

**OPERATOR AND ORGANIZATIONAL
MAINTENANCE MANUAL
COMMUNICATIONS CENTRAL
AN/TSC-38B**

This copy is a reprint which includes
current pages from Changes 1 - 4

WARNING

DANGEROUS VOLTAGES EXIST IN THIS EQUIPMENT

Be careful when working on the 120/208-and 240/416-volt ac line connections or on the high voltage dc circuits. Serious injury or death may result from contact with these terminals.

DON'T TAKE CHANCES!

EXTREMELY DANGEROUS VOLTAGES EXIST IN

THE FOLLOWING UNITS

Amplifier, Radio Frequency AM-4543/TSC-38B.	7,500 volts; 1,500 volts
Amplifier, Radio Frequency AM-4544/TSC-38B.	2,250 volts; 500 volts
Power Supply PP-6051/TSC-38B.	2,250 volts; 500 volts
Coupler, Antenna CU-1561/TSC-38B.	250 volts

EXPLOSIVE GASES

Insure that the battery charger exhaust vent on the outside of the AN/TSC-38B is open and the associated blower is operating when the power is on. Hydrogen gas is generated in the AN/TSC-38B battery assembly and unless properly exhausted can create an explosion.

CHANGE

DEPARTMENT OF THE ARMY
AND THE AIR FORCE
WASHINGTON, DC, 14 September 1977

NO. 4

**Operator's and Organizational Maintenance Manual
COMMUNICATIONS CENTRAL AN/TSC-38B
(NSN 5895-00-947-9653)**

TM 11-5895-356-12-1/TO 31R2-2TSC-38B -41, 3 March 1970, is changed as follows:

1. The title is changed as shown above.
2. New or changed material is indicated by a vertical line in the margin of the page.
3. Remove and insert pages as indicated in the page list below.

<i>Remove</i>	<i>Insert</i>
1-37 through 1-40.....	1-37 through 1-40
2-11 and 2-12.....	2-11 and 2-12

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

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Army Dep (1) except

Fort Carson (5)

Fort Gillem (5)

Fort Huachuca (3)

Ft Richardson (ECOM Ofc) (1)

WSMR (1)

LBAD (50)

SAAD (10)

TOAD (10)

SHAD (3)

USA Dep (1)

Sig Sec USA Dep (2)

Sig Dep (2)

SigFLDMS (1)

Units org under fol TOE: (1)

11-302

29-134

29-136

NG: None

USAR: None

For explanation of abbreviations used, see AR 310-50.

WARNING
VENTILATION IS REQUIRED

The shelter must be ventilated when occupied. When the equipment is operating, be sure that all equipment vents are open, the equipment shelter door air vent is open, and the air conditioner is in operation with its associated vents open (fig. 1-3 and fig. 1-4).

ELECTROMAGNETIC

RADIATION

DO NOT STAND IN THE DIRECT PATH OF THE SLOPING VEE ANTENNAS WHEN THE POWER IS ON. DO NOT WORK ON THE SLOPING VEE ANTENNAS WHILE THE POWER IS ON.

High frequency electromagnetic radiation can cause fatal internal burns. It can literally "cook" internal organs and flesh. If you feel the slightest warming effect while near this equipment, **MOVE AWAY QUICKLY!**

TECHNICAL MANUAL
No. 11-5895-356-12-1

TECHNICAL ORDER
No. 31R2-TSC-38B -41



DEPARTMENTS OF THE ARMY
AND THE AIR FORCE
WASHINGTON, D.C., 3 March 1970

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COMMUNICATIONS CENTRAL AN/TSC-38B

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CHAPTER 1 INTRODUCTION

Section I. GENERAL

1-1. Scope

- a. This manual describes Communication Central AN/TSC-38B (fig. 1-1) and contains installation, operation, and operator and organizational maintenance instructions. It includes instructions for operation under usual and unusual conditions, cleaning and inspection of the equipment, and replacement of parts available to the operator and organizational repairman.
- b. Official nomenclature is used to the maximum extent possible. Where official nomenclature for specific items has not been assigned, commercial nomenclature is used.
- c. The basic issue items list (BILL) appears in appendix B.

NOTE

Appendix B is current as of 30 May 1973.

1-2. Indexes of Publications

- a. *DA Pam 310-4.* 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.
- b. *DA Pam 310-7.* Refer to DA Pam 310-7. Refer to DA Pam 310-7 to determine whether there are modification work orders (MWO's) pertaining to the equipment.

1-3. Forms and Records

- a. *Reports of Maintenance and Unsatisfactory Equipment.* Maintenance forms, records, and reports which are to be used by maintenance personnel at all maintenance levels are listed in and prescribed by TM 38-750 (Army). Air Force personnel will use AFM 66-1 for maintenance reporting and TO-00-35D54 for unsatisfactory equipment reporting. Navy personnel will report maintenance performed utilizing the Maintenance Data Collection Subsystem (MDCS) IAW OP- NAVINST 4790.2, Vol 3 and unsatisfactory material/conditions (UR submissions) in accordance with OPNAVINST 4790.2, Vol 2, chapter 17.
- b. *Report of Packaging and Handling Deficiencies.* Fill out and forward DD Form 6 (Packaging Improvement Report) as prescribed in AR 700-58/NAVSUPINST 4030.29/AFR 71- 13/MCO P4030.29A, and DSAR 4145.8.
- c. *Discrepancy in Shipment Report (DISREP) (SF 361).* Fill out and forward Discrepancy in Shipment Report (DISREP) (SF 361) as prescribed in AR55-38/NAVSUPINST 4610.33A/AFR 75-18/MCO P4610.19B, and DSAR 4500.15.

1.3.1. Recommendations for Maintenance Publications Improvements

The reporting of errors, omissions, and recommendations for improving this manual by the individual user is encouraged. Reports should be submitted on DA Form 2028 (Recommended Changes to Publications and Blank Forms) or DA Form 2028-2 (Test) located in the back of the manual, and forwarded direct to Commander, US Army Electronics Command, ATTN: AMSEL- MA-Q, Fort Monmouth, NJ 07703. To use the form in the back of the manual, cut it out, fill it out as shown on the sample figure 1-1.1, fold it where shown, and drop it in the mail. A reply will be furnished direct to you.

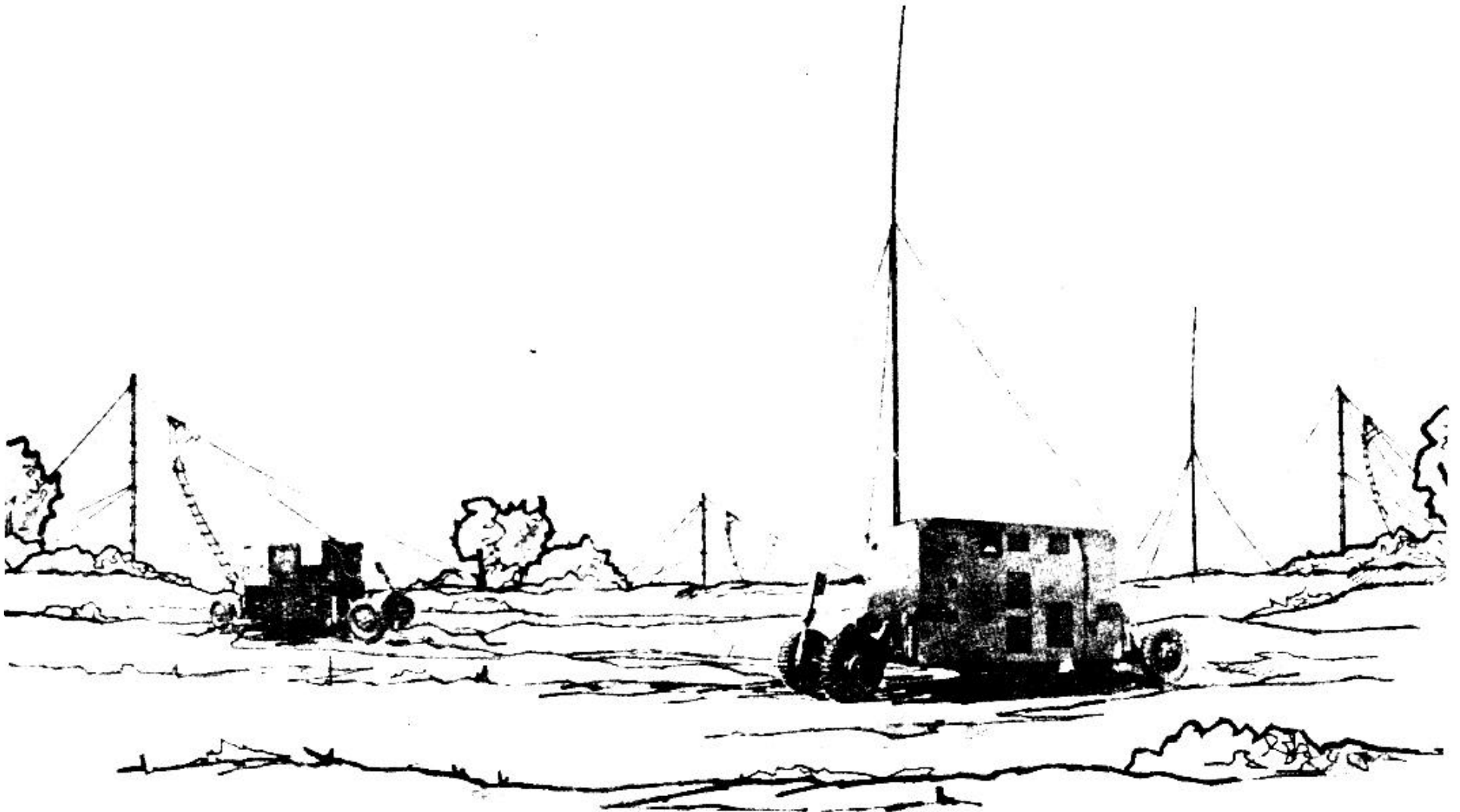



Figure 1-1. Communications Central AN/T.SC-38B.

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
TM 11-5840-340-12

DATE
23 Jan 74

TITLE
Radar Set AN/PSC-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			<p>Recommend that the installation antenna alignment procedure be changed through to specify a 2° IFF antenna lag rather than 1°.</p> <p>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.</p>
3-10	3-3		3-1	<p>Item 5, Function column. Change "2 db" to "3db."</p> <p>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.</p>
5-6	5-8		F03	<p>Add new step f.1 to read, "Replace cover plate removed in step e.1, above."</p> <p>REASON: To replace the cover plate.</p> <p>Zone C 3. On J1-2, change "+24 VDC to "+5 VDC."</p> <p>REASON: This is the output line of the 5 VDC power supply. + 24 VDC is the input voltage.</p>

TYPED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER
 SSG I. M. DeSpirito 999-1776

SIGN HERE:


TEAR ALONG DOTTED LINE

Figure 1-1.1 DA Form 2028-2 (TEST) sample.

Section II. DESCRIPTION AND DATA

1-4. Purpose and Use

a. Communications Central AN/TSC-38B (fig. 1-2) provides complete radio and wire line communications terminal facilities to both telephone and teletypewriter wire line subscribers. The entire system is contained in Communications Central Group OA-7998/TSC-38B and Communications Support Group OA-8036/TSC-38B. The OA-7998/TSC-38B uses Shelter, Electrical Equipment S-414/TSC-38B to house all the operating equipment necessary for limited system operation. The OA-8036/TSC-38B uses Pallet, Transport-Storage MT3655/TSC-38B to carry the generator sets and antenna equipment required for full system capabilities. The equipment shelter and the pallet are each mounted on Dolly Set, Lift, Transportable Shelter XM689 for ease in movement to and from operating locations. The AN/TSC-38B is air-transportable as a complete system and is totally contained in OA-7998/TSC-38B and OA-8036/TSC-38B.

b. The AN/TSC-38B has two separate radio terminals, one primary and one secondary. The primary radio terminal has a 10-kw power output and two receivers operating in space diversity with sloping "V" antennas. The secondary radio terminal has a 1-kw power output and one receiver with whip antennas. Each radio terminal provides up to four full-duplex voice frequency channels of communications.

c. Telephone facilities include a 20-line, common battery (CB), fully automatic switchboard, which is implemented with 12 line terminal units, 12 telephone line intercept control modules, 8 radio line control modules, and a Dial Service Assistance (DSA) position. The automatic switchboard is capable of operating with, and connecting to, telephone subscribers having all recognized line and signaling characteristics, with the exception of sound-powered systems.

d. Through use of system control facilities equipment, any radio circuit may be connected to any wire line subscriber for communication purposes. Three of the twelve telephone wire lines (lines 10, 11, and 12) are implemented in such a way that these subscribers may exercise remote control of the primary or secondary radio terminals. Frequency and operational modes may be selected on a present basis, or individually controlled after the AN/TSC-38B system operator has placed the desired radio terminal in the remote control mode.

e. The teletypewriter (TTY) facilities effectively provide three voice frequency telegraph terminals (VFTG). A 16-channel VFTG is associated with the primary radio terminal, and a two-channel VFTG is associated with the secondary radio terminal. A single-channel wideband VFTG is arranged for use with either radio terminal. One of the radio-derived voice channels is used for each VFTG.

f. Two full-duplex secure teletypewriter terminations are also provided. These terminations may be patched into the system and used on any of the VFTG terminal channels.

g. Primary power for the AN/TSC-38B is provided by two gas turbine generator sets located on the pallet. However, provisions are included within the equipment shelter to permit use of other generator sets or standard commercial

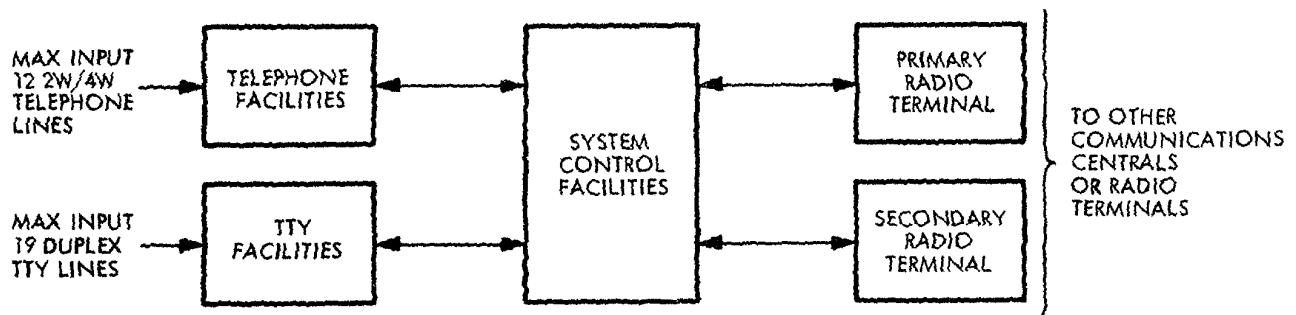


Figure 1-2. Communications Central AN/TSC-38B, simplified system block diagram.

power. Power for the AN/TSC-38B is applied to two buses. The nontechnical bus supplies power to the air conditioner and frequency changer. The remainder of the system is supplied power by the technical bus.

1-5. Technical Characteristics

a. Radio Subsystem.

(1) Primary radio terminal.

Frequency range 2 to 29.9999 mc.
 Tuning increments 100-cps steps.
 Frequency stability 1 part in 10⁸ per day.
 Tuning Automatic.
 Control Automatic from:
 Local switch select.
 Local frequency shift keying (FSK) dial pulse select.
 Remote FSK dial pulse select/push-to-talk (PTT) over remote 2-wire
 or 4-wire telephone line.
 Power output 10 kw.
 Receivers Two (space diversity).
 Frequency separation Receivers operate within 10 percent of transmitting frequency.
 Channelization Four independent 3-kc channels in a 12-kc spectrum.
 Antennas: (12).
 Transmit One sloping vee antenna (10 kw).
 Receive Two sloping vee antennas (1 kw).

(2) Secondary radio terminal.

Frequency range 2 to 29.9999 mc.
 Tuning increments 100-cps steps.
 Frequency stability 1 part in 10⁸ per day.
 Tuning Automatic.
 Control Automatic from:
 Local switch select.
 Local FSK dial pulse select.
 Remote FSK dial pulse select/PTT over 2-wire or 4-wire telephone
 line.
 Power output 1 kw.
 Receiver One.
 Frequency separation Receiver operates within 10 percent of transmitting frequency.
 Channelization Four independent 3-kc channels in a 12-kc spectrum.
 Antennas:
 Transmit 36-foot whip (shelter-mounted).
 Receive 36-foot whip (remote tripod mounted).
 Frequency separation Receiver operates within 10 percent of transmitting frequency.
 Channelization Four independent 3-kc channels in a 12-kc spectrum.
 Antennas:
 Transmit 36-foot whip (shelter mounted) .
 Receive 36-foot whip (remote tripod mounted).

b. Telephone Subsystem.

Type Automatic dial.
 Connection plan 4-wire.
 Number of lines 20.
 Loop operation Common battery.
 Loop voltage 28 vdc nominal.
 Internal termination 600 ohm balanced.
 Operator assist Dial Service Assist (DSA) position.
 Line terminal units 12.
 Type subscriber 4-wire FSK dial, FSK PTT (3).
 2-wire FSK dial, FSK PTT (3).
 4-wire DC-dial (12) .
 2-wire DC-dial (12) .
 4-wire common battery (CB) manual (12).
 2-wire CB manual (12).
 4-wire local battery (LB) ringdown (12) -
 2-wire LB ringdown (12).
 4-wire switchboard trunks (12).
 2-wire switchboard trunks (12).
 4-wire FSK dial switchboard trunk' (3).
 2-wire FSK dial switchboard trunks (3) -

NOTE

Any combination of 12 lines accepted without exceeding 3 FSK subscribers.

c. Nonsecure Data Subsystem.

(1) Primary VFTG terminal.

Number of channels..... 4-wire full duplex (16).
 Channel frequencies..... 425 to 2975 cps.
 Frequency shift Nominally - 42.5 cps.
 Mode of operation Space diversity and frequency diversity on a per-channel basis.
 Channel keying speed..... 60- and 100-words per minute (wpm) teletype writer capability.

(2) Secondary VFTG terminal.

Number of channels..... 4-wire full duplex (2).
 Channel frequencies 2,125 and 765 cps.
 Frequency shift Nominally + 42.5 cps.
 Mode of operation Nondiversity (normal), 1-channel in-band frequency diversity.
 Channel speed..... 60- and 100-wpm teletype writer capability.

(3) Wideband VFTG terminal.

Number of channels..... 4-wire full-duplex (1).
 Channel frequency..... 2,000 cps.
 Frequency shift..... Nominally t 42.5 cps.
 Mode of operation Nondiversity with secondary radio terminal, space diversity with primary radio terminal.
 Channel speed..... 60- and 100-wpm teletype capability.
 60- and 100-wpm teletype output.

(4) Test message generator.

d. Power Distribution and Lighting Subsystem.

Inverter..... 1.
 Input..... 42 vdc.
 Output..... Regulated 28 vdc.
 120 vac 3-phase, 4-wire, 60 cps.
 120 vac single-phase, 60-cps.

e. Utility Subsystem.

Generator sets..... Two (60-kw primary power)
 120/208-240/416 vac,
 3-phase, 4-wire, 400-cps,
 0.8 power, factor
 Air conditioner 1.
 Cooling capacity..... 27,000 BTU/hr at 124°F ambient and 90°F dry bulb, 750F wet bulb
 return air.
 Heating capacity 9 kw (30,735 BTU/hr) in two steps.
 Air quantity Approximately 935 cubic feet per minute (includes 100 cubic feet per
 minute fresh air) at 0 inch static pressure.
 Input power 208 volts, 3-phase, 400-cps, 30-amperes.
 Frequency converter 1.
 Input:
 Voltage 208/120 vac, +- 10%, 3-phase, 4-wire, Wire-connected.
 Frequency 47 to 63 cps and 380 to 420 cps.
 Output:
 Voltage..... 120/208 vac +15%, --10%, 3-phase, 4-wire, Wire-connected.
 Frequency 400 cpb.

1-6. Items Comprising an Operable Equipment

FSN	Qty	Nomenclature, part No., and mfr code	Fig. No.	Dimensions			Unit Weight (lb.)
				Height	Depth	Width	
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.							
5895-947-9653	1	Communications Central AN/TSC-38B consisting of: Air Conditioner: MOAC313; 45236	1-1 8-3	60	27	18¼	416
6350-999-8770	1	Alarm-Indicator, Fire Warning BZ-130/TSC-38B: 234143; 49956	3-5	3½	4	19	3
5895-926-2545	1	Amplifier, Audio Frequency AM-4576/TS.C-38B: 342001-20; 49956		5¼	134	19	16

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FSN	Qty	Nomenclature, part No., and mfr code	Fig. No.	Dimensions			Unit Weight (lb.)
				Height	Depth	Width	
5895-926-2535	1	Amplifier, Audio Frequency AM-4577/TSC-38B: 32400-21; 49556		5 ¼	13 ¾	19	16
5895-875-9714 8044/TSC-38B:	1	Amplifier-Decoder-Power Distribution Assembly MX-	3-21	3	17	19	12
5820-945-6134	1	Amplifier, Radio Frequency AM-4543/TSC-38B: 324010; 49956	2-6	69	27	40	1400
5820-945-6137	1	Amplifier, Radio Frequency AM-4544/TSC-38B: 324015; 49956	3-18	12 ½	20	19	135
5810-960-2165	4	Communications Security Equipment TSEC-KW-7; 80058					
5895-725-5654	1	Control, Antenna Coupler C-7703/TSC-38B: 324461-1; 49956	3-27	5 ¼	10	19	25
5895-947-1672	1	Control. Electronic Circuit C-8001/TSC-38B: 234001-8; 49956		5 ¼	13 ¾	19	16
5895-946-5714	1	Control-Indicator C-7081/TSC-38B: 234045,49956	3-25	8 ¾	8	19	14
5895-947-1673	1	Control-Indicator C-7080/TSC-38B: 234-42; 49956	3-29	8 ¾	8	19	14
5825-945-8695	1	Control-Monitor, Radio Line C-7092/TSC-38B:234001-9; 49956	3-30	8 ¾	8 ½	19	21
2330-226-6076	2	Dolly Set, Left, Transportable Shelter XM 689: 8736629; 19207		60 ½	181	96	3500
5915-999-7887	1	Filter, Radio Interference F-1088/TSC-38B: 324151; 49956	2-21	5	7 ½	36	4
5915-999-7388	1	Filter, Radio Interference F-1089/TSC-38B: 324152; 49956		12	3 ¼	11	6
5841-945-5873	1	Gate, Logic TD-826/TSC-38B: 234135;49956		5 ¼	9 ½	19	20
6130-856-7057	1	Generator, Ringing Static TA-703/TSC-38B: 324176; 49956		10 ½	4 ¾	19	14
6115-758-5492	2	Generator Set, Gas Turbine Engine: Model GTGE 70-9-2; 70210 (Used with but not part of this equipment)		44	79	36	1195
5895-945-8797	1	Control-Monitor, Telephone Line C-7091/TSC-38B: 324001-10; 49956	3-26	8 ¾	8 ½	19	25
5820-946-0848	1	Control, Radio Set C-7010/TSC-38B: 389697-1; 49956	3-13	14	20	19	70
5895-945-6288	1	Control-Selector-indicator C-7083/TSC-38B: 324036; 49956	3-28	7	10½	19	12
5895-947-3296	1	Control-Selector-IndicatorC-7084/TSC-38B: 234039; 49956	3-24	7	10 ½	19	12
5805-947-3300	1	Control-Selector, Telegraph Line C-7085/TSC-38B:234006-7; 49956	3-34	12 ¼	12 ½	19	42
5805-947-3301	1	Control, Telegraph Line C-7079/TSC-38B: 324006-6;49956	3-36	5 ¼	8	19	8
5895-926-2506	1	Converter, Frequency Static CV-2100/TSC-38B: 324017; 49956	3-7	12	27	18	188
6605-956-9276	1	Cooler, Air, Electronic Equipment HD-743/TSC-38B: 324155; 49956		7	16	19	9
5895-947-6522	1	Detector, Audio Frequency DT-326/TSC-38B: 324001-4; 49956		5 ¼	13 ½	19	22
6110-999-7389	1	Distribution Box J-2648/TSC-38B: 324164; 49956	3-12	10	3	6	2
5815-577-6256	1	Distribution Transmitter Teletypewriter TT123A/FG:		6 ¾	10 ½	9 ¾	17
5895-947-3297	1	Interconnector Box J-2649/TSC-38B: 600GMF-3/ 4ST-12; 49956	3-11	10	3	6	2
6130-926-3385	1	Inverter, Power Static PP-4545/TSC-38B: 324009-2; 49956	3-22	17 ½	17 ½	19	232
5935-999-8243	1	Jack Assembly, Telephone TA-693/TSC-38B: 234034; 49956	3-32	8 ¾	8	19	25
5815-179-8036	1	Jack Assembly, Teletype TH-92/TSC-38B: 386969-1; 49956	3-33	1 ¾	8 ¾	19	5
5958-945-8902	1	Keyer, Detector Ky-599/TSC-38B: 234001-7; 49956	5 ¼	13 ½	19	26	
6625-058-2751	1	Keyer, Ky-590/TSC-38B: 234006-5; 49956	3-41	5 ¼	16 ½	19	20
5895-926-2959	1	Pallet, Transport-Storage MT-3655/TSC-38B: 324023; 49956		83	122	81	12,885
5895-948-2576	1	Panel, Patching Radio Frequency SB-2808/TSC-38B: 324055-1; 49956	3-15	3 ½	1½	19	2
5815-999-8707	1	Panel, Patching Secure Teletype SB-2842/TSC-38B: 324095; 49956	3-10	7	10	19	8
6110-999-6944	1	Panel, Power Distribution SB-2806/TSC-38B: 324080; 49956	3-9	7	8	16	15

FSN	Qty	Nomenclature, part No., and mfr code	Fig. No.	Dimensions			Unit Weight (lb.)
				Height	Depth	Width	
6110-999-6945	1	Panel, Power Distribution SB-2784/TSC-38B: 324075; 49956	3-3	5 ¼	7	19	6
611-999-6946	1	Panel, Power Distribution SB-2785/TSC-38B: 324072; 49956	3-2	7	14	19	15
611-999-947	1	Panel, Power Distribution SB-2783/TSC-38B: 324069; 49956	3-1	21	17	19	98
6110-926-7907	1	Panel, Protection-Power Distribution SB-2947/TSC-38B: 324241; 49956		3 ½	3	19	4
6110-926-7908	1	Panel, Protection-Power Distribution SB-2948/TSC-38B: 324182; 49956	3- 16	3 ½	319	4	
5815-892-1096	1	Reperforator, Teletypewriter I-T-346A/FG:	12 ½	12 ¾	12 ¼	37	
5895-082-0356	1	Power, Supply PP-6051/TSC-38B: 7191-6000; 14304	3-19	7	20	19	145
5815-553-6061	1	Reperforator-Transmitter, Teletypewriter TT-76C/GGC:		12	18	21	45
5895-947-3393	1	Power Supply Assembly PP-4543/TSC-38B: 234019-1; 49956	3-27	7	13	19	80
5895-947-3397	1	Power Supply Assembly PP-4544/TSC-38B: 234019-2; 49956	3-31	7	13	19	82
5895-945-8872	1	Power Supply-Battery Charger PP-4536/TSC38B: 324009-1; 49956	3-4	17 ¾	17 ½	19	151
5820-945-6140	3	Receiver, Radio R-1402/TSC-38B: 234022-11; 49956	3-14	7	22	19	61
5410-880-2194	1	Shelter, Electrical Equipment S-414/TSC-38B: 324029; 49956		87	147	87	8000
6110-999-7385	1	Switchboard, Interior Communications SB-2844/TSC-38B: 234001-5; 49956		5 ¼	18 ¾	19	23
6110-999-7386	1	Switchboard, Interior Communications SB-2845/TSC-38B: 234001-6; 49956		5 ¼	18 ¾	19	20
6110-879-9809	1	Switchboard, Interior Communications SB-3160/TSC-38B: 324001-2; 49956		5 ¼	19 ¼	19	23
6110-879-9808	1	Switchboard, Interior Communications SB-3161/TSC-38B: 324001-3; 49956		5 ¼	19 ¼	19	23
5815-557-5970	2	Teletypewriter Set AN/UGC-4:		11 ¼	20 ¾	17 ¼	54
5895-947-6510	1	Terminal Box J-2650/TSC-38B: 324162; 49956		2 ½	3	8	1
5805-946-7541	1	Terminal, Telegraph TH-68/TSC-38B: 234006-1; 49956	3-38	7	17	19	42
5805-946-5759	1	Terminal, Telegraph TH-69/TSC-38B: 234006-2; 49956	3-39	7	17	19	37
5805-946-5740	1	Terminal, Telegraph TH-67/TSC-38B: 234006-4; 49956	3-37	7	17	19	42
5805-946-5764	1	Terminal, Telegraph TH-70/TSC-38B: 234006-3; 49956	3-40	7	17	19	46
5805-945-6170	1	Terminal, Telephone TA-694/TSC-38B: 324001-1; 49956	3-23	5 ¼	13 ¾	19	21
5820-945-6138	2	Transmitter, Radio T-1021/TSC-38B: 234021; 49956	3-20	7	22	19	1960
4210-595-4085	1	Bracket, Fire Extinguisher: 539468; 80063					
7105-943-3868	1	Chair Folding, Steel					
6645-303-4948	1	Messenger Clock: M2; 11755					

1-6.1. Running Spares

Item		Quantity
Fuse, 2.5A, 250V	AGC2.5	10
Fuse, 3A, 250V	AGC3	5
Fuse, 1A, 250V	FNM-1	5
Fuse, 7A, 250V	FNM-7	5
Fuse, 15A, 125V	FNM-15	3
Fuse, 1A, 250V	F02A-sOVIA	5
Fuse, 1.5A, 250V	F02A250V1.5A	10
Fuse, 3A, 250V	F02A250V3A	10
Fuse, 4A, 250V	F02A250V4A	10
Fuse, 5A, 250V	F02A250V5A	3
Fuse, 6A, 500V	F60CsOOV6A	5
Fuse, 8A, 125V	GLH8	3
Fuse, 1/4 A, 300V	GMT1/4	10
Fuse, 18/100A, 300V	GMT18/100	23
Fuse, IDA, 250V	MDL1-8	46
Fuse, 15A, 32V	MDL15	3
Fuse, 1A, 250V	MS90078-9	10
Fuse, 2A, 250V	MS90078-11	5

<i>Item</i>		<i>Quantity</i>
Fuse, 3A, 250V	MS90078-12.....	15
Fuse, 4A, 250V	MS90078-13.....	10
Fuse, 5A, 250V	MS90078-14.....	3
Fuse, 6A, 250V	MS90078-15.....	3
Fuse, 1A, 250V	312001 A.....	10
Fuse, 2A, 250V	312002.....	5
Fuse, 3A, 250V	312003.....	10
Fuse, 4A, 250V	312004.....	10
Fuse, 5A, 250V	312005.....	3
Fuse, 6A, 250V	312006.....	5
Fuse, 1.5A, 250V	31201.5.....	10
Fuse, 1/8A, 250V	312-125.....	10
Fuse, 1/2A, 250V	312.500.....	10
Fuse, 2.5A, 250V	31202.5.....	5
Fuse, 1A, 150V	313001.....	10
Fuse, 10A, 250V	314010.....	3
Guy MX-7738frSC-38B	B81815G1.....	4
Guy, rope	324004.....	2
Lamp, Incand. . 28V, .04A	MS18209-387.....	18
Lamp, Incand. 28V, .04A	MS25237-327T.....	1
Lamp, Incand. 25W, 125V	25T8DC1F.....	4
Lamp, Incand. 28V, .67A	308.....	2
Lamp, Incand. 30V, .05A	6S6-C-30.....	1
Lamp, Incand. 5V, .115A	718.....	1
Lamp, Glow 110V	MS25252-NE2D.....	3
Mast section	AB-10081SC-38B.....	1
Ring	2-in. die X #3GA.....	2
Shackles	AN116-5.....	25
Spacer, Transmission Line MX-7739/TSC-38B..	Q-285-1.....	2

1-7. Substitution of Common Name for Nomenclature

Common name	Nomenclature	Common name	Nomenclature
Accessories case	Case, Accessories CY-6164/TSC-38B.	Black TT patchcord (2-..... circuit)	Cord Assembly, Electrical CX-10815/U.
Adapter plate	Adapter Plate, Antenna MX-7334/TSC-38B.	Canvas bag	Bag, Multiple Leg Sling.
AF detector	Detector, Audio Frequency DT-326/TSC-38B.	Control-monitor fuse panel	Panel, Protection Power Distribution SB-2947/TSC- 38B.
Amplifier-decoder-power	Amplifier-Decoder-Power distribution assembly. Distribution Assembly MX-8044/TSC-38B.	Control-monitor group	Control-Monitor Group OA-001/TSC-38B.
Antenna accessories case	Case, Antenna Accessories CY-6165/TSC-38B.	Counterpoise wire	Counterpoise, Antenna MX-7740/TSC-38B.
Antenna base	Base, Antenna Support AB-997/TSC-38B.	Distribution box	Distribution Box J-2648/TSC-38B.
Antenna coupler	Coupler, Antenna CU-1561/TSC-38B.	Dolly set	Dolly Set, Lift, Transport able Shelter XI689.
Antenna coupler control	Control, Antenna Coupler C-7703/TSC-38B.	Electronic circuit control	Control, Electronic Circuit C-8001tTSC-38B.
Antenna mast assembly.....	Mast AB-998/TSC-38B.	Emergency power panel	Panel, Power Distribution SB-2784/TSC-38B.
Apex plate	Plate, GU.Y MX-7741/TSC-38B.	Equipment shelter	Shelter, Electrical Equipment S-414/TSC-38
Arrowhead anchors	Guy MX-77381SC-38B.	Field whip antenna	Antenna AS-1904/TSC-38
Audio patchcord	Cord Assembly, Electrical CS-10815/U.	Field whip antenna base	Base, Antenna Support AB-9961TSC-,38B.
Audio patch panel	Jack Assembly, Telephone TA-693/TSC-38B.	Fire warning panel	Alarm-Indicator, Fire Warning BZ130/TSC 38B.
Axe	Axe, Pick Head.	Fox generator	Keyer KY-590/TSC-38B.
Black TT patchcord (:3-	Cord Assembly, Electrical CX-10814/U.		

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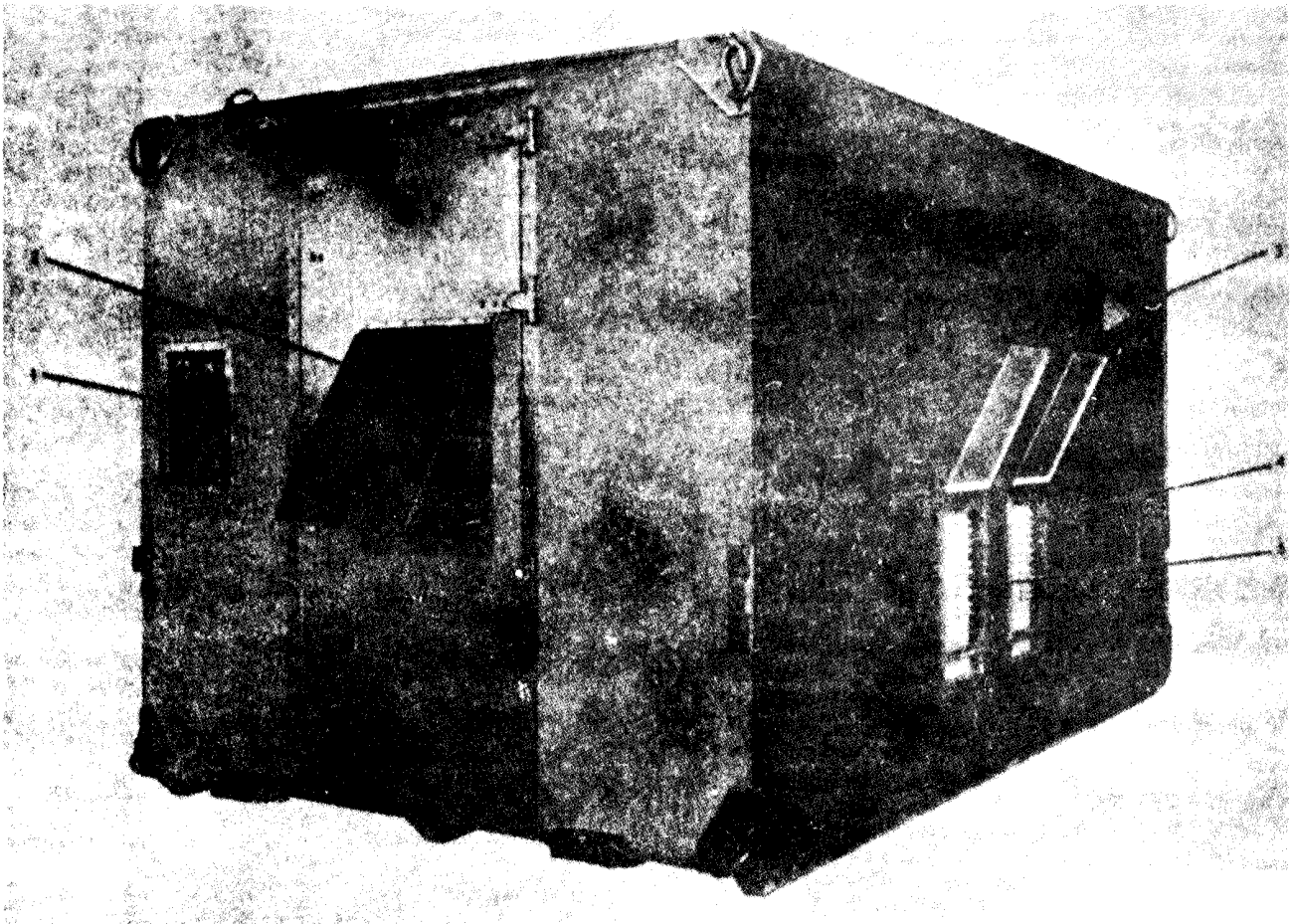
Common name	Nomenclature	Common name	Nomenclature
Frequency changer	Converter, Frequency, Static C;V-21001SC-38B.	Power rack	Rack, Electrical Equipment MT-3622/TSC-38B.
Front dolly	Dolly, Trailer, Front XM690.	Power supply-battery charger	Power Supply-Battery Charger PP4536/TSC 38B.
Generator power cable	Cable Assembly, Power, Electrical CX-11510/U.	Power supply-distribution group	Power Supply-Distribution Group OA-7999 TSC 38B.
Generator set	Generator Set, Gas Turbine Engine GTGE 70-9-2. (Used with, but not part of AN/TSC-38B)	Primary frequency select panel	Control-Selector Indicator C-7083/TSC-38B
Ground rod.....	Rod, Ground GP-125/G.	Primary mode and status panel	Control-Indicator C-7080/TSC-38B.
Guy stake	Stake, Guy GP-126/G.	Radio line control	Control-5lonitor, Radio Line C-7092/TSC-38B.
Interconnecting box	Interconnecting Box J-2649/TSC-38B.	Rear dolly	Dolly, Trailer, Rear XM691
Jack assembly	Jack Assembly, Teletype TH-92/TSC-38B.	Receiver	Receiver, Radio R-1402/TSC 38B.
Keyer-detector	Keyer-Detector KY-599/TSC-38B.	Receiver-transmitter group	Receiver-Transmitter Group OA-8000/TSC 38B.
Line amplifier No. 1	Amplifier, Audio Frequency AM4576/TSC-38B.	Red TT patchcord	Cord Assembly, Electrical CX-11511/U.
Line amplifier No. 2	Amplifier, Audio Frequency AM4577/TSC-38B.	Reel rack	Rack, Cable Reel MT 3805/TSC-38B.
Link logic unit	Switchboard, Interior Communication 2845/TSC-38B.	Remote control	Control, Radio Set C 7010/TSC-38B.
Logic gate	Gate, Logic TD-826/TSC-38B.	Reperforator	Reperforator, Teletype writer TT-346A/FG.
Lower guy cable	Guy MX-7735/TSC-38B.	Reperforator-transmitter	Reperforator Transmitter; Teletypewriter TT-76C/GGC.
Main ac power panel	Panel, Power Distribution SB-2783/TSC-38B.	RF1 filter No. 1	Filter, Radio Interference F-1088/TSC-.38B.
Mast stub	Mast Section AB-1008/TSC-.38B.	RFI filter No. 2	Filter, Radio Interference F-1089/TSC-38B.
Middle guy cable	Guy MX-77361SC-38B	RF Patch Panel	Panel, Patching, Radio Frequency SB-2808/TSC-38B.
Normal power panel	Panel, Power Distribution SB-2785/TSC-38B.	Ring generator	Generator, Ringing Static TA-703/TSC-38B.
Operator rack	Rack, Electrical Equipment MT-:3625/TSC-38B.	R/T fuse panel	Panel, Protection-Power Distribution SB-2948 TSC-38B.
Pallet	Pallet, Transport-Storage MT-3655/TSC-38B.	R/T rack	Rack, Electrical Equipment MT-3f623/TSC-38B.
Pedestal base	Base, Antenna Support AB-1009/TSC-38B.	Secondary frequency select panel	Control-Selector Indicator C-7084/TSC 38B.
Power cable	Cable Assembly, Power, Electrical CX-10813/U.		
Power inverter	Inverter, Power, Static PP4545/TSC-38B.		

Common name	Nomenclature	Common name	Nomenclature
Secondary mode and status.... panel	Control Indicator C-7081/TSC-38B.	VFTG channel control.....	Control, Telegraph Line C-7079/TSC-38B
Secure ac power panel.....	Panel, Power Distribution SB-2806/TSC-38B	VFTG power supply No. 1....	Power Supply Assembly PP-4543/TSC-38B
Secure teletype patch panel..	Panel, Patching, Secure Teletype SB-2842/TSC-38B	VFTG power supply No. 2....	Power Supply Assembly PP-4644/TSC-38B.
Shelter ground rod.....	Rod, Ground GP-128/G.	VFT No. 1.....	Terminal, Telegraph TH-67/TSC-38B
Shelter whip antenna.....	Antenna AS-1903/TSC-38B.	VFTG No. 2	Terminal, Telegraph TH-68/TSC-38B
Shelter whip antenna base....	Base, Mast AB-1090/TSC-38B	VFTG No. 3	Terminal, Telegraph TH-69/TSC-38B
Sling	Sling, multiple leg ST-157/G	VFTG No. 4	Terminal, Telegraph TH-70/TSC-38B.
Sloping vee antenna legs.....	Antenna Element AB-1010/TSC-38B	Whip antenna base case....	Case Antenna Base Section CY-6166 TSC-38B.
Spares/accessories case.....	Case, Accessories Spare Parts CY-6432/TSC-38B.	Whip antenna case.....	Case, Antenna Sections CY-6167/TSC-38B
Spreader insulator -l.....	Spacer, Transmission Line MX-7739/TSC-38B.	Whip antenna parts case....	Case, Antenna Accessories CY-6168/TSC-38B.
Strain insulator.....	Insulator, Strain IL-61/TSC-38B	1-kw balun -.....	Coupler, Transmission CU-1668/TSC-Line 38B.
Subscriber logic No. 1	Switchboard, Interior Communication SB-2844/TSC-38B.	1-kw balun case.....	Case, Electrical Equipment CY-6163/TSC-38
Subscriber logic No. 2	Switchboard, Interior Communication SB-3160/TSC-38B.	1-kw coaxial cable	Cable Assembly, Radio Frequency CG-3266/U.
Subscriber logic No. 3	Switchboard, Interior Communication SB-3161/TSC-38B.	1-kw P.A.....	Amplifier, Radio Frequency AM-4544/TSC-38B
Support group.....	Communications Support Group OA-8036/TSC-38B.	1-kw P.A. power supply.....	Power Supply PP-6051/TSC-38B.
Telegraph line control.....	Control-Selector, Telegraph Line C-7086/TSC-38B.	1-kw terminator.....	Terminating Unit, Radio Frequency MX-7650/TSC-38B.
Telephone control panel.....	Control-Monitor, Telephone Line C-7091/TSC-38B.	1-kw terminator case	Case, Electrical Equipment CY-6163/TSC-38.
Telephone terminal.....	Terminal, Telephone TA-694/TSC-38B.	1-kw vee antenna.....	Antenna Group OE-40/TSC-38B.
Teletypewriter group -.....	Teletypewriter Group OA-8002/TSC-38B.	10-kw balun.....	Coupler, Transmission Line CU-1667/TSC-38B.
Teletypewriter rack.....	Rack, Electrical Equipment-MT-3624/TSC-38B,	10-kw balun case.....	Case, Coupler, Transmission Line CY-6161/TSC-38B.
Teletypewriter set.....	Teletypewriter Set AN/UGC - 4.	10-kw coaxial cable.....	Cable Assembly, Radio Frequency CG-3246/U.
Terminal box	Terminal Box J-2660/TSC-38B.	10-kw P.A.....	Amplifier, Radio Frequency AM-4543/TSC-38B.
Terminator/balun mounting ...	Support, Antenna AB-1007/TSC-38B.	10-k- terminator.....	Terminating Unit, Radio Frequency MX-76B1/TSC-38B.
Transmitter	Transmitter, Radio T 1021/TSC-38B	10-kw terminator case	Case, Terminating Unit CY-6162/TSC-38B
Transmitter-distributor.....	Distributor-Transmitter, Teletypewriter TT-123A/FG.	10.kw vee antenna	Antenna Group OE-30/TSC-38B
Upper guy cable.....	Guy MX-7737/TSC-38B.		
VFTG blower.....	Cooler, Air, Electronic Equipment HD-743/TSC-38B.		

1-8. Description of Communications Central AN/TSC - 8B

(figs. 1-3 and 1-4)

The AN/TSC-38B consists of Communications

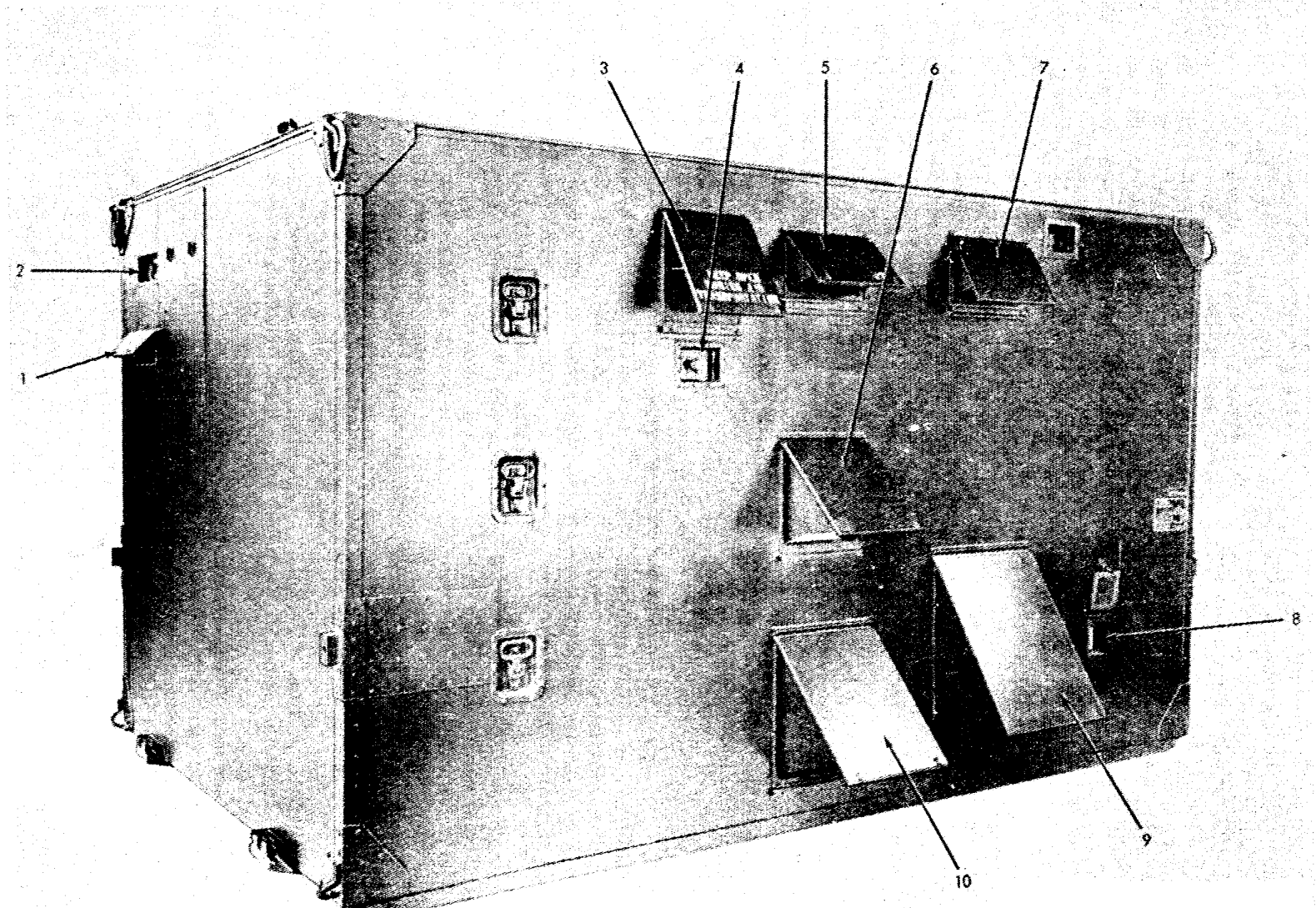


- | | |
|-----------------------------------|--------------------------------|
| 1 Power entry panel | 4 Teletype signal entry panel |
| 2 Equipment shelter door air vent | 5 Telephone signal entry panel |
| 3 1-kw P.A. air vent | |

Figure 1-3. Shelter, Electrical Equipment S-414/TSC-38B, curbside view.

Central Group OA-7998/TSC-38B and Communications Support Group OA-8036/TSC-38B. Both the OA-7998/TSC-38B and the OA8036/TSC-38B are equipped with Dolly Set, Lift, Transportable Shelter XM689. The AN/TSC-38B employs the unit numbering system for reference designations of components. For example, Power Supply-Distribution Group OA-7999/TSC-38B is designated as unit 1. Panel, Power Distribution SB-2784/TSC-38B is a subassembly which is mounted in unit 1 and has a reference designation of 1A2. Thus, 1A2 indicates the A2 subassembly of unit 1.

a. Communications Central Group OA-7998/TSC-38B provides shelter for both operating personnel and operating equipment of the AN/ TSC-38B in Shelter, Electrical Equipment S-14/TSC-38B. Most of the equipment in the shelter is arranged in racks according to its function. Power Supply-Distribution Group OA-7999/TSC-38B (unit 1) is rack-mounted equipment and is located on the left side of the shelter (viewed from the entrance). Amplifier, Radio Frequency AM4543/TSC-38B (unit 2) and the air conditioner (unit 3) are mounted on the floor and left wall of the shelter alongside the OA-7999/TSC-38B. Converter, Frequency, Static CV-2100/TSC-38B (unit 4) is mounted on the top of the air conditioner. Teletypewriter Group OA-8002/TSC-38B (unit 5) and Receiver-Transmitter Group OA800/TSC-38B - unit 6) are both rack-mounted) equipment groups located against the forward wall of the shelter. Control-Monitor Group OA8001/TSC-38B (unit 7) is rack-mounted along the right wall; it contains three functional groups of equipment; the control and monitoring facility



- | | | | | |
|------------------------------|----------------------------------|----------------------------------|--------------------------------|--|
| 1 1-kw P.A. air exhaust vent | 3 Equipment shelter exhaust vent | 5 Frequency changer exhaust vent | 7 Air-conditioner exhaust vent | 9 10-kw P.A. exhaust vent |
| 2 Antenna entry panel | 4 10-kw P.A. antenna entry panel | 6 Air-conditioner air vent | 8 10-kw P.A. air vent | 10 Battery compartment exhaust vent
(batteries removed) |

Figure 1-4. Shelter, Electrical Equipment S-414/TSC-38B, roadside view.

Change 3 1-11

for the entire AN/TSC-38B, the telephone terminal and switchboard equipments, and the voice frequency telegraph (VFTG) terminal equipment.

b. The S-414/TSC-38B is 87 inches high, 87 inches wide, and 147 inches long (inside dimensions). The shelter (nominal load capacity: 8,000 pounds) is fitted with lifting rings and can be mounted on Dolly Set, Lift, Transportable Shelter XM689 for movement by land. The shelter has a divided (Dutch type) entry door containing a ventilation opening. The doorway is provided with a blackout curtain, and a blackout light switch is mounted on the door frame. Ventilation openings for specific equipments are provided in the shelter surface. Entry panels to admit antenna, telephone, teletypewriter and power circuits are mounted in the shelter surface. A mounting plate/RF connector for the shelter whip antenna is provided on the roof; three flush-type steps and a handhold are provided for access to the roof.

c. The antenna entry panel is 4 by 10 inches and is located behind the R/T rack in the equipment shelter outer surface. It contains connectors, accessible from the shelter exterior, for connecting lead-in cables from the AN/TSC38B antennas (except the shelter whip antenna) to corresponding connectors on Panel, Patching, Antenna SB-2808/TSC-38B.

d. The telephone and teletype signal entry panels are 20 by 12 inches and are located behind the operator rack on the equipment shelter outer surface. They contain connectors, accessible from the shelter exterior, for attaching subscriber lines to the shelter.

e. The power entry panel is 10 by 10 inches and is located near the equipment shelter entry door on the shelter outer surface. It contains connectors, accessible from the shelter exterior, for attaching external power, ground, and intercom lines to the shelter. It also contains a duplex outdoor-type convenience outlet with waterproof covers for access to 120 volts ac, 60 cps.

f. The 10-kw vee antenna entry panel is 4 by 6 inches and is located behind the primary power amplifier (Amplifier, Radio Frequency AM4543/TSC-38B) on the equipment shelter outer surface. It contains a connector, accessible from the shelter exterior, for connecting the lead-in cable from the 10-kw transmitting antenna (Antenna AS-1901/TSC-38B) to the output of the primary power amplifier.

g. The shelter whip antenna connector is 5 inches in diameter and is located above the R/T rack on the equipment shelter roof. It contains a protective cap that, when removed, will accept the shelter whip antenna base.

1-9. Description of Rack, Electrical Equipment MT-3622/ TSC-38B

(fig. 1-5)

The MT-3622/TSC-38B (power rack) is 71 3/8 inches high, 25 inches deep, and 22 inches wide. It provides mechanical support for Power Supply Distribution Group OA-7999/TSC-38B. The power supply-distribution group consists of the SB-2783/TSC-38B (main ac power panel, 1A1), the SB-2784/TSC-38B (emergency power panel, 1A2), the SB-2785/TSC-38B (normal power panel, 1A3), the PP-4536/TSC-38B (power supply-battery charger 1-4), and the BZ130/TSC-38B (fire warning panel, 1A6).

The top compartment is fitted with drawer slides to permit the main ac power panel chassis to be rolled out. The back and sides of the bottom compartment are closed by sheet metal panels. This compartment is also fitted with drawer slides. A blower (fan, centrifugal) is mounted above the bottom compartment. Terminal boards associated with the power and signal distribution within the power rack are mounted on a panel at the rear of the rack. An over temperature (fire) sensor is mounted along the upper right side of the power rack.

1-10. Description of Panel, Power Distribution SB-2783/ TSC-38B

(fig. 1-5)

The SB -2783 /TSC-38B (main ac power panel 1A1) consists of a slide-mounted panel and chassis 21 inches high, 17 inches deep, and 19 inches wide. The chassis is completely inclosed in a metal framework. Electrical connections are made via terminal strips located behind the power rack. Equipment handles are provided on the front panel. The front panel contains power source indicators, alarm horns, circuit breakers, input source selector switches, and visual and audible blown fuse indicators. A bypass switch is provided to silence the audible alarm during fuse replacement. The main ac power panel is mounted in the power rack.

1-11. Description of Panel, Power Distribution SB-2784/ TSC-38B

(fig. 1-5)

The SB-2784/TSC-38B (emergency power panel 1A2) consists of a 5 1/4-inch high by 19-inch wide front panel with an attached 10-inch wide by 7-inch deep open chassis. The chassis supports the ac power circuit components, and electrical connections are made via terminal strips located

behind the power rack. The front panel contains a pushbutton switch, circuit breakers, audible alarms, and fuses. Equipment handles are provided on the outside edges of the front panel. The emergency power distribution panel is mounted in the power rack.

1-12. Description of Panel, Power Distribution

SB-2785/ TSC-38B

(fig. 1-5)

The SB-2785/TSC-38B (normal power panel 1A3) consists of a panel and chassis 7 inches high, 14 inches deep, and 19 inches wide. The front panel contains circuit breakers and a pushbutton switch. All electrical connections are made via terminal strips located behind the power rack. Equipment handles are provided on the front panel. The normal power panel is mounted in the power rack.

1-13. Description of Power Supply-Battery

Charger PP-4536/ TSC-38B

(fig. 1-5)

The PP-4536/TSC-38B (power supply-battery charger 1A4) consists of a slide-mounted panel and inclosed cabinet 17 3/4 inches high, 17 1/2 inches deep, and 19 inches wide. The front panel contains circuit breakers, power indicators, and a meter. The back of the cabinet contains intake and exhaust vents for internally mounted fans. Electrical connections are made via terminal strips located behind the power rack. The power supply-battery charger is mounted in the power rack.

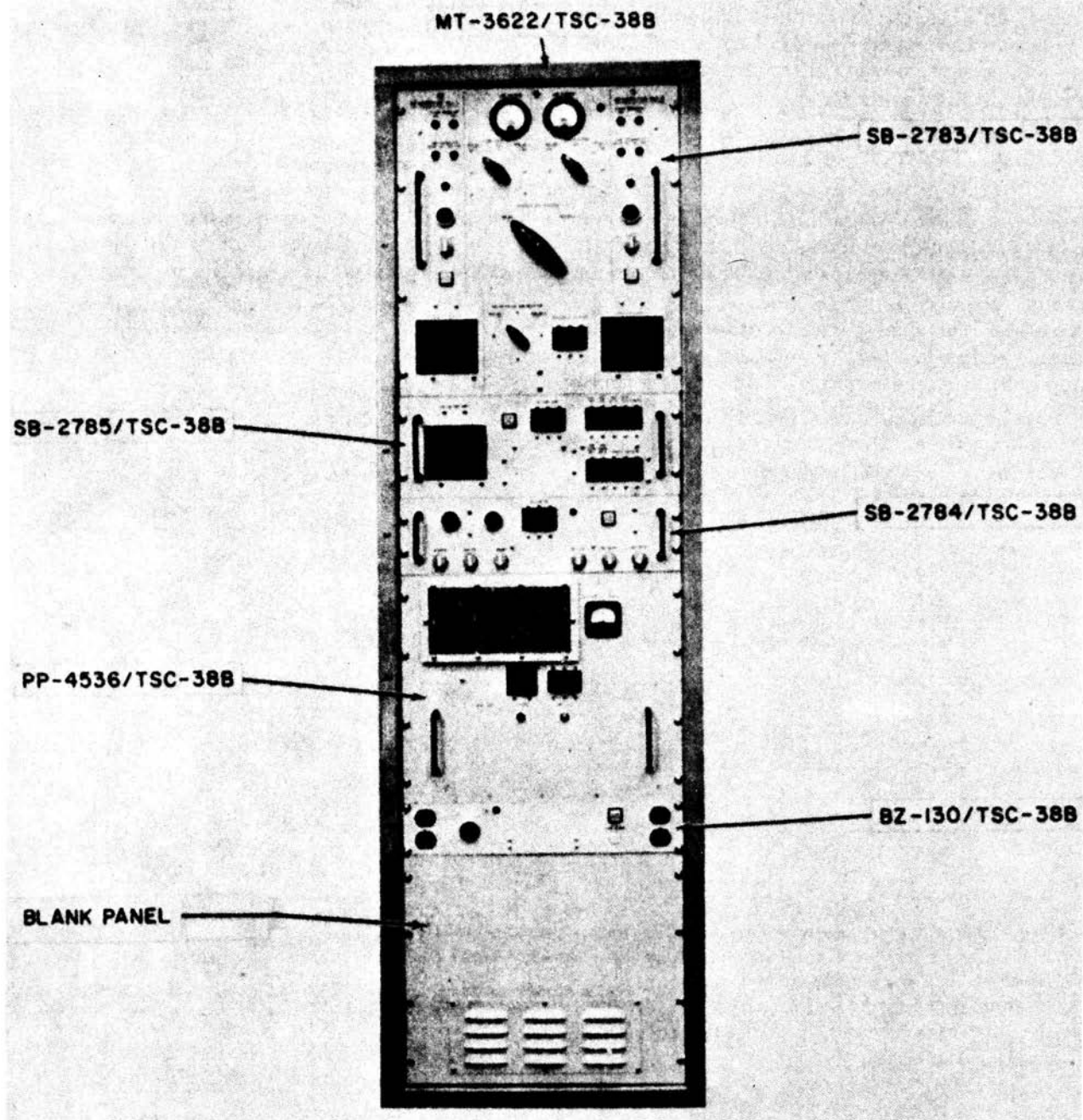


Figure 1-5. Power Supply-Distribution Group OA-7999/TSC-38B (unit 1).

1-14. Description of Alarm-Indicator, Fire Warning BZ-130/ TSC-38B

(fig. 1-5)

The BZ-130/TSC-38B (fire warning panel 1A6) is 3 1/2 inches high, 4 inches deep, and 19 inches wide, and contains the audible fire alarm, alarm bypass switch, fuse receptacles, and other items related to the fire alarm system. All electrical connections are completed via terminal strips located behind the power rack. The fire warning panel is mounted in the power rack.

1-15. Deleted.

1-16. Description of Amplifier, Radio Frequency AM-4543/ TSC-38B

(fig. 1-6)

The AM-4543/TSC-38B (10-kw P.A., unit 2) is 69

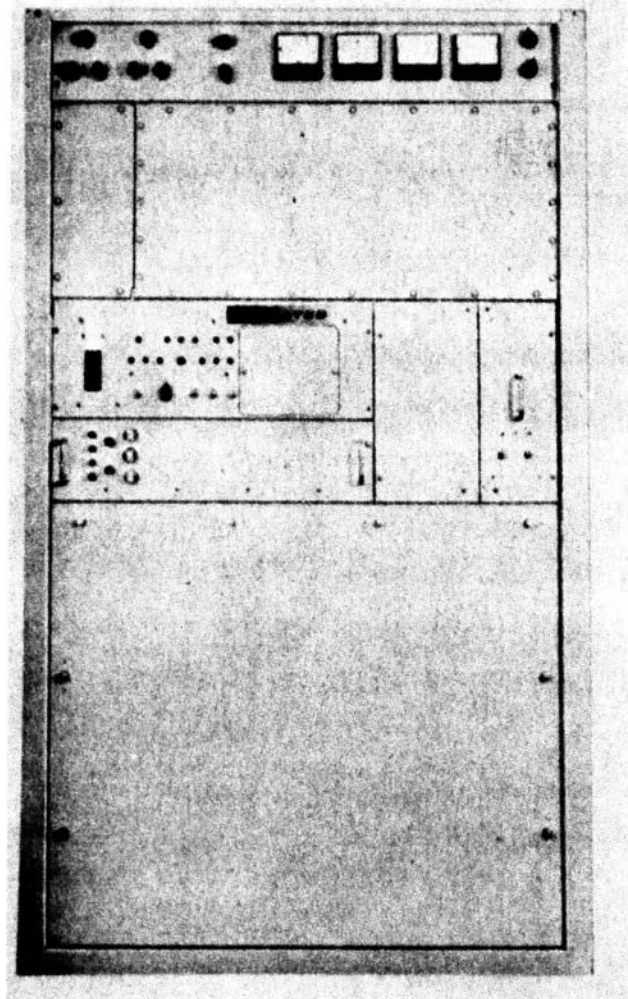


Figure 1-6. Amplifier. Radio Frequency AM-4543/TSC-38B (unit 2).

inches high, 27 inches deep, and 40 inches wide. It is securely attached to the shelter floor and wall. Access to the power, RF, and control circuit connections is available through the top of the unit. The rear of the unit is provided with air inlet and outlet ports for proper amplifier cooling. The air inlet and outlet ports are matched to air ports in the shelter to provide ducting to the outside of the shelter. Access to all circuits and major components of the amplifier is provided through the front of the unit.

1-17. Description of Air Conditioner

(fig. 1-7)

The air conditioner, unit 3, is 60 inches high, 27 inches deep, and 18 $\frac{1}{4}$ inches wide. All operating controls are mounted on a panel located in the front center of the unit. Power connections are completed through an access opening in the top of the unit. Air inlet and outlet ports are located on the rear of the unit and are aligned with similar ports in the shelter wall. Conditioned air (cooled or heated) is provided through a louvered port in the top right side of the unit. The air conditioner is bolted to the floor and wall of the shelter and to the frame of the 10-kw P.A.

1-18. Description of Converter, Frequency, Static CV-2100/ TSC-38B

(fig. 1-7)

The CV-2100/TSC-38B (frequency changer, unit 4) is located on top of the air conditioner. The unit is 12 inches high, 27 inches deep, and 18 inches wide. The front of the unit contains the input filter and the unit circuit breaker. Rigid-mounting techniques are employed to hold the unit in the operating position. Connections to the unit are completed by a terminal strip located at the side of the unit. Connections to the air conditioner are completed through an access hole in the bottom plate. This hole coincides with a corresponding hole in the top of the air conditioner.

1-19. Description of Rack, Electrical Equipment**MT-3624/ TSC-38B**

(fig. 1-8)

The MT-3624/TSC-38B (teletypewriter rack, unit 5) is 71 3/8 inches high and 38 inches wide. It is 25 inches deep in its upper part and 19 inches deep in the lower. It provides mechanical support for components of the communications security equipment and Teletypewriter Group OA- 8002/TSC-38B. Reference designations of the communications security equipment are 5A7, 5A8, 5A9, and 5A10. Teletypewriter Group OA-8002/TSC-38B consists of the SB-2806/TSC-38B (secure ac power panel, 5A1), the SB-2842/TSC-38B (secure teletype patch panel, 5A2), the TT- 76C/GGC (reperforator-transmitter, 5A3), the TT-123A/FG (transmitter-distributor, 5A4), the TT-346A/FG (reperforator, 5A5), the AN/UGC- 4 (teletypewriter set, 5A6), the F-1088/TSC-38B (RFI filter No. 1, 5A12), the F-1089/TSC-38B (RFI filter No. 2, 5A13), the J-2650/TSC-38B (terminal box, 5A14), the J-2649/TSC-38B (interconnecting box, 5A15), and the J- 2648/TSC-38B (distribution box, 5A16). Compartments for teletypewriter and communications security equipments are fitted with slide-mounted shelves; the shelves are secured from rolling by means of captive screws at the front of the shelves.

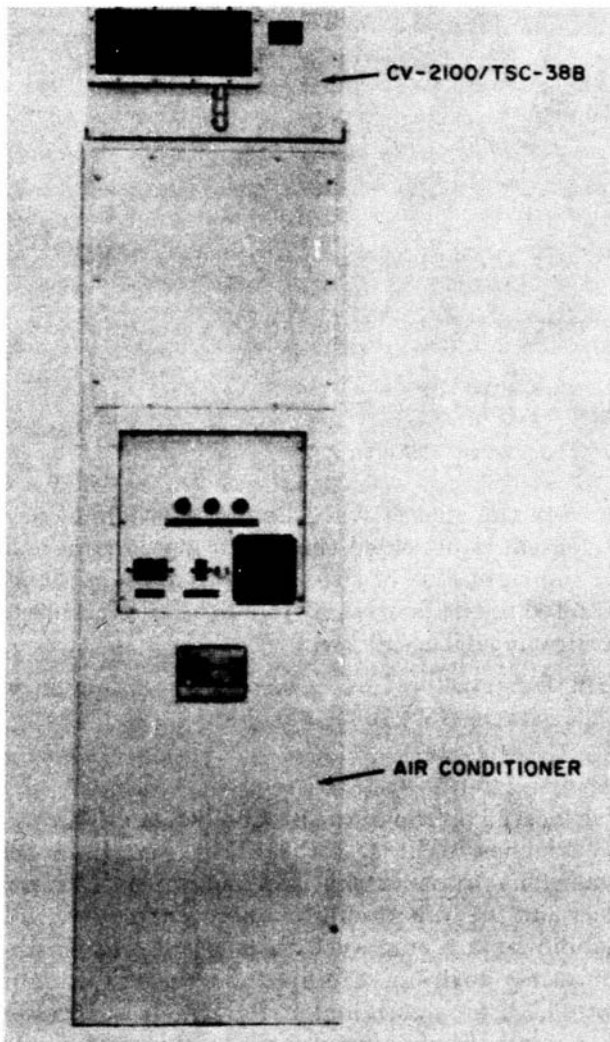


Figure 1-7. Converter, Frequency, Static CV-2100 /TSC-38B(unit 4) and air conditioner (unit 3).

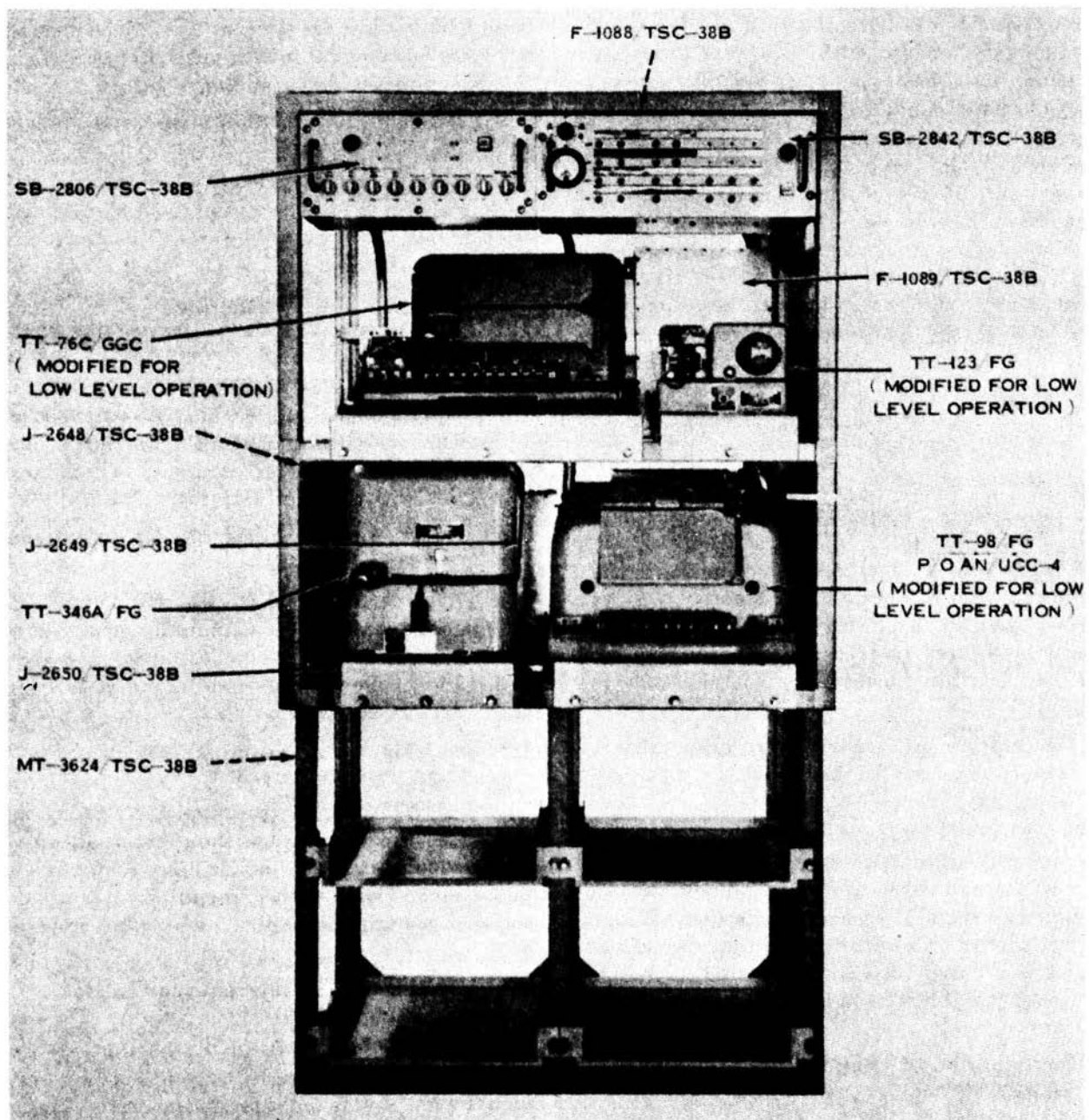


Figure 1-8. Teletypewriter Group OA-8002/TSC-38B (unit 5).

1-20. Description of Panel, Power Distribution

SB-2806/ TSC-38B

(fig. 1-8)

The SB-2806/TSC-38B (secure ac power panel, 5A1) is an inclosure 7 inches high, 8 inches deep, and 16 inches wide. The input ac power is supplied to the distribution panel through an RFI filter. All output circuits to equipment in the secure data subsystem are also filtered. All ac power leads to the equipment are routed through ferrous ducts which are bonded to the enclosure. The face panel of the enclosure provides the mounting for indicating type fuses for each circuit. An audible alarm bypass switch is also mounted on the panel.

1-21. Description of Panel, Patching, Secure

Teletype SB-2842/ TSC-38B

(fig. 1-8)

The SB-2842/TSC-38B (secure teletype patch panel, 5A2) consists of a radiofrequency in-

interference (RFI) shielded enclosure which is 7 inches high, 10 inches deep, and 19 inches wide. The front panel is easily removed for ready access to components located within the enclosure by unscrewing four front panel mounting screws. The front panel supports the secure teletype circuit jack appearances, indicators, indicator control switch, and loop circuit adjustments. In the closed (operating) position, the RFI shielding between the face panel and the shielded enclosure is complete. Jacks are provided for the alarmed, nonsecure send and receive teletypewriter trunks. Controls permit the audio alarm to be bypassed. All shielded, secure teletypewriter circuits leaving the panel are routed in ferrous ducts which are bonded to the rear panel of the shielded enclosure.

**1-22. Description of Reperforator-Transmitter,
Teletypewriter TT-76C/ GGC**

(fig. 1-8)

The TT-76C/GGC (reperforator-transmitter, 5A3) is 12 inches high, 18 inches deep, and 21 inches wide and is located on a shelf in the teletypewriter rack. The shelf is fitted with slides to permit the unit to be withdrawn for servicing. The unit is secured to the shelf with four bolts. The TT-76/GGC has been modified for low level operation.

**1-23. Description of Distributor Transmitter,
Teletypewriter TT-123A/ FG**

(fig. 1-8)

The TT-123A/FG (transmitter-distributor, 5A4) is 6³/₄ inches high, 10¹/₂ inches deep, and 9³/₄ inches wide, and is located on a shelf in the teletypewriter rack. The shelf is fitted with slides to permit the unit to be withdrawn for servicing. The unit is secured to the shelf with four bolts. The TT-123A/FG has been modified for low level operation.

**1-24. Description of Reperforator Teletype-
writer TT-346A/ FG**

(fig. 1-8)

The TT-346/FG (reperforator, 5A5) is 12¹/₂ inches high, 12 ³/₄ inches deep, and 12¹/₄ inches wide, and is located on a shelf in the teletypewriter rack. The shelf is fitted with slides to permit the unit to be withdrawn for servicing. The unit is secured to the shelf with four bolts. Three captive screws located on the front of the shelf secure the shelf to the rack assembly.

**1-25. Description of Teletypewriter Set
AN/ UGC-4**

(fig. 1-8 and 1-11)

The AN/UGC-4 (teletypewriter set, 5A6) is 11¹/₄ inches high, 20 ³/₄ inches deep, and 17¹/₄ inches wide. The unit is mounted on a sliding shelf with four bolts. The AN/UGC-4 (5A6) has been modified for low level operation. Teletypewriter set 7A19 is identical to teletypewriter set 5A6 and is also mounted on a sliding shelf.

**1-26. Description of Communications
Security Equipment**

The communications security equipment (5A7, 5A8, 5A9, and 5A10) is mounted on shelves fitted with slides. Two captive screws located on the front of each shelf secure the shelf to the rack assembly.

**1-27. Description of Filter, Radio Interference
F-1088/ TSC-38B**

The F-1088/TSC-38B (RFI filter No. 1, 5A12) is a completely inclosed unit without external controls or indicators. It is 5 inches high, 7¹/₂ inches deep, and 36 inches wide, and is mounted behind the SB-2806/TSC-38B and SB-2842/TSC-38B.

**1-28. Description of Filter, Radio Interference
F-1089/ TSC-38B**

The F.1089/TSC-38B (RFI filter No. 2, 5A13) is a completely inclosed unit without external controls or indicators. It is 12 inches high, 3¹/₄ inches deep, and 11 inches wide, and is mounted behind the TT-123A/FG.

**1-29. Description of Terminal Box
J-2650/ TSC-38B**

The J-2650/TSC-38B (terminal box, 5A14) is a completely inclosed unit without external controls or indicators. It is 2¹/₂ inches high, 3 inches deep, and 8 inches wide, and is mounted at the rear of the rack behind and slightly below the AN/UGC- 4.

**1-30. Description of Interconnecting Box
J-3649/ TSC-38B**

The J-2649/TSC-38B (interconnecting box, 5A15) is 10 inches high, 3 inches deep, and 6 inches wide, and is mounted in the rear of the rack behind the TT-346A/FG. It contains seven telephone jacks.

**1-31. Description of Distribution Box
J-2648/ TSC-38B**

The J-2648/TSC-38B (distribution box, 5A16) is 10 inches high, 3 inches deep, and 6 inches wide, and is mounted in the rear of the rack behind the TT-346A/FG. It contains four utility outlets (to make available operating power for the teletypewriter equipments).

**1-32. Description of Rack, Electrical Equip-
ment MT-3623/ TSC-38B**

(fig. 1-9)

The MT-3623/TSC-38B (R/T rack, unit 6) is a two-bay rack, 71 3/8 inches high, 25 inches deep, and 42 3/4 inches wide. It provides mechanical support for Receiver-Transmitter Group OA- 8000/TSC-38B. The receiver-transmitter group consists of the TD-826/TSC-38B (logic gate, 6A1), the C-7010/TSC-38B (remote control, 6A2), three R-1402/TSC-38B subassemblies (primary receiver No. 1, 6A3; primary receiver No. 2, 6A4; and secondary receiver, 6A5), the SB- 2808/TSC-38B (RF patch panel, 6A6), the C- 7703/TSC-38B (antenna coupler control, 6A7), the AM-4544/TSC-38B (1-kw P.A., 6A8) two T- 1021/TSC-38B subassemblies (primary transmitter, 6A9, and secondary transmitter, 6A11), the MX-8044/TSC-38B (amplifier-decoder-power distribution assembly, 6A12), the PP-4545/TSC- 38B (power inverter, 6A13), the SB-2948/TSC- 38B (R/T fuse panel, 6A15), and the PP- 6051/TSC-38B (1-kw P.A. power supply, 6A16). Eight of the compartments are fitted with slide mounts. (The slide mounts for the 1-kw P.A. and power inverter compartments are heavy duty.) A blower (fan, centrifugal) is mounted in the upper right-hand corner of the rack, behind the SB-2808/TSC-38B. Terminal boards associated with the power distribution panels are mounted to a panel at the rear of the rack, behind the TD- 826/TSC-38B. An overtemperature (fire) sensor is mounted on the upper left rear wall of the R/T rack. The intermediate distribution frame (IDF), used as an interconnecting terminal block for signals between the R/T rack and interfacing units, is located at the right top of the R/T rack.

1-33. Description of Gate, Logic

TD-826/ TSC-38B

(fig. 1-9)

The TD-826/TSC-38B (logic gate, 6A1) is 5 1/4 inches high, 9 1/2 inches deep, and 19 inches wide. It is secured to the rack with four screws. The front panel is fitted with a hinge and quick- release, one-quarter turn fasteners for rapid access to the board assemblies it contains. Each board is provided with a card ejector. There are thirteen 70-pin connectors located on the rear of the chassis.

1-34. Description of Control, Radio Set

C-7010/ TSC-38B

(fig. 1-9)

The C-7010/TSC-38B (remote control, 6A2) is 14 inches high, 20 inches deep, and 19 inches wide. The operating controls are recessed behind a clear front cover to provide protection for individual control settings and to permit rapid determination of settings with the protective cover in place. The unit is slide-mounted in the equipment rack and may be completely withdrawn for service by releasing the latches located on the equipment section of the slide assembly. All connections to the unit are completed through multicircuit connectors located on the rear of the unit.

1-35. Description of Receiver, Radio

R-1402/ TSC-38B

(fig. 1-9)

Three R-1402/TSC-38B receivers (primary No. 1, 6A3; primary No. 2, 6A4; and secondary, 6A5), contained in 22-inch deep metal cabinets, are mounted in the R/T rack. The front panel of each is 7 inches high and 19 inches wide. The receivers are slide-mounted for ease of removal or replacement in the rack. Equipment handles are provided on the outer edges of the front panel to provide greater ease of handling. All electrical and RF connections are completed through four coaxial connectors, two multicircuit connectors, and a primary power receptacle located on the rear of the receiver cabinets. Four screwdriver- adjustable gain controls for use of maintenance personnel are located on the front panels. Operator controls and indicators are located on the front panel. All three receivers used within the AN/TSC-38B radio subsystem are identical in appearance.

1-36. Description of Panel, Patching, Radio

Frequency SB-2808/ TSC-38B

(fig. 1-9)

The SB-2808/TSC-38B (RF patch panel, 6A6) is 3 1/2 inches high, 1/2 inch deep, and 19 inches wide. It is mounted in the R/T rack by use of four

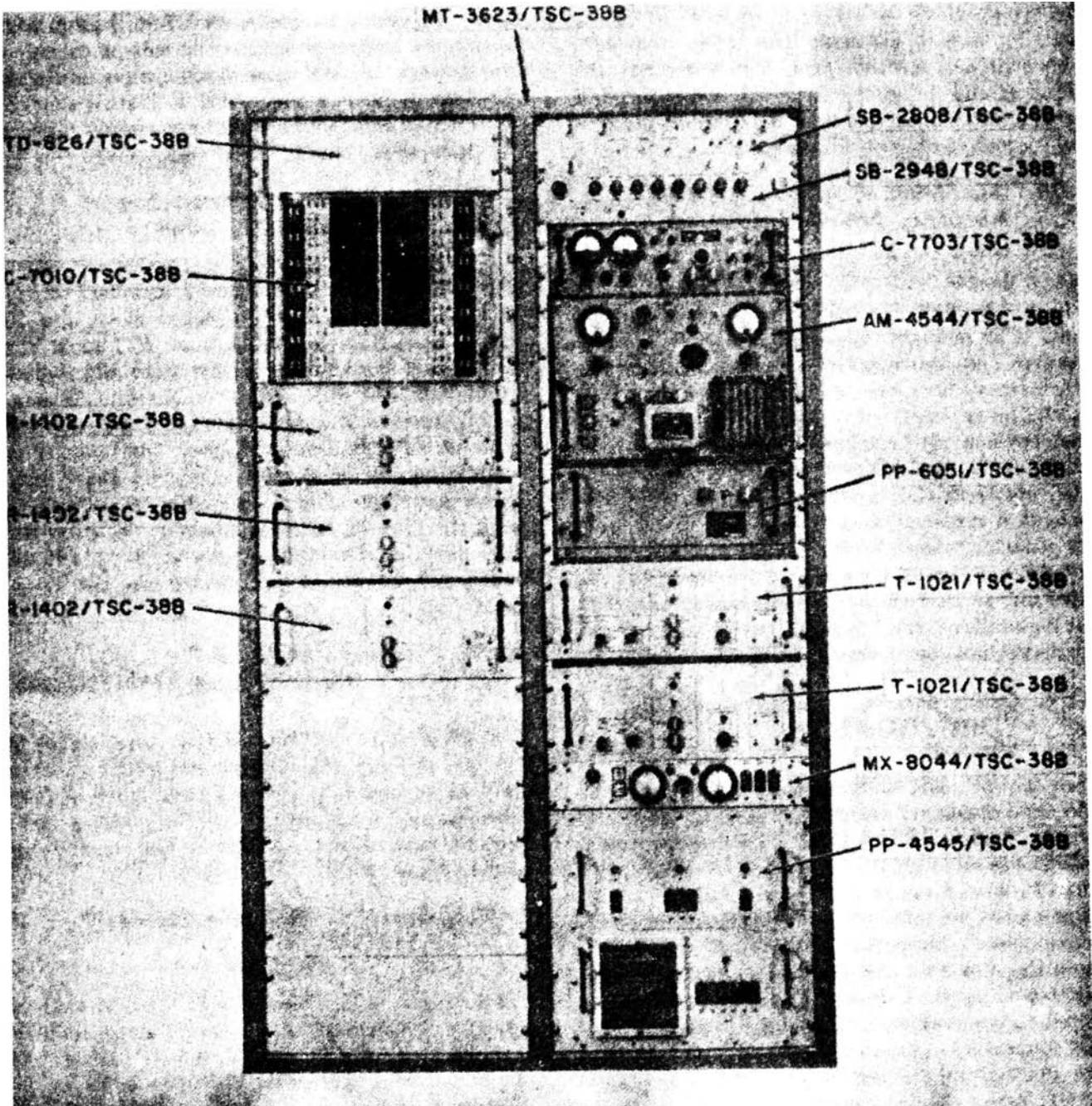


Figure 1-9. Receiver-Transmitter Group OA-8000/TSC-38B (unit 6).

panel mounting screws. The panel contains a group of coaxial connectors which terminate RF cables from the antenna entry panel and from the radio equipment. Distinctive connectors and coaxial cable cords are used to insure that improper connections will not occur.

1-37. Description of Control, Antenna Coupler C-7703/TSC-38B

(fig. 1-9)

The C-7703/TSC-38B (antenna coupler control, 6A7) is 5 1/4 inches high, 10 inches deep, and 19

inches wide. It is mounted in the R/T rack by use of four panel mounting screws. Equipment handles are provided on the outer edges of the front panel for ease of handling. The front panel contains switches, meters, fuses, and indicators. All electrical and RF connections are made through multicircuit connectors and RF coaxial connectors located on the rear of the unit.

**1-38. Description of Amplifier, Radio
Frequency AM-4544/TSC-38B**

(fig. 1-9)

The AM-4544/TSC-38B (1-kw P.A., 6A8) is 12 1/4 inches high, 20 inches deep, and 19 inches wide. It is mounted on slides in the R/T rack. Controls and indicators are located on the front panel. Heavy duty equipment handles are located on the outer edges of the front panel. An air inlet, covered with a reusable screen filter, is provided on the equipment front panel. The circulated air from the internal blower is exhausted through a screened port at the rear of the unit. All electrical connections for remote control are completed through multicircuit connectors located on the rear of the unit. RF input and output connections and the main power connections are also completed on the rear chassis apron.

**1-39. Description of Transmitter, Radio
T-1 021/TSC-38B**

(fig. 1-9)

Two T-1021/TSC-38B (primary transmitter, 6A9; and secondary transmitter, 6A11) high frequency, single-sideband (HF SSB) exciter transmitters are mounted in the radio rack. Each measures 7 inches high, 22 inches deep, and 19 inches wide, and is mounted on slides. The transmitters are completely inclosed to limit extraneous signal radiation. Controls and indicators are located on the front panel. Circuit connections are completed on the rear of the chassis. Three multicircuit connectors are used for remote control, a single multicircuit connector is used for input power, and a single coaxial connector provides for connection of the radio frequency output to the transmitter patching panel. Equipment handles are provided on the outer edges of the front panel.

**1-40. Description of Amplifier-Decoder-
Power Distribution Assembly
MX-8044/TSC-38B**

(fig. 1-9)

The MX-8044/TSC-38B (amplifier-decoder power distribution assembly, 6A12) is 3 inches high, 7 inches deep, and 19 inches wide, and is mounted in the R/T rack. The front panel contains the circuit breakers, switches, normal and emergency indicator lamps, and meters to monitor the normal and emergency power systems. Equipment handles are provided. Circuit connections are completed through multicircuit connectors located on the rear of the unit.

**1-41. Description of Inverter, Power,
Static PP-4545/TSC-38B**

(fig. 1-9)

The PP-4545/TSC38B (power inverter, 6A13) is 17 1/2 inches high, 17 1/2 inches deep, and 19 inches wide, and is mounted in the R/T rack. The front panel contains circuit breakers and indicator lamps. The rear chassis of the unit is completely inclosed in a metal cabinet. The rear cover contains inlet and exhaust fans. The inverter is installed in the equipment rack using heavy duty equipment slides. The inverter may be withdrawn from the rack by releasing the slide locks on the underside of the slide assembly. Two sets of equipment handles are provided on the front panel.

**1-42. Description of Panel, Protection-
Power Distribution SB-2948/TSC-386**

(fig. 1-9)

The SB-2948/TSC-38B (R/T fuse panel, 6A15) is 3 1/2 inches high, 21 1/2 inches deep, and 19 inches wide. It is mounted in the R/T rack by use of four panel mounting screws. The panel contains indicating fuseholders, an audible alarm, and an alarm bypass switch.

**1-43. Description of Power Supply PP-
6051/TSC-38B**

(fig. 1-9)

The PP-6051/TSC38B (1-kw P.A. power supply, 6A16) is 7 inches high, 20 inches deep, and 19 inches wide. It is mounted in the R/T rack by use of panel mounting screws. The panel contains indicating fuse holders and an indicator. The unit is fitted with equipment handles on the front panel.

**1-44. Description of Rack, Electrical
Equipment MT-3625/TSC-38B**

(figs. 1-10 and 1-11)

The MT3625/TSC38B (operator rack, unit 7) contains four bays and is 71 3/8 inches high and 84 inches wide. The right-hand bay is 21 inches deep; the other three bays are 15 1/2 inches deep. The rack provides mechanical support for the

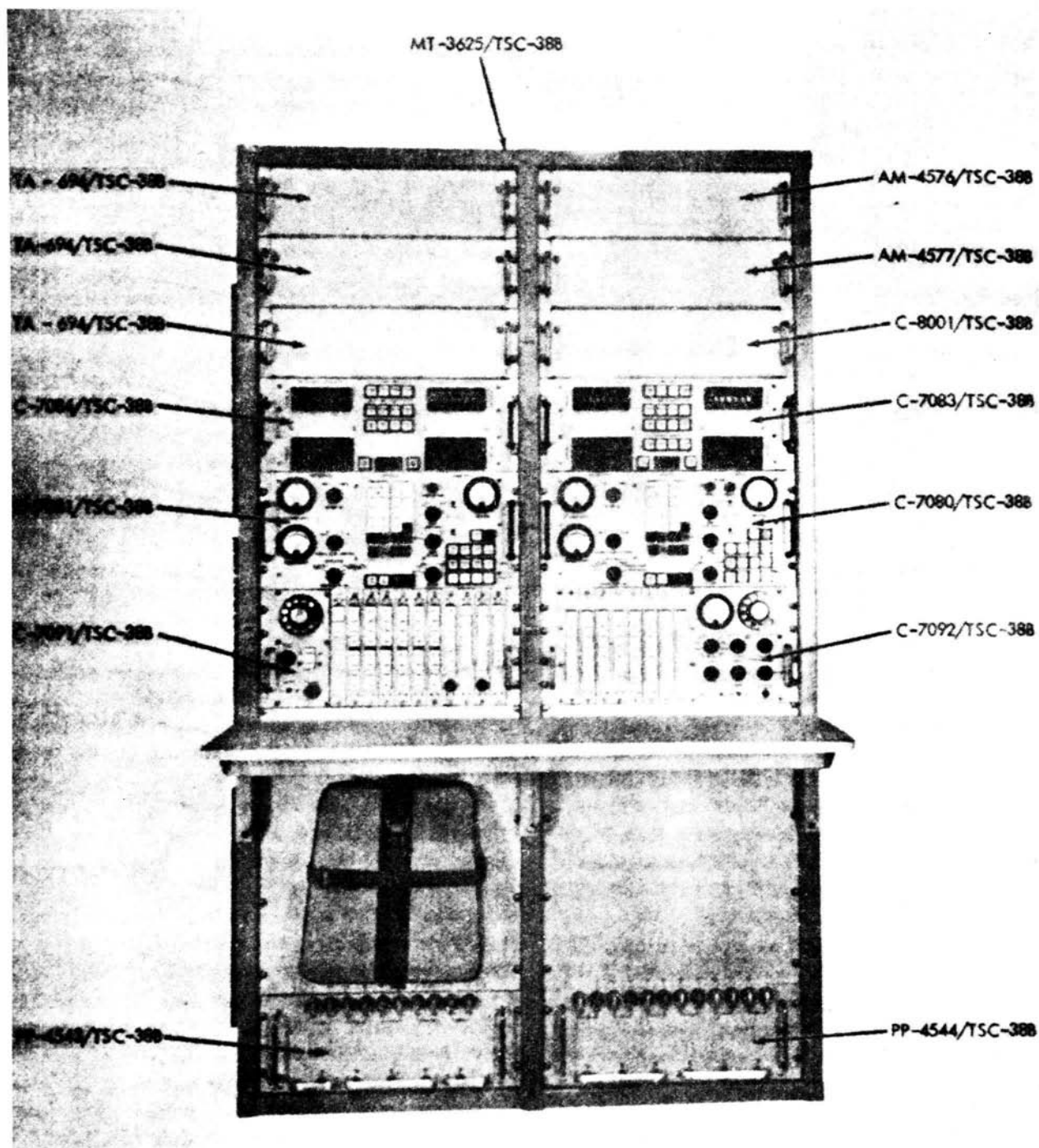


Figure 1-10. Control-Monitor Group OA-8001/TSC-38B (unit 7), left half.

OA-8001/TSC-38B (control-monitor group) which includes the telephone subsystem, the non-secure data subsystem (VFTG), and AN/TSC-38B operator control units. Thirteen of the rack compartments are fitted with drawer-type slide assemblies; one compartment is provided with a sliding shelf, held in place by three captive screws, for the operator teletypewriter. Utility outlets are located at the left side of the teletypewriter compartment to make available

M1-3625/TSC-38B

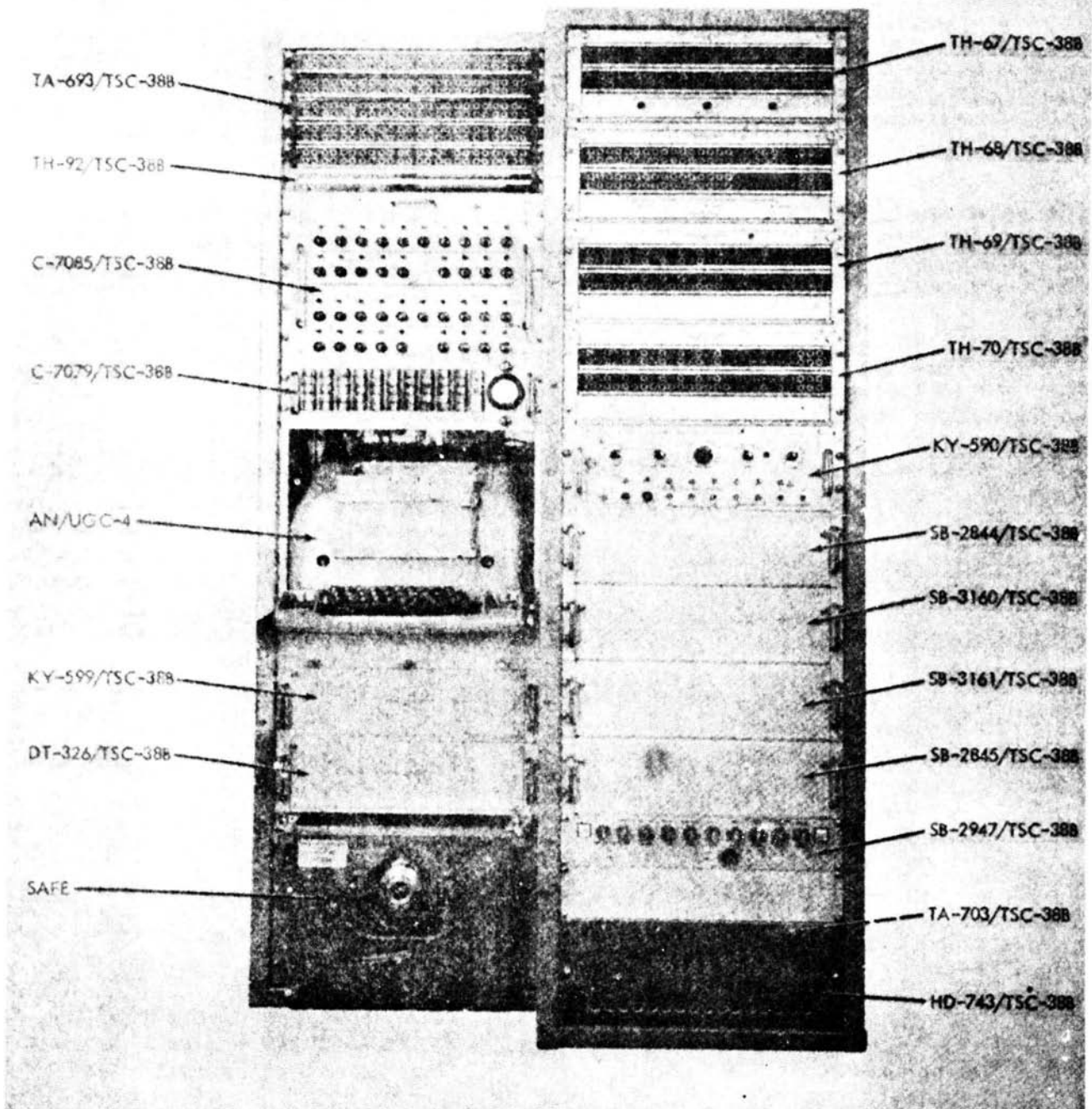


Figure 1-11. Control-Monitor Group OA-8001/TSC-8B (unit 7), right half.

operating power for the teletypewriter and the fox generator (Keyer KY-590/TSC-38B). An overtemperature (fire) sensor is mounted on the back wall of the operator rack. The combined distribution frame (CDF), used as an interconnecting terminal for the power and control signals between the operator rack and interfacing units, is located along the left outside wall of the operator rack. A blower (fan, centrifugal) is mounted to the top (inside) surface of the rack, above

Jack Assembly, Telephone TA-693/TSC-38B. Teletypewriter Set AN/UGC-4 (7A19) is identical to 5A6. The other nomenclatured subassemblies contained in the operator rack are described in paragraphs 1-45 through 1-66.

**1-45. Description of Terminal, Telephone
TA-694/TSC-38B**

(fig. 1-10)

Three identical TA-694/TSC-38B (telephone terminals, 7A1, 7A2, and 7A3) slide-mounted printed circuit card containers are located in the operator rack. Each terminal container is 5 1/4 inches high, 13 3/4 inches deep, and 19 inches wide, and is located in the operator rack. The front panel of each container is fitted with a hinge and quick-release, one-quarter turn fasteners for rapid access to the circuit cards and operating controls. The hinged cover is held in the horizontal position when opened. The entire container may be withdrawn from the equipment track by releasing the locks located on the under-side of the slide assembly. Each container is fitted with equipment handles. All electrical connections to these containers are completed through three 75-pin connectors located on the rear of each chassis.

**1-46. Description of Control-Selector-
Indicator C-7084/TSC-38B**

(fig. 1-10)

The C-7084/TSC-38B (secondary frequency select panel, 7A4) is 7 inches high, 10 1/2 inches deep, and 19 inches wide. The front panel contains operating controls and readout displays for the secondary radio facility. All electrical connections to the panel are completed through six multicircuit connectors on the rear panel of the assembly. The unit is fitted with equipment handles located on the front panel. The unit is slide-mounted and may be withdrawn by releasing the slide locks on the underside of the slide assembly.

**1-47. Description of Control-Indicator
C-7081/TSC-38B**

(fig. 1-10)

The C-7081/TSC-38B (secondary mode and status panel, 7A5) is 8 3/4 inches high, 8 inches deep, and 19 inches wide. The front panel provides the mounting area for controls, meters, and read out displays for equipment status and performance monitoring. Equipment handles are provided on the panel edges. All electrical connections are completed through six multicircuit connectors located on the rear panel of the assembly.

**1-48. Description of Control-Monitor,
Telephone Line C-7091/TSC-38B**

(fig. 1-10)

The C-7091/TSC-38B (telephone control panel 7A6) is 8 3/4 inches high, 8 1/2 inches deep, and 19 inches wide. The face panel contains an operator panel area which includes the operator controls used to complete interface functions with the automatic switchboard. The remaining area of the panel contains 11 plug-in switch modules which are held in position by captive screws located at the top and bottom of the individual modules. One module (DSA) is used with the DSA position functions, six modules (line intercept) are used with wire line telephone subscriber intercept functions, and four modules (10 KW XMTR, 10KW RCVR, 1 KW XMTR, and 1 KW RCVR) are associated with routing of the VFTG sending and receiving terminal tone groups to the radio equipment. Bolt-in techniques are used to hold each assembly in the operator rack. Equipment handles are provided at the lower outside edges of each assembly. All electrical connections are completed through five 75-pin connectors located on the rear of each assembly.

**1-49. Description of Power Supply
Assembly PP-4543/TSC-38B**

(fig. 1-10)

The PP-4543/TSC-38B (VFTG power supply No.1, 7A7) is 7 inches high, 13 inches deep, and 19 inches wide. The front panel contains on-off switches and fuse holders. The power supply assembly is composed of individual 130 vdc power supplies which may be disconnected and removed from the main chassis. The power supply assembly is supported in the equipment rack by means of chassis slides. It may be withdrawn for inspection, service, or other action by releasing the slide locks located on the underside of the slide assembly. The assembly is provided with equipment handles located on the front panel. All connections to the units are completed by means of barrier strip terminals located on the rear of the chassis.

**1-50. Description of Amplifiers, Audio
Frequency AM-4576/TSC-38B and
AM-4577/TSC-38B**

(fig. 1-10)

The AM-4576/TSC-38B (line amplifier No. 1, 7A8) and AM-4577/TSC-38B (line amplifier No.2, 7A9) are slide-mounted printed circuit card containers 5 1/4 inches high, 13 3/4 inches deep,

and 19 inches wide. They are used to house the amplifier units associated with the telephone audio subsystem. The front panel of each container is fitted with a hinge and quick-release, one-quarter turn fasteners for rapid access to the circuit cards. The hinged cover is held in the horizontal position when opened. The entire container may be withdrawn from the equipment rack by releasing the slide locks located on the underside of the slide assembly. Each container is fitted with equipment handles. All electrical connections are completed through three 75-pin connectors located on the rear of each chassis.

**1-51. Description of Control, Electronic
Circuit C-8001/TSC-38B**

(fig. 1-10)

The C-8001/TSC38B (electronic circuit control, 7A10) is a slide-mounted printed circuit card container 5 1/4 inches high, 1 3/4 inches deep, and 19 inches wide. This unit houses the supervisory equipment associated with the automatic switchboard, the telephone terminals, and the operator control subsystem. The front panel is fitted with a hinge and quick-release, one-quarter turn fasteners for rapid access to the circuit cards. The hinged cover is held in the horizontal position when opened. The entire container may be withdrawn from the operator rack by releasing the locks located on the underside of the slide assembly. The front panel is fitted with equipment handles. All electrical connections are completed through five 75-pin connectors located on the rear of the chassis.

**1-52. Description of Control-Selector-
Indicator C-7083/TSC-38B**

(fig. 1-10)

The C-7083/TSC38B (primary frequency select panel, 7A11) is used with the primary radio facility and is 7 inches high 10 1/2 inches deep, and 19 inches wide. The front panel contains operating controls and readout displays for the primary radio facility. All electrical connections to the panel are completed through six multicircuit connectors located on the rear panel of the assembly. The unit is fitted with equipment handles located on the front panel. It is slide-mounted and may be withdrawn by releasing the slide locks on the underside of the slide assembly.

**1-53. Description of Control-Indicator
C-7080/TSC-38B**

(fig. 1-10)

The C-7080/TSC38B (primary mode and status panel, 7A12) is associated with the primary radio facility and is 8 3/4 inches high 8 1/2 inches deep, and 19 inches wide. The front panel provides the mounting area for controls, meters, and displays for equipment status and performance monitoring. Equipment handles are provided on the panel edges. All electrical connections are completed through six multicircuit connectors located on the rear panel of the assembly.

**1-54. Description of Control-Monitor, Radio
Line C-7092/TSC-38B**

(fig. 1-10)

The C-7092/TSC-38B (radio line control, 7A13) is 8 3/4 inches high, 9 inches deep, and 19 inches wide. The front panel contains the controls and indicators used to provide radio-to-automatic switchboard interface connections. These controls are divided between an operator panel and eight plug-in switching modules. The switching modules are held in place on the panel by captive screws located at the top and bottom of each module. The unit is mounted in the equipment rack with rack mounting screws through the front panel. Handles are provided at the lower edges of the unit to facilitate removal.

**1-55. Description of Power Supply
Assembly PP-4544/TSC38B**

(fig. 1-10)

The PP-4544/TSC38B (VFTG power supply No.2, 7A14) is 7 inches high, 13 inches deep, and 19 inches wide. The front panel contains on/off switches and fuseholders. The 12- and 130-volt dc assemblies are composed of individual power supply units which may be disconnected and removed from the main chassis. The assembly is supported in the equipment rack by means of chassis slides. The entire assembly may be withdrawn for inspection, service, or other action by releasing the slide locks located on the underside of the slide assembly. The assembly is provided with equipment handles located on the front panel. All connections to the unit are completed by means of barrier strip terminals located on the rear edge of the chassis. The barrier strip terminals are provided with safety covers which must be removed before connections or disconnections can be completed.

**1-56. Description of Jack Assembly,
Telephone TA-93/TSC-38B**

(fig. 1-11)

The TA-693/TSC-38B (audio patch panel, 7A15) consists of an assembly of five jack panels. The

assembly is 83/4 inches high, 8 inches deep, and 19 inches wide. The TA-693/TSC-38B provides a jack field for audio frequency signals important to overall system performance. Each jack panel contains two rows of 24 jacks. All electrical internal connections to the TA-693/TSC-38B are made direct from the combined distribution frame(CDF).

**1-57. Description of Jack Assembly,
Teletype TH-92/TSC-38B** (fig. 1-11)

The TH-92/TSC-38B (jack assembly, 7A16) is 13/4 inch high, 83/8 inches deep, and 19 inches wide. The TA-92/TSC-38B provides a jack field for each teletype-writer subscriber and VFTG unit to allow crosspatching a selected teletype-writer subscriber to a selected VFTG terminal unit.

**1-58. Description of Control-Selector,
Telegraph Line C-7085/TSC-38B** (fig. 1-11)

The C-7085/TSC-38B (telegraph line control,7A17) consists of two units: a shallow, drawer-type chassis (LOOP CURRENT & BIAS ADJ.)which measures 13/4 inch high, 11 inches deep,and 19 inches wide and has an equipment handle mounted in the center of its front panel, and a drawer-type chassis which measures 101/2 inches high, 121/2 inches deep, and 19 inches wide and has equipment handles mounted at the outside edges of the front panel. The C-7085/TSC-38B provides the circuit controls, switches, and adjustments associated with each subscriber send and receive circuit. (The LOOP CURRENT &BIAS ADJ. chassis pulls out to give access to individual circuit level adjustments.) All electrical connections are made through 13 multicircuit connectors located on the rear of the chassis.

**1-59. Description of Control, Telegraph
Line C-7079/TSC-38B** (fig. 1-11)

The C-7079/TSC-38B (VFTG channel control 7A18) is 51/4 inches high, 8 inches deep, and 19 inches wide and is mounted in the operator rack.The front panel contains the operator control switches used for control of wire line teletype-writer subscribers to the VFTG terminal. Circuit monitoring provisions are also included. Equip-ment handles are provided on the outside edges of the panel. All electrical connections are made through ten multicircuit connectors located on the rear panel of the assembly. Nine of the connectors are 36-pin types; the remaining connector is a 16-pin type which is used for power and teletype loop current connections.

**1-60. Description of Keyer-Detector
KY-599/TSC-38B** (fig. 1-11)

The KY-599/TSC-38B (keyer-detector, 7A20) is 51/4 inches high, 13/2 inches deep, and 19 inches wide. The unit is mounted in the operator rack and is fitted with equipment handles. In the normally-closed (operating) position, the cover is held closed by two captive screws located in the upper corners of the cover.

**1-61. Description of Detector, Audio
Frequency DT-326/TSC-38B** (fig 1-11)

The DT-326/TSC-38B (AF detector, 7A21) is 51/4 inches high, 131/2 inches deep, and 19 inches wide. The unit is mounted in the operator rack and is fitted with equipment handles. The hinged front cover extends downward to expose the printed circuit cards. The cover is normally closed and held in position by two captive screws located in the upper portion of the cover.

**1-62. Description of Terminals, Telegraph
TH-7/TSC-38B, TH-8/TSC-38B,
TH-69/TSC-38B, and TH-70/TSC-
38B** (fig. 1-11)

The TH-67/TSC-38B (VFTG No. 1, 7A22),TH-68/TSC-38B (VFTG No. 2, 7A23),TH-69/TSC-38B (VFTG No. 3, 7A24), and TH-70/TSC-38B (VFTG No. 4, 7A25) are each 7 inches high, 17 inches deep, and 19 inches wide.Pilot pins mounted on the equipment rack in back of the units engage holes in the units to provide rear support. The hinged front panel of each unit is held in position by means of two captive screws located in the upper corners. The panels support jack fields for the VFTG system and swing down-ward to provide access to printed circuit cards.All electrical connections are made at the rear of the units, through multicircuit connectors (12 connectors for the TH--67/TSC-38B, three for the other units). The units contain components for three VFTG terminals (16-channel, 2-channel,and wide-band).

**1-63. Description of Keyer KY-590/TSC-
38B** (fig. 1-11)

The KY-590/TSC-38B (fox generator, 7A26) is 51/4 inches high, 161/2 inches deep, and 19 inches

wide. The unit is slide-mounted and the front panel contains all operational controls to permit use of the unit as either a standard message source or as maintenance equipment. All electrical connections are completed through two multi-circuit connectors, located inside the rear apron on the chassis, and a power cord.

**1-64. Description of Switchboards, Interior
Communication SB-2844/TSC-38B,
SB-2845/TSC-38B, SB-3160/TSC-
38B, and SB-3161/TSC-38B**
(fig. 1-11)

The SB-2844/TSC-38B (subscriber logic No. 1,7A27), SB-3160/TSC-38B (subscriber logic No.2, 7A28), and SB-3161/TSC-38B (subscriber logic No. 3, 7A29) contain provisions for the telephone subsystem subscriber logic and related sub-scriber circuitry. The SB-2845/TSC-38B (link logic switchboard, 7A30) performs switch board link selection functions. Each unit is 51/4 inches high, 183/4 inches deep, and 19 inches wide. All four units are slide-mounted in the operator rack. The front panel of each container is fitted with a hinge and quick-release fasteners for rapid access to the cards. The hinged cover is held in the horizontal position when opened. The entire container may be withdrawn by releasing the slide locks located on the equipment section of the slide. Each container is fitted with equipment handles. All electrical connections to these containers are completed through two 75-pin connectors located on the rear of each chassis.

**1-65. Description of Cooler, Air, Electronic
Equipment HD-743/TSC-38B**
(fig. 1-11)

The HD-743/TSC-38B (VFTG blower, 7A32) is 7 inches high, 16 inches deep, and 19 inches wide, and is mounted in the bottom of the operator rack by use of rack mounting screws. The front panel contains the air intake vent. The unit contains no integral controls nor indicators; it is automatically put into operation when power is applied to the system. Air is forced upward through exhaust outlets in the rear of the unit. The exhaust outlets are provided with protective guards.

**1-66. Description of Generator, Ringing,
Static TA-703/TSC-38B**
(fig. 1-11)

The TA-703/TSC-38B (ringing generator, 7A31), which provides ringing current for the telephone switchboard, is a completely enclosed unit without external controls or indicators. It measures 101/2 inches high, 43/4 inches deep, and 19 inches wide, and is mounted behind the HD-743/TSC-38B.

**1-67. Description of Panel, Protection-Power
Distribution SB-2947/TSC-38B**
(fig. 1-11)

The SB-2947/TSC-38B (control-monitor fuse panel, 7A34) is 31/4 inches high, 19 inches wide, and 3 inches deep. The front panel contains fuse holders and two switches.

**1-68. Description of Shelter Miscellaneous
Components**
(fig. 1-12)

Additional minor components of the AN/TSC-38B are as follows: 8-day mechanical-wind message center clock, two steel folding chairs, first aid kit, fire extinguisher, and portable typewriter. During transport the preceding items are stored against the shelter wall between the air conditioner and the teletypewriter rack. A pencil sharpener is mounted under the operator shelf, and a safe is mounted in a bottom compartment of the operator rack. Three parts and container cases are stored in the shelter during transport. These cases are described in paragraphs 1-69, 1-70, and 1-71. The antenna coupler is stored in the shelter during transport. The antenna coupler is described in paragraph 1-72.

Figure 1-12. Shelter, Electrical Equipment S-414/TSC-38 interior layout.

(Located in back of manual.)

**1-69. Description of Case, Antenna Sections
CY-6 167/TSC-38B**
(figs. 1-12 and 1-13)

The CY-6167/TSC-38B (whip antenna case) is 11 inches high, 8 inches deep, and 583/4 inches wide, and is located in the shelter during transport. The whip antenna case contains two Antenna Elements AT-1039/U, two Antenna Elements AT-1040/U, two Antenna Elements AT-1041/U, two Antenna Elements AT-1042/U, ten Antenna Elements AT-1043/U, and one Rod, Ground GP-128/G as shown in figure 1-13.

**1-70. Description of Case, Antenna Access-
ories CY-6168/TSC-38B**
(figs. 1-12 and 1-14)

The CY-6168/TSC-38B (whip antenna parts case) is 61/2 inches high, 8 inches deep, and 583/4 inches wide, and is located in the shelter

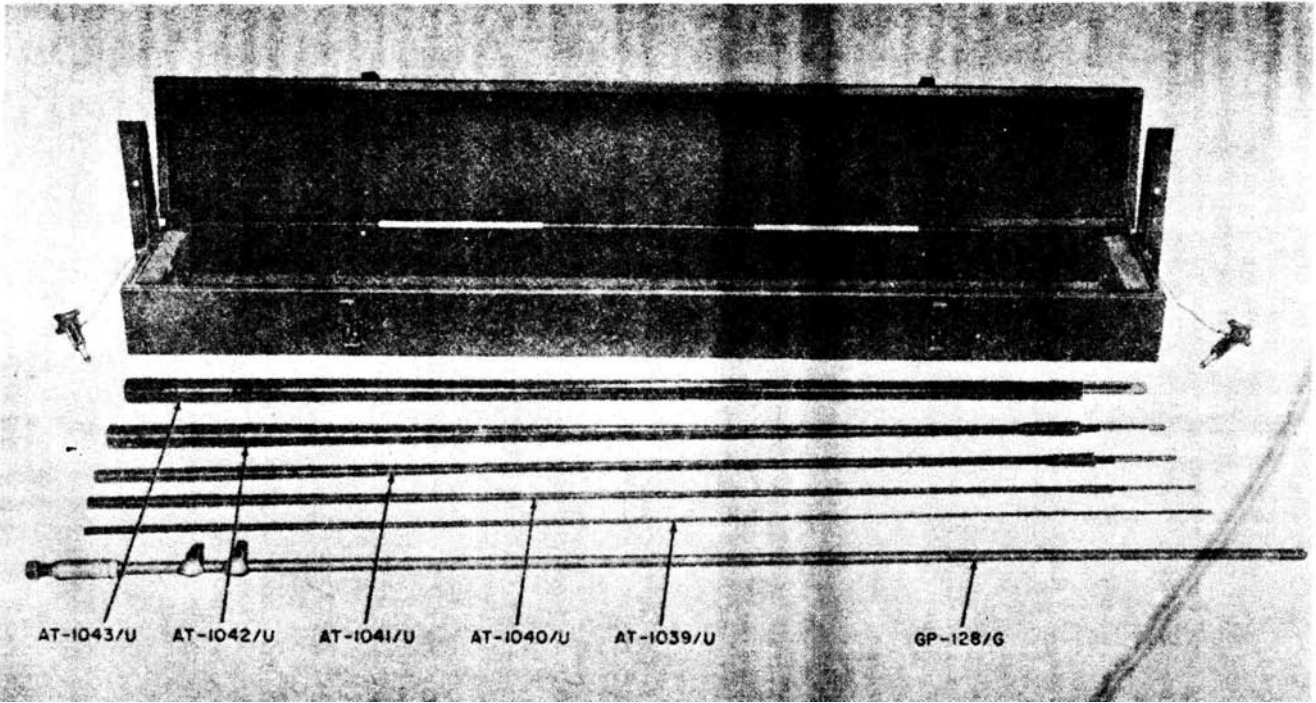


Figure 1-13. Identification of components in Case, Antenna Sections CY-6167/TSC-38B.
1-27

during transport. The whip antenna parts case contains four Stakes, Guy GP-126/G; one Reel,Cable RC-467/G; one Cable Assembly, Radio Frequency CG-3256/U; and other components as shown in figure 1-14.

