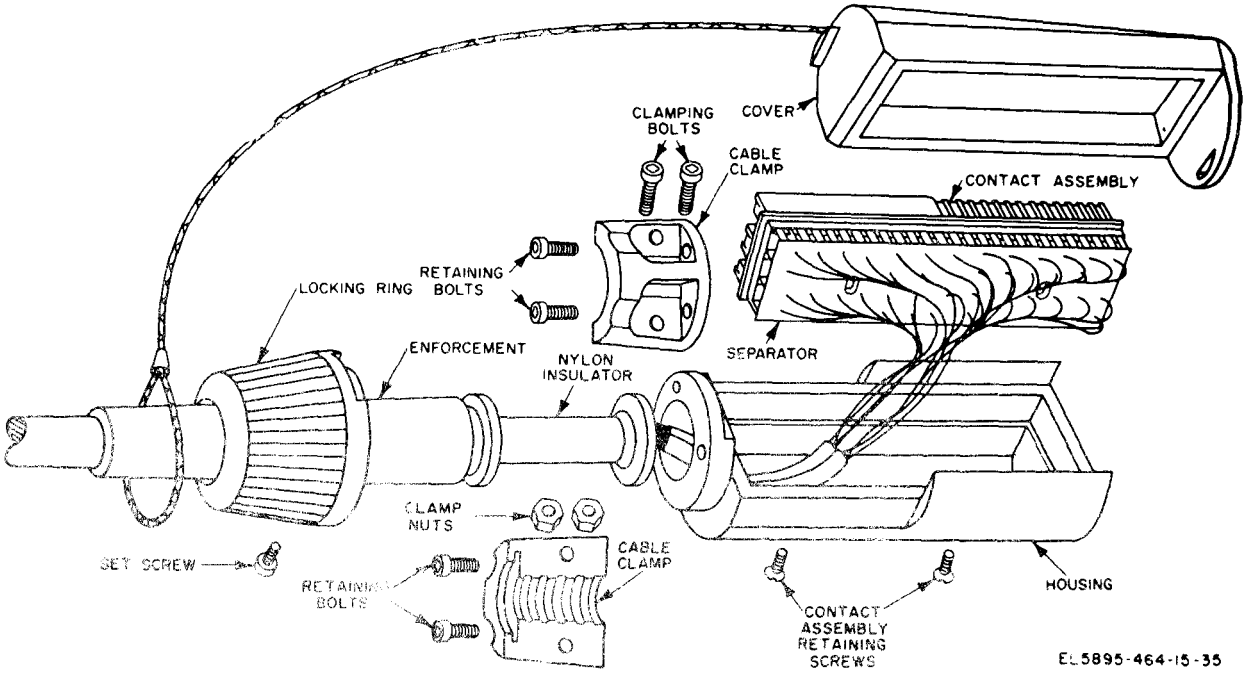


Figure 4-16. Twenty-six pair cable connector, exploded view.

CHAPTER 5
SHIPMENT AND LIMITED STORAGE

5-1. Preliminary Procedures

a. Turn off all operating equipment according to the stopping procedures in paragraph 3-5.

b. Turn all switches and circuit breakers to OFF.

c. Check to see that all equipments are secure in the proper storage racks (fig. 5-1).

d. For prolonged storage at long distance shipment, remove the batteries from the TA-312 PT and from the hand lantern.

e. Remove the mounting straps and fixtures from the storage cabinets for use in securing the equipment.

f. Secure all items on the common items panel with the clamps provided and mount the waste-paper baskets in the brackets.

g. Place all miscellaneous items in the storage cabinets.

5-2. Disassembly of Equipment

a. Disconnect all field wires from the signal entrance box building posts (fig. 1-5).

b. Disconnect the 26-pair cable at the signal entrance box and replace the covers on the receptacles and connectors (fig. 1-5).

c. When 115-volt ac power is obtained from an adjacent shelter, disconnect the AN/MSC-32A power cable from the OUT POWER 115V AC receptacle at the adjacent shelter. Replace the receptacle and connector cover.

d. When 115-volt ac power is obtained from a commercial source, proceed as follows:

(1) Turn off or disconnect the power.

(2) Disconnect the power cable connector from the power cable stub connector. Replace both connector covers.

(3) Disconnect the power cable stub from the commercial source and store it in a storage cabinet.

e. Disconnect the power cable from the IN POWER 115V AC receptacle in the power entrance box and replace the covers on the receptacle and connector.

f. Disconnect the ground strap from the GROUND TERMINAL in the power entrance box.

g. Disconnect the ground strap from the ground rod and store it in a storage cabinet.

h. Remove the ground rod; clean and stare it in the shelter (fig. 5-1).

i. Wind the power cable and the telephone cable on their respective reels and secure the reels to the shelter floor (fig. 5-1).

j. Disconnect the air conditioner power cable and store it in a storage cabinet (fig. 1-10).

k. Remove whip antennas and antenna wire and store in the storage bag inside the shelter (fig. 5-1).

l. Disconnect the radio cables and store in the storage bag.

5-3. Checking and Securing AN/MSC-32A

a. Close and secure the covers on the signal entrance box and the power entrance box.

b. Close and secure the blower vent cover on the front of the shelter and the filter cover on the entrance door.

c. Check the area to make sure that all components and parts have been recovered and stored (fig. 5-1).

d. Check the interior of the AN/MSC-32A to make sure that all components and parts have been properly secured and that all compartment doors are closed and secured (fig. 5-1).

e. If the AN/MSC-32A is truck-mounted, close and secure the tailgate and check to see that the sling assembly is secure.

5-4. Repackaging for Shipment or Limited Storage

Repackaging of the AN/MSC-32A for shipment or limited storage will normally be performed at a packaging facility or by a packaging team. If emergency packaging is required, select materials from those listed in SB 38-100. Package the AN/MSC-32A in accordance with the original packaging as far as possible with available materials (fig. 2-1).

NOTE

For repackaging the major components, refer to the instructions given in the applicable technical manuals.

CAUTION

When transporting the AN/MSC-32A by air, the outside vent covers of the shelter must be opened to equalize the atmospheric pressure in the shelter.

CHAPTER 6

INSTALLED EQUIPMENT TEST

Section I. TEST REQUIREMENTS

6-1. Operating Conditions

This paragraph lists connections for operating conditions of the AN/MSC-32A.

a. All shelter components and major components have been installed and connected as described in paragraphs 1-8 and 1-9, figures 1-7 through 1-14, 4-1, 4-2, and 5-1.

b. The AN/MSC-32A has been connected to available power source (para 2-3 and 2-4).

c. The AN/MSC-32A is not connected to any other communication equipments.

6-2. Preliminary Control Settings

The control settings required for the AN/MSC-2A are listed below.

a. Operate all shelter circuit breakers to OFF.

b. Operate all shelter ac power duct switches, shelter component switches to OFF.

c. Allow shelter door to remain open until test item No. 3 (para 6-3) has been completed.

WARNING

To prevent asphyxiation, the AN/MSC-32A must be ventilated at all times when occupied.

Section II. TEST ITEMS

6.3. Power Circuit Tests

Perform the following tests as shown for power circuits in AN/MSC-32A.

Item No.	Item	Action	Result
1	MAIN circuit breaker on shelter power distribution panel.	Set to ON	Voltmeter on power distribution panel indicates 0. The power indicator lamp (fig. 5-1) will light.
2	LIGHTS circuit breaker and LIGHT 1, LIGHT 2, and NIGHT LIGHT power duct switches.	Set to ON	Indicator bunp above LIGHTS circuit breaker is lighted. All other lights, except POWER INDICATOR NEON LAMP near door, are not lighted.
3	BLACKOUT BYPASS switch.	Operate to ON	Shelter fluorescent lights and incandescent night light are lighted.
4	BLOWERS circuit breaker.	Set to ON	Indicator lamp above BLOWERS circuit is lighted.
5	BLOWER 1 and BLOWER 2 power duct switches.	Open both Mower external vent covers and operate BLOWER 1 and BLOWER 2 switches to ON and then to OFF.	Blower No. 1 and blower No. 2 operate; blowers stop operating when switches are operated to OFF.
6	HEATER 1 and HEATER 2 circuit breakers.	Set to ON	Indicator lamp above HEATER 1 and HEATER 2 circuit breaker lights.

