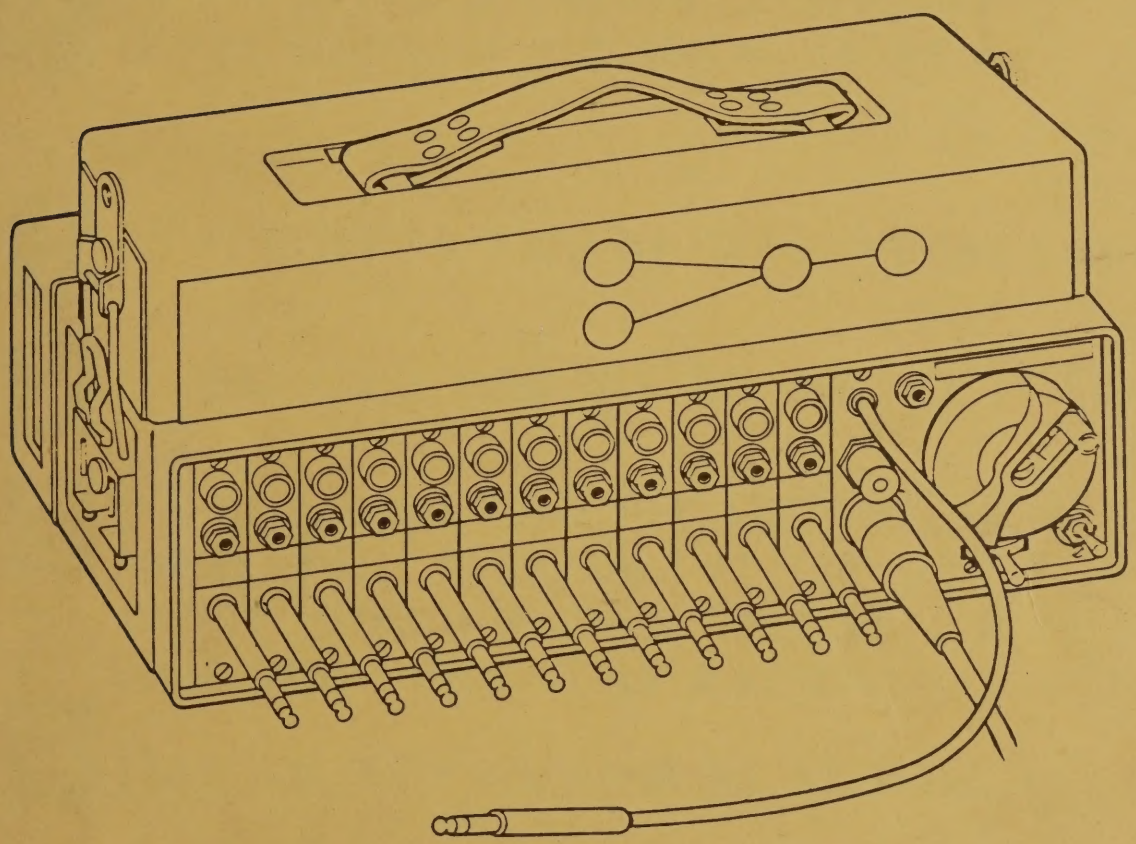
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TM 11-5805-262-12

TECHNICAL MANUAL

OPERATOR'S AND ORGANIZATIONAL MAINTENANCE MANUAL



SWITCHBOARDS, TELEPHONE, MANUAL SB-22/PT (NSN 5805-00-257-3602) AND SB-22A/PT (NSN 5805-00-715-6171)

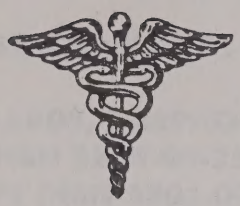
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(INCLUDING TONE SIGNALING ADAPTER TA-977/PT (NSN 5805-01-040-9653))

LIN: T 25726

HEADQUARTERS, DEPARTMENT OF THE ARMY
20 AUGUST 1984

Obsolete
Jun 90



5 SAFETY STEPS TO FOLLOW IF SOMEONE IS THE VICTIM OF ELECTRICAL SHOCK

1 DO NOT TRY TO PULL OR GRAB THE INDIVIDUAL

2 IF POSSIBLE , TURN OFF THE ELECTRICAL POWER

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

4 SEND FOR HELP AS SOON AS POSSIBLE

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

WARNING

Adequate ventilation should be provided while using TRICHLOROTRIFLUOROETHANE. 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.

Technical Manual

No. 11-5805-262-12

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, 20 August 1984

OPERATOR'S AND ORGANIZATIONAL MAINTENANCE MANUAL

SWITCHBOARDS, TELEPHONE, MANUAL SB-22/PT (NSN 5805-00-257-3602) AND SB-22A/PT (NSN 5805-00-715-6171) (INCLUDING TONE SIGNALING ADAPTER TA-977/PT (NSN 5805-01-040-9653))

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to: Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: DRSEL-ME-MP, Fort Monmouth, New Jersey 07703. In either case, a reply will be furnished direct to you.

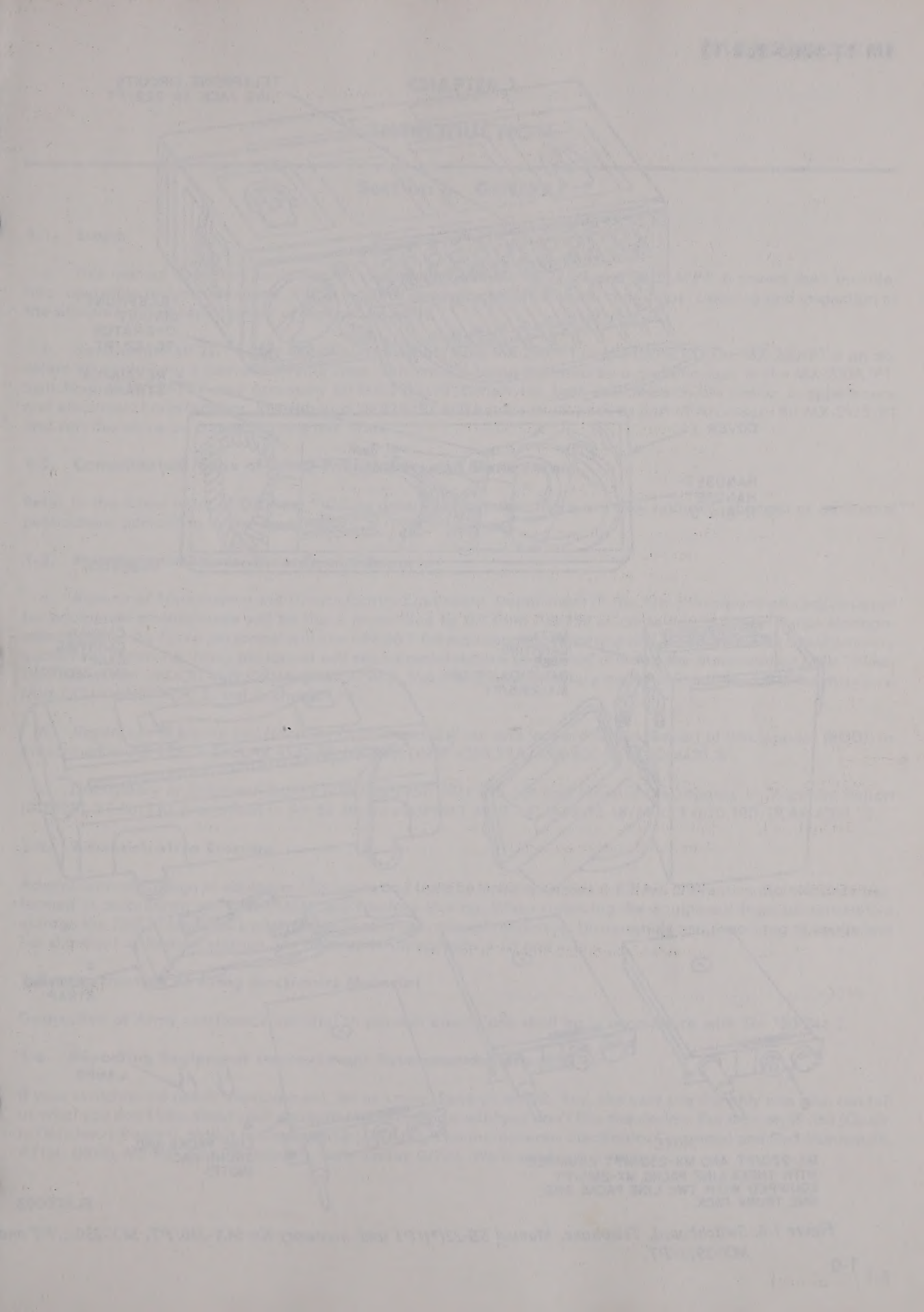
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*This manual supersedes TM 11-5805-262-12, 15 December 1960 including all changes.

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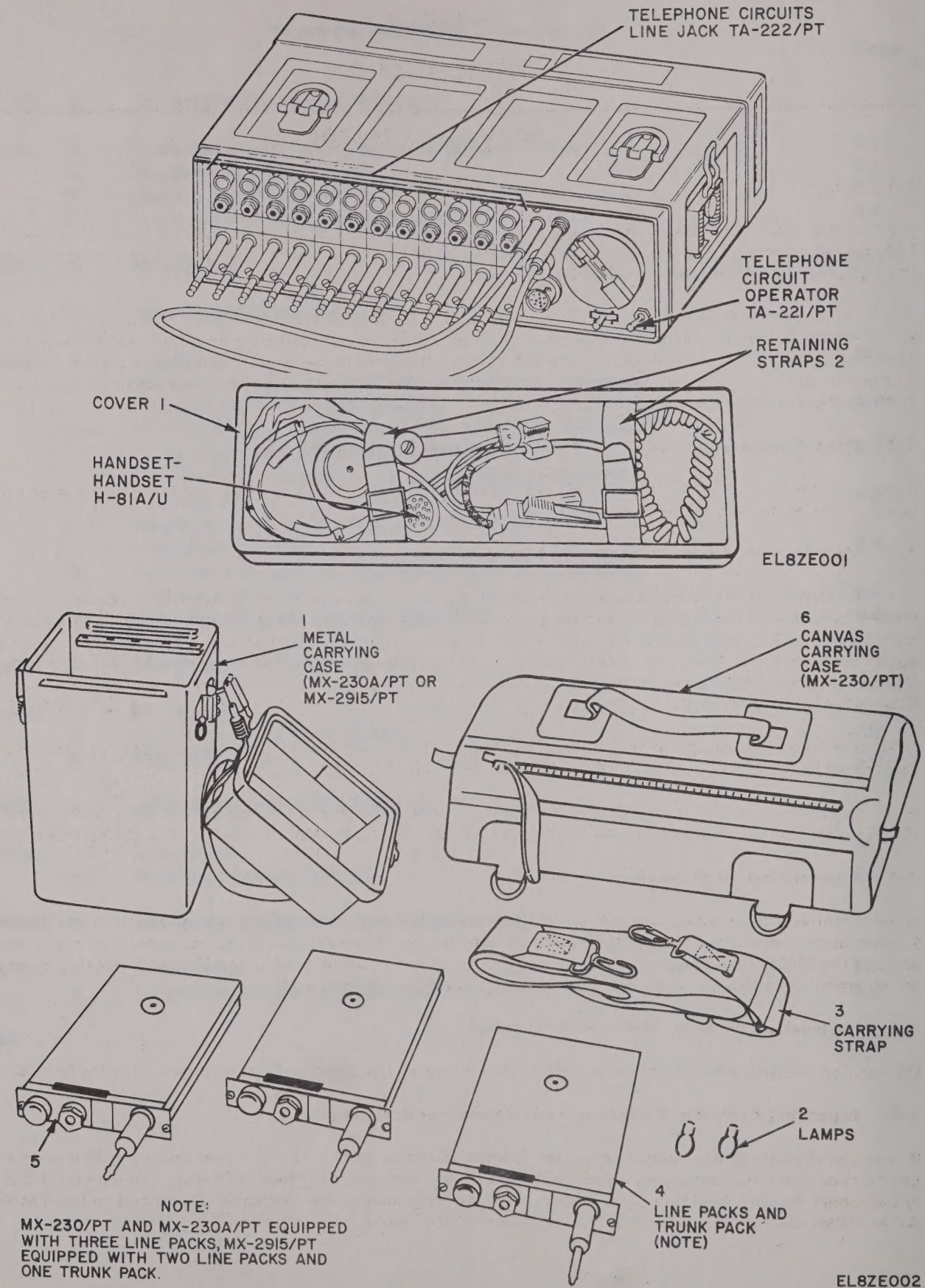


Figure 1-0. Switchboard, Telephone, Manual SB-22(*)/PT and Accessory Kit MX-230/PT, MX-230A/PT and MX-2915/PT.

CHAPTER 1

INTRODUCTION

Section I. GENERAL

1-1. Scope

a. This manual describes Switchboards, Telephone, Manual SB-22/PT and SB-22A/PT. It covers their installation, operation and maintenance. It also includes operation under unusual conditions, cleaning and inspection of the equipment and replacement of authorized parts.

b. Switchboard SB-22/PT uses one of two accessory kits, MX-230/PT or MX-230A/PT. The MX-230/PT is an obsolete kit containing a canvas carrying case. This case is being replaced by a metallic case in the MX-230A/PT. Switchboard SB-22A/PT uses Accessory Kit MX-2915/PT. Otherwise, both switchboards are similar in appearance and electrical characteristics. Switchboard SB-22A/PT will have a trunk pack as part of Accessory Kit MX-2915/PT and can therefore be connected to trunk lines.

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. Air Force personnel will use AFR 66-1 for maintenance reporting and TO-00-35D54 for unsatisfactory equipment reporting. Navy personnel will report maintenance performed utilizing the Maintenance Data Collection Subsystem (MDCS) IAW OPNAVINST 4790.2, Vol 3 and unsatisfactory material/conditions (UR submissions) IAW OPNAVINST 4790.2, Vol 2, chapter 17.

b. Report of Packaging and Handling Deficiencies. Fill out and forward SF 364 (Report of Discrepancy (ROD)) as prescribed in AR 735-11-2/DLAR 4140.55/NAVMATINST 4355.73A/AFR 400-54/MCO 4430.3F.

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 75-18/MCO P4610.19D/DLAR 4500.15.

1-4. 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 administrative storage the PMCS should be performed to assure operational readiness. Disassembly and repacking of equipment for shipment or limited storage are covered in paragraphs 4-10 and 4-11.

1-5. Destruction of Army Electronics Materiel

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

1-6. Reporting Equipment Improvement Recommendations (EIR)

If your switchboard 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. Put it on an SF 368 (Quality Deficiency Report). Mail it to Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: DRSEL-ME-MP, Fort Monmouth, New Jersey 07703. We'll send you a reply.

1-7. Official Nomenclature, Names, and Designation

NOMENCLATURE CROSS-REFERENCE LIST

This listing includes nomenclature cross-references used in this manual.

COMMON NAME	OFFICIAL NOMENCLATURE
Switchboard	Switchboard, Telephone, Manual SB-22(*)/PT
Line pack	Telephone Circuit, Line Jack TA-222/PT
Operator's pack	Telephone Circuit, Operator's TA-221/PT
Operator's telephone set	Headset-Microphone H-182/U
Trunk pack	Telephone Circuit, Trunk Jack TA-326/PT
Accessory Kit	Accessory Kit MX-230/PT, MX-230A/PT, MX-2915/PT
Tone signaling adapter	Tone Signaling Adapter TA-977/PT

Section II. EQUIPMENT DESCRIPTION AND DATA

1-8. Equipment Characteristics, Capabilities and Features

a. Purpose of Switchboard. Provides facilities for interconnection up to 12 voice frequency (VF) circuits. Normally used to interconnect local battery telephone circuits, remote controlled radio circuits and voice frequency teletypewriter circuits. A typical use of the switchboard in a local battery telephone and remote controlled radio system is shown in figure 1-1. A typical use of the switchboard in a VF teletypewriter system is shown in figure 1-2.

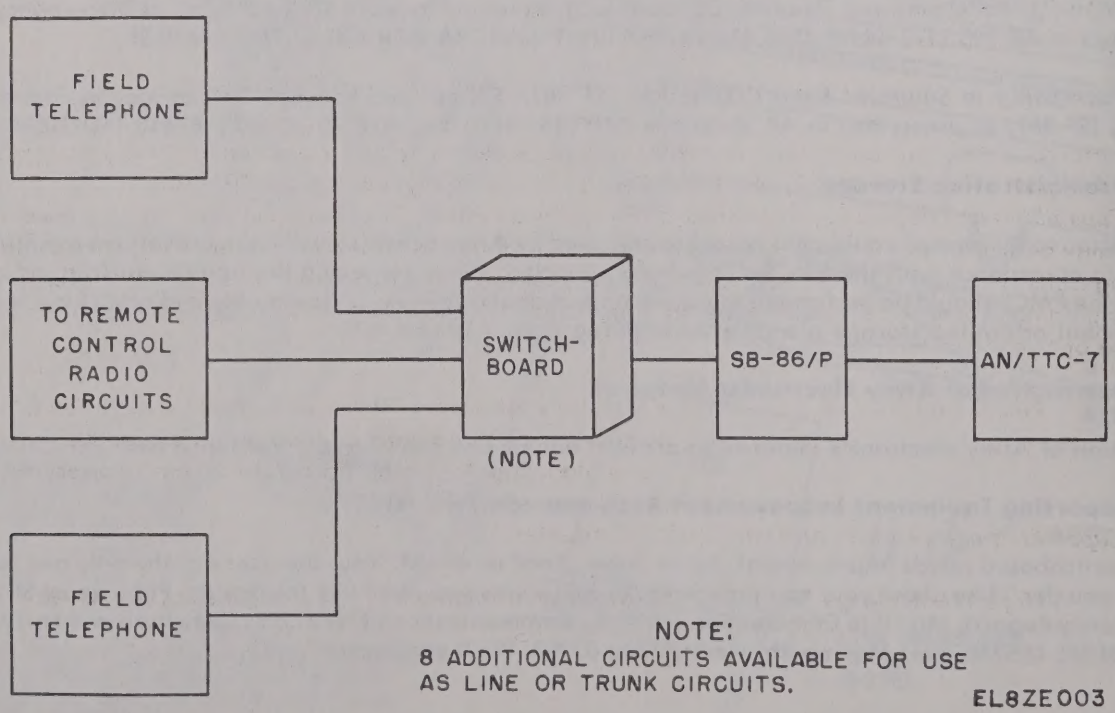
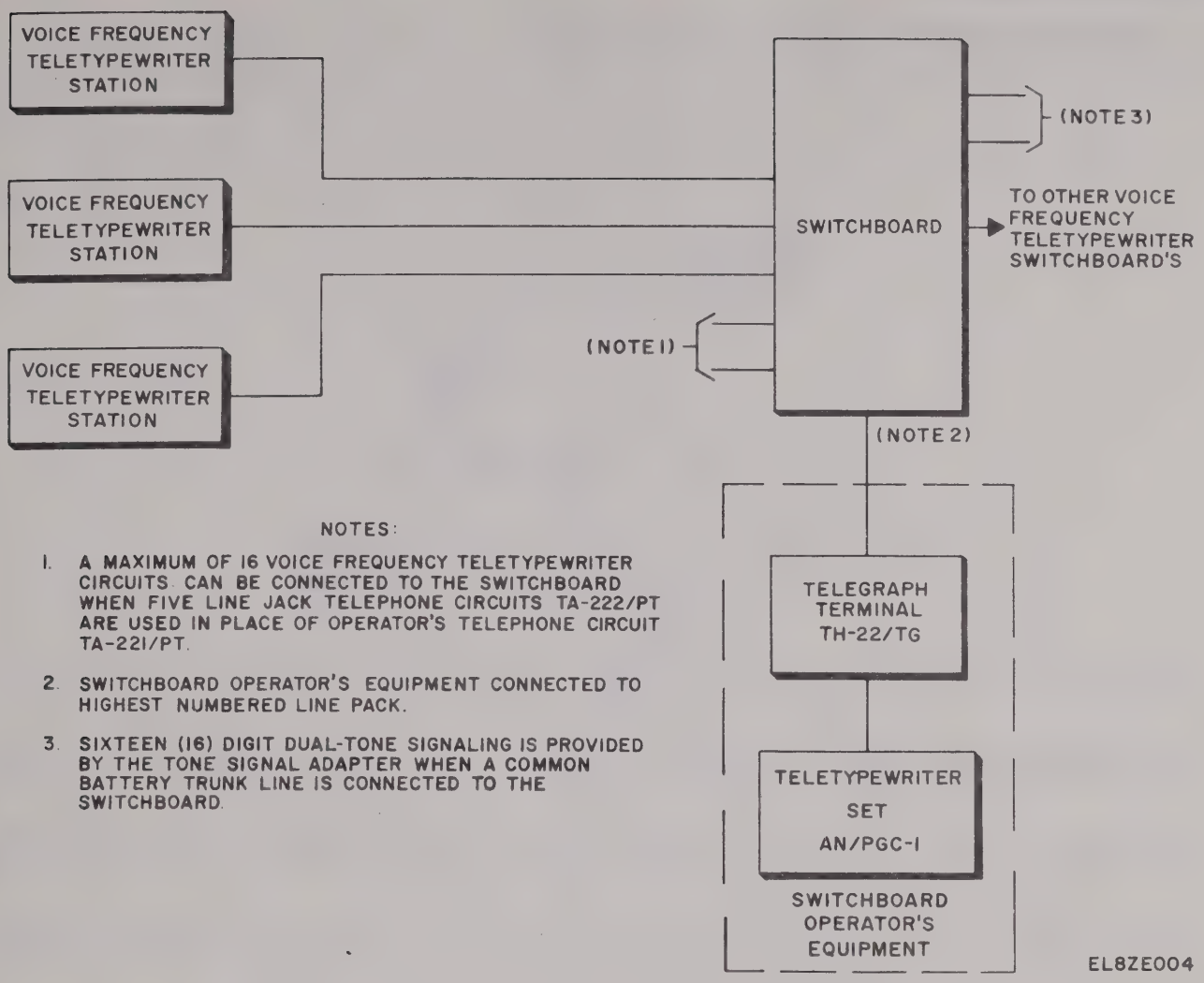


Figure 1-1. Local Battery Telephone Circuits and Remote Controlled Radio Circuits Using the Switchboard.



NOTES:

1. A MAXIMUM OF 16 VOICE FREQUENCY TELETYPEWRITER CIRCUITS CAN BE CONNECTED TO THE SWITCHBOARD WHEN FIVE LINE JACK TELEPHONE CIRCUITS TA-222/PT ARE USED IN PLACE OF OPERATOR'S TELEPHONE CIRCUIT TA-221/PT.
2. SWITCHBOARD OPERATOR'S EQUIPMENT CONNECTED TO HIGHEST NUMBERED LINE PACK.
3. SIXTEEN (16) DIGIT DUAL-TONE SIGNALING IS PROVIDED BY THE TONE SIGNAL ADAPTER WHEN A COMMON BATTERY TRUNK LINE IS CONNECTED TO THE SWITCHBOARD.

Figure 1-2. VF Teletypewriter Circuits Using the Switchboard.

b. Purpose of Tone Signaling Adapter. Provides dual tone signaling over a common battery trunk line. Normally used to signal Switchboard SB-3614/TT and Central Office Teletypewriter AN/TCC-38.

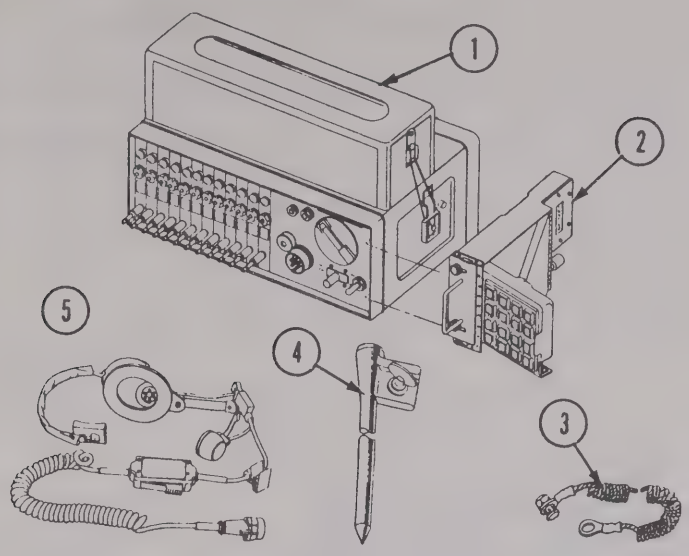
c. Capabilities and Features of Switchboard. Eleven local battery lines and one trunk line (29 lines, of which up to four may be trunk lines when two switchboards are installed in stacked configuration). One common battery signaling trunk (two trunks if the additional trunk pack stored in the accessory kit is substituted for the operator's pack). Lightning protection is provided by lightning arrestor, each line, or trunk and by use of ground strap kit with one or two switchboards.

Power Requirements	Operator's telephone: Three volts dc (two Batteries BA-30). Night Alarm: Three volts dc (two Batteries BA-30). Tone Signaling Adapter: Three volts dc (one Battery BA-90).

d. Capabilities and Features of Tone Signaling Adapter.

16 pushbutton keys.	Power requirements.	One Battery BA-90.

1-9. Location and Description of Switchboard Components



EL8ZE005

Cover (1) — Provides carying case for operator's telephone set; fastens to the top of the switchboard in operating position.

Tone Signaling Adapter (2) — If authorized to your unit, stored in Accessory Kit MX-230/PT; fastens to side of switchboard when required for use.

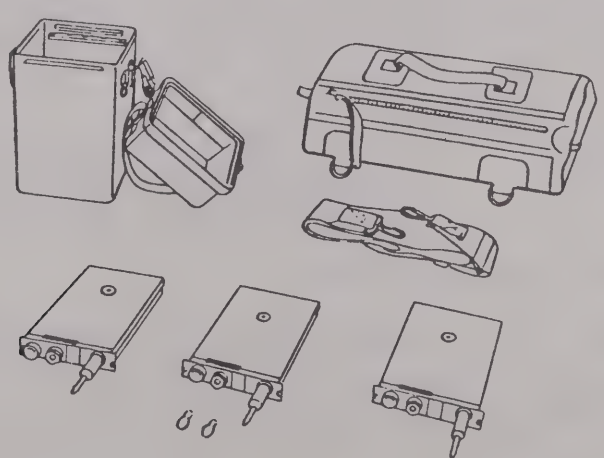
Ground Strap (3) — Normally stored in accessory kit; provides high amperage protection when properly attached to ground rod (4).