1-71. Description of Case, Base Antenna, Sections CY-6166/TSC-38B

(figs. 1-12 and 1-15)

The CY-6166/TSC-38B (whip antenna base case) is 15 inches high, 12 inches deep, and 13 inches wide, and is located in the shelter during transport. The whip antenna base case contains one Base, Antenna Support AB-996/TSC-38B;one Base, Mast AB-1090/TSC-38B; six Cord Assemblies, Electrical CX-11511/U; three Cable Assemblies, Radio Frequency CG-3247/U; one Cable Assembly, Radio Frequency CG-2851/U; four Cable Assemblies, Radio Frequency CG-3258/U; one Headset H-144C/U; one Head set H-216/U; one Microphone, Dynamic M-146/U; two Cords, Extender CD-307A; six Cord Assemblies, Electrical CX-10814/U; two Adaptors UG-29B/U; eight Cord Assemblies, Electrical CX-10815/U; and other components as shown in figure 1-15.

1-72. Description of Coupler, Antenna CU-1561/TSC-38B

(fig. 1-16)

The CU-1561/TSC-38B (antenna coupler, 10A1)is 103/4 inches high, 151/8 inches wide, and 251/2 inches deep. To facilitate carrying, the CU-1561/TSC4-38B has two handles attached at each end. During transport, the antenna coupler is stored in the shelter (fig. 1-12). During operation, the antenna coupler is mounted on the out-side end of the shelter.

1-73. Description of Antenna AS-1903/TSC-38B

The AS-1903/TSC-38B consists of a 36-foot whip antenna element and an antenna base threaded to mate with the whip antenna mounting on the roof of the equipment shelter. The antenna element is made up of nine sections. The bottom five sections are identical; the upper four section taper progressively. In normal operation, the AS-1903/TSC-38B is mounted on the shelter and,in the duplex mode of operation, serves as transmitting antenna for the secondary radio facility; in the simplex mode, it functions alternately as receiving and transmitting antenna. During transport, the components of the AS-1903/TSC-38B are stored in cases in the equipment shelter.

1-74. Description of Antenna AS-1904/TSC-38B

The AS-1904/TSC4-38B consists of a 36-foot whip antenna element (identical to the whip antenna element of AS-1903/TSC-38B), a tripod antenna base, and guy ropes. The antenna element is made up of nine sections. The bottom five sections are identical; the upper four sections taper progressively. In normal operation, the AS-1904/TSC-38B serves as the receiving antenna for the secondary radio facility. It is in-stalled at a distance of up to 200 feet from the shelter and connected to it by Cable Assembly, Radio Frequency CG-3256/U. During transport, the components of the AS-1904/TSC4-38B are stored in cases in the equipment shelter.

1-75. Description of Communications Support Group OA-8036/TSC-38B

(figs. 1-17 and 1-29)

The OA-8036/TSC-38B (support group) is mounted on Dolly Set, Lift, Transportable Shelter XM689, which consists of Dolly, Trailer, Front XM690 and Dolly, Trailer, Rear XM691.The major unit of OA-803,6/TSC4-38B is Pallet,Transport-Storage MT-3655/TSC-38B. The pal-let provides mounting space for two gas turbine engine generator sets, and storage space in nine waterproof compartments for antennas, cables, tool kits, and installation equipment. All compartment doors have recessed locking handles which may be locked with the same key. The compartment door (compartment 8)-on the front or towing end is divided to permit opening while the pallet is mounted on the dolly set. An equip ment box and cable reel assembly are mounted on top of the pallet between the generator sets.

-
- | | | |
|-----------------------------|---------------------------|----------------------------------|
| 1 RC-467/G | 5 Ground rod removal tool | 9 Shelter or field whip guy ring |
| 2 4-lb sledge hammer | 6 Small shackle (4) | (2) |
| 3 Whip antenna guy rope (6) | 7 Tripod leg (3) | 10 CG-3256/U (200 ft) |
| 4 Large shackle (2) | 8 GP-126/G(4) | |

Figure 1-14—Continued.
1-28

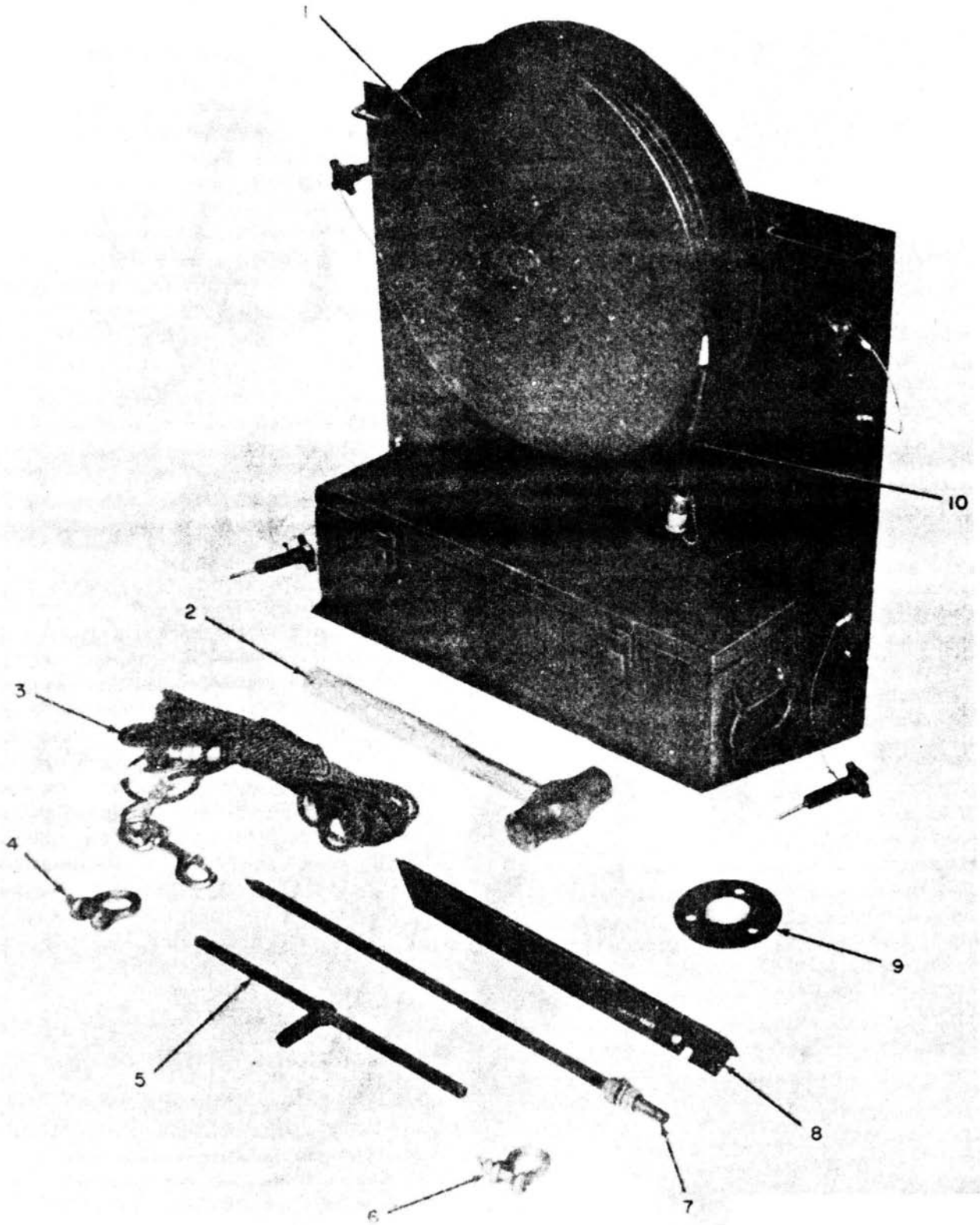


Figure 1-14. Identification of components in Case, Antenna Accessories
CY-6168/TSC-38B.

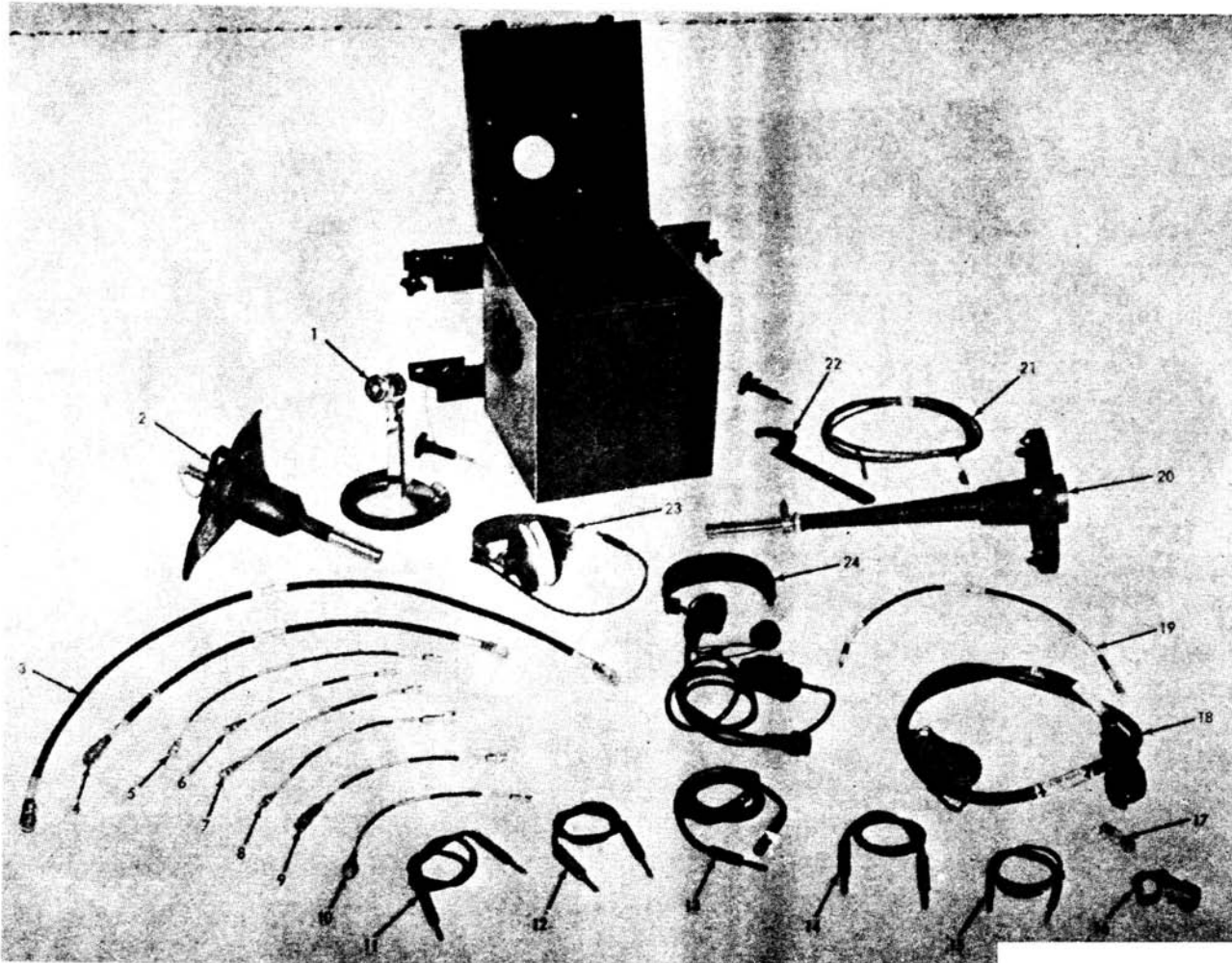


Figure 1-15. Identification of components in Case, Antenna Base Sections CY-666/TSC-8B.

- | | | |
|--------------------------------|------------------------------------|---|
| 1 M-146/U (dynamic microphone) | 10 CG-3258/U (1 ft 0 in.) W7 | 18 RF coupler multiconductor cable |
| 2 AB-996/TSC-38B | 11 CX-11511/U (2 ft 0 in.) (6) | 19 RF coupler to shelter whip antenna cable |
| 3 CG-3247/U (3 ft 10 in.) W15 | 12 CX-10815/U (2 ft 0 in.) (8) | 20 AB-1090/TSC-38B |
| 4 CG-3247/U (2 ft 3 in.) W6 | 13 CD-307A (2) | 21 Equipment shelter ground wire assembly |
| 5 CG-3258/U (1 ft 6 in.) W14 | 14 CX-10814/U (2 ft 0 in.) (6) | 22 Spanner wrench |
| 6 CG-3258/U (0 ft 10 in.) W13 | 15 PJ-714 (10) | 23 H-216/U (headset) |
| 7 CG-3258/U (1 ft 0 in.) W10 | 16 UG-216B/U (right angle adapter) | 24 H-144C/U (headset) |
| 8 CG-3258/U (1 ft 0 in.) W9 | 17 UG-29B/U (2) | |
| 9 CG-3258/U (1 ft 0 in.) W8 | | |

Figure 1-15-Continued.

1-76. Description of Generator Set, Gas Turbine Engine GTGE 70-9-2

(fig. 1-17)

Two GTGE 70-9-2 generator sets are provided. Each weighs 1,195 pounds and is 44 inches high, 36 inches wide, and 79 inches long. They are mounted on top of Pallet, Transport-Storage MT-3655/TSC-38B. Each generator has a rated output of 60 kilowatts of 3-phase, 120/208-240/416 vac, 400-cps electrical power. As installed for normal operation, the generators are grounded by means of grounding rods and the generator output circuits are connected to GENERATOR NO. 1 and GENERATOR NO. 2 connectors at the shelter power entry panel via Cable Assembly, Power, Electrical CX-11510/U.

1-77. Description of Pallet, Transport-Storage MT-3655/TSC-38B

(figs. 1-17 and 1-29)

The MT-3655/TSC-38B (pallet, unit 11) is 83 inches high, 81 inches wide, and 122 inches long. The pallet is fitted with lifting rings and is mounted on a Dolly Set, Lift, Transportable Shelter XM689 for movement by land. An equipment box, cable reels, and the gas turbine generator sets are carried on the top of the pallet. The open reels (i.e., those not enclosed in the reel box) include 2 Reels, Cable RC-470/G; 2 Cable Assemblies, Power, Electrical CX-11510/U; 1 Reel, Cable RC-471/G; and 1 Cable Assembly, Radio Frequency CG-3246/U (10-kw coaxial cable). Compartments are provided in the pallet to store and transport spare parts and antenna components.

1-78. Description of Case, Accessories CY-6164/TSC-38B

(figs. 1-18 and 1-19)

The CY-6164/TSC-38B (accessories case) is 9 inches high, 19 inches deep, and 9 inches wide. Three accessories cases are located in compart-

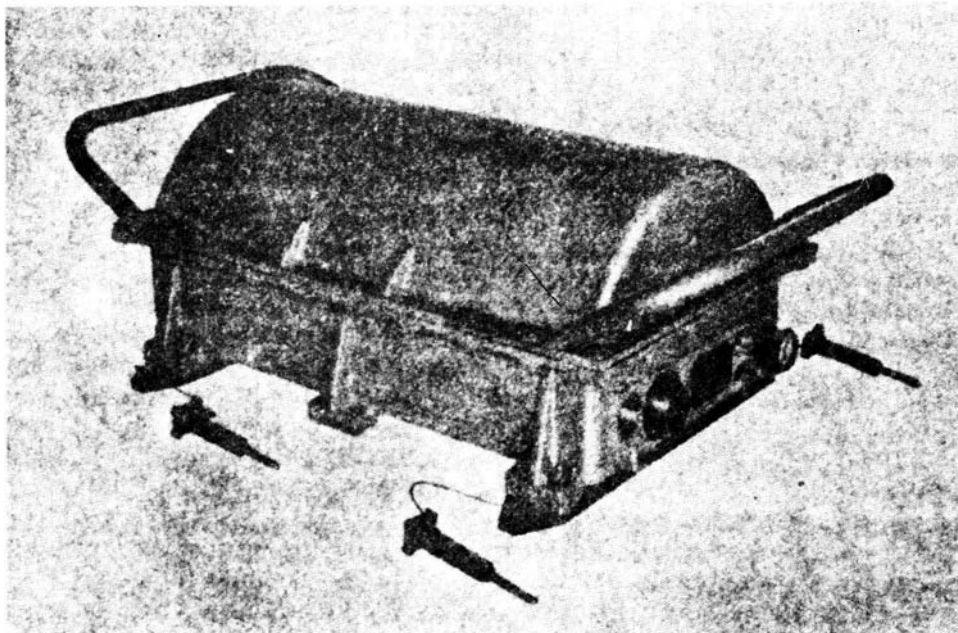


Figure 1-16. Coupler, Antenna CU-15611/TSC-38B.

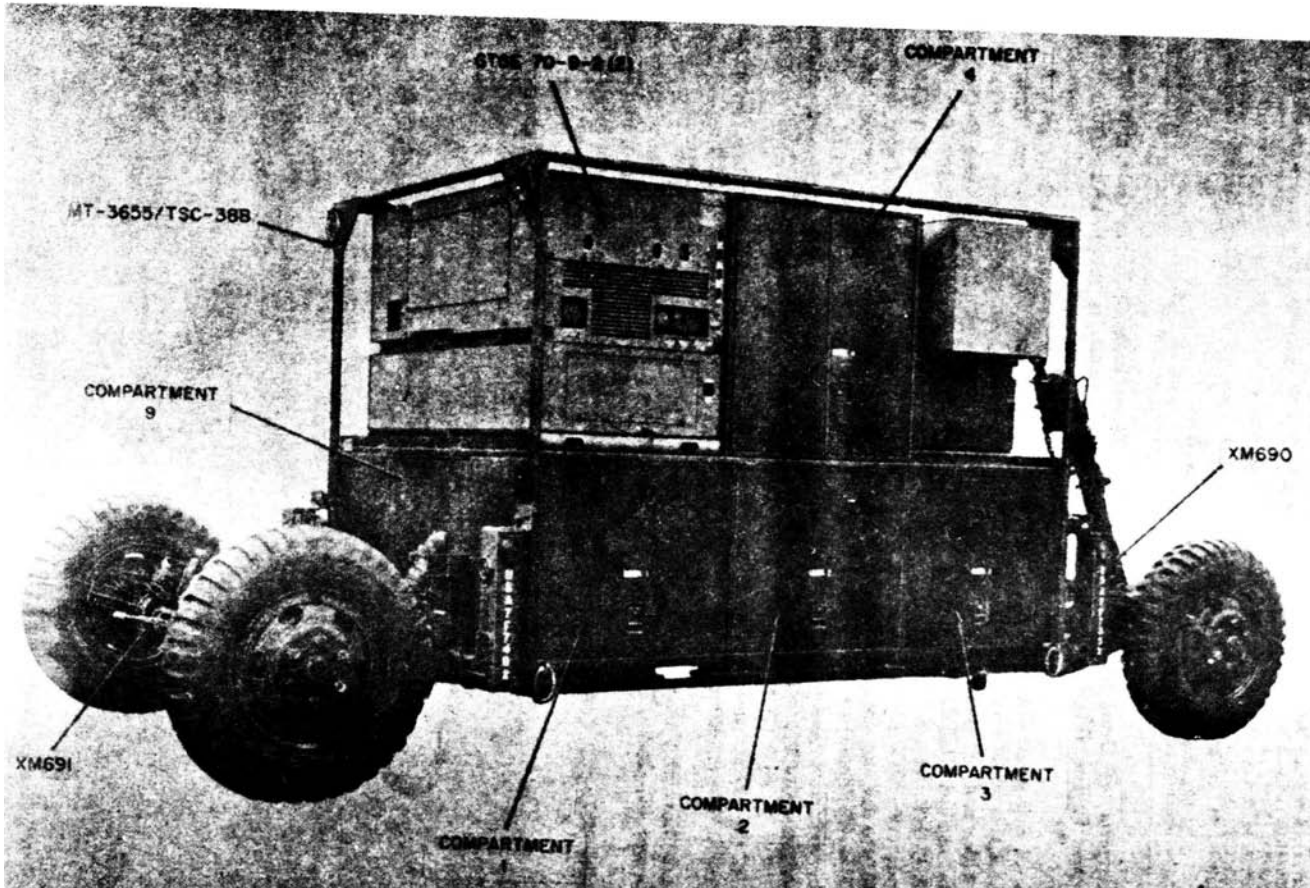


Figure 1-17. Communications Support Group OA-8056/TSC-38B, curbside view.

ment 1 of the pallet. Each accessories case contains 3 Bases, Antenna Support AB-1009/TSC-38B, 15 Stakes, Guy GP-126/G, 6 Guys MX-7738/TSC-38B, and other components as shown in figure 1-19.

1-79. Description of Case, Antenna Accessories CY-6165/TSC-38B

(figs. 1-18, 1-20, and 1-21)

The CY-6165/TSC-38B is 9 inches high, 35 inches deep, and 10 inches wide. Three of these cases are located in compartment 1 of the pallet. Each CY-6165/TSC-38 contains 8 Insulators, Strain IL-61/TSC-38B; 1 Plate, Guy MX-7741/TSC-38B; 7 Spacers, Transmission Line MX-7739/TSC-38B; and other components. There are two CY-6165/TSC-38B cases that are used with a 1-kw sloping vee antenna. The components of one of these cases are shown in figure 1-20. The third CY-6165/TSC-38B case contains those components that are used with a 10-kw sloping vee antenna and is shown in figure 1-21.

1-80. Description of Case, Electrical Equipment CY-6163/TSC-38B (1-KW Terminator)

(figs. 1-22 and 1-23)

The CY-6163/TSC-38B (1-kw terminator case)

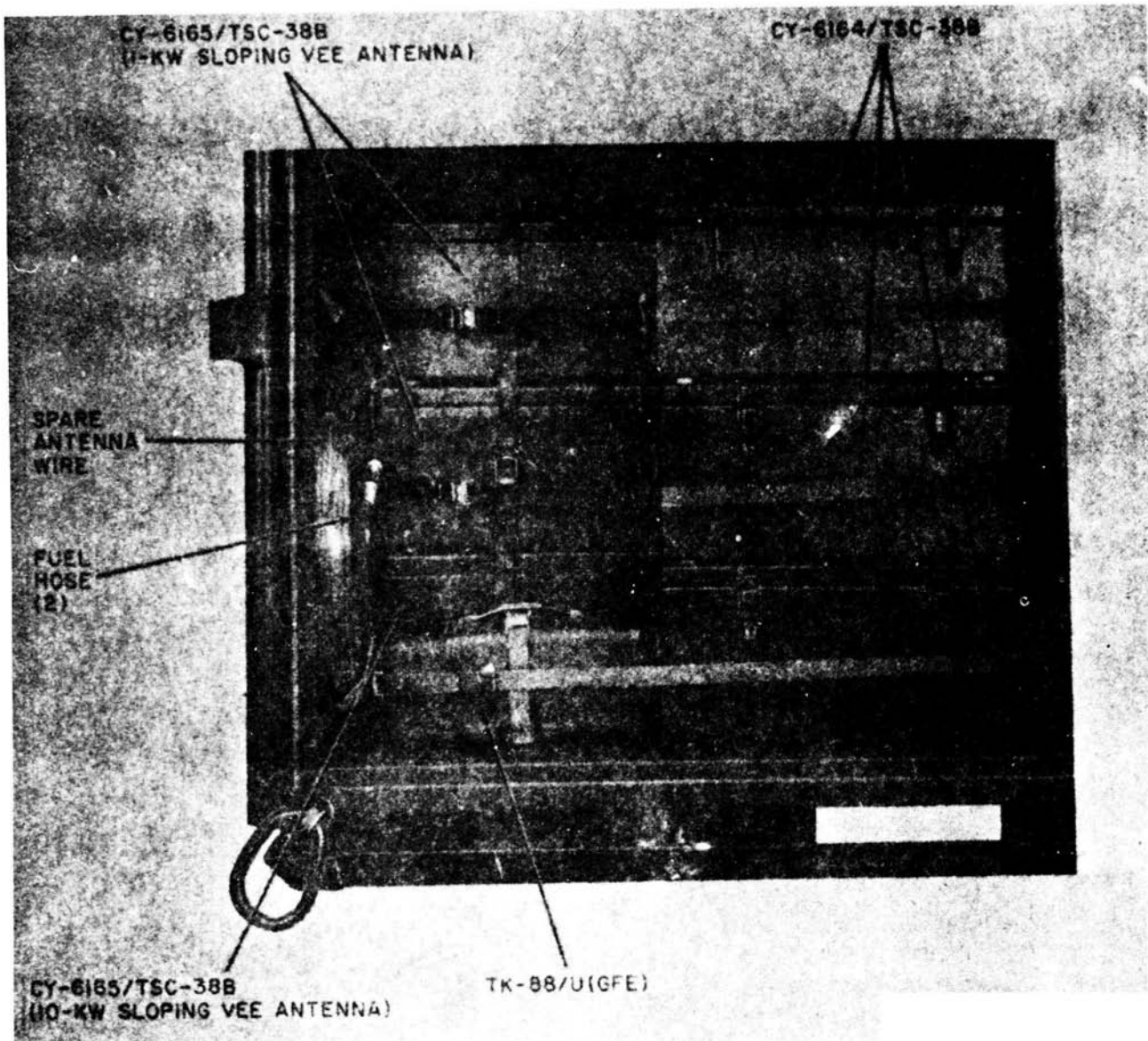


Figure 1-18. Compartment 1.

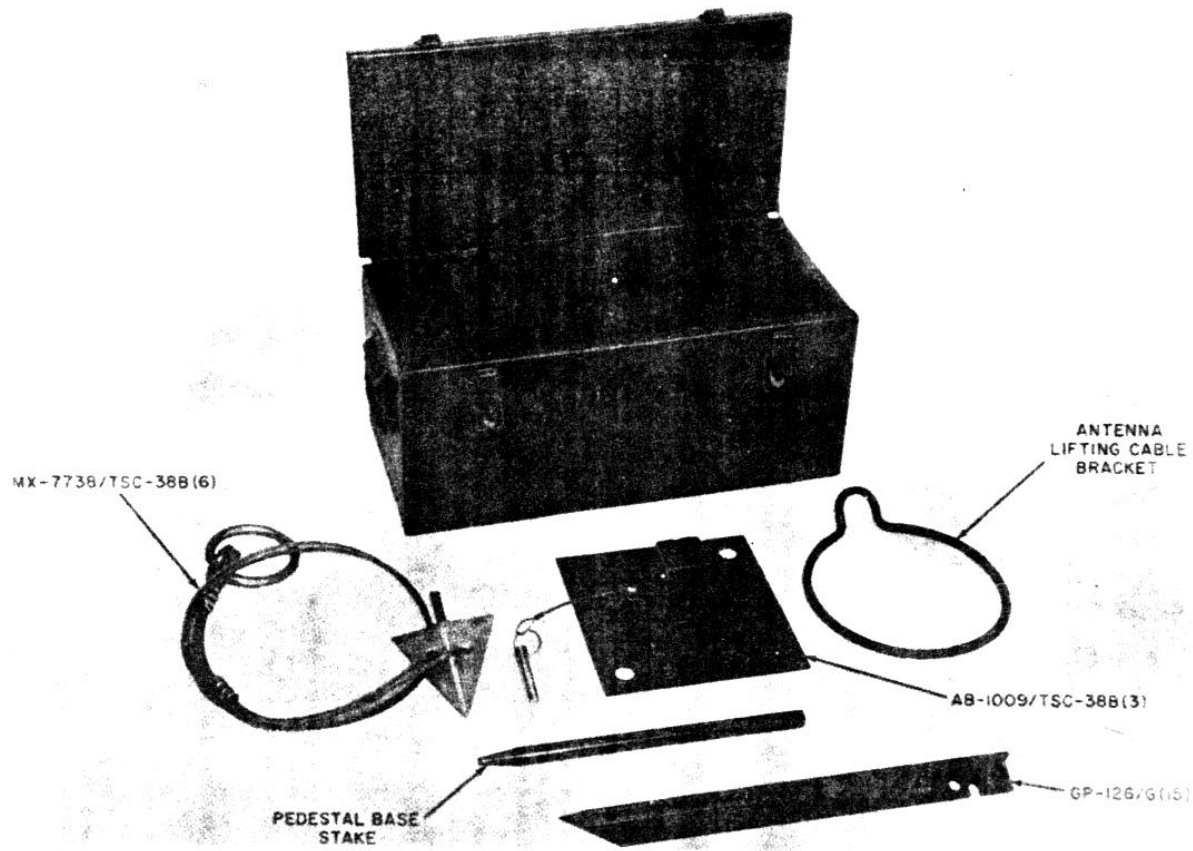


Figure 1-19. Identification of components in Case. Accessories CY-6164/TSC-38B.

TM 11-5895-356-12-1/TO 31R2-2TSC38-41

is 16 inches high, 12 inches deep, 36 inches wide and is located in compartment 2 of the pallet. Each 1-kw terminator case contains two Terminating Units, Radio Frequency MX-7650/TSC-38B (1-kw terminator).

1-81. Description of Case, Electrical Equipment CY-6163/TSC-38B (1-Kw Balun)

(figs. 1-22 and 1-24)

The CY-6163/TSC-38B (1-kw balun case) is 16 inches high, 12 inches deep, 36 inches wide and is located in compartment 2 of the pallet. The 1-kw balun case contains two Couplers, Transmission Line CU-1668/TSC-38B (1-kw balun).

1-82. Description of Case, Accessories-Spare Parts CY-6432/TSC-38B

(figs. 1-22 and 1-25)

The CY-6432/TSC-38B (spares/accessories case) is 9 inches high, 35 inches deep, and 10 inches wide, and is located in compartment 2 in the pallet. The spares/accessories case contains a soldering gun, a compass and case, a 100-foot tape measure, one packaged crocus cloth, one roll of cheesecloth, one package of sandpaper, a battery tester, and the running spares as shown in figure 1-25.

1-83. Description of Case, Terminating Unit CY-6162/TSC-38B

(figs. 1-26, 1-27, and 1-32)

The CY-6162/TSC-38B (10-kw terminator case) is 29¾ inches high, 24 inches deep, and 19½ inches wide. Two 10-kw terminator cases are provided; one is located in compartment 3, and one in compartment 6. Each 10-kw terminator case contains one Terminating Unit, Radio Frequency MX-7651/TSC-38B (10-kw terminator).

1-84. Components in Compartment 4

(fig. 1-28)

During transport, compartment 4 in the pallet contains the following: four Cable Assemblies, Radio Frequency CG-3256/U; four Reels, Cable RC-467/G; six Reels, Cable RC-468/G; six Reels, Cable RC-469/G; six Antenna Elements AB-1010/TSC-38B; and six Counterpoises, Antenna MX-7740/TSC-38B.

1-85. Description of Case, Coupler, Transmission Line CY-6161 /TSC-38B

(figs. 1-30 and 1-31)

The CY-6161/TSC-38B (10-kw balun case) is 27¼ inches high, 28¾ inches deep, and 17 inches wide, and is located in compartment 5 in the pallet. The 10-kw balun case contains one Coupler, Transmission Line CU-1667/TSC-38B (10-kw balun).

1-86. Description of Components in Compartments 8 and 9

(figs. 1-33 through 1-38)

Compartment 8 in the pallet contains a multiple leg sling bag and a mast base storage assembly. The mast base storage assembly consists of Base, Antenna Support AB-997/TSC-38B, three Guys MX-7738/TSC-38B; an Adapter Plate, Antenna MX-7734/TSC-38B; three Guys MX-7737/TSC-38B; three Guys MX-7735/TSC-38B; three Guys MX-7736/TSC-38B; and other components as shown in figures 1-34 and 1-35. The components in the multiple leg sling bag are shown in figure 1-36. Compartment 9 contains two mast base, storage assemblies, shown in figures 1-34 and 1-35, and three antenna storage board assemblies. Components in compartment 9 are shown in figures 1-37 and 1-38. Each of the antenna storage board assemblies contains Mast AB-998/TSC-38B; Mast Section AB-1008/TSC-38B; three Supports, Antenna AB-1007/TSC-38B; two Rods, Ground GP-125/G; and other components as shown in figure 1-38. One of the antenna storage board assemblies contains an additional Mast Section AB-1008/TSC-38B and a Jacobs staff and one additional Rod, Ground GP-125/G.

1-87. Description of Antenna Group OE-39/TSC-38B

The radiating elements of the OE-39/TSC-38B (10-kw sloping vee antenna) consist of two wires or legs, each approximately 500 feet long and installed in the form of a sloping "V." The "V" is supported at its angle by a 50-foot antenna mast, and at its ends by 4-foot posts. Electrically, the outer ends of the antenna legs are each connected, via a resistance-type terminator unit, to a counterpoise ground. The feed ends of the antenna legs are connected, via a balun and Cable Assembly, Radio Frequency CG-3246/U, to the primary (10-kw) power amplifier located in the equipment shelter. In transport, components of the OE-39, TSC-38B are stored in the pallet.

1-88. Description of Antenna Group OE-40/TSC-38B

The antenna elements of the OE-40/TSC-38B (1-kw sloping vee antenna) consist of two wires

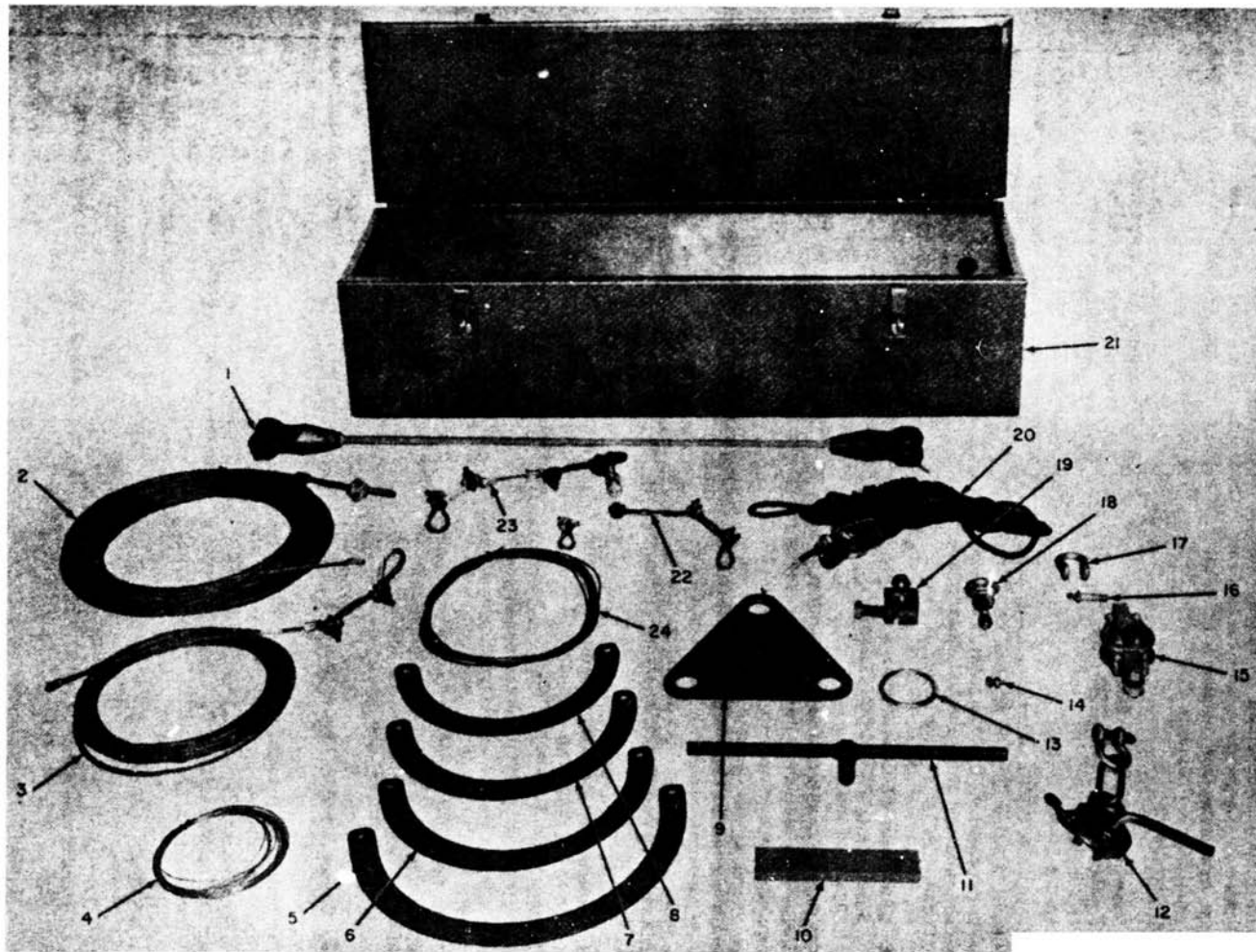


Figure 1-20. Identification of components in Case, Antenna Accessories CY-6165/TSC-38B (1-kw sloping vee antenna).

or legs, each approximately 500 feet long and installed in the form of a sloping "V." The 'V' is supported at its angle by a 50-foot antenna mast, and at its ends by 4-foot posts. Electrically, the outer ends of the antenna legs are each connected, via a resistance-type terminator unit, to a counterpoise ground. The feed ends of the antenna legs are connected, via a balun and two lengths of Cable Assembly, Radio Frequency CG-3256/U, to a primary radio facility receiver located in the equipment shelter. In normal operation the two antennas are used as receiving antennas for the primary radio facility; if necessary, however, either of the antennas can be used, without modification, as a transmitting antenna for the secondary (1-kw) radio facility. In transport, components of the OE-40/TSC-38B are stored in the pallet.

1 IL-61/TSC-38B (8)	9 MX-7741/TSC-38B (1)	17 Shackle (13)
2 Antenna lifting cable (1)	10 MX-7739/TSC-38B (7)	18 Eyebolt assembly (12)
3 Terminator guy wire (2)	11 Ground rod removal tool (1)	19 Counterpoise clamp (1)
4 Copper wire, 12 AWG (15 feet)	12 Snubit (3)	20 Guy rope (11)
5 Ring for mast section No. 1 (2)	13 Insulator-to-shackle adapter (4)	21 Separator board (1)
6 Ring for mast section No. 2 (2)	14 Serv-nut (30)	22 Strain insulator strap (4)
7 Ring for mast section No. 3 (2)	15 Antenna lifting pulley (1)	23 Apex strap
8 Ring for mast section No. 4 (2)	16 Clevis pin (13)	24 Pallet ground wire

Figure 1-20 - Continued

Change 4 1-37

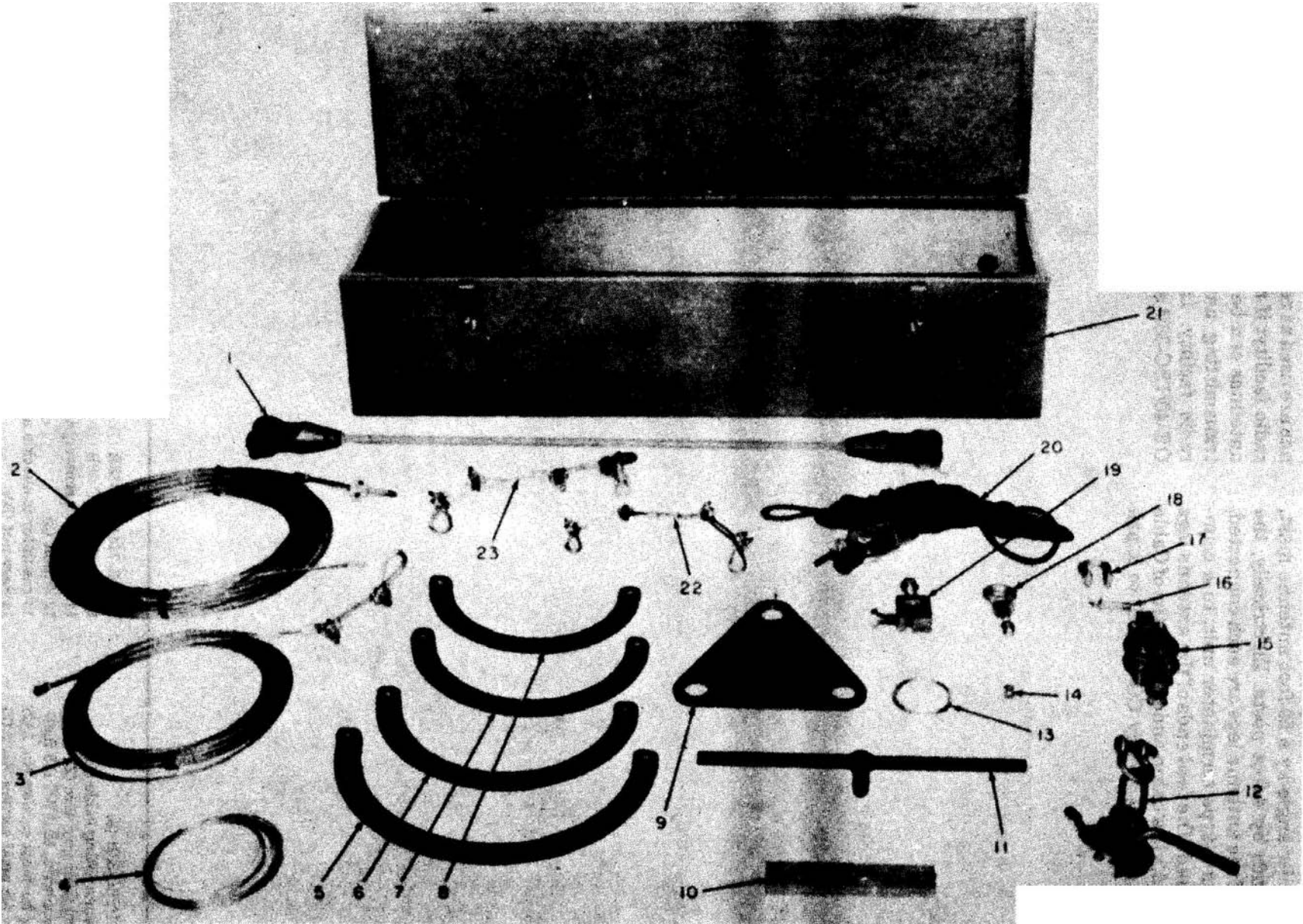
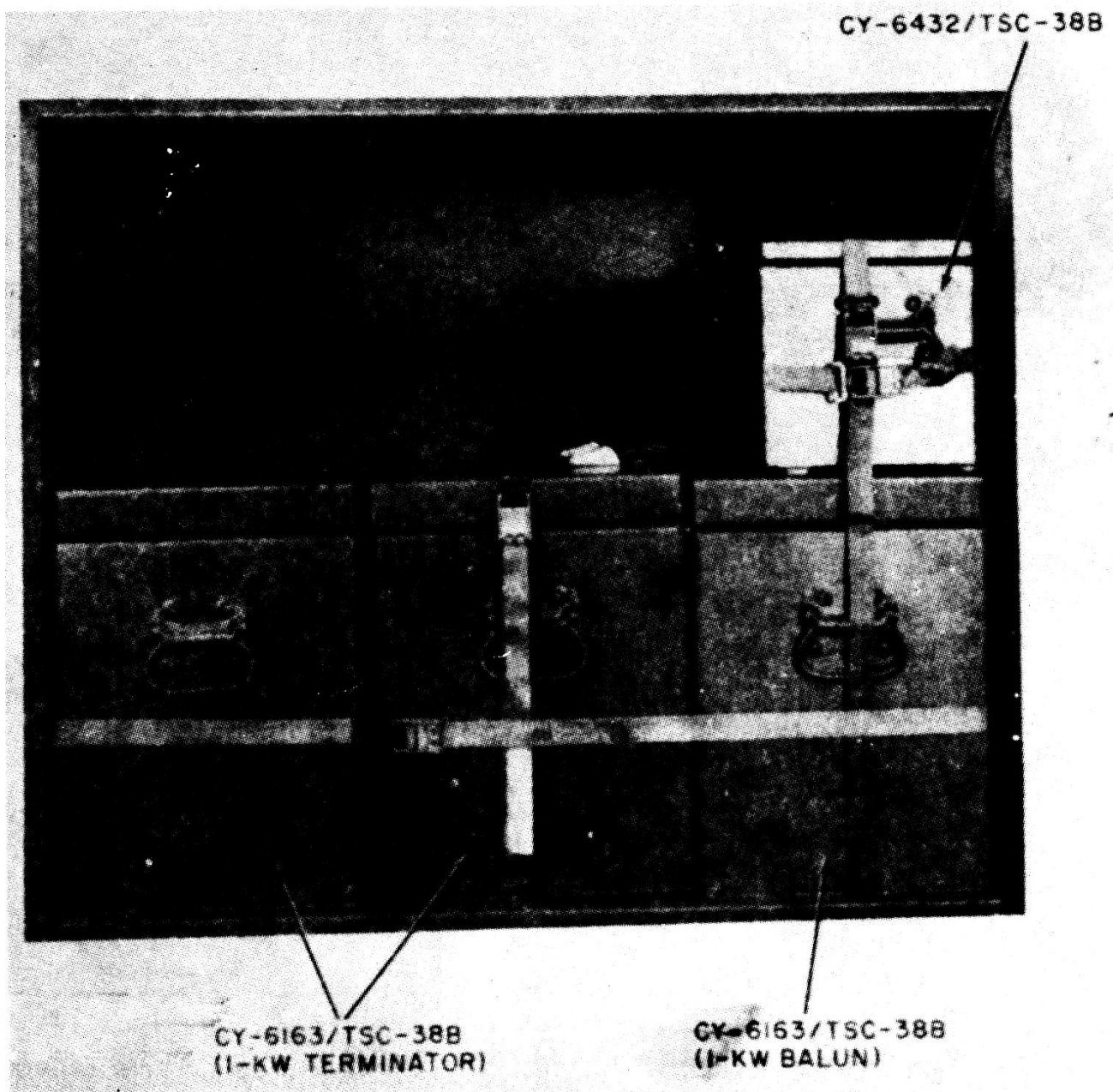


Figure 1-21. Identification of components in Case, Antenna Accessories CY-6165ITSC4-8B (10-kw sloping vee antenna).

- | | | |
|-----------------------------------|-------------------------------------|-------------------------------|
| 1 IL-61/TSC-38B (8) | 9 MX-7741/TSC-38B (1) | 17 Shackle (13) |
| 2 Antenna lifting cable (1) | 10 MX-7739/TSC-38B (7) | 18 Eyebolt assembly (12) |
| 3 Terminator guy wire (2) | 11 Ground rod removal tool (1) | 19 Counterpoise clamp (1) |
| 4 Copper wire, 12 AWG (15 feet) | 12 Snubit (3) | 20 Guy rope (11) |
| 5 Ring for mast section No. 1 (2) | 13 Insulator-to-shackle adapter (4) | 21 Separator board (1) |
| 6 Ring for mast section No. 2 (2) | 14 Serv-nut (30) | 22 Strain insulator strap (4) |
| 7 Ring for mast section No. 3 (2) | 15 Antenna lifting pulley (1) | 23 Apex strap |
| 8 Ring for mast section No. 4 (2) | 16 Clevis pin (13) | |

Figure 1-21 - Continued

Figure 1-22. Compartment 2.



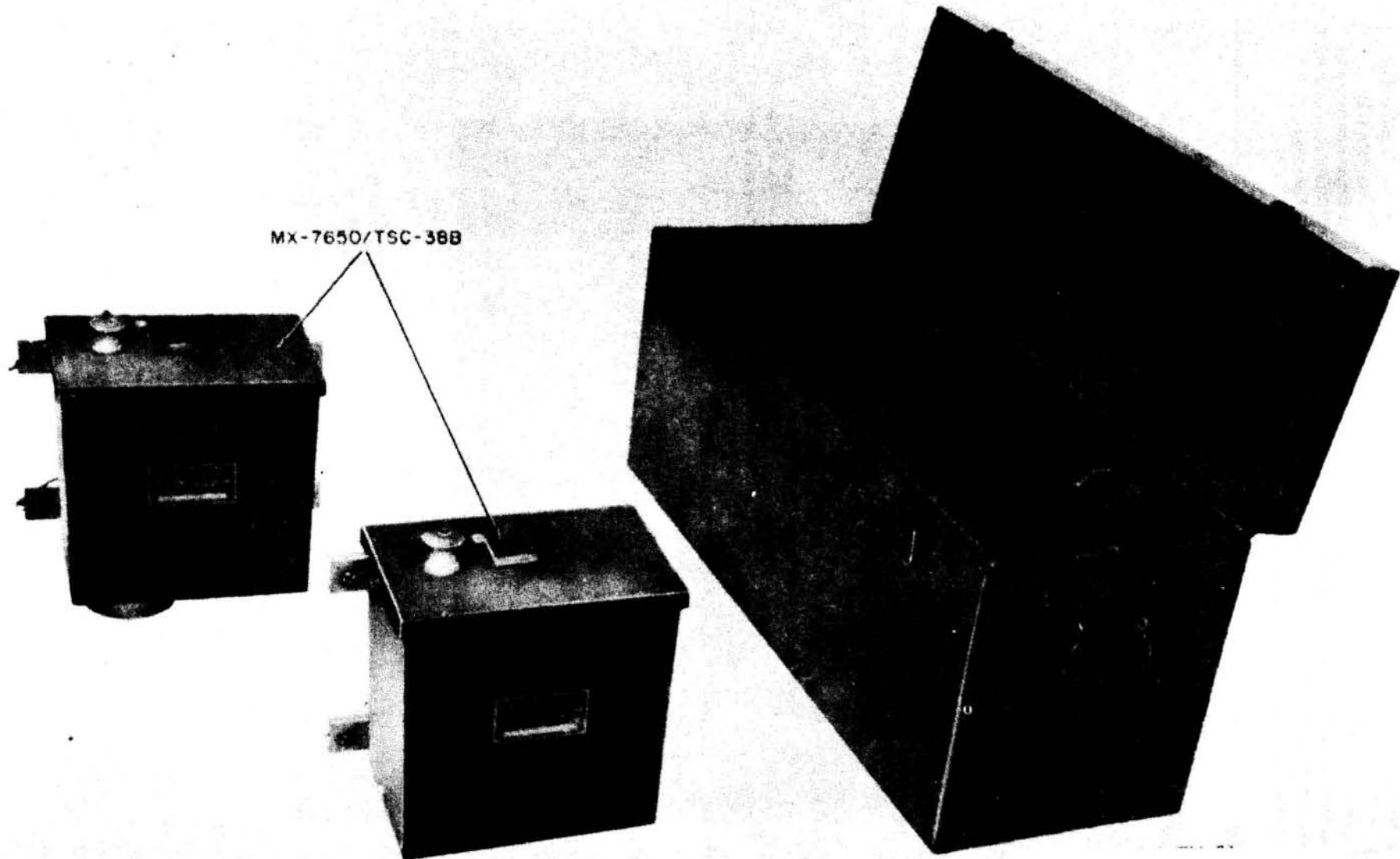


Figure 1-23. Identification of components in Case, Electrical Equipment CY-6163ITSC4-8B (1-kw terminators).

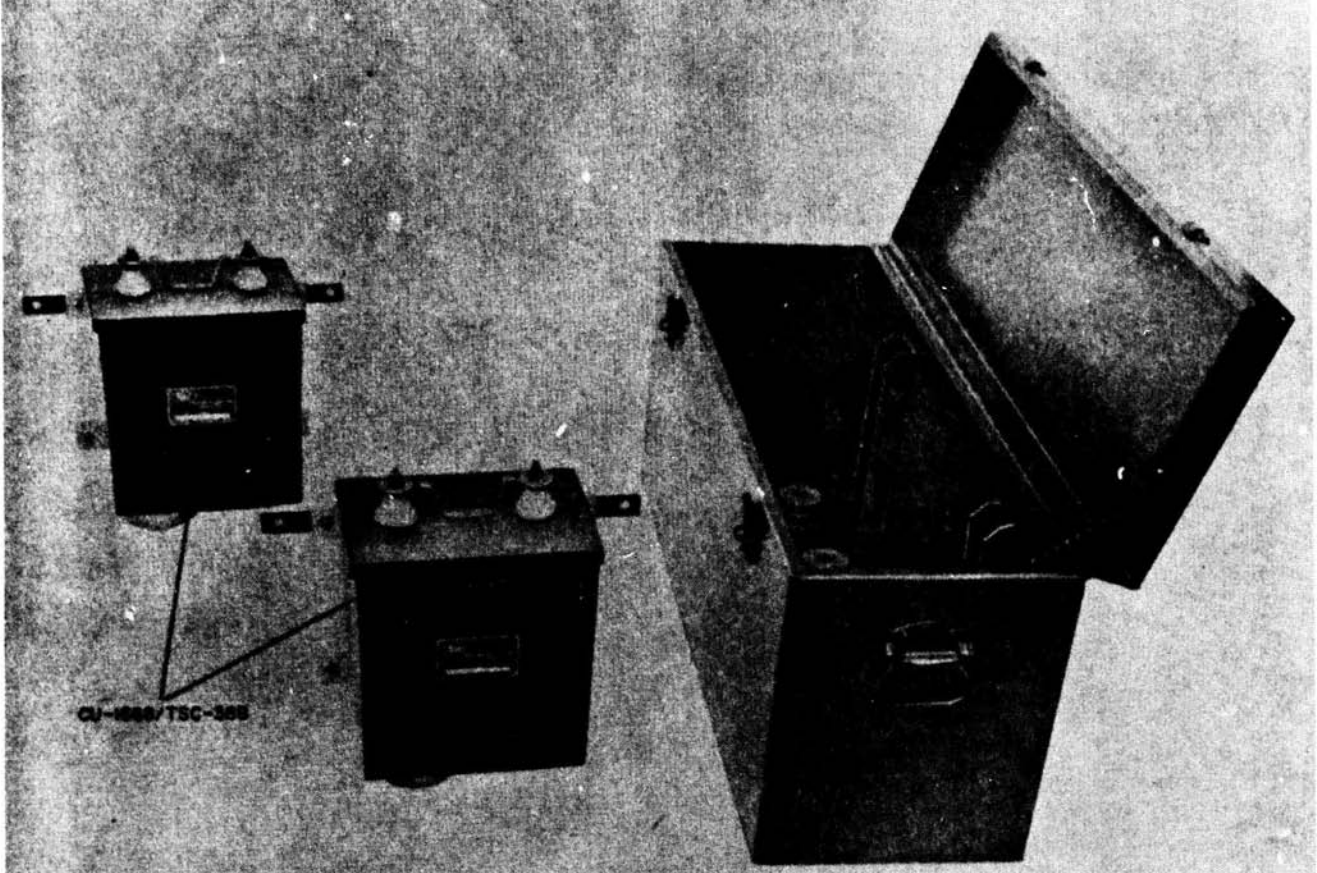


Figure 1-24. Identification of components in Case, Electrical Equipment CY-6163;/TSC-38B (1-kw balun).

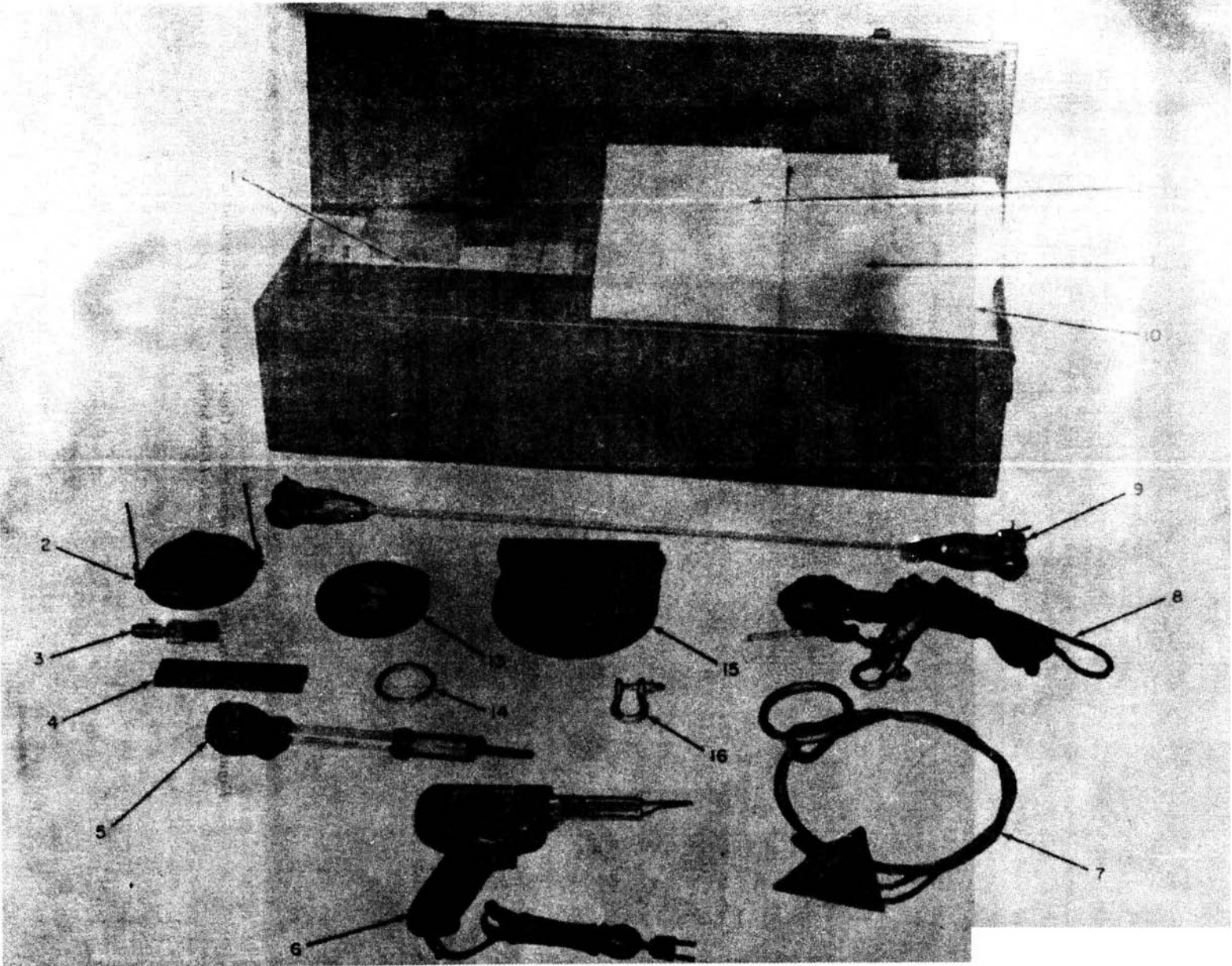


Figure 1-25. Identification of components in Case, Accessories-Spare Parts CY-6432/TSC-38B.

- | | | |
|------------------------------------|--------------------------|-------------------------------------|
| 1 Running spares (fuses and lamps) | 6 Soldering gun (1) | 12 Sandpaper (1 pkg.) |
| 2 Surveyor compass (1) | 7 MX-7738/TSC-38B (4) | 13 100-ft tape measure (1) |
| 3 Jacobs staff adapter (1) | 8 Guy rope (3) | 14 Insulator-to-shackle adapter (2) |
| 4 MX-7739/TSC-38B (2) | 9 IL-61/TSC-38B (2) | 15 Shackle (25) |
| 5 Battery tester (1) | 10 Cheesecloth (1 roll) | 16 Compass case (1) |
| | 11 Crocus cloth (1 pkg.) | |

Figure 1-25-Continued.

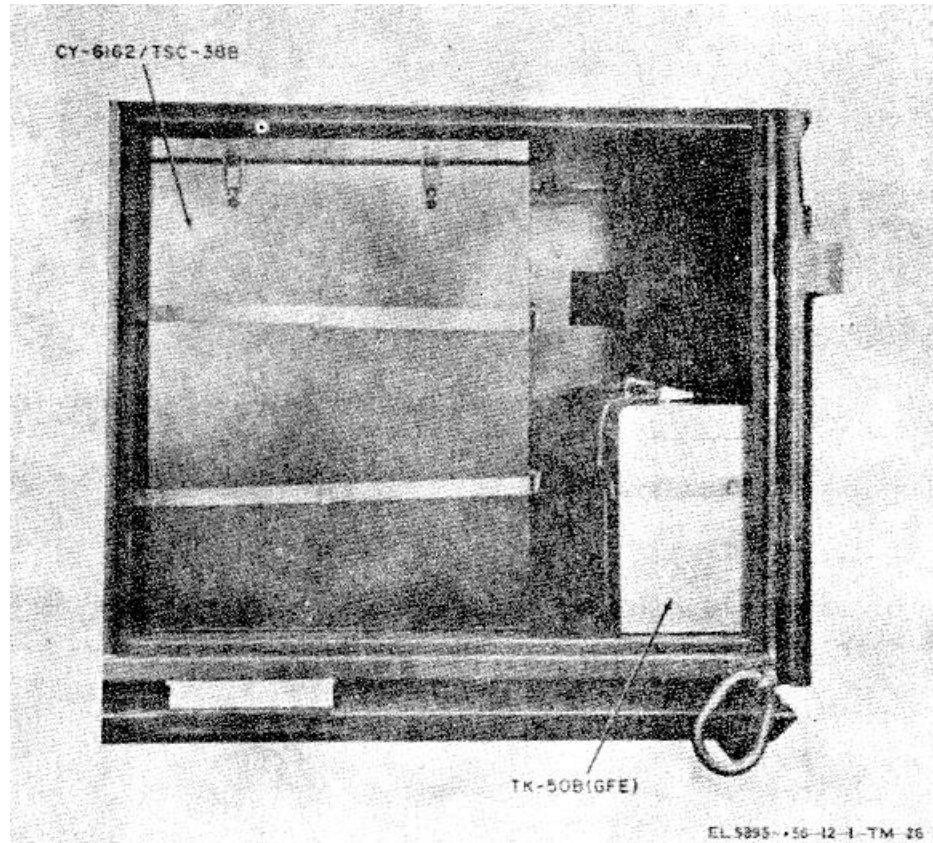


Figure 1-26. Compartment 3.

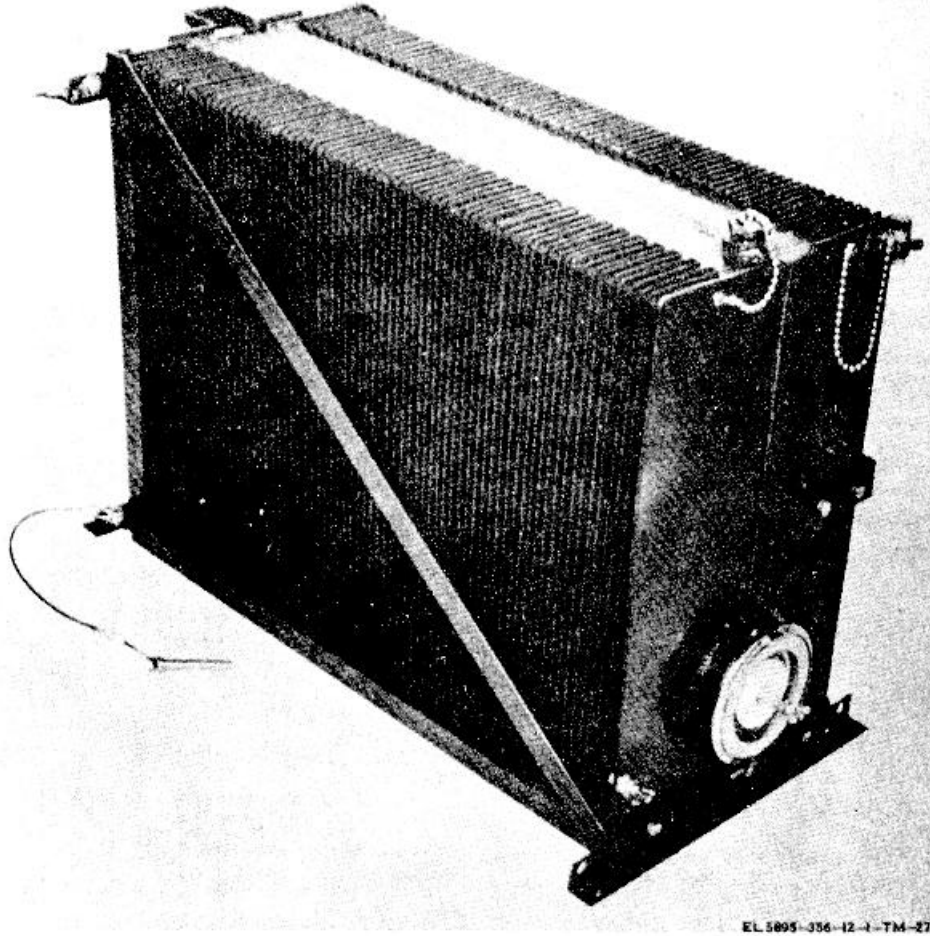


Figure 1-27. Identification of component in Case, Terminating Unit CY-6162/TSC-38B (10-kw terminator).

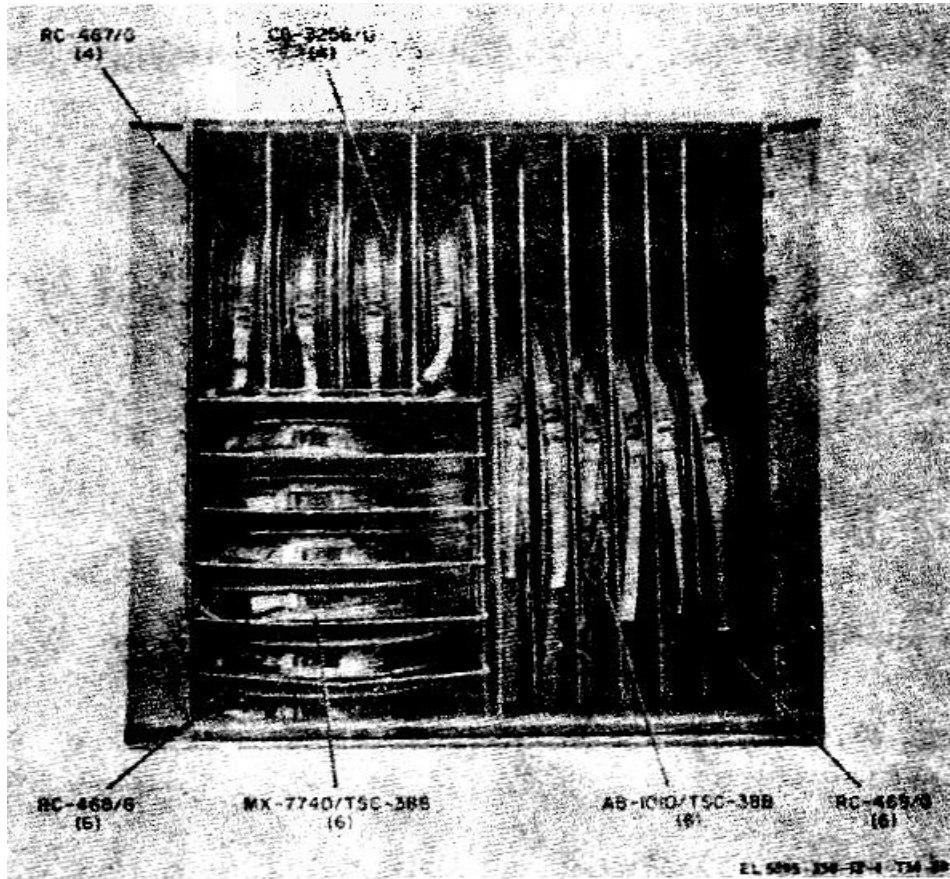


Figure 1-28. Compartment 4.

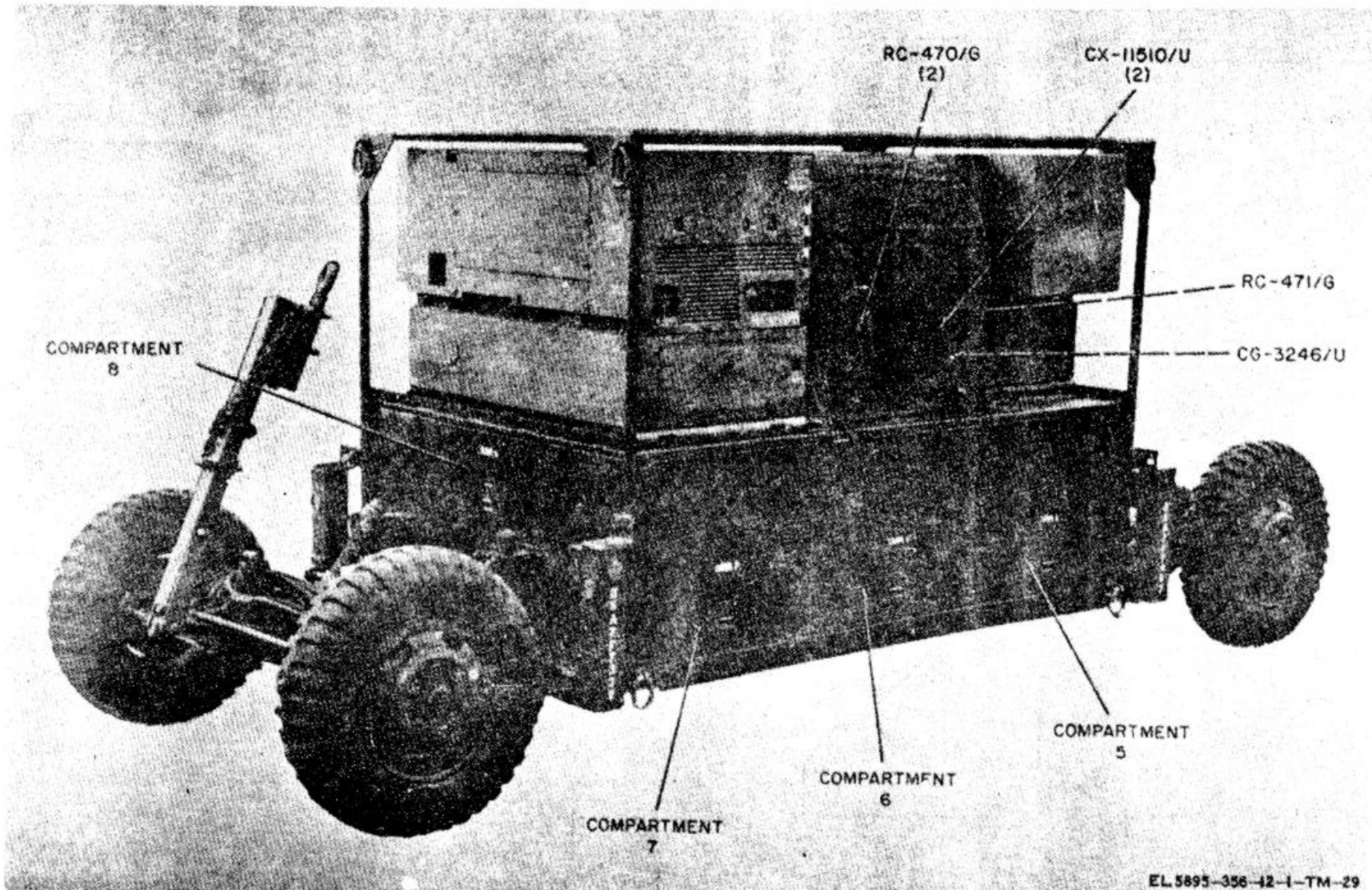


Figure 1-29. Communications Support Group OA-8056/TSC-38B, roadside view.

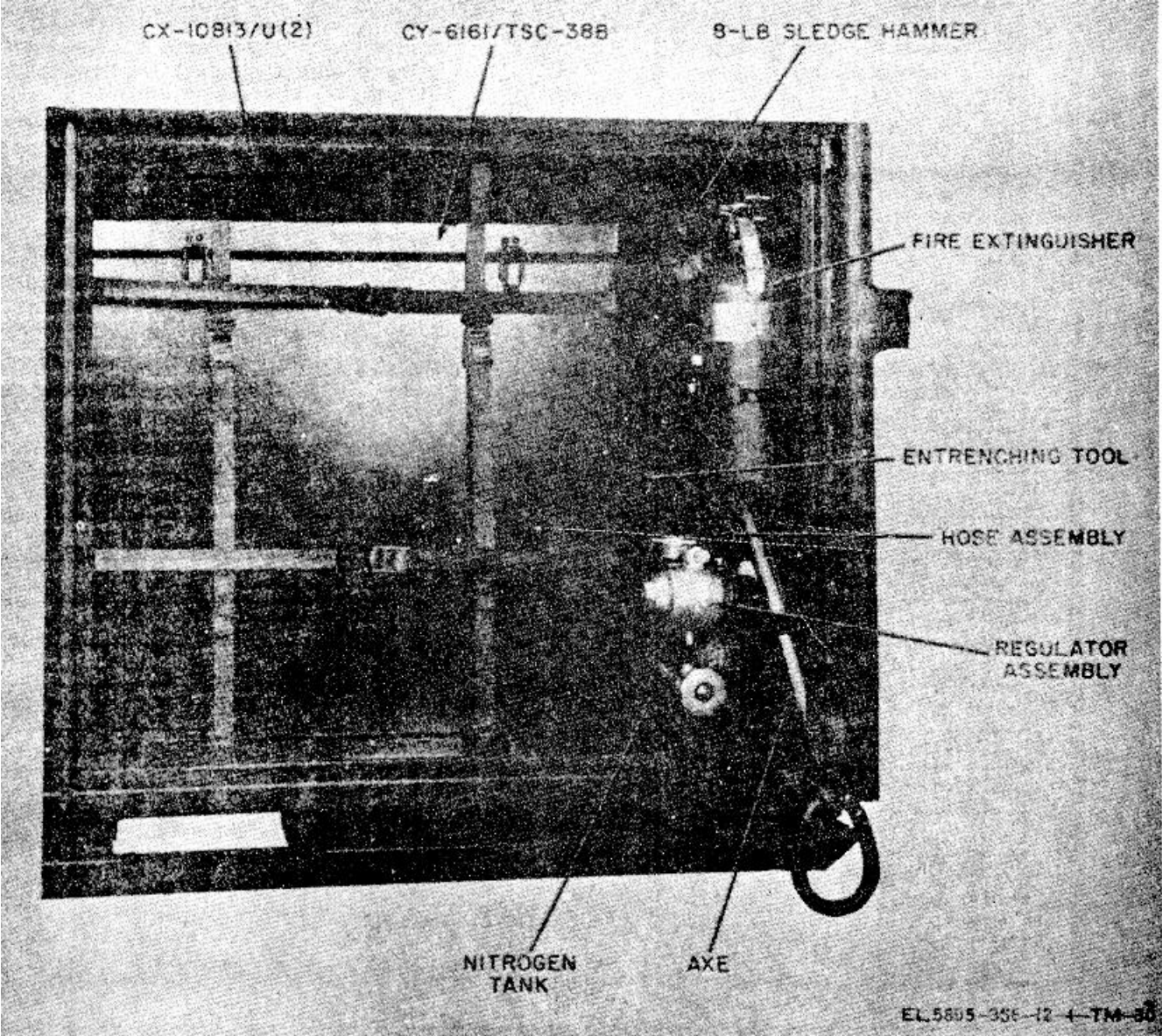


Figure 1-30. Compartment 5.

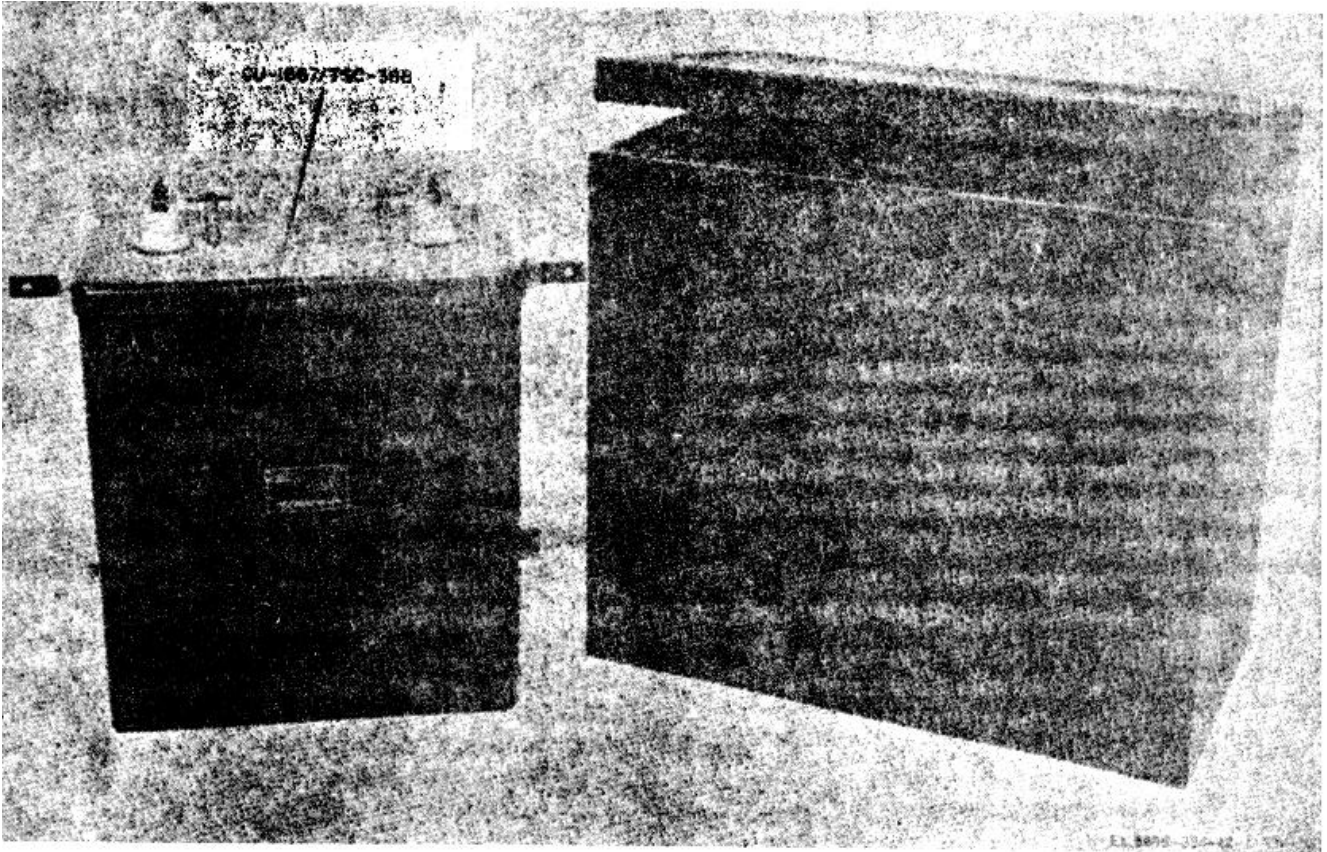


Figure 1-31 Identification of component in Case, Coupler, Transmission Line CY-6161/TSC-38B (10-kw balun).

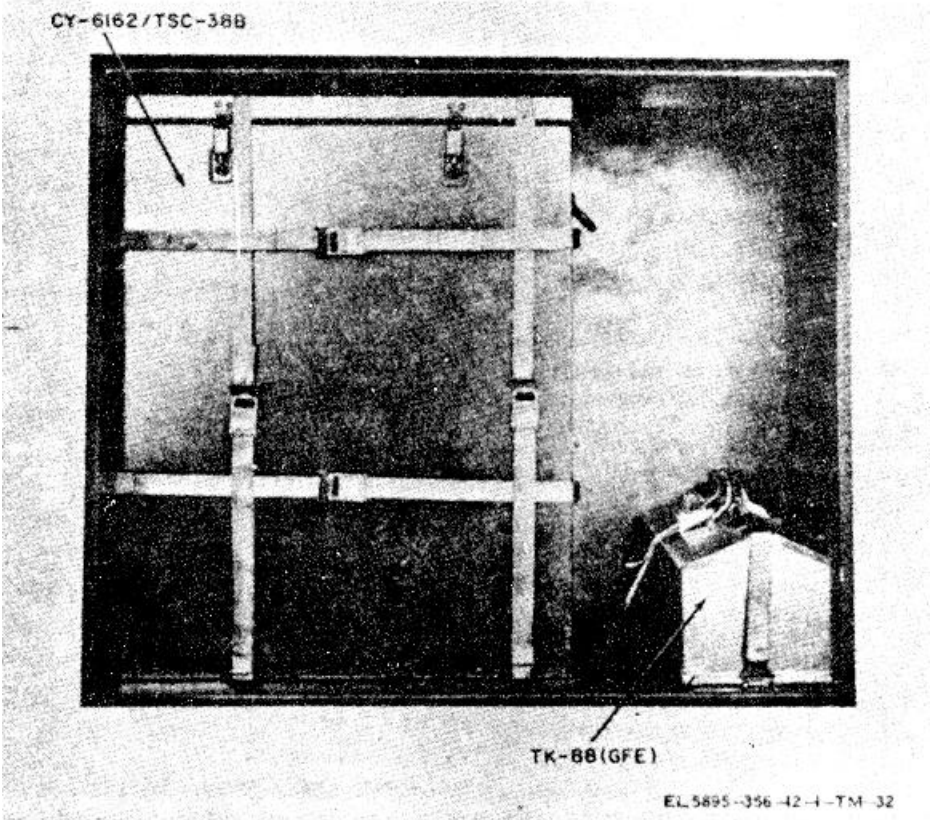


Figure 1-32. Compartment 6.

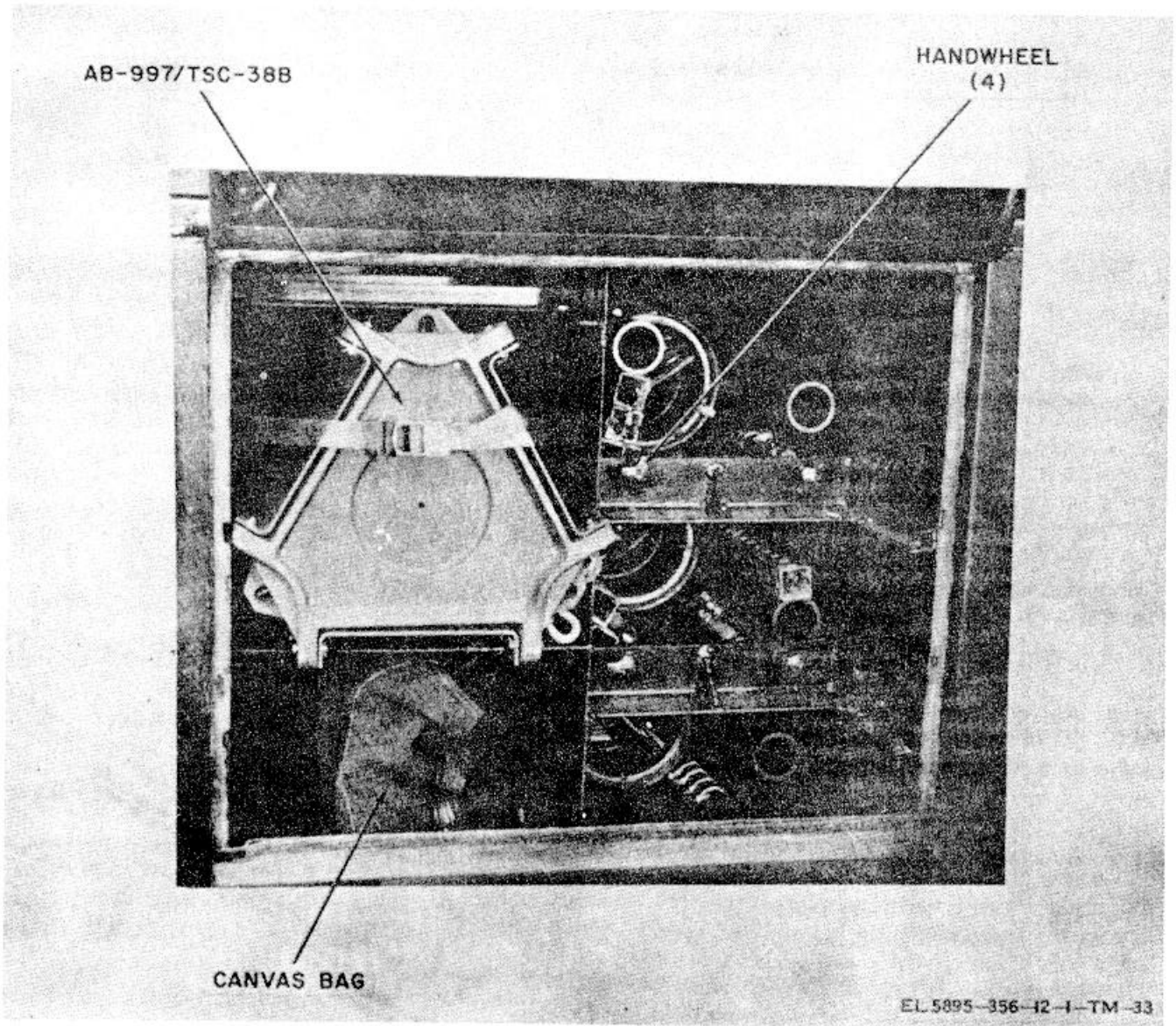


Figure 1-33. Compartment 8.

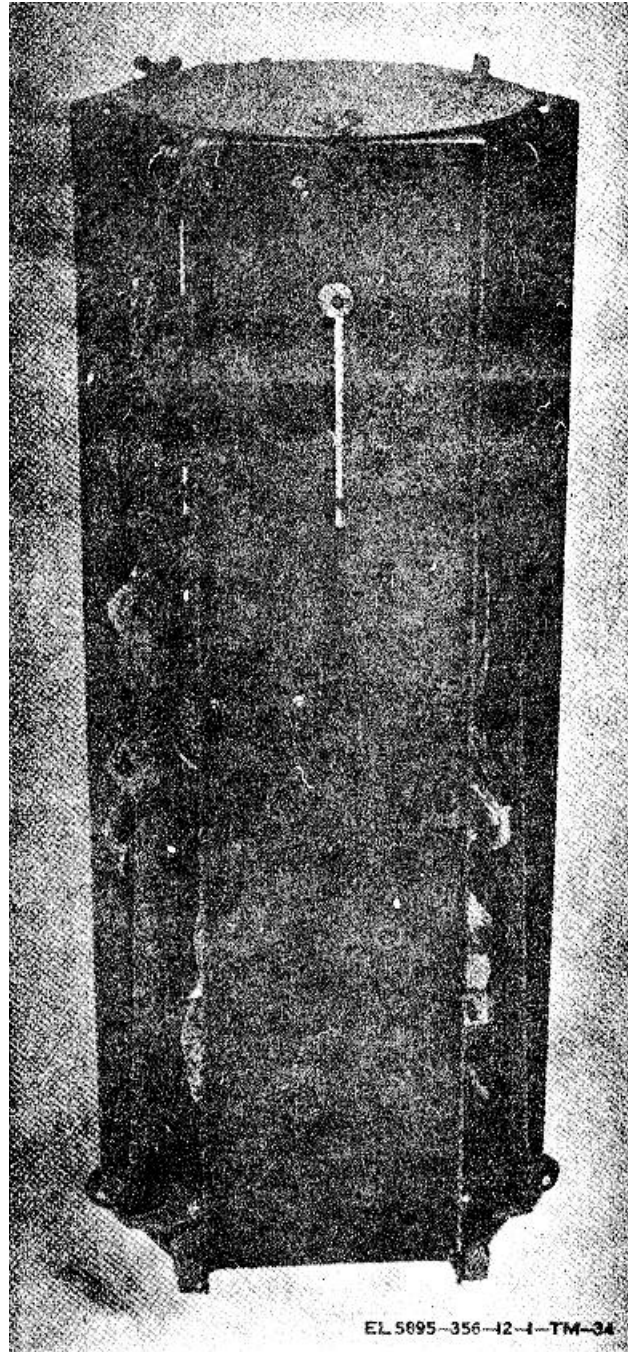
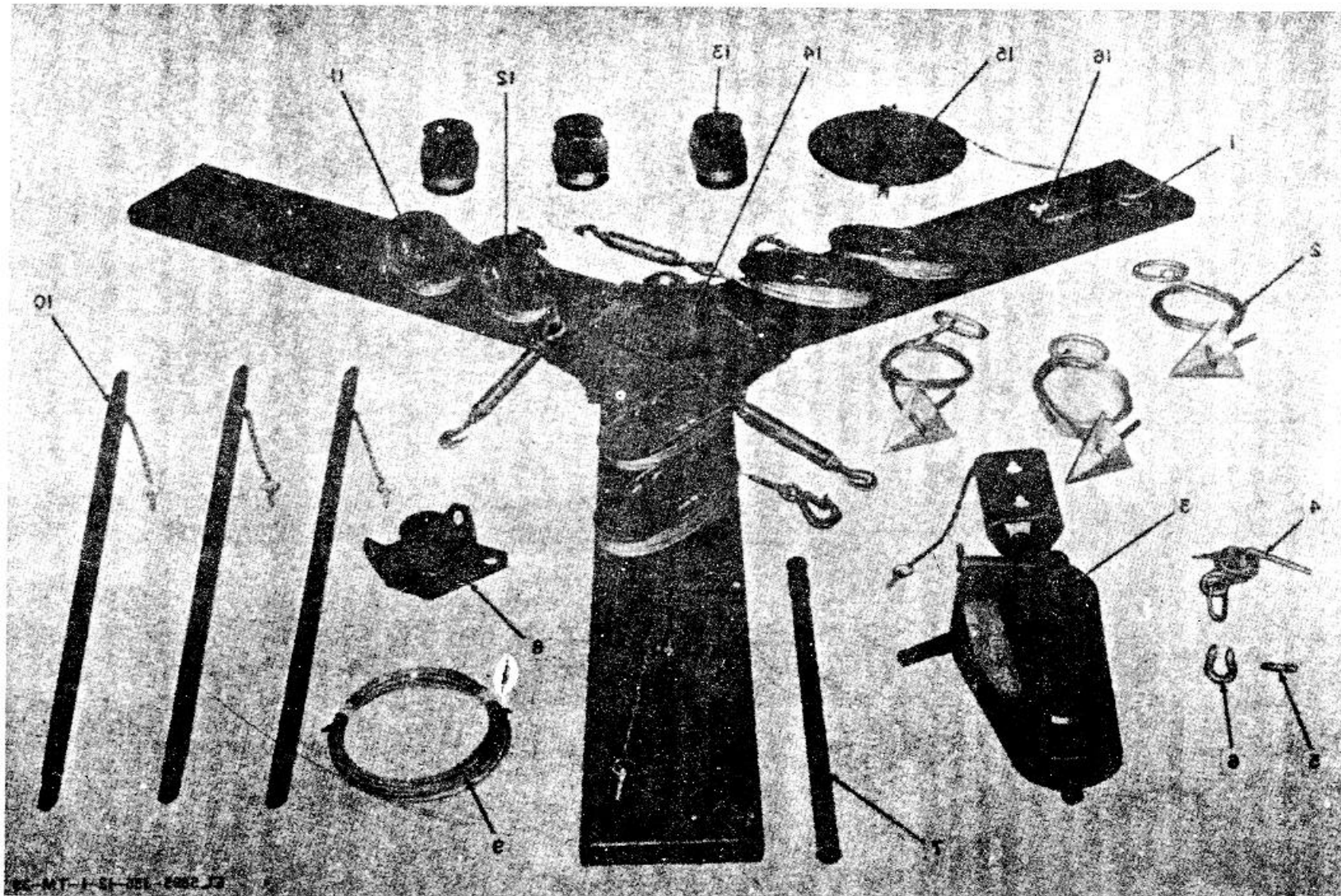
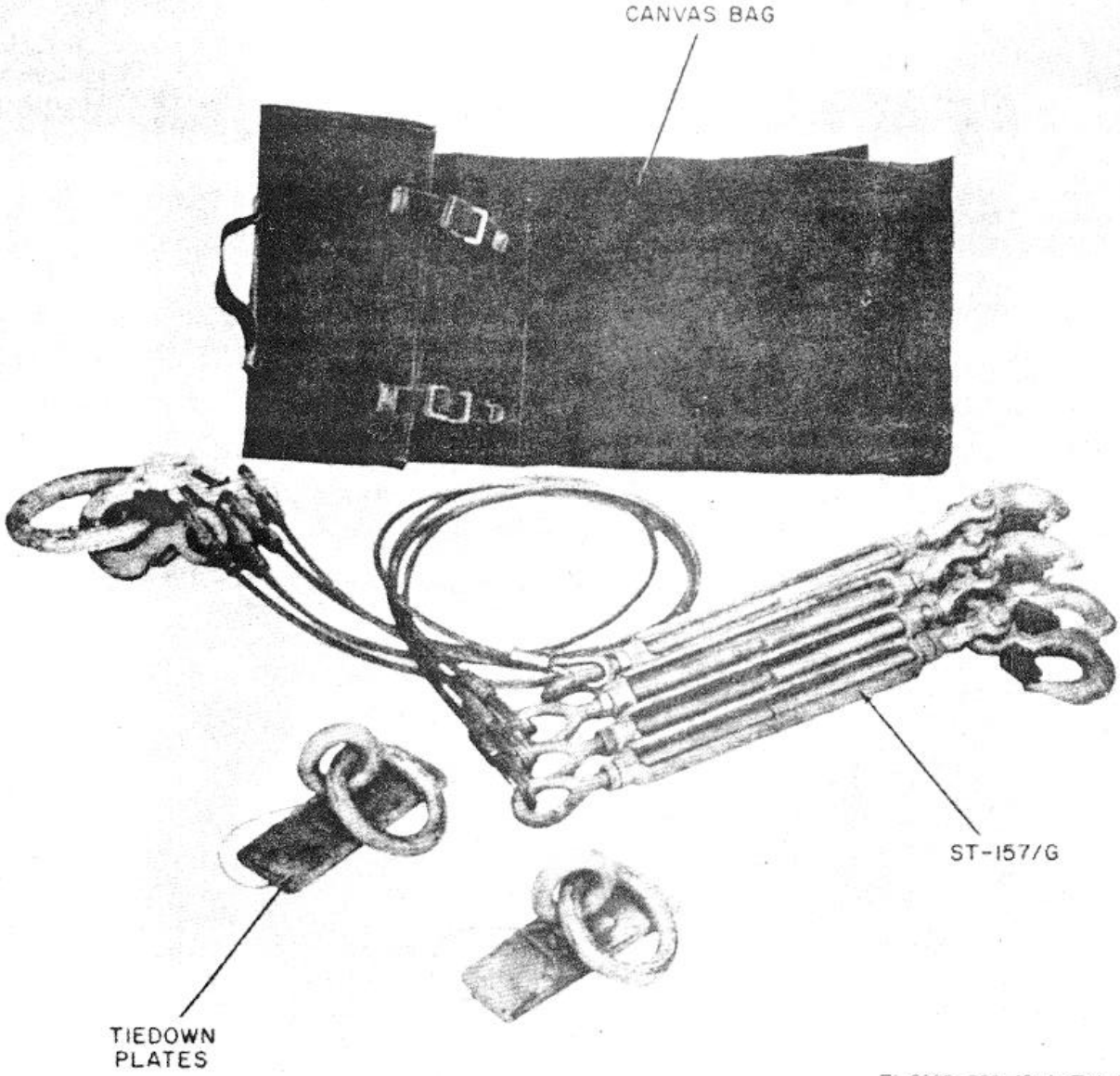


Figure 1-54. Base, Antenna Support AB-997/TSC-38B, components.



- | | | | |
|----------------------------------|--------------------|-----------------------------|--------------------------|
| 1 Mast strut locking pin (lower) | 5 Clevis pin (9) | 9 Guy anchor locating cable | 13 Locator key |
| 2 MX-7738/TSC-38B (3) | 6 Shackle (9) | 10 Mast strut (3) | 14 MX-7736/TSC-38B (3) |
| 3 Griphoist | 7 Griphoist handle | 11 MX-7737/TSC-38B (3) | 15 Cover plate |
| 4 Snubit (9) | 8 Adapter plate | 12 MX-7735/TSC-38B (3) | 16 Mast leveling bracket |

Figure 1-5. Identification of components in Base, Antenna Support AB-997/TSC-38B.



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Figure 1-36 Identification of components in Bag, Multiple Leg Sling CW-987/G.

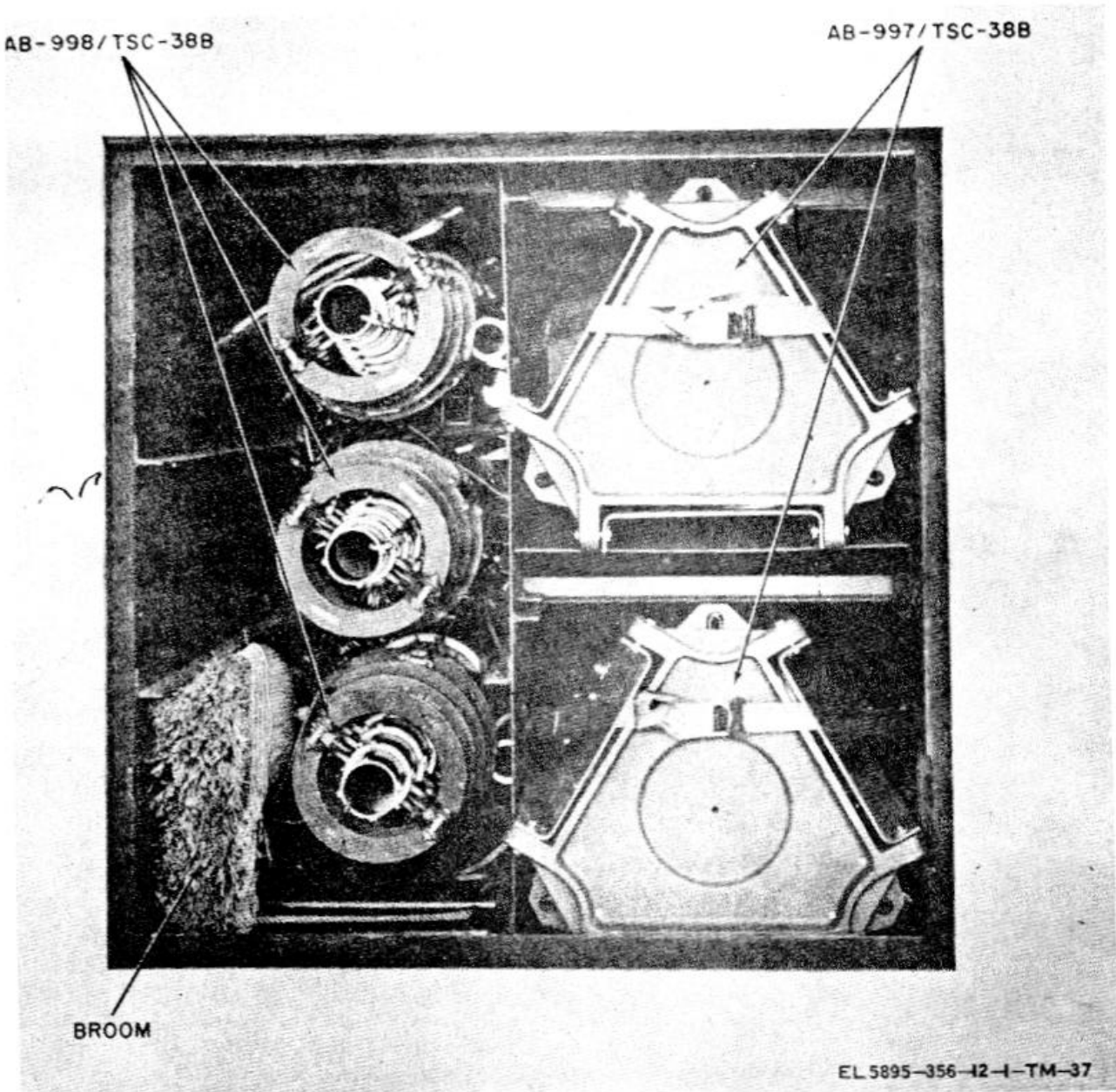
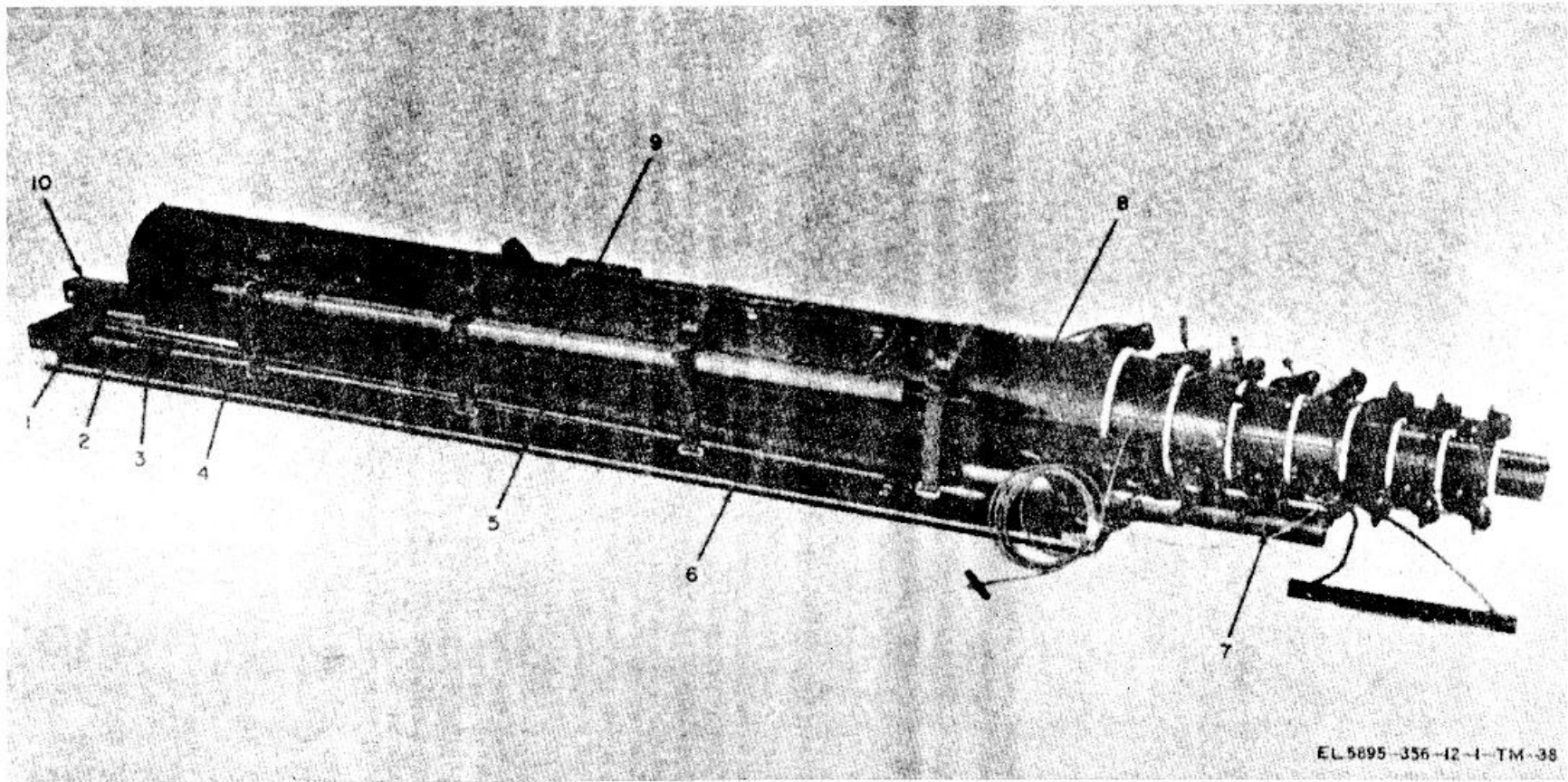


Figure 1-37. Compartment 9.



- | | | | |
|---|--|--------------------------------|-----------------------------------|
| 1 Ground rod driving stud (1)
(see note 1 below) | 3 Ground rod clamp (2) (see note
1 below) | 5 Arrowhead anchor driving rod | 8 AB-998/TSC-38B |
| 2 Ground rod coupling (2)
(see note 1 below) | 4 Ground rod (2) (see note 1 below) | 6 Storage board | 9 Jacobs staff (see note 3 below) |
| | | 7 AB-1007/TSC-38B | 10 AB-1007/TSC-38B |

NOTES

1. The quantity of these components comprise one GP-125/G ground rod assembly. One antenna storage board contains three GP-125/G. The remaining two antenna storage boards contain two GP-126/G.
2. Only one antenna storage board contains a Jacobs staff. The remaining two antenna storage boards do not contain any Jacobs staffs.

Figure 1-38. Identification of components on antenna storage board.

CHAPTER 2

INSTALLATION

Section I. SYSTEM PLANNING

2-1. General

System planning relates to the system application of the AN/TSC438B at locations remote from any major communication complex of which it is to become an extension, as well as the relationship which the AN/TSC-38B must maintain to the telephone and teletypewriter subscribers it is designed to serve. Every system application of the AN/TSC-38B may be slightly different and the requirements placed on the equipment may vary through any period of site occupancy. Therefore, using personnel will be continually faced with finding solutions which are based on the best compromise.

2-2. Radio Subsystem

a. In system application, the requirements of the radio subsystem of the AN/TSC-38B must be given first consideration. Three sloping vee antennas are provided and are normally used with the primary radio transmitter and receivers. Use of these antennas requires that a clear area (25 to 30 acres) must be selected to accommodate them physically. Further, this clear area must be such that the antennas can be oriented in the direction of the distant station with which communications are to be established. The area immediately in front of the antennas should be relatively free from trees, or other high vegetation, and the area under each antenna should be free from abrupt hillocks, ravines, or other terrain irregularities. Actual location of the antennas with respect to the AN/TSC-38B shelter is normally restricted by the lengths of coaxial cable supplied. The 10-kw coaxial cable for the transmitting antenna is 200 feet long. There are four lengths of the 1-kw coaxial cable, each 200 feet long; for use with the receiving antennas. Longer lengths of coaxial cable may be connected into the transmitting and receiving circuits, but the overall system performance will be degraded somewhat and this practice is not recommended. Figure 2-1 shows the antenna installation on site and the relative location of antennas, the equipment shelter, and the pallet. The exact relationship of distances between the antennas, shelter, and pallet may vary due to the contour of the terrain and positioning of the pallet and the shelter. The arrangement shown in figure 2-1 provides minimum interaction between the respective antennas and places the power generating equipment (on the pallet) in a location that will offer the least manmade interference to the receiving circuits.

b. The pallet should be located behind the sloping vee antennas so that the generator sets will present minimum RF interference to the receiving system, and the power cables will not pass under, or ahead of, the transmitting antenna.

2-3. Telephone Subsystem

a. The location of the AN/TSC-38B with respect to the telephone subscribers is controlled by several factors. Included in the considerations are the type of end-instrument termination, the type of service provided (common battery or local battery), interconnections to other telephone exchanges (military or commercial), and the type of telephone wire or cable used to complete the subscriber wire line. The type of service which can be implemented using the 12 outside telephone subscriber lines are as follows:

- (1) Four-wire frequency shift keying (FSK) dial, FSK push-to-talk (PTT) (3 each).
- (2) Two-wire FSK dial, FSK PTT (3 each).
- (3) Four-wire DC-dial common battery (500 ohms maximum loop resistance) (12 each).
- (4) Two-wire DC-dial, common battery (500 ohms maximum loop resistance) (12 each).
- (5) Four-wire common battery manual (500 ohms maximum loop resistance) (12 each).
- (6) Two-wire common battery manual (500 ohms maximum loop resistance) (12 each).
- (7) Four-wire local battery ringdown (12 each).

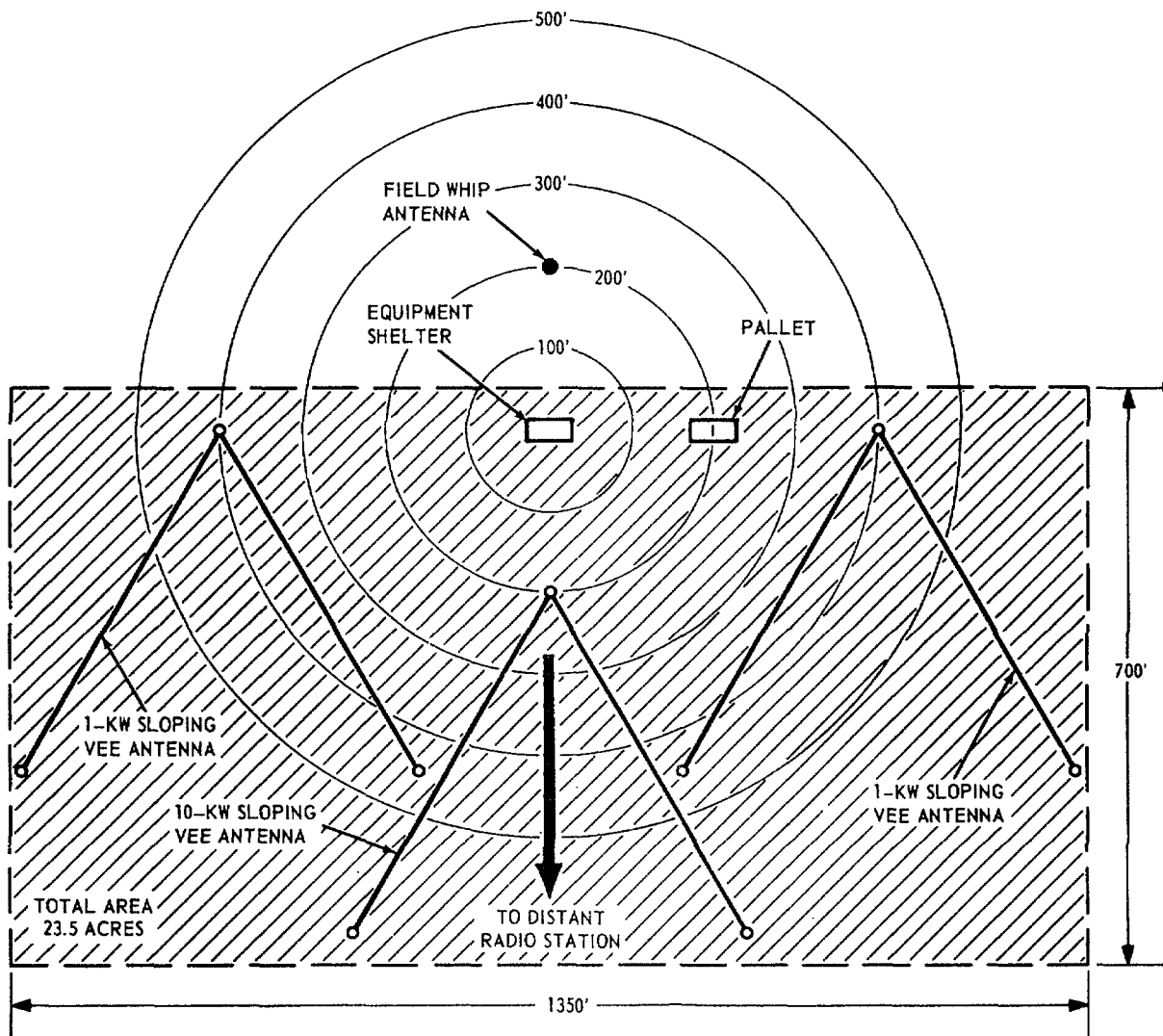


Figure 2-1. Communications Central AN/TSC-38B site plan.

- (8) Two-wire local battery ringdown (12 each).
- (9) Four-wire switchboard trunks (12 each).
- (10) Two-wire switchboard trunks (12 each).
- (11) Four-wire FSK dial switchboard trunks (3 each).
- (12) Two-wire FSK dial switchboard trunks (3 each).

b. Three of the twelve telephone lines within the switchboard interface units are designed to accept the FSK dial and FSK PTT type circuits: subscriber wire lines 10, 11, and 12.

c. Wire line distance between the AN/TSC-38B and the telephone line subscriber is limited when the AN/TSC-38B battery system is used to provide subscriber circuit power. The AN/TSC-38B battery system will provide operating power for subscriber circuits having a 500ohm maximum loop resistance. Because of its improved circuit balance and lower wire resistance, tactical field cable (spiral 4) is preferred over tactical field wire (WD-1/TT).

2-4. Nonsecure Data Subsystem

a. Teletypewriter subscribers are connected to the AN/TSC-38B on a 4-wire, full-duplex basis. The terminating facilities for all lines are arranged to supply send loop current of 60 made neutral, 20 made neutral or +30 made polar. The

terminal will also accept 60 made neutral, 20 made neutral or +-30 made polar signals with loop current supplied from the subscriber teletypewriter set. The AN/TSC38B can also supply 60 made battery to the subscriber keyboard circuit.

b. The type of wire or cable determines to a large degree the maximum wire line distance over which the teletypewriter circuit will operate efficiently. Each teletypewriter loop (send and receive) contains a 2,500-ohm rheostat for control of the individual loop currents.

Section II. SERVICE UPON RECEIPT OF EQUIPMENT

2-5. Siting

a. A site for the AN/TSC-38B will normally be selected following analysis of the data obtained from a thorough reconnaissance of several possible sites. During the reconnaissance, the factors influencing radio equipment performance and the proximity of telephone and teletypewriter subscribers must be carefully considered. Since the two major elements (equipment shelter and pallet) of the AN/TSC38B may be moved into the site by means of aircraft, possible operating locations can be considered that would normally be disregarded if land access routes were not available.

b. In the initial survey, precise azimuth measurements are not required. Compass bearings are usually sufficient to establish that the site has sufficient clearance in the desired direction of radio transmission for communication with the desired distant station. Sufficient data on local magnetic declination is normally available to enable the translation of these readings into approximate true bearings.

c. Having established the rough relative location of the transmitting and receiving antennas, the subscriber wire line routes to the equipment shelter should be examined. If at all feasible, these routes should be so selected as to avoid passing directly under any of the antennas. When this is not possible, the routes should pass under the receiving antennas only.

WARNING

In no case should a wire line route pass under or immediately ahead of the transmitting antenna since radiated RF power from the antenna will be induced into the communication circuits, thereby producing a condition which is hazardous to personnel and equipment. Although the signal lines entering the equipment shelter are equipped with RF filters to prevent these voltages from entering the equipment, personnel would be exposed to this hazardous condition when working on signal lines at the shelter signal entry panels during periods of radio transmission.

d. Upon the arrival of the equipment shelter and pallet at the selected operating site, the approximate location for these units should be determined. The equipment shelter should be located with respect to the antenna configuration and moved into position. The pallet should, if practical, be moved to each antenna location to enable the masts, baluns, and coaxial cable to be removed near their point of use. When the antenna material has been unloaded, the pallet should be moved to the selected operating position.

NOTE

The type of terrain on which the antenna form is to be located should be sampled to determine whether an arrowhead-type anchor can be used to provide proper guying support for the antenna mast. Rocky or sandy soil may require an alternate method of securing the antenna guy wires.

2-6. Unpacking

a. When packaged for shipment, the components of Communications Central AN/TSC-38B are either mounted in their operating positions or stowed in special transit cases and compartments. The transit cases are stowed for shipment in closed compartments of the pallet and inside the equipment shelter. Refer to figures 1-17 and 1-29 for location and identification of pallet storage compartments; refer to figure 1-12 for location and identification of transit cases stored in the equipment shelter.

b. Unpack the transit cases from the equipment shelter and pallet in the order given in section III of this chapter. Failure to follow this procedure may result in lost pieces, or inability to associate parts and their final locations during the installation procedure.

c. Attached to the underside of the pallet compartment doors is a length of stranded cable with a snap hook on one end. To keep the compartment door open, it is necessary to unsnap the cable from the metal eye on the door and refasten it to a metal eye mounted on the pallet tubular framework above the compartment door. The door will then rest open on the length of secured cable.

d. Compartment 8 (fig. 1-29) has two doors. The upper door is held open by using the technique described in c above. The lower door section is opened by sliding a bolt latch located along the left inside of the door. Slide the bolt latch to the right and lower the door until it rests on the dolly-mounted air reservoir tank.

CAUTION

Each antenna mast storage board weighs approximately 200 pounds. At least four men (two stationed on each side of the board) are required to remove each board from the pallet.

e. All transit cases in the pallet are held in place by straps, except for the three antenna mast storage boards. The storage boards cannot be removed until the set of hand wheels (fig. 1-33) (two for each board) have been removed. The boards can then be slid out of the pallet individually through compartment 9.

f. Components which are not mounted in their operating positions for transport should be unpacked during the installation of the equipment.

