D E P A R T M E N T O F T H E A R M Y T E C H N I C A L M A N U A L

OPERATOR'S, ORGANIZATIONAL, FIELD, AND DEPOT MAINTENANCE MANUAL TERMINAL, TELEGRAPH-TELEPHONE AN/TCC-14

Headquarters, Department of the Army, Washington 25, D. C.
7 November 1960

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***This manual supersedes so much of TM 11-2239/TO 16-30TCC-14-5, 4 April 1952, including C1, 13 May 1954; and C3, 14 April 1960 as is applicable to Filter Assembly, Electrical F-98/U and to the system application of Terminal, Telegraph Telephone AN/TCC-14.**

This copy is a reprint which includes current pages from Change 2.

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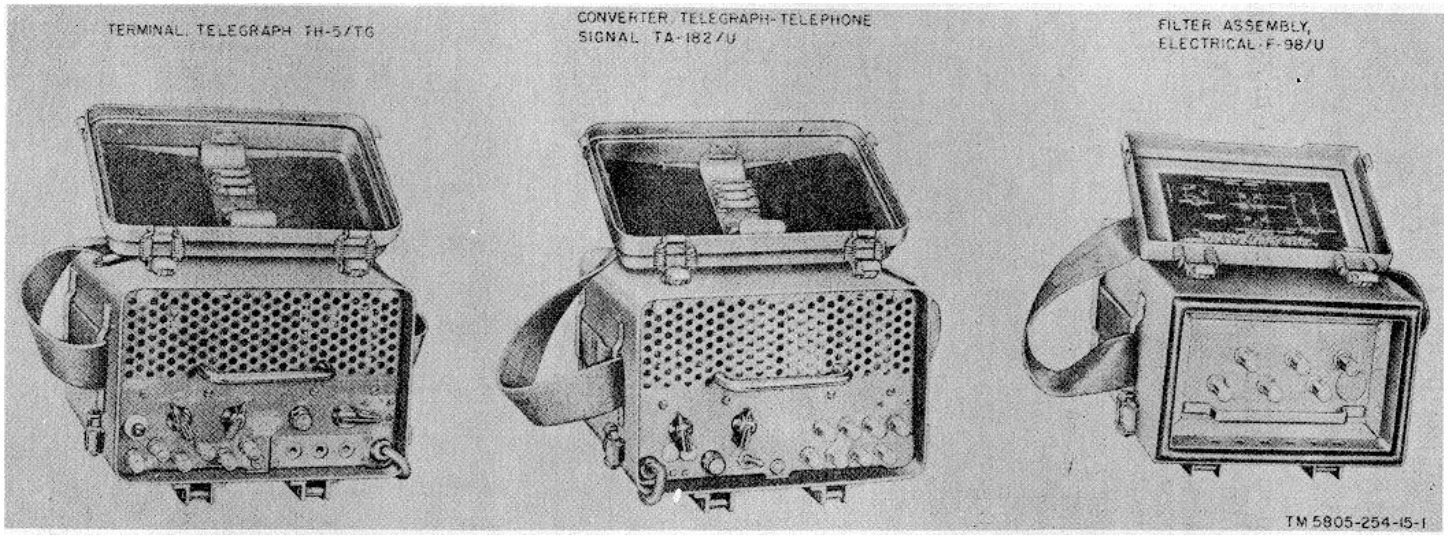


Figure 1. Terminal, Telegraph-Telephone AN/TCC-14, less running spares.

CHAPTER 1
INTRODUCTION

Section I. GENERAL

1. Scope

a. This manual describes Terminal, Telegraph-Telephone AN/TCC-14 (fig. 1) and covers its system applications and use. The manual also includes description, operation, theory, and maintenance of Filter Assembly, Electrical F-98/U (fig. 2). Publications with detailed information for Terminal, Telegraph TH-5/TG and Converter, Telegraph-Telephone Signal TA-182/U are listed in the appendix.

b. The basic issue items list and the maintenance allocation chart for the AN/TCC-14 is contained in TM 11-5805-254-15P.

2. Forms and Records

a. *Unsatisfactory Equipment Reports.*

(1) Fill out and forward DA Form 468 (Unsatisfactory Equipment Report) to the Commanding Officer, U. S. Army Signal Materiel Support Agency, ATTN: SIGMS-ML, Fort Monmouth, N. J. as prescribed in AR 700-38.

(2) Fill out and forward AF TO Form 29 (Unsatisfactory Report) to the Commander, Air Materiel Command, Wright-Patterson Air Force Base, Ohio, as prescribed in AF TO 0035D054.

b. *Report of Damaged or Improper Shipment.* Fill out and forward DD Form 6 (Report of Damaged or Improper Shipment) as prescribed in AR 700-58 (Army), Navy Shipping Guide, Article 1850-4 (Navy), and AFR 71-4 (Air Force).

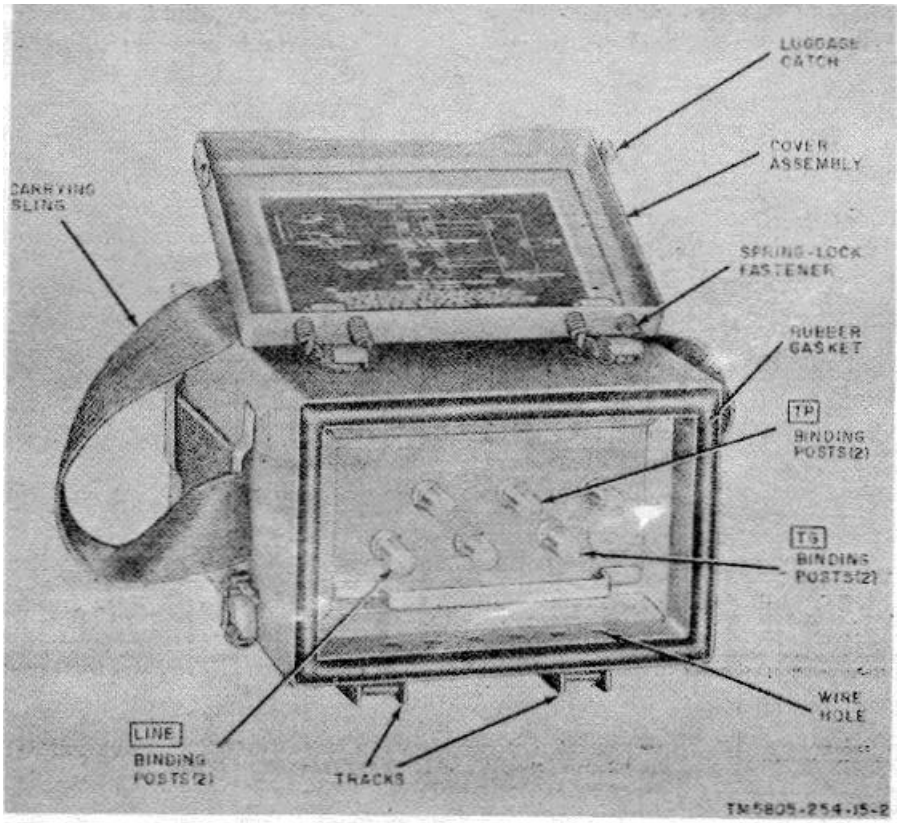


Figure 2. Filter Assembly, Electrical F-98/U

c. *Preventive Maintenance Form.* Prepare DA Form 11-238 (fig. 10 and 11) (Maintenance Checklist for Signal Equipment (Sound Equipment, Radio, Direction Finding, Radar, Carrier, Radiosonde and Television)), in accordance with instructions on the form.

d. *Comments on Manual.* Forward all other comments concerning this publication directly to the Commanding Officer, U. S. Army Signal Materiel Support Agency, ATTN: SIGMSPA2d, Fort Monmouth, N. J.

Section II. DESCRIPTION AND DATA

3. Purpose and Use

a. *Purpose.* Terminal, Telegraph-Telephone AN/TCC-14 (fig. 3) is a terminal for teletypewriter and telephone equipment and provides for simultaneous transmission of speech signals with voice-frequency (vf) telegraph and vf ringing signals (speech-plus-duplex operation).

(1) *Terminal, Telegraph TH-5/TG.* Neutral, half-duplex direct current (do) signals sent from the teletypewriter are converted to vf telegraph signals in the TH-5/TG. Vf telegraph signals received by the TH-5/TG are converted to neutral, half-duplex dc signals. Twenty-cycle-per-second (cps) ringing is provided for signaling and for breaking in on teletypewriter transmission at the distant station during half-duplex operation.

(2) *Converter, Telegraph-Telephone Signal TA-182/U.* The TA-182/U converts a 20-cps ringing signal transmitted from a TH-5/TG (or telephone equipment to a vf ringing signal. A vf ringing signal received by the TA-182/U is converted to a 20-cps signal.

(3) *Filter Assembly, Electrical F-98/U.* The filter provides for the insertion of the vf telegraph signals ((1) above) among the speech signals from telephone equipment. Thus, simultaneous transmission of vf telegraph and -

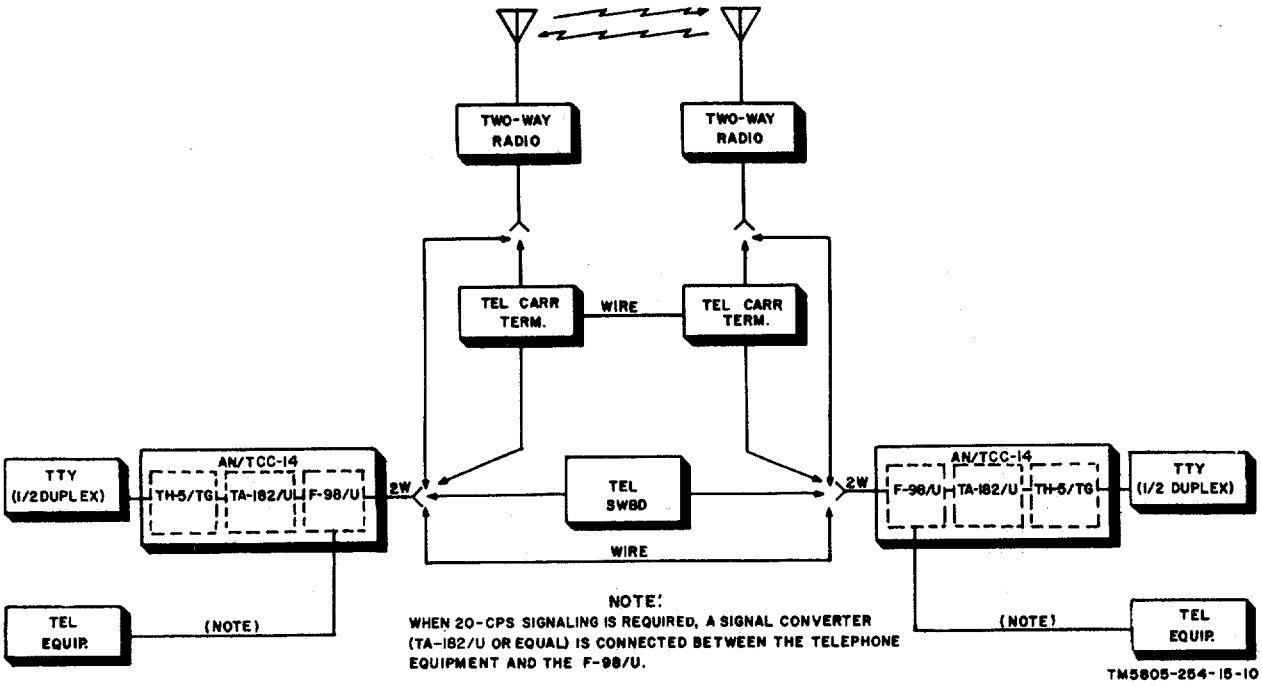


Figure 3. Typical system application of Terminal, Telegraph-Telephone AN/TCC-14.

speech signals is possible on a two-wire line circuit. When the signals from a two-wire circuit are received, the F-98/U separates the band of frequencies that contain the vf telegraph signals from the speech signals and passes the vf telegraph signals to the TH-5/TG and the speech signals to the telephone equipment.

b. *Use.* The AN/TCC-14 is used in any two-wire communication system (fig. 3) capable of transmitting speech signals (0-3,000 cps). For configurations in which the components of the AN/TCC-14 may be used, refer to paragraph 7.

4. Technical Characteristics

The individual characteristics of the TH-5/TG and the TA-182/U are covered in their respective technical manuals (appx). The technical characteristics of the AN/TCC-14 (connected as shown in figure 3) are covered in a below; the technical characteristics of the F-98/U are covered in b below.

a. *AN/TCC-14.*

Power consumption ..	100 watts (approx).
Voltage requirements	115 ±10 percent, 50 to 60 cps.
Line requirements	600 ohms, 2 wires.
Type of modulation (TH-5/TG)	Frequency shift.
Type of operation:	
Teletypewriter....	Half-duplex.
Telephone	Common or local battery.
Receiving sensitivity:	
TH-5/TG	—50 dbm.
TA-182/U	—45 dbm.
Frequency band:	
Teletypewriter circuit	1,200 to 1,400 cps (approx): 1,325 ±2 cps (mark); 1,225 ±2 cps (space); 1,225 ±6 cps (signaling and breaking).
Speech (telephone) circuit	0 to 1,200 cps and 1,400 to 3,000 cps (approx).
Teletypewriter transmission speeds	60, 75, or 100 words per minute
Teletypewriter loop current (provided by TH-5/TG):	
SEND jack	14.85 to 18.15 ma.
REC jack	19 to 23 ma.

b. F-98/U.

Impedance (of all circuits)	600 ohms.
Bandstop section (TP)	Passes from 0 to 1,150 cps and from 1,400 to more than 3,000 cps with maximum loss of 5 db; other frequencies attenuated 80 db or more.
Bandpass section (TG)	Passes from 1,200 to 1,350 cps with maximum loss of 5 db; other frequencies attenuated 80 db or more.
Input power level of the telephone (TP) circuit (without providing distortion to the teletypewriter (TG) circuit).	0 dbm (with signal peaks up to +5 dbm).

