TM 11-5895-590-10

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

OPERATOR'S MANUAL

AIR TRAFFIC CONTROL COMMUNICATION SETS

AN/FSQ-75(V)1, AN/FSQ-75(V)2, AND AN/FSQ-75(V)3

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

HEADQUARTERS, DEPARTMENT OF THE ARMY

SEPTEMBER 1968

WARNING

DANGEROUS VOLTAGES

are used in the operation of this equipment.

DEATH ON CONTACT

may result if safety precautions are not observed.

WARNING

All personnel should be familiar with the requirements of TB SIG 291 before attempting installation or operation of the equipment covered in this manual. Failure to follow requirements of TB SIG 291 could result in injury or DEATH.

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TECHNICAL MANUAL
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HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D. C., *30 September 1968*

Operator's Manual
AIR TRAFFIC CONTROL COMMUNICATION SETS
AN/FSQ-75(V)1, AN/FSQ-75(V)2, AND AN/FSQ-75(V)3

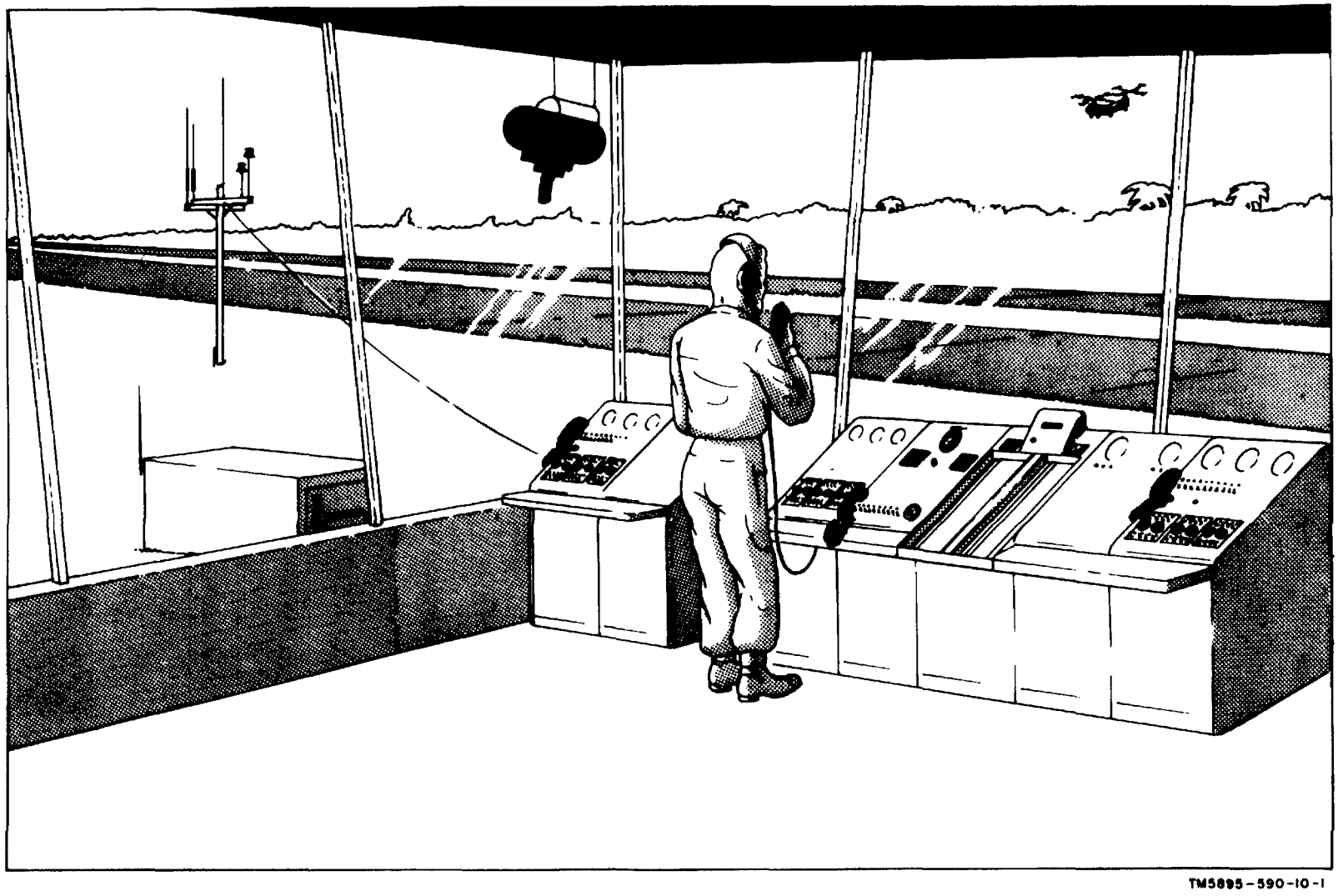


Figure 1-1. Air Traffic Control Communication Set AN/FSQ-75(V)(*), overall view.

CHAPTER 1
INTRODUCTION

Section I. GENERAL

1-1. Scope

a. This manual describes Air Traffic Control Communication Sets AN/FSQ-75(V)1, AN/FSQ-75(V)2, and AN/FSQ-75(V)3 and covers their installation, operation, and operator's maintenance. It includes operation under usual and unusual conditions, cleaning and inspection of the equipment, and replacement of parts available to the operator.

b. Official nomenclature followed by (*) is used to indicate all models of the equipment referenced in this manual; therefore, Air Traffic Control Communication Set AN/FSQ-75(V)(*) represents the three models listed in a above; Console Group, Air Traffic Control OJ-67(V)(*)/FSQ-75(V) represents Console Group, Air Traffic Control OJ-67(V)1/ FSQ-75(V) and OJ-67(V)2/FSQ-75(V); and Radio Group OZ-2(V)(*)/FSQ-75(V) represents Radio Group OZ-2(V)1/FSQ-75(V) and OZ-2(V)2/FSQ-75(V).

c. The manual provides general coverage for the major equipments and assemblies that make up the AN/FSQ-75(V)(*). Differences between the models are described in paragraph 1-15. Detailed information is included in separate equipment manuals (listed in appendix A) for the following units: Amplifier Group, Audio Frequency OG-72/FSQ-75(V): Amplifier group, Audio Frequency OG-73/FSQ-75(V); Connecting Group, Telephone AN/FCA-17; Transmitters, Radio T-1082/FSQ-75(V) and T-1083/FSQ-75(V); Receivers, Radio R1545/FSQ-75(V), R-1546/FSQ-75(V), and R-1547/ FSQ-75(V); Receiver-Transmitter, Radio RT-124/VRC; Radio Set AN/ARC-102; Recorder Group OA-8432/FSQ-75(V); Reproducer Group, Sound OA-8427/FSQ-75(V); and Air Conditioner, York Model MA 3-F23A. Other units of the equipment are discussed in detail in this manual.

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 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.

b. Report of Packaging and Handling Deficiencies. Fill out and forward DD Form 6 (Report of Packaging and Handling Deficiencies) as prescribed in AR 700-58 (Army)/NAVSUP Pub 378 (Navy)/AFR 71-4 (Air Force)/and MCO P4030.29 (Marine Corps).

c. Discrepancy in Shipment Report (DISREP) (SF 361). Fill out and forward Discrepancy in Shipment Report (DISREP) (SF 361) as prescribed in AR 55-38 (Army)/NAVSUP Pub 459 (Navy)/AFM 75-34 (Air Force)/and MCO P4610.19 (Marine Corps).

1-3.1. Reporting of Equipment Publication Improvements

The Reporting of errors, omissions, and recommendations for improving this publication by the individual user is encouraged. Report should be submitted on DA Form 2028 (Recommended Changes to Publications) and forwarded direct to Commander, US Army Electronics Command, ATTN: AMSEL-MA-A, Fort Monmouth, NJ 07703.

Section II. DESCRIPTION AND DATA

1.4. Use of Term Hertz

The National Bureau of Standards has officially adopted the term Hertz (Hz) to replace cycles per second (cps). The table below provides the common equivalents. The term Hertz is used throughout this manual except where equipment markings or decals reflect the old term.

Unit/quantity	Old term	Old abbreviation	New term	New abbreviation
Frequency	Cycles per second.	cps	Hertz	Hz
10^3 cycles per second	Kilocycles per second.	kc	Kilohertz	kHz
10^6 cycles per second	Megacycles per second,	mc	Megahertz	MHz
10^9 cycles per second	Gigacycles per second.	gc	Gigahertz	GHz

1-5. Purpose and Use

a. Purpose. Air Traffic Control Communication Set AN/FSQ-75(V)(*), (fig. 1-1), provides the ultrahigh frequency (uhf) and very-high frequency (vhf) communication facilities required for an airfield control tower operation. The AN/FSQ-75(V) (*) consists of Console Group, Air Traffic Control OJ-67(V)1/FSQ-75(V) (fig. 1-2) installed in a control tower, or Console Group, Air Traffic Control OJ-67(V)2/FSQ-75(V) installed in a control tower cab (fig. 1-3); Radio Group OZ-2(V)(*)/75(V), installed in a separate equipment shelter (fig. 1-5 and 16); and interrelated auxiliary equipment. The OJ-67(V)1/FSQ-75(V) enables three tower controllers to exert remote control over the OZ-2(V)(*)/FSQ-75(V) to establish 12 radio communication links which permit the aircraft controllers to exercise control over aircraft in their assigned control sectors. The OJ-67(V)2/FSQ-75(V) enables two controllers to provide the same operational capability. In each console group, a telephone connecting group provides land-line communications.

b. Use. Air Traffic Control Communication Set AN/FSQ-75(V)(*) is installed as a fixed installation at airfields or enroute facilities. It is primarily used to communicate with aircraft and control air traffic by providing ground control, approach control, routine communications (including weather information), and emergency procedures. All transmit/receive radio operations can be recorded through a five-channel tape recorder and played back through a tape reproducer. A receive-only, low frequency (lf) channel is also used to monitor lf navigational aids. A public address and airfield alarm system; a telephone connecting group, providing communication with other installations and with remote points at the airfield, and basic meteorological measuring equipment are also used as part of the air traffic control system.

1-6. Technical Characteristics

The technical characteristics of Air Traffic Control Communication Set AN/FSQ-75(V)(*) are as follows:

Frequency ranges for transmission..... 2 to 29 MHz (hf. am.).
30 to 75.95 MHz(vhf. fm).
118 to 136 MHz(vhf, am.).
225 to 400 MHz(uhf, am).
225 to 400 MHz(uhf. am.).

Frequency ranges for reception..... 200 to 400 kHz (am.).
1 to 30 MHz (am.).
30 to 75.95 MHz (FM).
108 to 152 MHz(am.).
225 to 399.9 MHz (am.).

Control tower power consumption .....1 kw for electronics only; 8 kw with air conditioning.
Equipment shelter power consumption .....6 kw mean (12.5 kw maximum) for electronics only. 13 kw mean (19.5 kw maximum) with air conditioning.
Power output (transmission) .....T-1082/FSQ-75 (V) and T-1083/FSQ-75(V): 45 watts minimum.
RT-524/VRC: 35 watts minimum.
AN/ARC-102: 95 watts minimum.
Available channels for transmission .....14.
Available channels for reception .....15.

a. Console Group, Air Traffic Control OJ-67(V)(*)/FSQ-75(V) (fig. 52).

(1) *Frequency Selector, Transmitter SA-1609/FSQ-75(V)* (fig. 1-10).
Operating voltage .....14 to 46 volts ac.

(2) *Buzzer BZ-166/FSQ-75(V)* (fig. 1-11).
Operating voltage .....-48 volts dc.

(3) *Controller, Channel Selector C-7685/FSQ-75(V)* (fig. 1-14).
Operating voltage .....48 volts dc.

(4) *Controller, Frequency Selector C-7686/FSQ-75(V)* (fig. 3-9).
Operating voltage .....48 volts dc.
Channel input impedance .....6,600 ohms.
Channel output impedance .....600 ohms.

(5) *Power Supply PP-6046/FSQ-75(V)* (fig. 3-12).
Input voltage .....115 to 125 volts ac, 50 to 60 Hz, 600 watts maximum.
Output voltages .....14, 17, 20, 23, 28, 34, 40 and 46 volts ac ±5%.
Output current (each tap) .....10 amperes (minimum).
Maximum input current ...5 amperes at unity power factor.

(6) *Panel, Power Distribution SB-8177/FSQ-75(V)* (fig. 38).
Input voltage .....23 and/or 46 volts ac, or +48 and/or -48 volts dc.
Output (14 circuits) .....2 amperes.

(7) *Amplifier-Mixer Group OG-71/FSQ-75(V)* (fig. 3-11).
Frequency range .....300 to 3,000 Hz.
Output to 600-ohm load ...10 milliwatts.
Source impedance .....6,000 ohms.
Load impedance .....600 ohms.
Power supply input .....120 vac.

(8) *Amplifier Group, Audio Frequency OG-72/FSQ-75(V)* (fig. 5-2).
Input power .....120 vac, 92 watts.
Frequency range .....300 to 3,000 Hz.
Gain .....56 dbm maximum, 53 dbm minimum.
Output .....+33 dbm.
Output impedance .....600 ohms.
Input impedance .....600 ohms.
Crosstalk, maximum .....-40 dbm.
Noise, maximum .....-40 dbm.
Distortion, maximum .....5%.

(9) *Amplifier Group, Audio Frequency OG-73/FSQ-75(V)* (fig. 52).
Input power .....120 vac, 168 watts.
Frequency range .....300 to 3,000 Hz.
Gain .....+ 88 dbm.
Output .....+ 24 dbm.
Output impedance .....600 ohms.
Input impedance .....25 or 600 ohms.
Crosstalk, maximum .....-40 dbm.
Noise, maximum .....-40 dbm.
Distortion, maximum .....4% maximum.

(10) *Clock, Direct Reading MX-8090/FSQ-75(V)* (fig. 3-3).
Input power .....120 volts ac.
Motors (two), speed .....4 and 10 rpm.

(11) *Aerological Measuring Set ML-629/FSQ-75(V)* (fig. 1-13).
Wind direction .....0° to 360°, indicator graduated every 10° numbered every 30°.
Windspeed .....0 to 100 knots, indicator graduated every 1 knot, numbered every 10 knots.
Barometric pressure .....28 to 31 inches of mercury, indicator graduated every 1/100 inch, numbered every 1/10 inch.
Altimeter setting .....-100 to +3,300 feet indicator graduated every 100 feet, numbered every 1,000 feet,

(12) *Connecting Group, Telephone AN/FCA-17* (fig. 52).
Lines served .....10.
Trunks served .....1.
Types of operation .....Common battery (CB) and local battery (LB).