2-7. Checking Unpacked Equipment

a. As each item is removed, or prepared for removal from the pallet storage location, it should be given a visual and mechanical inspection to determine if damage has occurred during transit. Report all damaged equipment in accordance with the instructions in paragraph 1-3b.

b. The balun case should be carefully inspected for evidence of cracks or other damage; the insulator bowls for nicks, chips, or cracks; and the terminal posts for indications of bending or corrosion which might cause faulty electrical contact. The coaxial cable connector should be checked for indication of looseness in the case housing and for the presence of dust or other foreign matter within the receptacle.

c. The terminators should be checked similarly for case, insulator bowl, and terminal post damage, and oil leaks.

d. The individual antenna elements which are stored on reels should be carefully inspected for damage to the copper conducting surface of the wire. This wire has a steel core with a copper covering. Since the RF is transmitted in the copper skin, the RF transmission path will be interrupted if the copper covering is broken. The transmission path will be reduced wherever nicks, gouges, or scrapes have occurred. The terminal lugs attached to each end of the individual wires should be checked for tightness, as well as for possible breaks in the copper covering at the junction points.

e. The antenna mast should be inspected for completeness and overall condition. In the closed position, the condition of individual mast sections and guy assemblies is difficult to determine; therefore, the mast with the antenna elements in place should be inspected during initial installation.

f. The balun support posts, guy anchors, and other similar hardware items should be checked to insure that the quantity required at each individual antenna is available, and the mounting and guying hardware complement is complete.

g. The coaxial cables should be initially inspected while still on the reels, and during pay out of the cable they must be checked for evidence of nicks, gouges, or deforming due to kinks or flattening which would impair the cable usefulness or result in damage to transmitting equipment when power is applied to the antenna. The connectors should be carefully inspected to insure that their threads are not deformed, that they are securely attached to the coaxial cable, and that they are free from dust, moisture, or other foreign material.

h. The primary power cables which connect source power to the equipment shelter normally conduct 208 vac. Each cable is terminated in a power connector which mates with a connector installed on the equipment shelter power entrance panel. The source end of each cable is terminated in a power connector which mates with a connector on the generator set. Each connector should be inspected for secure attachment to the cable and for presence of dust, moisture, or other foreign matter. The cable should be checked during pay out for evidence of broken, worn, or deformed sheath conditions.

Section III. INSTALLATION OF EQUIPMENT

2-8. General

a. The greatest time expenditure required for installation of the AN/TSC-38B is the assembly and erection of the sloping vee antennas. If operationally desirable, the pallet may be dispatched to the site in advance of the equipment shelter to permit the antenna area to be marked and staked, the antennas assembled and raised, and the coaxial cables run from the baluns to the specified equipment shelter location.

b. The equipment shelter and the pallet should remain mounted on their dolly sets until the coaxial and power cables are routed. This provides a means of making final siting adjustments.

2-9. 10-Kw Sloping Vee Antenna Installation

All tools, equipment, and material required to measure, stake, and construct the 10-kw sloping vee antenna in conformance with the previously prepared site plan are contained in the pallet. Figure 2-2 is the installation plan view for the 10kw sloping vee antenna and should be used as a reference for location of major components.

a. Site Location of Mast, Balun and Terminators.

- (1) Open and secure the door on compartment 2 (fig. 1-22). Remove the spares/accessories case (CY-6432/TSC-38B) (fig. 1-25).
- (2) Open the case and remove the surveyor compass, Jacobs staff adapter, and 100-foot tape measure.
- (3) Open and secure the doors to compartments 8 and 9, shown in figures 1-17 and 1-29. Note that compartment 8 has two doors, and the bottom door is secured by a slide bolt.

CAUTION

The antenna storage board weighs approximately 200 pounds. When removing the board, use two men on each side to lift and slide the storage board from the compartment.

- (4) Remove the two hand wheels (fig. 1-33) on the top antenna mast storage board. Slide the board out of the pallet through compartment 9.
- (5) Set the storage board down, clear of the pallet. Remove the four straps holding the antenna components to the board.
- (6) Remove the Jacobs staff (fig. 1-38) from the storage board.
- (7) One end of the Jacobs staff has a pointed metal cap; the other end is tapered wood. Fit the knurled end of the Jacobs staff adapter over the tapered wooden end of the Jacobs staff, Note that a hacksaw may be used to cut off a small length from the tapered end of the Jacobs staff to insure that the Jacobs staff adapter fits snugly.
- (8) Stick the metal capped end of the Jacobs staff into the ground at a point which corresponds to the planned location of the 10-kw sloping vee antenna mast (fig. 2-1).
- (9) Remove the surveyor compass from its leather case. Screw the compass to the Jacobs staff adapter.
- (10) Raise the two sight posts on the compass. Loosen the knurled screw on the top of compass to unlock the compass needle.
- (11) Using previously supplied logistic information relating to the geographic and magnetic position of the distant radio station, position the compass sight posts toward the distant radio station.
- (12) Open and secure the door to compartment 5 (fig. 1-29). Unfasten the two straps and remove the sledge hammer shown in figure 1-30.
- (13) Using the 100-foot tape, measure 430 feet in the direction of the distant radio station, as indicated by the compass guide posts. Using the sledge hammer, drive a stake (of sufficient height to be seen from the point where the compass is located) into the ground to a depth of 3 to 4 inches.
- (14) Rotate the compass card so that the guide posts are 30° to the left of the direction to the distant radio station (determined in step (11) above).
- (15) Using the 100-foot tape, measure a distance of 500 feet from the Jacobs staff in line with the guide posts. Drive another locating stake into the ground at this point.
- (16) Rotate the compass card so that the guide posts are 30° to the right of the direction to the distant radio station (determined in step (11) above). Repeat step (15) above.

NOTE

There should be three locating stakes driven into the field. The center stake marks the direction to the distant radio station, and the guy stakes on either side

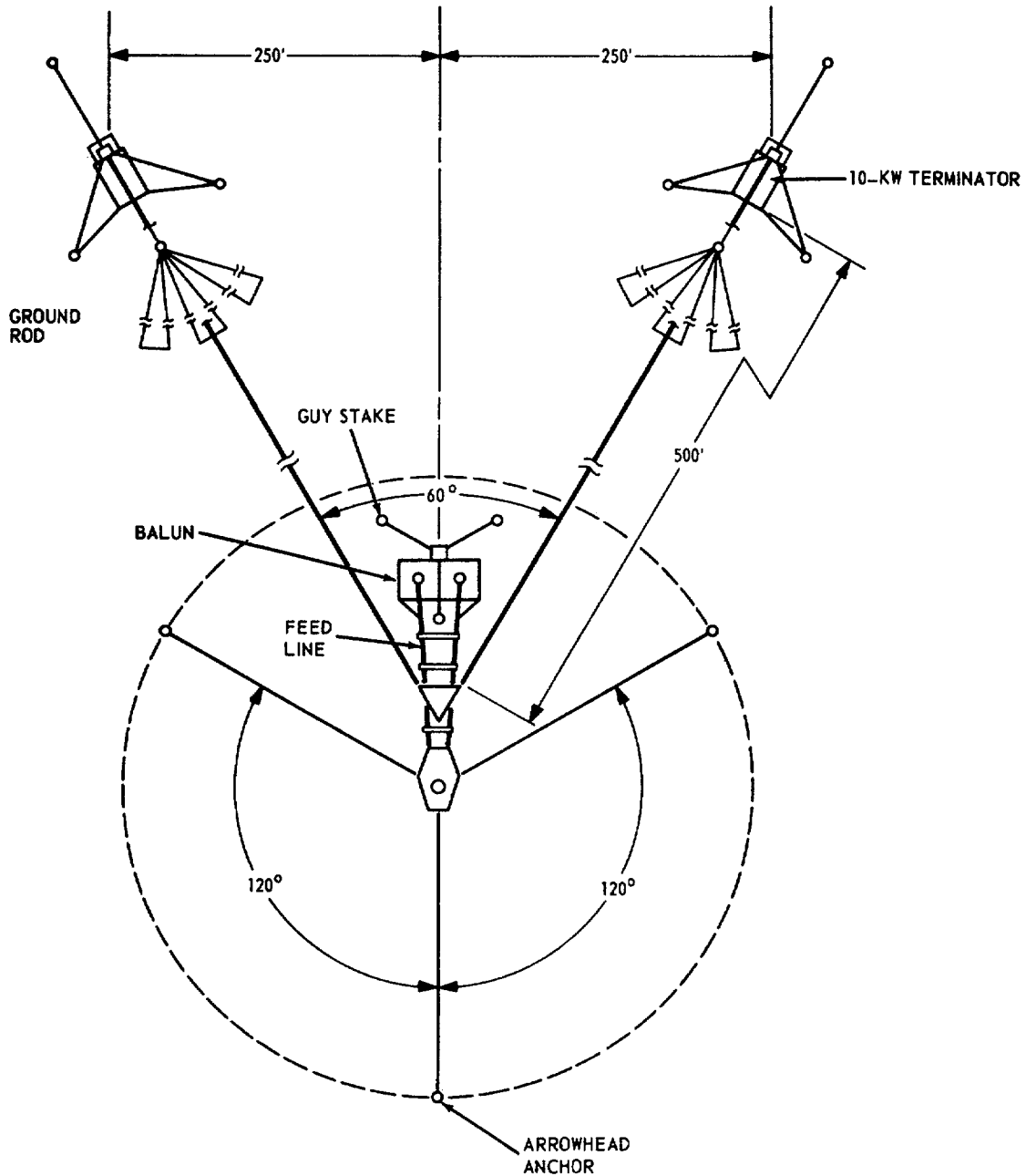


Figure 2-2. 10-kw sloping vee antenna installation, plan view.

mark the approximate location of the sloping vee antenna terminators.

b. Antenna Mast and Base Assembly.

- (1) Unfasten the strap securing the antenna base (AB-997/TSC-38B) shown in figure 1-33. Remove the antenna base from compartment 8 and place the base approximately 10 feet away from the Jacobs staff.

NOTE

The antenna base weighs 125 pounds and should be removed and carried by two men.

- (2) Orient the antenna base (fig. 1-4) so that the cover plate with the three wing thumbscrews is on top.
- (3) Remove each of the three chained clevis pins (under the cover plate) that secure the three mast stubs. Lift the mast stubs out of the antenna base.
- (4) Loosen one wing thumbscrew at a time

and lower each leg of the antenna base to the ground.

- (5) Unpack the components stored in the antenna base and identify them with the components shown in figure 1-35.
- (6) When unfolded, the antenna base resembles the letter Y. Slide the unfolded base toward the Jacobs staff, keeping the antenna leg nearest the locator key, shown in figure 1-35, at the rear and in line with the Jacobs staff and the distant radio station stake.
- (7) Remove the Jacobs staff and attached compass from the ground. Slide the center of the antenna base over the point where the Jacobs staff was located. Check that the rear leg of the base is still in line with the distant radio station locator stake.
- (8) Unroll the guy anchor locating cable (fig. 1-35). Starting at the center of the antenna base, extend the locating cable along the center of the rear leg of the base. Place an arrowhead anchor (fig. 1-35) on the ground at the end of the extended locator cable.
- (9) Repeat step (8) above for the other two legs of the antenna base.
- (10) Obtain the arrowhead anchor driving rod, located on the antenna mast storage board (fig. 1-38).
- (11) Set the shaft end of the arrowhead anchor into the hole in the end of the driving rod.
- (12) Position the arrowhead anchor at an angle of approximately 45° to the vertical, pointing away from the mast. Using the sledge hammer, drive the arrowhead anchor into the ground until the solid ring, attached to the arrowhead, is at ground level.
- (13) Repeat steps (11) and (12) above for the other two legs of the antenna base.
- (14) Identify the table of contents on antenna accessories case (CY-6165/TSC-38B) (fig. 1-18) in compartment 1 that lists 11 guy ropes. Remove this container from compartment 1 and set it approximately 25 feet from the antenna base.
- (15) Using two men, carry the antenna mast assembly (AB-998/TSC-38B) (fig. 1-38) from the antenna mast storage board and lay the antenna mast near the antenna base. Position the antenna mast assembly so that the base (widest diameter) is closest to the center of the antenna base.
- (16) Remove the mast rings (fig. 1-21) for the four sections of the antenna mast assembly. Use figure 1-21 to identify and match pairs of the same size rings. Each section of the antenna mast assembly requires two rings. The larger diameter rings fit closest to the base of the antenna base assembly (mast section No. 1).
- (17) Using the capscrews, locknuts, and sleeves (fig. 2-3) already assembled to each section mounting bracket, fasten the mast rings and lifting cables to the antenna mast.
- (18) Obtain the mast stub (AB-1008/TSC-38B) (fig. 1-38) from the antenna base storage board. Insert the small diameter end of the mast stub into the end of the telescoping portion of the antenna base assembly.
- (19) Set the adapter plate (fig. 1-35) on the mast stub. Note that the adapter plate has four tabs, three of which are bent downward.
- (20) Obtain one shackle with attached clevis pin (fig. 1-35) and the apex strap (fig. 1-21).

CAUTION

Clevis pins and shackles will be used to fasten several components in the following paragraphs. After tightening each clevis pin, safety wire the clevis pin to the shackle using a length of wire cut from the coil of safety wire.

- (21) Unscrew the clevis pin and pass the end of the shackle through the loop on one end of the apex strap and the hole in the tab, which is not bent, on the adapter plate. Replace and tighten the clevis pin to the shackle.
- (22) Using a shackle and clevis pin, fasten the antenna lifting pulley (fig. 1-20) to the other end of the apex strap.
- (23) Unroll and slip the ferruled end of the antenna lifting cable through the antenna lifting pulley in the manner shown in B, figure 2-6. Pull the antenna lifting rope until 55 feet (approximately half the length of the rope) has been pulled over the pulley.
- (24) Remove the three upper guy wires (fig. 1-35) from the UPPER GUY reels mounted on each leg of the antenna base. Hook an upper guy wire (color-coded red) to each of the bent tabs in the adapter plate.
- (25) Remove the accessories case (CY-6164/TSC-38B) (fig. 1-18) from compartment 1. Place the antenna lifting cable bracket (fig. 1-19) over the center plate of the antenna base so that the bent portion of the antenna lifting cable bracket is facing up.

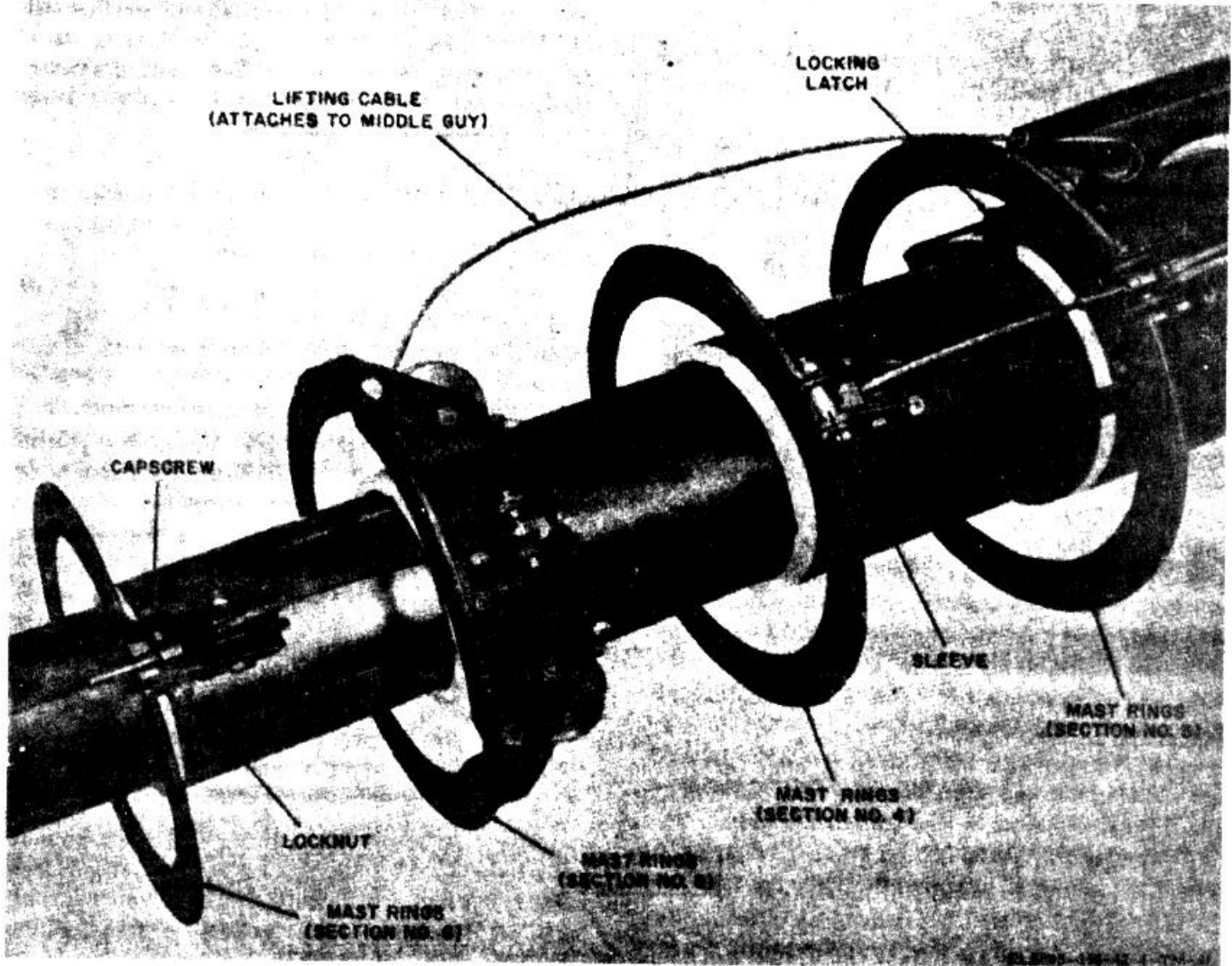
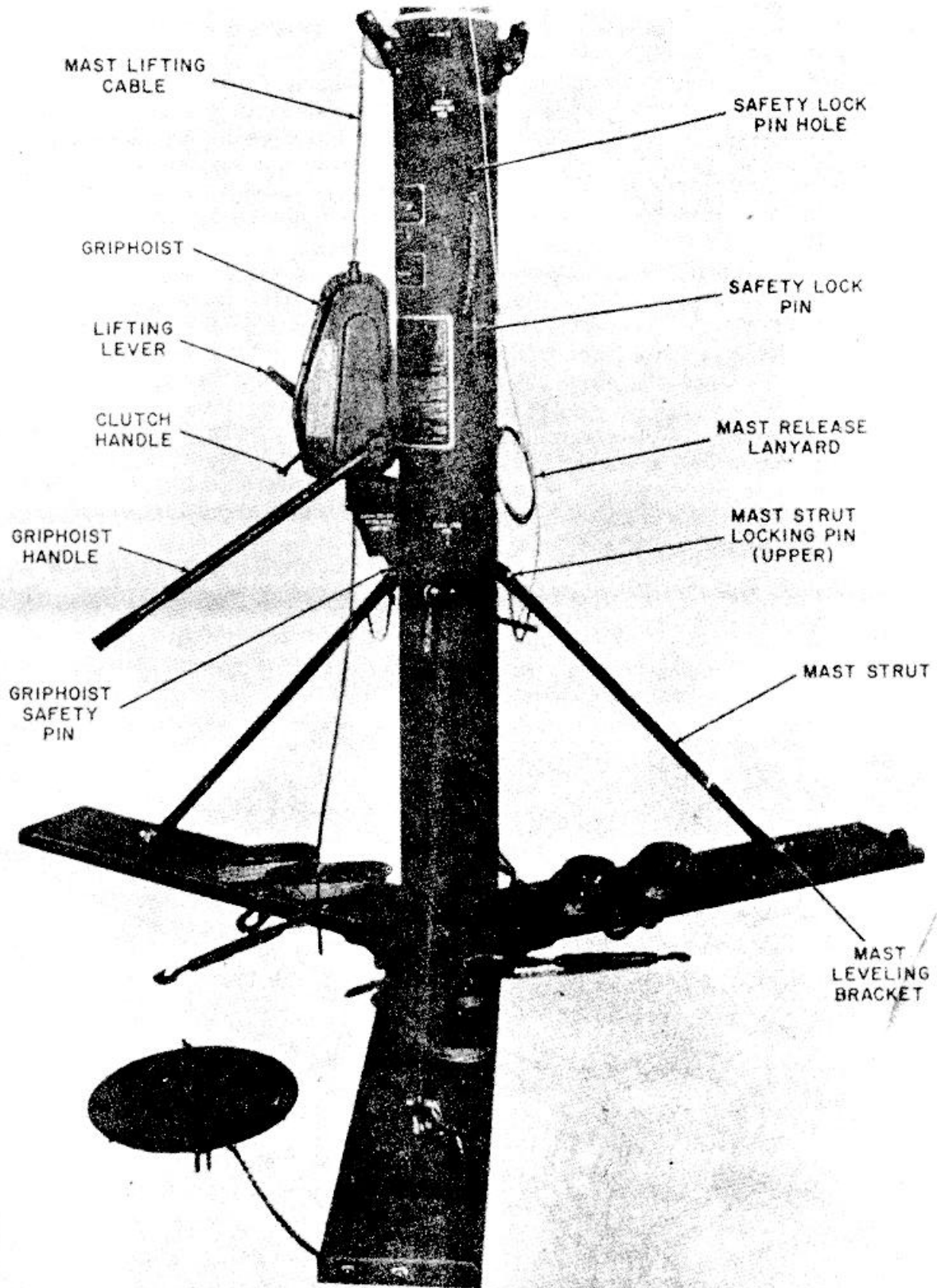


Figure 2-3. Mast ring installation.

- (26) Using three men, lift the antenna base assembly and set it into the center plate of the Y-shaped antenna base (fig. 2-4). Rotate the base until it locks into the locator key (fig. 1-35).
- (27) Insert the end of the mast strut (fig. 1-5) without the attached chained clevis pin into the mast-leveling stub (fig. 2-4). Fasten the mast stub to the mast-leveling stub using the attached clevis pin. Loosen the wing screw on the mast leveling bracket.
- (28) Insert the other end of the mast stub into the bracket on the mast base marked ATTACH STRUT HERE, and fasten it with the attached chained clevis pin.
- (29) Repeat steps (27) and (28) above for the other two antenna base legs.
- (30) Adjust the mast-leveling stubs along the leg of the antenna base until each leg is even with the ground and the antenna mast assembly is still perpendicular to the ground. Using a pair of pliers, tighten the wingnuts on each mast-leveling stub.
- (31) Attach one snubit (fig. 1-21) to the hook on the antenna lifting cable bracket using a shackle and clevis pin. The antenna lifting cable bracket is at the bottom of the antenna mast.
- (32) Insert and thread the end of the antenna lifting cable into the end of the snubit marked TO MAST.

NOTE

If the end of the antenna lifting cable does not fit into the end of the snubit,



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Figure 2-4. Antenna mast assembled to antenna base.

temporarily disassemble the snubit by: removing the wingnut and threaded stud on the side (fig. 25), sliding the center eccentric pulley out of the snubit housing, looping the antenna lifting cable around the eccentric pulley, replacing eccentric pulley into the snubit housing, inserting the threaded stud, and fastening the wingnut to the threaded stud.

- (33) Obtain three snubits, three shackles, and three clevis pins (fig. 1-35) from the group of components removed from the antenna base.
- (34) Attach the snubits to the exposed ring on one of the three arrowhead anchors which were driven into the ground by passing the shackle through the arrowhead anchor ring and through the link on the snubit. Screw the clevis pin into the shackle.
- (35) Repeat step (34) above to attach the remaining two snubits to the arrowhead anchor rings.
- (36) As directed in step (34) above attach the remaining six snubits to the three arrowhead anchor rings. There should be three snubits in each arrowhead anchor ring.
- (37) Remove the three lower guy wires (color-coded green) (fig. 1-35) from the LOWER GUY reels on the antenna base.
- (38) Connect the turnbuckle hook on the end of each lower guy wire to the bracket on the antenna mast marked ATTACH LOWER GUY HERE. Rotate the turnbuckle to allow maximum cable length.
- (39) Extend the lower guy wire, closest to the rear leg of the antenna base, to the bottom snubit on the ring of the arrowhead anchor in line with the rear leg of the antenna base.
- (40) Loosen the thumbscrew on the snubit closest to the ground. Insert the end of the lower guy wire into the pulley of the snubit and pull the wire until it is tight. Rotate the handle on the snubit to cinch the lower guy wire. Tighten the thumbscrew on the snubit that secures the lower guy wire.
- (41) Attach the other two lower guy wires to their corresponding snubits as directed in step (40) above.

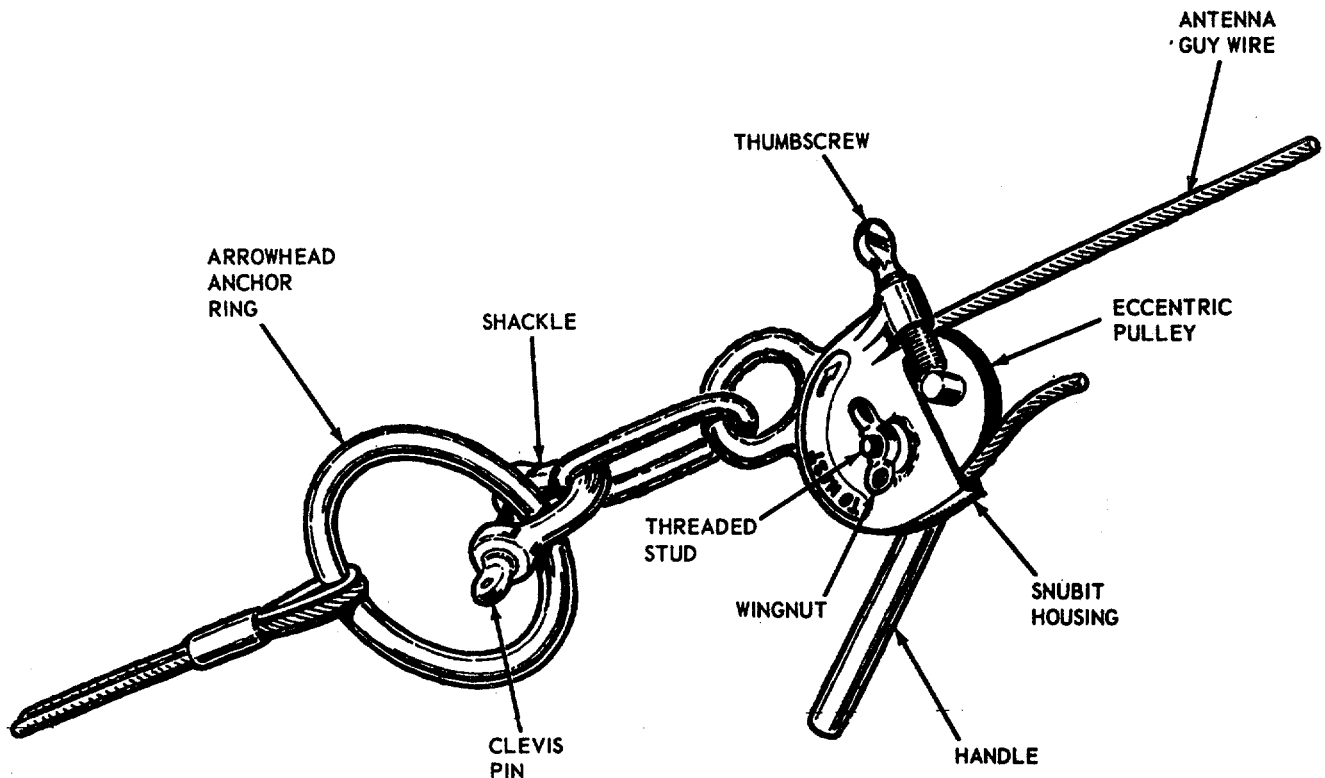


Figure 2-5. Securing sloping vee antenna guy wire.

(42) Adjust the turnbuckle in each of the lower guy wires until the antenna base is straight and all three guy wires are tight.

c. *Raising Antenna Mast Assembly.*

- (1) Install the griphoist on the griphoist mounting pad on the antenna mast assembly (fig. 2-4) so that the keyhole slots in the griphoist bracket are seated on the locating pin in the antenna mast mounting pad.
- (2) Insert the griphoist safety pin into the hole in the griphoist bracket.
- (3) Set the griphoist clutch handle (fig. 2-4) to the down detent position.
- (4) Insert the mast lifting cable (fig. 2-4) into the griphoist bushing and push the cable through the bottom end of the griphoist. Take up the slack in the cable.
- (5) Set the clutch handle to the up detent position.
- (6) Remove the griphoist handle from the leg of the antenna mast and slide it over the lifting lever (fig. 2-4) on the griphoist.
- (7) Unwind the three middle guy wires (color coded blue) (fig. 1-35) from the MIDDLE GUY reels. Attach the hook in the end of each cable to the thimble on the end of each middle guy lifting cable (fig. 2-4).
- (8) Operate the griphoist handle until a white mark on section No. 1 of the telescoping mast appears.
- (9) Extend the end of each middle guy cable to the snubit attached to the arrowhead rings.

NOTE

The bottom snubit on each arrowhead ring is already securing the end of the lower guy wire. Use the next snubit up to secure the middle guy cable. The procedures for securing the snubit and guy cable are given in b(40) and (42) above. Check that each middle guy cable has equal tension.

- (10) Operate the griphoist handle until a horizontal white line appears on the bottom of section No. 1 of the telescoping antenna mast. Continue to operate the griphoist handle until the horizontal white line is about 1 inch past the top of the bottom mast section. The locking latch (fig. 2-3) should engage. When this occurs, a red signal flag will appear at the top of mast section No. 2.
- (11) Unclip the safety lockpin (fig. 2-4) from the antenna mast. Insert the pin into the safety lockpin hole in the antenna base and through the first section of the telescoping mast.
- (12) Move the griphoist handle to the lowering lever on the right side of the griphoist. Operate the griphoist handle until the mast section rests on the safety lockpin.
- (13) Remove the griphoist handle from the lowering lever and place it on the lifting lever. Operate the griphoist handle to a point where the mast lifting cable is taut. Remove and store the griphoist handle on the leg of the antenna base.
- (14) Extend each of the upper guy cables to the remaining snubit on each of the three arrowhead anchor rings. Secure the cables to the snubits as directed in b(40) and (42) above.

d. *Antenna Feedline Installation.*

- (1) Attach the loop end of the antenna lifting cable to one corner of the apex plate (MX-7741/TSC-38B) (fig. 1-21) using a shackle and clevis pin.
- (2) Attach two strain insulator straps (fig. 1-21) to each of the remaining two corners of the apex plate using shackles and clevis pins.
- (3) Attach one strain insulator (IL-61/TSC38B) (fig. 1-21) to each of the four strain insulator straps using shackles and clevis pins. Detail B, figure 2-6, illustrates the assembly of the apex plate, strain insulator straps, and strain insulators.

CAUTION

Each sloping vee antenna leg assembly weighs approximately 75 pounds. Two men should be used to remove and carry each assembly.

- (4) Remove the two reel-mounted sloping vee antenna legs (AB-1010/TSC-38B) (fig. 1-28) from compartment 4 in the pallet.
- (5) At a distance of about 50 feet from the base of the antenna mast, and in the direction of the distant radio station, start unreeling one antenna leg toward the antenna mast until a pair of antenna leg ties appear. Unreel about 5 feet more of the antenna leg and lay the reel aside.
- (6) Repeat step (5) above for the second sloping vee antenna leg assembly.

Figure 2-6①. Sloping vee antenna installation details (part 1 of 2).
(Located in back of manual.)

Figure 2-6②. Sloping vee antenna installation details (part 2 of 2).
(Located in back of manual.)

- (7) Position the apex plate and its assembled components, shown in B, figure 2-6, so that two strain insulators extend from the right corner of the apex plate and two insulators from the left.
- (8) Locate the pair of antenna leg ties on the leg assembly and attach a strain insulator from the right corner of the apex plate to each antenna leg tie, using one shackle and clevis pin for each leg tie to strain insulator connection.
- (9) Repeat step (8) above for the other antenna leg assembly using the two strain insulators attached to the left side of the apex plate.
- (10) Position the unreeled portion of the antenna legs along the ground so that they are parallel and spaced approximately 12 inches apart.
- (11) Approximately 4 feet from the ends of the antenna legs, attach a spreader insulator (MX7729/TSC-38B) (fig. 1-21). Detail A, figure 2-6, illustrates the method of attaching the spreader insulator to each of the antenna legs. The storage location of the No. 12 AWG copper wire, serv-nut, and serv-bolt is shown in figure 1-2L
- (12) Measure approximately 6 feet along the antenna leg assembly and attach another spreader insulator in accordance with A, figure 2-6.
- (13) Repeat step (12) above until six of the seven spreader insulators have been installed.
- (14) Install the last spreader insulator halfway along the length of antenna between the strain insulators.
- (15) Unreel the remaining portion (approximately 500 feet) of the antenna leg on the left side of the apex plate toward the locating stake in the field. This stake was installed earlier to temporarily locate the position for the terminator.
- (16) Repeat step (15) above for the antenna leg on the right side of the apex plate.
- (17) Using the antenna lifting cable, hoist the apex plate toward the top of the antenna mast until the apex plate is touching the antenna lifting pulley.
- (18) Raise the antenna lifting cable bracket along the antenna mast until it rests against the three mast strut brackets marked ATTACH STRUT HERE.
- (19) Using the snubit attached to the antenna lifting cable bracket, secure the antenna lifting cable. Insure that there is no slack in the antenna lifting cable and the apex plate is touching the antenna lifting pulley.
- (20) Using the snubits associated with the upper guy wire, adjust the tension of the upper guy wires so that the antenna mast is perpendicular.

e. *Terminator Installation.*

- (1) Obtain four eyebolt assemblies (fig. 1-21).
Note that the mounting post has holes on all four sides. Each eyebolt assembly consists of an eyebolt, two flat washers and a hexagonal nut. When secured to the terminator/balun mounting post (AB-1007/TSC-38B) (fig. 1-38) a flat washer is placed on each side of the post.
- (2) Secure one eyebolt assembly to each of the four holes on the mounting post as shown in C, figure 2-6.

CAUTION

Each 10-kw terminator weighs approximately 140 pounds. Two men should be used to lift and carry the 10-kw terminators from the storage case to the locating site.

- (3) Remove the 10-kw terminators (MX-7650/TSC-38B) from their cases in compartments 3 and 6 (figs. 1-26, 1-27, and 1-32). In order to remove the 10-kw terminators, it is necessary to pull the two quick-disconnect pins from the case mounting bracket before sliding the terminators out of the cases.
- (4) Orient the terminator so that the filler plug is on top and the insulator bushing is facing the antenna mast.
- (5) Insert the end of the terminator/balun mounting post (opposite the end with the four eyebolts) into the bracket on the back of the 10-kw terminator. Check that the eyebolt in the second hole from the top of the terminator/balun mounting post is pointing toward the insulator in the 10-kw terminator.
- (6) Slide the 10-kw terminator half-way up the terminator/balun mounting post and align the hole in the top bracket of the 10-kw terminator in line with a hole in the terminator/balun mounting post. Insert the quick-disconnect pin attached to the 10-kw terminator into the aligned holes in the terminator bracket and terminator/balun mounting post.
- (7) Secure the bottom terminator bracket to the terminator/balun mounting post using the other quick-disconnect pins..
- (8) Insert a terminator/balun mounting post

into a pedestal base (AB-1009/TSC48B) (fig. 1-19). Secure the mounting post to the pedestal base with the chained locking pin on the pedestal base.

- (9) Attach an insulator-to-shackle adapter ring (fig. 1-21) to one end of a strain insulator.
- (10) Using a shackle and clevis pin, attach the insulator-to-shackle adapter ring to the eyebolt in the second hole from the top of the terminator/balun mounting post.
- (11) Using a shackle and clevis pin (fig. 1-21), secure a terminator guy wire to the eyebolt in the third hole from the top of the terminator/balun mounting post. Secure the end of the terminator guy wire which has the crimped ferrule.
- (12) Using a clevis pin and shackle (fig. 1-21) attach a snubit (fig. 1-21) to the ring on the arrowhead anchor cable.
- (13) Thread the end of the terminator guy wire through the end of the snubit marked TO MAST.
- (14) Pull the terminator guy wire tight and, using the handle and thumbscrew on the snubit, cinch and secure the terminator guy wire.
- (15) Using a shackle and clevis pin, attach a guy rope (fig. 1-21) to the eyebolt in the third hole from the top of the terminator/balun mounting post.
- (16) Using a shackle and clevis pin, attach a guy rope (fig. 1-21) to the eyebolt in the fourth hole from the top of the terminator/balun mounting post.
- (17) Extend the guy ropes so that they form an angle 120° from the terminator guy wire, as shown in figure 2-7.
- (18) Using an arrowhead anchor driving rod, drive an arrowhead anchor into the ground at a point where the end of each of the guy ropes touches the ground.
- (19) Using a shackle and clevis pin, attach the end of each guy rope to the arrowhead anchor guy ring. Adjust the guy ropes to remove any slack.

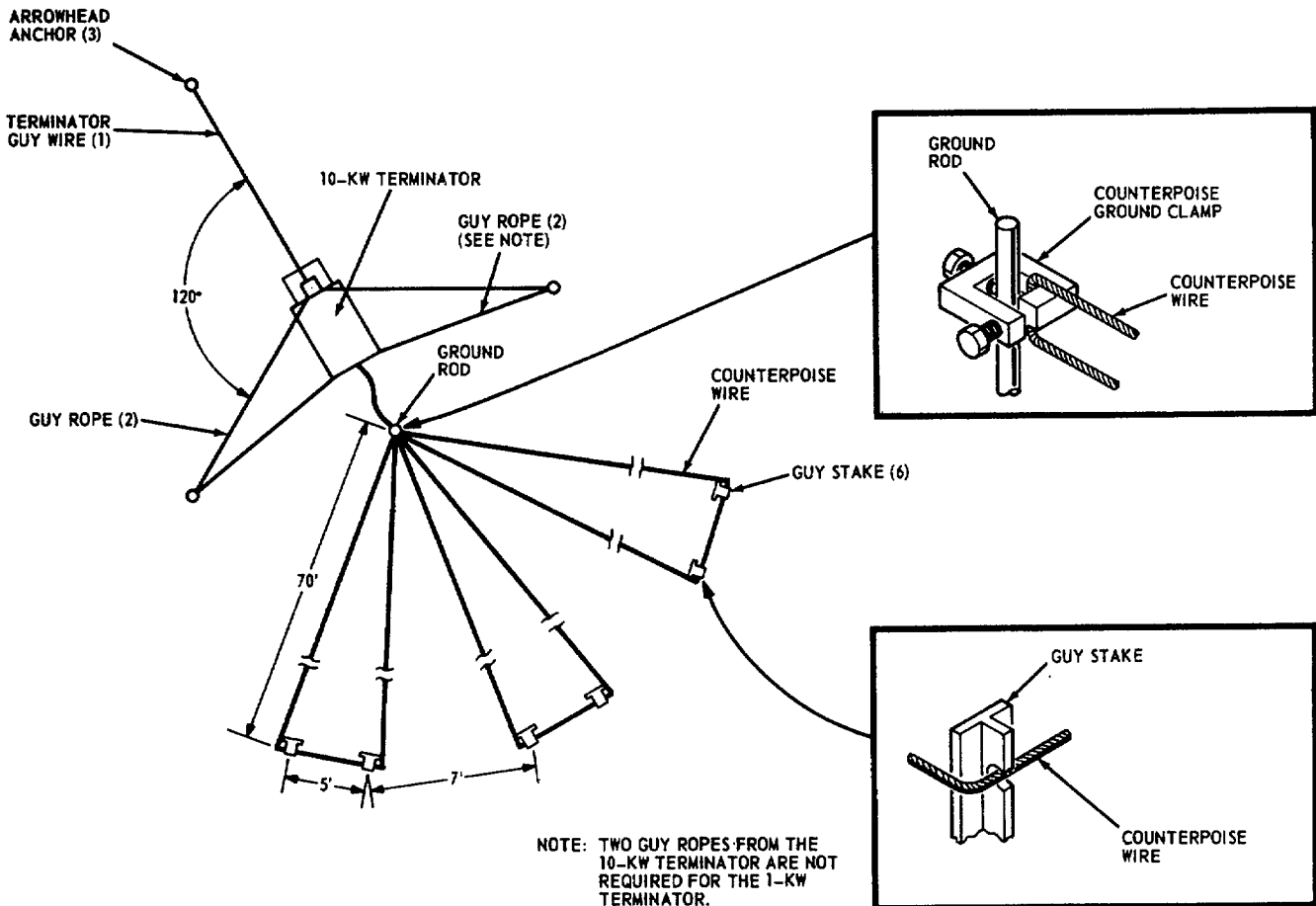


Figure 2-7. Sloping vee antenna counterpoise installation, plan view.

- (20) Using a shackle and clevis pin, attach a guy rope to the eye hook on the bottom front corners of the 10-kw terminator. Attach the end of each guy rope to the arrowhead anchor guy rings installed in step (18) above, using the existing shackle and clevis pins.
- (21) Adjust the tension of two guy ropes from the terminator/balun mounting post and the two guy ropes from the corners of the 10-kw terminator to insure that the terminator/balun mounting post is stable and perpendicular to the ground.
- (22) Using a sledge hammer, drive a pedestal base stake (fig. 1-19) through each of the two enlarged holes on the pedestal base.
- (23) Using a wrench, remove the filler cap on the top of the 10-kw terminator. Screw the pressure valve attached to the 10-kw terminator into the hole that was occupied by the filler cap.
- (24) Attach the terminal lug at the end of the antenna leg to the stud in the insulator bushing on the front of the 10-kw terminator.
- (25) Repeat steps (1) through (24) above to install the other 10-kw terminator.
- (26) Adjust the guy wires and guy ropes on the terminator/balun-mounting posts and antenna mast to insure that the posts and mast are perpendicular to the ground and that a minimum amount of slack exists in the antenna legs.

f. Balun Installation.

- (1) Assemble and secure the remaining pedestal base (fig. 1-19) to the remaining terminator/balun mounting post.
- (2) Remove the 10-kw balun from its case, located in compartment 5 (figs. 1-30 and 1-31). To remove the balun from the storage case, it is necessary to remove the two quick-disconnect pins from the case mounting bracket.
- (3) Slide the brackets on the back of the balun down over the terminator/balun mounting post until the hole in the top bracket is approximately in line with the twentieth hole from the top of the mounting post. Using the quick-disconnect pins on the balun brackets, secure the top and bottom brackets to the mounting post.
- (4) There should be two strain insulators and two insulator-to-shackle adapter rings left in the 10-kw sloping vee antenna accessories case (fig. 1-21). Attach an insulator-to-shackle adapter ring to the end of each insulator.
- (5) Using a shackle and clevis pin, attach the insulator-to-shackle adapter ring on each strain insulator (fig. 1-21) to each of the holes in the ends of the top balun bracket as shown in E, figure 2-6.
- (6) Attach the other end of each strain insulator to the loop in each antenna leg, using a clevis pin and shackle. This loop is approximately 3 feet from the end of each antenna leg.
- (7) Fasten the terminal lug on the end of each antenna leg to its appropriate insulated terminal at the top of the balun.
- (8) Position the terminator/balun mounting post and attached balun as shown in F, figure 2-6. One man must hold the mounting post in this position until the guy ropes have been installed as directed in (9) through (16) below.
- (9) Attach one eyebolt (fig. 1-21) to each of the first three holes in the mounting post. Arrange the position of each eyebolt as shown in E, figure 2-6.
- (10) Attach a guy rope (fig. 1-21) to each eyebolt using shackles and clevis pins. The end of the guy rope which has the crimped ferrule attaches to the shackle.
- (11) Extend the guy rope, attached to the eyebolt in the second hole from the top of the terminator/balun mounting post, toward the antenna mast, until the end reaches the ground.
- (12) At the point where the end of the guy rope reaches the ground, place a guy stake so that the side having a hole at the top is facing the mounting post. Using a sledge hammer, drive the guy stake (fig. 1-19) into the ground at an angle of approximately 45° away from the mounting post. Do not drive the guy stake into the ground deep enough to bury the slot or hole at the top of the guy stake.
- (13) Attach the end of the guy rope to the hole in the guy stake using a shackle and clevis pin.
- (14) Repeat steps (10) through (13) above to install the remaining two guy ropes. Use E, figure 2-6, to determine which eyebolt is used for each guy rope. Orient the guy stakes so that they are spaced approximately 1200 apart.
- (15) Tighten the three guy ropes, and insure that the mounting post is perpendicular to the ground.
- (16) The slack in the antenna feedlines may be further reduced by varying the position of the balun along the length of the terminator/balun mounting post. Repositioning the balun is accomplished by temporarily removing the quick-disconnect pins, sliding the balun along the

terminator/balun mounting post, and replacing the quick-disconnect pins.

g. *Counterpoise Installation.*

- (1) Remove one set of counterpoise wire (MX-7740/TSC-38B) and cable reel (RC-468/G) (fig. 1-28) from compartment 4.
- (2) Remove two ground rods (GP-125/G), two ground rod clamps, two ground rod couplings, and one ground rod driving stud (fig. 1-38) from the antenna mast storage board.
- (3) Screw one ground rod coupling onto a section of ground rod.
- (4) Screw the ground rod driving stud into the ground rod coupling.
- (5) Mark a point approximately 2 feet from the 10-kw terminator in the direction of the antenna mast. Insert the end of the ground rod into the ground, so that the driving stud is on top. Using a sledge hammer, drive the ground rod into the ground until only 6 inches of the ground rod is exposed.
- (6) Unscrew the driving stud, and screw the remaining ground rod into the exposed ground rod coupling.
- (7) Slide the two ground rod clamps over the ground rod.
- (8) Screw the other ground rod coupling to the top of the ground rod.
- (9) Screw the driving stud into the ground rod coupling. Using a sledge hammer, drive the ground rod into the ground until approximately 1 foot of the ground rod remains exposed (or as deep as the terrain will permit).
- (10) As shown in figure 27, measure and mark a point 70 feet from the ground rod and in line with the antenna mast.
- (11) Measure along an arc (with a 70-foot radius from the ground rod) to a point 14 feet 9 inches to the right of the reference point marked in step (10) above.
- (12) Obtain six guy stakes (GP-126/G) from the accessories case (CY-6164/TSC-38B) (fig. 1-19). Drive one of the six guy stakes into the measured point (14 feet 9 inches from the center of the arc) to a depth of 6 inches. For reference purposes only identify this guy stake as guy stake No. 1. Position the guy stake so that the side with the hole and slot is facing away from the terminator.
- (13) Measure 5 feet along the arc and drive in a second guy stake into the ground to a depth of 6 inches. Identify this guy stake as guy stake No. 2.
- (14) Measure 7 feet, 8 inches from guy stake No. 2 and drive a third guy stake into the ground to a depth of 6 inches. Identify this guy stake as guy stake No. 3.
- (15) Measure 5 feet from guy stake No. 3 and drive a fourth guy stake into the ground to a depth of 6 inches. Identify this guy stake as guy stake No. 4.
- (16) Measure 7 feet 3 inches from guy stake No. 4 and drive a fifth guy stake into the ground to a depth of 6 inches. Identify this guy stake as guy stake No. 5.
- (17) Measure 5 feet from guy stake No. 5 and drive a sixth guy stake into the ground to a depth of 6 inches. Identify this guy stake as guy stake No. 6.
- (18) Connect the terminal lug at one end of the counterpoise wire to the ground lug on the 10-kw terminator.
- (19) Slide the counterpoise clamp (fig. 1-21) over the top of the ground rod. Insure that the capscrew in the counterpoise clamp is adjusted so that the opening between the threaded end of the capscrew and the jaw of the counterpoise clamp is slightly larger than the diameter of the counterpoise wire.
- (20) Loop the counterpoise wire through the opening in the counterpoise clamp (fig. 2-7) and unreel the counterpoise wire toward guy stake No. 1.
- (21) Loop the counterpoise wire through the slot in guy stake No. 1 (fig. 2-7) and extend the counterpoise wire to guy stake No. 2.
- (22) Loop the counterpoise wire through the slot in guy stake No. 2 and unreel more counterpoise wire back to the counterpoise clamp.
- (23) Loop the counterpoise wire through the counterpoise clamp and unreel the counterpoise wire to guy stake No. S8.
- (24) Continue to thread the counterpoise wire between the ground rod and the guy stakes as shown in figure 2-7. Insure that each leg of the counterpoise is taut.
- (25) After the last loop has been taken through the counterpoise clamp tighten the capscrew to close the opening in the counterpoise clamp.
- (26) Tighten the capscrew on the counterpoise clamp until the counterpoise clamp and counterpoise wires are all secured to the ground rod.

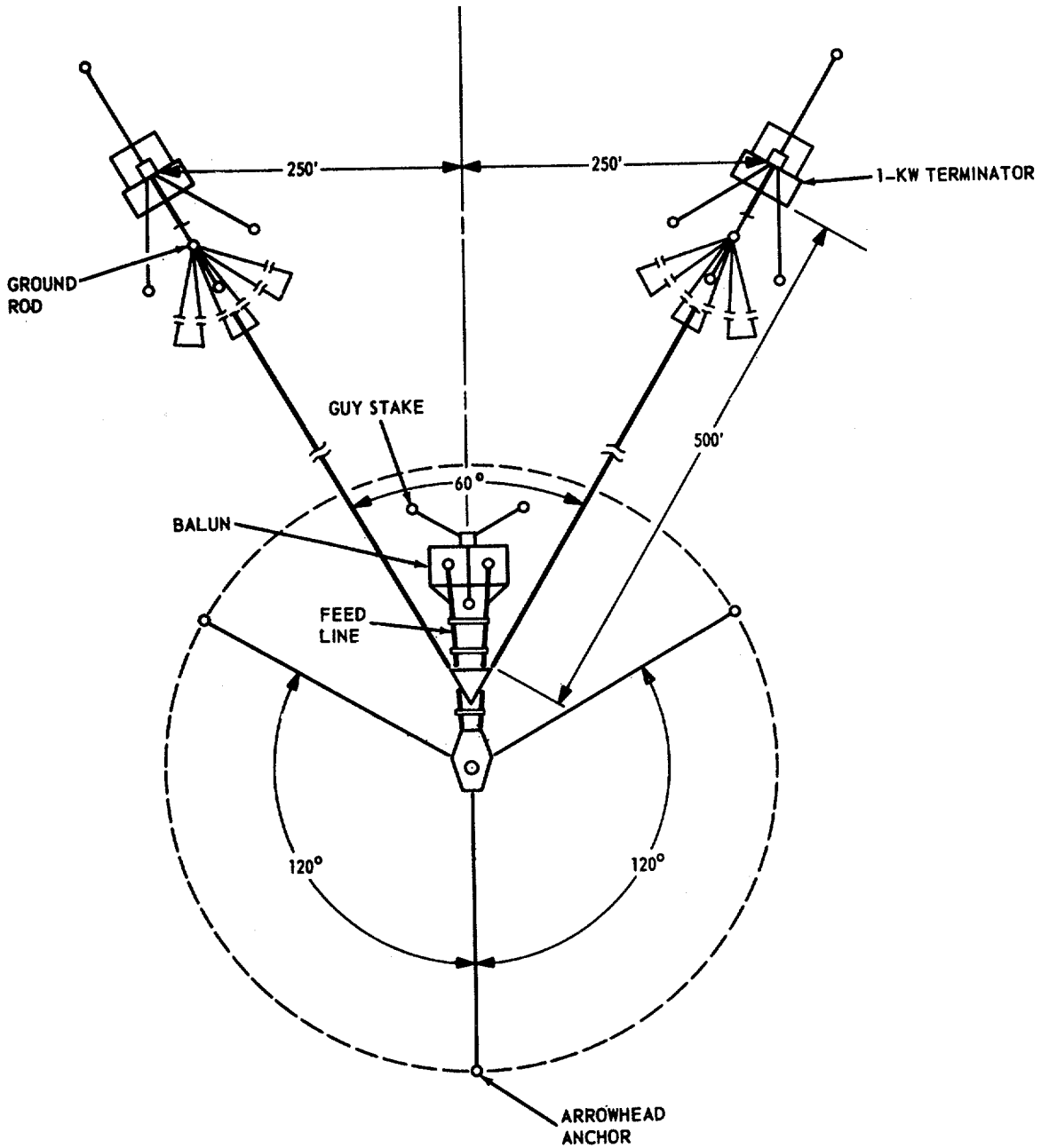


Figure 2-8. 1-kw sloping vee antenna installation, plan view.

- (27) Using a sledge hammer, drive each guy stake into the ground until the slot in the guy stake and the counterpoise wire are just beneath the ground.
- (28) Install the other counterpoise by using the procedure outlined in steps (1) through (27) above.

2-10. 1-Kw Sloping Vee Antenna Installation

The installation procedures for installing the 1kw sloping vee antenna are similar to the procedures outlined in paragraph 2-9 and figures 2-1 and 2-5 through 2-8. Differences in the procedures are listed-in a through c below.

- a. 1-kw terminators (MX-7650/TSC-38B), shown in figure 1-23, are used instead of 10-kw terminators (fig. 1-27).
- b. 1-kw baluns (CU-1668/TSC-38B), shown in figure 1-24, are used instead of 10-kw baluns (fig. 1-31).
- c. The additional guying from the corners of the 10-kw terminators is not required for the 1kw terminator. Refer to the note on figure 2-7.

2-11. Field Whip Antenna Installation

An additional antenna may be located within the antenna field, remote from the equipment shelter, for use with the secondary radio terminal. This is a 36-foot whip antenna (AS-1904/TSC38B) supported on a tripod-mounted base. Location of this antenna is determined by the direction of transmission to the distant radio station in relation to the 10-kw sloping vee antenna. A single 200-foot length of coaxial cable (CG-3256/U) is provided for use with this antenna. The field whip antenna is designed for use as the receiving antenna. The antenna components are stored in cases in the equipment shelter during transport. Installation of the field whip antenna is accomplished by performing the following steps:

- (1) Unfasten and remove the following three cases (fig. 1-12) from the equipment shelter: whip antenna base case (CY-6166/TSC38B), whip antenna case (CY-6167/TSC-38B), and whip antenna parts case (CY-6168/TSC38B).
- (2) Using figures 1-13, 1-14, and 1-15 for identification, remove the following components from the three cases removed from the equipment shelter: five antenna elements (AT-1043/U); one each of antenna elements (AT-1039/U, AT-1040/U, AT-1041/U and AT-1042/U) (fig. 1-13); field whip antenna base (AB-996/TSC-38B) (fig. 1-15); three tripod leg assemblies (with hex nuts and washers attached) (fig. 1-14); three guy rope assemblies; one guy ring; three guy stakes (GP-126/G); a roll of safety wire; and three shackles and clevis pins (fig. 1-14). Note that there are six sets of shackles and clevis pins included in the case. Four are the same size and two are larger. Remove three of the same size shackles and clevis pins.
- (3) Select the antenna location behind the sloping vee antennas and, if required, level the area.
- (4) Secure the tripod legs to the base assembly with nuts and washers as shown in figure 2-9.
- (5) Set the tripod in the selected location. If further leveling is necessary, back off or take up on the nuts securing the base assembly to the tripod legs.
- (6) Screw the nine antenna elements together in the sequence shown in figure 2-9. Adjust the rubber boots on the sixth, seventh, and eighth antenna elements to form a seal.
- (7) Slip the guy ring over the end of antenna assembly and pull it down until it fits snugly.
- (8) Secure the snap hooks on the end of the guy ropes to the eyes on the guy ring.
- (9) Using two men, screw the antenna assembly onto the male stud on the base assembly.

CAUTION

Pull ropes straight through rope fasteners. Damage to rope fasteners may occur if ropes are pulled at an angle.

- (10) About 15 feet from the center of the tripod, drive a guy stake at an angle of 45° away from the antenna. Secure the guy rope to the stake with a shackle.
- (11) About 15 feet from the center of the tripod, and 1200 from the first guy stake, drive a second guy stake at an angle of 45° away from the antenna. Secure the guy rope to the stake with a shackle.
- (12) About 15 feet from the center of the tripod, and 1200 from the first and second guy stakes, drive a third guy stake at an angle of 45° away from the antenna. Secure the guy rope to the stake with a shackle.
- (13) Tighten the guy ropes simultaneously by having a man at each guy stake draw the rope tight.
- (14) Cut 12-inch lengths from the roll of safety wire and safety wire each clevis pin to its shackle.

2-12. Shelter Whip Antenna Installation

Install the shelter whip antenna by performing the procedures outlined in the following steps:

- a. Remove the following components from the three cases removed from the equipment shelter in paragraph 2-11: five antenna elements (AT-1043/U), one each of antenna elements

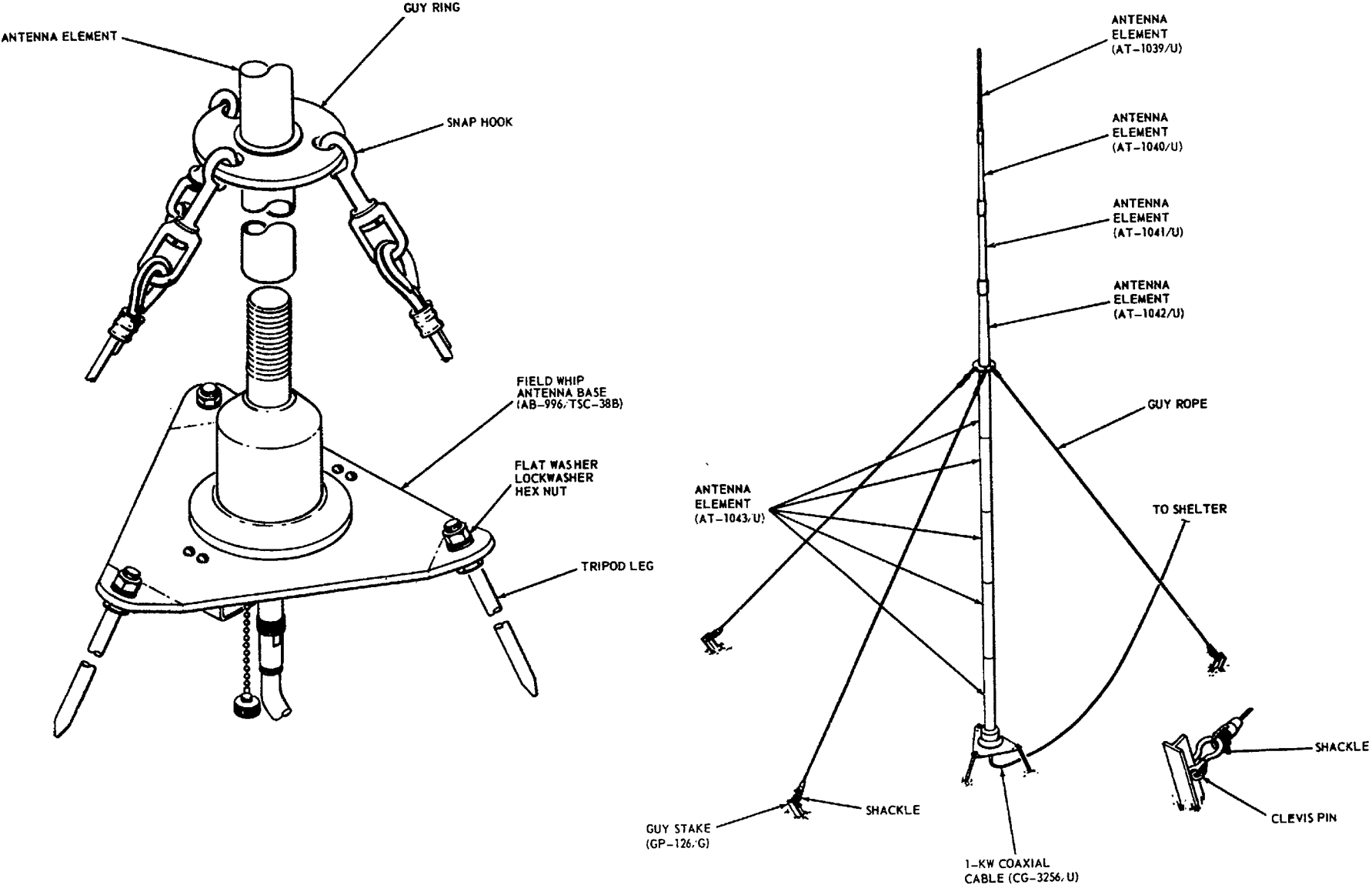


Figure 2-9. Field whip antenna installation.

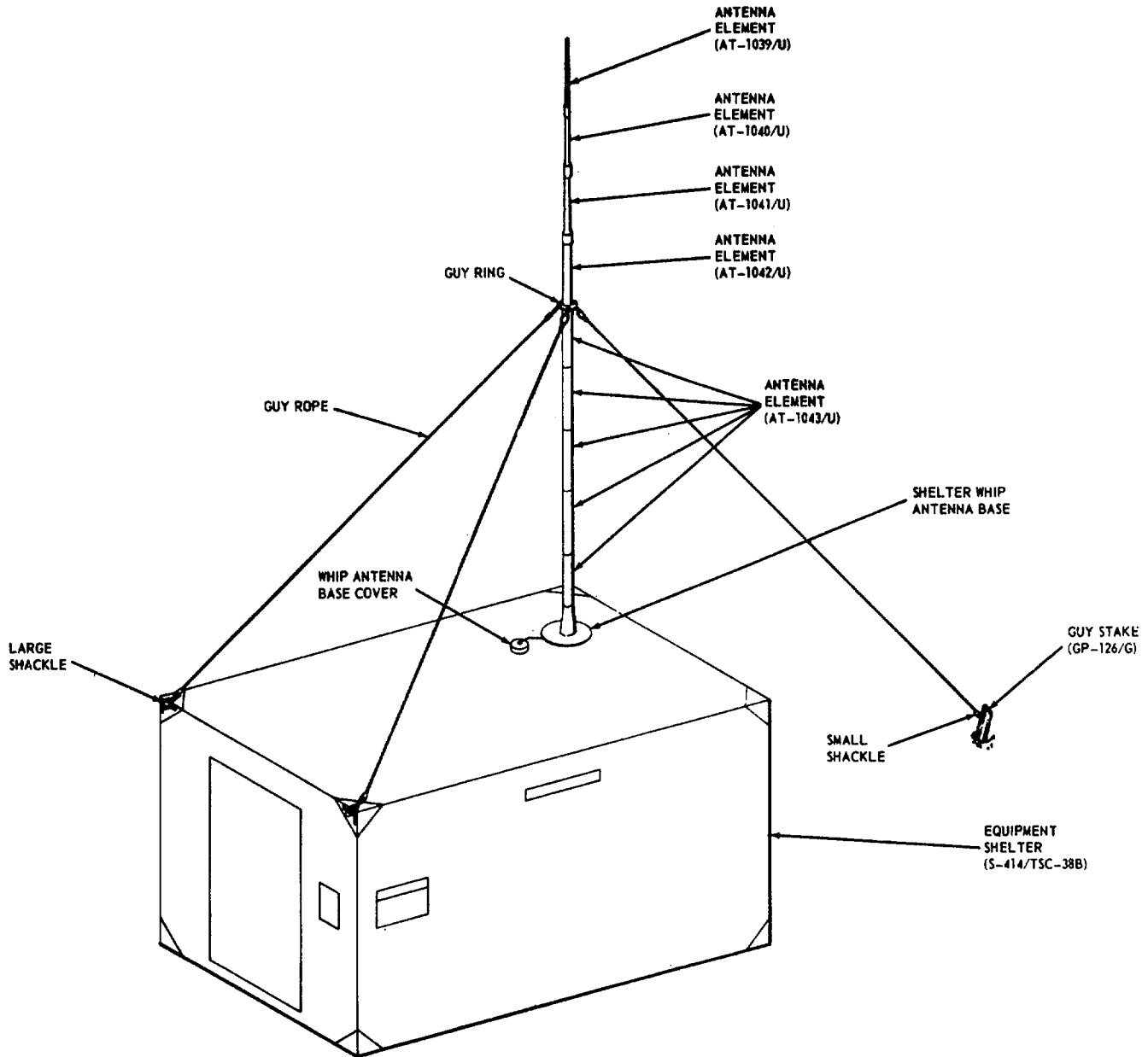


Figure 2-10. Shelter whip antenna installation.

(AT-1039/U, AT-1040/U; AT-1041/U and AT-1042/U) (fig. 1-13); shelter whip antenna base (AB-1090/TSC-38B) (fig. 1-15), guy ring, three guyrope assemblies; guy stake (GP-126/G); and three shackles and clevis pins (fig. 1-14). Note that two of the shackles are larger than the third shackle.

- b. Screw four of the AT-1043/U antenna elements together in the sequence shown in figure 2-10.
- c. Slip the guy ring over the end of the fourth antenna element.
- d. Screw the fifth antenna element (AT-1043/U) onto the fourth antenna element (AT-1043/U) to secure the guy ring.
- e. Continue to screw on the remaining four antenna elements (AT-1039/U to AT-1042/U), as shown in figure 2-10.
- f. Secure the snap hooks on the end of the guy ropes to the eyes on the guy ring.
- g. Unscrew the whip base cover (fig. 2-10) from the equipment shelter roof.
- h. Unscrew the shelter whip antenna base (fig.

1-15) from the cover of the whip antenna base case (CY-6166/TSC38B).

- i. Screw the shelter whip antenna base into the equipment shelter roof.
- j. Using two men, screw the antenna element assembly into the shelter whip antenna base.
- k. Attach the end of each of the two adjacent guy ropes to the lifting rings on the front corners of the shelter. Use the two largest shackles and clevis pins (fig. 1-14).
- l. Approximately 20 feet from the back of the equipment shelter, drive a guy stake into the ground. Leave 3 to 4 inches of the guy stake exposed.
- m. Fasten the remaining guy rope to the guy stake using the small shackle and clevis pin (fig. 1-14).
- n. Cut three 12-inch lengths from the roll of safety wire. Safety wire each clevis pin to each shackle.
- o. Tighten the three guy ropes simultaneously by having a man at each end draw the rope tight. Insure that the whip antenna is perpendicular to the shelter.

2-13. Antenna Coupler Installation Procedures

The antenna coupler (CU-1561/TSC38B) is stored in the equipment shelter during transport and is mounted in the outside back wall of the equipment shelter for operation. The following steps outline the procedures for installing the antenna coupler.

CAUTION

The antenna coupler weighs approximately 75 pounds. Two men should be used to carry the antenna coupler from the equipment shelter and secure it to the mounting on the outside of the equipment shelter.

- a. Using figure 1-12, locate the storage position of the antenna coupler along the right side wall (curbside) of the equipment shelter.
- b. Remove the four hand wheel fasteners that secure the antenna coupler to the interior of the equipment shelter wall. Retain the hand wheel fasteners.
- c. Carry the antenna coupler out of the equipment shelter and position it against the antenna coupler mounting plate (next to antenna entry panel) (fig. 1-4) so that the insulator bushing is facing the top of the equipment shelter.
- d. Secure the antenna coupler to the antenna coupler mounting plate using the four hand wheel fasteners retained in b above.

2-14. 1-Kw P.A. Air Duct Installation

This paragraph will detail the procedures required to install the 1-kw P.A. air duct (fig. 1-12) between the front of the 1-kw P.A. and the appropriate equipment shelter air vent.

- a. Remove the 1-kw P.A. air duct (fig. 1-12) from its storage bracket. Retain the fastening hardware.
- b. Remove and retain the four screws holding the air filter to the front of the 1-kw P.A. Note which side of the air filter is facing the 1-kw P.A.
- c. Orient the flanges of the 1-kw P.A. air duct so that they are aligned with the opening on the front of the 1-kw P.A. and the air vent in the equipment shelter wall (adjacent to the 1-kw P.A. air duct mounting bracket). Note which flange is closer to the 1-kw P.A.
- d. Align the four holes in the 1-kw P.A. with the four holes in the flange noted in c above. Check that the side of the air filter noted in b above is facing away from the 1-kw P.A. air duct.
- e. Using the four screws retained from b above, fasten the 1-kw P.A. air duct and air filter to the front of the 1-kw P.A.
- f. Using the hardware retained from a above, fasten the other 1-kw P.A. air duct flange to the vent in the shelter wall.

2-15. RF Cable Connection

This paragraph will detail the procedures required to connect the 10-kw sloping vee antenna, the 1-kw sloping vee antenna, the field whip antenna, and the shelter whip antenna to the equipment shelter, and RF panel patching procedures.

a. 10-Kw Sloping Vee Antenna Connection.

- (1) Unstrap and remove the canvas cover from the reel assembly located above compartment 6 (fig. 1-29).
- (2) Unreel the 10-kw coaxial cable (CG-3246/U).
- (3) Connect one end of the 10-kw coaxial

- cable to the connector at the bottom of the 10-kw balun, mounted in front of the 10-kw sloping vee antenna.
- (4) Obtain the right-angle adapter (UG-216B/U) from the whip antenna base case (CY-6166/TSC-8B) (fig. 1-15). Remove the cap from the 10 kW VEE ANT antenna connector on the roadside (left outside wall) of the equipment shelter and attach the right-angle adapter to the 10 kW VEE ANT connector. Orient the right-angle adapter so that it is as tight as possible and the unconnected end is facing down.
 - (5) Route the 10-kw coaxial cable to the left side (roadside) of the equipment shelter. Connect the end of the 10-kw coaxial cable to the right angle adapter attached to connector marked 10 kW VEE ANT on the 10-kw entry panel (fig. 2-11).

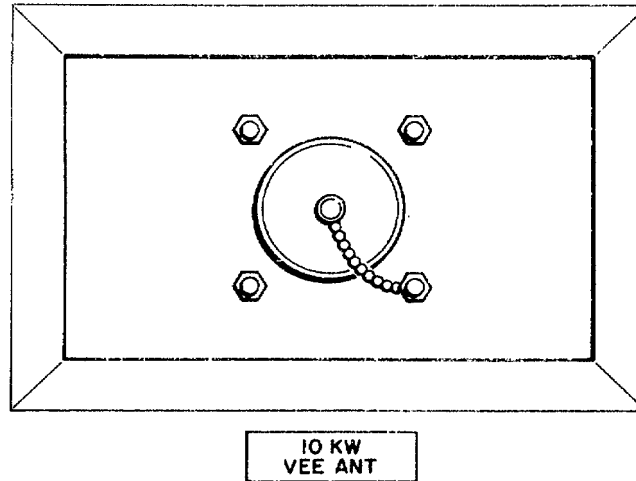


Figure 2-11 10-kw P.A. entry panel.

b. 1-Kw Sloping Vee Antenna Connection.

- (1) Remove two 1-kw coaxial cables (CG-3256/U) mounted on reels RC-467/G (fig. 1-28) from compartment 4.
- (2) Connect one end of the 1-kw coaxial cable to the bottom of one 1-kw balun mounted in front of the 1-kw sloping vee antenna.
- (3) Unreel the 1-kw coaxial cable until the connector on the end is reached. Using a type N coaxial adapter (fig. 1-15), attach the connector on the end of the unreeled 1-kw coaxial cable to the connector on the end of the reeled 1-kw coaxial cable.
- (4) Unreel the remaining length of coaxial cable and route it to the end of the equipment shelter opposite the shelter door.
- (5) Connect the 1-kw coaxial cable to the connector marked RCVR VEE ANT. NO. 1 on the antenna entry panel (fig. 2-12).
- (6) Repeat steps (1) through (5) above for the other 1-kw sloping vee antenna. Connect the end of the 1-kw coaxial cable to the connector marked RCVR VEE ANT. NO. 2.

c. Field Whip Antenna Connection.

- (1) Unreel the length of 1-kw coaxial cable (CG-3256/U (200 ft)) from the whip antenna parts case (CY-6168/TSC-38B) (fig. 1-14).
- (2) Connect one end of the 1-kw coaxial cable to the connector at the bottom of the field whip antenna base (AB-996/TSC-38B) (fig. 2-9).
- (3) Route the 1-kw coaxial cable toward the equipment shelter and connect the other end of the 1-kw coaxial cable to the connector marked WHIP ANT. FIELD on the antenna entry panel (fig. 2-12).

d. Shelter Whip Antenna Connection.

- (1) Connect the length of coaxial cable W15 (fig. 1-15) between coaxial connector J2 on the bottom of the shelter-mounted antenna coupler and the connector marked COUPLER RF on the antenna entry panel (fig. 2-12).
- (2) Connect the RF coupler multiconductor cable (fig. 1-15) between multipin connector J1 on the bottom of the shelter-mounted antenna coupler and the connector marked COUPLER CONTROL on the antenna entry panel.
- (3) Attach the shelter whip to antenna coupler lead (fig. 1-15) between the RF clip on the first section of the shelter whip antenna and the stud in the insulating bushing on top of the antenna coupler. Observe the sleeving markings on the lead for proper connection.

- e. RF Patch Panel Connections.* The RF connections between connectors on RF patch panel 6A1 (SB-2808/TSC-38B) (fig. 1-9) that are required for full operating capabilities of the equipment shelter are given in steps (1) through (7) below.

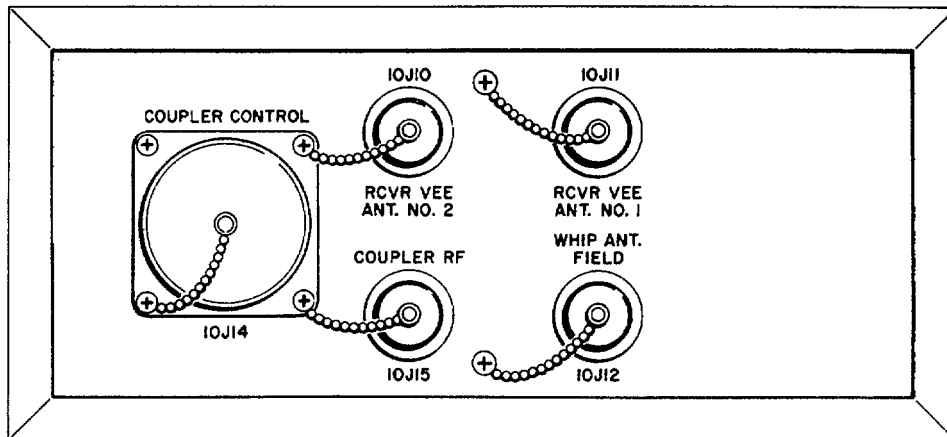


Figure 2-12. Antenna entry panel.

- (1) Obtain and identify the following cables from the whip antenna base case (CY-6166/TSC-38B) (fig. 1-15): W6, W7, W8, W9, W10, W13, and W14.
- (2) Connect cable W6 between the connectors marked 1 kW XMTR XMIT and WHIP ANT. SHELTER.
- (3) Connect cable W7 between the connectors marked SECONDARY RCVR and WHIP ANT. FIELD.
- (4) Connect cable W8 between the connectors marked PRIM RCVR NO. 1 and RCVR VEE ANT. NO. 1.
- (5) Connect cable W9 between the connectors marked PRIM RCVR NO. 2 and RCVR VEE ANT. NO. 2.
- (6) Connect cable W10 between the connectors marked PRIM EXCITER and 10 kW PA.
- (7) Connect cable W13 between the connectors marked SEC EXCITER and 1 kW PA.

NOTE

If simplex operation of the equipment shelter is required, disconnect the end of cable W7 from the connector marked SECONDARY RCVR and connect cable W14 between the connectors marked SECONDARY RCVR and 1 kW XMTR RECEIVE.

2-16. Microphone, Headset, and Earphone Connections

The connections required for the operation of the microphone, headset, and earphone included in the whip antenna base case (CY-6166/TSC-38B) (fig. 1-15) are given in *a*, *b*, and *c* below.

- a.* Obtain the dynamic microphone (M-146/U) and connect it to the connector marked MICROPHONE on the radio line control (7A13) (fig. 1-10).
- b.* Obtain the earphones (H-216/U) and insert the attached plug into the jack marked HEADSET on the radio line control (7A13) (fig. 1-10).
- c.* Obtain the operator No. 2 headset (H-144C/U) and insert the attached plug into the jack marked HEADSET on the telephone line control (7A6) (fig. 1-10).

2-17. Telephone and Teletypewriter Connections

The telephone and teletype signal entry panel circuit connectors are located behind covers installed on the wall of the shelter (fig. 1-3). These covers must be raised to gain access to the terminations. Latches are provided to hold the panel covers in the open position while personnel are engaged in terminating subscriber lines. The signal entry panel area contains an access port at the lower edge, below the connectors. The subscriber wire lines are threaded through this port

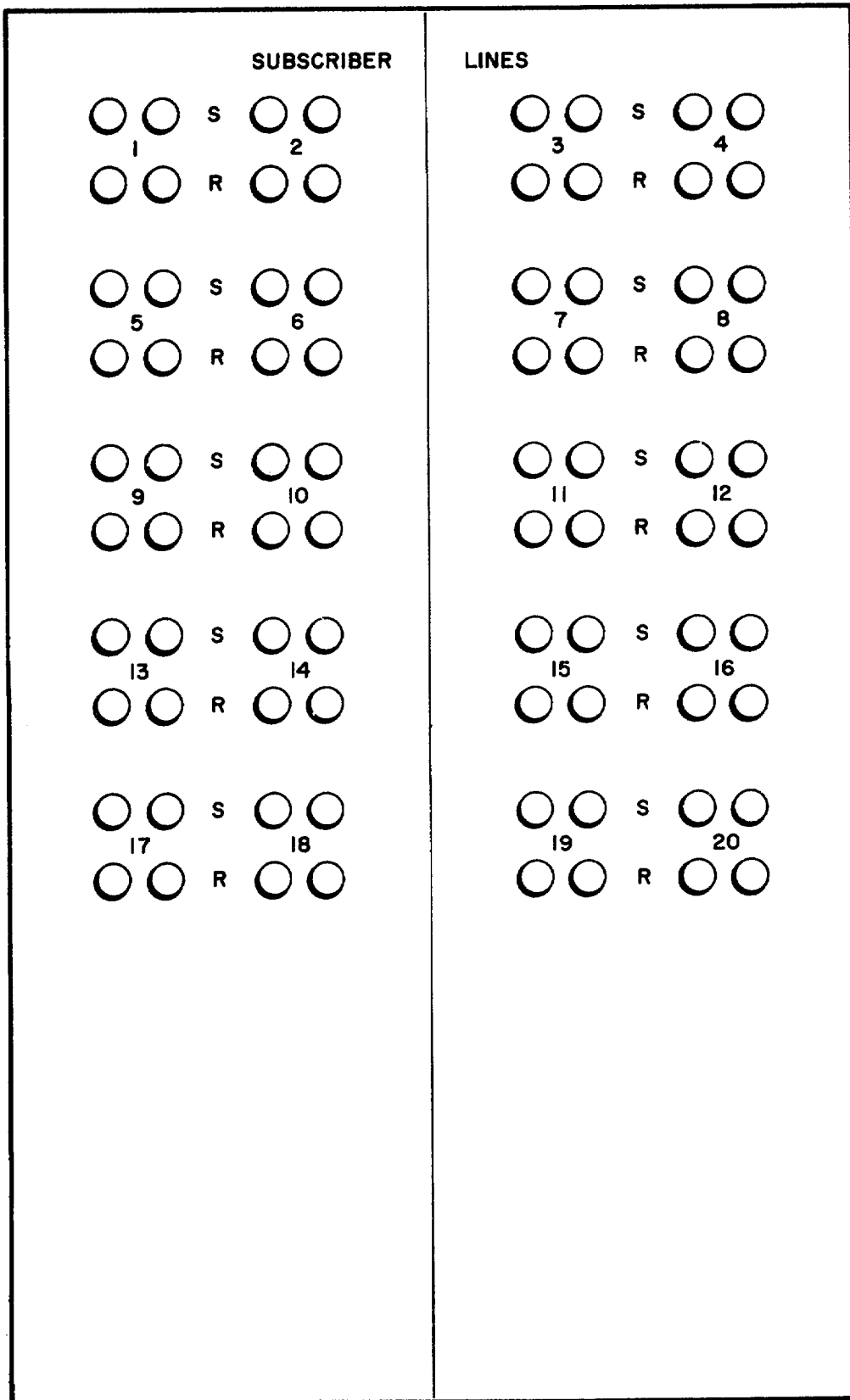


Figure 2-13. Telephone and teletype signal entry panels (7A36 and 7A35), connectors.

before they are connected to the wire line terminals. Use of this port permits the panel covers to be lowered into the closed position when connections (and disconnections) are not actually being made at the panel. In addition, this port arrangement provides a sufficient drip loop for wire lines and permits the line terminals to be protected from inclement weather conditions.

a. *Telephone Connections.* Each subscriber line termination appearing on the telephone signal entry panel (fig. 213) is arranged for full 4-wire operation. The four U-106/G connectors arranged around subscriber lines No. 1, 2, 3, etc., constitute the wire line termination. The subscriber send and receive pairs are also identified. The upper two connectors are the receive terminals.

- (1) For circuit assignments, only two restrictions must be observed:
 - (a) Connections to terminations 13 through 20 at the signal entry panel (fig. 213) are available at the audio patch panel (7A15) in the shelter. These external lines are not directly associated with internal telephone equipment.
 - (b) Within the shelter, only three circuit terminations are implemented to accept frequency shift keying (FSK) signaling and supervision. These terminations are associated with subscriber wire lines 10, 11, and 12.
- (2) Circuit assignments need not be made in any special order. Any 4-wire circuit may be connected to terminations 1 through 9 to provide the required service. If no FSK type instruments are to be served by the AN/TSC-38B, terminations 10 through 12 may also be used for any type service. The wire lines connected at subscriber terminations 13 through 20 may be connected into the AN/TSC-38B equipment by use of patching cords at the audio patch panel (7A15).
- (3) Subscriber terminations 1 through 12 are directly associated with the telephone subsystem equipment. If any outside subscriber is connected at terminations 13 through 20, the subscriber may be connected into the telephone switchboard facilities only by releasing an existing connection in the 1 through 12 subscriber grouping. For example, connecting a subscriber at wire line termination number 13 automatically completes the connection through the wire facilities to the audio-patch panel (7A15). If it is desired to connect the subscriber using termination number 13 into the telephone switchboard facilities used with subscriber No. 4, a 2-wire or 4-wire patchcord at the audio patching panel must be used. Use of a 2-wire or 4-wire cord is dictated by the type circuit being connected. Once this patch has been accomplished, subscriber No. 4 is no longer provided service. Disconnection of subscriber No. 4 occurred when the patchcord was connected between the telephone facility input and subscriber line 13. Therefore, if a new subscriber is to be provided service in lieu of an already connected subscriber, it is advantageous to make the change of subscribers at the signal entry panel, rather than by use of patchcords.
- (4) The greatest advantage offered by the use of the patchcord is the ability to bypass the normal circuit termination when unusual wire line conditions experienced have opened a line fuse, or high voltage surges have caused a circuit protector to operate. When service must be restored immediately, a subscriber line can be reconnected, and the patchcord used to provide the termination as previously provided. This avoids having to reassign a new telephone number on a temporary basis; therefore, persons holding telephone directories do not need to be advised of the temporary change.
- (5) As wire line assignments are made and circuits are connected at the signal entry panel, a record sheet should be initiated. This record sheet is the basis for the telephone directory and related station information.
- (6) The type and quantity of 4-wire telephone circuits which may be connected directly to the telephone switchboard facilities are as follows:

Four-Wire Telephone Circuit Terminations

Type operation	Type battery	Subscriber lines
DC-Dial Telephone	Common	1-12
Manual DC Telephone	Common	1-12
Automatic Dial Switchboard	Common	1-12
Manual DC Switchboard	Common	1-12
Manual Telephone	Local	1-12
Manual Switchboard (Tactical)	Local	1-12
FSK-Dial, FSK-PTT	Local	10, 11, 12
FSK-Dial Switchboard Trunk	Local	10, 11, 12

- (7) For telephone facility subscribers who require 2-wire service, the circuit assignment restrictions given for 4-wire subscribers are also applicable. The 2-wire telephone circuits are connected to the subscriber line send terminal pair; no connections are completed to the associated receive terminal pair. Circuit connections are completed within the line terminal units to arrange the equipment terminations to convert 4-wire service to 2-wire service. The type and quantity of 2-wire telephone circuits which may be connected directly to the switchboard facilities are as follows:

Two-Wire Telephone Circuit Terminations

Type operation	Type battery	Subscriber lines
DC-Dial Telephone	Common	1-12
Manual DC Telephone	Common	1-12
Automatic Dial Switchboard	Common	1-12
Manual DC Switchboard	Common	1-12
Manual (TA-312/PT) Telephone	Local	1-12
Manual Switchboard (Tactical)	Local	1-12
FSK-Dial, FSK-PTT	Local	10, 11, 12
FSK-Dial Switchboard Trunk	Local	10, 11, 12

b. Teletypewriter Connections.

- (1) The teletype signal entry panel is identical to the telephone signal entry panel in appearance, terminal layout, and identification of send pairs and receive pairs. For teletypewriter subscriber circuit assignments on a 4-wire basis, only two restrictions must be observed:
 - (a) Signal entry panel terminations associated with the VFTG channels used for the secure data subsystem are not available for use of outside subscribers. Therefore, these terminations must be ignored for other assignments of signal entry panel terminations.
 - (b) Termination 20 at the signal entry panel appears only at the combined distribution frame (CDF) and is not connected into the dc patching field in the shelter. This termination is not directly associated with any VFTG communication channel capability.
- (2) As assignments are made and circuits connected at the signal entry panel, a record sheet should be initiated. This record sheet is the basis for station use information and administrative matters relating to circuit performance.
- (3) Several switch settings within the equipment shelter must be made before connecting any teletype subscribers to the teletype signal entry panel. Instructions for determining and accomplishing these switch settings are given in paragraph 3-44.

2-18. Primary Power Connections

To provide connections for primary power to the equipment shelter, perform the installation instructions given in a and b below.

a. Connections from Generator Set No. 1.

- (1) Unreel one length of generator power cable (CX-11510/U), (fig. 1-29) from the pallet. Route the generator power cable along the ground between the pallet and the equipment shelter. The male connector on the generator power cable should be closest to the pallet. Do not lay the generator power cable directly under or in front of the 10-kw sloping vee antenna.
- (2) Connect the end of the generator power cable to the connector marked GENERATOR NO. 1 on the power entry panel (fig. 2-14).
- (3) Connect the other end of the generator power cable to the 400 CYCLE POWER J18 connector on one of the generator sets.

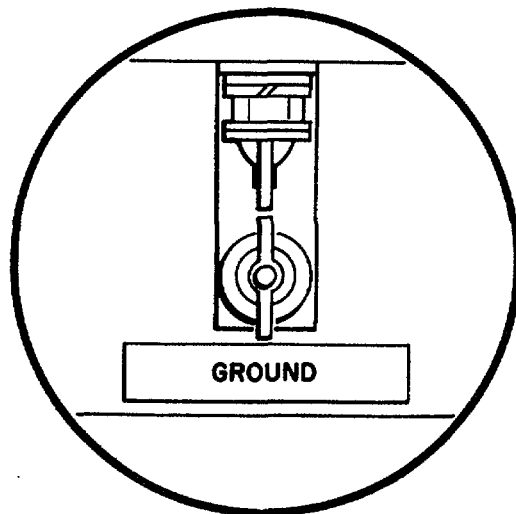
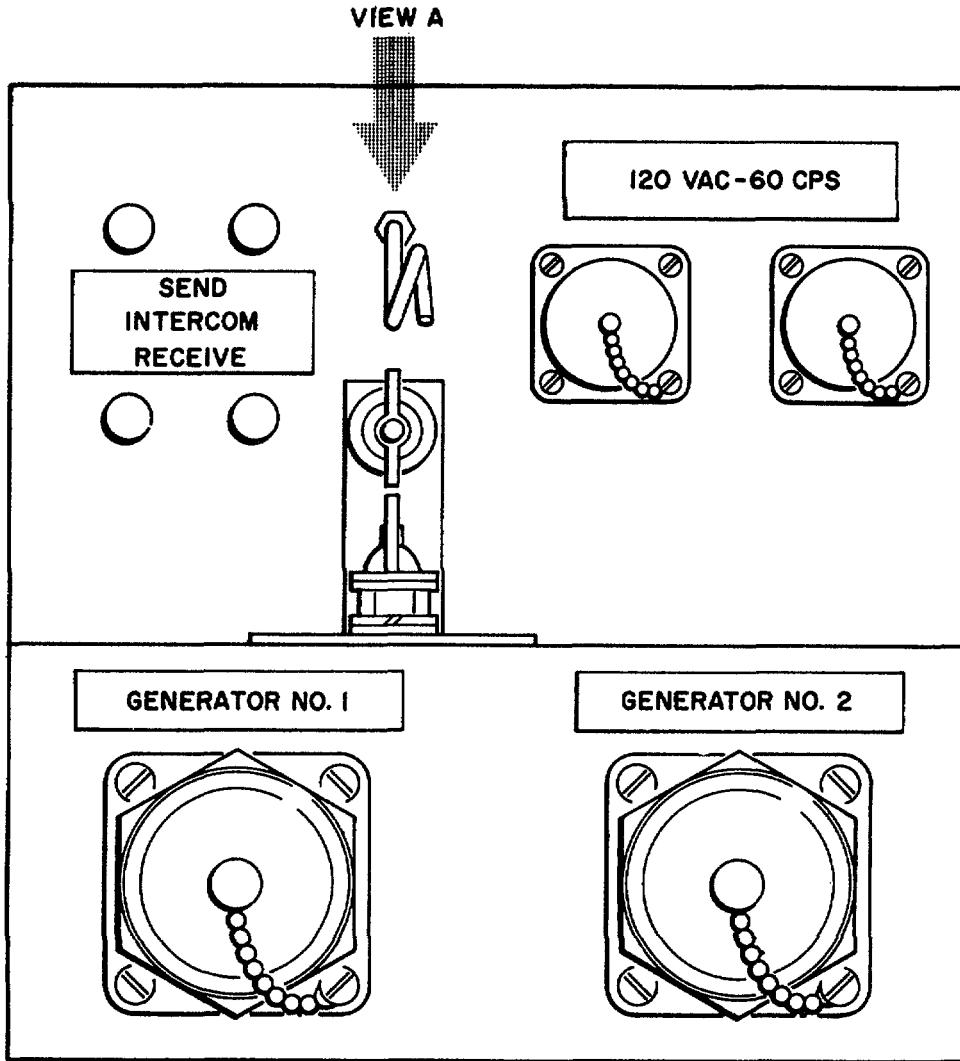
b. Connections From Generator Set No. 2. Repeat the instructions given in a above.

2-19. Grounding Procedures

The following instructions detail the procedure for grounding the equipment shelter and pallet.

a. Equipment Shelter Grounding;

- (1) Remove the short ground rod assembly (GP-128/G) from the whip antenna case (CY-6167/TSC-8B) (fig. 1-13). The short ground rod assembly consists of two sections of ground rod, two ground rod clamps, two ground rod couplings and one ground rod driving stud.
- (2) Screw the ground rod coupling to the end of one of the lengths of ground rod.
- (3) Screw the ground rod driving stud into the ground rod coupling.
- (4) Select a point approximately 10 feet



VIEW A

Figure 2-14. Power entry panel.

from the power entry panel on the equipment shelter. Using a sledge hammer (fig. 1-14), drive the ground rod into the ground until approximately 6 inches of the ground rod is exposed.

- (5) Remove the ground rod driving stud. Screw the remaining length of ground rod into the ground rod coupling.
- (6) Slide one ground rod clamp over the ground rod.
- (7) Screw the remaining ground rod coupling to the ground rod.
- (8) Screw the ground rod driving stud into the ground rod coupling.
- (9) Drive the ground rod into the ground until 1 foot of the ground rod remains exposed.
- (10) Using the length of grounding cable (fig. 1-15), attach the end of the grounding cable with the terminal lug to the wingnut terminal marked GROUND on the power entry panel (fig. 2-14).
- (11) Thread the other end of the grounding cable through the ground rod clamp, and attach this end of the grounding cable to the pallet.
- (12) Tighten the ground rod clamp to secure the grounding cable to the ground rod.

b. Pallet Grounding.

- (1) Obtain the remaining ground rod assembly from the antenna storage board (fig. 138) and unscrew the sections of ground rod.
- (2) Obtain the pallet ground wire from the antenna accessories case (CY-6165/TSC-38B) (fig. 1-20).
- (3) Screw the ground rod coupling to one of the lengths of ground rod.
- (4) Screw the ground rod driving stud into the ground rod coupling and slide a ground clamp onto the ground rod.
- (5) Select a point approximately 15 feet away from the ground stud on one of the pallet mounted engine generators.
- (6) Using a sledge hammer, drive the ground rod into the ground until approximately 6 inches of the ground rod is exposed.
- (7) Insert one end of the pallet ground wire to the ground rod clamp and tighten the ground rod clamp.
- (8) Insert the other end of the pallet ground wire into the grounding stud on the selected engine generator.
- (9) Remove the ground rod driven stud from the end of the ground rod driven into the ground.
- (10) Repeat steps (2) through (8) above to ground the other engine generator.

2-20. Adjustment of Air Inlet and Outlet Covers

The shelter wall contains various openings for air circulation within the equipment shelter. These openings are shown in figures 1-3 and 1-4.

a. 10-Kw Power Amplifier Air Vents. The air inlet and outlet vents for the 10-kw power amplifier must be opened before primary power is applied to the unit. Perform steps (1) through (4) below for both openings.

- (1) Release the one-quarter turn fasteners located in the lower corners of both the inlet and outlet covers.
- (2) Raise each cover to the fully extended position.
- (3) Rotate the rain shields out from the inside of the cover. Note the screwhead slots near the lower corner of each rain shield.
- (4) Lower each cover, with the rain shields extended, and engage the screwhead slots between the retaining screw and the frame of the opening, noting that the shield is engaged on both sides.

b. Deleted.

c. Air-Conditioner Air Openings. The air conditioner vents must be opened when the environmental conditions at the operating site require use of the air-conditioning equipment. If the climatic conditions require use of the heater, the vents may be opened, or may be left in the closed position, depending on the amount of required outside air. To open these covers, perform steps (1) through (4) below.

- (1) Release the one-quarter turn captive fasteners located in the lower corners of the top and bottom covers.
- (2) Raise the cover to the fully extended position.
- (3) Rotate the rain shields out from the inside of the cover.
- (4) Lower the cover, with the rain shields extended, and engage the rain shield slots between the retaining screw and the frame of the opening, insuring that the shield is engaged on both sides of the opening.

d. Shelter Wall Ventilation Port. A natural ventilation port is provided in the shelter wall adjacent to the air-conditioner vents. This port may be opened to provide outside air, as required. This port is fitted with lighttight louvers to prevent light leakage during blackout or other night operations. To open this port, perform steps (1) through (4) below.

- (1) Release the one-quarter turn captive fasteners located in the lower corners of the cover.
- (2) Raise the cover to the fully extended position. (Note the retaining clip located on the inside of the cover.)
- (3) Grasp the "V" rod and rotate the apex outward to a partially extended position.

(4) Engage the apex of the "VI" latching rod behind the clip located on the inside of the ventilation port cover.

e. Shelter Access Door Ventilation Port. A natural ventilation port is also provided in the shelter access door. This port, in conjunction with the smaller port located in the shelter wall, completes the natural ventilation path through the shelter. The port located in the shelter door is fitted with RFI gasket material and has light tight louvers to permit operation during blackout or other night operations. To open this port, perform steps (1) through (4) below.

(1) Release the one-quarter turn captive fasteners located in the lower corners of the cover.

(2) Raise the cover to the fully extended position. The retaining clip is located on the inside of the cover.

(3) Grasp the "V" rod and rotate the apex outward to a partially extended position.

(4) Engage the apex of the "V" rod behind the clip located inside the ventilation port cover.

f. 1-Kw P.A. Air Vents. Two air vents in the shelter wall (figs. 1-3 and 1-4) are provided for supplying proper ventilation for the 1-kw P.A. One vent is used for inlet air and the other vent for outlet air. To open these ports perform steps (1) through (5) below.

(1) Release the one-quarter turn captive fasteners located in the lower corners of the 1-kw P.A. air inlet vent cover (fig. 1-3).

(2) Raise the cover to the fully extended position.

(3) Rotate the rain shields out from the inside of the cover.

(4) Lower the cover, with the rain shields extended, and engage the rain shield slots between the retaining screw and the frame of the opening, insuring that the shield is engaged on both sides of the opening.

(5) Release the one-quarter turn captive fasteners located in the lower corners of the 1-kw P.A. air outlet vent cover (fig. 1-4) and repeat steps (2), (3), and (4) above.

2-21. Deleted.

Section IV. INITIAL ADJUSTMENT OF EQUIPMENT

2-22. Extent of Initial Adjustments

This section covers initial adjustments which must be made at the telephone terminals (7A1, 7A2, and 7A3) and the telegraph line control (7A17) as soon as the AN/TSC-38B is installed. The number and type of both landline telegraph and telephone subscribers must be known in order for the operator to initiate a record sheet from which a telephone directory and telegraph directory may be made.

2-23. Telephone Subsystem

- a. *General.* Using the information noted in paragraph 2-17a, perform steps b and c below.
- b. *Telephone Terminal Switch Settings.* On the telephone terminal (7A1, 7A2, and 7A3), position the 4W/2W, CB/LB/FSK, and D/M/20 switches (fig. 3-23) for landline telephone subscribers 1 through 12 as indicated in the chart below.

Type of line		Switches		
		4 W/2W	CB/LB/FSK	D/M/20
Subscribers 1 through 12	4-W CB DTP	4W	CB	D
	2-W CB DTP	2W	CB	D
	4-W CB MTP	4W	CB	M
	2-W CB MTP	2W	CB	M
	2-W LB TP	2W	LB	D
	4-W LB TP	4W	LB	D
	2-W LB SWBD.....	2W	LB	(20)M2
	4-W LB SWBD.....	4W	LB	(20)M2
	2-W CB SWBD	2W	CB	(20)M2
	4-W CB SWBD	4W	CB	(20)M2
	2-W CB 1-W SWBD.....	2W	CB	(20)M2
	2-W FSK DTP/TK1	2W	FSK	D
	4-W FSK DTP/TK1	4W	FSK	D

1Used on lines 10, 11 and 12 only.

2 (20) Indicate option to be determined at time of circuit connection in conjunction with outside exchange. If the switchboard subscriber desires a line closure signal, the D/M/20 switch should be set to the 20 position. If the switchboard subscriber is supplying a line closure signal to the AN/TSC-88B, the D/M/20 switch should be set to the M position.

- c. *Telephone Directory.* Using the information noted in b above, fill in the type of end instrument and subscriber identification for the landline telephone subscribers 1 through 20 in the telephone directory below.

Telephone Directory

Landline subscriber number	Telephone number	Type of end instrument	Subscriber identification
1	20		
2	21		
3	22		
4	23		
5	24		
6	25		
7	26		
8	27		
9	28		

Landline subscriber number	Telephone number	Type of end instrument	Subscriber identification
10	29		
11	30		
12	31		
13	--		
14	--		
15	--		
16	--		
17	--		
18	--		
19	--		
20	--		

Radio channels	Telephone number
SECONDARY A2	32
SECONDARY A1	33
SECONDARY B1	34
SECONDARY B2	35
PRIMARY A2	36
PRIMARY A1	37
PRIMARY B1	38
PRIMARY B2	39

2-24. Nonsecure Subsystem

If possible, the operator should determine the type of teletypewriter terminal equipment planned for use at the distant terminal at the time teletypewriter subscriber connection requirements are made known. The expected line current (i.e., 60 made, 20 made neutral, or 30 made polar) and whether the distant terminal equipment will supply line current should also be determined.

CAUTION

This determination must be made before teletypewriter wire lines are connected to the signal entry panel terminals. Failure to make this determination can result in blown line fuses, or other damage to teletypewriter terminal equipment.

2-25. General

Connection of teletypewriter subscriber wire lines to the teletype signal entry panel (fig. 213) and corresponding switch settings on the telegraph line control (C-7085/TSC-38B) (fig. 1-11) should be performed in accordance with the procedures given in a through e below. Adherence to these procedures will reduce exposure of personnel to voltages at the terminals of the teletype signal entry panel when the equipment is operating.

WARNING

130 vdc is present on the terminals of the teletype signal entry panel when the equipment is operating.

- a. If the equipment is operating, locate the VFTG channel control (C-7079/TSC-38B) (fig. 1-11). Press all the CHANNEL VFTG ON indicator pushbuttons so that they are lighted.
- b. Determine the teletypewriter subscriber loop currents and mode of operation, i.e., 60 made neutral or 30 made polar, etc.
- c. Prepare the teletypewriter subscriber wire lines and complete their connections at the teletype signal entry panel.
- d. On the telegraph line control (7A17), perform steps (1) through (4) below.
 - (1) Locate the desired subscriber SEND line rotary switch.

NOTE

SEND and RECEIVE designations indicated on the telegraph line control refer to the VFTG terminal functions, not the subscriber function. SEND indicates VFTG output to the subscriber printer; RECEIVE indicates VFTG input from the subscriber transmitter or keyboard.

- (2) Place the SEND switch in the position corresponding to the type of line current operating mode required.

<i>Position</i>	<i>Line current mode</i>
A	60 made neutral supplied by VFTG terminal
B	20 made neutral supplied by VFTG terminal.
C	30 made polar supplied by VFTG terminal
D	60 made neutral supplied by distant teletypewriter or other line source

- (3) Locate the desired subscriber RECEIVE line rotary switch.

- (4) Place the RECEIVE switch in the position corresponding to the type of line current operating mode required.

<i>Position</i>	<i>Line current mode</i>
A	60 made neutral supplied by distant teletypewriter.
B	20 made neutral supplied by distant teletypewriter.
C	30 made polar supplied by distant teletypewriter.
D	60 made neutral supplied by the VFTG terminal.

e. *Telegraph Directory.* Using the information noted in paragraph 2-17b (connections), fill in the type of end instrument and subscriber identification in the directory below.

Telegraph Subscriber Directory

Subscriber number	Type of end instrument	Subscriber identification
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		

**CHAPTER 3
OPERATING INSTRUCTIONS**

Section I. CONTROLS AND INDICATORS

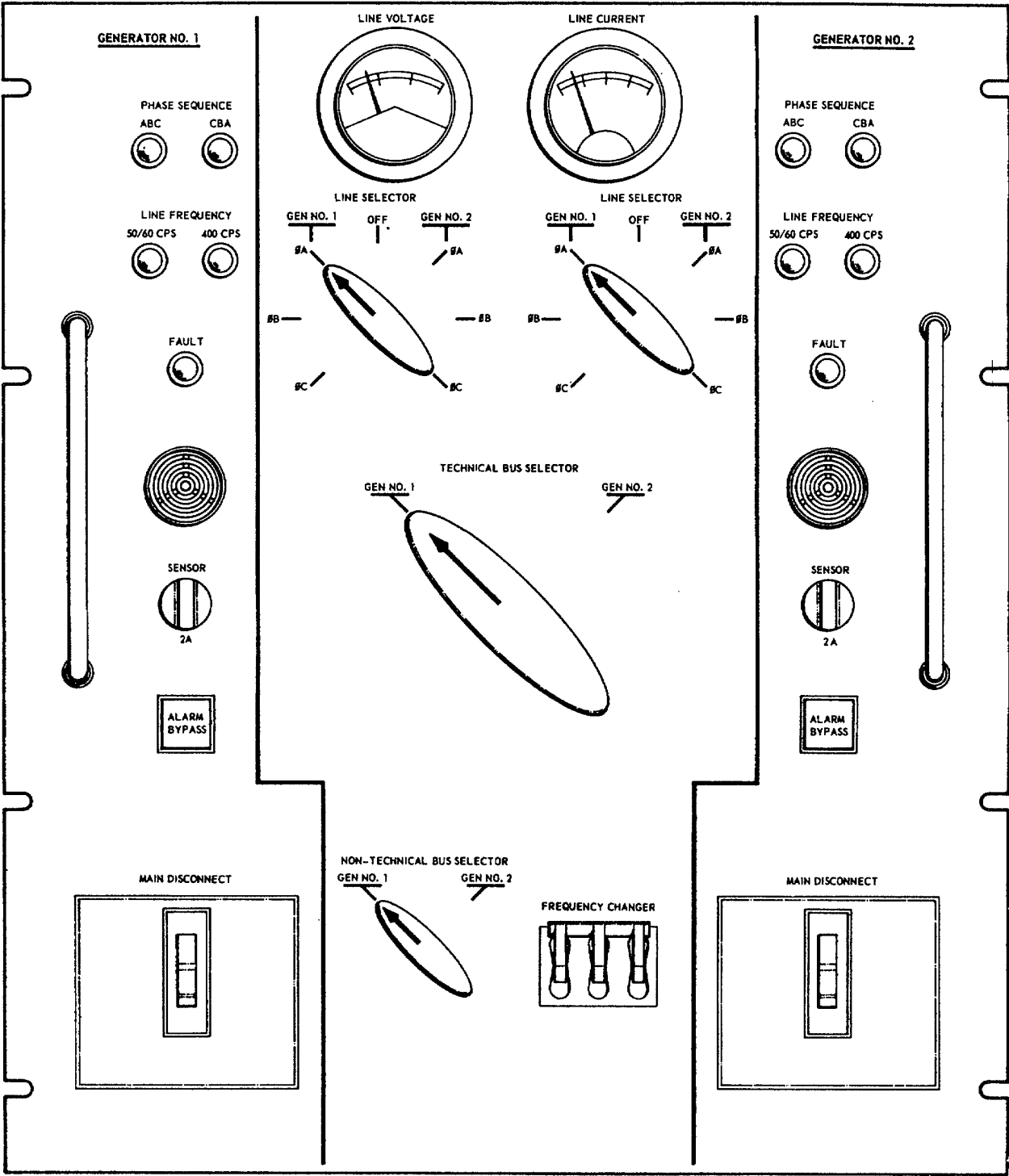
3-1. General

This section describes the functions of all controls, indicators, and jacks used for operation of Communications Central AN/TSC-48B.

3-2. Panel, Power Distribution SB-2783/TSC-38B Controls and Indicators
(fig. 3-1)

The main ac power panel (SB-2783/TSC-38B) contains the primary input power main disconnect circuit breakers and the required power system performance monitoring features.

<i>Control or indicator</i>	<i>Function</i>
GENERATOR NO 1:	
PHASE SEQUENCE ABC lamp (green).	Lights when the phase sequence of generator No. 1 is ABC.
PHASE SEQUENCE CBA lamp (red).	Lights when the phase sequence of generator No. 1 is CBA.
LINE FREQUENCY50/60 CPS lamp (green).	Lights when the frequency of generator No. 1 is 50 or 60 cps.
LINE FREQUENCY400 CPS lamp (blue).	Lights when the frequency of generator No. 1 is 400 cps.
FAULT lamp(red).	Lights when the input voltage or frequency from generator No. 1 is not within tolerance, or a trouble exists in the frequency-sensing equipment associated with generator No. 1.
Fuse audible alarm (located between FAULT lamp and SENSOR indicating fuse holder;no panel nomenclature)	Operates to indicate SENSOR fuse has blown.
SENSOR indicating fuse holder.	Lamp lights to indicate that fuse in generator No. 1 frequency/voltage sensor circuit has blown
ALARM BYPASS switch (backlighted pushbutton).	Silences the fuse audible alarm.
MAIN DISCONNECT circuit breaker	Connects output of generator No. 1 to equipment shelter circuits
LINE VOLTAGE meter.	Indicates line voltage of each phase of generator No. 1 or generator No. 2 output depending on setting of voltage LINE SELECTOR switch).
Voltage LINE SELECTOR switch (seven-position rotary switch).	Connects LINE VOLTAGE meter for measurement of output line voltage of each phase of generator No. 1 or generator No. 2.
	<i>Sw pos Measurements</i>
	GEN NO. 1
	ØA.....Voltage of generator No. 1 phase A.
	ØB.....Voltage of generator No. 1 phase B



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Figure 3-1. Panel, Power Distribution SB-2783/TSC-38B, controls and indicators.

Control or indicator

Function

Sw pos Measurements

ØC.....Voltage of generator No. 1 phase C.
OFF.....Disconnects meter from circuits.

GEN NO. 2:

ØA.....Voltage of generator No. 2 phase A.

ØB.....Voltage of generator No. 2 phase B.

ØC.....Voltage of generator No. 2 phase C.

Indicates line current of each phase of generator No. 1 or generator No. 2 output (depending on setting of current LINE SELEC TOR switch).

Connects LINE CUR RENT meter for measurement of output line current of each phase of generator No. 1 or generator No. 2.

Sw pos Measurements

GEN NO. 1:

ØA.....Current of generator No. 1 phase A.

ØB.....Current of generator No. 1 phase B.

ØC.....Current of generator No. 1 phase C.

OFF Disconnects meter from circuits.

GEN NO. 2:

ØA Current of generator No. 2 phase A.

ØB Current of generator No. 2 phase B.

ØC Current of generator No. 2 phase C.

Connects output of generator No. 1 or generator No. 2 to the equipment shelter technical bus.

Connects output of generator No. 1 or generator No. 2 to the equipment shelter non technical bus.

Connects the frequency changer to the non technical bus.

Lights when the phase sequence of generator No. 2 is ABC.

Lights when the phase sequence of generator No. 2 is CBA.

Lights when the frequency of generator No. 2 is 50 or 60 cps.

Lights when the frequency of generator No. 2 is 400 cps.

Lights when the input voltage or frequency from generator No. 2 is not within tolerance or a trouble exists in the frequency-sensing equipment associated with generator No. 2.

Operates to indicate SENSOR fuse has blown.

LINE CURRENT meter.

Current LINE SELECTOR switch (seven position rotary switch).

TECHNICAL BUS SELECTOR switch (two-position rotary switch).

NONTECHNICAL BUS SELECTOR switch (two position rotary switch).

FREQUENCY CHANGER circuit breaker (ganged three section circuit breaker).

GENERATOR NO. 2:

PHASE SEQUENCE ABC lamp (green).

PHASE SEQUENCE CBA lamp (red).

LINE FREQUENCY50/60 CPS lamp (green).

LINE FREQUENCY400 CPS lamp (blue).

FAULT lamp(red).

Fuse audible alarm (located between the FAULT lamp and the SENSOR indicating fuse holder; no panel nomenclature).

<i>Control or indicator</i>	<i>Function</i>
SENSOR indicating fuse holder.	Lamp lights to indicate that fuse in generator No. 2 frequency/voltage sensor circuit has blown.
ALARM BYPASS switch (back lighted push button).	Silences the fuse audible alarm.
MAIN DISCONNECT circuit breaker.	Connects output of generator No. 2 to the equipment shelter circuits

3-3. Panel, Power Distribution SB2785/TSC38B Controls and Indicators
(fig. 3-2)

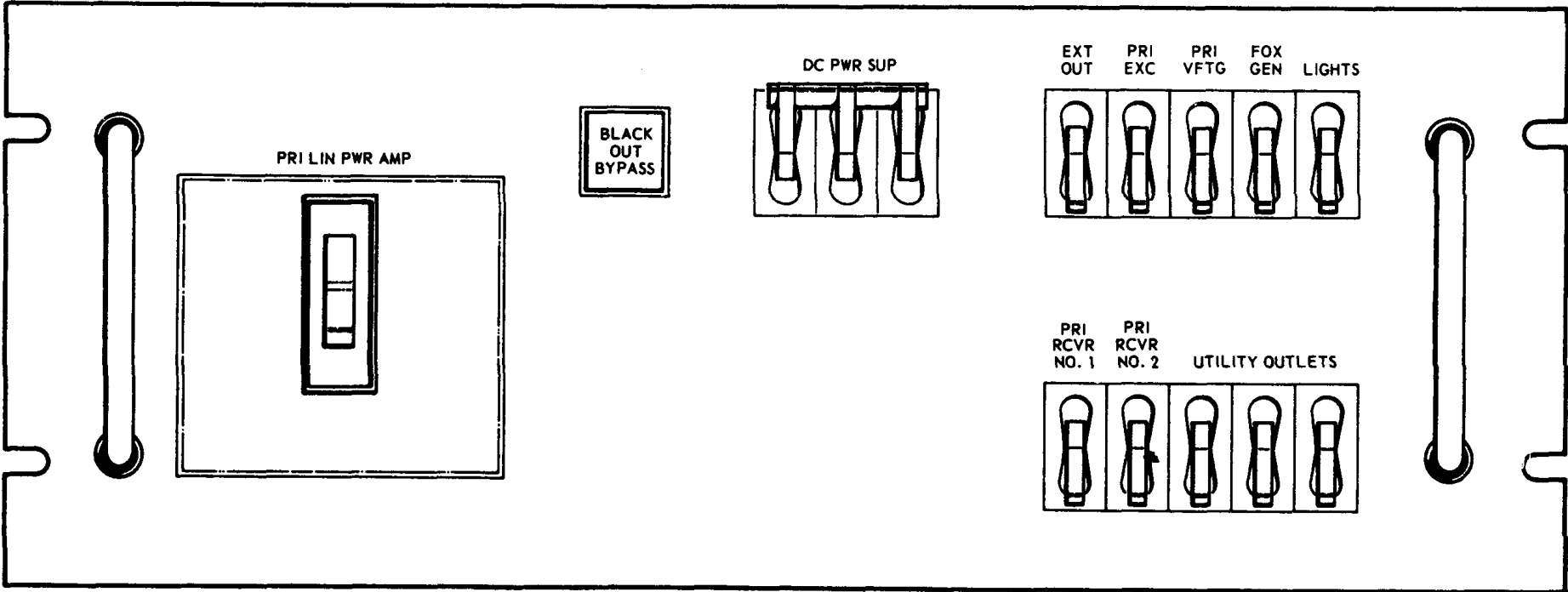
The normal power panel (SB-2785/TSC-38B) contains the primary service breakers for the ac power distribution system within the equipment shelter.

<i>Control</i>	<i>Function</i>
PRI LIN PWR AMP circuit breaker.	Connects the 10-kw P.A. to the equipment shelter technical bus.
BLACKOUT BYPASS switch(backlighted pushbutton).	Bypasses door switch to enable interior lights and status lights to function with the door open; lamp lights to bypassed.
DC PWR SUP circuit breaker (ganged three-section circuit breaker).	Connects the power supply-battery charger to the equipment shelter technical bus.
EXT OUT circuit breaker.	Connects the exterior convenience outlet to the 60-cps technical bus.
PRI EXC circuit breaker.	Connects the transmitter (primary) to the equipment shelter technical bus.
PRI VFTG circuit breaker.	Connects VFTG power supply No. 1 and VFTG power supply No. 2 to the locally generated 60-cps power.
FOX GEN circuit breaker.	Connects the fox generator to the equipment shelter technical bus.
LIGHTS circuit breaker.	Connects the equipment shelter lighting circuit to the equipment shelter technical bus.
PRI RCVR NO. 1 circuit breaker.	Connects the receiver(primary No. 1) to the equipment shelter technical bus.
PRI RCVR NO. 2 circuit breaker.	Connects the receiver(primary No. 2) the equipment shelter to technical bus.
UTILITY OUTLETS circuit breakers(three separate circuit breakers).	Connect equipment shelter convenience outlets to the equipment shelter technical bus

3-4. Panel, Power Distribution SB2784/TSC-38B Controls and Indicators
(fig. 3-3)

The emergency power panel (SB-2784/TSC-38B) distributes the equipment shelter technical bus and the locally generated 60-cps power for the emergency communication facilities of the AN/TSC38B.