Ground Rod (4) — An item similar to Ground Rod MX-148/G, which is not issued as a component of the switchboard and must be ordered separately.

Operator's Telephone Set (5) — Normally stored inside cover (1).

1-10. Description of Accessory Kits

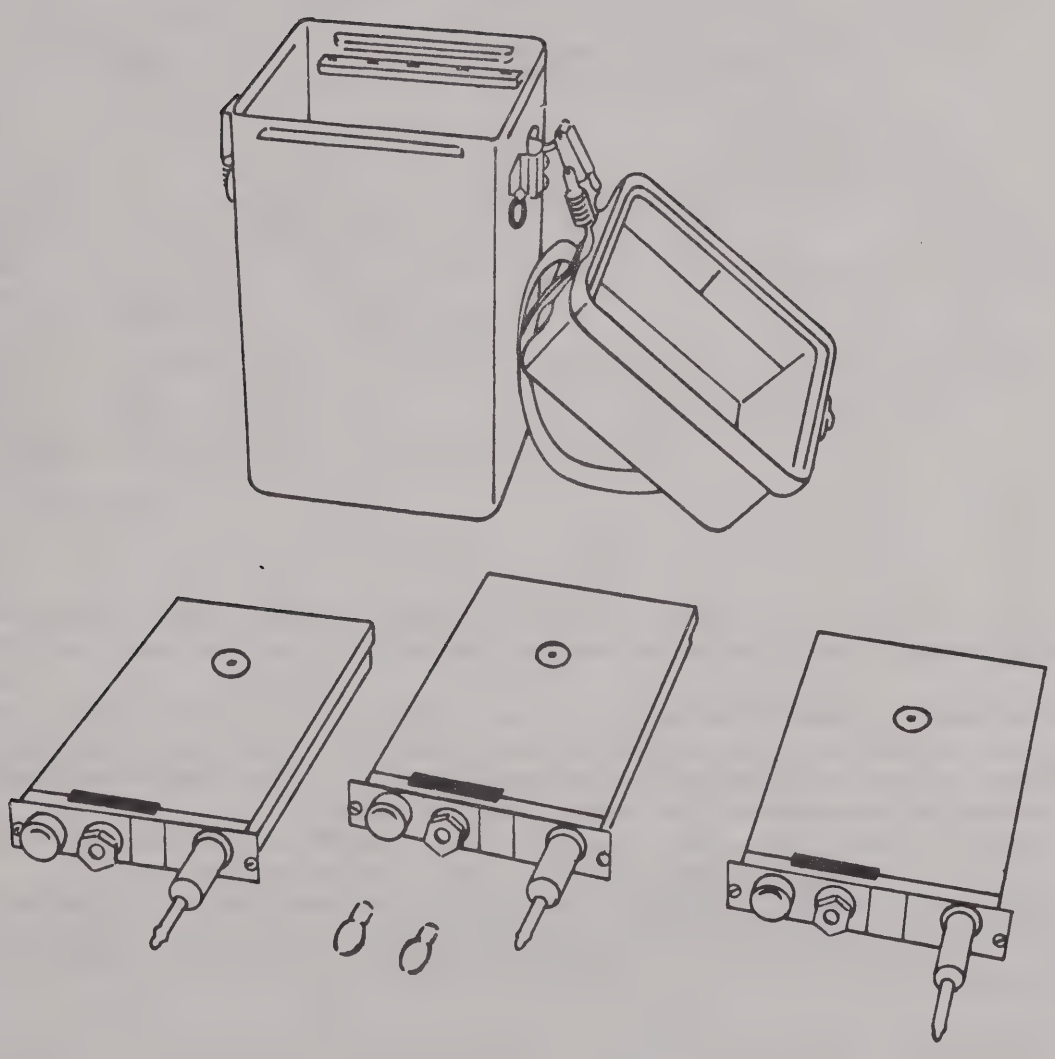
a. Switchboard Accessory Kit MX-230A/PT. Contains spare parts for SB-22/PT: three line packs TA-222/PT; two lamps, part no. 1490; metallic case.



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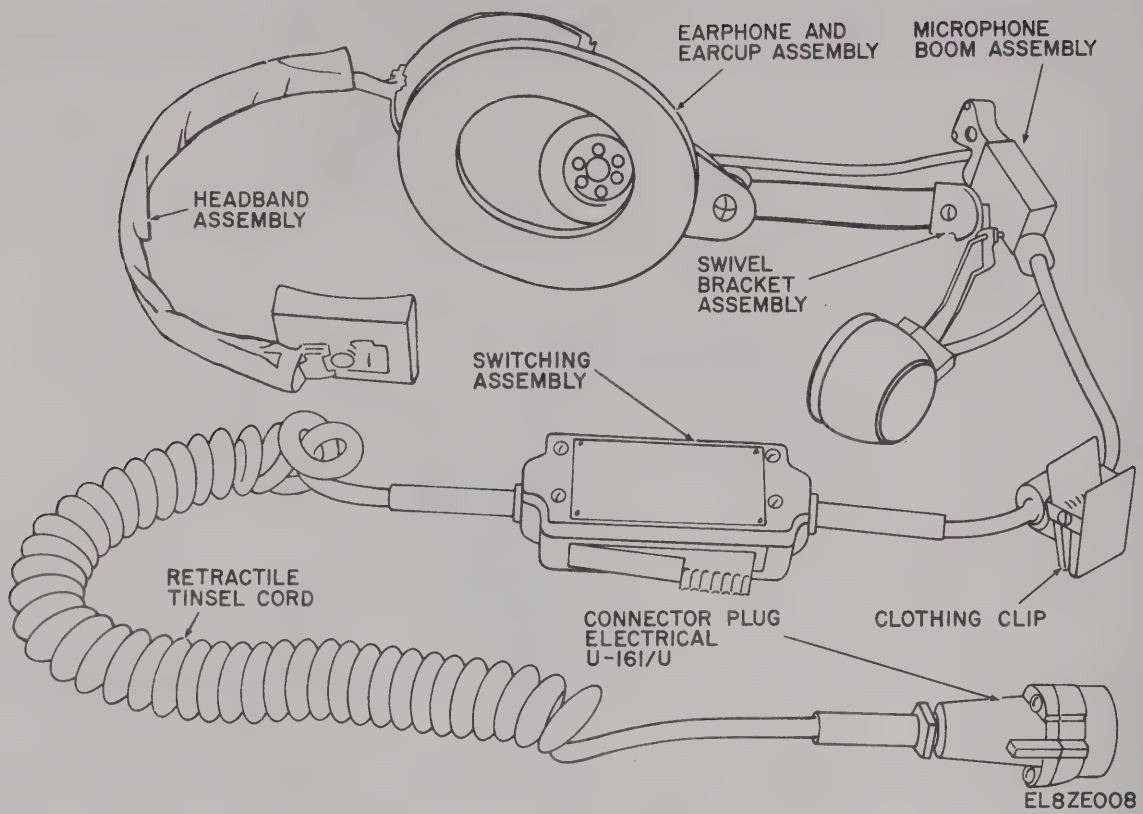
b. Switchboard Accessory Kit MX-230/PT. Accessory Kit MX-230/PT originally contained a canvas carrying bag and carrying strap. They are being replaced by a metallic case contained in Accessory Kit MX-230A/PT. Otherwise, the two cases are identical. Contains spare parts for SB-22/PT: three line packs, TA-222/PT: two lamps, part no. 1490; and canvas case which is being replaced by a metallic case.

c. Switchboard Accessory Kit MX-2915/PT. Contains spare parts for SB-22/PT; one trunk pack, TA-326/PT; two lamps; GE part no. 1490; aluminum case.



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1-11. Description of Operator's Telephone Set



a. Earphone and Earcup Assembly. The earphone and earcup assembly consists of Receiver Element TA-235/PT, a high-impact plastic earcup, a two-conductor terminal block and cover plate, and a soft-rubber ear cushion.

b. Boom Microphone Assembly. The boom microphone assembly consists of a high-impact plastic boom case containing a carbon microphone element, a ball and socket device, a wire loop, and a swivel bracket assembly.

c. Switchbox Assembly. The switchboard assembly consists of a high-impact plastic case housing, a push-to-talk lever and bar-actuated switch, a cover assembly, and a clothing clip.

d. Headband Assembly. The adjustable, flexible, headband assembly consists of a tubular, plastic-covered headband, a fold-away earphone adjusting assembly, and a cushion adjusting assembly.

e. Cord Assembly. The cord assembly consists of a two-conductor straight cord with solderless connectors, a four-conductor straight cord with stay cords and solderless connectors, and a seven-conductor retractile tinsel cord with stay cords and solderless connectors on one end and a Connector Plug, Electrical U-161/U on the other end.

1-12. Equipment Physical Data

a. Switchboard [1]

Height	5 1/4 in.
Depth	12 1/2 in.
Width	16 in.
Weight	30 lbs.

b. Tone Signaling Adapter

Height	4 in.
Depth	7 in.
Width	1 3/4 in.

c. Accessory Kit MX-230/PT

Height	4 1/2 in.
Depth	10 1/2 in.
Width	15 1/2 in.
Weight	4 lbs.

d. Accessory Kit MX-230A/PT

Height	9 7/8 in.
Depth	5 3/8 in.
Width	5 1/2 in.
Weight	4.9 lbs.

e. Accessory Kit MX-2915/PT

Height	9 7/8 in.
Depth	5 3/8 in.
Width	5 1/4 in.
Weight	4.9 lbs.

[1] Includes model with "plastic" case.

1-13. Additional Equipment Required

The equipment listed in *a* and *b* below is required when the switchboard is used to provide the service indicated. The equipment listed in *c* below will assist the switchboard operator when the calling rate is high. The equipment must be requisitioned separately through normal supply channels.

a. Telephone and Remote Controlled Radio Circuits. Four batteries (BA-30) are required to provide direct current (dc) for the night alarm and the operator's telephone set. A ground rod, such as Ground Rod MX-148/G, is required to ground the switchboard.

b. Vf Teletypewriter Circuits. Telegraph Terminal TH-5/TG and Teletypewriter Set AN/PGC-1 are required if the switchboard is to be used to interconnect vf teletypewriter circuits. Two batteries (BA-30) are required to provide dc for the night alarm.

c. Power Ringing. An external source of ringing current, such as Converter M-222 or M-222-A, Power Supply PP-990/G, Interrupter PE-250, or Static Ringing Generator TA-248/TT, is required if power ringing is to be used on the switchboard.

1-14. Differences in Models

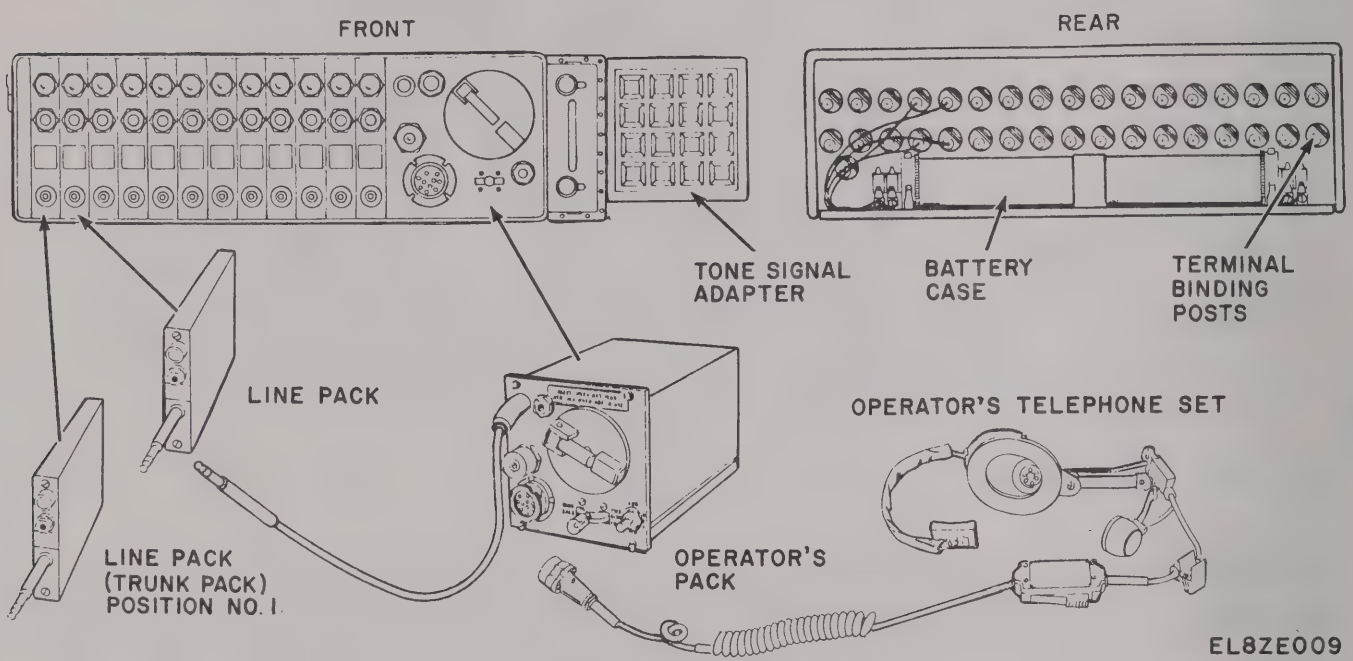
a. The switchboards may be equipped with Generator, Hand Ringing G-41/PT, G-42/PT or G-42A/PT. The G-41/PT, G-42/PT, and G-42A/PT are identical in size and operating characteristics and are interchangable, however, the internal components are different and are not interchangable.

b. Starting in 1975, SB-22A/PT cases were changed from a metal to a plastic material and a ground strap was provided. There is no other difference between the versions.

c. The H-182/PT is supplied with both switchboards.

Section III. TECHNICAL PRINCIPLES OF OPERATION

1-15. Functional Description



Trunk Pack — Provides for a connection to a distant switchboard which provides your switchboard with a common battery signaling (CBS) trunk. The trunk pack is equipped with a jack, line cord and call signal indicator. The jack gives the operator the means to answer or extend a call on the pack. The line cord gives the operator the capability of extending an incoming callers requested number to the appropriate telephone number. The line signal indicates an incoming call by rotating to white, indicating the circuit must be answered by the operator.

Line Pack — Used to interconnect local telephone circuits in a local battery (LB) switching system. Each line pack contains a jack, line cord and call signal indicator. Each operates the same as the trunk pack.

Operator's Pack

Provides a means for the operator to answer or extend and monitor calls placed through the switchboard. Each operator's pack is equipped with the following:

a. Visual and audible alarm switch; alerts the operator by activating a buzzer or light.

b. Operator's cord; allows the operator to answer incoming calls by inserting the operator's plug into the appropriate line jack.

c. Operator's telephone receptacle; provides a connection for the operator's telephone set to the front of the switchboard.

d. Night alarm in and light out switch; allows the use of either a visual alarm or illumination of the switchboard front panel during night operation.

NOTE

When used to illuminate the switchboard the night alarm cannot be used as a visual alarm.

e. Hand ringing generator; allows the operator to signal requested subscriber circuit when calls are being extended.

f. Ring back - PWR RING FWD SWITCH; used to ring forward or ring back when extending or ringing off telephone circuits during operation.

g. Operator jack; provides a place for the operator's plug when not in use and prevents excessive battery drainage when plug is properly stored in the operator's jack.

Tone Signaling Adapter

Used with the switchboard to provide dual-tone signaling over a CB trunk line when provided by the SB-3614/TT on the AN/TTC-38. It enables the switchboard operator to signal SB-3614/TT and Central Office AN/TCC-38. The adapter consists of 16 pushbutton keys arranged in a 4 by 4 configuration. The keys and associated circuitry are contained in a sealed key set module. The adapter is hinged to and folds into the housing assembly. The adapter is transported in Accessory Case, MX-230/PT, MX-230A/PT or MX-2915/PT.

Terminal Binding Posts

Used to make electrical connections using WD-1/TT.

Battery Case

Holds four batteries BA-30. Two batteries provide power for the night alarm and two provide power for the operator's telephone set.

Operator's Telephone Set

Connects to operator's pack at operator's telephone set receptacle. Push-to-talk switch has four positions. The first position is the raised position used for monitoring. The second position is the depressed position, which gives you access to the telephone circuit for transmission. The third position is the depressed and locked (pushed forward) position, which locks the switch in the telephone position. The fourth position is the depressed-from-the-locked position, which activates a radio when in a radio wire integration system.

CHAPTER 2

INSTALLATION

Section I. UNPACKING

2-1. Unpacking

a. When packed for export shipment, the components of the switchboard are packed as shown in figure 2-1 below. When packed for domestic shipment, the switchboard is sealed in cartons and packed in one nailed wooden box. Dimensions of packed equipment is given in table 2-1 below.

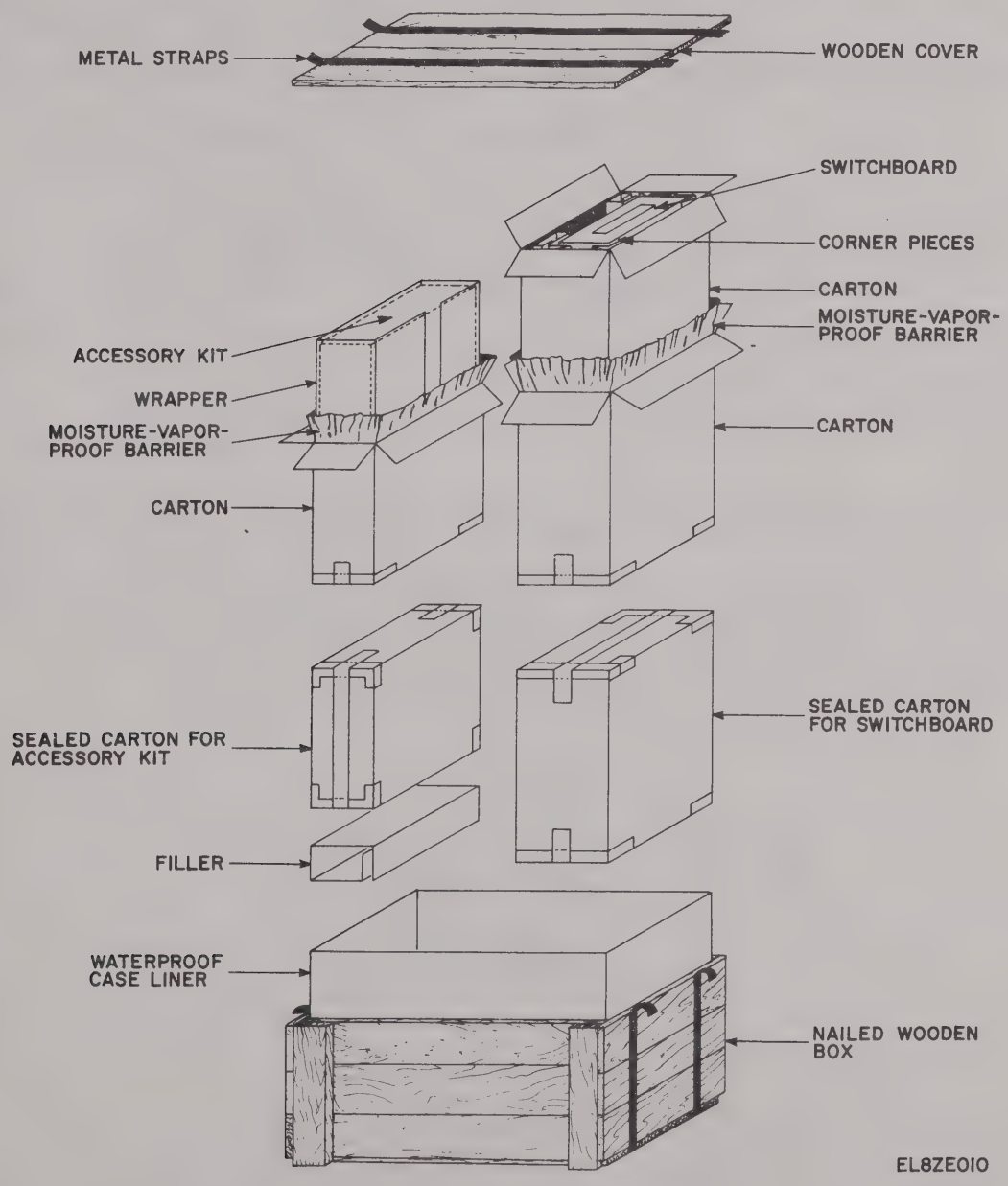


Figure 2-1. Switchboard, Typical Export Packaging Diagram.

Table 2-1. Packed Equipment Dimensions

Outside dimensions (in.)	Volume (cu ft)	Unit Weight	Contents
14½ x 19 x 17¼	2.8	58	Switchboard, Telephone, Manual SB-22/PT, with Accessory Kit MX-230/PT.
or			
9½ x 28½ x 16½	2.6	58	Switchboard, Telephone, Manual SB-22/PT, with Accessory Kit MX-230A/PT.
or			
9½ x 28½ x 16½	2.6	58	Switchboard, Telephone, Manual SB-22A/PT, with Accessory Kit MX-2915/PT.

b. To remove the contents of the export package, perform the following (fig. 2-1):

(1) Place the nailed wooden box on the floor or other flat surface.
(2) Cut the metal straps and bend them back to prevent injury to personnel.
(3) Pull the nails from the wooden cover and lift the cover from the nailed wooden box.
(4) Cut the waterproof case liner and lift the sealed cartons for the switchboard and the accessory kit from the nailed box.
(5) Open the sealed carton and the moisture-vaporproof barrier containing the switchboard. Remove the carton from inside the moisture-vaporproof barrier.
(6) Open the carton and remove the switchboard.
(7) Open the sealed carton for the accessory kit and the moisture-vaporproof barrier and remove the accessory kit.

c. To remove the contents of the domestic package, perform the following:

(1) Place the nailed wooden box on the floor or other flat surface.
(2) Pull the nails from the wooden cover and lift it from the nailed wooden box.
(3) Open the sealed carton for the switchboard and remove the switchboard.
(4) Open the sealed carton for the accessory kit and remove the accessory kit.

2-2. Checking the Unpacked Equipment

a. Check the equipment against the packing list. If no packing list accompanies the equipment, use the components of end item list (COEIL) (appx C) to check the equipment that was packed. Follow the procedures given in *b* through *f* below to check for damage incurred during shipment.

b. Check the contents of the accessory kit (fig. 2-2) as follows:

(1) Remove the line and trunk packs and the two lamps.

(2) Check each line pack and trunk pack (if supplied) for dented cases, damaged cords and plugs, broken or missing signal covers, and damaged jacks.

(3) Check the two lamps to be sure they are not broken.

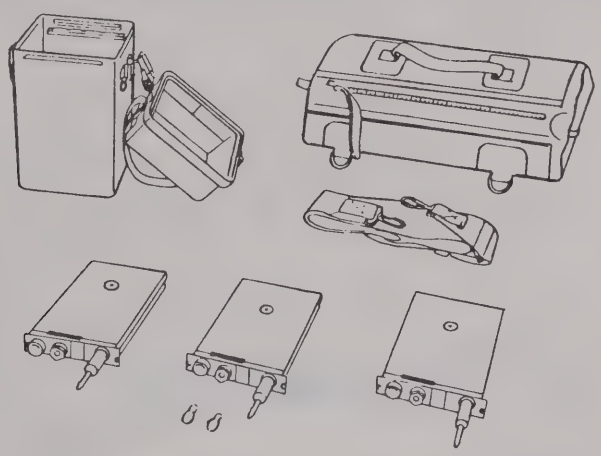


Figure 2-2. Accessory Kit.

c. Remove the front cover from the switchboard ((1) through (4) below). Check the face of the switchboard ((5) through (8) below).

(1) Place the switchboard on a table or other flat surface.

(2) Lift each cover latch handle off its stud (fig. 2-3).

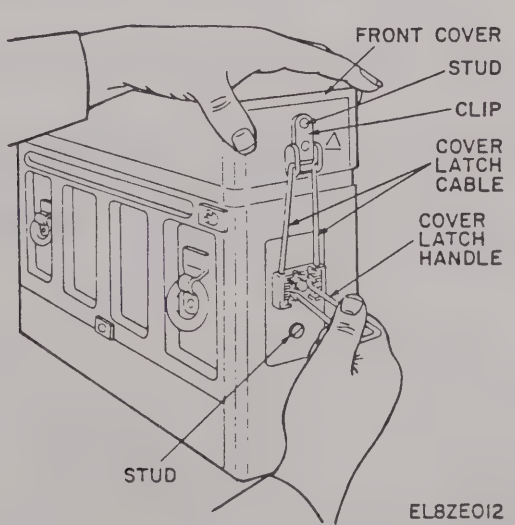


Figure 2-3. Removing Front Cover From Switchboard.

(3) Turn the cover latch handles one-half turn so that the cover latch cable is loose.
(4) Remove each of the clips from the studs on the front cover. Remove the front cover from the switchboard.
(5) Check the operator's telephone set (fig. 1-0) inside the front cover to be sure it is not damaged. Check the retaining straps inside the front cover to be sure they are not cut or broken.
(6) Check each line pack to be sure none of the controls have been damaged. Pull each cord out of the line pack and check to see that it retracts properly.
(7) Check the operator's pack to be sure that none of the controls have been damaged during shipment.
(8) Replace the front cover.

d. Open the rear cover of the switchboard (fig. 2-4). Check to be sure the cover swings free on its hinges. Check all of the binding posts in the rear compartment of the switchboard to be sure that none have been damaged during shipment. Close the rear cover.

