TM 11-6625-648-12

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

OPERATOR AND ORGANIZATIONAL MAINTENANCE MANUAL

TEST SET TELEPHONE AN/PTM-7

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

HEADQUARTERS, DEPARTMENT OF THE ARMY

AUGUST 1966

WARNING

DANGEROUS VOLTAGES EXIST IN THIS EQUIPMENT

Be careful when working on the pcm cable link. Dangerous voltages, up to 1,100 volts, are present in a typical pcm cable link. Serious injury or death may result from contact with these circuits.

DON'T TAKE CHANCES

CHANGE NO. 5

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC, *19 April 1982*

Operator's And Organizational

Maintenance Manual

TEST SET,

TELEPHONE AN/PTM-7

(NSN 6625-00-902-7574)

TM 11-6625-648-12, 18 August 1966, is changed as follows:
1. New or changed material is indicated by a verticle bar in the margin of the page.
2. Remove and insert pages as indicated below:

Remove	*Insert*
None	A through D (Front of manual)
i and ii	i and ii
l-l and l-2	1-1 and l-2
3-3 and 3-4	3-3 and 3-4
3-9 and 3-10	3-9 and 3-l0
4-l and 4-2	4-l and 4-2
Al-l	A1-l/(Al-2 Blank)

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

By Order of the Secretary of the Army:

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

Official:
ROBERT M. JOYCE
Brigadier General, United States Arrny
The Adjutant General

Distribution:

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

1. DO NOT TRY TO PULL OR GRAB THE INDIVIDUAL
2. IF POSSIBLE , TURN OFF THE ELECTRICAL POWER
3. IF YOU CANNOT TURN OFF THE ELECTRICAL POWER, PULL, PUSH, OR LIFT THE PERSON TO SAFETY USING A 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**

WARNINGS

Do not touch Restorer, Pulse Form TD-206/G or TD-206B/G during electrical storms or wet weather conditions. A lightning strike can cause a dangerous high voltage condition in a pcm cable link. Serious injury or DEATH may result from contact with these circuits.

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 with the solvent cannot penetrate. If the solvent is taken internally, contact a physician immediately.

Do not attempt internal service or adjustment unless another person, capable of rendering first aid and resuscitation, is present.

A periodic review of safety precautions in TB 385-4, Safety Precautions for Maintenance of Electrical/Electronic Equipment, is recommended. When the equipment is operated with covers removed, DO NOT TOUCH exposed connections or components. MAKE CERTAIN you are not grounded when making connections or adjusting components inside the test instrument.

Compressed air is dangerous and can cause serious bodily harm if protective means or methods are not observed to prevent a chip or particle (of whatever size) from being blown into the eyes or unbroken skin of the operator or other personnel. Compressed air shall not be used for cleaning purposes except where reduced to less than 30 psi, and then only with effective chip guarding and personnel protective equipment. Do not use compressed air to dry when TRICHLOROTRIFLUOROETHANE has been used.

WARNING

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DON'T TAKE CHANCES

WARNING

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WARNING

To be usable for cleaning, the compressed air source must limit the nozzle pressure to no more than 29 pounds per square inch gauge (PSIG). Goggles must be worn at all times while cleaning with compressed air.

TECHNICAL MANUAL

NO.11-6625-648-12

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON,DC, *18 August 1966*

OPERATOR'S AND ORGANIZATIONAL MAINTENANCE MANUAL

TEST SET, TELEPHONE AN/PTM-7

(NSN 6625-00-902-7574)

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, ATTN: DRSEL–ME–MQ, Fort Monmouth, NJ 07703.

In either case, a reply will be furnished direct to you.

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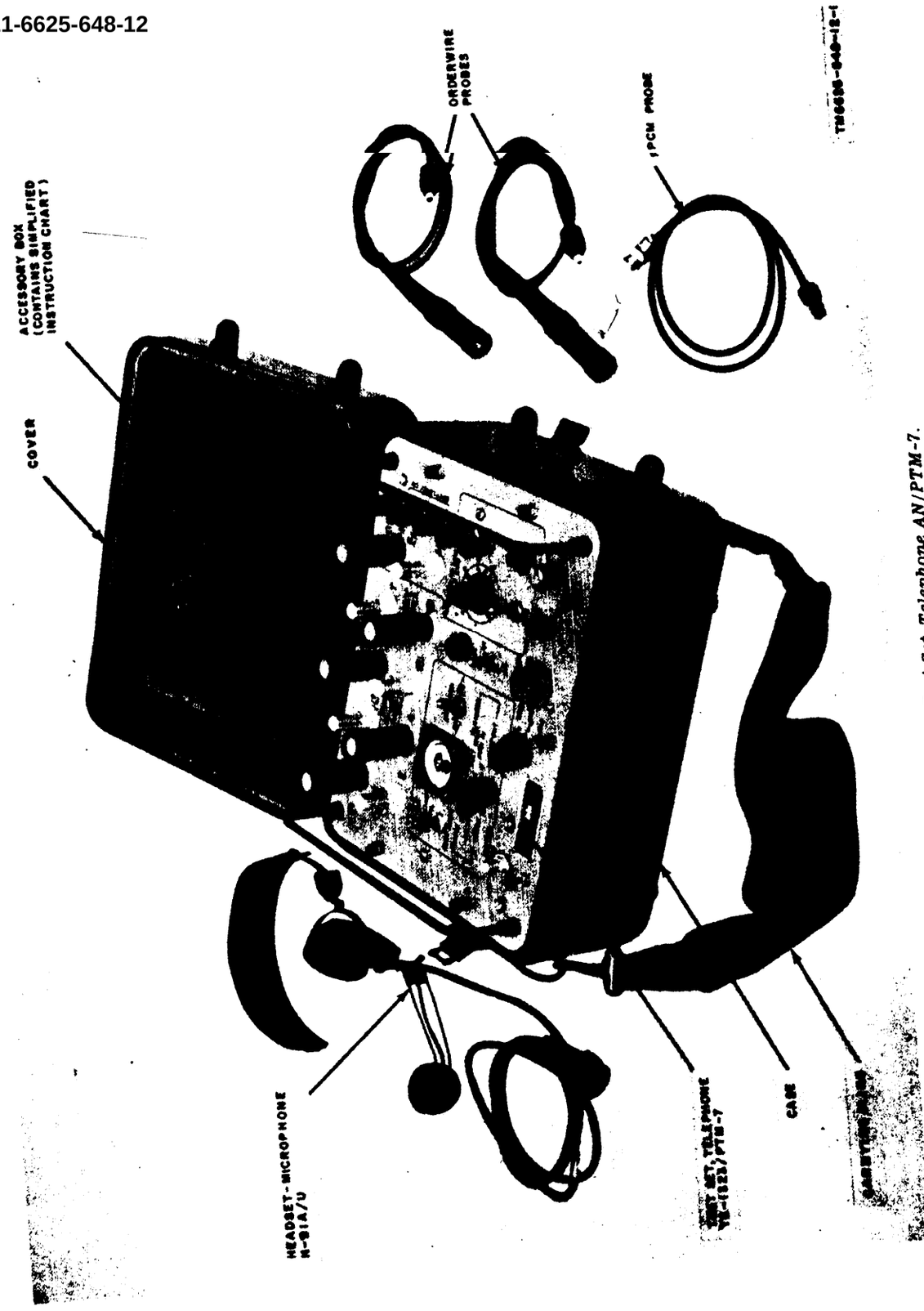

Figure 1-1. Test Set, Telephone AN/PTM-7.

CHAPTER 1

INTRODUCTION

Section I. GENERAL

NOTE

Restorer, Pulse Form TD-206/G is issued in two configurations which interface with two different cable types. Restorer TD-206B/G is similar to Restorer TD-206/G except for end cap configuration. Differences are summarized as follows:

Restorer, Pulse Form	*Interfaces With Cable, Special Purpose Electrical*
TD-206/G with 7A2 end cap	CX-4245/G
TD-206/G with 7A2 end cap	CX-11230/G
TD-206B/G	CX-l1230/G

In this manual, the designation TD-206/G applies to all sets unless otherwise specified. Cable, Special Purpose Electrical CX-4245/G is similar to Cable CX-11230/G except for connector configuration. In this manual, the designation CX-4245/G applies to both cables unless otherwise specified.

1-1. Scope

This manual describes Test Set, Telephone AN/PTM-7 (fig. 1-1). It includes instructions for installation, operation, and organizational maintenance.

1-1.1 Test Set Simplified Instruction Cards

When using the Test Set Simplified Instruction Cards, the following corrections are required:

a. Page 1, METER SELECT Switch Indications.

(1) PCM IN: Meter Indicates that a pcm input signal is present.

(2) PCM OUT: Meter indicates that a pcm output signal is being transmitted.

b. Page 3, Cable and Restorer Tests.

(1) Paragraph 3F. Place METER SELECT switch to DC AMPS. Meter should indicate between 7 and 10.

(2) Paragraph 3G. Place METER SELECT switch to VOLT DROP position. Meter should indicate between 7 and 9 in the green area.

(3) Paragraph 3H. Place METER SELECT switch to PCM IN position. If meter indicates zero, no pcm input signal is being received.

(4) Paragraph 3I. Place METER SELECT switch to PCM OUT position. If meter indicates zero, no pcm signal is being transmitted.

1-2. Index of Technical Publications

Refer to the latest issue of DA Pam 310-4 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 TM 38-750, The Army Maintenance System.

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/N AVMATINST 4355.73/AFR 400-54/MCO 4430.3E.

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 4610.33B/AFR 75-18/MCO 4610.19C/DLAR 4500.15.

1-3.1. Reporting Equipment Improvement Recommendations (EIR)

If your equipment needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design. Tell us why a procedure is hard to perform. Put it on an SF 368 (Quality Deficiency Report). Mail it to Commander, US Army Communications-Electronics Command, ATTN: DRSEL-ME-MQ, Fort Monmouth, NJ 07703. We'll send you a reply.

1-3.2. Administrative Storage

Administrative Storage of Equipment issued to and used by Army activities will have preventive maintenance 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 5-1 and 5-2.

1-3.3. Destruction of Army Electronic Materiel

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

Section II. DESCRIPTION AND DATA

1-4. Purpose and Use

The AN/PTM-7 (fig. l-l) can locate faults in a pulse-code modulation (pcm) cable link consisting of Restorers, pulse Forms TD-206/G and Cable, Special Purpose, Electrical CX-4245/G. The AN/PTM-7 also provides facilities for order-wire communication with attended stations.

1-5. Technical Characteristics

Pcm:

Impedance (input or output)	62 ohms.
Input amplitude	.30 mv pp maximum. 10 mv pp minimum.
Output amplitude	2 volts peak.
Pulse type	Binary dipulse.
Pulse rate	2,304 kc maximum.

Order wire:
- Impedance (input or output) . . . . . 62 ohms.
- Frequency response. . . . . 300 to 1,700 cps.
- Signaling frequency . . . . . 1,600 cps.
- Transmit level, ... More than 3.0 volts rms.
- Receive level . . . . . 50 to 270 mv.
- Voltage requirements . . . . . -7.5 Vdc and 14.5 vdc.
- Battery operating life. . . . . 8 hours continuous including 3 hours full current.

Bridge measurement:
- Range (distance to open or short) . . . . . 0 to 5,000 ft.
- Size . . . . . 14¾ in. wide by 8¾ in. high by 11¾ in. deep.
- Weight . . . . . 23 lbs.
- Operating temperature . . . . . 20° to 125° F.
- Storage temperature . . . . . 65° to 155° F.
- Operating altitude . . . . . 10,000 ft maximum.
- Air cargo altitude . . . . . 50,000 ft maximum.