Item No.	Item	Action	Result
7	HEATER No. 1 HEAT-OFF-FAN switch and TEMPERATURE CONTROL.	Operate to HEAT and midposition, respectively.	Heater fan operates and heat is circulated; shelter power distribution panel ammeter indicates approximately 17 amperes.
8	Heater No. 1 HEAT-OFF-FAN switch	Operate to OFF	Heater fan stops; heater element cools.
9	Heater No. 2 HEAT-OFF-FAN switch and TEMPERATURE CONTROL.	Operate to HEAT and mid-position, respectively.	Heater fan operates and heat is circulated; shelter power distribution panel ammeter indicates approximately 17 amperes.
10	CONVENIENCE circuit breaker.	Set to ON	Indicator lamp above circuit breaker lights.
11	EQUIPMENT circuit breaker.	Set to ON	Indicator lamp above circuit breaker lights.

6-4. Switchboard Circuit Test

Follow the steps below for preparations and connections to be made for performance of switchboard circuit test.

a. Prepare two Telephone Sets TA-312/PT for LB operation and equip them with telephone connecting cords.

b. Connect a TA-312/PT at the PHONE 1 and PHONE 2 signal duct jacks. Designate the TA-312/PT's as telephone sets No. 1 and No. 2, respectively.

c. Connect one end of Telephone Cable Assembly CX-4566A/G to the SIGNAL I receptacle in the POWER AND SIGNAL ENTRANCE BOX. Connect the other end of the CX-4566A/G cable to the 26-pair receptacle on DISTRIBUTION BOX J-1077A/U.

d. At the J–1077A/U connect a pair of jumper wires between binding post pairs No. 1 and No. 22. Connect a second pair of jumper wires between binding post pairs No. 12 and No. 23.

e. Operate the VIS-OFF-AUD switchon the SB–22(*)/PT to AUD.

f. Continue testing as described in the chart below.

Item No.	Item	Action	Result
1	Telephone set No. l—	Operate hand ringing generator	Switchboard line signal for line 1 operates from black to white and night alarm buzzer sounds.
2	Operator's telephone cord (on switchboard).	Insert cord plug into switchboard line 1 jack.	Line 1 signal operates from white to black and night alarm buzzer is silenced. Communication is possible between telephone set So. 1 and switchboard.
3	Ringing switch on switchboard	Operate to RING BACK and operate switchboard hand ringing generator.	Ringer of telephone set No. 1 sounds.
4	Telephone set No. 2—	Operate hand ringing generator	Switchboard line signal for line 12 operates from black to white and night alarm buzzer sounds.
5	Operator's telephone cord.	Insert into switchboard line 12 jack.	Line 12 signal operates from white to black and night alarm buzzer is silenced. Communication is possible between telephone set No. 2 and switchboard.

Item No.	Item	Action	Result
6	Cord of switchboard line pack 12.	Insert into switchboard line j jack. Operate switchboard hand ringing generator.	Ringer of telephone set No. 1 sounds. Communication is possible between telephone sets No. 1 and No. 2.
7	Switchboard line 1 pack	Disconnect line pack 12 cord from line 1 jack and disconnect operator's cord from line 12 jack. Connect line pack 1 cord into line 12 jack.	Communication is possible between telephone sets No. 1 and No. 2.
8	Operator's telephone cord.	Insert into line 1 jack and operate switchboard hand ringing generator.	Ringer of telephone set No. 2 sounds.
9	Shelter patch panel	Connect a patch cord between the PHONE 3 jack and LINES SB-22/ PT 1 jack.	Communication is possible only between telephone set No. 1 and telephone set No. 3.
10	J-1077A/U and telephone set No 1.	Move jumper wires at binding post pair No. 1 to pair No. 2; operate hand ringing generator.	Switchboard line signal for line 2 operates from black to white and night alarm buzzer sounds.
11	Operator's telephone cord.	Insert into line 2 jack	Line 2 signal operates from white to black and night alarm buzzer is silenced.
12	Cord of line pack 2	Insert cord plug into line 12 jack after removing line pack 1 cord plug.	Communication is possible between telephone sets No. 1 and No. 2.
13	Ringing switch on switchboard	Operate to RING BACK and operate switchboard hand ringing generator.	Ringer of telephone set No. 1 sounds.
14	Switchboard hand ringing generator.	Operate hand ringing generator	Ringer of telephone set No. 2 sounds.
15	Shelter patch panel	Connect a patch cord between PHONE 3 jack and LINES SB-22/PT 2 jack.	Communication is possible only between telephone set No. 1 and telephone set No. 3.
16	J-1077A/U and telephone set No. 1.	Move jumper wires at binding post pair No. 2 to pair No. 3; operate hand ringing generator.	Switchboard line signal for line 3 operates from black to white and night alarm buzzer sounds.
17	Operator's telephone cord.	Insert into line 3 jack	Line 3 signal operates from white to black and night alarm buzzer is silenced.
18	Cord of line pack 3	Insert cord plug into line 12 jack after removing line pack 2 cord plug.	Communication is possible between telephone sets No. 1 and No. 2.
19	Ringing switch on switchboard	Operate to RING BACK and operate switchboard hand ringing generator.	Ringer of telephone set No. 1 sounds.
20	Switchboard hand ringing generator.	Operate hand ringing generator.	Ringer of telephone set No. 2 sounds.
21	Shelter patch panel	Connect a patch cord between PHONE 3 jack and LINES SB-22/PT 3 jack.	Communication is possible only between telephone set No. 1 and telephone set No. 3.
22	J-I077A/U and telephone set No. 1.	Move jumper wires at binding post pair No. 3 to pair No. 4; operate hand ringing generator.	Switchboard line signal for line 4 operates from black to white and night alarm buzzer sounds.
23	Operator's telephone cord.	Insert into line 4 jack	Line 4 signal operates from white to black and night alarm buzzer is silenced.
24	Cord of line pack 4	Insert cord plug into line 12 jack after removing line pack 3 cord plug.	Communication is possible between telephone sets No. 1 and No. 2.
25	Ringing switch on switchboard.	Operate to RING BACK and operate switchboard hand ringing generator.	Ringer of telephone set No. 1 sounds.
26	Switchboard hand ringing generator	Operate hand ringing generator	Ringer of telephone set No. 2 sounds.