Incoming signals:
Lines .....Lamps.
Trunk .....Lamp and bell.
Outgoing signals:
Lines and trunk .....20-Hz ringing generator.
Power requirements .....115 vac ±10%, 50 or 60 Hz, single phase.
Fuses .....2 each; 5 ampere.
Ring frequency .....20 Hz.
Maximum LB line loop resistance .....2K.
Maximum LB line leakage resistance .....10K.
Maximum CB trunk loop resistance .....1,50/1 ohms.
Maximum CB trunk loop leakage resistance .....10K.

b. Radio Group OZ-2(V)(*)/FSQ-75(V):

(1) *Panel, Protection-Power Distribution SB-3178/FSQ-75(V)* (fig. 1-6 and 3-16).
48-volt dc inputs .....Maximum of four 15-ampere inputs.
49-volt dc outputs .....Maximum of three 10-ampere outputs.
Ac input voltage .....120 volts ac, single phase, 60 Hz.

(2) *Panel, Power Distribution SB-1179/FSQ-75(V)* (fig. 3-20).
27.5-volt dc inputs -.....Maximum of four.
27.5-volt dc outputs .....Maximum of ten.
Ac input voltage .....120 volts, single phase, 60 Hz.

(3) *Power Supply PP-6044/FSQ-75(V)* (fig. 3-15).
Input voltage .....11 volts ac.
Output voltage .....+48 or -48 volts dc.

(4) *Power Supply PP-6045,/FSQ-75(1)* (fig. 3-17).
Input voltage .....115 volts, single phase, 60 Hz.
Output voltage .....0 to 40 volts dc (used at 27.5 vdc).
Output current .....0 to 30 amperes.
Ripple (constant voltage mode) .....1 millivolt rms maximum.

(5) *Transmitters, Radio T-1082/FSQ-75(V) and T-1083/FSQ-75(V)* (fig. 1-5).
Power output .....50 watts with 90%, modulation.
Load impedance .....Nominal 50 ohm.
Frequency range:
T-1082/FSQ-75(V) ....118 to 136 MHz, single channel, fixed tuned.
T-1083/FSQ-75(V) .....5(V) -225 to 400 MHz, single channel, fixed tuned.
Oscillator .....Crystal-controlled.
Frequency accuracy .....±0.0014%
Harmonic and spurious output .....Not less than 80 db down from carrier.
Audio input .....-15 to + 10 dbm, 600 ohms balanced.
Audio response .....±1.5 db, 300 to 3,000 Hz.
Power input .....120 volts, 60 Hz, 570 watts.
Modulation .....Amplitude-modulated.

(6) *Receiver-Transmitter, Radio RT-524/VRC* (fig. 1-5).
Frequency range
Band A .....30 to 52.95 MHz.
Band B .....53 to 75.95 MHz.
Number of channels .....920.
Channel spacing .....50 kHz.
Type of signal .....FM.
Type of transmission and reception .....Voice.
Transmitter power output:
High power .....35 watts minimum.
Low power .....1 to 3 watts.
Input power requirements:
High power .....10 amperes at 25.5 volts de.
Low power .....3 amperes at 25.5 volts dc.
Antenna .....Center-fed whip.
Types of squelch .....Noise and tone operated.

(7) *Radio Set AN/ARC-102* (fig. 1-5).
Frequency range .....2 to 29 MHz.
Frequency channels .....28,000 at l-kHz intervals.
Time required to change channels .....8 seconds maximum.
Types of transmission .....Voice and cw.
Range .....Line-of-sight.
Power requirement .....27.5 volts dc at 950 watts.
RF power output .....Ssb: 400 watts.
Am.: 100 watts average.
Cw: 100 watts average.

(8) *Receiver, Radio R-1545/FSQ-75(V)* (fig. 1-5).
Frequency range .....108 to 152 MHz, am.
Preset frequencies .....1.
Type of frequency control ...Crystal.
Type of receiver .....Single-conversion superheterodyne.
Intermediate frequency .....18.3 MHz.
Output .....Main audio output of 1 watt into 600 ohms.
Antenna input impedance ...50 ohms unbalanced.
Bandwidth .....36 kHz minimum.
Power requirements .....120 vac, 60 Hz, 86 watts.

(9) *Receiver, Radio R-1546/FSQ-75(V)* (fig. 1-6).
Number of bands .....5.
Frequency range .....200 to 400 kHz, and 1.3 to 30.0 MHz.

Intermediate frequency ...A55 kHz.
Operating power .....70 watts at 105 to 125 volts, 50 to 60 Hz.
RF input impedance .....7 to 238 ohms.
Output impedance .....20K ohms and 600 ohms at terminals. 600 ohms at phone jack. 15K ohms for monitor.
Undistorted power output .3 watts.

(10) *Receiver, Radio R-1547/FSQ-75(V)* (fig. 14;).
Frequency range .....225 to 399.9 MHz.
Channel spacing .....100 kHz.
Bandwidth .....60 kHz at -6-db points.
Stability .....Within 10 kHz of channel frequency.
Primary power .....105 to 125 volts, single phase, 50 to 60 Hz.
Power consumption .....125 watts (average).

(11) *Recorder Group OA-8432/FSQ-75(V)* (fig. 1-6).
Audio frequency response .....300 to 2,700 Hz.
Number of channels .....5.
Number of tracks .....5.
Tape width .....1/4 inch.
Reel size .....10 1/2-inch diameter.
Tape speed .....1 7/8 inches per second.
Input power .....120 vac, 60 Hz, single phase, 350 watts.

(12) *Reproducer Group, Sound OA-8427/FSQ-75(V)* (fig. 1-27).
Audiofrequency response (1K ref) .....300 to 2,700 Hz ±3 db.
Number of channels .....2.
Number of tracks .....5.
Tape width .....1/4 inch.
Reel size .....10-1/2 inch diameter.
Tape speed .....1-7/8 inches per second.
Power supply .....120 vac, single phase 60 Hz.
Power required .....150 watts.

(13) *Monitor-Converter, Audio Frequency-Radio Frequency ID-1572/FSQ-75(V)* (fig. 1-28).
Bands .....4.
Frequency .....50 to 400 MHz.
Band selection .....Manual.
Input power .....115 volts, 60 Hz.
Indicator type .....Meter.

(14) *Test Set, Radio Frequency Power AN/USM-298* (fig. 130).
Frequency .....25 MHz to 1 GHz.
Ranges .....5.
Indicator .....Meter.
Rf power .....10 to 500 watts.
Impedance .....50 ohms.

c. Auxiliary Items.

(1) *Antenna AS-2223/FSQ-75(V).*
Frequency range .....Broadband, 117 to 140 MHz.
Type .....Half-wave at median frequency, coaxial.
Polarization .....Vertical.
Characteristic impedance 52 ohms.

(2) *Antenna AS-2222/FSQ-75(V)* (fig. 1-32).
Frequency range .....Broadband, 225 to 400 MHz.
Type .....Uhf discone.
Polarization .....Vertical.
Characteristic impedance .....52 ohms.

(3) *Antenna M-3B* (fig. 1-33).
Type .....Whip.
Frequency .....27 MHz.

(4) *Ssb antenna* (fig. 2-11).
Frequency range .....2 to 30 MHz.
Type .....Long wire.

1-7. Nomenclature and Common Names

A list of the nomenclature assignments for the components of Air Traffic Control Communication Set AN/FSQ-75(V) (*) is given below. The common name shown for each item is used throughout this manual.

Nomenclature	Common name
Aerological Measuring Set MIL-629/FSQ-75 (V)	Aerological equipment.
Adapter, Test MX-8091/FSQ-75(V)	Six-channel amplifier group test adapter.
Adapter, Test MX-8092/FSQ-75(V)	Four-channel amplifier group test adapter.
Air Traffic Control Communication Set AN/FSQ-75(V) (*).	Air traffic control system.
Amplifier Group Audio Frequency OG-72/FSQ-75(V)	Six-channel amplifier group.
Amplifier Group, Audio Frequency OG-73/FSQ-75(V)	Four-channel amplifier group.
Amplifier-Mixer Group OG-71/FSQ-75(V)	Mixing amplifier.
Antenna AS-1729/VRC	FM antenna.
Antenna AS-2222/FSQ-75(V)	Uhf antenna.

Nomenclature	Common name
Antenna AS-2223/FSQ-75(V)	Vhf antenna.
Antenna M-3B	Lf antenna.
Antenna Coupler CU-1658/A	Ssb antenna coupler.
Attenuator, Fixed CN-1238/U	Microphone input attenuator.
Attenuator, Fixed CN-1239/U	6-db attenuator.
Buzzer BZ-166/FSQ-75(V)	Buzzer alarm.
Cabinets, Electrical Equipment CY-6463/FSQ-75(V) through CY-6469/FSQ-75(V).	Console. **Note. These are used in consoles 1 through 7, respectively, (fig. 1-2 and 1-3).**
Cabinet, Electrical Equipment CY-6478/FSQ-75 (V).	Equipment rack 8 (recorder).
Clock, Direct Reading MX-8090/FSQ-75(V)	Clock.
Connecting Group, Telephone AN/FCA-17	Connecting group.
Telephone Switch Panel, Master TA-792/FCA-17.	Master switch panel.
Telephone Switch Panel, Auxiliary TA-793/FCA-17.	Auxiliary switch panel.
Telephone Switch Panel, Common Equipment TA-794/FCA-17.	Common equipment box.
Terminal Box, Signal Entrance TA-795/FCA-17.	Signal entrance box.
Console Group, Air Traffic Control OJ-67(V)1/FSQ-75(V), or Console Group OJ-67(V)2/FSQ-75(V).	Console group.
Console, Communication Control OJ-94/FSQ-75 (V).	Console 1.
Console, Aerological OJ-95/FSQ-75(V)	Console 2.
Console, Flight Status OJ-96/FSQ-75(V)	Console 3.
Console, Single Sideband Control OJ-97/FSQ-75 (V).	Console 4.
Console, Communication-Control Interface OJ-98/FSQ-75 (V).	Console 5.
Console, Communication Control OJ-99/FSQ-75(V).	Console 6.
Console, Auxiliary OJ-100/FSQ-75(V)	Console 7.
Control, Radio Set C-3940/ARC-94	Ssb control unit.
Control, Receiver Volume C-7684/FSQ-75(V)	Receiver volume control.
Controller, Channel Selector C-7685/FSQ-75(V)	Transmitter keying unit.
Controller, Frequency Selector C-7686/FSQ-75(V)	Interlock unit.
Control-monitor C-7823/FSQ-75(V)	Engine generator remote control panel.
Control, Power Supply C-7885/FSQ-75(V)	Power control cabinet.
Fixture, Test, Amplifier-Power Supply MX-8093/FSQ-75(V).	Six-channel amplifier test jig.
Fixture, Test, Amplifier-Power Supply MX-8094/FSQ-75 (V).	Four-channel amplifier test jig.
Fixture, Test, Amplifier-Power Supply MX-8099/FSQ-75 (V).	Mixing amplifier test jig.
Frequency Selector, Transmitter SA-1609/FSQ-75 (V).	Transmitter selector.
Loudspeaker Assembly LS-565/FSQ-75(V)	Ssb control panel.
Microphone, Carton M-144/U	Ssb microphone.
Microphone, Magnetic M-145/U	Microphone.
Monitor-Converter, Audio Frequency-Radio Frequency ID-1572/FSQ-75(V).	Modulation monitor.

Nomenclature	Common name
Monitor-indicator, Recorder, Receiver ID-1570/FSQ-75(V).	Recorder/navaid status panel.
Panel, Fuse SB-3180/FSQ-75(V)	48-volt de fuse panel.
Panel, Microphone-Headset SB-3187/FSQ-75(V)	Ssb microphone-headset panel.
Panel, Microphone-Headset SB-3188/FSQ-75(V)	Microphone-headset panel.
Panel, Power Distribution SB-3177/FSQ-75(V)	Ac/dc distribution unit.
Panel, Power Distribution SB-3179/FSQ-75(V)	27.5-volt power combining unit.
Panel, Protection-Power Distribution SB-3178/FSQ-75(V).	48-volt power combining unit.
Panel, Test Point SB-3181/FSQ-75(V)	RF body.
Panel, Test Point SB-3182/ FSQ-75(V)	FM RF body.
Panel, Transformer-Impedance Matching SB-3197/FSQ-75(V).	Receiver transformer panel.
Power Supply PP-6044/FSQ-75(V)	48-volt power supply.
Power Supply PP-6045/FSQ-75(V)	27.5-volt power supply
Power Supple PP-6046/FSQ-75(V)	23/46-volt power supply.
Power Supply-Oscillator PP-6040/FSQ-75(V)	Power Supply /bias oscillator.
Public Address Set AM/GIH-4	Alarm/pa system.
Rack, Electrical Equipment MT-686/GR	Equipment rack (racks 1 through 7).
Radio Group OZ-2(V)I/FSQ-75(V)	Radio group 1[a].
Radio Group OZ-2(V)2/FSQ-75(V)	Radio group 2[a].
Receiver, Radio R-1545/FSQ-75(V)	Vhf receiver.
Receiver, Radio R-1546/FSQ-75(V)	Lf receiver.
Receiver, Radio R-1547/FSQ-75(V)	Uhf receiver.
Receiver Test Panel FA-3700/3	Receiver test panel.
Receiver-transmitter RT-698/ARC-102	Ssb transceiver.
Receiver-Transmitter, Radio RT-524/VRC	FM transceiver.
Recorder Group OA-8432/FSQ-75(V)	Recorder.
Reproducer Group, Sound OA-8427/FSQ-75(V)	Reproducer.
Selector, Channel-Headphone-Speaker SA-1610/FSQ-75(NV).	Receiver mixing and channel selector.
Shelter, Electrical Equipment S-417/FSQ-75(V)	Equipment shelter.
Shelter. Air Traffic Control S-426/FSQ-75(V)	Control tower Cab[b].
Speaker Assembly LS-563/FSQ-75(V)	Speaker assembly.
Test Set, Radio TS-2682/FSQ-75 (V)	Receiver test set.
Test Set, Radio Frequency Power AN/USM-98	Rf wattmeter.
Transporter, Air-A-Plane Model AW-3	Trailer [b]
Transformer, Voltage, Step-Up TF-553/FSQ-75(V)	Receiver selector transformer.
Transmitter, Radio T-1082/FSQ-75(V)	Vhf transmitter.
Transmitter, Radio T-1083/FSQ-75(V)	Uhf transmitter.

[a] Radio group 1 and radio group 2 perform many of the same functions. *Radio group* is used as the common name when it is not necessary to distinguish between the two group-s

[b] Denotes equipment supplied with AN/FSQ-75(V)3 only.