1-6. Items Comprising an Operable Equipment

NSN	*Qty*	*Nomenclature, part No., and mfr code*	*Fig. No.*
		NOTE The part number is followed by the applicable 5-digit Federal supply code for manufacturers (FSCM) identified in SB 708-42 and used to identify manufacturer, distributor, or Government agency, etc.	
		NOTE Dry batteries shown are used with the equipment but are not considered part of the equipment. They will not be preshipped automatically but are to be requisitioned in quantities necessary for the particular organization in accordance with SB 11-6.	
6625-00-902-7574		Test Set, Telephone AN/PTM-7: 80058	1-1
		which includes:	
5995-00-944-4236	2	Lead, Test CX-10354/PTM-7 (3 ft 0 in.): SM-C-528076, 80063	1-1
5965-00-669-6871	1	Headset H-91 AU: 81349	1-1
6625-00-941-3000	1	Lead, Test CX-10355/PTM-7 (3 ft 0 in.): SM-C-528074, 80063	1-1
	1	Simplified Instruction Cards: SM-D-528098, 80063	1-1
6625-00-900-9416	1	Test Set, Telephone TS-1323/PTM-7: SM-E-528001, 80063	1-1

1-7. Description

a. The AN/PTM-7 (fig. 1-1) is a transistorized, battery-operated hand-portable test equipment containing facilities for testing the CX-4245/G and the TD-206/G. Test Set, Telephone TS-1323/PTM-7, the major component of the AN/PTM-7, is enclosed in an aluminum case. When the cover of the case is in place, the TS-1323/PTM-7 is watertight and floatable. When the cover is removed for operation, the chassis remains rainproof.

b. Connectors, controls, and indicators required for operation are all mounted on the TS-1323/PTM-7 front panel. The panel is divided into sections which are outlined for ease of location and operation of controls, indicators, and connectors required.

c. The accessory box in the case cover contains a Headset—Microphone H-91A/U, a Test Lead CX-10355/PTM-7 (pcm probe), two Test Leads CX-10354/PTM-7 (order-wire probes) a carrying sling, and a set of simplified instructional diagrams. The pcm probe is used to detect the presence of pcm signals in a TD-206/G. The order-wire probes permit connection of the TS-1323/PTM-7 into a cable link without interrupting traffic. The H-91A/U is used by the lineman to communicate over the order-wire circuits with the attended stations.

1-8. Additional Equipment Required

a. Batteries. Eight Batteries, Dry BA-30.

b. Grounding Rod. Grounding Rod MX-148/G and sufficient field wire, a grounding strap, or cable to connect the MX-148/G to the TS-1323/PTM-7 EARTH GRD terminal.

c. Cable Adapter. Adapter, Cable Assembly CX-10734/G is required when connecting the CX-11230/G to the TS-1323/PTM-7. The CX-10734/G is also required when connecting the TS-1323/PTM-7 to the TD-206/G with the 7A4 end cap and to the TD-206B/G. Four CX-10734/G adapters are required.

3-7. Testing Cable, Special Purpose, Electrical CX-4245/G

After faults have been sectionalized between two attended points in an overall system, the AN/PTM-7 may be used to further localize and isolate the fault within one of the links by performing loopback measurements *(a* below) and bridging measurements *(b* below). Troubleshooting by looping back is also effective for locating a defective TD-206/G which still appears to have an output. This type of fault usually shows up as loss of framing on the TD-352/U or TD-353/U, or as noise or clicks on all audio charnels.

a. Loopback Measurements. Loopback measurements are used to check link continuity and to accurately localize opens and shorts in the link. Dc cable current and pcm traffic are routed through the TD-206/G and returned to the attended point from which they originated. During loopback checks, attended-point operators can talk only as far as the AN/PTM-7. The procedure for performing a loopback check is described in (1) through (8) below:

NOTE

It is assumed that the lineman travels from the west attended point in the following discussion.

(1) Proceed to the first TD-206/G west of the suspected fault.

(2) Connect the TS-1323/PTM-7 to the TD-206/G and both CX-4245/G's as shown in figure 3-6.

(3) Operate the OPERATION SWITCH to LOOP BACK.

(4) Signal the east attended point. If an open circuit or low-resistance short exists, it should not be possible to signal or communicate with the east attended point. If a high-resistance short exists, it may be possible to signal and communicate with the east attended point,

(5) Request the west and, if possible, the east attended points to finish dc cable current, with the TD-204/U or TD-754/G NOR OPR-ZERO SET-READ switch operated to ZERO SET.

(6) Operate the TS-1323/PTM-7 DIRECTION switch to AB and check DC VOLTS, DC AMPS, and VOLT DROP measurements. Repeat for BA direction if communications can be established.

(7) Request the attended points to apply pcm traffic. If the fault is a short or an open, traffic may be applied by operating the TD-204/U or TD-754/G NOR OPR-ZERO SET-READ switch to READ. If a defective TD-206/G is at fault, the pcm should be the normal traffic from a TD-352/U or TD-353/U at the attended point.

(8) Check the PCM IN, PCM OUT, and VOLT DROP measurements in both directions. The attended points should both receive their respective looped-back pcm traffic, although one point will have an incorrect returned signal due to the fault.

Example: If the fault is a shorted CX-4245/G, the receive cable current (rcc) at the TD-204/U or TD-754/G will be low.

If the fault is a defective TD-206/G the TD-352/U or TD-353/U at the attended point will either be out of frame or have noise or clicks on a audio channels. Thus, the fault is on that side of the TS-1323/PTM-7 that is receiving an incorrect looped-back signal.

b. Bridge-Circuit Measurements. Bridge-circuit measurements are used to locate opens and shorts in the CX-4245/G at distances up to 1 mile. Before performing bridge-circuit measurements, both the nature of the fault (open or short) and the link in which the fault exists should have been determined in accordance with the loopback check procedure described in *a* above. If a shorted CX-4245/G is suspected, proceed as described in (1) below. If an open CX-4245/G is suspected, proceed as described in (2) below.

WARNING

Be sure cable power is removed before performing these tests.

(1) *Short-circuit checks.*

(a) Connect the suspected CX-4245/G to the TS-1323/PTM-7 as shown in figure 3-9 or 3-10.

(b) Pull out the BATTERY POWER switch; operate the CAP-RES switch to RES and the METER SELECT switch to BRIDGE.

(c) Depress and hold the READ switch. Slowly adjust the DISTANCE TO FAULT control until the TEST METER indicates zero (or null).

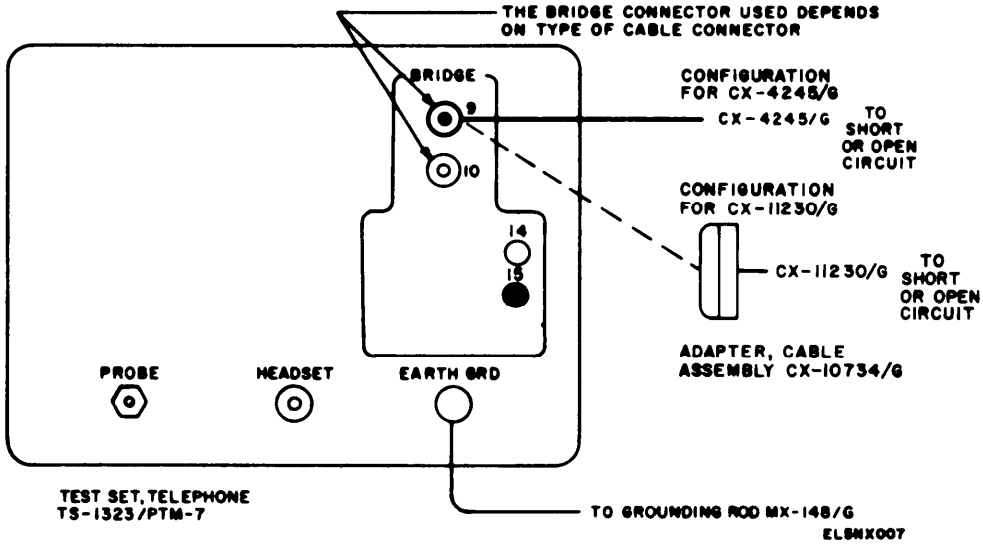

Figure 3-9. Normal CX-4245/G connections for bridge-circuit operation.

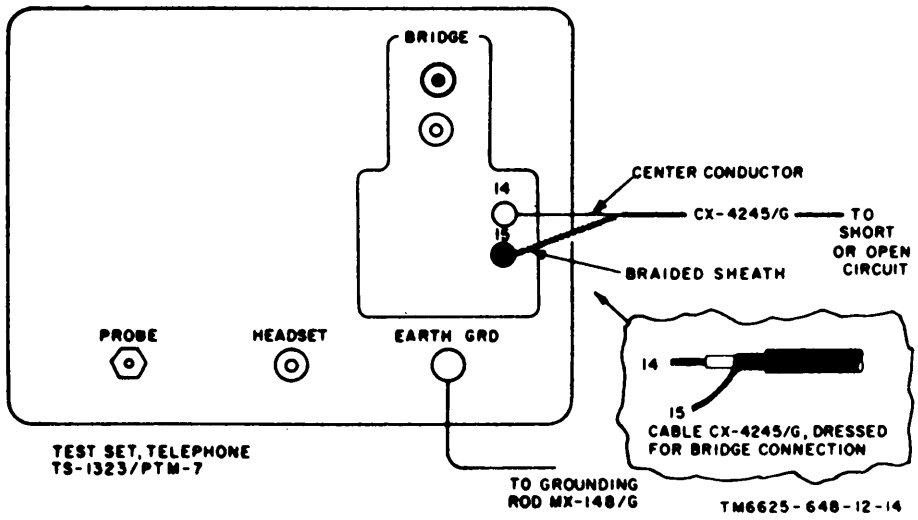

Figure 3-10. CX-4245/G connections for bridge-circuit operation if cable is broken or cable connectors are damaged.

(d) The pointer of the DISTANCE TO FAULT control knob will indicate the approximate distance to the short circuit (in thousands of feet) as indicated by the RES scale (outer scale). The CX-4245/G resistance will vary with changes in the ambient temperature. The results obtained should be plotted against the temperature-compensation curves shown in figure 3-11. The DISTANCE TO FAULT control may be read directly if the cable temperature is 75° F.

Example: If the DISTANCE TO FAULT control indicates 2½ (2,500 feet) on the RES scale at the ambient cable temperature of 30° F, the distance to the short should be approximately 2,310 feet.

(2) *Open-circuit checks.*

(a) Connect the suspected CX-4245/G to the TS-1323/PTM-l as shown in figure 3-9 or 3-10.

(b) Pull out the BATTERY POWER switch; operate the CAP-RES switch to CAP and the METER SELECT switch to BRIDGE.

(c) Depress and hold the READ switch. Slowly adjust the DISTANCE TO FAULT control until the TEST METER indicates zero (or null).

(d) The pointer of the DISTANCE TO FAULT control knob will indicate the approximate distance to the open circuit (in thousands of feet) as indicated by the CAP scale (inner scale).