Item No.	Item	Action	Result
27	Shelter patch panel	Connect a patch cord between PHONE 3 jack and LINES SB-22/PT 4 jack.	Communication is possible only between telephone set No. 1 and telephone set No. 3.
28	J-1077A/U and telephone set No. 1.	Move jumper wires at binding post pair No. 4 to pair No. 5; operate hand ringing generator.	Switchboard line signal for line 5 operates from black to white and night alarm buzzer sounds.
29	Operator's telephone cord.	Insert into line 5 jack	Line 5 signal operates from white to black and night alarm buzzer is silenced.
30	Cord of line pack 5	Insert cord plug into line 12 jack after removing line pack 4 cord plug.	Communication is possible between telephone sets No. 1 and No. 2
31	Ringing switch on switchboard.	Operate to RING BACK and operate switchboard hand ringing generator	Ringer of telephone set No. 1 sounds.
32	Switchboard hand ringing generator.	Operate hand ringing generator . .	Ringer of telephone set No. 2 sounds.
33	Shelter patch panel	Connect a patch cord between PHONE 3 jack and LINES SB-22/PT 5 jack.	Communication is possible only between telephone set No. 1 and telephone set No. 3.
34	J-1077A/U and telephone set No. 1.	Move jumper wires at binding post pair No. 5 to pair No. 6; operate hand ringing generator.	Switchboard line signal for line 6 operates from black to white and night alarm buzzer sounds.
35	Operator's telephone cord.	Insert into line 6 jack	Line 6 signal operates from white to black and night alarm buzzer is silenced.
36	Cord of line pack 6	Insert cord plug into line 12 jack after removing line pack 5 cord plug.	Communication is possible between telephone sets No. 1 and No. 2.
37	Ringing switch on switchboard.	Operate to RING BACK and operate switchboard hand ringing generator.	Ringer of telephone set No. 1 sounds.
38	Switchboard hand ringing-generator.	Operate hand ringing generator	Ringer of telephone set No. 2 sounds.
39	Shelter patch panel	Connect a patch cord between PHONE 3 jack and LINES SB-22/PT 6 jack.	Communication is possible only between telephone set No. 1 and telephone set No. 3.
40	J-1077A/U and telephone set No. 1.	Move jumper wires at binding post pair No. 6 to pair No. 7; operate hand ringing generator.	Switchboard line signal for line 7 operates from black to white and night alarm buzzer sounds.
41	Operator's telephone cord.	Insert into line 7 jack	Line 7 signal operates from white to black and night alarm buzzer is silenced.
42	Cord of line pack 7	Insert cord plug into line 12 jack after removing line pack 6 cord plug.	Communication is possible between telephone sets No. 1 and No. 2.
43	Ringing switch on switchboard.	Operate to RING BACK and operate switchboard hand ringing generator.	Ringer of telephone set No. 1 sounds.
44	Switchboard hand ringing generator.	Operate hand ringing generator	Ringer of telephone set No. 2 sounds.
45	Shelter patch panel	Connect a patch cord between PHONE 3 jack and LINES SB-22/PT 7 jack.	Communication is possible only between telephone set No. 1 and telephone set No. 3.
46	J-1077A/U and telephone set No. 1.	Move jumper wires at binding post pair No. 7 to pair No. 8; operate hand ringing generator.	Switchboard line signal for line 8 operates from black to white and night alarm buzzer sounds.
47	Operator's telephone cord.	Insert into line 8 jack	Line 8 signal operates from white to black and night alarm buzzer is silenced.
48	Cord of line pack 8	Insert cord plug into line 12 jack after removing line pack 7 cord plug.	Communication is possible between telephone sets No. 1 and No. 2.

Item No.	Item	Action	Result
49	Ringing switch on switchboard.	Operate to RING Back and operate switchboard hand ringing generator.	Ringer of telephone set No. 1 sounds.
50	Switchboard hand ringing generator.	Operate hand ringing generator	Ringer of telephone set No. 2 sounds.
51	Shelter patch panel	Connect a patch cord between PHONE 3 jack and LINES SB-22/PT 8 jack.	Communication is possible only between telephone set No. 1 and telephone set No. 3.
52	J–1077A/U and telephone set No. 1.	Move jumpe wires at binding post pair No. 8 to pair No. 9; operate hand ringing generator.	Switchboard line signal for line 9 operates from black to white and night alarm buzzer sounds.
53	Operator's telephone cord.	Insert into line 9 jack	Line 9 signal operates from white to black and night alarm buzzer is silenced.
54	Cord of line pack 9	Insert cord plug into line 12 jack after removing line pack 8 cord plug.	Communication is possible between telephone sets No. 1 and No. 2.
55	Ringing switch on switchboard.	operate to RING BACK and operate switchboard hand ringing generator.	Ringer of telephone eet No. 1 sounds.
56	Switchboard hand ringing generator.	Operate hand ringing generator	Ringer of telephone set No. 2 sounds.
57	Shelter patch panel	Connect a patch cor between PHONE 3 jack and LINES SB-22/PT 9 jack.	Communication is possible only between telephone set No. 1 and telephone set No. 3.
58	J–1077A/U and telephone set No. 1.	Move jumper wires at binding pair No. 9 to pair No. 10; 0perate hand ringing generator.	Switchboard line signal for line 10 operates from black to white and night alarm buzzer sounds.
59	Operator's telephone cord	Insert into line 10 jack	Line 10 signal operates from white to black and night alarm buzzer is silenced.
60	Cordof line pack 10	Insert cord plug into line 12 jack after removing line pack 9 cord plug.	Communication is possible between telephone acts No. 1 and No. 2.
61	Ringing switch on switchboard.	Operate to RING BACK and operate switchboard hand ringing generator.	Ringer of telephone set No. 1 sounds.
62	Switchboard hand ringing generator	Opemte hand ringing generator	Ringer of telephone set No. 2 sounds.
63	Shelter patch panel	Connect a patch cord between PHONE 3 jack and LINES SB-22/PT 10 jack.	Communications is possible only between telephone set No. 1 and telephone set No. 3.
64	J-1077A/U and telephone set No. 1.	Move jumper wires at binding post pair No. 10 to Pair No. 11; opemte hand ringing generator.	Switchboard line signal for line 11 operates from black to white and night alarm buzzer sounda.
65	Operator's telephone cord.	Insert into line 11 jack	Line 11 signal operates from white to black and night alarm buzzer is silenced.
66	Cord of line pack 11	Insert cord plug into line 12 jack after removing line pack 10 cord plug.	Communication is possible between telephone sets No. 1 and No. 2.
67	Ringing switch on switchboard.	Opemte to RING BACK and operate switchboard hand ringing generator.	Ringer of telephone set No. 1 sounds.
68	Switchboard hand ringing generator	Operate hand ringing generator	Ringer of telephone set No. 2 sounds.
69	Shelter patch panel	Connect a patch cord between PHONE 3 jack and LINES SB-22/PT 11 jack.	Communication is possible only between telephone set No. 1 and telephone set No. 3.

6-5. Teletypewriter TT–98C/FG Two-Wire, Half-Duplex Circuit Tests

Connections and procedures (fig. 1-7) for performing Teletypewriter TT–98C/FG two-wire, half-duplex circuit tests are described in this paragraph.

a. At the J–1077A/U, remove the jumper wire connections used during the tests in paragraph 6-4. Connect a pair of jumper wires between binding posts pairs No. 13 and No. 14.

b. At the shelter patch panel, connect patch cords between the TT–98C/FG #1 SEND and REC jacks and the TH–22/TG No. 1 SEND and REC jacks, respectively.

c. At the shelter patch panel, connect patch cords between the TT-98C/FG #2 SEND and REC jacks and the TH-22/TG No. 2 SEND and REC jacks, respectively.

d. At TH–22/TG No. 1 and No. 2, operate the 4W-2W-TEL switch to 2W and the NORM—REC-SEND switch to NORM.

e. Set TT-98C/FG No. 1 and No. 2 keyboard locks to the unlocked (send position.

f. Continue testing as described in the chart below.

Item No.	Item	Action	Result
1	MOTOR switch of TT-98C/FG No. 1 and No. 2	Operate to ON. Check and, if necessary, adjust motor speed.	TT-98C/FG No. 1 and No. 2 motors operate at correct speed.
2	Keyboard of TT-98C/FG No. 1.	Transmit test message from keyboard.	Test message correctly recorded by TT-98C/FG No. 1 and No. 2.
3	Keyboard of TT-98C/FG No. 2.	Transmit test message from keyboard.	Test message correctly recorded by TT-98C/FG No. 1 and No. 2.
4	Shelter patch panel LINES TH-22/TG No. 13 jack.	Insert one end of patch cord into jack. Transmit test message from keyboard of TT-98C/FG No. 1.	Test message correctly recoded by TT-98C/FG No. 1 and not recorded by TT-98C/FG No. 2.
5	Shelter patch panel TH-22/TG No. 1 jack.	Insert other end of patch cord (item 4 above) into jack. Transmit test message from keyboard of TT-98C/FG No. 1.	Test message correctly recorded by TT-98C/FG No. 1 and No. 2.
6	Shelter patch panel LINES TH-22/TG No. 14 jack.	Insert one end of patch cord into jack. Transmit test message from keyboard of TT-98C/FG No. 2.	Test message correctly recorded by TT-98C/FG No. 2 and not recorded by TT-98C/FG No. 1.
7	Shelter patch panel TH-22/TG jack.	Insert other end of patch cord (item 6 above) into jack. Transmit test message from keyboard of TT-98C/FG No. 2.	Test message correctly recorded by TT-98C/FG No. 2 and No. 1.