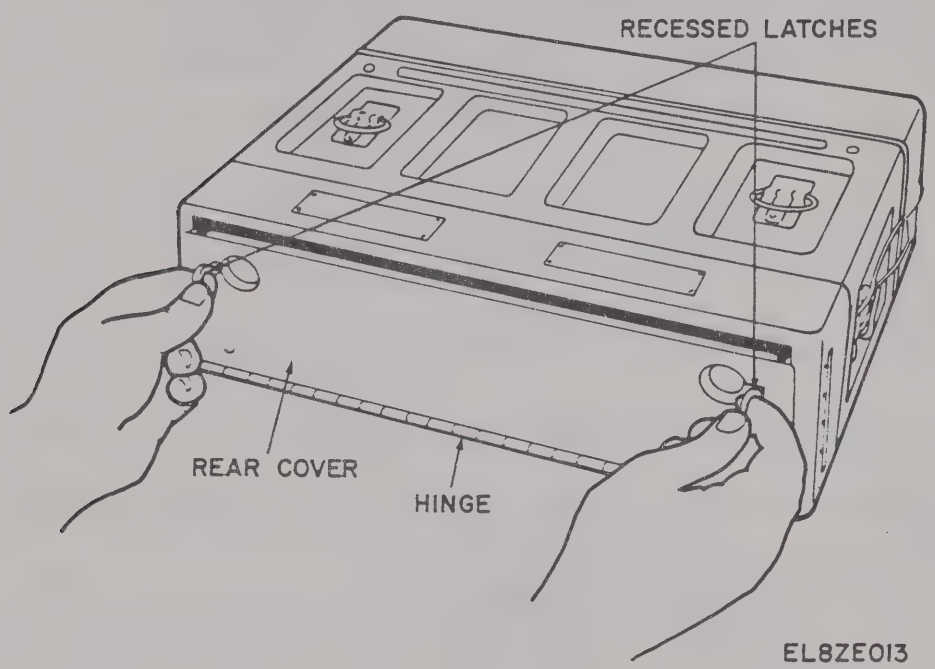


Figure 2-4. Opening the Rear Door of the Switchboard.

e. Check the exterior of the switchboard to be sure that the switchboard case has not been damaged during shipment.
f. If the equipment is used or reconditioned, check the equipment for tags or other markings that may indicate a modification of the equipment.

Section II. INSTALLATION

2-3. Preinstruction Checks

Before installing and connecting the switchboard, perform the procedures given in *a* through *d* below, as applicable.

a. Batteries.

(1) Open the rear cover of the switchboard (fig. 2-4).
(2) Place the index finger on the end of caps of the battery.
(3) Case (fig. 2-5).

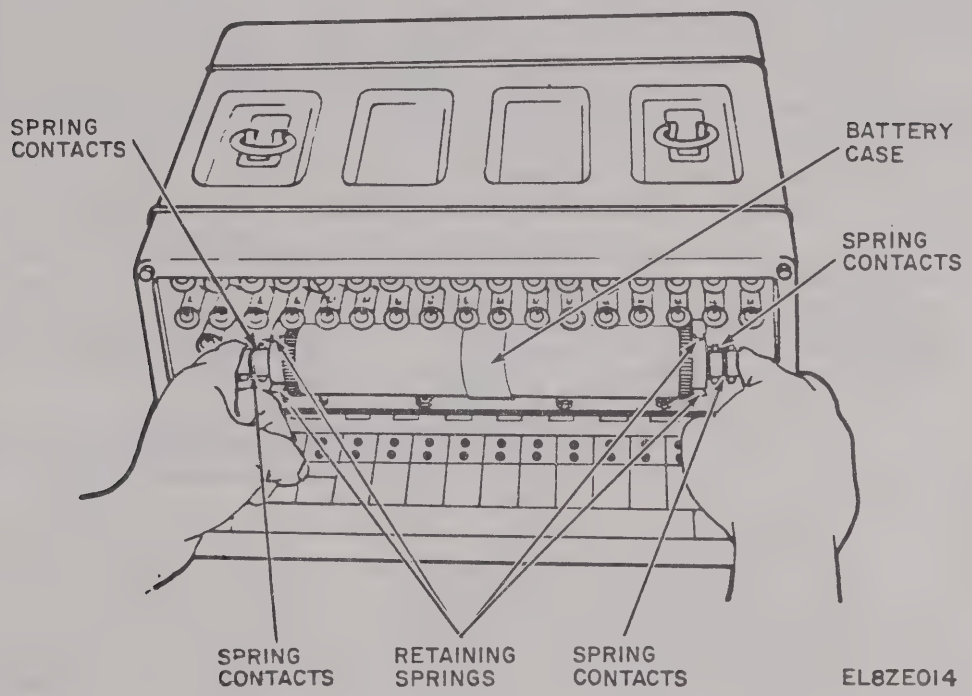


Figure 2-5. Removing Battery Case from Switchboard.

(4) Roll the battery case out evenly with index fingers to remove the battery case from the switchboard.
(5) Slide two batteries BA-30 into each end of the battery case (fig. 2-6). Be sure that each battery is positioned so that the top of the battery is toward the open end of the battery case.

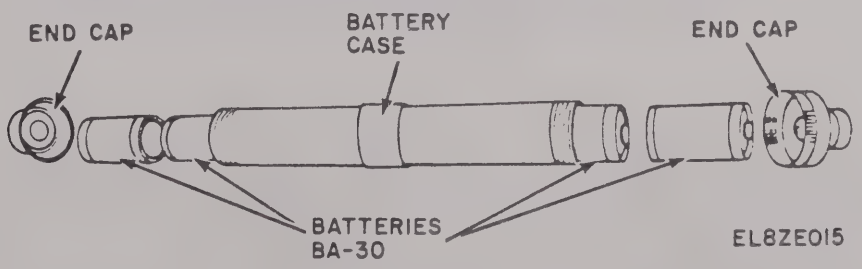


Figure 2-6. Installing Batteries in Battery Case.

(6) Replace the two end caps.

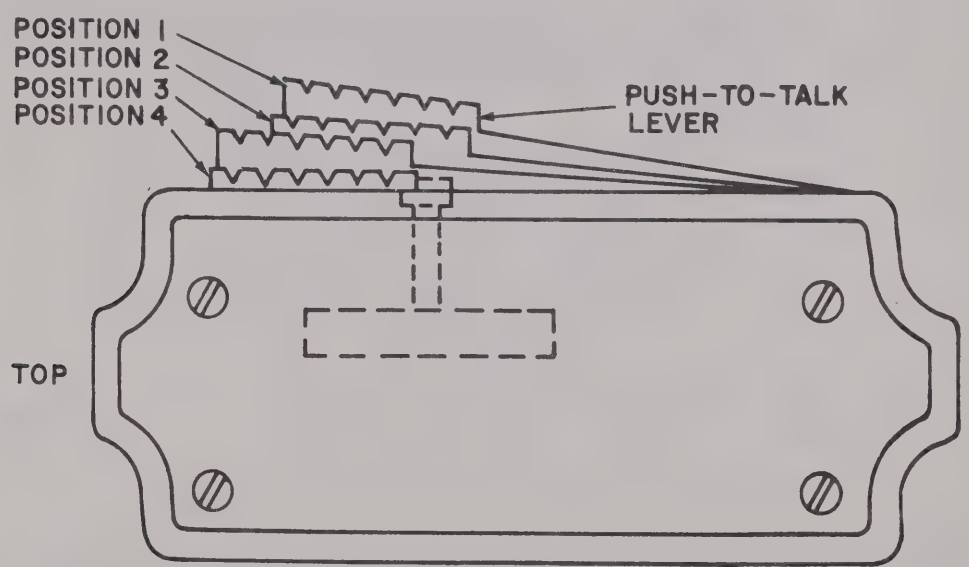
CAUTION

Do not screw the end caps onto the battery case too tightly;
the battery case or the end caps may be damaged.

(7) Place the battery case on the spring contacts and press it straight into the spring contacts (NSN 5999-00-643-7687). Be careful not to damage the spring contacts.

b. Line Packs.

(1) Connect a short piece of Wire WD-1/TT between a field telephone and the line binding posts of the line pack to be checked.
(2) Connect the operator's telephone set to the operator's pack.
(3) Operate the VIS OFF switch to VIS.
(4) Operate the hand ringing generator on the field telephone. The line signal on the line pack should operate to *white* and the light on the operator's pack should light.
(5) Insert the plug of the operator's cord into the jack on the line pack. The line signal should operate to *black* and the light on the operator's pack should go out.
(6) Operate the switch in the cord of the operator's telephone set (push-to-talk switch) to the first position, and check to see that two-way conversation is possible.
(7) Follow the procedure given in (1) through (6) above for each of the line packs.



c. Trunk Pack.

(1) The trunk pack must be operated on a common battery system (CBS) to work properly. However, a check of all but its outgoing ringing capabilities can be made on a local battery system, if necessary, by following procedures in (2), (3) and (4) below.
(2) Connect a field telephone to the line pack as discussed in *b* above.
(3) Insert plug from the line pack into the trunk jack.
(4) Signal the trunk pack with the field telephone. The line signal should operate to white. Two way conversation should be possible.

d. Operator's Pack.

(1) Connect a field telephone to a line pack.
(2) Operate the VIS OFF AUD switch to AUD.
(3) Operate the hand ringing generator on the field telephone. When the line signal on the line pack operates from *black* to *white,* the night alarm buzzer should sound.
(4) Insert the plug of the operator's cord into the jack on the line pack; the line signal should return to black and the buzzer should stop.
(5) Push the RING BACK-PWR RING FWD switch to the RING BACK position and turn the hand ringing generator on the operator's pack. The ringer in the field telephone should sound.
(6) Remove the plug of the operator's cord from the jack of the line pack connected to the field telephone and insert it into the jack of another line pack. Insert the plug of the cord on the second line pack into the jack of the line pack connected to the field telephone.
(7) Turn the hand ringing generator on the opeator's pack; the ringer on the field telephone should sound.
(8) Remove the two plugs from the jacks and insert the plug of the operator's cord into the jack on the operator's pack.
(9) Pull out the LITE-OUT-NA-IN knob; the lamp should light.
(10) Push the LITE-OUT-NA-IN knob into its original position; the lamp should be extinguished.

2-4. Siting

a. The switchboard *must* be protected from dampness, dust, dirt, ice, or snow. If possible, during subfreezing temperatures, the switchboard should be located in a heated shelter. The switchboard may be installed in a foxhole, bunker, or building.
b. The switchboard should be located centrally with respect to the line and trunk circuits terminated on the switchboard.

2-5. Installing One Switchboard

CAUTION

When installing the switchboard, do not lay it on the bare ground. Lay the switchboard on a shelter-half, poncho, or other canvas cover. During inclement weather, fold the edges of the cover back over the switchboard after it has been installed to prevent it from getting wet.

a. Select a flat surface, such as a table, packing box, or a ledge in a foxhole.
b. Lay the switchboard on its side so that the nameplate is up.
c. Release the front cover latch on each end of the switchboard and remove the front cover from the switchboard.
d. Loosen the retaining straps inside the front cover (fig. 1-0) and remove the operator's telephone set.
e. Place the cover on top of the switchboard (yellow side forward) and secure it in place with the front cover latches (fig. 2-7). The yellow side will be used to draw the circuit diagram.

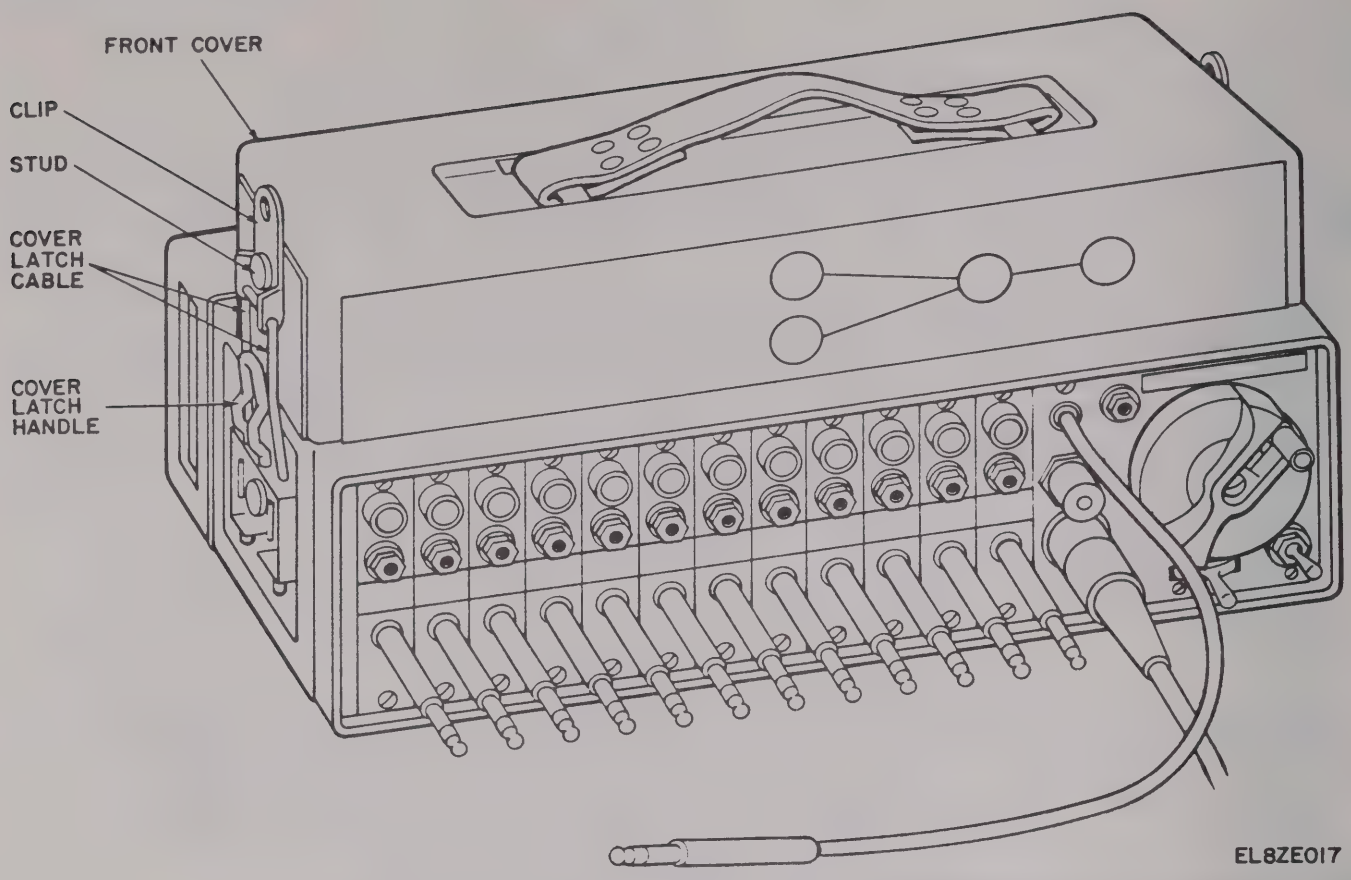


Figure 2-7. Switchboard Cover in Operating Position.

f. If the trunk pack is to be installed, follow the procedures given below:

(1) Unscrew the captive screws on the line pack no. 1 or no. 12.
(2) Insert the plug of the cord into the jack of the line pack.
(3) Grasp the plug and pull the line pack out of the switchboard case. Be sure to pull the line pack straight out of the switchboard case to prevent bending the plug or jack.
(4) Insert the plug of the cord into the jack on the trunk pack.
(5) Slide the trunk pack into the switchboard case and tighten the captive screws.
(6) Remove the plug from the jack and mark the trunk pack to indicate the trunk destination.

2-6. Installing Two Switchboards

a. Install the first switchboard as explained in paragraph 2-5, but do *not* place the cover on top of the switchboard.

b. Remove the cover from the second switchboard. Do *not* remove the operator's telephone set from inside of the cover.

c. Remove the operator's pack from the second switchboard as follows:

(1) Unscrew the captive screw located in each corner of the front of the operator's pack.
(2) Connect the operator's telephone set connector to the receptacle on the operator's pack.
(3) Grasp the operator's telephone set connector and pull the operator's pack from the switchboard case.

CAUTION

On new equipment, the operator's pack may be difficult to remove. Remove the line pack nearest the operator's pack, if necessary, before removing the operator's pack. BE SURE TO PULL THE OPERATOR'S PACK STRAIGHT OUT OF THE SWITCHBOARD CASE TO PREVENT DAMAGING THE CONNECTORS AT THE REAR OF THE OPERATOR'S PACK.

d. Install five line packs from the two accessory kits in the space from which the operator's pack was removed (fig. 2-8) as follows:

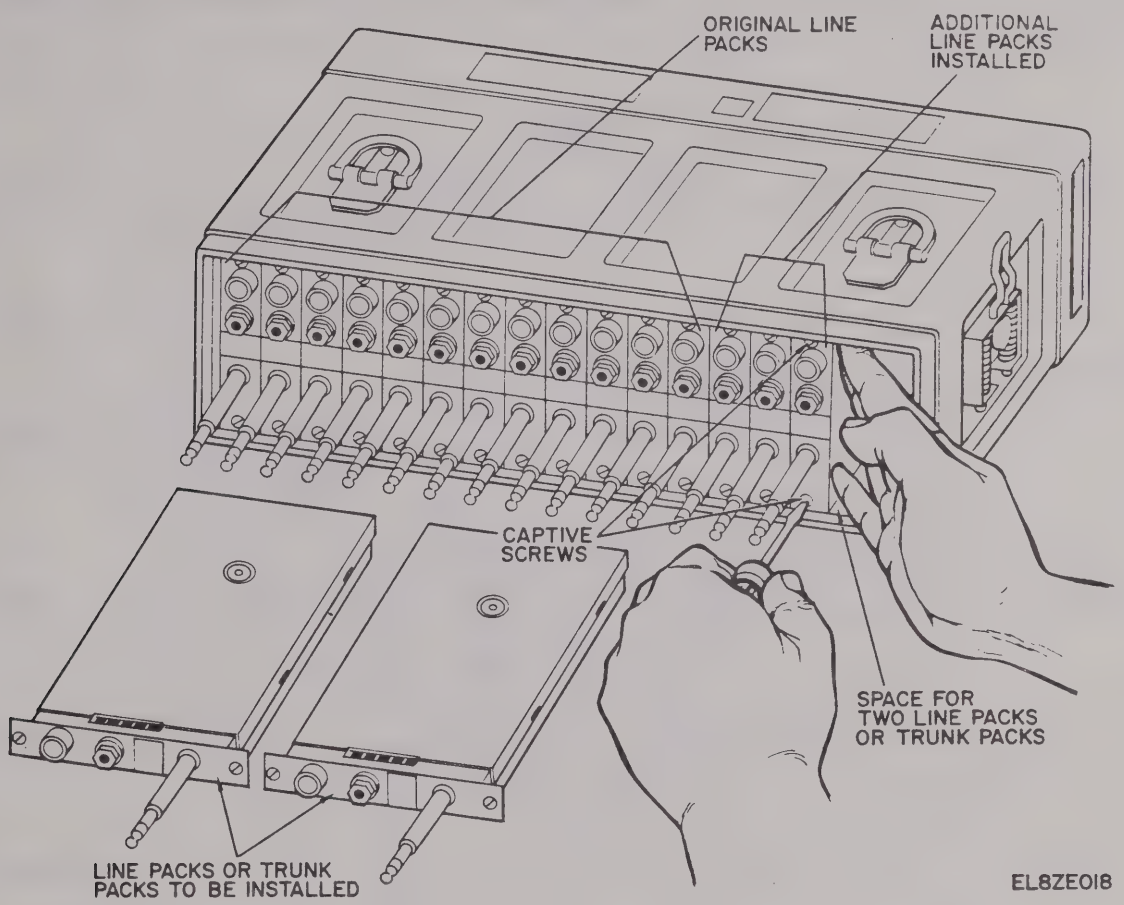


Figure 2-8. Installing Additional Line Packs.

(1) Slide one of the line packs into the switchboard case besides line pack no. 12. Be sure the receptacle at the rear of the line pack is alined with the plug at the back of the switchboard.

(2) Push the line pack into the switchboard case until the captive screws at the top and the bottom of the line pack are against the switchboard case.

(3) Screw the captive screws into the tapped holes. Be sure not to break the screws by tightening them too tight.

(4) Install the other four line packs as explained in (1), (2) and (3) above.

e. Position the second switchboard on top of the first switchboard. Be sure the front and the sides of the two switchboards are in line.

f. Secure one of the front covers on the top of the second switchboard with the cover latches (fig. 2-13) of the second switchboard.

g. Secure the second switchboard to the first switchboard with the cover latches of the first switchboard.

h. Make the following connections:

(1) Disconnect the two blue and the two red wires from the BAT NA and BAT MIC terminals in the second switchboard.

(2) Connect a short piece of WD-1/TT wire between the NA terminal of each switchboard.

i. Ground the switchboard as stated in paragraph 2-7.

j. Upon completion of the stacked operation, remove the ground strap from the GRD binding posts; remove the jumper wire between the two NA terminals; replace the two red and the two blue wires to the BAT MIC and BAT NA terminals on the second switchboard.

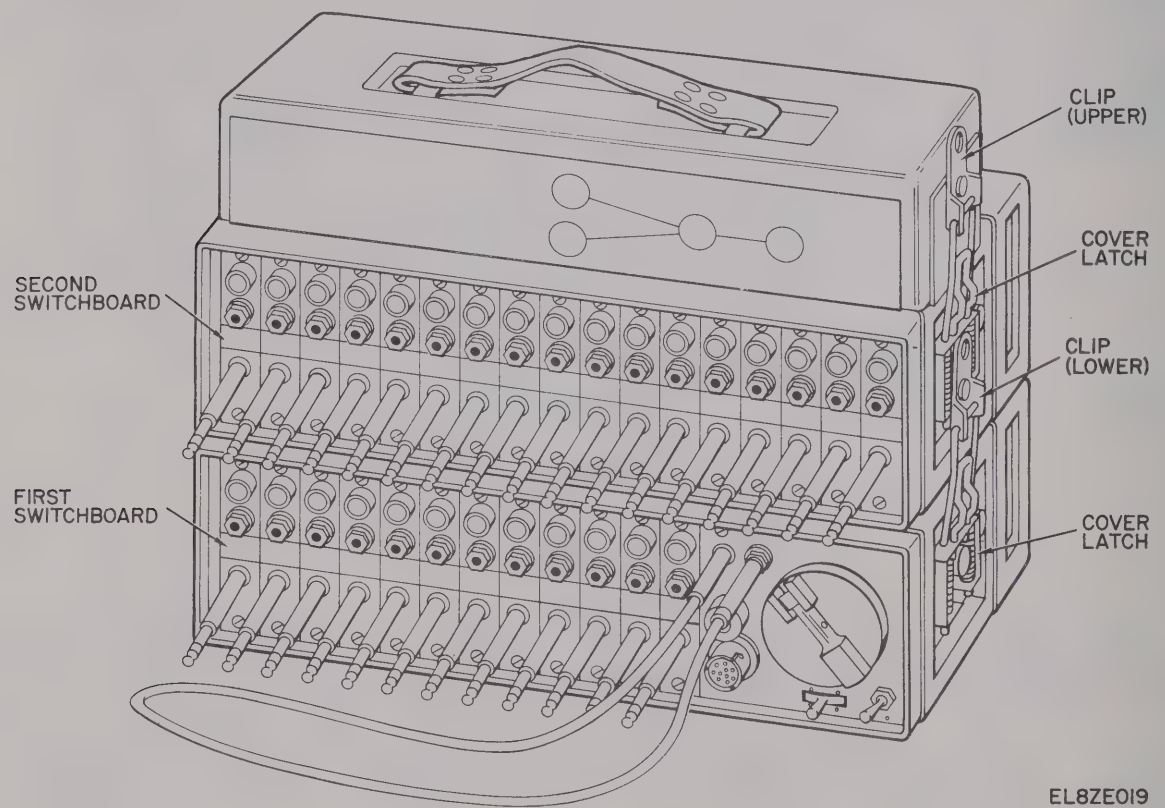


Figure 2-9. Installation Arrangements for Two Switchboards.

2-7. Grounding Procedures

a. To ground one switchboard, use the following procedures:

(1) Scoop out a small hole, about 6 inches deep, at the selected grounding site as close as convenient to the switchboard.

(2) Drive the ground rod into the hole until approximately 3 inches remain.

(3) Cut the ground strap to the length required to connect between the switchboard and the ground rod.

(4) Attach one end of the ground strap to the GRD terminal using screw, machine MS 3212-50.

(5) Connect the other end of the ground strap to the ground rod. Insure that the connection is clean and there is a good electrical connection.

b. To ground two switchboards, perform the following:

WARNING

DO NOT USE WD-1/TT TO GROUND TWO SWITCHBOARDS.

(1) Connect a short piece of ground strap between the GRD binding posts on the upper and lower switchboards.

(2) Connect one of the switchboards to the ground rod as explained in *a* above.

2-8. Installation of the Tone Signaling Adapter on the Switchboard

a. Remove the TA-977/PT from Accessory Kit MX-230/PT.

b. Remove battery compartment cover (fig. 2-10) and install BA-90 in battery compartment. Replace cover and tighten captive screws.

NOTE

THE BATTERY CLIP HAS A KEYED DESIGN WHICH PREVENTS IMPROPER BATTERY CONNECTIONS.

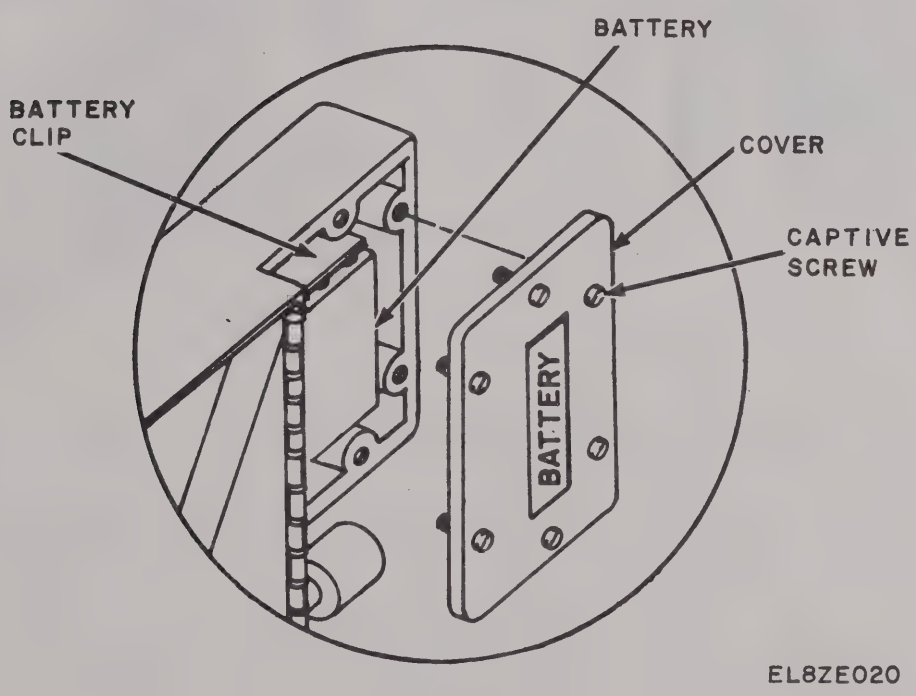


Figure 2-10. Installation of Battery In Battery Compartment.