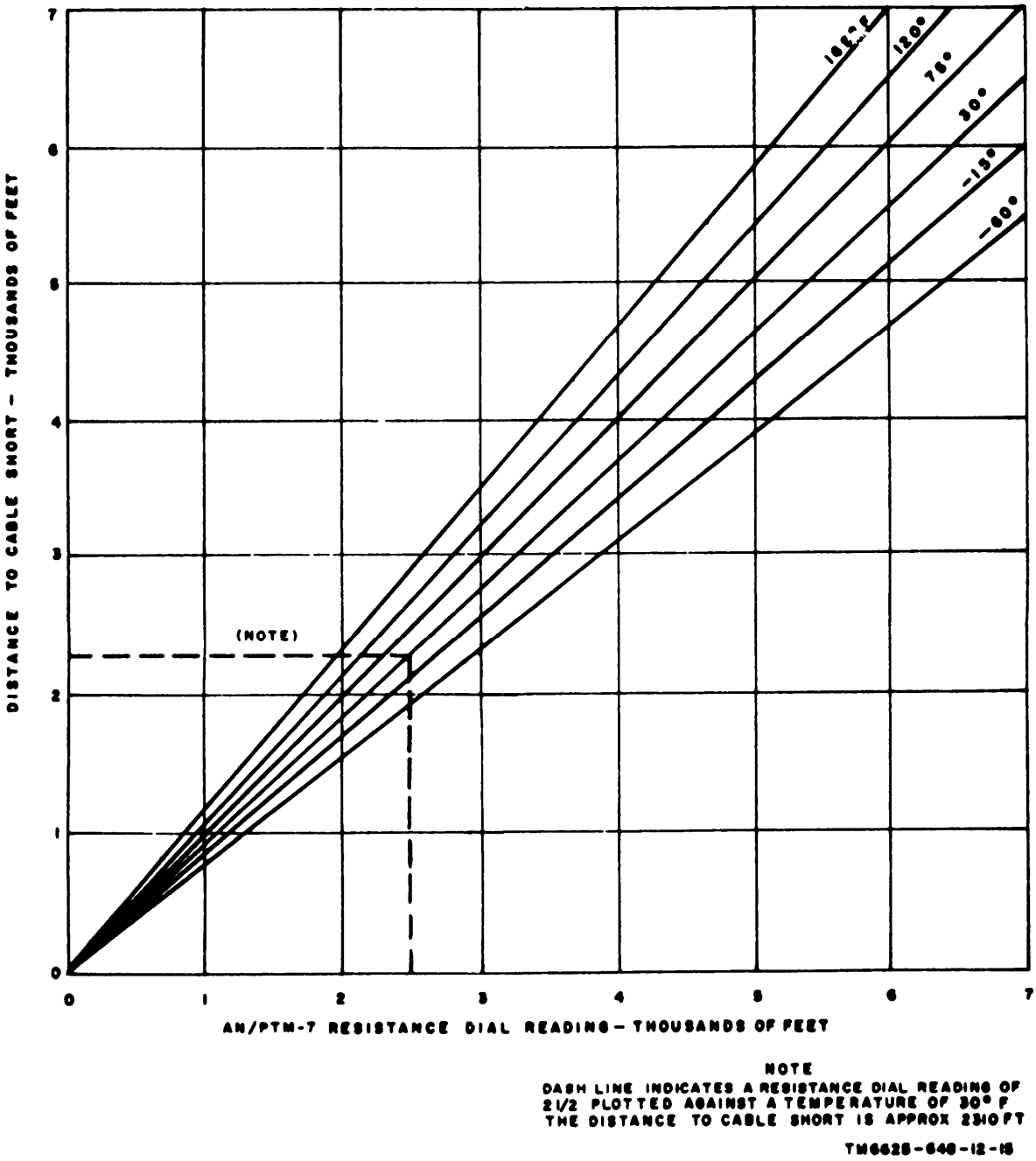

Figure 3-11. CX-4245/G resistance/temperature compensation curves.

3-8. Stopping Procedure

a. Order-Wire Measurements.

(1) Inform the attended-station operators by order wire when testing is complete. Request adequate time to disconnect the cables before restoration of cable current.

(2) Depress the BATTERY POWER switch.

(3) Disconnect the TD-206/G and CX-

4245/G from the TS-1323/PTM-7.

(4) Reconnect the TD-206/G to the CX-4245/G, or connect the two CX-4245/G's as appropriate.

(5) Disconnect the H-91A/U from the TS-1323/PTM-7 HEADSET connector.

(6) Return the H-91A/U and probes to the accessory box in the TS-1323/PTM-7 cover.

(7) Close the cover on the carrying case and fasten the latches.

b. PCM Probe.

(1) Depress the BATTERY POWER switch.

(2) Disconnect the pcm probe from the PROBE connector.

(3) Return the probe to the accessory box in the cover.

(4) Close the cover on the carrying case and fasten the latches.

3-9. Operation in Arctic Climates

Subzero temperatures and climatic conditions associated with cold weather affect the efficient operation of the equipment. Instructions and precautions for operation under such adverse conditions follow:

a. The shock-resistant characteristics of materials change at very low temperatures.

(1) Metals shrink and become brittle. Handle the equipment with reasonable care.

(2) Canvas loses its pliability. Handle the carrying case strap very carefully to avoid cracking the strap.

(3) Wiring becomes brittle. Handle the cables carefully.

b. When the AN/PTM-7 has been exposed to the cold and is brought into a warm room, leave the cover closed, Moisture will condense on all cold surfaces until the AN/PTM-7 reaches room temperature. When the AN/PTM-7 reaches room temperature, dry it thoroughly.

c. Special low-temperature batteries should be used for operation at subzero temperatures. Battery voltage will drop when the batteries are cold. This will result in weaker signals on the order wire, and in some amount of inaccuracy when tests are made. The BATTERY voltage will indicate low at extremely cold temperatures. Do not dispose of good batteries by mistake.

3-10. Operation in Tropical Climates

When operated in tropical climates, the AN/PTM-7 may be stored in tents, huts, or, when necessary, in underground dugouts. When equipment is stored below ground level, or when it is set up in swampy areas, moisture becomes more of a problem. High humidity causes condensation of moisture on equipment whenever its temperature becomes lower than that of the ambient air. To minimize this condition, keep the AN/PTM-7 case cover fastened when the equipment is not in use. Cover the AN/PTM-7 with a tarpaulin or any other available cover.

3-11. Operation in Desert Climates

The main problem in operating in desert areas in the large quantities of sand and dust which enter the equipment. Though the AN/PTM-7 is enclosed in a case, be careful to place the AN/PTM-7 in a location which is as dust-free as possible. Keep the case cover fastened when the AN/PTM-7 is not in use.

CHAPTER 4
MAINTENANCE

Section I. PREVENTIVE MAINTENANCE

4-1. Scope of Maintenance

a. General.

(1) Operator and organizational preventive maintenance is the systematic care, servicing, and inspection of equipment to prevent the occurrence of trouble, reduce downtime, and to maintain the equipment in serviceable condition. Preventive maintenance procedures for the AN/PTM-7 are performed weekly, monthly, and quarterly; specific procedures are provided in paragraphs 4-2, 4-3, and 4-4. Troubleshooting information is provided in paragraph 4-5 for isolation and replacement of authorized repair parts and running spares.

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

b. Preventive Maintenance Checks and Service Periods. Preventive maintenance checks and services for Test Set, Telephone AN/PTM-7 are required weekly (para 4-2), monthly (para 4-3), and quarterly (para 4-4). These checks must be performed during the specified intervals. In addition, the weekly checks and procedures must be performed under the following special conditions:

(1) When the equipment is initially received and unpacked.

(2) Before each use of the equipment by a lineman on a cable link.

c. *Cleaning.*

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, contact a physician immediately.

(1) Use a dry, clean, lint-free cloth or brush to remove dust and dirt. If necessary, moisten the cloth or brush with cleaning compound. After cleaning, wipe dry with a clean cloth.

WARNING

Compressed air is dangerous and can cause serious bodily harm if protective means or methods are not observed to prevent a chip or particle (of whatever size) from being blown into the eyes or unbroken skin of the operator or other personnel. Compressed air shall not be used for cleaning purposes except where reduced to less than 30 psi, and then only with effective chip guarding and personnel protective equipment. Do not use compressed air to dry parts when TRICHLOROTRIFLUOROETHANE has been used.

(2) Dry compressed air, not to exceed 30 pounds per square inch, may be used to remove dust and dirt from inaccessible places.

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

4-2. Operator's Weekly Preventive Maintenance Checks and Service Chart

Sequence No.	Item to be inspected	Procedure	References
1	Carrying sling	Check canvas carrying sling for wear or tear.	Para 1-7.
2	Completeness	See that all accessories in accessory box are present. No overstock should be evident, and all shortages must be on valid requisitions.	
3	Connectors	Check tightness of all connectors. Connect probes and H-91A/U to connectors to check tightness. Use connectors of a spare TD-206/G to check connectors 1 through 8.	
4	Meter glass and indicator lens	Check TEST METER glass for cracks or other damage. Check CALL indicator lamp lens.	
5	Rubber bumper	Check case assembly top for presence of rubber bumper Which engages BATTERY POWER switch.	Fig. 1-1.

Sequence No.	Item to be inspected	Procedure	References
6	Controls and indicators	While making operating checks (items 7, 8, and 9), observe that mechanical action of each knob, dial, and switch is smooth and free of external or internal binding, and no excessive looseness is apparent. Also, check TEST METER for sticking or bent pointer.	
7	BATTERY POWER switch	Pull to on position. Momentarily operate METER SELECT switch to BATTERY. Note that TEST METER indicates full scale or in green zone. Close assembly case cover fully and open again. Momentarily operate METER SELECT switch to BATTERY and note that TEST METER does not indicate.	Figs. 3-1 and 3-2.
8	Call indicator lamp and buzzer.	*a.* Operate BUZZER switch to ON. Operate ORDERWIRE switch to SIG. Note that buzzer sounds and CALL indicator lamp becomes illuminated. *b.* Hold ORDERWIRE switch at SIG and operate BUZZER switch to OFF. Note that buzzer stops sounding while CALL indicator lamp remains & luminated.	
9	Headset H-91A/U	Put on H-91A/U after connecting it to HEADSET connector. Operate ORDERWIRE switch to SIG. Note 1,600-cps tone and buzzer sound. Operate ORDERWIRE switch to TALK. Talk into microphone. You should hear your own voice. Note that CALL indicator lamp does not flicker while talking.	Figs. 1-1, 3-1, and 3-2.

4-3. Organizational Monthly Preventive Maintenance Checks and Service Chart

Sequence No.	Item to be inspected	Procedure	References
1	Handles and latches	Inspect handles, latches, and hinges for looseness. Replace or tighten as necessary.	
2	Metal surfaces	Inspect exposed metal surfaces for rust and corrosion. Clean and touchup paint as required.	Para 4-1.
3	Gasket	Inspect gasket that provides seal between case and cover. Check seat for damage.	
4	Binding posts	Observe that all binding posts are operable by inserting a cable into each.	
5	Probes	Inspect probes for chafed, cracked, or frayed insulation.	
6	Breather valve	Observe that orifice is not blocked.	
7	Battery compartment	Loosen 10 captive screws on front panel and remove chassis. Open battery compartment and inspect interior for evidence of water, leakage, condensation, and corrosion. Check door fasteners for correct operation.	Fig. 2-2.
8	Accessory box	Open accessory box door, remove contents, and examine interior. Check two door fasteners.	
9	Front-panel gasket	Inspect gasket that seals front panel. Look for aging or damage. Gasket must be clean, flexible, and in good condition.	
10	Preservation.	Check all surfaces for evidence of fungus. Remove rust and corrosion, and paint bare spots.	Para 4-1.
11	Cleanliness	See mat AN/PTM-7 is clean inside and out. Clean as necessary.	Para 4-1.
12	Spare lamp	Check spare incandescent lamp (GE-328) in accessory box cover. Apply volts dc to lamp to determine if it will illuminate.	
13.	Tightness	Tighten any external securing screws that are loose.	
14	Simplified instructions.	See that there are four laminated instruction cards, and that they are complete, serviceable, and current. Check fastener holding cards together.	Fig. 1-1.

4-4. Organizational Quarterly Preventive Maintenance Checks and Service Chart

Sequence No.	Item to be inspected	Procedure	References
1	BRIDGE test circuit	*a.* Obtain a spare operable CX-4245/G of known length (¼ mile approx) and connect it to the TS-1323/PTM-7 for a capacitance test. Conduct the test and compare the results with the actual length, allowing an error of 250 feet. *b.* Short the free end of the CX-4245/G and conduct a resistance test. Compare the results with the actual length of the CX-4245/G, allowing an error of 250 feet.	Para 3-8
2	Order-wire probe	*a.* Carry the TS-1323/PTM-7 to the closest TD-206/G known to be carrying pcm traffic and insert the order-wire probe into a lightning arrester well in the TD-206/G. Connect the order-wire probe to the TS-1323/PTM-7; pull out the BATTERY POWER switch, and operate the BUZZER switch to ON. *b.* Operate the ORDERWIRE switch to SIG momentarily. Note that the CALL lamp becomes illuminated and the buzzer sounds. A 1,600-cps tone should also be heard. *c.* Operate the ORDERWIRE switch to TALK, and request that the operator on one end call back. On the call back, note that the CALL lamp becomes illuminated and the buzzer sounds. Note that the CALL lamp does not flicker while you are talking.	
3	Pcm probe	Attach the pcm probe to the PROBE connector on the TS-1323/PTM-7. Operate the METER SELECT switch to PROBE. Insert the probe into the lightning arrester well of the TD-206/G. Note that the TEST METER shows a pronounced deflection. The meter pointer should reach at least 1 on the scale.	