6-6. Reperforator-Transmitter TT–76C/GGC, Two-Wire, Half-Duplex Circuit Tests

Follow *a* through *e* below to perform two-wire, half-duplex circuit tests for the Reperforator-Transmitter TT-76C/GGC.

a. At the J-1077A/U, remove the jumper wire connections used during the tests in paragraph 6-5. Connect the jumper wires between binding post pairs No. 13 and No. 15.

b At the shelter patch panel, connect patch cords between TT-76C/GGC TD and TR jacks and the two TH–22/TG No. 3 SEND jacks, respectively. Connect a patch cord between TT–76/GGC REC jack and the TH–22/TG No. 3 REC jack.

c. Operate the TT–76C/GGC KEYBOARD SEND-LOCK switches to SEND. Operate the SELECTOR switch to position 1.

d. At the TH–22/TG No. 3, operate the 4W-2W-TEL switch to 2W and the NORM-REC-SEND switch to NORM.

e. Continue testing as described in the chart below:

Item No.	Item	Action	Result
1	POWER and MOTOR switches of TT-76C/GGC.	Operate to ON. Check and, if necessary, adjust motor speed.	TT-76(*)/GGC motor operates.
2	Keyboard of TT-98C/FG No. 1.[a]	Transmit test message from keyboard	Test message correctly recorded by TT-98C/FG[a] and reperforator of TT-76(*)GGC.
3	BREAK switch of TT-76(*)/GGC.	Press and release	TT-98C/FG[a] and reperforator of TT-76(*)/GGC run open and than run closed.
4	Keyboard of TT-76(*)/GGC.	Transmit test message from key. board.	Test message correctly recorded by TT-98C/FG[a] and reperforator of TT-76(*)/GGC.
5	Transmitter-distributor and range-finder dial of TT-76(*)/GGC.	Insert test message tape (alternate, repeated R and Y code signals) in transmitter. distributor and move STOP-START level to START. During transmission, use rangefinder dial to determine high and low range limits for TT-76(*)GGC. Set dial midway between high low limits. Move STOP-START lever to STOP, and then to FEED RETRACT.	Test message transmitted from transmitter-distributor and correctly recorded by TT-98C/FG[a] and reperforator of TT-76(*)/GGC. Transmission stops when STOP-START level is at STOP or FEED-RETRACT.
6	Tight-tape level of TT-76C/GGC.	Move STOP-START level to START. During transmission raise and lower tight-tape lever.	Transmission resumes when STOP-START lever is moved to START. Transmission stops when tighttape level is raised, and resumes when tighttape lever is lowered. Transmission stops automatically when end of tape is fed through transmitter distributor.
7	Shelter patch panel LINES TH-22/TG No. 15 jack.	Insert one end of patch cord into jack. Transmit test message from keyboard of TT-76C/GGC.	Test message correctly recorded by reperforator of TT-76C/GGC and not recorded by TT-98C/FG[a]
8	Shelter patch panel TH-22/TG No. 3 jack.	Insert other end of patch cord (item 7 above) into jack. Tranemit test message from keyboard of TT-76C/GGC.	Test message correctly recorded by reperforator of TT-76C/GGC and TT-98C/FG[a]

[a] AN/MSC-32A model only. For the AN/MSC-32B, the teletypewriter is replaced by AN/UGC-74A(V)3.

6-7. Spare Lines Circuit Test (AN/MSC-32A only)

This paragraph describes the patch cord connections to be made at shelter patch panel and jacks.

a Disconnect the jumper wires at the J-1077A/U. Connect jumper wires between binding post pairs No. 16 and No. 17, between No. 18 and 19, and between No. 20 and No. 21.

b. At the shelter patch panel and the TH-22/TG jacks, make the following patch cord connections:

From TH-22/TG #1, Send to TT-98C/FG #1, Send

From TH-22/TG #1, Rec. to TT-98C/FG #1, Rec.

From TH-22/TG #2, Send to TT-98C/FG #2, Send

From TH-22/TG #2, Rec. to TT-98C/FG #2, Rec. for AN/MSC-32A

FROM	*TO*	*THEN*	*TO*	THEN	*TO*
TH-22/TG(1)	Spare 16	Spare	18	Spare	20
TH-22/TG(2)	Spare 17	Spare	19	Spare	21

c. While the patch cords are alternately plugged into each pair of SPARE jacks, transmit a test message from TT-98C/FG #1 and receive the test message on TT-98C/FG #2.

6-7.1. Spare Line Circuit Test (AN/MSC-32B only)

This paragraph describes the patch cord connections to be made at shelter patch panel and jacks.

a. Disconnect the jumper wires at the J-1077A/U. Connet jumper wires between binding post pairs No. 16 and No. 17, between No. 18 and 19, and between No. 20 and No. 21.

b, At the shelter patch panel and the TH-22/TG jacks, make the following patch cord connections:

From TH-22/TG #1, Send to TT-98C/FG #1, Send

From TH-22/TG #1, Rec. TT98C/FG #1, Rec.

From TH-22/TG #2, Send to AN/UGC-74 Send

From TH-22/TG #2, Rec. to AN/UGC-74 Rec. for AN/MSC-32A

FROM	*TO*	*THEN*	*T0*	*THEN*	*TO*
TH-22/TG(1)	Spare 16	Spare	18	Spare	20
TH-22/TG(2)	Spare 17	Spare	19	Spare	21

c. While the patch cords are alternately plugged into each pair of SPARE jacks, transmit a test message from TT-98C/FG #1 and receive the test message on AN/UGC-74.

NOTE

Refer to TM 11-5815-602-12 for instructions on setting the AN/UGC-74A(V)3 internal switches. The TH-22/TG loop provides the operating dc loop currents and TT-98C/FG operates in 7 unit Baudot code with baud rate of 45.5. Adjust loop current as necessary.

6-8. Intercommunication Station LS-147(*)/F1 Circuit Test

Follow *a, b* and *c* for circuit tests of the intercommunication station.

a. At the J-1077A/U, connect a pair of field wires between binding post pair No. 26 and the appropriate binding posts or connecting terminals associated with the second LS-147(*)/F1.

b. Perform the LS-147(*)/F1 circuit test (c below) at the INTERCOM jack location at the front of the shelter. lf improper results are obtained, move the LS-147(*)/F1 to an INTERCOM jack location on the roadside wall of the shelter, and repeat the test.

c. Continue testing as described in the following chart.

Item No.	Item	Action	Result
1	OFF-SEND switch	Turn the switch clockwise to midposition 5.	Neon glowlamp on front panel is lighted.
2	PRESS TO TALK switch	Press and hold switch down; speak into LS-147(*)/(F1 while varying position setting (1 through 10) of OFF-SEND switch.	Speech is audible at distant LS-147(*)/F1. Volume of speech at distant LS-147(*)/F1 varies from loud to soft.
3	Receive control	Vary position setting (1 through 10) of RECEIVE control while receiving signal from distant station.	Volume of received signal varies from loud to soft.
		NOTE For stopping procedures see paragrph 3-5.	