1-7.1. Items Comprising an Operable Equipment

FSN	QTY	Nomenclature, part No and mfr code	Usable on code	Fig. No.
		NOTE **The part number is followed by the applicable 5-digit Federal supply code for manufacturers (FSCM) identified in SB 708-42 and used to identify manufacturer, distributor, or Government agency, etc.** **NOTE** **Number 1 in the usable on code column refers to items comprising an operable AN/FSQ-75(V)1; number 2 refers to items comprising an operable AN/FSQ-75(V)2.**		

FSN	QTY	Nomenclature, part No and mfr code	Usable on code	Fig. No.
		Air Traffic Control Communication Set AN/FSQ-75(V)I: (Model column 1) Air Traffic Control Communication Set AN/FSQ-75(V)2: (Model column 2)		
5995-935-5170		Cable Assembly, Radio Frequency CG-3450/FSQ-75(V): 80058	1.2	2-8
5995-935-5171		Cable Assembly, Radio Frequency CG-3469/U: 80058	1.2	2-12
		Cable Assembly, Special Purpose. Electrical CX-10859/FSQ-75(V): 80058	1.2	2-1
5995-935-5176		Cable Assembly., Special Purpose. Electrical CX-10860/FSQ-75(V): 80058	1.2	2-1
5995-935-5169		Cable Assembly, Special Purpose. Electrical CX-1086i/FSQ-75(V): 80058	1.2	2-1
5995-056-7130		Cable Assembly, Special Purpose. Electrical CX-10862/FSQ-75(V): 80058	1.2	2-1
5815-034-7494		Cable Assembly, Special Purpose. Electrical CX-10863/FSQ-75(V): 80058	1.2	2-1
5995-935-5168	1	Cable Assembly, Special Purpose. Electrical CX-10864/FSQ-75(V): 80058	1.2	2-1
		Console Group. Air Traffic Control OJ-67/FSQ-75(V)	1.2	1-2
		Control-Monitor C-7823/FSQ-75(V)	1.2	1-19
		Control, Power Supply C-7885/FSQ-75(V)	1.2	2-1
5965-636-1925	2	Microphone. Carbon M-144/U: 80058	1.2	1-16
	3	Microphone. Magnetic M-145/U: 80058	1,2	1-16
		Radio Group OZ-2(V)l/FSQ-75(V)	1.2	1-5, 1-6
		Radio Group OZ-2(V)2/FSQ-75(V)	1.2	1-5, 1-6
5625-014-4488		Monitor-Converter, Audio Frequency-Radio Frequency ID-1572/FSQ-75(V)	1.2	1-28
6625-777-1231		Test Set, Radio TS-2682/FSQ-75(V)	1.2	1-29

1-8. Components and Dimensions

The charts below give dimensions and weights of the components.

a. Control Tower Components.

Quantity	Item	Dimensions (in.)			Unit weight (lb)
		Height	Depth	Width	
1	Aerological Measuring Set ML-629/ FSQ-75(V):				
1	Cable. 7-conductor	600 long	-	-	
1	Windspeed transmitter I fig. 1-13)	10	3	3	8
1	Wind direction transmitter(fig. 1-13)	10	3	3	8
1	Aerological panel assembly:				
1	Wind speed indicator(fig. 3-2)	4 1/2	2 1/2	4 1/2	2
1	Wind direction indicator(fig. 3-21	4 1/2	2 1/2	4 1/2	2
1	Power supply and distribution assembly	6 1/2	3 1/2	6 1/2	6
1	Altimeter setting barometer(fig. 3-2)	6	3	6	4
3[a]	Amplifier Group Frequency OG-72/FSQ-	7	14	19	49
2[b]	75(V)(fig. 5-2).				
1	Amplifier Group. Audio Frequency OG-73/FSQ-75(VI (fig. 5-2).	7	14	19	30
1	Amplifier-Mixer Group OG-71/FSQ-75(V) (fig. 5-2).	7	11 1/2	19	18
1	Attenuator. Fixed CN-1238/U (fig. 1-18)	1 1/2	2 7/8	2 3/8	1/4

Quantity	Item	Dimensions (in.)			Unit weight (lb)
		Height	Depth	Width	
3[a] 2[b]	Buzzer BZ-166/FSQ-75(V)(fig. 1-11)	4	21/4	6	31/4
1	Clock. Direct-Reading MX-8090/FSQ-75(V) (fig. 3-3).	67/16	5 1/4	97/8	4
7[a]	Cabinets, Electrical Equipment:	47	22	211/32	280
5[a]	CY-6463/FSQ-75(V) through CY-6469/ FSQ-75(V (includes 4 blowers in AN/FSQ-75(V)l and (V)2, and 3 in AN/FSQ-75(V)3.				
1	Connecting Group. Telephone AN/FCA-17 (fig. 5-2):				
1	Telephone Switch Panel, Master TA-792/FCA-17.	7	10	19	10
2[a]	Telephone Switch Panel.	7	10	19	9 1/2
1[b]	Auxiliary TA-793/FCA-17.				
1	Telephone Switch Panel, Common Equipment TA-794/FCA-17.	8 1/2	16	19	24 1/2
1	Terminal Box, Signal Entrance TA-795/FCA-17.	6	15 1/2	12 15/16	15 1/2
9[a]	Control, Receiver Volume	2	4	5	1/2
6[b]	C-7684/FSQ-75(V) (fig. 1-9).				
9[a]	Controller, Channel Selector	5 7/32	10 3/4	19	8
6[b]	C-7685/FSQ-75(V)(fig. 1-14).				
3	Controller, Frequency Selector C-7686/FSQ-75(V) (fig. 3-9).	5 7/32	8 29/64	19	13
1	Engine generator remote control panel (fig. 1-19).	9 1/16	8	13 1/2	10
9[a]	Frequency Selector, Transmitter	1 31/32	6 28/32	4 31/32	1
6[b]	SA-1609/FSQ-75(V)(fig. 1-10).				
1	Loudspeaker Assembly LS-565/FSQ-75(V) (fig. 3-5).	6 31/32	8	19	2
1	Monitor-Indicator, Recorder, Receiver ID-1570/FSQ-75(V) (fig. 3-4).	2 3/4	2 1/4	19	3/4
1	Panel. Microphone-Headset SB-3187/ FSQ-75(V) (fig. 3-7).	5 7/32	2	19	1
3[a]	Panel, Microphone-Headset	6 31/32	2	19	3/4
2[b]	SB-3188/ FSQ(V) (fig. 3-6).				
3	Panel Power Distribution SB-3177/FSQ(V) (fig. 3-8).	6 23/32	5	19	21/2
1	Panel, Transformer Impedance Matching SB-3197/FSQ-75(V) (fig. 3-10).	5 7/32	6	19	14

Quantity	Item	Dimensions (in.)			Unit weight (lb)
		Height	Depth	Width	
1	Power Supply PP-6046/FSQ-75(V) (fig. 3-12).	5 7/32	9	19	27
1	Public Address Set AN/GIH-4 (fig. 1-17):				
1	Amplifier 3 1/2	8	5 1/4	4	
2	Loudspeaker	6	4 1/2	14	8
9[a] 6[b]	Selector, Channel-Headphone-Speaker SA-1610/FSQ-75(V) (fig. 1-8).	2	4	5	1/2
3[a] 2[b]	Speaker Assembly LS-563/FSQ-75(V) (fig. 1-7).	6 31/32	8	19	5
9[a] 6[b]	Transformer, Voltage, Step-Up TF-553/FSQ-75(V) (fig. 1-12).	6	2 5/16	4	2
1[c]	Control Tower Cab (fig. 1-20)	92	187	96	5,000
1[c]	Trailer (fig. 1-23)	16	218	96	1,000

[a]Quantity furnished for AN/FSQ-75(V)1 and AN/FSQ-75(V)2.
[b]Quantity furnished for AN/FSQ-75(V)3.
[c]Items furnished with AN/FSQ-75(V)3 only.

b. Equipment Shelter Components (fig. 1-5 and 1-6).

Quantity	Item	Dimensions (in.)			Unit weight (lb)
		Height	Depth	Width	
2	Antenna Coupler CU-1658/A	7 5/8	12 5/8	10 1/8	19.6
1	Panel, Fuse SB-3180/FSQ-75(V)	1 23/32	2	19	1/2
1	Panel, Power Distribution SB-3179/FSQ-75 (V).	6 31/32	5 1/2	19	4
1	Panel, Protection-Power Distribution SB-3178/FSQ-75 (V).	5 7/32	9 7/16	19	10
10	Panel, Test Point SB-3181/FSQ-75(V)	3 15,/32	2	19	1
1	Panel, Test Point SB-3182/FSQ-75(V)	10 15/32	2	19	2
2	Power Supply PP-6044/FSQ-75(V)	6 31/32	11 1/4	19	18
4	Power Supply PP-6045/FSQ-75(V)	7	17	19	90
7	Rack, Electrical Equipment MT-686/GR	72	21	23 3/4	75
2	Radio Set AN/ARC-102:				
	Control, Radio Set C-3940/ARC-94	2 5/8	4 7/8	5 3/4	2
	Receiver-Transmitter RT-698/ARC-102 w/mount.	9 9/32	25	11	63
4[a] 3[b]	Receiver, Radio R-1545/FSQ-75 (V).	8 23/32	9 1/8	19	26
1	Receiver, Radio R-1546/FSQ-75(V)	8 3/4	14	19	64
4[a] 5[b]	Receiver, Radio R-1547/FSQ-75 (V).	12 1/4	22 1/2	19	55
1	Receiver Test Panel FA-3700/3	1 11/16	1 1/2	19	2/3
4	Receiver-Transmitter, Radio RT-524/VRC	6 9/32	13 5/32	15 11/32	85
1	Recorder Group OA-8432/FSQ-75(V)	69	22	21 3/4	380
1	Reproducer Group Sound OA-8427/FSQ-75(V) (fig. 1-27).	30 1/2	24 3/16	28 1/2	110
1	Shelter, Electrical Equipment S-417/FSQ-75(V).	83	147	7	4,800
4[a] 3[b]	Transmitter, Radio T-1082/FSQ-75 (V).	17 15/82	15 29/32	19	94
4[a] 5[b]	Transmitter, Radio T-1083/FSQ-75(V).	17 15/32	15 29/32	19	94

[a]Quantity furnished for AN/FSQ-75 (V) 1.
[b]Quantity furnished for AN/FSQ-75(V)2 and AN,/FSQ-75(V)3.

c. Exterior Equipment Components.

Quantity	Item	Dimensions (in.)			Unit weight (lb)
		Height	Depth	Width	
6[a]	Antenna	15 3/8	18 5/8		35
8[b]	AS-2222/FSQ-75(V).		diameter		
6[a]	Antenna	57 3/4	3 3/8		
5[b]	AS-2223/FSQ-75 (V).		diameter		8
1	Antenna, lf	102 length			
2	Antenna, ssb		660 length		
4	Antenna, FM	102 length			
4[c]	Antenna Support	76		50	35
1[c]	Wind equipment support	54		40	50

[a]Quantity furnished for AN/FSQ-75 (V) 1.
[b]Quantity furnished for AN/FSQ-75(V)2 and AN/FSQ-75(V)3.
[c]Items furnished with AN/FSQ-75(V)3 only.

d. Portable Equipment Components.

Quantity	Item	Dimensions (in.)			Unit weight (lb)
		Height	Depth	Width	
1	Monitor-Converter, Audio Frequency-Radio Frequency ID-1572/FSQ-75(V) (fig. 1-28).	8 1/2	11	15	19
1	Test Set, Radio TS-2682/FSQ-75 (V) (fig. 1-29).	4	3 1/16	6	6
1	Test Set, Radio Frequency Power AN/USM-298 (fig. 1-30).	7	3	4	4

e. Cables (fig. 2-1 and 2-2).

Note.
The wind-instrument cable is listed under Aerological Measuring Set ML-629/FSQ-75(V) in a above.

Quantity	Item	Length (ft)	Connection	
			From-	To-
6	Cables CX-10859/FSQ-75 (V) through CX-10864/FSQ-75 (V).	100	Equipment shelter.	Control tower.
1	4-conductor cable	70[a] or 100[b]	Equipment shelter.	Control tower.
1	4-conductor cable	50	Equipment shelter.	Power control cabinet.
2	4-conductor cable	20	Engine generators 1 and 2.	Power control cabinet.
2	4-conductor cable	15	Equipment shelter.	Air conditioner 1 and 2.
1	10-conductor cable	120	Control tower.	Power control cabinet.
2	10-conductor cable	20	Engine generators 1 and 2.	Power control cabinet.
1	4-conductor cable	50	Power control cabinet.	Commercial source.
2	4-conductor cable	*c*	Power control cabinet.	Maintenance shelter and storage shelter.
8	Cable Assembly, Radio Frequency CG-3450/FSQ-75 (V)	150	Equipment shelter bulk-head connector panel	Uhf and vhf antenna bases.
1	Cable Assembly, Radio Frequency CG-3469/U.	3	RCP jack of equipment shelter bulkhead con-nector panel.	Lf antenna mount (fig. 2-12).

[a]AN/FSQ-75(V)1 and AN/FSQ-75(V)2.
[b]AN/FSQ-75(V)3.
[c]Dependent on specific site.