Section II. TROUBLESHOOTING

4-5. Troubleshooting Chart

Troubleshooting is based on the operational checks contained in the preventive maintenance checks and services chart. To troubleshoot the equipment, perform all functions in sequence numbers 7, 8, and 9 in the weekly preventive maintenance checks and services chart (para 4-2) and sequence numbers 1, 2, and 3 in the quarterly preventive maintenance checks and services chart (para 4-4). Proceed through the items until an abnormal condition or result is observed. When an abnormal condition or result is observed, note the sequence number and turn to the corresponding item number in the troubleshooting chart. Perform the checks and corrective actions indicated in the troubleshooting chart. If the corrective measures indicated do not result in correction of the trouble, higher category maintenance is required.

Item No.	Trouble symptom	Probable trouble	(Checks and corrective measures
1 (para 4-2).	*a.* TEST METER fails to indicate in green zone.	Weak batteries	Replace batteries.
	b. BATTERY POWER switch does not depress when case cover is closed.	Rubber bumper does not engage the BATTERY POWER switch.	Check for presence of rubber bumper. Check to determine that case cover fully closes.
2	CALL indicator lamp fails to become illuminated and buzzer fails to sound.	Signaling oscillator, signaling detector, or signaling amplifier is faulty.	Higher category maintenance is required.
	CALL indicator lamp becomes illuminated but buzzer fails to sound.	BUZZER ON-OFF switch or buzzer is defective.	Higher category maintenance is required.
	Buzzer sounds but CALL indicator lamp fails to become illuminated.	CALL indicator lamp is defective.	Replace indicator lamp.

Item No.	Trouble symptom	Probable trouble	Checks and corrective measures
3_____	*a.* No audio in H-91A/U when talking into microphone, but 1,600-cps tone is heard with ORDERWIRE switch operated to SIG.	Transmitter amplifier is inoperative.	Higher category maintenance is required.
	b. No audio in H-91A/U when talking into microphone with ORDERWIRE switch at TALK.	H-91A/U is inoperative.	Substitute for operable H-91A/U.
		Receiver amplifier is inoperative.	Higher category maintenance is required.
	c. CALL lamp flickers while talking.	Antiring circuit is faulty.	Higher category maintenance is required.
1 (para 4-4).	*a.* TEST METER fails to deflect for either CAP test or RES test while DISTANCE TO FAULT switch is operated.	Poor cable connection or faulty internal circuit.	Interchange test cable connectors and repeat step. If not corrected, higher category maintenance is required.
	b. TEST METER fails to deflect during CAP test, but does deflect during RES test.	Capacitance-measuring portion of bridge circuit is faulty.	Higher category maintenance is required.
	c. TEST METER fails to deflect during RES test, but does deflect during CAP test.	Resistance-measuring part of bridge circuit is faulty.	Higher category maintenance is required.
	d. DISTANCE TO FAULT control does not indicate cable length within 250 feet.	Faulty bridge circuit_ _ _ _ _ _ _ _	Higher category maintenance is required.
2_____	*a.* CALL indicator lamp fails to become illuminated, buzzer fails to sound, and and audio cannot be heard on headphone.	One or both orderwire probes are defective.	Substitute for a pair of operable order-wire probes and repeat the step.
	b. CALL indicator lamp fails to become illuminated, but buzzer sounds.	CALL indicator lamp is faulty.	Replace indicator lamp.
	c. Buzzer fails to sound, but CALL lamp becomes illuminated.	Buzzer is faulty_ _ _ _ _ _ _ _ _ _	Higher category maintenance is required.
3-------	TEST METER fails to indicate properly.	Pcm probe or PROBE connector is faulty.	Substitute an operable probe. Check PROBE connector. If fault is not corrected, higher category maintenance is required.

4-6. Repairs and Adjustments

Operator and organization repairs and adjustments for the AN/PTM-7 are limited to replacement of the H-91A/U, probes, batteries, or the lamp in the call indicator. The procedure to be followed for replacing the BA-30's is given in paragraph 2-2.

CHAPTER 5
SHIPMENT AND LIMITED STORAGE

5-1. Repackaging Procedure

The exact procedure for repackaging depends on the material available and the conditions under which the equipment is to be shipped or stored. Adapt the procedures outlined in paragraph 5-2 whenever circumstances permit. The information concerning the original packaging (para 2-1) will also be helpful.

5-2. Material Requirements and Packaging

a. Material Requirements. The following materials are required for packaging Test Set, Telephone AN/PTM-7. For stock numbers of materials, refer to SB 38-100.

Material	Quantity
Plyboard (6 ply)	4ft. x 4 ft.
Furring (¾ in. x 2 in.)	28 ft.
Nails, common (2 in.)	2 lb.
Fiberboard, corrugated	36 sq. ft.
Batting material	6 sq. ft.

b. Packaging. Package the items of the AN/PTM-7 as outlined below:

(1) If available, use the original packing case; if not, fabricate a packing case as shown in figure 2-1. Refer to paragraph 2-1 for dimensions.

(2) Make sure all BA-30's have been removed from the battery compartment.

(3) Wrap accessories in batting material and place them in the accessory box. Pack any vacant spaces with batting. Close the compartment door and shut the case cover.

(4) Place cushioning materials and the AN/PTM-7 in the packing case in the order shown in figure 2-1.

(5) Nail the lid on the packing case.

APPENDIX I

REFERENCES

DA Pam 310-4	Index of Technical Publications.
SB 11-6	Dry Battery Supply Data.
SB 38-100	Preservation, Packaging, Packing and Marking Materials, Supplies, and Equipment Used by the Army.
TM 11-415	Primary Batteries (Dry and Reserve Types).
TM 11-664	Theory and Use of Electronic Test Equipment.
TM 38-750	The Army Maintenance Management System (TAMMS).
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 II
BASIC ISSUE ITEMS LIST (BIIL) AND ITEMS TROOP INSTALLED OR AUTHORIZED LIST (ITIAL)

Section I. INTRODUCTION

1. Scope

This appendix lists only basic issue items required by the crew/operator for installation, operation, and maintenance of Test Set Telephone AN/PTM-7.

2. General

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

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

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

3. Explanation of Columns

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

a. Illustration. This column is divided as follows:

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

(2) *Item Number.* Not applicable.

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

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

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

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

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

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

Section II. BASIC ISSUE ITEMS LIST

(1) Illustration (A) Fig. No.	(1) Illustration (B) Item No.	(2) Federal stock number	(3) Part number	(4) FSCM	(5) Description	Usable on code	(6) Unit of meas	(7) Qty furn with equip
1-1		6625-902-7574	MIL-S-1698C		SLING, CARRYING		EA	1

APPENDIX III

MAINTENANCE ALLOCATION

Section I. INTRODUCTION

1. General

This appendix provides a summary of the maintenance operations covered in the equipment literature for Test Set, Telephone AN/PTM-7. It authorizes levels of maintenance for specific maintenance functions on repairable items and components and the tools and equipment required to perform each function. This appendix may be used as an aid in planning maintenance operations.

2. Explanation of Format for Maintenance Allocation Chart

a. Group Number. Group numbers correspond to the reference designation prefix assigned in accordance with ASA Y32.16, Electrical and Electronics Reference Designations. They indicate the relation of listed items to the next higher assembly.

b. Component Assembly Nomenclature. This column lists the item names of component units, assemblies, subassemblies, and modules on which maintenance is authorized.

c. Maintenance Function. This column indicates the maintenance level at which performance of the specific maintenance function is authorized. Authorization to perform a function at any level also includes authorization to perform that function at higher levels. The codes used represent the various maintenance levels as follows:

Number	*Maintenance category (or level)*
C	Operator/crew
O	Organizational
F	Direct support
H	General support
D	Depot

d. Tools and Equipment. The numbers appearing in this column refer to specific tools and equipment which are identified by these numbers in section III.

e. Remarks. Self-explanatory.

3. Explanation of Format for Tool and Test Equipment Requirements

The columns in the tool and test equipment chart are as follows:

a. Tools and Equipment. 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 for the maintenance function.

b. Maintenance Category. The numbers in this column indicate the maintenance category normally allocated the facility.

c. Nomenclature. This column lists tools, test, and maintenance equipment required to perform the maintenance functions.

d. Federal Stock Number. This column lists the Federal stock number.

e. Tool Number. Not used.

SECTION II. MAINTENANCE ALLOCATION CHART

MAINTENANCE ALLOCATION CHART

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTIONS											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
A	TEST SET, TELEPHONE AN/PTM-7	C												
A1	TEST SET, TELEPHONE TS-1323/PTM-7	C		C										Preventive maintenance
				O									11	
			C											Operational
			O							O			11	Operational checks and replacement of lamps and batteries
			H		H		H						1 thru 10	All tests and adjustment calibrate quarterly
									O					
										H	H		9	
A2	HEADSET-MICROPHONE H-91A/U		C											Operational
									O					
			O										11	Continuity
										O			11	
A3	PROBES, ORDER WIRE AND PCM		O										11	Continuity
									O					
										H			9	

SECTION III. TOOL AND TEST EQUIPMENT REQUIREMENTS

TOOL AND TEST EQUIPMENT REQUIREMENTS

TOOLS AND EQUIPMENT	MAINTENANCE CATEGORY	NOMENCLATURE	FEDERAL STOCK NUMBER	TOOL NUMBER
		AN/PTM-7 (continued)		
1	4,5	ATTENUATOR TS-402/U	5905-230-5149	
2	4,5	FREQUENCY METER AN/TSM-16	6625-542-1666	
3	4,5	GENERATOR, PULSE SG-366/U	6625-892-3594	
4	4,5	MULTIMETER TS-352/U	6625-242-5023	
5	4,5	MULTIMETER, METER ME-26B/U	6625-542-6407	
6	4,5	TEST SET I-181	6625-229-1042	
7	4,5	TEST SET TS-140/PCM	6625-243-4888	
8	4,5	TEST SET, TRANSISTOR TS-1836/G		
9	4,5	TOOL KIT, ELECTRONIC TK-105/G	5180-610-8177	
10	4,5	VOLTMETER, METER ME-30/U	6625-669-0742	
11	2	TOOL AND TEST EQUIPMENT NORMALLY AVAILABLE TO ORGANIZATIONAL REPAIRMAN		

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL MANUALS

SOMETHING WRONG WITH THIS MANUAL?

THEN. . .JOT DOWN THE DOPE ABOUT IT ON THIS FORM, TEAR IT OUT, FOLD IT AND DROP IT IN THE MAIL!

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

DATE 10 July 1975

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

BE EXACT. . .PIN-POINT WHERE IT IS				IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:
PAGE NO.	PARA-GRAPH	FIGURE NO.	TABLE NO.	
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 20 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.

TYPED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER	SIGN HERE:
SSG I. M. DeSpiritof 999-1776	SSG I. M. DeSpiritof

DA FORM 1 AUG 74 2028-2

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PUBLICATION NUMBER	DATE	TITLE
TM 11-6625-648-12	18 Aug 66	Test Set, Telephone AN/PTM-7

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USACDCCBRA (1)
USACDCCEA (1)
USACDCCEA (Ft Huachuca) (1)
USACDCOA (1)
USACDCQMA (1)
USACDCTA (1)
USACDCADA (1)
USACDCARMA (1)
USACDCAVNA (1)
USACDCARTYA (1)
USACDCSWA (1)
USAMC (5)
USCONARC (5)
ARADCOM (5)
ARADCOM Rgn (2)
OS Maj Comd (4)
LOGCOMD (2) except
  1st LOGCOMD (10)
  9th LOGCOMD (10)
USAMICOM (4)
USASTRATCOM (4)
MDW (1)
Armies (5)
Corps (2)
USAC (3)
1st Cav Div (5)
Svc Colleges (2)
Br Svc Sch (2)
USATC AD (2)
USATC Armor (2)
USATC Engr (2)
USATC Inf (2)
USASTC (2)
WRAMC (1)
Army Pic Cen (2)
USACDCEC (10)
Instl (2) except
  Ft Monmouth (70)
  Ft Gordon (10)
  Ft Huachuca (10)
  WSMR (5)
  Ft Carson (25)
  Ft Knox (12)
Army Dep (2) except
  LBAD (14)
  SAAD (30)
  TOAD (14)
  LEAD (7)
  SHAD (3)
  NAAD (5)
  SVAD (5)
  CHAD (3)
  ATAD (10)
GENDEP (2)
Sig Sec GENDEPS (5)
Sig Dep (12)
Sig Fld Maint Shops (2)
AMS (1)
USAERDAA (2)
USAERDAW (13)
USACRREL (2)
Units Org under fol TOE:
  (2 each)
  11-57
  11-97
  11-98
  11-117
  11-127
  11-155
  11-157
  11-158
  11-500(AA-AC)
  11-587
  11-592
  11-597

NG: State AG (3).

