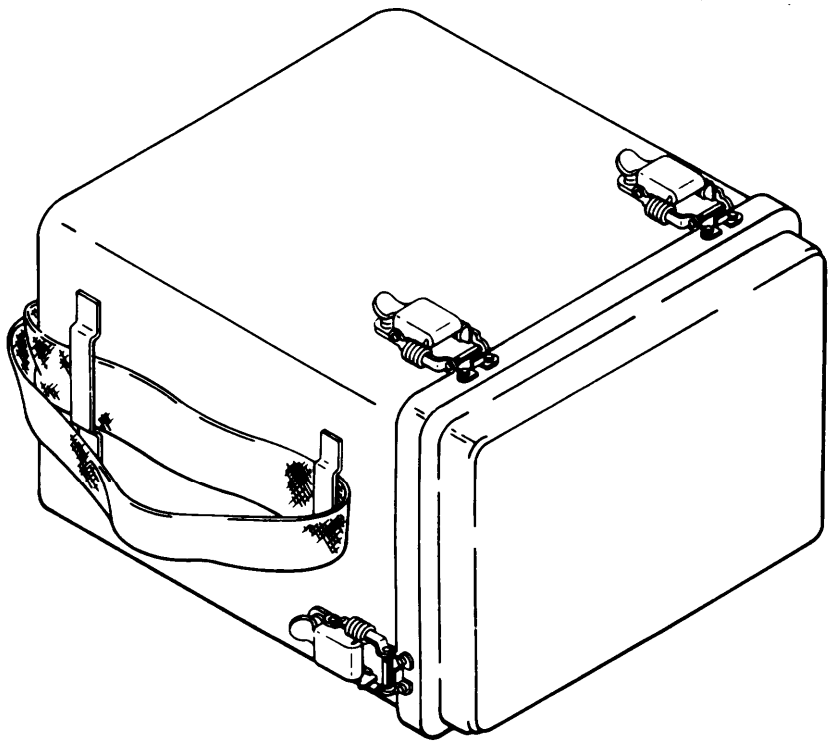
TM 11-5805-246-10

OPERATOR'S MANUAL



EQUIPMENT DESCRIPTION 1-3

OPERATING INSTRUCTIONS 2-1

PREVENTIVE MAINTENANCE 2-4

TROUBLESHOOTING PROCEDURES 3-2

MAINTENANCE PROCEDURES 3-5

TELEGRAPH TERMINAL TH-5/TG AND TH-5A/TG

(NSN 5805-00-315-2858)
(NSN 5805-00-246-8734)

HEADQUARTERS, DEPARTMENT OF THE ARMY

24 MARCH 1983

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

HIGH VOLTAGE IS USED IN THE OPERATION OF THIS EQUIPMENT.

DEATH ON CONTACT
MAY RESULT IF PERSONNEL FAIL TO OBSERVE SAFETY PRECAUTIONS.

DANGEROUS VOLTAGES EXIST IN THE FOLLOWING COMPONENTS OF TELEGRAPH TERMINAL TH-5/TG AND TH-5A/TG:

INPUT CIRCUIT:	TH-5/TG 115 VOLTS TH-5A/TG 115 VOLTS
POWER TRANSFORMER T6:	TH-5/TG 560 VOLTS TH-5A/TG 560 VOLTS
OUTPUT VOLTAGE:	285 VOLTS DC

DO NOT TAKE CHANCES!

REMOVE POWER CORD FROM POWER SOURCE OR REMOVE FUSE BEFORE MAKING ANY CONNECTIONS OR REPLACING ANY PARTS INSIDE THE EQUIPMENT.

TO PREVENT DAMAGE TO TELEGRAPH TERMINAL BE SURE TELEGRAPH TERMINAL IS CORRECTLY SECURED TO EQUIPMENT RACK MT-1278/U OR MOUNTING MT-791 NJ.

WARNING

ADEQUATE VENTILATION SHOULD BE PROVIDED WHILE USING TRICHLOROTRIFLUORO-ETHANE. PROLONGED BREATHING OF VAPOR SHOULD BE AVOIDED. THE SOLVENT SHOULD NOT BE USED NEAR HEAT OR OPEN FLAME; THE PRODUCTS OF DECOM-POSITION ARE TOXIC AND IRRITATING, SINCE TRICHLOROTRIFLUOROETHANE DIS-SOLVES NATURAL OILS, PROLONGED CONTACT WITH SKIN SHOULD BE AVOIDED. WHEN NECESSARY, USE GLOVES WHICH THE SOLVENT CANNOT PENETRATE. IF THE SOLVENT IS TAKEN INTERNALLY, CONSULT A PHYSICIAN IMMEDIATELY.

TECHNICAL MANUAL
No. 11-5805-246-10

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC 24 March 1983

OPERATOR'S MANUAL

TELEGRAPH TERMINAL
TH-5/TG (NSN 5805-00-315-2858)
TH-5A/TG (NSN 5805-00-246-8734)

REPORTING OF 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 back of this manual direct to: Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: DRSEL-ME-MP, Fort Monmouth, New Jersey 07703. A reply will be furnished to you.

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Section	I	General Information	1-1
	II	Equipment Description	1-3
	III	Technical Principles of Operation	1-6
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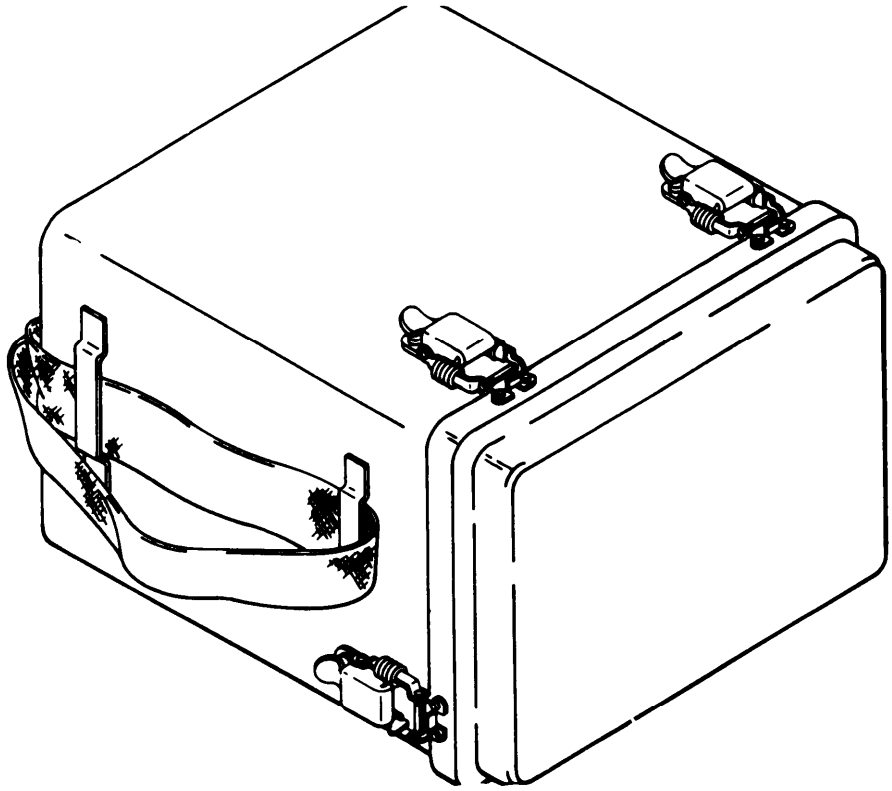
*This manual supersedes TM 11-5805-246-10, 20 June 1960, including all changes.



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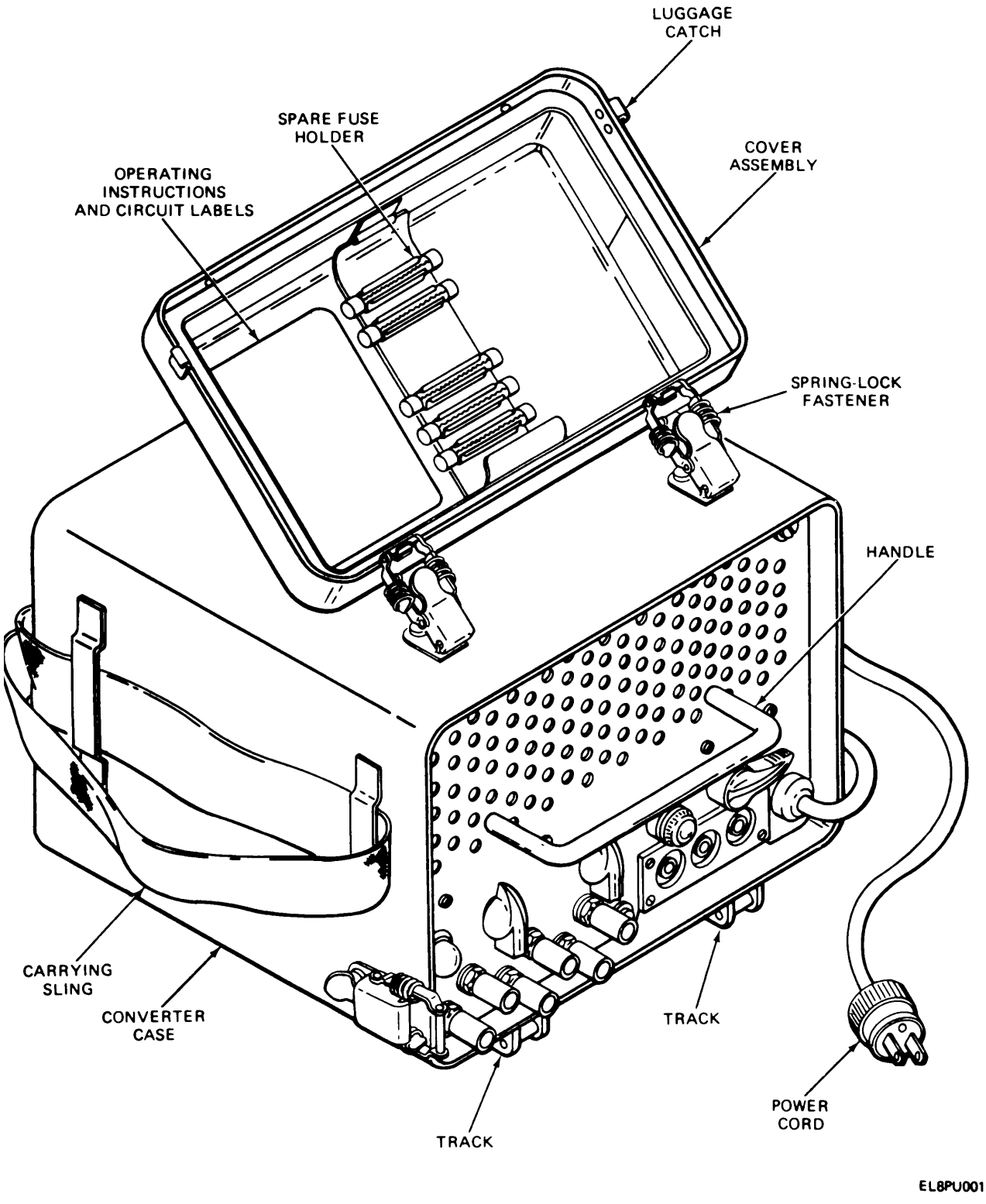
HOW TO USE THIS MANUAL

In this manual paragraphs are numbered by chapter and the order in which they appear in each chapter. To find the paragraph you need, first locate your subject in the table of contents. Turn to the page shown and read the paragraph headings until you see what you're looking for. Special tools and parts are shown in the rear of this manual as appendixes. If you find a word or term you don't understand, refer to the glossary.



TELEGRAPH TERMINAL TH-5/TG and TH-5A/TG

CHAPTER 1

INTRODUCTION

Subject	Section	Page
General Information	I	1-1
Equipment Description,	II	1-3
Technical Principles of Operation	III	1-6

OVERVIEW

This chapter contains general information, equipment description and principles of operation for Telegraph Terminal TH-5/TG and TH-5A/TG.

Section I GENERAL INFORMATION

Subject	Para	Page
Scope	1-1	1-1
Maintenance Forms, Records and Reports	1-2	1-1
Destruction of Army Electronics Materiel	1-3	1-2
Administrative Storage	1-4	1-2
Reporting Equipment Irnprovernent Recommendations	1-5	1-2
Nomenclature Cross-Reference List	1-6	1-2
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1-1. SCOPE.

This manual describes Telegraph Terminals TH-5/TG and TH-5A/TG and is a guide for operation, troubleshooting and maintenance of each unit. The telegraph terminals are used to provide teletypewriter transmission between distant stations.

1-2. MAINTENANCE FORMS, RECORDS AND REPORTS.

REPORTS OF Maintenance AND UNSATISFACTORY EQUIPMENT

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by TM 38-750, The Army Maintenance Management System (TAMMS).

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/NAVMATlNST 4355.73/AFR 400-54/MC0 4430.3E.

1-2. MAINTENANCE FORMS, RECORDS AND REPORTS. (CONT)

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 4610.33B/AFR 75-18/MCO P4610.19C/DLAR 4500.15.

1-3. DESTRUCTION OF ARMY ELECTRONICS MATERIEL.

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

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 paragraph 2-23.

1-5. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR).

If your telegraph terminal needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design or performance. Put it on an SF 368 (Quality Deficiency Report). Mail it to: commander, US Army Communications-Electronics Command and Fort Monmouth. ATTN: DRSEL-ME-MP, Fort Monmouth, New Jersey 07703. A reply will be sent to you.

1-6. NOMENCLATURE CROSS-REFERENCE LIST.

This list contains the common names used throughout this manual in place of official nomenclature.

Common Name	Official Nomenclature
Telegraph terminal	Telegraph Terminal TH-5/TG or TH-5A\TG
Telegraph terminal rack	Electrical Equipment Rack MT-1278/U
Telegraph terminal mount	Mounting MT-791/U
Remote control unit	Control Unit RM-39
Line control unit	Telegraph Line Control Unit C-2894/FG
Telephone	Telephone Set TA-312/PT
Vf ringer	Telegraph-Telephone Signal Coverter TA-182/U

1-7. LIST OF ABBREVIATIONS.

This list contains all abbreviations used in this manual.

Abbreviation	Name
ac	alternating current
am	amplitude modulation
bfo	beat frequency oscillator
cw	continuous wave
dbm	decibels referenced to one milliwatt
dc	direct current
dx	duplex
freq	frequency
fsk	frequency shift keying
Hz	Hertz
kHz	kilohertz
km	kilometer
ma	milliampere
mHz	megahertz
nsk	narrow frequency shift keying
ow	orderwire
owr	one way reverisble
pwr	power
rf	radio frequency
rtty	radio-teletypewriter
rt	receiver-transmitter
ssb	single side band
swr	standing wave radio
tty	teletypewriter
vac	volts alternating current
vf	voice frequency
vswr	voltage, standing wave ratio
wpm	words per minute

Section II EQUIPMENT DESCRIPTION

Subject	Para	Page
Equipment Characteristics	1-8	1-3
Capabilities and Features	1-9	1-4
Differences Between Models	1-10	1-4
Equipment Data	1-11	1-5

1-8. EQUIPMENT CHARACTERISTICS.

The telegraph terminal isused between teletypewriter stations to change dc telegraph pulses generated from a teletypewriter into voice frequency signals for transmission over voice channels and changes received voice frequency signals back into telegraph pulses.

1-9. CAPABILITIES AND FEATURES.

MAJOR SYSTEM COMPONENTS

Converter case

Cover assembly

Spare fuse holder

Running spares

Mounting tracks

FEATURES

All weather operational

Portable

Can be used with or without mounting MT-791/U

1-10. DIFFERENCES BETWEEN MODELS.

Telegraph Terminal TH-5/TG can be used with Telephone Terminal TH-5A/TG. The TH-5A/TG model is a modified TH-5/TG unit for use in the AN/TRC-80.

DIFFERENCE IN CHARACTERISTICS	TH-5/TG	TH-5A/TG
Line voltage	115 volts, single phase, 50 to 60 Hz	115 volts, single phase 47 to 420 Hz
Power transformer T6	50 to 60 Hz	CPN 672-0124-00 47 to 420 Hz
Rectifier shield	7-pin miniature, long	7-pin miniature, short
Receiving sensitivity	-50, -35, or -25 dbm	-50 or -25 dbm

NOTE

Vacuum tubes V3, V4, V6, V13, V14 and V15 may be replaced with semiconductors 5961-00-076-3545 and 5961-00-076-3546. Vacuum tube V13 may be replaced with semiconductor 5961-00-645-2331. Locator diagrams will reference semiconductors which may or may not be present. If a semiconductor is present, use a multimeter for tests.

1-11. EQUIPMENT DATA.

WEIGHTS AND DIMENSIONS

Weight	18-1/2 pounds
Length	11 inches
Width	10-1/2 inches
Height	7-1/2 inches

PERFORMANCE

Transmission speed	60, 75, 100 words per minute
Voltage requirement	115 vac
Power consumption	65 watts (approx.)
Circuit application	Used with two or four wire systems
Type of modulation	Frequency shift keying
Bandwidth	200 Hz
Transmission frequency	Mark 1325 Hz ±2 Hz Space 1225 Hz ±2 Hz Ringbreak 20 Hz
Minimum input level	vf signal 50 dbm Ringing signal 90 vac 20 Hz
Jack current	
Send	14.85 to 18.15 ma
Receive	19 to 32 ma
Signal time delay	5 to 8 milliseconds
Distortion	
Receiving	5 percent maximum
Transmitting	5 percent maximum
Impedance (at 1,000 Hz)	
Input	600 ohms
Output	600 ohms

Section Ill TECHNICAL PRINCIPLES OF OPERATION

Subject	Para	Page
Operating Characteristics	1-12	1-6
Component Functions	1-13	1-6

1-12. OPERATING CHARACTERISTICS.

Telegraph Terminals TH-5/TG and TH-5A/TG are used between teletypewriter stations to provide teletypewriter transmission over lines which will not pass direct current (de). For transmitting, the neutral mark and space signals from the teletypewriter are 1,325 and 1,225 Hz respectively. The received voice frequency (vf) signals are changed back to the corresponding neutral dc signals. The telegraph terminal provides a means of 20 Hz signaling. If vf signaling is needed a vf ringer such as Telegraph-Telephone Signal Converter TA-182/U must be used. The telegraph terminal also provides for connection of a local-battery field telephone. Teletypewriter transmissions cannot be made when the telephone is in use.

1-13. COMPONENT FUNCTIONS.

Component functions are divided into the following groups:

Sending circuit: Changes neutral dc teletypewriter signals to vf frequency shift teletypewriter signals.

Carrier removal circuit: Prevents the output of the sending circuit from being applied to the line when the teletypewriter sends a consent mark (idle) signal.

Receiving circuit: Changes vf frequency shift teletypewriter signals to neutral dc teletypewriter signals.

Threshold circuit (level control): Disables the receiving circuit when vf frequency shift teletypewriter signals below approximately 50 dbm are received from the line.

Signaling and ringing circuits: Transmit and receive 20 Hz signals.

Power supply: Provides operating power for the circuits of the telegraph terminal.

CHAPTER 2

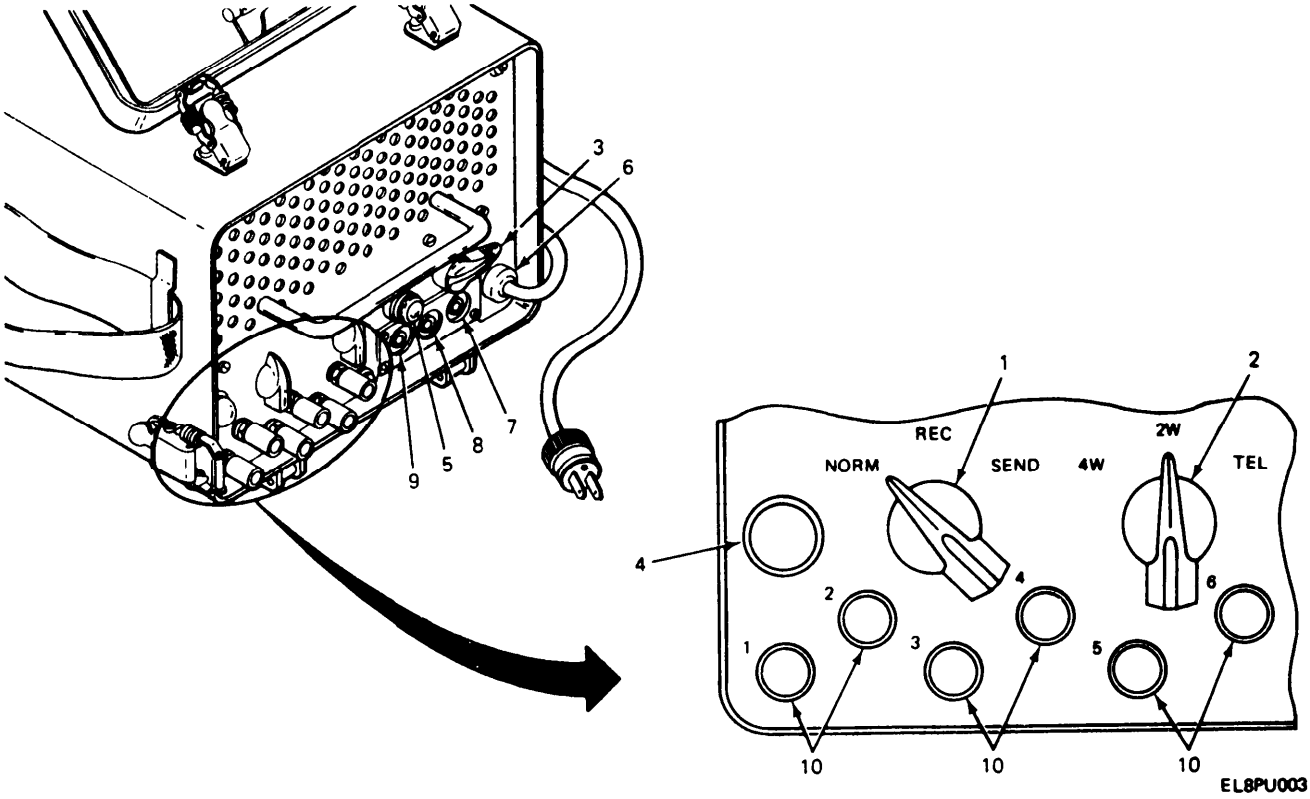
OPERATING INSTRUCTIONS

Subject	Section	Page
Description and Use of Operator's Controls and Indicators	I	2-2
Operator Preventive Maintenance Checks and Services	II	2-4
Operation Under Usual Conditions	III	2-15
Operation Under Unusual Conditions	IV	2-66

OVERVIEW

This chapter contains a description of controls and indicators, operating instructions, and operator preventive maintenance checks and services for the telegraph terminal.

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



DESCRIPTION OF CONTROLS	FUNCTION
(1) NORM-REC-SEND Switch	Arranges telegraph terminal for operation on either wire or radio circuits.
Switch position	
NORM	For transmitting or receiving over 2 or 4 wire circuit.
REC	For receiving over radio link.
SEND	For transmitting over radio link.
(2) 4W-2W-TEL Switch	Arranges for type of line circuit in teletypewriter or telephone operation.
Switch position	
4W	For operation on 4 wire circuit.
2W	For operation on 2 wire circuit.
TEL	For talking and signaling over telephone circuits.

2-1. DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND INDICATORS. (CONT)

DESCRIPTION OF CONTROLS	FUNCTION
(3) RING Switch	Controls signaling and buzzer unit.
Switch position	
Down	Connects power to ringing generator and applies 20 Hz signal to 2W or 4W-S binding posts.
up	Connects buzzer circuit and receiver disabling circuit (REC jack) across either 2W or 4W-R binding posts.
(4) Glowlamp	Provides visual indication (2W operation only) that the equipment is ready to transmit teletypewriter impulses.
(5) Fuse 1.5 amp	Contains a 1.5 amp fuse which protects the equipment from excessive voltages.
(6) Power cord strain relief	Power cord strain relief prevents damage and separation of power cord connection.
(7) REC jack	The REC jack receives red plug from receiver section of the teletypewriter.
(8) SEND jack	The SEND jack receives black plug from transmitter section of the teletypewriter.
(9) SEND jack	The SEND jack receives gray plug from transmitter distributor section of the teletypewriter.
(10) Binding posts 1 through 6	Binding posts 1 thru 6 provide for wire connections. The posts have a spring action and wires can be connected by pushing forward on the post. When the post is released the spring action will hold the wire securely. The number of wires and posts used determine the type of circuit and mode of communication.

Section II PREVENTIVE MAINTENANCE CHECKS AND SERVICES

Subject	Para	Page
Overview	2-2	2-4
Operator PreventiveMaintenance Checks and Services		2-5

2-2. OVERVIEW.

Operator's Preventive Maintenance Checks and Semites (PMCS) are required before operation of your equipment to keep it in good operating condition.

Before operation, do the before (B) PMCS listed in the PMCS table to be sure that your equipment is ready for operation.

If the equipment fails to operate, refer to. operator's troubleshooting (para 3-2) in this manual. Use TM 38-750 as a guide for reporting problems and using forms.

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

The column titled Equipment is not Ready/Available If tells you why your equipment cannot be used if the item to be inspected does not meet procedure needs.

Routine checks like equipment inventory, cleaning, and checking for loose hardware, nuts, bolts, and screws are not listed in the PMCS table. You should do these things any time that you see that they need to be done. If you find a routine check listed in the PMCS table, it is because other operators reported problems with this item.