APPENDIX A
REFERENCES

DA Pam 310-1	Consolidated Index of Army Publications and Blank Forms
DA Pam 738-750	The Army Maintenance Management System (TAMMS).
SB 11-6	Primary Battery Supply Data.
SB 11-30	Primary Battery Management Data.
SB 38-100	Preservation, Packaging, Packing and Marking Materials, Supplies and Equipment Used by the Army.
TB SIG 291	Safety Measures to be Observed when Installing and Using Whip Antennas, Field Type Masts, Towers, Antennas, and Metal Poles that are used with Communications, Radar and Direction Finder Equipment.
TB 43-0118	Field Instructions for Painting and preserving Electronics Command Equipment Including Camouflage Pattern Painting of Electrical Equipment Shelters.
TB 43-0124	Maintenance and Repair Procedure for Shelters, Electrical Equipment S-141/G and S-141B/G (NSN 5410-00-752-9698), S-144/G, S-144A/G, S-144B/G, S-144C/G and S-144D/G (NSN 5410-00-542-2532), S-250/G (NSN 5410-00-999-4935), S-250/G (Shielded) (NSN 5410-00-489-6076), S-280/G (NSN 5410-00-999-5269), S-280A/G (NSN 5410-00-999-6022), S-280B/G (NSN 5410-00-117-2868), S-280B/G (Shielded) (NSN 5410-00-001-4093), S-280C/G and S-318/G (NSN 5410-00-763-2339) and S-318A/G (NSN 5410-00-116-7086).
TB 43-0125	Installation of Communications-Electronic Equipment Hookup of Electrical Cables to Mobile Generator Sets or Fielded Equipment to Meet Electrical Safety Standards.
TM 5-4120-282-13	Operator's, Organizational and Direct Support Maintenance Manual (Including Repair Parts and Special Tools List): Air Conditioner, Floor Mounted, Air Cooled, Electric Motor Driven, 3/4 HP, 60 Hz, Ac, Single Phase: 9,000 BTU/HR (Harvey W. Hattel Inc., Model MAC-750M) (NSN 4120-00-592-4645); (KECO Model FŽ9000-2) (NSN 4120-00-679-2669); (Columbia Specialty Model CAS9000) (NSN 4120-00-926-4113) and (Redmanson Model A-9000) (NSN 4120-00-992-7055).
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 (NSN 6115-00-697-2402), PU-304C/MPQ-4 (NSN 6115-00-056-8421), PU-332/G (NSN 6115-00-577-8471), PU-332A/G (NSN 6115-00-738-8336), PU-375A/G PU-375/G (NSN 6115-00-753-2231), PU-375B/G (NSN 6115-00-931-6789), PU-401/M (NSN 6115-00-823-2217), PU-402/M (NSN 6115-00-722-3760), PU-406/M (NSN 6115-00-738-6342), PU-409/M (NSN 6115-00-702-3343), PU-409A/M (NSN 6115-00-733-6338), PU-495/G (NSN 6115-00-823-2218), PU-551/G (NSN 6115-00-889-1307), PU-564A/G (NSN 6115-00-728-6341), PU-564B/G (NSN 6115-00-179-2789), PU-617/M (NSN 6115-00-738-6335), PU-618/M (NSN 6115-00-738-6337), PU-619/M (NSN 6115-00-738-6339), PU-620/M (NSN 6115-00-738-6340), PU-625/G (NSN 6115-00-837-3915), PU-628/G (NSN 6115-00-087-0873), PU-629/G (NSN 6115-00-937-5555), PU-631/G (NSN 6115-00-059-5172), PU-656/G (NSN 6115-00-939-3296), PU-650B/G (NSN 6115-00-258-1622).

TM 11-5410-213-14P	Operator's Organizational, Direct Support, and General Support Maintenance Repair Parts and Special Tools List (Including Depot Maintenance Repair Parts and Special Tools) for Shelters, Electrical Equipment S-280A/G (NSN 5410-00-999-6022) and S-280B/G (NSN 5410-00-117-2868).
TM 11-5805-201-12	Operator's and Organizational Maintenance Manual: Telephone Set, TA-312/PT (NSN 5805-00-543-0012).
TM 11-5805-201-20P	Organizational Maintenance Repair Parts and Special Tools Lists for Telphone Set TA-312/PT (NSN 5805-00-543-0012).
TM 11-5805-201-35	Direct Support, General Support, and Depot Maintenance Manual (Including Repair Parts and Special Tools List): Telephone Set TA-312/PT (NSN 5805-00-543-0012).
TM 11-5805-262-12	Operator's and Organizational Maintenance Manual: Switchboards, Telephone, Manual, SB-22/PT (NSN 5805-00-257-3602) and SB22A/PT (NSN 5805-00-715-6171).
TM 11-5805-262-20P	Organizational Maintenance Repair Parts and Special Tools List for Switchboard, Telephone Manual, SB-22/PT (NSN 5805-00-257-3602) and SB-22A/PT (NSN 5805-00-715-6171).
TM 11-5805-262-35	Direct Support, General Support and Depot Maintenance Manual: Switchboards, Telephone, Manual SB-22/PT and SB-22A/PT.
TM 11-5805-262-34P	Direct Support and General Support Maintenance Repair Part and Special Tools Lists (Including Depot Maintenance Repair Parts and Special Tools) for Switchboards, Telephone, Manual SB-22/PT (NSN 5805-00-257-3602) and SB-22A/PT (5805-00-715-6171).
TM 11-5805-356-12	Operator and Organizational Maintenance Manual (Including Repair Parts and Special Tools List): Terminal, Telegraph-Telephone AN/TCC-29 (NSN 5805-00-902-3087) (Including Terminal, Telegraph TH-22/TG (5805-00-907-8300) and Converter, Telegraph-Telephone Signal CV-425U (5805-00-985-9088)).
TM 11-5805-356-34-1	Direct Support and General Support Maintenance Manual (Including Repail Parts and Special Tools Lists): Terminal, Telegraph TH-22/TG and Filter Assembly, Electrical F-316/U.
TM 11-5805-356-34-2	Direct Support and General Support Maintenance Manual (Including Repair Parts and Special Tools List): Converter, Telegraph-Telephone Signal CV-455/U.
TM 11-5815-200-12	Operator's and Organizational Maintenance Manual: Teletypewriter Sets AN/FGC-20 (NSN 5815-00-503-2652), AN/FGC-20X (5/815-00-392--7743), AN/FGC-21 (5815-00-503-2653), AN/FGC-66 (5815-00-817-9277), AN/FGC-159 and AN/FGC-l59X (5815-00-561-7964), AN/FGC-160 (5815-00-025-9036), AN/FGC - 177 (5815-01-017-3780), AN/FGC-4 (5815-00-557-5970), AN/UGC - 29 (5815-00-082-4199), AN/UGC-29X (5815-00-082-4200) and Teleprinter, TT-259/FG (5815-00-688-8761).
TM 11-5815-200-35	Direct Support, General Support, and Depot Maintenance Manual: Tetetypewriter Sets An/FGC-20 (NSN 5815-00-503-2652), AN/FGC-20X (5815-00-392-7743), AN/GFC-21 (5815-00-503-2653), AN/FGC-66 (5815-00-817-9277), AN/FGC-159 (5815-00-041-3382), AN/FGC-159X (5815-00-561-7964, AN/FGC-160 (5815-00-025-9036), AN/FGC-177 (5815-00-017-3780), AN/UGC-4 (5815-00-557-5970), AN/UGC-29 (5815-00-08204199) and AN/UGC-29X (5815-00-082-4200) and Teleprinter TT-259/FG (5815-00-688-8761) (TO 31W4-2FGC20-22).