USAR: None.

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

CHAPTER II

INSTALLATION

2-1. Service Upon Receipt of Equipment

a. *Packaging Data.* When packed for shipment, the AN/PTM-7 is placed in a wooden packing case padded with corrugated filler. The wooden packing case and its contents are shown in figure 2-1. The dimensions of the packing case are 12 inches high, 15 inches deep, and 17 inches wide; the volume is .75 cubic feet, and the weight is 30.7 pounds.

b. Removing Contents.

Caution: **Be careful when unpacking and handling the equipment. Although the AN/PTM-7 is housed in a ruggedized case, the painted surfaces and other features may be damaged by improper use of prying tools.**

(1) Remove the nails from the top of the packing case with a nailpuller.

(2) Remove the wooden cover.

(3) Remove the corrugated filler on top.

(4) Remove the envelope that contains the manual.

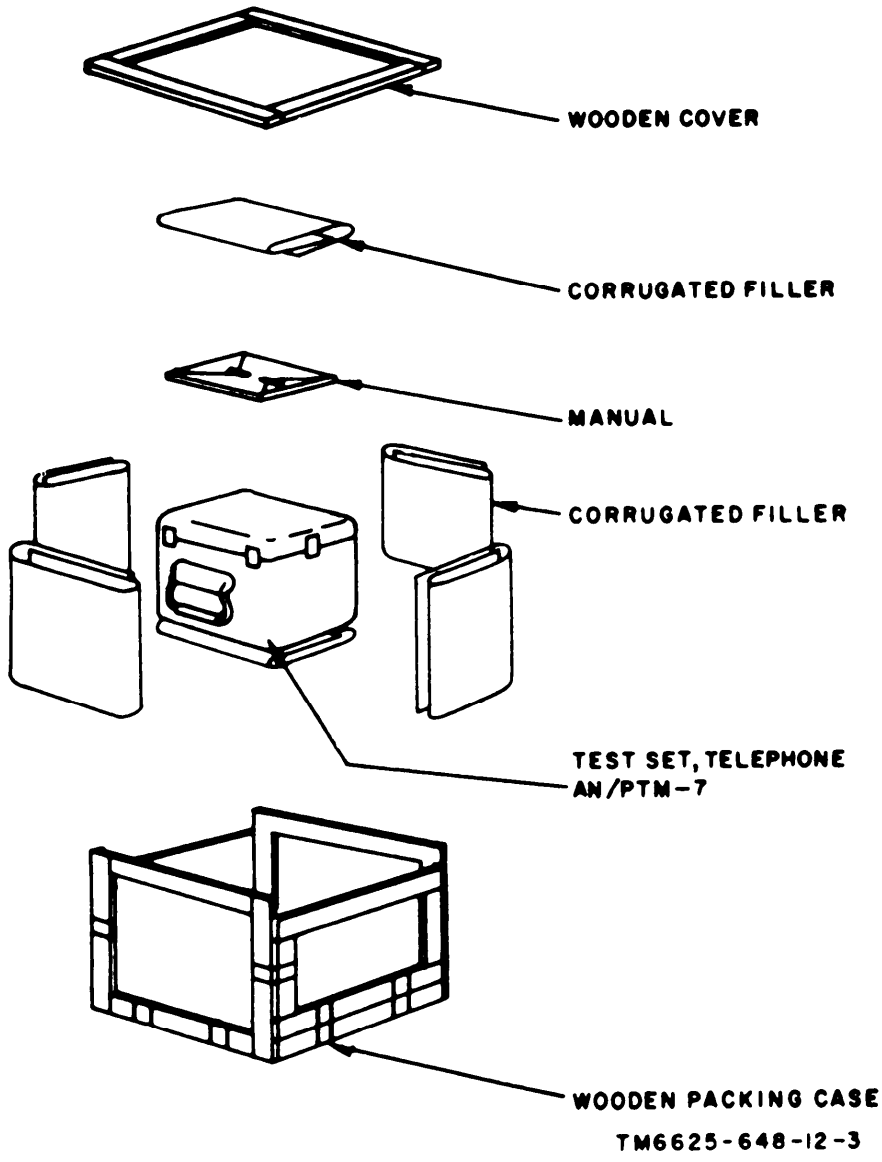

Figure 2-1. Packaging of Test Set, Telephone AN/PTM-7.

(5) Remove the corrugated filler.

(6) Remove the equipment.

(7) Open the cover of the TS-1323/PTM-7.

(8) Open the accessory box in the cover; remove the cushioning pads and unwrap the accessories.

(9) Store the packing case and filler for possible re-use.

c. Checking Unpacking Equipment.

(1) Inspect the equipment for damage incurred during shipment. If the equipment has been damaged, report the damage on DD Form 6 (para 1-3).

(2) Observe that the equipment is complete as listed on the packing slip. If a packing slip is not available, check the equipment against paragraph 1-6. Report all discrepancies in accordance with TM 38-750. Shortage of a minor assembly or part that does not affect proper functioning of the equipment should not prevent use of the equipment.

(3) If the equipment has been used or reconditioned, observe whether it has been changed by a modification work order (MWO). If the equipment has been modified, the MWO number will appear on the front panel near the nomenclature plate. If modified, see that any operational instruction changes resulting from the modification have been entered in the equipment manual.

NOTE

Current MWO's applicable to the equipment are listed in DA Pam **310-7.**

2-2. Installing Batteries, Dry BA-30

(fig. 2-2)

a. The procedure for initially installing or replacing the eight batteries of the TS-1323/PTM-7 is as follows:

(1) Loosen the 10 captive screws around the front panel.

(2) Remove the TS-1323/PTM-7 from the case with the handles provided on the front panel.

(3) Open the battery compartment door by loosening the two captive screws and releasing the spring clip on the compartment door (fig. 2-2)

(4) Remove any BA-30's that may be in the battery compartment.

(5) Insert eight BA-30's, as shown in figure 2-2. Batteries BT1, BT3, BT5, and BT7 are installed so that the positive terminal engages the contact on the compartment door. Batteries BT2, BT4, BT6, and BT8 are installed in the opposite direction, so that the positive terminal engages the contact on the spring inside the compartment.

(6) Close the compartment door, engage the spring clip, and tighten the two captive screws.

(7) Replace the TS-1323/PTM-7 in the case. Tighten the captive screws.

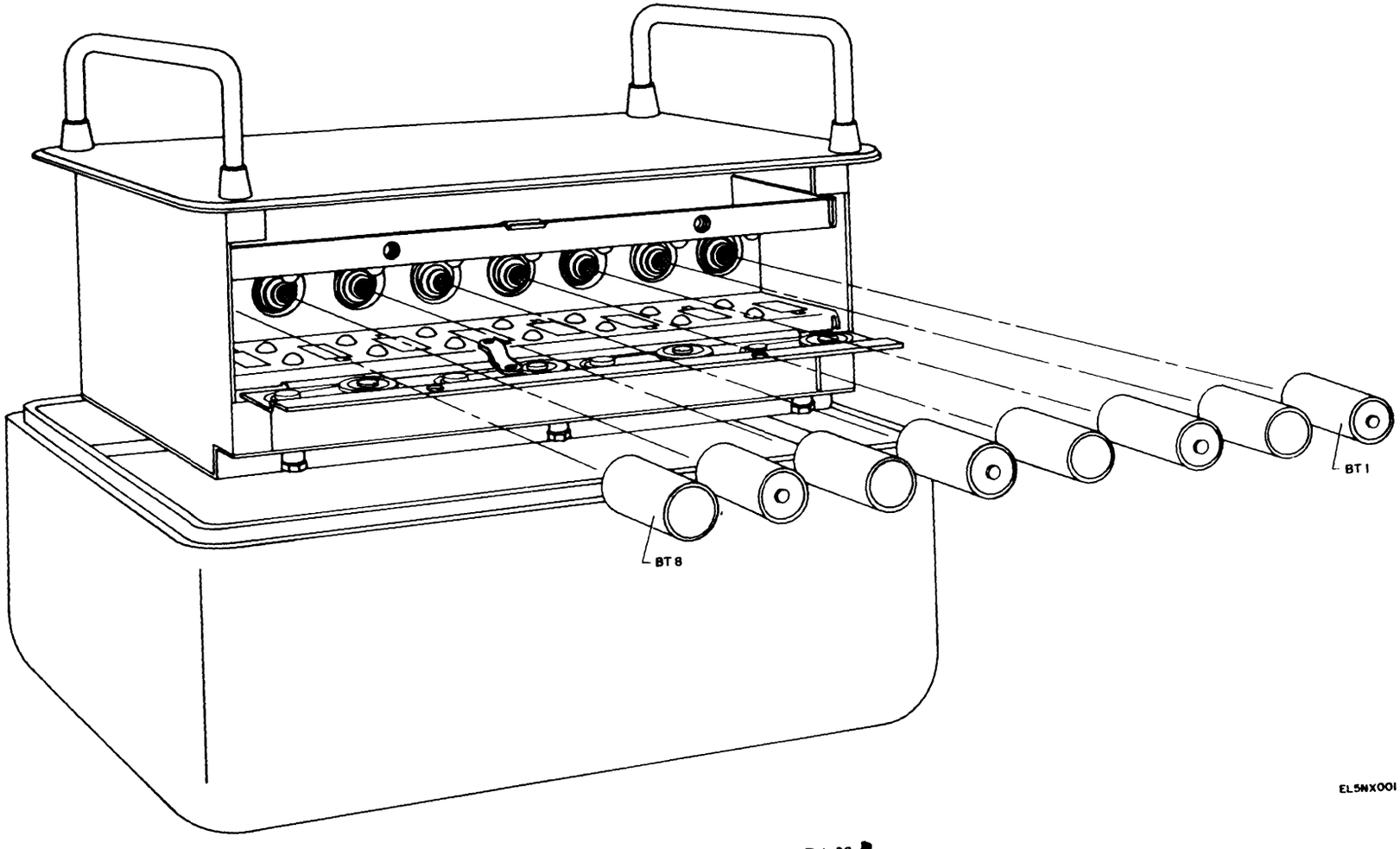

Figure 2-2. Location of batteries, dry BA-30.

b. If the AN PTM-7 is operated in subzero temperature, refer to paragraph 3-9 before relpacing BA-30's.

c. Remove BA-30's before shipment or inactive storage of 30 days or more.