5. Components and Running Spares

a. *Components.* The components of Terminal, Telegraph-Telephone AN/TCC-14 (fig. 1) with dimensions and weight are listed in the following table.

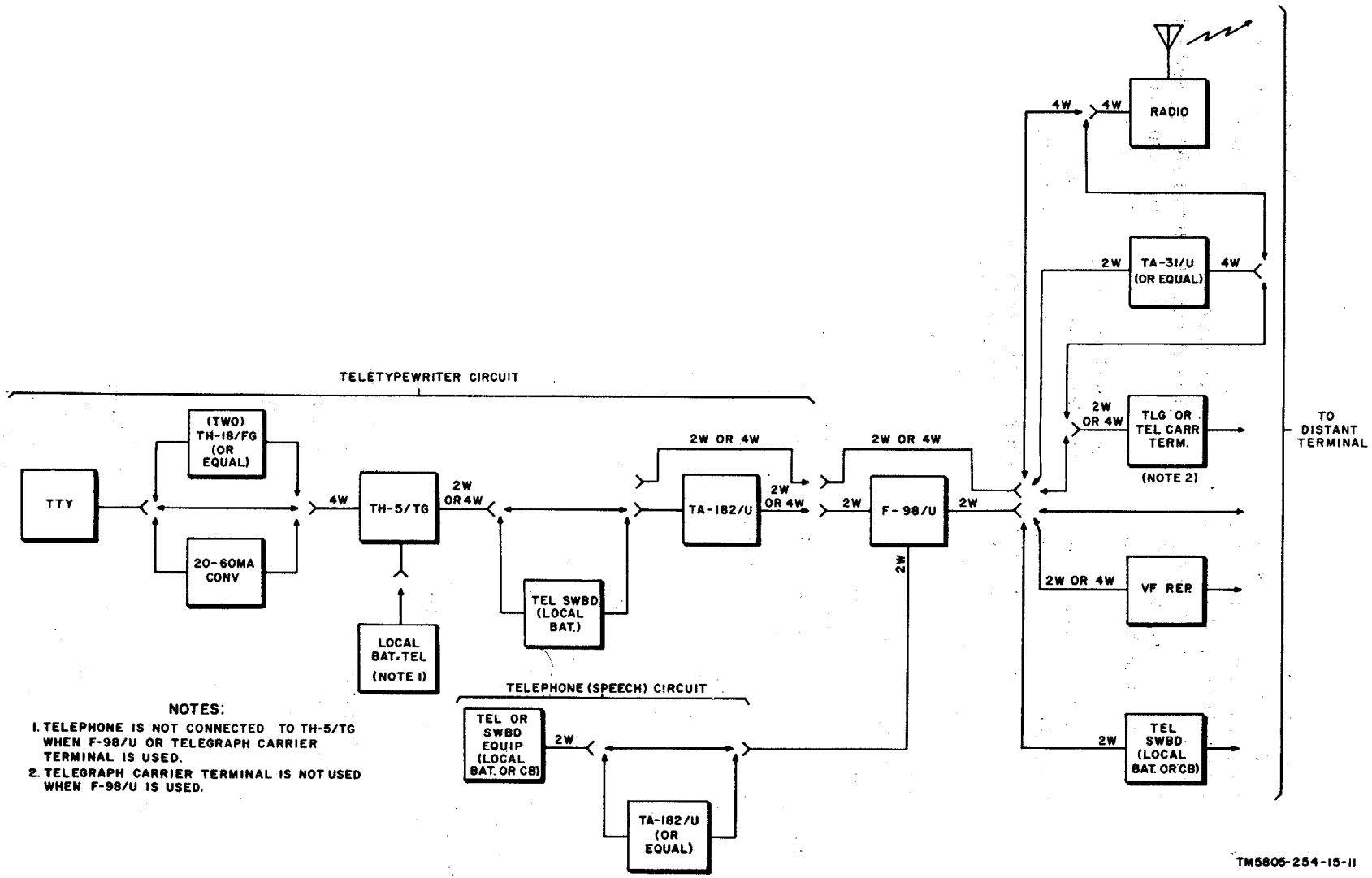


Figure 4. System terminal arrangements using components of AN/TCC-14.

Quantity	Item	Height (in.)	Depth (in.)	Width (in.)	Unit weight (lb)
1	Terminal, Telegraph TH-5/TG.....	11	10½	7½	18.6
1	Converter, Telegraph-Telephone, Signal TA-182/U.....	11	10½	7½	15
1	Filter Assembly, Electrical F-98/U.....	10	8¾	6½	25.6

b *Running Spares.* There are no running spares for the F-98/U.

(1) TH-5/TG.

Quantity	Item
2	Electron tube type 5726/6AL5W
1	Electron tube type 6X4W
3	Electron tube type 12AU7
2	Electron tube type 12AX7
5	Fuse, cartridge, 250 volts, 1 1/2 amperes
1	Lamp, glow-type, No. NE-61
1	Lamp, incandescent, 120 volts, 6 watts

(2) TA-182/U.

Quantity	Item
1	Electron tube type 6726/6AL5
1	Electron tube type 6X4W
2	Electron tube type 12AU7
1	Electron tube type 12AX7
5	Fuse, cartridge, 250 volts, 1 ampere
1	Lamp, incandescent, clear bulb, 120 volts, 6 watts

6. Description

(fig. 1)

All operating controls, fuses, indicators, and binding posts are on the front panel of each component of the AN/TCC-14. When the covers are closed and secured, each component is waterproof. Tracks are provided on each case so that the component can be mounted in a suitable rack (para. 10).

7. System Configuration, Using Components of AN/TCC-14

a. Figure 4 shows some of the system configurations in which the components of the AN/TCC-14 can be used.
   (1) The teletypewriter is normally connected directly to the TH-5/TG. If the loop current of the TH-5/TG exceeds certain limits (para. 4a), however, a dc repeater (such as Telegraph Repeater TH-18/TG) can be used between the teletypewriter equipment and the TH-5/TG. If the teletypewriter receiving equipment is restricted to operation with 60 milliamperes (ma), a 60- to 20-ma converter can be inserted in the line between the teletypewriter equipment and the TH-5/TG.
   (2) A local battery telephone can be connected to the TH-5/TG for speech communication when using a two wire line from the TH-5/TG and provided that neither the F-98/U nor a telegraph carrier terminal is used in the system.
   (3) The TA-182/U is used in either (or both) the teletypewriter or telephone circuit when the interconnecting equipment cannot pass 20-cps ringing signals; for example, when radio or carrier terminals are used in the system.
   (4) The F-98/U is used to combine the teletypewriter (vf telegraph signals) and a telephone circuit (speech signals) over a two-wire communication system. Such a system may be radio (through Hybrid Circuit Network TA-31/U, or equal), telephone carrier terminal, vf repeater, or telephone switchboard.

b. Figure 5 shows how the F-98/U can be connected in tandem (back to back).
   (1) A, figure 5 shows that teletypewriter users at stations A and B communicate and the telephone users at stations A and C communicate. Likewise, the telephone users at stations B and D communicate.
   (2) B, figure 5 shows that teletypewriter users at stations A and C communicate and the telephone users at stations A and B communicate. Likewise, the teletypewriter users at stations B and D communicate.

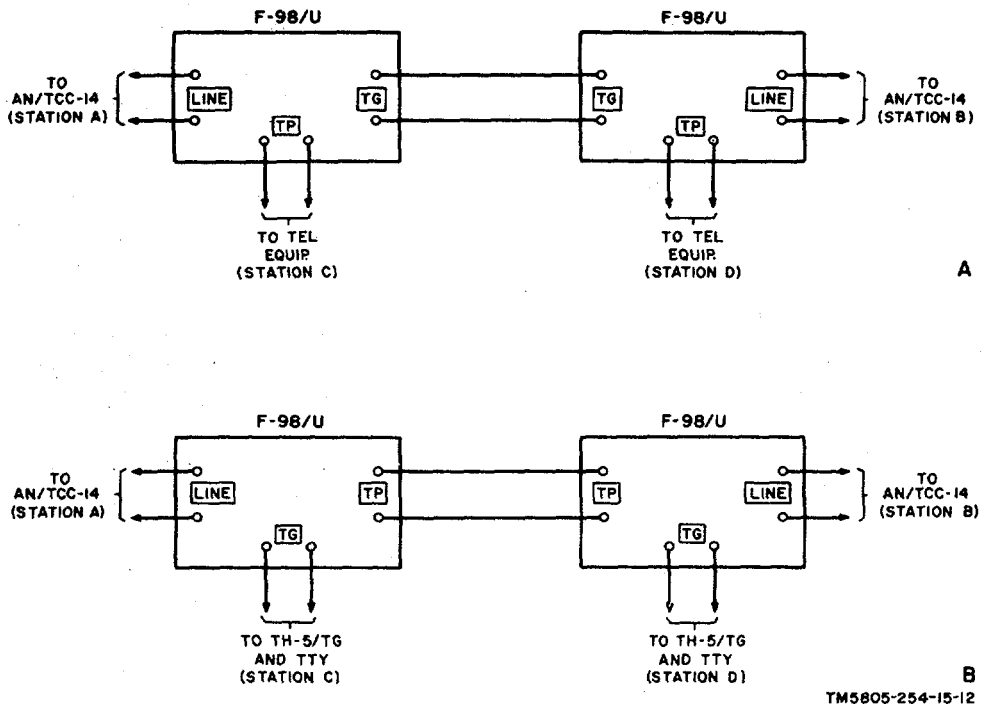


Figure 5. Tandem arrangements, using F-98/U.

CHAPTER 2
INSTALLATION

Section I. SERVICE UPON RECEIPT OF EQUIPMENT

8. Unpacking

a. Packaging Data. When packed for shipment, the components of Terminal, Telegraph Telephone AN/TCC-14 (para. 5) are packaged in fiberboard containers and packed in a wooden box. The AN/TCC-14 is packed in one package that is 251/2 inches high, 16 1/2 inches wide, and 12 1/2 inches deep. The package weighs 88.5 pounds and has a volume of 3.05 cubic feet.

b. Removing Contents (fig. 6). When the equipment is received, unpack it in a sheltered area as close as possible to the site at which it will be used. Perform the procedures given in (1) through (8) below for export packed equipment and in (2) through (8) below for domestic packed equipment.

(1) Cut and fold back the steel straps.
(2) Remove the nails from the top of the wooden box with a nailpuller and remove the wooden top.
(3) Lift each water-resistant fiberboard container out of the wooden box, in turn, and remove the technical manuals.
(4) Cut the pressure-sensitive tape around the top of each water-resistant fiberboard container and open the flaps.
(5) Remove the flat corrugated fiberboard pads from the top and four sides of the equipment and lift the equipment out of the fiberboard container.
(6) Remove the running spares from the fiberboard container.
(7) Cut through three edges of one side of the running spares package.
(8) Fold back the side of the running spares package and remove the contents.

9. Checking Unpacked Equipment (fig. 1)

Check to see that the type and quantity of items received are the same as those described on the packing list. When no packing list accompanies the equipment, refer to paragraph 5 for packaging data. Check each component of the AN/TCC-14 as follows:

a. Loosen the carrying sling. Release the spring-lock fasteners and swing open the cover assembly.
b. Check the binding posts and switches for proper functioning.
c. Check the power cords to see that the plugs and cabling are in good condition.
d. Check the covers of the TH-5/TG and the TA-182/U to see that the spare fuses are of the proper value, securely mounted, and in sufficient quantity (para. 5*b*). Check to see that a fuse of the correct value (1 ampere in TA-182/U and 1.5 amperes in TH-5/TG) is mounted in the fuse receptacle in these components.
e. Check to see that the glowlamp on the panel of the TH-5/TG, the proper electron tubes, and tube shields are in place in both the TH-5/TG and the TA-182/U. Refer to the operator's manual on each component for this information (apex).