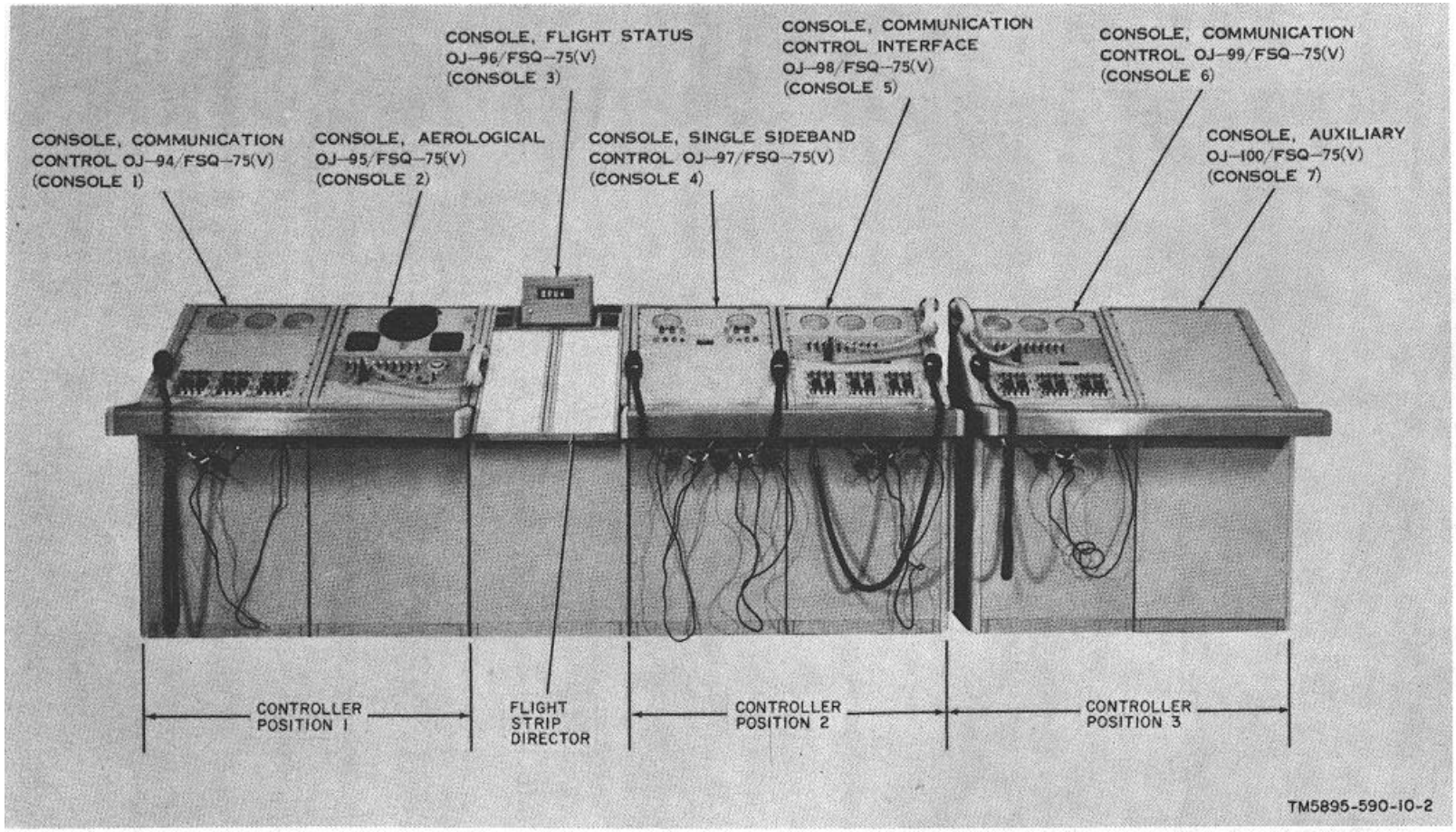


Figure 1-2. Console Group, Air Traffic Control OJ-7(V)1/FSQ-75(V).

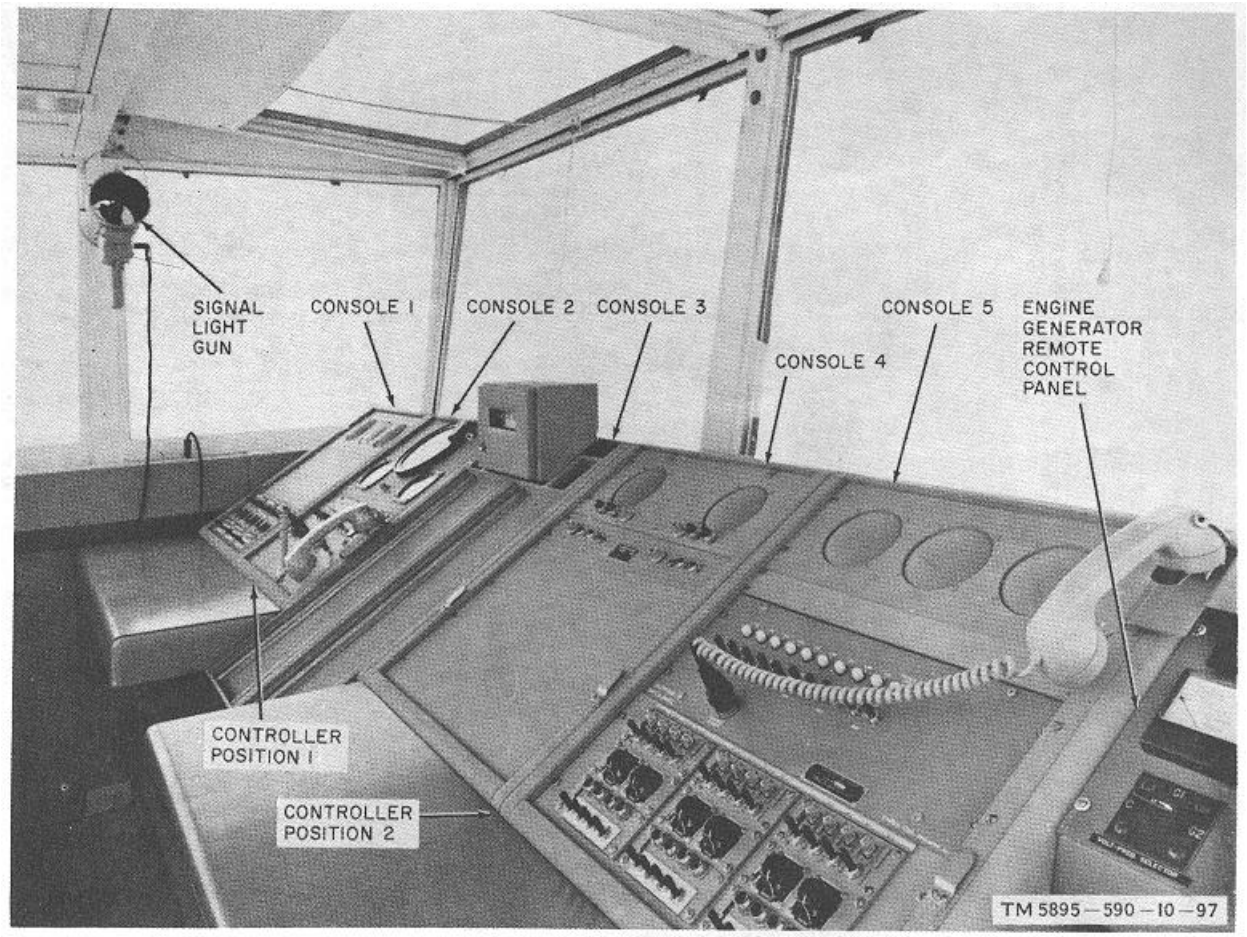


Figure 1-3. Console Group, Air Traffic Control OJ-67(V)S/FSQ-75(V)

1-9. Description of Air Traffic Control System

a. The air traffic control system contains vhf and uhf radio transmitting equipment; If, vhf, and uhf radio receiving equipment; control consoles; recording and reproducing equipment; control and switching equipment; antennas; display equipment: aerological equipment; interconnecting cables; and accessory and spare parts.

b. Figure 1-2 shows the control consoles that are provided with the AN/FSQ-75(V)1 and the AN/FSQ-75(V)2 and are located in the control towers. Figure 1-3 shows the consoles furnished with the AN/FSQ-75(V)3 mounted in the control tower cab. The consoles are identical; however, consoles 1 through 7 are provided with the AN/FSQ-75(V)1 and AN/FSQ-75(V)2, and only consoles 1 through 5 are provided with the AN/FSQ-75(V)3. Figures 1-5 and 1-6 are interior views of the equipment shelter.

c. Interconnecting cables allow separation of the control tower and the equipment shelter to a maximum distance of 70 feet and permit the controllers at the control consoles in the control tower to operate the radio equipment installed in the equipment shelter.

d. The air traffic control system receives operating power from two (one operating and one standby) diesel engine generators (not part of the AN/FSQ-75(V) (*) and located at a distance from the control tower) and the equipment shelter, or from a commercial power source where available. An engine generator remote control panel (fig. 1-19), located in the control tower, allows selection and monitoring of the various power sources from within the control tower.

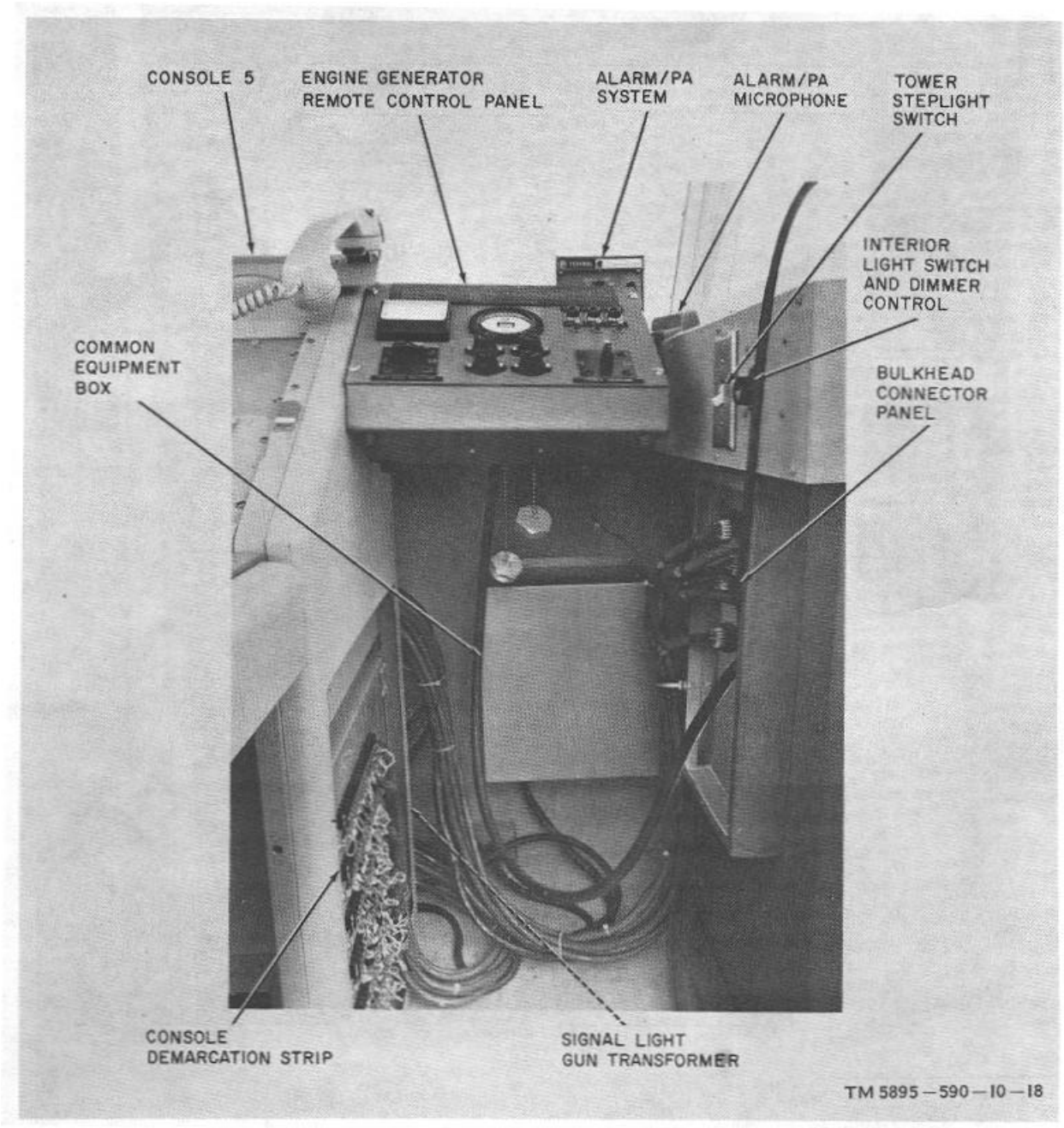


Figure 1-4. Control tower cab interior, right side of console group.

e. Air conditioning units (not part of the AN/FSQ-75(V)(*)) cool the equipment shelter and the control tower to provide equipment protection and comfort to operating personnel. An air conditioner is supplied as a part of the control tower cab which is supplied with the AN/FSQ-75(V)3. Two additional shelters (not part of the AN/FSQ-75(V) (*)) are used as a maintenance shop and for spare parts storage.

1-10. Description of Console Groups

The majority of the console group components (fig. 5-2) are housed in seven individual

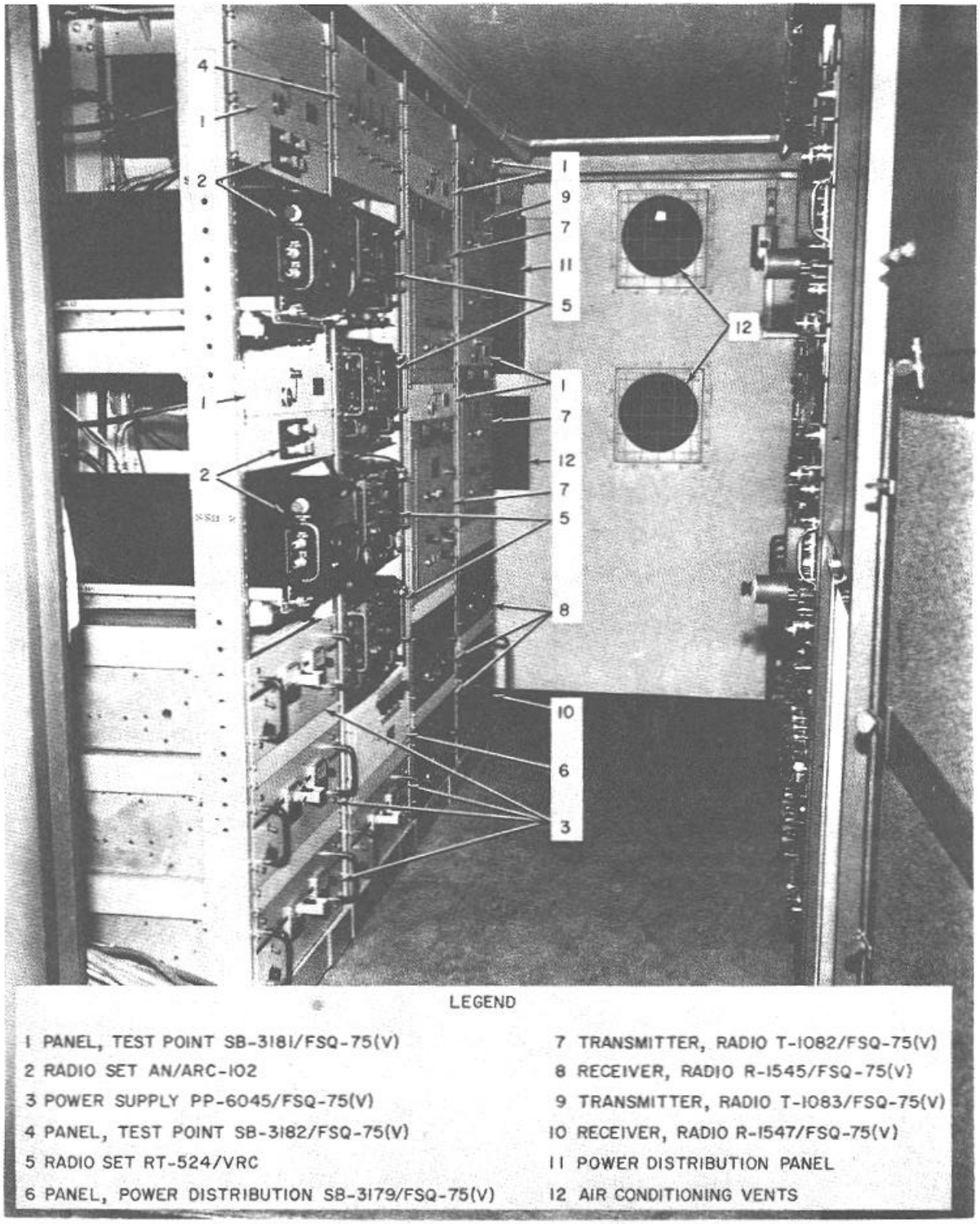


Figure 1-5. Shelter, Electrical Equipment S-417/FSQ-75(V), roadside interior view.