The Item Number column in the PMCS table is to be used as a source of item numbers for the TM Number column on DA Form 2404, Equipment Inspection and Maintenance Worksheet, for recording PMCS results.

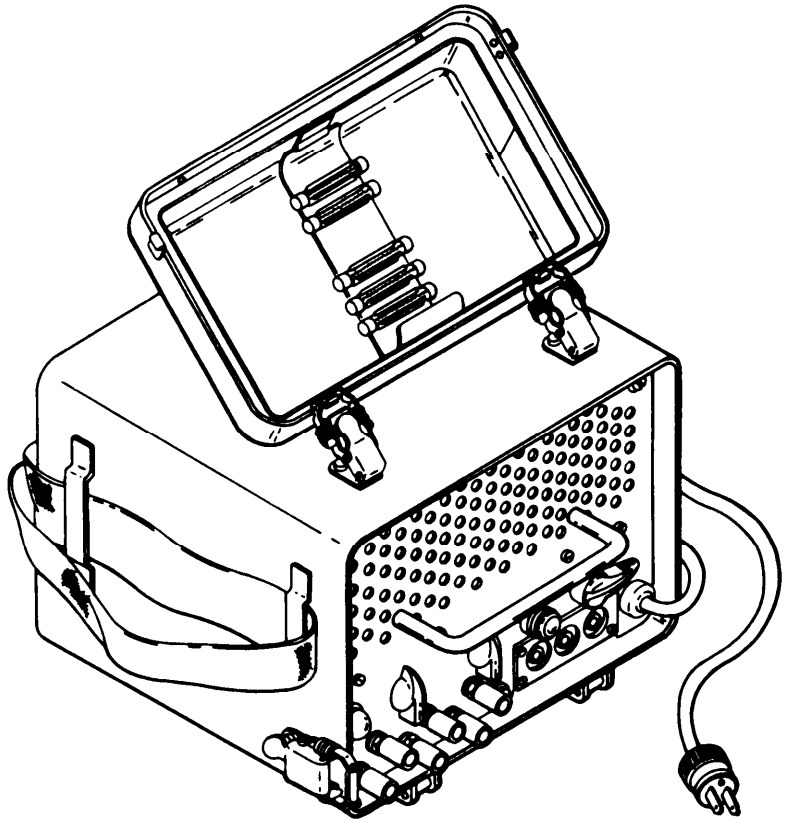
NOTE

Always keep in mind the CAUTIONS and WARNINGS.

OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES

B - BEFORE OPERATION

ITEM NO.	INTERVAL B	ITEM TO BE INSPECTED PROCEDURE	EQUIPMENT IS NOT READY/AVAIIABLE IF:
1	•	TELEGRAPH TERMINAL Check that equipment is complete.	Any parts are missing.



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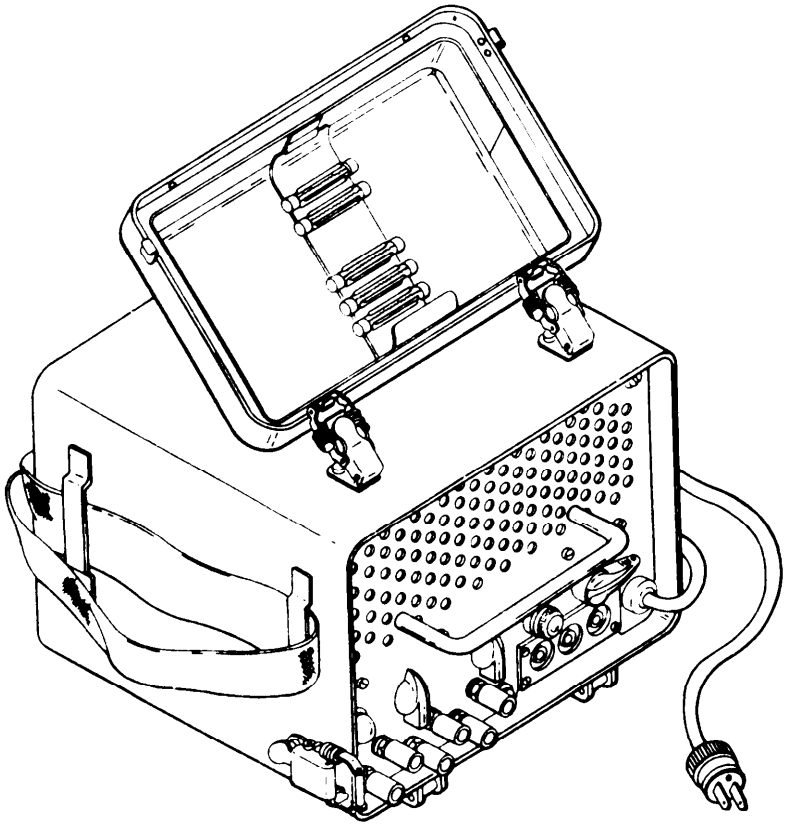
OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES (CONT)

B- BEFORE OPERATION

ITEM NO.	INTERVAL B	ITEM TO BE INSPECTED PROCEDURE	EQUIPMENT IS NOT READY/AVAIIABLE IF:
2	•	POWER CORD Check that power cord is not frayed or cut and that the power plug is not cracked. Check that power plug prongs are not badly bent or broken.	Power cord is cut or frayed. Power plug is cracked or prongs are broken.



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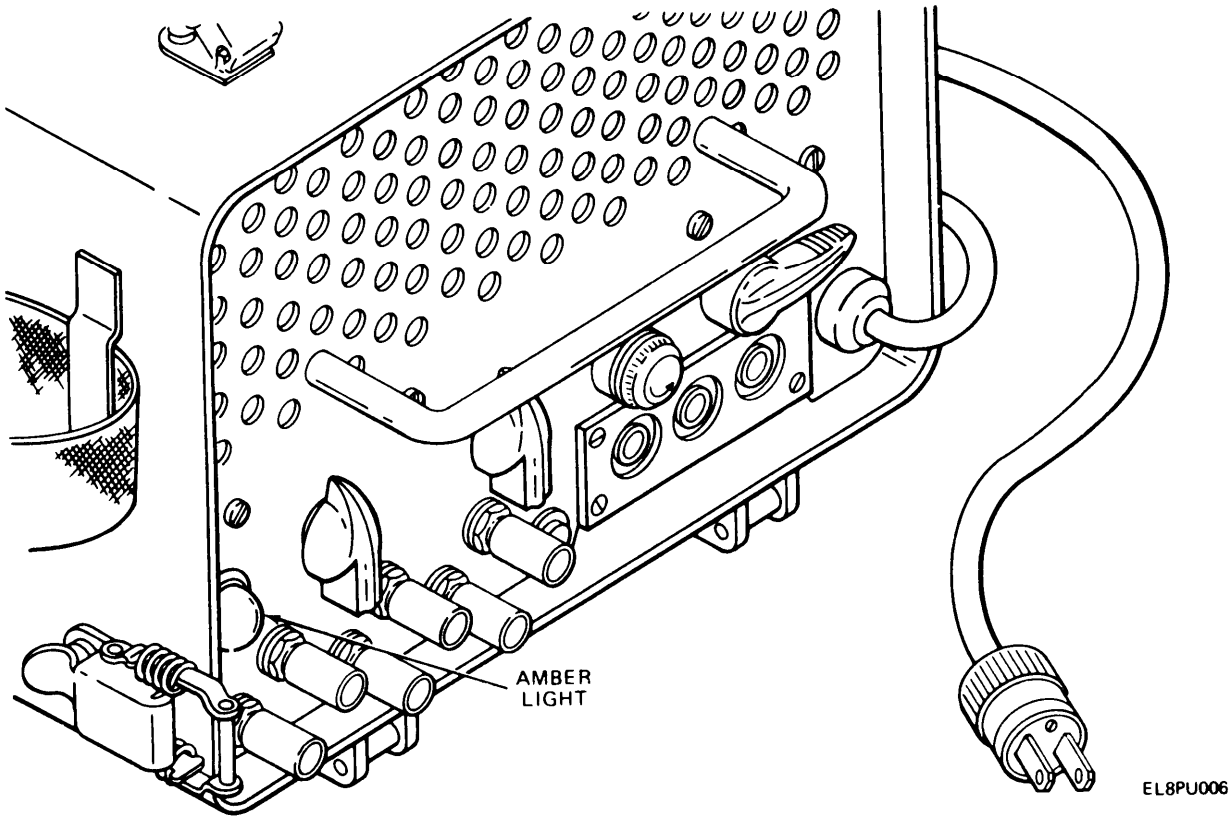
OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES (CONT)

B - BEFORE OPERATION

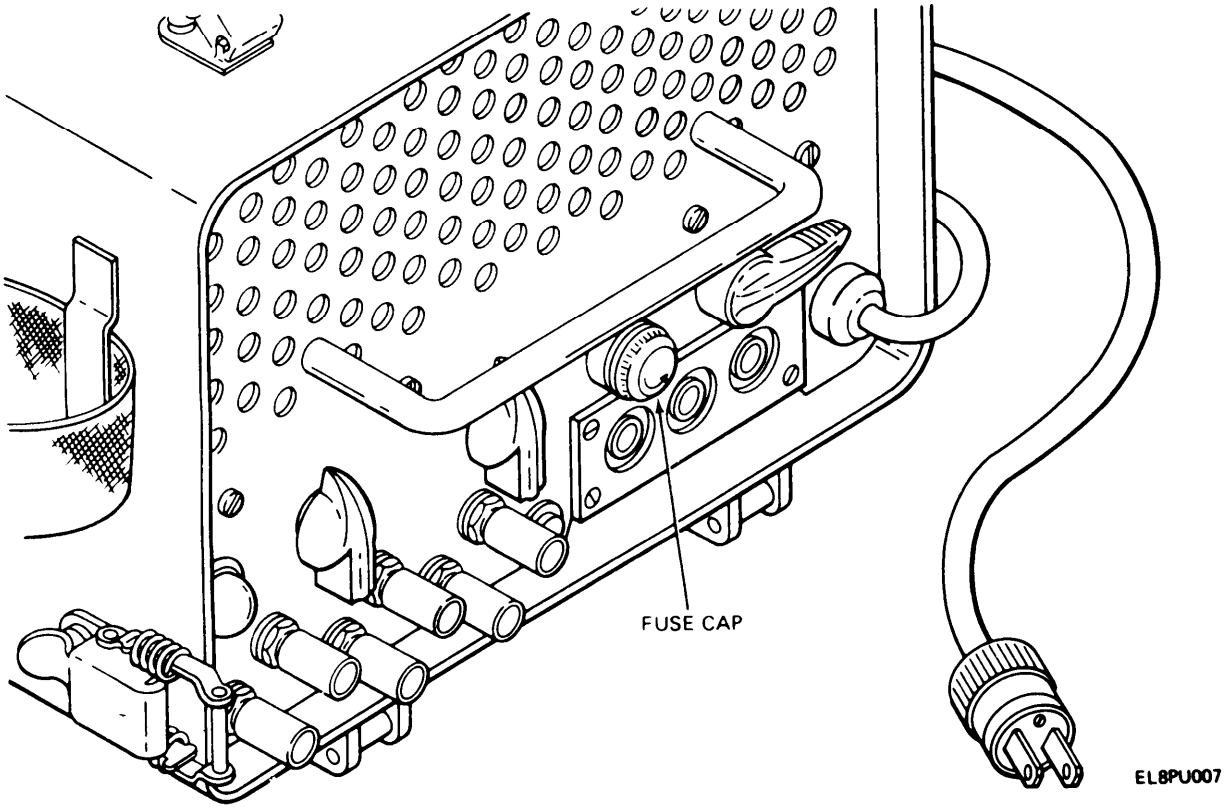
ITEM NO.	INTERVAL B	ITEM TO BE INSPECTED PROCEDURE	EQUIPMENT IS NOT READY/AVAILABLE IF:
3	•	TELEGRAPH TERMINAL Check that equipment is operational by inserting power plug into proper receptacle. Amber light will light if unit is working.	Amber light does not light.



OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES (CONT)

B- BEFORE OPERATION

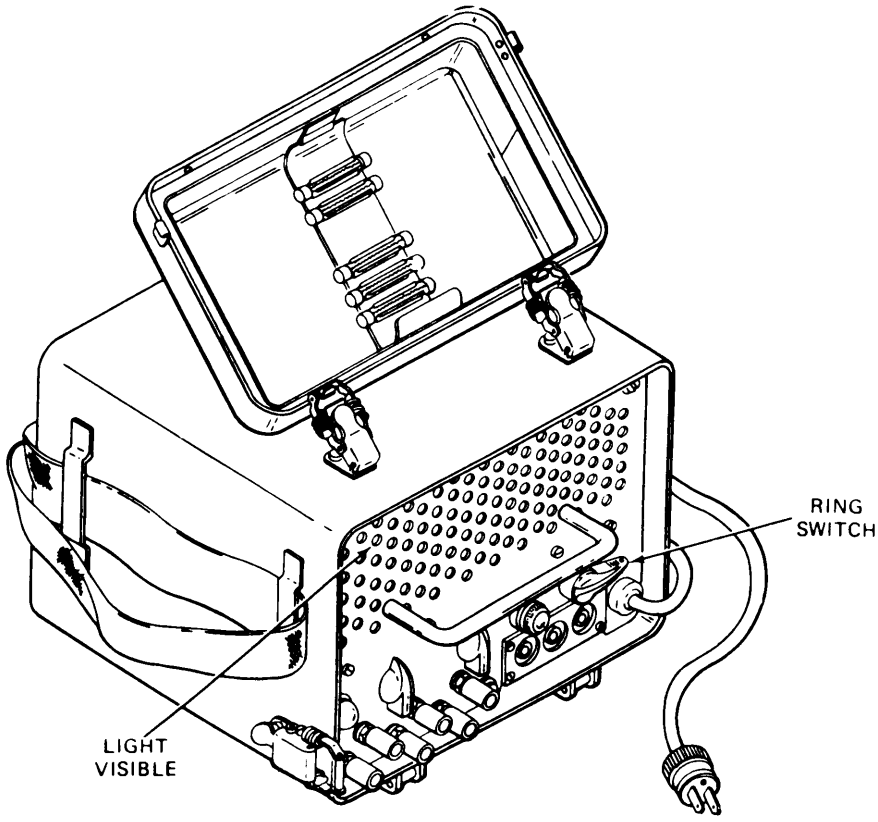
ITEM NO.	INTERVAL B	ITEM TO BE INSPECTED PROCEDURE	EQUIPMENT IS NOT READY/AVAILABLE IF:
4	•	TELEGRAPH TERMINAL Check that 1.5 amp fuse is not blown.	Fuse is blown.



OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES (CONT)

B - BEFORE OPERATION

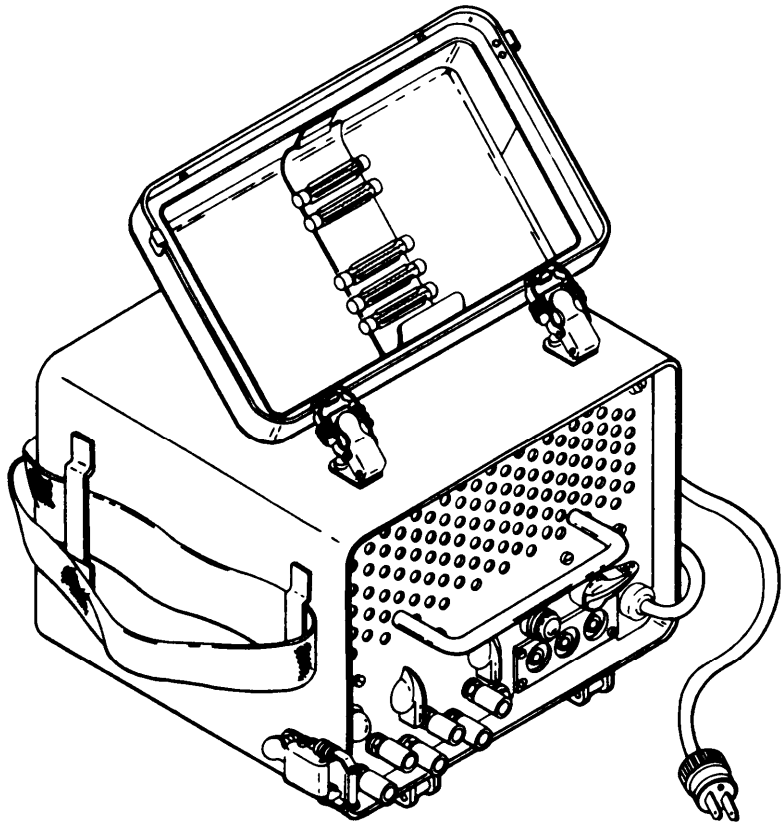
ITEM NO.	INTERVAL B	ITEM TO BE INSPECTED PROCEDURE	EQUIPMENT IS NOT READY/AVAILABLE IF:
5	•	TELEGRAPH TERMINAL Check RING switch with equipment power cord plugged into power receptacle. Push switch down, ring tone should be heard. Light should be visible behind front panel.	RING switch does not work.



OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES (CONT)

B - BEFORE OPERATION

ITEM NO.	INTERVAL B	ITEM TO BE INSPECTED PROCEDURE	EQUIPMENT IS NOT READY/AVAILABLE IF:
6	•	TELEGRAPH TERMINAL Check front panel controls and binding posts for trouble free operation.	Controls bind or binding posts do not work.



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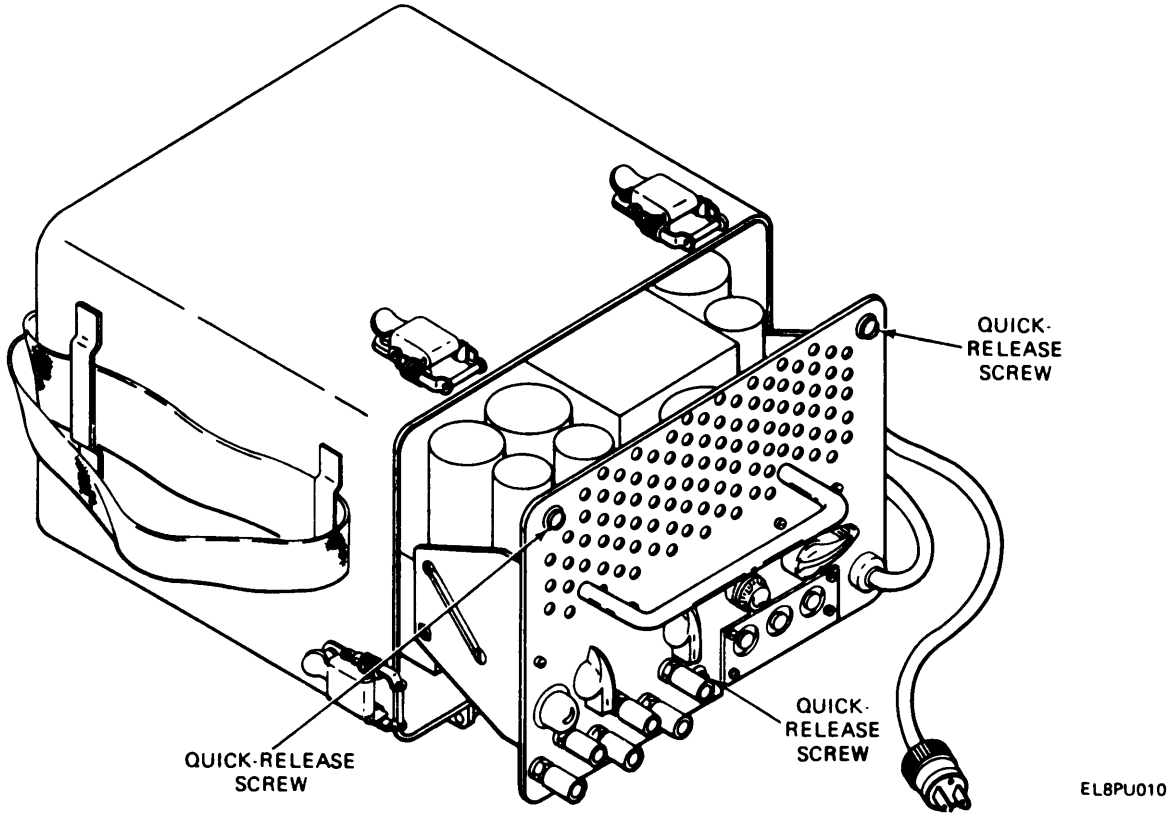
OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES (CONT)

B - BEFORE OPERATION

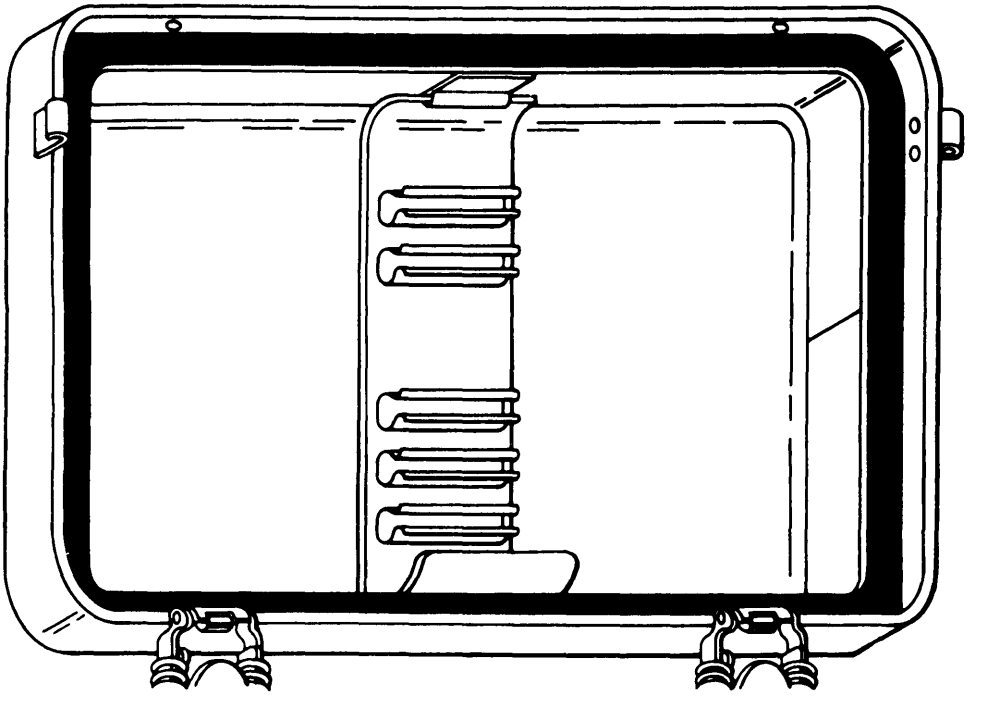
ITEM NO.	INTERVAL B	ITEM TO BE INSPECTED PROCEDURE	EQUIPMENT IS NOT READY/AVAILABLE IF:
7	•	TELEGRAPH TERMINAL Check that front panel quick-release screws are tight.	Screws cannot be tightened.



OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES (CONT)

B - BEFORE OPERATION

ITEM NO.	INTERVAL B	ITEM TO BE INSPECTED PROCEDURE	EQUIPMENT IS NOT READY/AVAILABLE IF:
8	•	COVER ASSEMBLY Check that the cover assembly's waterproof gasket is not cracked or torn. Cover should fit tight over unit.	Waterproof gasket is cracked, or worn.



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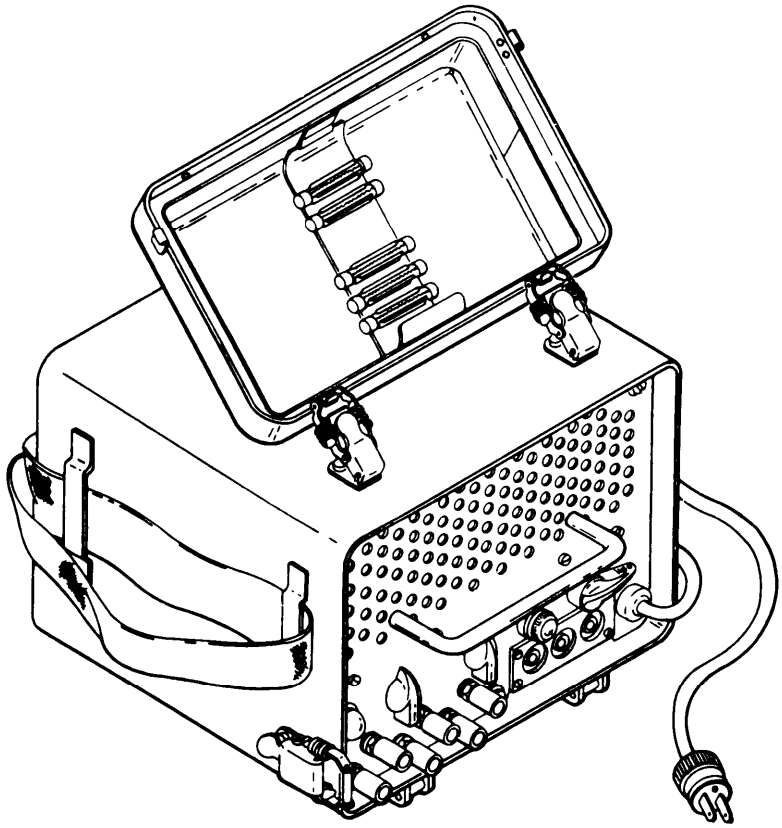
OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES (CONT)

B - BEFORE OPERATION

ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	EQUIPMENT IS NOT READY/AVAILABLE IF:
9	•	TELEGRAPH TERMINAL Check outside of transit case and front panel for rust. See paragraph 3-7 for cleaning instructions.	Outside of transit case or front panel badly corroded.