CHAPTER 3

OPERATING INSTRUCTIONS

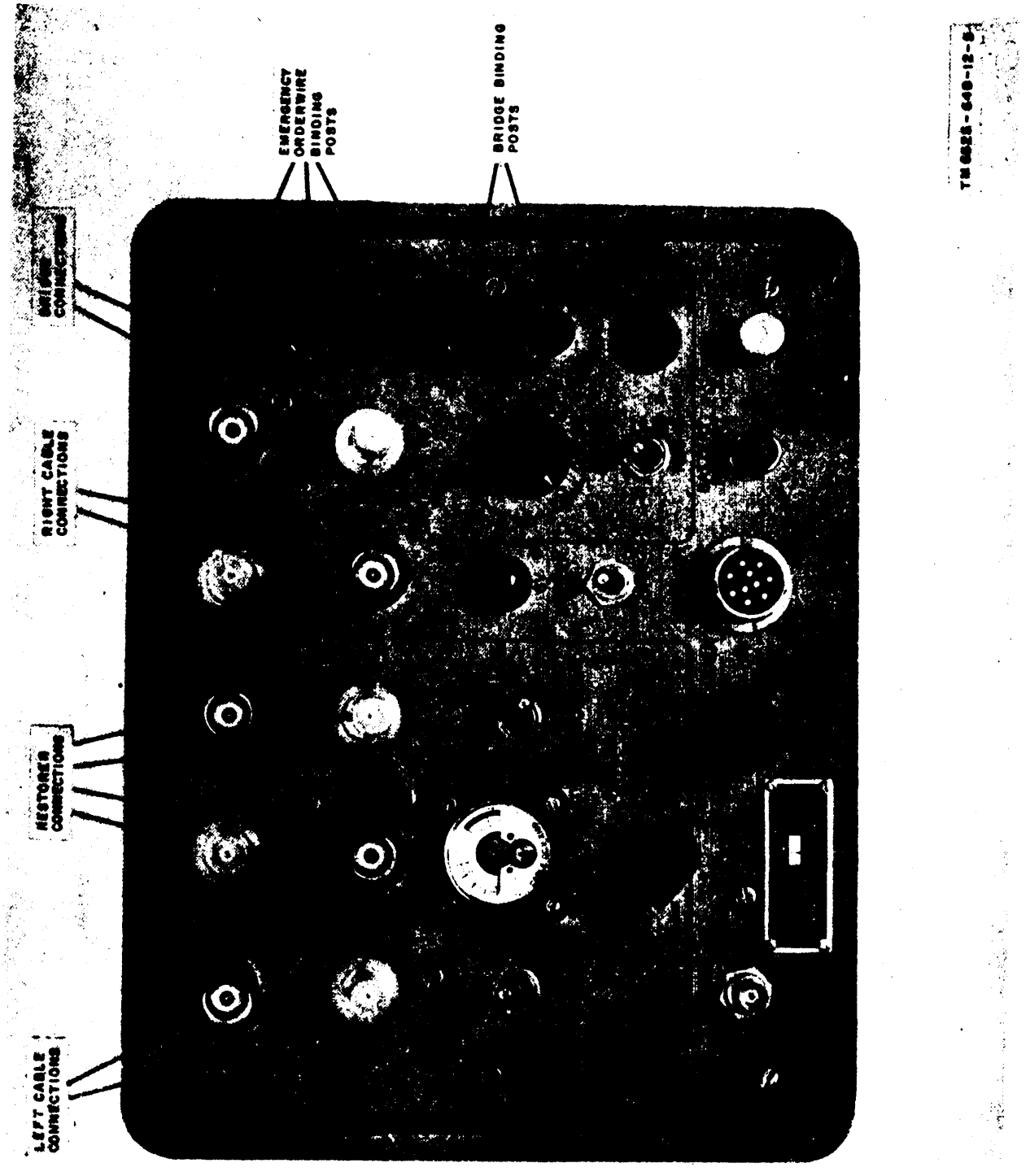

Figure 3-1. Test Set, Telephone TS-1323/PTM-7, front panel.

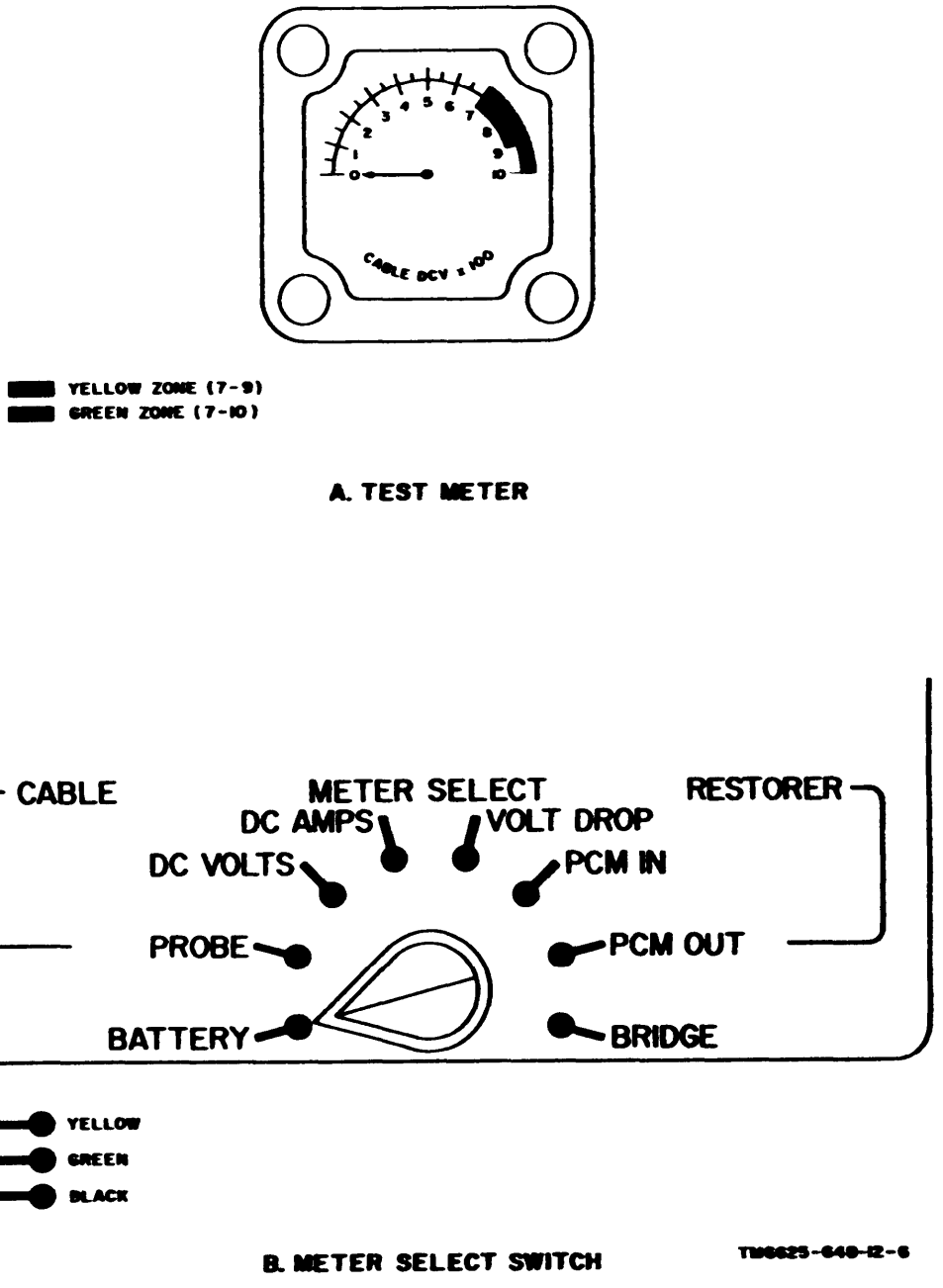

Figure 3-2. Color coding of meter scale and METER SELECT switch.

3-1. Operator's Controls, Switches, Indicators, and Connectors
(figs. 3-1 and 3-2)

Control, switch, indicator or connector	Function
OPERATION switch	In NORMAL position, system continuity is maintained for direct-current and pcm pulses between attended points. In LOOP BACK position, the direct-current and pcm pulses are returned (looped back) to their originating attended points.
DIRECTION switch	Position AB connects the meter switching circuit across the input and output of the AB repeater of the TD-206/G connected between RESTORER connectors 3 and 5. Position BA connects the meter switching circuit across the input and output of the BA repeater of the TD-206/G connected between RESTORER connectors 4 and 6
METER SELECT switch (figs. 3-1 and 3-2)	Selects mode of operation: *Switch positions* — *Action* Battery (spring-loaded portion) — Meter indicates battery voltage (7 or greater) BRIDGE — Connects the meter switching circuit for making CX-4245/G resistance and capacitance measurements with the bridge circuit. *CABLE positions* — *Action* DC AMPS — Meter indicates CX-4245/G dc (yellow zone). DC VOLTS — Meter indicates CX-4245/G dc voltage. PROBE — Pcm probe connected for pcm metering. *RESTORER positions* — *Action* VOLT DROP — Meter indicates dc drop across TD-206/G (green zone). PCM IN — Meter indicates TD-206/G PCM input voltage is present. PCMOUT — Meter indicates TD-206/G PCM output voltage is present.
DISTANCE TO FAULT control	Used to balance the bridge circuit; RES (outer scale) indicates the distance to a CX-4245/G short circuit; CAP (inner scale) indicates the distance to a CX-4245/G open circuit. Each scale is indexed from 0 to 6,000 ft.
CAP-RES switch	In RES position, the bridge circuits are connected to measure CX-4245/G resistance. In CAP position, the circuits are connected to measure CX-4245/G capacitance.
BUZZER switch	In ON position, the buzzer sounds when a 1,600-cps tone is transmitted to or received from an attended point. In OFF position, the buzzer is disconnected.
CALL indicator lamp	Illuminates when 1,600-cps tone is transmitted to or received from an attended point.
ORDERWIRE switch	In TALK position, transmitter and receiver of H-91A/U are connected to order-wire circuit. In OFF position, only the receiver portion of the H-91A/U is connected. In SIG position, 1,600-cps tone is transmitted in both directions over the cable link (spring-loaded in SIG position).
TEST METER (fig. 3-1 and 3-2).	DC microammeter; connects to various test measurement circuits as determined by position of METER SELECT switch.
PROBE connector	Provided for connection of the pcm probe to the TS-1323/PTM-7.
HEADSET connector	Provided for connection of the headset to the TS-1323/PTM-7.
RESTORER connectors (3, 5, 4, and 6).	Provided for connection of repeaters AB and BA of the TD-206/G to the TS-1323/PTM-7.
CABLE connectors (left and right) and right) 1, 2, 7 and 8.	Provided for connection of CX-4245/G to the TS-1323/PTM-7.
BRIDGE connectors (9 and 10).	Provided for connection of CX-4245/G with standard coaxial-type connectors to the TS-1323/PTM-7 bridge circuit.
EMERGENCY OW (emergency order wire) binding posts (11, 12, and 13).	Provided for connection of CX-4245/G without standard coaxial-type connectors to the TS-1323/PTM-7 order-wire circuit.
BRIDGE binding posts (14 and 15).	Provided for connection of CX-4245/G without standard coaxial-type connectors to the TS-1323/PTM-7 bridge circuit.

Control, switch, indicator or connector	Function
BATTERY POWER switch	Pull on position applies dc power to the TS-1323/PTM-7. PUSH OFF position removes power from the test set. If operator fails to remove power from the TS-1323/PTM-7, BATTERY POWER switch should automatically move to the off position when the cover is secured.
READ button	When depressed, arrange bridge circuit for making resistance and capacitance measurement on the CX-4245/G.
EARTH GRD binding post	For earth ground.

3-2. General Operating Procedures

Before using the AN/PTM-7, perform the weekly preventive maintenance checks (para 4-2) to determine that the AN/PTM-7 is operating properly. Obtain all available data on the nature and approximate location of the fault from the operator or organizational maintenance technician at the attended station. Be sure the operator has removed power from the faulty link (TD-204/U CABLE POWER or TD-754/G CABLE CURRENT switch to OFF). The TD-204/U and TD-754/G AC power switch should be left at ON to permit communications over the order-wire circuit. When the test location is reached, drive Grounding Rod MX-148/G into the ground, and connect a grounding cable or wire between the MX-148/G and the AN/PTM-7 EARTH GRD terminal before proceeding with any tests. Figure 3-3 illustrates a typical link configuration during testing with the AN/PTM-7.