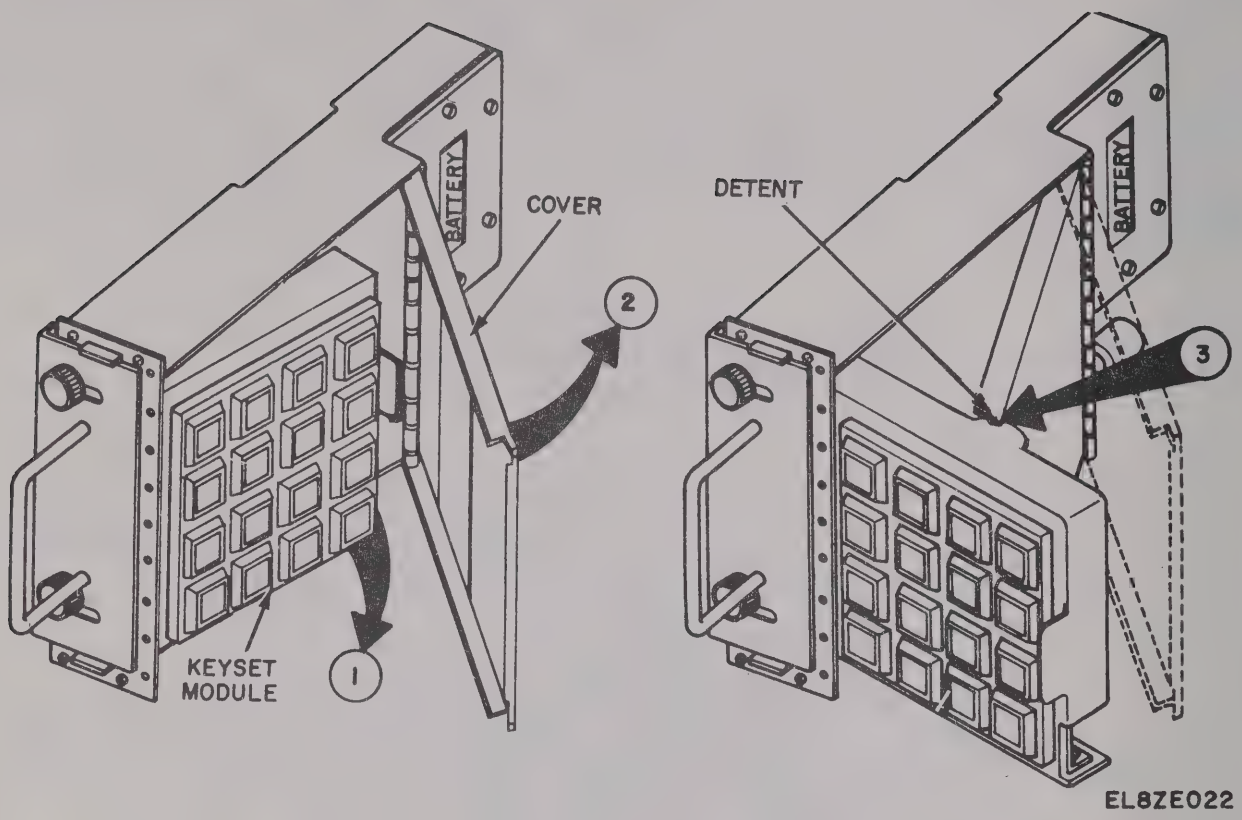


Figure 2-12. Securing Keyset Module to Cover.

c. Loosen the two locking screws several turns (fig. 2-11) and slide out mounting plate.

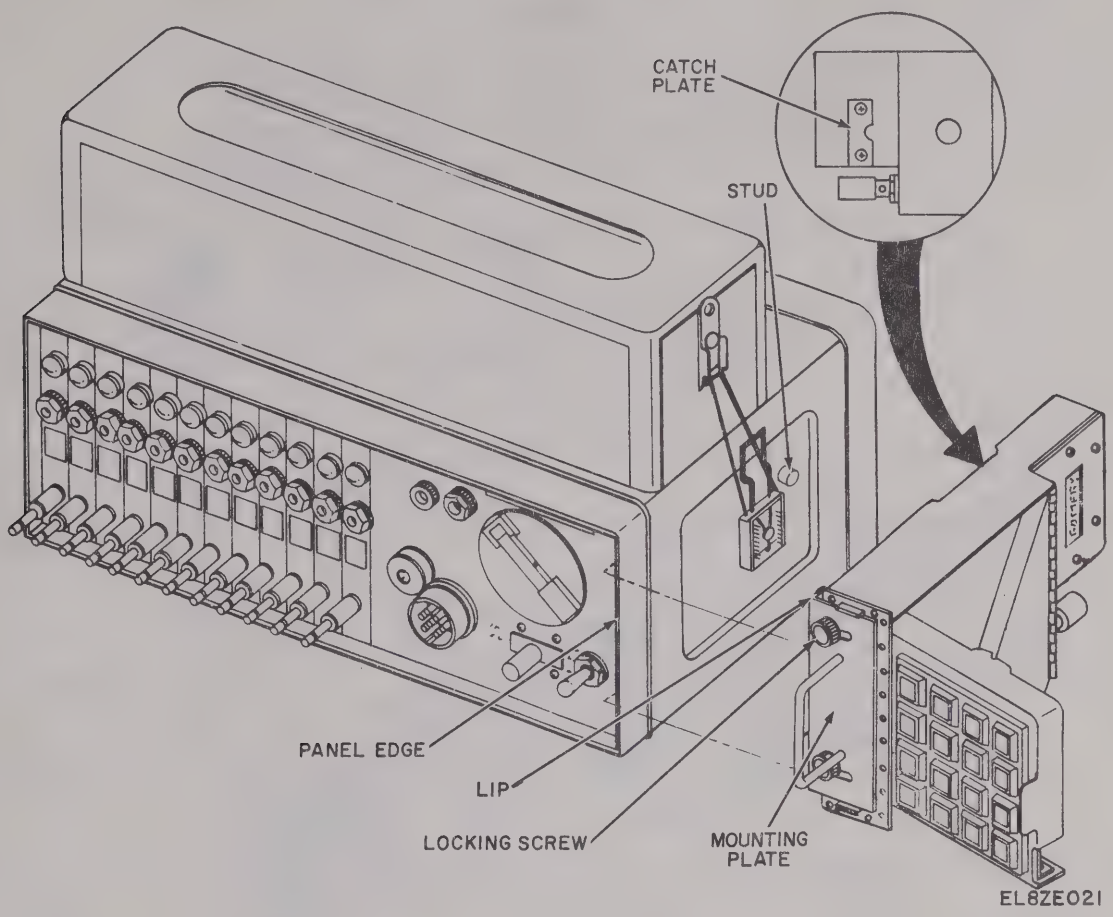


Figure 2-11. Installing Tone Signaling Adapter.

d. Hold adapter in right hand. Place catch plate over and slightly behind the stud on the right side of the switchboard.

e. Slide adapter forward so that the catch plate grips edge of stud on switchboard and, at the same time, place the lip on the mounting plate over the panel edge on switchboard case.

f. Press adapter against side of switchboard. Position the mounting plate with hand pressure and tighten locking screws.

g. Open adapter cover (1) and swing out keyset module (2) (fig. 2-12).

h. Set end of cover into detent (3) in rear of keyset module.

i. Connect a short length of field wire between the 2 binding posts on the adapter and EMG OPR binding posts on rear of the switchboard (fig. 2-13).

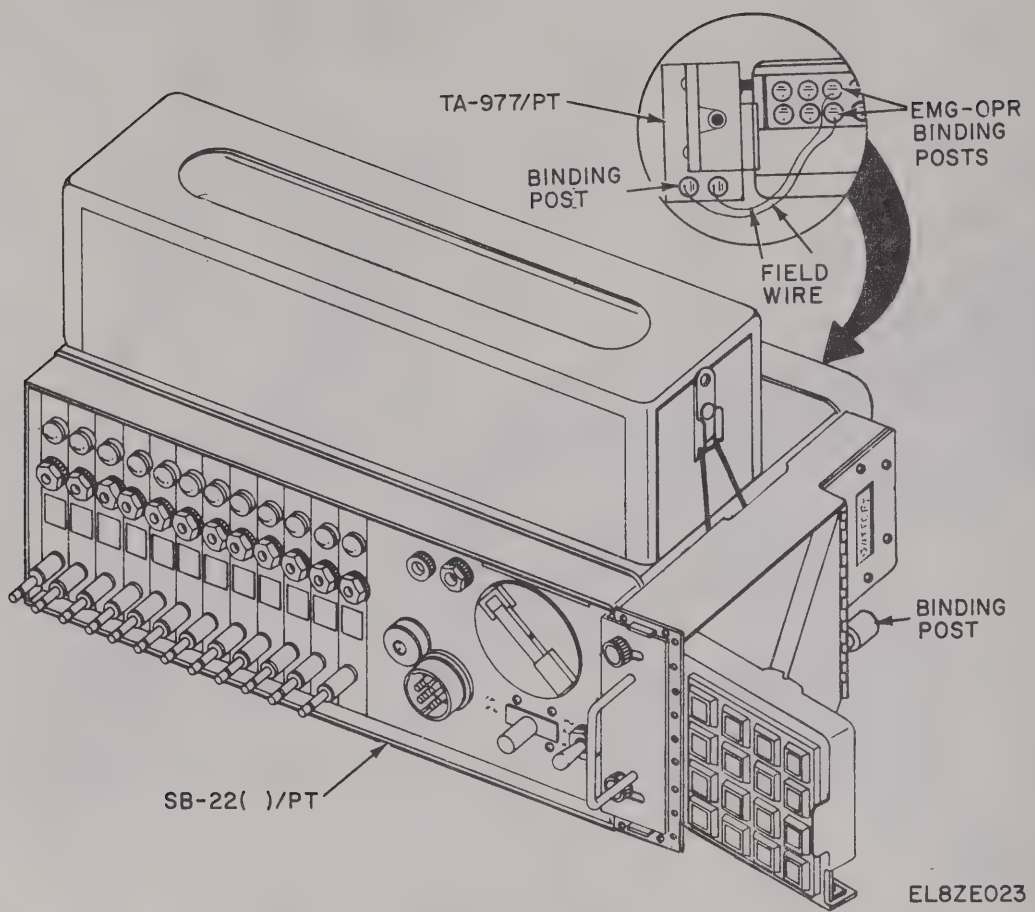


Figure 2-13. Tone Signaling Adapter Connections.

2-9. Telephone Line and Trunk Connection

WARNING

ALWAYS GROUND THE SWITCHBOARD BEFORE HOOKING UP THE FIELD WIRE. BE CAREFUL WHEN USING THE SWITCHBOARD DURING STORMS. LIGHTNING MAY POSE A SHOCK HAZARD.

Terminate each telephone line or trunk as it is brought to the switchboard site as follows:

a. Remove about three-quarters of an inch of insulation from each conductor.
b. Separate the copper strands from the steel strands in each conductor.
c. Wrap the copper strands around the steel strands in each conductor.
d. Fold about 6 inches of the wire back and pass the loop through the slit in the rubber gasket at one end of the switchboard.
e. Pull on the loop until the end of the wire is pulled through the rubber gasket. Pull enough slack through the gasket to reach the desired line pack binding post.
f. Place the tip of a screwdriver in the slot of one of the binding posts and push on the binding posts (fig. 2-14).

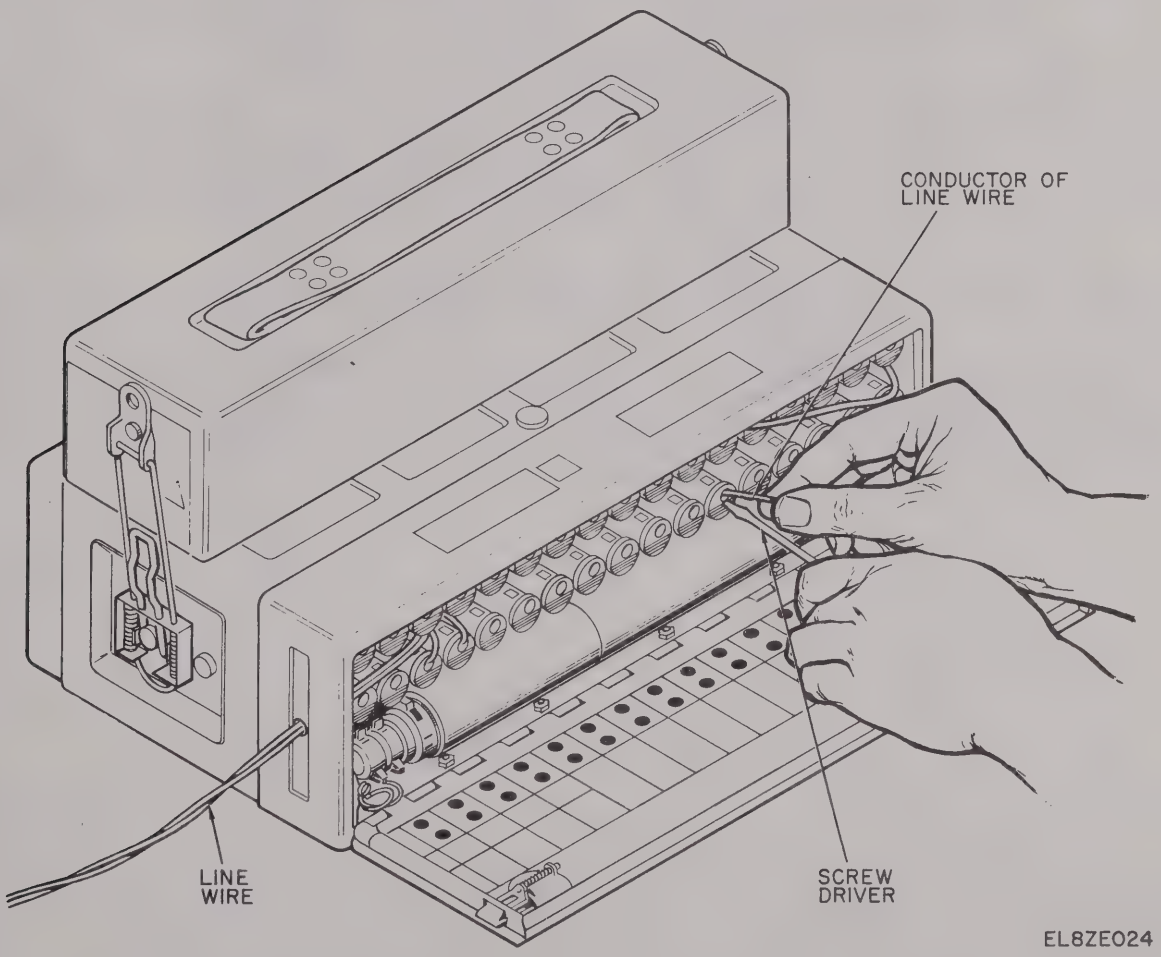


Figure 2-14. Terminating Line Wire in Switchboard.

g. Slide the bare end of the conductor into the hole in the center of the top of the binding post.

h. Remove the screwdriver from the top of the binding post. The top of the binding post will spring out and the conductor should be firmly clamped in the binding post. Pull gently on the conductor to be sure it is clamped firmly in the binding post.

i. Connect the other conductor to the other binding post in the desired circuit by following instructions in *f, g* and *h* above.

j. Dress the wire into the space between the two rows of binding posts and pull all excess slack out of the switchboard through the slit in the rubber gasket to provide a drip loop in the line wire.

CAUTION

DO NOT use ballpoint pen or magic marker on line pack designation strip. Use only grease pencil or soft lead pencil so it can be removed.

k. Record the line number in the space provided on the rear door and on the designation strip on the front of the line pack.

NOTE

Be sure the trunk circuit is terminated on the trunk pack binding posts.

2-10. Interconnection of Switchboard and SB-86/P

When the switchboard and the SB-86/P are being used to terminate both landlines and remote control radio circuits, connect the individual remote control radio circuits to the switchboard as explained in paragraph 2-11 and connect two switchboards as explained below.

a. Lift the log plate from the top of the SB-86/P and position the switchboard on top of the top jack field section (fig. 2-15).

b. Hook the cover latch cable under the front catches on the jack field section. Tighten the cover latches by turning the cover latch handles one-half turn.

c. Connect the EMG OPR binding posts at the rear of the switchboard to the EMG OPR binding posts on the front of the SB-86/P (fig. 2-16).

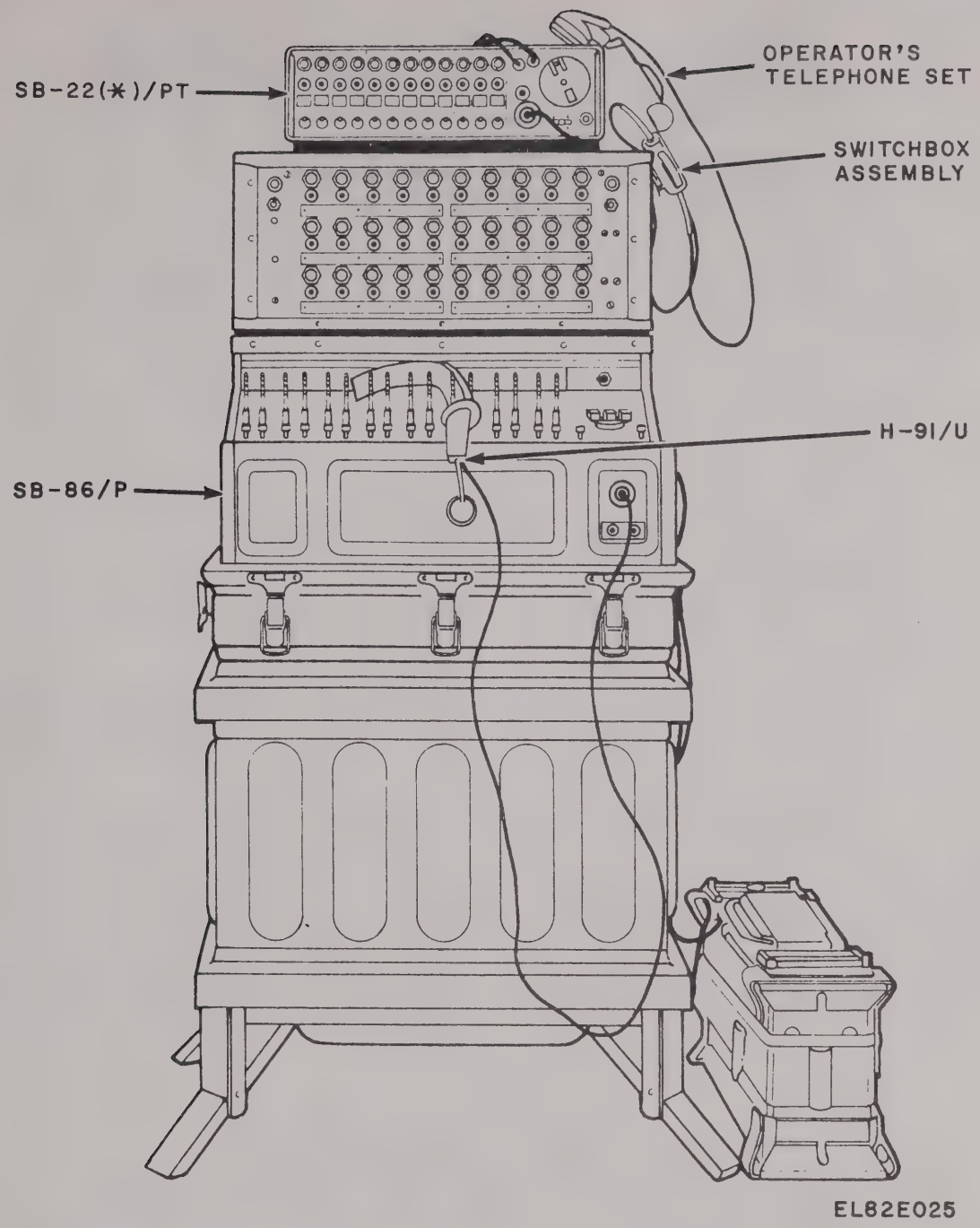


Figure 2-15. Interconnected Switchboard and SB-86/P.

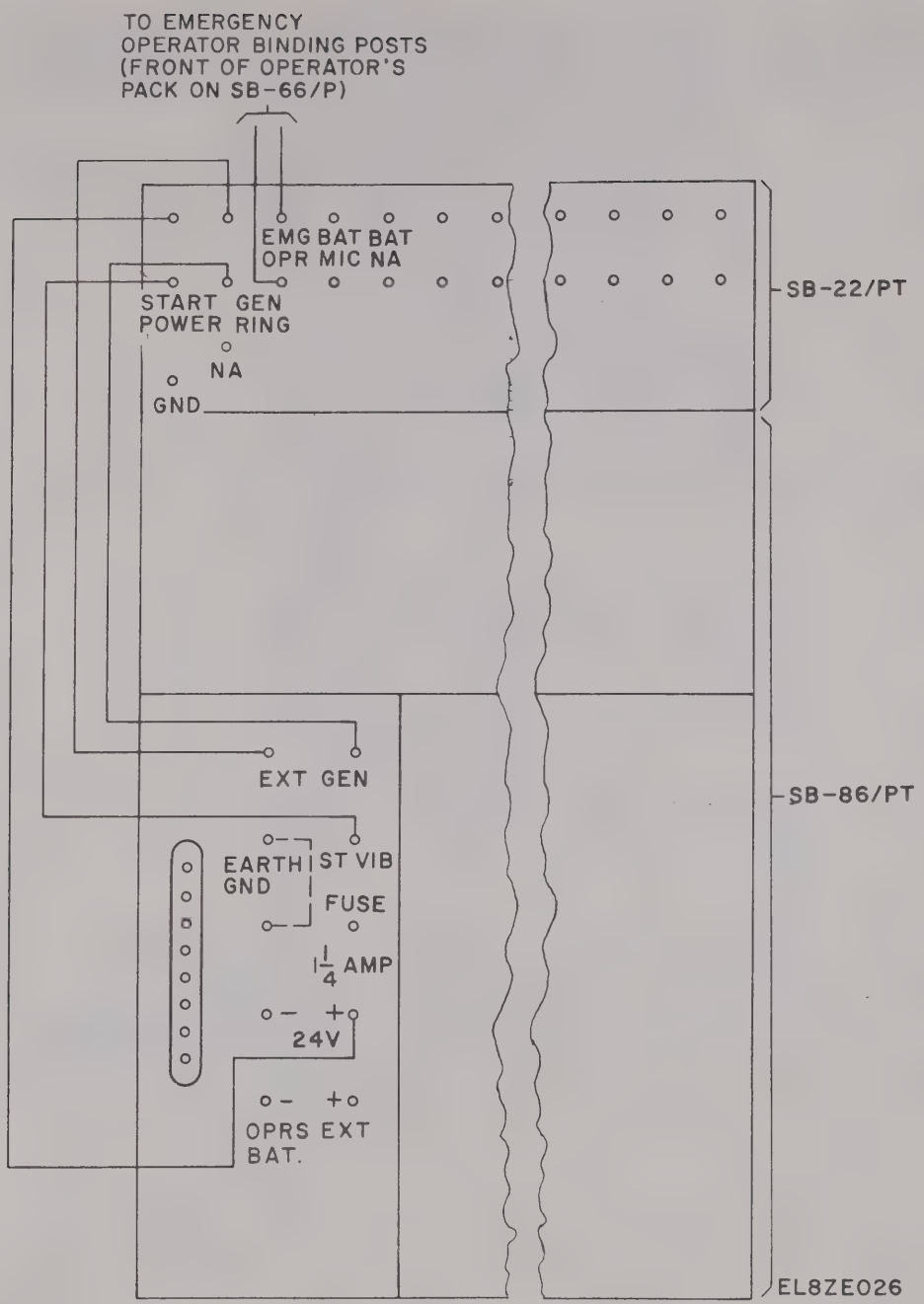
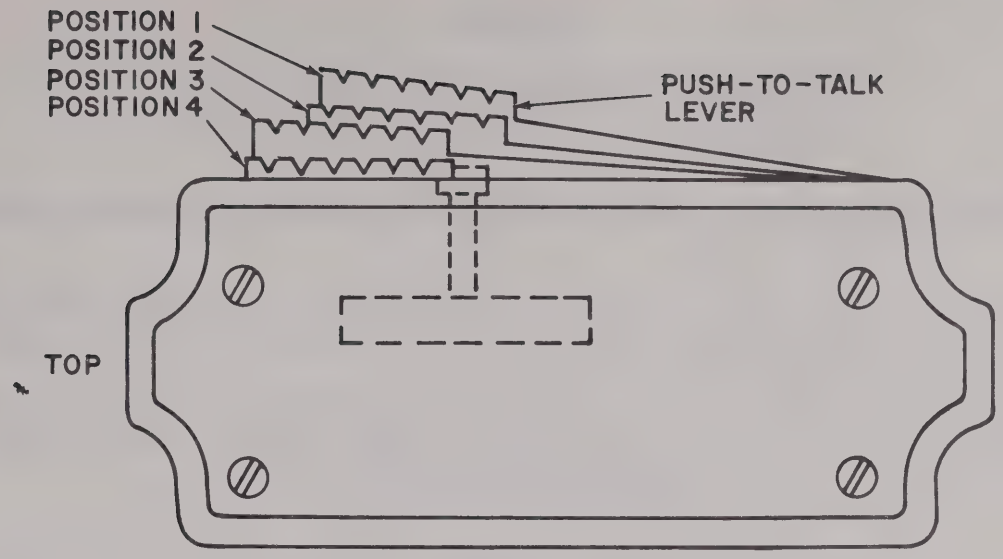


Figure 2-16. Connection Diagram for Switchboard and SB-86/P Operation.

d. Connect the GEN POWER RING (16) binding post at the rear of the switchboard to EXT GEN binding post at the rear of the operator's pack in the SB-86/P.

e. Connect one of the START POWER RING (17) binding posts on the switchboard to the ST VIB binding post on the SB-86/P, and connect the other START POWER RING binding post to the +24V binding post on the SB-86/P.

f. Connect the operator's telephone set connector to the operator's telephone set receptable on the front of the SB-86/P (fig. 2-15) so that it can be conveniently reached by the operator, and operate the push-to-talk lever to the continuous telephone transmission (position 3).