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Section III OPERATION UNDER USUAL CONDITIONS

Subject	Para	Page
Assembly and Preparation For Use	2-3	2-15
Checking Unpacked Equipment	2-4	2-18
initial Adjustments and Self-Test	2-5	2-20
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Standby Procedure	2-20	2-58
Shutdown Procedure	2-21	2-60
Operation of Auxiliary Equipment	2-22	2-62
Preparation For Movement	2-23	2-64

2-3. ASSEMBLY AND PREPARATION FOR USE.

When a single piece of equipment is packed for shipment, the telegraph terminal is placed in a water resistant fiberboard container and sealed. When shipped in quantity, separate fiberboard containers are packed in a wooden box reinforced with steel straps. Unpack the equipment in a sheltered area as close as possible to the site of operation. Equipment can be damaged by careless unpacking procedures. Be careful when using cutting tool on any container.

2-3. ASSEMBLY AND PREPARATION FOR USE. (CONT)

This task covers:

Preparation for use

INITIAL SETUP

Tools

Tool Kit, Electronic Equipment TK-100/G

Materials/Parts

None

Personnel Required

One technician

Equipment Condition

Not in operation

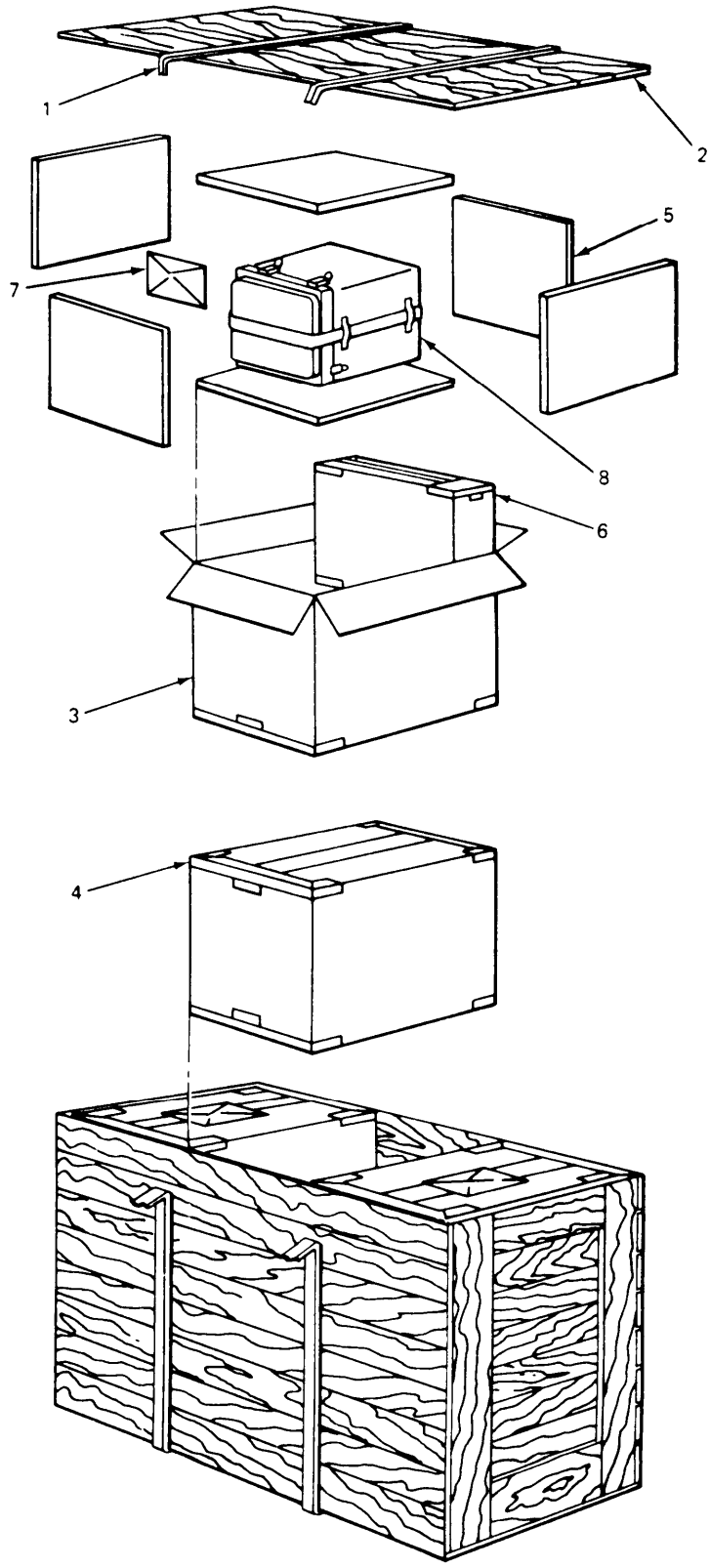
LOCATION	ITEM	ACTION	REMARKS

WARNING

Wear heavy gloves and protective eye wear when cutting straps.

1.	Top of wooden box	Steel straps (1)	Cut straps and fold back.
2.		Nails (2)	Using nail puller, remove.
3.	Below top of wooden box	Fiberboard container (3)	Lift each container out of box.
4.	Top of fiberboard container	Pressure sensitive tape (4)	Using knife, cut.
5.	Around unit	Fiberboard pads (5)	Remove pads from equipment.
6.	Inside fiberboard container	Running spares (6)	Remove running spares.
7.	Sides of package	Running spares container (6)	Fold back sides of container and remove contents.
8.	Top of fiberboard container	Technical manual (7)	Remove.
9.	Inside fiberboard container	Telegraph terminal (8)	Remove.

2-3. ASSEMBLY AND PREPARATION FOR USE. (CONT)



EL8PU013

2-4. CHECKING UNPACKED EQUIPMENT.

This task covers:

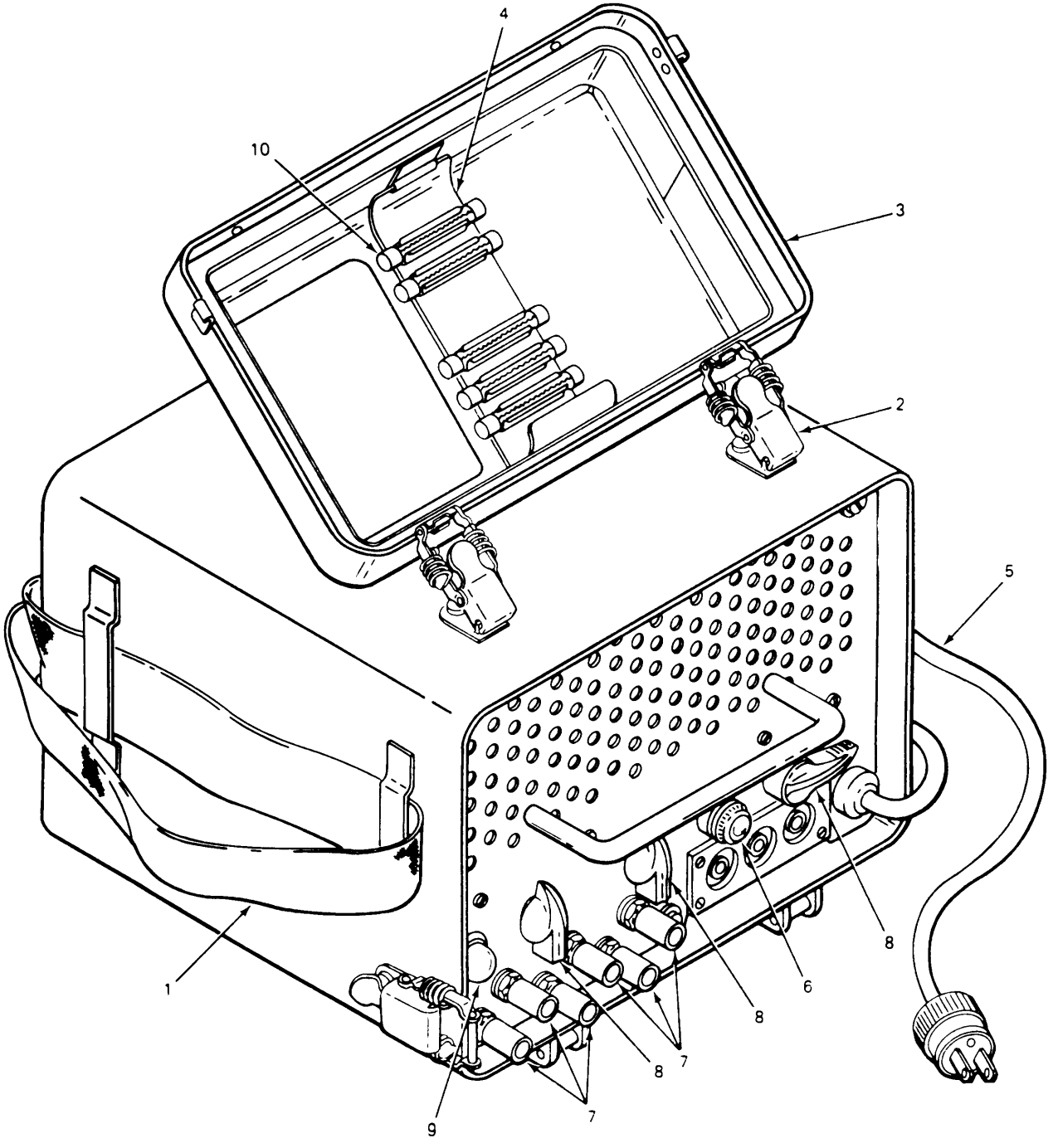
Checking unpacked equipment

INITIAL SETUP

Tools	Personnel Required
None	One technician
Materials/Parts	**Equipment Condition**
None	Not in operation

LOCATION	ITEM	ACTION **REMARKS**
1. Sides of unit	Carry sling (1)	Loosen sling, check for rips.
2. Between cover and unit	Spring fastener (2)	Release.
3. Top of unit	Cover assembly (3)	Open and check action.
4. Inside of cover	Spare fuse holder (4)	Check for damage or insecure mounting.
5. Front of unit	Power cord (5)	Unwind and inspect for damage.
6. Below fuse cap	Fuse (6)	Remove fuse. Check for damage, correct size (1-1/2 ampere) and proper installation.
7. Front panel	Binding posts (7)	Check action.
8.	Switches (8)	Check action.
9.	Glowlamp (9)	Unscrew lens. Check glowlamp for damage and proper installation.
10. Cover assembly (inside)	Five spare fuses (10)	Check quantity and for proper size (1-1/2 ampere).

2-4. CHECKING UNPACKED EQUIPMENT. (CONT)



EL8PU014

2-5. INITIAL ADJUSTMENTS AND SELF-TEST.

This task covers:

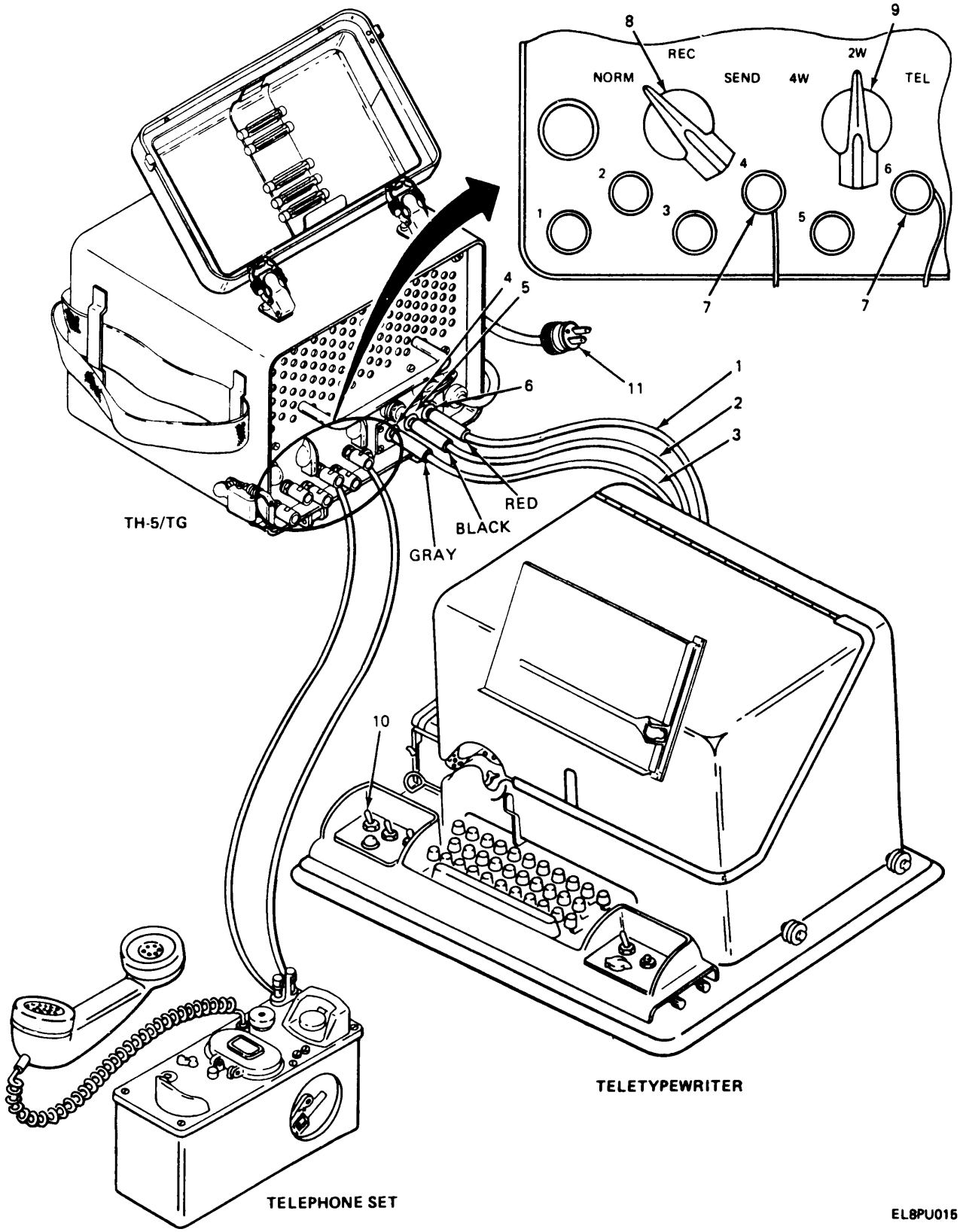
Initial adjustments and self-test

INITIAL SETUP

Tools	Personnel Required
None	One technician
Materials/Parts	**Equipment Condition**
Telephone Set TA-312/PT NSN 5805-00-543-0012 Teletypewriter TG-7A NSN 5805-00-198-9029	Equipment off

LOCATION	ITEM	ACTION **REMARKS**
1. Telegraph terminal and teletypewriter	Red plug (1) Black plug (2) Gray plug (3) SEND jack (4) SEND jack (5) Rec jack (6)	Connect teletypewriter by putting black plug into SEND, gray plug into SEND, red plug into REC jack.
2. Telegraph terminal	Binding posts 4 and 6 (7)	Connect telephone set leads.
3.	NORM-REC-SEND switch (8)	Set to NORM.
4.	4W-2W-TEL switch (9)	Set to 2W.
5. Teletypewriter	AC motor switch (10)	Set to ON. Teletypewriter runs open.
6. Telegraph terminal	Power cord (11)	Connect to 115 vac source. Teletypewriter runs closed and glow. lamp lights on TH-5/TG.

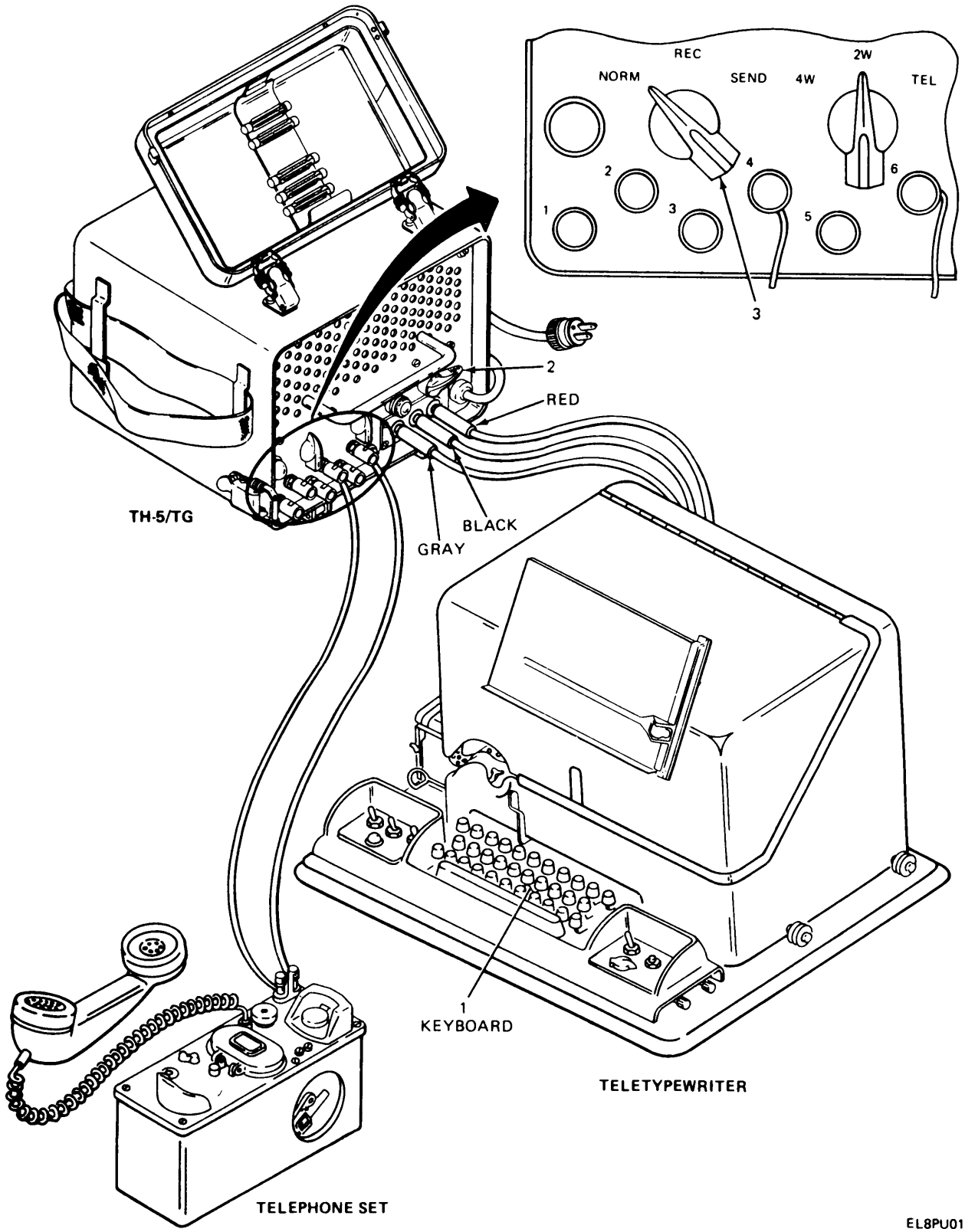
2-5. INITIAL ADJUSTMENTS AND SELF-TEST. (CONT)



2-5. INITIAL ADJUSTMENTS AND SELF-TEST. (CONT)

LOCATION	ITEM	ACTION **REMARKS**
7. Teletypewriter	Keyboard (1)	Type letters R and Y. **Observe error free copy. Glowlamp on TH-5/TG will go out. Varying tone is heard in telephone receiver.**
8.	Keyboard (1)	Stop typing. **Steady tone is heard in telephone receiver for 3 seconds. When tone stops glowlamp on TH-5/TG will light.**
9. Telegraph terminal	RING switch (2)	Hold down. **Ringing signal is heard in telephone receiver and glowlamp flickers.**
10.	NORM-REC-SEND switch (3)	Set to SEND. **Steady tone is heard in telephone receiver and glowlamp will go out.**
11. Teletypewriter	Keyboard (1)	Type letters R and Y. **Observe error free copy. Varying tone is heard in telephone receiver.**
12. Telegraph terminal	NORM-REC-SEND switch (3)	Set to REC. **No tone in telephone receiver, glow-lamp will light, and teletypewriter transmission is not possible.**
13.	NORM-REC-SEND switch (3)	Set to NORM. **No tone is heard In telephone receiver.**

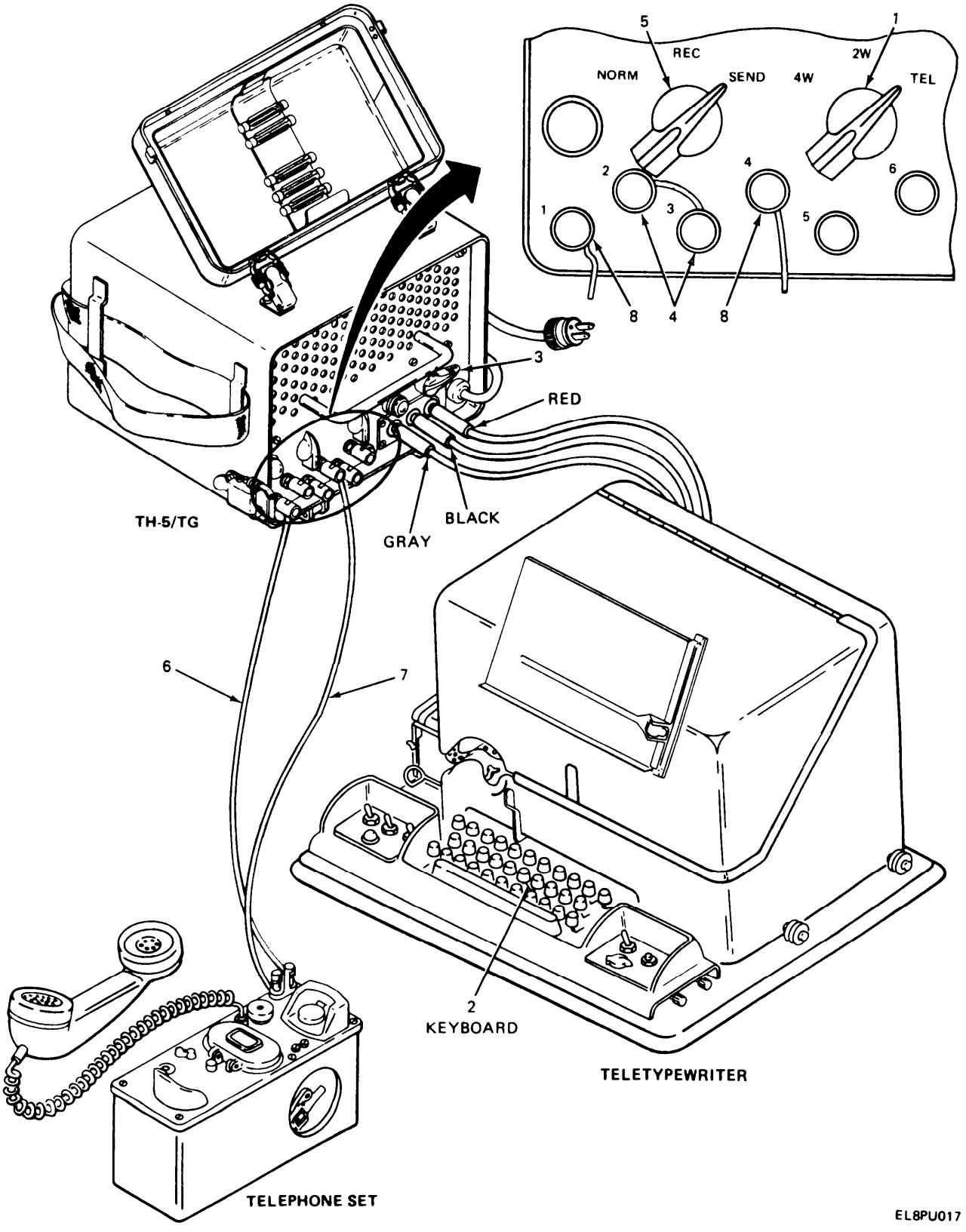
2-6. INITIAL ADJUSTMENTS AND SELF-TEST. (CONT)



2-5. INITIAL ADJUSTMENTS AND SELF-TEST. (CONT)

LOCATION	ITEM	ACTION **REMARKS**
14. Telegraph terminal	4W-2W-TEL switch (1)	Set to TEL.
15. Teletypewriter	Keyboard (2)	Press break key. **Tone is not heard in telephone receiver and teletypewriter runs open.**
16.	Keyboard (2)	Type letters R and Y. **Observe error free copy. Glowlamp on TH-5/TG will go out. Varying tone is heard in telephone receiver.**
17.	Keyboard (2)	Stop typing. **Steady tone is heard in telephone receiver for 3 seconds. When tone stops, glowlamp on TH-5/TG will light.**
18. Telegraph terminal	RING switch (3)	Hold down. **Ringing signal is heard in telephone receiver and glowlamp flickers.**
19.	Binding posts 2 and 3 (4)	Connect a wire stripped on both ends from binding post 2 to binding post 3.
20.	NORM-REC-SEND switch (5)	Set to SEND. **Glowlamp will go out.**
21. Telephone set	Lead (6), lead (7) and binding posts 1 and 4 (8)	a. Connect telephone leads by pushing binding posts in and attaching leads. **Steady tone will be heard in telephone receiver.** b. Disconnect leads.