Section II. INSTALLATION

10. Installation Requirements

Normally, the AN/TCC-14 (fig. 3) is installed near the equipment to which it is connected and mounted in racks or stacked at the equipment site. For special installation procedures concerning the prevention of home copy in full-duplex operation with the TH-5/TO, refer to TM 11-5805-246-20.

a. Installation on Level Working Area. When a mounting or rack is not available, place the component either on its tracks or on the rear of its transit case, with the front panel facing upward.
b. Installation in Prefabricated Rack. When two or more components are required for a particular installation, prefabricated racks are sometimes provided to accommodate the components. These racks are generally lined with

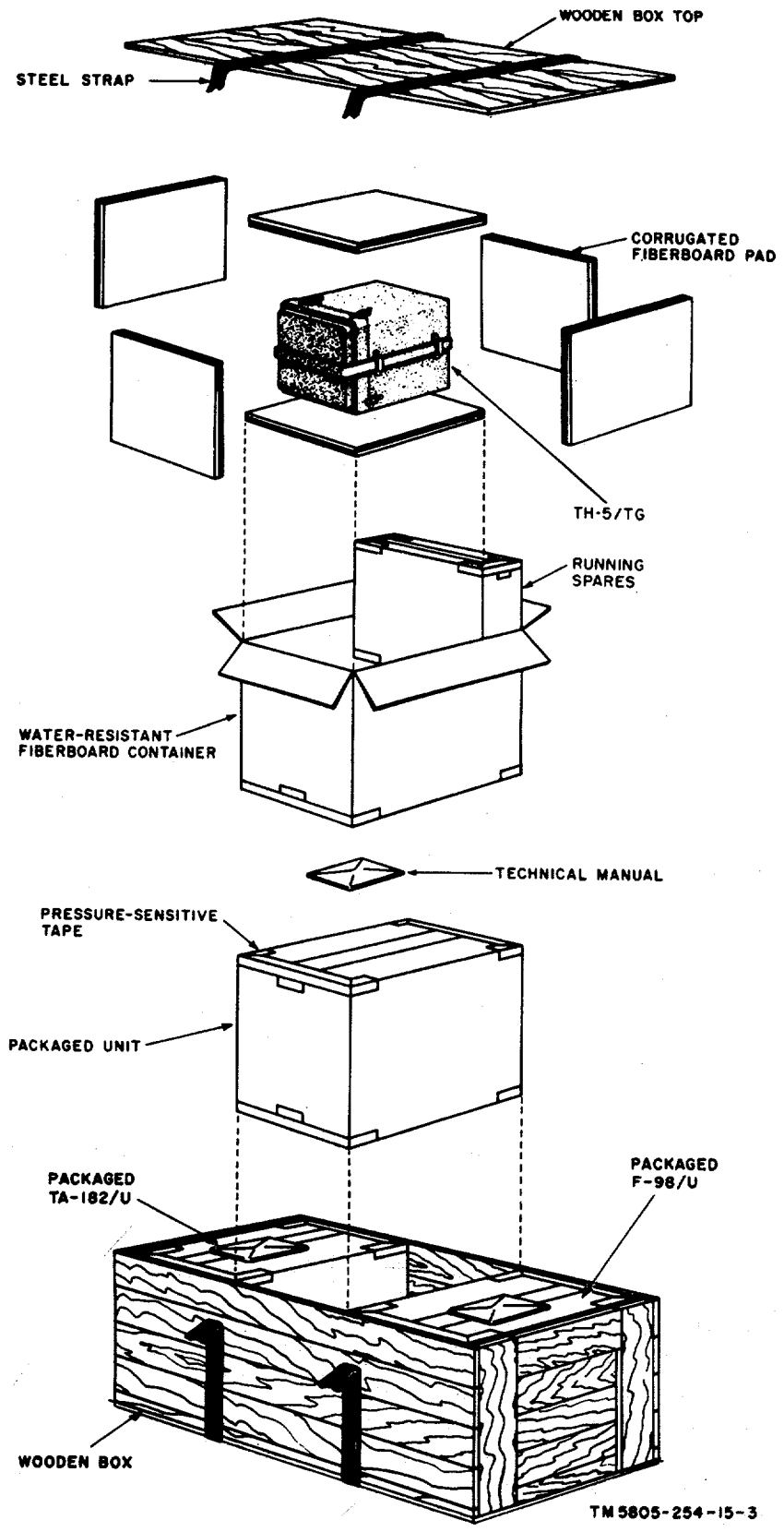


Figure 6. Packing diagram, Terminal, Telegraph-Telephone AN/TCC-14.

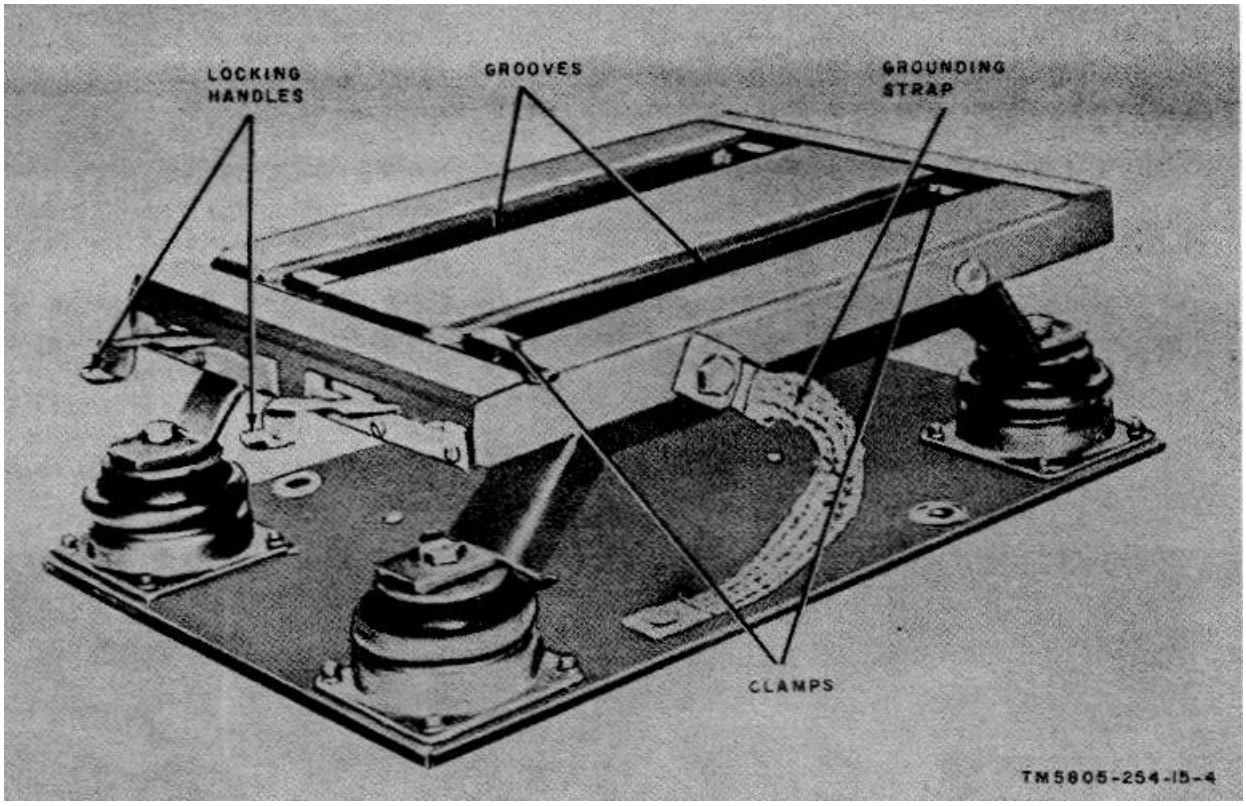


Figure 7. Mounting MT-791/U.

cushioning material which may require that the component be removed from its case prior to installation. Typical installation procedures are described below.

(1) Unlatch and raise the cover assembly of the component.
(2) For the TH-5/TG and the TA182/U loosen the three quick-release screws on the front panel; remove the front panel and chassis assembly from the case.
(3) Install the component in the rack and secure it with the fastening devices.

c. installation in Mounting MT-791/U or MT-791A/U. Either Mounting MT-791/U (fig. 7) or Mounting MT-791A/U (not shown) can be used when a component of the AN/TCC-14 is mounted in a vehicle or on a workbench. Secure the component of the AN/TCC-14 to either mounting as described below.

(1) Check to see that the mounting and its grounding strap are securely installed.
(2) Push in on the locking handles on the front of the mounting.
(3) Unlatch and raise the cover assembly of the component, and place the tracks of the component into the grooves in the mounting.
(4) Pull the locking handles forward on the mounting. Make sure that the component is securely locked in place.
(5) To remove the component from the mounting, push in on the locking handles, and lift the component from the mounting.

d. Installation in Rack, Electrical Equipment MT-1278/U (fig. 8). Rack, Electrical Equipment MT-1278/U (FSN 5805-333-9459) can be used for mounting the three components of the AN/TCC-14. Perform the following operations on each component of the AN/TCC-14.

(1) *Preliminary procedure*.
   (a) Remove the carrying sling from the component (fig. 1). Fold the carrying sling (approximately 4-inch folds) and tie it with string.
   (b) Release the spring-lock fasteners and raise the cover assembly.
   (c) Remove the fuses from the spare. fuseholders in the cover assembly and store them with the other running spares.
   (d) Carefully pry open the metal tabs on the cover assembly luggage catches which are secured to the spring-lock fasteners on the case of the component, and separate the cover assembly from the component case.

(2) *Installation.*
   (a) Unbuckle the cover assembly retaining strap (fig. 8).
   (b) Insert the folded carrying sling ((1) (a) above) behind the carrying sling bracket.
   (c) Place the cover assembly of the component in the cover support bracket with the luggage catches toward the rear of the MT-1278/U, and tighten the retaining strap.

Note. Make sure that the cover assembly is between the extended brackets to which each end of the retaining strap is secured.

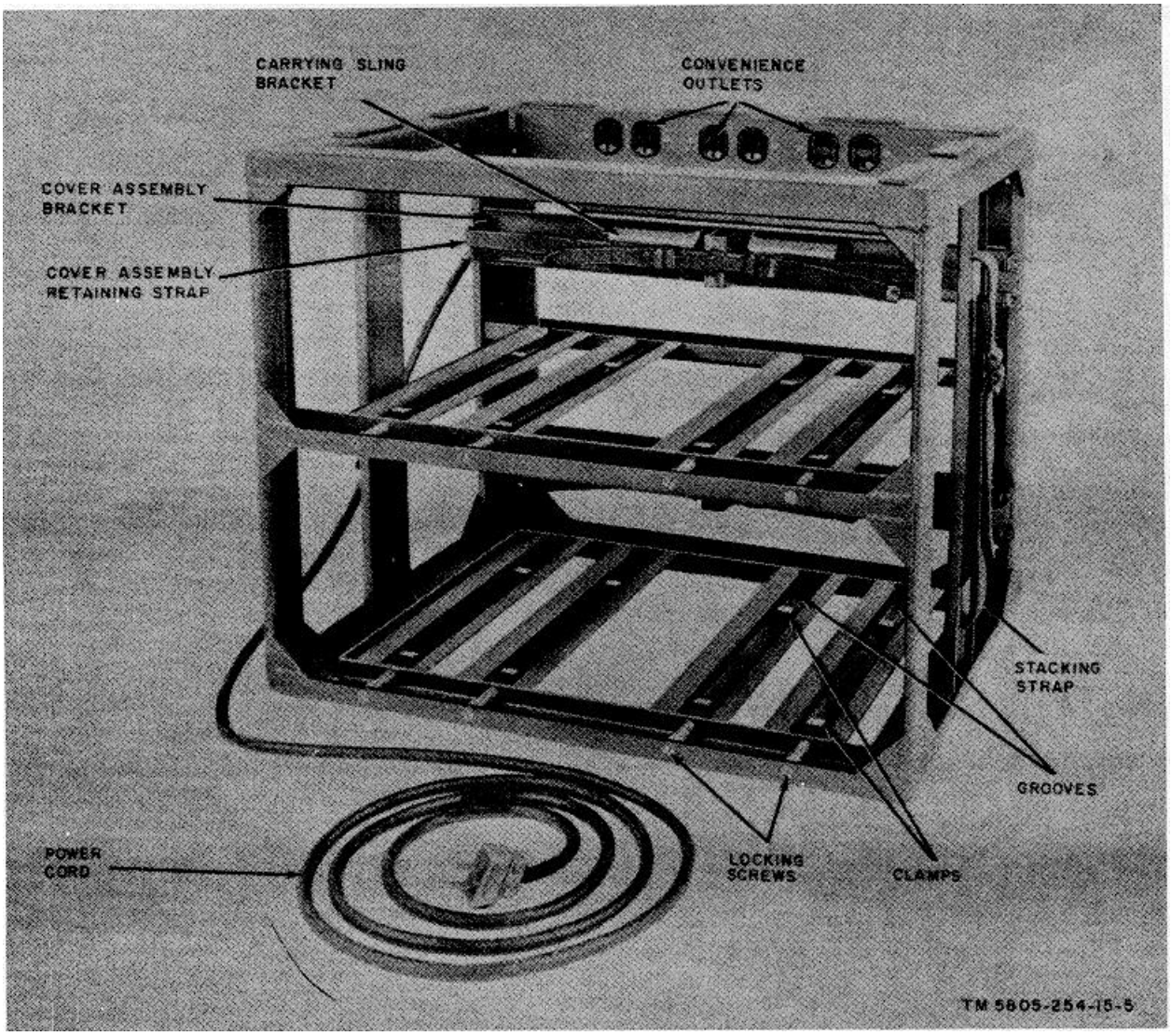


Figure 8. Rack, Electrical Equipment MT-1278/U

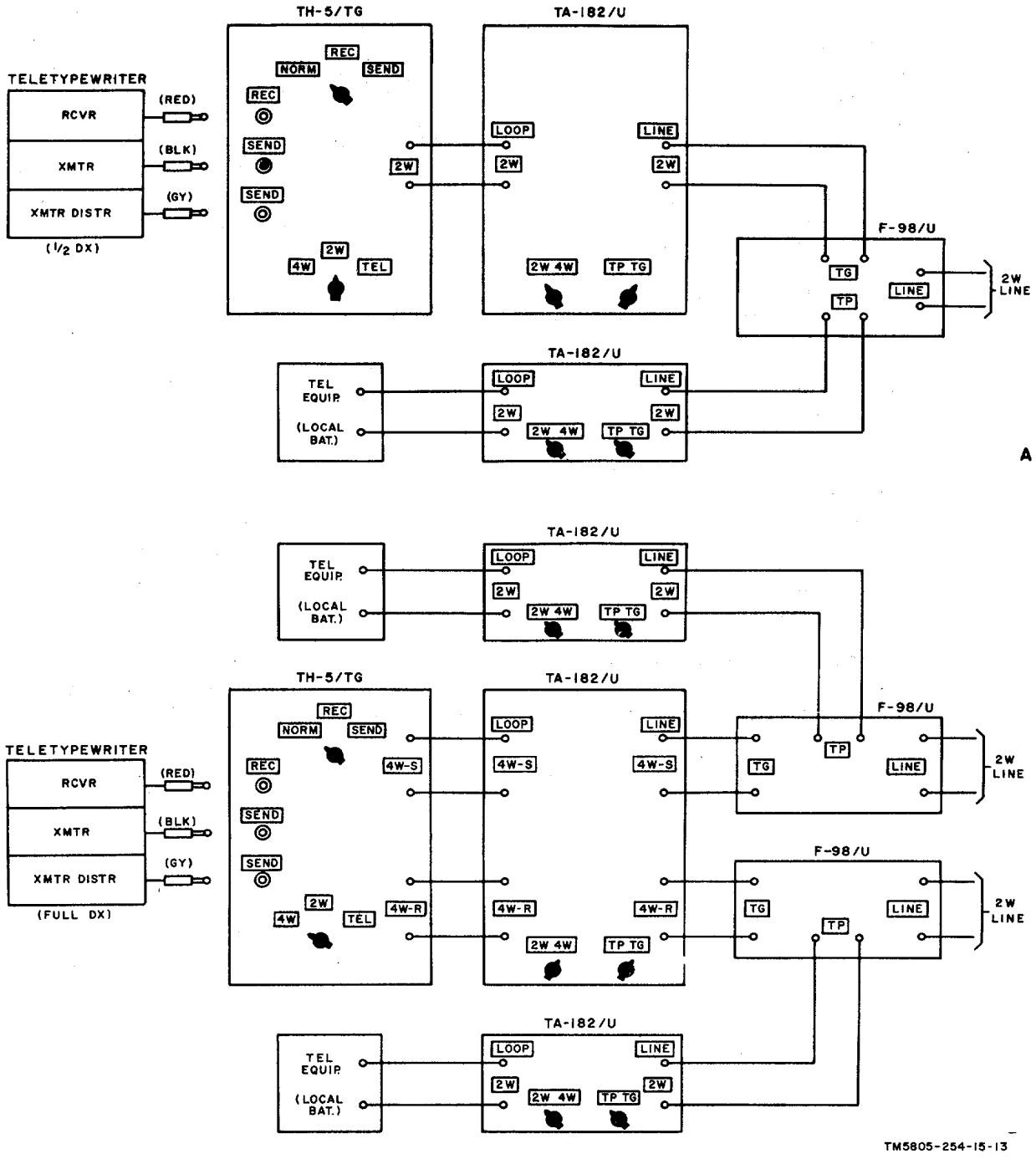


Figure 9. Typical connections and control settings.