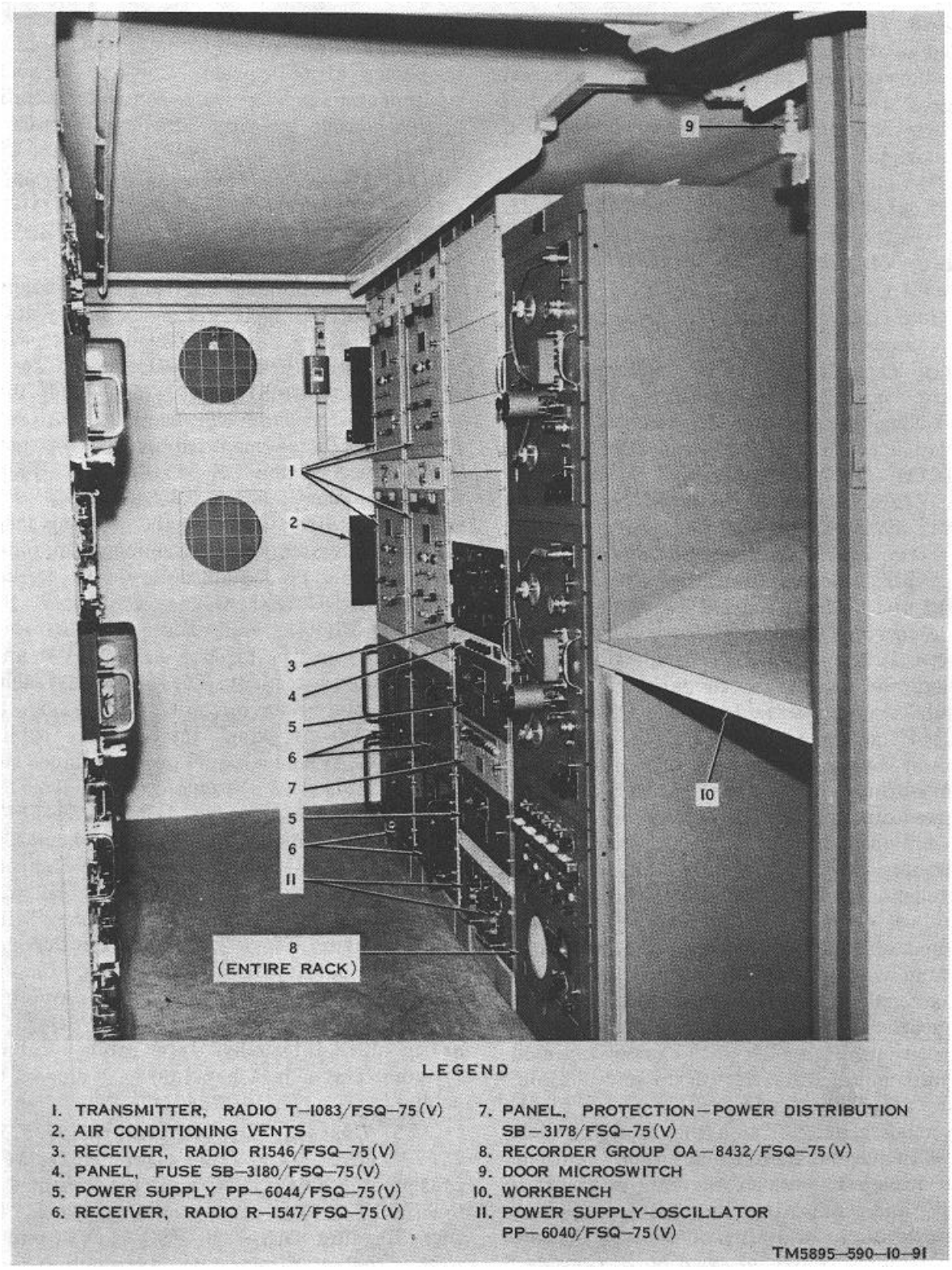


Figure 1-6. Shelter, Electrical Equipment S-417/FSQ-75(V), curbside interior view.

consoles (five consoles in the OJ-67(V)2/ FSQ-75(V)). Additional components included in the console group, such as the light gun and reel, the alarm/pa system and test fixtures, are located in the control tower but are external to the consoles. When installed together, the seven consoles included in the OJ-67(V)1/FSQ-75(V) provide three aircraft controller operating positions (fig. 1-2). The five consoles included in the OJ-67(V)2/ FSQ-75(V) provide two aircraft controller positions (fig. 1-3).

a. Individual Consoles (fig. 1-2 and 1-3). The equipment configuration of each console variers, depending on the function of the specific console, and is detailed in (1) through (7) below. The equipment included in the individual consoles is identical for both the OJ-67(V)1/FSQ-75(V) and the OJ-67(V)2/FSQ-75(V). Detachable writing shelves mount along the console fronts. Console 1 provides the controller at position 1 with control and monitoring capability for the 12 vhf and uhf communication channels. Console 2 provides aerological data for all controllers, and access to the connecting group through the master switch panel. This panel has dial line access and alarm features not available on the telephone switch panels located on consoles 5 and 6. Console 3 furnishes a time-of-day display and houses a flight progress director used to record and update information pertaining to aircraft arrivals and departures. This equipment is for use by all controllers. Consoles 4 and 5 form controller position 2. Console 4 provides the capability for control and monitoring of the two single sideband communication channels and monitoring capability for the operational status of the recorder and lf receiver. Console 5 provides the position 2 controller with control and monitoring capability for the 12 vhf and uhf communication channels, as well as access to the connecting group through the auxiliary telephone switch panel. A demarcation panel on this console serves as an interface point for all control and monitoring lines between the control tower and the equipment shelter. Consoles 6 and 7 form controller position 3. Console 6 provides the controller at position 3 with control and monitoring capability for the 12 vhf and uhf communication channels, and access to the connecting group through the auxiliary telephone switch panel. Console 7 houses equipment associated with controller position 3; this console has no operating controls or indicators.

(1) *Console, Communication Control OJ-94/FSQ-75(V)* (fig. 1-2). The OJ-94/ FSQ-75(V) consists of Cabinet, Electrical Equipment CY-6463/FSQ-75(V) which contains, on its sloping face, a transmitter-receiver volume control panel, (fig. 3-1) that contains three Selectors, Channel-Headphone-Speaker SA-1610/FSQ-75(V), three Controls, Receiver Volume C-7684/FSQ-75(V), and three Frequency Selectors, Transmitter SA-1609/ FSQ-75(V). Also mounted on the top panel is Speaker Assembly LS-563/FSQ-75(V) Panel. Microphone-Headset SB-3188/FSQ-75(V) is mounted directly below the writing ledge. Telephone Switch Panel, Common Equipment TA-794/FCA-17, Amplifier Group, Audio Frequency OG-72/FSQ-75(V), Buzzer BZ-166/FSQ-75(V), and three Transformer, Voltage, Step-Up TF 53/FSQ-75(V) units are mounted internally. They can be reached through the rear of the console or the removable front panel. Inter-cabinet cabling terminates at a jack panel on the cabinet side.

(2) *Console, Aerological OJ-95/FSQ-75(V)* (fig. 1-2). The OJ-95/FSQ-75(V) consists of Cabinet, Electrical Equipment CY-6464/FSQ-75(V) which houses the indicator panel of Aerological Measuring Set ML-629/ FSQ-75(V) (fig. 3-2) and Telephone Switch Panel, Master TA-792/FCA-17 on the sloping front panel. Three Controllers, Channel Selector C-7685/FSQ-75(V) and Amplifier Group, Audio Frequency OG-73/FSQ-75(V) are mounted internally. Inter-cabinet cabling terminates at a jack panel on each side of the cabinet.

(3) *Console, Flight Status OJ-96/FSQ-75(V)* (fig. 1-2). The OJ-96/FSQ-75(V) consists of Cabinet, Electrical Equipment CY-6465/FSQ-75(V) which contains Clock, Direct Reading MX-090/FSQ-75(V) and a flight-progress director on its sloping front panel. Three Panels, Power Distribution SB

3177/FSQ-75(V) are mounted on the front of the cabinet just below the writing ledge. Three Controllers, Frequency Selector C7686/FSQ-75(V), and Amplifier-Mixer Group OG-71/FSQ-75(V) are mounted internally. Inter-cabinet cabling terminates at jack panels on each side and at the rear of the cabinet. When all seven consoles are interconnected, as in the AN/FSQ-75(V)1 and the AN/FSQ-75(V)2, the jacks at the rear of console 3 are interconnected to jacks on consoles 6 and 7 through 25-foot cables. The jacks remain unterminated in the AN/FSQ-75(V)3, as consoles 6 and 7 are not used in that configuration.

(4) *Console, Single Sideband Control OJ-97/FSQ-75(V)* (fig. 1-2). The OJ-97/FSQ-75(V) consists of Cabinet, Electrical Equipment CY-6466/FSQ-75(V) which houses Loudspeaker Assembly LS-565/FSQ-75(V) and Monitor-Indicator, Recorder, Receiver ID-1570/FSQ-75(V) on its sloping face, and Panel, Microphone-Headset SB-3187/FSQ-75(V) on its front just below the writing ledge. Three Controllers, Channel Selector C-7685/FSQ-75(V), and Power Supply PP-6046/FSQ-75(V) are mounted internally. Inter-cabinet cabling terminates at jack panels on both sides of the cabinet.

(5) *Console, Communication-Control Interface OJ-98/FSQ-75(V)* (fig. 1-2). The sloping top of the OJ-98/FSQ-75(V) (made up of Cabinet, Electrical Equipment CY-6467/FSQ-75(V)) contains the same units as the OJ-94/FSQ-75(V) with the addition of Telephone Switch Panel, Auxiliary TA-793/ FCA-17. Panel, Microphone-Headset SB-3188/FSQ-75(V) is mounted on the front directly below the writing ledge. Panel, Transformer-Impedance Matching SB-3197/FSQ-75(V), Amplifier Group, Audio Frequency OG-72/FSQ-75 (V), Buzzer BZ-166/FSQ-75(V), and three Transformers, Voltage, Step-Up TF-553/FSQ-75 (V) are mounted internally. Inter-cabinet cabling terminates at a demarcation panel on the cabinet side. In the AN/FSQ-75(V)3 only, the engine generator remote control panel is bolted to the side of console 5 (fig. 14).

(6) *Console, Communication Control OJ-99/FSQ-75(V)* (fig. 1-2). The sloping front of OJ-99/FSQ-75(V) (made up of Cabinet, Electrical Equipment CY-6468/FSQ-75(V)) is identical to that of the OJ-98/FSQ-75(V) ((5) above). Microphone-Headset SO-3188/FSQ-75(V) is mounted on the front panel just below the writing ledge and Amplifier Group, Audio Frequency OG-72/FSQ-75(V), Buzzer BZ-116/FSQ-75(V), and three Transformers, Voltage, Step-Up TF-553/FSQ-75(V) are mounted internally. Inter-cabinet cabling terminates at a jack panel on the cabinet side.

(7) *Console, Auxiliary OJ-100/FSQ-75(V)* (fig. 1-2). The OJ-100/FSQ-75(V) (made up of Cabinet, Electrical Equipment CY-6469/FSQ-75(V)) has no controls on its sloping front panel. It houses three Controllers, Channel Selector C-7685/FSQ-75(V). Inter-cabinet cabling terminates at a jack panel on one side of the console. Intra-cabinet cabling enters console 7 through a cutout in the bottom of the console rear cover.

b. Console Components. As many of the components housed in the consoles are contained in more than one console, the individual components are described in the following paragraphs.

(1) *Speaker Assembly LS-563/FSQ-75(V)* (fig. 1-7). The speaker assembly is used for aural presentation of received signals. Individual speakers are designed to handle 5 watts of power. Three speakers mounted together in a standard 19-inch panel make up the assembly; each individual speaker is mounted in a bell-shaped housing with baffle material. The cone of each speaker is protected by metal grillwork. A cord extending from the speaker housing is provided with a plug for connection inside the console.

(2) *Selector, Channel-Headphone-Speaker SA-1610/FSQ-75(V)* (fig. 1-8). The receiver mixing and channel selector is an assembly of four three-position lever-type key switches and associated resistors, indicator lamps, terminal board, and connectors. The assembly is used to select receiver audio signals to be routed to the controller's headset or speaker. The unit consists of a front panel upon which the switches and indicator lamps are mounted, and a rear bracket which mounts a terminal board and connector. Receiver mixing

and channel selectors are mounted in groups of three (fig. 3-1) to control 12 receiving channels at each controller position.

(3) *Control, Receiver Volume C-7684/ FSQ-75(V)* (fig. 1-9). The receiver volume control is an assembly of two potentiometers and the necessary connectors. The unit consists of a front panel upon which the two potentiometers are mounted. One potentiometer controls speaker audio level; the other controls headset audio level. A connector jack is mounted at the rear of the chassis. Receiver volume controls are mounted in groups of three (fig. 3-1) to control 12 receiving channels.

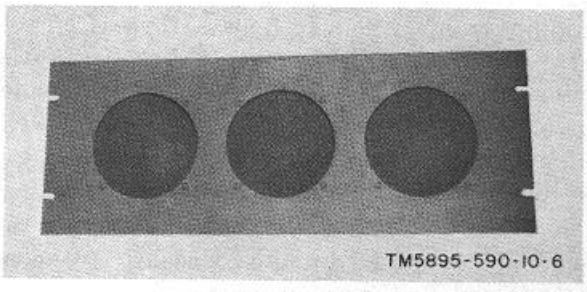


Figure 1-7. Speaker Assembly LS-563/FSQ-75(V).