TM 11-5815-206-12	Operator's and Organizational Maintenance Manual for Teletypewriter Sets, AN/PGC-1 and AN/PGC-3 and Teletypewriters TT-4A/TG, TT-4B/TG, TT-4CYTG, TT-335/TG, TT-537/TG, TT-698/TG,TT-698A/TG, TT-698B/TG, TT-698C/TG, TT-722/TG and TT-722A/TG.
TM 11-5815-206-20P	Organizational Maintenance Repair Parts and Special Tools List for Teletypewriter Sets, AN/PGC-1 (NSN 5815-00-198-5963), AN/PGC-3 (5815-01-012-8773) and Teletypewriters, TT-4A/TG, TT-4B/TG and TT-4C/TG (5815-00-198-4438), TT-335/TG (5815-00-878-8449), TT-537/TG (5815-00-926-7378), TT-698/TG, TT-698A/TG, TT-698B/TG (5815-01-008-9628) and TT-722/TG, TT-722A/TG (5815-01-017-9172).
TM 11-5815-206-35P/1	Direct Support, General Support, and Depot Maintenance Repair Parts and Special Tools Lists: Teletypewriter Set AN/PGC-1 Including Teletypewriters TT-4A/TG, TT-4B/TG, TT-4C/TG and TT-335/TG.
TM 11-5815-238-12	Operator's and Organizational Maintenance Manual: Teletypewriter Sets, AN/GGC-3 (NSN 5815-00-503-3309), AN/GGC-3A (5815-00-581-9751), AN/GGC-53 (5815-01-012-8772) and AN/GGC-53A (5815-01-017-0956) and Teletypewriter Reperforator-Transmitters, TT-76/GGC (5815-00-503-2760), TT-76A/GGC, TT-76B/GGC, TT-76C/GGC (5815-00-553-6061), TT-699/GGC (5815-01-012-8446), TT-699A/GGC, TT-699B/GGC and TT-699C/GGC (5815-01-017-9166).
TM 11-5815-238-34P	Direct Support and General Support Maintenance Repair Parts and Special Tools Lists (Including Depot Maintenance Repair Parts and Special Tools); Teletypewriter Sets AN/GGC-3 (NSN 5815-00-503-3309), AN/GGC-3A (NSN 5815-00-581-9751), AN/GGC-53 (5815-00-012-8772), and AN/GGC-53A (5815-01-017-0956) and Teletypewriter Reperforator-Transmitters TT-76/GGC (5815-00-503-2760), TT-76A/GGC (5815-00-553-6061), TT-76B/GGC (5815-00-553-6061), TT-76C/GGC (5815-00-503-2760), TT-699/GGC (5815-01-012-8446), TT-699A/GGC (5815-01-017-9166), TT-699B/GGC (5815-01-017-9166) and TT-699C/GGC (5815-01-017-9166).
TM 11-5815-238-35	Direct Support, General Support, and Depot Maintenance Manual: Teletypewriter Sets AN/GGC-3 (NSN 5815-00-503-3309), AN/GGC-3A (5815-00-581-9751), AN/GGC-53 (5815-01-012-8772) and AN/GGC-53A (5815-01-017-0956) and Teletypewriter Reperforator-Transmitters, TT-76/GGC (5815-00-503-2760), TT-76A/GGC, TT-76B/GGC, and TT-76C/GGC (5815-00-553-6061), TT-669/GGC (5815-01-012-8446), TT-699A/GGC, TT-699B/GGC, and TT-699C/GGC (5815-01-017-9166).
TM 11-5815-602-12	Operator's and Organizational Maintenance Manual for Terminal, Communications AN/UGC-74A(W3 (NSN 5815-01-062-8194).
TM 11-5815-602-34	Direct Support and General Support Maintenance Manual: Terminal, Communications AN/UGC-74A/(V)3 (NSN 5815-01-062-8194).
TM 11-5820-401-10-1	Operator's Manual: Radio Sets AN/VRC-12 (NSN 5820-00-223-7412), AN/VRC-43 (5820-00-223-7415), AN/VRC-44 (5820-00-223-7417), AN/VRC-45 (5820-00-223-7418), AN/VRC-46 (5820-00-223-7433), AN/VRC-47 (5820-00-223-7434), AN/VRC-48 (5820-00-223-7435) and AN/VRC–49 (5820–00–223–7437) (Used Without an Intercom System).

TM 11-5820-401-12	Operator's and Organizational Maintenance Manual Including Repair Parts and Special Tools Lists: Radio Sets AN/VRC-12 (5820-00-223-7412), AN/VRC-43 (5820-00-223-7415), AN/VRC-44 (5820-00-223-7417), AN/VRC-45 (5820-00-223-7418), AN/VRC-46 (5820-00-223-7433), AN/VRC-47 (5820-00-223-7434) AN/VRC-48 (5820-00-223-7435) AN/VRC-49 (5820-00-223-7437) AN/VRC-54 (5820-00-223-7567) AN/VRC-55 (5820-00-402-2265): Mounting MT-1029/VRC (5820-00-893-1323) and Mounting MT-1898/VRC (5820-00-893-1324); Antenna AT-912/VRC (5820-00-897-6357); Control Frequency Selector C-2742/VRC (5820-00-892-3343) and Control, Radio Set C-2299/VRC (5820-00-892-3340).
TM 11-5820-401-34-3	Direct Support and General Support Maintenance Manual: Radio Sets. AN/VRC-12 (NSN 5820-00-223-7412), AN/VRC-43 (5820-00-223-7415), AN/VRC-44 (5820-00-223-7417), AN/VRC-45 (5820-00-223-7418), AN/VRC46 (5820-00-223-7433), AN/VRC-47 (5820-00-223-7434), AN/VRC-48 (5820-00-223-7435) and AN/VRC-49 (5820-00-223-7437); Receivers, Radio, R-442/VRC and R-442A/VRC (5820-00-892-0624).
TM 11-5830-221-12	Operator's and Organizational Maintenance Manual: Intercommumcation Station 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 Tool Lists for Telecommunications Station LS-147C/FI (NSN 5830-00-752-5357).
TM 11-5895-463-15	Operator's Organizational, Direct Support, General Support and Depot Maintenance Manual for Operations Central, Communications. AN/MSC-31A (NSN 5895-00-999-2629).
TM 11-5895-1012-10	Operator's Manual, Technical Control Facility General.
TM 11-5965-206-14P	Operator's Organizational, Direct Support and General Support Maintenance Repair Parts and Special Tools Lists (Including Depot Maintenance Repair Parts and Special Tools): Headset-Microphone H-91A/U (FSN 5965-669-6871); Handset-Headset H-144/U. H-144A/U, H-144B/U and H-144C/U (FSN 5965-682-2769) and Headset-Microphone H-210/G (FSN 5965-89-1068).
TM 11-5965-224-14P	Operator's Organizational, Direct Support and General Support Maintenance Repair Parts and Special Tools List (Including Depot Maintenance Repair Parts and Special Tools): Handsets, H-60/PT (FSN 5965-669-9145) and H-165/U (5965-543-1837).
TM 11-5965-225-14P	Operator's Organizational, Direct Support and General Support Maintenance Repair Parts and Special Tools Lists (Including Depot Maintenance Repair Part; and Special Tools); Loudspeaker, Permanent Magnet LS-454/U (FSN 5965-792-3538).
TM 11-6110-201-12P	Operators and Organizational Maintenance Repair Parts and Special Tools Lists for Distribution Boxes J–1077IU and J–1077A/U (NSN 6110-00-985-7574).
TM 11-6130-233-12	Operator's and Organizational Maintenance Manual: Power Supplies, PP-2953/U, PP-2953A/U, PP-2953B/U and PP-2953CU (NSN 6130-00-985-7899).
TM 750-244-2	Procedures for Destruction of Electronics Materiel to Prevent Enemy Use (Electronics Command).

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

Section I. INTRODUCTION

B-1. Scope

This appendix lists basic issue items and items troop installed or authorized required by the crew/oprator for installation, operation, and maintenance of Operations Central Communications AN/MSC-32A.