<i>Control or indicator</i>	<i>Function</i>
Fuse audible alarm located above BLOWER 2 AMP indicating fuseholder.	Operates to indicate SEC VFTG fuse has blown.
Fuse audible alarm located above SPARE indicating fuseholder.	Operates to indicate that one or more of the following fuses has blown: BLOWER, OPR TTY, SPARE SEC EXC, SEC RCVR.
SEC LIN PA circuit breaker (ganged) three-section circuit breaker.	Connects input power to the 1-kw P.A.
ALARM BYPASS switch (back-	Silences one or both of the fuse audible



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Figure 3-2. Panel, Power Distribution SB-2785/TSC4-38B, controls and indicators

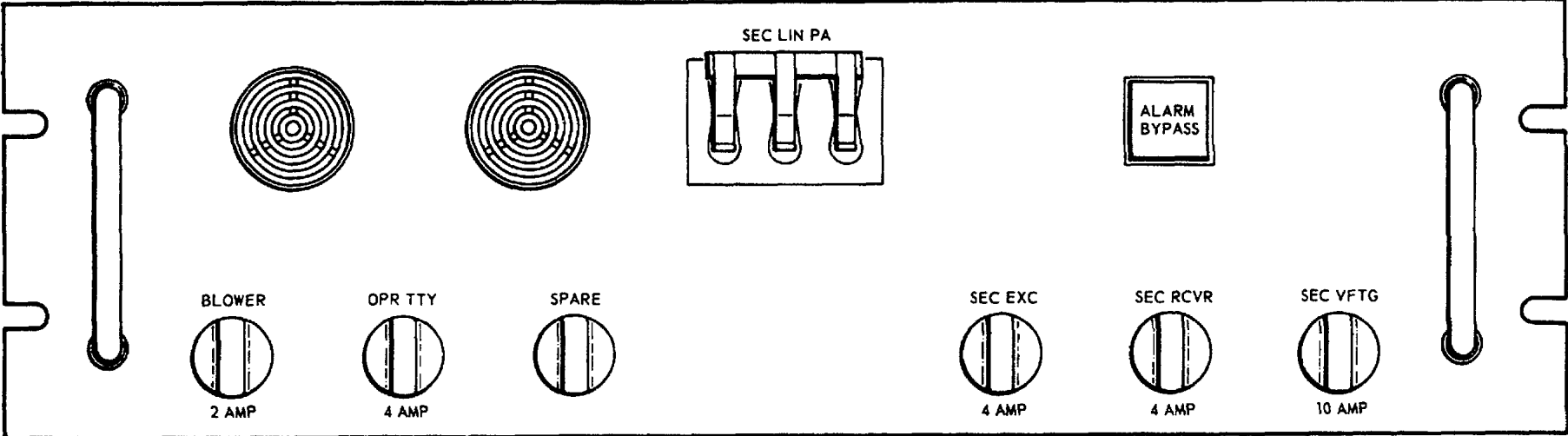
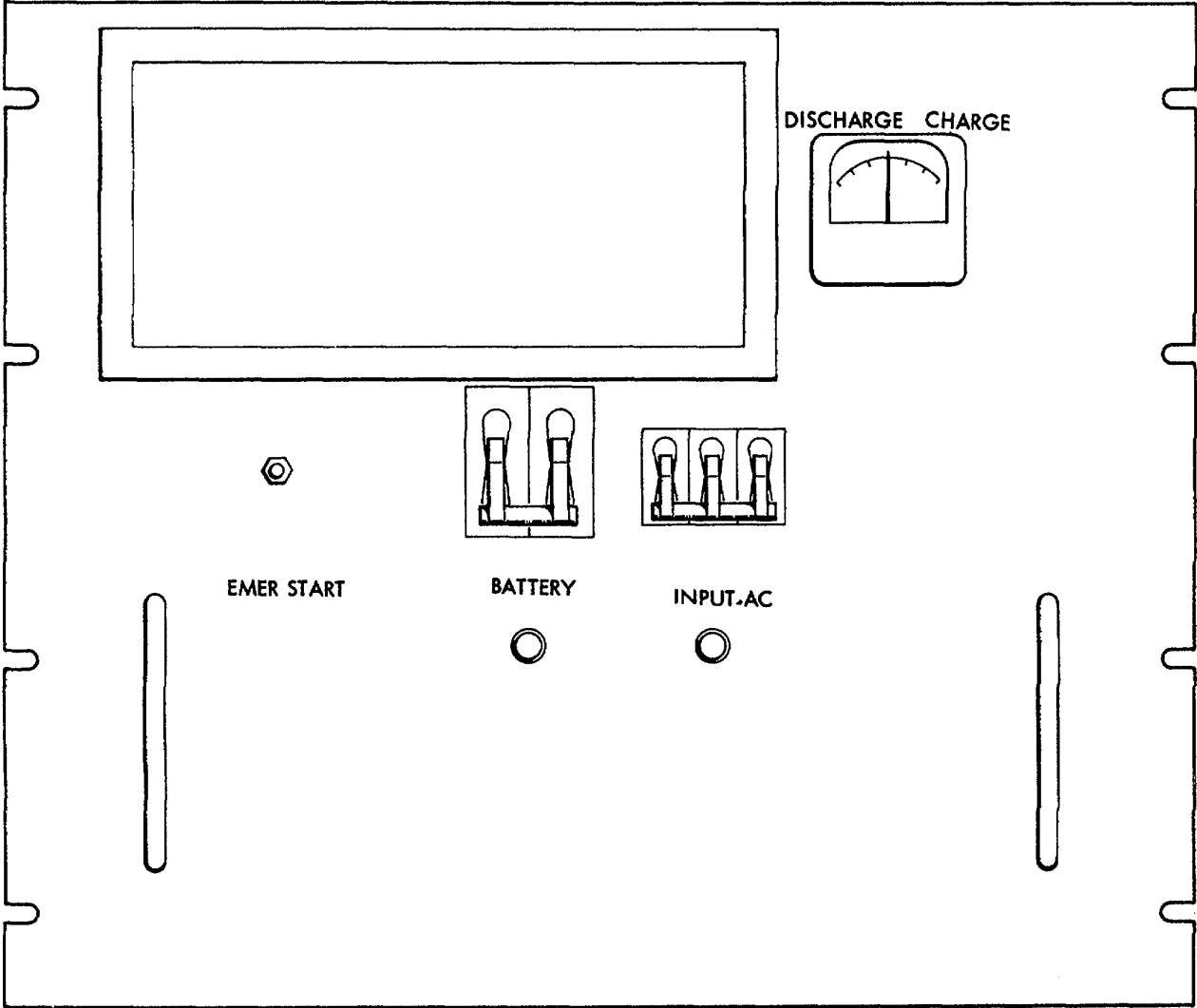


Figure 3-3. Panel, Power Distribution SB-2784/TSC-8B, controls and indicators.

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<i>Control or indicator</i>	<i>Function</i>
lighted push button).	Alarms; lamp lights to indicate alarm has been bypassed.
Indicating fuse holders:	
BLOWER	Lights to indicate blower line fuse has blown.
OPR TTY.....	Lights to indicate operator teletype line fuse has blown.
SPARE.....	Spare indicating fuse holder.
SEC EXC.....	Lights to indicate line fuse for the transmitter (secondary) has blown.
SEC RCVR.....	Lights to indicate the receiver (secondary) line fuse has blown.
SEC VFTG	Lights to indicate 12-vdc and 130-vdc VFTG power supply line fuse has blown.



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Figure 3-4. Power Supply-Battery Charger PP-4586/TSC-38B, controls and indicators.

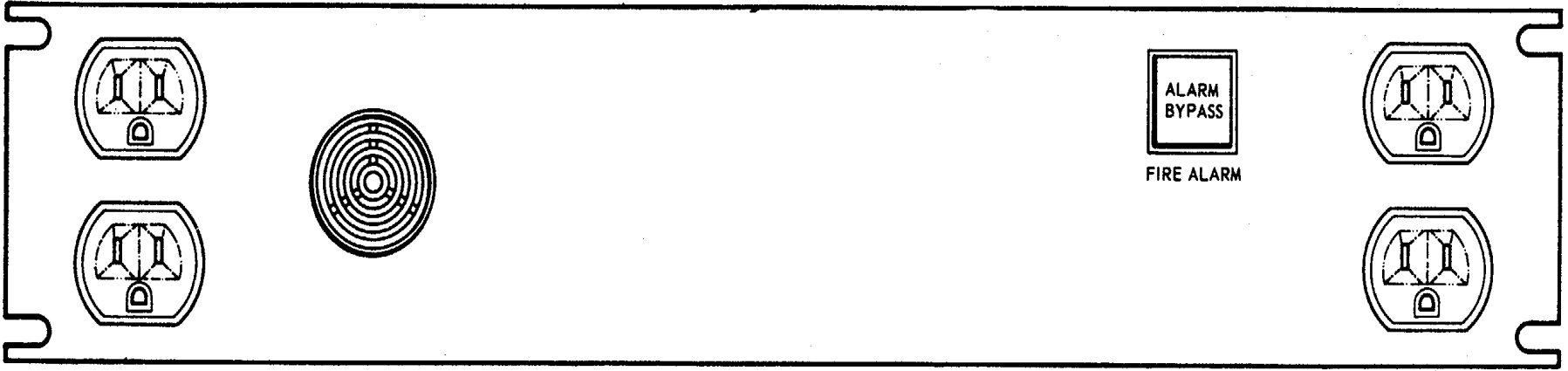


Figure 3-5. Alarm-Indicator, Fire Warning BZ-130/TSC-38B, controls and indicators.

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3-5. Power Supply-Battery Charger PP-4536/TSC-38B Controls and Indicators

(fig. 3-4)

The power supply-battery charger (PP-4536/TSC-38B) provides the primary dc power used for the operating equipment. The battery charger is nonfunctional (batteries removed).

<i>Control or indicator</i>	<i>Function</i>
INPUT AC circuit breaker.	Connects primary ac power to the power supply-battery charger.
Lamp (below INPUT AC circuit breaker).	Lights to indicate that primary ac power is connected to the power supply-battery charger.
BATTERY circuit breaker.	Nonfunctional (batteries removed)
Lamp (below BATTERY circuit breaker).	Nonfunctional due to battery removal. (Will light when BATTERY circuit breaker is on.)
DISCHARGE/CHARGE meter.	Nonfunctional (batteries removed)
EMER. START switch (pushbutton).	Nonfunctional (batteries removed)

3-6. Alarm-Indicator, Fire Warning BZ-130/TSC-38B Controls and Indicators

(fig. 3-5)

The fire warning panel (BZ-130/TSC-38B) provides the power distribution to the fire alarm system and the fire alarm signal. It also contains two duplex convenience power receptacles.

<i>Control or indicator</i>	<i>Function</i>
FIRE ALARM ALARM BYPASS switch (backlighted pushbutton).	Silences audible alarm on panel; lamp lights to indicate a bypassed condition.
Audible alarm	Operates to indicate that danger of fire may be present at the site of one or more of the fire sensors. (Operation of the alarm indicates that a temperature increase rate of 15°F. per minute (or more) and/or a temperature of 1360F. or more) has been detected.)

*Figure 3-6. Amplifier, Radio Frequency AM-4543/TSC-38B, controls and indicators.
(Located in back of manual.)*

3-7. Amplifier, Radio Frequency AM-4543/TSC-38B Controls and Indicators

(fig. 3-6)

The 10-kw P.A. (AM-4543 TSC-38B) is the radio frequency power amplifier in the primary radio facility of the AN/TSC-38B system. It provides an output of 10 kw and automatically tunes to the input RF signal from the low-power transmitter (primary).

<i>Control or indicator</i>	<i>Function</i>
FIL lamp (green)	Lights to indicate that filament voltage has been applied.
FIL ON switch (pushbutton).	Applies voltage to the filament circuit.
FIL OFF switch (pushbutton).	Removes power from the filament circuit.
HV lamp (red).	Lights to indicate that the high voltage has been applied.
HV ON switch (pushbutton).	Applies voltage to the high voltage circuits.
HV OFF switch (pushbutton).	Removes power from the high voltage circuits
SERVO MULTIMETER switch (nine-position rotary switch).	Connects SERVO MULTIMETER into selected circuits.
	<i>Sw pos.....Measurements</i>
	+28 VDC.....+28-volt supply voltage.
	+15 VDC.....+15-volt supply voltage.
	-15 VDC.....-15-volt supply voltage.

Control or indicator

Function

<i>Sw pos</i>	<i>Measurements</i>
COARSE POSITION:	
PA LOAD	Servo drive voltage for power amplifier load coarse tuning.
PA TUNE	Servo drive voltage for power amplifier coarse tuning.
DR TUNE	Servo drive voltage for driver stage coarse tuning.
FINE POSITION: PA LOAD	
	Servo drive voltage for power amplifier load fine tuning.
PA TUNE	Servo drive voltage power amplifier fine tuning.
DR TUNE	Servo drive voltage or driver stage fine tuning.
Connects AMPLIFIER selected circuits.	
+ 500DC IKV	+ 500-volt supply output voltage.
+ 1000DC 3KV	+ 1,000-volt supply output voltage.
1500DC 3KV.	-1,500-volt supply output voltage
PA PLT 10KV	Voltage applied to 4CX-10000 tube V5 plate.
PA FIL 10V	Voltage applied to 4CX-10000 tube V5 filament.
1A CATH 100MA.	Cathode current of 8233 tube V1.
BB AMP CATH 300MA.	Cathode current of 4CX350 tube V2.
DVR CATH 1000MA.	Total Cathode current of driver amplifier parallel-connected 4CX-350 tubes V3 and V4.
PA SCREEN 300MA.	Screen current of 4CX-10000 tube V5.

AMPLIFIER MULTIMETER switch (12-position rotary switch).

<i>Control or indicator</i>	<i>Function</i>
	Sw pos Measurements
	INPUT RF 10V. RF input voltage to power amplifier
	DVR GRID RF 30V. RF voltage to paralleled grids of tubes V3 and V4.-
	PA GRID RF 300V. RF voltage to grid of 4CX-10000 tube V5.
AMP MULTIMETER meter.	Displays readings of circuits connected through AMPLIFIER MULTIMETER switch.
SERVO MULTI METER meter.	Displays readings of circuits connected through AMPLIFIER MULTIMETER switch.
PLATE CURRENT meter.	Displays plate current of V5.
POWER meter	Displays forward output power or reflected power.
FORWARD REFLECTED switch (two-position rotary switch).	Enables measurement of power amplifier forward output or reflected power by use of POWER meter.
	Sw pos Measurements
	FORWARD Forward output power.
	REFLECTED Reflected power.
LOCAL/REMOTE switch (two-position rotary switch).	Enables selection of remote or local control of the 10-kw P.A.
	Sw pos Measurements
	LOCAL Places 10-kw P.A. under local operating control.
	REMOTE Places 10-kw P.A. under automatic control of remote equipment.
MAIN POWER circuit breaker.	Applies primary power to the 10-kw P.A.
FUSE INDICATORS.	Provide fusing protection for individual circuits.
FILAMENT	Lights to indicate filament circuit fuse has blown.
400 CY BLOWER.	Lights to indicate blower circuit fuse (one per phase(three)) has blown.
BIAS	Lights to indicate bias circuit fuse (one per bias source (two)) has blown.
60 CY BLOWER.	Lights to indicate blower circuit fuse(one per phase (three)) has blown.
+28 V	Lights to indicate +28-volt circuit fuse has blown.
DRIVER VOLTAGE.	Lights to indicate driver voltage circuit fuse one per phase(three)) has blown.
SYSTEM/PA KEY switch (toggle switch).	Determines the circuits of the 10-kw P.A. to be keyed. Enables complete amplifier to be keyed or only the final power output circuit to be keyed.
MANUAL/AUTOMATIC switch (two-position rotary	Enables tuning of 10-kw P.A. to be accomplished at amplifier panel, or to be ac

<i>Control or indicator</i>	<i>Function</i>
switch).	completed automatically by RF signals fed into the input of the amplifier.
MOTOR CONTROL INCREASE/DECREASE switches (two-position momentary action toggle switches, center-off):	Permit manual control of automatic tuning servo circuits to increase or decrease loading of respective stages.
DVR TUNE switch.	Increases or decreases loading of driver stage.
PA TUNE switch.	Increases or decreases loading of power amplifier stages.
PA LOAD switch.	Increases or decreases load of power amplifier output circuit Indicator lamps:
READY (blue)	Lights when tuning has been completed.
COARSE POS (yellow).	Lights when coarse tuning is in process.
FINE POS (yellow).	Lights when fine tuning is in process
TUNE FAULT (red).	Lights when 10-kw P.A. fails to tune within 20 sec after tune command is initiated.
START TUNE switch (pushbutton).	With the MANUAL/AUTO MATIC switch in the MANUAL position, causes power amplifier to tune to frequency which has been manually set into the amplifier
TUNE RESET switch (pushbutton).	With the MANUAL/AUTOMATIC switch in the MANUAL position, resets power amplifier servo circuits to accept a tune command.
3F2, 3F3, 3F4 indicating fuseholders.	Light to indicate fuses have blown in the servo control unit power supply.
DRIVER 1: DISABLE switch (push-permit button).	Disables driver No. 1 to measurement of driver No. 2 cathode current.
BIAS potentiometer.	Adjusts bias for driver No. 1.
DRIVER 2: DISABLE switch (pushbutton).	Disables driver No. 2 to permit measurement of driver No. 1 cathode current.
BIAS potentiometer.	Adjusts bias for driver No. 2.

3-8. Converter, Frequency, Static CV-2100/TSC-38B Controls and Indicators

(fig. 3-7)

The frequency changer (CV-2100/TSC-38B) accepts input frequencies of 50, 60, and 400 cps and provides a 400-cps output. It is associated with the primary power source for the air conditioner. All controls and indicators are located on the front panel.

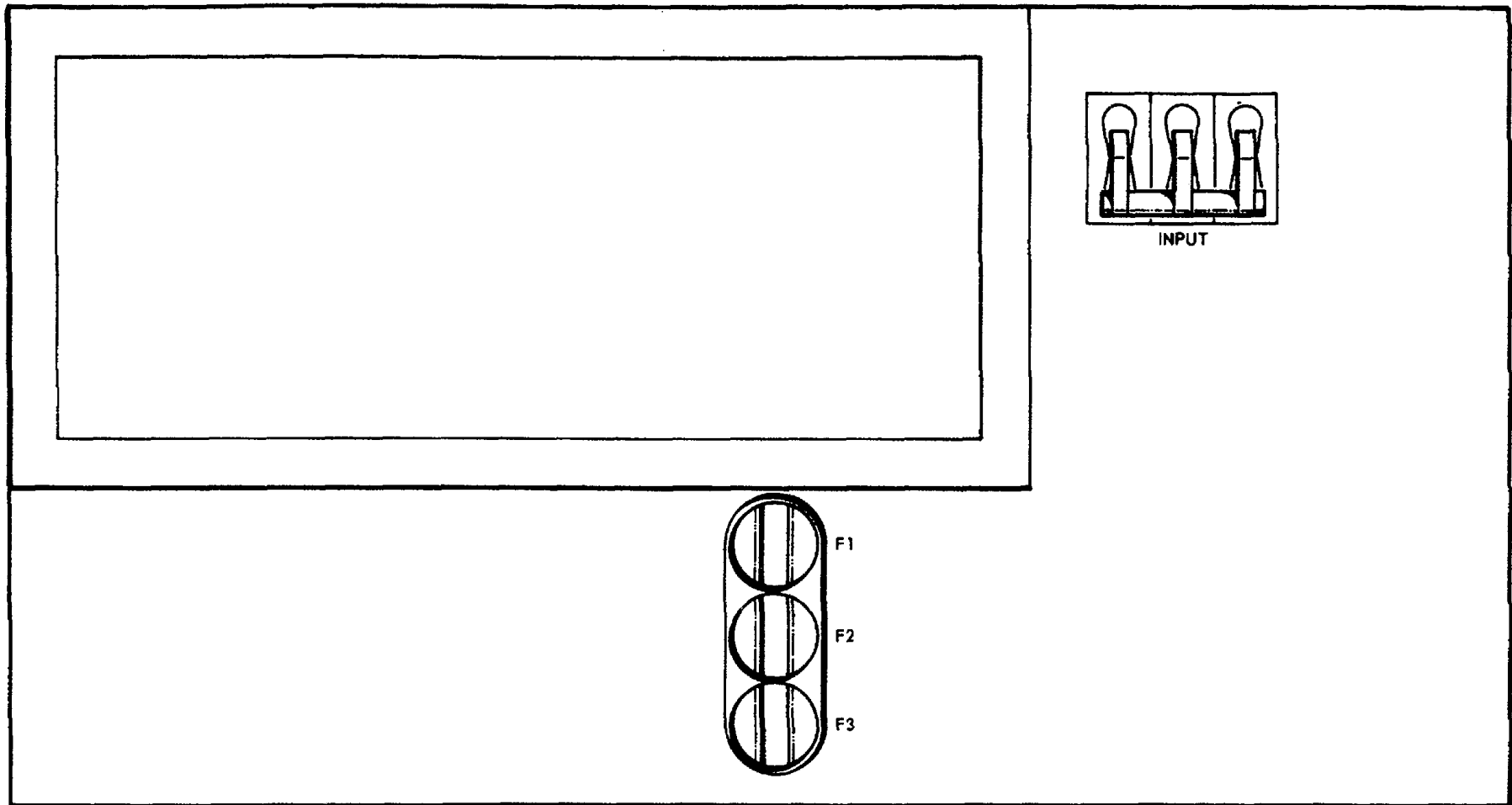
<i>Control or indicator</i>	<i>Function</i>
INPUT circuit breaker (ganged three-section circuit breaker).	Connects primary input power to internal frequency converter circuits.
F1, F2, F3 indicating holders.	Light to indicate fuses have blown in ac power input circuits.

3-9. Air Conditioner Controls and Indicator

(fig. 3-8)

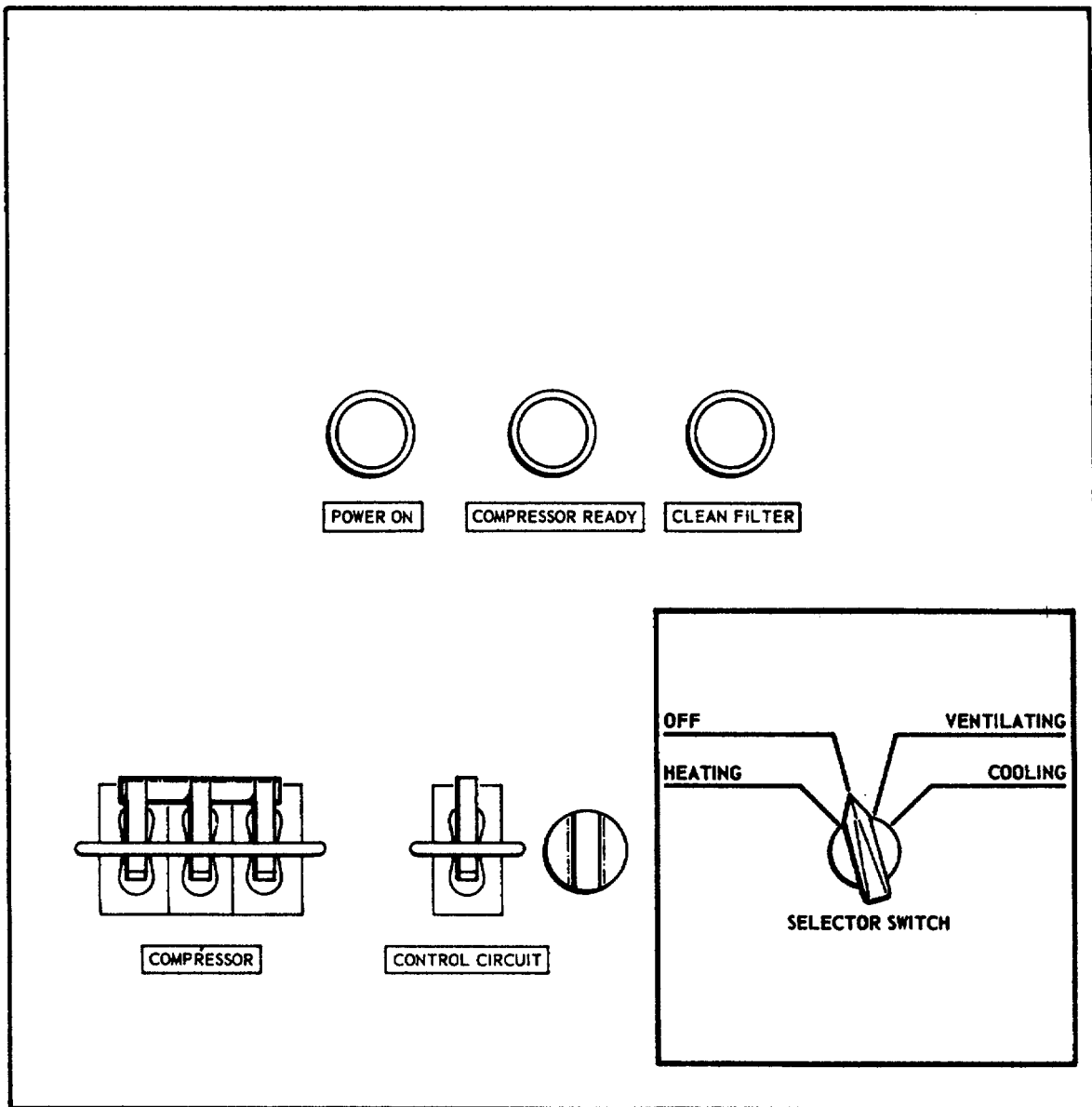
The air-conditioner panel contains the controls and indicators necessary for operation of the air conditioner.

<i>Control or indicator</i>	<i>Function</i>
POWER ON lamp(green).	Lights when primary power is applied to the air conditioner.
COMPRESSOR READY lamp(green).	Lights when compressor portion of air conditioner is ready for operation.
CLEAN FILTER Lamp (red).	Lights when filter is dirty and requires cleaning



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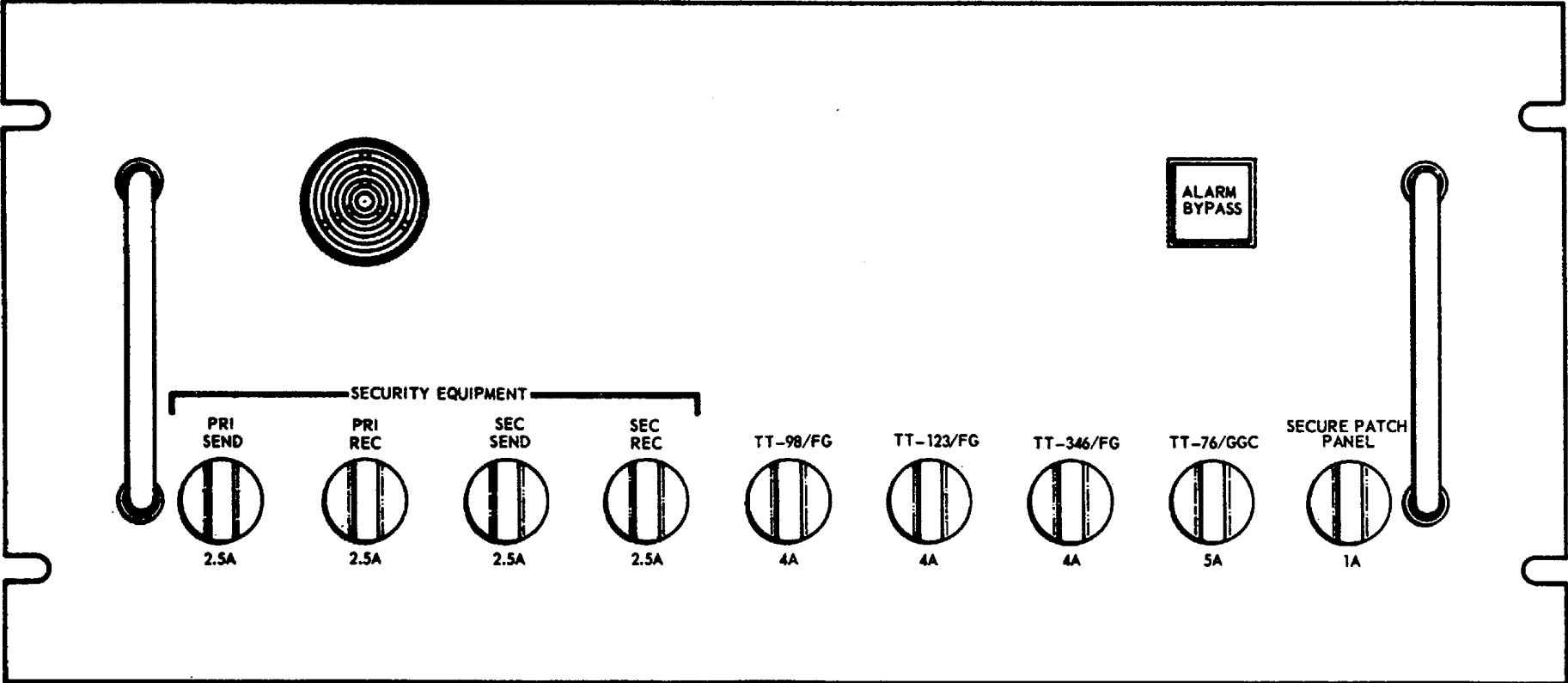
Figure 3-7. Converter, Frequency, Static CV-2100/TSC-38B, controls and indicators.



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Figure 3-8. Air conditioner, controls and indicators.

<i>Control or indicator</i>	<i>Function</i>
COMPRESSOR circuit breaker(ganged three-section circuit breaker).	Applies primary power to the compressor.
CONTROL CIRCUIT circuit breaker.	Allies power to the internal automatic control circuits.
SELECTOR SWITCH switch (four-position rotary switch):	
HEATING	Enables a heated air output to be obtained.
OFF	Turns off air conditioner.
VENTILATING.	Enables air circulation within the shelter.
COOLING	Enables a chilled air output to be obtained.



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Figure 3-9. Panel, Power Distribution SB-2806/TSC-38B, controls and indicators.

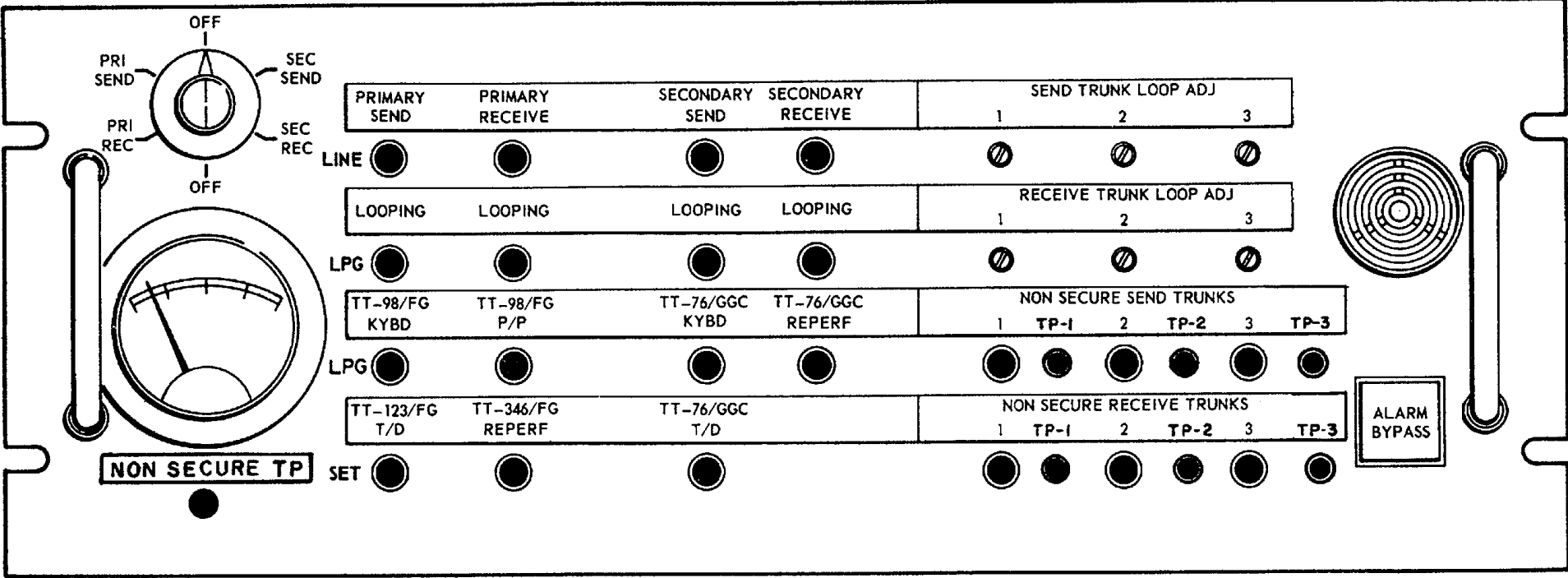


Figure 3-10. Panel, Patching. Secure Teletype SB-2842/TSC-38B, controls, indicators, and jacks.

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3-10. Panel, Power Distribution SB-2806/TSC-38B Controls and Indicators

(fig. 3-9)

The secure ac power panel (SB-2806/TSC-38B) protects and distributes power to the single-phase, filtered, 60ps, 120-volt power circuits of the cryptographic (Communications Security Equipment TSEC/KW-7) and teletypewriter equipments.

<i>Control or indicator</i>	<i>Function</i>
Fuse audible alarm	Operates to indicate that one or more fuses on panel have blown.
ALARM BYPASS switch (backlighted pushbutton).	Silences the audible alarm; lamp lights to indicate alarm has been bypassed.
Indicating fuse holder: SECURITY EQUIPMENT PRI SEND.	Lamp lights to indicate fuse has blown in Communications Security Equipment TSEC/KW-7 primary send circuit.
PRI REC.....	Lamp lights to indicate fuse has blown in Communications Security Equipment TSEC/KW-7 primary receive circuit
SEC SEND.....	Lamp lights to indicate fuse has blown in Communications Security Equipment TSEC(KW-7 secondary send circuit.
SEC REC.....	Lamp lights to indicate fuse has blown in Communications Security Equipment TSEC/KW-7 secondary receive circuit
TT-98/FG.....	Lamp lights to indicate fuse in the teletype writer (TT-98C/FG) circuit has blown.
TT-123/FG.....	Lamp lights to indicate fuse in the transmitter-distributor (TT-123A/FG) circuit has blown.
TT346/FG.....	Lamp lights to indicate fuse in the reperforator (TT-346A/FG) circuit has blown.
TT-76/GGC.....	Lamp lights to indicate fuse in the reperforator-transmitter(TT-76C/GGC) circuit has blown.
SECURE PATCH PANEL.	Lamp lights to indicate fuse in secure patch panel circuit has blown.

3-11. Panel, Patching, Secure Teletype SB-2842/TSC-38B Controls, Indicators, and Jacks

(fig. 3-10)

The secure teletype patch panel (SB-2842/TSC38B) is used for teletypewriter emergency or testing operations. It provides a means of patching Communications Security Equipment TSEC/KW-7 to teletypewriter equipment, patching nonsecure teletypewriter trunklines to teletypewriter equipment, and alerting personnel that secure equipment is patched into nonsecure jacks.

<i>Control, indicator, or jack</i>	<i>Function</i>
Audible alarm	Alarm operates to warn that secure equipment is patched into non secure jacks.-
ALARM BYPASS switch (backlighted pushbutton).	Silences the audible alarm; lamp lights to indicate alarm has been bypassed.
SEND TRUNK LOOP ADJ potentiometers(three).	Enable the internal loop current of the send trunk loops to be adjusted.
RECEIVE TRUNK LOOP ADJ potentiometers, three).	Enable the internal loop current of the receive trunk loops to be adjusted
PRIMARY SEND LINE jack.	Enables external equipments to be patched into the primary send line.
PRIMARY RECEIVE LINE jack.	Enables external equipments to be

Control, indicator, or jack

Function

SECONDARY SEND LINE jack.	patched into the primary receive line. Enables external equipments to be patched into the secondary send line.
SECONDARY RECEIVE LINE jack.	Enables external equipments to be patched into the secondary receive line.
PRIMARY SEND LOOPING LPG jack.	Enables an external equipment to be patched with the primary send line, teletypewriter keyboard, and transmitter-distributor.
PRIMARY RECEIVE LOOPING LPG jack.	Enables an external equipment to be patched with the primary receive line, teletypewriter printer, and reperforator
SECONDARY SEND LOOPING LPG jack.	Enables an external equipment to be patched with secondary send line the teletypewriter keyboard, and transmitter-distributor
SECONDARY RECEIVE LOOPING LPG jack.	Enables an external equipment to be patched with the secondary receive line and teletypewriter
NONSECURE SEND TRUNKS jacks (three).	Enables patching of the teletypewriter equipment to trunklines for transmitting unclassified information.
NONSECURE RECEIVE TRUNKS jacks (three).	Enables patching of the teletypewriter equipment to trunklines for receiving unclassified information.
NONSECURE SEND TRUNKS test points (three).	Enables the nonsecure send trunk current (60 ma.) to be monitored.
NONSECURE RECEIVE TRUNKS test points (three).	Enables the nonsecure receive trunk current (60 ma.) to be monitored.
TT-76 REPERF SET jack	Enables reperforator-transmitter to be patched to LPG or any of the NON SECURE RECEIVE TRUNK jacks.
TT-123/TT-98 SET jack	Enables transmitter-distributor and teletypewriter keyboard to be patched to LPG or any of the NON SECURE SEND TRUNKS jacks.
TT-346/TT-98 SET jack	Enables reperforator and teletypewriter printer to patched to LPG or any of the be NON SECURE RECEIVE TRUNKS jacks.
TT-76 T/D SET jack	Enables transmitter-distributor and reperforator-transmitter keyboard to be patched to LPG or any of the NON SECURE SEND TRUNKS jacks.
Loop monitor switch	Selects loop circuit to be monitored by the loop monitor meter.
PRI SEND	Selects primary send loop voltage ($6\pm$ vdc) to be monitored.
PRI REC	Selects primary receive loop voltage (± 6 vdc) to be monitored.
OFF	Disconnects the loop monitor meter circuit
SEC SEND	Selects the secondary send loop voltage (± 6 vdc) to be monitored.
SEC REC	Selects the secondary loop voltage (± 6 vdc) to be receive monitored.
Loop monitor meter	Monitors selected loop circuit voltages and Nonsecure send and receive trunk currents.
NONSECURE TRUNK TP (bantam jack)	Provides connection to loop monitor meter for monitoring nonsecure send and receive trunk currents.

3-12. Secure Teletype-writer and Communications Security Equipment Controls

The purpose and function of all secure teletypewriter and Communications Security Equipment TSEC/KW-7 controls, and their use and application in the AN/TSC-38B system, are covered in existing military technical publications available to the secure data subsystem operator and are not provided herein.

3-13. Interconnecting Box J-2649/TSC-38B Connectors (fig. 3-11)

The interconnecting box (J-2649/TSC-38B) contains telephone jacks that provide circuit connection points between the send and receive circuits of the teletypewriter equipments (excluding the teletypewriter in the operator rack) and the circuit appearances at jacks on the secure teletype patch panel.

<i>Connector</i>	<i>Function</i>
TT-98/FG KEYBOARD jack.	Provides connection to TT-123/TT-98 SET jack on the secure teletype patch panel.
TT-98/FG PRINTER jack.	Provides connection to TT-346/TT-98 SET jack on the secure teletype patch panel.
TT-123/FG jack	Not used. (Disconnected from secure telephone patch panel.)
TT-76/GGC REPERFORATOR jack.	Provides connection to TT-76 REPERF SET jack on the secure teletype patch panel.
TT-76/GGC KEYBOARD jack.	Provides connection to TT-76T/D SET jack on the secure teletype panel
TT-76/GGC XMTR XMTR DISTR jack.	Not used. (Disconnected from Secure telephone patch panel.)
TT-346/FG jack	Provides connection to TT-346/TT-98 SET jack on the secure teletype patch panel

3-14. Distribution Box J-2648/TSC-38B Connectors

(fig. 3-12)

The distribution box (J-2648/TSC-38B) provides four convenience outlets to make single-phase, 120-vac, 60-cps power available in the teletypewriter rack. The outlets are electrically identical.

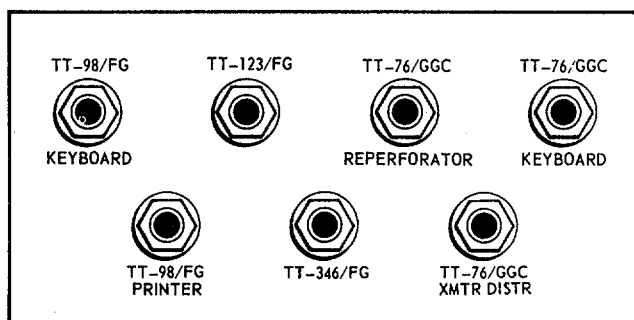
<i>Connector</i>	<i>Function</i>
TT-98/FG outlet.....	Provides connection point to single-phase, 120-vac, 60-cps electrical power.
TT-123/FG outlet.....	Provides connection point to single-phase, 120-vac, 60-cps electrical power.
TT-346/FG outlet.....	Provides connection point to single-phase, 120-vac, 60-cps electrical power.
TT-76/GGC outlet.....	Provides connection point to single-phase, 120-vac, 60-cps electrical power.

3-15. Control, Radio Set C-7010/TSC-38B Controls and Indicators

(fig. 3-13)

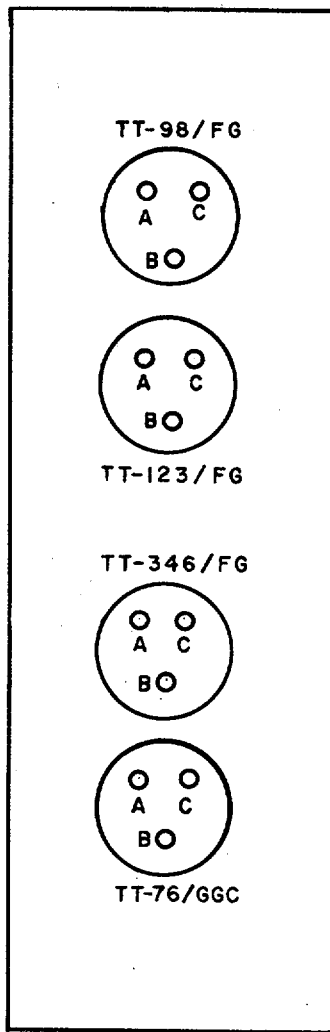
The remote control (C-7010/TSC-38B) contains the necessary controls to permit an individual telephone subsystem subscriber to control either the primary or secondary radio facility when the REMOTE pushbutton on the applicable frequency select panel is depressed.

<i>Control</i>	<i>Function</i>
TSB USB switches CHAN 1 through Chan10 and NORM CHAN 1 through NORM CHAN 4 (two position toggle switches).	Enables presetting of upper sideband mode of operation for transmitter and receivers when switches are in USB position. AN/TSC-38B system configuration allows only channel A1 (USB) to be selected by a remote FSK subscriber.
TSB LSB switches, CHAN 1 through CHAN 10 and NORM CHAN 1 through NORM CHAN 4 (two-position toggle switches).	Enables presetting of lower sideband mode of operation for transmitter and receivers when switches are in LSB position. AN/TSC-38B system configuration allows only channel A1 (USB) to be selected by a remote FSK subscriber.
AFC/PC ON-OFF switches, CHAN 1 through CHAN 10 and NORM CHAN 1 through NORM CHAN 4(two-position toggle switches).	Enables presetting of receiver automatic frequency control and transmitter pilot carrier in ON position.
G1/G2 switches, CHAN 1 through CHAN 10 and NORM CHAN 1 through NORM CHAN 4 (two position toggle switch).	Enables presetting of the receiver gain control. G1 position enables local control; G2 position enables full receiver gain to be selected from the remote position.
PWR ON/OFF switches CHAN 1 through CHAN10 and NORM CHAN 1 through NORM CHAN 4(two-position toggle switches).	Enables presetting of a power on or off condition for transmitter and receivers. AN/TSC-38B system configuration does not implement this switch.
FREQ. MC switches, CHAN 1 through CHAN 10 (digital dial switches).	Enables presetting of a fixed frequency to which transmitter and receivers will tune when channel is selected.
AZ switches, CHAN 1 through CHAN 10 and NORM CHAN1 through NORM CHAN 4 (digital dial switches)	Enables presetting of the azimuth bearing for steerable antennas in 300 increments(not implemented in AN/TSC-38B).



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Figure 3-11. Interconnecting Box J-2649/TSC-38B, connectors.



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Figure 3-12. Distribution Box J-2648/TSC-38B, connectors.

Figure 3-13. Control, Radio Set C-7010/TSC-8B, controls and indicators.
(Located in back of manual.)

3-16. Receiver, Radio R-1402/TSC38B Controls and Indicators

(fig. 3-14)

The two primary receivers (No. 1 and No. 2) and the secondary receiver (R-1402/TSC38B) are the same except for their position in the rack, and have identical front panel controls and indicators.

<i>Control or indicator</i>	<i>Function</i>
POWER ON/OFF switch (two-position toggle switch).	Applies source power to the receiver.
POWER lamp.....	Lights to indicate when power is applied to the receiver.
AUDIO OUTPUT A1, A2, B1, and B2 potentiometers (screwdriver adjust potentiometers).	Enable the audio output levels of the four receiver channels to be adjusted.
115 VAC 1.5 AMP indicating fuse holders (two).	Light when fuse in primary ac input lines is blown.

3-17. Panel, Patching, Radio Frequency SB-2808/TSC-38B Connectors

(fig. 3-15)

The RF patch panel (SB-2808/TSC-38B) contains connectors to permit the antennas of the AN/TSC-38B system to be patched to the system's transmitters and receivers.

<i>Connector</i>	<i>Function</i>
10 KW VEE ANT. connector.	Permits connection to the 10 KW VEE ANT. connector on 10-kw entry panel.
WHIP ANT. SHELTER connector.	Permits connection to the shelter whip antenna via the antenna coupler.
1 KW XMTR XMIT connector.	Permits patching 1 KW P.A. connection to antenna to either WHIP ANT. SHELTER, RCVR VEE ANT. NO. 1, RCVR VEE ANT. No. 2 or 10 KW VEE ANT. connectors.
1 KW XMTR RECEIVE connector	Permits patching secondary receiver to antenna transfer relay for simplex operation on one whip antenna.
WHIP ANT. FIELD connector.	Permits patching any receiver to WHIP ANT. FIELD connector on antenna entry panel.
RCVR VEE ANT. NO. 1 connector.	Permits patching the 1 KW XMTR XMIT or any receiver to RCVR ANT NO. 1 connector on antenna entry panel.
RCVR VEE ANT. NO. 2 connector.	Permits patching the 1 KW XMTR XMIT or any receiver connection to RCVR ANT NO. 2 connector on antenna entry panel.
SECONDARY RCVR connector.	Permits connection to input circuit of the receiver (secondary).
PRIM RCVR NO. 1 connector.	Permits connection to input circuit of the receiver (primary No1).
PRIM RCVR NO. 2 connector.	Permits connection to input circuit of the receiver (primary No. 2).
PRIM EXCITER connector	Permits patching the transmitter (primary) to either 10-KW PA or 1 KW PA connectors
10 KW PA connector	Permits patching either transmitter to input of 10-kw P.A.
SEC EXCITER connector.	Permits patching transmitter (secondary) to either 10-KW PA or 1 KW PA connectors.
1 KW PA connector	Permits patching either transmitter to input of 1-kw P.A.

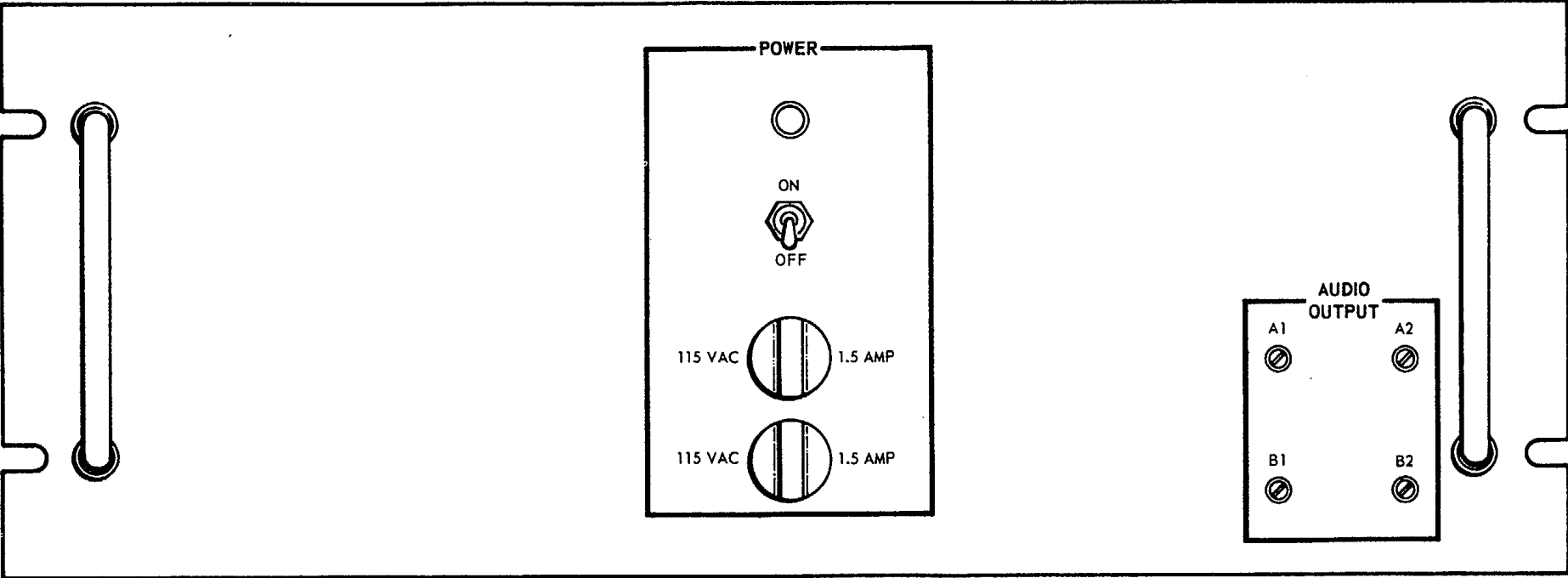


Figure 3-14. Receiver, Radio R-1402/TSC-38B, controls and indicators.

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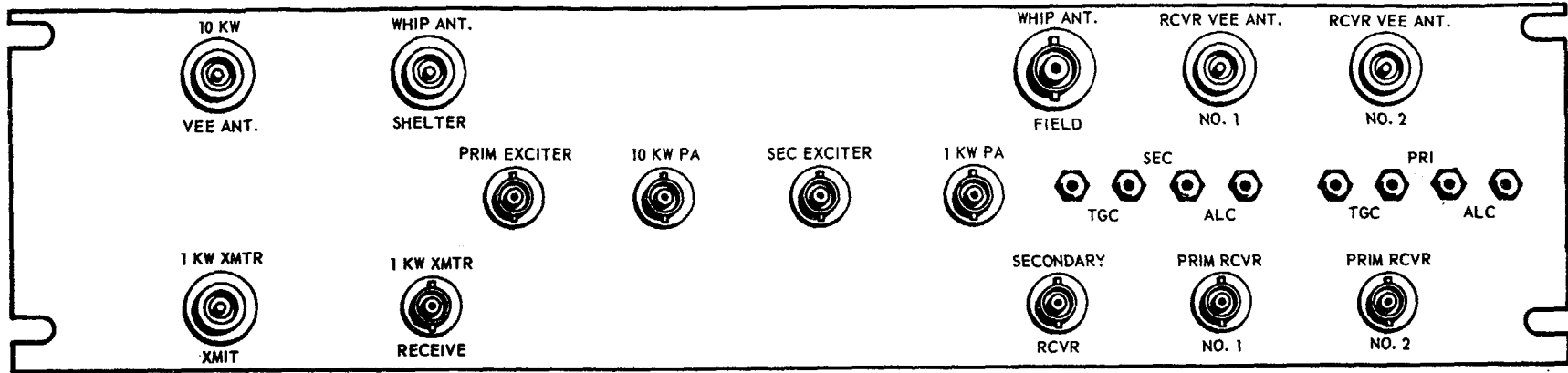


Figure 3-15. Panel, Patching, Radio Frequency SB-2808/TSC-38B, connectors.

EL5895-356-12-1-TM-67

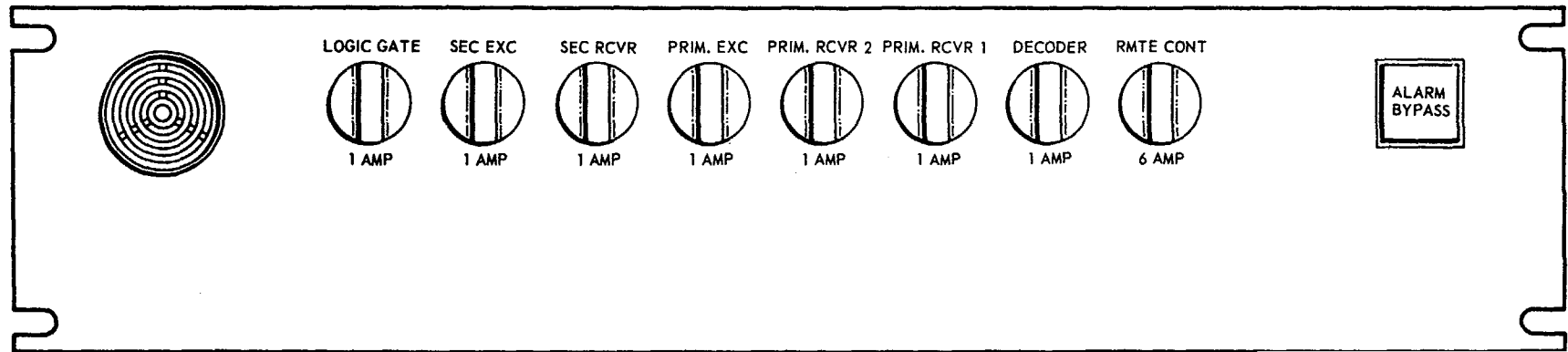


Figure 3-16. Panel, Protection-Power Distribution SB-2948/TSC-38B, controls and indicators.

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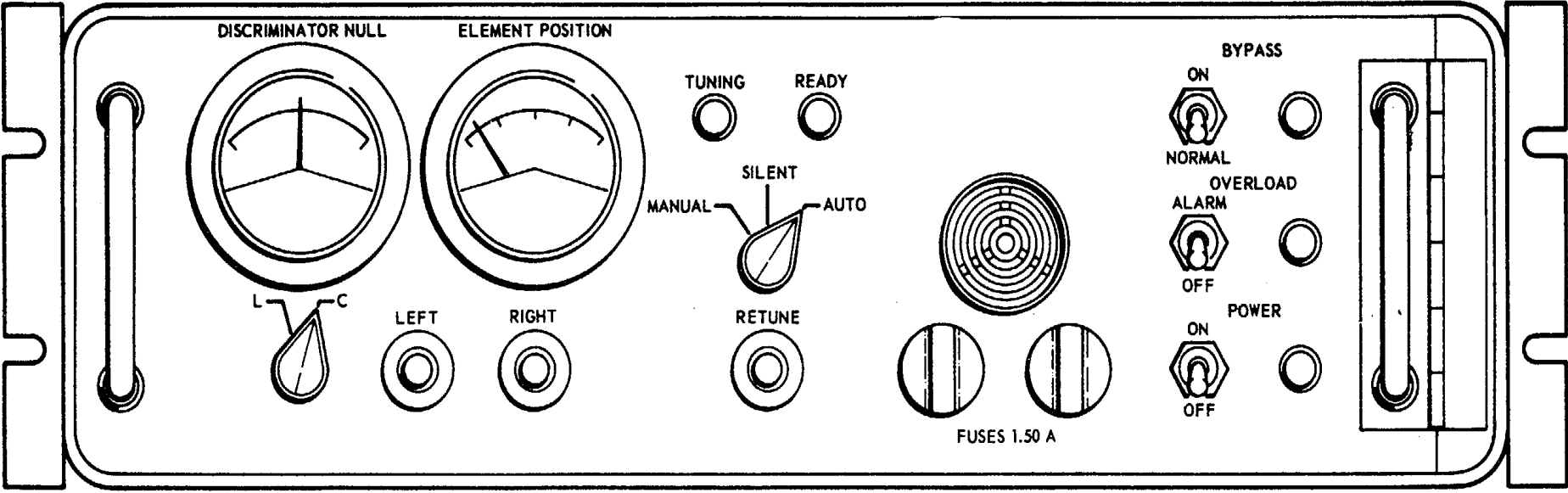


Figure 3-17. Control, Antenna Coupler C-7703/TSC-38B, controls and indicators.

EL5895-356-12-1-TM-69

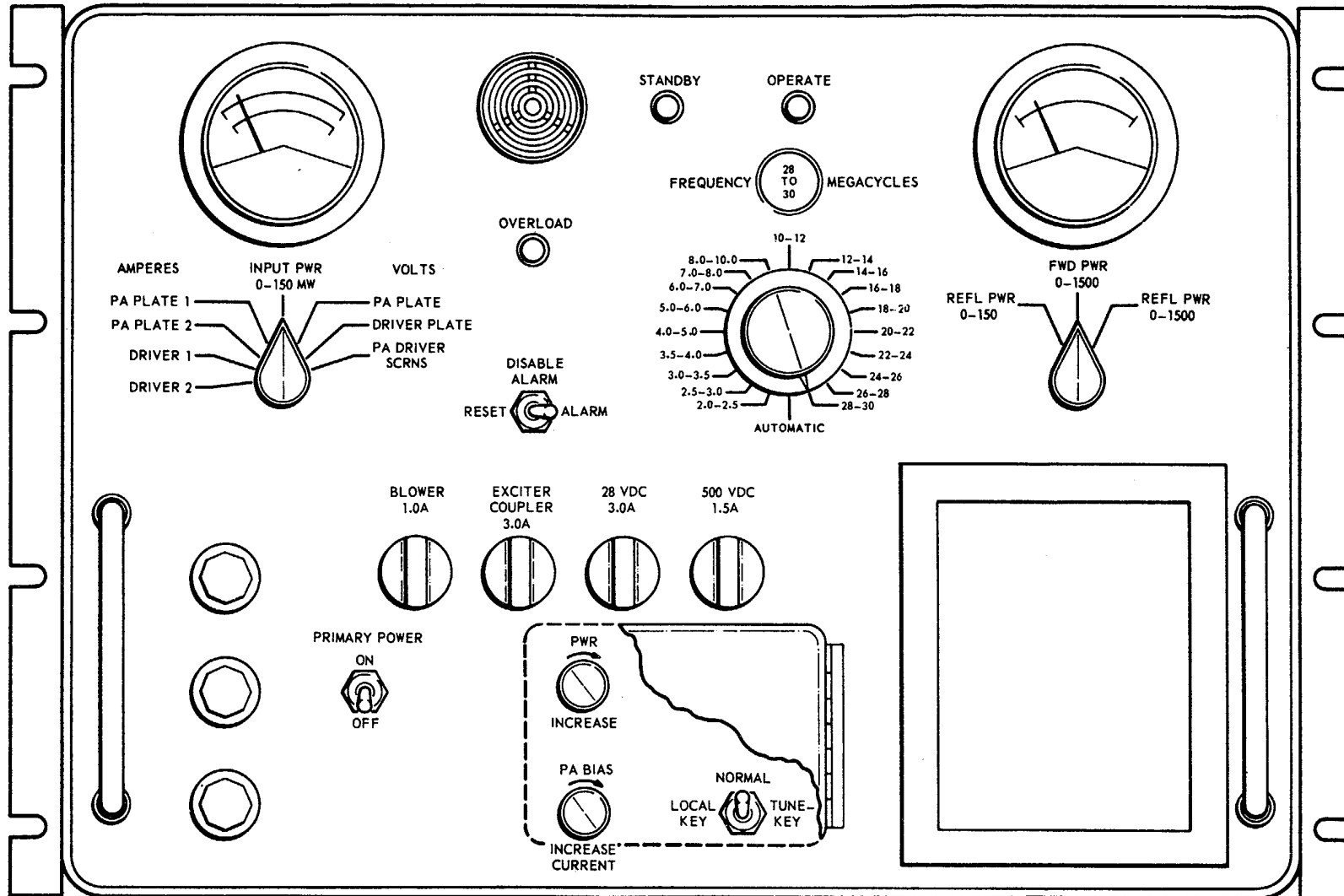


Figure 3-18. Amplifier, Radio Frequency AM-4544/TSC-38B, controls and indicators.

3-18. Panel, Protection-Power Distribution SB-2948/TSC-38B Controls and Indicators

(fig. 3-16)

The R/T fuse panel (SB-2948/TSC-38B) contains indicating fuse holders to provide protection for the dc input power circuits of equipments located in the R/T rack.

<i>Indicator</i>	<i>Function</i>
Audible alarm	Operates to indicate that one or more fuses on the panel has blown.
LOGIC GATE indicating fuse holder.	Lamp lights to indicate that fuse in dc input power circuit of logic gate has blown.
SEC EXC indicating fuse holder.	Lamp lights to indicate that fuse in dc input power circuit of the transmitter (secondary) has blown
SEC RCVR indicating fuse holder.	Lamp lights to indicate that fuse in dc input power circuit of the receiver (secondary) has blown.
PRIM EXC indicating fuse holder.	Lamp lights to indicate that fuse in dc input power circuit of the transmitter (primary) has blown.
PRIM RCVR 2 indicating fuse holder.	Lamp lights to indicate that fuse in dc input power circuit of receiver (primary No. 2) has blown.
PRIM RCVR 1 indicating fuse holder.	Lamp lights to indicate that fuse in dc input power circuit of receiver (primary No. 1) has blown.
DECODER indicating fuse holder.	Lamp lights to indicate that fuse in dc input power circuit of the amplifier-decoder-power distribution assembly has blown.
RMTE CONT indicating fuse holder.	Lamp lights to indicate that fuse in dc input power circuit of the remote control has blown.
ALARM BYPASS switch (backlighted pushbutton).	Silences audible alarm; lamp lights to indicate that alarm has been by passed

3-19. Control, Antenna Coupler C-7703/TSC-38B Controls and Indicators

(fig. 3-17)

The antenna coupler control (C-7703/TSC38B) provides automatic or manual control of the Coupler, Antenna (CU-1561/TSC38B) for the secondary radio equipment when using the shelter-mounted whip antenna.

<i>Control or indicator</i>	<i>Function</i>
DISCRIMINATOR NULL meter.	Provides an indication of L or C element mistuning as selected by L-C switch during manual mode of operation
ELEMENT POSITION meter.	Provides an indication of L or C element positioning as selected by L-C switch.
L-C switch.....	Selects metering and switching required to tune L or C element during manual and silent modes of operation.
LEFT pushbutton.....	When depressed, tuning element selected by L-C switch is repositioned in a direction which moves deflection of DISCRIMINATOR NULL or ELEMENT POSITION meter to left of scale.
RIGHT pushbutton.....	When depressed, tuning element selected by L-C switch is re positioned in a direction which moves deflection of DIS CRIMINATOR NULL or ELEMENT PO SITION meter to right of scale.
TUNING indicator	Glowes when either servo motor is operating.

<i>Control or indicator</i>	<i>Function</i>										
READY indicator.....	Glows when elements have been correctly tuned during automatic mode of operation.										
Mode selector switch	Selects mode of operation.										
	<table border="0" style="margin-left: 40px;"> <thead> <tr> <th style="text-align: left;"><i>Switch.....</i></th> <th style="text-align: left;"><i>Equipment</i></th> </tr> <tr> <th style="text-align: left;"><i>position</i></th> <th style="text-align: left;"><i>response</i></th> </tr> </thead> <tbody> <tr> <td>MANUAL.....</td> <td>Permits manual tuning.</td> </tr> <tr> <td>SILENT</td> <td>Permits coarse manual tuning without RF power. Fine tuning is automatic.</td> </tr> <tr> <td>AUTO.....</td> <td>All tuning is automatic.</td> </tr> </tbody> </table>	<i>Switch.....</i>	<i>Equipment</i>	<i>position</i>	<i>response</i>	MANUAL.....	Permits manual tuning.	SILENT	Permits coarse manual tuning without RF power. Fine tuning is automatic.	AUTO.....	All tuning is automatic.
<i>Switch.....</i>	<i>Equipment</i>										
<i>position</i>	<i>response</i>										
MANUAL.....	Permits manual tuning.										
SILENT	Permits coarse manual tuning without RF power. Fine tuning is automatic.										
AUTO.....	All tuning is automatic.										
RETUNE push-button	When depressed with MODE selector switch at AUTO or SILENT, a home cycle is initiated.										
Overload alarm.....	Provides an audible indication when a pressure or temperature overload exists in the antenna coupler. (OVERLOAD switch must be set at ALARM.)										
FUSES 1.50 A (with indicators).	Protect the antenna coupler control and the antenna coupler against overload; indicator glows when fuse is blown.										
BYPASS ON/NORMAL switch.	When set at ON, the antenna coupler matching network is bypassed whenever transmitter is not keyed, allowing reception to be made on a frequency different from that used for transmission. When set at NORMAL, the antenna coupler matching network is in RF signal path during both receive and transmit operation.										
BYPASS indicator	Glows when the antenna coupler matching network is bypassed.										
OVERLOAD ALARM/OFF	When set at ALARM, audible overload alarm is connected to overload circuit. When set to OFF, overload audible alarm is switch. disabled.										
OVERLOAD indicator.	Glows to provide a visual indication when a pressure or temperature overload exists in the antenna coupler										
POWER ON/OFF switch.	Controls primary power application to the antenna coupler control and the antenna coupler.										
POWER indicator.....	Glows when the antenna coupler control and the antenna coupler are energized.										

3-20. Amplifier, Radio Frequency AM-4544/TSC-38B Controls and Indicators
(fig. 3-18)

The 1-kw P.A. (AM-4544/TSC-38B) is the RF power amplifier in the secondary radio facility of the AN/TSC-38B system. It provides an output of 1 kw and automatically tunes to the input RF signal from the low-power transmitter (secondary), Transmitter, Radio T-1021/TSC-38B.

<i>Control or indicator</i>	<i>Function</i>
Multipurpose meter.....	Provides indications of the final and driver amplifier parameters as selected with the multipurpose meter switch.

Control or indicator

Function

Multipurpose meter switch.

Selects the final and driver amplifier parameters to be monitored with the multipurpose meter. The parameters selected are:

<i>Switch position</i>	<i>Equipment response</i>
DRIVER 2 AMPERES.	Multipurpose meter indicates cathode current of driver amplifier tube V2.
DRIVER 1 AMPERES.	Multipurpose meter indicates cathode current of driver amplifier tube V1.
PA PLATE 2 AMPERES.	Multipurpose meter indicates cathode current of final amplifier tube V2.
PA PLATE 1 AMPERES.	Multipurpose meter indicates cathode current of final amplifier tube V1.
INPUT PWR 0-150 MW	RF level applied to input of driver amplifier by exciter is connected to multipurpose meter.
PA PLATE VOLTS.	Dc voltage applied to plates of final amplifier tubes V1 and V2 is connected to multi-purpose meter.
DRIVER PLATE. VOLTS	Dc voltage applied to plates of driver amplifier tubes V1 and V2 is connected to multi-purpose meter.
PA DRIVER SCRNS VOLTS	Dc voltage applied to screen grids of final amplifier tubes V1 and V2 and driver amplifier tubes V1 and V2 is connected to multipurpose meter.

Overload alarm.....

Provides an audible indication when an overload occurs. The alarm can be disabled by setting the over-load alarm switch at DISABLE ALARM.

<i>Control or indicator</i>	<i>Function</i>	
OVERLOAD indicator.	Lights to provide a visual indication when an overload occurs.	
Overload switch	Determines condition of overload circuits.	
	<i>Switch position</i>	<i>Equipment response</i>
	ALARM ..	Overload alarm is enabled.
	DISABLE	Overload alarm is disabled.
	ALARM	
	RESET	Overload circuit is reset.
	(spring-loaded).	
STANDBY indicator lamp.	Lights when 1-kw P.A. is in a standby condition.	
OPERATE indicator lamp.	Lights when 1-kw P.A. is ready to transmit.	
FREQUENCY	When set at AUTOMATIC, a five-wire code from the amplifier-	
MEGACYCLES	decoder power distribution assembly is used to automatically tune	
selector switch	the 1-kw P.A. to the selected band. When set at any one of the	
	other nineteen positions, a five-wire code is internally generated	
	to automatically tune the 1-kw P.A. to the selected band.	
FREQUENCY	Indicates band to which the 1-kw P.A. is tuned.	
MEGACYCLES		
indicator window.		
Power meter	Provides an indication of forward or reflected output power in the	
	ranges selected with the power meter	
Power meter switch	Selects range of forward or reflected power to be monitored with power	
	meter.	
Primary power fuses	Provides overload protection to each phase of the primary power	
(three used, with indicators).	input. If the fuse in any phase opens, the associated indicator will	
	light.	
BLOWER fuse (with indicator).	Protects the blower against overload; indicator lights if fuse opens.	
EXCITER COUPLER	Protects the 115-volt single-phase primary power output to the 1-kw	
fuse (with indicator).-	P.A. from overload; indicator lights when fuse opens.	
500 VDC and 28	Protects the 500-vdc supply from overload within the 1-kw P.A.; VDC	
fuses (with indicator).	indicator lights if fuse opens.	
PRIMARY POWER	When set at ON, primary power is supplied to 1-kw P.A.	
ON/OFF switch.		
PWR INCREASE control.	Enables RF power output to be varied without disturbing APC and PPC	
	adjustments. Normally set maximum CW.	
PA BIAS INCREASE	Enables bias voltage to final amplifier tubes V1 and V2 to be	
adjusted.		
CURRENT control		
Key switch	Determines method by which 1-kw P.A. is keyed.	
	<i>Switch position</i>	<i>Equipment response</i>
	NORMAL	Automatic or remote keying from sys-
		tem controls.
	TUNE-KEY	Provides low-power carrier for manual
		tuning purposes.
	LOCAL KEY	Provides normal power carrier for
		manual tuning purposes.

3-21. Power Supply PP-6051/TSC-38B Indicators
(fig. 3-19)

The 1-kw P.A. power supply (PP-6051/TSC-38B) provides the high voltage required for the 1-kw P.A.

<i>Indicator</i>	<i>Function</i>
24V 5A SLOW-BLOW indicating fuse holder.	Provides overload protection for the 400-cps inverter circuit.
POWER ON lamp	Indicates that 400-cps primary power output to the 1-kw P.A. is present.
500V 1.5A indicating fuse holder	Provides overload protection for the 500-vdc power supply.

3-22. Transmitter, Radio T-1021/TSC-38B Controls and Indicators
(fig. 3-20)

Two T-1021/TSC-38B units function as transmitters for the primary and secondary power amplifiers.

<i>Control or indicator</i>	<i>Function</i>
CARRIER ADJUST LOCAL CONT. potentiometer position. (recessed potentiometer).	Used to adjust the amount of carrier inserted into the transmitter output when the four-position rotary switch is placed in the CONT.
STEP (-db) switch (11-position rotary switch).	Determines the amount of carrier suppression in 3-db increments when the four-position rotary switch is in the STEP position.
Switch (four-position rotary switch):	
STEP	Permits amount of carrier suppression to be varied by use of STEP (-db) switch.
CONT	Permits amount of carrier inserted into the transmitter output to be varied by CONT. potentiometer.
CARRIER ADJUST:	
AM	Not used in this application.
REMOTE	Enables remote control of carrier suppression by the operator using the XMTR PLT CARR switches on the mode and status control panels.
POWER lamp (red) ON/OFF switch to (two-position toggle switch).	Lights when power is applied to the transmitter. Applies source power the transmitter.
115 VAC 1.5A indicating fuse holders (two).	Lamps light to indicate fuses in source power circuit have blown.
EXCITER GAIN	Extends range of preset gain to allow for component aging in the transmitter.
MODULATION LEVEL A1, A2, B1, and B2 potentiometers (recessed potentiometers).	Permit adjustment of the audio signal level from the input lines to the designated channels of the transmitter.

3-23. Amplifier-Decoder-Power Distribution Assembly MX-8044/TSC-38B Controls and Indicators
(fig. 3-21)

The amplifier-decoder-power distribution assembly (MX-8044/TSC-38B) contains the switches and monitoring facilities required to enable control of the major dc power distribution branches within the equipment racks.

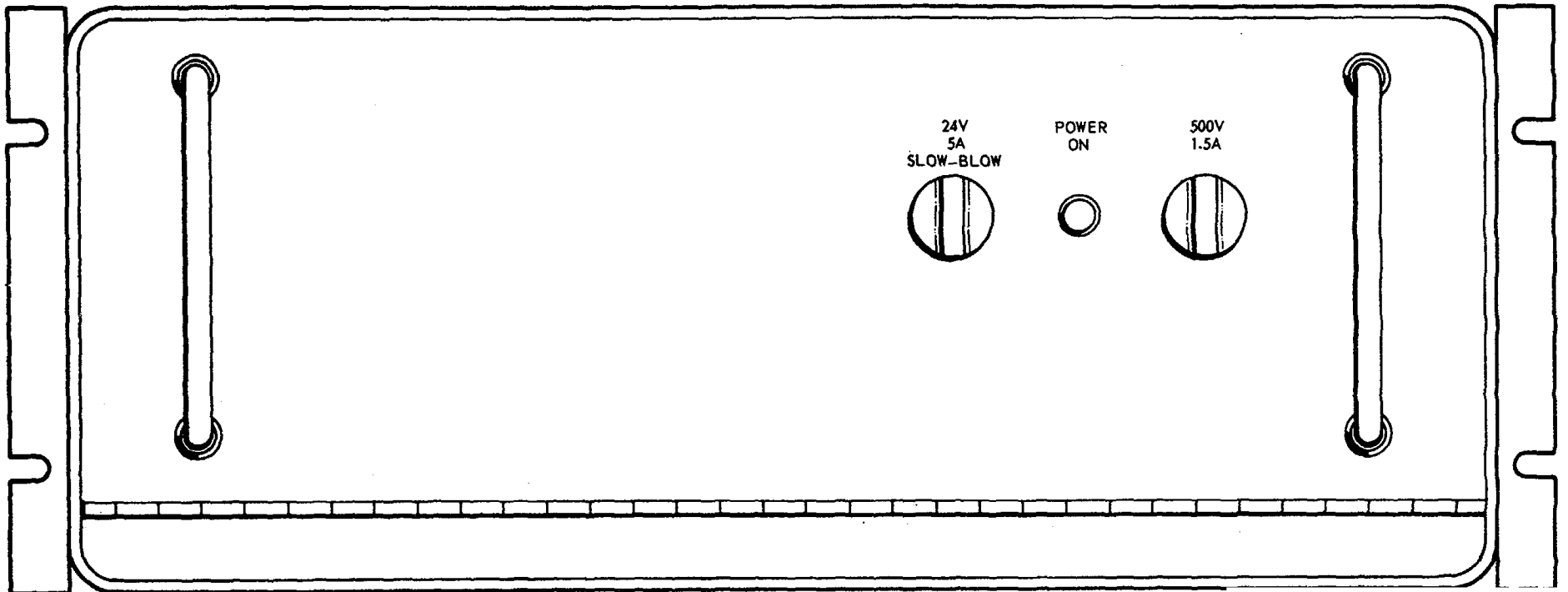


Figure 3-19. Power Supply PP-6051/TSC38B, controls and indicators.

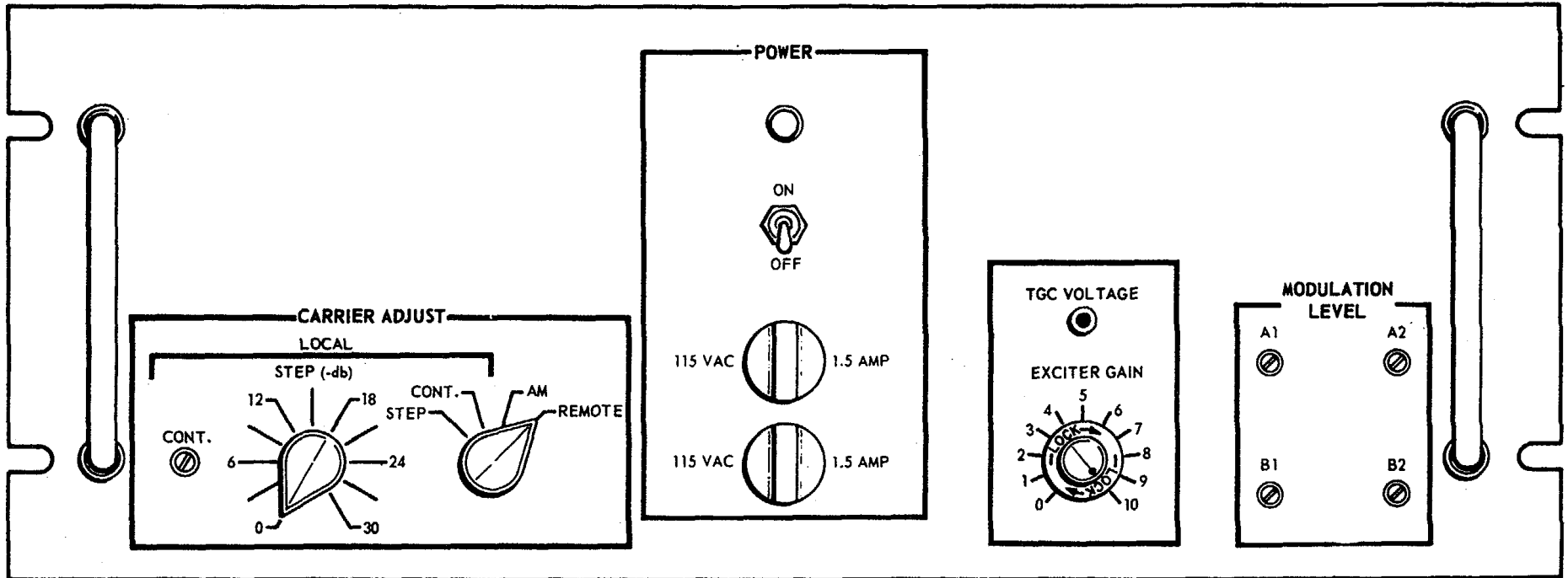


Figure 3-20. Transmitter, Radio T-1021/TSC-38B, controls and indicators.

<i>Control or indicator</i>	<i>Function</i>
POWER:	
EMER lamp	Lights to indicate emergency power is in use.
NORM lamp	Lights to indicate normal power is in use.
BUS VOLTAGE meter.	Monitors 28 vdc bus voltage from power inverter.
Audible alarm	Operates to indicate that EMER LTS fuse in equipment shelter emergency lighting circuit has blown.
BUS CURRENT meter.	Monitors 28 vdc line current from power inverter.
EMER LIGHT TEST switch (back-lighted push-button).	Enables power to be applied to the emergency lighting circuit for test purposes; lamp lights when emergency lighting is in use.
ALARM BYPASS switch (back lighted push-button)	Enables the audible alarm to be bypassed; lamp lights to indicate that the alarm has been bypassed.
OPR CSL circuit breaker.	Enables dc power to part of control-monitor fuse panel for distribution in the operator's rack.
EMER LTS 8 AMP indicating fuse holder	Lamp lights to indicate that fuse in equipment shelter emergency lighting circuit has blown.
RAD RMTE circuit breaker.	Enables dc power to R/T fuse panel for distribution in the R/T rack.
AUTO SWBD circuit breaker.	Enables dc power to part of control monitor fuse panel for the automatic switch-board equipment.
CW/FSK (back-lighted push-button).	Allows class B operation when a cw signal is present.

3-24. Inverter, Power, Static PP-4545/TSC-38B Controls and Indicators (fig. 3-22)

The power inverter (PP-4545/TSC-38B) converts 28 vdc input power to three-phase, 60-cps and single-phase, 60 cps output power. A portion of the 28 vdc power input is routed to the dc power distribution system (amplifier-decoder-power distribution assembly). All power inverter controls are located on the front panel.

<i>Control or indicator</i>	<i>Function</i>
DC INPUT circuit breaker.	Protects input circuits against an overload condition.
DC INPUT lamp.....	Lights to indicate presence of dc input.
3 Ø OUTPUT lamp	Lights to indicate when 3-phase power is available at power inverter output.
1 Ø OUTPUT lamp	Lights to indicate when 1-phase power is available at power inverter output.
DC OUTPUT lamp	Lights to indicate when dc power is available at power inverter output.
3 Ø OUTPUT circuit breaker.	Used to apply 3-phase power to external circuits.
1 Ø OUTPUT circuit breaker.	Used to apply single phase power to external circuits.
DC OUTPUT circuit breaker.	Used to apply 28 vdc power to the dc power distribution system.

3-25. Terminal, Telephone TA694/TSC-38B Controls (fig. 3-23)

The AN/TSC-38B contains three telephone terminals (TA-694/TSC-38B). The three units provide terminations for a total of twelve telephone subscribers. Access to telephone terminal controls is gained by opening the front panel.

<i>Control</i>	<i>Function</i>
4W/2W switches (12) position rotary switches).	Select 4-wire or 2-wire termination in accordance with subscriber (two-requirements).
D/CBM/20 switches	Select signaling-detection termination characteristics suited to

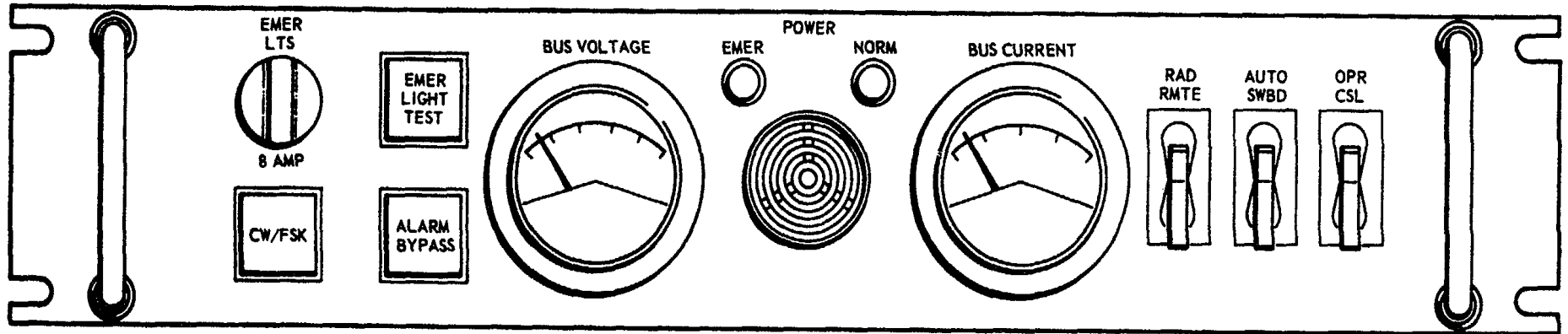
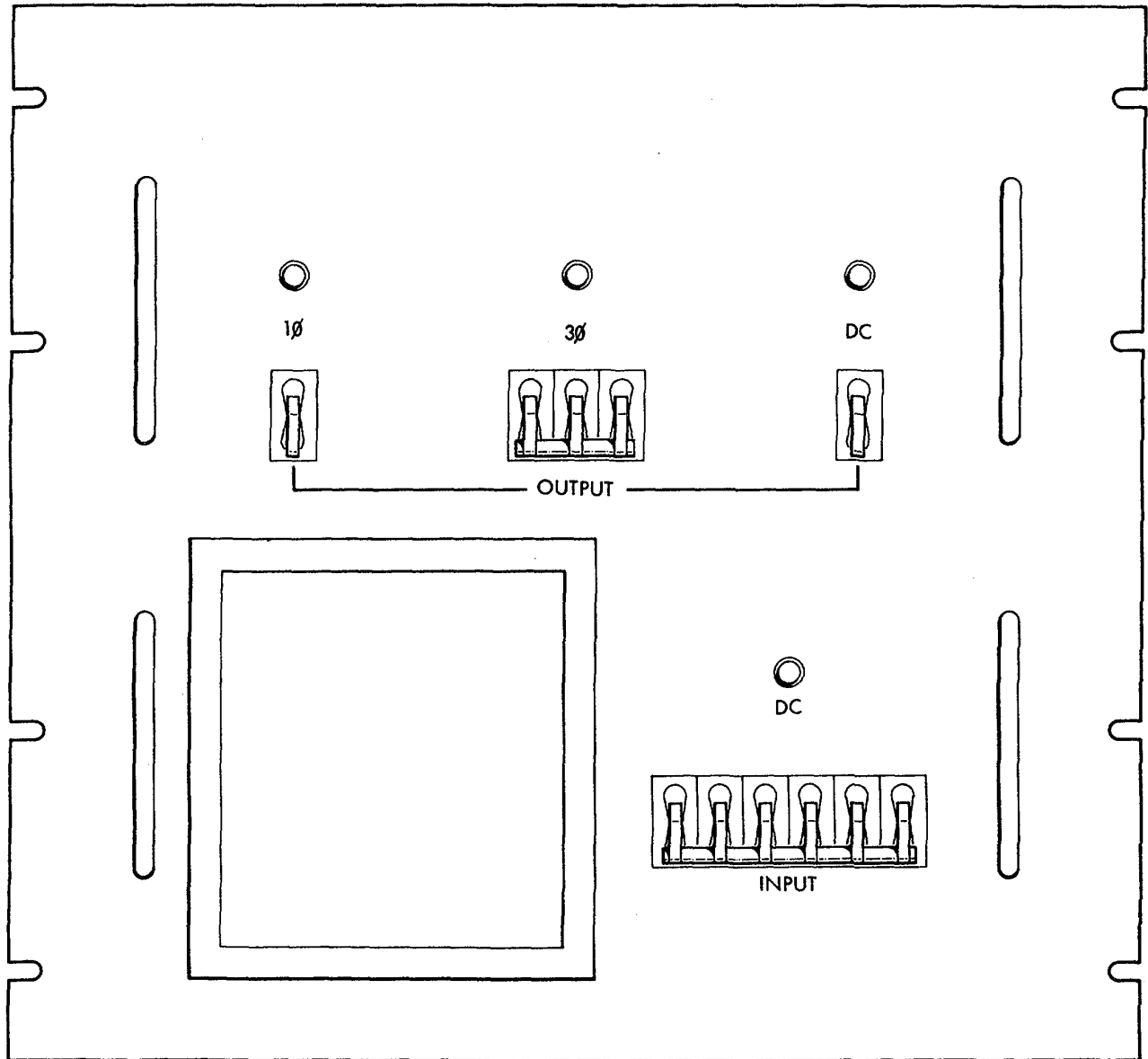


Figure 3-21. Amplifier Decoder-Power Distribution Assembly
MX-8044/TSC-38B, controls and indicators.



TM 11-5895-356-12-1-TM-74

Figure 3-22. Inverter, Power, Static PP-4545/TSC-38B, controls and indicators.

Control

Function

switches (12) (three-position rotary switches)
 CB/LB/FSK switches (12) (three-position rotary switches).

subscriber requirements (dial, common battery manual, or 20 cps ringing).
 Select termination characteristics suited to type of service (common battery, local battery, or frequency shift keying) required by subscriber.

3-26. Control-Selector-Indicator-C-7084/TSC-38B Controls and Indicators

(fig. 3-24)

The secondary frequency select panel (C-7084/TSC-38B) contains controls and indicators to enable an operator to control the secondary radio facility (1-kw radio transmitting facility and the secondary receiver). This panel also provides a transfer function (REMOTE switch) to enable the entire secondary radio facility to be

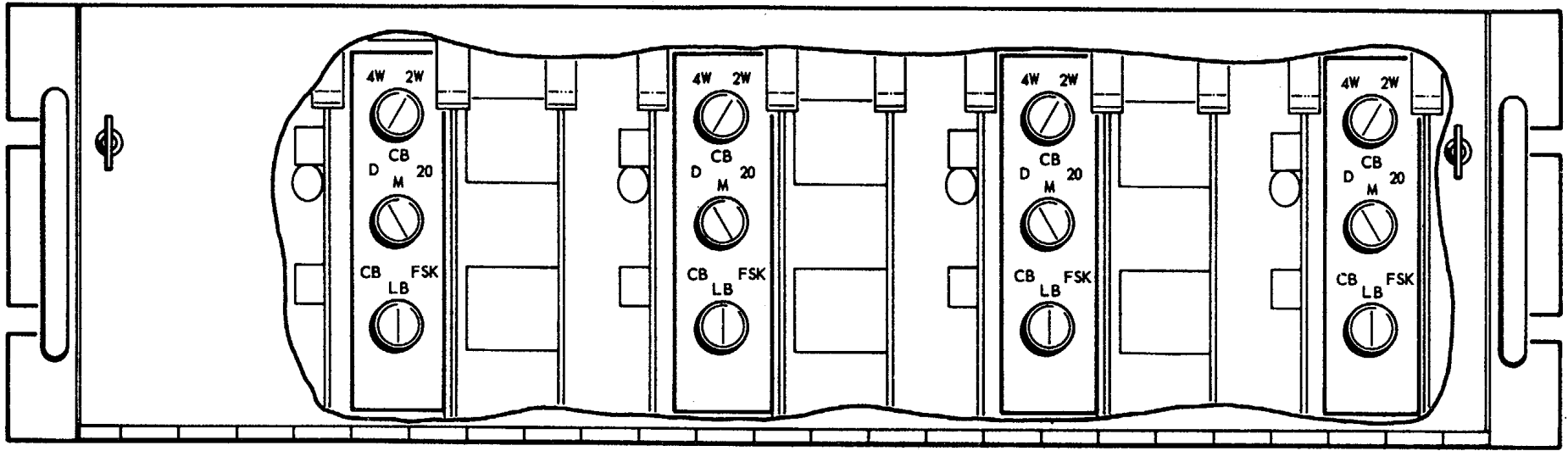


Figure 3-23. Terminal, Telephone TA-694/TSC-38B, controls.

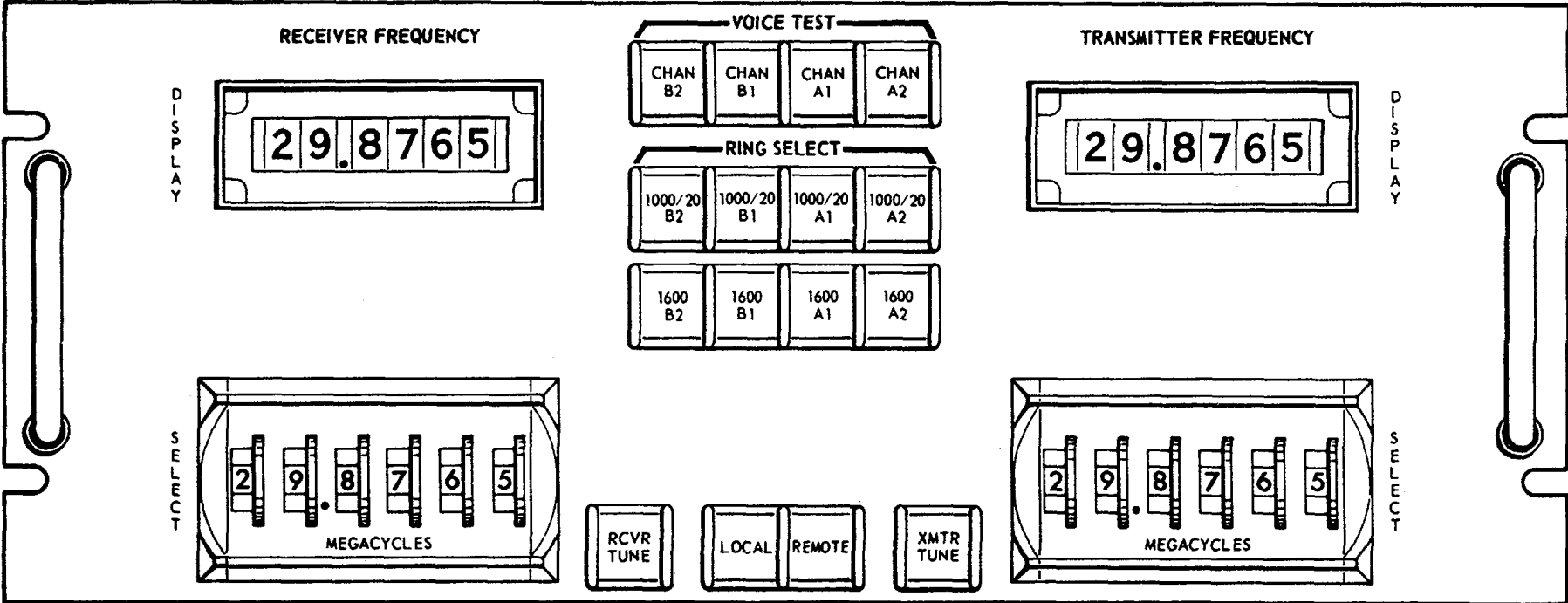


Figure 3-24. Control-Selector-Indicator C-7084/TSC-38B, controls and indicators

placed under remote FSK telephone subscriber control.

<i>Control or indicator</i>	<i>Function</i>
RECEIVER	
FREQUENCY:	
DISPLAY indicator (digital display indicator).	Indicates frequency (2 to 29.9999 mc) to which the receiver (secondary) is tuned.
SELECT switch (six-section dial switch).	Enables operator to select any receiver operating frequency between 2 and 29.9999 mc.
TRANSMITTER	
FREQUENCY:	
DISPLAY indicator- (digital display indicator).	Indicates frequency (2 to 29.9999 mc) to which the transmitter (secondary) is tuned.
SELECT switch (six-section dial switch).	Enables operator to select any transmitter (secondary) and 1-kw P.A. frequency between 2 and 29.9999 mc.
VOICE TEST CHAN B2, CHAN B1, CHAN A1, and CHAN A2 switches(back lighted push-buttons).	Enables the output from a voice test generator (not supplied with AN/TSC-38B) to be applied to any of the four secondary radio facility channels; lamps light to indicate selected channels.
RING SELECT 1000/20 B2, 1000/20B1, 1000/20A1, and 1000/ 20A2 switches(back lighted push buttons)	Enables a ring frequency of 1000/20 cps to be applied to any of the four secondary radio facility channels; lamps light to indicate selected channels.
RING SELECT 1600 B2, 1600 B1, 1600 A1 and 1600 A2 switches- (back lighted push- buttons).	Enables a ring frequency of 1600 cps to be applied to any of the four secondary radio facility channels; lamps light to indicate selected channels.
RCVR TUNE switch (backlighted push- button).	Enables the receiver to tune to the frequency set on the RECEIVER FREQUENCY SELECT dials; lamp lights to indicate functions are implemented.
LOCAL switch (back lighted push-button).	Enables control of the receiver (secondary) and transmitter (secondary) by the local operator; lamp lights to indicate local operation.
REMOTE switch (backlighted push-button).	Enables remote control of the receiver (secondary) and transmitter (secondary) by an external FSK telephone subscriber; lamp lights to indicate remote operation.
XMTR TUNE switch (backlighted push-button).	Enables the transmitter (secondary) to tune to the frequency set on the TRANSMITTER FREQUENCY SELECT dials; lamp lights to indicate this function is implemented.

3-27. Control-Indicator C-7081/TSC-38B Controls and Indicators

(fig. 3-25)

The secondary mode and status panel (C-7081/TSC-38B) contains the operating controls and performance monitors required by the local operator to determine the mode of operation and audio channels of the secondary (1-kw) radio facility.

<i>Control or indicator</i>	<i>Function</i>
METERING:	
RF POWER OUTPUT meter.	Measures forward and reflected output power of the 1-kw P.A.
RF PWR SEL switch (two-position rotary switch).	In FWD position, enables forward output power of 1-kw P.A. to be measured on the RF POWER OUTPUT, meter in REFL position, enables

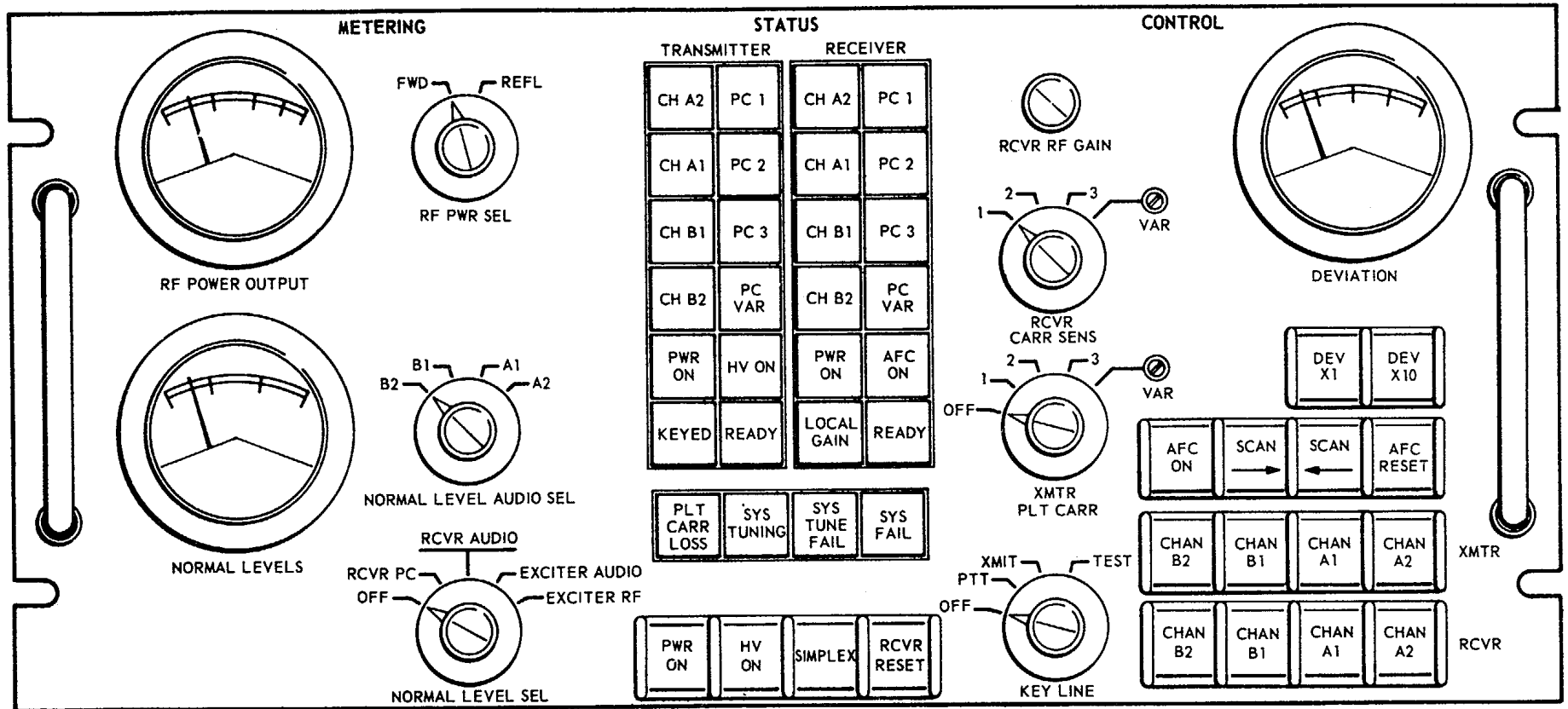


Figure 3-25. Control-Indicator C-7081/TSC-38B, controls and indicators.

Control or indicator

Function

NORMAL LEVELS meter.
 measurement of the reflected power.
 Measures approximate normal levels of audio and RF signals from circuits selected by the NORMAL LEVEL AUDIO SEL and NORMAL LEVEL SEL switches.

NORMAL LEVEL AUDIO SEL switch (four-position rotary switch).
 Operates in conjunction with RCVR AUDIO and EXCITER AUDIO positions of NORMAL LEVEL SEL switch. Enables audio output from one of four channels from receiver (secondary) or transmitter (secondary) to be applied to the NORMAL LEVELS meter for measurement.

<i>Sw pos</i>	<i>Measurement</i>
B2.....	Audio output channel B2.
B1.....	Audio output channel B1.
A1.....	Audio output channel A1.
A2.....	Audio output channel A2.

NORMAL LEVEL SEL switch (five-position rotary switch).
 Selects receiver (secondary) and transmitter (secondary) audio signals and transmitter (secondary) RF voltage to be measured on the NORMAL LEVELS meter.

<i>SW pos</i>	<i>Measurements</i>
OFF	Off position for switch.
RCVR PC	Receiver (secondary) pilot carrier level.
RCVR AUDIO.	Receiver(secondary) audio level.
EXCITER AUDIO.	Transmitter (secondary) audio level.
EXCITER RF.	RF level.
	Transmitter (secondary) RF level.

CONTROL: DEVIATION meter
 Measures frequency deviation in cps when receiver automatic frequency control is applied.

RCVR RF GAIN potentiometer.
 Enables control of the RF gain setting on the receiver (secondary).

RCVR CARR SENS switch(four-position rotary switch).
 Enables selection of attenuation to limit receiver sensitivity to pilot carrier input. The first three positions (1, 2, and 3) apply -40-db, -80-db, and -120-db attenuation, respectively. The VAR position selects a screwdriver-adjustable variable (0 to-120 db) attenuator.

XMTR PLT CARR switch (five-position rotary switch).
 Determines amount of suppression of transmitter pilot carrier. The first position is OFF. The next three positions (1, 2, and 3) are -20 db, -10 db, and 0 db. The VAR position selects a screwdriver-adjustable variable (0 to-50 db) attenuator.

<i>Control or indicator</i>	<i>Function</i>
KEY LINE switch:	
OFF	Key line open.
PTT	Selects push-to-talk transmitter keying mode.
XMIT	Selects continuous transmitter key.
TEST	Selects keying mode in which only the transmitter (secondary) is keyed and disables high voltage on 1-kw P.A.
DEV X1 and DEV X10 switches (backlighted Push-buttons).	Enables selection of the scale multiplier to be used with the DEVIATION meter; lamps light to indicate selected multiplier.
AFC ON switch (backlighted push-button).	Enables automatic frequency control to be applied to the receiver (secondary); lamp lights to indicate afc is applied.
SCAN switches (backlighted push-button).	Control receiver (secondary) frequency when automatic frequency control is not in use; lamps light when AFC ON switch is pushed to indicate that scan function is enabled.
AFC RESET switch (backlighted push-button).	Returns frequency deviation to zero after scanning; lamp lights to indicate afc reset switch is active.
XMTR:	
CHAN B2, CHAN B1, CHAN A1, and CHAN A2 switches (backlighted push-button).	Enables selection of the desired transmitter (secondary) channels; lamp lights to indicate selected channel.
RCVR:	
CHAN B2, CHAN B1, CHAN A1, and CHAN A2 switches (backlighted push-buttons).	Enables selection of the desired receiver (secondary) channels; lamp lights to indicate selected channel.
PWR ON switch (backlighted push-button).	Enables power to the transmitter (secondary), and to the 1-kw P.A. filaments; lamp lights to indicate power has been applied.
HV ON switch (backlighted push-button).	Enables high voltage to 1-kw P.A.; lamp lights to indicate power has been applied.
SIMPLEX switch (backlighted push-button).	Enables a key line voltage to mute the receiver (secondary) when transmitter (secondary) is on during simplex operation; lamp lights to indicate simplex operation.
RCVR RESET switch (backlighted push-button).	Resets an automatic variable attenuator after a receiver (secondary) front end overload has occurred; lamp lights to indicate that receiver (secondary) overload has occurred.
STATUS:	
TRANSMITTER CH A2, CH A1, CH B1, and CH B2 lamps.	Lamps light to indicate the transmitter (secondary) channels that have been enabled by the switches on the CONTROL section of the panel or by remote control.
TRANSMITTER PC 1, PC 2, PC 3, and PC VAR lamps.	Lamps light to indicate the transmitter (secondary) pilot carrier level 1, selected by the XMTR PLT CARR switch on the CONTROL section of the panel.
TRANSMITTER PWR ON lamp	Lamp lights to indicate that power is applied to the transmitter (secondary) and to the 1-kw P.A. filaments.

<i>Control or indicator</i>	<i>Function</i>
TRANSMITTER HV ON lamp.	Lamp lights to indicate that high voltage is applied to the 1-kw P.A.
TRANSMITTER KEYED lamp.	Lamp lights to indicate that the transmitter (secondary) and 1-kw P.A. are being keyed.
TRANSMITTER READY lamp.	Lamp lights to indicate that the transmitter (secondary) tuning is completed (no tuning in progress).
RECEIVER CH A2 CH A1, CH B1, and CH B2 lamps.	Lamps light to indicate the receiver (secondary) channels that are enabled by the switches on the CONTROL section of the panel or by remote control.
RECEIVER PC 1, PC 2, PC 3, and PC VA R lamps.	Lamps light to indicate the receiver (secondary) RF input attenuation level selected by the RCVR CARR SENS switch on the CONTROL section of the panel.
RECEIVER PWR ON lamp	Lamp lights to indicate that power is applied to the receiver (secondary).
RECEIVER LOCAL GAIN lamp.	Lamp lights to indicate that the receiver(secondary) gain is being controlled by the RCVR RF GAIN control on the CONTROL section of the panel.
RECEIVER AFC ON lamp .	Lamp lights to indicate that the receiver (secondary) is on automatic frequency control.
RECEIVER READY lamp.	Lamp lights to indicate that receiver (secondary) tuning is in progress.
PLT CARR LOSS lamp.	Lamp lights to indicate loss of receiver (secondary) pilot carrier.
SYS TUNING lamp.	Lamp lights to indicate that transmitter(secondary) or receiver (secondary) tuning is in progress
SYS TUNE FAIL lamp.	Lamp lights to indicate that the 1-kw P.A. has failed to tune.
SYS FAIL lamp	Lamp lights to indicate that the receiver (secondary) pilot carrier is lost, the receiver (secondary) is overloaded, or the 1-kw P.A. has failed to tune.

3-28. Control-Monitor, Telephone Line C-7091/TSC-38B Controls, Indicators and Jacks
(fig. 3-26)

The telephone control panel (C-7091/TSC-38B) consists of the operator module, the DSA module, six dual line intercept modules, and four VFTG data control modules.

<i>Control or indicator</i>	<i>Function</i>
Operator module: Telephone dial	Enables operator to provide dial service assistance, and allows operator access to switchboard via the intercept modules.
HEADSET VOLUME potentiometer.	Enables operator to adjust audio level in operator headset.
ENABLE switch (backlighted push-button).	Enables transmit and receive audio to operator module; lamp lights to indicate audio is enabled.
RING switch (back- lighted push-button).	Applies 20-cps ringing signal to the selected line.
HEADSET jack	Used for connection of an operator monitor headset.
MICROPHONE jack.	Used for connection of the operator microphone/headset.

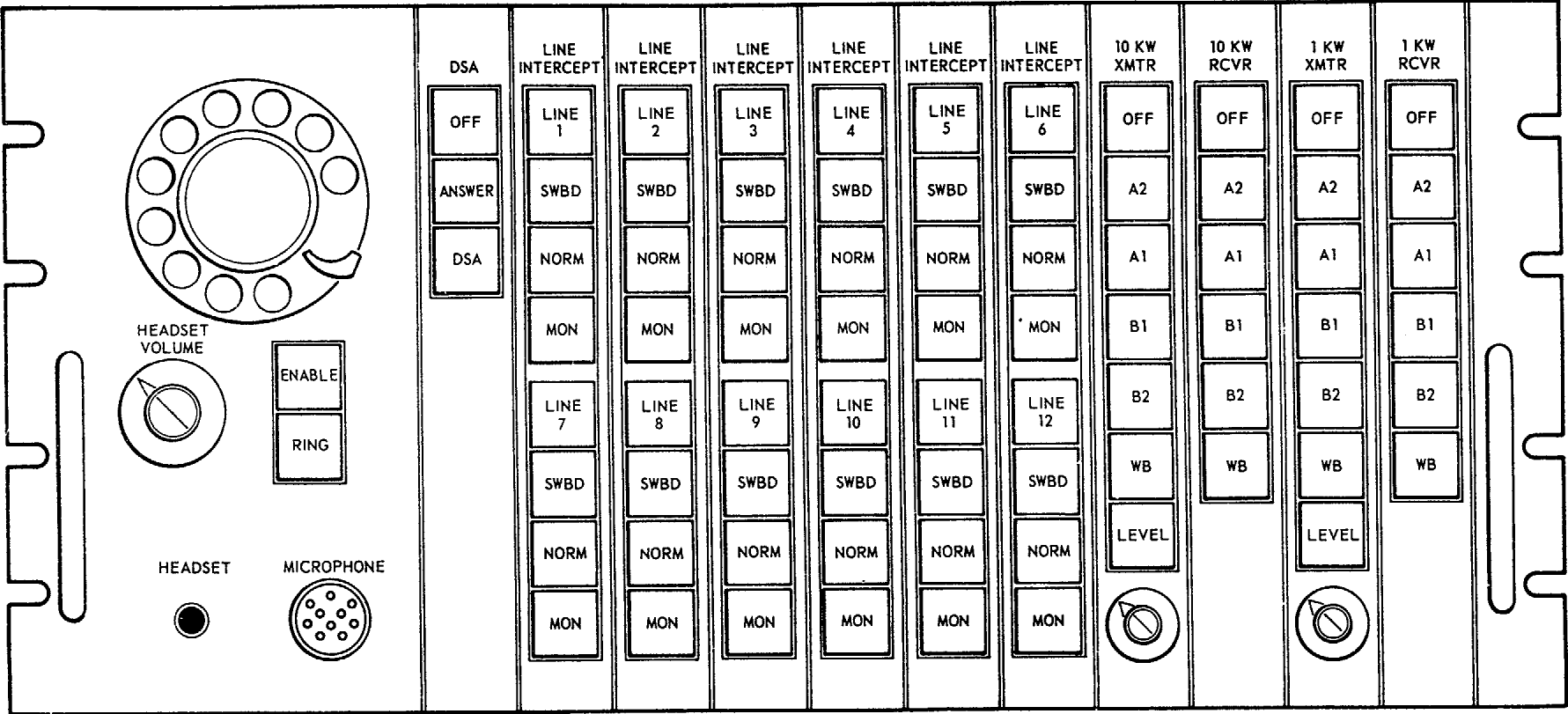


Figure 3-26. Control-Monitor, Telephone Line C-7091/TSC-38B, controls and indicators.

Control, indicator, or jack

Function

DSA module: OFF switch (backlighted push-button).	Used to reset the DSA functions; lamp lights to indicate reset.
ANSWER switch (back-lighted push-button).	Silences signal buzzer and connects operator to party requiring assistance; lamp lights to indicate the function has been implemented.
DSA switch (backlighted push-button).	Connects operator to automatic switch-board to provide assistance to calling subscriber; lamp lights to indicate function has been implemented.
LINE INTERCEPT modules: LINE 1 through LINE 12 switches (backlighted push-buttons).	Silence buzzer and connect operator to initiating subscriber; lamps light to indicate function has been implemented. push-buttons)
SWBD switches (backlighted push-buttons).	Connect operator into automatic switch-board; lamps light to indicate function has been implemented.
NORM switches (backlighted push-buttons).	Permit operator to leave circuit with parties connected together; lamps light to indicate function has been implemented.
MON switches (backlighted push-buttons).	Permit operator to monitor circuit performance without interrupting circuits; lamps light to indicate function has been implemented.
VFTG data control modules: 10 KW XMTR module OFF switch (back-lighted push- buttons	Terminates output of 16-channel VFTG terminal; lamp lights to indicate function completed (no tuning in progress).
A2, A1, B1, and B2 switches(back- lighted push-buttons).	Routes 16-channel VFTG send tones into selected primary radio transmitter channel; disconnects corresponding send and receive voice channels from the 10-kw transmitter and 10-kw receiver. Lamps light to indicate function has been implemented.
WB switch (backlighted push-button).	Substitutes wideband VFTG send tones into audio bus for routing into primary radio transmitter channel in lieu of 16-channel VFTG routing indicated in preceding items; lamp lights to indicate function has been implemented.
LEVEL switch (push-button).	Applies VFTG send tones (16-channel or wideband, as selected) to VFTG position of METER SELECT switch of the radio line control.
Potentiometer	Enables operator to adjust VFTG send tone level applied to primary radio transmitter channel selected.
10 KW RCVR module: OFF switch (backlighted push-button).	Terminates input to 16-channel VFTG terminal; lamp lights to indicate function has been implemented.
A2, A1, B1, and B2 switches (backlighted push-buttons).	Connect the selected primary radio receiver channel to 16-channel VFTG receiving terminal; disconnect voice channel to the operator.

Control, indicator, or jack

Function

<p>WB switch (backlighted push-button).</p> <p>1 KW XMTR module:</p> <p>OFF switch (backlighted push-button)</p> <p>A2, A1, B1, and B2 switches(back lighted push-buttons).</p> <p>WB switch (backlighted button).</p> <p>LEVEL switch (push-button).</p> <p>Potentiometer</p>	<p>Connects the selected primary radio channel to wideband VFTG input terminal in lieu of 16-channel VFTG routing indicated in preceding item; lamp lights to indicate function has been implemented.</p> <p>Terminates output of two-channel VFTG terminal; lamp lights to indicate function has been implemented.</p> <p>Routes two-channel VFTG send tones into selected secondary radio transmitter channel; disconnects corresponding send and receive voice channel from the 1-kw transmitter and 1-kw receiver; lamps light to indicate function has been implemented.</p> <p>Substitutes wideband VFTG send tones into audio bus for routing into secondary radio channels in lieu of two-channel VFTG routing push-indicated in preceding item; lamp lights to indicate function has been implemented.</p> <p>Applies VFTG send tones (two-channel or wideband, as selected) to VFTG position of METER SELECT switch of radio line control. Enables operator to adjust VFTG send tone level applied to secondary radio transmitter channel selected. Lamps light to indicate function has been implemented.</p>
<p>1 KW RCVR module:</p> <p>OFF switch (backlighted push-button).</p> <p>A2, A1, B1, and B2 switches (back lighted push-button).</p> <p>WB switch (back lighted push-button).</p>	<p>Terminates input to two-channel VFTG terminal; lamp lights to indicate function has been implemented.</p> <p>Routes selected secondary radio receiver channel to two-channel VFTA receiving terminal; disconnects voice channel to the operator. Lamps light to indicate function has been implemented.</p> <p>Routes audio bus of the selected secondary radio receiver channel to the input of the wideband VFTG terminal in lieu of two-channel VFTG routing indicated in preceding item; lamp lights to indicate function has been implemented.</p>

3-29. Power Supply Assembly PP-4543/TSC-38B Controls and Indicators
(fig. 3-27)

VFTG power supply No. 1 (PP-4543/TSC-38B) provides the 130 vdc power for the 16-channel VFTG terminal and the teletypewriter subscriber loops.

Control or indicator

Function

<p>PS1 6A AC through PS5 6A AC indicating fuse holders.</p> <p>PS1 3A DC through PS5 3A DC indicating fuse holders</p> <p>PS1 ON through PS5 ON switches (two- position toggle switches).</p>	<p>Provide protection for input power circuit to power supplies No. 1 PS5 through No. 5; lamps light to indicate blown fuses.</p> <p>Provide protection for output power circuit from 130 vdc power supplies No. 1 through No. 5; lamps light to indicate blown fuses.</p> <p>Apply input power to power supplies No. 1 through No. 5.</p>
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3-30. Control-Selector-Indicator C-7083/TSC-38B Controls and Indicators (fig. 3-28)

The primary frequency select panel (C-7083/TSC-38B) contains controls and indicators to enable an operator to control the primary radio facility (10-kw transmitting facility and diversity receivers). The primary frequency select panel also provides a transfer function to enable the entire primary radio facility to be placed under the control of a remote telephone subscriber.

<i>Control or indicator</i>	<i>Function</i>
RECEIVER	
FREQUENCY:	
DISPLAY indicator 1 (digital display indicator).	Indicates frequency (2 to 29.9999 mc) to which receivers (primary No. 1 and primary No. 2) are tuned.
SELECT switch (six-section dial switch).	Enables operator to select any receiver operating frequency between 2 and 29.9999 mc for receivers (primary No. 1 and primary No. 2).
TRANSMITTER	
FREQUENCY:	
DISPLAY indicator (digital display indicator).	Indicates frequency (2 to 29.9999 mc) to which transmitter (primary) is tuned.
SELECT switch (six-section dial switch).	Enables operator to select any transmitter (primary) and 10-kw P.A. frequency between 2 and 29.9999 mc.
VOICE TEST	
CHAN B2, CHAN B1, CHAN A1, and CHAN A2 Switches (backlighted push-buttons).	Enable the output a voice test generator from (not supplied with AN/TSC38B) to be applied to any of the four primary radio facility channels; lamps light to indicate selected channels.
RING SELECT	
1000/20 B2, 1000/20 B1, 1000/20 A1, and 1000/20 A2 switches (backlighted push-buttons).	Enable a ring frequency of 1000/20 cps to be applied to any of the four primary radio facility channels; lamps light to indicate selected channels.
RING SELECT 1600	
B2, 1600 B1, 1600 A1, and 1600 A2 switches (back- lighted push-buttons).	Enable a ring frequency of 1600 cps to be applied to any of the four primary radio facility channels; lamps light to indicate selected channels
DIVERSITY	
SELECT CHAN B2, CHAN B1, CHAN A1, and CHAN A2 switches (back lighted push-buttons).	Transpose audio output from the two receivers (primary No. 1 and No. 2); lamps light to indicate selected channels.
RCVR TUNE switch (backlighted push- button).	Enables the receivers (primary No. 1 and No. 2) to tune to the frequency set on the RECEIVER FREQUENCY SELECT dials; lamp lights to indicate functions are implemented.
LOCAL switch (backlighted push-button).	Enables control of the receivers (primary No. 1 and No. 2) and transmitter (primary) by the local operator; lamp lights to indicate local operation.
REMOTE switch (backlighted push-button).	Enables remote control of the receivers (primary No. 1 and No. 2) and transmitter (primary) by an external FSK telephone subscriber; lamp lights to indicate remote operation.
XMTR TUNE switch	Enables the transmitter the frequency set on (primary) to tune to

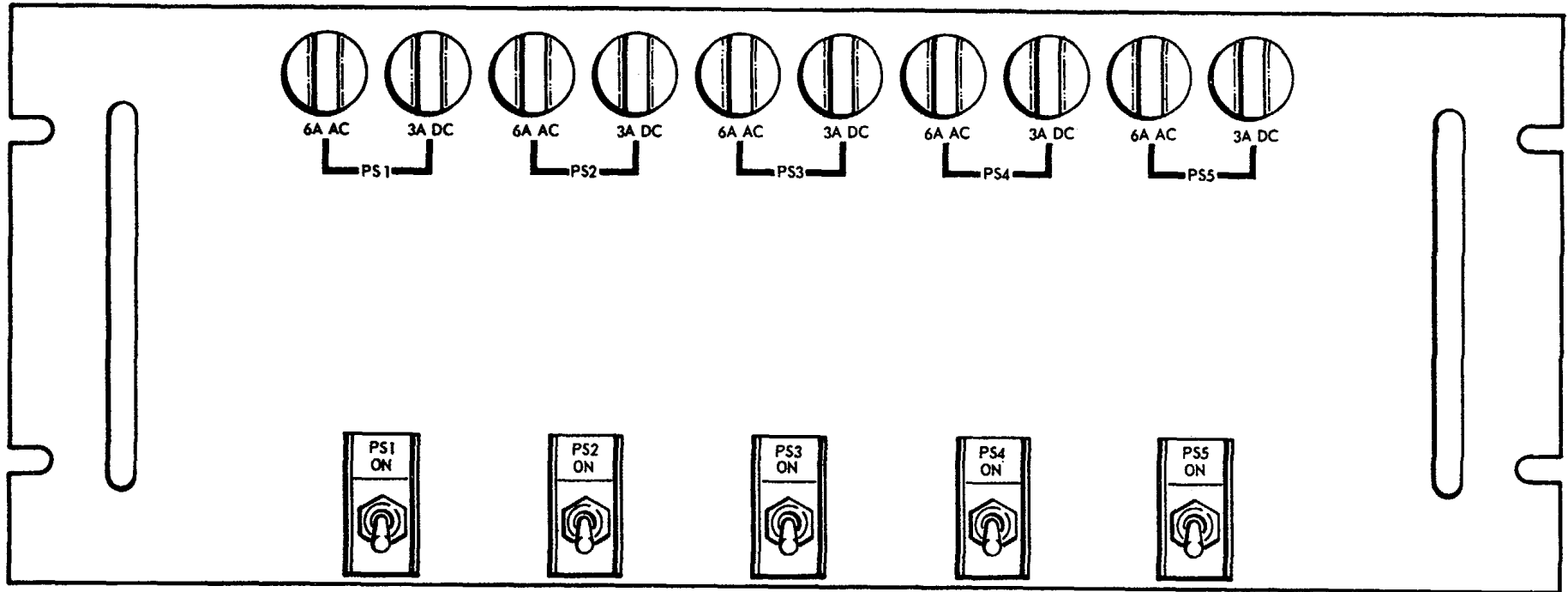


Figure 3-27. Power Supply Assembly PP-4543/TSC--38B, controls and indicators.