2-11. Remote Control Radio Circuit Connection (Switchboard Only)

a. Remove about three-fourths of an inch of insulation from each of the conductors in the remote control radio circuit.

b. Insert wire through the slit in the rubber gasket at the end of the switchboard.

c. Pull enough wire through the rubber gasket to reach the binding post on the desired line pack.

d. Connect the bare ends of the wire to the binding posts on the desired line pack.

e. Check the signal line to be sure it has not operated to the white position. If the signal is in the white position, insert the operator's cord into the associated jack and remove immediately. If the signal operates to white again, follow the procedure outlined in *f* below.

f. Remove wire from the binding posts. Reverse the conductors and reconnect them to the binding posts. Check the signal on the front of the line pack again.

CAUTION

The remote radio circuits must be correctly terminated on the switchboard to prevent the radio from operating continuously.

2-12. Connection for Teletypewriter Operation

a. Additional Line Packs. If more than 11 vf teletypewriter circuits are required, remove the operator's pack from the switchboard and install five line packs in its place as outlined in paragraph 2-6.

b. Connection of Lines and Trunks.

(1) Connect each teletypewriter line to a separate pair of binding posts at the rear of the switchboard (para 2-9).

CAUTION

DO NOT use ballpoint pen or magic marker on line pack designator strip. Use only grease pencil or soft lead pencil so it can be removed.

(2) Record the line designation in the space provided for each line on the front of the line pack and on the inside of the rear cover of the switchboard.

c. Connection of Telegraph Terminal TH-22/TG and Teletypewriter Set AN/PGC-1. The TH-22/TG and AN/PGC-1 are used by the operator to answer teletypewriter calls on the SB-22/PT. Follow the procedure outlined below to connect the TH-22/TG and AN/PGC-1 to the switchboard:

(1) Connect a piece of WD-1/TT to the line binding posts of the highest numbered line pack (fig. 2-17).

(2) Connect the other end of the WD-1/TT to the binding posts (2W-4WR) on Telegraph Terminal TH22/TG. Refer to TM 11-5805-356-12 for additional information concerning the TH-22/TG.

(3) Connect the teletypewriter to the TH-22/TG as explained in TM 11-5805-356-12.

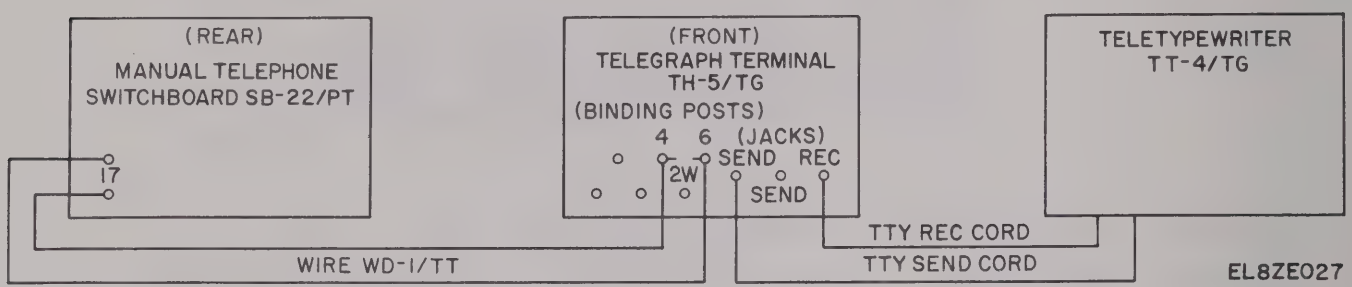


Figure 2-17. Connections for Teletypewriter Switching.

2-13. Connections for Teletypewriter Switching.

a. Connection.

(1) Connect the output binding posts of the external source of ringing current (para 1-12*c*) to the GEN POWER RING (fig. 2-16) binding posts at the rear of the switchboard.

(2) Connect the start leads of the external source ringing current to the START POWER RING binding posts at the rear of the switchboard, if they are required.

CAUTION

Do not connect the output binding posts of the external source of the ringing current to the START POWER RING binding posts.

b. Checks.

(1) Turn on the external source ringing current.

(2) Remove the plug of the operator's cord from the jack on the operator's pack and insert it into the jack of an idle line pack.

(3) Insert the plug on the cord of the idle line pack into the jack of the line pack with a field telephone connected.

(4) Operate the RING BACK-PWR RING FWD switch to PWR RING FWD. The ringer on the field telephone should sound.

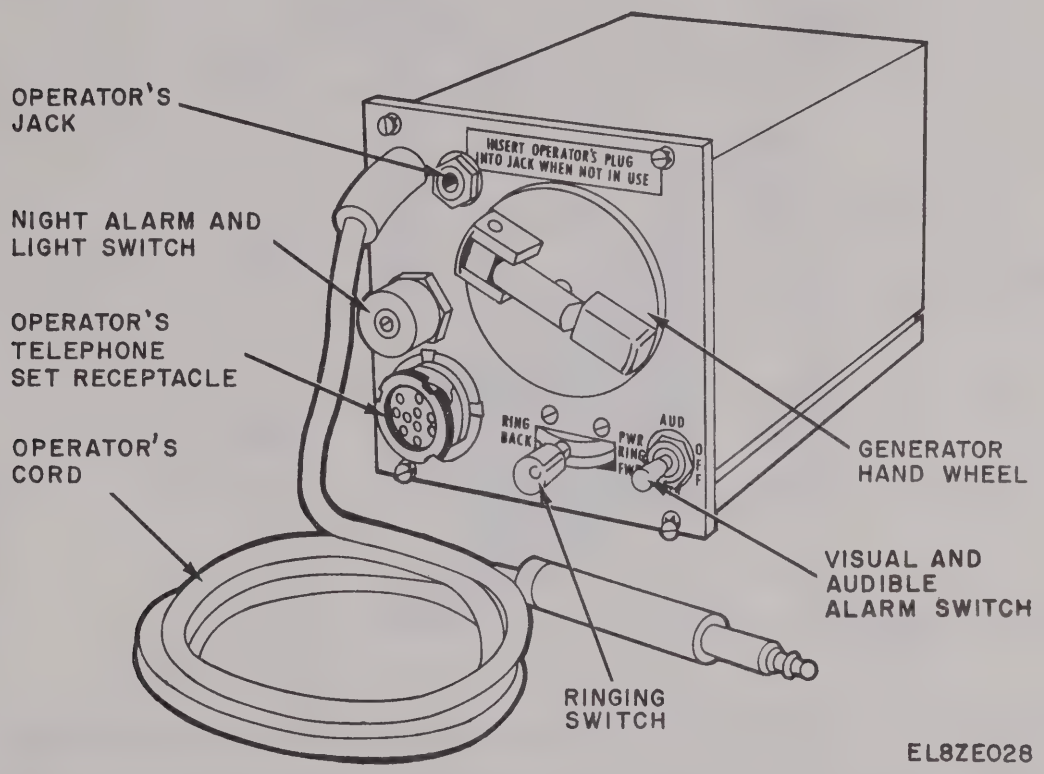
(5) Remove the plugs from the jacks. Allow the cord of the line pack to be retracted and insert the plug of the operator's cord into the jack on the operator's pack.

CHAPTER 3

OPERATING INSTRUCTIONS

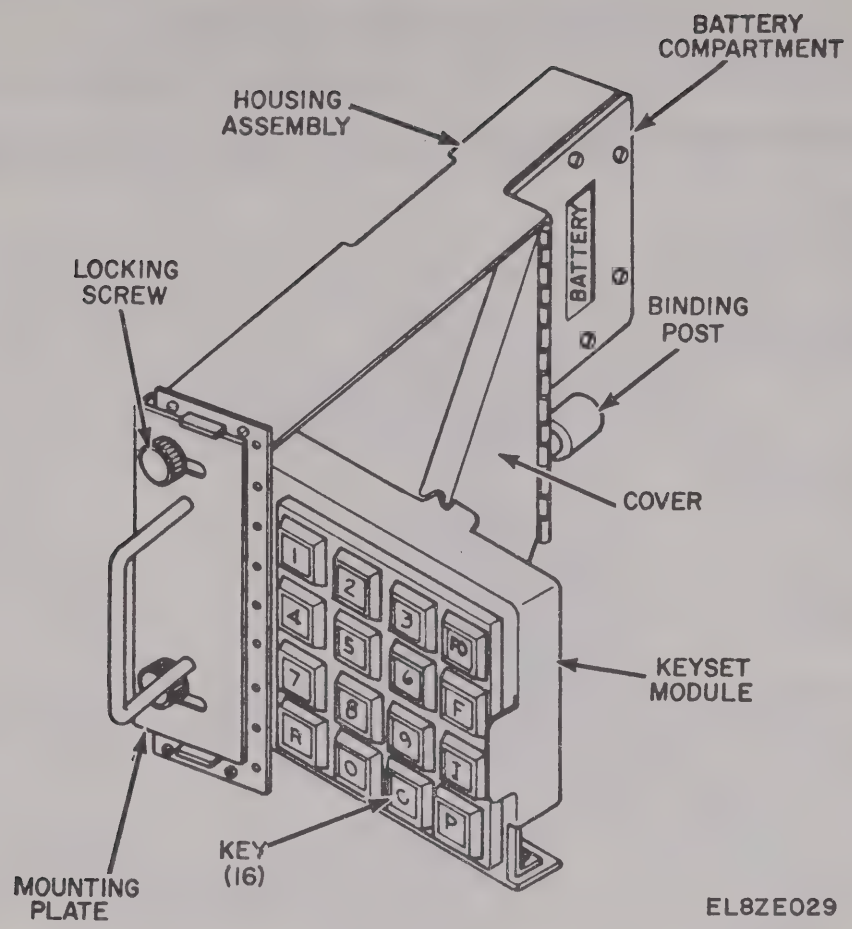
Section I. DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND INDICATORS

3-1. Operator's Pack



Operator's Jack	Disconnects the operator's telephone set battery when the operator's cord plug is inserted.
Night Alarm and Light Switch	NA-IN.....Permits the lamp to be used as a silent alarm. LITE-OUT.....Lights the lamp to illuminate the switchboard.
Operator's Telephone Set Receptacle	The location where the operator's handset (Plug U-161/U) connection is made.
Operator's Cord and Plug	Connects the operator's circuit to the line or the trunk pack.
Ringing Switch	RING BACK.....Connects ringing current to the calling party's line. PWR RING FWD.....Connects ringing current to the called party's line when an external source of ringing current is used.
Visual and Audible Alarm Switch	OFF.....Disconnects the alarm circuit. VIS.....Connects the lamp to the alarm circuit. AUD.....Connects a buzzer to the alarm circuit.
Hand Ringing Generator	Used with ringing switch to contact calling or called parties.

3-2. Tone Signaling Adapter



Locking Screw (2)	Used to hold and adjust mounting plate which attaches to switchboard.
Binding Posts (2)	Connect to EMG-OPR Binding posts on the switchboard.
Key (16)	Used to dial subscriber trunk line numbers in the same manner as a commercial telephone.

Section II. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

3-3. General

There are no PMCS for the switchboard. Routine checks like equipment inventory, cleaning, dusting, and washing, checking for frayed cables, stowing items not in use, covering unused receptacles and checking for nuts and bolts are not listed as PMCS checks. They are things that you should do anytime you see they must be done.

3-4. Readiness Reporting

Table 3-1 below lists readiness reporting criteria that can be noted as a result of monitoring the conditions of the equipment.

Table 3-1. Readiness Reporting Criteria

Component	Switchboard Ready/Available
Line Pack	If in seven or more line packs: *a.* Line pack signal indicators fail to turn white with incoming call. -OR- *b.* Line pack signal indicatiors fail to turn black when operator's cord is plugged in jack. -OR- *c.* Communications cannot be established.
Operator's Pack	*a.* Hand ringing generator fails to ring through a signal. -OR- *b.* Emergency telephone check fails to operate.
Trunk Pack **1**	*a.* Trunk pack signal indicator fails to turn white with incoming call. -OR- *b.* Trunk pack signal indicator fails to turn black when operator's cord is placed in jack. -OR- *c.* Communications cannct be established. -OR- *d.* Fails to produce ringing signal.
Tone Signaling Adapter **1**	Fails to produce tone signal.

1 If required for use.

Section III. OPERATION UNDER USUAL CONDITIONS

3-5. Preliminary Operating Procedures

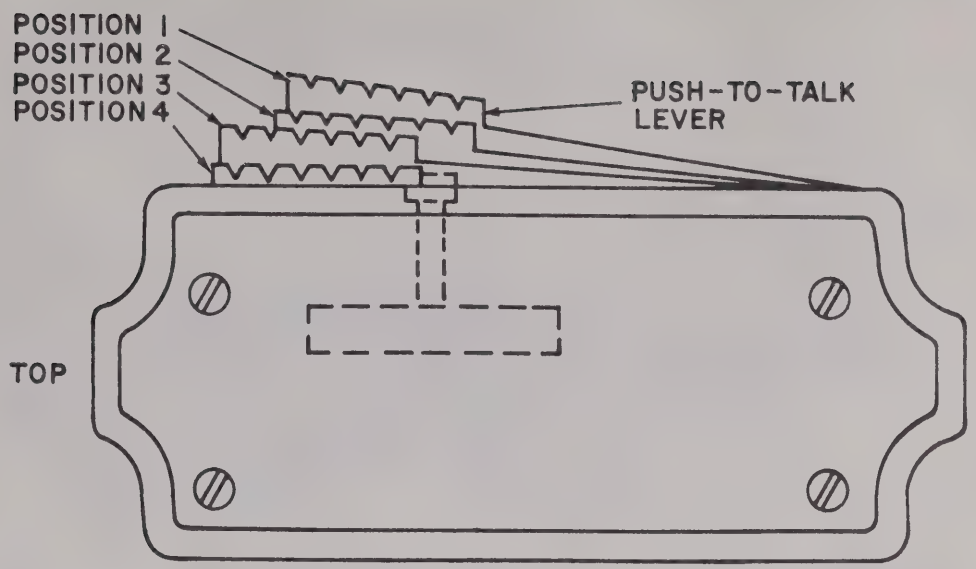
a. Put on the operator's telephone set and connect it to the switchboard as explained below.

(1) Extend the fold away earphone adjusting assembly and cushion adjusting assembly to their outward limits.
(2) Place the headband assembly on the head.
(3) Hold the earphone and earcup assembly in place over the ear and press down on the crown of the headband to slide the headband assembly smoothly into position.
(4) Position the cushion adjusting assembly for the maximum degree of comfort.
(5) Readjust both assemblies ((3) and (4) above) for maximum comfort.
(6) Loosen the tension nut on the swivel bracket assembly.
(7) Adjust the microphone boom assembly so that the microphone is approximately one-half inch from the lips.
(8) Tighten the tension nut ((6) above) on the swivel bracket assembly.
(9) Insert Connector Plug, Electrical U-161/U into the operator's telephone set receptacle on the switchboard and slowly rotate the connector clockwise with a steady forward pressure.
(10) When the guide pins of the connector ((9) above) are in the proper grooves, the connector will move forward and seat itself.
(11) Twist the knurled position of the connector to the right and pull sharply to set the connector.
(12) Clip the switchboard assembly to the front of your shirt.

b. If the operator must leave the switchboard, operate the visual and audible alarm switch (para 3-1) to VIS or AUD.

(1) Operate the night alarm switch to VIS when a silent alarm is required.
(2) Operate the night alarm switch to AUD when an audible alarm is required.
(3) Operate the visual and audible alarm switch to OFF when an alarm is not required.

c. If the switchboard is being operated in darkness, pull out on the lamp cap to turn the lamp on. The illuminating lamp cannot be used for the night alarm and to light the switchboard at the same time.
d. Insert the plug of the operator's cord into the operator's jack on the operator's pack.
e. Operate the push-to-talk lever and leave it in the monitoring position (position 1).



3-6. Connecting Local Calls

CAUTION

Be very careful to prevent the cords and the plugs from coming in contact with the ground when operating the switchboard. Carefully wipe the cord and the plug with a dry clean cloth if they accidentally drop onto the ground.

a. Answering Calling Party. Watch the signals on the front of the line packs. When the calling party signals the switchboard, the line signals turn from black to white. Follow the procedure outlined below to answer the incoming calls.

(1) Remove the plug of the operator's cord from the operator's jack and insert it into the jack associated with the white line signal (fig. 3-1).

(2) Obtain the called party's name or number from the calling party. Use standard operating procedure.

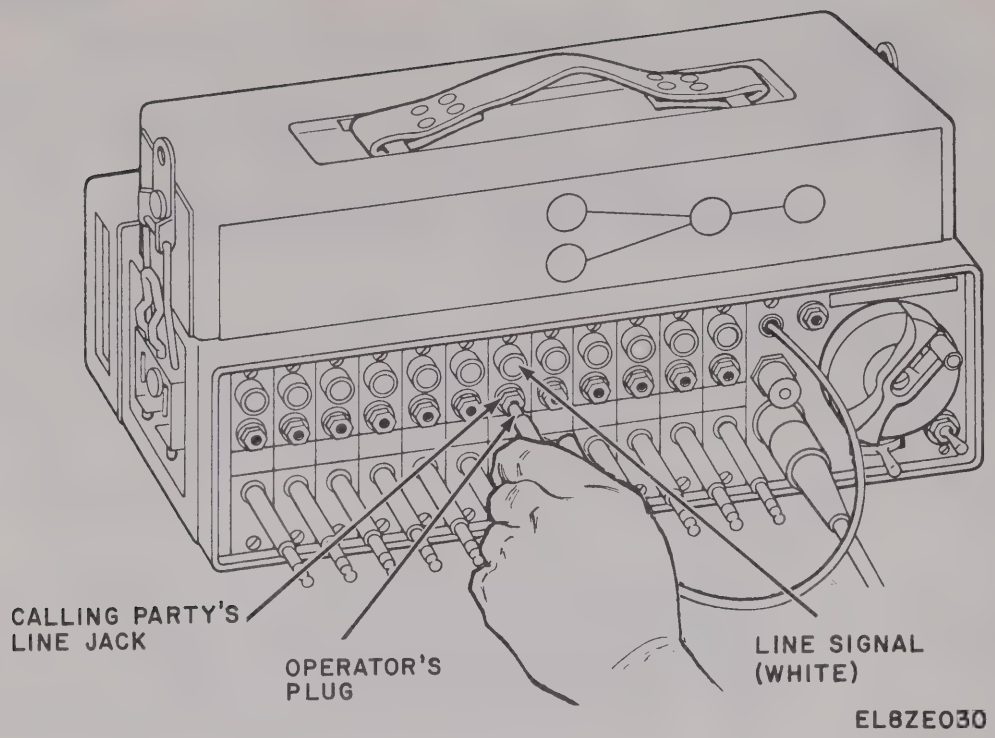


Figure 3-1. Answering Calling Party.

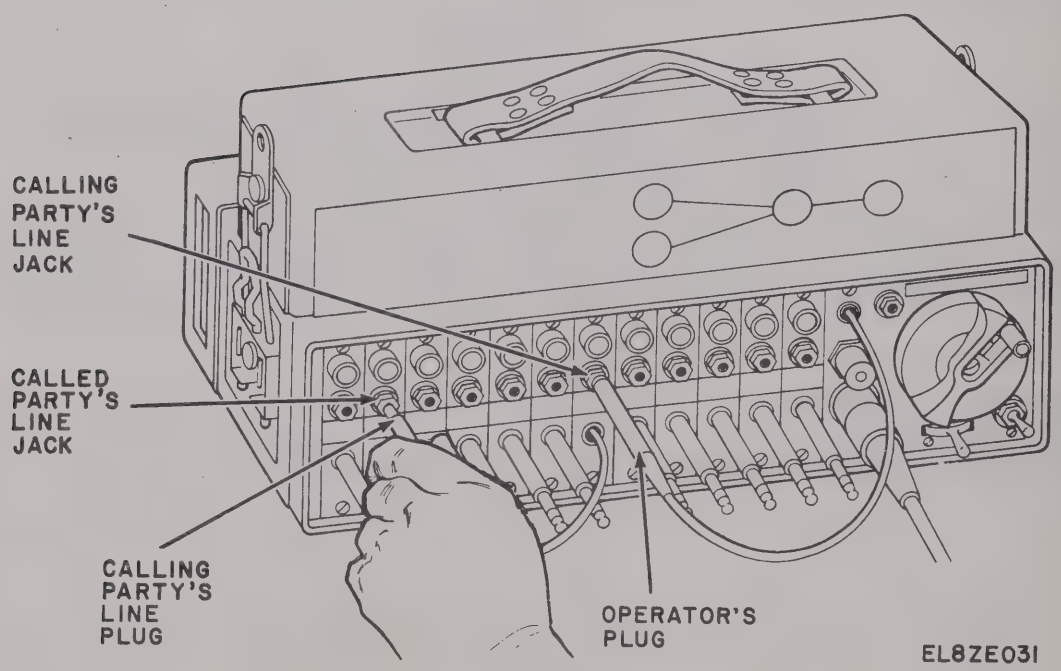


Figure 3-2. Connecting Calling Party of Called Party.

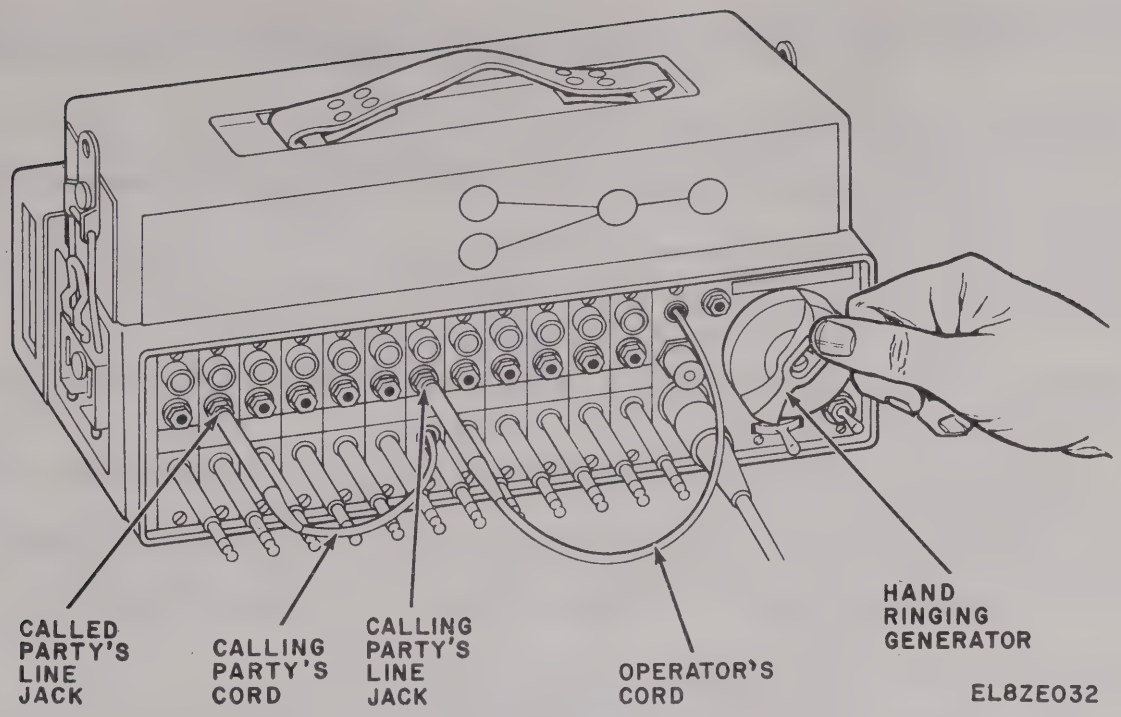


Figure 3-3. Signaling Called Party.

d. Challenging Ring-Off Signal. When the calling and called parties finish talking, both parties should ring off. The ring-off signal will cause the calling party's line signal to operate to white. Follow the procedure below to challenge a line:

(1) Remove the operator's plug from the operator's jack and insert it into the calling party's jack.
(2) Ask the parties if they have finished.
(3) If no answer is heard, disconnect the circuit.
(4) Remove the operator's plug from the calling party's jack and insert it into the operator's jack.

3-7. Connecting Outgoing Trunk Calls

a. Answering Calling Party.

(1) Remove the operator's cord from the operator's jack and insert it into the jack associated with line signal that has turned white.
(2) Obtain the name or number of the called party. Use standard operating procedures.

b. Connecting the Calling Party or Called Party.

(1) Pull out the cord on the calling party's line pack.
(2) Insert the calling party's plug into the called party's line jack (fig. 3-2).

c. Signaling Called Party (fig. 3-3).

(1) Turn the hand ringing generator rapidly approximately 10 turns. Do not operate the RING BACK-PWR RING FWD switch to either position.
(2) Wait for the called party to answer. After the called party answers, remove the operator's plug from the called party's jack and insert it into the operator's jack.

b. Passing the Number to Distant Operator (through Line Pack). When the calling party wants to talk to a party connected to another switchboard, use the following procedure to pass the number to the distant operator.

(1) Pull out the cord on the calling party's line pack.
(2) Insert the calling party's plug into the jack of the trunk to the distant switchboard.
(3) Turn the hand ringing generator to signal the distant operator. Do not operate the RING BACK-PWR RING FWD switch to either position.
(4) Pass the name or number of the desired party to the distant operator when the distant operator answers.
(5) Be sure the distant operator received the correct number; then remove the operator's plug from the line jack and insert it into the operator's jack.

c. Disconnecting Trunk Call (through Line Pack). Follow the procedures outlined below when the calling party's line signal turns white.

(1) Remove the operator's plug from the operator's jack and insert it into the calling party's line jack.
(2) Ask the party if they have finished.
(3) Turn the hand ringing generator to signal the distant operator. Do not wait for the distant operator to answer. Remove the plug from the trunk jack and let it retract into its line pack.
(4) Remove the operator's cord from the line jack and insert it into the operator's jack.

d. Connecting and Disconnecting Trunk Calls (through Trunk Pack).

(1) Connect the outgoing trunk call as explained in *b* above, but do not operate the hand ringing generator to signal the distant operator. Connecting the trunk call will open the circuit and signal the distant switchboard.
(2) Disconnect the trunk call as explained in *c* above, but do not operate the hand ringing generator to signal the distant operator.

CAUTION

Equipment at the distant end of the trunk circuit may be damaged if the hand ringing generator is operated.

3-8. Connecting Incoming Trunk Calls

a. Answering Incoming Trunk Calls.

(1) Remove the operator's plug from the operator's jack, and insert it into the jack associated with the white trunk signal.
(2) Obtain the name or number of the desired party.

b. Connecting Trunk to Called Party.