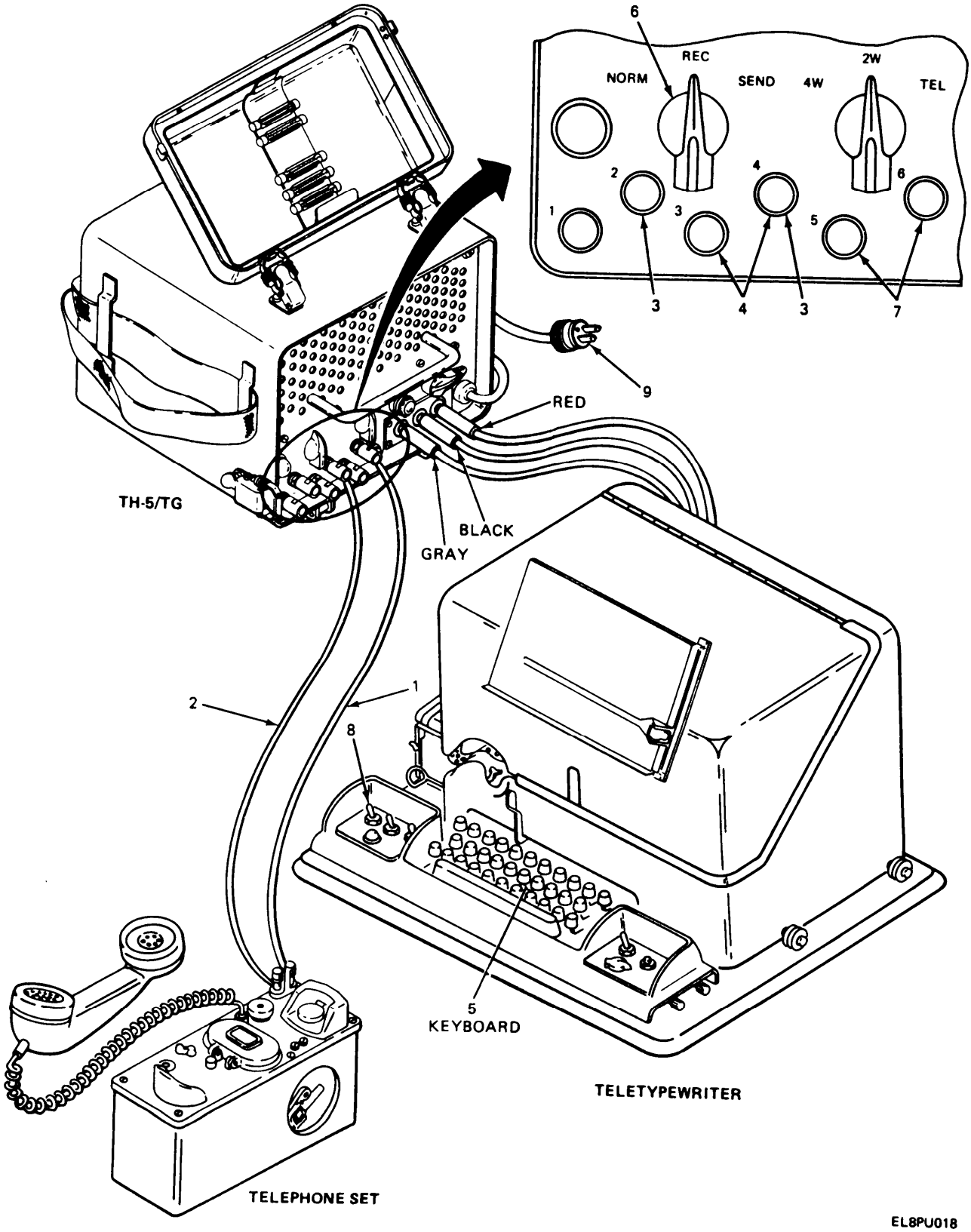
2-5. INITIAL ADJUSTMENTS AND SELF-TEST. (CONT)



2-5. INITIAL ADJUSTMENTS AND SELF-TEST. (CONT)

LOCATION	ITEM	ACTION **REMARKS**
22. Telephone set	Lead (1), lead (2) and binding posts 2 and 4 (3)	a. Connect telephone leads by pushing binding posts in and attaching leads. **Steady tone will be heard in telephone receiver.** b. Disconnect leads.
23.	Lead (1), lead (2) and binding posts 3 and 4 (4)	Connect telephone leads by pushing binding posts in and attaching leads. **Steady tone will be heard in telephone receiver.**
24. Teletypewriter	Keyboard (5)	Type letters R and Y. **Observe error free copy, and a varying tone is heard in telephone receiver, with telephone leads connected.**
25. Telegraph terminal	NORM-REC-SEND switch (6)	Set to REC. **Glowlamp will light.**
26. Telephone set	Lead (1), lead (2) and binding posts 2 and 4 (3)	Connect telephone leads by pushing binding posts in and attaching leads. **No tone is heard in telephone receiver. Teletypewriter transmission is not possible.**
27. Teletypewriter	AC motor switch (8)	Set to OFF. **Teletypewriter stops.**
28. Telegraph terminal	Power cord (9)	Remove from power source. **Glowlamp will go out.**

2-5. INITIAL ADJUSTMENTS AND SELF-TEST. (CONT)



2-6. ALTERNATE TELEPHONE-TELETYPEWRITER TRANSMISSION OVER TWO-WIRE CIRCUIT.

All connections and control settings are made on the front panel of the telegraph terminal. Jacks are provided for connecting the teletypewriter. Binding post connections and control settings are determined by the type of transmission circuit used.

This task covers:

Transmission

INITIAL SETUP

Tools	Personnel Required
None	One technician
Materials/Parts	**Equipment Condition**
None	Equipment on

LOCATION	ITEM	ACTION **REMARKS**
1. Telegraph terminal control panel	NORM-REC-SEND switch (1)	Set to NORM.
2.	4W-2W-TEL switch (2)	Set to 2W.
3. Teletypewriter	Gray plug (3)	Put gray plug into SEND jack.
4.	Black plug (4)	Put black plug into SEND jack.
5.	Red plug (5)	Put red plug into REC jack.

NOTE

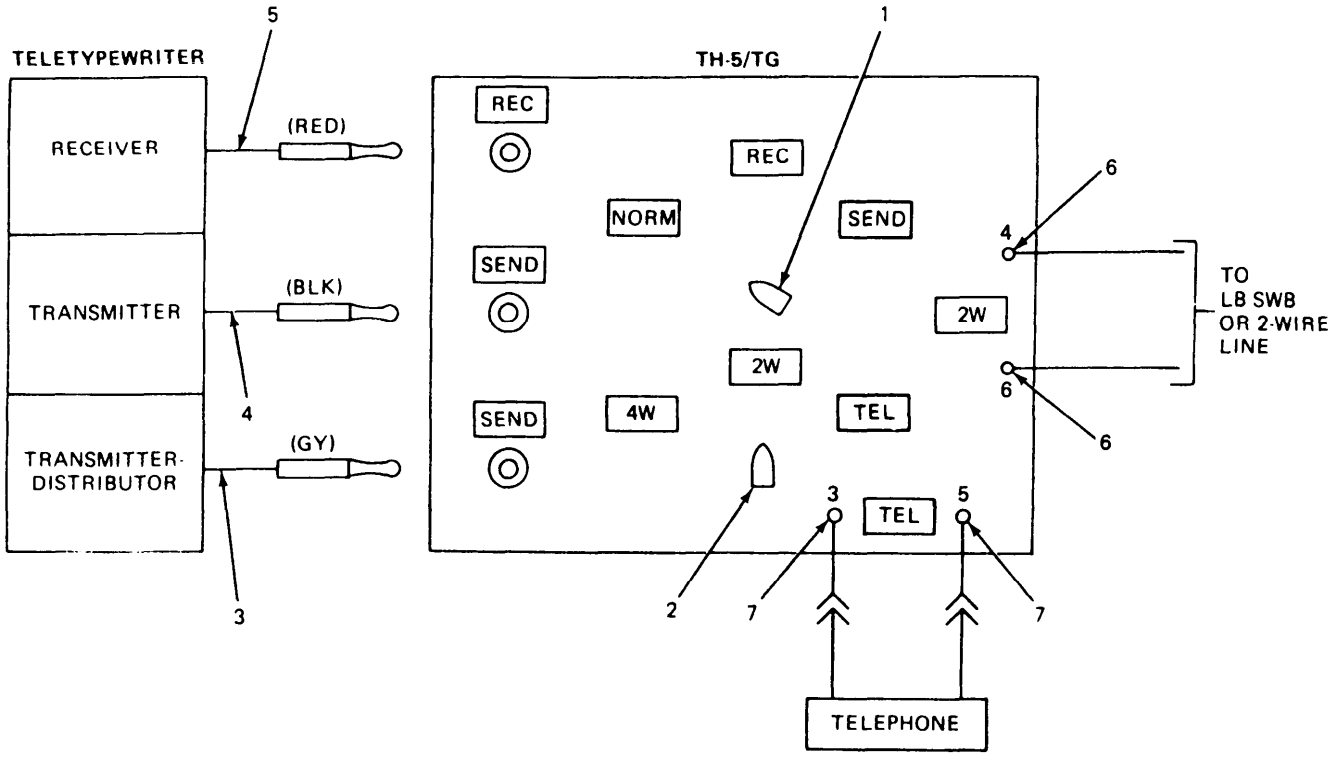
Telephone transmission is not possible when telegraph terminal is connected to a carrier terminal using a two-wire circuit. When connected to common battery switchboard, operate 4W-2W-TEL switch to TEL.

2-6. ALTERNATE TELEPHONE-TELETYPEWRITER TRANSMISSION OVER TWO-WIRE CIRCUIT. (CONT)

LOCATION	ITEM	ACTION **REMARKS**
6. Telegraph terminal control panel	Binding posts 4 and 6 (6)	Connect local battery switchboard lines or two wire line.
7.	Binding posts 3 and 5 (7)	Connect telephone set leads.

NOTE

When connected to common battery switchboard, set 4W-2W-TEL switch to TEL and have organizational maintenance install an internal wire strap.



EL8PU019

2-7. TWO-WIRE CIRCUIT WITH PUSH-TO-TALK RADIO LINK.

This task covers:

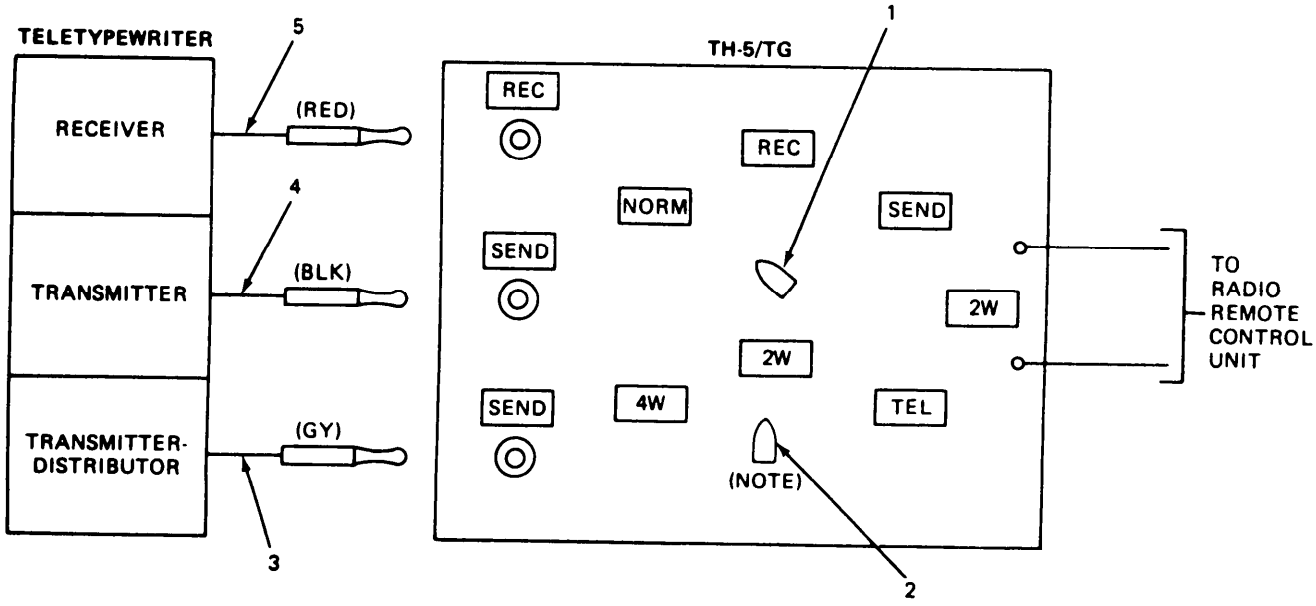
Transmission

INITIAL SETUP

Tools	Personnel Required
None	One technician
Materials/Parts	**Equipment Condition**
Control Unit RM-39, main component of Remote Control Equipment RC-289	Equipment connected to Control Unit RM-39

LOCATION	ITEM	ACTION	REMARKS
		NOTE A remote control unit such as Control Unit RM-39 is required when the TH-5/TG is used with push-to-talk radio on a two wire circuit. Refer to TM 11-2887 for information concerning connections to Control Unit RM-39.	
1. Telegraph terminal control panel	NORM-REC-SEND switch (1)	Set to NORM.	
2.	4W-2W-TEL switch (2)	Set to 2W.	
3. Teletypewriter	Gray plug (3)	Put gray plug into SEND jack.	
4.	Black plug (4)	Put black plug into SEND jack.	
5.	Red plug (5)	Put red plug into REC jack.	

2-7. TWO-WIRE CIRCUIT WITH PUSH-TO-TALK RADIO LINK. (CONT)



EL8PU020

2-8. FOUR-WIRE CIRCUIT WITH ONE-WAY REVERSIBLE TELETYPEWRITER TRANSMISSION.

This task covers:

Transmission

INITIAL SETUP

Tools	Personnel Required
None	One technician
Materials/Parts	**Equipment Condition**
4-wire line or TG carrier terminal	Equipment on

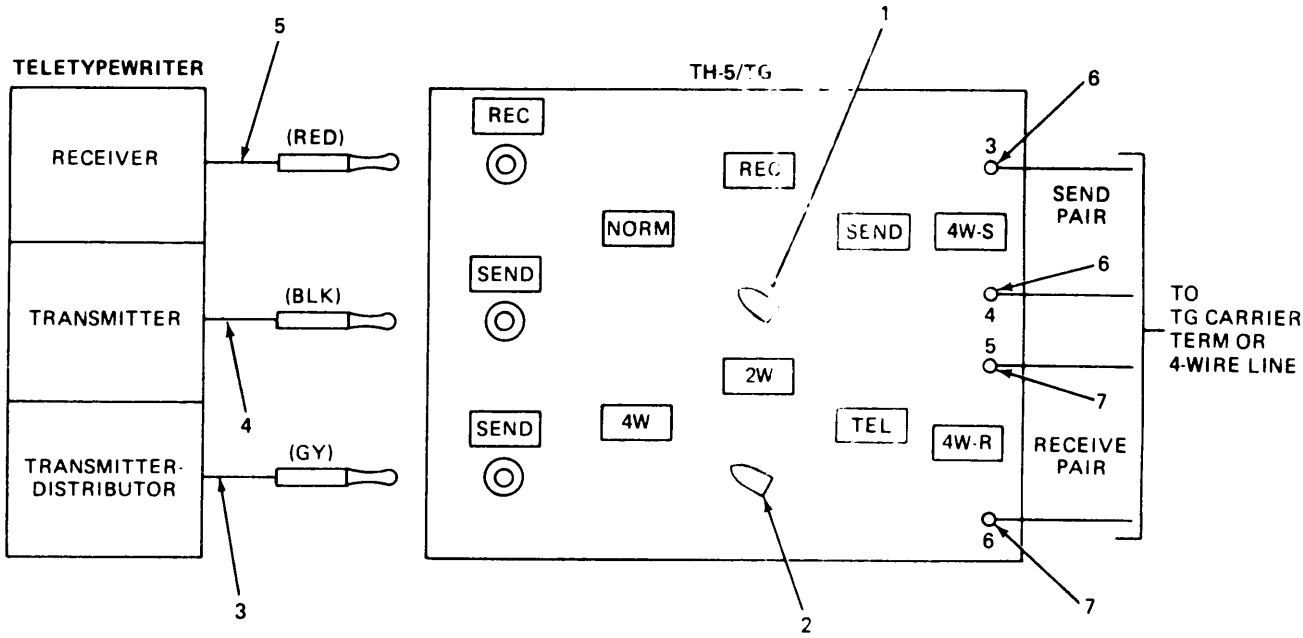
LOCATION	ITEM	ACTION **REMARKS**
1. Telegraph terminal control panel	NORM-REC-SEND switch (1)	Set to NORM.
2.	4W-2W-TEL switch (2)	Set to 4W.
3. Teletypewriter	Gray plug (3)	Put gray plug into SEND jack.
4.	Black plug (4)	Put black plug into SEND jack.
5.	Red plug (5)	Put red plug into REC jack.

NOTE

When using 4-wire line, the send pair is usually colored green and black, the receive pair is usually colored red, white, or yellow. If TG carrier terminal does not match above color code, refer to the proper TM for connection instructions.

2-3. FOUR-WIRE CIRCUIT WITH ONE-WAY REVERSIBLE TELETYPEWRITER TRANSMISSION. (CONT)

LOCATION	ITEM	ACTION **REMARKS**
6. Telegraph terminal control panel	Binding posts 3 and 4 (6)	Connect send leads of four-wire line or TG carrier terminal.
7.	Binding posts 5 and 6 (7)	Connect receive leads of four-wire line or TG carrier terminal.



EL8PU021

2-9. FOUR-WIRE CIRCUIT WITH PUSH-TO-TALK RADIO LINK.

This task covers:

Transmission

INITIAL SETUP

Tools	Personnel Required
None	One technician
Materials/Parts	**Equipment Condition**
Jumper wire Radio receiver and transmitter	Equipment on

	LOCATION	ITEM	ACTION **REMARKS**
1.	Telegraph terminal control panel	NORM-REC-SEND switch (1)	Set to SEND.
2.		4W-2W-TEL switch (2)	Set to 4W.
3.	Teletypewriter	Gray plug (3)	Put gray plug into SEND jack.
4.		Black plug (4)	Put black plug into SEND jack.
5.		Red plug (5)	Put red plug into REC jack.
6.	Telegraph terminal control panel	Binding posts 2 and 3 (6)	Connect a wire stripped on both ends from binding post 2 to binding post 3.

2-9. FOUR-WIRE CIRCUIT WITH PUSH-TO-TALK RADIO LINK. (CONT)

LOCATION	ITEM	ACTION **REMARKS**
7. Telegraph terminal	Binding posts 5 and 6 (7)	Connect receive leads of push-to-talk radio receiver.
8.	Binding posts 1, 2, 3, and 4 (8)	Connect send leads of push-to-talk radio transmitter.

2-10. FOUR-WIRE CIRCUIT WITH FULL DUPLEX TELETYPEWRITER TRANSMISSION.

This task covers:

Transmission

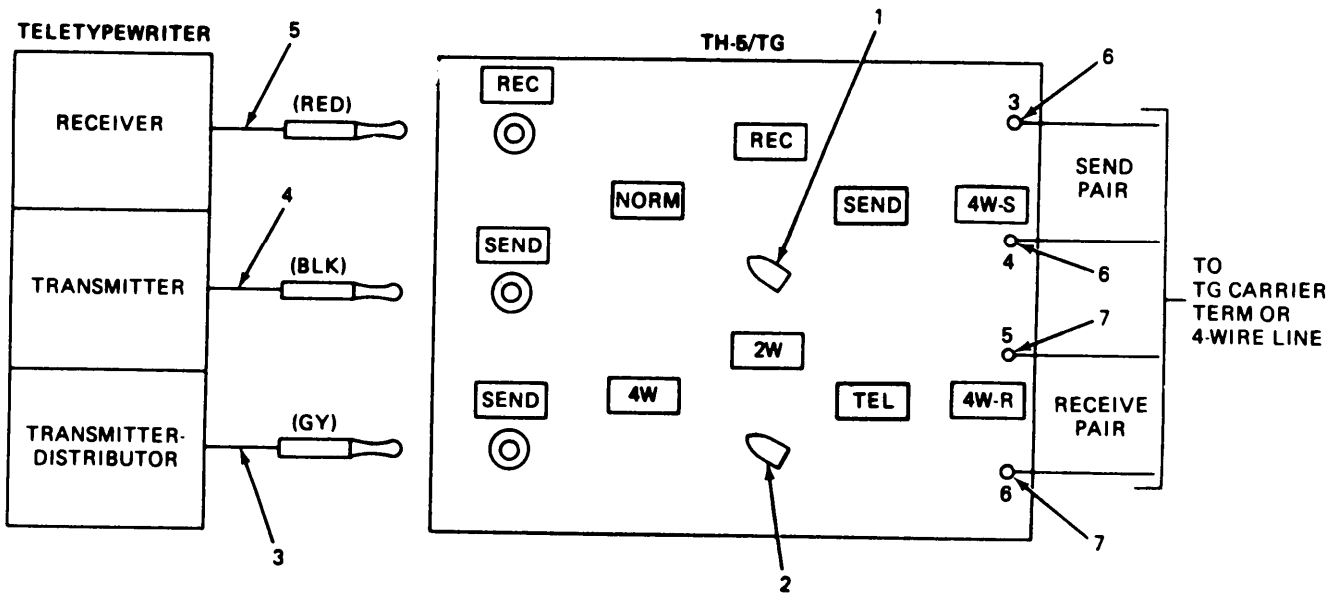
INITIAL SETUP

Tools	Personnel Required
None	One technician
Materials/Parts	**Equipment Condition**
4-wire line or TG carrier terminal	Equipment on

LOCATION	ITEM	ACTION	REMARKS
		NOTE	
		Have organizational maintenance remove home copy strap.	
1. Telegraph terminal control panel	NORM-REC-SEND switch (1)	Set to NORM.	
		NOTE	
		When using two-way radio set, NORM-REC-SEND switch is set to SEND.	
2.	4W-2W-TEL switch (2)		
3. Teletypewriter	Gray plug (3)	Put gray plug into SEND jack.	
4.	Black plug (4)	Put black plug into SEND jack.	
5.	Red plug (5)	Put red plug into REC jack.	
		NOTE	
		When using 4-wire line, the send pair is usually colored red, green and black, the receive pair is usually colored red, white, or yellow. If TG carrier terminal does not match above color code, refer to the proper TM for connection instructions.	

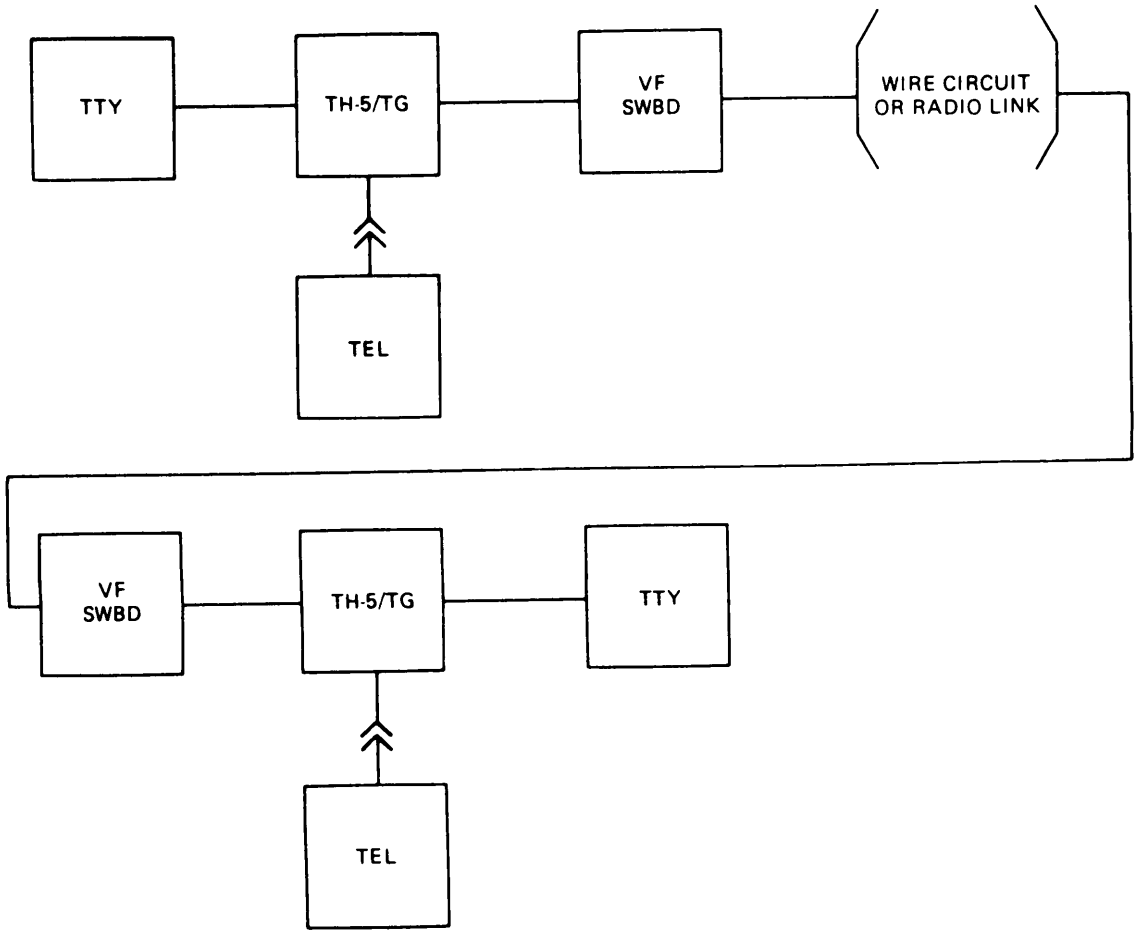
2-10. FOUR-WIRE CIRCUIT WITH FULL DUPLEX TELETYPEWRITER TRANSMISSION. (CONT)

LOCATION	ITEM	ACTION **REMARKS**
6. Telegraph terminal control panel	Binding posts 3 and 4 (6)	Connect send leads of four-wire line or TG carrier terminal.
7.	Binding posts 5 and 6 (7)	Connect receive leads of four-wire line or TG carrier terminal.