(d) Use a screwdriver to turn the locking screws on the MT-1278 U fully counterclockwise.
(e) Place the component tracks in the grooves in the MT-1278 U.
(f) Push the component toward the rear of the MT-1278 U until the tracks are firmly engaged by the clamps.
(g) Turn the locking screws clockwise until each locking mechanism is snug against the front of the tracks on the component.
***Caution*: Do not overtighten the locking mechanism**.
(h) Connect the MT-1278 U power cord connector plug to a 115-volt alternating-current (ac) + 10 percent, 50- to 60-cps power source capable of supplying 100 watts.
(i) Connect the power cord connector plug of the component to a convenience outlet on the MT-1278 U. Coil the slack of the power cord of the component and place it on top of the case.

11. Connections and Control Settings

(fig. 9)

Information on the connections and control settings of the components of the AN TCC-14 for some typical terminal arrangements are given in figure 9. For information on connections, controls, and control settings of the components in other system arrangements, refer to TM 11-5805-246-10 for the TH-5/TG and to TM 11-5805-247-10 for the TA-182/U.

12. Operation

The components of the AN TCC-14 can be used in a number of system applications. However, once the equipment has been installed (para. 10) and the connections and controls have been arranged to satisfy the arrangement of the particular terminal arrangement (para. 11), nothing is changed until the system is changed.

a. No component of the AN TCC-14 has a power on-off switch. To start the TH-5 TG And the TA-182 U. connect each power cord plug to the power source.

b. The TH-5 TO and TA-182 U operate automatically. If excessive fading occurs during operation with the SENSITIVITY switch in LO position on the TA-182 U operate the switch to HI position.

c. When the TH-5 TG or the TA-182 U is to be permanently removed from operation, disconnect the power cord of each component form the power source.

CHAPTER 3
ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

Section I. OPERATOR'S MAINTENANCE

13. General

The operator's maintenance for the AN/TCC-14 consists of preventive maintenance (para. 14), checking the performance of the equipment (para. 15), and replacement of fuses and a glowlamp. For cleaning, use a cloth or brush and Cleaning Compound (FSN 7930-395-9542).

14. Operator's Preventive Maintenance

Preventive maintenance for the operator of the TH-5/TG and the TA-182/U is covered in the respective operator's technical manual for these components (appx). Operator's maintenance for the F-98/U is covered in a and below.

a. DA Form t1-288. Items 1 through 11 on DA Form 11-238 (fig. 10 and 11) are applicable to the operator's (first echelon) maintenance of the F-98/U. Items not applicable to the maintenance have been lined out in the figures. References in the ITEMS block on the form are to the paragraph which contains additional maintenance information. Instructions for the use of the form appear on the form.

b. Performing Preventive Maintenance. The information outlined below is supplementary to DA Form 11-238. The item numbers correspond to the ITEM numbers on the form.

Item	Maintenance
2 and 5	Use cleaning compound (para. 13) as required.
3 and10	Check to see that the binding posts have enough tension to grip wires tightly. Check to see that the cover for the case is held firmly by the spring-lock fasteners. Refer the unit to higher echelon maintenance for repair of the cover.
4	Use the equipment performance checklist (para. 15) as a guide when checking the operation of the AN/TCC-14.

Warning: Cleaning compound is flammable and its fumes are toxic. Do not use near a flame and provide adequate ventilation.

15. Equipment Performance Checklist

Use the equipment performance checklist below to systematically check the operation of the AN/TCC-14. Start at the beginning and perform each step in sequence. Each operation assumes that the preceding test was satisfactory. When the equipment is referred to higher echelon for repair, note on the repair tag the trouble symptom and the corrective measures taken, if any. Higher echelon repair for the TH-5/TG and the TA-182/U is covered in the technical manual applicable to the particular equipment (appx). With the AN/TCC-14, a teletypewriter (such as Teletypewriter TT-4A/TG), and two local battery field telephones (such as Telephone Set TA312/PT) are required for the tests.

	Item No.	Item	Action or condition	Normal indication	Check and remedy
PREPARATORY	1	Equipment	Use X-wiring and connect as shown in figure 12. Set TP-TG switch on TA-182/U to TG. Connect testing telephone to test point D.	Spring tension of binding posts is sufficient to hold wires firmly.	Refer defective equipment to higher echelon repair.

ADDITIONAL ITEMS FOR 2D AND 3D ECHELON INSPECTIONS	CONDITION
26. ~~INSPECT ANTENNA FOR ECCENTRICITIES, CORROSION, LOOSE FIT, DAMAGED INSULATORS AND REFLECTORS.~~	
27. CHECK FOR NORMAL OPERATION. PARA 15	✓
28. ~~BEFORE SHIPPING OR STORING, REMOVE BATTERIES.~~	

IF DEFICIENCIES NOTED ARE NOT CORRECTED DURING THE INSPECTION, INDICATE ACTION TAKEN FOR CORRECTION.

ITEM 25. RUBBER GASKET CUT IN SEVERAL PLACES. HIGHER ECHELON REPAIR REQUIRED.

FOLD

MAINTENANCE CHECK LIST FOR SIGNAL EQUIPMENT
SOUND EQUIPMENT, RADIO, DIRECTION FINDING RADAR, CARRIER, RADIOSONDE AND TELEVISION

(AR 750-625)

EQUIPMENT NOMENCLATURE: FILTER ASSEMBLY, ELECTRICAL F-98/U

EQUIPMENT SERIAL NUMBER: 711

INSTRUCTIONS

This form may be used for a period of one month by using the correct dates and weeks of the month. It is to be used as a Preventive Maintenance check list for Signal equipment in actual use, or for a check on equipment prior to issue.

1. For detailed Preventive Maintenance instructions see:
   a. The Technical Manual *(in TM 11 series)* for the equipment. *(See DA Pamphlet Number 310-4)*
   b. The Supply Bulletin *(SB 11-100 series)* for the equipment. *(See DA Pamphlet Number 310-4)*
   c. The Department of the Army Lubrication Order. *(See DA Pamphlet Number 310-4)*

2. The following action will be taken by either the Communications Officer/ Chief for 1st echelon, or the Inspector for higher echelon:
   a. Enter Equipment Nomenclature and Serial Number.
   b. Strike out items that do not apply to the equipment.

3. Operator/Inspector will enter in the columns entitled CONDITION, on the proper line, a notation regarding the condition, using symbols specified under LEGEND.

4. After operator completes each daily inspection he will initial over the appropriate dates under "Daily Condition for Month", then return form to his supervisor.

TYPE OF INSPECTION

OPERATOR	2/3 ECHELON	DATE	SIGNATURE
✓		7 DEC 1960	A. Lax
	✓	31 DEC 1960	A. Tomer

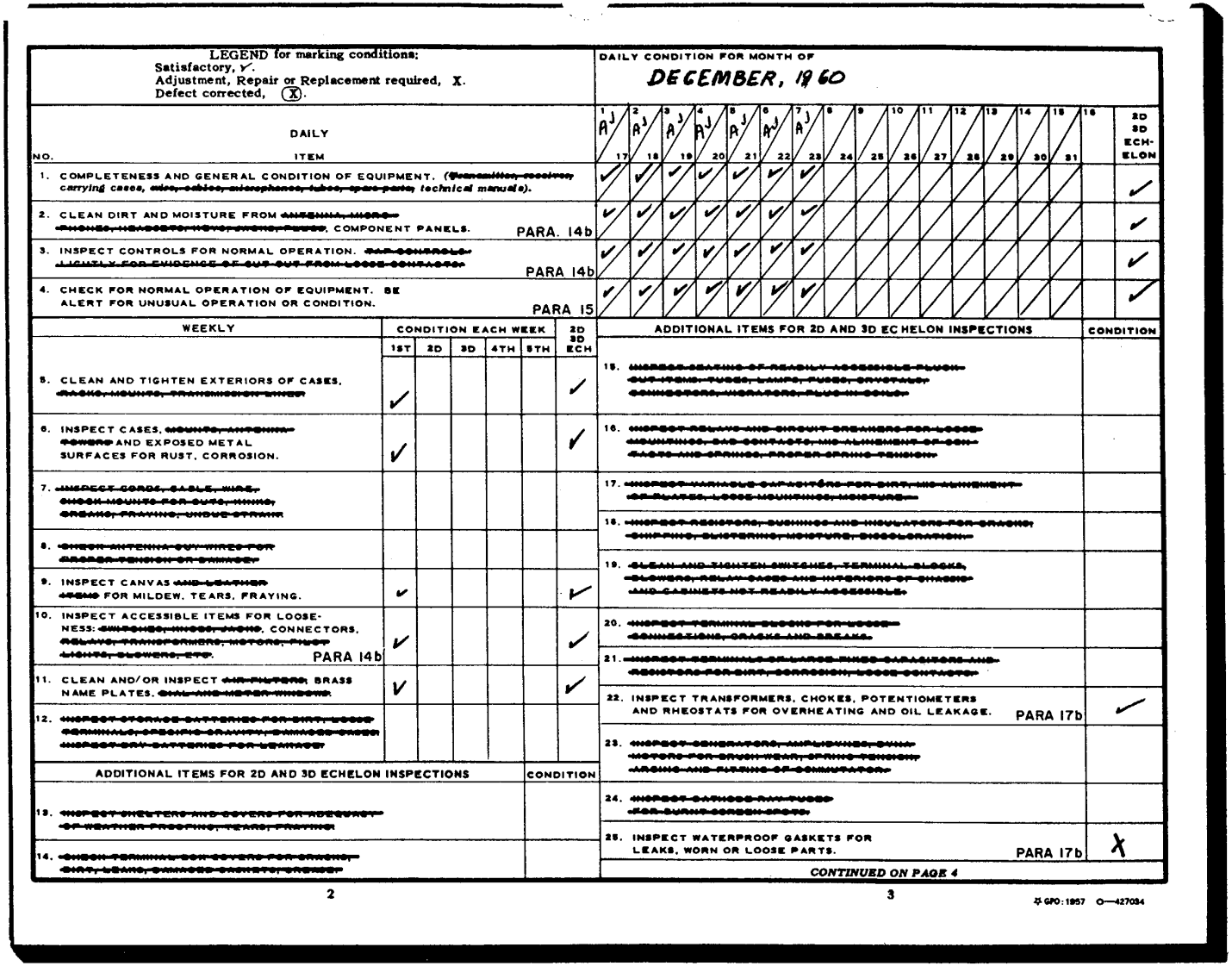
4

DA FORM 1 MAY 57 11-238

REPLACES DA FORMS 11-238, 1 NOV 55; 11-239, 11-244, 11-245, 11-246, 11-249, 11-250, AND 11-251; WHICH ARE OBSOLETE.

TM5805-254-15-8

Figure 10. DA Form 11-238, pages 1 and 4.



LEGEND for marking conditions:
Satisfactory, ✓.
Adjustment, Repair or Replacement required, X.
Defect corrected, (X).