(4) *Frequency Selector, Transmitter SA-1609/FSQ-75(V)* (fig. 1-10). The transmitter selector consists of four lever-type key switches and indicator lamps. A connector jack is mounted at the rear of the chassis. Transmitter selectors are mounted in groups of three (fig. 31) to control 12 transmitting channels.

(5) Panel, Microphone-Headset SB-3188/FSQ-75(V) (fig. 3-6). The microphone-headset panel consists of two front panel mounted jacks labeled MIC and PHONES. The microphone-headset panel serves as the interconnection point for a controller's microphone and headset.

(6) Connecting Group, Telephone AN/ FCA-17. The connecting group consists of a master switch panel, one or two auxiliary switch panels, a common equipment box, a signal entrance box, handsets, and interconnecting cables. The signal entrance box is weatherproofed and includes a hardwire cable assembly which connects incoming telephone lines to the common equipment box. The master switch panel contains telephone line control switches and associated indicators, a dial, and a plug-in handset. The two auxiliary

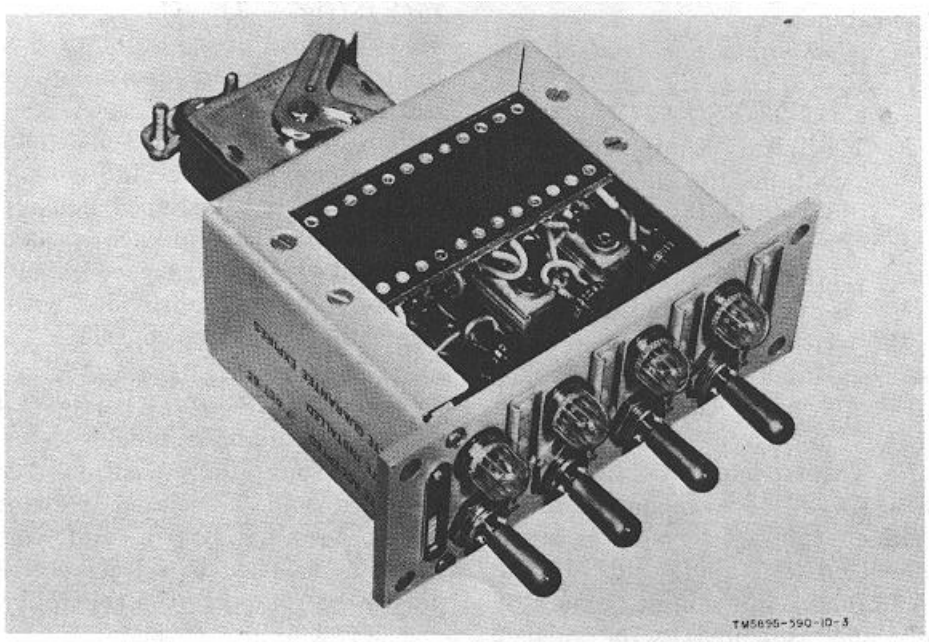


Figure 1-8. Selector, Channel-Headphone-Speaker SA-1610/FSQ-75(V).

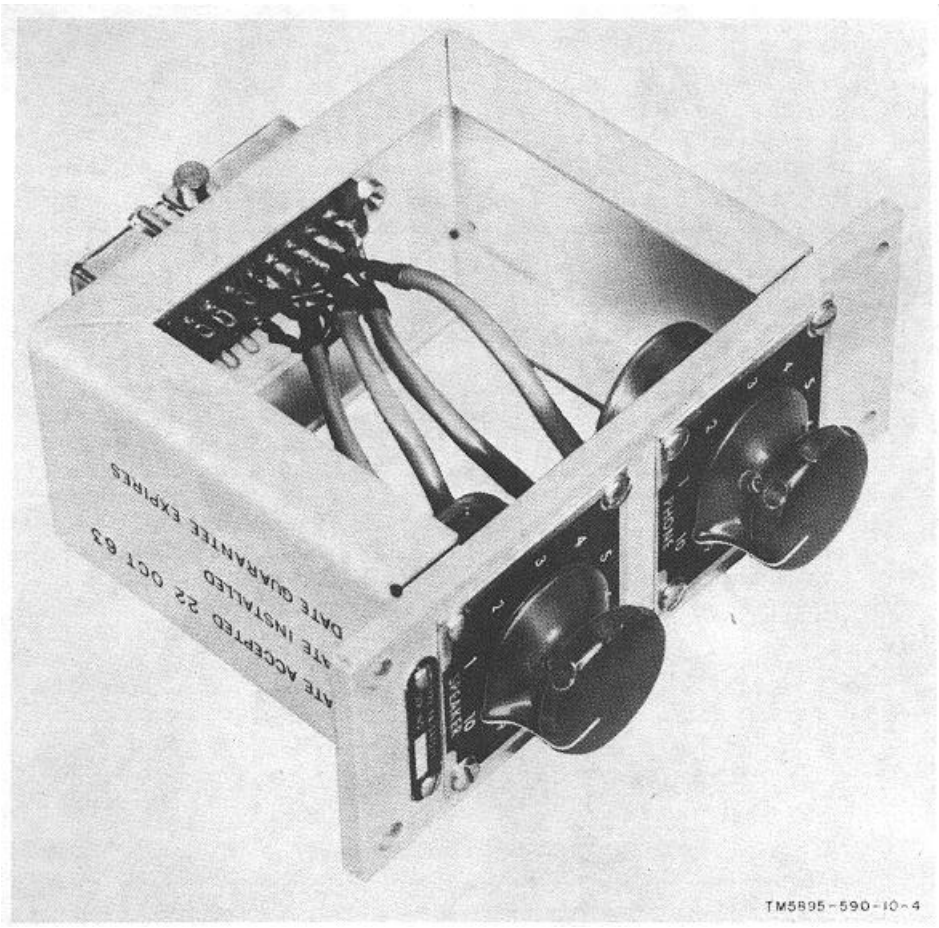


Figure 1-9. Control, Receiver Volume C-7684/FSQ-75(V)

switch panels provide telephone line control switches, indicators, and handset connectors. Four removable cable assemblies connect the common equipment box to a power source, the master switch panel, and the auxiliary switch panels. Both the master and auxiliary switch panels include handset brackets and cradles. The handset bracket is adaptable to either left- or right-hand mounting on consoles 2, 5, and 6. Refer to TM 11-5805-467-12, for more specific details on the AN/FCA-17.

(7) *Amplifier Group, Audio Frequency OG-72/FSQ-75(V).* The six-channel amplifier group consists of two power supply modules and six amplifier modules mounted in a common chassis. The assembly is slotted for mounting in a standard 19-inch rack. The power supply modules are inter-connected to the amplifier modules through internal chassis wiring. The power supply modules are identical and interchangeable; similarly, the amplifier modules are identical and interchangeable. This equipment provides amplification of up to six separate audio channels over a frequency range of 300 to 3,000 Hz. In the AN/FSQ-75(V) (*), four amplifier modules are in use with two modules as spares. When viewing the six-channel amplifier group from the front, the first and third modules from the left are spares; their sockets are not interconnected into the system. Adapter, Test MX-8091/FSQ-75(V) and Fixture, Test, Amplifier-Power Supply MX-8093/FSQ-75(V) allow maintenance of the modules when removed from the chassis. Refer to TM 11-5820-733-12 Audio for additional details on the OG-72/FSQ-75(V).

(8) *Buzzer BZ-166/FSQ-75(V)* (fig. 1-11). The buzzer alarm consists of a buzzer, a

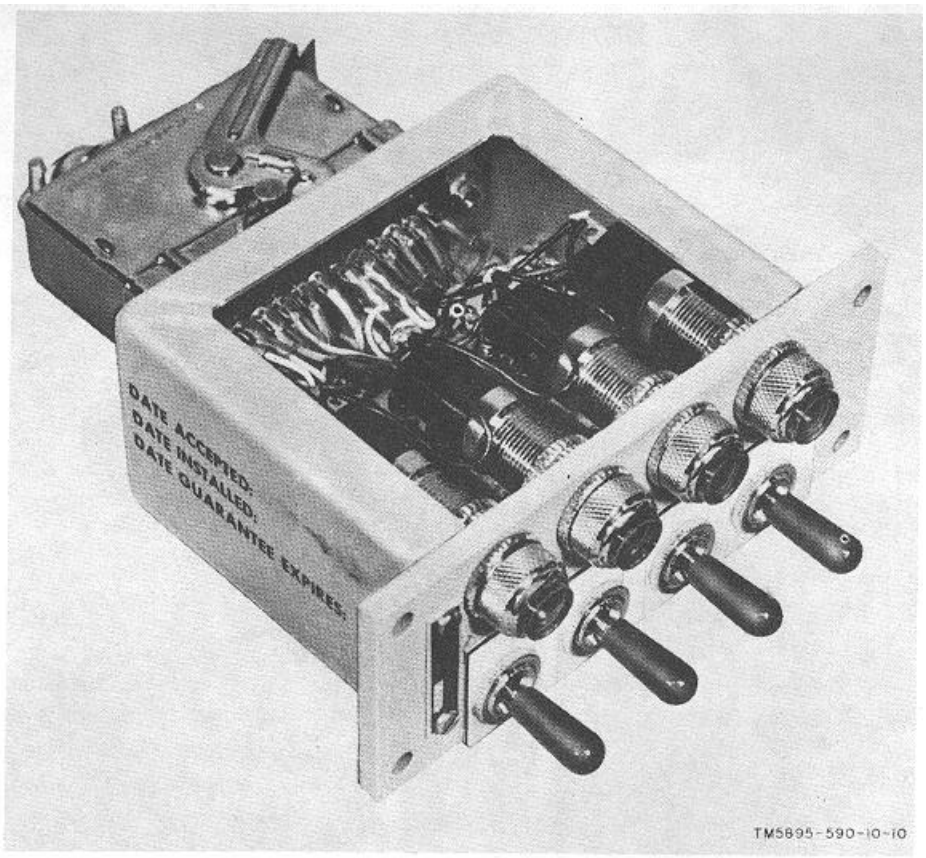


Figure 1-10. Frequency Selector, Transmitter SA-1609/FSQ-75(V)

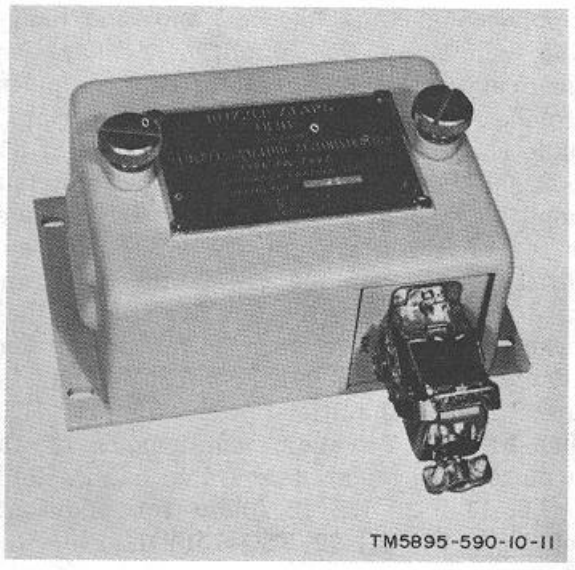


Figure 1-11. Buzzer BZ-166/FSQ-75(V).

relay, and a connector mounted on an aluminum plate. Four slots are provided for mounting the unit, and the unit is protected by a cover. A buzzer alarm at each controller position provides an audible warning if a controller attempts to select a transmitting channel already in use.

(9) *Transformer, Voltage, Step-Up TF-553/FSQ-75(V)* (fig. 1-12). The receiver selector transformer consists of four separate autotransformers mounted on a common chassis. The components are protected with a dust cover. The unit provides a 4 to 1 voltage step up.

(10) *Aerological Measuring Set ML-629/ FSQ-75(V)* (fig. 1-13). The aerological equipment consists of wind measuring equipment and an altitude setting barometer. A windspeed transmitter and a wind direction transmitter are pole-mounted exterior to the

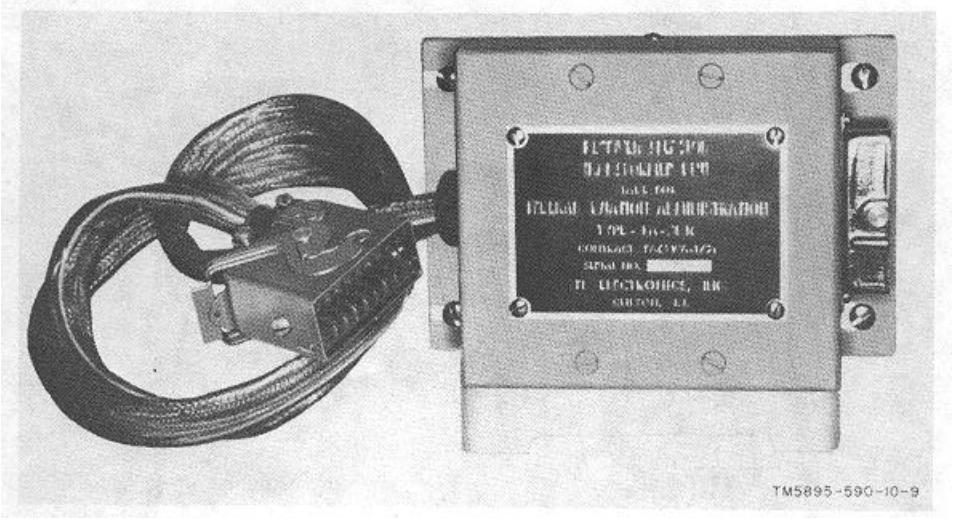


Figure 1-12. Transformer, Voltage, Step-Up TF-553/FSQ-75(V).

control tower The transmitters are physically attached to a rotating cupwheel and a wind vane. Output voltages from the transmitter are routed by a seven-conductor cable to a wind direction indicator (fig. 3-2) and a windspeed indicator mounted on a standard 19-inch panel in console 2. The windspeed indicator is calibrated to indicate windspeed in knots. The transmitter-indicator for the windspeed portion is entirely self-contained and requires no external source of electrical power. The altitude setting barometer indicator is mounted in the same panel with the wind indicator. A rheostat on the panel allows control of internal illumination of the indicators.