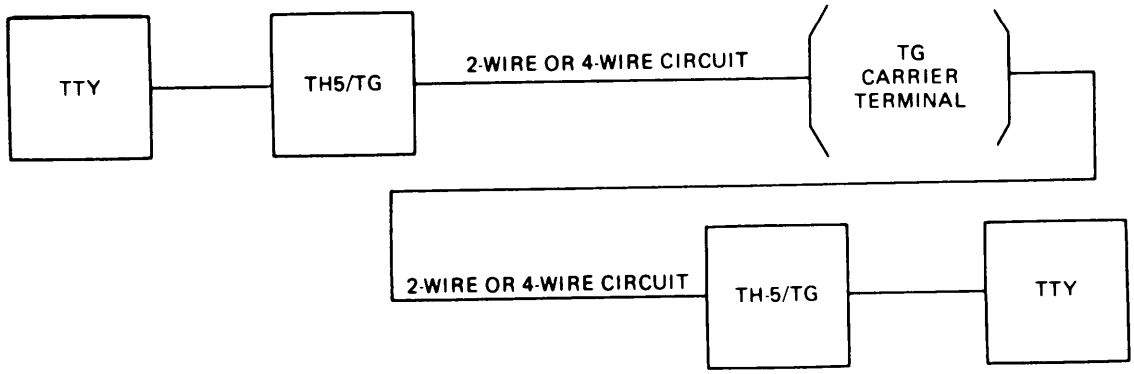


EL8PU023

2-11. TYPICAL TELEGRAPH TERMINAL ARRANGEMENTS.



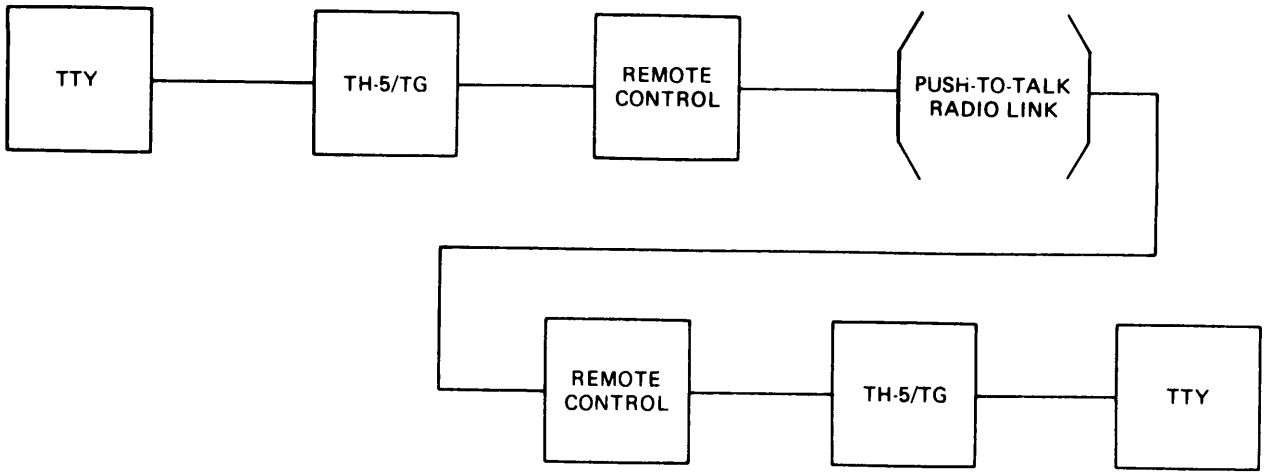
A. ALTERNATE TELEPHONE-TELEGRAPH TRANSMISSION



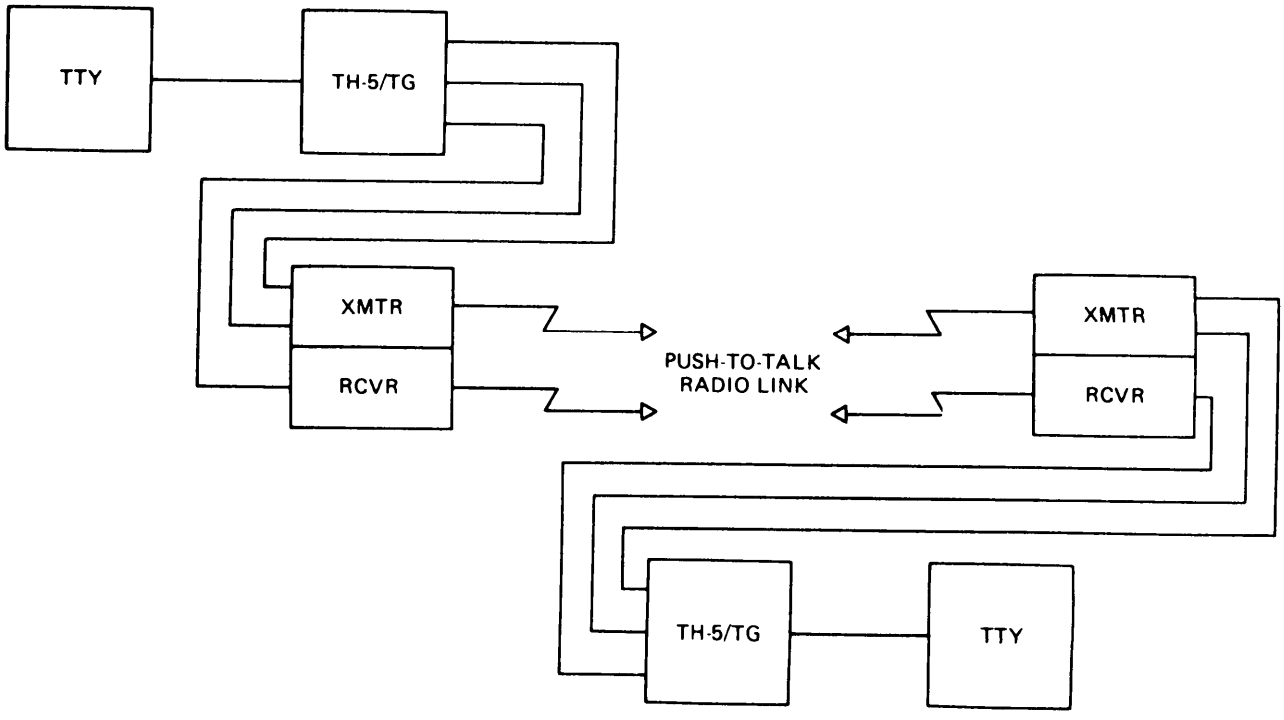
B. CARRIER TELEGRAPH TRANSMISSION

EL8PU024

2-11. TYPICAL TELEGRAPH TERMINAL ARRANGEMENTS. (CONT)



C. PUSH-TO-TALK RADIO OPERATION OVER TWO-WIRE CIRCUIT, USING REMOTE CONTROL UNIT



D. PUSH-TO-TALK RADIO OPERATION OVER FOUR-WIRE CIRCUIT

EL8PU025

2-1 2. TWO-WIRE ALTERNATE TELEPHONE-TELETYPEWRITER OPERATION POINT-TO-POINT.

This task covers:

1. Telephone signaling
2. Teletypewriter signaling

INITIAL SETUP

Tools	Personnel Required
None	One technician
Materials/Parts	**Equipment Condition**
None	Equipment connected. See paragraph 2-6.

LOCATION	ITEM	ACTION **REMARKS**
TELEPHONE SIGNALING		
1. Telegraph terminal control panel	NORM-REC-SEND switch (1)	Set to NORM.
2.	4W-2W-TEL switch (2)	Set to TEL
3. Telephone set	Hand generator (3)	Use hand generator to signal distant station.

2-12. TWO-WIRE ALTERNATE TELEPHONE-TELETYPEWRITER OPERATION POINT-TO-POINT. (CONT)

	LOCATION	ITEM	ACTION **REMARKS**
TELETYPEWRITER SIGNALING			
1.	Telegraph terminal control panel	NORM-REC-SEND switch (1)	Set to NORM.
2.		4W-2W-TEL switch (2)	Set to 2W.
3.		Ring switch (4)	Hold down for signaling distant stations.
4.	Telegraph terminal	Glowlamp (5)	Wait until glowlamp lights before starting or resuming transmission.

2-13. TWO-WIRE ALTERNATE TELEPHONE-TELETYPEWRITER OPERATION OVER LOCAL BATTERY SWITCHBOARD.

This task covers:

1. Station 1 transmit
2. Station 2 receive

INITIAL SETUP

Tools	Personnel Required
None	One technician
Materials/Parts	**Equipment Condition**
None	Equipment connected. See paragraph 2-6.

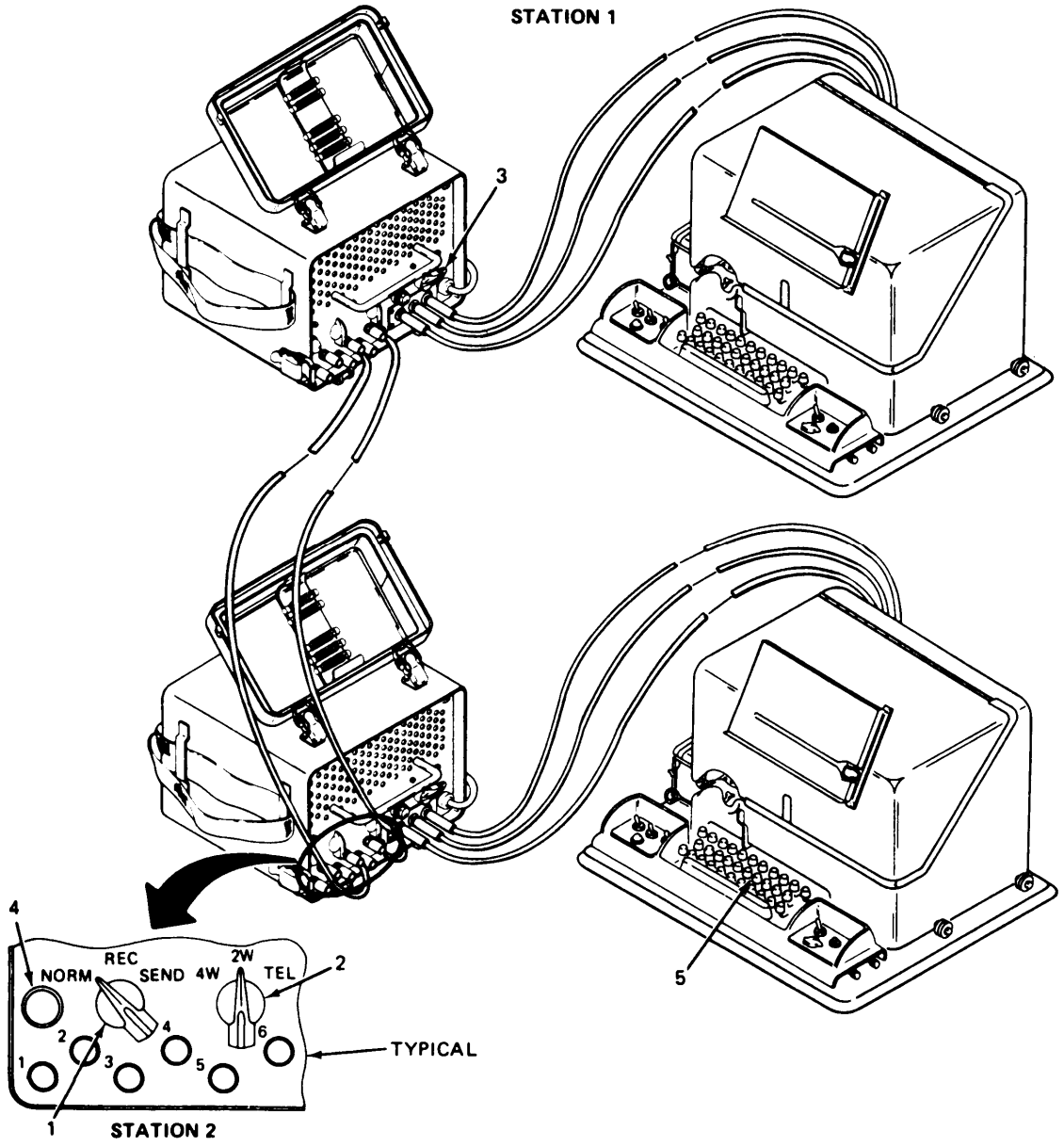
LOCATION	ITEM	ACTION **REMARKS**
STATION 1 TRANSMIT		
1. Telegraph terminal control panel	NORM-REC-SEND switch (1)	Set to NORM.
2.	4W-2W-TEL switch (2)	Set to 2W.
3.	RING switch (3)	Hold RING switch down to signal station 2.
4.	Glowlamp (4)	Glowlamp will go out when station 2 acknowledges RING signal. **Wait until glowlamp lights before starting or continuing transmission.**
STATION 2 RECEIVE		
1. Telegraph terminal control panel	NORM-REC-SEND switch (1)	Set to NORM.
2.	4W-2W-TEL switch (2)	Set to 2W.
3. Teletypewriter	Keyboard (5)	Acknowledge by typing on teletypewriter keyboard. Stop typing to receive message.

2-13. TWO-WIRE ALTERNATE TELEPHONE-TELETYPEWRITER OPERATION OVER LOCAL BATTERY SWITCHBOARD. (CONT)

STATION 2 RECEIVE (CONT)

NOTE

To signal Station 1, hold RING switch down for 3 seconds.
seconds.



EL8PU027

2-14. TWO-WIRE ALTERNATE TELEPHONE-TELETYPEWRITER OPERATION OVER COMMON BATTERY SWITCHBOARD.

This task covers:

1. Station 1 transmit
2. Station 2 receive

INITIAL SETUP

Tools	Personnel Required
None	One technician
Materiais/Parts	**Equipment Condition**
None	Equipment connected. See paragraph 2-6.

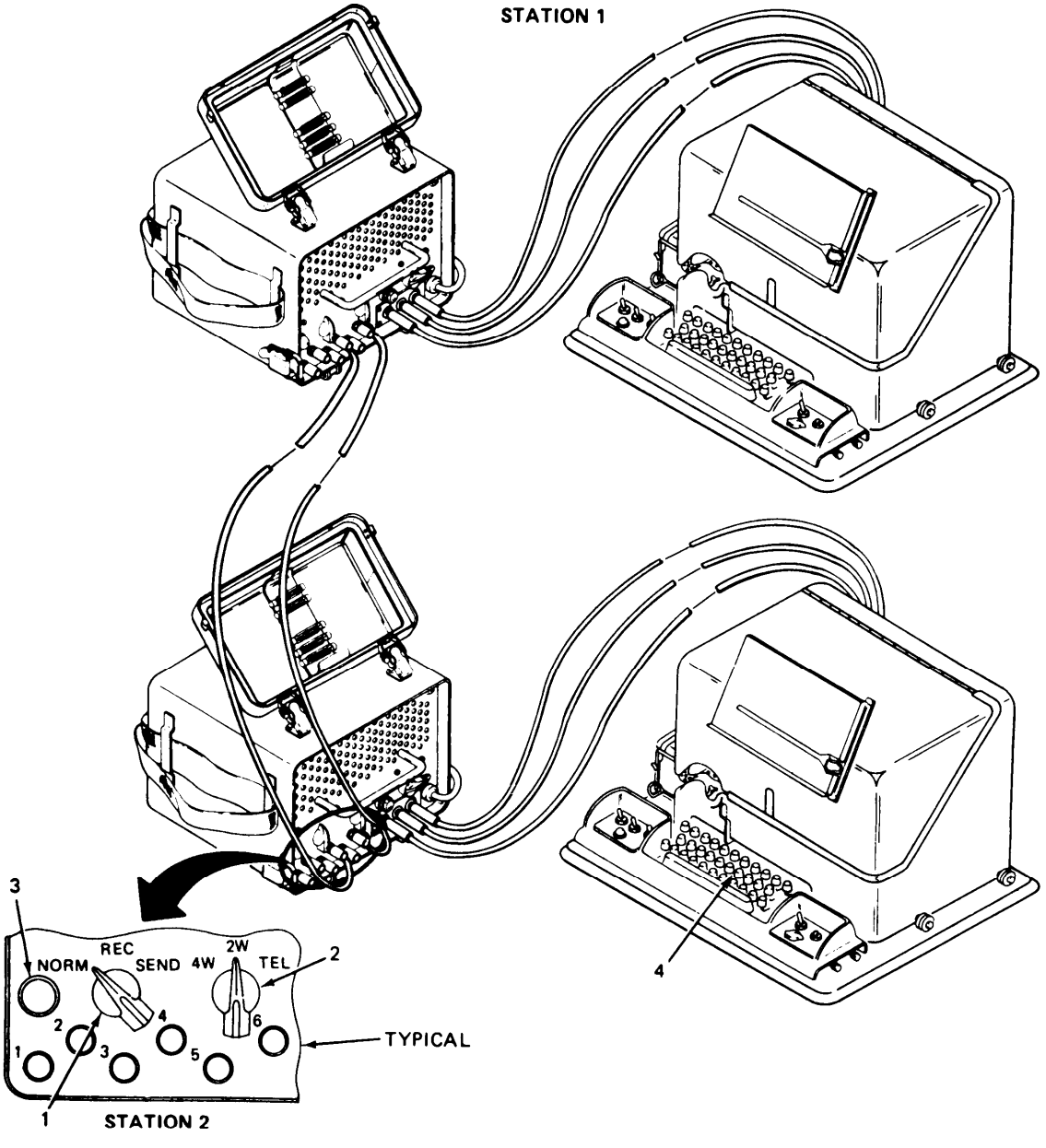
LOCATION	ITEM	ACTION **REMARKS**
STATION 1 TRANSMIT		
1. Telegraph terminal control panel	NORM-REC-SEND switch (1)	Set to NORM.
2.	4W-2W-TEL switch (2)	Set to 2W. This automatically signals switchboard.
3. Telegraph terminal	Glowlamp (3)	Wait until glowlamp lights before starting or continuing transmission. **Glowlamp will go out when station 2 acknowledges RING signal.**
4.	4W-2W-TEL switch (2)	Set to TEL when transmission is completed.
STATION 2 RECEIVE		
1. Telegraph terminal control panel	NORM-REC-SEND switch (1)	Set to NORM.
2.	4W-2W-TEL switch (2)	Set to 2W.
3. Teletypewriter	Keyboard (4)	Acknowledge incoming signal by typing or teletypewriter keyboard. **Stop typing to receive message.**

2-14. TWO-WIRE ALTERNATE TELEPHONE-TELETYPEWRITER OPERATION OVER COMMON BATTERY SWITCHBOARD. (CONT)

STATION 2 RECEIVE (CONT)

NOTE

To signal station 1 hold RING switch down for 3 seconds.
seconds.



2-15. TWO-WIRE TELETYPEWRITER OPERATION OVER PUSH-TO-TALK RADIO.

This task covers:

1. Transmitting
2. Receiving

INITIAL SETUP

Tools

None

Materials/Parts

Control Unit RM-39, main component of Remote Control Equipment RC-289

Personnel Required

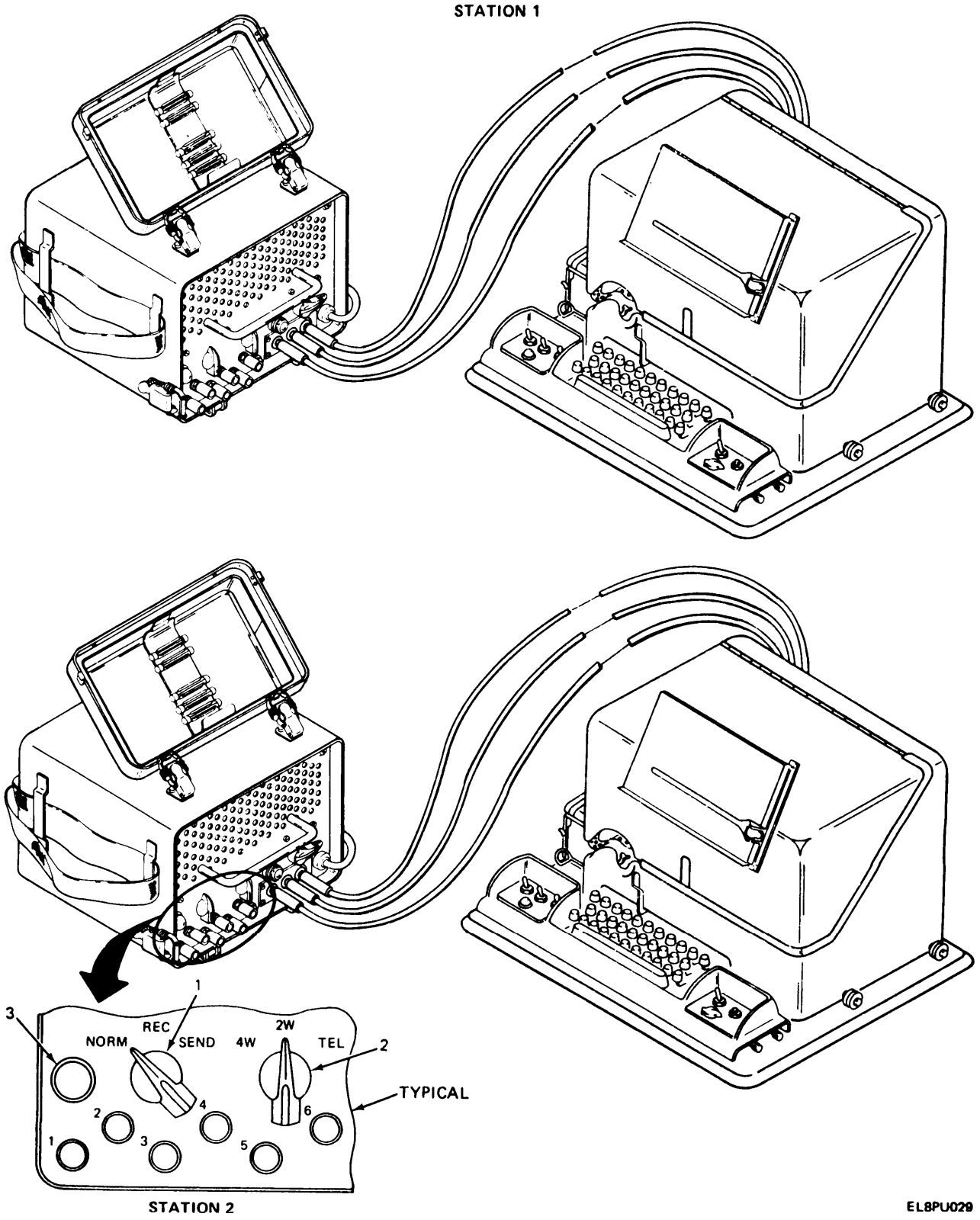
One technician

Equipment Condition

Equipment connected to Control Unit RM-39.

LOCATION	ITEM	ACTION	REMARKS
		NOTE A remote control unit is required for this type of operation. See paragraph 2-7. NORM-REC-SEND switch in SEND position turns on radio transmitter through the remote control unit.	
TRANSMITTING			
1. Telegraph terminal control panel	NORM-REC-SEND switch (1)	Set to NORM.	
2.	4W-2W-TEL switch (2)	Set to 2W.	
3.	Glowlamp (3)	Begin transmission after lamp is out. Do not use RING switch.	