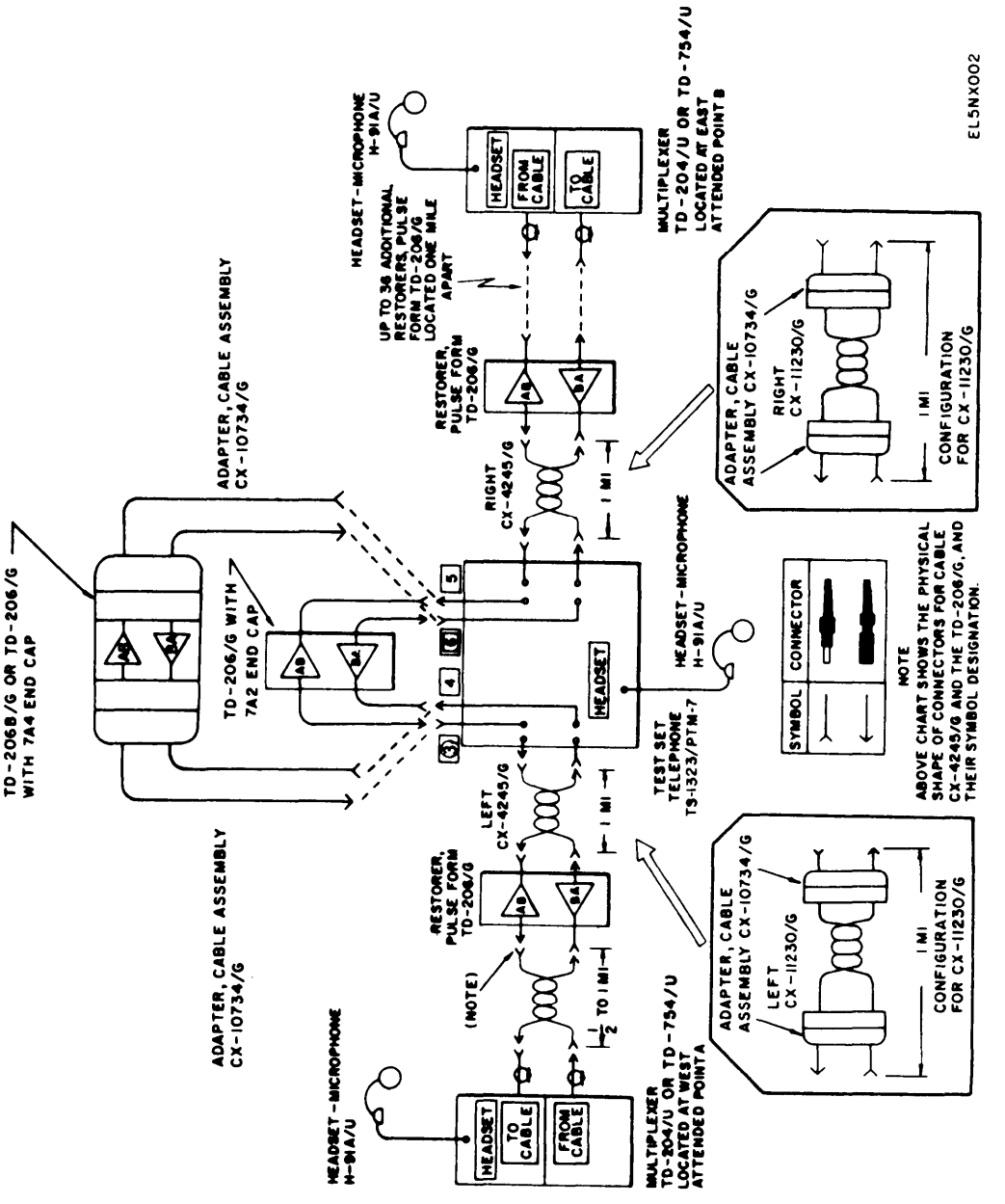

Figure 3-3. Typical link configuration during testing with AN/PTM-7.

3-3. Starting Procedure

a. Check the connectors on the TS-1323/PTM-7 front panel; remove any accumulated dirt or water. Set the front panel controls as follows:

Switch	Setting
BATTER POWER	Pull out
OPERATION	NORMAL
ORDERWIRE	OFF
DISTANCE TO FAULT	0

b. Check the battery voltage as follows:

(1) Operate the METER SELECT switch to BATTERY and hold. The meter should indicate in the green zone or above. If it does not, replace the BA-30's (para 2-2).

(2) Release the METER SELECT switch.

3-4. Use of Pcm Probe

(fig. 3-4)

The pcm probe is used to check for the presence of pcm signals at a TD-206/G in the link. An operating link will show normal pcm traffic; a faulty link will not. Use

the pcm probe as follows:

a. Connect the pcm probe to the TS-1323/PTM-7 PROBE connector.

b. Operate the METER SELECT switch to PROBE.

c. Remove one lightning arrestor cap from each end of the TD-206/G (order-wire cap on TD-206B/G).

d. Insert the pcm probe into each lightning arrestor well or order-wire connector. If traffic is present, a pronounced meter deflection will occur. DO NOT OPEN CONNECTORS IF A READING IS OBTAINED; this will disrupt traffic of an operating link.

e. Replace each lightning arrestor cap in TD-206/G (order-wire cap on TD-206B/G) after testing is corn-pleted.

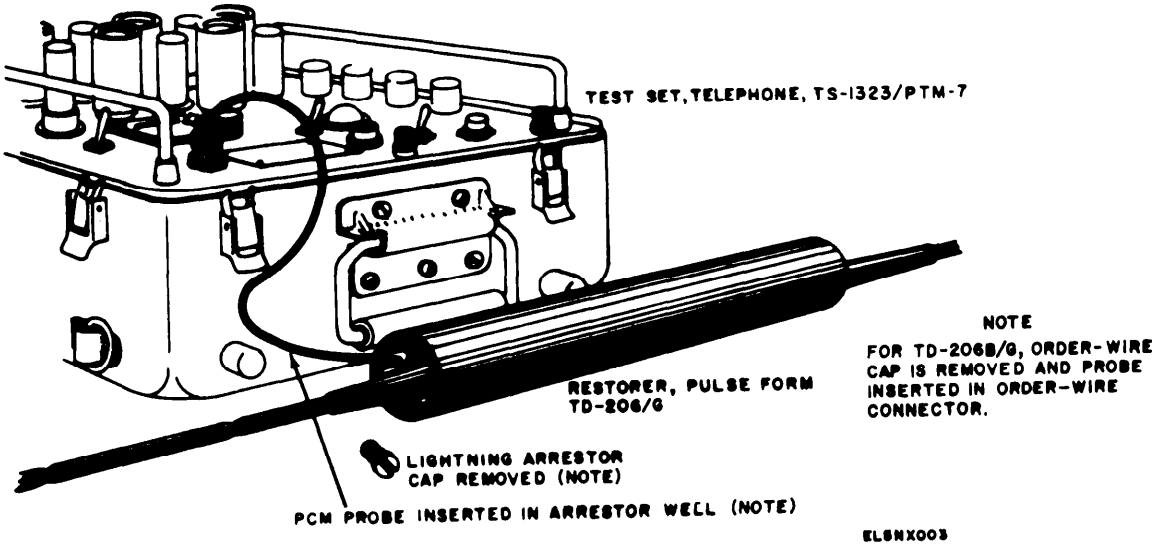

Figure 3-4. Use of pcm probe when measuring pcm signals at TD-206/G.

3-5. Use of Order-Wire Circuit

(figs. 3-5, 3-6, 3-7, and 3-8)

After the link to be tested has been identified (para 3-4) order-wire communications may be established with the operators of the attended stations at each end of the link, as described in *a* through *e* below:

a. Connect the H-91A/U to the HEADSET connector.

b. Set the TS-1323/PTM-7 controls and check the battery voltage as described in paragraph 3-3 *b.*

c. Connect the TS-1323/PTM-7 as described in either (1), (2), (3), or (4) below, as appropriate.

(1) To connect the TS-1323/PTM-7 without opening the link, connect the order-wire probes to the TD-206/G as shown in figure 3-5.

(a) Connect one order-wire probe to RESTORER connector 3.

(b) Connect the other order-wire probe to RESTORER connector 6.

(c) Remove two lightning arrestor caps from either end of the TD-206/G (order-wire caps on TD-206B/G).

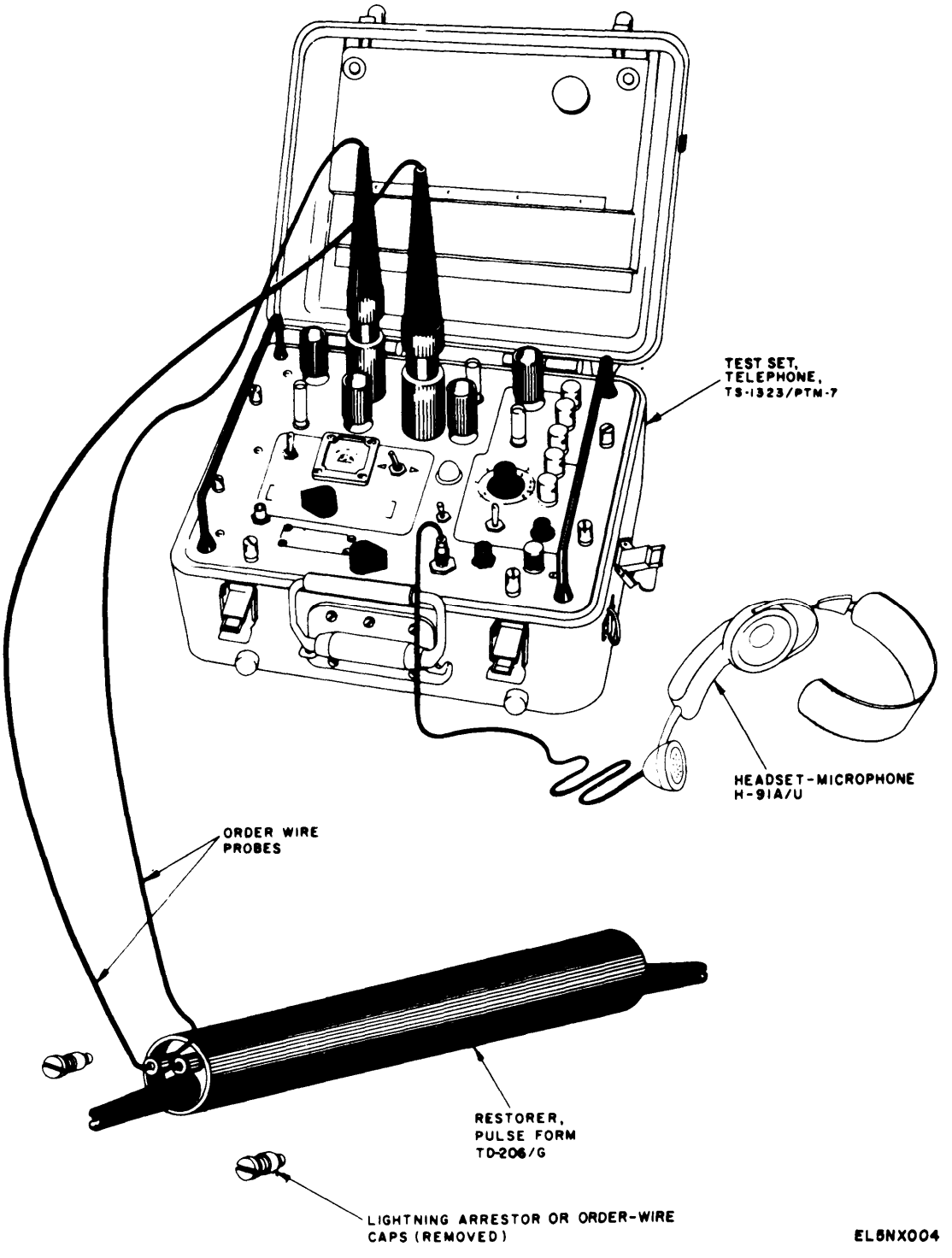

Figure 3-5. Use of order-wire probes on Restorer, Pulse Form TD-206/G.