B-2. General

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

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

b. Items Troop Installed or Authorized List – Section III. A list, in alphabetical sequence of items which, at the discretion of the unit commander, may accompany the end item, but are not subject to be turned in with the end item.

B-3. 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. Federal Stock Number. Indicates the Federal stock number assigned to the item and will be used for requisitioning purposes.

c. Part Number. Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or Government actitity), 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.

d. Federal Supply Code for Manufacturer (FSCM). The FSCM is a 5-digit numeric code used to identify the manufacturer, distributor, or Govenment agency, etc., and is identified in SB 708-42.

e. Description. Indicates the Federal item name and a minimum description required to identify the item.

f. 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.

g. Quantity Furnished with Equipment (Basic Issue Items Only). Indicates the quantity of the basic issue item furnished with the equipment.

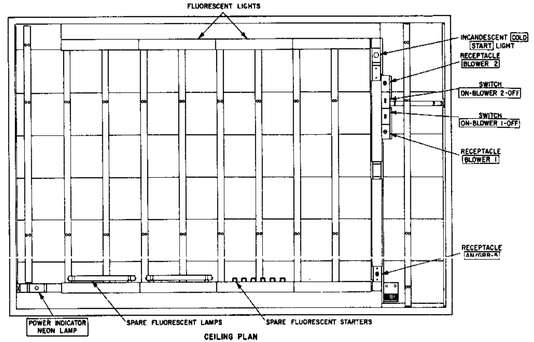
h. Quantity Authorized (Items Troop Installed or Authorized Only). Indicates the quantity of the item authorized to be used with the equipment.

Section III. ITEMS TROOP INSTALLED OR AUTHORIZED LIST

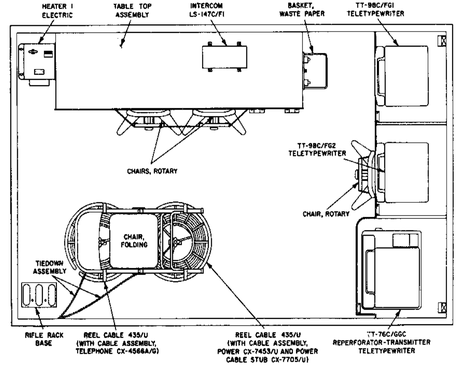
(1) Federal stock number	(2) Part number	(3) FSCM	(4) Description — Usable on code	(5) U of meas	(6) Qty a
5120-293-2696	7113	95344	EXTRACTOR, ELECTRON TUBE	EA	1
5120-293-2692	9113	95344	E ELECTRON TUBE	EA	1
5120-293-3603	8655	72653	PIN STRAIGHTENER, ELECTRON TUBE	EA	1
5120-752-9675	....	08600	SCREWDRIVER: 2143-6	EA	1

Section II. BASIC ISSUE ITEMS LIST

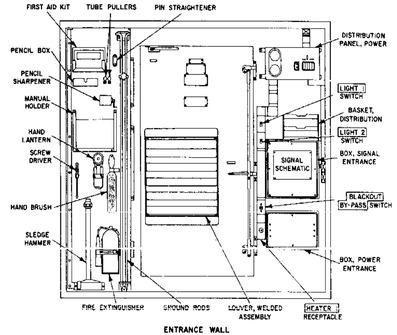
(1) Illustration (A) Fig no	(1) Illustration (B) Item no	(2) Federa stock number	(3) Pa number	(4) FSC	(5) Descri Usable on code	(6) Unit of meas	(7) Qty furn with equip
1-9		5110-293-2339		81349	AXE: GGG-A-926, TYPE I, CLASS I	EA	1
		5985-089-7089		80063	BAG ASSEMBLY, ANTENNA: SC-D-543385 P/O RADIO INSTALLATION KIT)	EA	1
5-1		4210-383-7129		80063	EXTINGUISHER, FIRE: 5 LB; SC-D-539482	EA	1
5-1		6545-922-1200		80063	FIRST AID KIT: SC-D-539483	EA	1
5-1		5120-251-4489		79796	HAMMER, HAND: 15	EA	1
5-1		5975-224 5260			ROD GROUND MX148/G	EA	2



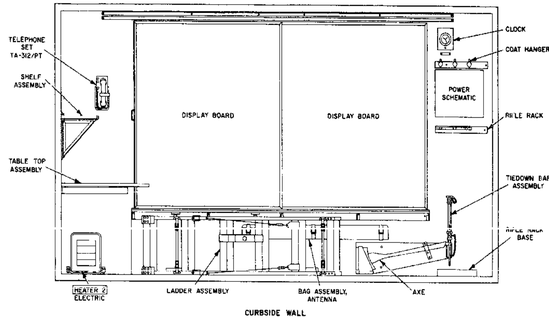
CEILING PLAN



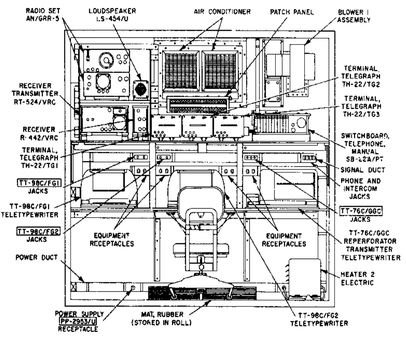
FLOOR PLAN



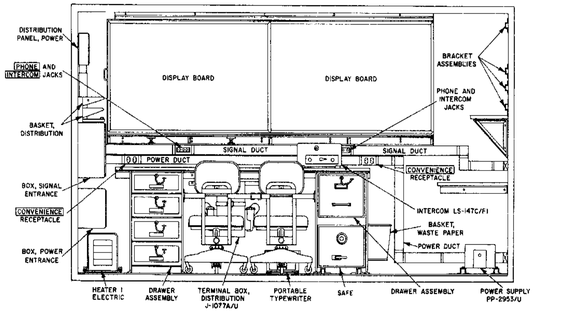
ENTRANCE WALL



CURBSIDE WALL



FRONT WALL



ROADSIDE WALL

EL5895-464-15-36

Figure 5-1. Operations Central, Communications AN/MSC-82A floor plan and elevation diagram.

APPENDIX C

MAINTENANCE ALLOCATION

Section I. INTRODUCTION

C-1. General

This appendix provides a summary of the maintenance operations for AN/MSC-32A and AN/MSC-32B. It authorizes categories of maintinance 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 operations.

C-2. Maintenance Function

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/of eletrical 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 equipments used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

g. 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, strtightening, 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 perfored by the Army. Overhaul does not nomally 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 classifying Army equipments/components.

C-3. Column Entries

a. Column 1, Group Number. Column 1 lists group numbers, the purpose of which is to

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 purpose of having the group numbers in the MAC and RPSTL coincide.

d. Column 4, Maintenance Category. Column 4 specifies, by the listing of a "worktime" figure in the appropriate subcolumn(s), the lowest level of maintenance authorized to perform the function listed in column 3. This figure repesents the active time required to perform that maintenance function at the indicated category of maintenance. If the number or complexity of the tasks within the listed maintenance function vary at different maintenance categories, approximate "worktime" figures will be shown for each category. The number of task-hours specified by the "worktime" figure represents the average time repuired 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 as follows:

C-Operator/Crew
O-Organizational
F-Direct Support
H-General Support
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 alphabetic code which leads to the remark in section IV. Remarks, which is pertinent to the item opposite the particular code.

C-4. Tool and Test Equipment Requirements (Sec III).

a. Tool or Test Equipment Reference Code. The number in this column coincide with the numbers used in the tools and equipment column of the MAC. The numbers indicate the applicable too1 or test equipment for the maintenance functions.

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

e. 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 specific tool or test equipment.

e. Tool Number. This column lists the manufacturer's part number of the tool followed by the Federal Supply Code for manufacturers (5-digit) in parentheses.

C-5. Remarks (Sec IV).

a. 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.