2-15. TWO-WIRE TELETYPEWRITER OPERATION OVER PUSH-TO-TALK RADIO. (CONT)



2-15. TWO-WIRE TELETYPEWRITER OPERATION OVER PUSH-TO-TALK RADIO. (CONT)

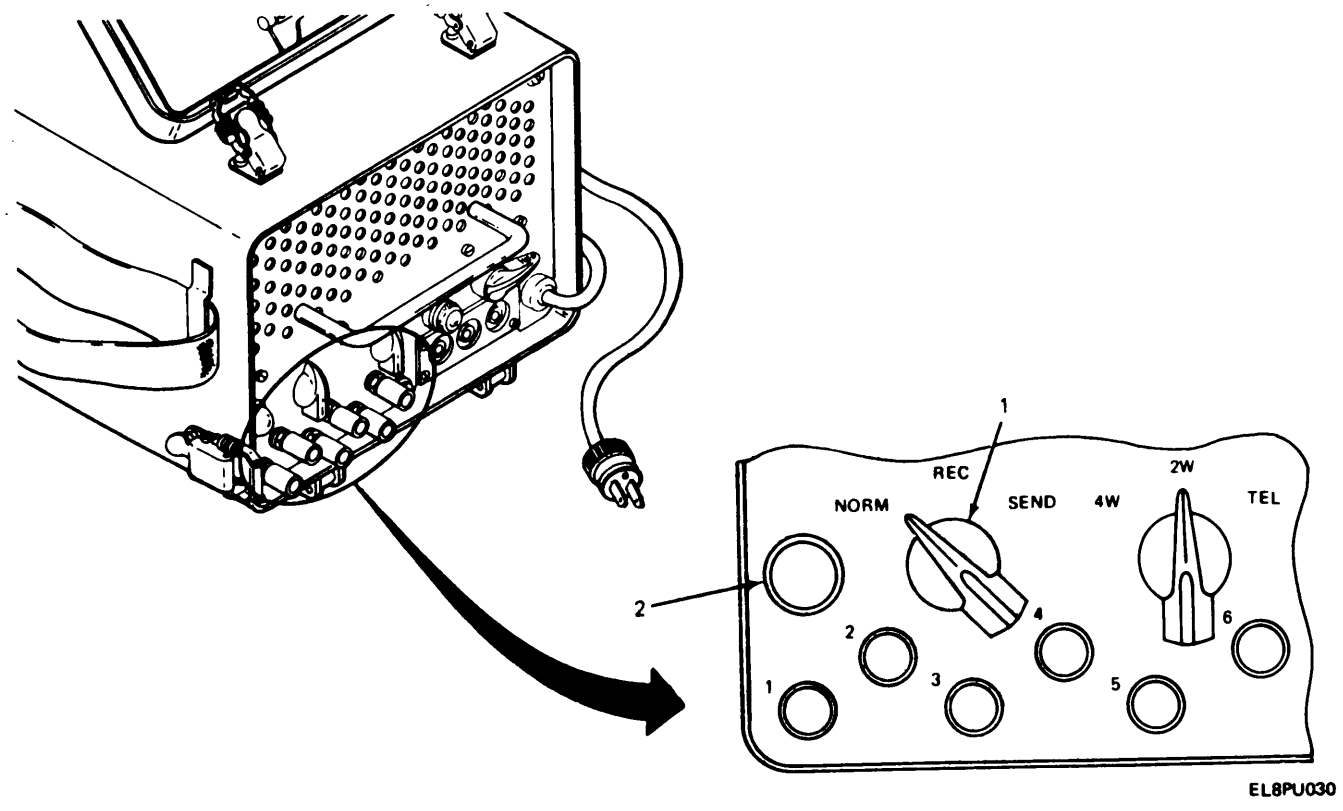
LOCATION	ITEM	ACTION **REMARKS**

NOTE

NORM-REC-SEND switch set to NORM position disables radio transmitter and turns on receiver through remote control unit.

RECEIVING

1.	Telegraph terminal control panel	NORM-REC-SEND switch (1)	Set to NORM.
2.		Glowlamp (2)	When the NORM-REC-SEND switch is set to NORM position, the glowlamp will light.



2-16. FOUR-WIRE CIRCUIT HALF-DUPLEX TELETYPEWRITER OPERATION OVER WIRE.

This task covers:

1. Transmitting
2. Receiving

INITIAL SETUP

Tools	Personnel Required
None	One technician
Materials/Parts	**Equipment Condition**
None	Equipment connected. See paragraph 2-8.

LOCATION	ITEM	ACTION	REMARKS
TRANSMITTING			
1. Telegraph terminal control panel	NORM-REC-SEND switch (1)	Set to NORM.	
2.	4W-2W-TEL switch (2)	Set to 4W.	
3.	RING switch (3)	Hold down for 3 seconds to signal or break transmission from the distant station.	
4.	Glowlamp (4)	Wait until lit before starting or continuing transmission.	

NOTE

If teletypewriter runs open, stop typing.

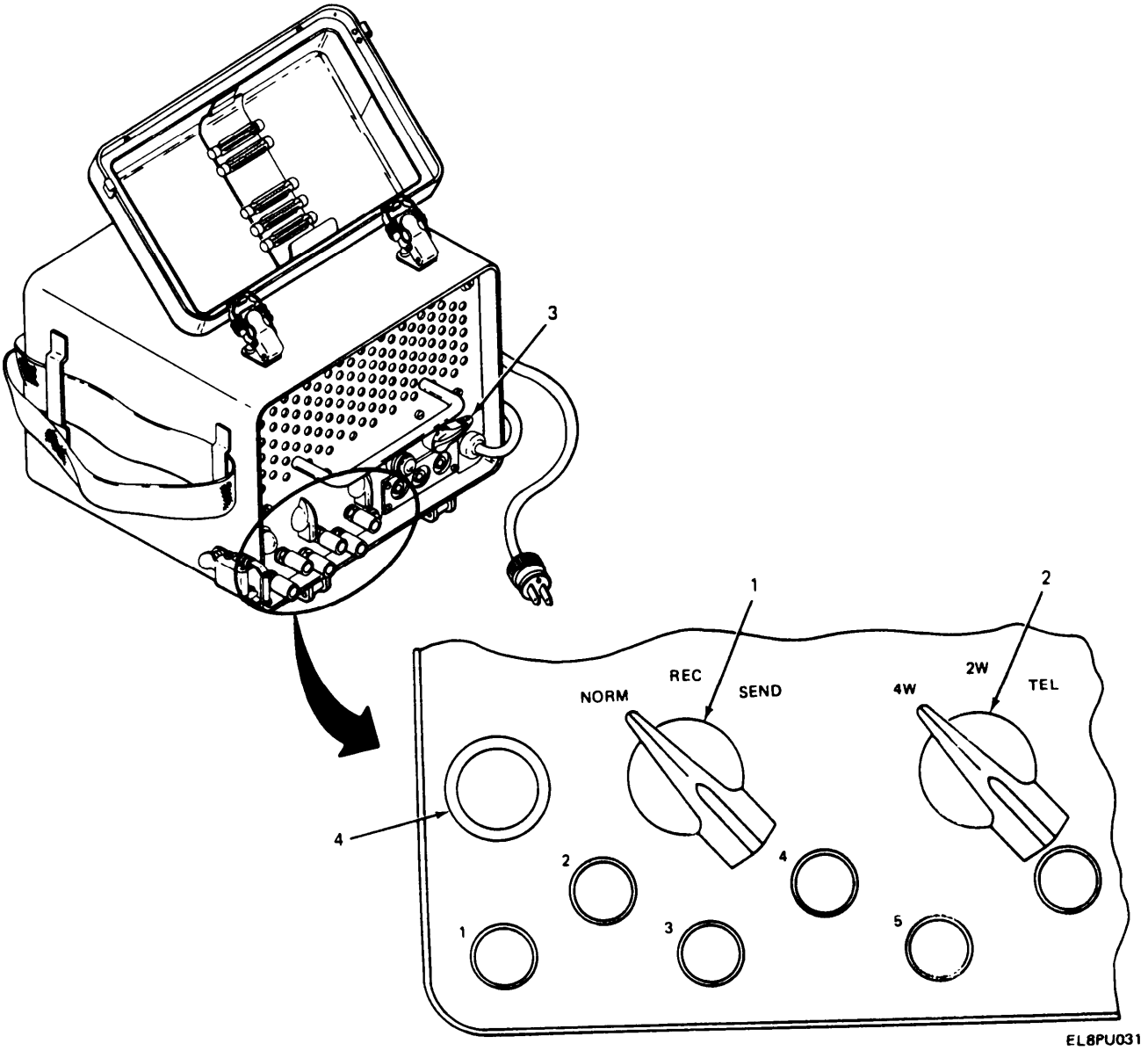
RECEIVING			
1. Telegraph terminal control panel	NORM-REC-SEND switch (1)	Set to NORM.	
2.	4W-2W-TEL switch (2)	Set to 4W.	
3.	Glowlamp (4)	Wait until lit before starting or continuing transmission.	

2-16. FOUR-WIRE CIRCUIT HALF-DUPLEX TELETYPEWRITER OPERATION OVER WIRE. (CONT)

RECEIVING (CONT)

NOTE

Four-wire, one-way reversible teletypewriter operation is the same as half duplex except that there is no break in feature.



2-17. FOUR-WIRE CIRCUIT HALF-DUPLEX TELETYPEWRITER OPERATION OVER PUSH-TO-TALK RADIO.

This task covers:

1. Transmitting
2. Receiving

INITIAL SETUP

Tools	Personnel Required
None	One technician
Materials/Parts	**Equipment Condition**
None	Equipment connected. See paragraph 2-9.

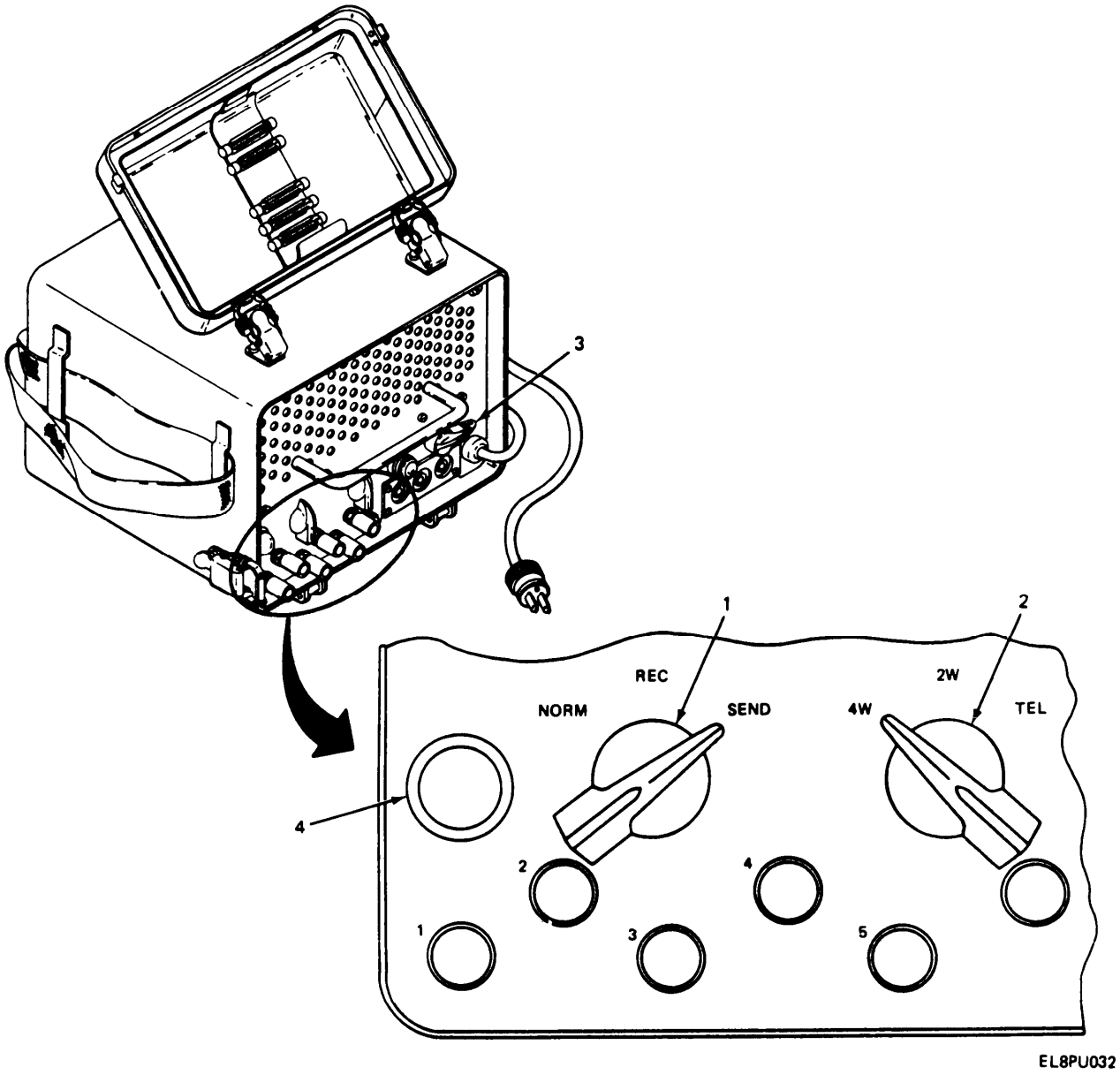
LOCATION	ITEM	ACTION	REMARKS
TRANSMITTING			
1. Telegraph terminal control panel	NORM-REC-SEND switch (1)	Set to SEND.	
		NOTE Setting NORM-REC-SEND switch to SEND automatically turns on radio transmitter and disables receiver.	
2.	4W-2W-TEL switch (2)	Set to 4W.	
3.	RING switch (3)	Hold down to signal the distant station only if distant station has a vf ringer.	
4.	Glowlamp (4)	Begin transmission after glowlamp goes out.	
RECEIVING			
1. Telegraph terminal control panel	NORM-REC-SEND switch (1)	Set to REC.	
2.	Glowlamp (4)	While NORM-REC-SEND switch is set to REC position, the glowlamp will be lit.	

2-17. FOUR-WIRE CIRCUIT HALF-DUPLEX TELETYPEWRITER OPERATION OVER PUSH-TO-TALK RADIO. (CONT)

RECEIVING (CONT)

NOTE

Setting the NORM-REC-SEND switch to REC automatically disables the radio transmitter and turns on the receiver.



2-18. FOUR-WIRE CIRCUIT FULL DUPLEX TELETYPEWRITER OPERATION OVER TWO-WAY RADIO.

This task covers:

Four-wire circuit

INITIAL SETUP

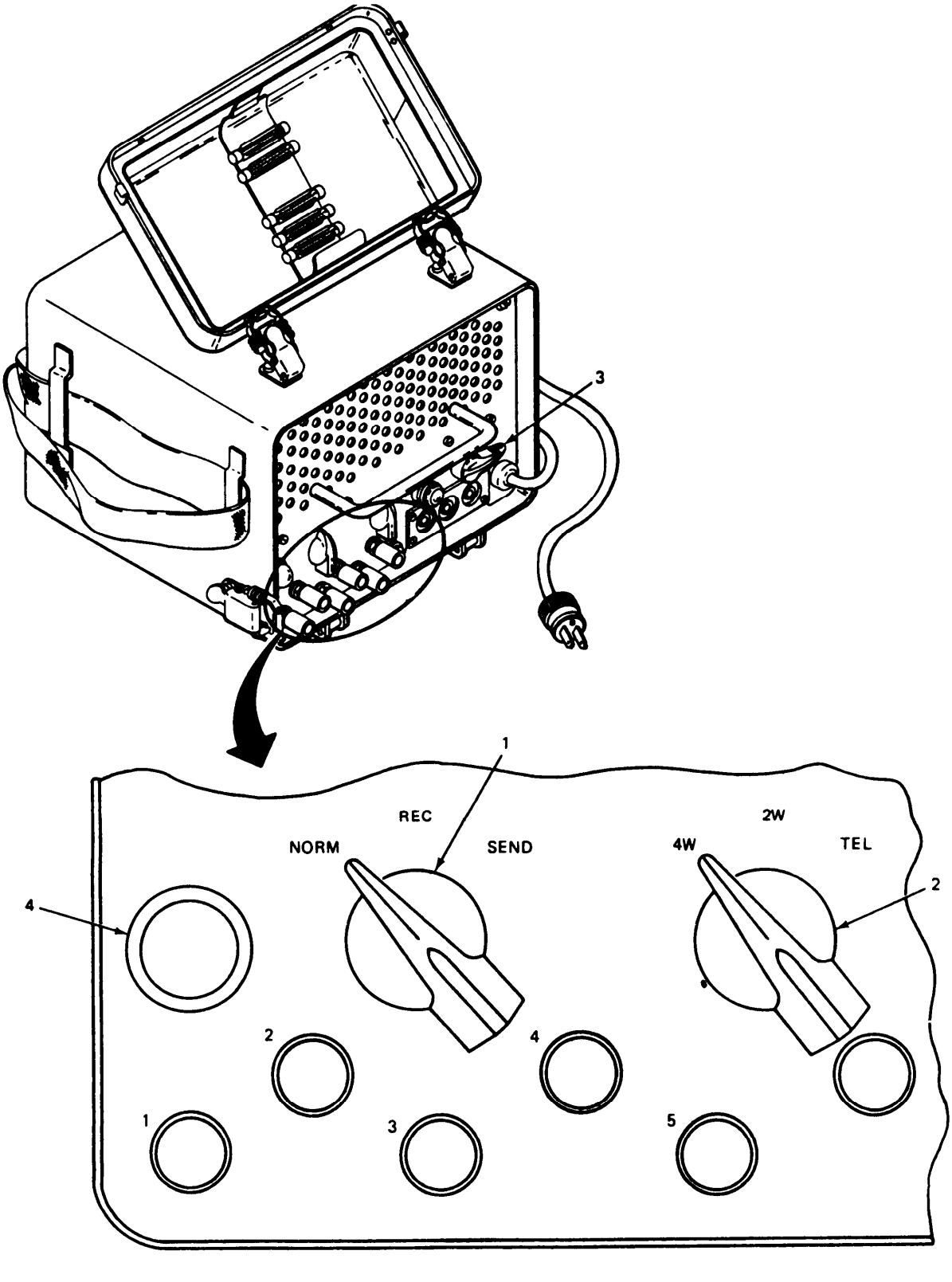
Tools	Personnel Required
None	One technician
Materials/Parts	**Equipment Condition**
None	Equipment connected. See paragraph 2-9.

LOCATION	ITEM	ACTION **REMARKS**
1. Telegraph terminal control panel	NORM-REC-SEND switch (1)	Set to NORM.
2.	4W-2W-TEL switch (2)	Set to 4W.
3.	RING switch (3)	Use RING switch to signal the distant station only if a vf ringer is a component of that system.
4.	Glowlamp (4)	Transmission is possible when lamp is on or off.

NOTE

Full duplex operation refers to sending and receiving between two points in both directions at the same time. Home copy is not possible during this time because internal home copy strap has been removed.

2-18. FOUR-WIRE CIRCUIT FULL DUPLEX TELETYPEWRITER OPERATION OVER TWO-WAY RADIO. (CONT)



2-19. FOUR-WIRE FULL DUPLEX TELETYPEWRITER OPERATION OVER TWO-WAY RADIO.

This task covers:

Two-way radio circuit

INITIAL SETUP

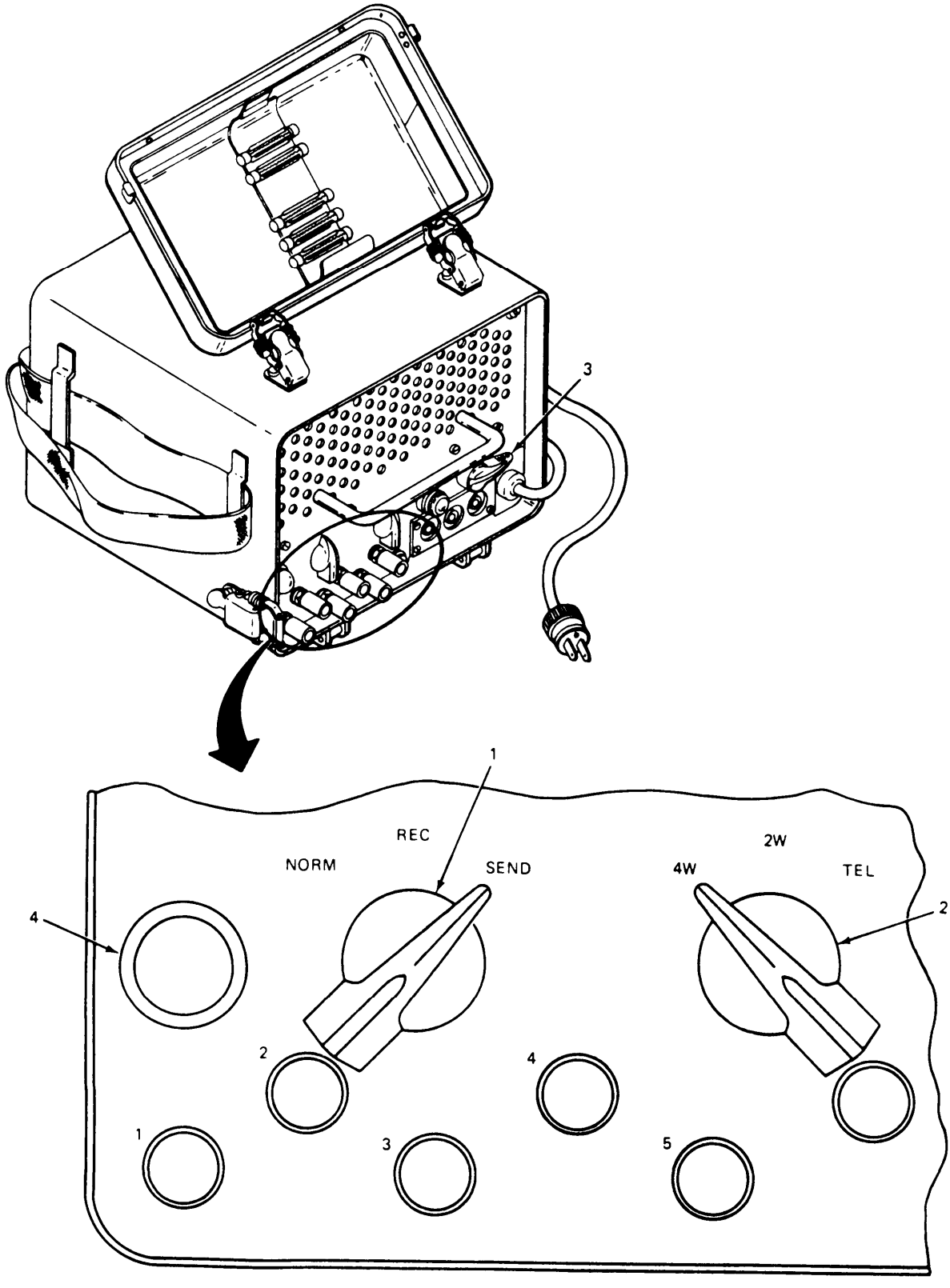
Tools	Personnel Required
None	One technician
Materials/Parts	**Equipment Condition**
None	Equipment connected. See paragraph 2-9.

	LOCATION	ITEM	ACTION **REMARKS**
1.	Telegraph terminal control panel	NORM-REC-SEND switch (1)	Set to SEND.
2.		4W-2W-TEL switch (2)	Set to 4W.
3.		RING switch (3)	Use RING switch to signal the distant station only if a vf ringer is a component of that system.
4.		Glowlamp (4)	Transmission is possible when lamp is on or off.

NOTE

Full duplex operation refers to sending and receiving between two points in both directions at the same time. Home copy is not possible during this time because internal home copy strap has been removed.

2-19. FOUR-WIRE FULL DUPLEX TELETYPEWRITER OPERATION OVER TWO-WAY RADIO. (CONT)



2-20. STANDBY PROCEDURE.