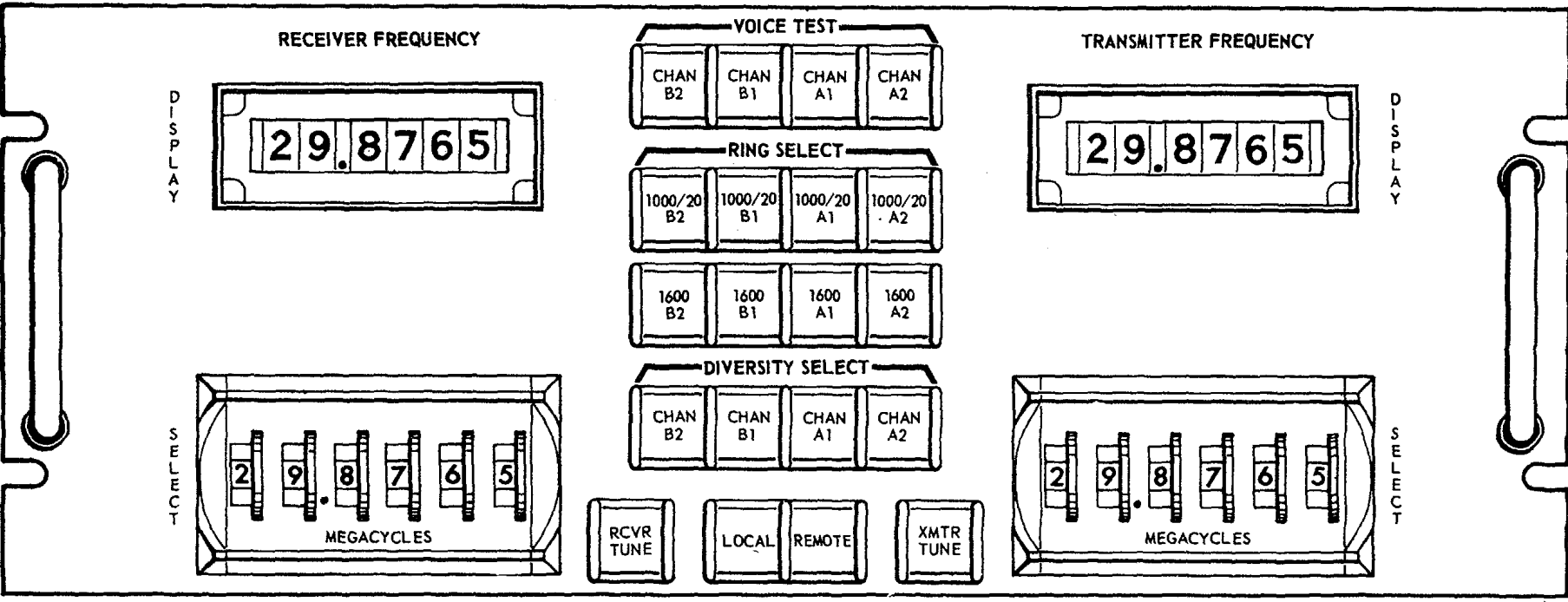


Figure 3-28. Control-Selector-Indicator C-7083/TSC-38B, controls and indicators.

Control or indicator

Function

(backlighted push-button).

the TRANSMITTER FREQUENCY SELECT dials; lamp lights to indicate this function is implemented.

3-31. Control-Indicator C-7080/TSC-38B Controls and Indicators

(fig. 3-29)

The primary mode and status panel (C-7080/TSC-38B) contains the operating controls and performance monitors required by the local operator to determine the mode of operation and audio channels of the primary (10-kw) radio facility.

Control or indicator

Function

METERING:

RF POWER OUTPUT meter.

Measures forward and reflected output power of the 10-kw P.A.

RF PWR SEL switch (two position rotary switch).

In FWD position, enables forward output of 10-kw P.A. to be measured on the RF POWER OUT-PUT meter; in REFL position, enables measurement of the reflected power.

NORMAL LEVELS meter.

Measures approximate normal levels of audio and Rf signals from circuits selected by the NORMAL LEVEL SEL and NORMAL LEVEL AUDIO SEL switches.

NORMAL LEVEL AUDIO SEL switch (four position rotary switch).

Enables audio output from one of four channels from either receiver (primary No. 1 and No. 2) to be applied to the NORMAL LEVELS-meter for measurement.

Sw pos

Measurement

B2

Audio output channel B2.

B1

Audio output channel B1.

A1

Audio output channel A1.

A2

Audio output channel A2.

NORMAL LEVEL SEL switch.

Selects receiver (primary No. 1), receiver(primary No. 2) and the transmitter (primary) audio signals and Rf voltage to be measured on the NORMAL LEVELS meter.

Sw pos

Measurement

OFF

Off position for switch.

RCVR PC

Receiver pilot carrier level.

PRI 1/D1V

Audio level of receiver(primary No. 1) or of receiver (primary No. 2), in accordance with DIVERSITY SELECT switches on primary frequency select panel.

RCVR AUDIO.

PRI 2 RCVR AUDIO.

Receiver (primary No. 2) audio level.

EXCITER AUDIO.

Transmitter(primary) audio level.

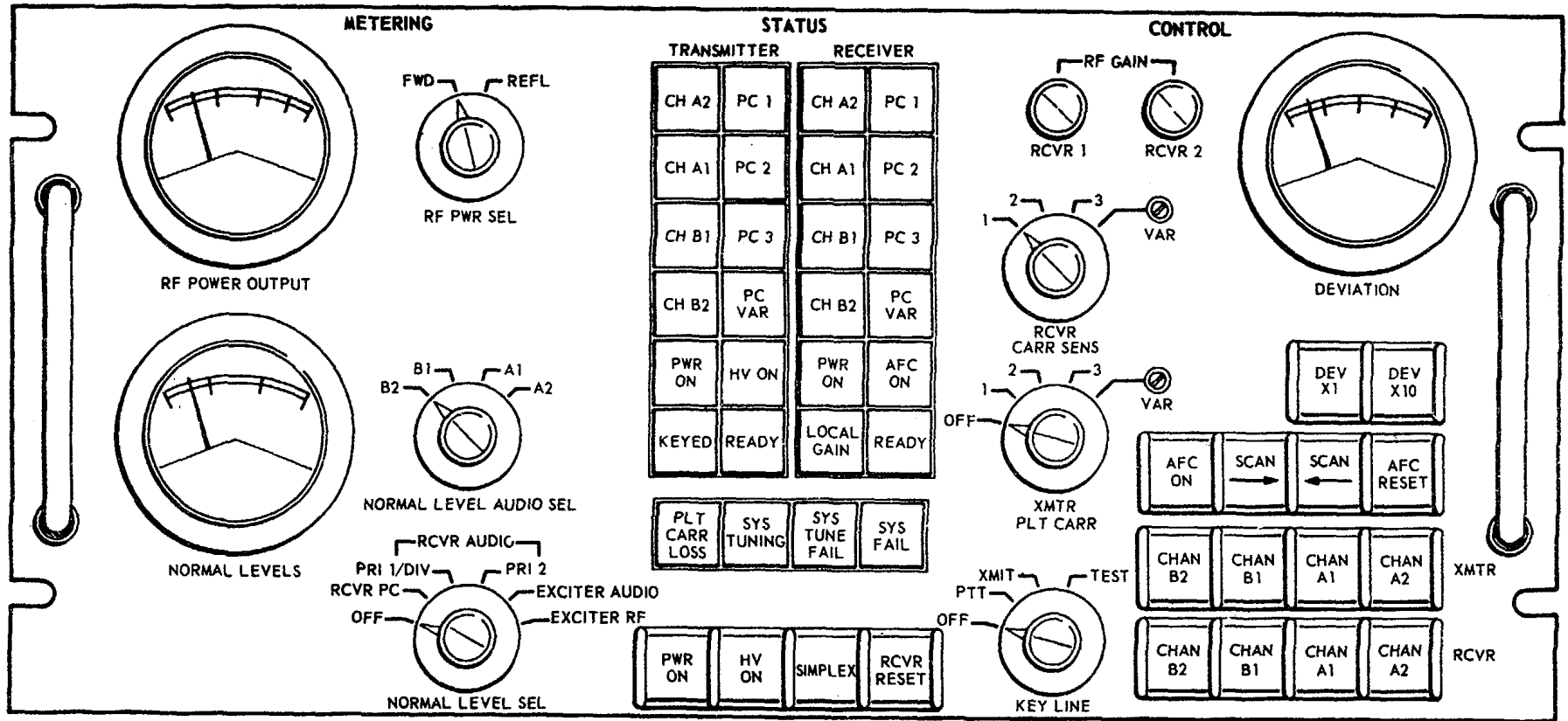


Figure 3-29. Control Indicator C-7080/TSC-38B, Controls and Indicators.

Control or indicator

Function

SW pos

Measurement

CONTROL:

DEVIATION
meter.

RF GAIN
RCVR 1
potentiometer.

RF GAIN
RCVR 2
potentiometer.

RCVR CARR
SENS switch
(four-position
rotary switch).

XMTR PLT
CARR switch (five-position
rotary switch).

KEY LINE
switch (four-position
rotary switch):

OFF-----
PTT-----
XMIT-----
TEST----

DEV X1 and X10
switches
(backlighted push-buttons).

AFC ON switch
(backlighted push-button).

SCAN switches----

AFC RESET switch
(backlighted push-button).

XMTR:
CHAN B2, CHAN B1,
CHAN A1, and CHAN
A2 switches (backlighted
push-buttons).

RCVR:
CHAN B2, CHAN B1,
CHAN A1, and CHAN A2
Switches (backlighted
push-buttons).

EXCITER
RF.

Measures frequency deviation in cps when receiver automatic frequency control is applied.

Enables control of the Rf gain setting of receiver (primary No. 1).

Enables control of the Rf gain setting of receiver (primary No. 2).

Enables selection of attenuation to limit receiver sensitivity to pilot carrier input. The first three positions (1, 2, and 3) apply -40-db, -80-db, and -120-db attenuation, respectively. The VAR position selects a screw-driver-adjustable variable (0 to-120) db attenuator.

Determines amount of suppression of transmitter (primary) pilot carrier. The first position is OFF. The next three positions (1, 2, and 3) are -20-db, -10-db, and 0-db attenuation, respectively. The VAR position selects a variable 0-to-20-db level by means of a screw-driver adjust potentiometer.

Enables selection of the mode of keying the transmitter (primary).

Key line open.

Selects push-to-talk transmitter (primary) keying mode.

Selects continuous transmitter (primary) key.

Selects keying mode in which only the transmitter (primary) is keyed and disables high voltage on 10-kw P.A.

Enable selection of the scale multiplier to be used with the DEVIATION meter; lamps light to indicate selected multiplier.

Enables automatic frequency control to be applied to the receivers (primary No. 1 and No. 2); lamp lights to indicate afc is applied.

Control receiver (primary No. 1) frequency within 1-kc of selected frequency. When AFC ON switch is pushed scanning function is enabled.

Returns frequency deviation to zero after scanning; lamp lights to indicate afc reset has occurred.

Enable selection of the desired transmitter(primary) channels lamps light to indicate selected channels.

Enable selection of the desired receiver(primary) channels; lamps light to indicate selected channels.

Control or indicator

Function

PWR ON switch (backlighted push-button).	Enables power to the transmitter (primary) and the 10-kw P.A. filaments; lamp power has been applied.
HV ON switch (backlighted push-button).	Enables high voltage to the 10-kw P.A.; lamp lights to indicate power has been applied.
SIMPLEX switch (backlighted push-button).	Enables a key line voltage to mute the receivers (primary No. 1 and No. 2) when transmitting during simplex operation; lamp lights to indicate simplex operation.
RCVR RESET switch (back-lighted push-button).	Resets an automatic variable attenuator after a receiver (primary No. 1 or No. 2) front end overload has occurred; lamp lights-to indicate overload.
STATUS:	
TRANSMITTER CH been A2, CH A1, CH B1, and CH B2 lamps.	Lamps light to indicate the transmitter (primary) channels that have enabled by the switches on the CONTROL section of the panel or by remote control.
TRANSMITTER PC1, PC2, PC3, and PC VAR lamps.	Lamps light to indicate the transmitter (primary) pilot carrier level selected by the XMTR PLT CARR switch on the CONTROL section of the panel.
TRANSMITTER PWR ON lamp.	Lamp lights to indicate that power is applied to the transmitter(primary) and to the 10-kw P.A. filaments.
TRANSMITTER HV ON lamp.	Lamp lights to indicate that high voltage is applied to 10-kw P.A.
TRANSMITTER KEYED lamp.	Lamp lights to indicate that the transmitter(primary) and 10-kw P.A. are being keyed.
TRANSMITTER READY lamp.	Lamp lights to indicate that the 10-kw P.A. tuning is completed(no tuning in progress).
RECEIVER CH A2, CH A1, CH B1, and CH B2 lamps.	Lamps light to indicate the receivers (primary No. 1 and No. 2) Channels are enabled bythe switches on the CONTROL section of the panel or by remote control.
RECEIVER PC 1, PC 2, PC 3 and PC VAR lamps.	Lamps light to indicate the receiver Rf input attenuation level selected by the RCVR CARR SENS switch on the CONTROL section of the panel.
RECEIVER PWR ON lamp.	Lamp lights to indicate that power is applied to receiver (primary No. 1) and receiver (primary No. 2).
RECEIVER LOCAL GAIN lamp.	Lamp lights to indicate that the receivers(primary No. 1 and No. 2) gain is being controlled by RCVR RF GAIN controls on the CONTROL section of the panel.
RECEIVER AFC ON lamp.	Lamp lights to indicate that the receivers (primary No. 1 and No. 2) are on automatic frequency control.
RECEIVER READY lamp.	Lamp lights to indicate that the receivers (primary No. 1 and No. 2) tuning is completed (no tuning in progress).

<i>Control or indicator</i>	<i>Function</i>
PLT CARR LOSS lamp.	Lamp lights to indicate the loss of receivers(primary No. 1 or No. 2) pilot carrier.
SYS TUNING lamp.	Lamp lights to indicate that 10-kw P.A. or receivers (primary No. 1 and No. 2) tuning is in progress.
SYS TUNE FAIL lamp.	Lamp lights to indicate that the 10-kw P.A. has failed to tune.
SYS FAIL lamp.	Lamp lights to indicate that the pilot carrier is lost, the receivers (primary No. 1 or No. 2) are overloaded, or the 10-kw P.A. has failed to tune.

3-32. Control-Monitor, Radio Line C-7092/TSC-38B Controls and Indicators
(fig. 3-30)

The radio line control (C-7092/TSC-38B) consists of an operator module and eight radio intercept modules. Four of the radio intercept modules are associated with primary radio facility audio circuits and four with secondary radio facility audio circuits.

<i>Control or indicator</i>	<i>Function</i>
Operator module:	
Meter	Measures audio level of the circuit selected by METER SELECT switch.
Telephone dial.....	Permits operator to dial commands to radio equipment and to the automatic switch-board.
METER SELECT switch (10-position rotary switch).	Enables audio level of various circuits to be measured on the meter.
	<i>Sw pos</i>
	<i>Measurement</i>
	OFF Disconnects level measuring circuit.
	XMTR Audio level of operator transmitting circuit.
	RCVR Audio level of operator receiving bus.
	JOIN 1 Audio out-put level of radio receiver side of switch-board circuit selected.
	JOIN 2 Transmit audio level of switch-board out-put to radio channel selected.
	0,-10, and-20 Provides range settings for audio level measurement for circuits patched to VU METER jack on the audio patch panel.
	VFTG Audio level of aggregate send tones of VFTG terminal (16-channel, two-channel, or wide-band, as selected by VFTG radio channel selection switches on 10 KW XMTR or 1 KW XMTR modules of the telephone control panel and applied by pressing corresponding LEVEL switch).

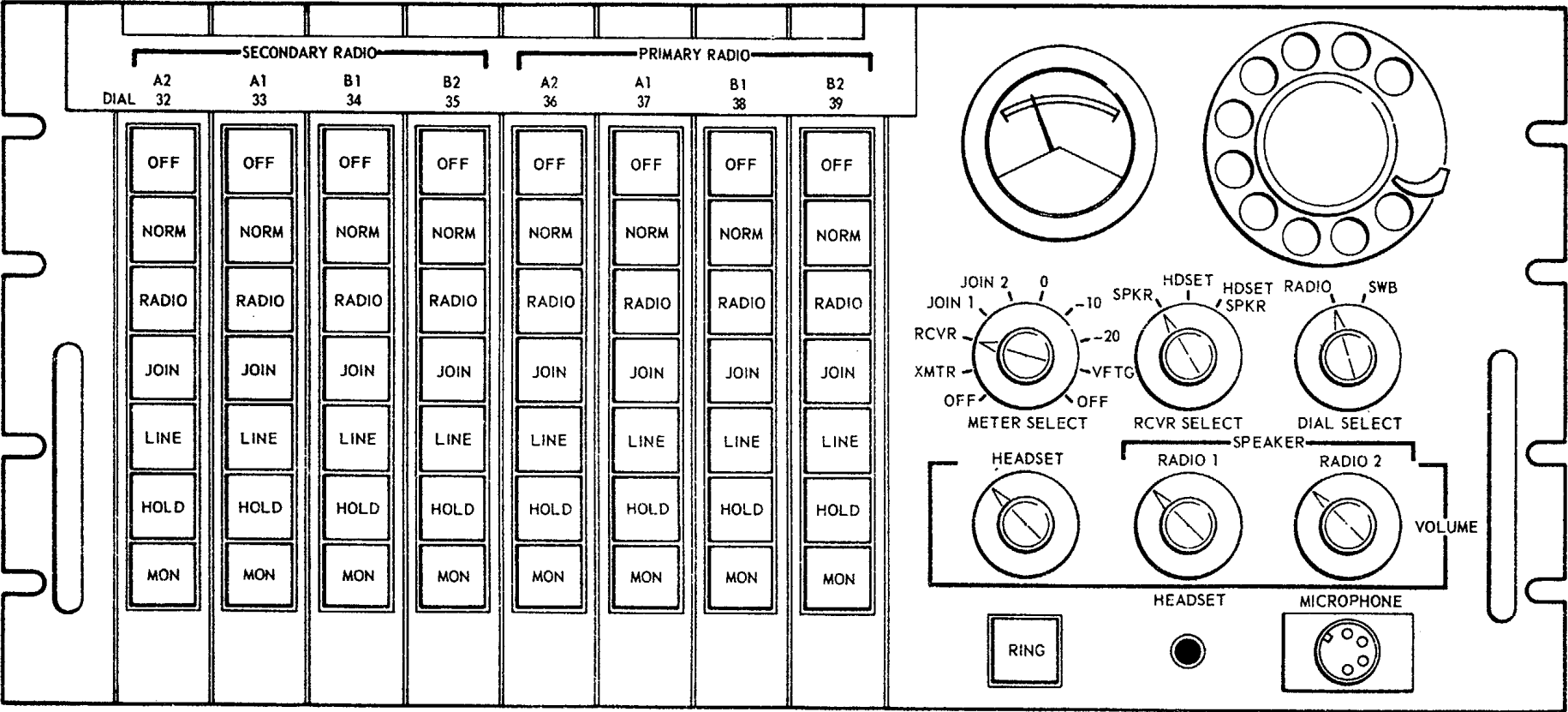


Figure 3-30. Control-Monitor, Radio Line C-7092/TSC-38B, controls and indicators.

Control or indicator

Function

	<i>SW pos</i>	<i>Measurement</i>
	OFF	Disconnects level measuring circuit.
RCVR SELECT switch (three-position rotary switch):		
SPKR		Routes operator receiving audio bus to speaker only.
HDSET		Routes operator receiving audio bus to headset only.
HDSET SPKR		Routes operator received audio to both speaker and headset.
DIAL SELECT switch (two-position rotary switch):		
RADIO		Enables FSK dialing to test remote control.
SWB		Enables dc dialing into automatic switch-board when a selected JOIN button is pressed.
VOLUME HEAD-SET potentiometer.		Enables audio level to operator headset to be adjusted.
VOLUME SPEAKER:		
RADIO 1 potentiometer.		Enables adjustment of audio level of the operator monitor speaker.
RADIO 2 potentiometer.		Enables adjustment of audio output level of utility monitor amplifier to the utility monitor speaker.
RING switch (push-button).		Initiates ring signal to radio circuit selected by operator.
HEADSET jack		Used for connection of the operator headset.
MICROPHONE connector.		Used for connection of the operator microphone.
SECONDARY RADIO A2, A1, B1, B2 and PRIMARY RADIO A2, A1, B1, B2 modules:		
OFF switches (backlighted push-button).		Terminate radio lines and switchboard lines in their characteristic impedance; lamps light to indicate function has been implemented.
NORM switches (backlighted push-button).		Connect switchboard line and radio line together allowing a telephone subscriber to dial into a selected radio channel without alerting the operator; lamps light to indicate function has been implemented.
RADIO switches (backlighted push-button).		Terminate switchboard line and connects operator microphone, headset, dial, and PTT facilities into selected radio circuit. Lamps light to indicate function has been implemented.
JOIN switches (backlighted push-button).		Provides operator access to switchboard and radio equipment; lamps light to indicate function has been implemented.

<i>Control or indicator</i>	<i>Function</i>
LINE switches (backlighted push-button).	Terminate radio line, and connect operator microphone and head-set to switchboard line; lamps light to indicate function has been implemented.
HOLD switches (backlighted push-button).	Permit operator to leave the radio intercept position from which connections are established; lamps light to indicate function has been implemented.
MON switches (backlighted push-button).	Permit operator monitoring and routes receive audio operator bus for headset/speaker operation; lamps light to indicate function has been implemented.

3-33. Power Supply Assembly PP-4544/TSC38B Controls and Indicators (fig. 3-31)

VFTG power supply No. 2(PP-4544/TSC-38B) provides the 12 volts dc used within the VFTG equipment and contains the required 130 volt dc power supplies for operation of the two-channel and wideband VFTG terminals and subscriber loop currents during emergency operation.

<i>Control or indicator</i>	<i>Function</i>
PS1 1A AC through PS4 1A AC indicating fuseholders.	Provide protection for input power circuit to power supplies No. 1 PS4 through No. 4; lamps light to indicate blown fuses.
PS1 4A DC through PS4 4A DC indicating fuseholders.	Provide protection for output power circuit of 12 vdc power supplies No. 1 through No. 4; lamps light to indicate blown fuses.
PS5 6A AC and PS6 6A AC indicating fuseholders.	Provide protection for input power circuit to power supplies No. 5 and No. 6; lamps light to indicate blown fuses.
PS5 3A DC and PS6 3A DC indicating fuseholders.	Provide protection for output power circuit of 130 vdc power supplies No. 5 and No. 6; lamps light to indicate blown fuses.
PS1 ON through PS6 ON (Two-position toggle switches).	Apply source power to power supplies No. 1 through No. 6.

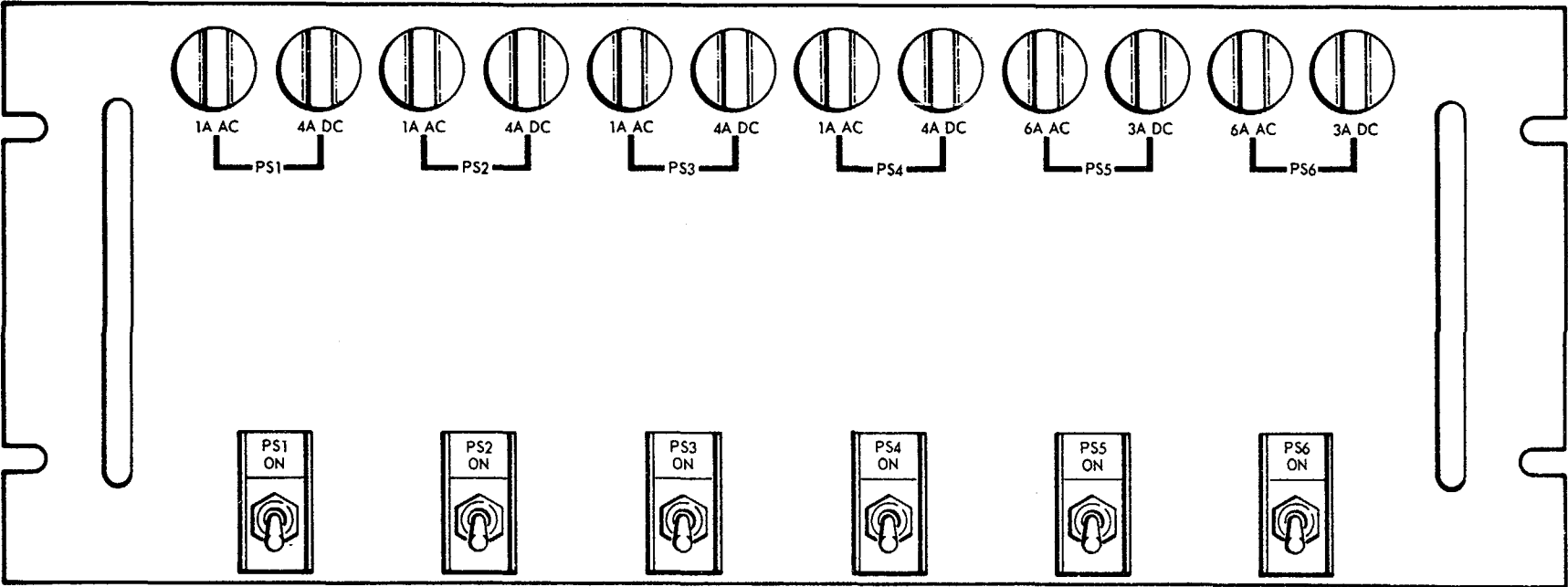
3-34. Jack Assembly, Telephone TA-693/TSC-38B Jacks (fig. 3-32)

NOTE

In 2-wire telephone operation the receive circuits of the 4-wire equipment are not functional. The send circuits are utilized for both sending and receiving.

The audio patch panel (TA-693/TSC-38B) jackfields make it possible to monitor the audio frequency channels of the AN/TSC-38B, to gain access to specific circuits for testing and trouble-shooting, and to alter circuit connections so as to reroute telephone subscriber communication channels within the AN/TSC-38B equipment. The jacks are associated in functional pairs. The lower jack of each pair provides a patching capability, and the upper provides for circuit monitoring. Insertion of a patch cord plug into a lower jack interrupts the normal circuit connections and routes to the patch cord the circuit indicated by the panel marking (for example, EXTERNAL TELEPHONE LINES SEND 1).

<i>Jack</i>	<i>Function</i>
MONITOR/ EXTERNAL TELEPHONE LINES SEND 1 through SEND 20 jack pairs: Lower jacks----	Permit access to external telephone send circuits at point between telephone signal entry panel and the telephone



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Figure 3-31. Power Supply Assembly PP-4544/TSC-38B, controls and indicators.

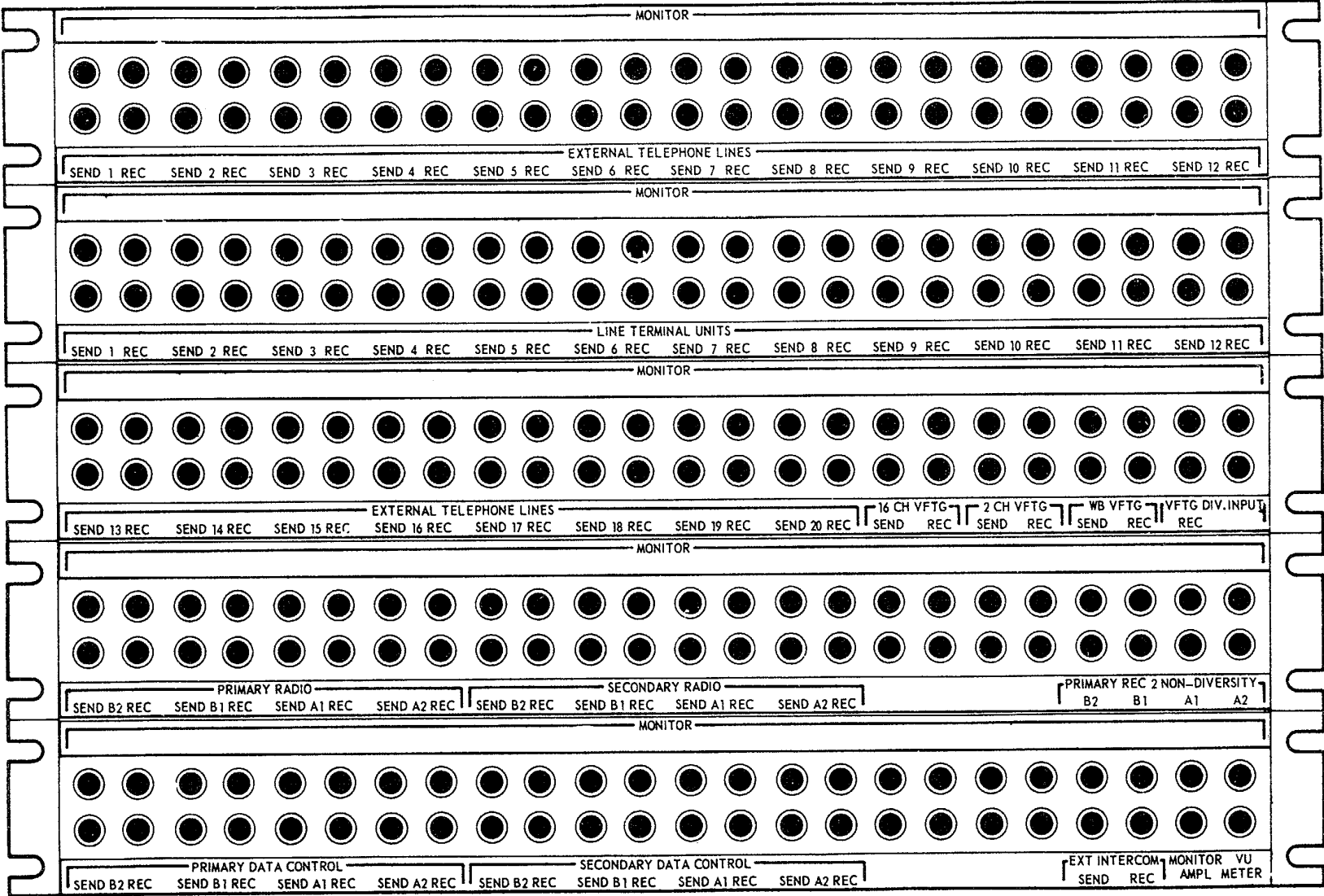


Figure 3-32. Jack Assembly, Telephone TA.-93/TSC-38B, jacks.

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<i>Jack</i>	<i>Function</i>
	terminals; permit patching these circuits to any desired internal telephone send channel (LINE TERMINAL UNITS SEND jacks).
MONITOR/EXTERNAL TELEPHONE LINES 1 REC through 20 REC jack pairs:	
Upper jacks-----	Permit monitoring of circuits connected to lower jacks.
Lower jacks-----	Permit access to receive circuits of external telephone receive circuits at point between telephone signal entry panel and the telephone terminal; permit patching these circuits to any desired internal telephone receive channel (LINE TERMINAL UNITS REC jacks).
Upper jacks-----	Permit monitoring of circuits connected to lower jacks.
MONITOR/LINE TERMINAL UNITS SEND 1 through SEND 12 jack pairs:	
Lower jacks-----	Permit access to send circuits of internal telephone channel (LINE TERMINAL UNIT SEND jacks); permit patching these circuits to any desired external telephone send line (EXTERNAL TELEPHONE LINES SEND jacks).
Upper jacks-----	Permit monitoring of circuits connected to lower jacks.
MONITOR/LINE TERMINAL UNITS 1 REC through 12 REC jack pairs:	
Lower jacks-----	Permit access to receive circuits of internal telephone channels (LINE TERMINAL UNIT REC jacks); permit patching these circuits to any desired external telephone receive line (EXTERNAL TELEPHONE LINES REC jacks).
Upper jacks-----	Permit monitoring of circuits connected to lower jacks.
MONITOR/16 CH VFTG SEND jack pair:	
Lower jack-----	Permits access to aggregate send circuit of the 16-channel VFTG terminal; permits patching this circuit to any desired radio send channel (PRIMARY RADIO SEND or SECONDARY RADIO SEND jacks).
Upper jack -----	Permit monitoring of circuits connected to lower jacks.
MONITOR/16 CH VFTG REC jack pair:	
Lower jack-----	Permits access to the normal aggregate receive channel of the 16-channel VFTG terminal; permits patching this circuit to any desired radio receive channel (PRIMARY RADIO REC, SECONDARY RADIO REC, or PRIMARY REC 2 NON-DIVERSITY jacks).

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<i>Jack</i>	<i>Function</i>
Upper jack -----	Permits monitoring of circuit connected to lower jack.

MONITOR/2 CH VFTG SEND jack pair:

Lower jack -----	Permits access to the aggregate send channel of the two-channel VFTG terminal; permits patching this circuit to any desired radio send channel (PRIMARY RADIO SEND or SECONDARY RADIO SEND jacks).
Upper jack -----	Permits monitoring of circuits connected to lower jack.

MONITOR/2 CH VFTG REC jack pair:

Lower jack -----	Permits access to the aggregate receive channel of the two-channel VFTG terminal; permits patching this circuit to any desired radio receive channel (PRIMARY RADIO REC, SECONDARY RADIO REC, or PRIMARY REC 2 NON-DIVERSITY jacks).
Upper jack -----	Permits monitoring of circuit connected to lower jack.

MONITOR/WB VFTG SEND jack pair:

Lower jack -----	Permits access to aggregate send channel of wideband VFTG terminal; permits patching this circuit to any desired radio send channel (PRIMARY RADIO SEND or SECONDARY RADIO SEND jacks).
Upper jack -----	Permits monitoring of circuit connected to lower jack.

MONITOR/WB VFTG REC jack pair:

Lower jack -----	Permits access to aggregate receive channel of wideband VFTG terminal; permits patching this circuit to any desired radio receive channel (PRIMARY RADIO REC, SECONDARY RADIO REC, or PRIMARY REC 2 NON-DIVERSITY jacks).
Upper jack -----	Permits monitoring of circuit connected to lower jack.

MONITOR/VFTG DIV. INPUT REC jack pair:

Lower jack -----	Permits access to aggregate diversity receive channel of the 16-channel VFTG terminal; permits patching this circuit to any desired radio receive channel (PRIMARY RADIO REC, SECONDARY RADIO REC, or PRIMARY REC 2 NONDIVERSITY jacks).
Upper jack -----	

(MONITOR/VFTG DIV. INPUT jack pair (end of row) is blank.) Permits monitoring of the circuit connected to the lower jack.

MONITOR/PRIMARY RADIO SEND and MONITOR/SECONDARY RADIO SEND jack pairs:

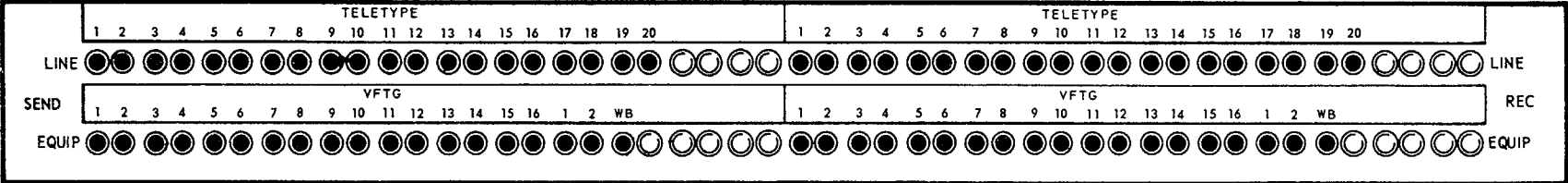
<i>Jack</i>	<i>Function</i>
Lower jacks-----	Permit access to selected radio send channel; permit patching these circuits to any desired VFTG terminal send channel (16 VFTG SEND, 2 CH VFTG SEND jacks) or to desired send channel of PRIMARY or SECONDARY DATA CONTROL SEND jacks.
Upper jacks-----	Permit monitoring of circuits connected to lower jacks.
MONITOR/PRIMARY RADIO REC and MONITOR /SECONDARY RADIO REC jack pairs:	
Lower jacks-----	Permit access to selected radio receive channel; permit patching these circuits to any desired VFTG terminal receive channel (16 CH VFTG REC, 2 CH VFTG REC, or WB VFTG REC jacks) or to desired receive channel of PRIMARY or SECONDARY DATA CONTROL REC jacks.
Upper jacks-----	Permit monitoring of circuits connected to lower jacks.
MONITOR/PRIMARY REC 2 NONDIVERSITY jack pairs	
Lower jacks-----	Permit access to selected channel of receiver (primary No. 1 or No. 2) (determined by selection of DIVERSITY pushbutton on primary frequency select panel); permit patching these circuits to any desired VFTG terminal input (16 CH VFTG REC, 2 CH VFTG REC, or WB VFTG REC jacks) or to the receive channels of the PRIMARY and SECOND DATA CONTROL REC jacks.
Upper jacks-----	Permit monitoring of circuits connected to lower jacks.
MONITOR/PRIMARY DATA CONTROL SEND and MONITOR/SECONDARY DATA CONTROL SEND jack pairs	
Lower jacks-----	Permit access to selected send channel of the 10 KW XMTR, 10 KW RCVR, 1 KW XMTR or 1 KW RCVR modules in the telephone control panel; permit patching these circuits to any desired transmitter channel (PRIMARY RADIO SEND or SECONDARY RADIO SEND jacks).
Upper jacks-----	Permit monitoring of circuit connected to lower jacks.
MONITOR/PRIMARY DATA CONTROL REC and MONITOR/SECONDARY DATA CONTROL REC jack pairs:	
Lower jacks-----	Permit access to selected receive channel of the 10 KW XMTR, 10 KW RCVR, 1 KW XMTR or 1 KW

<i>Jack</i>	<i>Function</i>
Upper jacks -----	RCVR modules in the telephone control panel; permit patching these circuits to any desired receiver channel (PRIMARY RADIO REC, SECONDARY RADIO REC, or PRIMARY REC NONDIVERSITY jacks). Permit monitoring circuits connected to lower jacks.
MONITOR/EXT INTER COM SEND jack pair:	
Lower jack -----	Provides connection point to 2-wire line leading to INTERCOM RECEIVE binding posts on power entry panel (located beside equipment shelter door).
Upper jack -----	Permits monitoring of circuit connected to lower jack.
MONITOR/EXT INTERCOM REC jack pair:	
Lower jack -----	Provides connection point to 2-wire line leading to INTERCOM RECEIVE binding posts on power entry panel (located beside equipment shelter door).
Upper jack -----	Permits monitoring of circuit connected to lower jack.
MONITOR/MONITOR AMPL jack pair:	
Lower jack -----	Provides connection point to input circuit of utility monitor amplifier; enables patching of monitor amplifier input to any desired MONITOR jack on the audio patch panel. Amplifier output controlled by VOLUME SPEAKER RADIO 2 potentiometer on the radio line control.
Upper jack -----	Permits monitoring of circuit connected to lower jack.
MONITOR/VU METER jack pair:	
Lower jack -----	Provides connection point to the 0, - 10, or -20 position, as selected, of METER SELECT switch on the radio line control; enables patching this meter circuit to any desired jack on the audio patch panel.
Upper jack -----	Permits monitoring of circuit connected to lower jack.

3-35. Jack Assembly, Teletype TH-92/TSC-38B Jacks
(fig. 3-33)

The jack assembly (TH-92/TSC-38B) contains the line and equipment jacks required to permit crosspatching the teletypewriter line subscribers to the VFTG terminal equipment inputs.

<i>Jack</i>	<i>Function</i>
TELETYPE 1-20 LINE SEND jacks.	Permit access to the external line teletype-writer send circuits at a point between the teletype signal entry panel and the jack assembly; permit patching these circuits to desired VFTG 1-16, 1-2, or WB EQUIP SEND jacks.
TELETYPE 1-20 LINE REC jacks.	Permit access to the external line teletypewriter receive circuits at a point between the teletype signal entry



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Figure 3-33. Jack Assembly, Teletype TH-92/TSC-38B, jacks.

<i>Jack</i>	<i>Function</i>
VFTG 1-16, 1-2 and WB EQUIP SEND jacks.	panel and the jack assembly; permit patching these circuits to desired VFTG 1-16, 1-2, or WB EQUIP REC jacks.
VFTG 1-16, 1-2, and WB EQUIP REC jacks.	Permit access to the send equipment input of the selected VFTG terminal; permit patching these circuits to desired teletypewriter subscriber (TELE-TYPE 1-20 LINE SEND jacks).
	Permit access to the receive equipment input of the selected VFTG terminal; permit patching these circuits to desired teletypewriter subscriber (TELETYPE 1-20 LINE REC jacks).

3-36. Control-Selector, Telegraph Line C-7085/TSC38B Controls and Test Points
(figs. 3-34 and 3-35)

The telegraph line control (C-7085/TSC-38B) enables the operator to select the type of loop compatible with the individual subscriber teletypewriter sets and to adjust the current loops of the individual circuits for optimum operation. Facilities are also provided for introduction of the test signal or test message into the nonsecure data subsystem (VFTG and subscriber) circuits on a per-loop basis.

NOTE

VFTG system panel nomenclature is referenced to the VFTG system itself, not to the AN/TSC-38B system as a whole. Consequently, in panel nomenclature at teletypewriter subscriber/VFTG system interface points, namely, the teletype signal entry panel, the telegraph line control and the RECEIVE LINE SERIES MONITOR and SEND LINE SERIES MONITOR jackfields on VFTG No. 1, the term "RECEIVE" refers to the VFTG circuit by which the subscriber sends and "SEND" to the VFTG circuit by which he receives.

<i>Control, indicator or connector</i>	<i>Function</i>
LOOP CURRENT & BIAS ADJUSTMENT drawer:	
NOTE	
Access to the following controls is gained by opening the LOOP CURRENT & BIAS ADJUSTMENT drawer. Panel markings are on the underside of the drawer assembly.	
REC BIAS 1 through REC BIAS 19 potentiometers.	Adjust loop bias levels for individual current VFTG receive (subscriber send) channels.
REC BIAS TP1 through REC BIAS-TP 19 test points.	Provide voltmeter test point contacts for adjusting loop bias current levels for individual VFTG receive (subscriber send) channels.
REC BIAS COMMON test point.	Provides voltmeter test point common contact for use when adjusting VFTG receive (subscriber send) loop bias current levels.
SEND CURRENT 1 through SEND CURRENT 19 potentiometers.	Adjust loop current level for individual VFTG send (subscriber receive) channels.
SEND CURRENT PRINTER potentiometer.	Adjusts loop current level for operator rack Teletypewriter TT-98C/TSC38B printer.
REC CURRENT 1 through REC CURRENT 19 potentiometers.	Adjust loop current level for individual VFTG receive (subscriber send) channels.

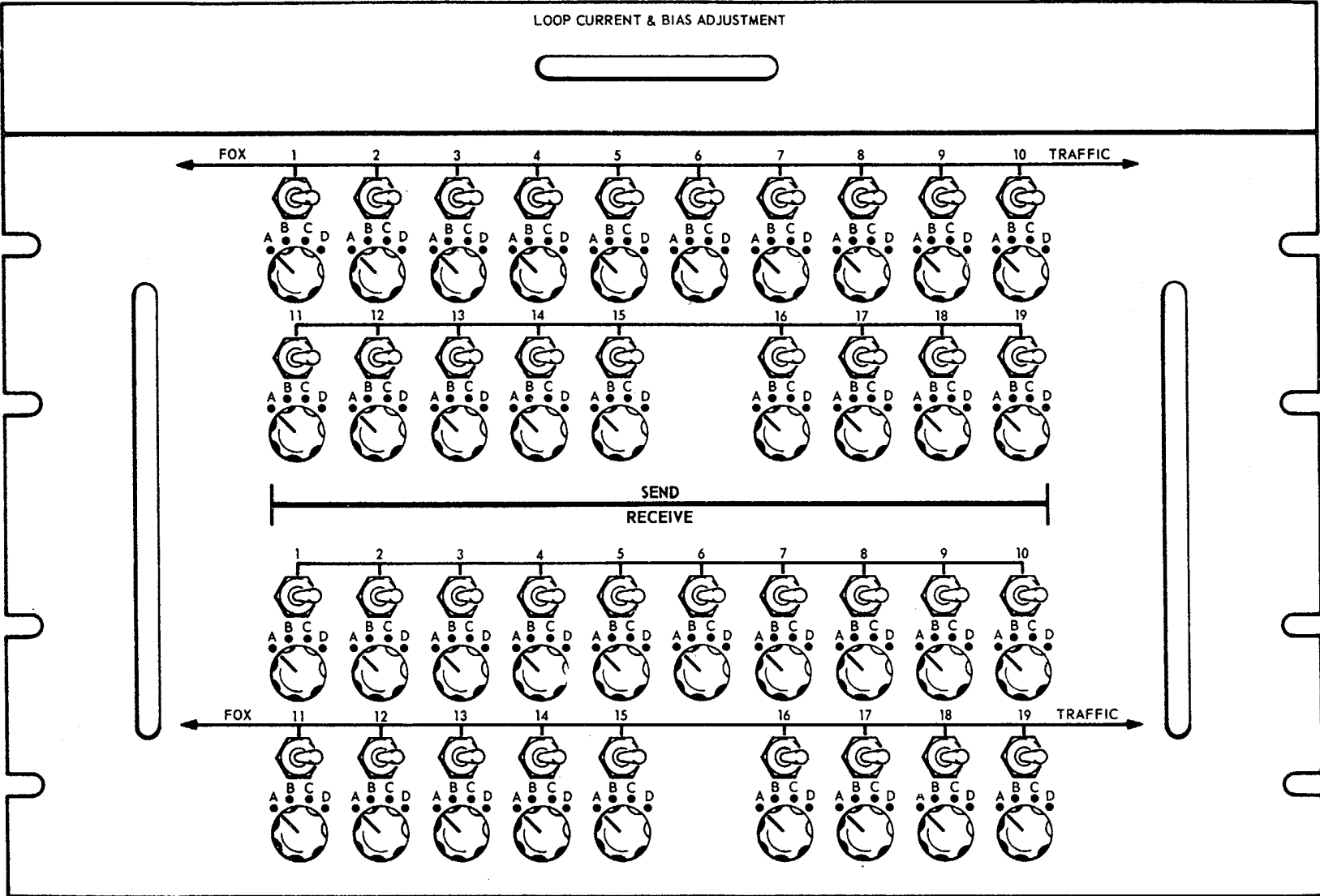
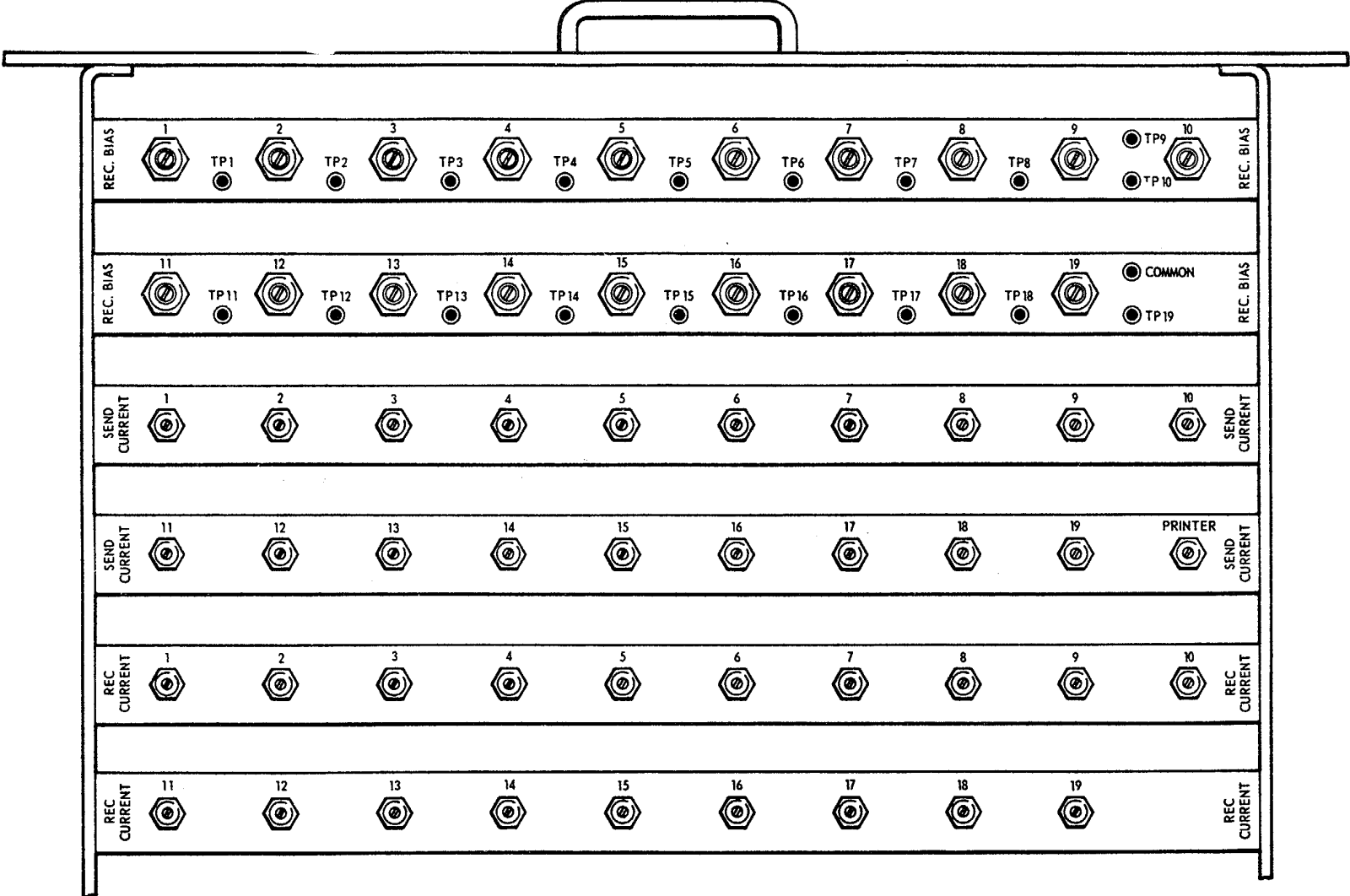


Figure 3-34. Control-Selector, Telegraph Line C-7085/TSC-38B, controls.

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Figure 3-35. Loop current and bias adjustment controls (part of C-7085/TSC-38B).

<i>Control, indicator or connector</i>	<i>Function</i>
FOX/TRAFFIC SEND 1 through FOX/TRAFFIC SEND 19 switches (two-position toggle switches):	
FOX-----	Connect output of fox generator to VFTG send (subscriber receive) channels 1 through 19.
TRAFFIC -----	Connect VFTG send channels 1 through 19 to subscriber receive channels 1 through 19.
SEND 1 through SEND 19 switches (four-position rotary switches):	
A-----	Provide 60-madc loop current to teletypewriters connected to VFTG send (subscriber receive) channels 1 through 19.
B-----	Provide 20-madc loop current to teletypewriters connected to VFTG send (subscriber receive) channels 1 through 19.
C-----	Provide 30-madc polar loop current to teletypewriters connected to VFTG send (subscriber receive) channels 1 through 19.
D-----	Disconnect AN/TSC-38B loop power supply and arrange circuit components to accept 60-madc loop current supplied by teletype-writers connected to VFTG send (subscriber receive) channels 1 through 19.
FOX/TRAFFIC RECEIVE 1 through FOX/TRAFFIC RECEIVE 19 switches (two-position toggle switches):	
FOX-----	Connect output of fox generator to VFTG receive (subscriber send) channels 1 through 19.
TRAFFIC -----	Connect VFTG receive channels 17 and 18 to subscriber send channels 17 and 18.
RECEIVE 1 through RECEIVE 19 switches (four-position rotary switches):	
A-----	Arrange circuit components to accept 60-madc loop current from teletypewriters connected to VFTG receive (subscriber send) channels 1 through 19.
B-----	Arrange circuit components to accept 20-madc loop current from teletypewriters connected to VFTG receive (subscriber send) channels 1 through 19.
C-----	Arrange circuit components to accept 30-madc polar loop current from teletypewriters connected to VFTG receive (subscriber send) channels 1 through 19.
D-----	Connect AN/TSC-38B loop power supply and arrange circuit components to supply 60-madc loop current to teletypewriters connected to VFTG receive (subscriber send) channels 1 through 19.

3-37. Control, Telegraph Line C-7079/TSC-38B Controls and Indicators

(fig. 3-36)

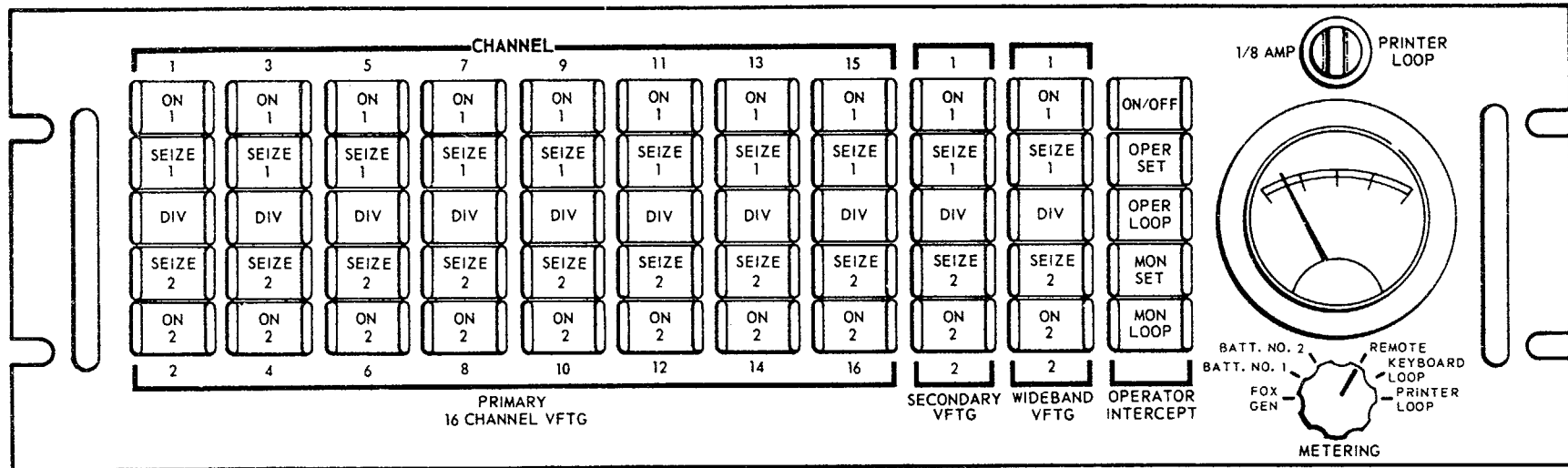
The VFTG channel control (C-7079/TSC-38B) enables the operator to attain circuit access to dc teletypewriter subscriber loops to monitor circuit performance, communicate with the selected subscriber, and rearrange the VFTG terminal facilities for both space and frequency diversity operation.

<i>Control or indicator</i>	<i>Function</i>
PRIMARY 16 CHANNEL VFTG: ON 1 through ON 16 switches (back-lighted pushbuttons).	Apply operating power to 16-channel VFTG send and receive channels 1 through 16 and permit subscriber or operator use of channels with distant terminal; lamps light to indicate function has been implemented.
SEIZE 1 through SEIZE 16 switches (backlighted pushbuttons).	Connect operator intercept position into 16-channel VFTG circuits 1 through 16 on a 4-wire, full-duplex basis; lamps light to indicate function has been implemented.
DIV switches (backlighted pushbuttons).	Provide frequency diversity operation. Disconnect teletypewriter subscribers associated with 16-channel VFTG circuits 2, 4, 6, 8, 10, 12, 14, and 16; connect 16-channel VFTG circuit 1, 3, 5, 7, 9, 11, 13, and 15 subscriber send circuits to circuits 1 and 2, 3 and 4, etc., combine 16-channel VFTG receive circuits 1 and 2, 3 and 4, etc., and route output to subscriber 1, 3, 5, etc. receive circuits. Lamps light to indicate function has been implemented.
SECONDARY VFTG: ON 1 and ON 2 switches (backlighted pushbuttons):	Apply operating power to two-channel VFTG send and receive channels 1 and 2 and permit subscriber or operator use of channels with distant terminal; lamps light to indicate function has been implemented.
SEIZE 1 and SEIZE 2 switches (backlighted pushbuttons).	Connect operator intercept position into two-channel VFTG circuits 1 and 2 on a 4-wire basis; lamps light to indicate function has been implemented.
DIV switches (backlighted pushbuttons).	Disconnects teletypewriter subscriber associated with two-channel VFTG circuit 2, connects two-channel VFTG circuit 1 subscriber send to circuits 1 and 2, combines two-channel VFTG receive circuits 1 and 2, and routes output to subscriber 1 receive circuit; lamp lights to indicate function has been implemented.

WIDEBAND VFTG:

NOTE

For purposes of parts uniformity, the switch assembly used for the WB switches is the same part as the other switch assemblies of this panel; however, only the upper two switches (WB ON and WB SEIZE) are functional.



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Figure 3-36. Control, Telegraph Line C-7079/TSC-38B, controls and indicators.

<i>Control or indicator</i>	<i>Function</i>
ON switch (backlighted pushbutton).	Applies operating power to wideband channel VFTG send and receive channels and permits subscriber or operator use of channels with distant terminal; lamp lights to indicate function has been implemented.
SEIZE switch(backlighted pushbutton).	Connects operator intercept position into wideband VFTG circuit on a 4-wire basis; lamp lights to indicate function has been implemented.
OPERATOR INTERCEPT: ON/OFF switch (backlighted pushbutton).	
OFF-----	Unit not ready for operation; OFF lamp lights when power supply assemblies, etc., are operational and ready for use.
ON -----	Places unit in an operational condition, ready for use; ON lamp lights to indicate this condition.
OPER SET switch (backlighted pushbutton).	Terminates VFTG channel controlled by SEIZE pushbutton switch in operator teletypewriter on a 4-wire full-duplex basis; lamp lights to indicate this function has been implemented.
OPER LOOP switch (backlighted pushbutton).	Terminates subscriber loop circuit controlled by SEIZE pushbutton switch in operator teletypewriter on a 4-wire full-duplex basis; lamp lights to indicate this function has been implemented.
MON SET switch (backlighted pushbutton).	Enables operator to monitor incoming VFTG signals from VFTG channel under control of SEIZE switch with page printer; lamp lights to indicate this function has been implemented.
MON LOOP switch (backlighted pushbutton).	Enables operator to monitor incoming signals from teletypewriter subscriber set under control of SEIZE switch with page printer; lamp lights to indicate this function has been implemented.
PRINTER LOOP: Indicating fuse holder	Provides protection for dc loop to operator printer (Teletypewriter TT-98/FG); lamp lights when fuse blows.
Meter-----	Enables measurement of current related to circuit selected by METERING switch.
METERING switch (six-position rotary switch).	
	<i>Sw pos</i>
	<i>Measurement</i>
	FOX GEN Monitor signal output of fox generator.
	BATT. NO. 1 Output (+130 vdc) of VFTG power supply No. 1.
	BATT. NO. 2. Output (-130 vdc) of VFTG power supply No. 2.

Control or indicator

Function

<i>Sw pos</i>	<i>Measurement</i>
REMOTE	Connects meter circuit into DC MTR jack in VFTG No. 3 and into DC MTR jack in VFTG No. 4.
KEY-BOARD LOOP.	Operator key-board loop.
PRINTER LOOP.	Operator printer loop.

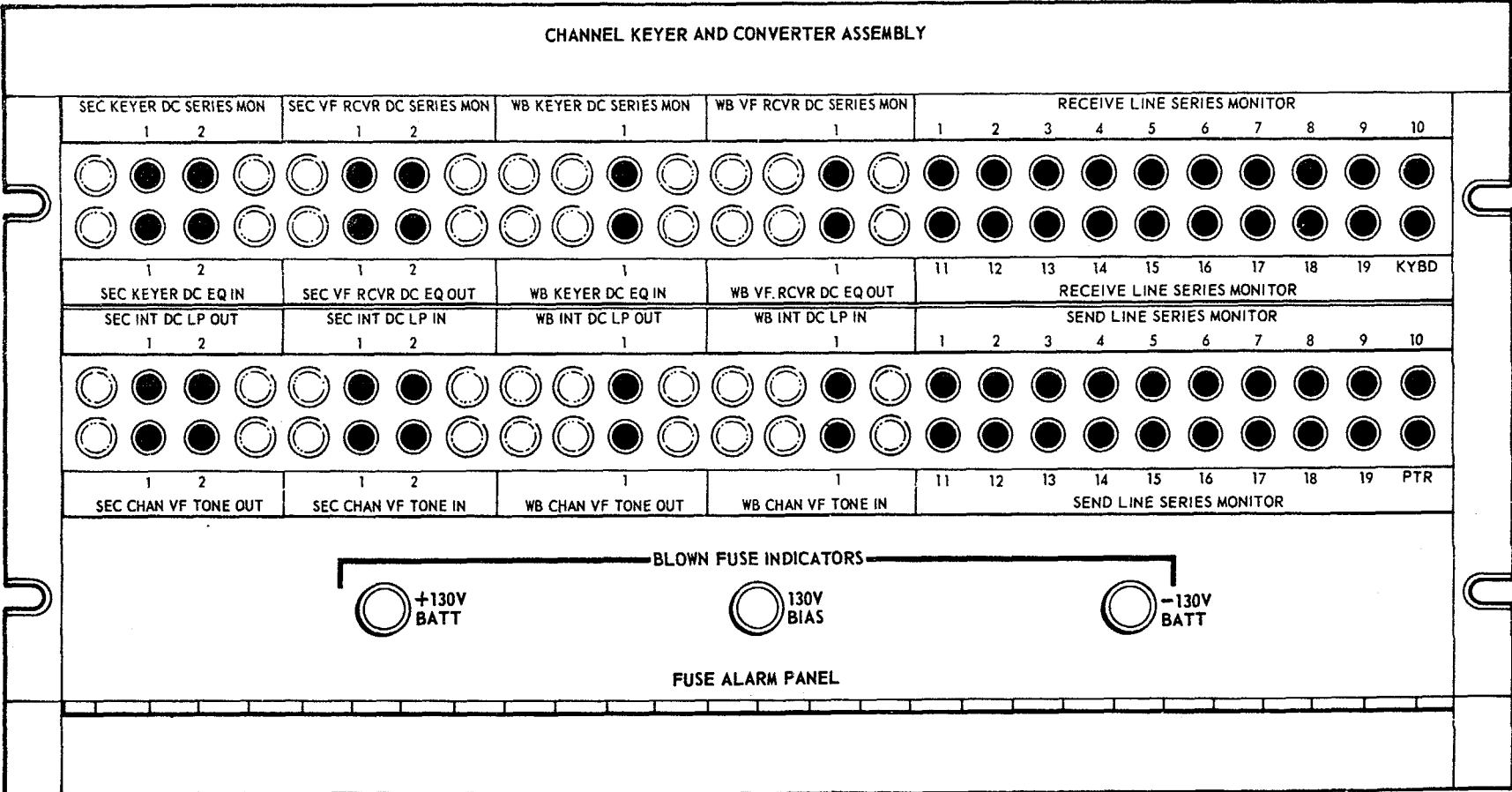
3-38. Terminals, Telegraph TH67/TSC-38B, TH68/TSC-38B, TH69/TSC-38B, and TH-70/TSC-38B Controls, Indicators and Jacks
(figs. 3-37, 3-38, 3-39, and 3-40)

The jackfields of the VFTG units No. 1 through No. 4 (TH-67/TSC-8B, TH-68/TSC-38B TH-69/TSC-38B, and TH-70/TSC38B) make it possible to monitor the operation of the three VFTG terminals (16-channel, two-channel, and wideband), to gain circuit access for test purposes, and to alter circuit connections in order to reroute teletypewriter subscriber communications channels within the AN/TSC-38B equipment.

Jack, control, or indicator

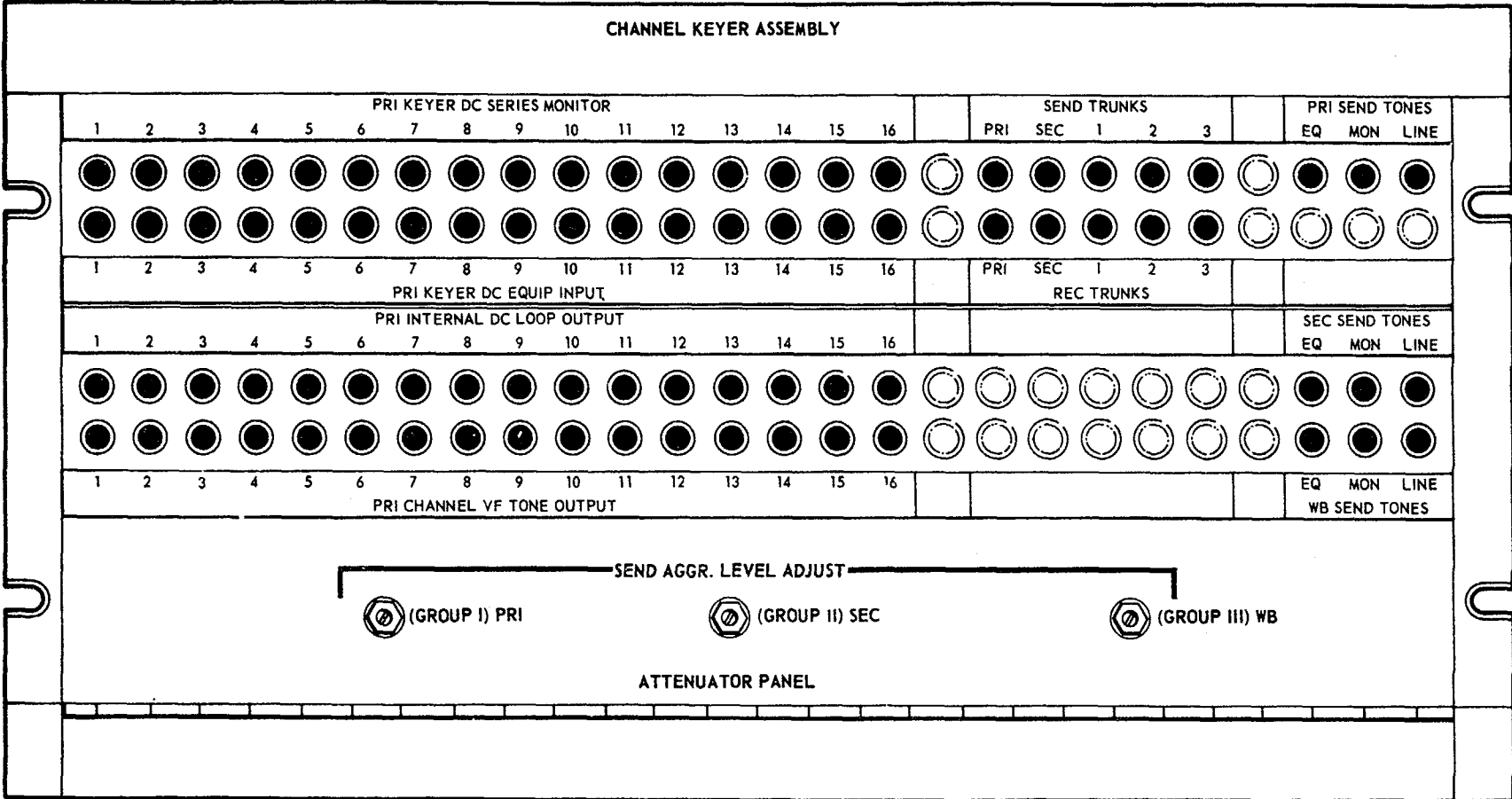
Function

SEC KEYER DC SERIES MON 1 and 2.	Permit series monitoring of input circuits (dc) of two-channel VFTG tone keyers.
SEC VF RCVR DC SERIES MON 1 and 2.	Permit series monitoring of output circuits (dc) of two-channel VFTG tone receivers.
WB KEYER DC SERIES MON 1.	Permits series monitoring of input circuit (dc) of wideband VFTG tone keyer.
WB VF RCVR DC SERIES MON 1.	Permits series monitoring of output circuit (dc) of wide-band VFTG tone receiver.
SEC KEYER DC EQ IN 1 and 2 jacks.	Permit access to input circuits (dc) of two-channel VFTG tone keyers; permit patching these circuits to any desired teletypewriter subscriber send line. When plug is inserted, the normalled through connection is broken.
SEC VF RCVR DC EQ OUT 1 and 2 jacks.	Permit access to output circuits (dc) of two-channel VFTG tone receivers; permit patching these circuits to any desired teletypewriter subscriber receive line.
WB KEYER DC EQ IN 1 jack	Permits access to input circuit (dc) of wide-band VFTG tone keyer; permits patching the tone keyer input circuit to any desired teletypewriter subscriber send line.
WB VF RCVR DC EQ OUT 1 jack.	Permits access to output circuit (dc) of wide-band VFTG tone receiver; permits patching the tone receiver output circuit to any desired teletypewriter subscriber receive line.
SEC INT DC LP OUT 1 and 2 jacks.	Permit access to output circuits (send lines) of internal dc loops of teletypewriter subscribers 17 and 18; permit patching these circuits to any desired VFTG terminal send channel.



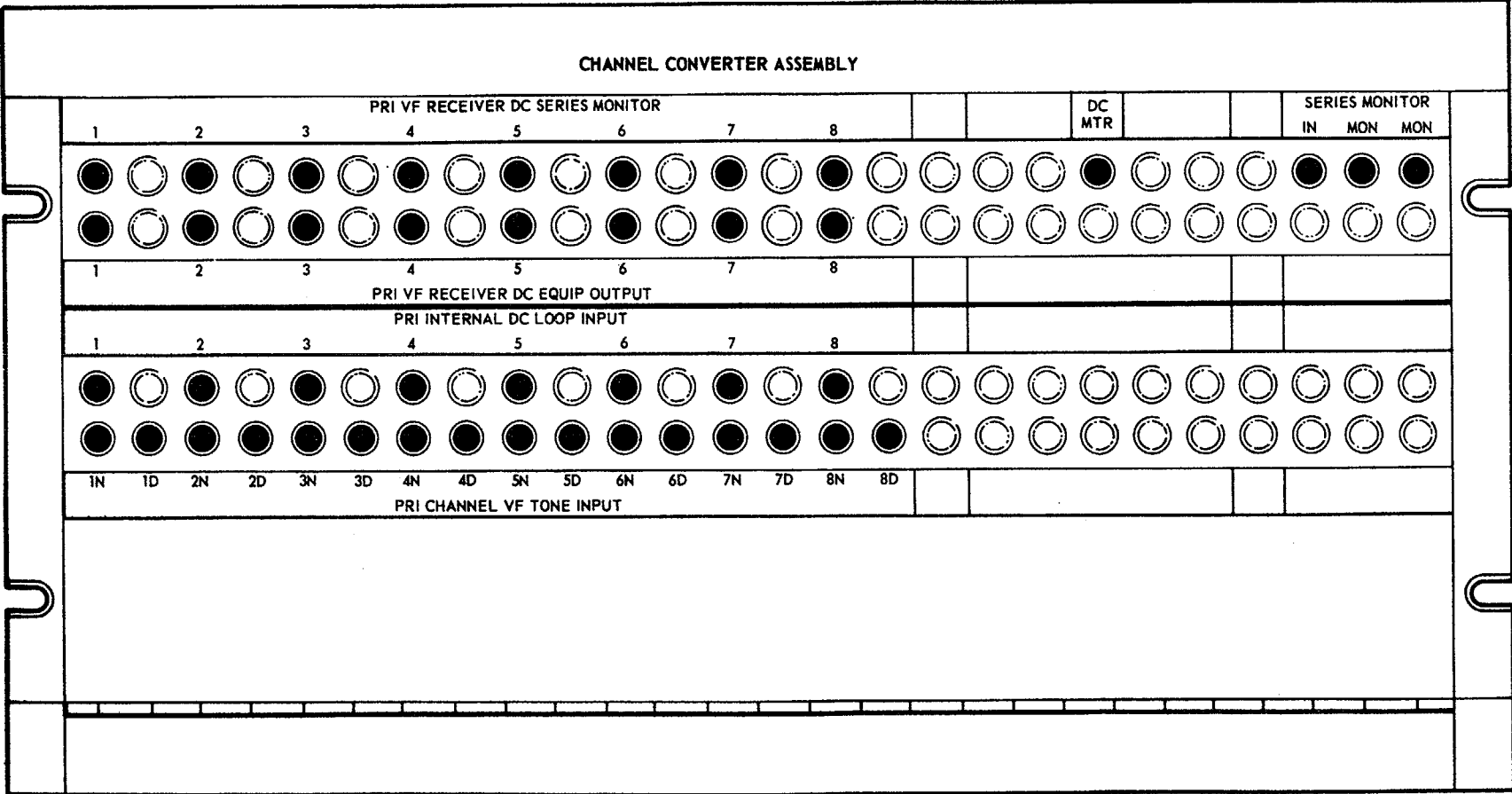
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Figure 3-37. Terminal, Telegraph TH-67/TSC-38B, jacks and indicators.



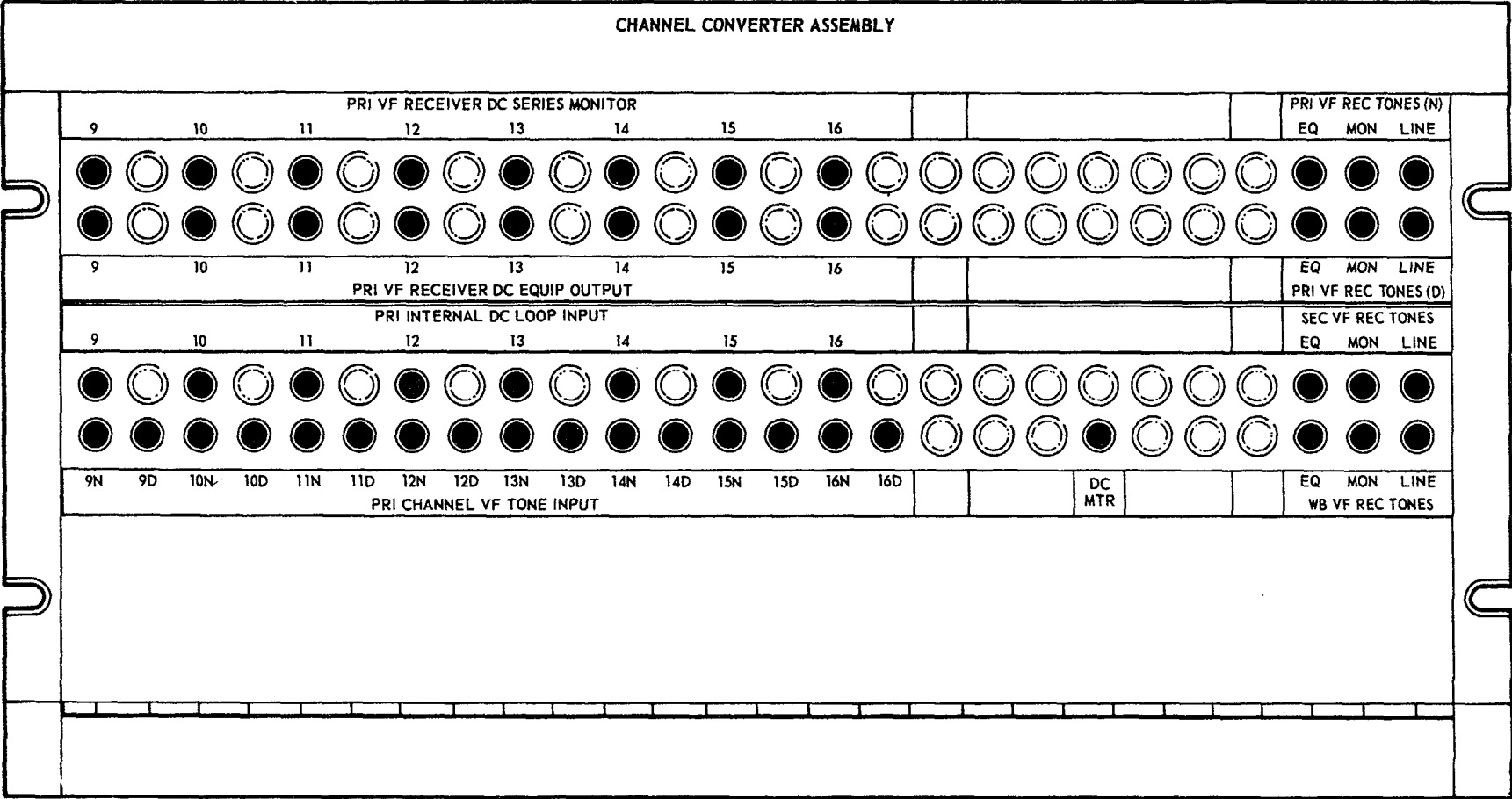
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Figure 3-38. Terminal, Telegraph TH-68/TSC-38B, jacks and controls.



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Figure 3-39. Terminal, Telegraph TH-69/TSC-38B, jacks.



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Figure 3-40. Terminal, Telegraph TH-70/TSC-38B, jacks.

<i>Jack, control, or indicator</i>	<i>Function</i>
SEC INT DC LP IN 1 and 2 jacks.	Permit access to input circuits (receive lines) of internal dc loops of teletypewriter subscribers 17 and 18; permit patching these circuits to any desired VFTG terminal receive channel.
WB INT DC LP OUT 1 jack.	Permits access to output circuit (send line) of internal dc loop of teletypewriter subscriber 19; permits patching this circuit to any desired VFTG terminal receive channel.
WB INT DC LP IN 1 jack.	Permits access to input circuit (receive line) of internal de loop of teletypewriter subscriber 19; permits patching this circuit to any desired VFTG terminal receive channel.
SEC CHAN VF TONE OUT 1 2 jacks.	Permit access to output and signals of two-channel VFTG tone keys; permit patching these circuits to any desired VFTG aggregate send channel (SEND TONES LINE).
SEC CHAN VF TONE IN 1 and 2 jacks.	Permit access to input circuits of two-channel VFTG tone receivers.
WB CHAN VF TONE OUT 1 jack.	Permits access to output signal of wide-band VFTG tone keyer; permits patching this circuit to any desired VFTG aggregate send channel (SEND TONES LINE).
WB CHAN VF TONE IN 1 jack.	Permits access to input circuit of wideband VFTG tone receiver.
RECEIVE LINE SERIES MONITOR 1 through 19 jacks.	Permit series monitoring of teletypewriter subscriber send circuits at circuit point between teletype signal entry panel and telegraph line control.
RECEIVE LINE SERIES MONITOR KYBD jack.	Provides connection point to permit series-patching of the operator rack teletypewriter keyboard.
SEND LINE SERIES MONITOR 1 through 19 jacks.	Permit series monitoring of teletypewriter subscriber receive circuits at circuit point between the telegraph line control and the teletype signal entry panel.
SEND LINE SERIES MONITOR- PTR jack.	Provides connection point to permit series patching of the operator rack teletypewriter printer.
BLOWN FUSE INDICATORS:+ 130 V BATT lamp (red).	Lights to indicate that one or more fuses have blown in +130-volt section of internal fuse panel. Access to fuses is gained by opening hinged front panel of VFTG No. 1.
130 V BIAS lamp (red)	Lights to indicate that one or more fuses have blown in relay bias section of internal fuse panel. Access to fuses is gained by opening hinged front panel of VFTG No. 2.
-130 V BATT lamp (red).	Lights to indicate that one or more fuses have blown in -130-volt section of internal fuse panel. Access to fuses is gained by opening hinged front panel of VFTG No. 1.
PRI KEYER DC SERIES MONITOR through 16 jacks.	Permit series monitoring of input circuits (dc) of

Jack, control, or indicator

Function

16-channel VFTG tone keyers; permit patching these circuits to any desired teletypewriter subscriber send line. When plug is inserted, the normalled through connection is broken.

PRI INTERNAL DC LOOP OUTPUT 1 through 16 jacks. Permit access to output circuits (send lines) of internal dc loop of teletypewriter subscribers 1 through 16; permit patching these circuits to any desired VFTG terminal send channel. When plug is inserted, the normalled-through connection is broken.

PRI CHANNEL VF TONE OUTPUT 1 through 16 jacks. Permits access to output signals of 16-channel VFTG tone keyers; permit patching these circuits to any desired VFTG aggregate send channel (SEND TONES LINE). When plug is inserted, the normalled-through connection is broken.

SEND TRUNKS:

PRI jack ----- Provides connection point to permit patching of crypto primary send circuit into any desired teletypewriter send circuit.

SEC jack ----- Provides connection point to permit patching of crypto secondary send circuit into any desired teletypewriter send circuit.

1, 2, and 3 jacks ----- Provide connection points to permit patching of circuits from NON SECURE SEND TRUNKS jacks on the secure teletype patch panel into any desired teletypewriter send circuits.:

REC TRUNKS

PRI jack----- Provides connection point to permit patching of crypto primary receive circuit into any desired teletypewriter receive circuit.

SEC jack ----- Provides connection point to permit patching of crypto secondary receive circuit into any de- sired teletypewriter receive circuit.

1, 2, and 3 jacks ----- Provide connection points to permit patching of circuits from NON SECURE RECEIVE TRUNKS jacks on the secure teletype patch panel into any desired teletypewriter receive circuit.

PRI SEND TONES EQ jack. Permits access to aggregate output signal of 16-channel VFTG tone keyers.

PRI SEND TONES MON jack. Permits series monitoring of aggregate send circuit of 16-channel VFTG terminal.

PRI SEND TONES LINE jack. Permits access to input circuit of primary radio transmitter channel as selected at 10 KW XMTR module in the telephone control panel.

SEC SEND TONES EQ jack. Permits access to aggregate output signal of two-channel VFTG

Jack, control, or indicator

Function

	tone keyers. When plug is inserted, the normalled-through connection is broken.
SEC SEND TONES MON jack.	Permits series monitoring of aggregate send circuit of two-channel VFTG terminal.
SEC SEND TONES LINE jack.	Permits access to input circuit of secondary radio transmitter channel as selected at 1 KW XMTR module in the telephone control panel.
WB SEND TONES EQ jack.	Permits access to output signal of wideband VFTG tone keyer.
WB SEND TONES MON jack.	Permits series monitoring of aggregate send circuit of wide-band VFTG terminal.
WB SEND TONES LINE jack.	Permits access to input circuit of primary or secondary radio transmitter channel as selected by WB switches of 10 KW XMTR or 1 KW XMTR module in the telephone control panel.
SEND AGGR. LEVEL ADJUST ATTENUATOR PANEL (GROUP I) PRI, (GROUP II) SEC, and (GROUP III) WB, screwdriver-adjustable potentiometers (three).	Permit audio tone level adjustment of, respectively, the 16-channel, two-channel, and wide-band VFTG terminal aggregate send circuits.
PRI VF RECEIVER DC SERIES MONITOR 1 through 8 jacks.	Permit series monitoring of receive channels 1 through 8 of the 16-channel VFTG terminal at the output (dc) of the VFTG tone receiver units.
PRI VF RECEIVER DC EQUIP OUTPUT 1 through 8 jacks.	Permit access to tone receiver output circuits (dc) of channels 1 through 8 of the 16-channel VFTG terminal; permit patching these circuits to any desired teletypewriter subscriber receive line.
PRI INTERNAL DC LOOP INPUT 1 through 8 jacks.	Permit access to input circuits (receive lines) of internal dc loops of teletypewriter subscribers 1 through 8; permit patching these circuits to any desired VFTG terminal receive channel.
PRI CHANNEL VF TONE INPUT 1N through 8N and 1D through 8D jacks.	Permit access to input circuits of individual tone receivers 1N through 8N and 1D through 8D.
DC MTR jack.....	Permits patching of selected circuit to REMOTE position of METERING switch on the VFTG channel control for current level measurement. Jack is disabled if a plug is inserted into the DC MTR jack on VFTG No. 4.
SERIES MONITOR 1N jack.	Permits patching of selected dc circuits on VFTG No. 1 and No. 2 to both SERIES MONITOR MON jacks on VFTG No. 3.
SERIES MONITOR MON jacks (adjacent to SERIES MONITOR 1N jack).	Permits series monitoring of the selected dc circuit if patched into the SERIES MONITOR IN jack.
PRI VF RECEIVER DC SERIES MONITOR 9 through 16 jacks.	Permit series monitoring of receive channels 9 through 16 of the 16-channel VFTG terminal at the output of the VFTG tone receiver units.

<i>Jack, control or indicator</i>	<i>Function</i>
PRI VF RECEIVER DC EQUIP OUTPUT 9 through 16 jacks.	Permit access to output circuits (dc) of channels 9 through 16 of the 16-channel VFTG terminal; permit patching these circuits to any desired teletype subscriber receive line.
PRI VF INTERNAL DC LOOP INPUT 9 through 16 jacks.	Permit access of input circuits (receive lines) of internal dc loops of teletypewriter subscribers 9 through 16; permit patching these circuits to any desired VFTG terminal receive channel.
PRI CHANNEL VF TONE INPUT 9N through 16N and 9D through 16D jacks.	Permit access to input circuit of individual tone receivers 9N through 16N and 9D through 16D.
DC MTR jack-----	Permits patching of selected circuit to REMOTE position of METERING switch on the VFTG channel control for current level measurement. Insertion of plug into this jack disables DC MTR jack on VFTG No. 3.
PRI VF REC TONES (N) EQ jack.	Permits access to normal (N) input circuits (see note above) of the 16-channel VFTG tone receivers.
PRI VF REC TONES (N) MON jack.	Permits series monitoring of normal (N) aggregate receive circuits of 16-channel VFTG terminal.
PRI VF REC TONES (N) LINE jack.	Permits access to signal from primary radio receiver No. 1 channel as selected at 10 KW RCVR module on the telephone control panel.
PRI VF REC TONES (D) EQ jack.	Permits access to diversity (D) input circuits (see note above) of 16-channel VFTG tone receivers.
PRI VF REC TONES (D) MON jack.	Permits series monitoring of diversity (D) aggregate receive circuit of 16-channel VFTG terminal.
PRI VF REC TONES (D) LINE jack.	Permits access to signal from receiver (primary No. 2) channel as selected by patching on the audio patch panel between VFTG DIV. INPUT REC jack and appropriate radio channel jack under PRIMARY REC 2 NONDIVERSITY.
SEC VF REC TONES EQ jack.	Permits access to input circuits of the two-channel VFTG tone receivers.
SEC VF REC TONES MON jack	Permits series monitoring of aggregate receive circuit of two-channel VFTG terminal.
SEC VF REC TONES LINE jack.	Permits access to signal from secondary radio receiver channel as selected at 1 KW RCVR module on the telephone control panel.
WB VF REC TONES EQ jack.	Permits access to input circuit of the wide-band VFTG tone receiver.
WB VF REC TONES MON jack.	Permits series monitoring of aggregate receive circuit of wideband VFTG terminal.
WB VF REC TONES LINE jack.	Permits access to signal from primary or secondary radio receiver channel as selected at 10 KW RCVR

Jack, control or indicator

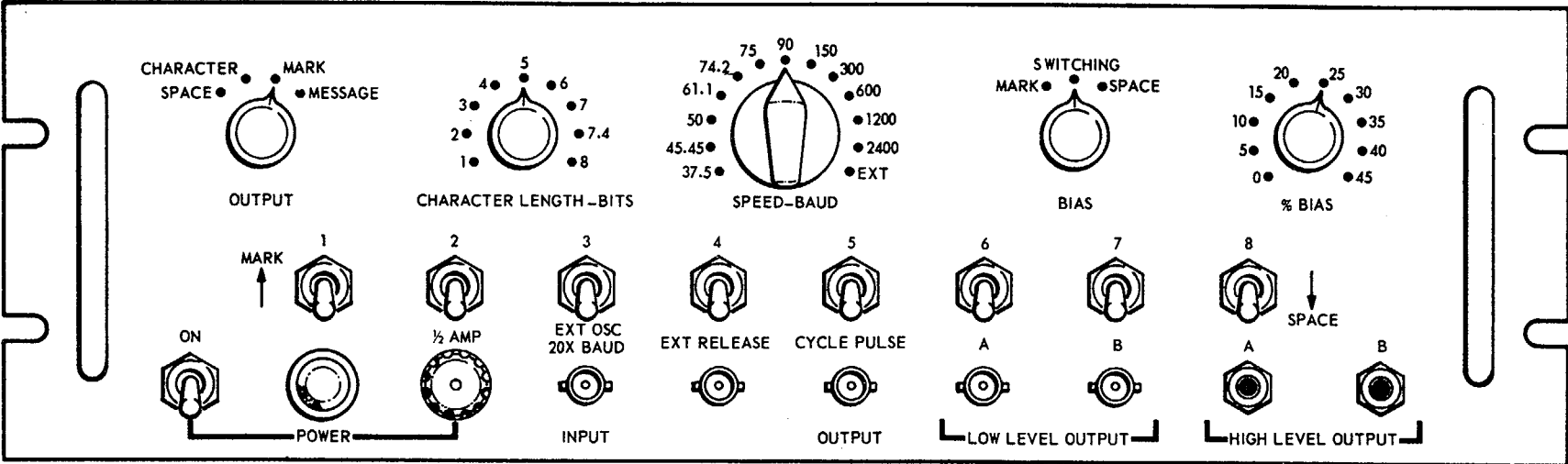
Function

or 1 KW RCVR module on the telephone control panel.

3-39. Keyer KY-590/TSC-38C Controls and Indicators
(fig. 3-41)

The fox generator (KY-590/TSC38B) provides a test signal or test message output for use in the dc circuits of the nonsecure data subsystem during system lineup, circuit testing, or other test functions associated with system operation. It may also be used as a test equipment item for VFTG subsystem maintenance.

<i>Control, indicator, or connector</i>	<i>Function</i>
OUTPUT switch (four-position rotary switch):	
SPACE -----	Enables transmission of a continuous output of spacing signals.
CHARACTER -----	Enables transmission of a continuous output derived from the MARK/SPACE toggle switch settings.
MARK -----	Enables transmission of a continuous output of marking signals.
MESSAGE -----	Enables transmission of a continuous fox message.
CHARACTER LENGTH-BITS switch (eight-position rotary switch):	
1 through 8 -----	Setting determines character length or bit length which is continuously transmitted.
SPEED-BAUD switch (13-position rotary switch):	
37.5 through EKT.	Setting determines transmitted baud length. This feature is normally used for maintenance or for highspeed data circuit lineup.
BIAS switch (three-position rotary switch):	
MARK -----	Enables a continuously marking bias of the percentage set by the BIAS control.
SWITCHING -----	Enables a continuously switching bias from mark to space of the percentage set by the BIAS control.
SPACE -----	Enables a continuously spacing bias of the percentage set by the bias control.
% BIAS switch (ten-position rotary switch):	
0 through 45 -----	Switch setting determines percent of bias continuously introduced into the output signal.
MARK-SPACE switches (two-position toggle switches):	Operate in conjunction with CHARACTER LENGTH-BITS switch.
MARK-SPACE 1.	Baudot start pulse
MARK-SPACE 2.	Baudot No. 1 pulse
MARK-SPACE 3.	Baudot No. 2 pulse
MARK-SPACE 4.	Baudot No. 3 pulse
MARK-SPACE 5.	Baudot No. 4 pulse
MARK-SPACE 6.	Baudot No. 5 pulse
MARK-SPACE 7.	Baudot stop pulse
MARK-SPACE 8.	Baudot stop pulse
POWER:	
On switch -----	Applies primary input power.
Indicator lamp -----	Lamp lights when primary power is applied.



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Figure 3-41. Keyer KY-590/TSC-38B, controls and indicators.

Control, indicator, or connector

Function

1/2 AMP fuse	Protection for primary input power circuit.
EXT OSC 20X BAUD INPUT connector.	Used for application of 50-kc square wave input from an external source.
EXT RELEASE connector	Provides connection point for external control to govern timing of character generation.
CYCLE PULSE OUTPUT connector.	Used for measurement of cycle pulse.
LOW LEVEL OUTPUT A and B connectors.	Used to provide polar 10.5 volts for high-speed keying output.
HIGH LEVEL OUTPUT A and B jacks.	Relay contact output for neutral or polar. (External battery and current limiting must be provided.) Outputs disabled at 300 to 2400 baud positions of SPEED-BAUD switch.

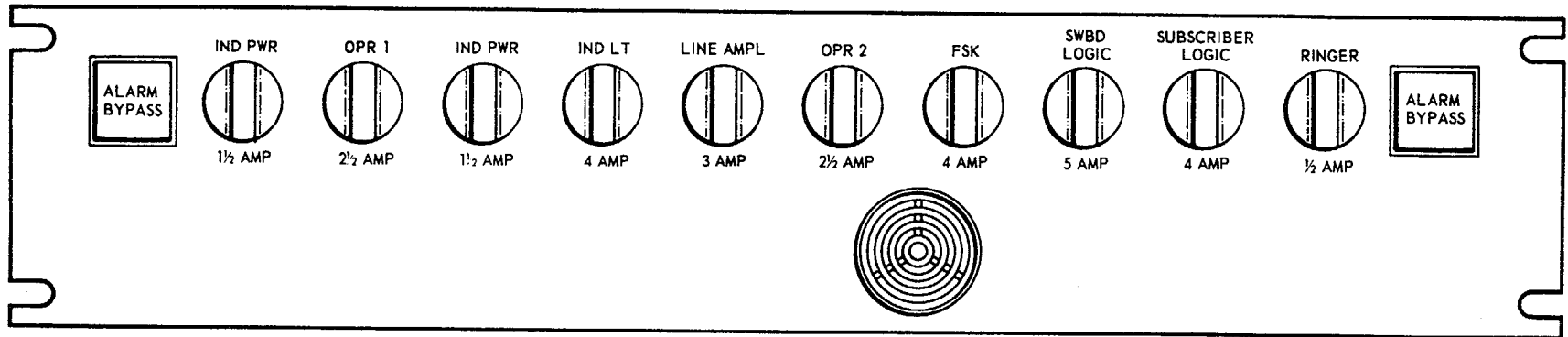
3-40. Panel, Protection-Power Distribution SB-2947/TSC-38B Controls and Indicators
(fig. 3-42)

The control-monitor fuse panel (SB-2047/TSC-38B) provides fuse-protected dc power distribution to several of the operating equipments mounted in the operator rack. A blown-fuse audible alarm and alarm bypass switches are also provided.

Control or indicator

Function

ALARM BYPASS switches (right and left sides of panel).	Used to silence audible blown-fuse alarm when any of the ten fuses open; switches light when alarm is bypassed. Both switches must be pressed (lighted) to the bypass condition to silence the blown-fuse alarm on this panel.
IND PWR (left) indicating fuse holder.	Provides 28 vdc input power protection for the secondary frequency select panel and the secondary mode and status panel; lamp lights to indicate blown fuse.
OPR 1 indicating fuse holder.	Provides 28 vdc input power protection for radio line control; lamp lights to indicate blown fuse.
IND PWR (right) indicating fuse holder.	Provides 28 vdc input power protection for the primary frequency select panel and the primary mode and status panel; lamp lights to indicate blown fuse.
IND LT indicating fuse holder.	Provides 28 vdc input power protection for the status lights on both the primary and secondary frequency select panels and both the primary and secondary mode and status panels; lamp lights to indicate blown fuse.
LINE AMPL indicating fuse holder	Provides 28 vdc input power protection for line amplifier No. 1 and line amplifier No. 2; lamp lights to indicate blown fuse.
OPR 2 indicating fuse holder.	Provides 28 vdc input power protection for the telephone control panel; lamp lights to indicate blown fuse.
FSK indicating fuse holder.	Provides 28 vdc input power protection for the keyer-detector and the AF detector; lamp lights to indicate blown fuse.
SWBD LOGIC indicating fuse holder.	Provides 28 vdc input power protection for link logic unit; lamp



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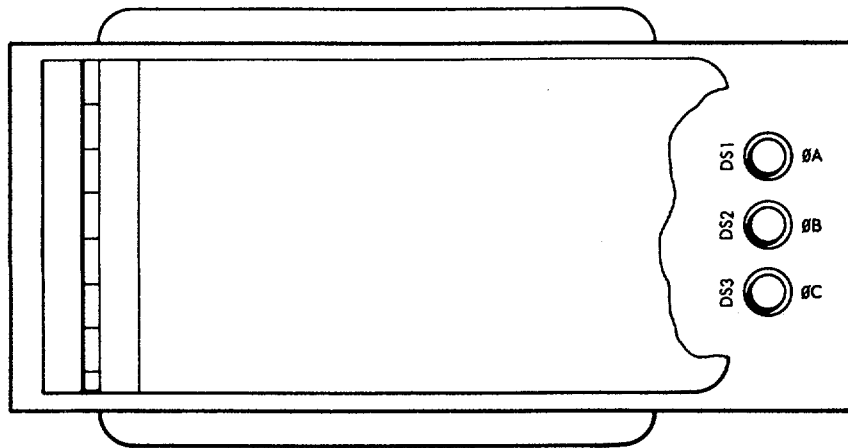
Figure 3-42. Panel, Protection-Power Distribution SB-2947/TSC-38B, controls and indicators.

<i>Control or indicator</i>	<i>Function</i>
SUBSCRIBER LOGIC indicating fuse holder.	lights to indicate blown fuse. Provides 28 vdc input power protection for subscriber logic units 1, 2, and 3; lamp lights to indicate blown fuse.
RINGER indicating fuse holder.	Provides 28 vdc input power protection for the ringing generator; lamp lights to indicate blown fuse

3-41. Fuse Box Assembly Indicators
(fig. 3-43)

The fuse box assembly provides overload protection for the frequency changer.

<i>Indicator</i>	<i>Function</i>
ØA lamp indicator	When extinguished, indicates that ØA ac input power to the frequency changer is not available.
ØB lamp indicator	When extinguished, indicates that ØB ac input power to the frequency changer is not available.
ØC lamp indicator	When extinguished, indicates that ØC ac input power to the frequency changer is not available.



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Figure 3-43. Fuse box assembly indicators.

Section II. SYSTEM OPERATION

3-42. Types of Operation

a. Communications Central AN/TSC-38B is capable of several types of operation. To perform any of the operating functions, refer to the following procedures:

- (1) Turn-on procedures for shelter lighting and air conditioner (para 3-43).
- (2) Preliminary control settings (para 3-44).
- (3) Starting procedures (para 3-45).
- (4) Telephone subsystem preoperational checks and adjustment (para 3-46).
- (5) Nonsecure data subsystem preoperational checks and adjustments (para 3-47).
- (6) Secure data subsystem preoperational checks and adjustment (para 3-48).
- (7) Primary radio terminal preoperational checks and adjustments (para 3-49).
- (8) Secondary radio terminal preoperational checks and adjustments (para 3-50).

- (9) Remote control preoperational checks and adjustments (para 3-51).
- (10) Telephone subsystem operation (para 3-52).
- (11) Nonsecure subsystem operation (para 3-53).
- (12) Secure data subsystem operation (para 3-54).
- (13) Primary radio terminal operation (para 3-55).
- (14) Secondary radio terminal operation (para 3-56).
- (15) Remote control operation (para 3-57).
- (16) Stopping procedure (para 3-58).

b. The turn-out procedure for the shelter lighting and air conditioner is to be performed prior to any other type of operation. It is assumed that the equipment has been properly installed and checked in accordance with chapter 2.

3-43. Turn-On Procedures for Shelter Lighting and Air-Conditioner Operation

The procedures for illuminating the shelter lights and operating the air conditioner are given in *a* and *b* below and should be performed sequentially.

a. *Shelter Lighting.* The shelter lighting turn-on procedure is to be performed with the equipment shelter door open.

(1) On the main ac power panel (1A1), place both MAIN DISCONNECT circuit breakers to the down (off) position.

NOTE

ALARM BYPASS on the emergency power panel (1A2), and ALARM BYPASS on the fire warning panel (1A6) may be lit. If these indicators are lit, press each one until it goes out.

(2) Start the engine generator GTGE 70-9-2 following the instructions furnished in TM 5-6115-339-12.

NOTE

If a power source other than the generator set is to be used, refer to the appropriate instructions to insure that power is properly applied.

(3) On the main ac power panel (1A1) observe that the GENERATOR NO. 1 PHASE SEQUENCE ABC and LINE FREQUENCY 400CPS indicators are lit.

NOTE

ALARM BYPASS (generator No. 1) on the main ac power panel (1A1), and BLACK OUT BYPASS on the normal power panel (1A3) may be lit. If these indicators are lit, press each one until it goes out.

(4) On the main ac power panel (1A1), turn the LINE VOLTAGE LINE SELECTOR switch through the GEN NO. 1ØA, ØB, and ØC positions, observing the LINE VOLTAGE meter for a 120 vac indication on each phase. Reset the LINE VOLTAGE LINE SELECTOR switch to ØA.

(5) Set the TECHNICAL BUS SELECTOR switch to GEN NO. 1.

(6) Place the GENERATOR NO. 1 MAIN DISCONNECT circuit breaker to the ON position.

NOTE

Noise from equipment blower motors and teletypewriters may be heard and certain equipment indicators may light. The number of blower motors operating and equipment indicators lit may vary with respect to prior switch settings. No action is required at this time to silence the blower motors, or to extinguish the indicators. If the air conditioner is heard operating, set the INPUT circuit breaker on the frequency changer (unit 4) to the down (off) position.

(7) Set the light switch (located to the left of the main ac power panel (1A1)) to the down (off) position.

(8) On the normal power panel (1A3), place the LIGHTS circuit breaker to the up position and press the BLACKOUT BYPASS pushbutton. The pushbutton should light.

NOTE

Depending upon previous equipment switch settings, the emergency lights may light.

(9) Set the light switch (located to the left of the main ac power panel (1A1)) to the up (on) position; the normal shelter lights should light.

NOTE

The equipment shelter door may be now

closed and the equipment shelter interior lights will remain illuminated.

b. Air-Conditioner Operation.

- (1) At the air-conditioner panel (unit 3), place the COMPRESSOR circuit breaker and CONTROL CIRCUIT breaker to the up (on) position.
- (2) The SELECTOR SWITCH allows the operator to select a HEATING, COOLING, or VENTILATING (environmental air circulation) mode of operation. The selected mode should be determined by the shelter environmental temperature. Temporarily set the SELECTOR SWITCH to OFF.
- (3) On the main ac power panel (1A1), set the NONTECHNICAL BUS SELECTOR switch to GEN NO. 1.
- (4) On the main ac power panel (1A1), place the FREQUENCY CHANGER circuit breaker to the up (on) position.
- (5) On the frequency changer (unit 4) using a quick positive motion, place the INPUT circuit breaker to the up (on) position. The POWER ON indicator on the air conditioner should light.

NOTE

The INPUT circuit breaker must make contact with all three phases simultaneously; otherwise, damage to the equipment may occur.

- (6) If the VENTILATING position is selected, the blower motor in the air conditioner should operate after approximately 8 seconds.
- (7) If the COOLING position is selected, the compressor should be heard after approximately 5 seconds and the COMPRESSOR READY indicator should light.
- (8) If the HEATING position is selected, the air-conditioner blower motor should be heard after approximately 8 seconds.

3-44. Preliminary Control Settings

Set the following equipment controls, switches, and circuit breakers to the preliminary positions indicated:

<i>Location</i>	<i>Switch or circuit breaker</i>	<i>Position</i>
Main ac power panel (1A1) -----	GENERATOR NO. 2 MAIN DISCONNECT circuit breaker	down (off)
	LINE CURRENT SELECTOR switch -----	down (off)
Emergency power panel (1A2) ----- Normal power panel (1A3) -----	SEC LIN PA circuit breaker -----	down (off)
	PRI LIN PWR AMP circuit breaker -----	down (off)
	DC PWR SUP circuit breaker -----	down (off)
	EXT OUT circuit breaker -----	down (off)
	PRI EXC circuit breaker -----	down (off)
	PRI VFTG circuit breaker -----	down (off)
	FOX GEN circuit breaker -----	down (off)
	RPI RCVR NO. 1 circuit breaker -----	down (off)
	PRI RCVR NO. 2 circuit breaker -----	down (off)
	UTILITY OUTLETS circuit breakers (three) -----	down (off)
Power supply-battery charger (1A4).	INPUT AC circuit breaker -----	down (off)
	BATTERY circuit breaker -----	Non functional
10-kw P.A. (unit 2)-----	SERVO MULTIMETER switch -----	+28 VDC
	AMPLIFIER MULTIMETER switch -----	INPUT RF 40V
	FORWARD/REFLECTED switch -----	FORWARD
	LOCAL/REMOTE switch -----	REMOTE
	MAIN POWER circuit breaker -----	down (off)
	MANUAL/AUTOMATIC switch -----	AUTOMATIC
	Meter selector switch -----	OFF
Reperforator-transmitter (5A3)-----	MOTOR ON/OFF switch -----	OFF
	LIGHT ON/OFF switch -----	OFF
	POWER ON/OFF switch -----	OFF
Transmitter-distributor (5A4)-----	POWER ON/OFF switch -----	OFF
Reperforator (5A5)-----	POWER ON/OFF switch -----	OFF
Teletypewriter set (5A6)-----	MOTOR ON/OFF switch -----	OFF
	LIGHT ON/OFF switch -----	OFF
Remote control (6A2)-----	PWR ON/OFF switch (CHAN 1 through CHAN 10) -----	ON
	PWR ON/OFF switch (NORM CHAN 1 and NORM CHAN 3).	ON
	POWER ON/OFF switch -----	OFF
Receiver (6A3)-----	POWER ON/OFF switch -----	OFF

Location	Switch or circuit breaker	Position
Receiver (6A4) -----	POWER ON/OFF switch -----	OFF
Receiver (6A5) -----	POWER ON/OFF switch -----	OFF
Antenna coupler control (6A7)--	POWER ON/OFF switch -----	OFF
	OVERLOAD ALARM/OFF switch -----	OFF
	BYPASS ON/NORMAL switch -----	NORMAL
	MANUAL/SILENT/AUTO switch -----	AUTO
	L/C switch -----	L
	1-kw P.A. (6A8) -----	PRIMARY POWER ON/OFF switch -----
Band selector switch (under the FREQUENCY MEGACYCLES indicator).		AUTOMATIC
Forward power/reflected power meter switch --		FWD PWR 0-1500
Multimeter switch -----		INPUT PWR 0-150 MW.
Transmitter (6A9) -----	DISABLE/ALARM switch .-----	midposition
	POWER ON/OFF switch -----	OFF
	CARRIER ADJUST switch -----	REMOTE
Transmitter (6A11) -----	POWER ON/OFF switch -----	OFF
Amplifier-decoder-power distribu- (6A12).	CARRIER ADJUST switch -----	REMOTE
	RAD RMTE circuit breaker -----	down (off)tion assembly
	AUTO SWBD circuit breaker -----	down (off)
	OPR CSL circuit breaker -----	down (off)
	OUTPUT DC circuit breaker -----	up (on)
Power inverter (6A13) -----	OUTPUT 11 circuit breaker -----	down (off)
	OUTPUT 30 circuit breaker -----	down (off)
	INPUT DC circuit breaker -----	up (on)
Secondary mode and status panel (7A5).	RF PWR SEL switch -----	FWD
	NORMAL LEVEL AUDIO SEL switch -----	B2
	NORMAL LEVEL SEL switch -----	OFF
	RCVR RF GAIN control -----	clockwise
	RCVR CARR SENS switch .-----	1
	XMTR PLT CARR switch -----	OFF
	KEY LINE switch -----	OFF
	DSA OFF indicator pushbutton -----	depressed
	LINE INTERCEPT (LINE 1 through LINE 12) NORM indicator pushbutton. depressed	
	10 KW XMTR OFF indicator pushbutton -----	depressed
10 KW RCVR OFF indicator pushbutton -----	depressed	
1 KW XMTR OFF indicator pushbutton -----	depressed	
1 KW RCVR OFF indicator pushbutton -----	depressed	
VFTG power supply No. 1 (7A7)	PSI ON through PS5 ON switch -----	off
Primary mode and status panel (7A12).	RF PWR SEL switch -----	FWD
	NORMAL LEVEL AUDIO SEL switch -----	B2
Radio line control (7A1S) -----	NORMAL LEVEL SEL switch -----	OFF
	RF GAIN RCVR 1 control -----	clockwise
	RF GAIN RCVR 2 control .-----	clockwise
	RCVR CARR SENS switch -----	1
	XMTR PLT CARR switch -----	OFF
	KEY LINE switch -----	OFF
	.SECONDARY RADIO A2, A1, B1, B2 NORM indicator pushbuttons.	depressed
	PRIMARY RADIO A2, A1, B1, B2 NORM indicator pushbuttons.	depressed
	METER SELECT switch -----	off
	RCVR SELECT switch -----	HDSET/SPKR
DIAL SELECT switch -----	SWBD.	
VFTG power supply No. 2 (7A14).	SPEAKER VOLUME control:	
	RADIO 1 -----	midposition
	RADIO 2 -----	midposition
	HEADSET VOLUME control -----	clockwise
	P1 O0 through PS6 ON switches -----	off

Location	Switch or circuit breaker	Position
VFTG channel control (7A18) .--	PRIMARY 16 CHANNEL VFTG CHANNEL 1-16 (ON 1 and ON 2) indicator pushbuttons.	released
	SECONDARY VFTG CHANNEL 1 and 2 (ON 1 and ON 2) pushbuttons.	released
	WIDEBAND VFTG CHANNEL 1 ON I indicator pushbutton.	released
	OPERATOR INTERCEPT ON/OFF indicator pushbutton.	released
Teletypewriter set (7A19) -----	METERING switch -----	FOX GEN
	MOTOR ON/OFF switch -----	OFF
	LIGHT ON/OFF switch -----	OFF
	OUTPUT switch -----	MARK
Fox generator (7A26) -----	CHARACTER LENGTHS-BITS switch -----	7.4
	SPEED-BAUD switch -----	74.2
	BIAS switch -----	SWITCHING
	% BIAS switch -----	0
	POWER ON switch -----	off
	MARK/SPACE 1 switch -----	SPACE
	MARK/SPACE 2 switch -----	MARK
	MARK/SPACE 3 through 8 switches -----	SPACE

3-45. Starting Procedures

a. *General.* Because of the extensive number of indicators on the various panels, Communications Central AN/TSC-8B must be energized in a methodical, step-by-step way, to insure that proper indications are obtained. The step-by-step procedures are given in b below.

b. *Equipment Turn-On.* Perform steps (1) through (27) below to apply operating power to the units in the equipment shelter (unit 10).

(1). On the normal power panel (1A3), place the following circuit breakers to the up position: DC PWR SUP, EXT OUT, PRI EXC, PRI VFTG, FOX GEN, PRI RCVR NO. 1, PRI RCVR NO. 2, PRI LIN PWR AMP, and 3 UTILITY OUTLETS.

CAUTION

In the following step, the power supply-battery charger and the inverter are activated simultaneously when the INPUT AC circuit breaker is placed to the up position. The INPUT AC lamp should light on the power supply-battery charger (1A4). The OUTPUT DC lamp and the DC lamp should light on the power inverter (6A13). If the above actions do not occur, place the INPUT AC circuit breaker to the down position immediately. Do not proceed any further until the trouble has been isolated.

(2) On the power supply-battery charger (1A4), place the INPUT AC circuit breaker to the up position. An audible sound should be heard from the power supply battery charger and the INPUT AC lamp should light. Simultaneously, on the power inverter (6A13) the DC lamp and the OUTPUT DC lamp should light. The power inverter operation should also be heard.

(3) On the amplifier-decoder-power distribution assembly (6A12), the NORM indicator should light, the BUS VOTAGE meter should indicate 29 vdc (nominal), and the BUS current meter should indicate 15 amp (nominal).

(4) Deleted.

(5) On the power inverter (6A13), place the OUTPUT 3 0 circuit breaker to the up position; the OUTPUT 3 0 indicator should light and equipment blowers should operate.

(6) On the amplifier-decoder-power distribution assembly (6A12), the CW/FSK, ALARM BYPASS, and EMER LIGHT TEST indicator pushbuttons may be lit. If so, push each indicator pushbutton to extinguish the lights.

(7) On the amplifier-decoder-power distribution assembly (6A12), place the RAD RMTE circuit breaker to the up position. Equipment re-lays may be heard energizing. If the ALARM BYPASS indicator pushbutton switch on the R/T fuse panel (6A15) lights, press the pushbutton to extinguish the light.

(8) On the amplifier-decoder-power distribution assembly (6A12), place the AUTO SWBD circuit breaker to the up position.

NOTE

If an audible alarm is heard, press the ALARM BYPASS indicator button on the right side of the control-monitor

fuze panel (7A34). This should turn off the alarm and the ALARM BYPASS indicator should light. The DSA OFF, 10 KW XMTR OFF, 10 KW RCVR OFF, 1 KW XMTR OFF, and 1 KW RCVR OFF indicators on the telephone control panel (7A6) are lit.

(9) Place the OUTPUT 1 0 circuit breaker to the up position; the OUTPUT 1 X; indicator should light. If the ALARM BYPASS indicator pushbutton on the secure ac power panel (SAI) lights, depress the pushbutton to extinguish the light.

(10) On the amplifier-decoder-power distribution assembly (6A12), place the OPR CSL circuit breaker to the up position. On the radio line control (7A13) the PRIMARY RADIO A2, A1, B1, B2 and SECONDARY RADIO A2, A1, B1, B2 NORM indicator pushbuttons should light. The ALARM BYPASS indicator pushbutton on the left of the control-monitor fuse panel (7A34) may light. Press the ALARM BYPASS indicator pushbutton to turn it off. On the VFTG channel control (7A18), the OPERATOR INTERCEPT ON/OFF indicator should light. If any of the indicator pushbuttons on the secondary frequency select panel (7A4) and the primary frequency select panel (7A11) should light, press the push- buttons to turn them off. Various status indicator lamps on the secondary mode and status panel (7A5) and the primary mode and status panel (7A12) may be illuminated depending on prior switch settings. Resetting these indicator lamps is not required at this time.

(11) On the secondary frequency select panel (7A4), press the LOCAL indicator pushbutton. The LOCAL, RCVR TUNE, and XMTR TUNE indicator pushbuttons should light.

(12) On the secondary mode and status panel (7A5), if any of the indicator pushbuttons under the DEVIATION meter should light, press the pushbuttons which are lit to turn them off except for the DEV XI or DEV X10 pushbuttons.

(13) Press the DEV XI indicator pushbutton; the DEV XI indicator pushbutton should light. The following STATUS RECEIVER indicators should be lit: PC 1, PWR ON, LOCAL GAIN, and READY.

(14) On the primary frequency select panel (7A11), press. the LOCAL indicator pushbutton. The LOCAL, RCVR TUNE, and XMTR TUNE indicator pushbuttons should light.

(15) On the primary mode and status panel (7A12), if any of the indicator pushbuttons under the DEVIATION meter should light, press the indicator pushbuttons which are lit to turn them off, except for the DEV X1 or DEV X10 indicator pushbuttons.

(16) Press the DEV X1 indicator pushbutton; the DEV X1 indicator pushbutton should light. The following STATUS RECEIVER indi- cators should be lit: PC 1, PWR ON, LOCAL GAIN and READY. (17) On the receiver (6A3), set the POWER ON/OFF switch to ON. The POWER indicator should light.

NOTE

On the primary mode and status panel (7A12), the STATUS RECEIVER READY indicator will temporarily go out and the SYS TUNING indicator should light. Within approximately 1,0 seconds, the STATUS RECEIVER READY indicator will again light and the SYS TUNING indicator will go out.

(18) On the receiver (6A4), set the POWER ON/OFF switch to ON. The POWER indicator should light.

(19) On the receiver (6A5), set the POWER ON/OFF switch to ON. The POWER indicator should light.

NOTE

On the secondary mode and status panel (7A5), the STATUS RECEIVER READY indicator will temporarily go out and the SYS TUNING indicator should light. Within approximately 10 seconds, the STATUS RECEIVER READY indicator will again light and the SYS TUNING indicator will go out.