(11) *Controller, Channel Selector C-7685/FSQ-75(V)* (fig. 1-14). The transmitter keying unit is a panel-mounted assembly consisting of relays, resistors, and connectors. Four mounting slots are provided to fit a standard 19-inch rack. Transmitter keying units activate control lines to remotely key the transmitters in the equipment shelter. Each unit controls from one to four transmitters. Units are mounted in groups of three in consoles 2, 4, and 7 to provide control of 12 transmitting channels.

(12) *Amplifier Group, Audio Frequency OG-73/FSQ-75(V).* The four-channel amplifier group consists of two power supply modules, four amplifier modules, and a meter panel grouped in a chassis for rack mounting in a standard 19-inch rack. The power supply modules are connected to the amplifier modules through internal chassis wiring. The outputs of the amplifier modules can be monitored by an operator at the meter panel. Operating controls and indicators are front panel mounted. The amplifier provides amplification of up to four separate audio channels over the frequency range of 300 to 3,000 Hz. In the AN/FSQ-75(V)1 and the AN/FSQ-75(V)2, three amplifier modules are in use, and the fourth is a spare which is not interconnected into the system. When viewing the four-channel amplifier group from the front, the first module on the right is the spare module. In the AN/FSQ-75(V)3, only two amplifier modules are in use, and the other two are spare units. When viewing the fourchannel amplifier group from the front, the first two modules on the right are the spare modules; however, the second module from the right is connected into the system for use in the event a third controller position is added to the system in the future. Fixture, Test, Amplifier-Power Supply MX-8094/ FSQ-75(V) and Adapter, Test MX-8092/ FSQ-75(V) facilitate maintenance of the modules when removed from the chassis. Refer to TM 11-5820-768-12, for a detailed description of the OG-73/FSQ-75(V).

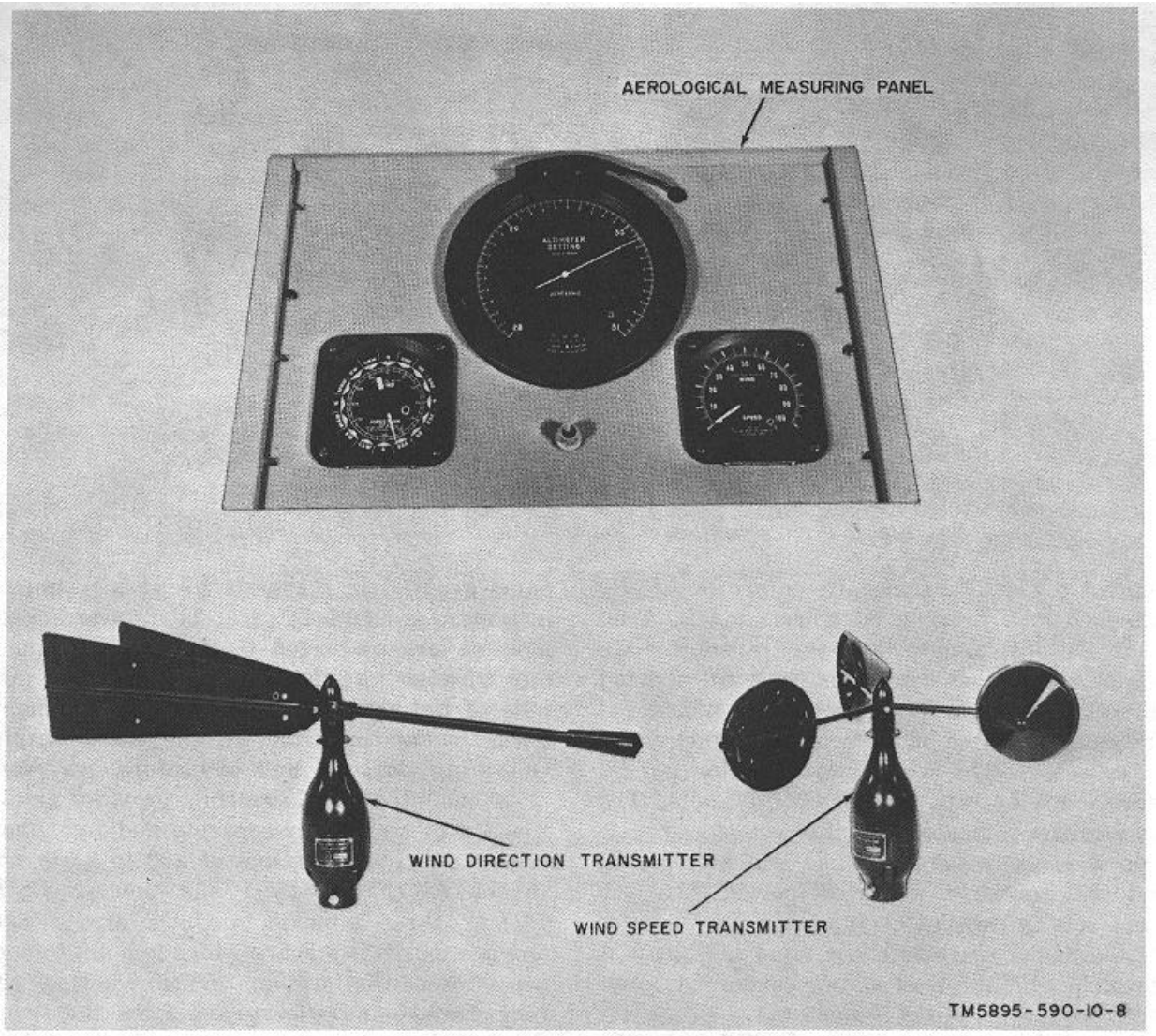


Figure 1-13. Aerological Measuring Set ML-629/FSQ-75(V)

(13) *Clock, Direct Reading MX-8090/ FSQ-75(V)* (fig. 3-3). The clock is a 24-hour, direct-reading, precision instrument which displays 0000 to 2,359 hours-minutes on four graduated drums, and 0 to 59 seconds on a fifth drum. The 10-hour, 10-minute, and 1-minute drums have black numerals on a white background. The seconds drum is divided into four different color quadrants. The drums are indirectly lighted. An 8-foot alternating current (ac) line cord is provided with the clock. A removable cover plate permits access to the gears, the lamp, and a current interrupter switch.

(14) *Panel, Power Distribution SB-3177/FSQ-75(V)* (fig. 38). The ac/dc distribution unit is a fuse panel used for protection of 14 individual power circuits. All fuses are mounted on the front panel. The panel is installed in a standard 19-inch rack. The unit distributes power to various components within the console group. If a fuse opens, a built-in indicator lamp lights. The panel includes terminal boards and a connector plug for wiring interconnection.

(15) *Controller, Frequency Selector C-7686/FSQ-75(V)* (fig. 3-9). The interlock unit consists of a front panel with attached

chassis on which relays, attenuators, transformers and connectors are mounted. A hinged front door in the panel allows access to interior components. The interlock unit mounts in a standard 19-inch rack. Each interlock unit controls a maximum of four channels. Three interlock units (mounted in console 3) serve together to prevent controller selection of a transmitting channel already in use and to mute associated receivers when transmitters are keyed.

(16) *Amplifier-Mixer Group OG-71/FSQ-75(V)* (fig. 3-11). The mixing amplifier consists of a rack-mounted chassis with six plug-in amplifier modules and one plug-in power supply module. Each amplifier will accept and mix four separate input signals over a frequency range of 300 to 3,000 Hz to produce a single output signal. The power supply and each amplifier is provided with an ON-OFF switch located on the front panel. The equipment is slotted for installation in a standard 19-inch rack. The power supply module is connected to the amplifier modules through internal chassis wiring. Each amplifier module is identical and interchangeable. Fixture, Test, Amplifier-Power Supply MX-8090/FSQ-75(V) (fig. 1-15) is provided for test and alignment of the mixing amplifier.

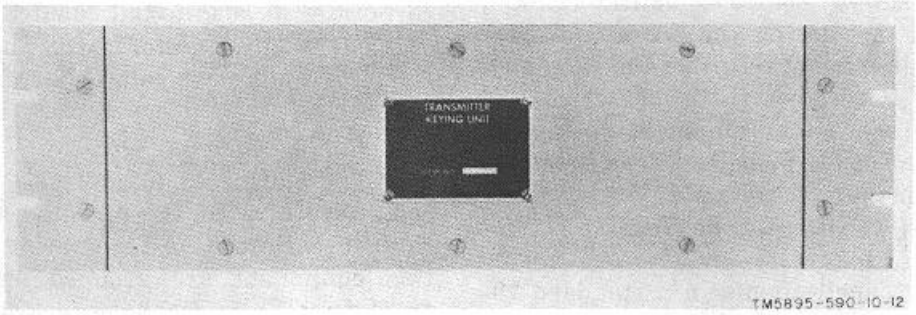


Figure 1-14. Controller, Channel Selector C-7685/FSQ-75(V).

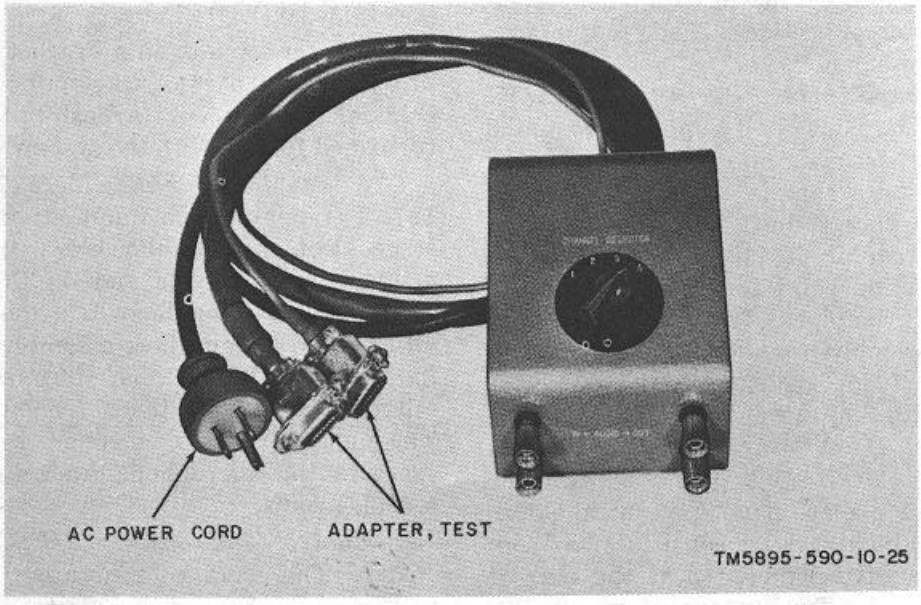


Figure 1-15. Fixture, Test, Amplifier-Power Supply MY-8099/FSQ-75(V).

(17) *Loudspeaker Assembly LS-565/FSQ-75(V)* (fig. 3-5). The single sideband (ssb) control panel (mounted in console 4) allows remote monitoring of Radio Set AN/ARC-102 installed in the equipment shelter. The panel mounts in a standard 19-inch rack. A speaker, two indicator lamps, and a potentiometer are associated with each of the two Radio Sets AN/ARC-102. All components are mounted on the panel with wiring interconnections at the rear of the panel. The speaker construction and housing is identical to that of Speaker Assembly LS-563/FSQ-75(V) described in (1) above.

(18) *Monitor-Indicator, Recorder, Receiver ID-1570/FSQ-75(V)* (fig. 3-4). The recorder/navaid status panel mounts in a 17-inch rack. It consists of controls, indicators, and jacks used in monitoring the operational status of the multichannel recorder and the audio output of the if receiver, both of which are remotely located in the equipment shelter. A jack at the rear of the panel serves as the panel interconnection point.

(19) *Panel, Microphone-Headset SB-3187/FSQ-75(V)* (fig. 3-7). The ssb microphone-headset panel mounts in a standard 19-inch rack. It contains two microphones and two headset jacks used for connection of a controller's headset and microphone for remote keying and monitoring either or both Radio Sets AN/ARC-102 located in the equipment shelter. Wiring interconnection is made to the jacks at the rear of the panel.

(20) *Power Supply PP-6046/FSQ-75(V)* (fig. 3-12). The 23/46-volt supply is mounted in console 4. It is made up of a panel-mounted transformer and a chassis assembly designed for mounting in a 19-inch rack. A terminal board at the rear of the chassis assembly provides a connection point for selection of up to eight available voltages. Jacks at the rear of the chassis assembly provide all other interconnections. The front panel contains a power switch, a power indicator lamp, and a fuse.

(21) *Panel, Transformer-Impedance Matching SB-3197/FSQ-75(V)* (fig. 3-10). The receiver transformer panel is installed in a standard 19-inch rack. It consists of a front panel and a subpanel mounted at the rear of the front panel. Twelve transformers are mounted on the subpanel. Twenty-four test jacks located on the front panel are used in groups of two to check the audio output of 12 receiving channels. Interconnection to the unit is made through two jacks at the rear of the front panel.

c. Microphone, Magnetic M-145/U (fig. 1-16). The microphone is a hand-held, magnetic type used for voice communication. The microphone includes a push-to-talk switch and a connector cord. One microphone is connected to the SB-3188/FSQ-75(V) at each of the three controller positions.

d. Microphone, Carbon M-144/U (fig. 116). The ssb microphone is a hand-held, carbon type used for voice communication with Radio Set AN/ARC-102. The microphone incorporates a push-to-talk switch and is provided with a connector cord. The microphone connects to the ssb microphone-headset panel in console 4.

e. Public Address Set AN/GIH-4 (fig. 1-17). The alarm/public address (pa) system is comprised of a chassis-mounted amplifier in a cabinet enclosure. All operating controls for this equipment are grouped on the chassis front panel; a microphone jack is provided on the bottom of the chassis. A stand is attached to the cabinet enclosure for mounting purposes. Two self-enclosed, weatherproof speakers are also provided which connect to a terminal board at the rear of the amplifier. The speaker mounts on a bracket, which is not provided as a part of the equipment. A handheld microphone with a push-to-talk switch is furnished for use with the system.

f. Attenuator, Fixed CN-1238/U (fig. 1-18). The microphone input attenuator is constructed of an aluminum box with components mounted on one side and on the cover. The cover mounts a toggle switch; the box includes an external banana jack assembly of two binding posts. A 3-foot cable, terminated with a microphone plug, extends from the assembly. The plug permits connection to microphone jacks at the microphone-headset panel on the console group.

g. Control-Monitor C-7823/FSQ-75(V) (fig. 1-19). The engine generator remote control panel is housed in a steel cabinet. All