DAILY CONDITION FOR MONTH OF DECEMBER, 1960

NO.	DAILY ITEM	1 A J 17	2 A J 18	3 A J 19	4 A J 20	5 A J 21	6 A J 22	7 A J 23	8 24	9 25	10 26	11 27	12 28	13 29	14 30	15 31	16	2D 3D ECHELON
1.	COMPLETENESS AND GENERAL CONDITION OF EQUIPMENT. (~~Presentation, receiver, carrying cases, wire, cables, microphones, tubes, spare parts~~, technical manuals).	✓	✓	✓	✓	✓	✓	✓										✓
2.	CLEAN DIRT AND MOISTURE FROM ~~ANTENNA, MICRO-PHONES, HEADSETS-MICROPHONES, PLUGS~~, COMPONENT PANELS. PARA. 14b	✓	✓	✓	✓	✓	✓	✓										✓
3.	INSPECT CONTROLS FOR NORMAL OPERATION. ~~AIR CONTROLS LIGHTLY FOR CHOKING OF CUT-OUT FROM LOOSE CONTACTS.~~ PARA 14b	✓	✓	✓	✓	✓	✓	✓										✓
4.	CHECK FOR NORMAL OPERATION OF EQUIPMENT. BE ALERT FOR UNUSUAL OPERATION OR CONDITION. PARA 15	✓	✓	✓	✓	✓	✓	✓										✓

WEEKLY	CONDITION EACH WEEK 1ST	2D	3D	4TH	5TH	2D 3D ECH
5. CLEAN AND TIGHTEN EXTERIORS OF CASES, ~~RADIO, MOUNTS, TRANSMISSION SHIELD~~	✓					✓
6. INSPECT CASES, ~~MOUNTS, ANTENNA POSTS~~ AND EXPOSED METAL SURFACES FOR RUST, CORROSION.	✓					✓
7. ~~INSPECT CORDS, CABLE, WIRE, CHECK MOUNTS FOR CUTS, WIRING, ORDING, FRAYING, UNDUE STRAIN~~						
8. ~~CHECK ANTENNA GUY WIRES FOR PROPER TENSION OR SLIPPAGE~~						
9. INSPECT CANVAS ~~AND LEATHER ITEMS~~ FOR MILDEW, TEARS, FRAYING.	✓					✓
10. INSPECT ACCESSIBLE ITEMS FOR LOOSENESS: ~~SHIELDING, INNER WIRING~~, CONNECTORS, ~~RELAYS, TRANSFORMERS~~, MOTORS, ~~PILOT LIGHTS, BLOWERS, ETC~~. PARA 14b	✓					✓
11. CLEAN AND/OR INSPECT ~~AIR FILTERS~~, BRASS NAME PLATES. ~~DIAL AND MOTOR WINDOWS~~	✓					✓
12. ~~INSPECT STORAGE BATTERIES FOR DIRT, LOOSE TERMINALS, CRACKS OR LIQUID, SHINGS UNDER INSPECT DRY BATTERIES FOR LEAKAGE~~						

ADDITIONAL ITEMS FOR 2D AND 3D ECHELON INSPECTIONS	CONDITION
13. ~~INSPECT SHELTERS AND COVERS FOR ADEQUACY OF WEATHER PROOFING, TEARS, FRAYING~~	
14. ~~CHECK TERMINAL BOX COVERS FOR GASKETS, DIRT, LEAKS, BINDINGS CRACKED INSULATOR BRACES~~	

ADDITIONAL ITEMS FOR 2D AND 3D ECHELON INSPECTIONS	CONDITION
15. ~~INSPECT OPERATING OF READILY ACCESSIBLE PLUGS, CUT-OUTS, FUSES, LAMPS, FUSES, SHUNTING CONNECTORS, VIBRATORS, PLUG-IN COILS~~	
16. ~~INSPECT RELAYS AND CIRCUIT BREAKERS FOR LOOSE MOUNTINGS, BAD CONTACTS, MIS-ALIGNMENT OF COIL PLATES AND SPRINGS, PROPER SPRING TENSION~~	
17. ~~INSPECT VARIABLE CAPACITORS FOR DIRT, MIS-ALIGNMENT OF PLATES, LOOSE MOUNTINGS, MOISTURE~~	
18. ~~INSPECT RESISTORS, BUSHINGS AND INSULATORS FOR CRACKING, CHIPPING, BLISTERING, MOISTURE, DISCOLORATION~~	
19. ~~CLEAN AND TIGHTEN SWITCHES, TERMINAL BLOCKS, BLOWERS, RELAY CASES AND INTERIORS OF CHASSIS AND CABINETS NOT READILY ACCESSIBLE~~	
20. ~~INSPECT TERMINAL BUSHING FOR LOOSE CONNECTIONS, CRACKS AND BREAKS~~	
21. ~~INSPECT TERMINALS OF LARGE FIXED CAPACITORS AND RESISTORS FOR DIRT, CORROSION, LOOSE CONTACTS~~	
22. INSPECT TRANSFORMERS, CHOKES, POTENTIOMETERS AND RHEOSTATS FOR OVERHEATING AND OIL LEAKAGE. PARA 17b	✓
23. ~~INSPECT CONDENSERS, AMPLIFIERS, SYNCHRONOTORS FOR BRUSH WEAR, SPRING TENSION, ARCING AND PITTING OF COMMUTATORS~~	
24. ~~INSPECT CATHODE RAY TUBES FOR BURNT SCREEN SPOTS~~	
25. INSPECT WATERPROOF GASKETS FOR LEAKS, WORN OR LOOSE PARTS. PARA 17b	X

CONTINUED ON PAGE 4

2 3

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TM5805-254-15-9

Figure 11. DA Form 11-238, pages 2 and 3.

	Item No.	Item	Action or condition	Normal Indication	Check and remedy
START	2	Teletype-writer.	Insert power cord plug into the ac power source and operate power switch to ON position.	Teletypewriter motor runs and the machine runs open.	Refer the teletypewriter to maintenance for repair.
	3	TA-182/U	Insert power cord plug into ac power source.	None	None.
	4	TH-5/TG	Insert power cord plug into ac power source.	Within a minute the glowing lamp should light.	Check glowlamp filament and fuse for continuity; replace defective part. Refer the equipment to higher echelon for repair.
	5	Teletype-writer.	Adjust CURRENT control until meter indicates 20 ma.	Teletypewriter runs closed and meter indicates correct current.	If the teletypewriter CURRENT meter indicates proper current, but teletypewriter runs open, refer the teletypewriter to maintenance for repair. If the meter indicates no current, refer the TH-5/TG to higher echelon for repair.
EQUIPMENT PERFORMANCE	6	Teletype-writer.	a. Alternately type letters R and Y (approximately 5 complete lines).	a. Error-free copy (R and Y) Is printed. The glowlamp in the TH-5/TG is extinguished and twittering tone is heard in the testing telephone receiver.	a. If a few errors are typed, check the bias adjustments of the teletypewriter and adjust as necessary. If the glowlamp does not extinguish, or copy is not received, refer the TH5/TG to higher echelon for repair. If the twittering tone is not heard, connect the leads of the testing telephone, in turn, to test points C and A. If the tones are heard at test point C, replace the F-98/U. If the test tones are heard at test point A but not at test point C, refer the TA-182/U to higher echelon for repair.
			b. Connect the leads of the testing telephone to test point D. Stop typing while listening to the receiver of the testing telephone.	a. A steady tone (1,325 cps) is heard in the receiver of the testing telephone for approximately 3 seconds, then stops and simultaneously the glow-lamp lights.	b. Refer the TH-51TG to higher echelon for repair.

	Item No.	Item	Action or condition	Normal Indication	Check and remedy
EQUIPMENT PERFORMANCE	7	TH-5/TG.	Operate the RING switch longer than 3 seconds.	A steady tone (1,225 cps) is heard in the receiver of the testing telephone. On the TH-51TG, the glowlamp flickers and the ballast lamp (inside) glows.	Operate the RING switch on the TH-5/TG when the testing telephone is connected to the test points that follow. Connect the leads of the testing telephone, in turn, to test points-B and C. If the bell in the testing telephone connected to test point B does not ring, refer the TH 5/TG to higher echelon for repair. If a steady tone is not heard in the receiver of the telephone connected to test point C, check the fuse in the TA-182/U for continuity; replace if defective. Refer the TA-182/U to higher echelon maintenance for repair. Connect the leads of the testing telephone to test point D.
	8	Telephones.	Connect the leads of the testing telephone to test point D. Ring from and communicate between both telephones.	Both telephones ring, and speech is clear.	If normal indications are not obtained, replace the F-98/U.
	9	Equipment.	Use Y-wiring and connect as shown in figure 12. Set TP-TG switch on TA-182/U to TP Connect the leads of the testing telephone to test point D.	Spring tension of binding posts is sufficient to hold wires firmly.	Refer the defective equipment to higher echelon for repair.
	10	Station telephone	Ring from the station telephone.	A steady tone (1,600 cps) is heard in the testing telephone.	Ring from the station telephone when the testing telephone is connected to the test points that follow. Connect the testing telephone, in turn, to test points B and C. At test point B. the testing telephone should ring. At test point C, a steady tone (1,600 cps) is heard in the testing telephone; if the tone is not heard, refer the TA-182/U to higher echelon for repair
STOP	11	Teletype-writer.	Operate power switch to OFF and disconnect power cord from ac power source.	Motor stops.....	None.
	12	TH-5/TG and TA-1821U.	Disconnect power cord from ac power source.	Glowlamp on TH-5/TG is	None.

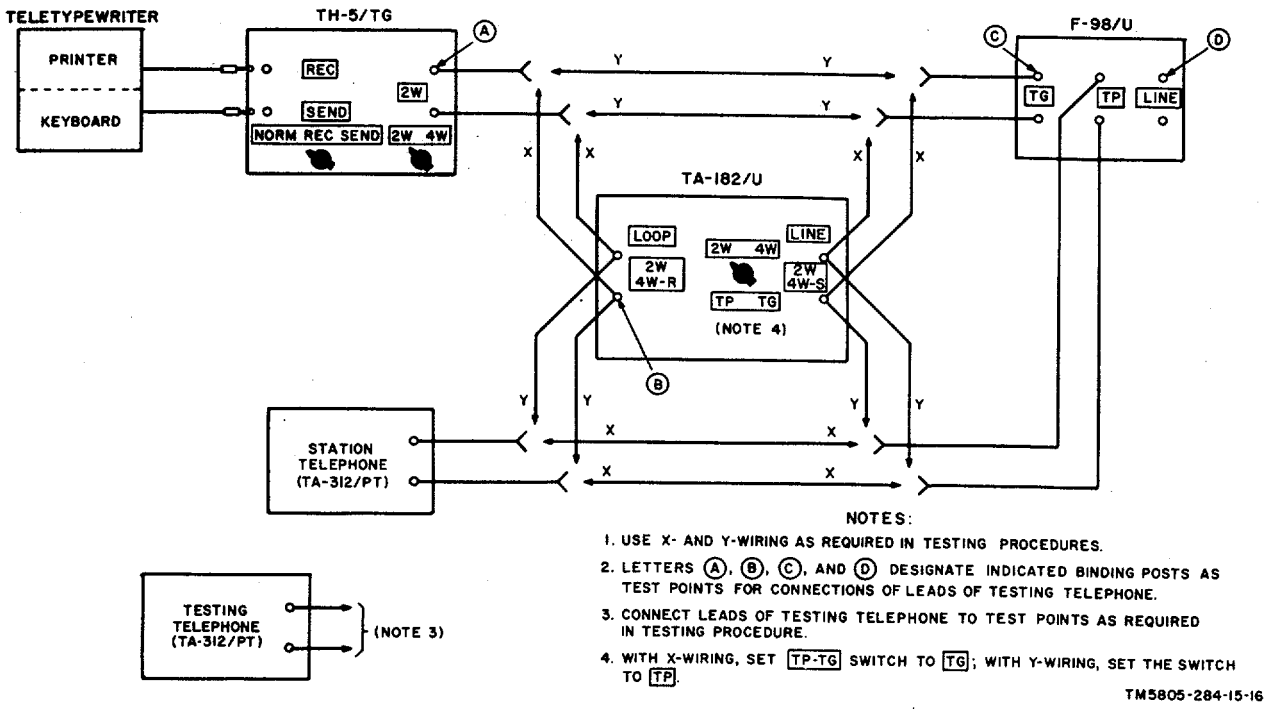

Figure 12. Test setup for checking performance of AN/TCC-14

Section II. SECOND ECHELON MAINTENANCE

16. General

Second echelon maintenance for the AN/TCC-14 is arranged as follows:

a. TH-5/TG. For troubleshooting and repair, refer to TM 11-5805-246-20; for allowances on repair parts, refer to TM 115805-246-12P.

b. TA-182/U. For troubleshooting and repair, refer to TM 11-5805-247-20; for allowances on repair parts, refer to TM 11-5805247-12P.

c. F-98/U. Preventive maintenance practices are given in paragraph 17. There are no troubleshooting procedures because the F-98/U is replaced if it fails to pass the tests given in the operator's troubleshooting procedures (para. 15).

17. Second Echelon Preventive Maintenance

Second echelon personnel preventive maintenance for the TH-5/TG and the TA-182/U is covered in the respective organizational technical manual for these components (appx). Second echelon maintenance for the F-98/U is covered in *a* and *b* below.

a. DA Form 11-238. Items 1 through 25 on DA Form 11-238 (fig. 10 and 11) are applicable to the second echelon maintenance of the F-98/U. Items not applicable to the maintenance have been lined out in the figures. References in the ITEMS block on the form are to the paragraph which contains additional maintenance information. Instructions for the use of the form appear on the form.

b. Performing Preventive Maintenance. The information outlined below is supplementary to DA Form 11-238. The item numbers correspond to the ITEM numbers on the form.

Item	Maintenance procedure
22	Check to see that there is no leakage of the compounds that seal the parts inside the case.
25	If the rubber gasket is damaged, refer the F-98/U to higher echelon for repair.