(1) Pull out the cord on the trunk line pack and insert it into the called party's line jack.
(2) Turn the hand ringing generator to signal the called party.
(3) Wait for the called party to answer. After the called party answers, remove the operator's cord from the trunk jack and insert it into the operator's jack.

c. Signaling Calling Party with Ring Back (fig. 3-4). If the calling party disconnects before the called party answers, follow the procedures outlined below to signal the distant operator:

(1) Remove the operator's plug from the operator's jack and insert it into the jack associated with the trunk circuit.

(2) Operate the RING BACK-PWR RING FWD switch to RING BACK.

NOTE

If the call is connected through the trunk pack, do not operate the RING BACK-PWR RING FWD switch.

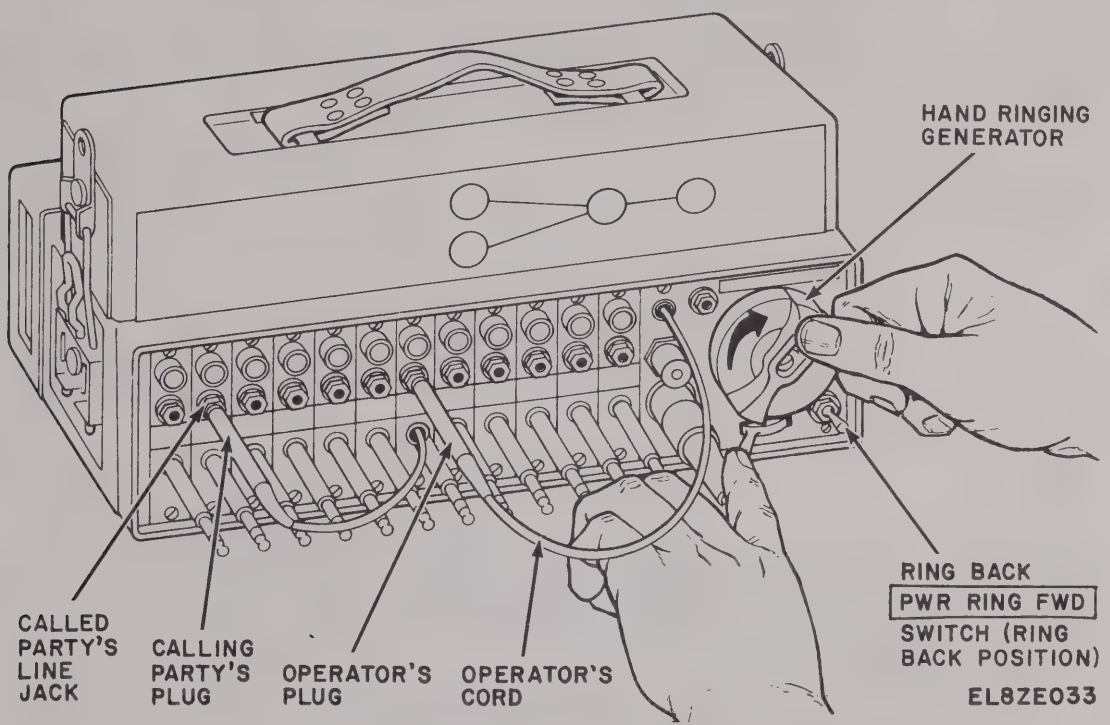


Figure 3-4. Signaling Calling Party with Ring Back.

(3) When the distant operator answers, tell the distant operator the name or number of the party that disconnected. The distant operator will signal the party connected to the distant switchboard.

(4) Wait for the conversation to start; then remove the operator's plug from the trunk jack and insert it into the operator's jack.

d. Disconnecting Incoming Trunk Call. Follow the procedure outlined below when the trunk signal turns white:

(1) Remove the operator's plug from the operator's jack and insert it into the trunk jack.

(2) Ask the parties if they have finished.

(3) Operate the RING BACK-PWR RING FWD switch to RING BACK, and turn the hand ringing generator to signal the distant operator. Do not wait for the distant operator to answer.

NOTE

If the call is connected through the trunk pack, do not operate the RING BACK-PWR RING FWD switch.

(4) Remove the plug from the called party's jack and let it retract into its line pack. Remove the operator's cord from the trunk jack and insert it into the operator's jack.

3-9. Recall Procedure, Local Calls

If the calling party fails to reach the called party or if the call is disconnected before the conversation is completed, follow the procedures given below to reconnect the calling and called parties when the call is completed through line pack.

a. Signaling the Calling Party with Ring Back (fig. 3-5). If the calling party disconnects before the called party answers, follow the procedure outlined below to signal the calling party.

(1) Remove the plug of the operator's cord from the operator's jack on the operator's pack and insert it into the calling party's jack.

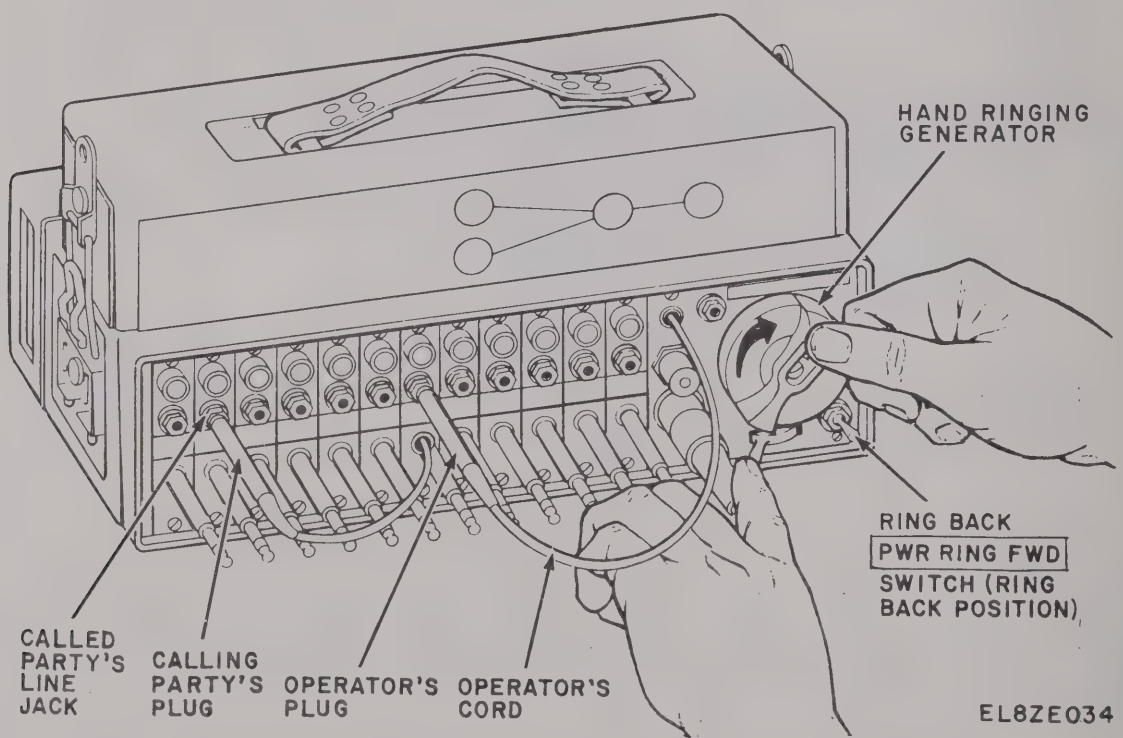


Figure 3-5. Signaling the Calling Party with SB-22/PT.

(2) Operate the RING-PWR RING FWD switch to RING BACK.
(3) Turn the hand ringing generator rapidly approximately 10 turns.
(4) Remove the operator's plug from the calling party's jack and insert it into the operator's jack on the operator's pack when both parties have answered.

b. Signaling Called Party. If the called party disconnects before the conversation is completed, follow the procedure given below to recall the called party.

(1) Remove the plug of the operator's cord from the operator's jack on the operator's pack and insert it into the jack of the calling party's line pack.
(2) Operate the hand ringing generator rapidly approximately 10 turns.
(3) Remove the plug of the operator's cord from the jack on the calling party's line pack and insert it into the operator's jack on the operator's pack after both parties have answered.

3-10. Recall Procedures, Trunk Calls

a. Line Pack. Recall procedures for trunk calls through line packs are the same as the recall procedures for local calls (para 3-9) except that the distant switchboard must signal the distant party.
b. Trunk Pack. If recall is necessary on a call completed through a trunk pack, the call must be disconnected and reconnected as explained in paragraphs 3-7 and 3-8.

3-11. Connecting Conference Calls

a. Request for Conference Call. When the operator answers a call, the party will tell the operator that a conference call is required. Follow the procedure outlined below to determine who is to be called:

(1) Ask the calling party who is to be included in the conference.
(2) Write down each party's name and number.
(3) Inform the calling party that he will be called as soon as all of the parties are on the line.

b. Signaling the Called Parties. Follow the procedure outlined below to signal each of the parties to be included in the conference:

(1) Insert the operator's plug into the line jack of the first party.
(2) Operate the RING-PWR RING FWD switch to RING BACK, and turn the hand ringing generator.
(3) Tell the called party to stand by for a conference call.
(4) Remove the operator's plug from the line jack and insert the plug of the party requesting the conference call into the line jack.
(5) Insert the operator's plug into the line jack of the second party.
(6) Operate the RING-BACK-PWR RING FWD switch to RING BACK. Inform the second party to stand by for a conference call.
(7) Remove the operator's plug from the line jack and insert the plug of the first party into the line jack.
(8) Repeat the procedure described in (1) through (7) above for all other parties to be included in the conference call.
(9) Insert the operator's cord into the line jack of the party requesting the conference call.
(10) Operate the RING BACK-PWR RING FWD switch to RING BACK, and turn the hand ringing generator. Inform the party that all the parties with the conference are on the line.
(11) Remove the operator's plug from the line jack and insert it into the operator's jack.

c. Disconnecting Conference Call. Follow the procedure outlined below when disconnecting a conference call:

(1) When the parties have finished, each party will ring off and the signal on the calling party's line will turn white.
(2) Remove the operator's plug from the operator's jack and insert it into the calling party's line jack. Ask the parties if they have finished.
(3) If no answer is received, remove the plugs from the jacks and allow them to be retracted into their respective line packs. Remove the operator's plug from the line jack and insert it into the operator's jack.

3-12. Connecting Teletypewriter Calls (Teletypewriter Operation)

a. Answering Incoming Calls. Watch the signals on the front of the line pack. When one of the signals turns white, follow the procedure outlined below to answer the call:

(1) Insert the plug of the line pack into the jack associated with the white signal.
(2) Use the teletypewriter to obtain the called party's name or number. Use standard teletypewriter operating procedures.

b. Connecting Called Party to Calling Party.

(1) Remove the plug of the operator's line pack from the calling party's line jack and insert it into the called party's line jack.
(2) Operate the RING switch on the TH-22/TG to RING.
(3) Wait for the called party to answer the incoming call. If the called party does not answer within 30 seconds, operate the FIGS key and the BELL key on the operator's teletypewriter.
(4) Inform the called party to stand by for a message.
(5) Pull out the cord on the called party's line pack and insert the plug into the line jack of the calling party. Instruct both parties to go ahead.
(6) Be sure the parties are connected, and then remove the line jack and let it retract into the operator's line pack.

c. Disconnecting Teletypewriter Calls. When the parties have finished, they will ring off by operating the RING switch of the TH-22/TG to RING, causing the line signal on the called party's line pack to operate to white. Follow the procedure outlined below to disconnect the call when the ringing off signal is received:

(1) Insert the operator's plug into the called party's line jack.
(2) Use the teletypewriter to ask the parties if they have finished. Wait for the parties to answer.
(3) If no answer is received, remove the called party's plug from the calling party's jack and let it retract into the line pack. Remove the plug of the operator's line pack from the called party's jack and let it retract into the operator's line pack

3-13. Connecting Teletypewriter Calls (Telephone Operation)

Teletypewriter circuits connected to the switchboard can be interconnected without using a teletypewriter set as an operator's set. When this type of operation is used, the calling party will request the number by voice (telephone). After the connection has been completed, the calling party will proceed with the teletypewriter operation. Refer to paragraph 3-6 for the telephone connecting procedure.

3-14. Connecting Push-To-Talk Radio with Switchboard and SB-86/P

a. Outgoing Calls. Follow the procedure outlined below when a party connected to the SB-86/P has been answered and requires the use of the push-to-talk radio circuit.

(1) Inform the calling party that the push-to-talk radio circuit is being used.
(2) Remove the answering cord from the calling party's jack (SB-86/P).
(3) Insert the plug of the line pack cord (switchboard) connected to the push-to-talk radio circuit.
(4) Insert the plug of the operator's cord (switchboard) into the line pack being used.
(5) Push the RING BACK-PWR RING FWD switch to RING BACK.
(6) Remove the plug of the operator's cord from the jack of the line pack (switchboard) when the radio wire integration equipment operator answers.
(7) When the calling and called parties have finished talking they will ring off, and the signal associated with the cord (switchboard) will operate to white. Insert the plug of the operator's cord into the jack of the line pack (switchboard) and challenge the circuit.
(8) Disconnect the line pack cord and the operator's cord, if both parties have been disconnected.

b. Incoming Calls. Use the following procedure to extend calls received from push-to-talk radio circuits connected to the switchboard.

(1) Insert the plug of the operator's cord into the jack associated with the signal indicating an incoming call from a push-to-talk radio circuit.
(2) Answer the incoming call.
(3) Insert the plug of the cord associated with the incoming signal (switchboard) into the called party's jack (SB-86/P).
(4) Operate the RING BACK-PWR RING FWD switch to PWR RING FWD (switchboard).
(5) Inform the called party that the push-to-talk radio circuit is being used.
(6) When the conversation is finished, both the parties will ring off, and the signal associated with the cord being used will operate to white. Disconnect the call after challenging the circuit.

3-15. Tone Signaling Adapter Operation — Connecting Outgoing Trunk Calls (fig. 3-6)

NOTE

The switchboard operator must make sure that the TA-312/PT has its CB/LB/CBS switch to CBS position.

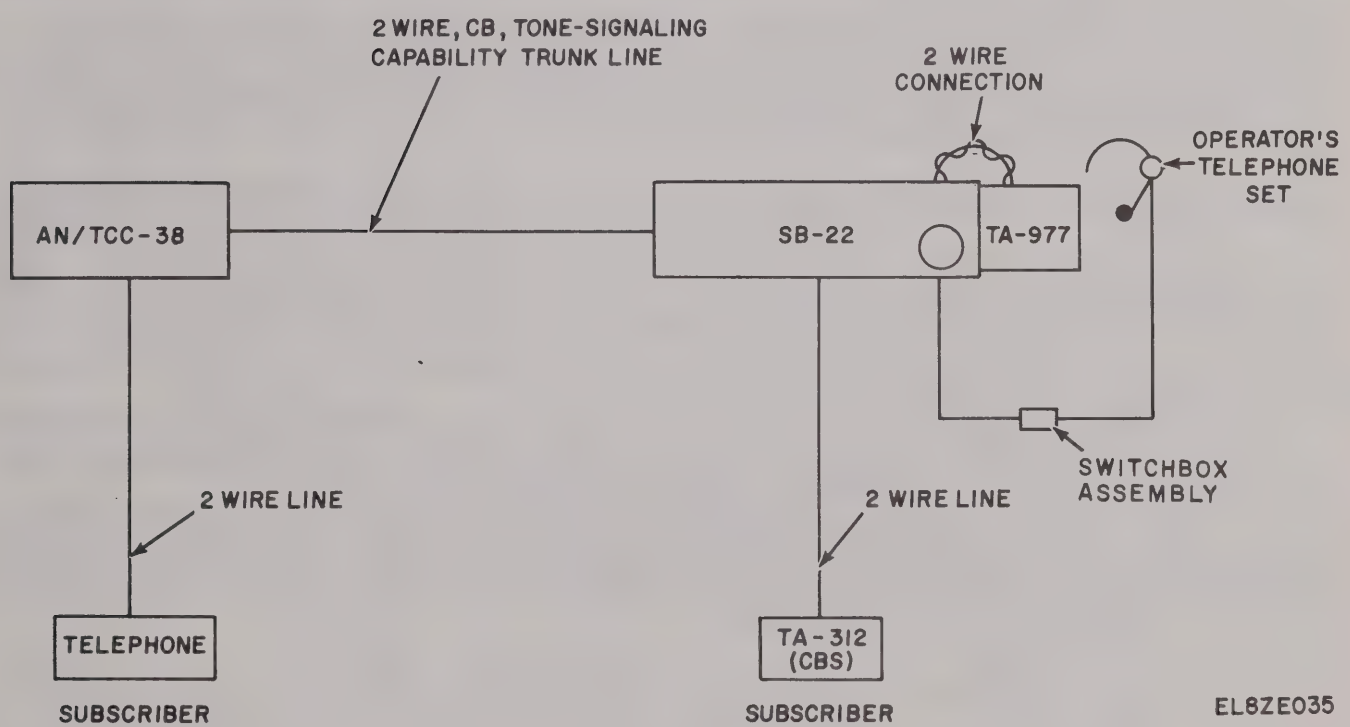


Figure 3-6. Tone Signaling Adapter — Connecting Outgoing Trunk Calls.

a. The local TA-312/PT subscriber signals the switchboard and informs the operator that communication is desired with a subscriber connected to the distant switchboard (SB-3614/TT).
b. The switchboard operator extends the call by plugging into the trunk jack and, using the hand ringing generator, signals the SB-3614/TT.

CAUTION

Do not operate the RING-PWR RING FWD switch.

c. When the distant switchboard recognizes the 20 Hz signal from the switchboard, the dial tone is connected to the switchboard.

NOTE

The calling party also hears the dial tone.

d. When dial tone is received, the switchboard operator uses the keyset on the adapter to dial the called party.

e. When the distant switchboard rings the called party, both the switchboard operator and the calling party hear the ringing.

NOTE

If the line is busy, both will hear the busy signal.

f. When the called party answers, the switchboard operator disconnects the operator's circuit by returning the operator's plug to the operator's jack.

g. The call is completed by either party going on ON HOOK. If the called party goes ON HOOK first, the distant switchboard sends a 20 Hz RING OFF signal to the switchboard indicating that the connection has been broken. If the calling party goes ON HOOK first, the calling party uses the hand ringing generator on the TA-312/PT to generate a RING OFF signal for both switchboards.

3-16. Tone Signaling Adapter Operation — Connecting Incoming Trunk Calls, 2 Wire, 20 Hz Ringdown (fig. 3-7)

a. The distant subscriber goes OFF HOOK and receives a dial tone. The subscriber then dials the number for the trunk line connecting the SB-3614/TT to the switchboard.

b. The switchboard operator answers the trunk signal by removing the operator's plug from the operator's jack and inserting it into the jack associated with the trunk signal.

c. After determining which switchboard subscriber is being called, the switchboard operator extends the call to the local subscriber in the normal manner. When the called party answers, the switchboard operator disconnects the operator's circuit by returning the operator's plug to the operator's jack.

d. The call is completed by either party going ON HOOK. If the calling party goes ON HOOK first, the distant switchboard sends a 20 Hz RING OFF signal to the switchboard indicating that the connection has been broken. If the called party goes ON HOOK first, the called party uses the hand ringing generator on the TA-312/PT to generate a RING OFF signal for both switchboards.

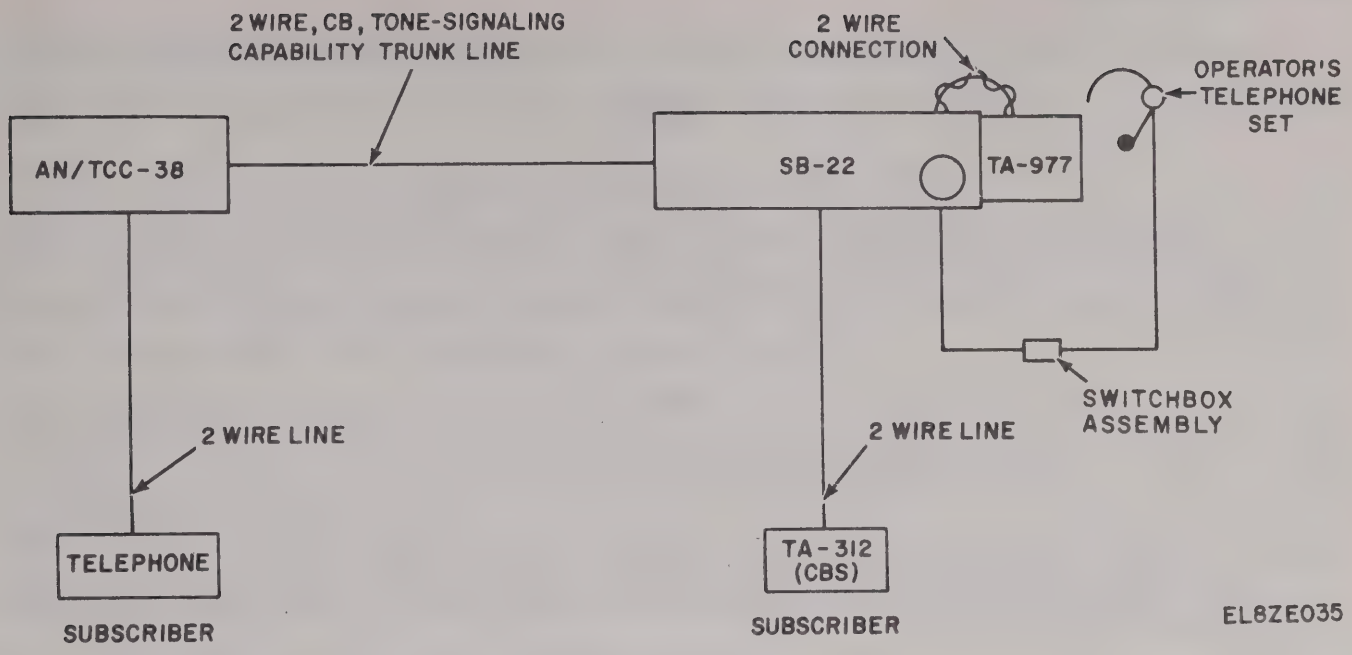
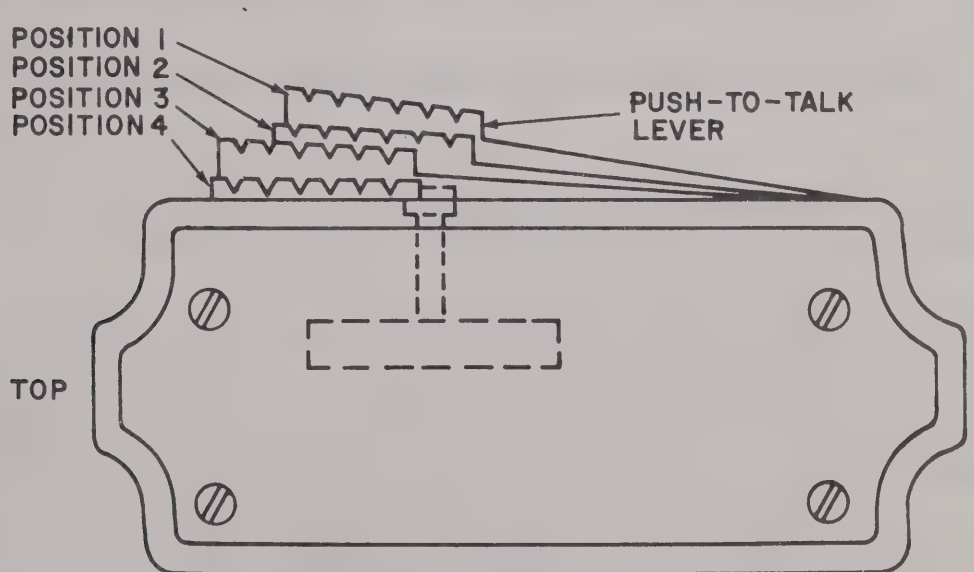


Figure 3-7. Tone Signaling Adapter — Connecting Incoming Trunk Calls, 2 Wire, 20 Hz Ringdown.

3-17. Tone Signaling Adapter Operation — Connecting Outgoing Trunk Calls, 2 Wires, CB, Tone Signaling

a. The local TA-312/PT subscriber signals the switchboard and informs the operator that communication is desired with a subscriber connected to a distant switchboard (AN/TTC-38).

b. The switchboard operator extends the call by plugging into the 2 wire, CB, tone signaling trunk line connected to the AN/TTC-38. While extending the call the switchboard operator holds the operator's PUSH-TO-TALK lever to the momentary radio transmission position (position 4). This simulates a dc closure.



c. When the distant switchboard recognizes the dc closure, dial tone is connected to the switchboard operator.

NOTE

The calling party also hears the dial tone.

d. When the dial tone is received, the switchboard operator uses the keyset on the adapter to dial the desired called party.

e. When the distant switchboard rings the called party, both the switchboard operator and the calling party hear the ringing.

NOTE

If the line is busy, both parties hear the signal.

f. When the called party answers, the switchboard operator returns the operator's PUSH-TO-TALK lever to the monitoring telephone or radio position (position 1) and returns operator's plug to the operator's jack.

g. After the call is completed, a RING OFF signal can only be generated by calling the party using the hand ringing generator on the TA-312/PT.

3-18. Tone Signaling Adapter Operation — Connecting Incoming Trunk Calls, 2 Wires, CB, Tone Signaling

a. The distant subscriber (calling party) goes OFF HOOK, receives a dial tone, and dials the number for the trunk line connected to the switchboard.

b. While answering the trunk signal, the switchboard operator holds the PUSH-TO-TALK lever to the MOMENTARY radio transmission (position 4) (para 3-17). The lever is held in this position while extending the call and until the called party answers.

c. When the called party answers, the operator returns the operator's PUSH-TO-TALK lever to position 1 and return the operator's plug to the operator's jack.

d. After the call is completed, a RING OFF signal can only be generated by the called party using the hand ringing generator on the TA-312/PT.

Section IV. OPERATION UNDER UNUSUAL CONDITIONS

3-19. General

Operation of the switchboard may be difficult in regions where extreme heat, cold, moisture and adverse weather conditions prevail. Procedures for minimizing these effects are given below.

a. Operations in Extremely Cold Climates. Keep the equipment warm and dry. Do not bend the cord sharply and do not release the cords so they retract rapidly and cause the plug to strike the front of the line packs.

b. Operation in Warm, Damp Climates. Keep the equipment as dry as possible. Wipe the equipment with clean, dry lint free cloth to prevent moisture from accumulating.

c. Operation in Hot, Dry Climates. Protect the equipment from sand and dust. Check the equipment frequently. Keep the equipment clean.