This task covers:

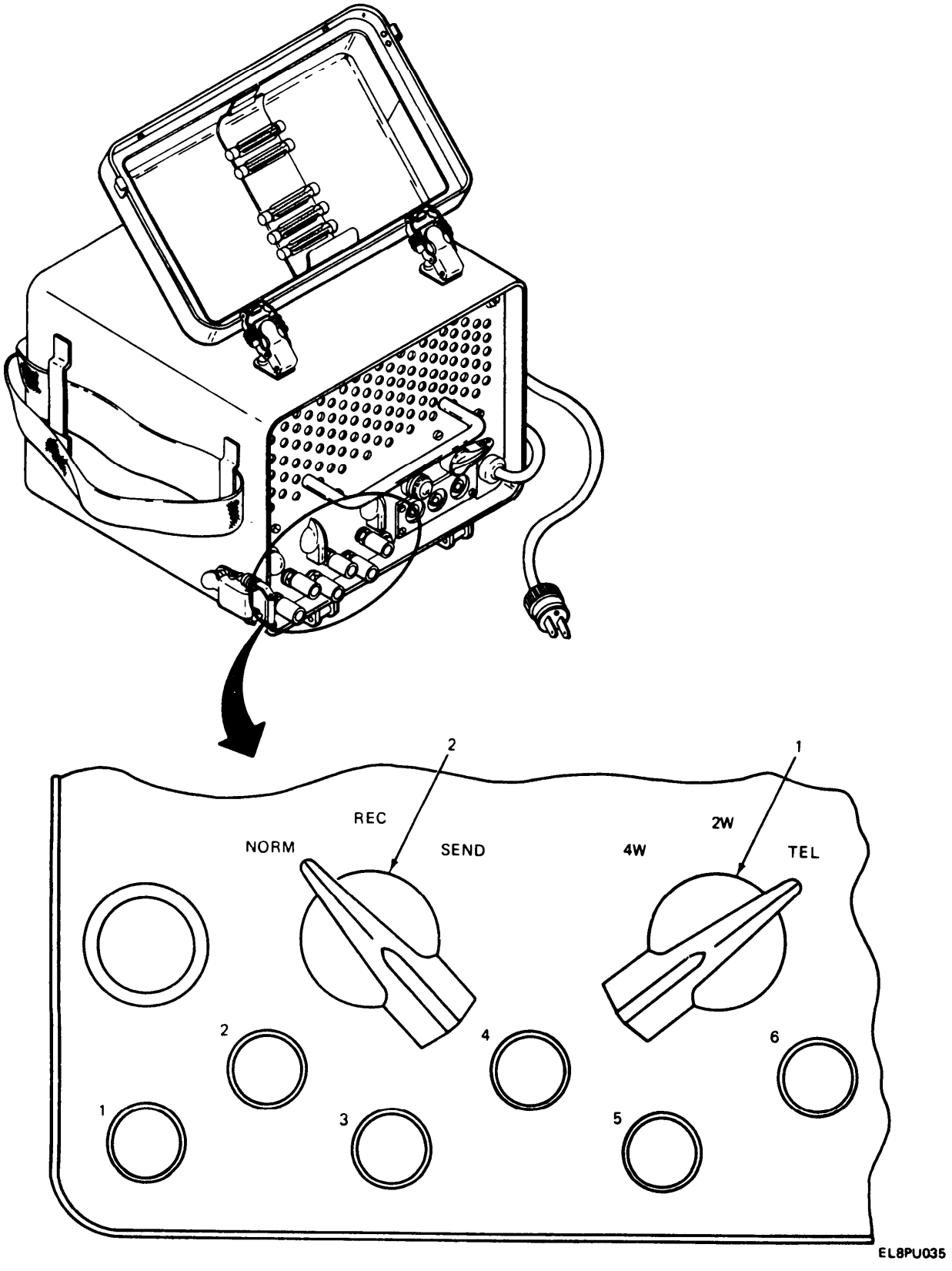
Standby Procedure

INITIAL SETUP

Tools	Personnel Required
None	One technician
Materials/Parts	**Equipment Condition**
None	Not in operation

LOCATION	ITEM	ACTION **REMARKS**
1. Front panel	4W-2W-TEL switch (1)	Set to TEL. **During two-wire teletypewriter operation over common battery switchboard.**
2.	NORM-REC-SEND switch (2)	Set to NORM. **During two-wire teletypewriter operation over push-talk radio.**
3.	NORM-REC-SEND switch (2)	Set to REC. **During four-wire operation.**

2-20. STANDBY PROCEDURE. (CONT)



2-21. SHUTDOWN PROCEDURE.

This task covers:

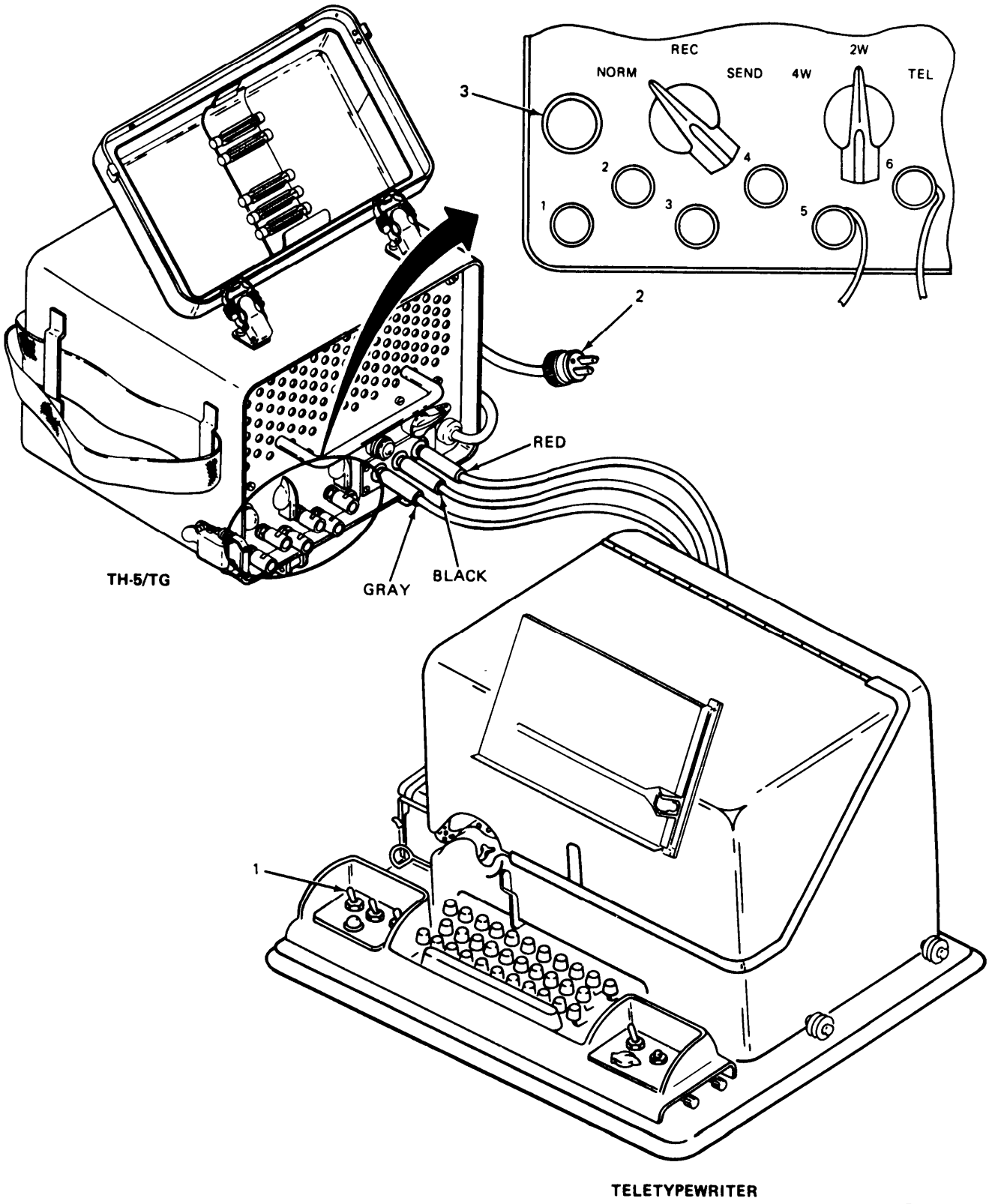
Shutdown procedure

INITIAL SETUP

Tools	Personnel Required
None	One technician
Materials/Parts	**Equipment Condition**
None	Equipment on

LOCATION	ITEM	ACTION / REMARKS
1. Teletypewriter	AC motor switch (1)	Set AC motor switch to OFF. Teletypewriter stops typing.
2. Telegraph terminal control panel	Power cord (2)	Remove power cord from power source.
3.	Glowlamp (3)	Glowlamp will be off.

2-21. SHUTDOWN PROCEDURE. (CONT)



2-22. OPERATION OF AUXILIARY EQUIPMENT.

This task covers:

1. Mounting telegraph terminal
2. Using prefabricated racks
3. Using remote control unit
4. Using line control unit

INITIAL SETUP

Tools	Personnel Required
None	One technician
Materials/Parts	**Equipment Condition**
Mounting MT-791/U	Equipment off

LOCATION	ITEM	ACTION **REMARKS**
MOUNTING TELEGRAPH TERMINAL		
1. Base of mounting	Grounding strap (1)	Check that grounding strap is secure.
2. Front of mount	Locking handles (2)	Push in locking handles on front of mounting.
3. Telegraph terminal cover	Luggage catch (3)	Unlatch and raise cover assembly on terminal.
4. Bottom of converter case	Tracks (4)	Set tracks on bottom of converter case in grooves of mounting.
5. Front of mount	Locking handles (2)	Pull locking handles forward. Make sure that mounting clamps hold unit securely.

2-22. OPERATION OF AUXILIARY EQUIPMENT. (CONT)

USING PREFABRICATED RACKS

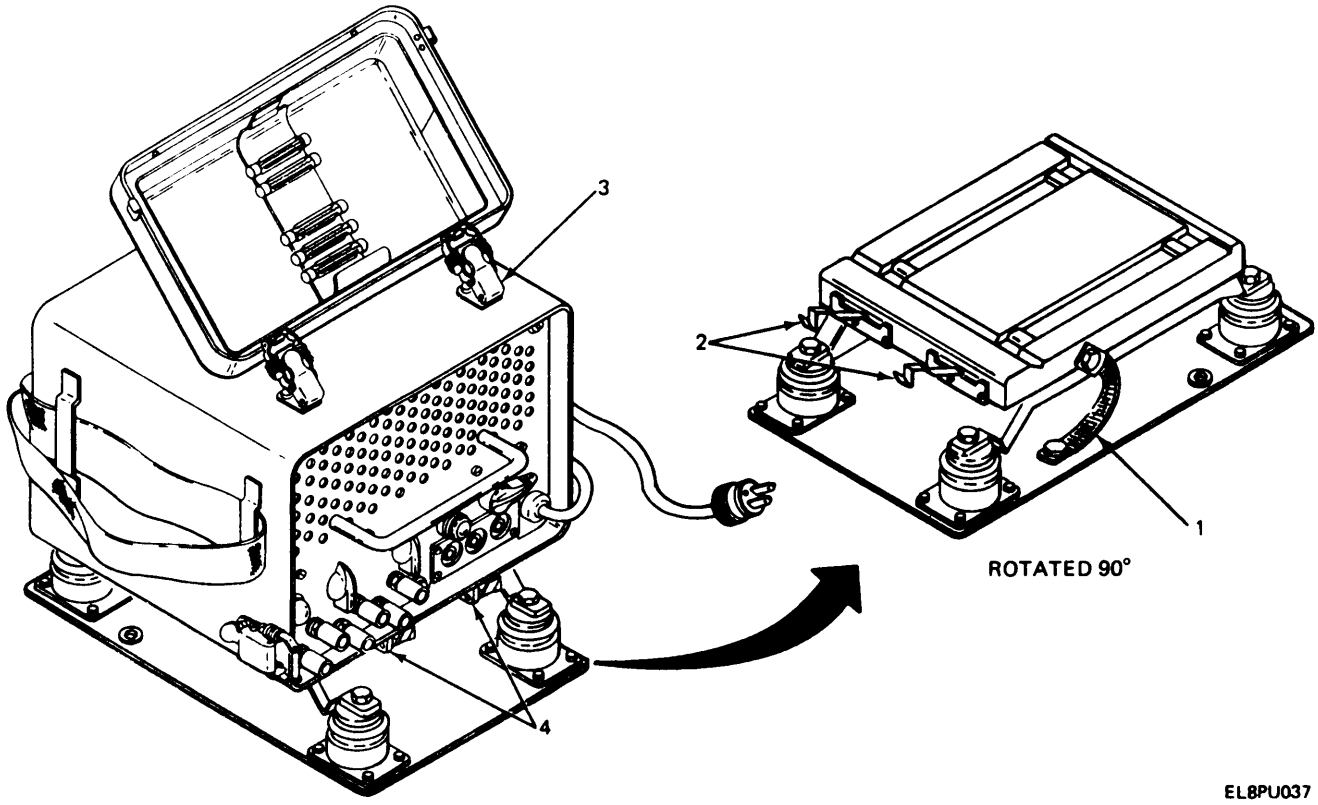
When two or more units are needed in a shelter, prefabricated racks are sometimes used. These racks are usually lined with a cushioning material which may require the removal of the telegraph terminal transit case before installation. Removal is to be performed by the organization technician.

USING REMOTE CONTROL UNIT

The telegraph terminal can be used with Remote Control Unit RM-39. Refer to TM 11-2667 for connection information.

USING LINE CONTROL UNIT

The telegraph terminal can be used with a line control unit such as Telegraph Line Control Unit C-2894/FG. Refer to TM 11-5805-204-15 for connection information.



2-23. PREPARATION FOR MOVEMENT.

This task covers:

Preparation for movement

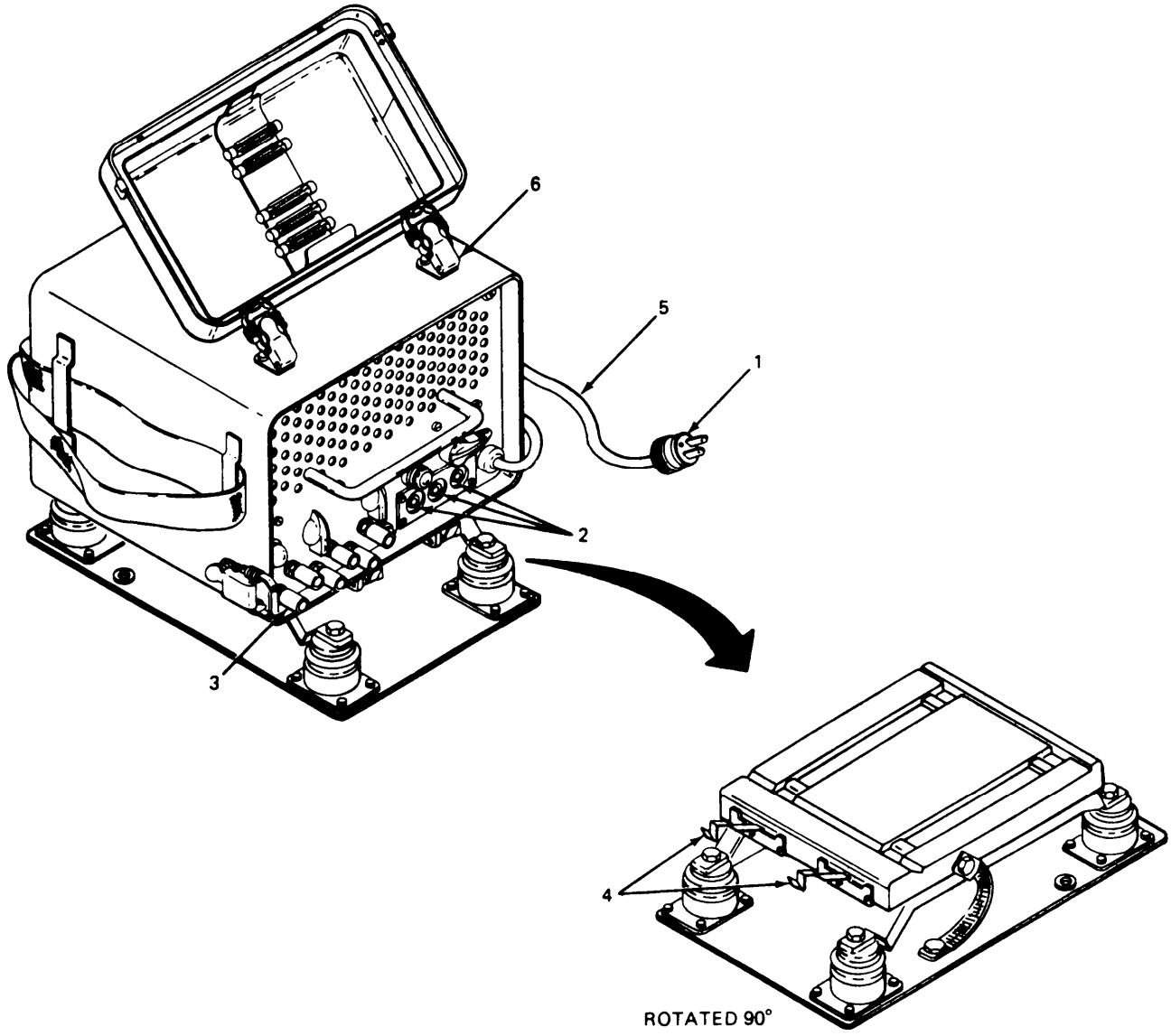
INITIAL SETUP

Tools	Personnel Required
None	One technician
Materials/Parts	**Equipment Condition**
None	Equipment off

LOCATION	ITEM	ACTION / REMARKS
1. Telegraph terminal control panel	Power plug (1)	Disconnect from power source.
2.	Teletypewriter cord jacks (2)	Remove the teletypewriter plugs from the SEND and REC jacks.
3.	Binding posts (3)	Remove all transmission wires from binding posts.
4. Front of mounting MT-791/U	Locking handles (4)	Push in and lift the unit from mounting.
		NOTE If the front panel chassis assembly has been removed from the transit case, report to a higher level of maintenance.
5. Telegraph terminal control panel	Power cord (5)	Wind and stow against the front panel.
6. Telegraph terminal converter case	Running spares and technical manuals	Assemble running spares and technical manuals.

2-23. PREPARATION FOR MOVEMENT. (CONT)

LOCATION	ITEM	ACTION **REMARKS**
7.	Latch and cover assembly (6)	Close. When the cover Is closed, the equipment is waterproof.



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Section IV OPERATION UNDER UNUSUAL CONDITIONS

Subject	Para	Page
Operation Under Unusual Conditions	2-24	2-66
Fording	2-25	2-66
Emergency Procedures	2-26	2-66

2-24. OPERATION UNDER UNUSUAL CONDITIONS.

COLD CLIMATES

Keep the telegraph terminal warm and dry. Operate the equipment continuously, if possible. Tube filaments will furnish some heat.

When the equipment has been exposed to low temperatures and then is brought into a warm room, condensation will form on the inside and outside surfaces. Wait for condensation to dry before placing equipment in operation.

HOT DRY CLIMATES

Protect the telegraph terminal from sand, dust, and strong sunlight. Clean and dust the outside surfaces often.

Whenever installation permits, keep equipment in its case to protect components from sand and dust.

WARM, DAMP Climates

Protect equipment from humidity and fungus.

Remove moisture and fungus from outside surfaces with lint free cloth.

2-25. FORDING.

Before: Close and latch cover assembly. When cover is closed the equipment is waterproof.

During: Keep latch and cover assembly closed.

After: Dry exterior with lint-free cloth.

2-26. EMERGENCY PROCEDURES.

If an emergency occurs, disconnect power cord from power source.

CHAPTER 3

MAINTENANCE INSTRUCTIONS

Subject	Section	Page
Lubrication Instructions	I	3-1
Troubleshooting	II	3-2
Maintenance Procedures	III	3-5

OVERVIEW

This chapter contains maintenance instructions for the telegraph terminal.

Section I LUBRICATION INSTRUCTIONS

3-1. LUBRICATION INSTRUCTIONS

The telegraph terminal does not require lubrication.

Section II TROUBLESHOOTING

Subject	Para	Page
Overview	3-2	3-2
Symptom Index		3-2
Troubleshooting		3-3

3-2. OVERVIEW

The table lists common problems which you may find during the operation or maintenance of the telegraph terminal or its components. You should perform the tests/inspections and corrective actions in the order listed.

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

WARNING

To prevent injury when performing troubleshooting procedures, all CAUTIONS and WARNINGS must be observed. Always discharge capacitors before working on chassis assembly. Capacitors may retain dangerous voltages when power cord is removed from power source.

SYMPTOM INDEX

Telegraph Terminal
Does net work 3-3
Glowlamp
Does not light 3-4
Remote Control Unit
Does not operate 3-4
Line Control Unit
Does not operate 3-4

TROUBLESHOOTING

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

NOTE

These procedures apply to both the TH-5/TG and the TH-5A/TG.

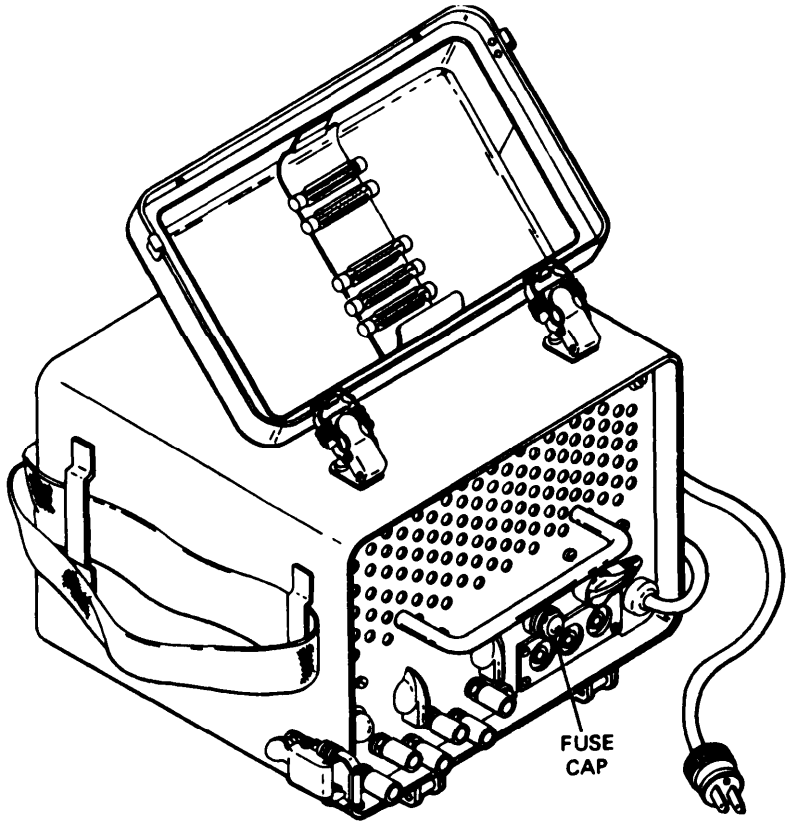
1. Telegraph terminal does not work.

Step 1. Check that power cord is connected to power source and that it is not cut or frayed.

Connect or report to higher level of maintenance.

Step 2. Check fuse.

Replace 1.5 amp fuse. See paragraph 3-4.



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TROUBLESHOOTING (CONT)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

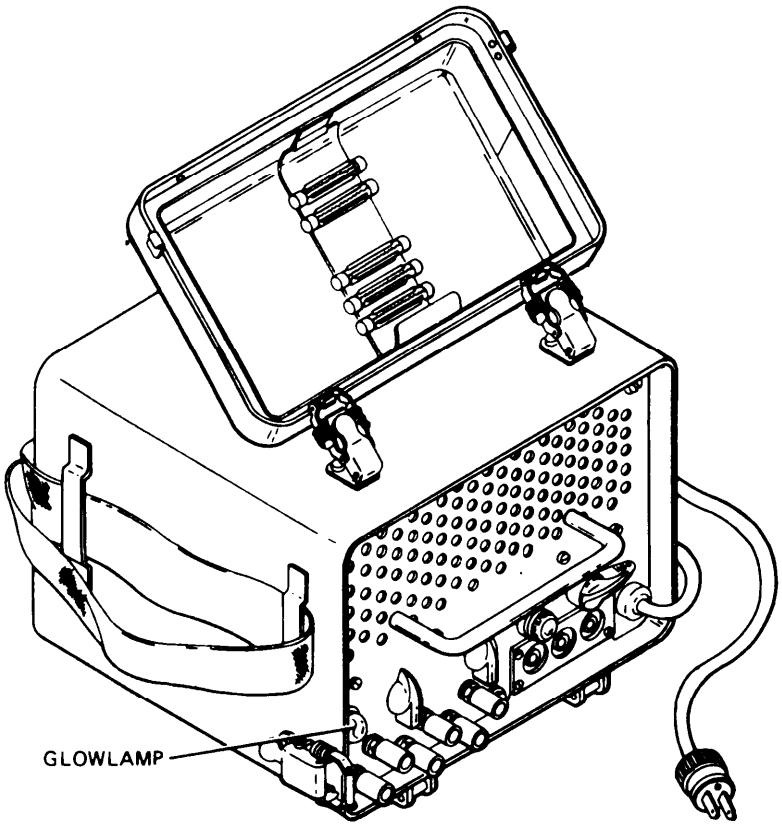
2. Glowlamp does not light

Step 1. Check that power cord is connected to power source.

Connect to power source.

Step 2. Check bulb.

Replace bulb. See paragraph 3-5.



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3. Remote control unit does not operate.

See TM 11-2667 for information.

4. Line control unit does not operate.

See TM 11-5805-204-15 for information.

Section III MAINTENANCE PROCEDURES

Subject	Para	Page
Overview	3-3	3-5
Replacement of Fuse	3-6	3 4
Replacement of Neon Glowlamp	3-5	3-8
Checks/Adjustments/Alinement.	3-6	3-10
Cleaning	3-7	3-10
Testing	3-8	3-10
Maintenance of Auxiliary Equipment	3-9	3-10

3-3. OVERVIEW.

Maintenance is the systematic care, inspection, and servicing of equipment to keep it in serviceable condition, prevent breakdowns and ensure maximum operational condition.

3-4. REPLACEMENT OF FUSE.