(20) On the transmitter (6A9), set the POWER ON/OFF switch to ON. The POWER in- dicator should light.

NOTE

Soil- indicator lights on the primary mode and status panel (7A12) may light momentarily and then go out.

(21) On the transmitter (6A11), set the POWER ON/OFF switch to ON. The POWER indicator should light.

(22) On the emergency power panel (1A2), place the SEC LIN PA circuit breaker to the up position.

- (23) On the antenna coupler control (6A7), set the POWER switch to ON. The POWER indicator should light.
- (24) On the 1-kw P.A. (6A8), set the PRIMARY POWER switch to ON.
- (25) On the 10-kw P.A. (unit 2), place the MAIN POWER circuit breaker to the up position.
- (26) On the secondary mode and status panel (7A5), press the PWR ON indicator pushbutton located below the DEVIATION meter. The PWR ON indicator pushbutton and the STATUS TRANSMITTER PWR ON indicator, the PWR ON indicator on the 1-kw P.A. power supply (6A16), and the STANDBY indicator on the 1- kw P.A. (6A8) should be lit.
- (27) On the primary mode and status panel (7A12), press the PWR ON indicator pushbutton (under the DEVIATION meter). The PWR ON indicator pushbutton and the STATUS TRANSMITTER PWR ON indicator should be lit. In the 10-kw P.A. (unit 2), the blower motor should be heard and the FIL indicator should light.

3-46. Telephone Subsystem Preoperational Checks

a. *Operator-to-Subscriber Checks.* Perform steps (1) through (6) below to check the operator-to-subscriber connections.

(1) Check the telephone directory that was prepared in paragraph 2-23c to determine which of the telephone lines have been assigned and connected to telephone subscribers. (2) Open the doors on the three telephone terminals (7A1, 7A2, and 7A3) and compare the three switch settings in each of the line terminal hybrid printed circuit cards with the associated settings from the telephone directory.

Example: 4W/2W ----- 2W
 D/CBM/20.----- D
 CB/LB/FSK.----- CB

NOTE

If the D/ CBM/20 or the CB/LB/FSK switches are set to 20 or LB respectively, check that the corresponding LINE TERMINAL INTERCEPT NORM indicator pushbutton on the telephone control panel (7A6) is lit.

(3) Check the directory to determine if one of the 12 line terminals is unassigned. If there is an unassigned line terminal, perform steps and (6) below. If all terminal lines are used, perform steps (5) and (6) below.

(4) On the unassigned line terminal set the 4W/2W switch to 2W, the D/CBM/20 switch to D, and the CB,/LB/FSK switch to LB. Check that the LINE INTERCEPT NORM indicator pushbutton corresponding to the selected line terminal is lit.

(5) Select the LINE INTERCEPT module that has the NORM indicator pushbutton lit. This LINE INTERCEPT module will be referred to as the selected LINE INTERCEPT module. If none of the LINE INTERCEPT NORM indicator pushbuttons are lit, select a line intercept module and perform step (4) above.

(6) Perform steps (a)through (e)below on the LINE INTERCEPT module in the telephone control panel (7A6) selected in steps (3) and (5) above.

(a) Press the ENABLE indicator pushbutton. The ENABLE indicator pushbutton should light.

(b) On the selected line intercept module, press the LINE indicator pushbutton. The LINE indicator pushbutton should light.

(c) Press the SWBD indicator pushbutton. The SWBD indicator pushbutton should light.

(d) Rotate the HEADSET VOLUME control clockwise until the dial tone is audible on the operator No. 2 headset/microphone (H144C/U).

(e) Using the telephone directory, select a subscriber and dial the subscriber assigned number. The subscriber end instrument should receive a ring signal, and the subscriber should respond to the ring signal and carry out satisfactory communication between the operator and the subscriber. Inform the subscriber that the call will be terminated and direct him to initiate a call to the operator.

b. *Subscriber-to-Operator Checks.* Perform steps (1) through (5) below to check the subscriber-to-operator connections.

(1) Press the LINE indicator pushbutton. The LINE indicator pushbutton should light. Press the NORM indicator pushbutton. The LINE indicator pushbutton should go out, and the NORM indicator pushbutton should light. Terminate the call.

(2) Depending upon the type of subscriber end instrument, the operator should receive one of the following two indications:

- (a) Operator position alarm buzzer should sound and the DSA ANSWER indicator pushbutton should flash.
- (b) Operator position alarm buzzer should sound and the calling subscriber's LINE INTER-CEPT LINE indicator should flash.
- (3) Press the flashing indicator pushbutton and answer the subscriber call. Again, insure satisfactory communication between operator and landline subscriber.
- (4) Terminate the call by performing steps (a) or (b) below.
 - (a) If the subscriber signal was a flashing DSA ANSWER indicator pushbutton, press the DSA OFF indicator pushbutton.
 - (b) If the subscriber signal was a flashing LINE indicator pushbutton on the LINE INTER-CEPT module, press the NORM indicator push-button on the corresponding LINE INTERCEPT module.
- (5) Repeat the procedures given in a(6) and b above for the remaining telephone line subscribers.

c. Telephone-to-Radio Checks. Perform steps (1) through (6) below to check the telephone-to-radio connections.

- (1) On the radio line control (7A13), press all the radio channel NORM indicator pushbuttons.(2) On the selected LINE INTERCEPT module, depress the SWBD indicator pushbutton.The SWBD indicator pushbutton should light and a dial tone should be heard in the operator No. 2 headset/microphone.
- (3) Dial the numbers 32 from the operator No. 2 position. At the radio line control (7A13), the secondary channel A2 LINE indicator pushbutton should flash and the operator No. 1 position 'alarm buzzer should sound.
- (4) Depress the flashing LINE indicator pushbutton. The LINE indicator pushbutton should stop flashing, the OFF indicator pushbutton should go out, and the operator No. 1 position alarm buzzer should silence. Insure that satisfactory communication is possible between operator No. 1 and operator No. 2.
- (5) Perform steps (a) and (b) below to terminate this connection.
 - (a) On the telephone control panel (7A6), press the LINE indicator pushbutton and then on the NORM pushbutton on the selected LINE IN-TERCEPT module.
 - (b) On the radio line control (7A13), press the secondary channel A2 OFF pushbutton. The LINE indicator pushbutton should go out and the OFF indicator pushbutton should light.
- (6) Repeat steps (2) through (4) above for the remaining radio channels using the following list:

	Radio channel	Telephone number
SECONDARY	A1.....	33
	B1.....	34
	B2	35
PRIMARY	A2.....	36
	A1.....	37
	B1.....	38
	B2.....	39

d. Radio-to-Telephone Checks. Perform steps (1) through (10) below to check the radio-to-telephone connections.

- (1) On the radio line control (7A13), press the SECONDARY RADIO A2 JOIN indicator pushbutton.
- (2) Set the RCVR SELECT switch to HDSET.
- (3) Turn the HEADSET control in a clock-wise direction until a dial tone is heard in the headset.
- (4) On the radio line control (7A13), dial the telephone number of the LINE INTERCEPT MODULE selected in a(3) or (5) above.
- (5) The selected LINE INTERCEPT SWBD indicator pushbutton should flash, and the operator No. 2 position alarm buzzer should sound. Press the flashing LINE INTERCEPT SWBD indicator pushbutton. The alarm buzzer should silence, the LINE INTERCEPT SWBD indicator pushbutton should remain lit, and the LINE INTERCEPT NORM indicator pushbutton should go out. Satisfactory communication should be available between operator No. 1 and operator No. 2.
- (6) Press the selected LINE INTERCEPT LINE indicator pushbutton. The LINE INTER-CEPT LINE indicator pushbutton should light and communication between operator No. 1 and No. 2 should terminate.
- (7) Press the selected LINE INTERCEPT NORM indicator pushbutton. The LINE INTER-CEPT LINE indicator pushbutton should go out

(8) At the radio line control (7A13), press the SECONDARY RADIO A2 OFF indicator pushbutton. The SECONDARY RADIO A2 JOIN indicator pushbutton should go out and the SECONDARY RADIO A2 OFF indicator pushbutton should light.

(9) Repeat steps (1) through (8) above for the remaining SECONDARY RADIO and PRIMARY RADIO channels on the radio line control (7A13).

Example: SECONDARY RADIO A1 module,
SECONDARY RADIO B1 module, etc.

(10) If an assigned telephone subscriber line terminal was used as the selected line terminal during these checks, return the three switch settings in the telephone terminal (7A1, 7A2, or 7A3) to their original settings.

3-47. Nonsecure Data Subsystem Preoperational Checks and Adjustments

a. Power Supply Checks. Perform steps (1) through (6) below to energize the power supplies in the nonsecure data subsystem.

(1) On VFTG power supply No. 1 (7A7), set the PS1 through PS5 switches to ON.

(2) On VFTG power supply No. 2, set the PS1 through PS6 switches to ON.

(3) On the telegraph line control (7A17), compare the switch settings with switch settings in the VFTG subscriber directory that was generated in paragraph 2-25.

(4) On the fox generator (7A26), set the POWER ON switch to ON and the OUTPUT switch to MESSAGE. On the VFTG channel control (7A18), the meter above the METERING switch should deflect to the left of center and fluctuate, indicating that the fox message is being generated.

(5) Set the METERING switch to BATT.NO. 1. The meter should deflect to the right of center.

(6) Set the METERING switch to BATT.NO. 2. The meter should deflect to the left of center.

b. Subscriber Send Loop Current Checks and Adjustments. Perform steps (1) through (7) below to insure that the proper loop current exists between the teletypewriter subscriber output and the AN/TSC-38B.

(1) On VFTG No. 1 (7A22), insert one end of a 3-circuit patch cord into the RECEIVE LINE SERIES MONITOR 1 jack. On VFTG No. 3 (7A24), insert the other end of the patchcord into the DC MTR jack.

(2) On the VFTG channel control (7A18), set the METERING switch to REMOTE and observe the meter reading associated with the METERING switch. The current indication on the meter should correspond to the loop current assigned to the channel 1 teletypewriter subscriber as listed in the teletypewriter directory.

(3) If the current indication on the meter in step (2) above does not agree with the teletypewriter directory, perform steps (a) through (d) below.

(a) Remove the two screws on either side of the LOOP CURRENT & BIAS ADJUSTMENT tray (the sixth panel from the top of the audio patch panel (7A15)).

(b) Slide the tray out to its stops.

(c) Observing the extended tray from the bottom, identify the REC CURRENT 1 slotted shaft.

(d) Adjust the REC CURRENT 1 slotted shaft until the meter reading above the METERING switch on the VFTG channel control (7A18) indicates a current value equal to that assigned to the channel 1 teletypewriter subscriber.

(4) Remove the end of the patchcord from the RECEIVE LINE SERIES MONITOR 2 jack on the VFTG No. 1 (7A22).

(5) On the VFTG channel control (7A18), check that the meter current indication above the METERING switch corresponds to the current of the channel 2 teletypewriter subscriber listed in the teletypewriter directory.

(6) If the meter current does not correspond with the assigned teletypewriter subscriber, repeat step (3) above and adjust the associated REC CURRENT adjust on the extended LOOP CURRENT & BIAS ADJUSTMENT panel (in this case, REC CURRENT 2).

(7) Repeat steps (4), (5), and (6) above for RECEIVE LINE SERIES MONITOR jacks 3 through 19.

c. Subscriber Receive Loop Current Checks and Adjustments. Perform steps (1) through (10) below to insure that proper loop current exists

ists between the AN/TSC-38B output and the teletypewriter subscriber input.

(1) On the VFTG No. 3 (7A24), check that one end of the 3-circuit patchcord is still inserted in the DC MTR jack.

(2) Transfer the other end of the patchcord from the RECEIVE LINE SERIES MONITOR 19 jack on the VFTG No. (7A22) to the SENDLINE SERIES MONITOR 1 jack.

(3) On the VFTG channel control (7A18), press the PRIMARY 16 CHANNEL VFTG ON 1 and ON 2 indicator pushbuttons (CHANNEL 1 through 16). Each ON indicator pushbutton should light.

(4) Press the SECONDARY VFTG ON 1 and ON 2 indicator pushbuttons. Each ON indicator pushbutton should light.

(5) Press the WIDEBAND VFTG ON 1 indicator pushbutton. The ON 1 indicator should light.

(6) Observe the reading on the meter above the METERING switch. Check that the meter reading corresponds to the teletypewriter No. 1 subscriber as listed in the teletypewriter directory.

(7) If the meter reading does not correspond to the current required for the associated teletypewriter subscriber, perform steps (a) and (b) below.

(a) Looking at the extended LOOP CURRENT & BIAS ADJUSTMENT tray from the bottom, identify the SEND CURRENT 1 slotted shaft.

(b) Adjust the SEND CURRENT 1 slotted shaft until the meter indication (above the METERING switch) corresponds with the current listed for teletypewriter subscriber No. 1 in the teletypewriter directory.

(8) Transfer the end of the 3-wire patchcord from the RECEIVE LINE SERIES MONITOR 1 jack to the RECEIVE LINE SERIES MONITOR 2 jack on the VFTG No. 1 (7A22).

(9) Repeat steps (6) through (8) above using the meter readings and current requirements for teletypewriter subscribers 2 through 19.

(10) Remove the 3-circuit patchcord inserted in step (8) above.

d. Operator-to-Subscriber (Operator Loop) Checks. Perform steps (1) through (7) below to determine that satisfactory teletypewriter communication between the operator and the teletypewriter subscriber exists.

(1) At the teletypewriter set (7A19), set the MOTOR ON/OFF switch to ON and the LIGHT ON/OFF switch to ON. The teletypewriter indicates an open loop and the carriage light lights.

(2) On the VFTG channel control (7A18), press the CHANNEL 1 SEIZE 1 indicator pushbutton. The CHANNEL 1 SEIZE 1 indicator pushbutton should light.

(3) Press the OPERATOR INTERCEPT OPER LOOP indicator pushbutton. The OPERATOR INTERCEPT OPER LOOP indicator push button should light and the teletypewriter set should indicate a closed loop.

(4) At the teletypewriter set (7A19), type a message to the channel 1 teletypewriter subscriber, requesting a return message indicating the quality of teletypewriter communications.

(5) As the message is being received on the operator teletypewriter page printer, press the OPERATOR INTERCEPT MON LOOP indicator pushbutton. The OPERATOR INTERCEPT MON LOOP indicator pushbutton lights and the operator teletypewriter continues to print the channel 1 subscriber message.

(6) Press the CHANNEL 1 SEIZE 1 indicator pushbutton. The CHANNEL 1 SEIZE 1 indicator pushbutton should go out and the teletypewriter should indicate an open loop.

(7) Repeat steps (2) through (6) above for channel 2 through 19 teletypewriter subscribers, using the associated CHANNEL SEIZE indicator pushbuttons.

e. Operator-to-VFTG (Operator Set) Checks. Perform steps (1) through (54) below to determine that the conversion of dc teletypewriter signals to VFTG tones is being accomplished by utilizing the operator teletypewriter as the sending instrument.

(1) On the VFTG channel control (7A18), press the OPER SET indicator pushbutton. The OPER SET indicator pushbutton should light.

(2) Insert one end of a 2-circuit patchcord into the 16 CH VFTG SEND jack and the other end into the 16 CH VFTG RECD jack on the audio patch panel (7A15).

(3) On the VFTG channel control (7A18), press the PRIMARY 16 CHANNEL VFTG

CHANNEL 1 SEIZE 1 indicator pushbutton. The CHANNEL 1 SEIZE 1 indicator pushbutton should light and the operator teletypewriter should indicate a closed loop.

(4) Using the operator teletypewriter key-board, type out a message. The page printer on the operator teletypewriter should indicate that the message is satisfactorily copied.

(5) Press the OPERATOR INTERCEPT MON SET indicator pushbutton. The OPERATOR INTERCEPT MON SET indicator pushbutton should be lit.

(6) On the telegraph line control (7A17), set the RECEIVE 1 toggle switch to the left. The fox message should be copied on the operator teletypewriter. The fox message should also be copied by the channel 1 teletype subscriber.

(7) On the VFTG channel control (7A18), press the PRIMARY 16 CHANNEL VFTG CHANNEL 1 SEIZE 1 indicator pushbutton. The CHANNEL 1 SEIZE 1 indicator pushbutton should go out and the operator teletypewriter set (7A19) should indicate an open loop.

(8) On the VFTG channel control (7A18), press the PRIMARY 16 CHANNEL VFTG CHANNEL 2 ON 2 indicator pushbutton. The CHANNEL 2 ON 2 indicator pushbutton should go out.

(9) Press the PRIMARY 16 CHANNEL VFTG CHANNEL 1 DIV indicator pushbutton. The CHANNEL 1 DIV and the CHANNEL 2 ON 2 indicator pushbutton should light.

(10) Press the PRIMARY 16 CHANNEL VFTG CHANNEL 2 SEIZE 2 indicator pushbutton. The CHANNEL 2 SEIZE 2 indicator pushbutton should light, and the operator teletypewriter should indicate an open loop.

(11) Press the OPERATOR INTERCEPT MON LOOP indicator pushbutton. The MON SET indicator pushbutton should go out and the OPERATOR INTERCEPT MON LOOP indicator should light. The operator teletypewriter should indicate an open loop.

(12) Press the PRIMARY 16 CHANNEL VFTG CHANNEL 2 SEIZE 2 indicator pushbutton; the PRIMARY 16 CHANNEL VFTG CHANNEL 2 SEIZE 2 indicator pushbutton should go out.

(13) Press the PRIMARY 16 CHANNEL VFTG CHANNEL 1 SEIZE 1 indicator pushbutton. The PRIMARY 16 CHANNEL VFTG

CHANNEL 1 SEIZE 1 indicator pushbutton should light and the operator teletypewriter should copy the fox message.

(14) Press the OPERATOR INTERCEPT MON SET indicator pushbutton. The MON LOOP indicator pushbutton should go out and the MON SET indicator pushbutton should light. The operator teletypewriter should copy the fox message.

(15) Press the PRIMARY 16 CHANNEL VFTG CHANNEL 1, SEIZE 1, and DIV indicator pushbuttons. The PRIMARY 16 CHANNEL VFTG CHANNEL 1 SEIZE 1, DIV and CHANNEL 2 ON 2 indicator pushbuttons should go out and the operator teletypewriter set should indicate an open loop.

(16) On the VFTG channel control (7A18), press the PRIMARY 16 CHANNEL VFTG CHANNEL 2 ON 2 indicator pushbutton. The PRIMARY 16 CHANNEL VFTG CHANNEL 2 ON 2 indicator pushbutton should light.

(17) On the telegraph line control (7A17), set the RECEIVE 1 toggle switch to the right.

(18) On the VFTG channel control (7A18), press the OPER TEST indicator pushbutton.

(19) Press the PRIMARY 16 CHANNEL 1 SEIZE 2 indicator pushbutton.

(20) Set the METERING switch to KEY-BOARD LOOP. The meter reading above the METERING switch should fluctuate as the operator teletypewriter keyboard is operated. (21) Set the METERING switch to PRINTER LOOP. The meter reading above the METERING switch should fluctuate as the operator teletypewriter page printer operates.

(22) Return the METERING switch to REMOTE.

(23) Repeat steps (1) and (3) through (22) above, pressing the PRIMARY 16 CHANNEL VFTG SEIZE indicator pushbuttons for channels 1 through 16.

NOTE

Press the PRIMARY 16 CHANNEL VFTG CHANNEL SEIZE indicator pushbutton to its off position after each channel test is complete.

(24) Remove both ends of the 2-circuit patchcord from the audio patch panel (7A15). Insert one end of the patchcord into the 2 CH VFTG SEND jack and the other end into the 2 CH VFTG RECD jack.

(25) On the VFTG channel control (7A18), press the SECONDARY VFTG CHANNEL 1 SEIZE 1 indicator pushbutton. The CHANNEL 1 SEIZE 1 indicator pushbutton should light and the operator teletypewriter should indicate a closed loop.

(26) Using the operator teletypewriter keyboard, type out a message. The page printer on the operator teletypewriter should indicate that the message is satisfactorily copied.

(27) Press the OPERATOR INTERCEPT MON SET indicator pushbutton. The OPERATOR INTERCEPT MON SET indicator pushbutton should be lit.

(28) On the telegraph line control (7A17), place the RECEIVE toggle switch to the left. The fox message should be copied on the operator teletypewriter. The fox message should also be copied by the channel 17 teletypewriter subscriber.

(29) On the VFTG channel control (7A18), press the SECONDARY VFTG- CHANNEL 1 SEIZE 1 indicator pushbutton. The CHANNEL 1 SEIZE 1 indicator pushbutton should go out and the operator teletypewriter set should indicate an open loop.

(30) On the VFTG channel control (7A18), press the SECONDARY VFTG CHANNEL 2 ON 2 indicator pushbutton. The CHANNEL 2 ON 2 indicator pushbutton should go out.

(31) Press the SECONDARY VFTG CHANNEL 1 DIV indicator pushbutton. The CHANNEL 1 DIV and the CHANNEL 2 ON 2 indicator pushbuttons should light.

(32) Press the SECONDARY VFTG CHANNEL 2 SEIZE 2 indicator pushbutton. The CHANNEL 2 SEIZE 2 indicator pushbutton should light and the operator teletypewriter should indicate an open loop.

(33) Press the OPERATOR INTERCEPT MON LOOP indicator pushbutton. The MON SET indicator pushbutton should go out and the OPERATOR INTERCEPT MON LOOP indicator should light. The operator teletypewriter should indicate an open loop.

(34) Press the SECONDARY VFTG CHANNEL 2 SEIZE 2 indicator pushbutton. The CHANNEL 2 SEIZE 2 indicator pushbutton should go out.

(35) Press the SECONDARY VFTG CHANNEL 1 SEIZE 1 indicator pushbutton. The CHANNEL 1 SEIZE 1 indicator pushbutton should light and the operator teletypewriter set should copy the fox message.

(36) Press the OPERATOR INTERCEPT MON SET indicator pushbutton. The MON LOOP indicator pushbutton should go out and the MON SET indicator pushbutton should light. The operator teletypewriter should copy the fox message.

(37) On the VFTG channel control (7A18), press the SECONDARY VFTG CHANNEL 2 ON 2 indicator pushbutton. The CHANNEL 2 ON 2 indicator pushbutton should light.

(38) On the telegraph line control (7A17), set the RECEIVE toggle switch to the right.

(39) On the VFTG channel control (7A18), set the METERING switch to KEYBOARD LOOP. The meter reading above the METERING switch should fluctuate as the operator teletypewriter keyboard is operated.

(40) Press the OPER SET indicator pushbutton. The OPER SET indicator pushbutton should light.

(41) Remove both ends of the 2-circuit patchcord from the audio patch panel (7A15). Insert one end of the patchcord into the VB VFTG SEND jack and the other end into the WB VFTG RECD jack.

(42) Press the WIDEBAND CHANNEL VFTG CHANNEL 1 SEIZE 1 indicator pushbutton. The CHANNEL 1 SEIZE 1 indicator pushbutton should light and the operator teletypewriter should indicate a closed loop.

(43) Using the operator teletypewriter keyboard, type out a message. The page printer on the operator teletypewriter should indicate that the message is satisfactorily copied.

(44) Press the OPERATOR INTERCEPT MON SET indicator pushbutton. The OPERATOR INTERCEPT MON SET indicator pushbutton should be lit.

(45) On the telegraph line control (7A17), place the RECEIVE toggle switch to the left. The fox message should be copied on the operator teletypewriter. The fox message should also be copied by the channel 1 teletypewriter subscriber.

(46) On the VFTG channel control (7A18), press the PRIMARY 16 CHANNEL VFTG CHANNEL 1 SEIZE 1 indicator pushbutton. The CHANNEL 1 VFTG SEIZE 1 indicator

pushbutton should go out and the operator teletypewriter set should indicate an open loop.

(47) On the VFTG channel control (7A18), press the OPERATOR INTERCEPT MON LOOP indicator pushbutton. The MON SET indicator pushbutton should go out and the OPERATOR INTERCEPT MON LOOP indicator should light. The operator teletypewriter should indicate an open loop.

(48) Press the WIDEBAND CHANNEL VFTG CHANNEL 1 SEIZE 1 indicator pushbutton. The WIDEBAND CHANNEL VFTG CHANNEL 1 SEIZE 1 indicator pushbutton should light and the operator teletypewriter set should copy the fox message.

(49) Press the OPERATOR INTERCEPT MON SET indicator pushbutton. The MON LOOP indicator pushbutton should go out and the OPERATOR INTERCEPT MON SET indicator pushbutton should light. The operator teletypewriter should copy the fox message.

(50) On the telegraph line control (7A17), set the RECEIVE 19 toggle switch to the right.

(51) On the VFTG channel control (7A18), set the METERING switch to KEYBOARD LOOP. The meter reading above the METERING switch should fluctuate as the operator teletypewriter keyboard is operated.

(52) Set the METERING switch to PRINTER LOOP. The meter reading above the METERING switch should fluctuate as the operator teletypewriter page printer operates.

(53) Return the METERING switch to REMOTE.

(54) Remove the 2-circuit patchcord from the jacks on the audio patch panel (7A15).

f. Primary 16-Channel VFTG Tone Generator Checks and Adjustments. Perform steps (1) through (7) below to determine that the 16-channel VFTG tone generators have the proper output level.

(1) Check that the PRIMARY 16 CHANNEL VFTG ON indicator pushbuttons for all 16 channels have been pressed and are lit.

(2) On the radio line control (7A13), set the METER SELECT switch to VFTG.

(3) On the telephone control panel (7A6), press and hold the LEVEL pushbutton on the 10KW XMTR module.

(4) While holding the LEVEL pushbutton, rotate the control just below the LEVEL pushbutton from a maximum counterclockwise position to a maximum clockwise position.

(5) On the radio line control (7A13), observe the reading of the meter just above the METER SELECT switch. As the control below the LEVEL pushbutton is rotated from the maximum counterclockwise to the maximum clockwise positions the meter should indicate a reading of - 20 to at least + 3.

(6) If the specified meter indication in step (5) above is not obtained, adjust the SEND AGGR. LEVEL ADJUST (GROUP 1) PRI potentiometer on the VFTG No. 2 (7A23).

(7) Release the LEVEL pushbutton.

g. Secondary VFTG Tone Generator Checks and Adjustments. Perform steps (1) through (6) below to determine that the secondary VFTG tone generators have the proper output.

(1) On the VFTG channel control (7A18), press the SECONDARY VFTG ON 1 and ON 2 indicator pushbuttons, The SECONDARY VFTG ON 1 and ON 2 indicator pushbuttons should be lit.

(2) On the telephone control panel (7A6), press and hold the LEVEL pushbutton on the 1 KW XMTR module.

(3) While holding the LEVEL pushbutton, rotate the control just below the LEVEL pushbutton from a maximum counterclockwise to a maximum clockwise position.

(4) On the radio line control (7A13), observe the reading of the meter just above the METER SELECT switch. As the control below the LEVEL pushbutton is rotated from the maximum counterclockwise to maximum clockwise position, the meter should indicate a reading of - 20 to at least +2.

(5) If the specified meter indication in step

(4) above is not obtained, adjust the SEND

AGGR. LEVEL ADJUST (GROUP II) SEC potentiometer on the VFTG No. 2(7A23).

(6) Release the LEVEL pushbutton.

h. Wideband VFTG Tone Generator Checks and Adjustments. Perform steps (1) through (7) below to determine that the wideband VFTG tone generators have the proper output level.

(1) On the VFTG channel control (7A18), press the WIDEBAND VFTG ON 1 indicator

pushbutton. The WIDEBAND VFTG ON 1 indicator pushbutton should be lit.

(2) On the telephone control panel (7A6), press the WB indicator pushbutton on the 10 KW XMTR module. The WB indicator pushbutton should be lit.

(3) Press and hold the LEVEL pushbutton on the 10 KW XMTR module.

(4) While holding the LEVEL pushbutton, rotate the control just below the LEVEL pushbutton from the maximum counterclockwise position to the maximum clockwise position.

(5) On the radio line control (7A13), observe the reading of the meter just above the METER SELECT switch. As the control below the LEVEL pushbutton is rotated from the maximum counterclockwise to the maximum clockwise position, the meter should read from --20 to +3.

(6) If the specified meter indication in step (5) above is not obtained, adjust the SEND AGGR. LEVEL ADJUST (GROUP III) WB potentiometer on the VFTG No. 2 (7A23).

(7) Release the LEVEL pushbutton and press the WB indicator pushbutton. The WB indicator should go out.

3-48. Secure Data Subsystem Preoperation Checks and Adjustments

Perform steps a through r to insure that the alarm circuitry and the secure equipment patching to nonsecure trunks are operating properly.

a. On the secure teletype patch panel (5A2), insert one end of a 3-circuit patchcord into the NON SECURE RECEIVE TRUNK 1 jack.

b. Observe that the ALARM BYPASS indicator pushbutton light is lit.

c. If the ALARM BYPASS indicator pushbutton lights and an audible alarm is sounded, press the ALARM BYPASS indicator pushbutton. The audible alarm should stop and the ALARM BYPASS indicator pushbutton should remain lit.

d. Repeat a, b, and c above for NONSECURE RECEIVE TRUNKS 2 and 3 and NONSECURE SEND TRUNKS 1, 2, and 3.

e. On the VFTG No. 2 (7A23), insert three 3-circuit patchcords as indicated below.

SEND TRUNKS 1	REC TRUNKS1
SEND TRUNKS 2	REC TRUNKS 2
SEND TRUNKS 3	REC TRUNKS3

NOTE

The above patch connections will loop the send and receive trunks. This will allow the operator to loop his secure equipment and insure that it is operating properly.

f. On the secure teletype patch panel (5A2), insert two 3-circuit patchcords as indicated below.

From	To
TT-123/TT-98 SET jack	NONSECURE SEND TRUNKS 1 jack
TT-346/TT-98 SET jack	NONSECURE RECEIVE TRUNKS 1 jack

g. On the transmitter-distributor (5A4), reperforator (5A5), and teletypewriter (5A6), set the appropriate POWER, MOTOR, or LIGHT switch to ON. Check all equipment motors and lamps for operation.

h. Type a message on the keyboard and insure that the page printer is copying satisfactorily.

i. Transmit a test tape from the transmitter- distributor and note that the reperforator reproduces the test tape.

j. Transfer the 3-circuit patchcord from NONSECURE SEND TRUNKS 1 to NON- SECURE SEND TRUNKS 2. Transfer the 3- circuit patchcord from NONSECURE RECEIVE TRUNKS 1 to NONSECURE RECEIVE TRUNKS 2 and repeat h and i above.

k. Transfer the 3-circuit patchcord from NONSECURE SEND TRUNKS 2 to NOSECURE SEND TRUNKS 3. Transfer the 3- circuit patchcord from NONSECURE RECEIVE TRUNKS 2 to NONSECURE RECEIVE TRUNKS 3 and repeat h and i above.

l. Set the appropriate POWER, MOTOR, or LIGHT switch on the transmitter-distributor, reperforator, and teletypewriter to OFF.

m. Remove the patchcord from the TT-246/TT-98 SET jack and insert it into the TT-76 REPERF jack.

n. Remove the patchcord from the TT-123/TT-98 SET jack and insert it in the TT-76 T/D SET jack.

o. On the reperforator-transmitter (5A3), set the MOTOR and POWER and LIGHT switches to their ON position.

p. Transmit a test tape from the reperforator- transmitter and insure that it reproduces the test tapes.

q. Type a test message on the reperforator-transmitter keyboard and insure that it reproduces the typed message.

r. Set the MOTOR and POWER switches to their OFF positions and remove all patchcords.

On the secure teletype patch panel (5A2), the ALARM BYPASS indicator should go out.

3-49. Primary Radio Terminal Preoperation

Checks and Adjustments Perform steps a through x below to insure that the primary radio terminal will operate properly.

- a. On the primary frequency select panel (7A11), set the RECEIVER FREQUENCY SELECT MEGACYCLES thumbwheel switches to the receiver frequency assigned to the primary radio terminal.
- b. Press the RCVR TUNE indicator pushbutton. The RECEIVER FREQUENCY DISPLAY should indicate the selected receiver frequency. On the primary mode and status panel (7A12), the RECEIVER READY indicator should go out. the SYS TUNING indicator should light while the receiver is tuning and then, go out, and the RECEIVER READY indicator should light.

NOTE

The maximum tune time for the receiver is 10 seconds.

- c. On the primary frequency select panel (7A11), set the TRANSMITTER FREQUENCY SELECT MEGACYCLES thumbwheel switches to the transmitter frequency assigned to the primary radio terminal.
- d. Press the XMTR TUNE indicator pushbutton. The TRANSMITTER FREQUENCY DISPLAY indicator should display the selected transmitter frequency. On the primary mode and status panel (7A12), the TRANSMITTER HV ON indicator and the SYS TUNING indicator should light, the TRANSMITTER HV ON indicator should go out, the TRANSMITTER KEYED indicator should light, the SYS TUNING indicator should go out, and then the TRANSMITTER KEYED indicator should go out.
- e. On the radio line control (7A13), press the PRIMARY RADIO A2 RADIO indicator pushbutton. The PRIMARY RADIO A2 OFF indicator should go out and the PRIMARY RADIO A2 RADIO indicator pushbutton should light.
- f. On the audio panel (7A15), insert the operator No. 1 headset plug in the PRIMARY DATA CONTROL A2 SEND jack.
- g. Press the microphone push-to-talk switch and talk into the operator microphone on the radio line control (7A13). The audio should be heard in the operator headset.
- h. On the primary frequency select panel (7A11), press the VOICE TEST CHAN A2 indicator pushbutton. The VOICE TEST CHAN A2 indicator pushbutton should light and the audio from the operator microphone should not be heard in the operator headset.
- i. Press the VOICE TEST CHAN A2 indicator pushbutton. The VOICE TEST CHAN A2 indicator pushbutton should go out.
- j. Press the RING SELECT 1000/20 A2 indicator pushbutton. The RING SELECT 1000/20 A2 indicator pushbutton should light.
- k. On the radio line control (7A13), press the RING pushbutton. A 1000/20 ring signal should be heard on the operator headset.
- l. On the primary frequency select panel (7A11), press the RING SELECT 1000/20 A2 indicator pushbutton. The RING SELECT 1000/20 A2 indicator pushbutton should go out.
- m. Repeat steps *j* through *l* above using the RING SELECT 1600 A2 indicator pushbutton.
- n. Press the PRIMARY RADIO A2 OFF pushbutton.

The RADIO indicator should go out and the OFF indicator should light.

- o. Repeat the steps *e* through *n* above for the PRIMARY RADIO A1, B1, and B2 using the appropriate marked pushbuttons and jacks.
- p. On the primary mode and status panel (7A12), press the RCVR and XMTR CHAN B2, CHAN B1, CHAN A1, and CHAN A2 indicator pushbuttons. The CHAN B2, CHAN B1, CHAN A1, and CHAN A2 indicator pushbuttons should light. The STATUS TRANSMITTER CH A2, CH A1, CH B1, and CH B2 indicators should light. The STATUS RECEIVER CH A2, CH A1, CH B1, and CH B2 indicators should light.
- q. Press the PRIMARY RADIO B2 RADIO indicator pushbutton. The PRIMARY RADIO B2 OFF indicator should go out and the PRIMARY RADIO B2 RADIO indicator pushbutton should light. Background noise or signal should be heard from the speaker.
- r. On the primary mode and status panel (7A12), rotate the RF GAIN RCVR 1 control counter-clockwise and note that the background noise or signal can be controlled.
- s. On the primary frequency select panel (7A11), press the DIVERSITY SELECT CHAN B2 indicator pushbutton. The DIVERSITY SELECT CHAN B2 indicator pushbutton should light.
- t. On the primary mode and status panel (7A12), rotate the RF GAIN RCVR 2 control and note that the background noise or signal can be controlled.
- u. On the radio line control (7A13), press the PRIMARY RADIO B2 OFF pushbutton. The OFF indicator should light, the RADIO indicator should go out, and the background noise or signal should silence.
- v. Repeat steps *q* through *u* above for PRIMARY RADIO B1, A1, and A2 using the appropriately marked pushbuttons.
- w. On the primary frequency select panel (7A11), press the DIVERSITY SELECT indicator pushbuttons, extinguishing the four DIVERSITY SELECT indicator pushbuttons.
- x. On the primary mode and status panel (7A12), press the HV ON indicator pushbutton. The HV ON indicator and the STATUS TRANSMITTER HV ON indicator should light. The STATUS TRANSMITTER CHAN A2, CHAN A1, CHAN B1, and CHAN B2 indicators should go out and the KEYED indicator should momentarily light. The SYS TUNING indicator should light while the 10-kw P.A. is tuning, then should go off and the STATUS TRANSMITTER KEYED indicator should momentarily light. Then the STATUS TRANSMITTER READY, CH A2, CH A1, CH B1, and CH B2 indicators should light. The 10-kw P.A. should have the READY, FIL, and HV indicators lit.

3-50. Secondary Radio Terminal Preoperation Checks and Adjustments

Perform steps *a* through *d* below to insure that the secondary radio terminal will operate satisfactorily.

- a. *Secondary Radio Ring Select and Voice Test Check.*
 - (1) On the radio line control (7A13), press the SECONDARY RADIO A2 RADIO indicator pushbutton. The SECONDARY RADIO A2 OFF indicator should go out and the SECONDARY RADIO A2 RADIO indicator pushbutton should light.
 - (2) On the audio patch panel (7A15), insert the operator No. 1 headset plug into the SECONDARY DATA CONTROL SEND A2 jack.
 - (3) Press the push-to-talk switch on the operator No. 1 microphone and transmit a test voice message. The test voice message should be received in the operator No. 1 headset.
 - (4) On the secondary frequency select panel (7A4), press the VOICE TEST CHAN A2 indicator pushbutton. The VOICE TEST CHAN A2 indicator pushbutton should light. The voice test message from the operator No. 1 microphone should be silenced.
 - (5) Press the VOICE TEST CHAN A2 indicator pushbutton. The VOICE TEST CHAN A2 indicator pushbutton should go out.
 - (6) Press the RING SELECT 1000/20 A2 indicator pushbutton. The RING SELECT 1000/20 A2 indicator pushbutton should light.
 - (7) On the radio line control (7A13), press the RING pushbutton and a 1000/20 ring signal should be heard in the operator No. 1 headset.
 - (8) On the secondary frequency select panel (7A4), press the RING SELECT 1000/20 A2 indicator pushbutton should go out.
 - (9) Press the RING SELECT 1600 A2 indicator pushbutton.

cator pushbutton. The 1600 A2 indicator pushbutton should light.

(10) On the radio line control (7A13), press the RING pushbutton. A 1600-cps ring signal should be heard in the operator No. 1 headset.

(11) On the secondary frequency select panel (7A4), press the RING SELECT 1600 A2 indicator pushbutton. The RING SELECT 1600 A2 indicator pushbutton should go out.

(12) On the radio line control (7A13), press the SECONDARY RADIO A2 OFF pushbutton. The OFF indicator should light and the SECONDARY RADIO A2 RADIO indicator should go out.

(13) Repeat steps (1) through (12) above for secondary radio channels A1, B1, and B2 using the appropriately marked pushbuttons and jacks. Remove the operator No. 1 headset plug from the audio patch panel (7A15).

b. Secondary Radio Receiver Tuning.

(1) On the secondary frequency select panel (7A4), set the RECEIVER FREQUENCY SELECT thumbwheel switches to the receiver frequency assigned to the secondary radio terminal.

(2) Press the RCVR TUNE pushbutton. The RECEIVER FREQUENCY DISPLAY should indicate the selected receiver frequency. The STATUS RECEIVER READY indicator should go out and the SYS TUNING indicator should light then, when the receiver is tuned, the STATUS RECEIVER READY indicator should light.

NOTE

On the secondary mode and status panel (7A5), the SYS TUNING indicator may remain lit.

c. Secondary Radio Transmitter Tuning.

(1) On the secondary frequency select panel (7A4), set the TRANSMITTER FREQUENCY SELECT thumbwheel switches to the transmitter frequency assigned to the secondary radio terminal.

(2) On the secondary mode and status panel (7A5), press the HV ON indicator pushbutton.

On the secondary frequency select panel (7A4), the TRANSMITTER FREQUENCY DISPLAY should indicate the selected transmitter frequency. The HV ON indicator pushbutton and the STATUS TRANSMITTER HV ON indicator should light. The SYS TUNING indicator should momentarily light, and then the STATUS TRANSMITTER READY indicator should light.

d. Secondary Radio Receiver Check. Perform steps (1) through (5) below to insure that the secondary receiver will operate properly.

(1) On the secondary mode and status panel (7A5), press the RCVR and XMTR CHAN B2, CHAN B1, CHAN A1, and CHAN A2 indicator pushbuttons; the indicator pushbuttons CHAN B2, CHAN B1, CHAN A1, and CHAN A2 should light, and the STATUS TRANSMITTER and RECEIVER CH B2, CH B1, CH A1, and CH A2 indicators should light.

(2) On the radio line control (7A13), press the SECONDARY RADIO A2 RADIO indicator pushbutton. The SECONDARY RADIO A2 OFF indicator should go out, the SECONDARY RADIO A2 RADIO indicator should light, and background noise or signal should be heard from the speaker.

(3) On the secondary mode and status panel (7A5), rotate the RCVR RF GAIN control counter-clockwise and note that the signal or background noise from the speaker should be decreased.

(4) Press the SECONDARY RADIO A2 OFF pushbutton. The SECONDARY RADIO A2 OFF indicator should light, the SECONDARY RADIO A2 RADIO indicator should go out, and the background noise or signal from the speaker should be silenced.

(5) Repeat steps (2) through (4) above for secondary radio channels A1, B1, and B2 using the appropriately marked pushbuttons and indicators.

3-51. Remote Control Preoperational Checks and Adjustments

Perform steps a through d below to check the remote control using the operator No. 1 position controls to substitute the operator for the remote wire subscriber.

a. Remote Normal Preset Check.

(1) On the primary frequency select panel (7A11), press the REMOTE indicator pushbutton. The LOCAL indicator should go out and the REMOTE indicator should light. On the primary mode and status panel (7A12), the STATUS TRANSMITTER PWR ON indicator and the STATUS RECEIVER PWR ON, PC1, READY,

and the DEV XI indicators should be the only indicators lit.

(2) On the remote control (6A2), set the CHAN 1 FREQ. MC thumbwheel switches through the CHAN 10 FREQ. MC thumbwheel switches and all channel mode toggle switches to the remote frequencies and modes assigned for the remote wire subscriber. (3) On the radio line control (7A13), press the PRIMARY RADIO AI RADIO indicator pushbutton. The PRIMARY RADIO AI OFF indicator should go out and the PRIMARY RADIO AI RADIO indicator pushbutton should light.

(4) Set the DIAL SELECT switch to the RADIO position. The primary radio receivers and transmitter should tune to the frequencies that are selected on the RECEIVER FREQUENCY SELECT and TRANSMITTER FREQUENCY SELECT thumbwheel switches on the primary frequency select panel (7A11). The RECEIVER FREQUENCY DISPLAY and the TRANSMITTER FREQUENCY DISPLAY should display the selected receiver and transmitter frequencies. The STATUS TRANSMITTER and RECEIVER indicators should display the condition of the mode select switches for NORM CHAN 1 on the remote control (6A2). Two tone bursts should be heard from the speaker when the remote control function is completed.

b. *Dialed Preset Check.* This procedure checks the 10 preset dialing operations of the remote control (6A2).

(1) The dial digits for the transmitter and receiver preset channels are as follows:

Channel	Transmitter dialed digits	Receiver dialed digits
1	91	71
2	92	72
3	93	73
4	94	74
5	95	75
6	96	76
7	97	77
8	98	78
9	99	79
10	90	70

(2) On the radio line control (7A13), dial the digits 92. After the first digit (9) is dialed, one tone burst should be heard from the speaker. After the second digit (2) is dialed, a steady tone should be heard from the speaker during the time the transmitter is tuning. On the primary frequency select panel (7A11), the TRANSMITTER FREQUENCY DISPLAY should display according to the toggle switch settings on CHAN 2 of the remote control (6A2).

(3) On the radio line control (7A13), dial the digits 71. After the first digit (7) is dialed, one tone burst should be heard from the speaker. After the second digit (1) is dialed, a steady tone should be heard from the speaker during the time the receiver is tuning. On the primary frequency select panel (7A11), the RECEIVER FREQUENCY DISPLAY should display the frequency that is selected on CHAN 1 on the remote control (6A2). On the primary mode and status panel (7A12), the STATUS RECEIVER indicators should light according to the toggle switch setting on CHAN 1 of the remote control (6A2).

(4) Repeat steps (2) and (3) above for CHAN 1 through CHAN 10 for the transmitter and the receiver digits.

c. *Dialed Mode Checks.* The dialed modes and their respective dialed digits are as follows:

Mode	Dialed digits
TSB USB on.....	61
TSB LSB on	62
TSB USB and LSB on	63
TSB USB and LSB off.....	64
G1.....	65
G2.....	66
AFC/PC ON	67
AFC/PC OFF	68
HV ON.....	69
OFF.....	60

(1) On the radio line control (7A13), dials the digits 64. After the first digit (6) is dialed, one tone burst should be heard from the speaker and, on the primary mode and status panel (7A12), the STATUS TRANSMITTER and RECEIVER indicators CH A2, CH A1, CH B1, and CH B2 should go out.

(2) On the radio line control (7A13), dial the digits 61. After the second digit (1) is dialed, two bursts should be heard from the speaker and, on the primary mode and status panel (7A12), the STATUS TRANSMITTER and RECEIVER indicators CH A2 and CH A1 should light.

(3) On the radio line control (7A13), dial the digits 62. After the first digit (6) is dialed, one tone burst should be heard from the speaker. After the second digit (2) is dialed, two tone burst should be heard from the speaker and, on the primary mode and status panel (7A12), the STATUS TRANSMITTER and RECEIVER indicators CH B1 and CH B2 should light.

(4) On the radio line control (7A13), dial the digits 63. After the first digit (6) is dialed, one tone burst should be heard from the speaker. After the second digit (3) is dialed, two tone bursts should be heard from the speaker and, on the primary mode and status panel (7A12), the STATUS TRANSMITTER and RECEIVER indicators CH A2 and CH A1 should light.

(5) On the radio line control (7A13), dial the digits 66. After the first digit (6) is dialed, one tone burst should be heard from the speaker. After the second (6) is dialed, two tone bursts should be heard from the speaker and, on the primary mode and status panel (7A12), the STATUS RECEIVER LOCAL GAIN indicator should go out.

(6) On the radio line control (7A13), dial the digits 65. After the first digit (6) is dialed, one tone burst should be heard from the speaker. After the second digit (5) is dialed, two tone bursts should be heard from the speaker and, on the primary mode and status panel (7A12), the STATUS RECEIVER LOCAL GAIN indicator should light.

(7) On the radio line control (7A13), dial the digits 68. After the first digit (6) is dialed, one tone burst should be heard from the speaker. After the second digit (8) is dialed, two tone bursts should be heard from the speaker and, on the primary mode and status panel (7A12), the STATUS RECEIVER AFC ON indicator should go out and the PLT CARR LOSS, SYS FAIL, and AFC ON pushbuttons should go out.

(8) On the radio line control (7A13), dial the digits 67. After the first digit (6) is dialed, one tone burst should be heard from the speaker. After the second digit (7) is dialed, two bursts should be heard from the speaker and, on the primary mode and status panel (7A12), the STATUS RECEIVER AFC ON indicator should light. The PLT CARR LOSS, SYS FAIL and AFC ON indicator pushbuttons should light.

(9) On the radio line control (7A13) dial the digits 60. After the first digit (6) is dialed, one tone burst should be heard from the speaker. After the second digit (0) is dialed, two tone bursts should be heard from the speaker and, on the primary mode and status panel (7A12), the STATUS TRANSMITTER HV ON and READY indicators should go out.

(10) On the radio line control (7A13), dial the digits 69. After the first digit (6) is dialed, one tone burst should be heard from the speaker. After the second digit (9) is dialed, two tone bursts should be heard from the speaker and, on the primary mode and status panel (7A12), the STATUS TRANSMITTER HV ON and READY indicators should light when the 10-kw P.A. has completed its tuning cycle.

d. Dialed Frequency Check. The following procedures will check the dialed frequency operation of the remote control (6A2). The first digit dialed (5 for receiver or 8 for transmitter) determines the equipment to be tuned, and the following six digits designate the desired frequency.

(1) On the radio line control (7A13) dial the digits 5 plus the desired 6 frequency digits. After the first digit (5) is dialed, one tone burst should be heard from the speaker. After the seventh digit is dialed, a continuous tone should be heard from the speaker while the receiver is tuning, and at the completion of the tuning cycle two tone bursts should be heard from the speaker. During the tuning cycle, on the primary mode and status panel (7A12) the STATUS RECEIVER READY indicator should go out and the SYS TUNING indicator should light at the completion of the receiver tuning cycle.

(2) On the radio line control (7A13), dial the digit 8 plus the selected 6-digit frequency. After the first digit (8) is dialed, one tone burst should be heard from the speaker. After the seventh digit is dialed, a continuous tone should be heard from the speaker while the transmitter is tuning. On the primary mode and status panel (7A12), the STATUS TRANSMITTER indicators CH A2, CH A1, CH B1, CH B2, and READY should go out while the transmitter is tuning. The SYS TUNING indicator is lit. At the completion of tuning, the SYS TUNING indicator should go out, the STATUS TRANSMITTER KEYED indicator should momentarily light, and then the STATUS TRANSMITTER CH A2, CH A1, CH B1, CH B2 and READY indicators should light. On the primary frequency select panel (7A11), the TRANSMITTER FREQUENCY DISPLAY should display the selected dialed frequency.

(3) On the radio line control (7A13), set the DIAL SELECT switch to the SWBD position.

(4) Press the PRIMARY RADIO AI OFF indicator pushbutton. The PRIMARY RADIO AI OFF indicator pushbutton should light and the PRIMARY RADIO AI RADIO indicator should go out.

(5) On the primary frequency select panel (7A11), press the LOCAL indicator pushbutton. The LOCAL indicator pushbutton should light and the REMOTE indicator should go out. The primary receivers and the transmitter should tune to the frequencies that are set on the RECEIVER FREQUENCY and TRANSMITTER FREQUENCY SELECT MEGACYCLES thumb wheel switches.

3-52. Telephone Subsystem Operation

When the telephone line terminal unit switches have been positioned to correctly arrange the circuitry to match the subscriber end-instrument, and the subscriber wire lines have been connected to the signal entry panel the subsystem is ready for operation. The operator actions required to provide service or assistance to the telephone subscribers are defined in *a* through *k* below for each type subscriber service connected.

a. Four-Wire Dial Subscriber Service. This type service is automatic and does not require operator No. 2 assistance or attention unless the subscriber dials the digit 0 requesting assistance, or inadvertently dials a nonexistent number. To complete the subscriber access to the automatic telephone switchboard at the dual line intercept position associated with the wireline subscriber, press the LINE pushbutton. If a call is established through the line intercept, operator No. 2 will not be alerted to any activity associated with this line. Should another subscriber advise the operator that the subscriber line is busy and cannot be reached, operator No. 2 may determine the status of the circuit by pressing the LINE INTERCEPT MON pushbutton on the telephone control panel (7A6). If the circuit is busy, the operator may then so advise the party placing the call.

b. Two-Wire Dial Subscriber Service. With the switches properly positioned on the telephone terminals (7A1, 7A2, or 7A3) and the associated LINE INTERCEPT LINE pushbutton pressed, no further action is required on the part of the operator. The operation of the 2-wire dial service from the operator No. 2 standpoint is identical to the 4-wire service described in *a* above.

c. Four-Wire Common Battery Manual Telephone Service.

(1) On the telephone control panel (7A6) at the LINE INTERCEPT modules for all common battery manual telephone subscribers, press the LINE INTERCEPT LINE indicator pushbutton. When the distant wire subscriber lifts his telephone receiver, the DSA ANSWER indicator pushbutton will flash, and the buzzer will sound to alert operator No. 2 that subscriber assistance is required.

(2) Press the DSA ANSWER indicator pushbutton. The buzzer should silence, the flashing DSA ANSWER indicator pushbutton should change to a steady indication, and the calling subscribers LINE INTERCEPT LINE indicator should light. This action also connects the operator No. 2 headset, microphone, and other equipment into the circuit. The operator then determines the number of the distant party that the caller wishes to reach.

(3) Operator No. 2 then presses the DSA indicator pushbutton. The DSA ANSWER indicator should go out and the DSA indicator pushbutton should light. A dial tone should be heard from the operator No. 2 headset and on the wire subscribers receive lines.

(4) Operator No. 2 then dials the desired subscriber telephone number on the dial. Operator No. 2 may remain in the circuit to determine that the called party answers. Press the DSA OFF indicator pushbutton. The DSA indicators should go out, the DSA OFF indicator pushbutton should light, and the calling subscribers LINE INTERCEPT LINE indicator should go out. This action removes operator No. 2 from the circuit and resets the DSA circuitry.

d. Two-Wire Common Battery Manual Telephone Service. The operator No. 2 actions required to provide service to subscribers who have 2-wire common battery manual telephone instruments is identical to that described in *c* above. No differences exist in the signals provided to operator No. 2 to alert him that service assistance is required.

e. Four-Wire Local Battery Telephone. The presentation to operator No. 2 at the LINE INTERCEPT module in the telephone control panel (7A6) associated with a subscriber having this type of telephone instrument is different from common battery subscribers in that the subscriber LINE INTERCEPT NORM indicator should be lit. The calling subscriber must turn a generator crank which provides a 20-cps signal on the line to initiate a call. When the local battery subscriber initiates a call, the operator No. 2 positional arm buzzer should sound, and the calling subscriber LINE INTERCEPT

scriber LINE INTERCEPT LINE indicator should flash.

(1) Operator No. 2 then presses the flashing LINE INTERCEPT LINE indicator pushbutton. The calling subscriber LINE INTERCEPT NORM indicator should change from a flashing to a steady indication. This action places the operator No. 2 headset, microphone, and other equipment into the circuit. The operator then determines the number of the distant party the caller wishes to reach.

(2) Operator No. 2 then presses the calling subscriber LINE INTERCEPT SWBD indicator pushbutton. The LINE INTERCEPT LINE indicator should go out and the LINE INTERCEPT SWBD indicator should light. A dial tone should be heard in the operator No. 2 headset and on the wire subscriber receive lines.

(3) Operator No. 2 then dials the desired subscriber telephone number. The operator may remain in the circuit to determine that the called party answers; or, if other calls are waiting, he may press the calling subscriber LINE INTERCEPT NORM indicator pushbutton, which leaves the calling party connected through the switchboard and waiting for the called party to answer the call. The operator should, when he is able, return to the circuit on which communication was attempted and, by pressing the LINE INTERCEPT MON indicator pushbutton, determine that the call was completed satisfactorily and no further assistance is required. When operator No. 2 presses the calling subscriber LINE INTERCEPT NORM indicator pushbutton, the LINE INTERCEPT SWBD indicator pushbutton should go out and the LINE INTERCEPT NORM indicator pushbutton should light. This action removes the operator No. 2 equipment from the circuit and connects the calling subscribers through the switchboard.

(4) When the calling subscriber terminates the call, he should signal the operator by placing a 20-cps signal on the line. The calling subscriber LINE INTERCEPT LINE indicator pushbutton should flash and the operator No. 2 position buzzer should sound. The operator then presses the flashing LINE INTERCEPT LINE indicator pushbutton. The LINE INTERCEPT NORM indicator pushbutton should go out and the LINE INTERCEPT LINE indicator pushbutton should indicate a steady indication. The operator No. 2 position alarm buzzer should be silenced. The operator then presses the LINE INTERCEPT NORM indicator pushbutton. The LINE INTERCEPT LINE indicator pushbutton should go out and the LINE INTERCEPT NORM indicator pushbutton should light. The circuit is now reset and is ready to accept another request for service.

f. Two-Wire Local Battery Telephone. The operation of the 2-wire telephone service at the operator No. 2 position is identical to that described for the 4-wire local battery telephone described in e above. Again, the calling party must initiate a signal to indicate to operator No. 2 that the conversation is terminated and the switchboard connection is to be released.

g. Four-Wire and Two-Wire Switchboard Trunk Circuits. Operation of the LINE INTERCEPT indicator pushbuttons to provide service on circuits connected to another switchboard on a 4-wire or a 2-wire basis is identical to that described for the telephone service. In some instances, the outside telephone exchange will provide a 20-cps ringing signal to the adjacent switchboard, or, in other instances, only a line-closure which is similar in operation to that of a common battery manual telephone. For those outside telephone switchboards operated on a local battery basis, the method of operation is identical to that described for the 4-wire and 2-wire local battery telephone service in d and e above.

h. Four-Wire and Two-Wire FSK Telephones and Switchboard Trunk Circuits. The FSK signal recognition equipment accepts the dial information and converts these FSK tones to dc pulses equivalent to the normal dial pulses. These derived dc pulses operate the automatic switchboard in a manner identical to that which would be completed in response to the 4-wire or 2-wire dial telephone subscriber service.

i. Dial Subscriber to Local Battery Subscriber. When a dial subscriber initiates a call to a local battery subscriber, one ring signal will automatically be placed on the local battery subscriber receive lines. On the telephone control panel (7A6), the SWBD indicator pushbutton on the called subscriber LINE INTERCEPT will flash and the operator No. 2 position buzzer should sound. Operator No. 2 presses the LINE INTERCEPT SWBD indicator pushbutton, causing the flashing light to give a steady indication and silencing the buzzer. This action places the operator No. 2 headset, microphone, and other equipment into the circuit. The operator then insures that the called party answers. If the called party did not

answer the call, the operator may furnish additional ringing by pressing the RING pushbutton. When the called party answers, the operator then presses the called subscriber LINE INTERCEPT NORM indicator pushbutton. The LINE INTERCEPT NORM indicator pushbutton should light and the LINE INTERCEPT SWBD indicator pushbutton should go out. This action removes the operator No. 2 equipment from the circuit and connects the calling subscriber through the switchboard.

j. Dial Telephone to Radio Operation.

(1) A subscriber with a dial telephone may dial any radio channel by dialing the 2-digit number assigned to that channel.

(2) The operator No. 1 position alarm should sound and, on the radio line control (7A13), the called radio channel LINE indicator pushbutton should flash on receipt of a call.

(3) Operator No. 1 presses the flashing LINE indicator pushbutton; this should silence the position alarm, cause a steady light on the LINE indicator pushbutton, and cause the OFF indicator to go out. The operator No. 1 microphone and headset are now connected into the circuit.

(4) Operator No. 1 should insure that on the primary mode and status panel (7A12), or on the secondary mode and status panel (7A5), the KEY LINE switch is in the XMIT position and the STATUS TRANSMITTER KEYED indicator should be lit.

(5) On the radio line control (7A13), press the selected radio channel JOIN indicator pushbutton. The JOIN indicator pushbutton should light and the LINE indicator pushbutton should go out. This action joins operator No. 1, the wire subscriber, and the distant radio subscriber.

(6) Operator No. 1 may elect to alert the distant radio subscriber by sending a voice message from the operator No. 1 microphone, or, by using the RING SELECT pushbuttons on the primary frequency select panel (7A11) or the secondary frequency select panel (7A4), he may send either a 1000/20- or 1,600-cps ring signal to the distant radio subscriber.

(7) To send a ring signal, the operator may press either RING SELECT 1000/20 or 1600 pushbutton for the desired radio channel, and on the radio line control (7A13), press the RING pushbutton.

(8) The operator should insure that good communication is available between the radio and wire subscribers; then, he may leave the circuit by pressing the desired radio channel HOLD indicator pushbutton on the radio line control (7A13).

(9) Operator No. 1 may gain access to the circuit at any time by pressing the desired radio channel HOLD indicator pushbutton. The HOLD indicator pushbutton should go out and operator No. 1 should be joined to the radio and wire subscriber.

(10) Operator No. 1 may monitor the wire-to-radio circuit at any time by pressing the desired radio channel MON indicator pushbutton on the radio line control (7A13). The MON indicator pushbutton should light and the communication between radio and wire subscriber may be heard in the operator No. 1 headset.

(11) Operator No. 1 may terminate the radio-to-wire connection by pressing the MON indicator pushbutton on the selected radio channel on the radio line control (7A13) and determining that the subscriber has terminated the call by the presence of a dial tone in the operator No. 1 headset; or, he may instruct the wire subscriber to dial the digit 0 after he terminates his call to the radio, alerting operator No. 2 that he has terminated his call. (12) Operator No. 1 resets the selected radio channel by pressing the OFF, HOLD, and MON indicator pushbuttons on the radio line control (7A13). The JOIN, HOLD, and MON indicator pushbuttons should go out and the OFF indicator should light.

k. Radio-to-Wire Operation.

(1) The distant radio subscriber may signal any radio channel with either a 1000/20 or 1,600-cps ring signal.

(2) Operator No. 1 will be alerted by a position alarm and the called radio channel RADIO indicator pushbutton on the radio line control (7A13) should flash.

(3) Operator No. 1 then presses the flashing RADIO indicator pushbutton. The RADIO indicator pushbutton should light, the position alarm should silence, and the OFF indicator should go out. This action connects the operator to the calling radio subscriber.

(4) The operator determines the number of the desired wire subscriber and presses the se-

lected radio channel JOIN indicator pushbutton. The RADIO indicator pushbutton should go out and the JOIN indicator should light. A dial tone should be heard in the operator No. 1 headset. Operator No. 1 then dials the wire subscriber number. The operator insures that satisfactory communication exists between the radio and wire subscribers and he may leave the circuit by pressing the HOLD indicator pushbutton on the selected radio channel. The HOLD indicator pushbutton should light.

(5) The operator No. 1 access to the radio wire circuit is the same as in j(9) above. Operator No. 1 may monitor the radio-wire circuit by performing step j (10) above.

(6) Operator No. 1 may terminate the radio wire connection by performing step j(11) above.

3-53. Nonsecure Data Subsystem Operation

When the teletypewriter subscriber connections have been completed and the loop currents have been adjusted as described in the setup instructions (para 3-47), perform steps a through h below to assure the operation of the nonsecure subsystem.

a. Primary 16-Channel VFTG to Radio Equipment.

(1) On the VFTG channel control (7A18), insure that the PRIMARY 16 CHANNEL VFTG CHANNEL 1 through 16 ON 1 and ON 2 pushbutton indicators are lit.

(2) On the telegraph line control (7A17), insure that SEND and RECEIVE FOX/TRAFFIC switches 1 through 16 are in the TRAFFIC position.

(3) On the primary mode and status panel (7A12), set the KEY LINE switch to the XMIT position. The STATUS TRANSMITTER KEYED indicator should light.

(4) On the radio line control panel (7A13), set the METER SELECT switch to the VFTG position.

(5) On the telephone control panel (7A6), press the 10 KW XMTR LEVEL pushbutton. With the 10 KW XMTR LEVEL pushbutton pressed, rotate the control below the 10 KW XMTR LEVEL pushbutton, while observing the meter located above the METER SELECT switch on the radio line control panel (7A13). Adjust the control for an indication of -12 on the meter.

NOTE

The operator may elect to use all or a portion of the available 16 channels of VFTG. The following chart indicates the level to set for the use of each of the 16 channels. If the operator elects to use only a portion of the 16 channels, he should perform the following operations on the VFTG channel control (7A18). Press the PRIMARY 16 CHANNEL VFTG CHANNEL ON 1 or ON 2 pushbutton indicator for the unused channel or channels for an off indication. Number of channels

selected	Set level
1	0 dbm
2	-3 dbm
3	-5 dbm
4	-6 dbm
5	-7 dbm
6	-8 dbm
7	-9 dbm
8	-9 dbm
9	-10 dbm
10	-10 dbm
11	-10 dbm
12	-11 dbm
13	-11 dbm
14	-12 dbm
15	-12 dbm
16	-12 dbm

(6) On the telephone control panel (7A6), the operator may use any of the radio channels (A2, A1, B1, or B2) for sending VFTG by pressing one of the 10 KW XMTR A2, A1, B1, or B2 indicator pushbuttons. When the selected 10 KW XMTR indicator pushbutton is pressed, the 10 KW XMTR OFF indicator pushbutton should go out and the selected 10 KW XMTR indicator pushbutton should light. This action connects the PRIMARY 16 CHANNEL VFTG tones to the selected radio channel of the primary transmitter.

(7) The operator may use any of the radio channels (A2, A1, B1, or B2) for receiving VFTG by pressing one of the 10 KW RCVR A2, A1, B1, or B2 indicator pushbuttons. When the selected 10 KW RCVR indicator pushbutton is pressed, the 10 KW RCVR OFF indicator pushbutton should go out and the selected 10 KW RCVR indicator pushbutton should light. This action connects the received audio of the selected radio channel to the VFTG receiving equipment. In the event that the selected 10 KW XMTR radio channel is different from the selected 10 KW

RCVR radio channel, the selected 10 KW XMTR radio channel received audio should be routed to the selected 10 KW RCVR channel radio line control (7A13).

(8) Using the operator teletypewriter (7A19) and the VFTG channel control (7A18) indicator pushbuttons, contact the landline subscriber and advise the subscriber that the radio loop is now connected and he should attempt contact with the distant terminal channel subscriber.

(9) To contact the subscriber, press the selected subscriber SEIZE indicator pushbutton. The selected SEIZE indicator pushbutton should light. Press the OPERATOR INTERCEPT OPER LOOP indicator pushbutton. The OPER LOOP indicator pushbutton should light and the operator and the subscriber may communicate.

NOTE

Should the landline subscriber fail to answer the call, contact the teletypewriter station via alternate communication means and request that the distant operator attend the teletypewriter and attempt to contact the AN/TSC-38B operator.

(10) When the landline subscriber has been advised to attempt contact with the distant terminal station, press the OPERATOR INTERCEPT MON LOOP indicator pushbutton. The OPERATOR INTERCEPT OPER LOOP indicator pushbutton should go out and the OPERATOR INTERCEPT MON LOOP indicator pushbutton should light. Observe that the landline subscriber transmission is being copied correctly on the operator teletypewriter (7A19).

(11) Press the OPERATOR INTERCEPT MON SET indicator pushbutton. The OPERATOR INTERCEPT MON LOOP indicator pushbutton should go out and the OPERATOR INTERCEPT MON SET indicator pushbutton should light. Observe that the distant terminal station transmission is being copied correctly on the operator teletypewriter (7A19).

(12) Should the landline subscriber have difficulty in contacting the distant terminal station, contact the distant terminal station via alternate communication means and advise the terminal operator that the landline subscriber is connected and is ready to communicate with the designated distant end terminal. Request assistance in establishing the required teletypewriter circuit. Complete periodic monitoring functions until the two subscribers are in communication.

(13) Repeat steps (8) through (12) for PRIMARY 16 CHANNEL VFTG CHANNEL 2 through 16.

NOTE

Insure that, during the operation of indicator pushbuttons on the VFTG channel control (7A18), only one SEIZE indicator pushbutton is pressed at a time. If more than one SEIZE indicator pushbutton is pressed, traffic in transmission on both channels will be disrupted. Damage will not result to installed equipment, but traffic time will be lost to the subsystem subscribers.

b. Primary 16 Channel VFTG Space Diversity Operation.

(1) On the telephone control panel (7A6), observe the 10 KW RCVR indicator pushbutton and note the lighted indicator pushbutton.

(2) On the audio patch panel (7A15), insure that no patchcords are connected between the VFTG DIV. INPUT 16 CH jack and the PRIMARY REC 2 NONDIVERSITY B2, B1, A1, or A2 jack as indicated by the corresponding 10 KW RCVR indicator pushbutton noted in a above.

c. Primary 16-Channel VFTG Frequency Diversity Operation. On the VFTG channel control (7A18), press the PRIMARY 16 CHANNEL VFTG CHANNEL 1 through 16 DIV indicator pushbuttons. The DIV indicator pushbuttons should light. This action terminates all even number landline telegraph subscribers and permits odd channel landline telegraph subscribers to send traffic on their own and adjacent even channel frequencies.

d. Primary Radio Wideband VFTG Channel Operation.

(1) On the VFTG channel control (7A18), insure that the WIDEBAND VFTG CHANNEL 1 ON 1 indicator pushbutton is lit.

(2) On the telegraph line control (7A17), insure that the SEND and RECEIVE FOX/TRAFFIC switches 19 are in the traffic position.

(3) On the primary mode and status panel (7A12), set the KEY LINE switch to the XMIT position. The STATUS TRANSMITTER KEYED indicator should light.

(4) On the radio line control (7A13), set the METER SELECT switch to the VFTG position.

(5) On the telephone control panel (7A6),

press the 10 KW XMTR OFF indicator pushbutton. The 10 KW XMTR OFF indicator pushbutton should light. Press the 10 KW XMTR WB indicator pushbutton. The 10 KW XMTR WB indicator pushbutton should light. Press and hold the 10 KW XMTR LEVEL pushbutton and rotate the control located below the 10 KW XMTR LEVEL pushbutton while observing the meter located above the METER SELECT switch on the radio line control (7A13). Adjust the control for an indication of 0 on the meter.

(6) On the telephone control panel (7A6), the operator may use any of the radio channels (A2, A1, B1, or B2) for sending the WB VFTG by pressing one of the 10 KW XMTR A2, A1, B1, or B2, indicator pushbuttons. When the selected 10 KW XMTR pushbutton is pressed, the 10 KW XMTR OFF indicator pushbutton should go out and the selected 10 KW XMTR indicator pushbutton should light. This action connects the wide-band VFTG tones to the selected radio channel of the primary transmitter.

(7) Repeat steps a(7) through (12) above.

e. Secondary VJ;TG to Radio Equipment.

(1) On the VFTG channel control (7A18), insure that the SECONDARY VFTG CHANNEL 1, 2, ON 1, and ON 2 indicator pushbuttons are lit.

(2) On the telegraph line control (7A17), insure that the SEND and RECEIVE FOX/TRAFFIC switches 17 and 18 are in the TRAFFIC position.

(3) On the secondary mode and status panel (7A5), set the KEY LINE switch to the XMIT position. The STATUS TRANSMITTER KEYED indicator should light.

(4) On the radio line control (7A13), insure that the METER SELECT switch is in the VFTG position.

(5) On the telephone control panel (7A6), press the 1 KW XMTR LEVEL pushbutton. With the 1 KW XMTR LEVEL pushbutton pressed, rotate the control below the 1 KW XMTR LEVEL pushbutton while observing the meter located above the METER SELECT switch on the radio line control (7A13). Adjust the control for an indication of -3 on the meter.

NOTE

The operator may elect to use only one channel of the secondary VFTG. If this is the case, he should press the SECONDARY VFTG CHANNEL ON 1 or ON 2 indicator pushbutton on the VFTG channel control (7A18) of the unused channel for an off indication, and set the telephone control panel (7A6) LEVEL control for an indication of 0 on the meter located above the METER SELECT switch on the radio line control (7A13).

(6) On the telephone control panel (7A6), the operator may use any of the radio channels (A2, A1, B1, or B2) for sending VFTG by pressing one of the 1 KW XMTR A2, A1, B1, or B2 indicator pushbuttons. When the selected 1 KW XMTR pushbutton indicator is pressed, the 1 KW XMTR OFF indicator pushbutton should go out and the selected 1 KW XMTR indicator pushbutton should light. This action connects the secondary transmitter.

(7) The operator may use any of the radio channels (A2, A1, B1, or B2) for receiving VFTG by pressing one of the 1 KW RCVR A2, A1, B1, or B2 indicator pushbuttons. When the selected 1 KW RCVR indicator pushbutton is pressed, the 1 KW RCVR OFF indicator pushbutton should go out and the selected 1 KW RCVR indicator pushbutton should light. This action connects the received audio of the selected radio channel to the VFTG equipment. In the event that the selected 1 KW XMTR radio channel is different from the 1 KW RCVR radio channel, the selected 1 KW XMTR radio channel received audio should be routed to the selected 1 KW RCVR channel radio line control (7A13).

(8) Repeat steps a(8) through (12) above. *f. Secondary VFTG Frequency Diversity Operation.* On the VFTG channel control (7A18), press the SECONDARY VFTG CHANNEL 1 DIV indicator pushbutton. The DIV indicator pushbutton should light. This action terminates the even channel landline telegraph subscriber (CHANNEL 2) and permits the odd channel (CHANNEL 1) landline telegraph subscriber to send traffic on CHANNEL 1 and CHANNEL 2 frequencies.

g. Secondary Radio Wideband VFTG Channel Operation.

(1) On the VFTG channel control (7A18), insure that the WIDEBAND VFTG CHANNEL 1 ON 1 indicator pushbutton is lit.

(2) On the telegraph line control (7A17), insure that the SEND and RECEIVE FOX/TRAFFIC switches 19 are in the traffic position.

(3) On the secondary mode and status panel (7A5), set the KEY LINE switch to the XMIT position. The STATUS TRANSMITTER KEYED indicator should light.

(4) On the radio line control (7A13), set the METER SELECT switch to the VFTG position.

(5) On the telephone control panel (7A6), press the 1 KW XMTR OFF indicator pushbutton. The 1 KW XMTR OFF indicator pushbutton should light. Press the 1 KW XMTR WB indicator pushbutton. The 1 KW XMTR WB indicator pushbutton should light. Press the 1 KW XMTR LEVEL pushbutton. With the 1 KW XMTR LEVEL pushbutton pressed, rotate the control below the 1 KW XMTR LEVEL pushbutton while observing the meter, located above the METER SELECT switch on the radio line control (7A13). Adjust the control for an indication of 0 on the meter.

(6) On the telephone control panel (7A6), the operator may use any of the radio channels (A2, A1, B1, or B2) for sending the wideband VFTG by pressing one of the 1 KW XMTR A2, A1, B1, or B2 indicator pushbuttons. When the selected 1 KW XMTR pushbutton is pressed, the 1 KW XMTR OFF indicator pushbutton should go out and the selected 1 KW XMTR indicator pushbutton should light. This action connects the wideband VFTG tones to the selected radio channel of the secondary transmitter.

(7) Repeat steps e(7) and (8) above. h. Fox Generator Operation. To introduce the output of the fox generator (7A26) into the land- line telegraph subscriber printer, or into the VFTG terminal for transmission to the distant terminal subscriber, perform steps (1) and (2) below.

(1) On the fox generator, set the OUTPUT switch to MESSAGE.

(2) On the telegraph line control (7A17), perform steps (a) through (d) below.

(a) Locate the FOX/TRAFFIC switch for the desired channel on the SEND area of the panel.

(b) Set the SEND FOX/TRAFFIC switch to the FOX position. This automatically introduces the test message into the circuit from the terminal to the landline telegraph subscriber page printer.

(c) Locate the FOX/TRAFFIC switch for the desired channel on the RECEIVE area of the panel.

(d) Set the RECEIVE FOX/TRAFFIC switch to the FOX position. This automatically introduces the test message into the circuit from the terminal to the distant VFTG terminal.

NOTE

The operator may be requested to send a dotter message (equal mark/space signals) to either the landline telegraph subscribers or the distant VFTG terminal subscribers. To accomplish this function, set the following switches on the fox generator (7A26) as indicated below.

Switch	Position
OUTPUT	CHARACTER
CHARACTER LENGTH-	
BITS.....	2

Perform steps (2) (b) through (d) above.

3-54. Secure Data Subsystem Operation

a. Primary Cryptographic Terminal to Pri- mary Radio Terminal.

(1) On the VFTG No. 2 (7A23), insert one end of a 3-circuit patchcord in the SEND TRUNKS PRI jack.

(2) The operator may connect the primary cryptographic send trunk to any of the primary 16 VFTG channels or the wideband channel by selecting a channel in the chart below and insert- ing the other end of the patchcord installed in step (1) above in the designated jack for the se- lected channel.

Primary 16-channel VFTG	Jack	Location
1	PRI KEYER DC EQUIP INPUT 1	7A23
2	PRI KEYER DC EQUIP INPUT 2	7A23
3	PRI KEYER DC EQUIP INPUT 3	7A23
4	PRI KEYER DC EQUIP INPUT 4	7A23
5	PRI KEYER DC EQUIP INPUT 5	7A23
6	PRI KEYER DC EQUIP INPUT 6	7A23
7	PRI KEYER DC EQUIP INPUT 7	7A23
8	PRI KEYER DC EQUIP INPUT 8	7A23

Primary

16-channel VFTG	Jack	Location
9	PRI KEYER DC EQUIP INPUT 9	7A23
10	PRI KEYER DC EQUIP INPUT 10	7A23
11	PRI KEYER DC EQUIP INPUT 11	7A23
12	PRI KEYER DC EQUIP INPUT 12	7A23
13	PRI KEYER DC EQUIP INPUT 13	7A23
14	PRI KEYER DC EQUIP INPUT 14	7A23
15	PRI KEYER DC EQUIP INPUT 15	7A23
16	PRI KEYER DC EQUIP INPUT 16	7A23
(wide- 1 band)	WB KEYER DC EQ IN 1	7A22

(3) On VFTG No. 2, insert one end of a 3- circuit patchcord in the REC TRUNKS PRI jack.

(4) The operator may connect the primary cryptographic receive trunk to any of the primary 16 VFTG channels or the wideband channel by selecting a channel in the chart below and inserting the other end of the patchcord installed in step (3) above in the designated jack for the selected channel.

Primary

16-channel VFTG	Jack	Location
1	PRI VF RECEIVER DC EQUIP OUTPUT 1	7A24
2	PRI VF RECEIVER DC EQUIP OUTPUT 2	7A24
3	PRI VF RECEIVER DC EQUIP OUTPUT 3	7A24
4	PRI VF RECEIVER DC EQUIP OUTPUT 4	7A24
5	PRI VF RECEIVER DC EQUIP OUTPUT 5	7A24
6	PRI VF RECEIVER DC EQUIP OUTPUT 6	7A24
7	PRI VF RECEIVER DC EQUIP OUTPUT 7	7A24
8	PRI VF RECEIVER DC EQUIP OUTPUT 8	7A24
9	PRI VF RECEIVER DC EQUIP OUTPUT 9	7A25
10	PRI VF RECEIVER DC EQUIP OUTPUT 10	7A25
11	PRI VF RECEIVER DC EQUIP OUTPUT 11	7A25
12	PRI VF RECEIVER DC EQUIP OUTPUT 12	7A25
13	PRI VF RECEIVER DC EQUIP OUTPUT 13	7A25
14	PRI VF RECEIVER DC EQUIP OUTPUT 14	7A25
15	PRI VF RECEIVER DC EQUIP OUTPUT 15	7A25
16	PRI VF RECEIVER DC EQUIP OUTPUT 16	7A25
(wide- 1 band)	WB VF RCVR DC EQ OUT 1	7A22

(5) At the teletypewriter group (5), the operator may use either the teletypewriter set (5A6) or the transmitter-distributor (5A4) to initiate a message.

(6) The teletypewriter set (5A6) and the reperforator (5A5) are used for receiving the primary cryptographic message.

NOTE

Refer to the applicable technical manual for the operation of the telegraph terminal equipment installed in the teletype- writer group (5).

b. Primary Cryptographic Terminal to Land- line Telegraph Subscriber.

(1) On the VFTG No. 2(7A23), insert one end of a 3-circuit patchcord in the SEND TRUNKS PRI jack.

(2) The operator may connect the primary cryptographic send trunk to any of the landline telegraph subscribers by selecting a subscriber in the chart below and inserting the other end of the patchcord installed in step (1) above in the designated jack for the selected landline tele- graph subscriber.

Landline telegraph subscriber No.	Jack	Location
1	PRI INTERNAL DC LOOP INPUT 1	7A24
2	PRI INTERNAL DC LOOP INPUT 2	7A24
3	PRI INTERNAL DC LOOP INPUT 3	7A24
4	PRI INTERNAL DC LOOP INPUT 4	7A24
5	PRI INTERNAL DC LOOP INPUT 5	7A24
6	PRI INTERNAL DC LOOP INPUT 6	7A24
7	PRI INTERNAL DC LOOP INPUT 7	7A24
8	PRI INTERNAL DC LOOP INPUT 8	7A24
9	PRI INTERNAL DC LOOP INPUT 9	7A25
10	PRI INTERNAL DC LOOP INPUT 10	7A25
11	PRI INTERNAL DC LOOP INPUT 11	7A25
12	PRI INTERNAL DC LOOP INPUT 12	7A25
13	PRI INTERNAL DC LOOP INPUT 13	7A25
14	PRI INTERNAL DC LOOP INPUT 14	7A25
15	PRI INTERNAL DC LOOP INPUT 15	7A25
16	PRI INTERNAL DC LOOP INPUT 16	7A25
17	SEC INT DC LP IN 1	7A22
18	SEC INT DC LP IN 2	7A22
19	WB INT DC LP IN 1	7A22

(3) On the VFTG No. 2 (7A23), insert one end of a 3-circuit patchcord in the REC TRUNKS PRI jack.

(4) The operator may connect the primary cryptographic receive trunk to any of the land- line telegraph subscribers by selecting a landline telegraph subscriber in the chart below and inserting the other end of the patchcord installed in step (3) above in the designated jack for the selected landline telegraph subscriber.

Landline telegraph subscriber No.	Jack	Location
1	PRI INTERNAL DC LOOP OUTPUT 1	7A23
2	PRI INTERNAL DC LOOP OUTPUT 2	7A23
3	PRI INTERNAL DC LOOP OUTPUT 3	7A23
4	PRI INTERNAL DC LOOP OUTPUT 4	7A23
5	PRI INTERNAL DC LOOP OUTPUT 5	7A23
6	PRI INTERNAL DC LOOP OUTPUT 6	7A23
7	PRI INTERNAL DC LOOP OUTPUT 7	7A28
8	PRI INTERNAL DC LOOP OUTPUT 8	7A23
9	PRI INTERNAL DC LOOP OUTPUT 9	7A23
10	PRI INTERNAL DC LOOP OUTPUT 10	7A23
11	PRI INTERNAL DC LOOP OUTPUT 11	7A23
12	PRI INTERNAL DC LOOP OUTPUT 12	7A23
13	PRI INTERNAL DC LOOP OUTPUT 13	7A23
14	PRI INTERNAL DC LOOP OUTPUT 14	7A23
15	PRI INTERNAL DC LOOP OUTPUT 15	7A23
16	PRI INTERNAL DC LOOP OUTPUT 16	7A23
17	SEC INT DC LP OUT 1	7A22
18	SEC INT DC LP OUT 2	7A22
19	WB INT DC LP OUT 1	7A22

(5) At the teletypewriter group (5), the operator may use either the teletypewriter set (5A6) or the transmitter-distributor (5A4) to initiate a message.

(6) The teletypewriter set (5A6) and the reperforator (5A5) are used for receiving the primary cryptographic message.

NOTE

Refer to the applicable technical manual for the operation of the telegraph terminal equipment installed in the teletype-writer group (5).

c. Primary Cryptographic Terminal to Secondary Radio Terminal.

(1) On the VFTG unit No. 2(7A23), insert one end of a 3-circuit patchcord in the SEND TRUNKS PRI jack.

(2) The operator may connect the primary cryptographic send trunk to either of the secondary channels or the wideband channel by selecting a channel in the chart below and inserting the other end of the patchcord, installed in step (1) above, in the designated jack for the selected channel.

Secondary 2-channel VFTG	Jack	Location
1	SEC KEYER DC EQ IN 1	7A22
2	SEC KEYER DC EQ IN 2	7A22
(wide- 1 band)	WB KEYER DC EQ IN 1	7A22

(3) On the VFTG No. 2, insert one end of a 3-circuit patchcord in the REC TRUNKS PRI jack.

(4) The operator may connect the primary cryptographic receive trunk to either secondary VFTG channel or the wideband channel, by selecting a channel in the chart below and inserting the other end of the patchcord installed in step

(3) above in the designated jack for the selected channel.

Secondary 2-channel VFTG No.	Jack	Location
1	SEC VF RCVR DC EQ OUT 1	7A22
2	SEC VF RCVR DC EQ OUT 2	7A22
(wide- 1 band)	WB VF RCVR DC EQ OUT 1	7A22

(5) At the teletypewriter group (5), the operator may use either the teletypewriter set (5A6) or the transmitter-distributor (5A4) to initiate a message. (6) The teletypewriter set (5A6) and the reperforator (5A5) are used for receiving the primary cryptographic message.

d. Secondary Cryptographic Terminal to Secondary Radio Terminal.

(1) On the VFTG No. 2(7A23), insert one end of a 3-circuit patchcord in the SEND TRUNKS SEC jack.(2) The operator may connect the secondary cryptographic terminal send trunk to either of the secondary VFTG channels or the wideband channel by selecting a channel in the chart below and inserting the other end of the patchcord, installed in step (1) above, in the designated jack for the selected channel.

Secondary 2-channel VFTG	Jack	Location
1	SEC KEYER DC EQ IN 1	7A22
2	SEC KEYER DC EQ IN 2	7A22
(wide- 1 band)	WB KEYER DC EQ IN 1	7A22

(3) On the VFTG No. 2, insert one end of a 3-circuit patchcord in the REC TRUNKS SEC jack.
 (4) The operator may connect the secondary cryptographic receive trunk to either secondary VFTG channel or the wideband channel by selecting a channel in the chart below and inserting the other end of the patchcord installed in step

(3) above in the designated jack for the selected channel.

Secondary

2-channel

VFTG No.	Jack	Location
1	SEC VF RCVR DC EQ OUT 1	7A22
2	SEC VF RCVR DC EQ OUT 2	7A22
(wide- 1 band)	WB VF RCVR DC EQ OUT 1	7A22

(5) At the teletypewriter group (5), the operator may use either the transmitter-distributor or the teletypewriter functions of the reperforator-transmitter (5A3) to initiate a message. (6) The reperforator function is used for receiving the secondary cryptographic message.

NOTE

Refer to the applicable technical manual for the operation of the telegraph terminal equipment installed in the teletypewriter group (5).

e. Secondary Cryptographic Terminal to Landline Telegraph Subscriber.

(1) On the VFTG No. 2(7A23), insert one end of a 3-circuit patchcord in the SEND TRUNKS SEC jack.

(2) The operator may connect the secondary cryptographic send trunk to any of the landline telegraph subscribers by selecting a subscriber in the chart below and inserting the other end of the patchcord installed in step (1) above in the designated jack for the selected landline telegraph subscriber.

Landline

telegraph

subscriber

No.	Jack	Location
1	PRI INTERNAL DC LOOP INPUT 1	7A24
2	PRI INTERNAL DC LOOP INPUT 2	7A24
3	PRI INTERNAL DC LOOP INPUT 3	7A24
4	PRI INTERNAL DC LOOP INPUT 4	7A24
5	PRI INTERNAL DC LOOP INPUT 5	7A24
6	PRI INTERNAL DC LOOP INPUT 6	7A24
7	PRI INTERNAL DC LOOP INPUT 7	7A24
8	PRI INTERNAL DC LOOP INPUT 8	7A24
9	PRI INTERNAL DC LOOP INPUT 9	7A25
10	PRI INTERNAL DC LOOP INPUT 10	7A25
11	PRI INTERNAL DC LOOP INPUT 11	7A25
12	PRI INTERNAL DC LOOP INPUT 12	7A25
13	PRI INTERNAL DC LOOP INPUT 13	7A25
14	PRI INTERNAL DC LOOP INPUT 14	7A25
15	PRI INTERNAL DC LOOP INPUT 15	7A25
16	PRI INTERNAL DC LOOP INPUT 16	7A25
17	SEC INT DC LP IN 1	7A22
18	SEC INT DC LP IN 2	7A22
19	WB INT DC LP IN 1	7A22

(3) On the VFTG No. 2, insert one end of a 3-circuit patchcord in the REC TRUNKS SEC jack.

(4) The operator may connect the secondary cryptographic receive trunk to any of the landline telegraph subscribers by selecting a landline telegraph subscriber in the chart below and inserting the other end of the patchcord installed in step (3) above in the designated jack for the selected landline telegraph subscriber.

Landline
telegraph
subscriber
No.

Jack

Location

1	PRI INTERNAL DC LOOP OUTPUT 1	7A23
2	PRI INTERNAL DC LOOP OUTPUT 2	7A23
3	PRI INTERNAL DC LOOP OUTPUT 3	7A23
4	PRI INTERNAL DC LOOP OUTPUT 4	7A23
5	PRI INTERNAL DC LOOP OUTPUT 5	7A23
6	PRI INTERNAL DC LOOP OUTPUT 6	7A23
7	PRI INTERNAL DC LOOP OUTPUT 7	7A23
8	PRI INTERNAL DC LOOP OUTPUT 8	7A23
9	PRI INTERNAL DC LOOP OUTPUT 9	7A23
10	PRI INTERNAL DC LOOP OUTPUT 10	7A23
11	PRI INTERNAL DC LOOP OUTPUT 11	7A23
12	PRI INTERNAL DC LOOP OUTPUT 12	7A23
13	PRI INTERNAL DC LOOP OUTPUT 13	7A23
14	PRI INTERNAL DC LOOP OUTPUT 14	7A23
15	PRI INTERNAL DC LOOP OUTPUT 15	7A23
16	PRI INTERNAL DC LOOP OUTPUT 16	7A23
17	SEC INT DC LP OUT 1	7A22
18	SEC INT DC LP OUT 2	7A22
19	WB INT DC LP OUT 1	7A22

(5) Repeat steps d(5) and (6) above. f. Secondary Cryptographic Terminal to Primary Radio Terminal. (1) On the VFTG No. 2(7A23), insert one end of a 3-circuit patchcord in the SEND TRUNKS SEC jack. (2) The operator may connect the secondary cryptographic send trunk to any of the primary 16 VFTG channels or the wideband channel by selecting a channel in the chart below and inserting the other end of the patchcord installed in step

(1) above in the designated jack for the selected channel.

Primary

16-channel
VFTG

Jack

Location

1	PRI KEYS DC EQUIP INPUT 1	7A23
2	PRI KEYS DC EQUIP INPUT 2	7A23
3	PRI KEYS DC EQUIP INPUT 3	7A23
4	PRI KEYS DC EQUIP INPUT 4	7A23
5	PRI KEYS DC EQUIP INPUT 5	7A23
6	PRI KEYS DC EQUIP INPUT 6	7A23
7	PRI KEYS DC EQUIP INPUT 7	7A23
8	PRI KEYS DC EQUIP INPUT 8	7A23
9	PRI KEYS DC EQUIP INPUT 9	7A23
10	PRI KEYS DC EQUIP INPUT 10	7A23
11	PRI KEYS DC EQUIP INPUT 11	7A23
12	PRI KEYS DC EQUIP INPUT 12	7A23
13	PRI KEYS DC EQUIP INPUT 13	7A23
14	PRI KEYS DC EQUIP INPUT 14	7A23
15	PRI KEYS DC EQUIP INPUT 15	7A23
16	PRI KEYS DC EQUIP INPUT 16	7A23
(wide- 1 band)	WB KEYS DC EQ IN	7A22

(3) On the VFTG No. 2, insert one end of a 3-circuit patchcord in the REC TRUNKS SEC jack.

(4) The operator may connect the secondary cryptographic receive trunk to any of the primary 16 VFTG channels or the wideband channel

by selecting a channel in the chart below and inserting the other end of the patchcord installed in step (3) above in the designated jack for the selected channel.

Primary

16B-channel

VFTG No.	Jack	Location
1	PRI VF RECEIVER DC EQUIP OUTPUT 1	7A24
2	PRI VF RECEIVER DC EQUIP OUTPUT 2	7A24
3	PRI VF RECEIVER DC EQUIP OUTPUT 3	7A24
4	PRI VF RECEIVER DC EQUIP OUTPUT 4	7A24
5	PRI VF RECEIVER DC EQUIP OUTPUT 5	7A24
6	PRI VF RECEIVER DC EQUIP OUTPUT 6	7A24
7	PRI VF RECEIVER DC EQUIP OUTPUT 7	7A24
8	PRI VF RECEIVER DC EQUIP OUTPUT 8	7A24
9	PRI VF RECEIVER DC EQUIP OUTPUT 9	7A25
10	PRI VF RECEIVER DC EQUIP OUTPUT 10	7A25
11	PRI VF RECEIVER DC EQUIP OUTPUT 11	7A25
12	PRI VF RECEIVER DC EQUIP OUTPUT 12	7A25
13	PRI VF RECEIVER DC EQUIP OUTPUT 13	7A25
14	PRI VF RECEIVER DC EQUIP OUTPUT 14	7A25
15	PRI VF RECEIVER DC EQUIP OUTPUT 15	7A25
16	PRI VF RECEIVER DC EQUIP OUTPUT 16	7A25
(wide- band)	WB VF RCVR DC EQUIP OUTPUT 1	7A22

(5) Repeat steps d(5) and (6) above.

3-55. Primary Radio Terminal Operation

a. Operator to Distant Radio Subscriber.

(1) At the radio line control (7A13), the operator may connect his circuits to any of the PRIMARY RADIO channels (A2, A1, B1 or B2) by pressing the selected channel RADIO indicator pushbutton. The selected channel RADIO indicator pushbutton should light and the selected channel's OFF indicator pushbutton should go out.

(2) At the primary mode and status panel (7A12), set the KEY LINE switch to the XMIT position. The STATUS TRANSMITTER KEYED indicator should light.

(3) The operator can initiate a voice message by pressing the push-to-talk switch and talking into the operator microphone (M-146/U). The distant terminal audio should be heard in the operator headset.

(4) The operator may elect to signal the distant radio terminal with either a 1,000/20- or 1,600-cps ringing signal by performing steps (a) and (b) below.

(a) At the primary frequency select panel (7A11), press the desired RING SELECT indicator pushbutton for the selected radio channel. The pressed RING SELECT indicator pushbutton should light.

(b) At the radio line control (7A13), press the RING pushbutton. The selected ring signal will be transmitted to the distant radio terminal on the selected radio channel. To remove the ring signal, release the RING pushbutton switch.

b. Simplex Operation.

(1) At the primary mode and status panel (7A12), press the SIMPLEX indicator pushbutton. The SIMPLEX indicator pushbutton should light.

NOTE

Press the unused radio channel XMTR and RCVR CHAN B2, CHAN B1, CHAN A1, or CHAN A2 indicator pushbuttons so their lights will be out. If a radio channel is not in use, insure that the unused radio channel ENABLE indicator pushbutton is pressed so the light is out. This action insures that all available power will be utilized in the used radio channels.

(2) The operator can initiate a voice message by pressing the push-to-talk switch and talking into the operator microphone. This action permits sending when the microphone is keyed, and receiving when the microphone is not keyed.

(3) On the primary mode and status panel (7A12), press the STMPLEX indicator pushbutton to return the primary radio terminal to du- plex operation. The SIMPLEX indicator should go out.

c. Operator Functions for Primary Radio Re- mote Control Operation.

(1) When the operator is directed by the FSK landline telephone subscriber to place the radio terminal in remote control, perform steps (a) through (g) below.

(a) At the primary frequency select panel (7A11), press the REMOTE indicator pushbutton. The LOCAL indicator pushbutton should go out and the REMOTE indicator p u s h b u t t o n should light.

(b) At the primary mode and status panel (7A12), set the KEY LINE switch to the PTT position.

(c) At the radio line control (7A13), press the PRIMARY RADIO AI JOIN indicator p u s h b u t t o n. The LINE indicator pushbutton should go out and the JOIN indicator pushbutton should light. This action releases the control of the radio terminal to the landline FSK telephone subscriber.

(d) The operator may leave the circuit by pressing the PRIMARY RADIO AI HOLD indicator pushbutton. The HOLD indicator pushbutton should light.

(e) At the primary mode and status panel (7A12), the operator may observe the STATUS indicator to determine the remote operational modes.

(f) At the primary frequency select panel (7A11), the remote selected frequencies should be d i s p l a y e d on the RECEIVER FREQUENCY DISPLAY and on the TR, ANSMITTER FRE- QUENCY DISPLAY.

(g) At the radio line control (7A13), the o p e r a t o r may monitor the remote circuit by pressing the PRIMARY RADIO AI MON indicator pushbutton. The MON indicator pushbutton should light and the remote audio should be heard in the operator's headset.

(2) To reset the primary radio to local control, perform steps (a), (b), and (c) below. (a) At the primary frequency select panel (7A11), press the LOCAL indicator pushbutton. The REMOTE indicator pushbutton should go out and the LOCAL indicator pushbutton should light. The radio equipment should resume to the frequencies that are set on the SELECT MEGA- CYCLES t h u m b w h e e l switches, and the RE- CEIVER F R E Q U E N C Y DISPLAY and the T R A N S M I T T E R FREQUENCY DISPLAY should indicate these frequencies.

(b) At the radio line control (7A13), press the PRIMARY RADIO AI OFF indicator p u s h b u t t o n. The JOIN indicator pushbutton should go out and the OFF indicator pushbutton should light.

(c) Press the P R I M A R Y RADIO AI HOLD indicator pushbutton. The HOLD indica- tor pushbutton should go out.

d. Primary Radio Receiver Select Operation. At the primary frequency select panel (7A11), the operator may select receivers on a channel basis by performing steps (1) and (2) below.

(1) The DIVERSITY SELECT CHAN B2, CHAN B1, CHAN A1, and CHAN A2 indicator p u s h b u t t o n s are the receiver select switches. When one of these indicator buttons is pressed, the indicator pushbutton should light, and on the primary mode and status panel (7A12) the RF GAIN RCVR 2 control should control the RF level of the selected diversity channel. This action selects the receiver (primary No. 2) (6A4) output to be routed to the telephone control panel (7A(:) 10 KW RCVR module.

(2) At the primary frequency select panel (7A11), the operator should press the DIVER- SITY SELECT CHAN B2, CHAN B1, CHAN A1, or CHAN A2 indicator pushbuttons so the indicator pushbuttons will be out if the output of the receiver (primary No. 1) (6A3) is desired. On the primary mode and status panel (7A12), the RF GAIN RCVR 1 control should control the RF gain of the receiver channel selected.

e. Primary Radio AFC Operation. At the primary mode and status panel (7A12), perform steps (1) through (6) below.

(1) Press the AFC ON indicator pushbutton. The AFC ON indicator and the STATUS RECEIVER AFC ON indicator should light.

NOTE

The PLT CARR LOST indicator and the SYS FAIL indicator may light if the receiver is not locked to the carrier of the distant radio terminal. (2) Set the NORMAL LEVEL SEL switch to the RCVR PC position.

(3) Press the AFC RESET pushbutton. The DEVIATION meter should indicate 0.

(4) Press and hold one of the SCAN pushbuttons while observing the indication of the

NORMAL LEVELS meter. If the indication on the meter starts to deflect to the left, release the pressed SCAN pushbutton switch and press and hold the adjacent SCAN pushbutton until a peak deflection is observed on the NORMAL LEVELS meter.

NOTE

If the indication of the NORMAL LEVELS meter deflects to full-scale before a peak is observed, set the RCVR CARR SENS switch to 2.

The STATUS RECEIVER PC 2 indicator should light. This action reduces the sensitivity of the received pilot carrier circuits. If necessary, the operator may set the RCVR CARR SENS to position 3, which further reduces the pilot carrier sensitivity, or to the VAR position. The STATUS RECEIVER indicators PC 3 or PC VAR should light indicating the position of the RCVR CARR SENS switch.

(5) When the DEVIATION meter indicates full-scale deflection, press the DEV X10 indicator pushbutton. The DEV X1 indicator pushbutton should go out and the DEV X10 indicator push-button should light. This action extends the DEVIATION meter indication from full-scale deflection of 100 cps to full-scale deflection of 1,000 cps.

NOTE

When the indication on the DEVIATION meter reaches full-scale deflection and the SCAN pushbutton is held in the depressed position, the indication will reset to full scale in the opposite direction and then continue to scan in the original direction.

(6) AFC lock is indicated by the extinguishing of PLT CARR LOSS and SYS FAIL indication lights and a peak on the NORMAL LEVELS meter.

f. Primary Radio Pilot Carrier Options. At the primary mode and status panel (7A12), perform steps (1) through (4) below as required for desired level operation.

(1) To operate at -20-dbm carrier suppression, set the XMTR PLT CARR switch to 1. The STATUS TRANSMITTER PC 1 indicator should light.

(2) To operate at -10-dbm carrier suppression, set the XMTR PLT CARR switch to 2. The STATUS TRANSMITTER PC 2 indicator should light.

(3) To operate at 0-dbm carrier suppression, set the XMTR PLT CARR switch to 3. The STATUS TRANSMITTER PC 3 indicator should light.

NOTE

Although a setting for 0-dbm suppression is provided, this is usually reserved for maintenance operation to permit qualified maintenance personnel to make an accurate adjustment of the -10-dbm and -20-dbm position settings.

(4) An additional variable carrier suppression control setting is available, but is normally not used with the AN/TSC-38B. Use of this position and the associated variable carrier suppression which may be obtained is provided for those applications where the transmitting and receiving facilities are employed in a fixed station application. Under these conditions, personnel familiar with the behavior of fixed radio propagation paths are able to adjust precisely the transmitting and receiving equipment to obtain the high quality service demanded of this type of facility. Field personnel may use this variable carrier suppression control when they have become qualified and experienced through practice during training periods. It must be recognized that a radio circuit which will operate quite satisfactorily at -20-dbm suppression settings can be rendered unusable if incorrect operation of the variable control setting is attempted.

g. Primary Radio Receiver Frequency Selection. At the primary frequency select panel (7A11), the primary receivers (6A3 and 6A4) are controlled by the same RECEIVER FREQUENCY SELECT MEGACYCLES thumbwheel switches. The frequency to which the receivers are to be tuned (in 100-cps increments) is positioned by the RECEIVER FREQUENCY SELECT MEGACYCLES thumbwheel switch.

NOTE

The 10-mc increment thumbwheel switch (left-hand section) is blocked beyond positions 0, 1, and 2. Do not try to force this thumbwheel beyond these three settings.

The desired frequency may be set into the switch window in any sequence of operation. The receivers will not follow the setting changes while the frequency is being set up. The last digit (right-hand switch section) is in 100-cps increments, and the left-hand section represents 10-mc

increments. Therefore, for a frequency of 6,875 kc (6.875 mc), the switch setting would be, reading left-to-right, 068750. Having determined the desired receiving frequency, and having set the RECEIVER FREQUENCY SELECT MEGACYCLES thumbwheel switches to the correct positions, perform steps (1), (2), and through (3) below.

(1) Insure that the LOCAL indicator push-button is lit.

(2) Press the RCVR TUNE pushbutton. This action causes the receiver to tune and, within 10 seconds, on the primary mode and status panel (7A12), the STATUS RECEIVER READY indicator should light, indicating that the receiver has completed its tune cycle.

NOTE

On the primary mode and status panel (7A12), the STATUS RECEIVER READY light should go out and the SYS TUNING indicator should light while the receiver is tuning. The SYS TUNING indicator should go out and the STATUS RECEIVER READY indicator should light at the completion of the receiver tune cycle.

(3) At the primary frequency select panel (7A11), check the RECEIVER FREQUENCY DISPLAY and insure that the selected receiver frequency is display.

h. Primary Radio Transmitter Frequency Selection. At the primary frequency select panel (7A11), the transmitter frequency is controlled from the TRANSMITTER FREQUENCY SELECT MEGACYCLES thumbwheel switches. The frequency to which this transmitting facility is to be tuned is positioned by the TRANSMITTER FREQUENCY SELECT MEGACYCLES thumbwheel switch. The stipulations governing switch position settings and frequency display provided for the receiver are also applicable to the TRANSMITTER FREQUENCY SELECT MEGACYCLES switch positions. Having set the desired transmitter frequency using the switches, complete steps (1) through (5) below.

(1) At the 10-kw P.A. (unit 2), insure that the LOCAL/REMOTE switch is in the REMOTE position.

(2) At the primary mode and status panel (7A12), check that the STATUS TRANSMITTER HV ON, PWR ON, and READY indicators are lit.

(3) At the primary frequency select panel (7A11), ensure that the LOCAL indicator push-button is lit. Press the XMTR TUNE pushbutton.

(4) At the primary mode and status panel (7A12), observe that the STATUS TRANSMITTER READY light goes out, and the SYS TUNING indicator lights while the transmitter is tuning. At the completion of the tune cycle, the SYS TUNING indicator should go out and the STATUS TRANSMITTER READY indicator should light.

(5) At the primary frequency select panel (7A11), the TRANSMITTER FREQUENCY DISPLAY should display the selected transmitter frequency.

NOTE

The tune cycle time of the transmitter should not exceed 20 seconds maximum.

i. Primary Radio Signal Monitoring.

(1) At the primary mode and status panel (7A12), perform steps (a) through (f) below.

(a) Set the NORMAL LEVEL SEL to the RCVR AUDIO PRI 1/DIV position. Observe the NORMAL LEVELS meter while rotating the NORMAL LEVEL AUDIO SEL switch to positions B2, B1, A1, and A2. This action will display the normal levels for the selected radio channels on the NORMAL LEVELS meter.

NOTE

The meter is calibrated to display a deflection in the green portion of the scale for an audio signal of 0 dbm at 1,000 cps.

(b) Set the NORMAL LEVEL SEL switch to the PRI 2 position. Observe the NORMAL LEVELS meter while rotating the NORMAL LEVEL AUDIO SEL switch to positions B2, B1, A1, and A2. This action will display the normal levels for the nonselected radio channels on the NORMAL LEVELS meter.

(c) Set the NORMAL LEVEL SEL switch to the EXCITER AUDIO position. Observe the NORMAL LEVELS meter while rotating the NORMAL LEVEL AUDIO SEL switch to positions B2, B1, A1, and A2. This action should display the normal exciter audio levels for each radio channel.

(d) Set the NORMAL LEVEL SEL to the EXCITER FR position. The output level of the exciter will be indicated on the NORMAL LEVELS meter.

- (e) Set the RF PWR SEL switch to the FWR position. The forward power output of the 10-kw P.A. (units 2) should be displayed on the RF POWER OUTPUT meter.

NOTE

The RF POWER OUTPUT meter is an average rms power meter used to provide the operator with a rough indication of output power.

- (f) Set the RF POWER SEL switch to the REFL position. The primary transmitter reflected power should be displayed on the RF POWER OUTPUT meter.
- (2) At the radio line control (7A13), perform steps (a) through (e) below.
 - (a) Set the METER SELECT switch to the XMTR position. This action allows the operator transmit signal level to the landline telephone subscriber to be displayed on the meter located above the METER SELECT switch.
 - (b) Set the METER SELECT switch to the RCVR position. This action allows the operator receive signal level from the landline telephone subscriber to be displayed on the meter located above the METER SELECT switch.
 - (c) Set the METER SELECT switch to the JOIN 1 position. This action allows the operator receive signal from the radio subscriber to be displayed on the meter located above the METER SELECT switch.
 - (d) Set the METER SELECT switch to the JOIN 2 position. This action allows the operator transmit signal to the radio subscriber to be displayed on the meter located above the METER SELECT switch.
 - (e) Set the METER SELECT switch to the OFF position.

3-56. Secondary Radio Terminal Operation

a. Operator to Distant Radio Subscriber.

- (1) Repeat the procedures given in paragraph 3-55a(1).
- (2) Repeat the procedures given in paragraph 3-55a(2) using the secondary mode and status panel (7A5).
- (3) The operator can initiate a voice message by pressing the push-to-talk switch and talking into the operator microphone (M-146/U). The distant terminal audio should be heard in the operator headset.
- (4) Repeat the procedures given in paragraph 3-55a(4) using the secondary frequency select panel (7A4).

b. Simplex Operation.

- (1) Repeat the procedures given in paragraph 3-55a(1) using the secondary mode and status panel (7A5).
- (2) Repeat the procedures given in paragraph 3-55b(2).
- (3) On the secondary mode and status panel (7A5), press the SIMPLEX indicator pushbutton. The SIMPLEX indicator should go out.

c. Operator Functions for Secondary Radio Remote Control Operation.

- (1) When the operator is directed by the FSK landline telephone subscriber to place the radio terminal in remote control, perform steps (a) through (g) below.
 - (a) Repeat the procedures given in paragraph 3-55c(1) (a) using the secondary frequency select panel (7A4).
 - (b) Repeat the procedures given in paragraph 3-55c(1) (b) using the secondary mode and status panel (7A5).
 - (c) Repeat the procedures given in paragraph 3-55c(1) (c) USING THE SECONDARY RADIO A1 JOIN indicator pushbutton.
 - (d) Repeat the procedures given in paragraph 3-55c(1) (d).
 - (e) Repeat the procedures given in paragraph 3-55c(1) (e) using the secondary mode and status panel (7A5).
 - (f) Repeat the procedures given in paragraph 3-55c(1) (f) using the secondary frequency select panel (7A4).
 - (g) Repeat the procedures given in paragraph 3-55c(1) (g) using the SECONDARY RADIO A1 MON indicator pushbutton.
- (2) To reset the secondary radio to local control, perform steps (a) (b) and (c) below.
 - (a) Repeat the procedures given in paragraph 3-55c(2) (a) using the secondary frequency select panel (7A4).
 - (b) Repeat the procedures given in paragraph 3-55c(2) (b) using the SECONDARY RADIO A1 OFF indicator pushbutton.
 - (c) Repeat the procedures given in paragraph 3-55c(2) (c) using the SECONDARY RADIO A1 HOLD indicator pushbutton.
- d. Secondary Radio AFC Operation.* Repeat the procedures given in paragraph 3-55e using the secondary mode and status panel (7A5).

- e. Secondary Radio Pilot Carrier Options. Repeat the procedures given in paragraph 3-55 using the secondary mode and status panel (7A5).
- f. Secondary Radio Receiver Frequency Selection. Repeat the procedures given in paragraph 3-55 using the secondary frequency select panel (7A4) for control of the secondary receiver (6A5), and the secondary mode and status panel (7A5), to observe the STATUS indications.
- g. Secondary Radio Transmitter Frequency Selection. Repeat the procedures given in paragraph 3-55h using the secondary frequency select panel (7A4).
 - (1) At the 1-kw P.A. (6A8), insure that the FREQUENCY MEGACYCLES selector switch is set to the AUTOMATIC position.
 - (2) Repeat the procedures given in paragraph 3-55h(2) using the secondary mode and status panel (7A5).
 - (3) Repeat the procedures given in paragraph 3-55h(3) using the secondary frequency select panel (7A4).
 - (4) Repeat the procedures given in paragraph 3-55h(4) using the secondary mode and status panel (7A5).
 - (5) Repeat the procedures given in paragraph 3-55h(5) using the secondary frequency select panel (7A4).

h. Secondary Radio Signal Monitoring.

- (1) At the secondary mode and status panel (7A5), perform steps ~~g~~ through (e) below.
 - (a) Set the NORMAL LEVEL SEL to the RCVR AUDIO position. Observe the NORMAL LEVELS meter while rotating the NORMAL LEVEL AUDIO SEL switch to positions B2, B1, A1, and A2. This action will display the normal levels for the selected radio channels on the NORMAL LEVELS meter.

NOTE

The meter is calibrated to display a deflection in the green portion of the scale for an audio input signal of 0 dbm at 1,000 cps.

- (b) Repeat the procedures in paragraph 3-55(1) (c).
- (c) Repeat the procedures in paragraph 3-55(1) (d).
- (d) Set the RF PWR SEL switch to the FWD position. The forward power output of the 1-kw P.A. (6A8) should be displayed on the RF POWER OUTPUT meter.

NOTE

The RF POWER OUTPUT meter is an average power indicating meter. It provides the operator with a coarse indication of output power.

- (e) Set the RF POWER SEL switch to the REFL position. The secondary transmitter reflected power should be displayed on the RF POWER OUTPUT meter.
- (2) Repeat the procedures in paragraph 3-55(2).

3-57. Remote Control Operation

The primary and secondary radio facilities may both be placed under control of the radio line control (7A13), or a remote telephone subscriber. Both facilities may be under the remote control condition simultaneously, and operated independently, although certain portions of the remote control (6A2) are operated on a shared basis. To place either, or both, radio terminals under control of a remote position, perform steps *a*, *b*, and *c* below.

- a. Remote Control of Primary Radio Terminal by Operator.* Repeat the procedures in paragraph 3-51a through *d*.
- b. Remote Control of Secondary Radio Terminal by Operator.* Perform steps *c* through *f* below to check the remote control using the operator No. 1 position controls, effecting a substitution of the operator for the remote wire subscriber.
- c. Remote Normal Preset Check.*

- (1) On the secondary frequency select panel (7A4), press the REMOTE indicator pushbutton. The LOCAL indicator should go out and the REMOTE indicator should light. On the secondary mode and status panel (7A5), the STATUS TRANSMITTER PWR ON indicator and the STATUS RECEIVER PWR ON, PCI READY, and DEV XI indicators should be the only indicators lit.
- (2) Repeat the procedure given in paragraph *a*(2).
- (3) On the radio line control (7A13), press the SECONDARY RADIO A1 RADIO indicator pushbutton. The SECONDARY RADIO A1 OFF indicator should go out and the SECONDARY RADIO A1 RADIO indicator pushbutton should light.
- (4) Set the DIAL SELECT switch to the

RADIO position. The secondary radio receiver and transmitter should tune to the frequencies that are selected on the RECEIVER FREQUENCY SELECT and TRANSMITTER FREQUENCY SELECT thumbwheel switches on the secondary frequency select panel (7A4). The RECEIVER FREQUENCY DISPLAY and the TRANSMITTER FREQUENCY DISPLAY should display the selected receiver and transmitter frequencies. The STATUS TRANSMITTER and RECEIVER indicators should display the condition of the mode select switches for NORM CHAN 3 on the remote control (6A2). Two tone bursts should be heard from the speaker when the remote control function is completed.

d. Dialed Preset Checks. This procedure checks the 10 preset dialing operations of the remote control (6A2).

(1) Repeat the procedures in paragraph 3-5**b**(1).

(2) Repeat the procedures in paragraph 3-5**b**(2) using the secondary frequency select panel (7A4) and the secondary mode and status panel (7A5) to observe the indications.

(3) Repeat the procedures in paragraph 3-5**b**(3) using the secondary frequency select panel (7A4) and the secondary mode and status panel (7A5) to observe the indications.

(4) Repeat steps (2) and (3) above CHAN 1 through CHAN 10 for the transmitter and the receiver digits.

e. Dialed Mode Checks.

(1) Repeat the procedures in paragraph 3-5**b**.

(2) Repeat the procedures in paragraph 3-5**b**(1) through (9) using the secondary mode and status panel (7A5) to observe the indications.

(3) On the radio line control (7A13), dial the digits 69. After the first digit (6) is dialed, one tone burst should be heard from the speaker. After the second digit (9) is dialed, two tone bursts should be heard from the speaker, and on the secondary mode and status panel (7A5) the STATUS TRANSMITTER HV ON and READY indicators should light when the 1-kw P.A. has completed its tuning cycle.

f. Dialed Frequency Check. The following procedures will check the dialed frequency mode of the remote control (6A2). The first digit dialed (5 for receiver or 8 for transmitter) selects the equipment to be tuned, and the following six digits designate the desired frequency.

(1) Repeat the procedures in paragraph 3-5**b**(1) and (2) using the secondary mode and status panel (7A5) and the secondary frequency select panel (7A4) to observe the indications.

(2) On the radio line control (7A13), set the DIAL SELECT switch to the SWBD position.

(3) Press the SECONDARY RADIO A1 OFF indicator pushbutton. The SECONDARY RADIO A1 OFF indicator pushbutton should light and the SECONDARY RADIO A1 RADIO indicator should go out.

(4) On the secondary frequency select panel (7A4), press the LOCAL indicator pushbutton. The LOCAL indicator pushbutton should light and the REMOTE indicator should go out. The secondary receiver and transmitter should tune to the frequencies that are set on the RECEIVER FREQUENCY and TRANSMITTER FREQUENCY SELECT MEGACYCLES thumbwheel switches.

g. Remote Control Operation by Landline Telephone Subscriber. The 10 channel frequency and mode information presets have been set into the switch positions to correspond to the assigned frequencies and modes of operation assigned to the AN/TSC-38B. The information in any of the 10 presets may be used with the primary and secondary transmitters as well as with the primary and secondary receivers. The determination of which equipment is commanded into the mode and frequency of a preset is determined by the telephone subscriber having access to the remote control, therefore, the operator must be continuously aware of the frequencies displayed at his area when either or both radio terminals are under control of a remote telephone subscriber. If one subscriber, unaware of the actions of the other subscriber, commands the primary transmitting terminal onto the same frequency being used by the secondary terminal for receiving, the operator should seize control of the equipment and notify the distant telephone subscriber that the requested frequency is temporarily denied. Normally, the same frequencies will not be operated simultaneously on both primary and secondary terminals. but since the capability for simultaneous operation exists, the operator must be alert to avoid possible equipment difficulty.

h. Operator Functions to Allow Landline Telephone Subscribers Access to Remote Control.

(1) Repeat the procedures in paragraph 3-55c for access to the remote control of the primary radio terminal.

(2) Repeat the procedures in paragraph 3-56c for access to the remote control of the secondary radio terminal.

3-58. Stopping Procedure

The entire system may be shut down or the individual major units may be deenergized. Perform steps *a* and *b* below to stop the equipment.

a. Normal Shutdown Procedure. To completely shut down the entire system, perform steps (1) through (11) below.

(1) On the primary frequency select panel (7A11) and the secondary frequency select panel (7A4), press all lighted VOICE TEST, RING SELECT, and DIVERSITY SELECT indicator pushbuttons. The lighted indicators should go out.