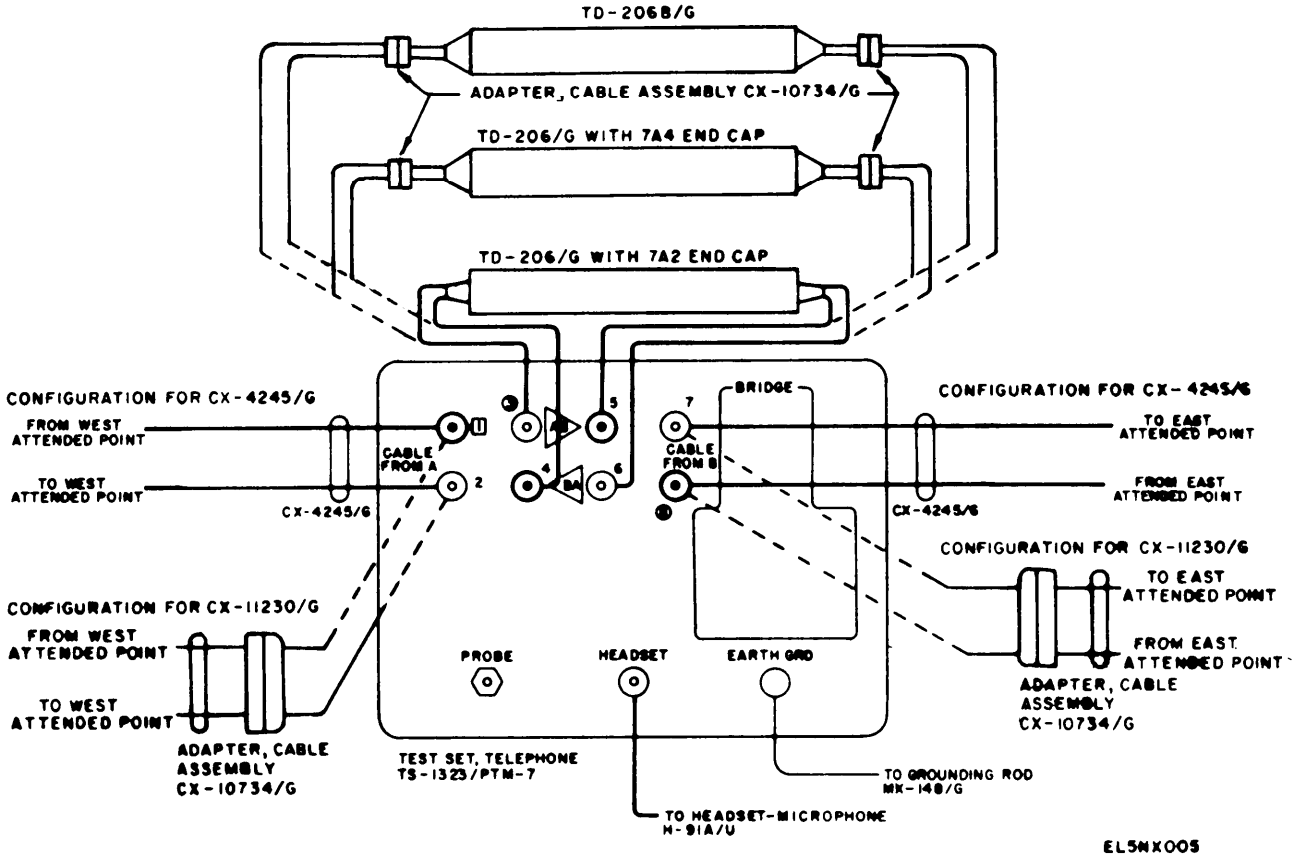

Figure 3-6. Normal connections for order-wire circuit operation and TD-206/G tests.

(2) To connect the TS1323/PTM-7 for order-wire operation at a TD-206/G location, connect the TD-206/G and the two CX-4245/G's to the TS-1323/PTM-7 as shown in figure 3-6.

NOTE

These connections should be made only to a link known to be faulty. Making these connections to an active link will disrupt service.

(3) If the cable is cut or the connectors are broken, refer to figure 3-7 and connect the TS-1323/PTM-7 as follows:

WARNING

Before handling cable, be sure the operator has removed power from the faulty link (cable driver power switch at 00.

(a) Strip the outer insulation from the CX-4245/G to expose about 1 inch of the inside braided sheath and the center conductor.

(b) Connect the center conductor of the CX-4245/G to red EMERGENCY OW binding posts 11 and 13.

(c) Connect the braided sheath from both strands of the cable to black EMERGENCY OW binding post 12.

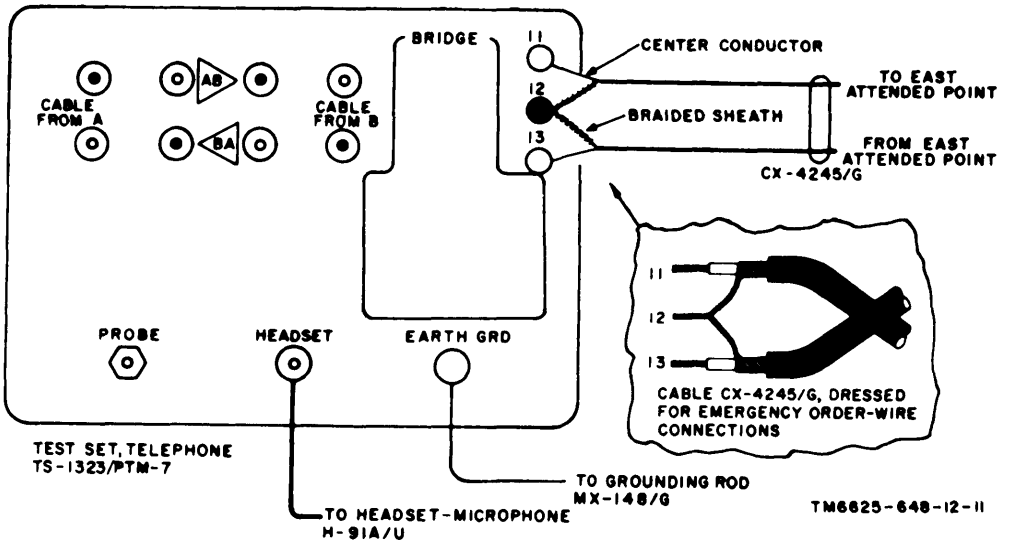

Figure 3-7. Connections for order-wire operation if CX-4245/G is broken or connectors are damaged.

(4) To connect the TS-1323/PTM-7 to the CX-4245/G at a junction point where there is no TD-206/G, refer to figure 3-8. The CX-4245/G from the west attended point is connected to connectors 1 and 6. The CX-4245/G from the east attended point is connected to connectors 3 and 8.

NOTE

These connections should be made only to a link known to be faulty. Making these connections to an active link will disrupt service.

d. Momentarily operate the ORDERWIRE switch to SIG to signal the operators at the attended point.

e. Operate the ORDERWIRE switch to TALK to communicate with the operators at the attended stations.

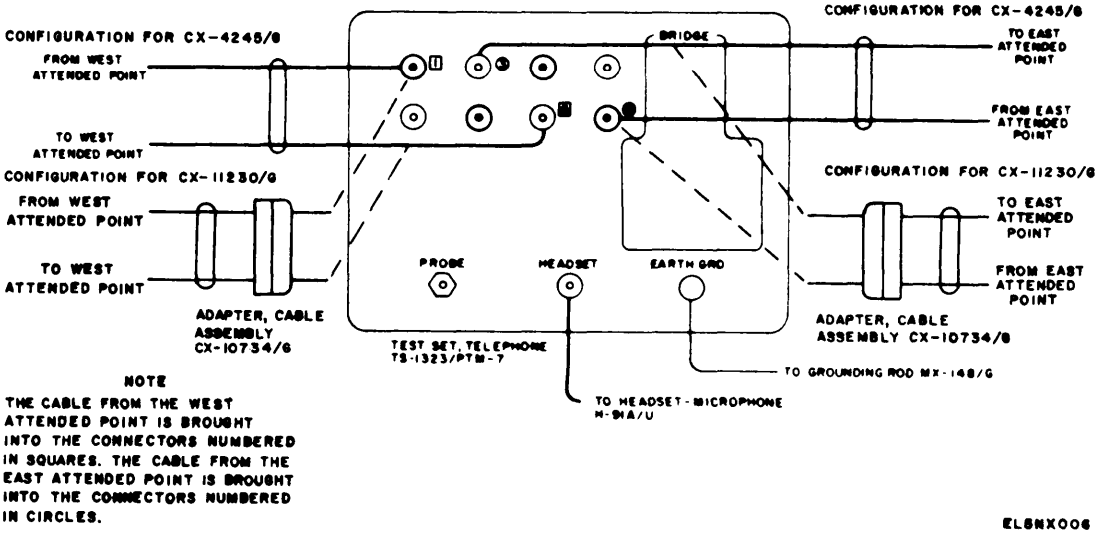

Figure 3-8. Cable connections for order- wire circuit operation at quarter-mile junction points of cable CX-4245/G.

3-6. Testing Restorers, Pulse Form TD-206/G

After communication has been established with the operators at both attended stations (para 3-5), test the TD-206/G as described in *a* through *m* below. This test is effective if the TD-206/G has completely failed (no output and there is no traffic received at the adjacent attended station). See paragraph 3-7a for locating a TD-206/G that is operative, but has incorrect output.

NOTE

The terms A and B used in the following instructions have been arbitrarily assigned to the attended stations (fig. 3-3). Each TD-206/G contains two repeaters; one is designated AB and the other BA. Repeater AB transmits pcm traffic in one direction (west to east or A to B) and repeater BA transmits traffic in the opposite direction (east to west or B to A). The following instructions are applicable to repeater AB. To test repeater BA, operate the DIRECTION switch to BA *(e* below) and substitute B for A and A for B as appropriate throughout the following instructions.

a. Connect the TD-206/G to the TS-1323/PTM-7 as shown in figure 3-6.

b. Perform the starting procedures (para 3-3).

c. Establish communication over the order-wire circuit with the operators at the attended stations (para 3-5d and e).

d. Request the operator at the attended stations to perform the following on the TD-204/G's or TD-754/G's.

(1) Operate the CABLE POWER or CABLE CURRENT switch to ON.

(2) Operate the NOR OPR-ZERO SETREAD switch to ZERO SET.

e. Operate the TS-1323/PTM-7 DIRECTION switch to AB.

f. Operate the TS-1323/PTM-7 METER SELECT switch to DC VOLTS to check cable voltage drop. The meter should indicate approximately 14 volts for each TD-206/G between the TS-1323/PTM-7 and the B attended point (including the one being checked). For example, if there are 15 TD-206/G's (including the one being checked) between the TS-1323/PTM-7 and the B attended station, the meter should indicate approximately 210 volts (14 volts per TD-206/G).

g. Momentarily operate the ORDERWIRE switch to SIG to signal the attending operators.

h. Request the operators of the attended stations to operate the TD-204/U or TD-754/G NOR OPR-ZERO SET-READ switch to READ: this will transmit pcm pulses over the line from the attended stations.

i. With the TS-1323/PTM-7 METER SELECT switch operated to DC VOLTS, note the TEST METER indication. The meter should indicate approximately 10 volts for each TD-206/G between the TS-1323/PTM-7 and the B attended station. For example, if there are 15 TD-206/G's (including the one being checked) between the TS-1323/PTM-7 and the B attended station, the meter should indicate approximately 150 volts.

j. Operate the METER SELECT switch to DC AMPS to check CX-4245/G current. The meter should indicate between 7 and 10. If it indicates slightly lower, but not zero, there may be a high-resistance short circuit between the TS-1323/PTM-7 and the A attended station. If a high-resistance short circuit is suspected, check the CX-4245/G as described in paragraph 3-7.

k. Operate the METER SELECT switch to VOLT DROP to check the direct current (dc) voltage drop across the TD-206/G. The meter indicates between 7 and 9 in the green zone. A nearly full-scale deflection is an indication that the TD-206/G is not receiving or is not amplifying pcm signal.

l. Operate the METER SELECT switch to pcm in to check if pcm signals are being received. If the meter indicates zero no pcm input signal is being received.

m. Operate the METER SELECT switch to pcm out to check to see if pcm signals are being amplified. If meter indicates zero no pcm signal is being transmitted.

NOTES

If normal indications are obtained in *k, l,* and *m* above, and if the TD-206/G being tested and the CX-4245/G and TD-206/G's preceding it are apparently operating satisfactorily, the trouble is between the TS-1323/PTM-7 and the B attended station.

If an abnormal meter indication is obtained in *k* and *m* above, the TD-206/G being tested is probable defective, and should be replaced. Insert the new TD-206/G and repeat the above procedure.

If an abnormal meter indication is obtained in *k, l,* and *m* above, the trouble is between the TS-1323/PTM-7 and the A attended station.

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