This task covers:

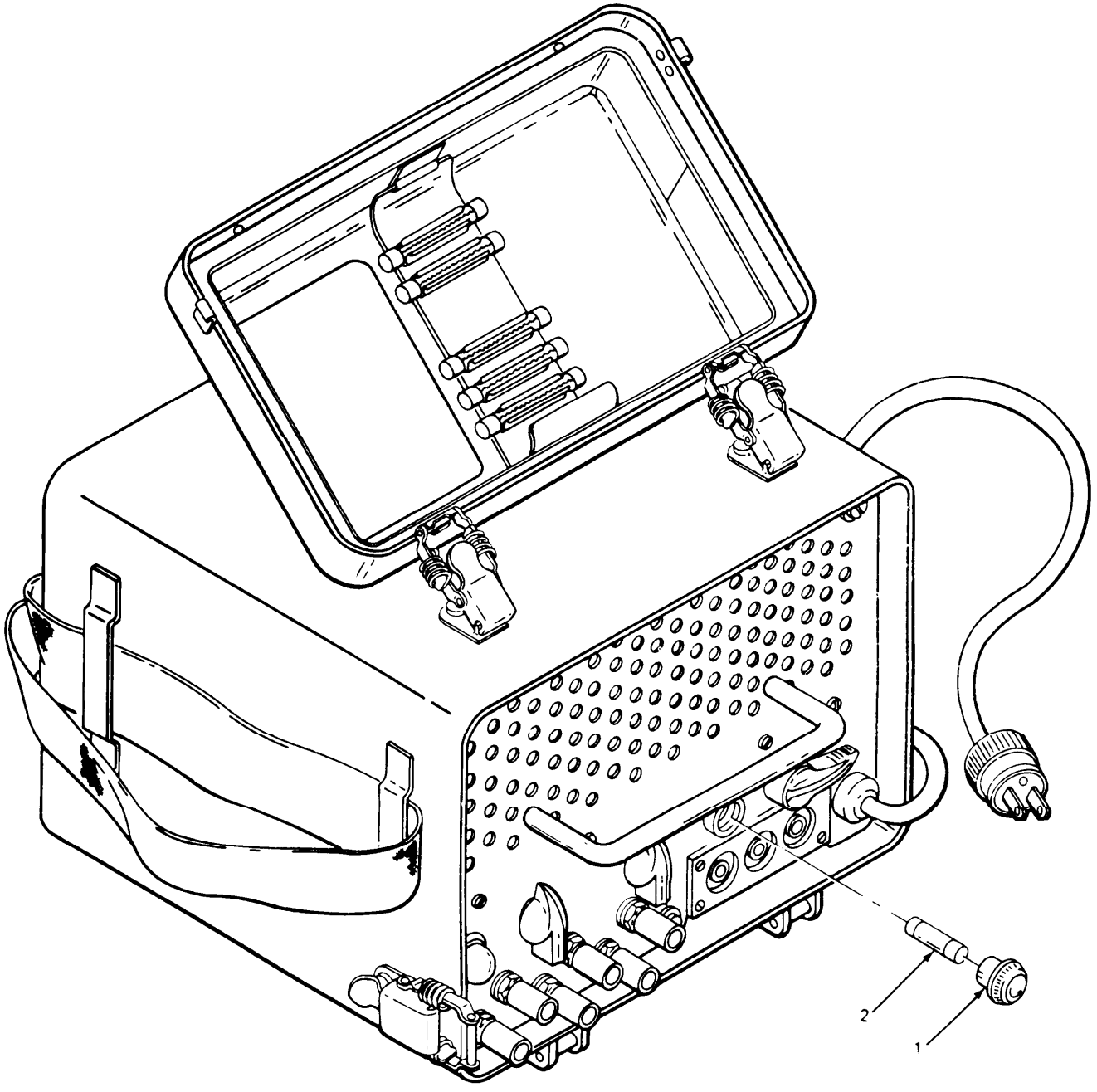
1. Removal
2. Installation

INITIAL SETUP

Tools	Personnel Required
None	One technician
Materials/Parts	**Equipment Condition**
Fuse, 1.5 amp NSN 5920-00-199-9482	Equipment off

LOCATION	ITEM	ACTION / REMARKS
REMOVAL		
1. Telegraph terminal control panel	Fuse cap (1)	Remove.
2.	Fuse (2)	Remove.
INSTALLATION		
		CAUTION Use only a 1.5 amp fuse. An improper fuse can cause damage to telegraph terminal circuits.
1.	Fuse (2)	Install.
2.	Fuse cap (1)	Replace.

3-4. REPLACEMENT OF FUSE. (CONT)



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3-5. REPLACEMENT OF NEON GLOWLAMP.

This task covers:

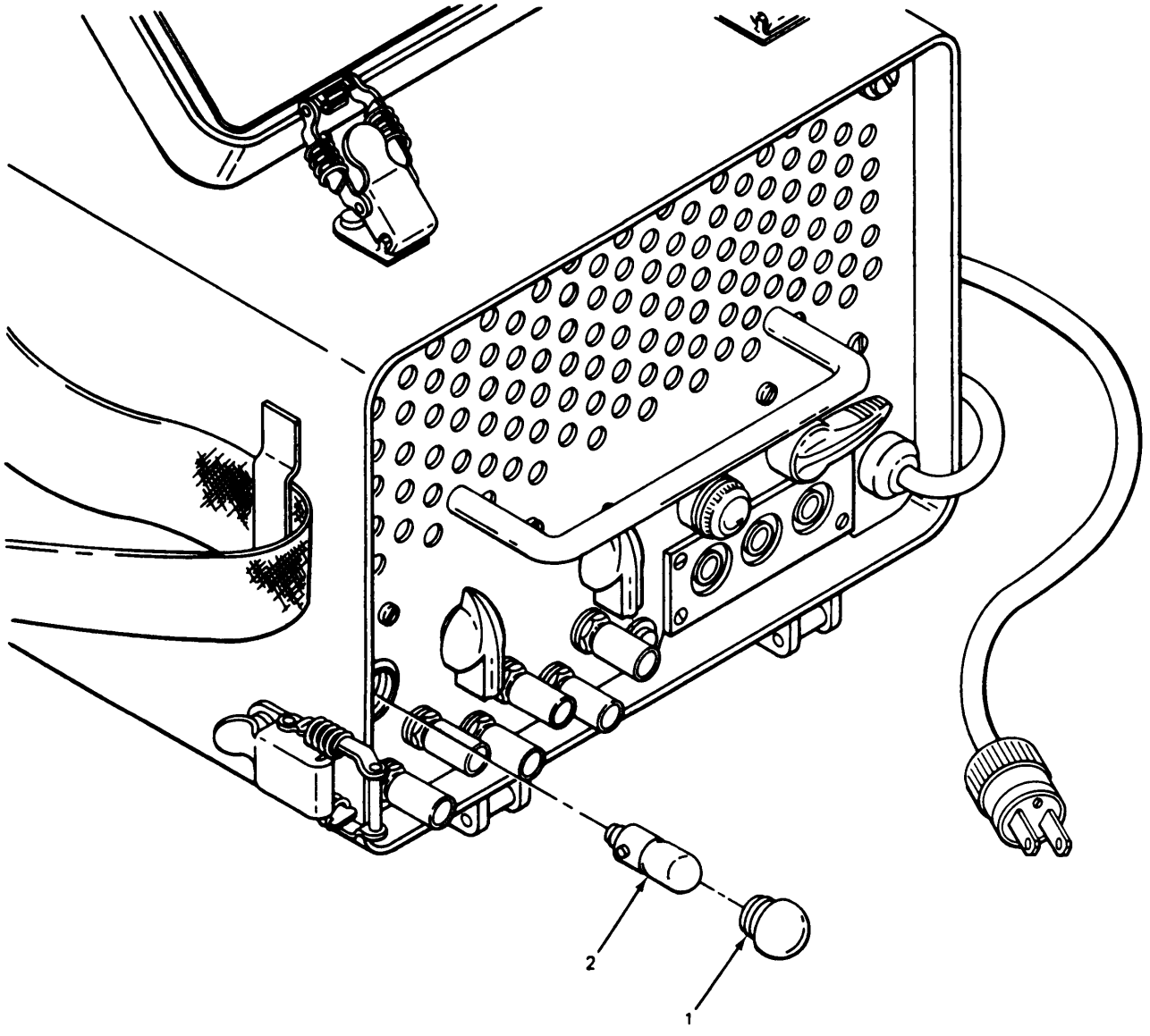
1. Removal
2. Installation

INITIAL SETUP

Tools	Personnel Required
None	One technician
Materials/Parts	**Equipment Condition**
Lamp NSN 6240-00-155-8014	Equipment off

LOCATION	ITEM	ACTION **REMARKS**
REMOVAL		
1. Telegraph terminal control panel	Lens (1)	Unscrew and remove.
2.	Glowlamp (2)	Release from base and remove.
INSTALLATION		
1. Telegraph terminal control panel	Glowlamp (2)	Install.
2.	Lens (1)	Replace and tighten. **Do not overtighten.**

3-5. REPLACEMENT OF NEON GLOWLAMP. (CONT)



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3-6. CHECKS/ADJUSTMENT/ALINEMENTS.

Check controls for easy movement. Check that the teletypewriter is not placed more than 6 feet away from telegraph terminal and that plugs are long enough to reach the telegraph terminal.

3-7. CLEANING.

Case should be kept free of dirt, grease, rust, fungus, and corrosion. Clean and dust the outside surfaces frequently with a lint free cloth dampened with cleaning compound (NSN 6850-00-984-5853).

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 immediately.

3-8. TESTING.

For test procedures, see paragraph 2-5 (Initial Adjustments and Self-Test).

3-9. MAINTENANCE OF AUXILIARY EQUIPMENT.

REMOTE CONTROL UNIT.

The telegraph terminal can be used with Remote Control Unit RM-39. See TM 11-2667 for maintenance procedures.

LINE CONTROL UNIT.

The telegraph terminal can be used with a line control unit such as Telegraph Line Control Unit C-2894/FG. See TM 11-5805-204-15 for maintenance procedures.

APPENDIX A

REFERENCES

A-1. SCOPE.

This appendix lists all forms, field manuals, technical manuals, and miscellaneous publications referenced in this manual.

A-2. FIELD MANUALS.

Military Training . . . . . FM 21-5

Techniques of Military Instruction. . . . . FM 21-6

Military Symbols . . . . . FM 21-30

A-3. TECHNICAL MANUALS.

Remote Control Equipment RC-289 and Receiver Transmitter Control Group AN/GRW-2 . . . . . TM 11-2667

Operator's, Organizational, Field and Depot Maintenance Manual: Terminal, Telegraph-Telephone AN/TCC-14 . . . . . TM 11-5805-254-15

Operator's, Organizational, Direct Support, General Support and Depot Maintenance Manual (Including Repair Parts and Special Tools List): Panel Patching Communication SB-611/MRC . . . . . TM 11-5805-204-15

Procedures for Destruction of Electronics Materiel to Prevent Enemy Use (Electronics Command) . . . . . TM 750-244-2

A-4. MISCELLANEOUS PUBLICATIONS.

lndex of Army Motion Pictures, Filmstrips, Slides, and Phono-Recordings. . . . . DA Pam 310 Series

Military Publications: Index of Supply Manuals; Signal Corps . . . . . DA PAM 310 Series

Dictionary of United States Army Terms . . . . . SR 320-5

Authorized Abbreviations and Brevity Codes SR-320-50

Consolidated lndex of Army Publications and Blank Forms . . . . . DA PAM 310-1

APPENDIX B

COMPONENTS OF END ITEM LIST

Section I. INTRODUCTION

B-1. Scope

This appendix lists integral components of and basic issue items for the Telegraph Terminal TH-5/TG and TH-5A/TG to help you inventory items required for safe and efficient operation.

B-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 TH-5/TG and TH-5A/TG 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 TH-5/TG and TH-5A/TG in operation, to operate it, and to perform emergency repairs. Although shipped separately packed they must accompany the TH-5/TG and TH-5A/TG 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 Bll, based on TOE/MTOE authorization of the end item.

B-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 which 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.

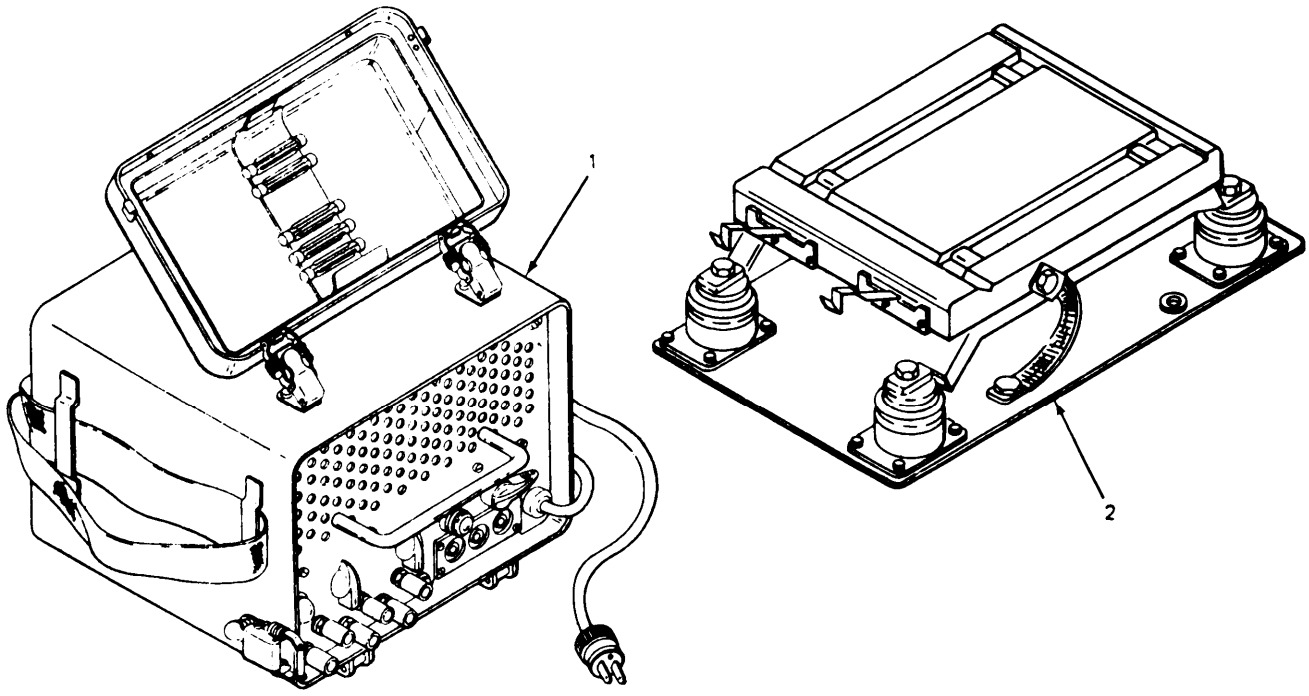
e. Location. The physical location of each item listed is given in this column. The lists are designed to inventory all items in one area of the major item before moving on to an adjacent area.

f. Usable on Code. Not applicable.

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 COMPONENTS OF END ITEM



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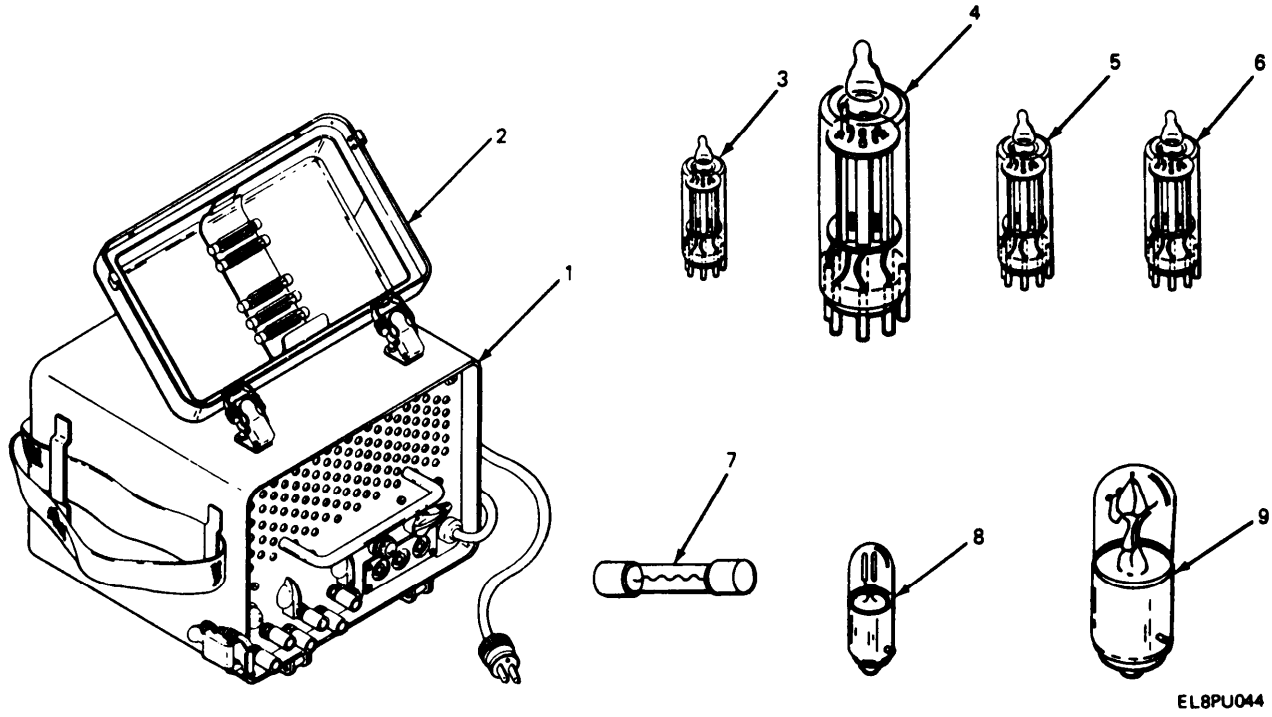
(1) ILLUS NO	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION FSCM AND PART NUMBER	(4) USABLE ON CODE	(5) U/M	QTY REQ'D
1	5805-00-315-2858 5805-00-246-8734	Telegraph Terminal, (80058) or (80063), TH-5/TG		EA	1
1	5805-00-020-5720	Telegraph Terminal, (80058) TH-5A/TG		EA	1
2	5805-00-186-9464	Mounting, (80058), MT-791/U		EA	1

Section III BASIC ISSUE ITEMS



(1) ILLUS NO	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION FSCM AND PART NUMBER	(4) USABLE ON CODE	(5) U/M	QTY REQ'D
1	5805-00-615-6503	Case, Electrical Equipment Cabinet (less cover and straps), (80063), SC-D-98317		EA	1
2	5805-00-625-5418	Cover Assembly (P/O Case, Electrical Equip Cabinet) installed in equip. (80063) SC-C-98314		EA	1
3	5960-00-519-7812	Electron tube, (80131), 5726/6ALSW		EA	2
4	5960-00-539-7910	Electron tube, (9488), 6X4W		EA	1
5	5960-00-166-7663	Electron tube, (01362), 12AU7		EA	3
6	596040-166-7764	Electron tube, (01362), 12AX7		EA	2
7	5920-00-199-9482	Fuse one and one-half amp, (71400), 3AGF1		EA	5
8	6240-00-223-9100	Glowlamp, (01808), NE 51		EA	1
9	6240-00-155-8014	Lamp, (24446), 6S600-125 (E7)		EA	1

APPENDIX C

EXPENDABLE SUPPLIES AND MATERIALS LIST

Section I INTRODUCTION

C-1. SCOPE.

This appendix lists expendable supplies and materials you will need to operate and maintain Telegraph Terminal TH-5/TG or TH-5A/TG. These items are authorized to you by CTA 50-970, Expendable Items (Except Medical, Class V, Repair Parts, and Heraldic items).

C-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 3. Level. This column identifies the lowest level of maintenance that requires the listed item.

C - Operator/Crew

O - Organizational Maintenance/Aviation Unit Maintenance

F - Direct Support Maintenance/Aviation Intermediate 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 Federal Supply Code for Manufacturer (FSCM) in parentheses followed by a part number.

e. Column 5. U/M (Unit of Measure). 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, requestion the lowest unit of issue that will satisfy your requirements.

Section II EXPENDABLE SUPPLIES AND MATERIALS LIST

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) U/M
1	C	6850-00-984-5833	Trichlorotrifluoroethane	OZ.
2	C	7920-00-924-5700	Cleaning cloth	EA.
3	C	5350-00-260-3485	Sandpaper	PKG.

GLOSSARY

ALTERNATING CURRENT	Electric current (waves) that continually changes in amplitude and reverses polarity.
AMPERE	Basic unit of electrical current flow.
CARRIER	A wave of constant amplitude, frequency and phase which can be modulated by changing amplitude, frequency, or phase.
CONTINUOUS WAVE	Electric current (waves) of a constant amplitude and frequency.
CURRENT	Flow of charge or rate of such flow.
DIRECT CURRENT (dc)	Electric current (waves) that flows in only one direction and remains essentially constant in magnitude.
DUPLEX	Transmission and reception over teletypewriter lines are possible at the same time.
FUSE	A device to open a circuit when excess current exists in a circuit.
MARKING PULSE	Equal length pulses making up a code with spacing elements.
NEUTRAL	In a normal condition; neither positive (+) nor negative (-).
OSCILLATOR	Generates repetitive waveforms at a fixed or varying frequency.
POWER SUPPLY CIRCUIT	Provides dc voltage to operate tubes. Power transformer T6 changes 115 vac line voltage to higher ac voltage and then is tube rectified to dc. Also provides low voltage of 12.6 and 6.3 vac for tube filaments.
PULSE	A quick change in voltage, either positive or negative which conveys information to a circuit.
RECEIVE	To receive a signal or message.
ECEPTACLE	An outlet to which the male end of a power cord is inserted.
RECTIFIER CIRCUIT	Changes ac voltage to dc.
SPACING PULSE	Equal length pulses making up a code with marking elements.

GLOSSARY (CONT)

TRANSMIT	To send a signal or message.
THRESHOLD CIRCUIT	A circuit which cuts off a received telegraph signal if its level is below -50 dbm.
VOLTAGE	Electromotive force, or pressure which causes current to flow through an electrical conductor.
VOLTAGE DOUBLER	Multiplies voltage amplitude by two.

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2-25	2-28			Recommend that the installation antenna alignment procedure be changed throughout to specify a 2^{o} IFF antenna lag rather than 1^{o} REASON: Experience has shown that with only a 1^{o} 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^{o} without degradation of operation.
3-10	3-3		3-1	Item 5, Function column. Change "2 db" to "3db." REASON: The adjustment procedure the 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.

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THE METRIC SYSTEM AND EQUIVALENTS

LINEAR MEASURE

1 Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches
1 Meter = 100 Centimeters = 1000 Millimeters = 39.37 Inches
1 Kilometer = 1000 Meters = 0.621 Miles

WEIGHTS

1 Gram = 0.001 Kilograms = 1000 Milligrams = 0.035 Ounces
1 Kilogram = 1000 Grams = 2.2 Lb
1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces
1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

SQUARE MEASURE

1 Sq Centimeter = 100 Sq Millimeters = 0.155 Sq Inches
1 Sq Meter = 10,000 Sq Centimeters = 10.76 Sq Feet
1 Sq Kilometer = 1,000,000 Sq Meters = 0.386 Sq Miles

CUBIC MEASURE

1 Cu Centimeter = 1000 Cu Millimeters = 0.06 Cu Inches
1 Cu Meter = 1,000,000 Cu Centimeters = 35.31 Cu Feet

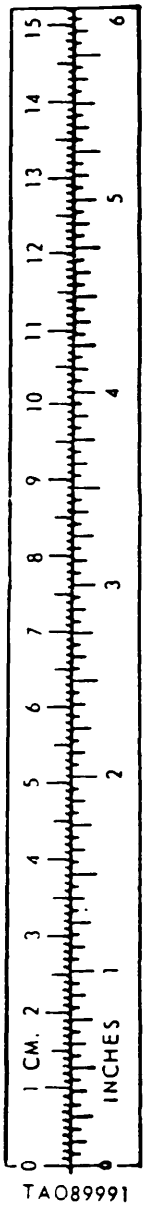
TEMPERATURE

$5/9 (^{0}F - 32) = {}^{0}C$
212^{0} Fahrenheit is equivalent to 100^{0} Celsius
90^{0} Fahrenheit is equivalent to 32.2^{0} Celsius
32^{0} Fahrenheit is equivalent to 0^{0} Celsius
$9/5\ C^{0} + 32 = F^{0}$

APPROXIMATE CONVERSION FACTORS

TO CHANGE	TO	MULTIPLY BY
Inches	Centimeters	2.540
Feet	Meters	0.305
Yards	Meters	0.914
Miles	Kilometers	1.609
Square Inches	Square Centimeters	6.451
Square Feet	Square Meters	0.093
Square Yards	Square Meters	0.836
Square Miles	Square Kilometers	2.590
Acres	Square Hectometers	0.405
Cubic Feet	Cubic Meters	0.028
Cubic Yards	Cubic Meters	0.765
Fluid Ounces	Milliliters	29.573
Pints	Liters	0.473
Quarts	Liters	0.946
Gallons	Liters	3.785
Ounces	Grams	28.349
Pounds	Kilograms	0.454
Short Tons	Metric Tons	0.907
Pound-Feet	Newton-Meters	1.356
Pounds per Square Inch	Kilopascals	6.895
Miles per Gallon	Kilometers per Liter	0.425
Miles per Hour	Kilometers per Hour	1.609

TO CHANGE	TO	MULTIPLY BY
Centimeters	Inches	0.394
Meters	Feet	3.280
Meters	Yards	1.094
Kilometers	Miles	0.621
Square Centimeters	Square Inches	0.155
Square Meters	Square Feet	10.764
Square Meters	Square Yards	1.196
Square Kilometers	Square Miles	0.386
Square Hectometers	Acres	2.471
Cubic Meters	Cubic Feet	35.315
Cubic Meters	Cubic Yards	1.308
Milliliters	Fluid Ounces	0.034
Liters	Pints	2.113
Liters	Quarts	1.057
Liters	Gallons	0.264
Grams	Ounces	0.035
Kilograms	Pounds	2.205
Metric Tons	Short Tons	1.102
Newton-Meters	Pound-Feet	0.738
Kilopascals	Pounds per Square Inch	0.145
Kilometers per Liter	Miles per Gallon	2.354
Kilometers per Hour	Miles per Hour	0.621



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