(2) Insure that the LOCAL indicator pushbuttons are lit. If the REMOTE indicator pushbutton is lit, press the LOCAL indicator pushbutton. The REMOTE indicator should go out and the LOCAL indicator should light.

(3) On the primary mode and status panel (7A12) and the secondary mode and status panel (7A4), perform steps (a) through (h) below.

(a) Set the KEY LINE switch to the OFF position.

(b) Press the DEV XI indicator pushbutton. The DEV XI indicator should light.

(c) Press all lighted indicator pushbuttons. The lighted indicators should go out.

(d) Set the XMTR PLT CARR switch to the OFF position.

(e) Set the RCVR CARR SENS switch to 1. The STATUS RECEIVER PC1 indicator should light.

(f) Set the NORMAL LEVEL SEL switch to the OFF position.

(g) Set the NORMAL LEVEL AUDIO SEL to position B2.

(h) Set the RF PWR SEL switch to the FWD position.

(4) On the radio line control (7A13), perform steps (a), (b), and (c) below.

(a) Press all NORMAL indicator pushbuttons. The NORMAL indicator should light.

(b) Set the DIAL SELECT switch to the SWB position.

(c) Set the METER SELECT switch to the OFF position.

(5) On the telephone control panel (7A6), press the 10 KW XMTR OFF, 10 KW RCVR OFF, 1 KW XMTR OFF and 1 KW RCVR indicator pushbuttons. The OFF indicator should light.

(6) On the power supply-battery charger (1A4), place the BATTERY circuit breaker to the down position.

(7) On the frequency changer (unit 4), place the INPUT circuit breaker to the down position.

(8) On the main ac power panel (1A1), place the GENERATOR NO. 1 MAIN DISCONNECT and GENERATOR NO. 2 MAIN DISCONNECT circuit breakers to their down positions.

(9) On the emergency power panel (1A2), check the ALARM BYPASS indicator pushbutton. If the indicator is lit, press the pushbutton.

(10) On the fire warning panel (1A6), check the ALARM BYPASS pushbutton indicator. If the indicator is lit, press the pushbutton.

(11) Shut down the engine generator (GT-GE-70-9-2) following the instructions furnished in TM 5-6115-339-12.

NOTE

If a power source other than the generator set is used, refer to the appropriate instructions to insure that power is properly shut down.

b. Emergency Shutdown Procedure. The entire system may be shut down by performing steps (1) through (5) below.

(1) On the power supply-battery charger (1A4), place the BATTERY circuit breaker to the down position.

(2) On the main ac power panel (1A1), place the GENERATOR NO. 1 MAIN DISCONNECT and the GENERATOR NO. 2 MAIN DISCONNECT circuit breakers to their down positions.

(3) On the emergency power panel (1A2), check the ALARM BYPASS indicator pushbutton. If the indicator is lit, press the pushbutton.

(4) On the fire warning panel (1A6), check the ALARM BYPASS indicator pushbutton. If the indicator is lit, press the pushbutton.

(5) Shut down the engine generator (GT-GE-70-9-2) following the instructions furnished in TM 5-6115-339-12.

NOTE

If a power source other than the generator set is used, refer to the appropriate instructions to insure that the power is properly shut down.

Table 5-1. Nomenclature Cross-Reference.

Reference designation	Type No.	Figure No.
1A1 -----	SB-2783/TSC-38B	3-1
1A2 -----	SB-2784/TSC-38B	3-3
1A3 -----	SB-2785/TSC-38B	3-2
1A4 -----	PP-4536/TSC-38B	3-4
1A6 -----	BZ-130/TSC-338B	3-5
2 -----	AM-4543/TSC-38B	3-6
3 -----	AIR CONDITIONER	3-8
4 -----	CV-2100/TSC-38B	3-7
5A1 -----	SB-2808/TSC-38B	3-9
5A2 -----	SB-2842/TSC-38B	3-10
5A15 -----	J-2649/TSC-38B	3-11
5A16 -----	J-2648/TSC-38B	3-12
6A2 -----	C-7010/TSC/38B	3-13
6A3, 6A4 and 6A5 -----	R-1402/TSC-38B	3-14
6A6 -----	SB-2808/TSC-38B	3-15
6A7 -----	C-7703/TSC38B	3-17
6A8 -----	AM-4544/TSC-38B	3-18
6A9 and 6A11 -----	T-1021/TSC-38B	3-20
6A12 -----	MX-8044/TSC-38B	3-21
6A13 -----	PP-4545/TSC-38B	3-22
6A15 -----	SB-2948/TSC-38B	3-16
6A16 -----	PP-6051/TSC-38B	3-19
7A1, 7A2 and 7A3 -----	TA-694/TSC-38B	3-23
7A4 -----	C-7084/TSC-38B	3-24
7A5 -----	C-7081/TSC-38B	3-25
7A6 -----	C-7091/TSC-38B	3-26
7A7 -----	PP-4543/TSC-38B	3-27
7A11 -----	C-7083/TSC-38B	3-28
7A12 -----	C-7080/TSC-38B	3-29
7A13 -----	C-7092/TSC-38B	3-30
7A14 -----	PP-4544/TSC-38B	3-31
7A15 -----	TA-693/TSC-38B	3-32
7A16 -----	TH-92/TSC-38B	3-33
7A17 -----	C-7085/TSC-38B	3-34
7A18 -----	C-7079/TSC-38B	3-36
7A22 -----	TH-67/TSG-38B	3-37
7A23 -----	TH-68/TSG-38B	3-38
7A24 -----	TH-69/TSG-38B	3-39
7A25 -----	TH-70/TSG-38B	3-40
7A26 -----	KY-590/TSC-38B	3-41
7A34 -----	SB-2947/TSC-38B	3-42
10A2 -----	Fuse box assembly	3-43

**CHAPTER 4
MAINTENANCE**

Section I. ORGANIZATIONAL MAINTENANCE

4-1. Scope of Organizational Maintenance

This section contains instructions covering organizational maintenance of the AN/TSC-38B. It includes instructions for performing periodic preventive maintenance to be accomplished by the organizational repairman.

- a. Preventive maintenance (para 4-3).
- b. Checking condition of antenna groups (para 4-6) and antenna mast assembly (para 4-7).
- c. Checking condition of battery compartment (para 4-6).
- d. Preventive maintenance of 10-kw P.A. (para 4-5).
- e. Lubrication (para 4-8).

4-2. Tools and Test Equipment Required

- a. Tools. Maintenance Kits MK-87, MK-88, and TE-50B.
- b. Test Equipment. Multimeter TS-352 B/U, used for measuring resistance and voltage. Hydrometer 40-B, or equivalent, used for measuring specific gravity of the storage batteries.
- c. Cleaning Materials. Use trichloroethane, cloths, lubricating oil, and sandpaper. These items are normally available to organizational maintenance personnel.

4-3. Organizational Preventive Maintenance

a. Preventive maintenance is the systematic care, inspection, and servicing of equipment to maintain it in serviceable condition, prevent breakdown, and assure maximum operational capability. Included are inspection and checking of parts, subassemblies, or units to reveal possibility of breakdown leading to failure prior to regularly scheduled periodic servicing. Whenever possible, preventive maintenance should be scheduled concurrently with other periodic inspections and the service schedule of the carrying vehicle. Organizational preventive maintenance is performed at weekly and monthly intervals because of constant use of the system in a 24-hour daily operational duty cycle.

- b. Weekly and monthly preventive maintenance checks and services charts are given in c and d below. The Reference column refers to specific paragraphs within this section where more detailed operational procedures and equipment characteristics are found.

c. Weekly Preventive Maintenance Checks and Services Chart.

Sequence No.	Item	Procedure	Reference
1	Antenna groups-----	Inspect and check Antenna Assemblies OE-39/TSC and OE-40/TSC-38B.	Para 4-4
2	Antenna hardware-----	Inspect and check guy wires for kinks or looseness and adjust tension. Check anchor devices, snubits, bolts, and nuts. Replace any missing hardware.	None
3	Transmission coaxial lines and insulators	Inspect all transmission cables from antenna terminators to shelter entry receptacles. Check for jacket breaks, cable fraying or deterioration. Tighten connectors, if found loose. Check insulators for cracks or chipping.	None
4	Power cables-----	Inspect all power cables from commercial or primary power source to shelter entry receptacles. Check for jacket breaks, cable fraying, and deterioration. Tighten any loose connectors.	None

Sequence No.	Item	Procedure	Reference
5	Battery compartment	Remove front panel of battery compartment, pull out battery drawer to a position where interior of the compartment can be checked for leakage, moisture condensation, or corrosion.	None
6	Batteries	Inspect storage batteries for loose terminals. Check electrolyte level and specific gravity.	Para 4-6
7	Air filter (air conditioner)	Check condition of air filter. If dirty, clean and replace.	Fig. 4-1
8	Panels and access covers (air conditioner) -	Check all panels and access covers. Secure tightly in place to prevent leakage of conditioned air, and to keep out dirt and dust.	None
9	Air inlets and outlets	Check all inlets and air discharge openings for obstruction or foreign matter. Free airflow is essential to proper operation.	None
10	Sight glass (refrigerant)	Turn off air conditioner and check condition of refrigerant by observing sight glass. Glass should be clear. If appearance is milky, or bubbles are present, check for leaks.	None

d. Monthly Preventive Maintenance Checks and Services

Sequence No.	Item	Procedure	Reference
1	System units, AN/TSC-38B	Observe that all equipment is correctly located, cleaned, and ready for use.	None
2	Publications	Verify that all applicable publications are complete and up to date.-	DA Pam 310-4.
3	Modifications	Check DA Pam 310-7 to determine if new applicable MWO's have been published. All URGENT MWO's must be applied immediately, and all that are ROUTINE must be scheduled.	TM 38-750 and DA Pam 310-4.
4	Lubrication	Perform all required lubrication	Para 4-8
5	Fuses	Inspect fuse holders and fuses	Para 4-9
6	Interlocks	Check for shorted, improperly installed, loose, bent, or broken interlocks.	None

4-4. Antenna Groups

a. Antenna masts should be carefully inspected for signs of wear and damage. Principal areas of inspection are listed below.

WARNING

before commencing inspection of antenna equipment, turn off the transmitters so that personnel will not be exposed to harmful radiation.

(1) Inspect pulleys and brackets to verify that they are securely mounted and cables are properly positioned over the pulley sheaves.

(2) Inspect the latch release lanyard for fraying or kinks.

(3) Check for dents or corrosion on mast base and tube sections.

(4) Inspect baluns, spreaders, and feeder lines.

b. If corrosion is detected, clean and sand lightly the affected area with fine sandpaper. After cleaning and sanding, apply two coats of paint to deter further corrosion. (Refer to TM 746-10 for refinishing instructions.)

4-5. 100-Kw P.A.

a. *Weekly.*

(1) Remove and clean air filters, if necessary.

(2) Clean interior of power supply and RF cabinets. Pay particular attention to high voltage points, insulators, and vacuum variable capacitors. Use a clean cloth to wipe off all accumulations which tend to gather at these points.

(3) Examine rotary coils for tight contacts, and clean off any accumulation of dirt.

b. *Monthly.*

(1) Examine power amplifier tube socket for bent or broken finger-stock. Clean the socket and ceramic and radiator portions of the tube.

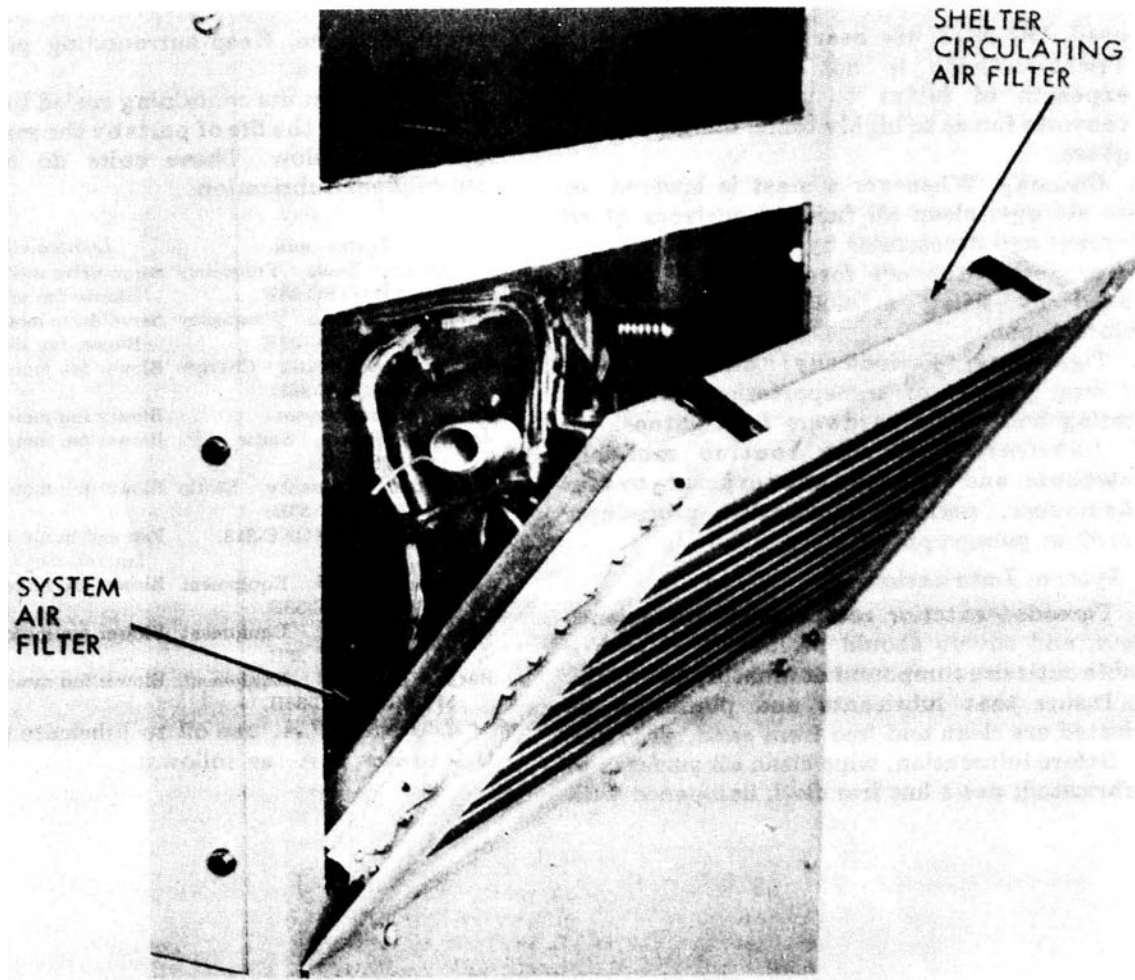


Figure 4-1. Air condition, location of air filters.

- (2) Examine all RF fittings for tightness, and insure that air gasket material on the drive and side panels are as airtight as possible.
- (3) Examine all chain drivers, sprockets, and idlers for alignment and ease of control. Adjust chain idlers, if necessary, so that only a small amount of slack is noticeable in a run of chain, and control backlash is at a minimum.
- (4) Perform all required lubrication (para 3-8).

4-6. Deleted.

4-7. Antenna Mast Assembly

a. Inspection. Inspect antenna masts for signs of wear and damage after any period of transportation, whenever equipment is taken out of storage, before erection, and after lowering mast. Principal areas of inspection are as follows:

- (1) Inspect all guy cables and lifting cables for wear, fraying, or kinks.
- (2) Inspect all pulleys and pulley brackets to see that they are securely mounted and all cables are properly running over the pulley sheaves.
- (3) Inspect the latch release lanyard for fraying or kinks.
- (4) Inspect the latch for damage; pay particular attention to the latch string.
- (5) Inspect all tubes, mast base, and surfaces for damage. Dented or severely gouged surfaces indicate possible additional part alignment damage.

WARNING

The fumes of trichloroethane are toxic. Provide thorough ventilation whenever used. DO NOT use near an open flame. Trichloroethane is not flammable, but exposure of fumes to in open flame converts fumes to highly toxic, dangerous gases.

b. Cleaning. Whenever a mast is lowered, or before storage, clean all finished surfaces of all equipment and accessories by wiping with a dry, lint free cloth. Stubborn foreign matter may be removed by using a cloth dampened with trichloroethane.

c. Tightening. Periodically, and especially after long periods of transportation, check all mounting and clamp hardware for tightness.

d. Lubrication. During routine monthly maintenance, and especially after exposure to rain or dampness, perform lubrication procedures outlined in paragraph 4-8.

4-8. System Lubrication

a. Threaded exterior receptacles, convenience outlets, and covers should be lubricated with a suitable antiseize compound at monthly intervals.

b. Insure that lubricants and points to be lubricated are clean and free from sand, grit, and dirt. Before lubrication, wipe clean all surfaces to be lubricated; use a lint free cloth dampened with trichloroethane. Keep surrounding parts free of trichloroethane.

c. System units containing sealed ball bearings lubricated for the life of parts by the manufacturer are listed below. These units do not require subsequent lubrication.

System unit	Lubricated part
Amplifier, Radio Frequency Servo drive motor; AM-4544/TSC-38B.	Blower fan motor.
Amplifier, Radio Frequency AM-4543/TSC-38B.	Servo drive motor; Blower fan motor
Power Supply-Battery Charger PP-4536/TSC-38B.	Blower fan motor
Battery Compartment	Blower fan motor
Inverter, Power, Static PP- 4545/TSC-38B.	Blower fan motor
Converter, Frequency, Static CV-2100/TSC-38B.	Blower fan motor
Air Conditioner MOAC-313.	Fan and motor (¾-hp); fan and motor 1-hp).
Rack, Electrical Equipment MT-3622/TSC-38B.	Blower fan motor
Rack, Electrical Equipment MT-3624/TSC-38B.	Blower fan motor
Rack, Electrical Equipment MT-3625/TSC-38B.	Blower fan motor

d. 10-Kw P.A. use oil to lubricate sections of the 10-Kw P.A. as follows:

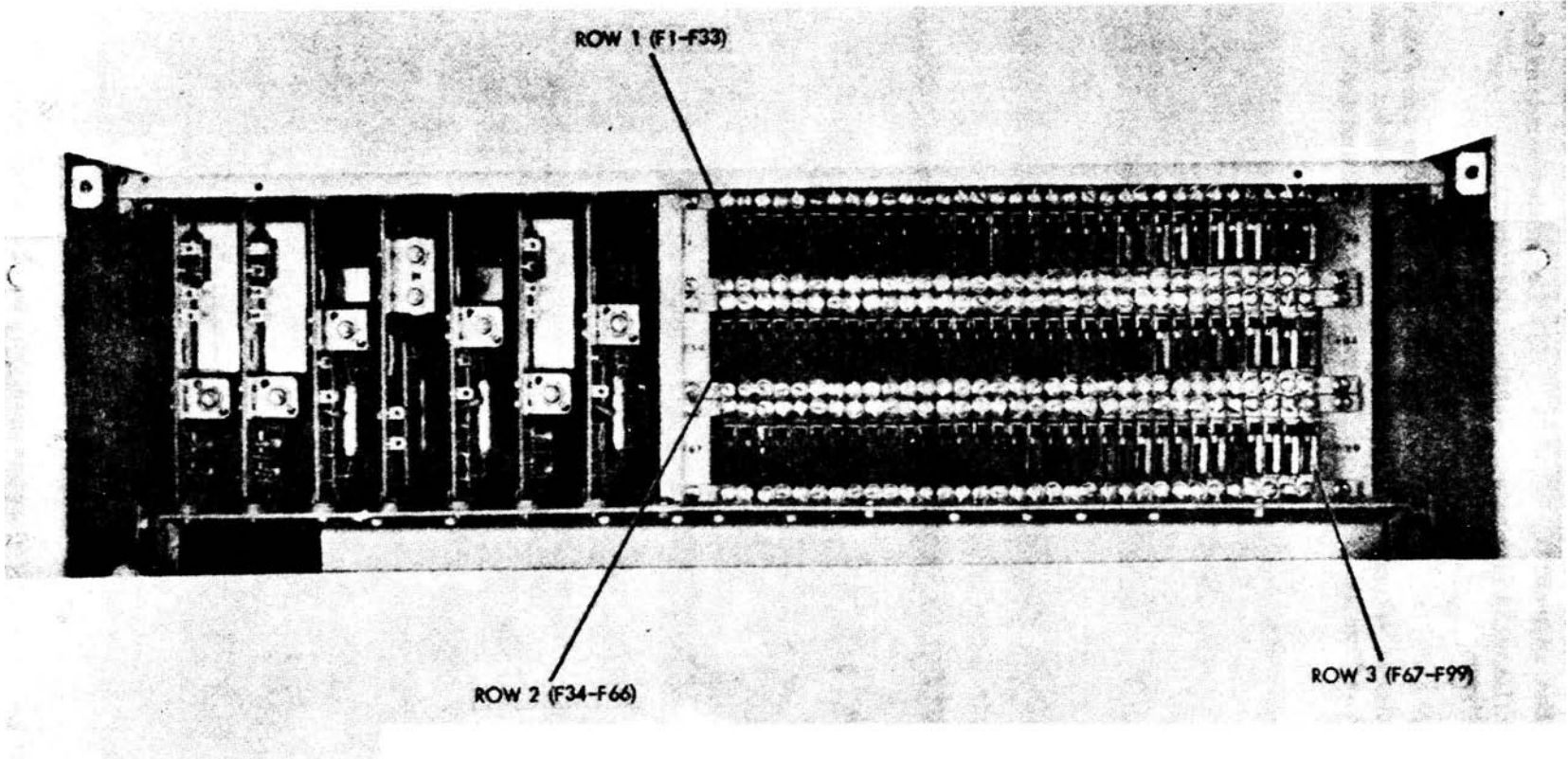


Figure 4-2. Terminal, Telegraph TH-67/TSC-38B, location of fuses.

- (1) Apply a slight amount of lubricant to all chains.
- (2) Apply a thin coat of lubricant to all roller transverse shafts; and then, wipe off.
- e. Antenna Mast Assembly. Use oil to lubricate sections of antenna mast as follows:

CAUTION

Do not overlubricate. Apply oil sparingly, and carefully wipe off excess oil.

- (1) Lubricate the griphoist levers and all exposed moving parts.
- (2) Lubricate the mast base assembly hinges.
- (3) Lubricate threads of the turnbuckles and snubit lockscrews.

4-9. Fuse Location

The front panel fuses are shown in figures 3-1 through 3-42. The behind front panel fuses are shown in figures 4-2 and 4-3.

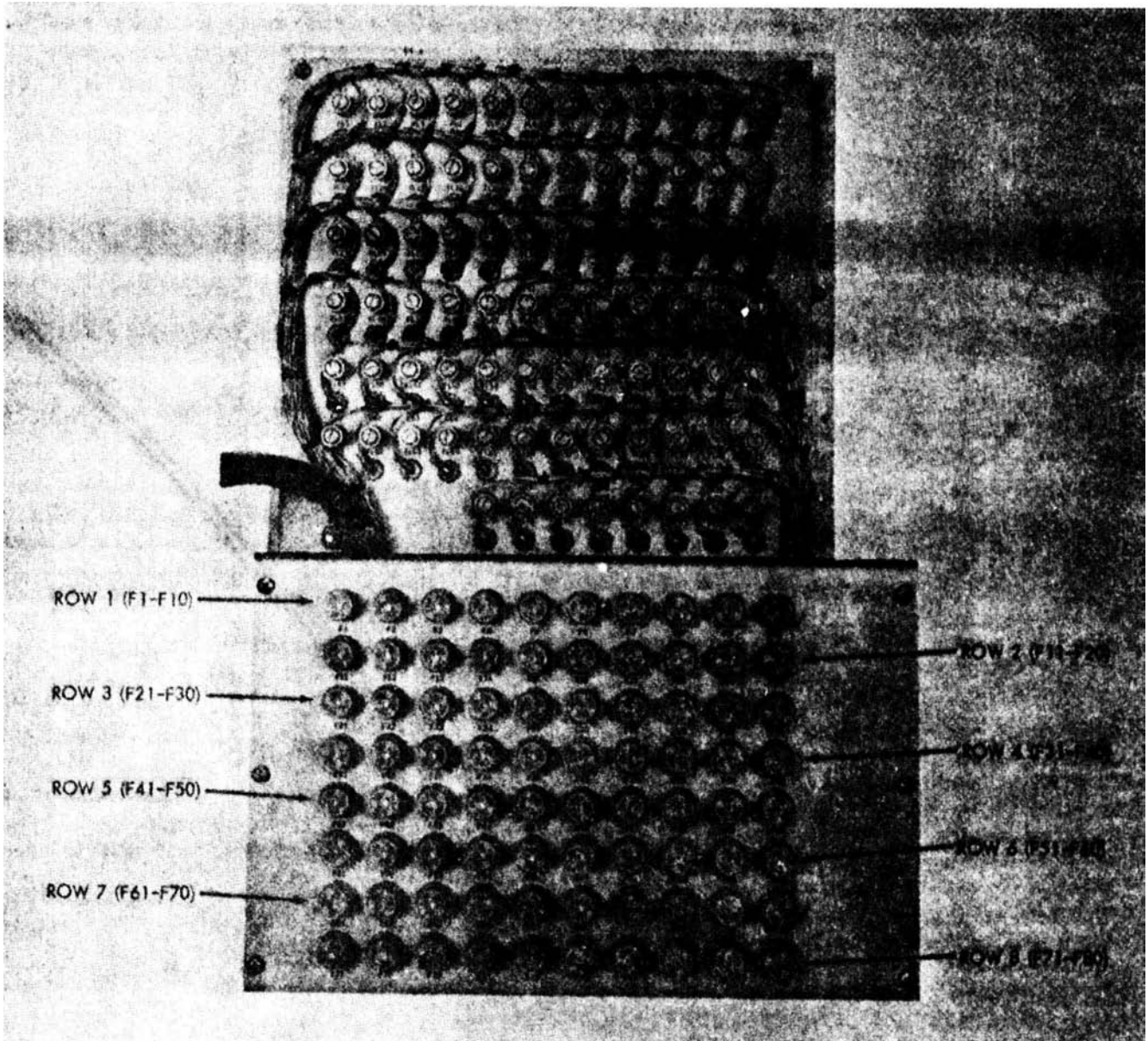


Figure 4-3. Telephone or teletype signal entry panel, location of fuses.

Section II. TROUBLESHOOTING

4-10. Visual Inspection

Troubles are sometimes caused by defects that are easy to see. Such defects are listed below. Check as many of these as may apply to the troubleshooting problem before using more involved procedures.

- a. Sprung or damaged unit frames, resulting in improper operation of interlocks when units are closed.
- b. Units improperly secured, allowing interlocks to open under slight shock or vibration.
- c. Burned-out fuses, indicated by illumination of blown-fuse indicators.
- d. Improper position of switches and improper meter readings.
- e. Obvious damage or mechanical abnormalities, especially of the antenna and RF line sections.
- f. Presence of dirt, corrosion, moisture, and bits of wire and solder inside the equipment units.
- g. Inadequate provisions for ventilation.
- h. Worn, broken or disconnected cables, wire, and plugs.
- i. Incorrect interunit cable connections and internal cable connections.
- j. Loose tube shields and clamps, resulting in improperly seated tubes.
- k. Cracked or charred resistors.
- l. Bulging or leaking electrolytic capacitors.
- m. Blistering of paint and other signs of over-heating on transformers, chokes, potentiometers, and motors.
- n. Discoloration of the insulation on wires. Under heavy overloads, it is possible for some wires to metal and produce no visible evidence other than a slight discoloration of the insulation surrounding the wire.

4-11. Sectionalization, Localization, and Isolation of Trouble

a. *General.* Sectionalization of trouble consists of tracing the fault to the system or unit responsible for the abnormal operation. Localization consists of tracing the trouble to the faulty assembly, subassembly, network, channel, circuit, or stage. For example, after trouble has been sectionalized, the trouble may be localized to one of the amplifiers. Isolation consists of tracing the trouble to the defective part after completion of localization. The organizational maintenance repairman will perform only very limited isolation. When faults do occur, the repairman must locate and correct them as rapidly as possible. It is seldom possible to observe a symptom of trouble and immediately diagnose the cause. Usually it will be necessary to perform the sequence of troubleshooting steps referred to as sectionalization, localization, and isolation of trouble.

b. *Procedure.* When the cause of the failure is not known immediately, the 'defect usually can be sectionalized by following the systematic method used to put the system into operation while keeping a close watch for abnormal indications, such as faulty equipment meter readings or the failure of .controls to function properly. If the abnormal indication does not sectionalize the trouble, use a process of eliminating systems that are operating properly to discover the defective one. Localization and isolation can then be performed. Some faults such as burned-out resistors, inoperative blowers, and RF arcing, can be located by sight, smell, and hearing. The majority of faults, however, can be located only by making further checks with the aid of a higher category of maintenance.

4-12. Equipment Performance Checklist

a. *General.* The equipment performance checklist is a step-by-step procedure based on the equipment starting, operating, and testing procedures for sectionalizing, localizing, and sometimes isolating trouble. When using the checklist, start at the beginning and follow each step in order. If an abnormal indication is obtained, follow the procedures given in the Corrective measures column before proceeding to the next step. If the trouble persists after the corrective measures have been performed, troubleshooting is required by a higher category of maintenance. Note on the repair tag how the equipment performed and what corrective measures were taken, if the equipment is turned in for repair.

b. Equipment Performance Checklist.

Action	Normal indication	Corrective measures
<p>1 Energize shelter lighting and air conditioning with shelter equipment door open. <i>Note.</i> The ALARM BYPASS indicator on emergency power panel (1A2) and the ALARM BYPASS indicator on the fire warning panel (1A6) may light. Press each indicator until it goes out.</p>	<p>The ALARM BYPASS indicator lights to out.</p>	<p>Higher category of maintenance required.</p>
<p>a. On the main ac power panel (1A1), place both MAIN DISCONNECT circuit breakers to the down position. b. Start engine generator GTGE 70-9-2 following the instructions in TM5-6115-339-12. If a power source other than the generator set is to be used, refer to the appropriate instructions to insure that power is properly applied.</p>	<p>On the main ac power panel(1A1) the GENERATOR NO. 1 PHASE SEQUENCE ABC and LINE FREQUENCY 400 CPS indicators light.</p>	<p>Check lamps. Higher category of maintenance required.</p>
<p><i>Note.</i> The ALARM BYPASS (generator No. 1) on the main ac power panel (1A1) and BLACKOUT BYPASS on the normal power panel (1A3) may light. Press each indicator until it goes out</p>	<p>The ALARM BYPASS and BLACKOUT BYPASS indicators go out.</p>	<p>Higher category of maintenance required.</p>
<p>c. On the main ac power panel (1A1), turn the LINE SELECTOR switch through the GEN NO. 1 positions ØA, ØB, and ØC. d. Set the TECHNICAL BUS SELECTOR switch to GEN NO. 1 position.</p>	<p>The LINE VOLTAGE meter indicates 120 vac indication on each phase.</p>	<p>Higher category of maintenance required.</p>
<p>e. Place the MAIN DISCONNECT circuit breaker for GEN NO. 1 to the up position.</p>	<p>Noise from equipment blower motors and teletypewriters may be heard, and certain equipment indicators may light. The number of blower motors operating and equipment indicators lighted may vary with respect to prior switch settings. No action is required at this time to silence the blower motors, or to extinguish the indicators.</p>	<p>Higher category of maintenance required.</p>
<p><i>Note.</i> If the air conditioner is heard operating, set the INPUT circuit breaker on the frequency changer (unit 4) to the down position.</p>	<p>The air conditioner shuts down</p>	<p>Higher category of maintenance required.</p>
<p>f. Set the light switch (located along the left of the main ac power panel (1A1)) to the down position. g. On the normal power panel (1A3), press the BLACKOUT BYPASS indicator.</p>	<p>The BLACKOUT BYPASS indicator pushbutton lights. <i>Note.</i> Depending on previous equipment switch settings, the emergency lights may light</p>	<p>Check lamp. Higher category of maintenance required.</p>
<p>h. On the' normal power panel (1A3) place the LIGHTS circuit breaker to the up position. i. Set the light switch (located along the left of the main ac power panel(1A1)) to the up position.</p>	<p>The normal shelter lights to on</p>	<p>Check lamps. Higher category of maintenance required.</p>

Action	Normal Indication	Corrective measure
<p>Note. The equipment shelter door may now be closed.</p> <p>j. At the air-conditioner panel (unit 3), place the COMPRESSOR circuit breaker and CONTROL CIRCUIT circuit breaker to the up position and set the SELECTOR SWITCH to VENTILATING.</p> <p>k. On the main ac power panel (1A1), set the NONTECHNICAL BUS SELECTOR switch to GEN NO. 1, and the FREQUENCY CHANGER circuit breaker to the up position.</p> <p>L. On the frequency changer (unit 4), using a quick positive motion, place the INPUT circuit breaker to the up position.</p> <p>m. At the air-conditioner panel (unit 3), set the SELECTOR SWITCH to COOLING.</p> <p>n. At the air-conditioner panel (unit 3), set the SELECTOR SWITCH to HEATING. Note. The SELECTOR SWITCH allows the operator to elect HEATING, COOLING, or VENTILATING (environmental air circulation) mode of operation. The selected mode should be determined by the shelter environmental temperature.</p> <p>o. Set switches and controls as indicated in paragraph 3-44. 2 Apply power to shelter subassemblies.</p> <p>a. On the normal power panel (1AB), place the following circuit breakers to the up positions: DC PWR SUP, EXT OUT, PRI EXC, PRI VFTG, FOX GEN, PRI RCVR No. 1, PRI RCVR NO. 2, PRI LIN PWR AMP, and 3 UTILITY OUTLETS.</p> <p>b. On the power supply-battery charger(1A4), place the INPUT A. C. circuit breaker to the up position.</p> <p>c. Deleted.</p> <p>d. On the power inverter (6A13) place the INPUT DC circuit breaker to the up position.</p> <p>e. Place the OUTPUT 1i circuit breaker to the up position.</p> <p>Note. If the ALARM BYPASS indicator pushbutton on the secure ac power panel(5A1) lights, press the pushbutton to extinguish the light</p>	<p>The equipment shelter interior lights remain illuminated.</p> <p>An audible sound is heard from the frequency changer.</p> <p>The blower motor in the air conditioner operates after approximately 8 seconds. The POWER ON indicator on the air conditioner lights.</p> <p>The compressor is heard after approximately 5 seconds and the COMPRESSOR READY indicator lamp lights. The air-conditioner blower motor is heard after approximately 8 seconds.</p> <p>An audible sound is heard from the power supply-battery charger and the INPUT A.C. lamp lights.</p> <p>The DC indicator lights and power inverter operation is heard. The OUTPUT 10 indicator lights.</p> <p>The ALARM BYPASS indicator light goes out</p>	<p>Higher category of maintenance required.</p> <p>Check fuses 10F1, 10F2 and 10F3 on fuse and lamp panel 10A2. On the frequency changer (unit4), check fuses F1, F2 and F3. Higher category of maintenance required. Higher category of maintenance required.</p> <p>Check lamp. Higher category of maintenance required. Check lamp. Higher category of maintenance required.</p> <p>Higher category of maintenance required.</p> <p>Check lamp. Higher category of maintenance required.</p> <p>Check lamp. Higher category of maintenance required.</p> <p>Check lamp. Higher category of maintenance required.</p> <p>Check lamp. Higher category of maintenance required.</p>

Action	Normal Indication	Corrective measures
<p>f. On the power inverter (6A13), place the OUTPUT 30 circuit breaker to the up position.</p>	<p>The OUTPUT 30 indicator lights and equipment blowers operate.</p>	<p>Check lamp. On the emergency power panel (1A2), check the BLOWER fuse. Higher category of maintenance required.</p>
<p>g. Place the OUTPUT DC circuit breaker to the up position.</p>	<p>The OUTPUT DC indicator lights and the NORM indicator on the amplifier-decoder-power distribution assembly (6A12) lights.</p>	<p>Check lamps. Higher category of maintenance required.</p>
<p><i>Note.</i> The CW/FSK, ALARM BYPASS, and EMER LIGHT TEST indicator pushbuttons may be lighted. If so, press each indicator pushbutton to extinguish the lights.</p>	<p>The CW/FSK, ALARM BY-PASS, and EMER LIGHT TEST indicators go out.</p>	<p>Higher category of maintenance required.</p>
<p>h. Place the RAD RMTE circuit breaker to the up position.</p>	<p>The BUS VOLTAGE meter indicates 29 vdc (nominal) and the BUS CURRENT meter indicates 25 amps (nominal). Equipment relays may be heard energizing.</p>	<p>Higher category of maintenance required.</p>
<p><i>Note.</i> If the ALARM BYPASS indicator pushbutton switch on the R/T fuse panel(6A15) lights, press the pushbutton to extinguish the light.</p>	<p>The ALARM BYPASS indicator light goes out.</p>	<p>Check the fuses on the R/T fuse panel (6A15). Higher category of maintenance required. Check lamp. Higher category of maintenance required.</p>
<p>i. On the amplifier-decoder-power distribution assembly (6A12), place the AUTO SWBD circuit breaker to the up position.</p>	<p>The DSA OFF, 10 KW XMTR OFF, 10 KW RCVR OFF, 1 KW XMTR OFF and 1 KW RCVR OFF indicators on the telephone control panel (7A6) light.</p>	<p>Check lamps. Higher category of maintenance required.</p>
<p><i>Note.</i> If an audible alarm is heard, press the ALARM BYPASS indicator pushbutton on the right side of the control-monitor fuse panel (7A34).</p>	<p>The audible alarm silences, and the ALARM BYPASS indicator lights.</p>	<p>Check fuses on the control-monitor fuse panel (7A34). Check lamp. Higher category of maintenance required.</p>
<p>j. On the amplifier-decoder-power distribution assembly (6A12), place the OPR CSL circuit breaker to the up position.</p>	<p>On the radio line control (7A13) the NORM indicator pushbuttons light.</p>	<p>Check lamps. Check fuses on the control-monitor fuse panel (7A34). Higher category of maintenance required.</p>
<p><i>Note.</i> The ALARM BYPASS indicator pushbutton on the left of the control-monitor fuse panel (7A34) may light. Press the ALARM BYPASS indicator pushbutton.</p>	<p>The ALARM BYPASS indicator light goes out.</p>	<p>Check lamps. Higher category of maintenance required.</p>
<p>If any of the indicator pushbuttons on the secondary frequency select panel (7A4) and the primary frequency select panel(7A11) light, press the pushbuttons to turn them off.</p>	<p>The indicator lights go out.</p>	<p>Check lamp. Higher category of maintenance required.</p>
	<p>On the VFTG channel control(7A18) the OPERATOR INTERCEPT ON/OFF indicator lights. Various status indicator lamps on the secondary mode and status panel (7A5) and the primary mode and status panel (7A12) may be illuminated depending on prior switch settings. Resetting these indicator lamps is not required at this time.</p>	<p>Check lamp. Higher category of maintenance required.</p>

Action	Normal indication	Corrective measures
<p>k. On the secondary frequency select panel (7A4), press the LOCAL indicator pushbutton.</p>	<p>The LOCAL, RCVR TUNE, XMTR TUNE indicator pushbuttons light.</p>	<p>Check lamps. Higher category of maintenance required.</p>
<p><i>Note.</i> On the secondary mode and status panel (7A5), if any of the indicator pushbuttons under the DEVIATION meter should light press the lighted pushbuttons except for DEV X1 or DEX X10 pushbutton switches.</p>	<p>The lighted indicator pushbuttons go out.</p>	<p>Higher category of maintenance required.</p>
<p>l. Press the DEV XI indicator pushbutton.</p>	<p>The DEV X1 indicator pushbutton lights. The following STATUS RECEIVER indicators also light: PC 1, PWR ON, LOCAL GAIN, and READY.</p>	<p>Check lamps. Higher category of maintenance required.</p>
<p>m. On the primary frequency select panel(7A11), press the LOCAL indicator pushbutton.</p>	<p>The LOCAL, RCVR TUNE, and XMTR TUNE indicator push- buttons light.</p>	<p>Check lamps. Higher category of maintenance required.</p>
<p><i>Note.</i> On the primary mode and status panel (7A12) if any of the indicator pushbuttons under the DEVIATION meter light, press the lighted indicator pushbuttons to turn them off, except the DEV X1 or DEV X10 indicator pushbuttons.</p>	<p>The lighted indicator push buttons go out.-</p>	<p>Higher category of maintenance required.</p>
<p>n. Press the DEV X1 indicator pushbutton.</p>	<p>The DEV X1 indicator push button lights. The following STATUS RECEIVER indicators are also lighted: PC 1, PWR ON, LOCAL GAIN, and READY.</p>	<p>Check lamps. Higher category of maintenance required.</p>
<p>o. On the receiver (6A8), set the POWER ON/OFF switch to ON.</p>	<p>The POWER indicator lights</p>	<p>Check lamp. On the receiver (6A3), check the115 VAC fuses. On the R/T fuse panel (6A15), check the PRIM. RCVR 1 fuse. Higher category of maintenance required.</p>
	<p><i>Note.</i> On the primary mode and status panel (7A12), the STATUS RECEIVER READY indicator will again light and the SYS TUNING indicator will go out.</p>	<p>Check lamps. Higher category of maintenance required.</p>
<p>p. On the receiver (6A4), set the POWER ON/OFF switch to ON.</p>	<p>POWER indicator lights</p>	<p>Check lamp. On the receiver (6A4), check the115 VAC fuses. On the R/T fuse panel (6A15), check the PRIM. RCVR 2 fuse. Higher category of maintenance required.</p>
	<p><i>Note.</i> On the primary mode and status panel (7Ai2). STATUS RECEIVER READY indicator will temporarily go out and the SYS TUNING indicator will light. Within approximately 10 seconds, the STATUS RECEIVER READY indicator will again light and the SYS TUNING indicator will go out.</p>	<p>Check lamps. Higher category of maintenance required.</p>
<p>q. On the receiver (6A5), set the POWER ON/OFF switch to ON.</p>	<p>POWER indicator lights</p>	<p>Check lamps. Check the 115 VAC fuses. Check the SEC RCVR fuse on the emergency power panel (1A2). Check the SEC RCVR fuse on the R/T fuse panel (6A1). Higher category of maintenance required.</p>
	<p><i>Note.</i> On the secondary mode and status panel (7A5). STATUS RECEIVER READY indicator will temporarily go out</p>	

Action	Normal indication	Corrective measures
<p>r. On the transmitter (6A9), set the POWER ON/OFF switch to ON.</p>	<p>and the SYS TUNING indicator will light. Within 10 seconds, the STATUS RECEIVER READY indicator will again light and the SYS TUNING indicator will go out. The POWER indicator lights</p>	<p>Check lamp.</p>
<p>s. On the transmitter (6A11), set the POWER ON/OFF switch to ON.</p>	<p><i>Note.</i> Some indicator lights on the primary mode and status panel (7A12) may light momentarily and then go out..</p>	<p>Check the 115 VAC fuses. Check the PRIM. EXC fuse on the R/T fuse panel (6A15). Higher category of maintenance required.</p>
<p>t. On the emergency power panel (1A2), place the SEC LIN PA circuit breaker to the up position.</p>	<p>The POWER indicator lights</p>	<p>Check lamp. Check the 115 VAC fuses.</p>
<p>u. On the antenna coupler control (6A7), set the POWER switch to ON.</p>	<p>The POWER indicator lights</p>	<p>Check the SEC EXC fuse on the emergency power panel (1A2). Check the SEC EXC fuse on the R/T fuse panel (6A15). Higher category of maintenance required.</p>
<p>v. On the 1-kw P.A. (6A8), set the PRIMARY POWER switch to ON. On the 10-kw P.A. (unit 2), place the MAIN POWER circuit breaker to the up position. On the secondary mode and status panel (7A5), press the PWR ON indicator pushbutton.</p>	<p>The PWR ON indicator push- button, the STATUS TRANS-MITTER PWR ON indicator and the PWR ON indicator on 1-kw P.A. power supply (6A16), and the STANDBY indicator on 1-kw P.A. (6A8) light.</p>	<p>Check lamp. Check the FUSES 1.50A. On the emergency power panel(1A2), check the SEC EXC fuse. Higher category of maintenance required.</p>
<p>w. On the primary mode and status panel(7A12), press the PWR ON indicator pushbutton.</p>	<p>The PWR ON indicator push-button, the STATUS TRANS-MITTER PWR ON indicator and the PWR ON indicator on 1-kw P.A. power supply (6A16), and the STANDBY indicator on 1-kw P.A. (6A8) light.</p>	<p>Check lamps. On the control-monitor fuse panel (7A34), check the IND LT, and IND PWR fuses.</p>
<p>3 Make telephone subsystem operator to subscriber checks.</p>	<p>The PWR ON indicator push-button and the STATUS TRANSMITTER PWR ON indicator should light. In the 10-kw P.A. (unit 2), the blower motor should be heard and the FIL indicator should light.</p>	<p>On the R/T fuse panel (6A15), check the LOGIC GATEF fuse. On the 1-kw P.A. (6A8), check the primary power and BLOWER fuses. On the 1-kw P.A. power supply(6A16), check the 24V fuse. Higher category of maintenance required.</p>
<p>a. Check the telephone directory that was prepared in paragraph 2-23c to determine which of the telephone lines have been assigned and connected to telephone subscribers.</p>	<p>The switch settings agree with the telephone directory. <i>Note.</i> If the D/CBM/20 or the CB/LB/-FSK switches are set to C0 or LB, respectively, check that the corresponding LINE INTERCEPT NORM indicator pushbutton on telephone control panel (7A6) is lighted.</p>	<p>Check lamps. On the emergency power panel(1A2), check the SEC EXC fuse. Higher category of maintenance required.</p>
<p>b. Check the directory to determine if one of the 12 line terminals is unassigned. If there is an unassigned line terminal, perform steps (1) and (3) below. If all terminal lines are used,) perform steps (2) and (3) below.</p>	<p>The PWR ON indicator push-button, the STATUS TRANSMITTER PWR ON indicator and the PWR ON indicator on 1-kw P.A. power supply (6A16), and the STANDBY indicator on 1-kw P.A. (6A8) light.</p>	<p>Check lamps. On the 10-kw P.A. (unit 2), check the 28V and BLOWER fuses. Higher category of maintenance required.</p>
<p>3 Make telephone subsystem operator to subscriber checks.</p>	<p>The switch settings agree with the telephone directory. <i>Note.</i> If the D/CBM/20 or the CB/LB/-FSK switches are set to C0 or LB, respectively, check that the corresponding LINE INTERCEPT NORM indicator pushbutton on telephone control panel (7A6) is lighted.</p>	<p>Check lamps. On the control-monitor fuse panel(7A34), check the OPR 2 fuse. Higher category of maintenance required.</p>
<p>a. Check the telephone directory that was prepared in paragraph 2-23c to determine which of the telephone lines have been assigned and connected to telephone subscribers.</p>	<p>The switch settings agree with the telephone directory. <i>Note.</i> If the D/CBM/20 or the CB/LB/-FSK switches are set to C0 or LB, respectively, check that the corresponding LINE INTERCEPT NORM indicator pushbutton on telephone control panel (7A6) is lighted.</p>	<p>Check lamps. On the control-monitor fuse panel(7A34), check the OPR 2 fuse. Higher category of maintenance required.</p>
<p>b. Check the directory to determine if one of the 12 line terminals is unassigned. If there is an unassigned line terminal, perform steps (1) and (3) below. If all terminal lines are used,) perform steps (2) and (3) below.</p>	<p>The switch settings agree with the telephone directory. <i>Note.</i> If the D/CBM/20 or the CB/LB/-FSK switches are set to C0 or LB, respectively, check that the corresponding LINE INTERCEPT NORM indicator pushbutton on telephone control panel (7A6) is lighted.</p>	<p>Check lamps. On the control-monitor fuse panel(7A34), check the OPR 2 fuse. Higher category of maintenance required.</p>

Action	Normal indication	Corrective measures																																										
<p>(1) On the unassigned line terminal set the 4W/2W switch to 2W, the D/CBM/20 switch to D, and the CB/LB/FSK switch to LB.</p> <p>(2) Select the LINE INTERCEPT module that has the NORM indicator pushbutton lighted. This LINE INTERCEPT module will be referred to as the selected LINE INTERCEPT module. Perform step (1) above.</p> <p>(3) Perform the following action on the selected LINE INTERCEPT module in the telephone control panel (7A6).</p> <p>Press the ENABLE indicator pushbutton.</p> <p>On the selected line intercept module, press the LINE indicator pushbutton.</p> <p>c. Press the SWBD indicator pushbutton lights.</p> <p>d. Rotate the HEADSET VOLUME control clockwise until the dial tone is audible on the operator No. 2 H144C/U headset microphone. Using the telephone directory, select a subscriber and dial the subscriber assigned number.</p> <p>r. Inform the subscriber that the call will be terminated and direct him initiate a call to the operator for the to next action.</p> <p>4 Make telephone subsystem subscriber to operator checks</p>	<p>The LINE INTERCEPT NORM indicator pushbutton corresponding to the selected line terminal is lighted.</p> <p>The ENABLE indicator pushbutton lights.</p> <p>The LINE indicator pushbutton lights.</p> <p>The SWBD indicator pushbutton lights.</p> <p>The subscriber end instrument receives a ring signal, and the subscriber responds to the ring signal to allow satisfactory communication between the operator and the subscriber.</p>	<p>Check lamps.</p> <p>Higher category of maintenance required.</p> <p>Check lamp.</p> <p>Higher category of maintenance required.</p> <p>Check lamp.</p> <p>Higher category of maintenance required.</p> <p>Check lamp.</p> <p>On the control-monitor fuse panel (7A34), check the SWBD LOGIC, SUBSCRIBER LOGIC, RINGER, and LINE AMPL fuses. On the telephone signal entry panel (7A36), check the called subscribers fuses as indicated below.</p> <table border="1"> <thead> <tr> <th>Telephone subscriber</th> <th>Fuse</th> </tr> </thead> <tbody> <tr><td>1</td><td>F1, F2, F3, F4</td></tr> <tr><td>2</td><td>F5, F6, F7, F8</td></tr> <tr><td>3</td><td>F9, F10, F11, F12</td></tr> <tr><td>4</td><td>F13, F14, F15, F16</td></tr> <tr><td>5</td><td>F17, F18, F19, F20</td></tr> <tr><td>6</td><td>F21, F22, F23, F24</td></tr> <tr><td>7</td><td>F25, F26, F27, F28</td></tr> <tr><td>8</td><td>F29, F30, F31, F32</td></tr> <tr><td>9</td><td>F33, F34, F35, F36</td></tr> <tr><td>10</td><td>F37, F38, F39, F40</td></tr> <tr><td>11</td><td>F41, F42, F43, F44</td></tr> <tr><td>12</td><td>F45, F46, F47, F48</td></tr> <tr><td>13</td><td>F49, F50, F51, F52</td></tr> <tr><td>14</td><td>F53, F54, F55, F56</td></tr> <tr><td>15</td><td>F57, F58, F59, F60</td></tr> <tr><td>16</td><td>F61, F62, F63, F64</td></tr> <tr><td>17</td><td>F65, F66, F67, F68</td></tr> <tr><td>18</td><td>F69, F70, F71, F72</td></tr> <tr><td>19</td><td>F73, F74, F75, F76</td></tr> <tr><td>20</td><td>F77, F78, F79, F80</td></tr> </tbody> </table> <p>Higher category of maintenance required.</p>	Telephone subscriber	Fuse	1	F1, F2, F3, F4	2	F5, F6, F7, F8	3	F9, F10, F11, F12	4	F13, F14, F15, F16	5	F17, F18, F19, F20	6	F21, F22, F23, F24	7	F25, F26, F27, F28	8	F29, F30, F31, F32	9	F33, F34, F35, F36	10	F37, F38, F39, F40	11	F41, F42, F43, F44	12	F45, F46, F47, F48	13	F49, F50, F51, F52	14	F53, F54, F55, F56	15	F57, F58, F59, F60	16	F61, F62, F63, F64	17	F65, F66, F67, F68	18	F69, F70, F71, F72	19	F73, F74, F75, F76	20	F77, F78, F79, F80
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Action	Normal Indication	Corrective measures
a. Press the LINE indicator pushbutton.	The LINE indicator pushbutton lights.	Check lamp. Higher category of maintenance required.
b. Press the NORM indicator pushbutton.	The LINE indicator pushbutton goes out, and the NORM indicator pushbutton lights to terminate the call. Depending upon the type of subscriber end instrument, the operator should receive one of the following two indications: the operator position alarm buzzer sounds and the DSA ANSWER indicator pushbutton flashes, or the operator position alarm buzzer sounds and the calling subscriber LINE INTERCEPT LINE indicator flashes.	Check lamp. Higher category of maintenance required.
c. Press the flashing indicator pushbutton and answer the subscriber call to insure satisfactory communication between operator and landline subscriber.	Indicator stops flashing	Higher category of maintenance required.
d. Terminate the call as follows: If the subscriber signal was a flashing DSA ANSWER indicator push-button, press the DSA OFF indicator pushbutton. If the subscriber signal was a flashing LINE indicator pushbutton on the LINE INTERCEPT module, press the NORM indicator pushbutton on the corresponding LINE INTERCEPT module.	The DSA OFF indicator push-button lights.	Check lamp. Higher category of maintenance required.
e. Repeat the procedures above for the remaining telephone line subscribers.	The NORM indicator lights	Check lamp. Higher category of maintenance required.
f. On the radio line control (7A13), press all the radio NORM indicator pushbuttons.	The NORM indicator push- buttons light.	Check lamps. Higher category of maintenance required.
g. On the selected LINE INTERCEPT Module, press the SWBD indicator pushbutton.	The SWBD indicator pushbutton lights and a dial tone is heard in the operator No. 2 headset/ Microphone.	Check lamp. Higher category of maintenance required. On the control-monitor fuse panel(7A34), check the OPR 2 fuse. Higher category of maintenance required.
h. Dial the number 32 from the operator No. 2 position.	At the radio line control (7A13) SECONDARY RADIO A2 LINE indicator pushbutton Flashes and the operator No. 1 position alarm buzzer sounds.	Check lamp. On the control-monitor fuse panel(7A34), check the OPR 1 fuse. Higher category of maintenance required.
i. Depress the flashing LINE indicator pushbutton.	The LINE indicator pushbutton stops flashing, the OFF indicator pushbutton goes out, and the operator No. 1 position alarm buzzer is silent. Satisfactory communications is possible between operator No. 1 and operator No. 2.	Higher category of maintenance required. Higher category of maintenance required.
j. Perform the following to terminate this connection: On the telephone control panel (7A6), press the LINE indicator pushbutton and then the	The LINE indicator pushbutton goes out and the OFF indicator pushbutton lights.	Check lamp. Higher category of maintenance required.

Action	Normal indication	Corrective measures																
<p>NORM pushbutton on the selected LINE INTERCEPT module. On the radio line control (7A13) press the SECONDARY RADIO A2 OFF pushbutton.</p> <p>k. Repeat the actions above for the remaining radio channels using the following list:</p> <table border="0"> <tr> <td>Radio</td> <td>Telephone Number</td> </tr> <tr> <td>SECONDARY. A1</td> <td>33</td> </tr> <tr> <td> B1</td> <td>34</td> </tr> <tr> <td> B2</td> <td>35</td> </tr> <tr> <td>PRIMARY A2</td> <td>36</td> </tr> <tr> <td> A1</td> <td>37</td> </tr> <tr> <td> B1</td> <td>38</td> </tr> <tr> <td> B2</td> <td>39</td> </tr> </table> <p>5 (Not Used)</p> <p>6 Make radio to telephone checks.</p> <p>a. On radio line control (7A13), press the SECONDARY RADIO A2 JOIN indicator pushbutton. Set the RCVR SELECT switch to HDSET. Turn the HEADSET control in a clockwise direction until a tone is heard in the headset. On the telephone control panel (7A6), dial the telephone number of the selected LINE INTERCEPT module.</p> <p>b. Press the flashing LINE INTERCEPT SWBD indicator pushbutton.</p> <p>c. Press the selected LINE INTERCEPT LINE indicator pushbutton.</p> <p>d. Press the selected LINE INTERCEPT NORM indicator pushbutton.</p> <p>e. At the radio line control (7A13), press the SECONDARY RADIO A2 OFF indicator pushbutton.</p> <p>f. Repeat the above actions for the remaining SECONDARY RADIO and PRIMARY RADIO channels on the radio line control (7A13).</p> <p>g. If an assigned telephone subscriber line terminal was used as the selected line terminal during these checks, return the three switch settings in the telephone terminals -</p>	Radio	Telephone Number	SECONDARY. A1	33	B1	34	B2	35	PRIMARY A2	36	A1	37	B1	38	B2	39	<p>The SECONDARY RADIO A2 JOIN indicator lights.</p> <p>The selected LINE INTERCEPT SWBD indicator pushbutton flashes and the operator No. 2 position alarm buzzer sounds</p> <p>The alarm buzzer is silent. The LINE INTERCEPT SWBD indicator pushbutton remains lit and the LINE INTERCEPT NORM indicator pushbutton goes out. Satisfactory communication is available between operator No. 1 and operator No. 2.</p> <p>The LINE INTERCEPT LINE indicator pushbutton lights and communication between Operator No. 1 and No. 2 is terminated.</p> <p>The LINE INTERCEPT LINE indicator pushbutton goes out and the LINE INTERCEPT NORM indicator pushbutton lights.</p> <p>The SECONDARY RADIO A2 JOIN indicator pushbutton goes out and the SECONDARY RADIO A2 OFF indicator push- button lights.</p>	<p>Check lamp. Higher category of maintenance required.</p> <p>Check lamp. Higher category of maintenance required.</p> <p>Higher category of maintenance required.</p> <p>Check lamp. Higher category of maintenance required.</p> <p>Check lamp. Higher category of maintenance required.</p> <p>Check lamp. Higher category of maintenance required.</p>
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PRIMARY A2	36																	
A1	37																	
B1	38																	
B2	39																	

Action	Normal indication	Corrective measures
<p>(7A1, 7A2, 7A3) to their original settings.</p> <p>7 Make nonsecure data power supply checks.</p> <p>a. On VFTG power supply No. 1 (7A7), set switches PSI through PS5 to ON.</p> <p>b. On VFTG power supply No. 2 (7A14), set switches PSI through PS6 to ON.</p> <p>c. On telegraph line control (7A17), compare the switch settings with switch settings in the VFTG subscriber directory.</p> <p>d. On fox generator (7A26), set the POWER ON switch to ON and the OUTPUT switch to MESSAGE.</p> <p>e. Set the METERING switch to BATT NO. 1.</p> <p>f. Set the METERING switch to BATT NO. 2.</p>	<p>The switch settings agree with the directory.</p> <p>The POWER indicator lights</p> <p>On VFTG channel control (7A18), the meter above the METERING switch should deflect to the left of center and fluctuate, indicating the fox message is being generated.</p> <p>The meter deflects to the right of center.</p> <p>The meter deflects to the left of the center.</p>	<p>Check lamp.</p> <p>On the fox generator (7A26), check the POWER fuse.</p> <p>Higher category of maintenance required.</p> <p>On the VFTG No. 1 (7A22), check the fuses.</p> <p>Higher category of maintenance required.</p> <p>On the VFTG power supply No. 2 (7A14), check the fuses.</p> <p>On the emergency power panel (1A2), check the SEC VFTG fuse.</p> <p>Higher category of maintenance required.</p>
<p>8 Make nonsecure data subscriber send loop current checks:</p> <p>a. On VFTG No. 1 (7A22), insert one end of a 3-circuit patchcord into the RECEIVE LINE SERIES MONITOR 1 jack. On VFTG No. 3(7A24), insert the other end of the patchcord into the DC MTR jack</p> <p>b. On the VFTG channel control (7A18), set the METERING switch to REMOTE and observe the meter reading associated with the METERING switch.</p>	<p>The current indication on the meter corresponds to the loop current assigned to the channel1 teletypewriter directory.</p>	<p>If the current indication on the meter does not agree with the teletypewriter directory, perform the steps below.</p> <p>Remove the two screws on either side of the LOOP CURRENT & BIAS ADJUSTMENT tray (the sixth panel from the top of the audio patch panel(7A15)).</p> <p>Slide the tray out to its stops.</p> <p>Observing the extended tray from the bottom, identify the REC CURRENT 1 slotted shaft.</p> <p>Adjust the REC CURRENT 1 slotted shaft until the meter reading above the METERING switch on VFTG channel control (7A18) indicates a current</p>

Action	Normal indication	Corrective measures																																								
<p>c. Remove the end of the patchcord from the RECEIVE LINE SERIES MONITOR 1 jack on the VFTG No. 1 (7A22) and insert it into the RECEIVE LINE SERIES MONITOR 2 jack.</p> <p>d. On VFTG channel control (7A18), check that the meter current indication above the METERING switch corresponds to the current of the channel 2 teletypewriter subscriber listed in the teletypewriter directory.</p> <p>e. Repeat the steps above for the RECEIVE LINE SERIES MONITOR jacks 3 through 19.</p>	<p>Meter current corresponds to teletypewriter directory.</p> <p>Meter current corresponds to teletypewriter directory.</p>	<p>value equal to that assigned to the channel 1 teletypewriter subscriber.</p> <p>If the meter current does not correspond with the assigned teletype subscriber, repeat the steps above, and adjust the associated REC CURRENT adjust on the extended LOOP CURRENT & BIAS ADJUSTMENT panel; in this case, REC CURRENT 2.</p> <p>Repeat steps above for appropriate subscriber.</p> <p>If no current indication can be obtained on the meter, check the information below for telegraph subscriber fuses and check the selected subscriber fuses on the telegraph signal entry panel (7A35).</p> <table border="0"> <thead> <tr> <th>Telegraph subscriber</th> <th>Fuses</th> </tr> </thead> <tbody> <tr><td>1</td><td>F3, F4</td></tr> <tr><td>2</td><td>F7, F8</td></tr> <tr><td>3</td><td>F11, F12</td></tr> <tr><td>4</td><td>F15, F16</td></tr> <tr><td>5</td><td>F19, F20</td></tr> <tr><td>6</td><td>F23, F24</td></tr> <tr><td>7</td><td>F27, F28</td></tr> <tr><td>8</td><td>F30, F32</td></tr> <tr><td>9</td><td>F35, F36</td></tr> <tr><td>10</td><td>F39, F40</td></tr> <tr><td>11</td><td>F43, F44</td></tr> <tr><td>12</td><td>F47, F48</td></tr> <tr><td>13</td><td>F51, F52</td></tr> <tr><td>14</td><td>F55, F56</td></tr> <tr><td>15</td><td>F59, F60</td></tr> <tr><td>16</td><td>F63, F64</td></tr> <tr><td>17</td><td>F67, F68</td></tr> <tr><td>18</td><td>F71, F72</td></tr> <tr><td>19</td><td>F75, F76</td></tr> </tbody> </table>	Telegraph subscriber	Fuses	1	F3, F4	2	F7, F8	3	F11, F12	4	F15, F16	5	F19, F20	6	F23, F24	7	F27, F28	8	F30, F32	9	F35, F36	10	F39, F40	11	F43, F44	12	F47, F48	13	F51, F52	14	F55, F56	15	F59, F60	16	F63, F64	17	F67, F68	18	F71, F72	19	F75, F76
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<p>9. Make nonsecure data subscriber receive loop current checks:</p> <p>a. On VFTG No. 3 (7A24), check that one end of the 3-circuit patch cord is still inserted in the DC MTR jack.</p> <p>b. Transfer the other end of the patch cord from the RECEIVE LINE SERIES MONITOR 19 jack on VFTG No. 1 (7A22) to the SEND LINE SERIES MONITOR 1 jack.</p> <p>c. On the VFTG channel control (7A18), press the PRIMARY 16 CHANNEL VFTG ON indicator pushbuttons(CHANNEL 1 through 16).</p>	<p>Each ON indicator pushbutton lights.</p>	<p>Check lamp. Higher category of maintenance required.</p>																																								

Action	Normal indication	Corrective measures																																								
<p>d. Press the SECONDARY VFTG ON 1 and ON 2 indicator pushbuttons.</p> <p>e. Press the WIDEBAND VFTG ON 1 indicator pushbutton.</p> <p>f. Observe the meter reading above the METERING switch.</p> <p>g. Transfer the end of the 3-wire patch cord from the RECEIVE LINE SERIES MONITOR 1 jack to the RECEIVE LINE SERIES MONITOR 2 jack on VFTG No. 1 (7A22), and repeat the steps above using the meter readings and current requirements for teletypewriter subscribers 2 through 19. Remove the 3-circuit patchcord inserted in step above.</p>	<p>Each ON indicator pushbutton lights.</p> <p>The ON 1 indicator lights -----</p> <p>The meter reading corresponds to the teletypewriter No. 1 sub- scriber as listed in the teletype writer directory.</p> <p>The meter reading corresponds to the directory.</p>	<p>Check lamp.</p> <p>Higher category of maintenance required.</p> <p>Check lamp.</p> <p>Higher category of maintenance required.</p> <p>If the meter reading does not correspond to the associated teletypewriter subscriber, perform the following:</p> <p>Looking at the extended LOOP CURRENT & BIAS ADJUSTMENT tray from the bottom, identify the SEND CURRENT 1 slotted shaft. Adjust the SEND CURRENT 1 slotted shaft until the meter indication (above the METERING switch) corresponds with the current listed for teletypewriter subscriber No. 1 in the teletypewriter directory.</p> <p>Repeat step above for applicable subscriber.</p> <p>If no current indication can be obtained on the meter, check the table below for telegraph subscriber fuses and check the selected subscriber fuses on the telegraph signal entry panel(7A35).</p> <table border="0"> <thead> <tr> <th>Telegraph subscriber</th> <th>Fuses</th> </tr> </thead> <tbody> <tr><td>1</td><td>F1, F2</td></tr> <tr><td>2</td><td>F5, F6</td></tr> <tr><td>3</td><td>F9, F10</td></tr> <tr><td>4</td><td>F13, F14</td></tr> <tr><td>5</td><td>F17, F18</td></tr> <tr><td>6</td><td>F21, F22</td></tr> <tr><td>7</td><td>F25, F26</td></tr> <tr><td>8</td><td>F29, F30</td></tr> <tr><td>9</td><td>F33, F34</td></tr> <tr><td>10</td><td>F37, F38</td></tr> <tr><td>11</td><td>F41, F42</td></tr> <tr><td>12</td><td>F45, F46</td></tr> <tr><td>13</td><td>F49, F50</td></tr> <tr><td>14</td><td>F53, F54</td></tr> <tr><td>15</td><td>F57, F58</td></tr> <tr><td>16</td><td>F61, F62</td></tr> <tr><td>17</td><td>F65, F66</td></tr> <tr><td>18</td><td>F69, F70</td></tr> <tr><td>19</td><td>F73, F74</td></tr> </tbody> </table>	Telegraph subscriber	Fuses	1	F1, F2	2	F5, F6	3	F9, F10	4	F13, F14	5	F17, F18	6	F21, F22	7	F25, F26	8	F29, F30	9	F33, F34	10	F37, F38	11	F41, F42	12	F45, F46	13	F49, F50	14	F53, F54	15	F57, F58	16	F61, F62	17	F65, F66	18	F69, F70	19	F73, F74
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<p>10 Make nonsecure data operator-to-subscriber (operator loop) checks.</p> <p>a. At the teletypewriter set (7A19), set the MOTOR ON/OFF switch to ON and the LIGHT ON/OFF switch to ON.</p>	<p>The teletypewriter indicates an open loop and the carriage light lights.</p>	<p>Check lamp.</p> <p>Check POWER and printer fuse inside teletypewriter set.</p> <p>Check that the ac cord on the teletypewriter set is plugged into the OPER TTY 60 CPS receptacle (located behind the teletypewriter set). On the emergency power panel (1A2),</p>																																								

Action	Normal indication	Corrective measures
<p>b. On the VFTG channel control (7A18), press the CHANNEL 1 SEIZE 1 indicator pushbutton.</p> <p>c. Press the OPERATOR INTERCEPT OPER LOOP indicator pushbutton.</p> <p>d. At the teletypewriter set (7A19), type a message to the channel 1 teletypewriter subscriber, requesting a return message indicating the quality of teletypewriter communications.</p> <p>e. As the message is being received on the operator teletypewriter page printer, press the OPERATOR INTERCEPT MON LOOP indicator pushbutton.</p> <p>f. Press the CHANNEL 1 SIZE 1 indicator pushbutton.</p> <p>g. Repeat steps above for channel 2 through 19 teletypewriter subscribers using the associated CHANNEL SEIZE indicator pushbuttons.</p>	<p>The CHANNEL 1 SEIZE 1 indicator pushbutton lights.</p> <p>The OPERATOR INTERCEPT OPER LOOP indicator pushbutton lights and the teletype writer set indicates a closed loop.</p> <p>The OPERATOR INTERCEPT MON LOOP indicator push button lights and the operator teletypewriter continues to print the channel 1 subscriber message.</p> <p>The CHANNEL 1 SEIZE 1 indicator pushbutton goes out and The teletypewriter indicates an open loop.</p>	<p>check the opr tty fuse. Higher category of maintenance required. Check lamp. Higher category of maintenance required.</p> <p>Check lamp. On the VFTG channel control(7A18), check the PRINTER LOOP fuse. Higher category of maintenance required.</p> <p>Check lamp. Higher category of maintenance required.</p> <p>Higher category of maintenance required.</p>
<p>11 Make nonsecure data operator-to-VFTG (operator set) checks.</p> <p>a. Perform steps a through d below to determine that the conversion of dc teletypewriter signals to VFTG tones is being accomplished by substituting the operator teletype writer for the subscriber teletypewriter.</p> <p>(1) On the VFTG channel control(7A18), press the OPER SET indicator pushbutton. Insert one end of a 2-circuit patch cord into the 16 CH VFTG SEND jack and the other end into the 16 CH VFTG RECD jack on the audio patch panel (7A15).</p> <p>(2) On VFTG channel control (7A18), press the PRIMARY 16 CHANNEL VFTG CHANNEL 1 SEIZE 1 indicator pushbutton.</p> <p>(3) Using the operator teletypewriter keyboard, type out a message.</p> <p>(4) Press the OPERATOR INTERCEPT MON SET indicator pushbutton.</p>	<p>The OPER SET indicator push- button lights.</p> <p>The CHANNEL 1 SEIZE 1 indicator pushbutton lights and the operator teletypewriter indicates a closed loop.</p> <p>The page printer on the operator teletypewriter indicates that the message is satisfactorily copied.</p> <p>The OPERATOR INTERCEPT MON SET indicator pushbutton lights.</p>	<p>Check lamp. Higher category of maintenance required.</p> <p>Check lamp. Higher category of maintenance required.</p> <p>Higher category of maintenance required.</p> <p>Check lamp. Higher category of maintenance required.</p>

Action	Normal indication	Corrective measures
(5) On the telegraph line control(7A17), set the RECEIVE 1 toggle switch to the left.	The fox message is copied on the operator teletypewriter. The fox message is also copied by the channel 1 teletypewriter subscriber.	Higher category of maintenance required.
(6) On the VFTG channel control(7A18), press the PRIMARY 16 CHANNEL VFTG CHANNEL1 SEIZE 1 indicator pushbutton.	The CHANNEL 1 SEIZE 1 indicator pushbutton goes out and the operator teletypewriter set(7A19) indicates an open loop.	Higher category of maintenance required.
(7) On the VFTG channel control(7A18), press the PRIMARY 16 CHANNEL VFTG CHANNEL2 ON 2 indicator pushbutton.	The CHANNEL 2 ON 2 indicator pushbutton goes out.	Higher category of maintenance required.
(8) Press the PRIMARY 16 CHANNEL VFTG CHANNEL1 DIV indicator pushbutton.	The CHANNEL 1 DIV and the CHANNEL 2 ON 2 indicator pushbuttons light.	Check lamps. Higher category of maintenance required.
(9) Press the PRIMARY 16 CHANNEL VFTG CHANNEL2 SEIZE 2 indicator pushbutton.	The CHANNEL 2 SEIZE 2 indicator pushbutton lights the operator teletypewriter lights, and the operator teletypewriter indicates an open loop.	Check lamp. Higher category of maintenance required.
(10) Press the PRIMARY 16 CHANNEL VFTG CHANNEL2 SEIZE 2 indicator pushbutton.	The PRIMARY 16 CHANNEL VFTG CHANNEL 2 SEIZE 2 indicator pushbutton goes out.	Higher category of maintenance required.
(11) Press the PRIMARY 16 CHANNEL VFTG CHANNEL 1 SEIZE 1 indicator pushbutton.	The PRIMARY 16 CHANNEL VFTG CHANNEL 1 SEIZE 1 indicator pushbutton lights and the operator teletypewriter copies the fox message	Check lamp. Higher category of maintenance required.
(12) Press the OPERATOR INTERCEPT MON SET indicator pushbutton.	The MON LOOP indicator push- button goes out, the MON SET indicator pushbutton lights, and the operator teletypewriter copies the fox message.	Check lamp. Higher category of maintenance required.
(13) Press the PRIMARY 16 CHANNEL VFTG CHANNEL1, SEIZE 1, and DIV indicator pushbuttons.	The PRIMARY 16 CHANNEL VFTG CHANNEL 1 SEIZE 1 DIV and CHANNEL 2 ON 2 indicator pushbuttons go out and the operator teletypewriter set (7A19) indicates an open loop.	Higher category of maintenance required.
(14) On the VFTG channel control(7A18), press the PRIMARY 16 CHANNEL VFTG CHANNEL2 ON 2 indicator pushbutton.	The PRIMARY 16 CHANNEL VFTG CHANNEL 2 ON 2 indicator pushbutton lights.	Check lamp. Higher category of maintenance required.
(15) On the telegraph line control(7A17), set the RECEIVE 1 toggle switch to the right.		
(16) On the VFTG channel control(7A18), press the OPER SET indicator pushbutton and the PRIMARY 16 CHANNEL 1 SEIZE 2 indicator pushbutton, and set the METERING switch to KEYBOARD LOOP.	The meter reading above the METERING switch fluctuates as the operator teletypewriter keyboard is operated. The OPER SET and the PRIMARY 16 CHANNEL 1 SEIZE 2 indicators light.	Check lamps. Higher category of maintenance required.
(17) Set the METERING switch to PRINTER LOOP.	The meter reading above the METERING switch fluctuates as the operator teletypewriter page printer operates.	Higher category of maintenance required.
(18) Return the METERING switch to REMOTE.		

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Action	Normal Indication	Corrective measures
(19) Repeat the steps pressing the PRIMARY 16 CHANNEL VFTG SEIZE indicator push-buttons for channels 1 through 16. <i>Note.</i> Press the PRIMARY 16 CHANNEL VFTG CHANNEL SEIZE indicator	The SEIZE indicator light goes out.	Higher category of maintenance required.

<p>pushbutton to its off position after each channel test is complete.</p>		
<p>b. Remove both ends of the 2-circuit patchcord from the audio patch panel (7A15). Insert one end of the patchcord into the 2 CH VFTG SEND jack and the other end into the 2 CH VFTG REC jack.</p>		
<p>(1) On the VFTG channel control(7A18), press the SECOND-ARY VFTG CHANNEL 1 SEIZE 1 indicator pushbutton.</p>	<p>The CHANNEL 1 SEIZE 1 indicator pushbutton lights and the operator teletypewriter indicates a closed loop.</p>	<p>Check lamp. Higher category of maintenance required.</p>
<p>(2) Using the operator teletype- writer keyboard, type out a message.</p>	<p>The page printer on the operator teletypewriter indicates that the message is satisfactorily copied.</p>	<p>Higher category of maintenance required.</p>
<p>(3) Press the OPERATOR INTERCEPT MON SET indicator pushbutton.</p>	<p>The OPERATOR INTERCEPT MON SET indicator push- button lights.</p>	<p>Check lamp. Higher category of maintenance required.</p>
<p>(4) On the telegraph line control(7A17), place the RECEIVE toggle switch to the left.</p>	<p>The fox message is copied on the operator teletypewriter and is also copied by channel 17 teletypewriter subscriber.</p>	<p>Higher category of maintenance required.</p>
<p>(5) On the VFTG channel control(7A18), press the SECOND-ARY VFTG CHANNEL 1 SEIZE 1 indicator pushbutton.</p>	<p>The CHANNEL 1 SEIZE 1 indicator pushbutton goes out and the operator teletypewriter set (7A19) indicates an open loop.</p>	<p>Higher category of maintenance required.</p>
<p>(6) On the VFTG channel control(7A18), press the SECONDARY VFTG CHANNEL 2 ON2 indicator pushbutton.</p>	<p>The CHANNEL 2 ON 2 indicator pushbutton goes out.</p>	<p>Higher category of maintenance required.</p>
<p>(7) Press the SECONDARY VFTG CHANNEL 1 DIV indicator pushbutton.</p>	<p>The CHANNEL 1 DIV and the CHANNEL 2 ON 2 indicator pushbuttons light.</p>	<p>Check lamps. Higher category of maintenance required.</p>
<p>(8) Press the SECONDARY VFTG CHANNEL 2 SEIZE 2 indicator pushbutton.</p>	<p>The CHANNEL 2 SEIZE 2 indicator pushbutton lights and the operator teletypewriter indicates an open loop.</p>	<p>Check lamp. Higher category of maintenance required.</p>
<p>(9) Press the OPERATOR INTERCEPT MON LOOP indicator pushbutton.</p>	<p>The MON SET indicator push-button goes out and the OPERATOR INTERCEPT MON loop indicator lights. The operator teletypewriter indicates an open loop.</p>	<p>Check lamp. Higher category of maintenance required.</p>
<p>(10) Press the SECONDARY VFTG CHANNEL 2 SEIZE 2 indicator pushbutton.</p>	<p>The CHANNEL 2 SEIZE 2 indicator pushbutton goes out.</p>	<p>Higher category of maintenance required.</p>
<p>(11) Press the SECONDARY VFTG CHANNEL 1 SEIZE 1 indicator pushbutton.</p>	<p>The CHANNEL 1 SEIZE 1 indicator pushbutton lights and the operator teletypewriter set copies the fox message.</p>	<p>Check lamp. Higher category of maintenance required.</p>
<p>(12) Press the OPERATOR INTERCEPT MON SET indicator pushbutton.</p>	<p>The MON LOOP indicator pushbutton goes out and the MON SET indicator push-button lights. The operator</p>	<p>Check lamp. Higher category of maintenance required.</p>

Action	Normal indication	Corrective measures
	teletypewriter copies the fox message.	
<p>(13) On the VFTG channel control(7A18), press the SECOND-ARY VFTG CHANNEL 2 ON2 indicator pushbutton.</p>	The CHANNEL 2 ON 2 indicator pushbutton lights.	Check lamp. Higher category of maintenance required.
<p>(14) On the telegraph line control(7A17), set the RECEIVE toggle switch to the right.</p>		
<p>(15) On the VFTG channel control(7A18), set the METERING switch to KEYBOARD LOOP.</p>	The meter reading above the METERING switch fluctuates as the operator teletypewriter keyboard is operated.	Higher category of maintenance required.
<p>(16) Press the OPER SET indicator pushbutton.</p>	The OPER SET indicator push- button lights.	Check lamp. Higher category of maintenance required.
<p>c. Remove both ends of the 2-circuit patchcord from the audio patch panel (7A15). Insert one end of the patchcord into the WB VFTG SEND jack and the other end into the WB VFTG REC. jack.</p>		
<p>(1) Press the WIDEBAND CHANNEL VFTG CHANNEL 1 SEIZE 1 indicator pushbutton.</p>	The CHANNEL 1 SEIZE 1 indicator pushbutton lights and the operator teletypewriter indicates a closed loop.	Check lamp. Higher category of maintenance required.
<p>(2) Using the operator teletypewriter keyboard, type out a message.</p>	The page printer on the operator teletypewriter indicates that the message is satisfactorily copied.	Higher category of maintenance required.
<p>(3) Press the OPERATOR INTERCEPT MON SET indicator pushbutton.</p>	The OPERATOR INTERCEPT MON SET indicator pushbutton lights.	Check lamp. Higher category of maintenance required.
<p>(4) On the telegraph line control(7A17), place the RECEIVE toggle switch to the left.</p>	The fox message is copied on the operator teletypewriter and is also copied by the channel 1 teletypewriter subscriber.	Higher category of maintenance required.
<p>(5) On the VFTG channel control(7A18), press the PRIMARY 16 CHANNEL VFTG CHANNEL1 SEIZE 1 indicator pushbutton.</p>	The CHANNEL 1 SEIZE 1 indicator pushbutton goes out and the operator teletypewriter set(7A19) indicates an open loop.	Higher category of maintenance required.
<p>(6) On the VFTG channel control(7A18), press the OPERATOR INTERCEPT MON LOOP indicator pushbutton.</p>	The MON SET indicator push- button goes out and the OPERATOR INTERCEPT MON LOOP indicator lights. The operator teletypewriter indicates an open loop.	Check lamps. Higher category of maintenance required.
<p>(7) Press the WIDEBAND VFTG CHANNEL 1 SEIZE 1 indicator pushbutton.</p>	The WIDEBAND VFTG CHANNEL 1 SEIZE 1 indicator pushbutton lights and the operator teletypewriter set copies the fox message.	Check lamp. Higher category of maintenance required.
<p>(8) Press the OPERATOR IN- TERCEPT MON SET indicator pushbutton.</p>	The MON LOOP indicator push- button goes out and the OPERATOR INTERCEPT MON SET indicator pushbutton lights. The operator teletypewriter copies the fox message.	Check lamp. Higher category of maintenance required.
<p>(9) On the telegraph line control(7A17), set the RECEIVE 19 toggle switch to the right.</p>		

Action	Normal indication	Corrective measures
(10) On the VFTG channel control (7A18), set the METERING switch to KEYBOARD LOOP.	The meter reading above the METERING switch fluctuates as the operator teletypewriter keyboard is operated.	Higher category of maintenance required.
(11) Set the METERING switch to PRINTER LOOP.	The meter reading above the METERING switch fluctuates as the operator teletypewriter page printer operates.	Higher category of maintenance required.
(12) Return the METERING switch to REMOTE.		
d. Remove the 2-circuit patchcord from the jacks on the audio patch panel (7A15).		
12 Make nonsecure data primary 16-channel VFTG tone generator checks.		
a. Check that the PRIMARY 16 CHANNEL VFTG ON indicator pushbuttons for all 16 channels have been pressed.	The PRIMARY 16 CHANNEL VFTG ON indicators are lighted.	Check lamps. Higher category of maintenance required.
b. On the radio line control (7A13), set the METER SELECT switch to VFTG.		
c. On the telephone control panel (7A6), press and hold the LEVEL pushbutton on the 10KW XMTR module, and rotate the control just below the LEVEL pushbutton from a maximum counterclockwise position to a maximum clockwise position.	On the radio line control (7A13), observe the reading of the meter just above the METER SELECT switch. As the control below the LEVEL pushbutton is rotated from the maximum counterclockwise to the maximum clockwise position the meter indicates a reading of -20 to at least +3.	On the VFTG No. 2 (7A23), adjust the SEND AGGR. LEVEL ADJUST (GROUP 1) PRI potentiometer. Higher category of maintenance required.
d. Release the LEVEL pushbutton.		
13 Make nonsecure data secondary VFTG tone generator checks.		
a. On the VFTG channel control (7A18), press the SECONDARY VFTG ON 1 and ON 2 indicator pushbuttons.	The SECONDARY VFTG ON 1 and ON 2 indicator pushbuttons light.	Check lamp. Higher category of maintenance required.
b. On the telephone control panel (7A6), press and hold the LEVEL pushbutton on the 1 KW XMTR module and rotate the control just below the LEVEL pushbutton from a maximum counterclockwise to a maximum clockwise position.	On the radio line control (7A13), observe the reading of the meter just above the METER SELECT switch. As the control below the LEVEL pushbutton is rotated from the maximum clockwise position, the meter indicates a reading of -20 to at least +2.	Adjust the SEND AGGR. LEVEL ADJUST (GROUP II) SEC potentiometer on VFTG No. 2 (7A23). Higher category of maintenance required.
c. Release the LEVEL pushbutton.		
14 Make nonsecure data wideband VFTG tone generator checks.		
a. On the VFTG channel control (7A18), press the WIDEBAND VFTG ON 1 indicator pushbutton.	The WIDEBAND VFTG ON 1 indicator pushbutton lights.	Check lamp. Higher category of maintenance required.
b. On the telephone control panel (7A6), press the WB indicator pushbutton on the 10 KW XMTR module.	The WB indicator pushbutton lights.	Check lamp. Higher category of maintenance required.
c. Press and hold the LEVEL pushbutton on the 10 KW XMTR module and rotate the control just below the LEVEL pushbutton from the	On the radio line control (7A13), observe the reading of the meter just above the METER SELECT switch. As the control	Adjust the SEND AGGR. LEVEL, ADJUST (GROUP III) WB potentiometer on VFTG No. 2 (7A23).

Action	Normal Indication	Corrective measure
<p>maximum counterclockwise position to the maximum clockwise position.</p>	<p>below the LEVEL pushbutton is rotated from maximum counterclockwise to maximum clockwise, the meter indicates from --20 to+3.</p>	
<p>d. Release the LEVEL pushbutton and press the WB indicator pushbutton.</p>	<p>The WB indicator goes out</p>	<p>Higher category of maintenance required.</p>
<p>15 Make secure data subsystem checks. a. On the secure teletype patch panel (5A2), insert one end of a 3-circuit patchcord into the NONSECURE RECEIVE TRUNKS 1 jack.</p>	<p>The ALARM BYPASS indicator pushbutton lights.</p>	<p>.Check lamps. On the secure ac power panel (5A1), check the SECURE PATCH PANEL fuse. Higher category of maintenance required.</p>
<p>Note. An audible alarm may sound, press the ALARM BYPASS indicator pushbutton.</p>	<p>The audible alarm should stop and the ALARM BYPASS indicator pushbutton should remain lighted.</p>	
<p>b Repeat the step a. above for NONSECURE RECEIVE TRUNKS2 and 3 and NONSECURE SEND TRUNKS 1, 2, and</p>	<p>.....</p>	<p>Check lamp. Higher category of maintenance required.</p>
<p>3. c. On VFTG No. 2 (7A23), insert 3-circuit patch cords as follows: SEND TRUNKS REC TRUNKS 1..... 1 2..... 2 3..... 3</p>	<p>.....</p>	<p>Higher category of maintenance required.</p>
<p>Note. The above patch connections will loop the send and receive trunks and allow the operator to check the secure equipment</p>		
<p>d. On the secure teletype patch panel (5A2) insert 3-circuit patch cords as follows: SET TT-123/TT-98. .NONSECURE SEND TRUNKS 1 SET TT-346/TT-98 NONSECURE RECEIVE TRUNKS 1</p>		
<p>e. On the teletypewriter set (5A6), set the MOTOR and LIGHT switches to the ON position. On the transmitter-distributor (5A4) and the reperforator (5A5), set the POWER switch to the ON position.</p>	<p>The teletypewriter motor runs and the teletypewriter lamp lights. The equipment motors operate and the reperforator lamp lights.</p>	<p>On the secure ac power panel (5A1), check the TT-98/FG, TT-346/FG and TT-123/FG fuses. Check the teletypewriter set POWER and printer fuses and the fuses in the transmitter-distributor and the reperforator. Higher category of maintenance required.</p>
<p>f Type a test message on the keyboard.</p>	<p>The page printer copies satisfactorily.</p>	<p>Higher category of maintenance required.</p>
<p>g. Transmit a test tape from the transmitter-distributor (5A4).</p>	<p>The reperforator (5A5) reproduces the test tape.</p>	<p>Higher category of maintenance required.</p>
<p>h. Transfer the 3-circuit patch cord from NONSECURE SEND TRUNKS 1 to NONSECURE SEND TRUNKS 2. Transfer the 3-circuit patch cord from NONSECURE RECEIVE TRUNKS 1 to NONSECURE RECEIVE TRUNKS 2 and repeat steps f and g above.</p>	<p>Same as f and g above.</p>	<p>Same as f and g above.</p>
<p>i. Transfer the 3-circuit patchcord from NONSECURE SEND TRUNKS 2 to NONSECURE SEND TRUNKS 3. Transfer the 3-circuit patch cord from NONSECURE RECEIVE TRUNKS 2 to NONSECURE RECEIVE TRUNKS 3 and repeat steps f and g above.</p>	<p>Same as f and g above.</p>	<p>Same as f and g above.</p>

Action	Normal indication	Corrective measures
<p><i>j.</i> On the teletypewriter set (5A6) set the MOTOR and LIGHT switches to the OFF position. On the transmitter-distributor (5A4) and the reperforator (5A5) set the POWER switch to the OFF position.</p>	<p>The teletypewriter motor stops and the teletypewriter lamp goes out. The equipment motors stop and the reperforator lamp goes out.</p>	<p>Higher category of maintenance required.</p>
<p><i>k.</i> Remove the patchcord from the SET TT-346/TT-98 jack and insert it in the TT-76 REPERF jack.</p>		
<p><i>l.</i> Remove the patchcord from the SET TT-123/TT-98 jack and insert it in the SET TT-76 T/D jack.</p>		
<p><i>m.</i> On the reperforator-transmitter (5A3), set the MOTOR, POWER, and LIGHT switches to their ON positions.</p>	<p>The reperforator-transmitter motor runs and the reperforator-transmitter lamp lights.</p>	<p>On the secure ac power panel (5A1), check the TT-76/GGC fuse. Check the fuses in the reperforator-transmitter. Higher category of maintenance required.</p>
<p><i>n.</i> Transmit a test tape from the reperforator-transmitter (5A3).</p>	<p>The test tape is reproduced.</p>	<p>Higher category of maintenance required.</p>
<p><i>o.</i> Type a test message on the reperforator-transmitter (5A3) keyboard.</p>	<p>The test tape is reproduced.</p>	<p>Higher category of maintenance required.</p>
<p><i>p.</i> On the reperforator-transmitter (5A3), set the MOTOR, POWER and LIGHT switches to their OFF position.</p>	<p>The reperforator-transmitter stops and the reperforator-transmitter lamp goes out. On the secure teletype patch panel (5A2) the ALARM BYPASS indicator should go out.</p>	<p>Higher category of maintenance required.</p>
<p>16 Make primary radio subsystem checks.</p>		
<p><i>a.</i> On the primary frequency .select panel (7A1), set the RECEIVER FREQUENCY SELECT MEGACYCLES thumbwheel switches to the receiver frequency assigned to the primary radio system.</p>		
<p><i>b.</i> Press the RCVR TUNE indicator push-button.</p>	<p>The RECEIVER FREQUENCY DISPLAY indicates the selected receiver frequency. On the primary mode and status panel (7A12), the RECEIVER READY indicator goes out; the SYS TUNING indicator lights while the receiver is tuning, then goes out; and the RECEIVER READY indicator lights. Note. The maximum tune time for the receiver is 10 seconds.</p>	<p>Check lamps. Check that the RECEIVER FREQUENCY SELECT MEGACYCLES thumbwheel switches are in the detent position. Press the RCVR TUNE indicator pushbutton again. Higher category of maintenance required.</p>
<p><i>c.</i> On the primary frequency select panel (7A11), set the TRANSMITTER FREQUENCY SELECT MEGACYCLES thumbwheel switches to the transmitter frequency assigned to the primary radio system.</p>		
<p><i>d.</i> Press the XMTR TUNE indicator push-button.</p>	<p>The TRANSMITTER FREQUENCY DISPLAY indicator displays the selected transmitter frequency. On the primary mode and status panel (7A12), the TRANSMITTER HV ON indicator and the SYS TUNING indicator light, the TRANSMITTER HV ON indicator goes out, the TRANSMITTER KEYED indicator lights, the SYS TUNING indicator goes out, and the TRANSMITTER KEYED indicator goes out.</p>	<p>Check lamps. Check that the TRANSMITTER FREQUENCY SELECT MEGACYCLES thumbwheel switches are in the detent position. Press the XMTR TUNE indicator pushbutton again. Higher category of maintenance required.</p>

Action	Normal indication	Corrective measures
<p>e. On the radio line control (7A13), press the PRIMARY RADIO A2 indicator pushbutton.</p>	<p>The PRIMARY RADIO A2 OFF indicator goes out and the PRIMARY RADIO A2 RADIO indicator pushbutton lights.</p>	<p>Check lamp. Higher category of maintenance required.</p>
<p>f. On the audio patch panel (7A15), insert the operator No. 1 headset plug in the PRIMARY DATA CONTROL SEND A2 REC jack.</p>		
<p>g. Press the microphone push to talk switch and talk into the operator microphone on the radio line control (7A13).</p>	<p>The audio is heard in the operator headset.</p>	<p>Higher category of maintenance required.</p>
<p>h. On the primary frequency select panel (7A11), press the VOICE TEST CHAN A2 indicator pushbutton.</p>	<p>The VOICE TEST CHAN A2 indicator-pushbutton lights and the audio from the operator microphone is not heard in the operator headset.</p>	<p>Check lamp. Higher category of maintenance required.</p>
<p>i. Press the VOICE TEST CHAN A2 indicator pushbutton.</p>	<p>The VOICE TEST CHAN A2 indicator-pushbutton goes out.</p>	
<p>j. Press the RING SELECT 1000/20 A2 indicator pushbutton.</p>	<p>The RING SELECT 1000/20 A2 indicator pushbutton lights.</p>	<p>Check lamp. Higher category of maintenance required.</p>
<p>k. On the radio line control (7A13), press the RING pushbutton.</p>	<p>A 1000/20-cps ring signal can be heard on the operator headset.</p>	<p>Higher category of maintenance required.</p>
<p>l. On the primary frequency select panel (7A11), press the RING SELECT 1000/20 A2 indicator pushbutton.</p>	<p>The RING SELECT 1000/20 A2 indicator pushbutton goes out.</p>	<p>Higher category of maintenance required.</p>
<p>m. Repeat steps above using the RING SELECT 1600 A2 indicator pushbutton.</p>		
<p>n. Press the PRIMARY RADIO A2 OFF pushbutton.</p>	<p>The RADIO indicator goes out and the OFF indicator lights.</p>	<p>Check lamp. Higher category of maintenance required.</p>
<p>o. Repeat the steps above to check the PRIMARY RADIO A1, B1, and B2 using the appropriate pushbuttons and jacks.</p>		
<p>p. On the primary mode and status panel (7A12), press the XMTR and RCVR indicator pushbuttons CHAN B2, CHAN B1, CHAN A1, and CHAN A2.</p>	<p>The CHAN B2, CHAN B1, CHAN A1, and CHAN A2 indicator pushbuttons light. The STATUS TRANSMITTER CH A2, CH A1, CH B1, and CH B2 indication</p>	<p>Check lamps. Higher category of maintenance required.</p>

Action	Normal indication	Corrective measures
q. Press the PRIMARY RADIO B2 RADIO indicator pushbutton.	<p>tors light. The STATUS RECEIVER CH A2, CH A1, CH B1, and CH B2 indicators light. The PRIMARY RADIO B2 OFF indicator goes out and the PRIMARY RADIO B2 RADIO indicator pushbutton lights. Background noise or signal can be heard from the speaker.</p>	<p>Check lamp. Higher category of maintenance required.</p>
r. On the primary mode and status panel (7A12), rotate the RF GAIN RCVR 1 control counterclockwise and note that the background noise or signal can be controlled.	<p>The background noise or signal can be controlled.</p>	<p>Higher category of maintenance required.</p>
s. On the primary frequency select panel (7A11), press the DIVERSITY SELECT CHAN B2 indicator pushbutton.	<p>The DIVERSITY SELECT CHAN B2 indicator pushbutton.</p>	<p>Check lamp. Higher category of maintenance required.</p>
t. On the primary mode and status panel (7A12), rotate the RF GAIN RCVR 2 control and note the background noise or signal.	<p>The background noise or signal level can be controlled.</p>	<p>Higher category of maintenance required.</p>
u. On the radio line control (7A13), press the PRIMARY RADIO B2 OFF pushbutton.	<p>The OFF indicator lights the RADIO indicator goes out and the background noise or signal are silenced.</p>	<p>Check lamp. Higher category of maintenance required.</p>
v. Repeat steps above to check the PRIMARY RADIO B1, A1, and A2 using the appropriately marked pushbuttons.		
w. On the primary frequency select panel (7A11), press the DIVERSITY SELECT indicator pushbuttons.	<p>The four DIVERSITY SELECT indicator pushbuttons extinguish-</p>	
x. On the primary mode and status panel (7A12), press the HV ON indicator pushbutton.	<p>The HV ON indicator pushbutton and the STATUS TRANSMITTER HV ON indicator light; the STATUS TRANSMITTER CHAN A2, CHAN A1, CHAN B1, and CHAN B2 indicators go out; the KEYED indicator momentarily lights; and the SYS TUNING indicator lights while the 10-kw P.A. is tuning, then goes out. The STATUS TRANSMITTER KEYED indicator momentarily lights, then the STATUS TRANSMITTER READY, CH A2, CH A1, CH B1 and CH B2 indicators light. The 10-kw P.A. READY, FIL, and HV indicators light.</p>	<p>Check lamps. Higher category of maintenance required.</p>
17 Make secondary radio subsystem checks. a. Check secondary radio ring select and voice test as follows:		
(1) On the radio line control (7A13) press the SECONDARY RADIO A2 RADIO indicator pushbutton.	<p>The SECONDARY RADIO A2 OFF indicator goes out and the SECONDARY RADIO A2 RADIO indicator pushbutton lights.</p>	<p>Check lamp. Higher category of maintenance required.</p>
(2) On the audio patch panel (7A15) insert the operator No.		

Action	Normal indication	Corrective measure
1 headset plug into the SECONDARY DATA CONTROL SEND A2 REC jack.		
(3) Press the push-to-talk switch on the operator No. 1 microphone on the radio line control (7A13) and transmit a test voice message-	The test voice message is received in the operator No. 1 headset.	Higher category of maintenance required.
(4) On the secondary frequency select panel (7A4), press the VOICE TEST CHAN A2 indicator-pushbutton.	The VOICE TEST CHAN A2 indicator pushbutton lights. The voice test message from the operator No. 1 microphone is silenced.	Check lamp. Higher category of maintenance required.
(5) Press the VOICE TEST CHAN A2 indicator pushbutton. (6) Press the RING SELECT 1000/20 A2 indicator pushbutton.	The VOICE TEST CHAN A2 indicator pushbutton goes out. The RING SELECT 1000/20 A2 indicator pushbutton lights.	Check lamp. Higher category of maintenance required.
(7) On the radio line control (7A13), press the RING pushbutton.	A 1000/20-eps ring signal is heard in the operator No. 1 headset.	Higher category of maintenance required.
(8) On the secondary frequency select panel (7A4), press the RING SELECT 1000/20 A2 indicator pushbutton.	The 1000/20 A2 indicator pushbutton goes out.	
(9) Press the RING SELECT 1600 A2 indicator pushbutton. required.	The 1600 A2 indicator pushbutton lights.	Check lamp. Higher category of maintenance
(10) On the radio line control (7A13), press the RING pushbutton.	A 1600-cps ring signal is heard in the operator No. 1 headset.	Higher category of maintenance required.
(11) On the secondary frequency select panel (7A4), press the RING SELECT 1600 A2 indicator-pushbutton.	The RING SELECT 1600 A2 indicator-pushbutton goes out.	
(12) On the radio line control (7A13), press the SECONDARY RADIO A2 OFF pushbutton.	The OFF indicator lights and the SECONDARY RADIO A2 RADIO indicator goes out.	Check lamps. Higher category of maintenance required.
(13) Repeat the steps above for secondary radio channels A1, B1, and B2 using the appropriately-marked pushbuttons and jacks. Remove the operator No. 1 headset plug from the audio patch panel (7A15).		
b. Check secondary radio receiver tuning:		
(1) On the secondary frequency select panel (7A4), set the RECEIVER FREQUENCY SELECT thumbwheel switches to the receiver frequency assigned to the secondary radio system.		
(2) Press the RCVR TUNE pushbutton.	The RECEIVER FREQUENCY DISPLAY should indicate the selected receiver frequency. The STATUS RECEIVER READY indicator goes out, the SYS TUNING indicator lights, and	Check lamps. Check that the RECEIVER FREQUENCY SELECT ME-GACYCLES thumbwheel switches are in the detent position.

Action	Normal indication	Corrective measures
<p>c. Check secondary radio transmitter tuning.</p> <p>(1) On the secondary frequency select panel (7A4), set the TRANSMITTER FREQUENCY SELECT thumb-wheel switches to the transmitter-frequency assigned to the secondary radio system.</p>	<p>when the receiver is tuned the STATUS RECEIVER READY indicator lights.</p>	<p>Press the RCVR TUNE indicator pushbutton again. Higher category of maintenance required.</p>
<p><i>Note On the secondary mode and status-panel (7A5), the SYS TUNING indicator may remain lighted.</i></p>		
<p>(2) On the secondary mode and status panel (7A5), press the HV ON indicator pushbutton.</p>	<p>On the secondary frequency select panel (7A4), the TRANSMITTER FREQUENCY DISPLAY indicates the selected transmitter frequency. The HV ON indicator pushbutton and the STATUS TRANSMITTER HV ON indicator light. The SYS TUNING indicator momentarily lights, and then the STATUS TRANSMITTER READY indicator lights.</p>	<p>Check lamps. Higher category of maintenance required.</p>
<p>d. Check Secondary Radio Receiver operation.</p>		
<p>(1) On the secondary mode and status panel (7A5), press XMTR and RCVR indicator pushbuttons CHAN B2, CHAN B1, CHAN A1, and CHAN A2. B2, CH B1, CH A1, and CH A2 indicators light.</p>	<p>XMTR and RCVR indicator pushbuttons CHAN B2, CHAN B1, CHAN A1, and CHAN A2 light. The STATUS TRANSMITTER and RECEIVER CH</p>	<p>Check lamps. Higher category of maintenance required.</p>
<p>(2) On the radio line control (7A13), press the SECONDARY RADIO A2 RADIO indicator pushbutton. background noise or signal is heard from the speaker.</p>	<p>The SECONDARY RADIO A2 OFF indicator goes out, the SECONDARY RADIO A2 RADIO indicator lights, and</p>	<p>Check lamp. Higher category of maintenance required.</p>
<p>(3) On the secondary mode and status panel (7A5), rotate the RCVR RF GAIN control counterclockwise.</p>	<p>The signal or background noise from the speaker can be decreased.</p>	<p>Higher category of maintenance required.</p>
<p>(4) Press the SECONDARY RADIO A2 OFF pushbutton.</p>	<p>The SECONDARY RADIO A2 OFF indicator lights. The SECONDARY RADIO A2 RADIO indicator goes out, and the background noise or signal from the speaker is silenced.</p>	<p>Check lamp. Higher category of maintenance required.</p>
<p>(5) Repeat the steps above for secondary radio channels A1, B1, and B2 using the appropriately-marked pushbuttons and indicators.</p>		
<p>18 Make remote control subsystem checks.</p>		
<p>a. Cheek remote normal preset.</p> <p>(1) On the primary frequency select panel (7A11), press the REMOTE indicator pushbutton.</p>	<p>The LOCAL indicator goes out and the REMOTE indicator lights. On the primary mode and status</p>	<p>Check lamps. Higher category of maintenance required.</p>

Action	Normal indication	Corrective measures
<p>(2) On the remote control (6A2), set the CHAN 1 FREQ MC thumbwheel switches and all channel mode toggle switches to the remote frequencies and modes assigned for the remote wire subscriber.</p> <p>(3) On the radio line control (7A13), press the PRIMARY RADIO AI RADIO indicator pushbutton.</p> <p>(4) Set the DIAL SELECT switch to the RADIO position.</p>	<p>panel (7A12), the STATUS TRANSMITTER PWR ON indicator and the STATUS RECEIVER PWR ON, PC 1, READY and DEV X1 indicators are the only indicators lighted.</p> <p>The PRIMARY RADIO AI OFF indicator goes out and the PRIMARY RADIO AI RADIO indicator pushbutton lights.</p> <p>The primary radio receivers and transmitter tune to the frequencies-selected on the RECEIVER FREQUENCY SELECT and TRANSMITTER FREQUENCY SELECT thumbwheel switches on the primary frequency select panel(7A11). The RECEIVER FREQUENCY DISPLAY and the TRANSMITTER FREQUENCY DISPLAY display the selected receiver and transmitter frequencies. The STATUS TRANSMITTER and RECEIVER indicators display the condition of the mode select switches for NORM CHAN 1 on the remote control (6A2). Two tone bursts are heard from the speaker when the remote control function is completed.</p>	<p>Check lamp. Higher category of maintenance required.</p> <p>Check the RMTE CONT fuse on the R/T fuse panel (6A15). Check lamps. Higher category of maintenance required.</p>
<p>b. Check dialed preset.</p> <p>(1) On the radio line control (7A13), dial the digits 92.</p>	<p>After the first digit (9) is dialed, one tone burst is heard from the speaker. After the second digit (2) is dialed, a steady tone is heard from the speaker during the time the transmitter is tuning. On the primary frequency-select panel (7A11), the TRANSMITTER FREQUENCY DISPLAY indicates thumbwheel switch settings on CHAN 2 of the remote control (6A2).</p>	<p>Higher category of maintenance required.</p>
<p>(2) On the radio line control (7A13), dial the digits 71.</p>	<p>After the first digit (7) is dialed, one tone burst is heard from the speaker. After the second digit (1) is dialed, a steady tone is heard from the speaker during the time the receiver is tuning. On the primary frequency select panel (7A11), the RECEIVER FREQUENCY DISPLAY indicates the frequency selected on</p>	<p>Check lamps. Higher category of maintenance required.</p>

Action	Normal indication	Corrective measures																																	
<p>(3) Repeat the steps for CHAN 1 through CHAN 10 for the transmitter and the receiver digits as indicated below.</p>	<p>CHAN 1 on the remote control (6A2). On the primary mode and status panel (7A12), the STATUS RECEIVER indicators light according to the toggle switch setting on CHAN 1 of the remote control (6A2).</p>																																		
<table border="0"> <thead> <tr> <th>Channel</th> <th>Transmitter dialed digits</th> <th>Receiver dialed digit</th> </tr> </thead> <tbody> <tr><td>1</td><td>-----91-----</td><td>-----71</td></tr> <tr><td>2</td><td>-----92-----</td><td>-----72</td></tr> <tr><td>3</td><td>-----93-----</td><td>-----73</td></tr> <tr><td>4</td><td>-----94-----</td><td>-----74</td></tr> <tr><td>5</td><td>-----95-----</td><td>-----75</td></tr> <tr><td>6</td><td>-----96-----</td><td>-----76</td></tr> <tr><td>7</td><td>-----97-----</td><td>-----77</td></tr> <tr><td>8</td><td>-----98-----</td><td>-----78</td></tr> <tr><td>9</td><td>-----99-----</td><td>-----79</td></tr> <tr><td>10</td><td>-----90-----</td><td>-----70</td></tr> </tbody> </table>	Channel	Transmitter dialed digits	Receiver dialed digit	1	-----91-----	-----71	2	-----92-----	-----72	3	-----93-----	-----73	4	-----94-----	-----74	5	-----95-----	-----75	6	-----96-----	-----76	7	-----97-----	-----77	8	-----98-----	-----78	9	-----99-----	-----79	10	-----90-----	-----70		
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<table border="0"> <thead> <tr> <th>Mode</th> <th>Dialed digits</th> </tr> </thead> <tbody> <tr><td>TSB USB on</td><td>-----61</td></tr> <tr><td>TSB LSB on</td><td>-----62</td></tr> <tr><td>TSB USB and LSB on</td><td>-----63</td></tr> <tr><td>TSB USB and LSB off</td><td>-----64</td></tr> <tr><td>G1</td><td>-----65</td></tr> <tr><td>G2</td><td>-----66</td></tr> <tr><td>AFC/PC ON</td><td>-----67</td></tr> <tr><td>AFC/PC OFF</td><td>-----68</td></tr> <tr><td>HV ON</td><td>-----69</td></tr> <tr><td>OFF</td><td>-----60</td></tr> </tbody> </table>	Mode	Dialed digits	TSB USB on	-----61	TSB LSB on	-----62	TSB USB and LSB on	-----63	TSB USB and LSB off	-----64	G1	-----65	G2	-----66	AFC/PC ON	-----67	AFC/PC OFF	-----68	HV ON	-----69	OFF	-----60													
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G2	-----66																																		
AFC/PC ON	-----67																																		
AFC/PC OFF	-----68																																		
HV ON	-----69																																		
OFF	-----60																																		
<p>(4) On the radio line control (7A13), dial the digits 64.</p>	<p>After the first digit (6) is dialed, one tone burst is heard from the speaker. After the second digit (4) is dialed, two tone bursts are heard from the speaker and, on the primary mode and status panel (7A12), the STATUS TRANSMITTER and RECEIVER indicators CH A2, CH A1, CH B1 and CH B2 go out.</p>	<p>Higher category of maintenance required.</p>																																	
<p>(5) On the radio line control (7A13), dial the digits 61.</p>	<p>After the second digit (1) is dialed, two tone bursts are heard from the speaker and, on the primary mode and status panel (7A12) the STATUS TRANSMITTER and RECEIVER indicators CH A2 and CH A1 light.</p>	<p>Check lamps. Higher category of maintenance required.</p>																																	
<p>(6) On the radio line control (7A13), dial the digits 62.</p>	<p>After the first digit (6) is dialed, one tone burst is heard from the speaker. After the second digit (2) is dialed, two tone bursts are heard from the speaker and, on the primary mode and status</p>	<p>Check lamps. Higher category of maintenance required.</p>																																	

Action	Normal indication	Corrective measures
(7) On the radio line control (7A13), dial the digits 63.	<p>panel (7A12), the STATUS TRANSMITTER and RECEIVER indicators CH B1 and CH B2 light.</p> <p>After the first digit (6) is dialed, one tone burst is heard from the speaker. After the second digit (3) is dialed, two tone bursts are heard from the speaker and, on the primary mode and status panel (7A12), the STATUS TRANSMITTER and RECEIVER indicators CH A2 and CH A1 light.</p>	<p>Check lamps. Higher category of maintenance required.</p>
(8) On the radio line control (7A13), dial the digits 66.	<p>After the first digit (6) is dialed, one tone burst is heard from the speaker. After the second digit (6) is dialed, two tone bursts are heard from the speaker and, on the primary mode and status panel (7A12), the STATUS RECEIVER LOCAL GAIN indicator goes out.</p>	<p>Higher category of maintenance required.</p>
(9) On the radio line control (7A13), dial the digits 65.	<p>After the first digit (6) is dialed, one tone burst is heard from the speaker. After the second digit (5) is dialed, two tone bursts are heard from the speaker and, on the primary mode and status panel (7A12), the STATUS RECEIVER LOCAL GAIN indicator lights.</p>	<p>Check lamps Higher category of maintenance required.</p>
(10) On the radio line control (7A11), dial the digits 68.	<p>After the first digit (6) is dialed, one tone burst is heard from the speaker. After the second digit (8) is dialed, two tone bursts are heard from the speaker and, on the primary mode and status panel (7A12), the STATUS RECEIVER AFC ON indicator goes out and the PLT CARR LOSS, SYS FAIL, and AFC ON indicator pushbuttons go out.</p>	<p>Higher category of maintenance required.</p>
(11) On the radio line-control (7A13), dial the digits 67.	<p>After the first digit (6) is dialed, one tone burst is heard from the speaker. After the second digit (7) is dialed, two tone bursts are heard from the speaker and, on the primary mode and status panel (7A2), the STATUS RECEIVER AFC ON indicator lights. The PLT CARR LOSS, SYS FAIL, and the AFC ON indicator pushbuttons light.</p>	<p>Check lamps. Higher category of maintenance required.</p>
(12) On the radio live control (7A13), dial the digits 60.	<p>After the first digit (6) is dialed, one tone burst is heard from the speaker. After the second digit (0) is dialed, two tone bursts are heard from the speaker and, on the primary mode and status panel (7A12), the STATUS TRANSMITTER HV ON and READY indicators go out.</p>	<p>Higher category of maintenance required.</p>

Action	Normal indication	Corrective measures
<p>(13) On the radio line control (7A13), dial the digits 69.</p>	<p>After the first digit (6) is dialed, one tone burst is heard from the speaker. After the second digit (9) is dialed, two tone bursts are heard from the speaker and, on the primary mode and status panel (7A12), the STATUS TRANSMITTER HV ON and READY indicators light when the 10-kw P.A. has completed its tuning cycle.</p>	<p>Check lamps. Higher category of maintenance required.</p>
<p>c. Check dialed frequency. (1) On the radio line control (7A13), dial the digit 5 plus the desired 6 frequency digits.</p>	<p>After the first digit (5) is dialed, one tone burst is heard from the speaker. After the seventh digit is dialed, a continuous tone is heard from the speaker while the receiver is tuning and at the completion of the tuning cycle two tone bursts are heard from the speaker. During the tuning cycle, on the primary mode and status panel (7A12), the STATUS RECEIVER READY indicator goes out and the SYS TUNING indicator lights. At the completion of the receiver tuning cycle, the STATUS RECEIVER READY indicator lights.</p>	<p>Check lamps. Higher category of maintenance required.</p>
<p>(2) On the radio line control (7A13), dial the digit 8 plus the selected 6 digit frequency.</p>	<p>After the first digit (8) is dialed, one tone burst is heard from the speaker. After the seventh digit is dialed, a continuous tone is heard from the speaker while the transmitter is tuning. On the primary mode and status panel (7A12), the STATUS TRANSMITTER indicators CH A2, CH AI, CH B1, CH B2, and READY go out while the transmitter is tuning and the SYS TUNING indicator lights. At the completion of tuning, the SYS TUNING indicator goes out and the STATUS TRANSMITTER KEYED indicator momentarily lights; then the STATUS TRANSMITTER CH A2, CH AI, CH B1, CH B2 and READY indicators light. On the primary frequency select panel (7A11), the TRANSMITTER FREQUENCY DISPLAY displays the selected dialed frequency.</p>	<p>Check lamps. Higher category of maintenance required.</p>
<p>(3) On the radio line control (7A13), set the DIAL SELECT switch to the SWBD position. (4) Press the PRIMARY RADIO AI OFF indicator pushbutton.</p>	<p>The PRIMARY RADIO AI OFF indicator pushbutton lights and the PRIMARY RADIO AI RADIO indicator goes out.</p>	<p>Check lamp. Higher category of maintenance required.</p>

Action	Normal indication	Corrective measures
(5) On the primary frequency select panel (7A11), press the LOCAL indicator pushbutton.	The LOCAL indicator pushbutton lights and the REMOTE indicator goes out. The primary receivers and the transmitter tune to the frequencies that are set on the RECEIVER FREQUENCY and TRANSMITTER FREQUENCY SELECT ME- GACYCLES thumbwheel switches.	Check lamp. Higher category of maintenance required.
19 Shut down the equipment.		
a. On the primary frequency select panel (7A11) and the secondary frequency select panel (7A4), press all lighted VOICE TEST, RING SELECT, and DIVERSITY SELECT indicator pushbuttons.	The lighted indicators go out ----	Higher category of maintenance required.
b. Insure that the LOCAL indicator pushbuttons are lighted.	The LOCAL indicator is lighted--	If the REMOTE indicator pushbutton is lighted, press the LOCAL indicator pushbutton. Check lamp.
c. On the primary mode and status panel (7A12) and the secondary mode and status panel (7A4), perform steps below:		Higher category of maintenance required.
d. Set the KEY LINE switch to OFF.		
e. Press the DEV X1 indicator pushbutton.	DEV X1 indicator lights -----	Check lamp. Higher category of maintenance required.
f. Press all lighted indicator pushbuttons.	The lighted indicators go out	Higher category of maintenance required.
g. Set the XMTR PLT CARR switch to the OFF position.		
h. Set the RCVR CARR SENS switch to position 1.	The STATUS RECEIVER PC 1 indicator lights.	Check lamp. Higher category of maintenance required.
i. Set the NORMAL LEVEL SEL switch to the OFF position.		
j. Set the NORMAL LEVEL AUDIO SEL to position B2.		
k. Set the RF PWR SEL switch to the FWD position.		
l. On the radio line control (7A13), perform steps below:		
m. Press all NORMAL indicator pushbuttons.	The NORMAL indicators light	Check lamps. Higher category of maintenance required.
n. Set the DIAL SELECT switch to the SWB position.		
o. Set the METER SELECT switch to the OFF position.		
p. On the telephone control panel (7A6), press the 10KW XMTR OFF, 10KW RCVR OFF, 1 KW XMTR OFF, and 1 KW RCVR indicator pushbuttons.	The OFF indicators light -----.	Check lamps Higher category of maintenance required.
q. On the power supply-battery charger (1A4), place the BATTERY circuit breaker to the down position.		
r. On the frequency changer (unit 4), place the INPUT circuit breaker to the down position.		