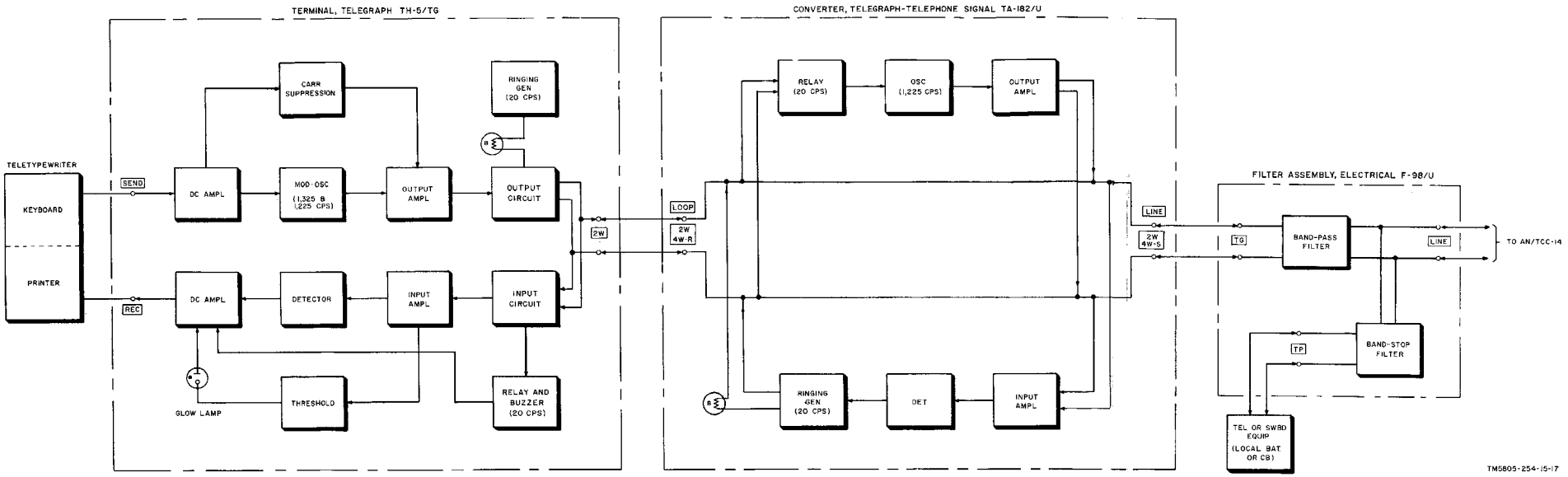

Figure 13. AN/TCC-14, block diagram.

CHAPTER 4
THEORY

Note: For detailed theory of the circuits of Terminal Telegraph TH-5/TG and Converter, Telegraph-Telephone Signal TA-182/U, refer to the field and depot maintenance manual for each component (apprx).

18. Block Diagram Analysis, AN/TCC-14 (fig. 13)

a. General

(1) *Telegraph circuit*.

(a) Mark and space signals (dc) sent from the teletypewriter are converted to voice-frequency telegraph signals by the TH-5/TG and passed through the TA-182/U and the F-98/U to the line. Vf telegraph signals received from the line pass through the F-98/U and the TA-182/U to the TH-5/TG. In the TH-5/TG the signals are converted to dc signals and sent to the teletypewriter

(b) Twenty-cycle-per-second ringing signals activated by the RING switch of the TH-5/TG are converted in the TA-182/U to a vf ringing signal (1,225 cps) and sent through the F-98/U to the line. A vf ringing signal received from the line passes through the F-98/U to the TA-182/U. In the TA-182/U, the signal Is converted to a 20-cps ringing signal and sent to the TH-5/TG. In the TH-5/TG, the 20-cps ringing signal is converted to a steady space signal and applied to the teletypewriter, causing it to run open.

(2) *Telephone (speech) circuit.* Speech and 20-cps ringing signals sent from and received by the telephone or switchboard pass through the F-98/U.

b. Teletypewriter Transmission.

(1) During typing of messages with halfduplex operation, mark and space dc signals are applied from the keyboard of the teletypewriter to the TH-5/TG.

(2) In the TH-5/TG, the dc signals are amplified and cause the modulator to activate the oscillator to transmit vf telegraph signals (mark, 1,325 cps; space, 1,225 cps) The vf telegraph signals are amplified in the output amplifier and passed through the TA-182/U to the F-98/U.

(3) In the F-98/U, the signals pass through the bandpass filter to the line

(4) Three seconds after the typing from the teletypewriter has ceased, the steady mark signal causes the carrier suppression circuit In the TH-5/TG to activate and prevents the output amplifier from transmitting the mark vf telegraph signal to the line

(5) Home copy of the transmitted message is received by passing the vf telegraph signals from the output amplifier of the TH-5/TG to the input amplifier and back to the teletypewriter printer through the detector and dc amplifier. At this time the glowlamp is extinguished.

c. Teletypewriter Reception.

(1) During reception of messages, mark and space vf telegraph signals are applied from the line to the F-98/U.

(2) In the F-98/U, the vf telegraph signals pass through the bandpass filter to the TA-182/U.

(3) In the TA-182/U, the vf telegraph signals pass through to the TH-5/TG.

(4) In the TH-5/TG, the vf telegraph signals are amplified in the input amplifier and converted to dc signals in the detector. The dc signals are then amplified and sent to the printer of the teletypewriter. At this time the glowlamp is extinguished.

(5) Three seconds after cessation of typing at the teletypewriter *b*(4) above), the threshold circuit provides a steady marking dc signal for the printer of the teletypewriter; thus, the teletypewriter is kept running closed. At this time the glowlamp lights.

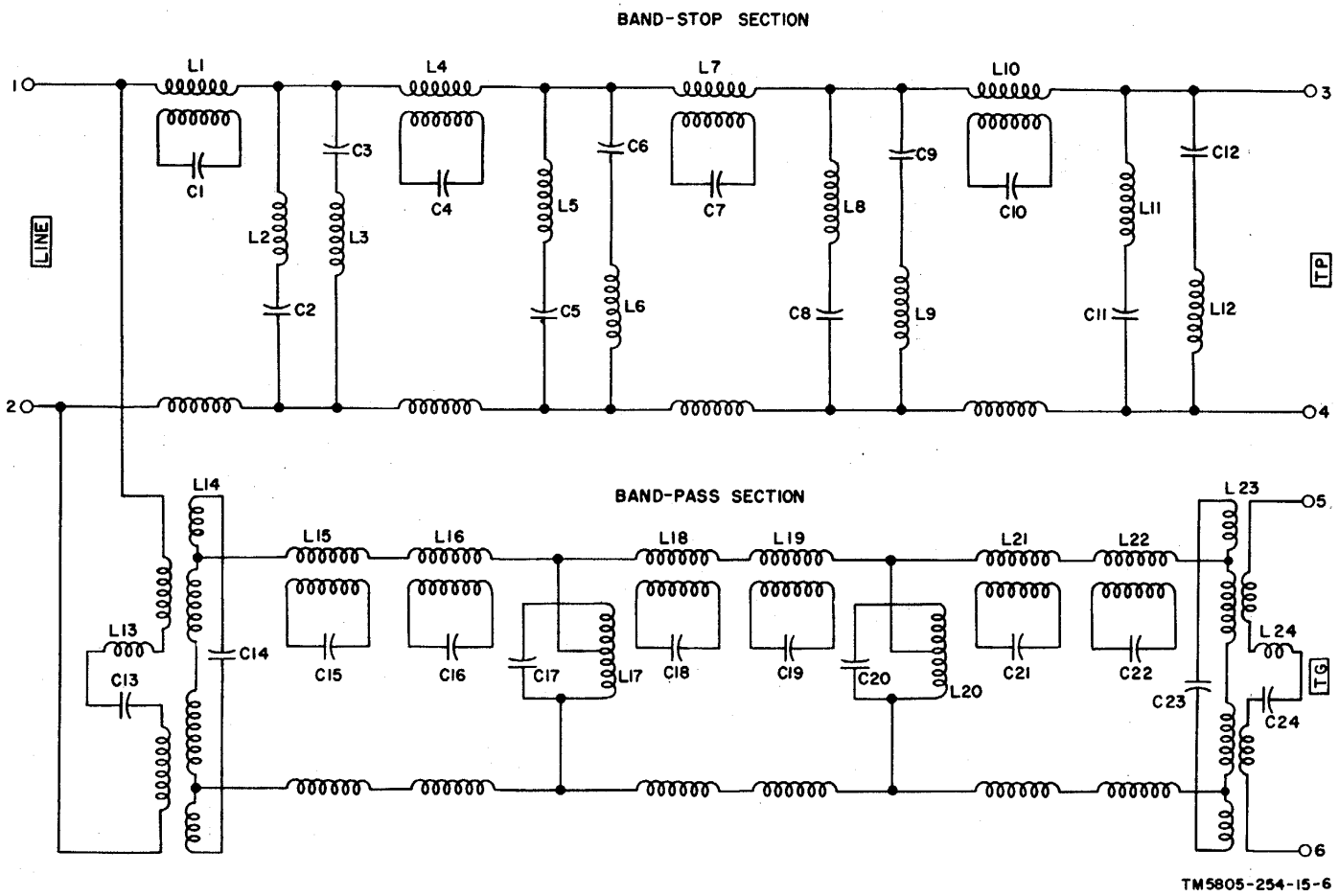

Figure 14. F-98/U, schematic diagram.

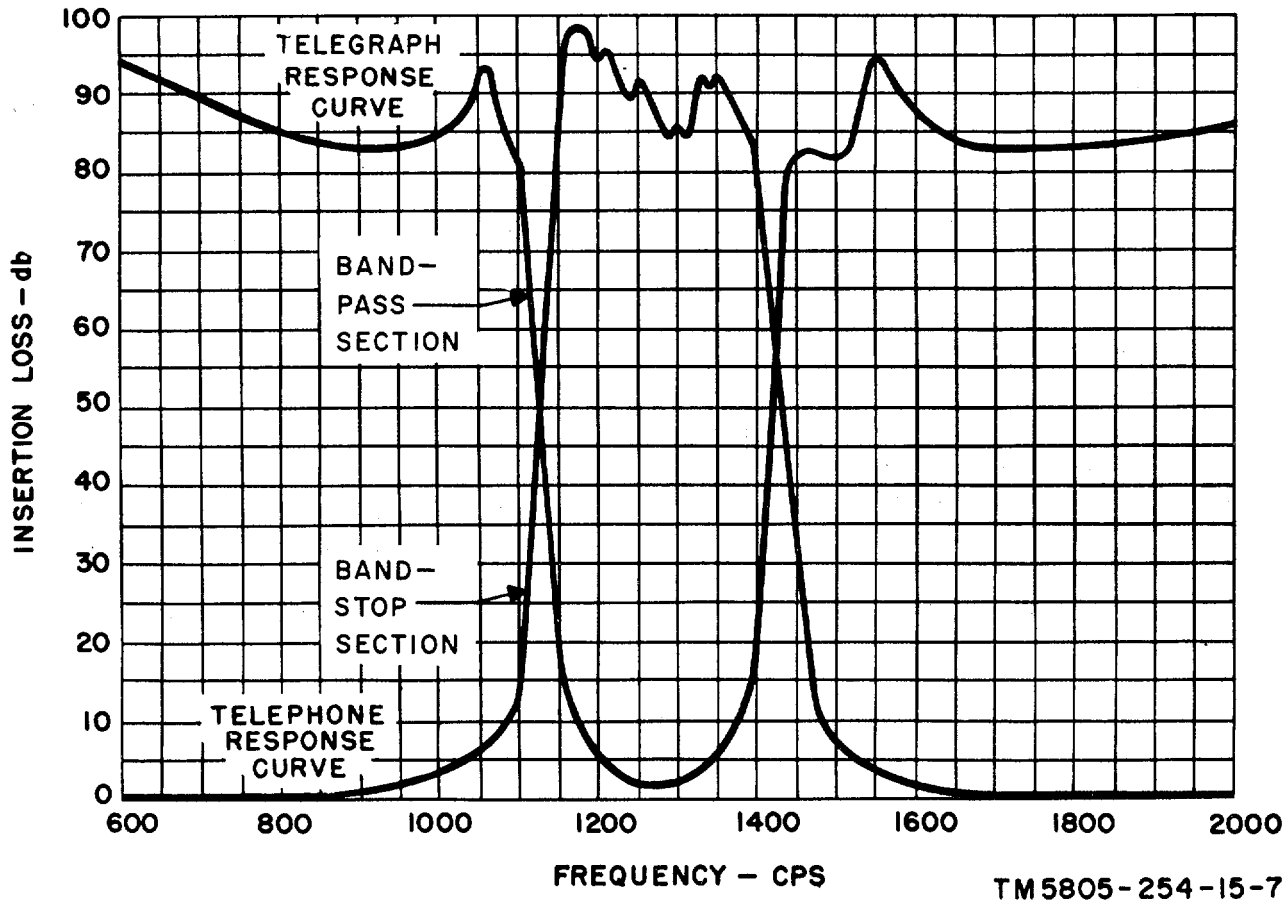

Figure 15. F-98/U, frequency response characteristics.

d. *Teletypewriter Signaling (Break-In).* To provide the teletypewriter station (operating on half-duplex basis) with a means of interrupting transmission at the distant station, a ringing signal circuit is provided in the TH-5/TG.

(1) *Sending*.
   (a) With the RING switch of the TH-5/TG operated, a 20-cps ringing signal Is applied from the ringing generator to the TA-182/U At this time the ballast lamp in the TH-5/TG lights
   (b) In the TA-182/U, the 20-cps signal operates a relay that, In turn, causes an oscillator to send a vf ringing signal (1,225 cps) through the output amplifier to the F-98/U
   (c) In the F-98/U. the vf ringing signal passes through the bandpass filter to the line

(2) *Receiving.*
   (a) The vf ringing signal received from the line passes through the bandpass filter in the F-98/U to the TA-182/U.
   (b) In the TA-182/U, the vf ringing signal passes through the input amplifier to the detector. The detector causes the ringing generator to operate and send a 20-cps ringing signal to the TH-5/TG. At this time the ballast lamp in the TA-182/U lights
   (c) In the TH-5/TG, the 20-cps ringing signal operates a relay which in turn causes the dc amplifier to send a steady space signal to the printer of the teletypewriter and causes the machine to run open.

e. *Speech Transmission*. Since the bandstop filter in the F-98/U (fig. 15) passes all frequencies between 0 and 1,220 cps (approximately) and between 1,400 and 3,000 cps (approximately), 20-cps ringing signals, speech signals, and even dc applied from a telephone or switchboard pass through this section of the F-98/U. Thus, signals in these bands received from the line or a telephone or switchboard are routed through the bandstop filter.