3-20. Connection of Emergency Operator's Set

If the operator's set is damaged so that it cannot be used, a field telephone may be used for emergency operations. Follow the procedure outlined below to connect the field telephone to the switchboard.

a. Disconnect the operator's telephone set from the operator's pack.
b. Secure the field telephone to the switchboard so that it is convenient to the operator.
c. Connect one end of a short piece of Wire WD-1/TT to the line binding posts on the field telephone.
d. Connect the other end of the WD-1/TT to the EMG OPR binding post at the rear of the switchboard.

3-21. Operation Using Field Telephone for Operator's Telephone Set

To use a field telephone as the operator's telephone set, be sure it is connected to the switchboard as explained in paragraph 3-5. Operate the switchboard as explained in paragraphs 3-6 through 3-14; use the handset of the field telephone instead of the operator's telephone set. Follow the procedure outlined below when operating the switchboard with the field telephone.

a. Hold the receiver against the ear with the transmitter positioned in front of the lips.
b. Depress the PUSH-TO-TALK switch on the side of the handset handle to talk to the calling or called party.

3-22. Operation Using External Source of Ringing Current

To operate the switchboard with external ringing current, check with the installer to be sure that the ringing equipment is connected to the switchboard (para 2-13). Operate the switchboard as explained in paragraphs 3-6 through 3-14, except for the hand ringing generator. Operate the RING BACK-PWR RING FWD switch to PWR RING FWD to signal the called party; operate it to RING BACK to signal the calling party. *Do not operate the hand ringing generator at any time.*

3-23. Connection of Emergency Battery Supply

If Batteries BA-30 are not available, follow the procedure outlined below to provide the necessary direct current for the operation of the switchboard.

a. Connection of Batteries.

(1) Select four dry cell batteries, such as Battery BA-23.
(2) Connect two of the batteries in series to provide 3 volts.

CAUTION

Do not connect more than 3 volts to the switchboard.

(3) Connect the other two batteries in series to provide another 3-volt battery.

b. Connecting Batteries to Switchboard.

(1) Disconnect the wires from the BAT NA and the BAT MIC binding post at the rear of the switchboard.
(2) Connect one of the 3-volt batteries (*a* above) to the BAT MIC binding posts.
(3) Connect the other 3-volt battery (*a* above) to the BAT NA binding posts.

CHAPTER 4

OPERATOR MAINTENANCE

Section I. LUBRICATION

There is no lubrication required for the switchboard.

Section II. TROUBLESHOOTING PROCEDURES

4-1. General

Troubleshooting at the operational level is done in response to problems noted while operating the equipment. It consists of performing the portion of the switchboard troubleshooting table (table 3-1) that pertains to the trouble being noted.

4-2. Troubleshooting Table

a. Table 4-1 lists the common malfunctions that you may find during the operation or maintenance of the switchboard or its components. You should perform the test/inspections and corrective actions in the order listed.

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

NOTE

Tag faulty equipment with fault and conditions under which the fault was detected.

Table 4-1. Switchboard Troubleshooting

- **Malfunction**
  - **Test or Inspection**
    - **Corrective Action**

1. Communication cannot be established.
   a. Check for open lines or connections.
   Repair breaks or connections.
   b. Check subscriber for inoperative field telephones.
   Replace defective field telephones.
   c. Switch circuit to a good line or trunk pack.
   Replace line or trunk pack.
   d. Switch operator's headset.
   Replace inoperative headset if problem corrected, or replace operator's pack.

2. Line signal stays black or flutters when call is received, communications already established.
   Switch circuit to a good line or trunk pack.
   Replace defective line or trunk pack.

3. Line signal stays white when operator's plug is in jack.
   Switch circuit to a good line or trunk pack.
   Replace defective line or trunk pack.

Table 4-1. Switchboard Troubleshooting — Continued

● Malfunction ● Test or Inspection ● Corrective Action
4. Operator's pack fails to generate a ringing signal at called party or at the calling party, communications already established.
Check batteries and attempt to ring through.
Replace batteries, if necessary.
Replace operator's pack.
5. Illuminating lamp fails to light or night alarm fails to operate visual (VIS) signal.
Check batteries and lamp.
Replace batteries, lamp or operator's pack.
6. Night alarm fails to operate audible (AUD) signal.
Check batteries.
Replace batteries; if situation is not corrected, replace operator's pack.
7. No sidetone in operator's telephone set when PUSH-TO-TALK switch is operated and operator's plug is removed from operator's jack.
Switch operator's telephone set.
Replace defective operator's telephone set if corrected, otherwise, replace operator's pack.

Section III. MAINTENANCE PROCEDURES

4-3. Introduction

The maintenance duties assigned to the operator of the switchboard do not require tools or test equipment other than those issued with the set.

4-4. Cleaning

Inspect the exteriors of the switchboard and the operator's telephone set and the tone adapter. The exterior surfaces should be clean, free of dust, dirt, grease and fungus.

a. Remove dust and loose dirt with a clean soft cloth.

WARNING

Adequate ventilation should be provided while using TRICHLOROTRIFLUOROETHANE. Prolonged breathing of vapor should be avoided. The solvent should not be used near heat or open flames; 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 solvent cannot penetrate. If solvent is taken internally, consult a physician immediately.

b. Remove grease, fungus and ground in dirt from the cases; use a cloth dampened with TRICHLOROTRIFLUOROETHANE.

CAUTION

Be careful when cleaning plugs and jacks; dust and dirt forced into jacks will cause malfunctions.

c. Remove dust and dirt from plugs and jacks with a brush. Do not use crocus cloth, emery or other such abrasive materials.

d. Clean the front panels, switch handles and keys, generator crank; use a soft clean cloth. If it is difficult to remove dirt, dampen the cloth with water and mild soap to make cleaning more effective.

e. Clean rust and corrosion from metal surfaces by lightly sanding them with fine sandpaper. Brush two thin coats of paint on the bare metal to protect from further corrosion. Refer to applicable cleaning and refinishing practices specified in TM 43-0139.

4-5. Replacement of Batteries

Replace batteries as indicated in paragraph 2-3.

4-6. Replacement of Night Alarm Lamp or Lite-Out-NA-IN Knob

a. Removal of Lamp.

(1) Pull the LITE-OUT-NA-IN knob to the LITE-OUT position.

CAUTION

Do not use any tools to remove the knob from the switchboard.

(2) Turn the knob counterclockwise to unscrew it from the mounting.
(3) Push in on the lamp and turn it about one-fourth turn counterclockwise. Slide the lamp out of the lampholder.

b. Installation of New Lamp.

(1) Slide a lamp known to be in good condition into the lampholder. Be sure to aline the lugs on the lamp with the grooves in the lampholer.
(2) Push the lamp in and turn it clockwise to lock it in the lampholder.
(3) Screw the LITE-OUT-NA-IN knob on the mounting. Tighten the knob finger tight.
(4) Check the light to be sure it lights when the knob is pulled out, and goes out when the knob is pushed in.

4-7. Replacement of Operator's Pack

a. Removal of Operator's Pack.

(1) Remove the operator's pack from the switchboard case as explained in paragraph 2-6*c* above.
(2) Inspect the inside of the switchboard case for damage that may prevent the new operator's pack from being installed.

b. Installation of New Operator's Pack.

(1) Connect the operator's telephone set to the receptacle on the front of the new operator's pack.

CAUTION

Do not force the operator's pack into the switchboard case.

(2) Grasp the connector and slide the new operator's pack into the switchboard case.
(3) Tighten the captive screws located at each corner of the operator's pack. Do not strip the screws.
(4) If a line pack was removed from the switchboard case to free the operator's pack, replace the line pack (para 4-6*b*).

4-8. Replacement of Line or Trunk Pack

a. Removal of Line or Trunk Pack.

(1) Unscrew the captive screw located at the top and the bottom of the line pack.
(2) Insert the plug of the cord into the jack of the pack.
(3) Grasp the plug and pull the pack out of the switchboard case. Be sure to pull the pack straight out of the switchboard case to prevent bending the plug or the jack.
(4) Remove the plug from the jack and mark the pack with a tag. Write the trouble or suspected trouble on the tag.

b. Installation of New Line or Trunk Pack.

(1) Select a pack known to be in good condition. Insert the plug into the jack.
(2) Aline the pack with the space in the switchboard case. Be sure it is positioned correctly.
(3) Slide the new pack into the switchboard case. Do not force the pack into the switchboard case.
(4) Tighten the captive screws at the top and the bottom of the pack. Do not break or strip the screws.

CHAPTER 5

ORGANIZATIONAL MAINTENANCE

Section I. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

There are no organizational PMCS.

Section II. TROUBLESHOOTING PROCEDURES

Organizational and operator troubleshooting procedures are essentially the same (table 4-1).

Section III. MAINTENANCE PROCEDURES

5-1. General

a. Organizational maintenance consists of repair of the operator's telephone set.
b. The required tools include Tool Equipment TE-33.

5-2. Repair of Operator's Telephone Set

a. Replacing the microphone element (fig. 5-1).

(1) Remove the microphone mouthpiece (3) by turning counterclockwise.
(2) Remove the microphone element (1) from the microphone case (4) and remove the O-ring from the microphone element.
(3) Replace the O-ring on the microphone element.
(4) Insert the microphone element in the microphone case.
(5) Turn the microphone mouthpiece clockwise onto the microphone case.

NOTE

For repair parts refer to TM 11-5965-283-20P.

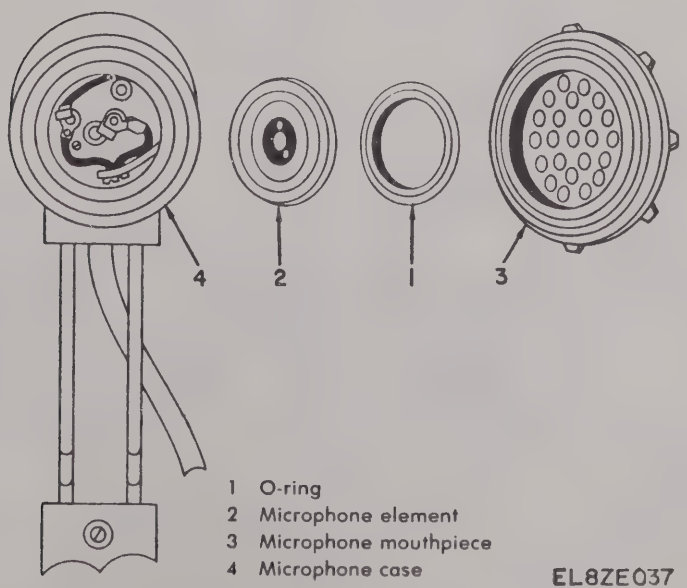


Figure 5-1. Microphone, Exposed View.

b. Replacing earphone element (fig. 5-2)

(1) Pull out one side of the cradle (5) from the earphone cup assembly (6).
(2) Slide the cradle off the earphone cup assembly.
(3) Lift off one part of the cushion (1) from the retainer plate (3).
(4) Peel the cushion from the earcup assembly.
(5) Remove the four screws (2) until the retainer plate is free from the earphone cup assembly.
(6) Remove the earcup mounting screw (9) and remove the earcup cover (8).
(7) Unscrew the two terminal screws (10) and gently remove the terminals from the cord (11).
(8) Remove the two earphone mounting screws (7) with their O-rings from the earphone cup assembly (6).
(9) Hold the earcup in one hand and tap gently but firmly against the palm of the other hand until the earphone element (4) falls free.
(10) Place the earphone element in the earcup, taking care to position the holes for the earcups mounting screws.
(11) Place the two earphone mounting screws with their O-rings in the earphone cup assembly.
(12) Place the two terminal screws in their terminals on the cord and screw them into the earphone element. Insure that ground terminal is positioned.
(13) Place the earcup mounting screw in the earcup cover and fasten the earcup cover.
(14) Place the retainer plate on the earphone cup assembly. Replace the four screws that hold the retainer plate to the earphone assembly.
(15) Replace the cushion on the retainer plate.
(16) Replace the cradle on the earphone cup assembly.

1 Cushion with filler
2 Screws
3 Retainer plate
4 Earphone element
5 Cradle
6 Earphone cup assembly
7 Earphone mounting screws
8 Earphone cover
9 Earcup mounting screw
10 Terminal screws
11 Cord
12 Pad, headband
13 Swivel assembly
14 Guide boom assembly
15 Gasket
16 Packing, preformed
17 Breather
18 Pivot, retaining ring and pivot plate

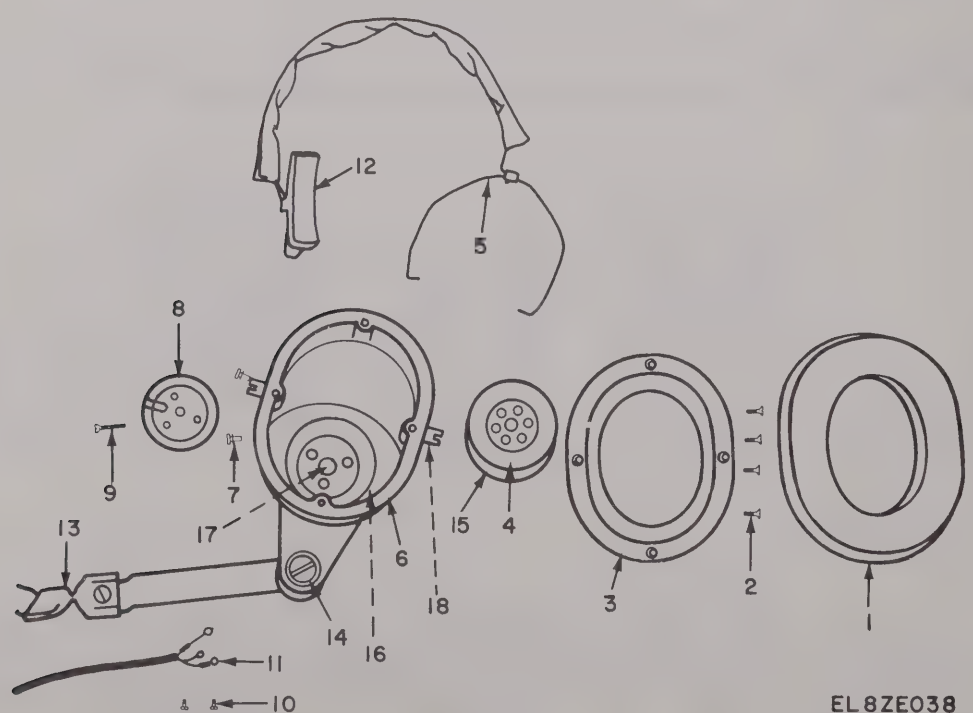


Figure 5-2. Operator's Telephone Set, Earphone Assembly.

5-3. Repair of Trunk or Line Jack (fig. 5-3)

a. A broken window assembly is repaired by unscrewing it from the mount as shown below and replacing with a new item.

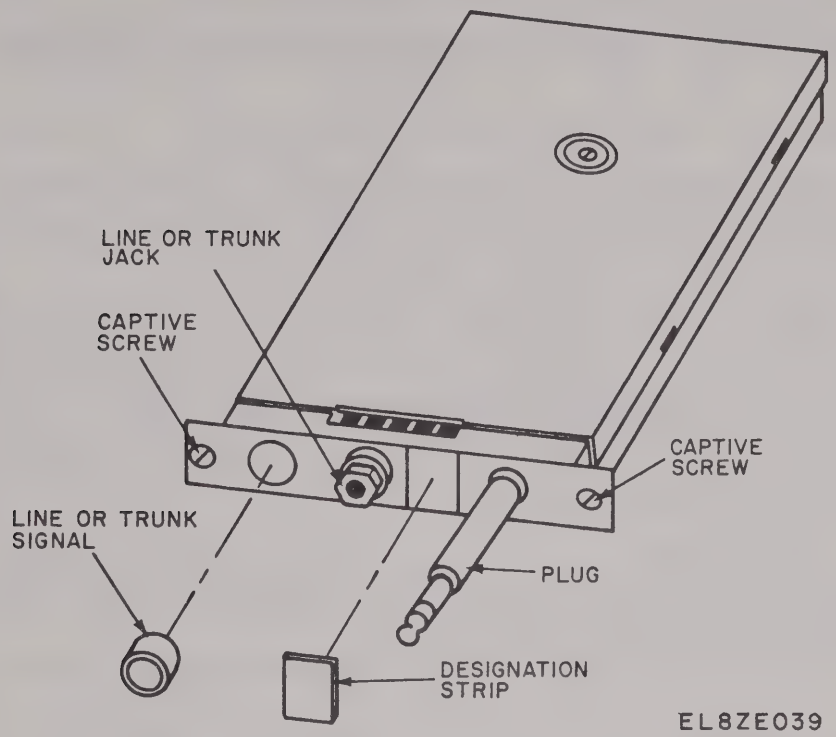


Figure 5-3. Repair of Trunk or Line Jack.

b. The designation strip is repaired by replacing the existing with a new strip. It has a peel-away backing that allows you to stick it on the trunk or line jack.

5-4. Removal and Replacement of Spring Contacts (Spring Clips) (fig. 5-4)

a. Remove the battery case assembly. This exposes the spring clip with their terminal assemblies and mounting hardware.

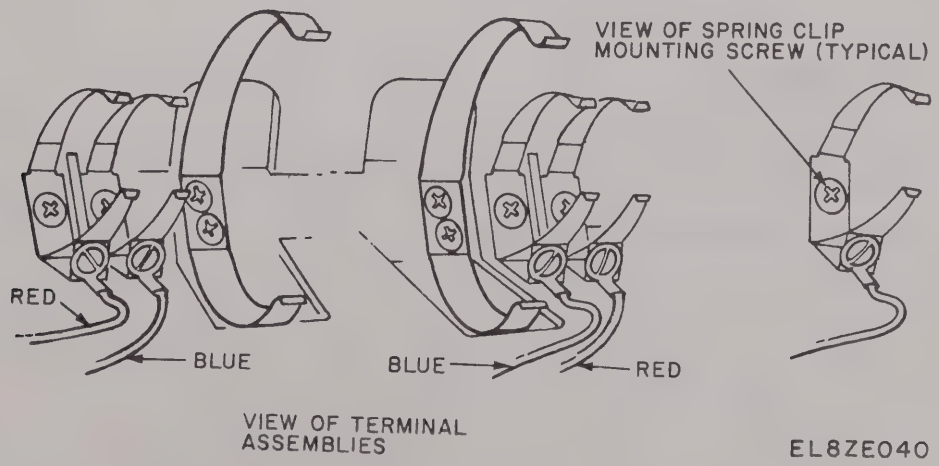


Figure 5-4. Repair of Spring Contacts (Spring Clips).

b. Remove either the red or blue wire from the terminal assembly, retain the hardware.
c. Remove the spring clip by removing screw MS35214-23 and lockwasher MS35333-37.
d. Replace the spring clip by attaching it to the case assembly with screw MS35214-23 and lockwasher MS35333-37
e. Replace the red or blue wire using the hardware retained in *b* above.

Section IV. PREPARATION FOR STORAGE OR SHIPMENT

5-5. Disassembly

a. If the tone assembly adapter is mounted, disassemble and pack it (para 5-6*d* below).
b. Open the rear door of the switchboard and disconnect the line wires and the ground strap.
c. Remove the battery case and remove all batteries. Replace the battery case in the rear compartment.
d. Close the rear cover. Set the switchboard upright on the rear door.
e. Disconnect the operator's telephone set from the operator's pack and place it in the switchboard cover. Strap it in position with the retaining straps.
f. Remove the operator's plug from the operator's jack and lay the cord on the line packs.
g. Fold the handle on the hand ringing generator handwheel into the wheel.
h. Replace the front cover.

5-6. Packing for Shipment or Limited Storage

a. The exact procedures for repacking depends on the material available and the conditions under which the equipment is to be shipped or stored. Adapt the procedures outlined below whenever possible. The information concerning the original packing (para 2-1) will also be helpful.
b. The following materials are required for packing the switchboard, for stock numbers of materials, consult SB 38-100.

Materials	Quantity
Corrugated cardboard	23 sq ft
Waterproof paper	23 sq ft
Waterproof tape	30 running ft
Moisture-vaporproof barrier	12 sq ft
Nailed wooden box	9½ x 28½ x 16½
Steel strap, ½ inch	14 running ft

c. To pack the operator's telephone set see figure 5-5.

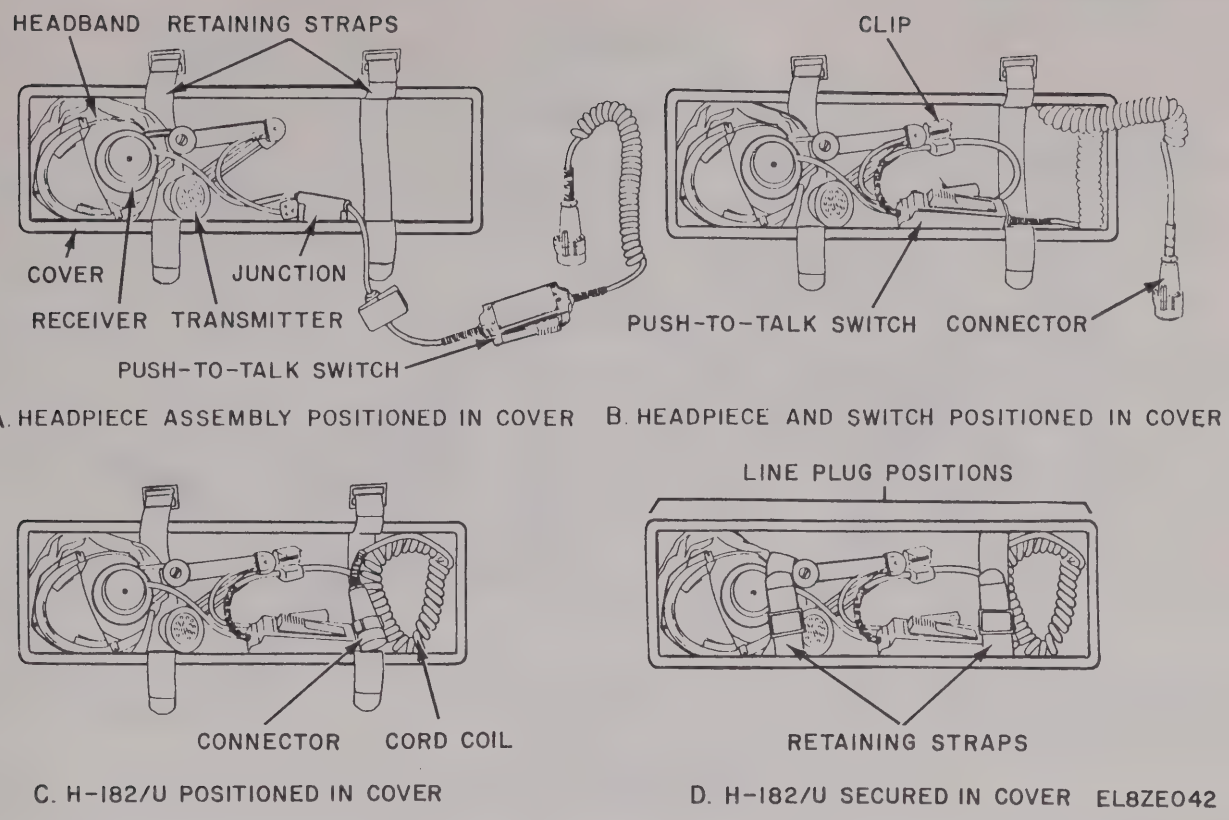


Figure 5-5. Operator's Telephone Set.

d. To disassemble and pack the tone signaling adapter perform the following (fig. 5-6).

(1) Remove any field wire used in connections.
(2) Remove end of cover from detent (3) in the rear of the keyset module. Swing to open position.
(3) Place keyset module to the closed position.

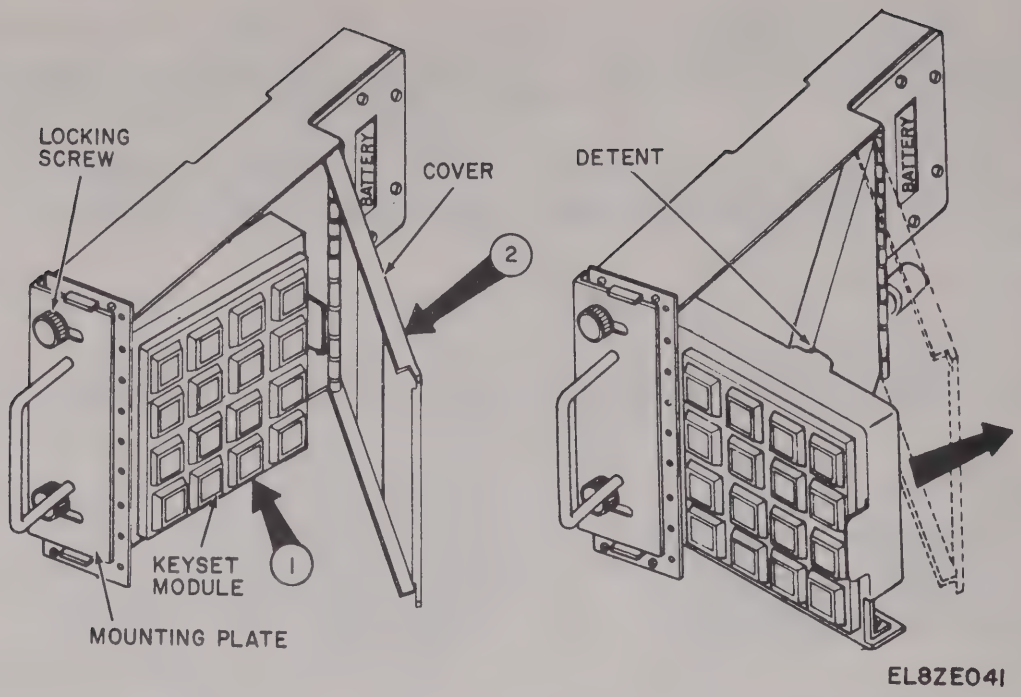


Figure 5-6. Disassembly of Tone Signaling Adapter.

(4) Unloosen locking screws and move mounting plate so tone signaling adapter can be moved away from the switchboard.

(5) Remove battery compartment cover and remove BA-90.

(6) Place the tone signaling adapter in the accessory kit.

5-7. Packing

a. Wrap the switchboard and the accessory kit in waterproof paper and seal the package with waterproof tape.

b. Wrap the switchboard and the accessory kit in corrugated cardboard and seal the package with waterproof tape.

c. Line the wooden box with moisture-vaporproof barrier.

d. Place the switchboard and the accessory kit in the nailed wooden box.

e. Place the cover on the nailed wooden box and secure it in place with nails.

f. Place the steel straps around the box and secure them in accordance with the recommended procedures.