Action	Normal Indication	Corrective measures
<p>s. On the main ac power panel (1A1), place the GENERATOR NO. 1 MAIN DISCONNECT and GENERATOR NO. 2 MAIN DISCONNECT circuit breakers to their down positions.</p> <p>t. On the emergency power panel (1A2), check the ALARM BYPASS indicator pushbutton.</p> <p>u. On the fire warning panel (1A6), check the ALARM BYPASS pushbutton indicator. If the indicator is lighted, press the pushbutton.</p> <p>v. Shut down the engine generator GTGE 70-9-2 following the instructions furnished in TM 5-6115-839-12.</p> <p><i>Note. If a power source other than the generator set is used, refer to the appropriate instructions to insure that power is properly shut down.</i></p>	<p>The ALARM BYPASS indicator pushbutton goes out.</p>	<p>If the indicator is lighted, press the pushbutton.</p> <p>Higher category of maintenance required.</p>

4-13. Telephone Patching Procedures

a. *General.* In the event that communications between telephone subscribers is interrupted, the operator may reestablish communications by performing telephone patching between the EXTERNAL TELEPHONE LINES jacks and the LINE TERMINAL UNITS jacks on the audio patch panel (7A15).

b. *Procedure.* Assume that communications between subscriber No. 1 and subscriber No. 12 have been interrupted, and subscriber No. 12 has reported the interruption to the operator. Reestablish communications by performing steps (1) through (7) below. (1) Determine which subscriber circuit is faulty by recording the number of the complaining subscriber and the number of the desired subscriber. (2) Select one of the remaining known operating lines to be used as a substitute for subscriber No. 1. (3) Call the selected substitute line subscriber and inform him that his circuit will be disconnected. (4) On the telephone terminal (7A1, 7A2, or 7A3), position the 4W/2W, CB/LB/FSK, and D/M/20 switches for the selected substitute line to accommodate subscriber No. 1 as indicated in paragraph 2-23b. (a) On the audio panel (7A16), insert one end of a 2-circuit patchcord into the EXTERNAL TELEPHONE LINES SEND 1 jack. Insert the other end of the patchcord into the selected LINE TERMINAL UNITS SEND jack.

NOTE

If subscriber No. 1 is a 4-wire instrument, a second patchcord must be inserted in the EXTERNAL TELEPHONE LINES REC 1 and the selected LINE TERMINAL UNITS REC jack.

(6) Request that subscriber No. 1 call subscriber No. 12. (7) On the telephone control panel (7A6), depress the LINE INTERCEPT MON pushbutton for line 1 and insure that communication has been restored between subscriber No. 1 and subscriber No. 12.

4-14. Teletypewriter Patching Procedures

a. *General.* In the event that communications of a teletypewriter subscriber is interrupted, the operator may reestablish communications by performing teletypewriter patching at the jack assembly (7A16). b. *Procedure.* Assume that communications to teletypewriter subscriber No. 1 have been interrupted. Perform steps (1) through (15) below to reestablish communications. (1) Select one of the operating PRIMARY 16 CHANNEL VFTG channels to be used as a substitute for teletypewriter No. 1. (2) On the VFTG channel control (7A18), press the selected PRIMARY 16 CHANNEL VFTG CHANNEL SEIZE pushbutton and the

OPERATOR INTERCEPT OPER LOOP pushbutton.

(3) Using the operator teletypewriter set (7A19), notify the selected substitute subscriber that his circuit will be disconnected.

(4) On the VFTG channel control (7A18), press the OPERATOR INTERCEPT MON LOOP pushbutton.

(5) On the jack assembly (7A16), insert one end of a small 2-circuit patchcord (PJ-714, fig. 1-15) into the selected substitute VFTG SEND EQUIP jack.

(6) On the telegraph line control (7A17), set the selected substitute subscriber SEND line rotary switch to the same position as the subscriber No. 1 SEND line rotary switch.

(7) On the jack assembly (7A16), insert the other end of the patchcord installed in step (5) above into the TELETYPE SEND LINE 1 jack.

(8) On the jack assembly (7A16), insert one end of a small 2-circuit patchcord (PJ-714, fig. 1-15) into the selected substitute VFTG REC EQUIP jack.

(9) On the telegraph line control (7A17), set the selected substitute subscriber RECEIVE line rotary switch to the same position as the subscriber No. 1 RECEIVE line rotary switch.

(10) On the jack assembly (7A16), insert the other end of the patchcord installed in step (8) above into the TELETYPE REC LINE 1 jack.

(11) Perform the subscriber send loop current checks and adjustments (pare 3-47b) using the selected substitute REC CURRENT adjustment and RECEIVE LINE SERIES MONITOR jack

(12) Perform the subscriber receive loop current checks and adjustments (pare 3-47c), using the selected substitute SEND CURRENT adjustment and SEND LINE SERIES MONITOR jack.

(13) Using the operator teletypewriter set (7A19), check the subscriber No. 1 send loop by monitoring his send message.

(14) On the VFTG channel control (7A18), press the OPERATOR INTERCEPT MON SET pushbutton and check subscriber No. 1 receiver loop by monitoring his receive message.

(15) On the VFTG channel control (7A18), press the selected substitute PRIMARY 16 CHANNEL VFTG CHANNEL SEIZE pushbutton for an off light indication.

CHAPTER 5
FUNCTIONING

Section I. SYSTEM BLOCK DIAGRAM ANALYSIS OF
COMMUNICATIONS CENTRAL AN/TSC-38B

5-1. General

a. Communications Central AN/TSC-38B provides terminal equipment and radio transmission facilities for telephone and teletypewriter wire line subscribers. Facilities are also provided for two full-duplex secure teletypewriter terminals. Functionally, the AN/TSC-38B consists of six subsystems (fig. 5-1)- (1) Radio subsystem (sec. II) (2) Telephone subsystem (sec. III) (3) Nonsecure data subsystem (sec. IV) (4) Secure data subsystem (sec. V) (5) Control subsystem (sec. VI) (6) Power distribution subsystem (sec. VII) b. Each subsystem will be discussed briefly in this section. The major subsystems will be discussed in more detail in sections II through VII. c. In addition to the components contained in each of the six subsystems, the AN/TSC-38B equipment shelter contains an air conditioner that provides temperature (heating and cooling) and humidity control of the equipment shelter environment.

5-2. Radio Subsystem

a. The radio subsystem consists of a primary and a secondary radio terminal. Each radio terminal provides duplex radio transmission facilities for up to four voice frequency channels simultaneously on four independent sidebands. The distant radio terminal may be another AN/TSC38B, or any other terminal having compatible radio equipment. b. Operation of the primary and secondary radio equipment is independent of each other and is normally performed by the local AN/TSC-38B radio operator. Remote control of either, or both, radio terminals is provided for in the control subsystem.

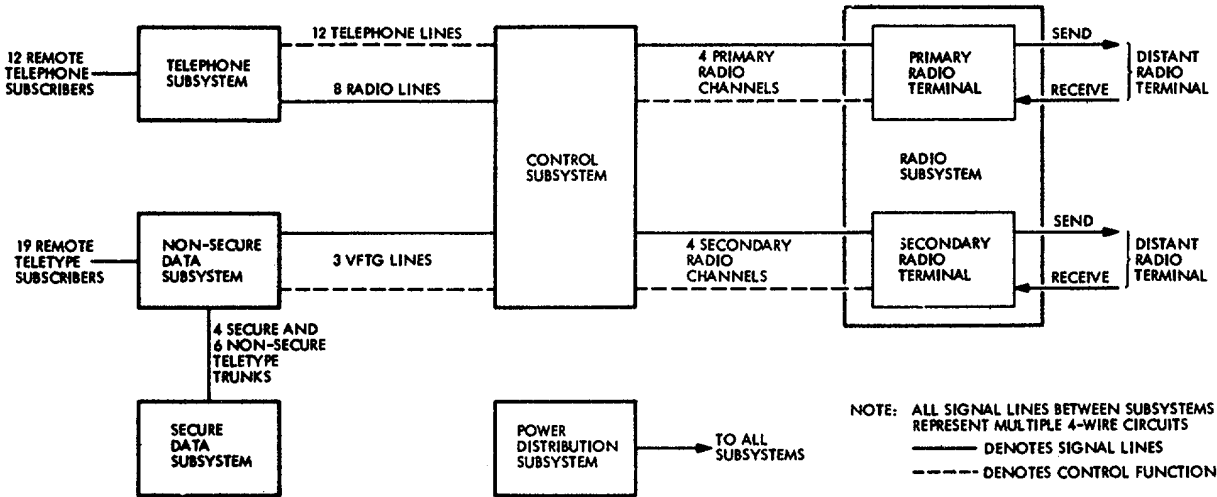


Figure 5-1. AN/TSC8-B System, functional block diagram.

5-3. Telephone Subsystem

The telephone subsystem consists basically of a 20-line, fully automatic, 4-wire, dc dial switchboard and line terminal units for the 12 remote telephone subscribers to the AN/TSC-38B system. The other eight lines of the switchboard are used to connect radio channels to telephone subscribers. Dial service assistance and line intercept facilities (for manual telephone subscribers) are provided.

5-4. Nonsecure Data Subsystem

The nonsecure data subsystem provides voice frequency telegraph (VFTG) terminal equipment for up to 20 (19 active) full-duplex, teletypewriter subscribers or circuits. The 19 circuits are handled in three groups, the primary group is a 16-channel VFTG terminal for subscribers 1 through 16, the secondary group is a 2-channel VFTG terminal for subscribers 17 and 18, and the third group is a single-channel wideband VFTG terminal for subscriber 19. The output of the VFTG terminal is routed to the control subsystem.

5-5. Secure Data Subsystem

The secure data subsystem provides facilities and equipment capable of terminating two full-duplex, secure teletypewriter circuits. One circuit designated primary and the other secondary. The secure circuits are connected to the nonsecure data subsystem over four secure teletype trunks (two send and two receive). Six nonsecure trunks (three send and three receive) are provided which allow the teletypewriter equipment to be used as inputs to the nonsecure data subsystem.

5-6. Control Subsystem

The control subsystem provides the operator with control and monitoring facilities for all telephone, teletypewriter, and radio communications. Dial service assistance and line intercept functions are provided for the telephone subsystem. A remote control allows FSK telephone subscribers (at the operator's option) to control operation of either or both radio terminals by dialing specific control code numbers. The operator is provided with a teletypewriter and monitor meter to monitor the quality and performance of all established teletypewriter circuits.

5-7. Power Distribution Subsystem

The primary purpose of the power distribution subsystem is to supply and distribute main power to all subsystems. This subsystem also contains a fire alarm facility. Metering and protection circuitry are utilized throughout. The operator is thus able to monitor circuits in use and to take necessary corrective action in case of failure of a power source.

Section II. RADIO SUBSYSTEM

5-8. General

The radio subsystem (fig. 5-2) consists of two full-duplex (primary and secondary) independent RF radio terminals. Each radio terminal provides duplex radio transmission facilities for up to four voice frequency channels simultaneously on four independent sidebands. The distant radio terminal(s) may be another AN/TSC-38B, or any other terminal having compatible radio equipment. Operation of the primary and secondary radio equipment is independent of each other and is normally performed by the local AN/TSC-38B radio operator. The primary radio terminal is capable of transmitting RF signals at a power level of 10 kilowatts. The secondary radio terminal is capable of transmitting RF signals at a power level of 1 kilowatt.

5-9. Primary Radio Terminal (Receive)

a. The received primary radio signals from the 1-kw vee antennas are connected to the RCVR VEE ANT NO. 1 and RCVR VEE ANT. NO. 2 connectors on the antenna entry panel, which are internally connected to coaxial jacks RCVR VEE ANT NO. 1 and RCVR VEE ANT. NO. 2, respectively, on the RF patch panel. b. The RCVR VEE ANT. NO. 1 and the RCVR VEE ANT. NO. 2 coaxial jacks in the RF patch panel are connected by short coaxial cable patching cords to coaxial jacks PRIM RCVR NO. 1 and PRIM RCVR NO. 2, respectively. This patching configuration completes the path from 1-kw vee antennas to the primary receivers (primary No. 1 and primary No. 2).

Figure 5-2. Radio subsystem block diagram.
(Located in back of manual.)

c. The primary receivers (No. 1 and No. 2) translate the input RF signals to four individual

audio channels contained within a 12-kc segment of the 2- to 29.9999-mc frequency spectrum.

- d. The two RF inputs to the primary radio terminal permit space diversity reception.

5-10. Primary Radio Terminal (Transmit)

a. The primary transmitter translates the four-channel audio input to a 12-kc segment of the 2- to 29.9999-mc spectrum. This RF signal is connected to the PRIM EXCITER coaxial jack on the RF patch panel. This coaxial jack permits the operator access to the RF output of the primary transmitter.

b. The PRIM EXCITER coaxial jack is connected by a short coaxial cable patchcord to the 10KW PA coaxial jack. This jack permits the operator access to the input of the 10-kw P.A.

c. The 10-kw P.A. amplifies the low-level RF input from the primary transmitter to an RF level of 10 kilowatts and routes the high-power RF signal to the 10-kw vee antenna via the 10-kw entry panel.

d. The 10KW VEE ANT. coaxial jack on the RF patch panel permits the operator access to the input connection of the 10-kw vee antenna by disconnecting the connection from the 10-kw P.A. (at the 10-kw signal entry panel) and connecting the 10-kw vee antenna cable to the 10-kw signal entry panel.

5-11. Secondary Radio Terminal (Receive)

a. The received secondary radio signal from the field whip antenna is connected to the WHIP ANT. FIELD connector on the antenna entry panel. The WHIP ANT. FIELD connector is connected to the WHIP ANT. FIELD coaxial jack on the RF patch panel. This coaxial jack permits the operator access to the field whip antenna connection.

b. The WHIP ANT. FIELD coaxial jack is connected by a short coaxial cable patchcord to the SECONDARY RCVR coaxial jack on the RF patch panel. This jack permits the operator access to the RF input of the secondary receiver.

c. The secondary receiver translates the input RF signal to four individual audio channels contained within a 12-kc segment of the 2-to 29.9999-mc spectrum.

d. The SECONDARY RCVR coaxial jack may be connected to the 1KW XMTR RECEIVE coaxial jack on the RF patch panel. This jack permits use of the shelter whip antenna for receiving when the secondary radio terminal (transmit) is operating in simplex mode.

5-12. Secondary Radio Terminal (Transmit)

a. The secondary transmitter translates the four-channel audio input to a 12-kc segment of the 2- to 29.9999-me spectrum. This RF signal is connected to the SEC EXCITER coaxial jack on the RF patch panel. This coaxial jack permits the operator access to the RF output of the secondary transmitter.

b. The SEC EXCITER coaxial jack is connected by a short coaxial cable patchcord to the 1KW PA coaxial jack. This jack permits the operator access to the input of the 1-kw P.A.

c. The 1-kw P.A. amplifies the low-level RF input from the secondary transmitter to an RF level of 1 kw and routes the high-power RF signal via directional couplers to the 1KW XMTR XMIT coaxial jack on the RF patch panel. This jack permits the operator access to the output of the 1-kw P.A.

d. The 1KW XMTR XMIT coaxial jack is connected by a short coaxial cable patchcord to the WHIP ANT. SHELTER coaxial jack on the RF patch panel. This jack permits the operator access to the input of the antenna coupler.

e. The WHIP ANT SHELTER coaxial jack is connected to the shelter whip antenna, via the COUPLER RF connection on the antenna signal entry panel and the antenna coupler.

- f. The antenna coupler matches the whip antenna electrical length to the selected 1-kw P.A. RF frequency.

Section III. TELEPHONE SUBSYSTEM

5-13. General

The telephone subsystem (fig. 5-3) functionally consists of wire lines (12 wire line subscriber line terminals), radio lines (8 radio line channels,) audio equipment, an automatic switchboard, dial service assist (DSA), and two operator positions. The telephone subsystem is a 20-line, 10-link, 4- wire, dc dial, single-register, 28-volt dc loop-operated automatic switchboard with dc and frequency-shift keying (FSK) dial-through provided. The telephone subsystem is capable of operating as a 2-wire or 4-wire switching system, utilizing

local battery, common battery, or FSK (three subscribers only).

5-14. Line Terminals

The telephone subsystem includes the automatic telephone switching and operator control equipment for operation with 12 external wire line subscribers. Each subscriber line is terminated in an identical line terminal which allows initial selection of the type of line and signaling characteristics for each subscriber. The following types of subscriber lines may be serviced: *a.* 4-wire/2-wire, dial, common battery telephone. *b.* 4-wire/2-wire, manual, common battery telephone. *c.* 4-wire/2-wire, local battery telephone. *d.* 4-wire/2-wire, local battery switchboard. *e.* 4-wire/2-wire, common battery switchboard. *f.* 2-wire, common battery one-way switchboard. *g.* 4-wire/2-wire, FSK dial, FSK push-to-talk.

5-15. Telephone Line Intercept

The line intercept function provides operator access to the local battery lines and associated switchboard entries for assistance and monitoring purposes. Incoming ringing signals are intercepted and displayed by the line intercept function. When a local battery line is selected by the switchboard, one ring is automatically transmitted on the local battery line without action by the operator. Additional ringing requires action by the operator.

5-16. Radio Subscribers

Eight radio subscribers comprise four channels from the secondary radio terminal and four channels from the primary radio terminal. Each radio line is a full-duplex radio channel, with each channel assigned to one of four specific sidebands.

5-17. Radio Intercept

The radio intercept function allows a call to be detected, either through the switchboard or from the radio lines, and permits the operator to monitor or assist the calling subscribers. The radio intercept function also permits the operator to complete a subscriber circuit by connecting the radio circuit to one side of a 4-way, 4-wire bridge network connecting the switchboard lines to the other side, and connecting the operator No. 1 headset, microphone, FSK dial, and PTT tone generators to the third side of the bridge. The fourth side of the bridge is terminated.

5-18. Operator Positions

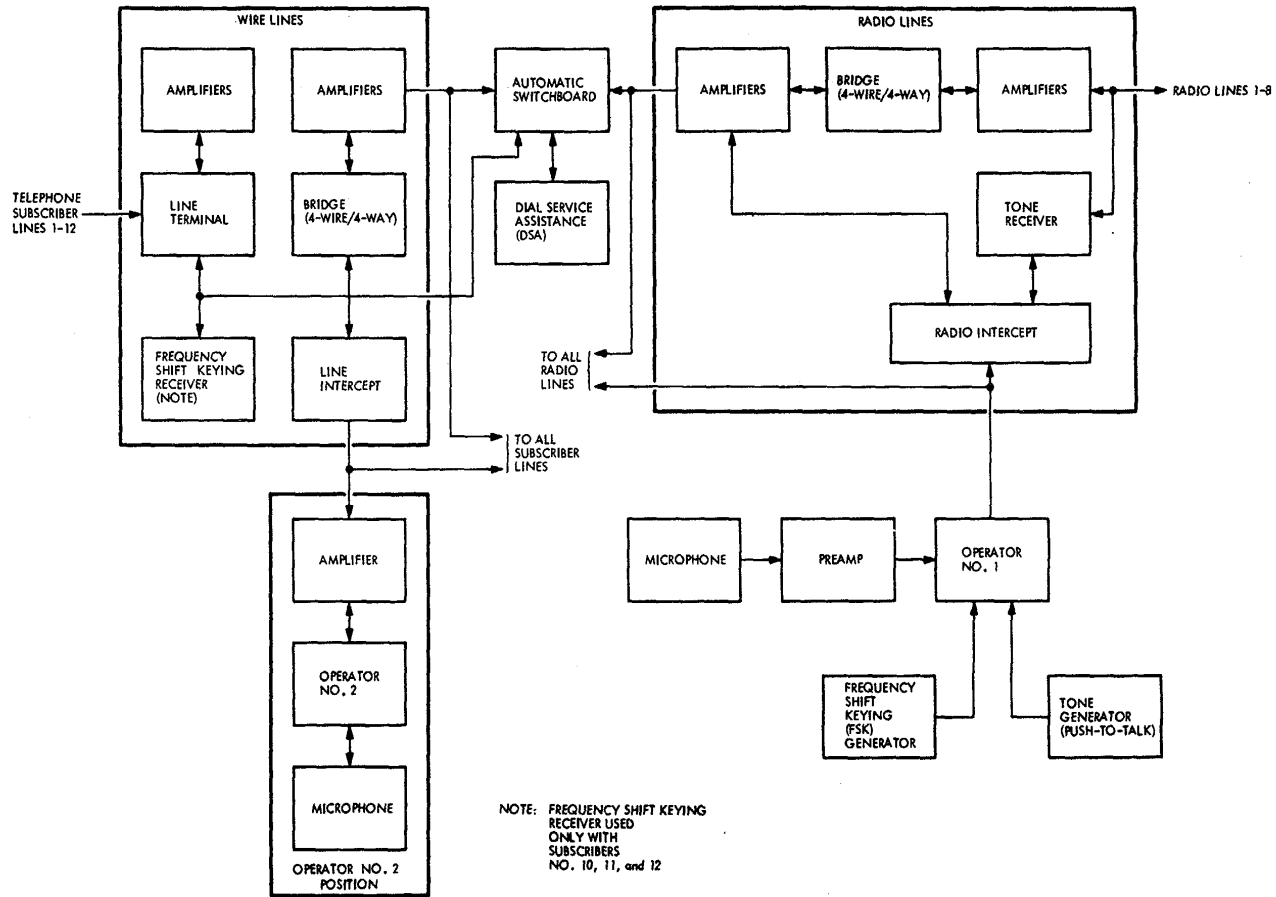
Two operator positions are provided. One position, No. 1, is the common position and contains the control equipment and facilities to provide the operator access to and control of the various radio wire integration functions. The other position, No. 2, is for use exclusively with the subscriber lines and the dial service assistance (DSA) functions. This position may be controlled from the operator No. 1 position.

5-19. Dial Service Assistance

A single DSA function is provided to aid subscribers in the use of the switchboard and to provide a switchboard operator position. The function provides wire line subscribers access to the operator, alerts the operator that a calling party requires assistance, permits the operator to provide the desired connection, and resets the associated circuits to accept another request for assistance.

5-20. Automatic Switchboard

a. The function of the automatic switchboard is to connect a calling subscriber to a set of audio buses by a relay. Following the dialing of a subscriber number, another relay is employed to connect the called subscriber to the same set of audio buses. *b.* During a period of no subscriber activity, the automatic switchboard generates a sequential series of electrical codes which comprise the telephone numbers of all subscribers. This series of data operates to insure an orderly assignment of interconnecting links. A subscriber can initiate a call only at the instant that his number is being generated. *c.* At the time the calling subscriber number is being generated and the subscriber is waiting to place a call, the automatic switchboard will initiate a search for a free link to which the subscriber will be connected. *d.* After receiving a link, the subscriber may proceed to dial the selected party. At the completion of the dialed number, the automatic switchboard connects the called party to the calling subscriber link.



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Figure 5 - 3. Telephone subsystem block diagram.

Section IV. NONSECURE DATA SUBSYSTEM

5-21. General

The nonsecure data subsystem (fig. 5-4) includes all facilities necessary to connect a wire line teletypewriter subscriber, on a full-duplex basis, to a distant subscriber service by a distant voice frequency teletypewriter (VFTG) terminal. The nonsecure data subsystem provides voice frequency telegraph (VFTG) terminal equipment for up to 19 full-duplex teletypewriter subscribers or circuits. The 19 circuits are handled in three groups: the primary group is a 16-channel VFTG terminal for subscribers 1 through 16, the secondary group is a two-channel VFTG terminal for subscribers 17 and 18, and the third group is a single-channel wideband VFTG terminal for subscriber 19. The primary group is used with the primary radio terminal and the secondary group is used with the secondary radio terminal. The wideband single-channel VFTG terminal may be used with either radio terminal.

5-22. Teletype Signal Entry Panel

Wire line terminations from 20 teletypewriter subscribers are made at the teletype signal entry panel where each wire line is equipped with line protection devices and routed to the jack assembly.

5-23. Jack Assembly

The jack assembly provides the operator with access to the individual teletypewriter subscribers send and receive circuits and provides connection to individual VFTG equipment circuits. The send and receive teletypewriter signals from the jack assembly are routed to the telegraph line control.

5-24. Telegraph Line Control

The telegraph line control isolates the teletypewriter subscriber circuits from the VFTG terminal and provides battery for the teletype subscriber send and receive circuits. It also contains the controls for routing the fox generator output.

5-25. Fox Generator

The fox generator provides either fixed characters or a fox test message. The output of the fox generator is routed to the telegraph line control where it is applied either to the teletypewriter subscriber or into the VFTG terminal for transmission to the distant VFTG terminal channel output circuit.

5-26. VFTG Terminal

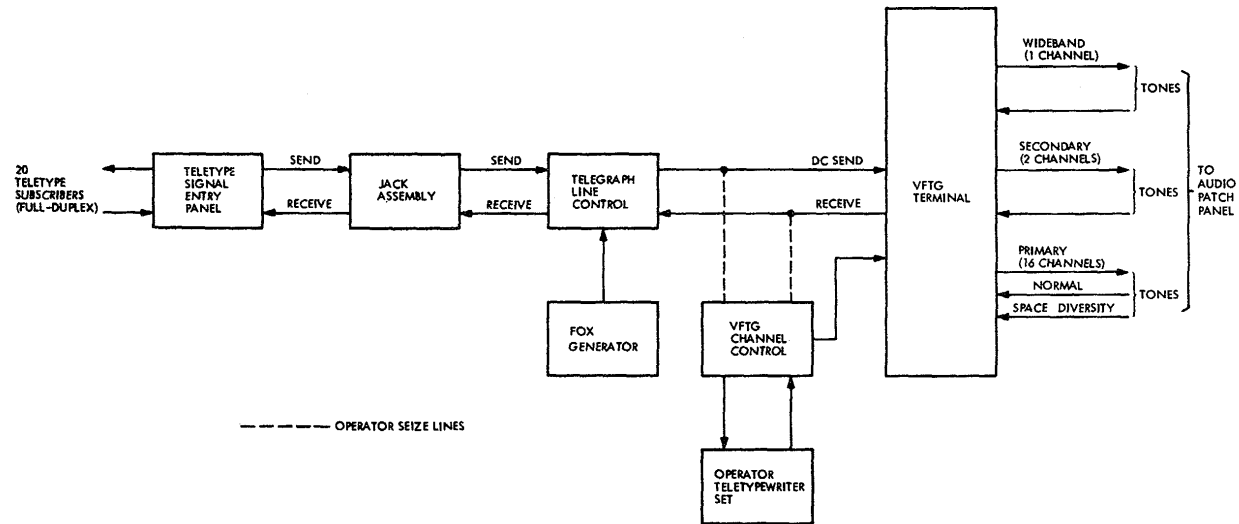
The VFTG terminal accepts the dc teletypewriter signals from the telegraph line control and converts them to tones. The received tones from the audio patch panel are converted to dc teletypewriter signals and routed to the telegraph line control. The primary VFTG terminal consists of 16 full-duplex send and receive channels. The receive channels are arranged for space diversity signal inputs. The secondary terminal is a two-channel facility which may be arranged for frequency diversity. The third terminal is a single wideband channel. Tone inputs and outputs of the VFTG terminal are available on the audio patch panel which provides the operator with access to the tone send and receive circuits.

5-27. VFTG Channel Control

The VFTG channel control performs the functions of turning on the terminal power and loop circuits, providing the operator with access to the terminal and subscriber circuits, and providing diversity operation selection.

5-28. Operator Teletypewriter

The operator teletypewriter set is used in conjunction with the VFTG channel control to monitor send and receive traffic, or to seize the send or receive circuits and provide communications to the wire line teletypewriter subscriber or the distant VFTG terminal channel subscriber.



EL5895-356-12-1-TM-102

Figure 5-4. Nonsecure data subsystem block diagram.

Section V. SECURE DATA SUBSYSTEM

5-29. General

The secure data subsystem (fig. 5-5) contains two full-duplex cryptographic terminals and three full-duplex nonsecure trunks. The cryptographic terminal has a primary send and receive circuit along with a secondary send and receive circuit. The nonsecure trunks have three send and three receive circuits which allow the teletype equipment to be used as inputs to the nonsecure data subsystem. The teletypewriter equipment used in the secure data subsystem have been modified for low-level operation.

5-30. Primary Trunk

The secure data primary send circuit has a transmitter-distributor and a keyboard (part of the teletypewriter set) connected to the secure teletype patch panel. This combination permits a choice of either tape or manual sending, respectively. The secure data primary receive circuit has a page printer (part of the teletypewriter set) and a reperforator connected to the secure teletype patch panel. This combination permits a choice of either page printer or tape reception, respectively. The primary send and primary receive circuits are wired through their respective communications security equipment to RFI filter No. 2 and terminated at patching jacks at the nonsecure subsystem.

5-31. Secondary Trunk

The secure data secondary send circuit has a transmitter-distributor and keyboard (part of the reperforator-transmitter) connected to the secure teletype patch panel. This combination permits a choice of either tape or manual sending, respectively. The secure data secondary receive circuit has a reperforator (part of the reperforator-transmitter), permitting tape reception only, connected to the secure teletype patch panel. The secondary send and secondary receive circuits are wired through their respective communications security equipment to RFI filter No. 2, and terminate at patching jacks at the nonsecure subsystem.

5-32. Nonsecure Trunks

Three nonsecure send and receive alarm-protected trunks are provided between the secure teletype patch panel and the nonsecure subsystem. Patching from a secure primary or secondary circuit into a nonsecure circuit actuates a visual and audible alarm. The nonsecure send and receive trunks have been modified for low-level operation by the addition of a + 6 volt to 30 volt signal converter.

5-33. Patching

All the secure and nonsecure circuits terminate at patching jacks in the nonsecure subsystem. Patching options permit connections to send and receive circuits of landline subscribers, or send and receive circuits to the radio transmitter and receiver.

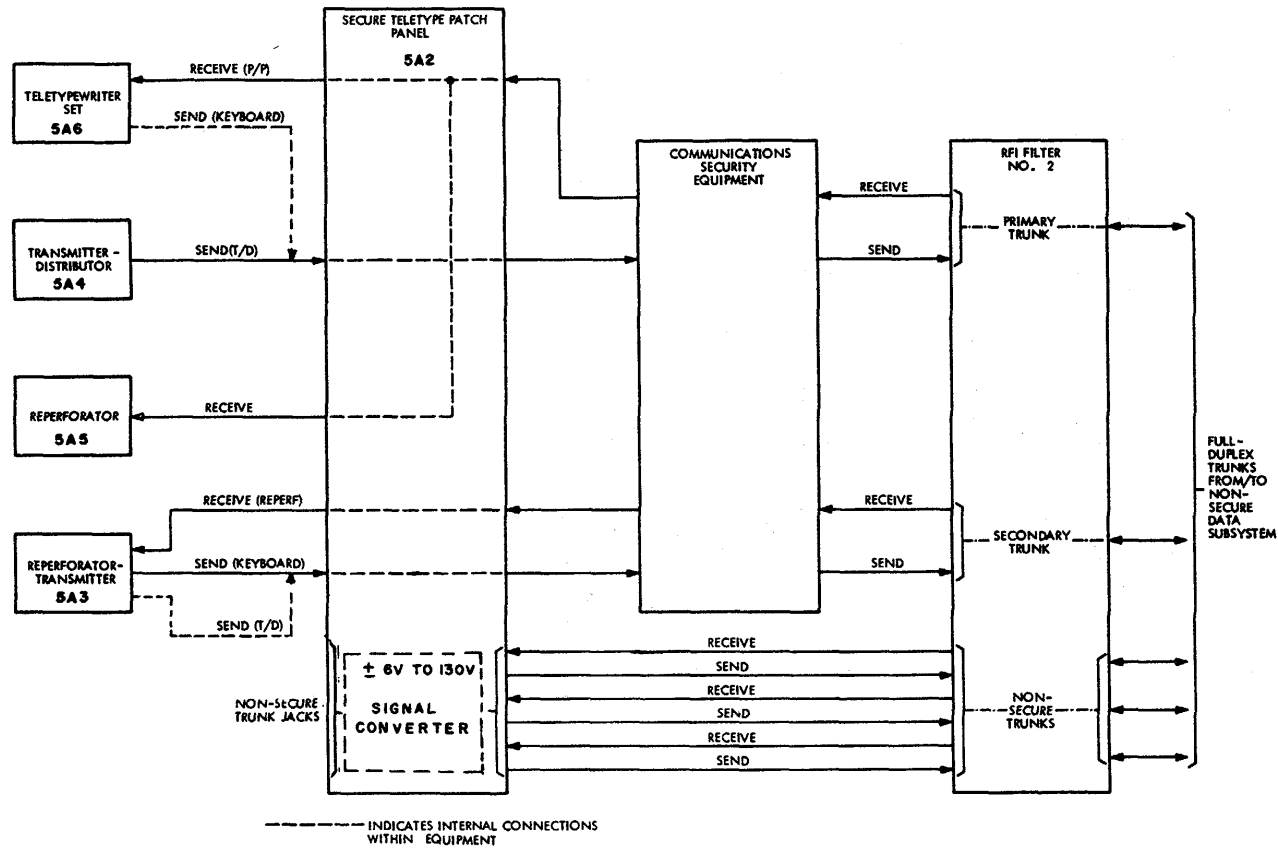


Figure 5-5. Secure data subsystem block diagram.

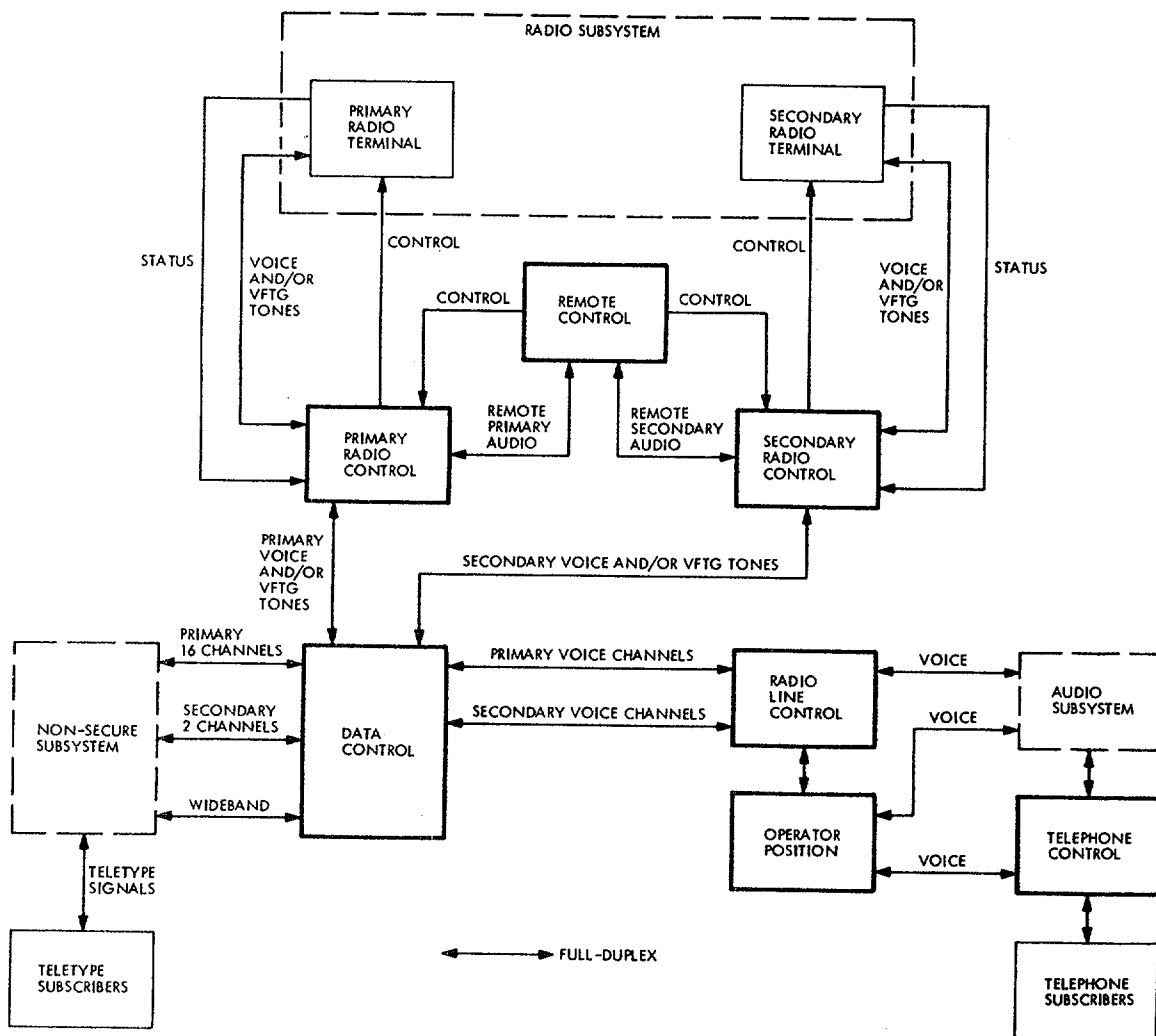
Section VI. CONTROL SUBSYSTEM

5-34. General

The control subsystem (fig. 5-6) is the operating center of the AN/TSC-38B and functionally consists of data control, telephone control, operator position, radio line control, primary radio control, secondary radio control, and the remote control. The control subsystem provides local and remote control of the primary and secondary radio terminals, local control of the application of the nonsecure subsystem VFTG tones to the primary and secondary radio terminals, and the operator position for radio intercept and wire line intercept together with control of the telephone subscriber audio subsystem connections. These control facilities, while performing independent functions, are interrelated to permit complete flexibility and use of audio and teletypewriter input and output channels.

5-35. Data Control

The data control accepts the primary 16 channels, secondary two channels and wideband channel from the nonsecure subsystem, and the primary voice channels and secondary voice channels from the radio line control, and provides the operator with the controls to select, on an individual channel basis, the assignment of the VFTG tones and the control of the level of the VFTG tones. The data control routes the primary voice and/or tones to the primary radio control and the secondary voice and/or tones to the secondary radio control.



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Figure 5-6. Control subsystem block diagram.

5-36. Primary Radio Control

a. The primary radio control routes the primary voice and/or VFTG tones to the primary radio terminal and provides the following control functions: (1) Voice test. (2) Ring select. (3) Diversity select. (4) Receiver tune. (5) Transmitter tune. (6) Receiver frequency select. (7) Transmitter frequency select. (8) AFC on, scan and reset. (9) Receiver and transmitter channel enable. (10) Transmitter pilot carrier level. (11) Receiver pilot carrier level. (12) Receiver RF gain control. (13) Power on. (14) High voltage on. (15) Simplex operation. (16) Receiver reset. (17) Transmitter key line options. (18) Remote primary audio to the remote control. b. The primary radio control receives status signals from the primary radio terminal which provide the operator with a visual indication of the status of the primary radio terminal.

5-37. Secondary Radio Control

The secondary radio control routes the secondary voice and/or VFTG tones to the secondary radio terminal and provides the same control signals as the primary radio control, except for the diversity select control. The secondary radio control accepts status signals from the secondary radio terminal which provide the operator with a visual indication of the status of the secondary radio terminal.

5-38. Remote Control

The remote control accepts primary and/or secondary audio signals from the primary radio control and the secondary radio control, respectively, and permits certain telephone subscribers (FSK subscribers 10, 11, and 12) to remotely control the primary and/or the secondary radio terminals by use of frequency shift keying audio signaling.

5-39. Telephone Control

The telephone control contains the facilities for intercepting, monitoring, signaling, and providing dial service assist to telephone subscribers.

5-40. Operator Position

The operator position contains position alarm circuits that alert the operator to an incoming radio or wire call, and provides the operator with microphone and headset connections to radio or wire circuits.

5-41 . Radio Line Control

The radio line control provides individual radio channel control for the primary voice channels and the secondary voice channels. The radio line control also permits wire-to-radio or radio-to-wire connection through the audio subsystem.

Section VII. POWER DISTRIBUTION SUBSYSTEM

5-42. General

a. The primary purpose of the power distribution subsystem (fig. 5-7) is to supply and distribute main power to all subsystems. This subsystem also provides an emergency power function in the event of power failure and contains a fire alarm facility. Metering and protection circuitry are utilized throughout that enable the operator to monitor circuits in use and to take necessary corrective action in case of failure of a power source. b. Under normal operating conditions, all power requirements of the AN/TSC-38B are supplied by two motor generator sets located on the pallet outside the equipment shelter. The AN/TSC-38B will, however, accept input power from other sources for alternative operations. Two generators may be used, or the power may be provided by a single generator, or commercial power may be utilized. Input power required by the equipment shelter is 120/208 volts ac, 3-phase, 4-wire, 47 to 63 cps or 380 to 420 cps. Two 200-foot power cables are provided to connect the generator output to the power entry panel located near the door of the shelter.

5-43. Input Power

The power circuits from the generators are routed through the power entry panel and two

line filters directly to the main ac power panel. Two power line buses are developed within the main ac power panel: a technical bus and a nontechnical bus. Basically, each bus is 3-phase power, 60 or 400 cps, but the technical bus is split into single-phase services for certain applications of primary power throughout the system. The main ac power panel permits selection of the generator to be used for either bus.

Figure 5-7. Power distribution subsystem block diagram.
(Located in back of manual.)

5-44. Nontechnical Bus

The bus may be either 60 or 400 cps (3-phase) power, usually supplied by a generator and delivered to the main ac power panel. The main ac power panel routes this power bus to the frequency changer. The frequency changer converts 60-cps power to 400 cps, which is then used as primary power for the air conditioner. If 400-cps power is applied to the frequency changer, it is routed directly to the air conditioner.

5-45. Technical Bus

The technical bus is 3-phase 60-cps or 400-cps power used throughout the system as the main source of power during periods of normal operation. In some cases, it is split and only single phases are used. The 3-phase technical bus (60 or 400 cps) is routed out of the main ac power panel and fed to the normal power panel for distribution as follows:

<i>Single-phase 60 or 400 cps</i>	<i>Three-phase 60 or 400 cps</i>
Utility outlets.....	10-kw P. A.
Fox generator.....	Power supply-battery charger.
Transmitter (primary).	
Shelter lights (during normal operation).	
Receivers (primary No. 1 and No. 2).	
Amplifier-decoder-power distribution assembly.	

a. In addition to the above power distribution, one single-phase, 60-cps (only) power circuit is utilized for external outlets located near the power entry panel. b. The 3-phase technical bus is routed from the main ac power panel to the emergency power panel to be utilized by the 1-kw P.A. and the 1-kw P.A. power supply. A single-phase branch of the technical bus from the emergency power panel is used to supply 60- or 400-cps power to VFTG power supply No. 2.

5-46. Power Inverter Distribution

a. A dc voltage from the power supply-battery charger is applied to the power inverter where it is inverted to single- and 3-phase 60-cps power. The 3-phase 60-cps power is applied to the 1-kw P.A. through the emergency panel. The single-phase, 60-cps power is sent to the emergency power panel where it is distributed to the teletypewriter group. Single-phase power is also distributed through the emergency power panel to the following assemblies: (1) 1-kw P.A. (2) Antenna coupler control. (3) Antenna coupler. (4) VFTG and equipment blowers. (5) Teletypewriter set (located in operator rack). (6) Transmitter (secondary). (7) Amplifier-decoder-power distribution assembly. (8) Receiver (secondary). b. A single-phase line from the power inverter is applied direct to the blackout bypass in the normal power panel. Another single-phase line from the power inverter is sent to the normal power panel to supply power to VFTG power supplies No. 1 and No. 2.

5-47. 28-Volt Distribution

a. Dc voltage from a 28-volt power supply is used to power two indicators in the fire warning panel. Three fire sensors are in the return side of this line. The dc voltage is routed from the power supply to interlock switches in the power rack and to audible indicators and an alarm bypass indicator in the emergency power panel. The dc voltage is applied to the power supply-battery charger which provides the dc input to the power inverter. One output of the power inverter is a 28-volt regulated main bus. The regulated main bus is routed to the amplifier-decoder-power distribution assembly where it is distributed into three branches. One branch provides power to the shelter lights during emergency operation. Another branch provides regulated power to the R/T fuse panel for distribution to the following assemblies: (1) Logic gate (relay power). (2) Remote control (prime power). (3) Receivers (primary No. 1 and No. 2 and secondary) (relay power). (4) Transmitters (primary and secondary) (relay power). (5) Amplifier-decoder-power distribution assembly (relay power).

b. The remaining branch delivers 28-volt regulated dc power to the control-monitor fuse panel and then is split into two branches--

(1) One branch provides a 28-volt indicator bus to the following assemblies: (a) Secondary frequency select panel. (b) Secondary mode and status panel. (c) Primary frequency select panel. (d) Primary mode and status panel. (f) VFTG channel control. (2) The other branch provides 28-volt prime power to the following assemblies: (a) Telephone terminals. (b) Secondary frequency select panel. (c) Secondary mode and status panel. (d) Telephone control panel. (e) Line amplifier No. 1. (f) Electronic circuit control. (g) Primary frequency select panel. (h) Primary mode and status panel. (i) Radio line control. (j) Keyer-detector. (k) Af detector. (l) Subscriber logic No. 1. (m) Subscriber Logic No. 2. (n) Subscriber logic No. 3. (o) Link logic unit. (p) Ringing generator.

5-48. Emergency Operation

In the event of generator failure or unavailability of main power input, the system will not operate due to the removal of the battery assembly.

APPENDIX A

REFERENCES

DA Pam 310-4	Index of Technical Manuals, Technical Bulletins, Supply Manuals (types 7, 8, and 9), Supply Bulletins and Lubrications Orders.
DA Pam 310-7 TB 746-10	U. S. Army Equipment Index of Modification Work Orders. Field Instructions for Painting and Preserving Electronics Command Equipment.
TM 5-6115-339-12	Organizational Maintenance Manual: Generator Set, Gas Turbine Engine, 600Kw, Ac, 120/208, 240/416V, 3-Phase, 4Wire, Skid-Mounted, Win-terized, (Airesearch Model GTGE 70-9-2) FSN 6115-758-5492.
TM 38-750	Army Equipment Record Procedures.

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

Section I. INTRODUCTION

B-1. Scope

This appendix lists only basic issue items required by the crew/operator for installation, operation, and maintenance of Communications Central ANITSC-38B.

B-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.

B-3. Explanation of Columns.

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

- a. Illustration. 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 SB 708-42.
- e. Description. Indicates the Federal item name and a minimum description required to identify the item.
- f. Unit of Measure (UIM). 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		(2) Federal stock number	(3) Part number	(4) FSCM	(5) Description Usable on code	(6) Unit of meas	(7) Qty furn with equi p
(A) Fig No.	(B) Item No						
		6545-922-1200	9-221-20	89875	FIRST AID KIT	EA	1

Change 2 B-1

APPENDIX C

MAINTENANCE ALLOCATION

Section I. INTRODUCTION

C-1. General

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

C-2. Maintenance Functions

Maintenance functions will be limited to and defined as follows:

- a. Inspect. To determine serviceability of an item by comparing its physical, mechanical, and electrical characteristics with established standards.
- b. Test. To verify serviceability and to detect incipient electrical or mechanical failure by use of special equipment such as gages, meters, etc. This is accomplished with external test equipment and does not include operation of the equipment and operator type tests using internal meters or indicating devices.
- c. Service. To clean, to preserve, to charge, and to add fuel, lubricants, cooling agents, and air. If it is desired that elements, such as painting and lubricating, be defined separately, they may be so listed.
- d. Adjust. To rectify to the extent necessary to bring into proper operating range.
- e. Align. To adjust two or more components or assemblies of an electrical or mechanical system so that their functions are properly synchronized. This does not include setting the frequency control knob of radio receivers or transmitters to the desired frequency.
- f. Calibrate. To determine the corrections to be made in the readings of instruments or test equipment used in precise measurement. Consists of the comparison of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared with the certified standard.
- g. Install. To set up for use in an operational environment such as an encampment, site, or vehicle.
- h. Replace. To replace unserviceable items with serviceable like item.
- i. Repair. To restore an item to serviceable condition through correction of a specific failure of unserviceable condition. This function includes, but is not limited to welding, grinding, riveting, straightening, and replacement of parts other than the trial and error replacement of running spare type items such as fuses, lamps, or electron tubes.
- j. Overhaul. Normally, the highest degree of maintenance performed by the Army in order to minimize time work in process is consistent with quality and economy of operation. It consists of that maintenance necessary to restore an item to completely serviceable condition as prescribed by maintenance standards in technical publications for each item of equipment. Overhaul normally does not return an item to like new, zero mileage, or zero hour condition.
- k. Rebuild. The highest degree of materiel maintenance. It consists of restoring equipment as nearly as possible to new condition in accordance with original manufacturing standards. Rebuild is performed only when required by operational considerations or other paramount factors and then only at the depot maintenance category. Rebuild reduces to zero the hours or miles the equipment, or component thereof, has been in use.
- l. Symbols. The uppercase letter placed in the appropriate column indicates the lowest level at which that particular maintenance function is to be performed.

C-3. Explanation of Format

- a. Column 1, Group Number. Column 1 lists group numbers, the purpose of which is to identify components, assemblies, subassemblies; and modules with the next higher assembly.

b. Column 2, Functional Group. Column 2 lists the noun names of components, assemblies, subassemblies and modules on which maintenance is authorized.

c. Column 3, Maintenance Functions. Column 3 lists the maintenance category at which performance of the specific maintenance function is authorized. Authorization to perform a function at any category also includes authorization to perform that function at higher categories. The codes used represent the various maintenance categories as follows:

Code	Maintenance category
C	Operator/crew
O.	Organizational maintenance
F	Direct support maintenance
H.	General support maintenance
D	Depot maintenance

d. Column 4, Tools and Test Equipment. Column 4 specifies, by code, those tools and test equipment required to perform the designated function. The numbers appearing in this column refer to specific tools and test equipment which are identified in table 1.

e. Column s, Remarks. Self-explanatory.

C 4. Explanation of Format of Table 1, Tool and Test Equipment Requirements

The column in Table I, Tool and Test Equipment Requirements 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 applicable tool for the maintenance function.

b. Maintenance Category. The codes 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 of the specific tool or test equipment.

e. Tool Number. Not used.

C-2 Change 1.

SECTION II. MAINTENANCE ALLOCATION CHART

MAINTENANCE ALLOCATION CHART

GROUP NUMBER	FUNCTIONAL GROUP	MAINTENANCE FUNCTIONS										TOOLS AND EQUIPMENT	REMARKS	
		I N S P E C T	T E S T	S E R V I C E	A D J U S T	A L I G N	C A L I B R A T E	I N S T A L L	R E P L A C E	R E P A I R	O V E R H A U L			R E B U I L D
1	COMUNICATIONS CENTRAL AN/TSC-38B													
	COMMUNICATIONS SUPPORT GROUP 0A-8036	0		0										
	GENERATOR GTGE-70-9-2													
	COMMUNICATIONS CENTRAL GROUP OA-7998	0		0										
	RACK, ELECTRICAL EQUIPMENT MT-3622	0									D			
	1A1 POWER DISTRIBUTION PANEL SB-2783	0								H			2	
	1A2 POWER DISTRIBUTION PANEL SB-2784	0	F							F			2, 3 1, 22, 22, 66	
	1A3 POWER DISTRIBUTION PANEL SB-2785	0	F						F				2 2, 10	
	1A4 POWER SUPPLY-BATTERY CHARGER PP-4536	0	F							H			2 2, 10	
	1A4A1 BATTERY CHARGER AND EMERGENCY TRANSFER CARD			0			F				F	D	2 2, 11, 12 2, 5, 7, 11, 12, 33 2, 5, 7, 33, 35, 52, 53, 54 2, 5, 7, 42, 52	
1A4A2 PREAMPLIFIER CARD						F			F		D	2, 5, 7, 33 2, 5, 7, 33 2, 5, 7, 33, 42 2, 5, 7, 33 2, 5, 7, 33 2, 5, 7, 33, 42		

See TM 5-6115-339-12

SECTION II. MAINTENANCE ALLOCATION CHART

MAINTENANCE ALLOCATION CHART

GROUP NUMBER	FUNCTIONAL GROUP	MAINTENANCE FUNCTIONS										TOOLS AND EQUIPMENT	REMARKS	
		I N S P E C T	T E S T	S E R V I C E	A D J U S T	A L I G N	C A L I B R A T E	I N S T A L L	R E P L A C E	R E P A I R	O V E R H A U L			R E B U I L D
1A4A3	AN/TSC-38B (Cont) PULSE WIDTH MODULATOR CARD				F				F				2, 5, 7, 33 2, 5, 7, 33, 2, 5, 7, 33, 42 2	
1A5	BATTERY ASSEMBLY	0	0	0				H						
1A6	ALARM INDICATOR, FIRE INDICATOR BZ-130			0									2 2, 10	
2	AMPLIFIER, RADIO FREQUENCY AM-4543	0	F H							F			1, 2, 6, 7, 22, 23 1, 6, 14, 15, 22, 27, 28, 37, 55 1, 2, 6, 7, 22, 23	Replace tubes 1V1, 2V1, 2V2, 2V3, and 2V4
2A3	SERVO CONTROL DRAWER		F	F					F				1, 6, 14, 15, 17, 22, 23 27, 28, 30, 37, 47 2, 2, 6	Replace PI relays and repair 15V power supply.
3	AIR CONDITIONER	0		0									2, 37, 47	
4	CONVERTER FREQUENCY, STATIC CV-2100	0 F	0										1, 3, 5, 7	Replace relay K3 and control circuits.
	.		0							F			1, 3, 5, 7, 53	

SECTION II. MAINTENANCE ALLOCATION CHART

MAINTENANCE ALLOCATION CHART

GROUP NUMBER	FUNCTIONAL GROUP	MAINTENANCE FUNCTIONS										TOOLS AND EQUIPMENT	REMARKS	
		I N S P E C T	T E S T	S E R V I C E	A D J U S T	A L I G N	C A L I B R A T E	I N S T A L L	R E P L A C E	R E P A I R	O V E R H A U L			R E B U I L D
4AIA1	AN/TSC-38B (Cont) LOGIC TIMER AND DRIVER REFERENCE BOARD		F	.	F				F				1, 2, 7 1, 2, 7, 10	
5	TELETYPE GROUP OA-8002	0	H							D			1, 2, 7, 10, 42 2, 7	
5A1	PANEL, POWER DISTRIBUTION SB-2806	0	H							H			2, 7	
5A2	PANEL, PATCHING, SECURE TELETYPE SB-2842	0	H							H			2	
5A2A1PS1	POWER SUPPLY, 28-VOLT		F						F	F			10, 22 2	
5A3	REPERFORATOR-TRANSMITTER TELETYPEWRITER TT-76C	#								H			10, 22	See TM 11-2225
5A4	DISTRIBUTOR-TRANSMITTER TELETYPEWRITER TT-123A	#		#										See TM 11-2227
5A5	REPERFORATOR, TELETYPEWRITER TT-346	#												See TM-11-2226
5A6	TELETYPEWRITER SET AN/UGC-4	#			#									See TM 11-5815-200-10
5A7 thru 5A12	COMMUNICATION SECURITY EQUIPMENT													
5A12	FILTER, RADIO INTERFERENCE F1088	0												
5A13	FILTER, RADIO IRTERFERENCE F1089	0								H			7	
5A14	TERMINAL BOX J-2650	0								H			7	
5A15	INTERCONNECTING BOX J-2649	0								H			2	
5A16	DISTRIBUTION BOX J-2648	0								H			2	

SECTION II. MAINTENANCE ALLOCATION CHART

MAINTENANCE ALLOCATION CHART

GROUP NUMBER	FUNCTIONAL GROUP	MAINTENANCE FUNCTIONS										TOOLS AND EQUIPMENT	REMARKS	
		I N S P E C T	T E S T	S E R V I C E	A D J U S T	A L I G N	C A L I B R A T E	I N S T A L L	R E P L A C E	R E P A I R	O V E R H A U L			R E B U I L D
6	AN/TSC-38B (Cont)													
6A1	RECEIVER-TRANSMITTER GROUP MT-3623	0								H			2, 3	Caution: mercury relays
6A1A1 thru 6A1A13	GATE, LOGIC TD-826	0								F			2	
	PLUG-IN CARDS		F										2	
6A2	DIODE MATRIX (A1 thru A9) RELAY BOARD (A10, All) RELAY BOARD A12 RELAY BOARD A13 CONTROL, RADIO SET C-7010	0								F	D		2, 10, 43	
6A2A25 thru 6A2A28	FSK.TONE RECEIVER BOARDS			F							F	D	1, 2, 7, 10, 17 1, 2, 7, 10, 17, 20, 40	
6A2A3 thru 6A2A23	PLUG-IN CARDS											D	1, 2, 3, 17, 48	
	INPUT AUDIO (A5, A10) SUPERVISORY CONTROL (A7, A12) DIAL CONTROL (A8 A13) MODE STORAGE (A9 A14) DC-DC CONVERTER (A3) FREQUENCY CONTROL (A15) ANTENNA CONTROL AND DIAL DECODE (A}7) PRESET MODE CONTROL (A18) FREQUENCY DBCODE (A19) FREQUENCY REGISTER (A20, A21) ANTENNA BAND MATRIX `1 (A22)										F	D	1, 2, 3, 13, 17, 48	

SECTION II. MAINTENANCE ALLOCATION CHART

MAINTENANCE ALLOCATION CHART														
GROUP NUMBER	FUNCTIONAL GROUP	MAINTENANCE FUNCTIONS										TOOLS AND EQUIPMENT	REMARKS	
		I N S P E C T	T E S T	S E R V I C E	A D J U S T	A L I G N	C A L I B R A T E	I N S T A L L	R E P L A C E	R E P A I R	O V E R H A U L			R E B U I L D
6A2A3 thru. 6A2A23	AN/TSC-38B (Cont) PLUG-IN CARDS (Cont) ANTENNA BAND MATRIX `2 (A23) AP CONTROL AND DIAL DECODE (A16) AUDIO SWITCHING tA6 All)													
6A2A29 thru. 6A2A33	PLUG-IN CARDS AZIMUTH SWITCH f1 (A30) . AZIMUTH SWITCH f2 (A29) CONNECTOR BOARD (A33) MODE SWITCH BOARD f1 (A31) MODE SWITCH BOARD f2 (A32)								F		D		1, 2, 3, 13, 17, 48	
6A3, 6A4, 6A5	RECEIVER, RADIO R-1402	0		F									1 thru :4, 6, 7, 24, 32 1, 3, 6, 15 thru 18, 32	
6A3A13, 6A3A14, 6A3A15	FREQUENCY SELECT MEMORY CARD				F				F		F	H	1 thru 4, 6-7 1 thru 4, 6-7	Use 6A4 as replacement Replace -28-V power supply
6A3A17 and 6A3A18	CODE CONVERSION MATRIX CARD								F		D		2, 41	Use spare in 6A4
									F		D		2, 41	Use spare in 6A4

SECTION II. MAINTENANCE ALLOCATION CHART

MAINTENANCE ALLOCATION CHART															
GROUP NUMBER	FUNCTIONAL GROUP	MAINTENANCE FUNCTIONS										TOOLS AND EQUIPMENT	REMARKS		
		I N S P E C T	T E S T	S E R V I C E	A D J U S T	A L I G N	C A L I B R A T E	I N S T A L L	R E P L A C E	R E P A I R	O V E R H A U L			R E B U I L D	
6A3A16	AN/TSC-38B (Cont) BAND CONTROL CARD								F						
6A3A19	GAIN CONTROL CARD				F					D			2, 41	Use spare in 6A4	
6A3A11	AUDIO AMPLIFIER CARD							F		D		1, 3, 6, 41			
6A3A10	CARRIER AMPLIFIER CARD							F		D		3, 6, 7, 25, 41 6, 7, 32			
6A3A9	MULTIPLEX CARRIER GENERATOR							F		D		6, 7, 41			
6A3A4, 6A3A5, 6A3A8	IF TRANSLATOR CARD				F					D		1, 7, 41			
6A3A3, 6A3A6	FILTER A1, B1, A2, B2, CARDS							F		D		1, 39 1, 6, 41			
6A3A1	RF TRANSLATOR		F		F					D		1, 6, 19, 41 1, 2, 4, 6, 32			
6A3A21, 6A3A22, 6A3A23	POWER SUPPLIES, 6-V, 20-V, and -28-V					F				D		1, 2, 4, 6, 41			
								H		D		22, 39			
										D		7, 8, 22, 32, 39			

SECTION II. MAINTENANCE ALLOCATION CHART

MAINTENANCE ALLOCATION CHART

GROUP NUMBER	FUNCTIONAL GROUP	MAINTENANCE FUNCTIONS										TOOLS AND EQUIPMENT	REMARKS	
		I N S P E C T	T E S T	S E R V I C E	A D J U S T	A L I G N	C A L I B R A T E	I N S T A L L	R E P L A C E	R E P A I R	O V E R H A U L			R E B U I L D
6A3A24	AN/TSC-38B (Cont) RF ATTENUATOR		F							H			6, 9, 22, 32 6, 9, 22, 32	Use spare in 6A4
6A3A2	SYNTHESIZER		F					F			D		6, 9, 22, 41 1, 2, 4, 6, 7, 32, 39	
6A3A2A5A1 6A3A2A5A3 6A3A2A3 6A3A2A7	PLUG-IN CARDS MASTER OSCILLATOR AFC CARD HF VCO 1 to 6 MHz				F H H H							D	1, 2, 4, 6, 7, 39, 41	
6A6	RF PATCH PANEL SB-2808	0	0										1 1, 7, 39 1, 7, 39 1, 7, 39	
6A7	CONTROL, ANTENNA COUPLER C-7703	0	H		H				F				2 2	
6A7A1A1 thru 6A7A1A4	PLUG-IN CARDS SERVOAMPLIFIER (A1, A2) POWER SUPPLY (A3) LOGIC BOARD (A4)							H		H		D	14, 28 2, 10 2, 14, 28 2, 14, 28, 49	
													2, 10	

SECTION II. MAINTENANCE ALLOCATION CHART

MAINTENANCE ALLOCATION CHART

GROUP NUMBER	FUNCTIONAL GROUP	MAINTENANCE FUNCTIONS										TOOLS AND EQUIPMENT	REMARKS
		I N S P E C T	T E S T	S E R V I C E	A D J U S T	A L I G N	C A L I B R A T E	I N S T A L L	R E P L A C E	R E P A I R	O V E R H A U L		
6A8	AN/TSC-38B (Cont) AMPLIFIER, RF AM-4544	0	F									2, 10, 22 6, 28	Replace driver and final amplifier tubes.
6A8A1A1 thru 6A8A1A4	MODULES DRIVER TUBE ASSEMBLY (A1) FINAL TRANSFORMER ASSEMBLY (A2) VSWR BRIDGB ASSEMBLY (A3) DRIVER TRANSFORMER ASSEMBLY (A4)	0	H						H	D		1, 2, 6, 28, 37 2, 6, 22, 28, 49	
6A8A1A5 and 6A8A1A6	PLUG-IN CARDS DC POWER CONTROL (A5) APC-PPC (A6)							H		D		2, 6, 22, 28, 49	
6A9 thru 6A11	TRANSMITTER, RADIO T-1021	0	F		F					D		2, 10	
6A9A8	PLUG-IN CARDS AUTO CHANNEL LOAD CARD				F			F		D		1, 3, 4, 9, 24, 32 1, 3, 4, 9, 15, 17, 24, 32 1, 3, 4, 9, 15, 17, 24, 41 2	Replace PI cards

SECTION II. MAINTENANCE ALLOCATION CHART

MAINTENANCE ALLOCATION CHART

GROUP NUMBER	FUNCTIONAL GROUP	MAINTENANCE FUNCTIONS										TOOLS AND EQUIPMENT	REMARKS	
		I N S P E C T	T E S T	S E R V I C E	A D J U S T	A L I G N	C A L I B R A T E	I N S T A L L	R E P L A C E	R E P A I R	O V E R H A U L			R E B U I L D
6A9A4	AN/TSC-38B (Cont) TRANSMIT GAIN CONTROL CARD				F				F				2	
6A9A5	SIGNAL CONTROL CARD				F				F		D	3, 4, 17, 24, 39, 41		
6A9A7, 6A9A2	DUAL BALANCE MODULATOR CARD								F		D	1, 4, 24, 39, 41		
6A9A13,, 6A9A14, 6A9A15	FREQUENCY SELECT MEMORY CARDS								F		D	1, 2, 4, 6, 41		
6A9A17, 6A9A18	CODE CONVERSION MATRIX CARDS								F		D	2, 41	Use spare in 6A4.	
6A9A16	BAND CONTROL CARD								F		D	2, 41	Use spare in 6A4.	
6A9A9	MULTIPLEX CARRIER GENERATOR CARD								F		D	2, 41		
6A9A3, 6A9A6	FILTER A1, B1, A2, B2 CARD								F		D	1, 7, 41		
									F		D	1, 6, 19, 41		

SECTION II. MAINTENANCE ALLOCATION CHART

MAINTENANCE ALLOCATION CHART

GROUP NUMBER	FUNCTIONAL GROUP	MAINTENANCE FUNCTIONS										TOOLS AND EQUIPMENT	REMARKS	
		I N S P E C T	T E S T	S E R V I C E	A D J U S T	A L I G N	C A L I B R A T E	I N S T A L L	R E P L A C E	R E P A I R	O V E R H A U L			R E B U I L D
MODULES 6A9A10, 6A9A11, 6A9A19	AN/TSC-38B (Cont) POWER SUPPLIES 6-V, 20-V, -28-V		F		F				H				7, 8, 22, 39 22, 39	Applies only to 6-V and 20-V modules. The -28-V power supply is a sealed unit. Synthesizer same as 6A3A2 except AFC card not used. except AFC card not
6A9A1	RF TRANSLATOR		F		F					D		7, 8, 22, 32, 39 1, 2, 4, 6, 32		
6A9A2	SYNTHESIZER		F		F			F		D		1, 2, 4, 6, 41 1, 2, 4, 6, 7, 32, 39		
6A12	AMPLIFIER-DECODER POWER DISTRIBUTION ASSEMBLY MX-8044					D				D		1, 2, 4, 6, 7, 39, 41 1, 2, 4, 6, 7, 39		
6A13	INVERTER, POWER, STATIC PP-4545	0	F		F				H			2, 7 2, 7 2, 7, 10, 38		
		0	F	0	F							1, 2, 7, 22, 34		
6A13A1A1 THRU 6A13A1A4	PLUG-IN CARDS					F				H F	D	1, 2, 7 1, 2, 7, 22, 34, 52	Replace PI cards	
	LOGIC TIMER (A1A2, A1A4) LOGIC TIMER (A1A3) OSCILLATOR (A1A1)							F		D		1, 2, 7, 22, 42, 52 1, 2, 7, 22, 34, 42		

SECTION II. MAINTENANCE ALLOCATION CHART

MAINTENANCE ALLOCATION CHART

GROUP NUMBER	FUNCTIONAL GROUP	MAINTENANCE FUNCTIONS										TOOLS AND EQUIPMENT	REMARKS	
		I N S P E C T	T E S T	S E R V I C E	A D J U S T	A L I G N	C A L I B R A T E	I N S T A L L	R E P L A C E	R E P A I R	O V E R H A U L			R E B U I L D
6A15	AN/TSC-38B (Cont) PANEL-PROTECTION POWER DISTRIBUTION 5B-2948						F						2 2	Replace power transformer
6A16	POWER SUPPLY PP-6051	0	F							F			2, 22 11	
7	CONTROL-MONITOR GROUP OA-8001	0	F							H F			1, 2, 7, 22	
7A1, 7A2, 7A3	TELEPHONE TERMINAL TA-694	0	F							F			2 2	Replace plug-in cards
7A1A12 thru 7A1A12	PLUG-IN CARDS LINE TERMINAL RBLAYS (A1, A4, A7, A10) LINE TERMINAL CONTROL (A2, A5, A8, A11) LINE TERMINAL HYBRID (A3, A6, A9, A12)									F	D		2, 50, 51	
7A4	CONTROL-SELECTOR- INDICATOR C-7084	0	F							F	D		2, 10, 44	
7A5	CONTROL-INDICATOR C-7081	0	F							F	D		2, 50, 51	
7A6	CONTROL-MONITOR, TELEPHONE LINE C-7091	0	F			F				F	D		2, 10, 44	Replace modules.
										F	H		2, 7, 10, 50, 51	
													2, 7, 10, 17	

SECTION II. MAINTENANCE ALLOCATION CHART

MAINTENANCE ALLOCATION CHART

GROUP NUMBER	FUNCTIONAL GROUP	MAINTENANCE FUNCTIONS										TOOLS AND EQUIPMENT	REMARKS
		I N S P E C T	T E S T	S E R V I C E	A D J U S T	A L I G N	C A L I B R A T E	I N S T A L L	R E P L A C E	R E P A I R	O V E R H A U L		
7A6A1 thru 7A6A11	AN/TSC-38B (Cont) PLUG-IN MODULES LINE INTERCEPT (A2 thru A7) SWITCH MODULATOR (A1) DATA CONTROL 10 KW TRANSMIT (A8 DATA CONTROL 10 KW RECEIVER (A9) DATA CONTROL 1 KW TRANSMIT (A10) DATA CONTROL 1 KW RECEIVER (A11) POWER SUPPLY ASSEMBLY PP-4543								F		D	2, 3, 10, 17	A8 is electrically identical to A10. A9 is electrically identical to all. Use 7A7PS5 as spare.
7A7		0	F							F		2 2	
7A7PS1 thru 7A7PS5	MODULES, 130-V							F		H		2, 3, 7, 36	
7A8	AMPLIFIER AUDIO-FREQUENCY AM-4576	0	F							F		2, 50, 51 2	
7A8A1 thru 7A8A15	PLUG-IN CARDS DUAL LINE AMPLIFIER (A1 thru A6) DUAL RADIO AMPLIFIER (A7 thru A10) DUAL AGC AMPLIFIER (All thru A13) DUAL OPERATIONAL AMPLIFIER (A14) DUAL SPEAKER AMPLIFIER (A15)					F		F		D		2, 3 3, 7, 10, 17, 46	
7A9	AMPLIFIER, AUDIO FREQUENCY AM-4577	0		F						F		2, 50, 51 2	

SECTION II. MAINTENANCE ALLOCATION CHART

MAINTENANCE ALLOCATION CHART

GROUP NUMBER	FUNCTIONAL GROUP	MAINTENANCE FUNCTIONS										TOOLS AND EQUIPMENT	REMARKS
		I N S P E C T	T E S T	S E R V I C E	A D J U S T	A L I G N	C A L I B R A T E	I N S T A L L	R E P L A C E	R E P A I R	O V E R H A U L		
7A9A1 thru 7A9A15	AN/TSC-38B (Cont) PLUG-IN CARDS					F		F				2, 3	Plug-in cards 7A9A14 and 7A9A15 are same as 7A8A14 Dual Speaker Amplifier is not used with 7A9. Plug in cards 7A9A1 thru 7A9A13 are identical to 7A8A1 thru 7A&A13. This unit is identical to 7A4 except for diversity switch on 7A11. Replace PI modules
7A10	DUAL LINE AMPLIFIER (A1 thru A6) DUAL RADIO AMPLIFIER (A7 thru A10) DUAL AGC AMPLIFIER (All thru A13) DUAL OPERATIONAL AMPLIFIER (A14. Ai5) CONTROL, ELECTRONIC CIRCUIT C-8001	0		F						D	3, 7, 10, 17, 46		
7A10A1 thru 7A10A10	PLUG-IN CARDS RADIO INTERCEPT RELAY (A1 thru A8) FLASHER (A9) BUSY TONE (A10)							F			2, 7, 10, 50, 51		
7A11	CONTROL-SELECTOR-INDICATOR C-7083	0	F						F	D	2		
7A12	CONTROL-INDICATOR C-7080	0		F				F		D	2, 7, 10, 31, 46		
7A13	CONTROL MONITOR, RADIO LINE C-7092	0				F		F		D	2, 50, 51		
			F								2, 10, 44		
								F			2, 10, 17, 44		
			F						H F		2, 3, 50, 51 2, 10, 17		

SECTION II. MAINTENANCE ALLOCATION CHART

MAINTENANCE ALLOCATION CHART

GROUP NUMBER	FUNCTIONAL GROUP	MAINTENANCE FUNCTIONS										TOOLS AND EQUIPMENT	REMARKS
		I N S P E C T	T E S T	S E R V I C E	A D J U S T	A L I G N	C A L I B R A T E	I N S T A L L	R E P L A C E	R E P A I R	O V E R H A U L		
7A13A1 thru 7A13-8	AN/TSC-38B (Cont) PLUG-IN MODULES								F	H	D	2, 10 2, 46	7A13A1 thru 7A13A8 are electrically identical.
7A13A9	SWITCH RADIO INTERCEPT 1 KW (A1 thru A4) SWITCH RADIO INTERCEPT 10 KW (A1 thru A8) PREAMP, MICROPHONE							F		D	2, 3, 10, 17 3		
7A13A10	VU METER AMPLIFIER				F					D	2, 3, 10, 17 3		
7A14	POWER SUPPLY ASSEMBLY PP-4544	0								D	2, 3, 10, 17		
7A14PS5, 7A14PS6	130-VOLT POWER SUPPLY		.F						F		2 2	Replace relay R1 and modules.	
7A14PS1 thru 7A14PS4	12-VOLT POWER SUPPLY								F	H	2 2, 3, 7, 36		
7A15	JACK ASSEMBLY, TELEPHONE TA-693	0								H	2, 3, 36	PS4 is spare power supply.	
7A16	JACK ASSEMBLY, TELETYPE TH-92	0							F		2		
7A17	CONTROL-SELECTOR, TELEGRAPH LINE C-7085	0			0				F		2		
									F		2	Replace Plug-in cards.	

SECTION II. MAINTENANCE ALLOCATION CHART

MAINTENANCE ALLOCATION CHART		MAINTENANCE FUNCTIONS										TOOLS AND EQUIPMENT	REMARKS			
GROUP NUMBER	FUNCTIONAL GROUP	I N S P E C T	T E S T	S E R V I C E	A D J U S T	A L I G N	C A L I B R A T E	I N S T A L L	R E P L A C E	R E P A I R	O V E R H A U L			R E B U I L D		
7A17A1 thru 7A17A8	AN/TSC-38B (Cont) PLUG-IN CARDS									F					2, 22 2, 22, 48	
7A18	COMPONENT BOARD COMPONENT BOARD COMPONENT BOARD CONTROL, TELEGRAPH LINE C-7079	0									H				2	
7A19	TELETYPEWRITER SET AN/UGC-4	#														See TM 11-5815-200-10
7A20	KEYER-DETECTOR KY-599	0	F				H								1, 2, 50, 51 1, 2, 7, 10, 22, 24 1,3,7,17,18	Replace PI cards
7A20A12	LOW PASS FILTER CARD								F						1, 2, 3, 17, 19, 48	
7A2A1 thru 7A20A11, 7A20A13 thru 7A20A18	PLUG-IN CARDS FREQUENCY SHIFT TONE KEYER (A1, A2) LINE AMPLIFIER (A3,A5, A7, A9, A11) AM TONE KEYER (A4) KEYER (A6, A8, A10)									F					1, 3, 7 1, 2, 3, 17, 19, 48	7A20A13 thru 7A20A18; see note 1 Caution- mercury relays. A1 and A2 are identical cards using different crystals.

SECTION II. MAINTENANCE ALLOCATION CHART

MAINTENANCE ALLOCATION CHART

GROUP NUMBER	FUNCTIONAL GROUP	MAINTENANCE FUNCTIONS										TOOLS AND EQUIPMENT	REMARKS				
		I N S P E C T	T E S T	S E R V I C E	A D J U S T	A L I G N	C A L I B R A T E	I N S T A L L	R E P L A C E	R E P A I R	O V E R H A U L			R E B U I L D			
7A20FLI thru 7A20FL8 7A21	AN/TSC-38B (Cont)																
	FREQUENCY SHIFT TONE RECEIVER (A13 thru A18)																
7A21A1 thru 7A21A18	BAND PASS FILTER DETECTOR, AUDIO FREQUENCY DT-326	0	F						F								1, 2, 7, 22, 50, 51 1, 2, 7, 10, 17
	PLUG-IN CARDS				F					H F							2, 3
7A22	RINGING DETECTOR (A5, A14) AM TONE DEMODULATOR (A1 thru A4, A6 thru A13, A15 thru A18) TERMINAL, TELEGRAPH TH-67		0		F						D						1,2,3,7,10,17, 48
	PLUG-IN CARDS									H F							1, 2, 3, 7 1, 2, 3, 7, 10
7A22A1 thru 7A22A7	DIGITAL KEYER (A1, A2, A6) DIVERSITY FREQ SHIFT TONE RCVR (A4) FREQUENCY SHIFT TONE RECEIVER (A3, A5, A7)						F										2, 3
	BAND PASS FILTER								F		D						1, 2, 3, 17, 48
7A22FL1 thru 7A22FL6																	

SECTION II. MAINTENANCE ALLOCATION CHART

MAINTENANCE ALLOCATION CHART

GROUP NUMBER	FUNCTIONAL GROUP	MAINTENANCE FUNCTIONS										TOOLS AND EQUIPMENT	REMARKS
		I N S P E C T	T E S T	S E R V I C E	A D J U S T	A L I G N	C A L I B R A T E	I N S T A L L	R E P L A C E	R E P A I R	O V E R H A U L		
7A23	AN/TSC-38B (Cont) TERMINAL, TELEGRAPH TH-68	0	F		0					H		1, 2, 3, 7 2, 3, 7, 10, 17	Replace PI cards See note 3. Caution: mercury relays
7A23A1 thru 7A23A16	PLUG-IN CARDS			F				F				2, 3	
7A23FL1 thru 7A23FL16 7A24	DIGITAL KEYS BANDPASS FILTER TERMINAL, TELEGRAPH TH-69	0	F					F		D		1, 2, 3, 17, 48	
7A24A1 thru 7A24A16	PLUG-IN CARDS FREQ SHIFT TONE RECEIVER (A1, A3, A5, A7, A9, A11, A13, A15) DIVERSITY FREQ SHIFT TONE RECEIVER (A2,A4,A6,A8,A10,A12,A14,A16)				F			F		H F		1, 2, 3, 7 1, 2, 3, 7, 10	
7A24A17	RECEIVER TWINNING CARD			F				F		H		2, 3	
7A24FL1 thru 7A24FL16 7A25	BANDPASS FILTER TERMINAL, TELEGRAPH TB-70	0	F					F		H D		2 48	
									H F			1, 2, 3, 7 1, 2, 3, 7, 10	

SECTION II. MAINTENANCE ALLOCATION CHART

MAINTENANCE ALLOCATION CHART

GROUP NUMBER	FUNCTIONAL GROUP	MAINTENANCE FUNCTIONS										TOOLS AND EQUIPMENT	REMARKS	
		I N S P E C T	T E S T	S E R V I C E	A D J U S T	A L I G N	C A L I B R A T E	I N S T A L L	R E P L A C E	R E P A I R	O V E R H A U L			R E B U I L D
7A25A1 thru 7A25A16	AN/TSC-38B (Cont.) PLUG-IN CARDS FREQ SHIFT TONE RECEIVER (A1, A3, A5, A7, A9, A11, A13, A15) DIVERSITY FREQ RECEIVER (A2, A4, A5, A8, A10, A12, A14, A16)				F							D	2, 3 1, 2, 3, 17, 48	See remarks for 7A24A1 thru 7A24A16
7A25FL1 thru 7A25FL16 7A25A17	BAND PASS FILTER RECEIVER TWINNING CARD				F				F				2, 3 2 48	Identical to 7A24A17
7A26	KEYER KY-590	0	F									D	1, 2, 7, 10, 21 1, 2, 7, 19	Replace PI cards
7A26TB4A1 7A26TB4A2 7A26TB4A3	PLUG-IN CARDS								F			D	2, 7, 48	
7A27	SWITCHBOARD INTERIOR COMMUNICATIONS SB-2844	0	F									H F	2, 50, 51 2	Replace PI cards
7A27A1 thru 7A27A14	PLUG-IN CARDS SUBSCRIBER LOGIC (A1,A3,A5,A7,A9,A11,A13) SUBSCRIBER RELAY (A2,A4,A6,A8,A10,A12,A14)								F			D	10, 45	
7A28	SWITCHBOARD INTERIOR COMMUNICATIONS SB-3160	0	F									H F	2, 50, 51 2	Replace PI cards

SECTION II. MAINTENANCE ALLOCATION CHART
 MAINTENANCE ALLOCATION CHART

GROUP NUMBER	FUNCTIONAL GROUP	MAINTENANCE FUNCTIONS										TOOLS AND EQUIPMENT	REMARKS
		I N S P E C T	T E S T	S E R V I C E	A D J U S T	A L I G N	C A L I B R A T E	I N S T A L L	R E P L A C E	R E P A I R	O V E R H A U L		
7A28A1 thru 7A28A14	AN/TSC-38B (Cont.) PLUG-IN CARDS								F		D	10, 45	Cards identical to those in 7A27. Replace plug in cards. Cards identical to those in 7A27, except cards 7A13 and 7A14 not used. Replace PI cards
7A29	SUBSCRIBER LOGIC (A1, A3, A5, A7, A9, A11, A13) SUBSCRIBER RELAYS (A2, A4, A6, A8, A10, A12, A14) SWITCHBOARD INTERIOR COMMUNICATIONS SB-3161	0	F									2, 50, 51 2	
7A29A1 thru 7A29A12	PLUG IN CARDS							F	H F	D	10, 45		
7A30	SWITHBOARD INTERIOR COMMUNICATIONS SB-2845	0	F						H F		2, 10, 50, 51 2, 10		
7A30A1 thru 7A30A11	PLUG IN CARDS							F		D	7, 10, 21, 45		
7A31	LINK SELECTOR (A1) LINK LOGIC (A2 thru All) GZNERATOR, RINGING, STATIC TA-703	0	F	F								1, 2, 3, 7 1, 7 1, 2, 3, 7, 10	
7A32	COOLER, AIR, ELECTRONIC EQUIPMENT HD-743	0		0				H				2	
7A33	TERMINAL BOARD RELAY ASSEMBLY	0	F						F			2, 3 2, 3, 7, 10	
7A34	PANEL, PROTECTION-POWER DISTRIBUTION SB-2947	0	F						H F			2, 3 2,3	

SECTION II. MAINTENANCE ALLOCATION CHART

MAINTENANCE ALLOCATION CHART

GROUP NUMBER	FUNCTIONAL GROUP	MAINTENANCE FUNCTIONS										TOOLS AND EQUIPMENT	REMARKS	
		I N S P E C T	T E S T	S E R V I C E	A D J U S T	A L I G N	C A L I B R A T E	I N S T A L L	R E P L A C E	R E P A I R	O V E R H A U L			R E B U I L D
7A35	AN/TSC-38B (Cont.) PANEL, SIGNAL ENTRY TELETYPEWRITER	O	F										2	
7A36	PANEL, SIGNAL ENTRY TELETYPEWRITER	O	F							F			2	
7A37	LOOP RESISTOR HOUSING ASSEMBLY SA-1055 O	O	F							F			2	
10A1	COUPLER, ANTENNA CU-1561 0	O	H	F						F			2	
					H								14	
													1, 14	
													1, 14, 49	
														Recharge as required
														NOTES: 1. Identical basic cards, 602R, with different networks 2. Identical basic cards, 610A, with different networks and strapping options. 3. Identical basic cards, 601LC, with different networks.

TABLE I TOOL AND TEST EQUIPMENT REQUIREMENTS					
TOOLS AND EQUIPMENT	MAINTENANCE CATEGORY*	NOMENCLATURE		FEDERAL STOCK NUMBER	TOOL NUMBER
1	F,H,D	AN/USM-207	COUNTER. ELECTRONIC, DIGITAL READOUT	6625-911-6368	
2	F,H,D	AN/USM-210	VOLTMETER	6625-019-0815	
3	F,H,D	ME-30A/U	VOLTMETER METER	6625-643-1670	
4	F,H,D	AN/URM-145	VOLTMETER, ELECTRONIC	6625-973-3986	
5	F,H,D	AN/USM-33	VOLTMETER	6625-648-9172	
6	F,H,D	SG-479/GRM-50	GENERATOR, SIGNAL	6625-819-0472	
7	F,H,D	AN/USM-281	OSCILLOSCOPE	6625-053-3112	
8	F,H,D	CN-16A/U	TRANSFORMER	5950-235-2086	
9	F,H,D	CN-796/U	ATTENUATOR, VARIABLE	5985-087-2547	
10	F,H,D	PY-2309()/U	POWER SUPPLY	6130-752-2215	
11	F,H,D	TK-105/G	TOOL KIT, ELECTRONIC EQUIPMENT	5180-610-8177	
12	F,H,D	TK-100/G	TOOL KIT, ELECTRONIC EQUIPMENT	5180-605-0079	
13	F,H,D	TS-1836/U	TEST SET, TRANSISTOR	6625-893-2628	
14	H,D	AN/URM,120	WATTMETER	6625-813-8430	
15	H,D	R390A/URR	RECEIVER, RADIO	5820-538-7555	
16	H,D	AN/USM-44A	GENERATOR, SIGNAL	6625-539-9685	
17	F,H,D	AN/URM-127	GENERATOR,, SIGNAL	6625-783-5965	
18	F,H,D	TS-1830/U	ANALYZER, SPECTRUM	6625-806-5929	
19	D	TS-723A/U	ANALYZER, SPECTRUM	6625-668-9418	
20	D	SG-453/U	GENERATOR, THERMAL NOISE	6625-799-8999	
21	D	PP-3941/G	POWER SUPPLY	6130-953-7500	
22	F,H,D	ME-303/U	MULTIMETER	6625-902-7140	

TABLE I TOOL AND TEST EQUIPMENT REQUIREMENTS					
TOOLS AND EQUIPMENT	MAINTENANCE CATEGORY*	NOMENCLATURE		FEDERAL STOCK NUMBER	TOOL NUMBER
23	F,H,3	11045A HP	HIGH VOLTAGE PROBE		
24	F,H,D	8491A HP	ATTENUATOR, FIXED, 20 dB		
25	F,H,D	P6161	TRANSFORMER, ISOLATION		
26	F,H,D	H10G3 GR	TRANSFORMER, VARIABLE		
27	H,D	AN/URH-39	BRIDGE, RESISTANCE AND REACTANCE		
28	H,D	DA-411/U	DUMKY LOAD, 10 KW	5985-485-9007	
29	D	405L AD-YU	PHASEMETER, AUDIO		
30	D	AN/URM,134A	TEST SET, AUDIO	6625 762-5906	
31	D	23V80	TRANSFORMER, ISOLATION		
32	F,H,D	T324732A	RECEIVER-EXCITER TEST FIXTURE		
33	F,H	490092	POWER SUPPLY/BATTERY CHARGER EXTENDER CARD		
34	F,H	490129 -1	INVERTER. LOAD PANEL		
35	F,H	490131-2	DC LOAD PANEL		
36	H	386903-2	VFTG POWER SUPPLY TEST SET		
37	H	324730-2	VSWR TEST SET		
38	H	386904-2	AMP-DECODER TEST SET		
39	F,H,D	HE-202/U	VOLTMETER, DIFFERENTIAL	6625-709-0288	
40	D	T386909A	REHOTZ CONTROL TEST FIXTURE		
41	D	P1089	RECEIVER-EXCITER TEST FIXTURE		
42	D	577049-1	POWER SUPPLY TEST SET 001		
43	D	577074-1	LOGIC GATE TEST SET 002		
44	D	577083-1	INTERFACE/CONTROL TEST SET 003		

TABLE I TOOL AND TEST EQUIPMENT REQUIREMENTS					
TOOLS AND EQUIPMENT	MAINTENANCE CATEGORY*	NOMENCLATURE		FEDERAL STOCK NUMBER	TOOL NUMBER
45	D	577084-1	AUTOMATIC SWITCHBOARD TEST SET 004		
46	D	577085-1	TELEPHONE TERMINAL TEST SET 005		
47	D	577086-1	POWER AMPLIFIER TEST SET 006 (10-KW)		
48	D	577087-1	VPTG TEST SET 007		
49	D	577088-1	CONTROL PANEL TEST SET 008 (1-kw)		
50	F,H,D	TA-312/PT	TELEPHONE SET	5805-543-0012	
51	P,H,D	TA-236/PT	TELEPHONE SET	5805-503-2774	
52	F,H,D	SC 5180-90-CL-R16	TOOL SET, AUTO HEX3LUNIC	5780-754-0641	
53	F,H	490132-1	THREE PHASE INPUT POWER CONTROL		
54	F,H	490130-2	LOOP SENSING SIMULATOR		
55	H,D	AN/PRM-10	TEST OSCILATOR SET	6625-339-2046	
		* Tools and test equipment required for F category of maintenance will be stored in AN/TSC-38B maintenance shelter.			
		Change 1 C-25			

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NG: None.

USAR: None.

For explanation of abbreviations used, see AR 310-50.

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Reference designation	Type No.
1	OA-7999/TSC-38B
1A1	SB-2783/TSC-38B
1A2	SB-2784/TSC-38B
1A3	SB-2785/TSC-38B
1A4	PP-4536/TSC-38B
1A5	BLANK PANEL
1A6	BZ-130/TSC-38B
2	AM-4543/TSC-38B
3	AIR CONDITIONER
4	CV-2100/TSC-38B
5	OA-8002/TSC-38B
5A1	SB-2806/TSC-38B
5A2	SB-2842/TSC-38B
5A3	TT-76C/GGC
5A4	TT-123A/FG
5A5	TT-346A/FG
5A6	AN/UGC-4
5A7, 5A8, 5A9 AND 5A10	COMMUNICATONS SECURITY EQUIPMENT
5A12	F-1088/TSC-38B
5A13	F-1089/TSC-38B
5A14	J-2650/TSC-38B
5A15	J-2649/TSC-38B

Reference designation	Type No.
5A16	J-2648/TSC-38B
6	OA-8000/TSC-38B
6A1	TD-826/TSC-38B
6A2	C-7010/TSC-38B
6A3, 6A4 and 6A5	R-1402/TSC-38B
6A6	SB-2808/TSC-38B
6A7	C-7703/TSC-38B
6A8	AM-4544/TSC-38B
6A9 AND 6A11	T-1021/TSC-38B
6A12	MX-8044/TSC-38B
6A13	PP-4545/TSC-38B
6A15	SB-2948/TSC-38B
6A16	PP-6051/TSC-38B
7	OA-8001/TSC-38B
7A1, 7A2 AND 7A3	TA-694/TSC-38B
7A4	C-7084/TSC-38B
7A5	C-7081/TSC-38B
7A6	C-7091/TSC-38B
7A7	PP-4543/TSC-38B
7A8	AM-4576/TSC-38B
7A9	AM-4577/TSC-38B
7A10	C-8001/TSC-38B

Reference designation	Type No.
7A11	C-7083/TSC-38B
7A12	C-7080/TSC-38B
7A13	C-7092/TSC-38B
7A14	PP-4544/TSC-38B
7A15	TA-693/TSC-38B
7A16	TH-92/TSC-38B
7A17	C-7085/TSC-38B
7A18	C-7079/TSC-38B
7A19	AN/UGC-4
7A20	KY-599/TSC-38B
7A21	DT-326/TSC-38B
7A22	TH-67/TSC-38B
7A23	TH-68/TSC-38B
7A24	TH-69/TSC-38B
7A25	TH-70/TSC-38B
7A26	KY-590/TSC-38B
7A27	SB-2844/TSC-38B
7A28	SB-3160/TSC-38B
7A29	SB-3161/TSC-38B
7A30	SB-2845/TSC-38B
7A31	TA-703/TSC-38B
7A32	HD-743/TSC-38B
7A34	SB-2947/TSC-38B
10A2	FUSE BOX ASSEMBLY

Figure 1-12. Shelter, Electrical Equipment S-414/TSC-38 interior layout.

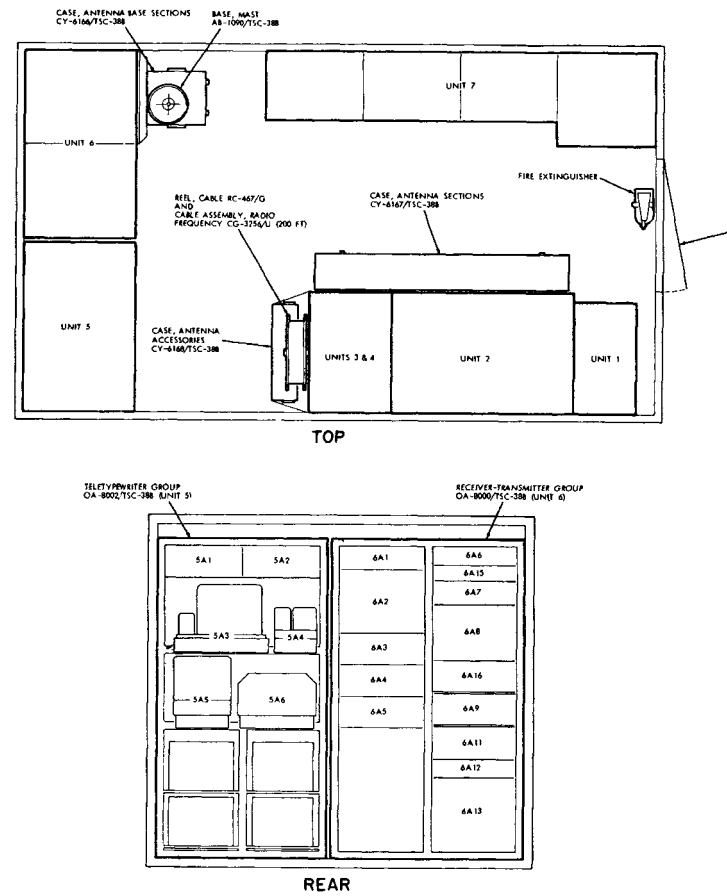


Figure 1-12. Shelter, Electrical Equipment S-414/TSC-38 interior layout.

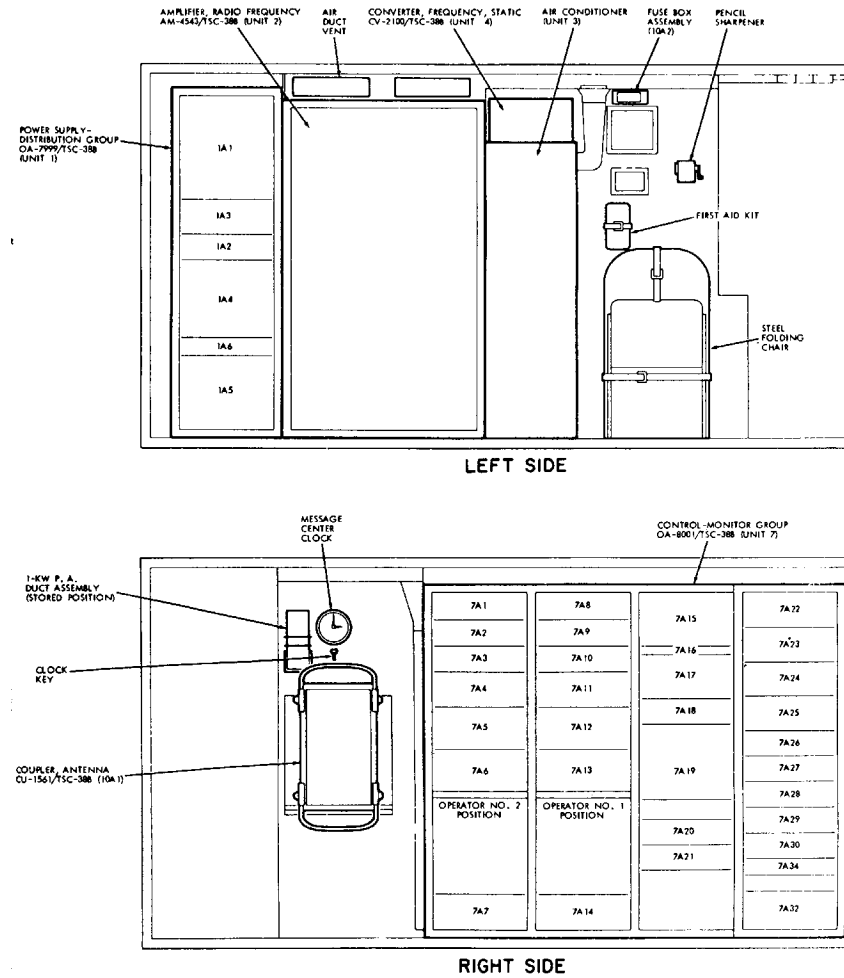


Figure 1-12. Shelter, Electrical Equipment TSC-38 interior layout.

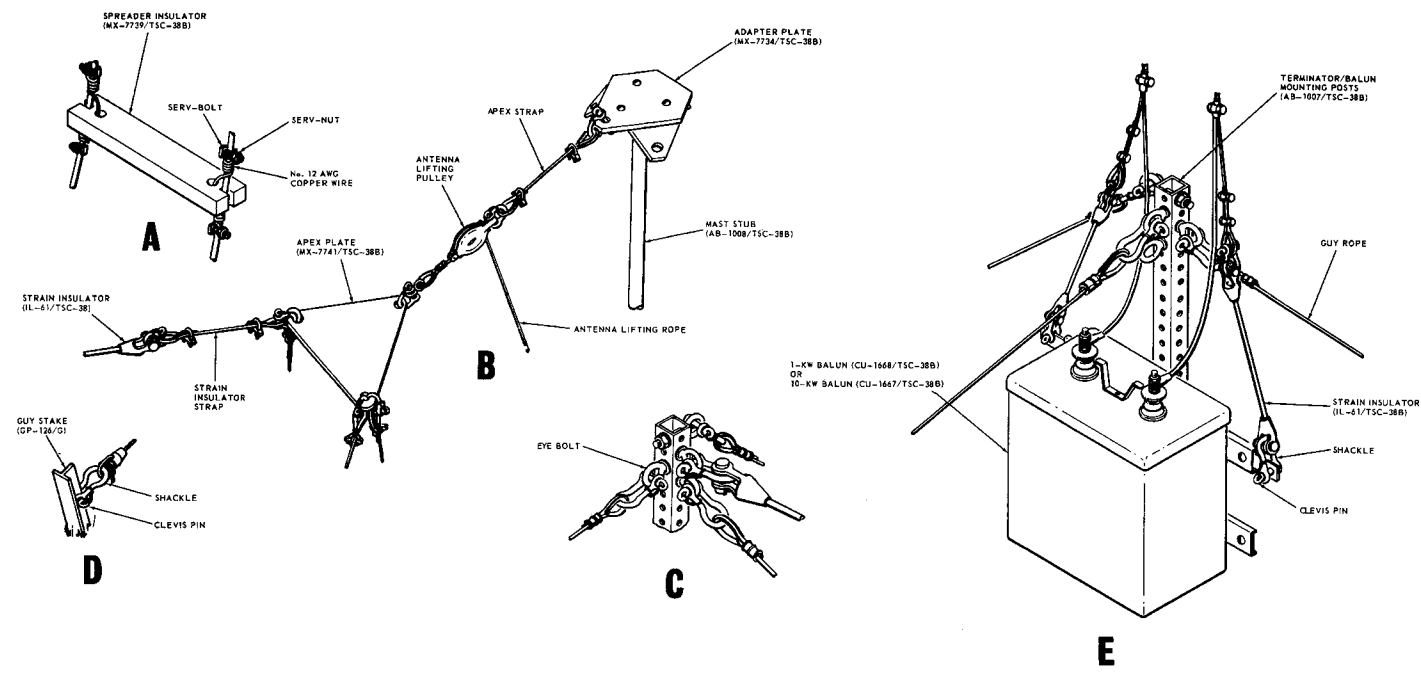


Figure 2-6①. Sloping vee antenna installation details (part 1 of 2)

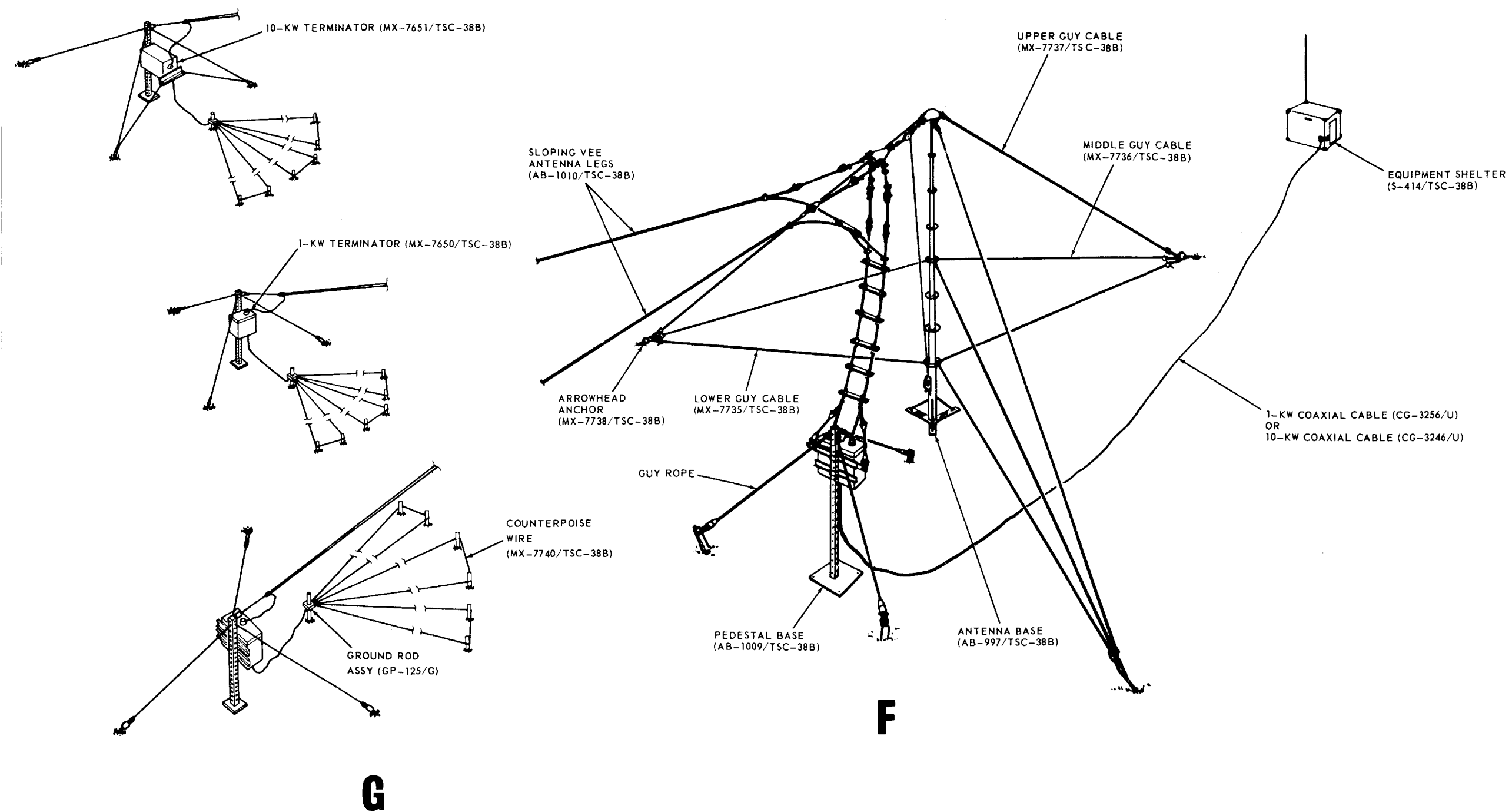


Figure 2-6②. Sloping vee antenna installation details (part 2 of 2)

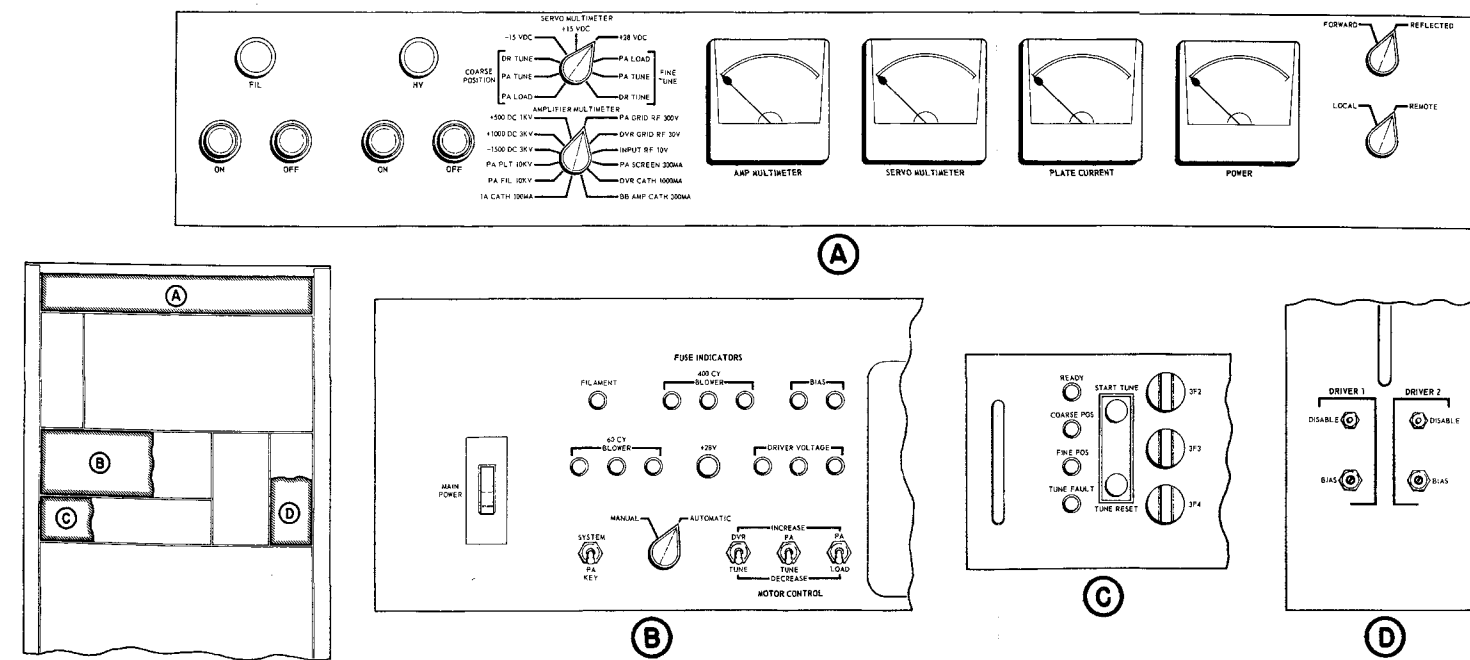


Figure 3-6. Amplifier, Radio Frequency AM-4543/TSC-38B, controls and indicators.

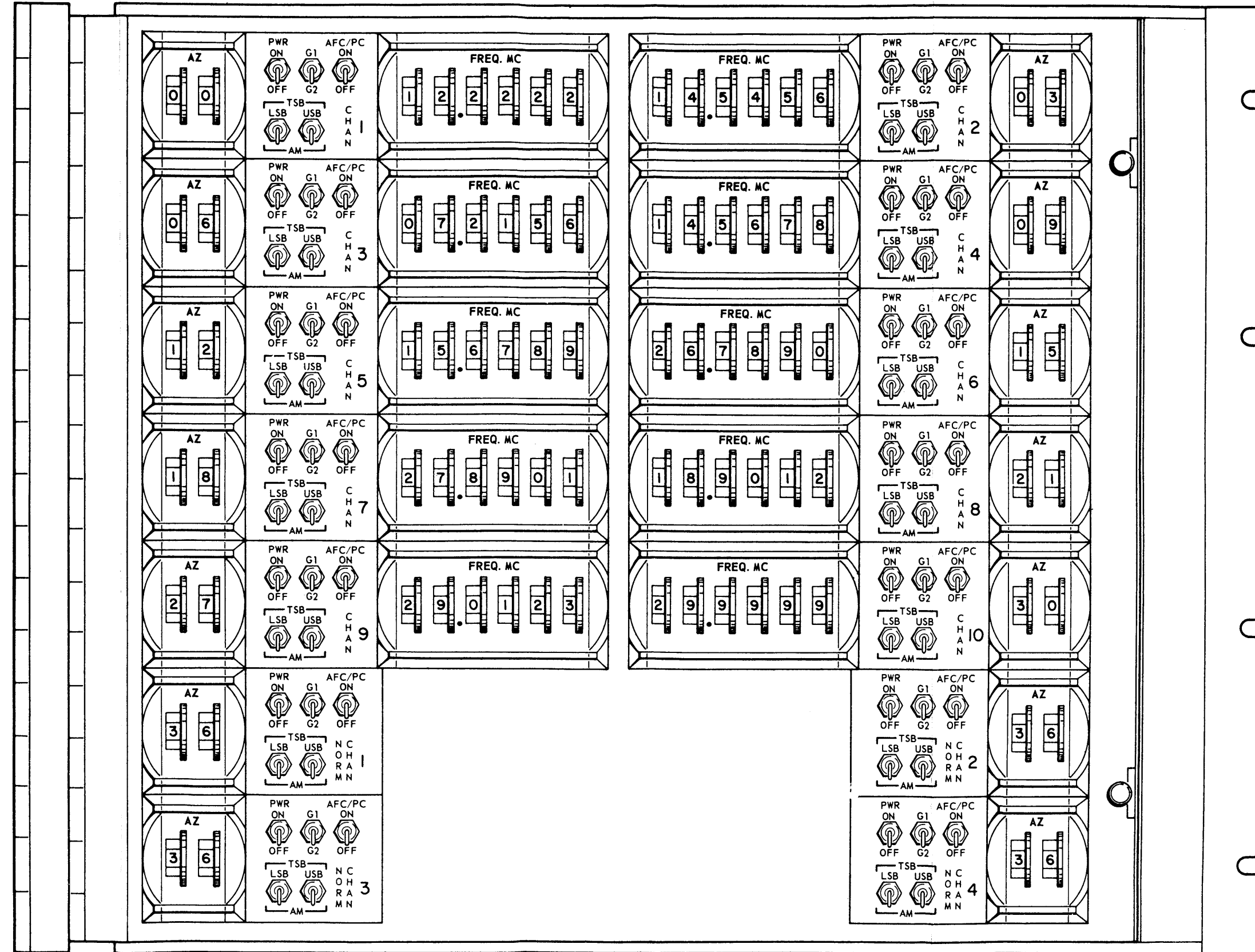


Figure 3-13. Control, Radio Set C-7010/TSC-38B, controls and indicators.

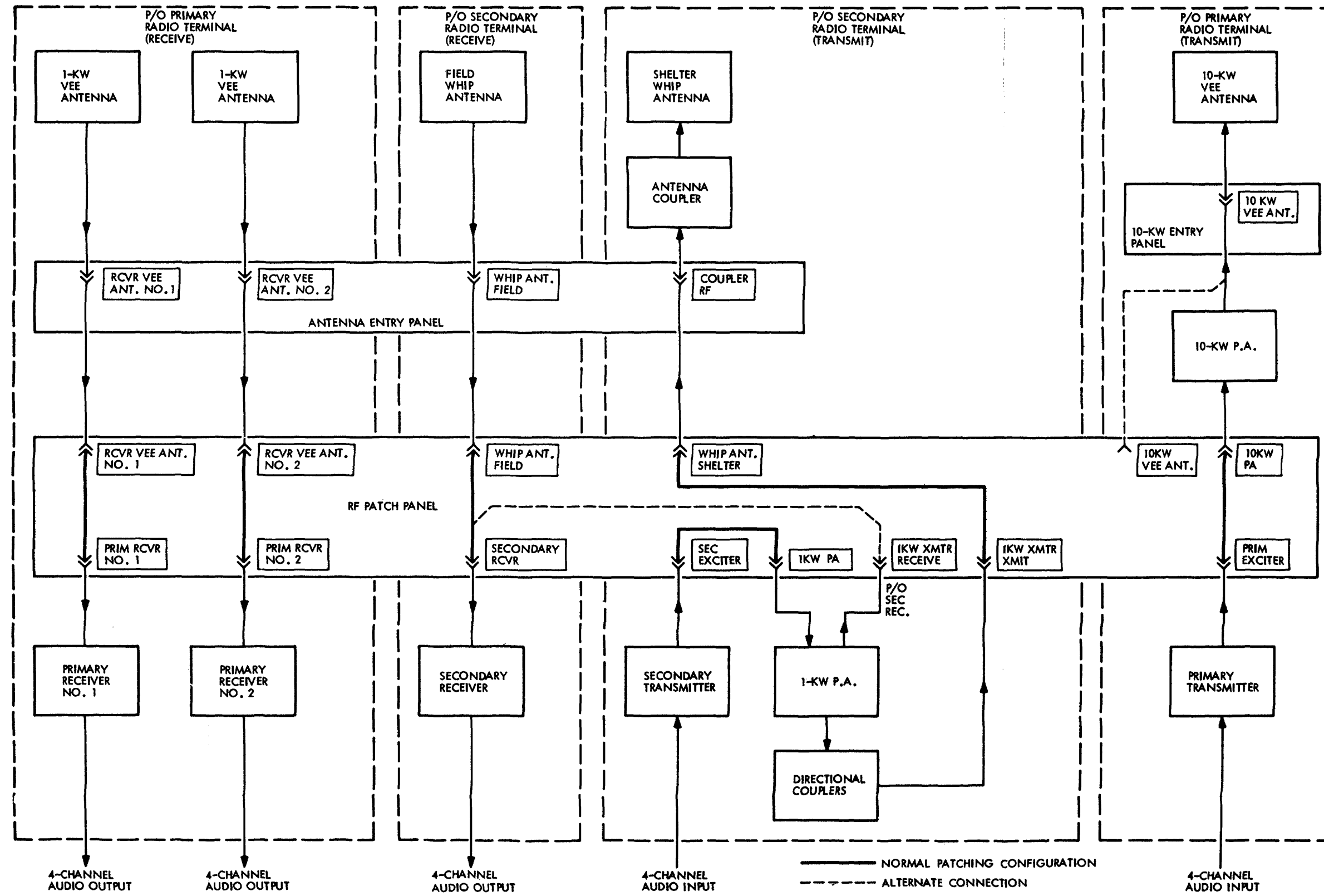


Figure 5-2. Radio subsystem block diagram.

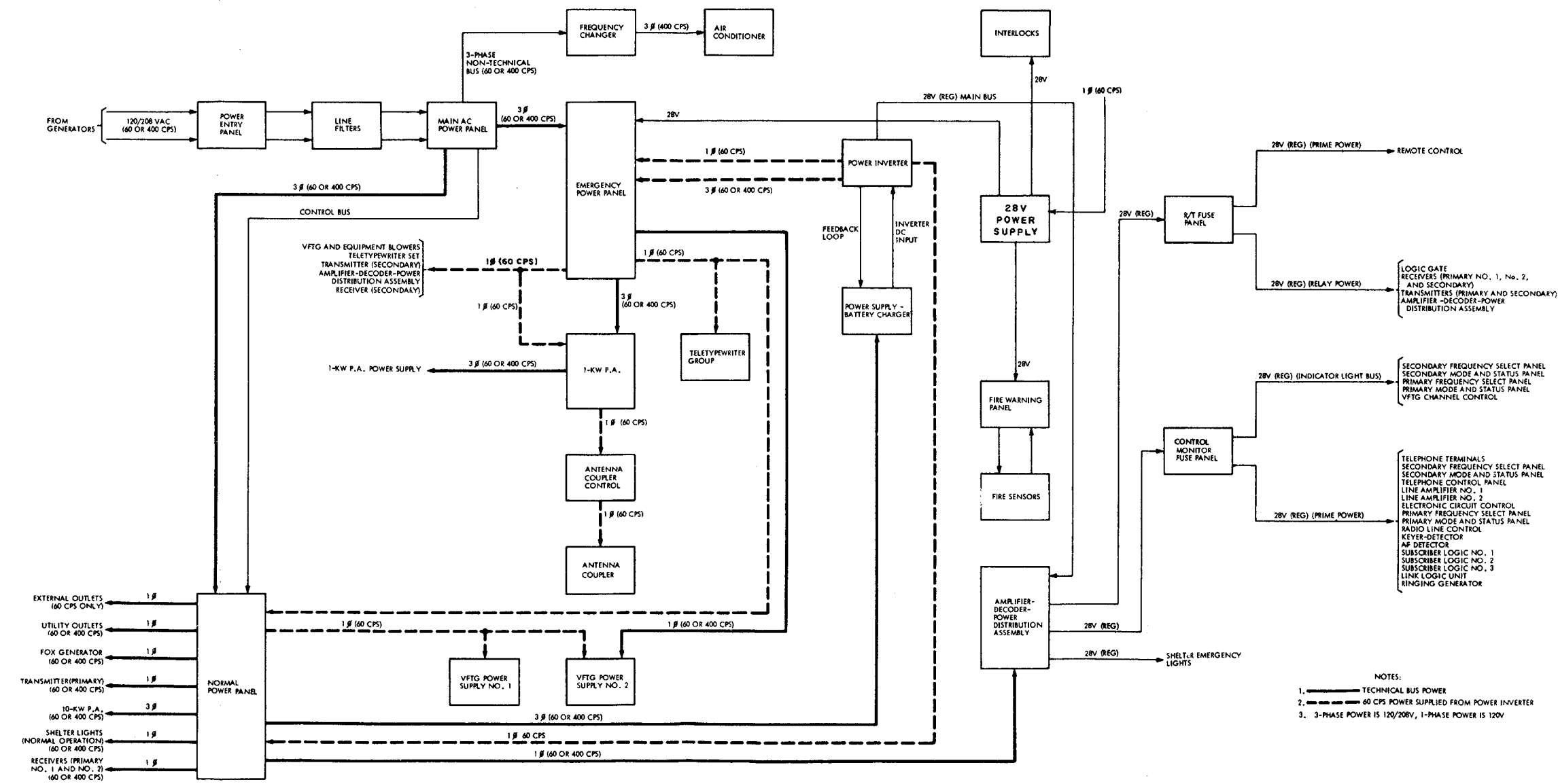


Figure 5-7. Power distribution subsystem block diagram.