(Next printed page is C-3.)

SECTION II MAINTENANCE ALLOCATION CHART
FOR

OPERATIONS CENTRAL, COMMUNICATION AN/MSC-32A AND AN/MSC-32B

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY C	O	F	H	D	(5) TOOLS AND EQPT.	(6) REMARKS
00	OPERATIONS CENTRAL, COMMUNICATION AN/MSC-32A AND AN/MSC-32B	Inspect	0.1						
		Test		0.5				,8	A
		Test			1.0				B
		Test				2.0		,6	
		Service		0.5					
		Repair		1.0				,2,8	C
		Repair			2.0			thru 5, 8	D
		Repair				4.0		thru 7, 8	E
		Overhaul					30.0	thru 9	
01	SHELTER, ELECTRICAL EQUIPMENT S-372/MSC-32A	Inspect	0.1						
		Test		0.5					F
		Test			1.0				G
		Test				2.0			
		Repair		1.0				,2	H
		Repair			2.0			thru 5	I
		Repair				4.0		thru 7	
0101	CABLE ASSEMBLY CX-4566/G	Replace		0.5					
		Repair			1.0			,4	
0102	CABLE ASSEMBLY CX-4760/U	Replace		0.5					
		Repair			1.0			,4	
0103	AIR CONDITIONER A/N F9000-2	Replace		1.0				,2	J
0104	EXHAUST BLOWER	Replace		0.5				,2	
		Repair			1.0			,4	
0105	HEATER, ELECTRICAL 1500 WATTS	Replace		0.5				,2	
		Repair			1.0			,4	
0106	DISTRIBUTION BOX J-1077A/U	Replace		0.5				,2	K
0107	SHELTER, ELECTRICAL EQUIPMENT S-280/G								L
02	INTERCOMMUNICATION STATION LS-147C/FI	Replace		0.5				,2	M
03	RADIO SET R-392/URR	Replace		0.5				,2	N
04	SWITCHBOARD, TELEPHONE MANUAL SB-22A/PT	Replace		0.5				,2	O
05	TELEPHONE SET TA-312/PT	Replace		0.5				,2	P
06	TELETYPEWRITER SET AN/GGC-3A; TELETYPEWRITER REPERFORATOR-TRANSMITTER TT-76, A, B/GGC	Replace		0.5				,2	Q
07	TELETYPEWRITER TT-98/FG	Replace		0.5				,2	R
08	TELETYPEWRITER TT-4A/TG	Replace		0.5				,2	S
09	FORWARD AREA TELETYPE (FATT) AN/UGC-74A	Replace		0.5				,2	T
10	HANDSET, HEADSET H-144/U								U
11	TSEC/KW-7 COMMUNICATIONS SECURITY EQUIPMENT	Replace							V

SECTION III TOOL AND TEST EQUIPMENT REQUIREMENTS FOR

OPERATIONS CENTRAL, COMMUNICATIONS AN/MSC-32A AND AN/MSC-32B

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE CATEGORY	NOMENCLATURE	NATIONAL/NATO STOCK NUMBER	TOOL NUMBER
1	O, F, H, D	MULTIMETER AN/USM-223	625-00-999-7465	
2	O, F, H, D	TOOL KIT, ELECTRONIC EQUIPMENT TK-101/G	180-00-064-5178	
3	F, H, D	MULTIMETER TS-352(*)/U	625-00-553-0142	
4	F, H, D	TOOL KIT, ELECTRONIC EQUIPMENT TK-100/G	180-00-605-0079	
5	F, H, D	TOOL KIT, AUTOMOTIVE MECHANICS	180-00-672-2611	
6	H, D	OHMMETER ZM-21(*)	625-00-643-1030	
7	H, D	TOOL KIT, SHELTER REPAIR TK-144/G	180-00-973-4369	
8	O, F, H, D	TOOLS AND TEST EQUIPMENT ASSOCIATED WITH COMPONENTS OF THIS END ITEM		
9	D	TOOLS AND TEST EQUIPMENT REQUIRED FOR DEPOT TO TEST, OVERHAUL, OR REBUILD THIS EQUIPMENT		

SECTION IV. REMARKS

REFERENCE CODE	REMARKS
A	EQUIPMENT OPERATION TEST.
B	CONTINUITY AND POWER CHECKS .
C	REPAIR AS INDICATED IN COMPONENT BREAKDOWN.
D	REPAIR AS INDICATED IN GROUP 0101.
E	LIMITED TO S-184 /MSC-32 REPAIR AS INDICATED BELOW.
F	CHECK OPERATION OF ELECTRIC HEATER, CIRCUIT BREAKERS, AND CURRENT TRANSFORMERS .
G	TEST INTERNAL WIRING AND STRUCTURE OF SHELTER.
H	REPLACEMENT OF ELECTRIC HEATER, CIRCUIT BREAKERS, AND CURRENT TRANSFORMERS.
I	REPAIR OF POWER CABLES, CONNECTOR, AND RF CABLES. EMERGENCY REPAIRS OF HOLES AND MINOR STRUCTURAL DAMAGE (TB 750-240) . ALL OTHER REPAIRS WILL BE PERFORMED BY GENERAL SUPPORT.
J	SEE TM 5-4120-282-13 FOR MAINTENANCE ALLOCATION.
K	SEE TM 11-611 0-2 01-15P FOR MAINTENANCE ALLOCATION.
L	SEE TM 11-541 0-213-15P FOR MAINTENANCE ALLOCATION.
M	SEE TM 11-5830-221-12 FOR MAINTENANCE ALLOCATION.
N	SEE TM 11-5820-334-20 FOR MAINTENANCE ALLOCATION.
O	SEE TM 11-5805-262-12 FOR MAINTENANCE ALLOCATION.
P	SEE TM 11-5805-201-12 FOR MAINTENANCE ALLOCATION.
Q	SEE TM 11-5815-238-12 FOR MAINTENANCE ALLOCATION.
R	ONLY IN AN/MSC-32A (FOR MAINTENANCE ALLOCATION, REFER TO TM 11-5815-200-12) .
S	ONLY IN AN/MSC-32A (FOR MAINTENANCE ALLOCATION, REFER TO TM 11-5815-206-12).
T	ONLY IN AN/MSC-32B (FOR MAINTENANCE ALLOCATION, REFER TO TM 11-5815-602-12) .
U	SEE TM 11-5965-206-14P FOR MAINTENANCE ALLOCATION.
V	FOR MAINTENANCE ALLOCATION, REFER TO TM 11-5805-232-12P AND KAM-258A(*) /TSEC (FOUO).

By Order of the Secretary of the Army:

HAROLD K. JOHNSON
General, United States Army,
Chief of Staff.

Official:

KENNETH G. WICKHAM,
Major General, United States Army,
The Adjutant General.

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- USAIS (2)
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- USATC Armor (2)
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- USASTC (2)
- Gen. Dep (2)
- Sig. Sec, Gen Dep (5)
- Sig Dep (12)
- USASESS (60)
- Army Dep (2) except
  - LBAD (14)
  - SAAD (30)
  - TOAD (14)
  - LEAD (7)
  - SHAD (3)
  - NAAD (5)
  - SVAD (5)
  - CHAD (3)
  - ATAD (10)
- AMS (1)
- WRAMC (1)
- Army Pic Cen (2)
- MAAG (2)
- USARMIS (2)
- USAERDAA (2)
- USAERDAW (13)
- USACRREL (2)
- Sig FLDMS (2)
- Units org under fol TOE: -2 ea.
  - 11-15
  - 11-16
  - 11-17
  - 11-45
  - 11-57
  - 11-85
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  - 11-158
  - 11-225
  - 11-226
  - 11-247
  - 11-327
  - 11-357
  - 11-500 (AA-AC)
  - 11-587
  - 11–592
  - 11-597
  - 31-105

NG: None.

USAR: None.

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

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