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	FSC Class 6135; Dry Battery Supply Data.
SB 38-100	Preservation, Packaging, Packing and Marking Materials, Supplies, and Equipment Used by the Army.
TB 43-0118	Field Instructions for Painting and Preserving Electronics Command Equipment Including Camouflage Pattern Painting of Electrical Equipment Shelters.
TM 11-2134	Manual Telephone Switchboard SB-86/P; Installation and Operation (NSN 5805-00-503-2660).
TM 11-2146	Central Office, Telephone, Manual, AN/TTC-7 (NSN 5805-00-395-9422) and AN/TTC-7A (NSN 5805-00-820-9549); Telephone Central Office Group, Manual, AN/GRA-14(V) (NSN 5805-00-892-1081) and Telephone Circuit Trunk Relay, TA-276/TTC (NSN 5805-00-503-3347).
TM 11-5805-201-12	Operator 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 Telephone Set TA-312/PT (NSN 5805-00-543-0012).
TM 11-5805-298-15	Operator's, Organizational, Direct Support, General Support and Depot Maintenance Manual: Generators, Ringing, Static TA-248/TT and TA-248A/TT (NSN 5805-00-503-1482).
TM 11-5805-298-24P	Organizational, Direct Support, and General Support Maintenance Repair Parts and Special Tools Lists (Including Depot Maintenance Repair Parts and Special Tools): Generators, Ringing, Static TA-248/TT and TA-248A/TT (NSN 5805-00-503-1482).
TM 11-5805-356-12	Operator and Organizational Maintenance Manual (Including Repair Parts and Special Tools Lists): Teminal, Telegraph-Telephone AN/TCC-29 (NSN 5805-00-902-3087) (Including Terminal, Telegraph TH-22/TG (NSN 5805-00-907-8300) and Converter, Telegraph-Telephone Signal CV-425/U (NSN 5805-00-985-9088).
TM 11-5805-628-12	Operator's and Organizational Maintenance Manual for Automatic Telephone Central Offices AN/TCC-38(V)1 (NSN 5805-00-186-0681) and AN/TCC-38(V)2 (NSN 5805-00-186-0640).
TM 11-5805-628-20P	Organizational Maintenance Repair Parts and Special Tools Lists for Automatic Telephone Central Offices, AN/TTC-38(V)1 (NSN 5805-00-186-0681) and AN/TCC-38(V)2 (NSN 5805-00-186-0640).

TM 11-5805-695-12	Operator's and Organizational Maintenance Manual for Switchboard, Telephone SB-3614(V)TT (NSN S5805-01-032-1694).
TM 11-5805-695-20P	Organizational Maintenance Repair Parts and Special Tools Lists: Switchboard, Telephone SB-3614(V)TT (NSN 5805-01-032-1694).
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-335/TG, TT-537/TG, TT-698/TG, TT-698A/TG, TT-698B/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 (NSN 5815-01-012-8773) and Teletypewriters, TT-4A/TG, TT-4B/TG and TT-4C/TG (NSN 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 11-5965-283-15	Operator's, Organizational, Direct Support, General Support and Depot Maintenance Manual (Including Repair Parts and Special Tools Lists): Headset-Microphone H-182/PT (NSN 5965-00-069-8885).
TM 11-5965-283-20P	Organizational Maintenance Repair Parts and Special Tools Lists for Headset-Microphone H-182/PT (NSN 5805-00-069-8885).
TM 740-90-1	Administrative Storage of Equipment.
TM 750-244-2	Procedures for Destruction of Electronics Materiel to Prevent Enemy Use (Electronics Command).

APPENDIX B

MAINTENANCE ALLOCATION

Section I. INTRODUCTION

B-1. General

This appendix provides a summary of the maintenance operations for the SB-22/PT and the TA-977/PT. It authorizes categories of maintenance for specific maintenance functions on repairable items and components and the tools and equipment required to perform each function. This appendix may be used as an aid in planning maintenance operations.

B-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/or electrical characteristics with established standards through examination.

b. Test. To verify serviceability and to detect incipient failure by measuring the mechanical or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. Service. Operations required periodically to keep an item in proper operating condition, i.e., to clean (decontaminate), to preserve, to drain, to paint, or to replenish fuel, lubricants, hydraulic fluids, or compressed air supplies.

d. Adjust. To maintain, within prescribed limits, by bringing into proper or exact position, or by setting the operating characteristics to the specified parameters.

e. Align. To adjust specified variable elements of an item to bring about optimum or desired performance.

f. Calibrate. To determine and cause corrections to be made or to be 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 service (inspect, test, service, adjust, align, calibrate, replace) or other maintenance actions (welding, grinding, riveting, straightening, facing, remachining, or resurfacing) to restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

j. Overhaul. That maintenance effort (service/action) necessary to restore an item to a completely serviceable/operational condition as prescribed by maintenance standards (i.e., DMWR) in appropriate technical publications. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

k. Rebuild. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of materiel maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours, miles, etc.) considered in classifying Army equipment/components.

B-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 "work time" figure in the appropriate subcolumn(s), the lowest level of maintenance authorized to perform the function listed in column 3. This figure represents the active time required to perform that maintenance function at the indicated category of maintenance. If the number or complexity of the tasks within the listed maintenance function vary at different maintenance categories, appropriate "work time" figures will be shown for each category. The number of task-hours specified by the "work time" figure represents the average time required to restore an item (assembly, subassembly, component, module, end item or system) to a serviceable condition under typical field operating conditions. This time includes preparation time, troubleshooting time, and quality assurance/quality control time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the maintenance allocation chart. Subcolumns of column 4 are 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 remarks in section IV, Remarks, which is pertainent to the item opposite the particular code.

B-4. Tool and Test Equipment Requirements (Sect. III and VI)

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

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

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

d. National/NATO Stock Number. This column lists the National/NATO stock number of the 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.

B-5. Remarks (Sect. 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.

Section II. MAINTENANCE ALLOCATION CHART FOR SWITCHBOARDS, TELEPHONE, MANUAL SB-22/PT AND SB-22A/PT

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINT CATEGORY					(5) TOOLS AND EQPT.	(6) REMARKS
			C	O	F	H	D		
00	SWITCHBOARDS, TELEPHONE, MANUAL SB-22/PT AND SB-22A/PT	INSPECT	0.2						A
		SERVICE	0.2						A
		TEST				0.5			
		REPAIR			1.0			2, 12	B
		OVERHAUL					4.0	2 THRU 12	B
01	TELEPHONE CIRCUIT, OPERATOR'S TA-221/PT	REPLACE	0.3						
		TEST			0.3				
		REPAIR			0.5			2	
		REPAIR		0.1					
02	TELEPHONE CIRCUIT, LINE TA-222/PT	REPLACE	0.3						
		TEST			0.3				
		REPAIR			0.5				
03	HEADSET-MICROPHONE H-182/PT	INSPECT	0.1						C
		REPAIR		0.5				1	D
		REPAIR			0.5			2	E
04	ACCESSORY KIT MX-230/PT								
0401	CASE, CANVAS	INSPECT		0.1					
		SERVICE		0.1					
		REPAIR			0.5				F
0402	SLING, CARRYING	INSPECT		0.1					
		SERVICE		0.1					F
		REPAIR			0.5				
0403	TELEPHONE CIRCUIT, LINE TA-222/PT								G
05	ACCESSORY KIT MX-230A/PT								
0501	CASE	INSPECT		0.1					
		SERVICE		0.1					
		REPAIR			0.5			2	
0502	TELEPHONE CIRCUIT, LINE TA-222/PT								G
06	ACCESSORY KIT MX-2915/PT								
0601	TELEPHONE CIRCUIT, LINE TA-222/PT								
0602	TELEPHONE CIRCUIT, TRUNK TA-326/PT	REPLACE	0.3						
		TEST			0.3			2	
		REPAIR			0.5				
		REPAIR		0.1					

Section III. TOOL AND TEST EQUIPMENT REQUIREMENTS FOR SWITCHBOARDS, TELEPHONE, MANUAL SB-22/PT AND SB-22A/PT

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE CATEGORY	NOMENCLATURE	NATIONAL/NATO STOCK NUMBER	TOOL NUMBER
1	O	TOOL EQUIPMENT TE-33	5180-00-408-1859	
2	F,H,D	TOOL KIT, ELECTRONIC EQUIPMENT TK-105/G	5180-00-610-8177	
3	H,D	TELEPHONE TEST SET AN/PTM-6	6625-00-229-1048	
4	H,D	TEST SET I-181(*)	6625-00-229-1042	
5	H,D	MULTIMETER TS-352B/U	6625-00-242-5023	
6	H,D	TEST SET TS-140/PCM	6625-00-243-4888	
7	H,D	CANVAS REPAIR KIT		
8	D	POWER SUPPLY PP-990/G	6130-00-547-1030	
9	D	TELEPHONE SET TA-312/PT	5805-00-543-0012	
10	D	ELECTRONIC MULTIMETER ME-26D/U	6625-00-912-3826	
11	D	TEST SET TS-1775/U	6625-00-064-6096	
12	F,D	TOOL KIT, TELEGRAPH TK-141/GT	5180-00-227-6399	

Section IV. REMARKS
FOR
SWITCHBOARDS, TELEPHONE, MANUAL SB-22/PT AND SB-22A/PT

REFERENCE CODE	REMARKS
A	EXTERIOR AND BATTERY RETAINER.
B	USE GAGE, SPRING TENSION TO ADJUST SPRING CONTACTS.
C	SEE TM 11-5965-283-15.
D	REPAIR BY REPLACING EARPHONE AND MICROPHONE ELEMENTS.
E	REPAIR BY REPLACING CONNECTOR PLUG AND SWITCH.
F	REPAIR CANVAS.
G	SEE GROUP 02.

Section V. MAINTENANCE ALLOCATION CHART FOR TONE SIGNALING ADAPTER TA-977/PT

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINT CATEGORY					(5) TOOLS AND EQPT.	(6) REMARKS
			C	O	F	H	D		
00	TONE SIGNALING ADAPTER TA-977/PT	INSPECT		0.1					
		TEST		0.1				1	A
		TEST			0.2			1,2	B
		TEST						1 THRU 10	C
		INSPECT		0.1					
		REPAIR		0.1				1,10	D
		REPLACE			0.1			1,10	

Section VI. TOOL AND TEST EQUIPMENT REQUIREMENTS FOR TONE SIGNALING ADAPTER TA-977/PT

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE CATEGORY	NOMENCLATURE	NATIONAL/NATO STOCK NUMBER	TOOL NUMBER
1	O,F,H,D	MULTIMETER TS-352(*)/U	6625-00-242-5023	
2	F	TELEPHONE SET TA-312/PT	5805-00-543-0012	
3	D	ELECTRONIC MULTIMETER AN/PSM-45		
4	D	VOLTMETER ME-30(*)/U	6625-00-643-1670	
5	D	ELECTRONIC COUNTER CP-772A/U	6625-00-973-4837	
6	D	OSCILLOSCOPE AN/USM-182	6625-00-133-1196	
7	D	SPECTRUM ANALYZER AN/URM-184	6625-00-802-8718	
8	D	VOLTMETER, DIGITAL AN/GSM-64(*)	6625-01-124-0834	
9	D	TRANSFORMER UTC 0-30	5950-00-087-1046	
10	D	RINGING GENERATOR G-42A/PT	5805-00-503-1469	
11	O	TOOL KIT TK-105/G	5180-00-610-8177	
12	O	GAGE, SPRING TENSION	6635-00-918-2788	
13	O	TOOL KIT, TK-141/GT		

Section VII. REMARKS
FOR
TONE SIGNALING ADAPTER TA-977/PT

REFERENCE CODE	REMARKS
A	EQUIPMENT OPERATION, TEST BATTERY.
B	GO-NO GO WITH TA-312/PT.
C	DEPOT ACCEPTANCE TESTING.
D	REPAIR BY REPLACEMENT OF BATTERY.

APPENDIX C

COMPONENTS OF END ITEM LIST

Section I. INTRODUCTION

C-1. Scope

This appendix lists integral components of and basic issue items for the SB-22/PT to help you inventory items required for safe and efficient operation.

C-2. General

This Components of End Item List is divided into the following sections:

a. Section II. Integral Components of the End Item. These items, when assembled, comprise the SB-22/PT and must accompany it whenever it is transferred or turned in. The illustrations will help you identify these items.

b. Section III. Basic Issue Items. These are the minimum essential items required to place the SB-22/PT in operation, to operate it, and to perform emergency repairs. Although shipped separately packed they must accompany the SB-22/PT during operation and whenever it is transferred between accountable officers. The illustrations will assist you with hard-to-identify items. This manual is your authority to requisition replacement BII, based on TOE/MTOE authorization of the end item.

C-3. Explanation of Columns

a. Illustration. This column is divided as follows:
(1) *Figure number.* Indicates the figure number of the illustration on which the item is shown.
(2) *Item number.* The number used to identify item called out in the illustration.

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

c. Part Number. Indicates the primary number used by the manufacturer, 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. Following the part number, the Federal Supply Code for Manufacturers (FSCM) is shown in parentheses.

d. Description. Indicates the Federal item name and, if required, a minimum description to identify the item.

e. Location. The physical location of each item listed is given in this column. The lists are designed to inventory all items in one area of the major item before moving on to an adjacent area.

f. Usable on Code. "USABLE ON" codes are included to help you identify which component items are used on the different models. Identification of the codes used in these lists are:

Code	Used on
512	SB-22/PT
ABK	SB-22/PT SB-22A/PT

g. Quantity Required (Qty Reqd). This column lists the quantity of each item required for a complete major item.

h. Quantity. This column is left blank for use during an inventory. Under the Rcvd column, list the quantity you actually receive on your major item. The Date columns are for your use when you inventory the major item at a later date; such as for shipment to another site.

Section II. INTEGRAL COMPONENTS OF END ITEM

(1) ILLUSTRATION (A) FIG	(1) ILLUSTRATION (B) ITEM	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION PART NUMBER (FSCM)	(4) LOCATION	(5) USABLE ON CODE	(6) QTY REQD	(7) QUANTITY RCVD	(7) QUANTITY DATE
C-1	1	5805-00-257-3602 5805-00-715-6171	SWITCHBOARD SB-22/PT OR SB-22A/PT (80058) CONSISTING OF:			1		
C-1	2	5805-00-069-8885	TELEPHONE CIRCUIT TA-221/PT (80058)			1		
C-1	3	5805-00-503-3337	TELEPHONE CIRCUIT TA-222/PT (80058)			12		
C-1	4	5965-00-069-8885	HEADSET MICROPHONE H-182/PT (80058)			1		
C-1	5	6135-00-635-5223	CASE ASSEMBLY SCB84406			1		
C-1	6	5805-00-356-2693	ACCESSORY KIT MX-230A/PT OR MX-230/PT CONTAINING: (80063)		5I2	1		
C-1	7	5805-00-503-3337	TELEPHONE CIRCUIT TA-222/PT (80058)			3		
C-1	8	5805-00-799-3225	ACCESSORY KIT MX-2915/PT (80063) CONTAINING:		ABK			
C-1	9	5805-00-503-3337	TELEPHONE CIRCUIT TA-222/PT (80058)			2		
C-1	10	5805-00-715-6175	TELEPHONE CIRCUIT TA-326/PT (80058)			1		

Section III. BASIC ISSUE ITEMS

(1) ILLUSTRATION (A) FIG	(1) ILLUSTRATION (B) ITEM	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION PART NUMBER (FSCM)	(4) LOCATION	(5) USABLE ON CODE	(6) QTY REQD	(7) QUANTITY RCVD	(7) QUANTITY DATE
		6240-00-196-4501	LAMP, INCANDESCENT 1490 (24446)			2[a]		
			GROUND STRAP			1		
			TM 11-5805-262-12			1		

[a] **STORED IN ACCESSORY KIT MX-230/PT, MX-230A/PT, OR MX-2915/PT.**

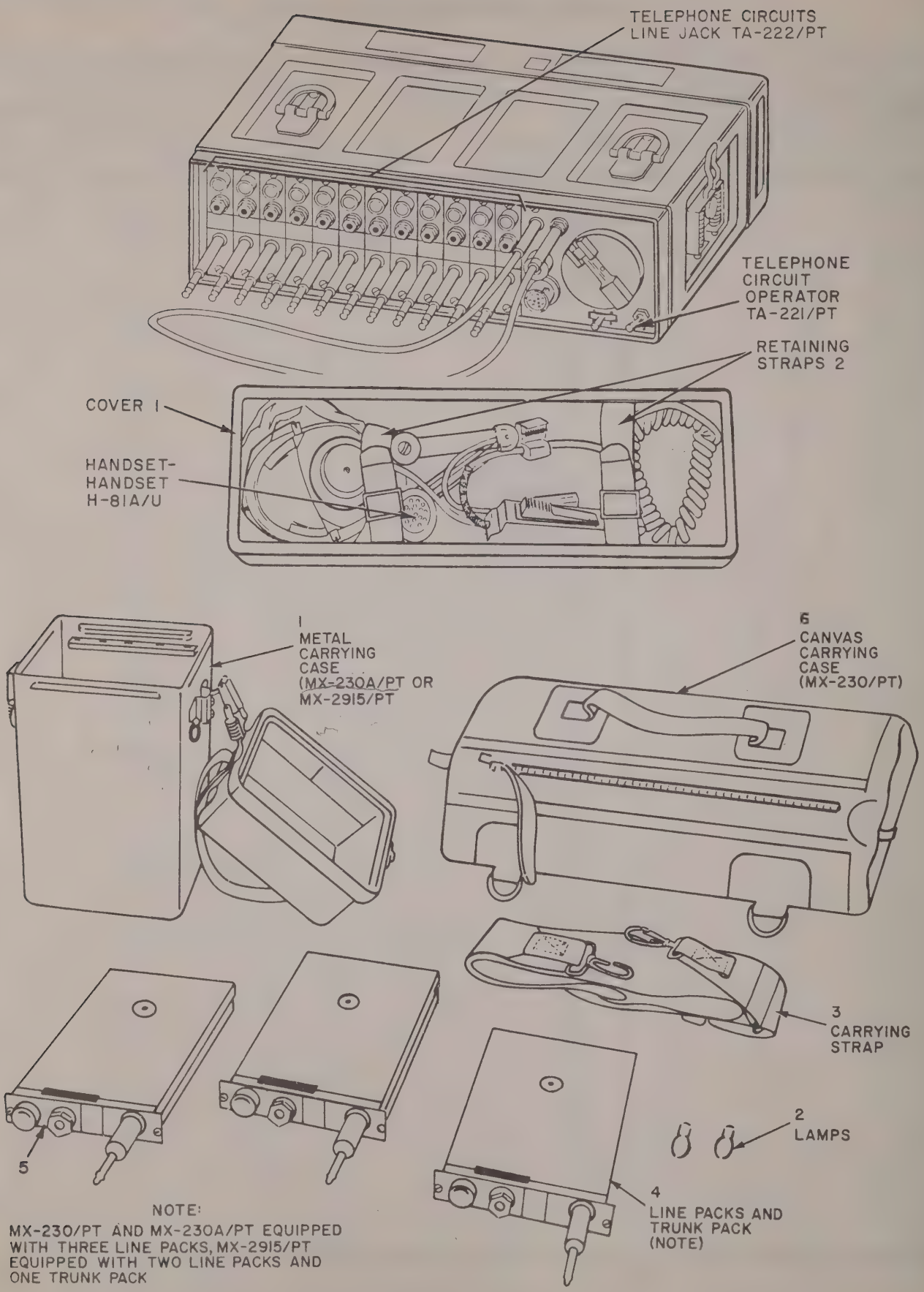
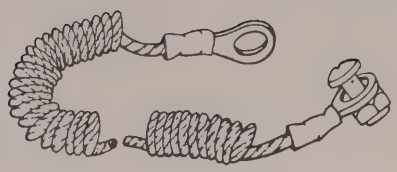


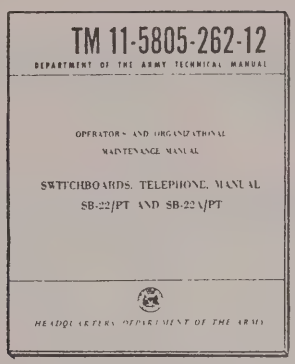
Figure C-1. Components of Switchboard SB-22/PT or SB-22A/PT.

8 8

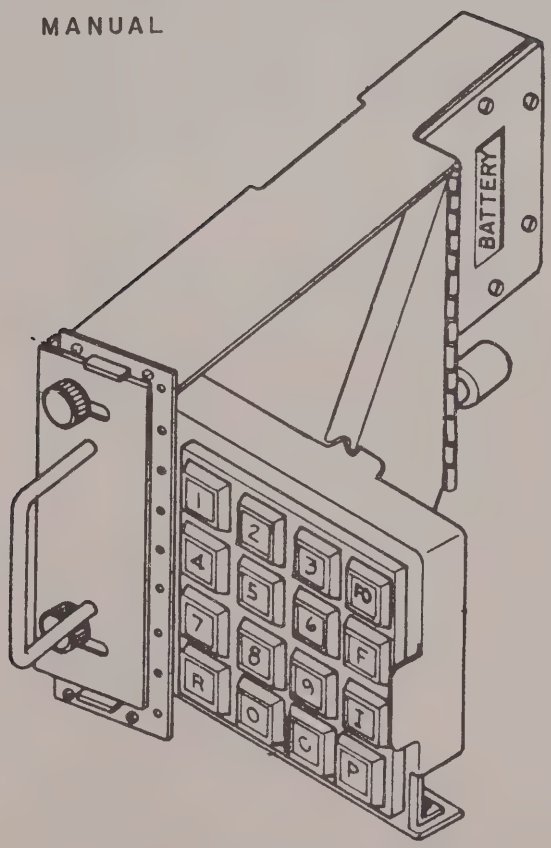
LAMPS



GROUND STRAP



MANUAL



TONE SIGNAL ADAPTER TA-977/PT

Figure C-2. Basic Issue Items of Switchboard SB-22/PT or SB-22A/PT.

APPENDIX D

ADDITIONAL AUTHORIZATION LIST

Section I. INTRODUCTION

D-1. Scope

This appendix lists additional items you are authorized for the support of the SB-22/PT.

D-2. General

This list identifies items that do not have to accompany the SB-22/PT and that do not have to be turned in with it. These items are all authorized to you by CTA, MTOE, TDA, or JTA.

D-3. Explanation of Listing

National stock numbers, descriptions, and quantities are provided to help you identify and request items you require to support this equipment. The items are listed in alphabetical sequence by item name under the type document (i.e., CTA, MTOE, TDA, or JTA) which authorizes the item(s) to you. If the item you require differs betwen serial numbers of the same model, effective serial numbers are shown in the last line of the description. If item required differs for different models of this equipment, the model is shown under the "Usable on" heading in the description column. These codes are identified as:

Code	Used on
~~512~~	~~SB-22/PT~~
ABK	SB-22/PT
	SB-22A

Section II. ADDITIONAL AUTHORIZATION LIST

(1) NATIONAL STOCK NUMBER	(2) DESCRIPTION PART NUMBER AND FSCM USABLE ON CODE	(3) UNIT OF MEAS	(4) QTY AUTH
5975-00-224-5260	GROUND ROD MX-148/G (80062)	EA	1
6135-00-120-1020	BATTERY BA-30 (09477)	EA	4
6135-00-850-3177	BATTERY BA-90 (83740)	EA	1
5805-01-040-9633	ADAPTER, TONE SIGNALING TA-977/PT (80063)	EA	1

APPENDIX E

EXPENDABLE SUPPLIES AND MATERIALS LIST

Section I. INTRODUCTION

E-1. Scope

This appendix lists expendable supplies and materials you will need to operate and maintain the SB-22/PT. These items are authorized to you by CTA 50-970, Expendable Items (Except Medical, Class V, Repair Parts, and Heraldic Items).

E-2. Explanation of Columns

a. Column 1 — Item Number. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material (e.g., "Use cleaning compound, item 5, App. D").

b. Column 2 — Level. This column identifies the lowest level of maintenance that requires the listed item.

C — Operator/Crew
O — Organizational Maintenance
F — Direct Support Maintenance
H — General Support Maintenance

c. Column 3 — National Stock Number. This is the National stock number assigned to the item; use it to request or requisition the item.

d. Column 4 — Description. Indicates the Federal item name and, if required, a description to identify the item. The last line for each item indicates the part number followed by the Federal Supply Code for Manufacturer (FSCM) in parentheses, if applicable.

e. Column 5 — Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pr). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

Section II. EXPENDABLE SUPPLIES AND MATERIALS LIST

(1) ITEM NO.	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION PART NO. AND FSCM	(5) UNIT MEAS.
	O	6850-00-105-3084	TRICHLOROTRIFLUOROETHANE	PT
	O	7930-00-249-8036	DETERGENT, GENERAL PURPOSE	CN
	O	530-00-578-5708	SANDPAPER NO. 0000	SH
	O		PAINT, MIL-C-46168	QT
	O		GLUE	BTL

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RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS



SOMETHING WRONG WITH THIS PUBLICATION?

FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)
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Stateside Army Depot
ATTN: AMSTA-US
Stateside, N.J. 07703

DATE SENT
10 July 1975

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE
TM 11-5840-340-12	23 Jan 74	Radar Set AN/PRC-76

BE EXACT PIN-POINT WHERE IT IS

PAGE NO	PARA-GRAPH	FIGURE NO	TABLE NO	IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:
2-25	2-28			Recommend that the installation antenna alignment procedure be changed throughout to specify a 2° IFF antenna lag rather than 1°. REASON: Experience has shown that with only a 1° lag, the antenna servo system is too sensitive to wind gusting in excess of 25 knots, and has a tendency to rapidly accelerate and decelerate as it hunts, causing strain to the drive train. Hunting is minimized by adjusting the lag to 2° without degradation of operation.
3-10	3-3		3-1	Item 5, Function column. Change "2 db" to "3db." REASON: The adjustment procedure for the TRANS POWER FAULT indicator calls for a 3 db (500 watts) adjustment to light the TRANS POWER FAULT indicator.
5-6	5-8			Add new step f.1 to read, "Replace cover plate removed in step e.1, above." REASON: To replace the cover plate.
		F03		Zone C 3. On J1-2, change "+24 VDC to "+5 VDC." REASON: This is the output line of the 5 VDC power supply. +24 VDC is the input voltage.

SAMPLE

PRINTED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER
SSG I. M. DeSpiritof 999-1776

SIGN HERE
I. M. DeSpiritof

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