19. Schematic Analysis of F-98 /U

(fig. 14 and 15)

Filter Assembly, Electrical F-98/U is used to derive a telegraph channel from a portion of the voice-frequency band while retaining the telephone channel for speech transmission

a. The F-98/U consists of a bandpass filter section for passing vf telegraph signals and a bandstop filter section for passing dc, 20-cps ringing, and speech signals.

Note: Bandstop and bandpass refer to the stopping or passing of vf telegraph signals

b. The bandpass filter section contains a series-resonant circuit that offers very low attenuation to vf telegraph signals in the frequency band between 1,100 and 1,400 cps. This filter section offers high attenuation to all other frequencies

c. The bandstop filter section contains a parallel-tuned circuit that offers very low attenuation to all frequencies above and below those that are passed in the bandpass section (*b* above) Thus, dc, 20-cps ringing signals, and speech signals below 1,100 cps and above 1,400 cps (approximately) pass through the bandstop filter section with the least loss.

CHAPTER 5

FIELD AND DEPOT MAINTENANCE

20. General

a. The field (third and fourth echelon) and depot (fifth echelon) maintenance procedures for Terminal, Telegraph TH-5,/TG and Converter, Telegraph-Telephone Signal TA-182/U are covered In the respective manuals for these echelons (appx).

b. For Filter Assembly, Electrical F-98/U, third echelon maintenance consists of replacing the cover assembly (para. 21) and the rubber gasket (para. 22). Fourth echelon maintenance consists of testing the F-98/U for serviceability (para. 23). Fifth echelon maintenance consists of repairing the case as necessary and all the repair and testing procedures designated for a lower echelon.

21. Replacing Cover Assembly in F-98/U

(fig. 2)

Perform the following operations on both spring-lock fasteners.

a. To remove the cover assembly, carefully bend the metal tip on the spring-lock fastener just enough to free the cover assembly. Remove the cover assembly.

b. To replace the cover assembly, place the catch of the cover assembly into the catch on the spring-lock fastener and carefully bend the metal tip just enough to hold the catch of the cover assembly in place

22. Replacing Rubber Gasket in F-98/U

(fig. 2)

To remove and replace the rubber gasket (preformed packing), perform the following operations:

a. To remove the rubber gasket, carefully pry up the gasket a little at a time around the rim of the case until it is free.

b. Before replacing the rubber gasket, make sure the receptacle for the gasket is clean. Place the gasket over the receptacle and press down a little at a time all along its length until it is completely in place

23. Testing F-98 / U

To test the serviceability of the F-98/U, use the test procedures given in *b* and *c* below.

a. Equipment and Material Required

(1) Signal Generator SG-15/PCM (TM 11-2096) or equal.
(2) Decibel Meter ME-22/PCM (TM 11-2096) or equal.
(3) Telephone Set TA-312/ PT (TM 11-2155) or equal; two telephones are required.
(4) Resistor, 600 ohms, ±10 percent. (The 600-ohm terminating resistor in the ME-22/PCM may be used.)
(5) Hookup wire.

b. Insertion Loss Tests. Connect the plugs on the power cords of the SG-15/PCM and the ME-22/PCM to the ac power source. Allow the equipment to warmup. Set the INPUT IMPEDANCE switch on the ME-22/PCM to 600 OHM position. When the insertion loss of the sections of the filter are not within 40 percent of the required decibel (db) level given for each frequency, discard the filter.

Test No.	Component	Action and indication
1	F-98/U	Connect the equipment as shown in A, figure 16.
	SG-15/PCM	Adjust the output frequency from 0 to 3,500 cps. Maintain the output level at 0 dbm for all frequencies. The ME-22/PCM should indicate -80 dbm or less for all frequencies[a].
	F-98/U	Disconnect the leads of the SG-15/PCM from the TP binding posts.
		Disconnect the 600-ohm resistor from the LINE binding posts.

Test No.	Component	Action and indication
2	F-98/U	Connect the equipment as shown in B, figure 16.
	SG-15/PCM	Adjust the output frequency from 0 to 3,500 cps. Maintain the output level at 0 dbm for all frequencies. The ME-22/PCM should idicate the losses shown In figure 16 or the bandpass section filter of the F-98/U[a, b].
	F-98/U	Disconnect the leads of the ME-22/PCM from the TG binding posts of the F-98/U. Disconnect the 600-ohm resistor from the TP binding posts of the F-98/U.
3	F-98/U	Connect the equipment as shown in C, figure 16.
	SG-15/PCM	Adjust the output frequency from 0 to 3,500 cps. Maintain the output level at 0 dbm for all frequencies. The ME-22/PCM should indicate the losses shown in figure 15 for the bandstop filter section of the F-98/U[a].
	F-98/U	Disconnect all equipment from the binding posts.

[a] The use of the ME-22 PCM permits measurements of losses to the value of -45 dbm based on an Input of 0 dbm from the SG-I5/PCM Therefore, off-scale indications on the ME-22/PCM will be acceptable The actual loss requirements, as shown in figure 15, have been specified for these tests as a guide in case other than these test sets are used

[b] Between 600 and 700 cps, the ME-22/PCM may show losses as high as -30 db. This is acceptable because the first harmonic of this frequency band, present in the output of the SG-15/PCM, is within the frequency band of the bandpass filter section of the filter (1,200 to 1,400 cps).

c. Ringing Signal Tests. On each Telephone Set TA-312/PT, set the CB-LB-CBS switch to the LB position and place the handset in the handset retaining bracket. When the following test falls, discard the filter.

Test No.	Component	Action and indication
1	TA-312/PT (No. 1)	Connect as shown in D, figure 16.
	F-98/U and 600-ohm resistor	Connect the leads of the TA-312/PT (No. 2) to the TP binding posts; connect 600-phm resistor to the TG binding posts.
	TA-312/PT (No. 1)	Operate the hand generator. The buzzer in the TA-312/PT (No. 2) should sound.
2	F-98/U	Disconnect the leads of the TA-312/PT (No. 2) (D, fig. 16) from the TP binding posts and connect the leads to the TG binding posts. Disconnect the 600-ohm resistor from the TG binding posts and connect to the TP binding posts.
	TA-312/PT (No. 1)	Operate the hand generator. The buzzer in the TA-312/PT (No. 2) should not sound.

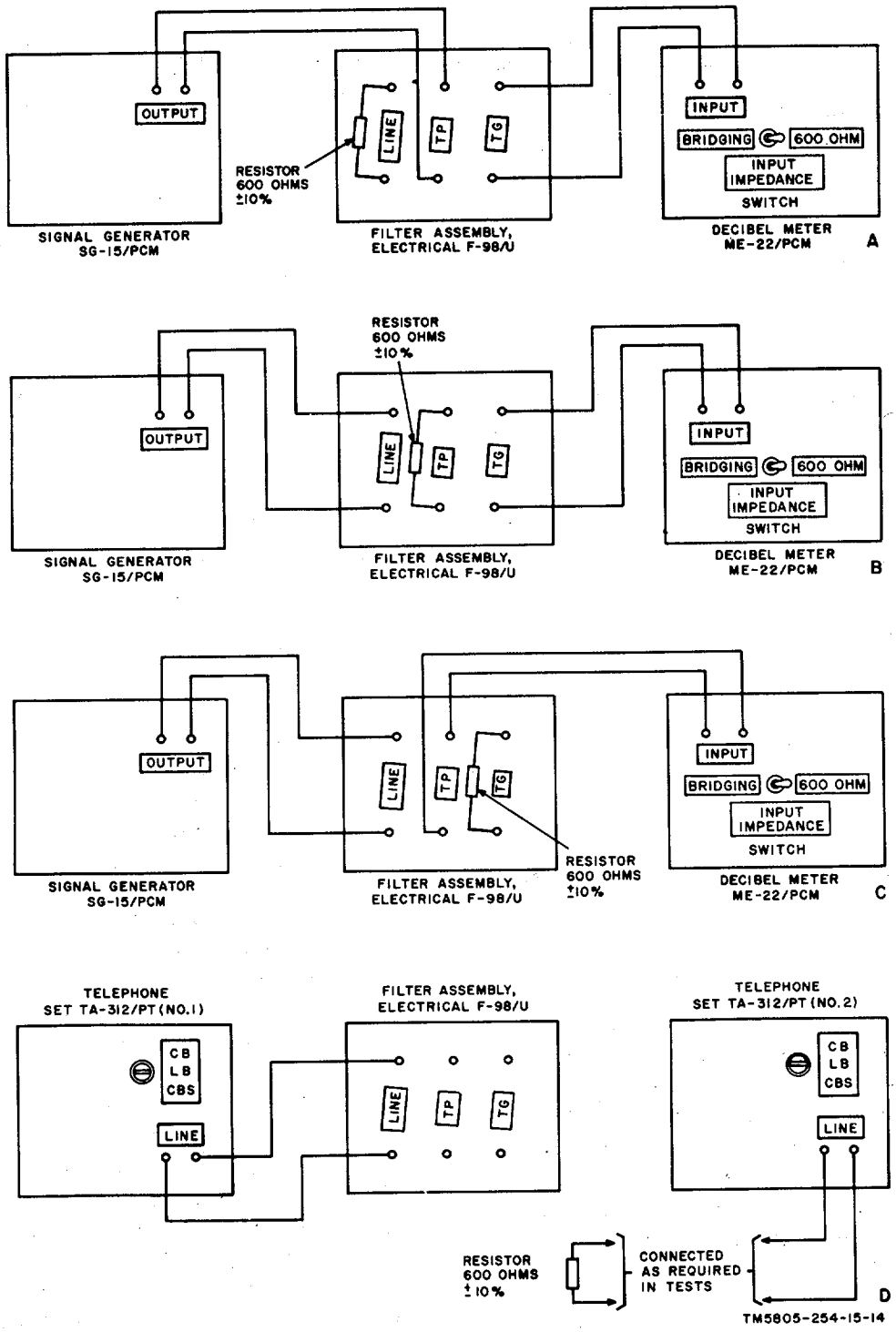

Figure 16. Test setups for F-98/U.

CHAPTER 6
SHIPMENT OR LIMITED STORAGE AND DEMOLITION TO PREVENT ENEMY USE

Section I. SHIPMENT OR LIMITED STORAGE

24. Disassembly of Equipment

If the shelter or the vehicle in which the AN,/TCC-14 is installed is to be moved to another site, omit the procedure in *d* below. Otherwise, to prepare the equipment for shipment or limited storage, perform all the operations given in *a* through *f* below.

a. Disconnect the power cords from the ac power source.

b. Remove the cord plugs of the teletypewriter from the SEND and REC jacks of the TH-5/TG.

c. Disconnect all wires from the binding posts.

d. Remove the components from their rack or mounting.

e. If the chassis assembly of the TH-5/TG and the TA-182/U has been removed from its case, put the chassis back in its case and tighten the three screws on the front panel.

f. Assemble the running spares (para. 5b) and technical manuals (appx) for the TH-5/TG, the TA-182/U, and the AN/TCC-14.

25. Repacking for Shipment or Limited Storage

After the equipment has been disassembled (para. 24), use the following procedures to repack the equipment for shipment or limited storage. The exact procedure for repacking depends on the condition under which the AN/TCC-14 is to be shipped or stored. Use the original shipping containers, if available. Refer to paragraph 8 as a guide for repackaging and repacking the equipment.

a. Materials Required. For stock numbers of materials, refer to SB 38-100.

Material	Quantity (approx)
Waterproof wrapping paper	30 sq ft
Corrugated single-faced fiberboard	24 sq ft
Pressure-sensitive waterproof tape, 3 in.	30 ft
Gummed paper tape, 3 in.	45 ft
Wooden, box	14 board ft
Strapping, flat steel (5/8 x 0.020 in.)[a]	10 ft

[a] Required for intertheater shipment.

b. Packaging.

(1) *Technical manuals*. Package the technical manuals of each similar-type equipment (TH-5/TG, TA-182/U, and AN/TCC-14) within a bag fabricated from waterproof paper. Seal the seams of each bag with pressure-sensitive tape and label the package

(2) *Running spares*.

(a) *Fuses.* Place the proper fuses (15 amperes in TH-5/TG and 1 ampere in TA-182/U) in the clips in each cover assembly (fig. 1).

(b) *Tubes and lamps.* Individually wrap each tube and lamp within two layers of corrugated cardboard; secure the package with gummed paper tape. Keep the parts of the TH-5/TG and the TA-182/U in separate groups.

(3) *Power cord and carrying sling*. Wind the power cord into a coil around the front panel. Be careful not to damage the spare fuses and close and secure the cover assembly. Tighten the carrying sling; secure the slack end of the carrying sling with string.

c. Packing

(1) *Running spares package.* Consolidate the running spares for the TH-5/TG and the TA-182/U within separate packages fabricated of waterproof wrapping paper and labeled to indicate the unit to which it belongs. Seal the seams of each package with pressure-sensitive tape. With pressure-sensitive tape, secure each package to one side of the case of the unit to which it is associated.

(2) *Wrapping*. Wrap each case within corrugated fiberboard and secure the wrapping with gummed paper tape. Lay the packaged technical manuals (b (1) above) on top of the associated packaged component and secure the package with pressure-sensitive tape. Put the AN TCC-14 technical manual with the F-98/U. Place each package within a close-fitting bag fabricated of waterproof wrapping paper and seal the seams of the bag with pressure-sensitive tape

(3) *Shipping boxes*. When shipped as single units, shipping boxes are not required. When shipped in multiples of three units, fabricate a wooden box large enough to contain the three units snugly. Pack the units in the wooden box; use filler material as required.

(4) *Strapping*. When packed for intertheater shipment, apply steel strapping girthwise.

(5) *Markings*. Mark each single unit or wooden box as prescribed In MIL-STD-129B and the pertinent instructions in the shipment directive.

Section II. DEMOLITION OF MATERIEL TO PREVENT ENEMY USE

26. Authority for Demolition

Demolition of equipment will be accomplished only upon the order of the commander The destruction procedure outlined in paragraph 27 will be used to prevent further use of the equipment.

27. Methods of Destruction

Use any or all of the following methods to destroy the equipment:

a. Smash. Smash the controls, tubes, switches, capacitors, coils, and transformers; use sledges, axes, handaxes, pickaxes, hammers, or crowbars.

b. Cut. Cut the power cables and slash the wiring on the terminal boards, use axes, handaxes, and machetes

c. *Burn*. Burn the power cables, wiring, and technical manuals, use gasoline, kerosene, oil, flamethrowers, or incendiary grenades

d. Bend. Bend the front panels, cases, and cover assemblies

e. Explode. If explosives are necessary, use firearms, grenades, or TNT.

f. *Dispose*. Bury or scatter the destroyed parts in slit trenches, foxholes, or throw them into streams.

APPENDIX
REFERENCES

The following references are applicable for the operator and maintenance personnel of Terminal, Telegraph-Telephone AN TCC-14.

AR 320-5	Military Terms, Abbreviations and Symbols, Dictionary of United States Army Terms.
AR 320-50	Military Terms, Abbreviations and Symbols, Authorized Abbreviations and Brevity Codes.
DA Pam 108-1	Index of Army Motion Pictures, Film Strips, Slides, and Phono-Recordings.
DA Pam 310-1	Military Publications Index of Administrative Publications (Army Regulations, Special Regulations, Department of the Army Pamphlets, Commercial Traffic Bulletins, Military Traffic Management Bulletins, General Orders, Bulletins, and Circulars)
DA Pam 310-3	Military Publications Index of Training Publications, Field Manuals, Reserve Officers' Training Corps Manuals, Tramping Circulars, Army Training Programs, Army Subject Schedules, Army Tracing Tests, War Department and Department of the Army Posters, and Firing Tables and Trajectory Charts.
DA Pam 310-4	Military Publications: Index of Technical Manuals, Technical Bulletins, Supply Bulletins, Lubrication Orders, and Modification Work Orders.
DA Pam 310-7	Military Publications: Index of Tables of Organization and Equipment, Type Tables of Distribution, and Tables of Allowances.
DA Pam 310-21	Military Publications: Index of Supply Manual Signal Corps.
FM 21-5	Military Training.
FM 21-6	Techniques of Military Instruction.
FM 21-30	Military Symbols.
MIL-STD-129B	Military Standard, Marking for Shipment and Storage.
SB 38-100	Preservation, Packaging, and Packing Materials, Supplies, and Equipment Used In the Army.
TM 11-2096	Test Set TS-140-PCM, Signal Generators SG-15 PCM and SO-15A/PCM, and Decibel Meters ME-22/PCM and ME-22A/PCM.
TM 11-2144	Hybrid Circuit Network TA-31.
TM 11-2155	Telephone Set TA-312/PT.
TM 11-5805-246-10	Operator's Manual, Terminal, Telegraph TH-5/TG.
TM 11-5805-246-12P	Operator's and Organizational Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart for Terminal, Telegraph TH-5 /TG

TM 11-5805-246-20	Organizational Maintenance Manual, Terminal, Telegraph TH-5 /TG.
TM 11-5805-246-35P	Field and Depot Maintenance Repair Parts and Special Tools List, Terminal, Telegraph TH-5/TG.
TM11-5805-247-10	Operator's Manual, Converter, Telegraph-Telephone Signal A-182/U.
TM11-5805-247-12P	Operator's and Organizational Maintenance, Repair Parts and Special Tools List and Maintenance Allocation Chart for Converter, Telegraph- Telephone Signal TA-182/U.
TM 11-5805-247-20	Organizational Maintenance Manual, Converter, Telegraph-Telephone Signal TA-182/U.
TM 11-5805-247-35P	Field and Depot Maintenance Repair Parts and Special Tools List, Converter, Telegraph-Telephone Signal TA-182/U.
TM 11-5805-265-12	Operation and Organizational Maintenance, Telegraph Repeater TH-18*F*G.
TM 11-5815-206-12	Operation and Organizational Maintenance, Teletypewriter Set AN*P*GC-1 and Teletypewriters TT-4A/TG and TT-4B/TG.
TM 11-5805-254-15P	Operator's Organizational, Field and Depot Maintenance, Repair Parts and Special Tools List and Maintenance Allocation Chart for Terminal, Telegraph-Telephone AN/TCC-14.

By Order of *Wilbur M. Brucker*, Secretary of the Army:

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NG: State AG (3); Units—Same as Active Army except allowance is one copy to each unit.

USAR: None.

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

TECHNICAL MANUAL

Operator's, Organizational, Field, and Depot Maintenance Manual

TERMINAL, TELEGRAPH-TELEPHONE AN/TCC-14

TM 11-5805-254-15
CHANGES NO. 2

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON 25, D.C., *25 March 1963*

TM 11-5805-254-15, 7 November 1960, is changed as follows:

Page 5. Make the following changes:

1.1. Index of Equipment Publications

(Added)

Refer to the latest issue of DA Pam 310-4 to determine whether there are new editions, changes, or additional publications pertaining to your equipment. Department of the Army Pamphlet No. 310 - is an index of current Technical Manuals, Technical Bulletins, Supply Bulletins, Lubrication Orders, and Modification Work Orders that are available through publications supply channels. The index lists the individual parts (-10, -20, -35P, etc.) and the latest changes to and revisions of each equipment publication.

Paragraph 2.

2. Forms and Records

(Superseded)

a. *Reports of Maintenance and Unsatisfactory Equipment*. Use equipment forms and records in Accordance with instructions in TM 88-760.
b. *Report of Damaged or Improper Shipment*. Fill out and forward DD Form 6 (Report of Damaged or Improper Shipment) as prescribed in AR 700-58 (Army), NAVSANDA Publication 378 (Navy), and AFR 71-4 (Air Force).
c. *Comments on Manual*. Forward all comments on this publication direct to - Commanding Officer, U.S. Army Electronics Materiel Support Agency, ATTN: SELMS-MP, Fort Monmouth, N.J. (DA Form 1698 (Record of Comments on Publications), DA Form 2496 (Disposition Form), or letter may be used.)

Page 17, paragraph 13, line 2. Change "preventive maintenance" to: performing periodic maintenance service and inspection.

14. Daily Maintenance Service end Inspection

(Superseded)

First echelon maintenance service and inspection is made at daily intervals unless otherwise directed by the commanding officer.

a. *General.* Maintenance forms and records to be used are specified in TM 38-760. The maintenance service and inspection chart (b below) indicates what to inspect, how to inspect, and what the normal conditions are. The Reference column provides corrective information. Deficiencies or shortcomings and those not corrected during maintenance service and inspection will be immediately reported to higher echelon by use of forms and procedures specified in TM 38-760. Equipment that has deficiencies which make it unserviceable should be deadlined in accordance with TM 38-750.
b. *Daily Maintenance Service and Inspection Chart*. Refer to TM 11-5805-246-10 for the daily maintenance service and inspection procedures for the TH-5 /TG, and to TM 11-5805-247-10 for the procedures for the TA-182/U. *Note*. Item numbers used in the following chart correspond to item numbers used in the quarterly maintenance service and inspection chart provided for second echelon maintenance personnel.

Item No.	Procedure		Reference
	Item	Normal indication or result	
1	COMPLETENESS: Inspect for presence of all parts.	All parts are available	TM 11-5805-254-15P
2	PUBLICATIONS: Check to see that publications are available and in usable condition.	Publications (and their Changes) for AN/TCC-14 and its components are available and in useable condition (app. I).	DA Pam 310-4 lists current changes.
3	INSTALLATION: Check installation conditions and connections.	Equipment is properly installed and connected.	Paras. 10 and 11.
4	CLEANLINESS: Check for dirt, grease, moisture and fungus.	Parts are free of dirt, grease, moisture and fungus.	See c(1) below.
7	CONTROLS: Inspect for positive action and tightness of knobs.	Controls operate with positive action to all positions; knobs are not loose.	See c(2) below.
10	EQUIPMENT PERFORMANCE:		
	a. When AN/TCC-14 is connected to operating communication system, observe for normal operation.	a. Error-free and distortion-free observation in obtained.	a. Para. 15
	b. When AN/TCC-14 is not connected operating communication system, check its performance (para. 15).	b. Equipment shows no sign of abnormal operations.	b. See check and remedy column in pars. 14 and c(3) below.

c. Maintenance Procedures.

(1) *Cleaning*. Remove dirt, grease, moisture, and fungus; use a clean cloth or brush. Dampen the cloth with cleaning compound and after cleaning, wipe the area with a clean cloth.
Warning: Cleaning compound is flammable and its fumes are toxic; provide adequate ventilation in work area.

(2) *Mounting hardware*. Tighten mounting hardware.

(3) *Repairs*. The F-98/U cannot be repaired if it fails electrically; it must be replaced. For the repair of the F-98/U cover assembly or replacement of the carrying strap, refer the F-98/U to higher echelon.

Pages 18 and 19. Delete figures 10 and 11.

Page 20, paragraph 15, chart, Item No. 5, last sentence in "Check and remedy" column. After "TH-5/TG", add: and teletypewriter.

Page 21, paragraph 16, chart, item No. 8, line 2 in "Check and remedy" column. Delete “replace the F-98/U" and substitute: check the telephones; if the telephones operate properly, replace the F-98/U.

Page 22, paragraph 16. Make the following changes:

Subparagraph *a*, line 4. Change "TM 11-5805-246-12P" to: TM 11-5805-246-20P.

Subparagraph *b*, line 3. Change "TM 115805-247-12P" to: TM 115805-247-20P.

Paragraph 17.

17. Quarterly Maintenance Service and Inspection

(Superseded)

a. General. Quarterly maintenance service and inspection (*b* below) is scheduled at quarterly intervals in accordance with the requirements of TM 38-750 unless otherwise directed by the commanding officer. If the equipment is part of a vehicular installation, the quarterly maintenance should be scheduled concurrent with the periodic service schedule of the carrying vehicle to reduce the out-of-service time to a minimum. Refer to paragraph 14*a* for information on the use of the chart.

b. Quarterly Maintenance Service and Inspection Chart. Refer to TM 11-5805-246-20 for the quarterly maintenance service and inspection of the TH-5/TG, and to TM 11-5805-247-20 for the quarterly maintenance service and inspection of the TA-182/U.

Item No.	Procedure		Reference
	Item	Normal indication or result	
1	COMPLETENESS: Inspect for presence of all parts.	All parts are available	TM 11-5805-254-15P
2	PUBLICATIONS: Check to see that publications for all AN/TCC-14 components are available and in usable condition.	a. Maintenance and parts manuals are available and in usable condition. b. All Changes for maintenance and parts manuals are available and in usable condition.	a. TM 11-5805-254-15 and TM 11-5805-254-15P (for AN/TCC-14). b. DA Pam 310-4.
3	INSTALLATION: Check installation conditions and connections.	Equipment is properly installed.	Par. 10 and 11.
4	CLEANLINESS AND PRESERVATION: Check parts for dirt, grease, rust and corrosion.	Parts are free of dirt, grease, rust, and corrosion; metal surfaces are painted.	Par. 14*c* (1) and c(1) below.
5	MODIFICATION WORK ORDERS: Determine whether MWO's are required for AN/TCC-14 and its components (see DA Pam 310-4). Check equipment to see if applicable MWO's are applied ad MWO number is stamped as required.	MWO's have been applied or have been scheduled for application.	Applicable MWO.
6	GASKET AND COVER ASSEMBLY: Check gasket and cover assembly for tight fit and evidence of damage.	Gasket and cover assembly fit tightly and show no signs of damage.	See *c*(2) below.
7	a. CONTROLS: Inspect for positive action and tightness of knobs.	Controls operate with positive action to all positions; knobs are not loose.	See *c*(2) below.
8	POWER CORDS: Inspect for cut and frayed insulation; inspect plug for bent pins; inspect attachment of cord to plug.	Insulation is not cut or frayed; plug pins are straight; cord and wires are attached firmly to plug.	See *c*(2) and (3) below.
9	CHASSIS PARTS: Inspect wiring, wiring harness, and parts for looseness, burns, blistering, swelling, or other signs of deterioration or overheating.	Wiring, wiring harness, and parts show no signs of looseness, burns, blistering, swelling, or signs of deterioration or overheating.	See *c*(2) and (3) below.
10	EQUIPMENT PERFORMANCE: Check operation of equipment (para. 15).	Equipment performs satisfactorily	Para. 15, *Check and remedy* column.

c. Maintenance Procedures.

(1) *Touchup painting*. Remove rust and corrosion from metal surfaces by lightly sanding them with sandpaper. Brush two thin coats of paint on the bare metal to protect it from further corrosion. Refer to applicable cleaning and refinishing practices specified in TM 9-2851.

(2) *Mounting hardware*. Tighten all screws, nuts, and bolts.

(3) *Repair or replacement*. Repair or replace damaged parts using tools and parts available to first and second echelon. The appendix lists manuals and parts lists available for the components of the AN/TCC-14. Repair broken insulation with electrical insulation tape. Straighten pins of power cord plug.

Page 32, appendix. Delete "TM 11-5805-246-12P" and its title and substitute: TM 11-5805-246-20P,

Organizational Maintenance Repair Parts and Special Tools List for Terminal, Telegraph TH-5/TG.

Page 33, appendix. Delete "TM 11-5805-247-12P" and its title and substitute: TM 11-5805-247-20P, Organizational Maintenance Repair Parts and Special Tools List for Converter, Telegraph-Telephone Signal TA-182/U.

By Order of the Secretary of the Army:

EARLE G. WHEELER,
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USAR: None.
For explanation of abbreviations used, see AR 320-50
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