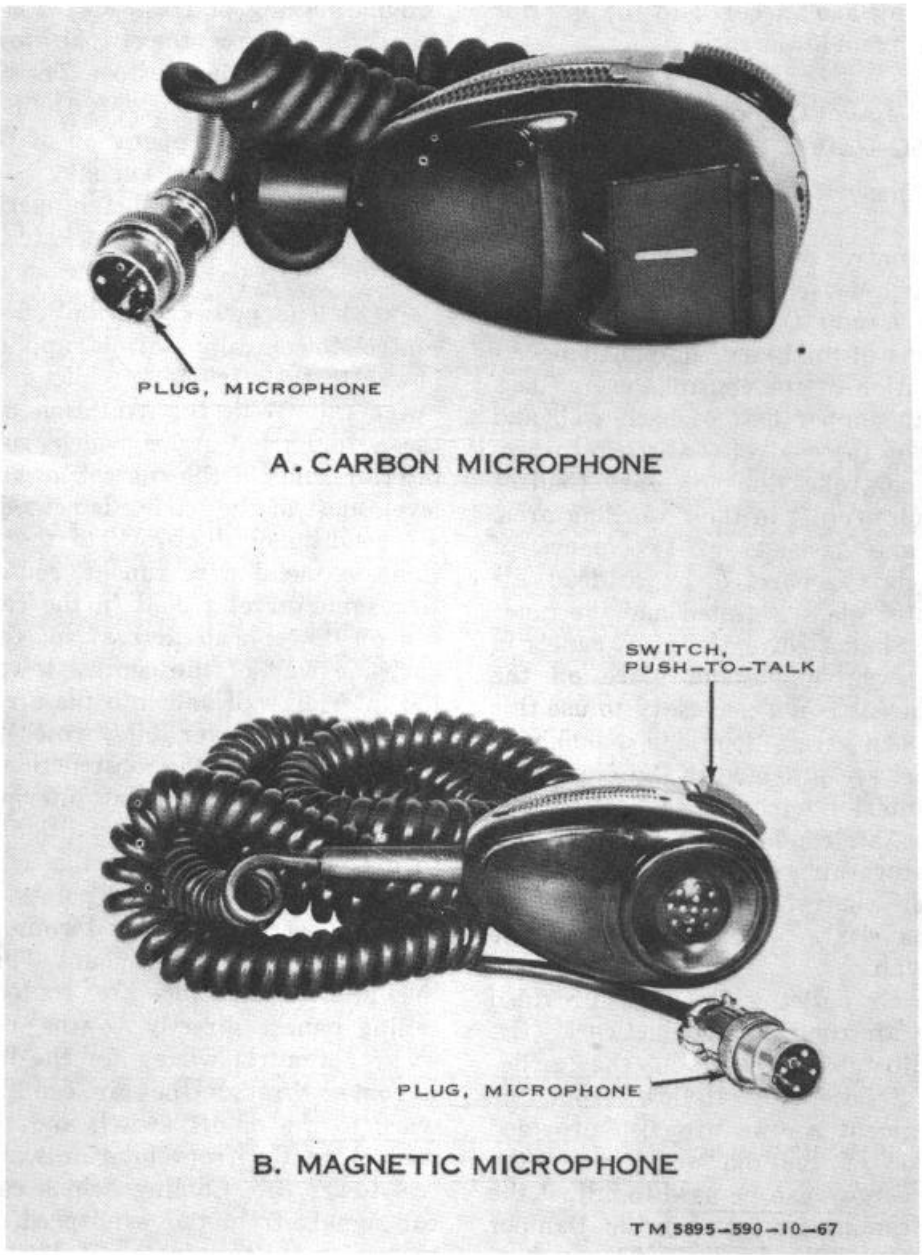


Figure 1-16. Microphone, Magnetic M-145/U and Microphone, Carbon M-144/U.

controls and indicators are grouped on the panel. All wiring is contained within the cabinet and terminates at a jack at the cabinet rear. The jack provides interconnection to a power control cabinet. Operating instructions are engraved on the front panel which is held in place by four fasteners. The bottom of the cabinet is equipped with four rubber shock pads.

h. Console Group Auxiliary Items. A Crouse-Hinds model W-1 light gun with model 50 reel and cable is provided and installed within the AN/FSQ-75(V)1 and AN/FSQ75(V)2 control towers as auxiliary equipment. The light gun only is provided with the AN/

FSQ-75(V)3. The light gun is suspended from a mounting hook secured to the interior ceiling of the control tower cab.

1-11. Control Tower Cab and Trailer of AN/FSQ-75(V)3

a. Control Tower Cab (figs. 1-20, 1-21, and 1-22).

(1) The control tower cab is an insulated structure used to house the five consoles which form Console Group OJ-67(V)2/FSQ-75(V) and other items of auxiliary equipment necessary for operation of the control tower. Glass panels from the upper half of each wall and half the roof of the control tower cab to provide aircraft controlles the necessary field of view to control aircraft in their working area. Each glass panel consists of two panes of shatterproof glass separated by a dead air space. The outer glass is tinted and the inner glass is clear. Shades cover the glass panels in the roof to prevent undue sun glare on the controllers when it is not necessary to use this field of view. An access door and a bulkhead connector panel are provided in the front wall (fig. 1-20). Interior wiring, electrical outlets, recessed lamps, air conditioning ductwork, air conditioner return air grilles, a thermostat, an air conditioner control panel, and a power distribution panel are permanent parts of the control tower cab.

(2) Cool air outlet grilles are provided on top of the air conditioning ductwork (fig. 2-19(2)). Adjustable louvers in the grilles control the direction of airflow from the grilles. Adjustment screws are also provided in the interior of the ductwork below the grilles. These screws can be used to adjust the volume of air coming from each grille. Damper controls on the rear interior wall of the control tower cab allow adjustment of the amount of fresh air to be mixed with available air as it is recirculated through the cooling system. If desired, the dampers may be closed so that only available air from the control tower cab is recirculated though the cooling system. Also, the dampers may be completely opened so that air returned from the control tower cab is exhausted and only fresh air is circulated through the cooling system and into the cab. Intermediate settings of the damper controls provide mixing of fresh air with returned air from the control tower cab for circulation through the cooling system. The air conditioner control panel (fig. 3-26) in the control tower cab controls operation of the air conditioner. Cooling operation may be selected; or, if cooling is not desired, fan operation may be selected to circulate fresh air through the control tower cab.

(3) The power distribution panel in the control tower cab controls application of ac power to the various circuits in the control tower cab. With the exception of wiring for the ac plugmold strips which run along the interior walls of the control tower cab at floor level, most of the wiring is routed through the air conditioner ductwork to the desired locations. A metal wire run is routed from the flare gun turret mount in the ceiling of the control tower cab across the ceiling to the curbside wall of the control tower cab, down the interior wall and into the air conditioning ductwork. Ac power lines, which furnish operating power for the obstruction lights, and recessed control tower cab interior lights are routed through the air conditioning ductwork to the wire run, through the wire run, and terminated at the desired points. The ac line for the obstruction lights terminates at J301 in the flare gun turret mount. The ac lines for the interior lighting are routed above the ceiling panels directly to the recessed light sockets. Control wiring for the interior lights is routed through the air conditioning ductwork to the on-off switch and the DIMMER control on the front interior wall of the control tower cab. Cabling, which carries electrical signals from the windspeed and direction transmitters (terminated at J302 in the flare gun turret mount), is routed through the wire run described above, and through the air conditioning ductwork to the area behind console 2. The wiring exits the ductwork at this point and is wired into the proper equipment in console 2. Wiring to the on-off switch for the obstruction lights (located on top of the air conditioning ductwork on the curbside wall of the control tower cab) is also routed through the air conditioning ductwork to the

switch. The 8-volt ac output from the signal light gun transformer is routed into the air conditioning ductwork and then to each of two connectors, one mounted on top the ductwork on the rear interior wall of the cab and the other mounted on top of the ductwork on the front interior wall of the cab (fig. 2-19(2)).

(4) Power is connected to the power distribution panel in the control tower cab through a power input feedthrough receptacle located on the curbside wall of the tower (fig. 121).

(5) An air conditioner, a permanent part of the control towers cab, is mounted in a compartment at the rear of the control tower cab (fig. 1-22). Refer to TM 5-4120-259-15 for detailed cover-age of the air conditioner. The compartment also contains storage compartments (fig. 1-22) for storage of the 100-foot power cable, the lifting sling, and the flare gun turret, which are furnished with the control tower cab, and limited spare parts.

(6) A flare gun turret (fig. 1-34) is provided with the control tower cab. The flare gun turret mounts on the roof of the control tower cab (fig. 1-20) and contains four openings for insertion of flare guns; however, two of the openings are covered with cover plates and only two of the openings are provided with fittings to permit insertion of flare guns. The flare gun turret also serves as a mount for the wind equipment support (fig. 1-34).

(7) The control tower cab is also supplied with four antenna support mounts (fig. 1-20 and 1-21), each of which can mount one antenna support capable of mounting one uhf and one vhf antenna.

(8) The control tower cab may be transported by truck or air; or, for limited distances, on the trailer furnished with the AN/FSQ-75(V)3. Lifting eyes, tiedown clamps, reflectors and marker lights are a physical part of the framework. Plywood covers are furnished for all glass panels for use when the control tower cab is transported. Figures 1-20 and 1-21 show the tower cab mounted on the trailer.

(9) The five consoles which make up the console group (fig. 1-3) are bolted to the floor of the control tower cab.

(10) The alarm/pa system is mounted on the front roadside wall of the control tower cab (fig. 1-4) and the signal junction box is mounted on the wall below the alarm pa system. The engine generator remote control panel is bolted to the end of console 5.

(11) Figure 2-19(1) depicts the location of a spare parts box, a fire extinguisher, a thermostat, an air conditioning control panel, and a power distribution panel located on the curbside wall of the control tower cab. Figure 1-4 depicts cable routing from the console demarcation strip and the engine generator remote control panel to the tower bulkhead connector panel. The tower bulkhead connector panel provides interface for interconnecting cables between the control tower cab and the equipment shelter and the power control cabinet (fig. 2-2).

b. Trailer. The low-profile trailer (fig. 1-23), designed to mount the control tower cab, is equipped with stoplights, tiedown bolt clamps stoplights, tiedown bolt clamps, hydraulic-operated air brakes, a handbrake, a safety brake locking device, and electrical cabling which connects to the towing equipment and to the control tower cab. This, in turn, provides power for operating the stoplights on the trailer and the marker lights on the control tower cab. Small diameter (20 x 8.00) tires give the low-profile capability so that the overall height with the control tower cab mounted on the trailer will not exceed 108 inches (the maximum height which may be transported by air). The primary function of the trailer is to provide an easy method of onloading and offloading the control tower cab on trucks and cargo aircraft.

c. Auxiliary Equipment Mounted on Exterior of Control Tower Cab.

(1) *Antenna Supports*. Four antenna supports are provided with each control tower cab. Figure 1-21 depicts a typical antenna support. The antenna spreaders are fabricated from 1 1/4-inch standard galvanized pipe and two 1 1/4-inch pipe couplings. The base is 16 inches high and the antenna spreader is 50 inches in width (centered through the pipe couplings). A 2 1/2-foot length of 1 1/4-inch pipe, threaded on both ends, screws into one of the pipe couplings on the antenna spreader to become the vhf antenna mast. A 5-foot

length of 1 1/4-inch pipe, threaded on one end, screws into the other pipe coupling to become the uhf antenna mast.

(2) *Wind equipment support*. This assembly (fig. 1-34) is constructed of 1 1/4-inch pipe with the condulets, unions, and couplings as illustrated. The base of the assembly is 12 inches long and is threaded to screw into the mount provided on the top of the flare gun turret. The center mast is 42 inches high and mounts the obstruction lights. The antenna spreader is 40 inches wide. Thirty inch masts screw into condulets on each end of the antenna spreader and become masts for the and direction transmitters. The support is furnished with the obstruction lights mounted and the windspeed and direction transmitter adapters secured to their respective masts. Cabling is routed from the windspeed and direction transmitter adapters through the support masts, out the base, and terminated at P302. The ac cable from the obstruction lights is also routed through the support mast, out the base, and terminated at P301.

1-12. Radio Group OZ-2(V)(*)/FSQ-75(V)

(fig. 1-5 and 1-6)

The majority of components used with the radio group are mounted in eight racks in the equipment shelter. The reproducer and various items of test equipment included as a part of the radio group are housed and used at convenient locations within the equipment shelter.

a. Shelter, Electrical Equipment S-417/FSQ-75(V) (fig. 1-24 and 1-25).

(1) The equipment shelter is an insulated structure that houses components of the radio group. An entrance door with an air vent and a filter is provided in the rear wall; the front wall contains four vents for installation of accessory air conditioning units not supplied with the equipment shelter. Interior wiring, electrical outlets, fluorescent lamps, an exhaust fan, and a workbench are permanent parts of the equipment shelter. The unit is also outfitted with housekeeping and firefighting equipment.

(2) Power is connected to the equipment shelter circuit breakers through the main power access panel and the main circuit breaker (fig. 3-27) mounted on the curbside wall of the equipment shelter.

(3) The equipment shelter can be transported by truck or air. Lifting eyes, tiedown clamps, and forklift access slots necessary for transporting the equipment shelter are a physical part of the framework.

(4) Connections to two AN/ARC-102 ssb antennas are made at feedthrough receptacles in the roadside and curbside walls of the equipment shelter. Connections to the remaining antennas and to the interconnecting cabling from the control tower are made at a bulkhead connector panel in the roadside wall (fig. 1-25).

b. Rack, Electrical Equipment MT-686/GR (fig. 1-5 and 1-6). The equipment rack is used within the equipment shelter to house components of the radio group. The MT686/GR includes mounting holes along the two front supports to accommodate standard 19-inch panels of assorted heights. The equipment rack is completely open on all four sides. Mounting holes are provided in the base to secure the equipment rack to the floor.

c. Panel, Test Point SB-3181/FSQ-75(V) (fig. 3-19 and 1, fig. 1-5). The rf body consists of a panel which mounts a radio-frequency (RF) line section. A coaxial connector extending through the panel allows connection of test equipment for monitoring transmitter functions. A socket extending through the front panel allows insertion of a test equipment element used for measuring transmitter power output. Two coaxial connectors on the rf body allow connection of the unit in an antenna transmission line.

d. Radio Set AN/ARC-102 (2, fig. 1-5, and 11, 12, 21, and 24, fig. 5-1). Radio Set AN/ARC-102 consists of the ssb transceiver, the ssb control unit, and a power-inverter mounting. Antenna Coupler CU-1658/A and an antenna entrance insulator are used with each AN/ARC-102. The coaxial cable connection from the receiver-transmitter to the ssb antenna is made through the antenna entrance insulator and the ssb antenna coupler. Two

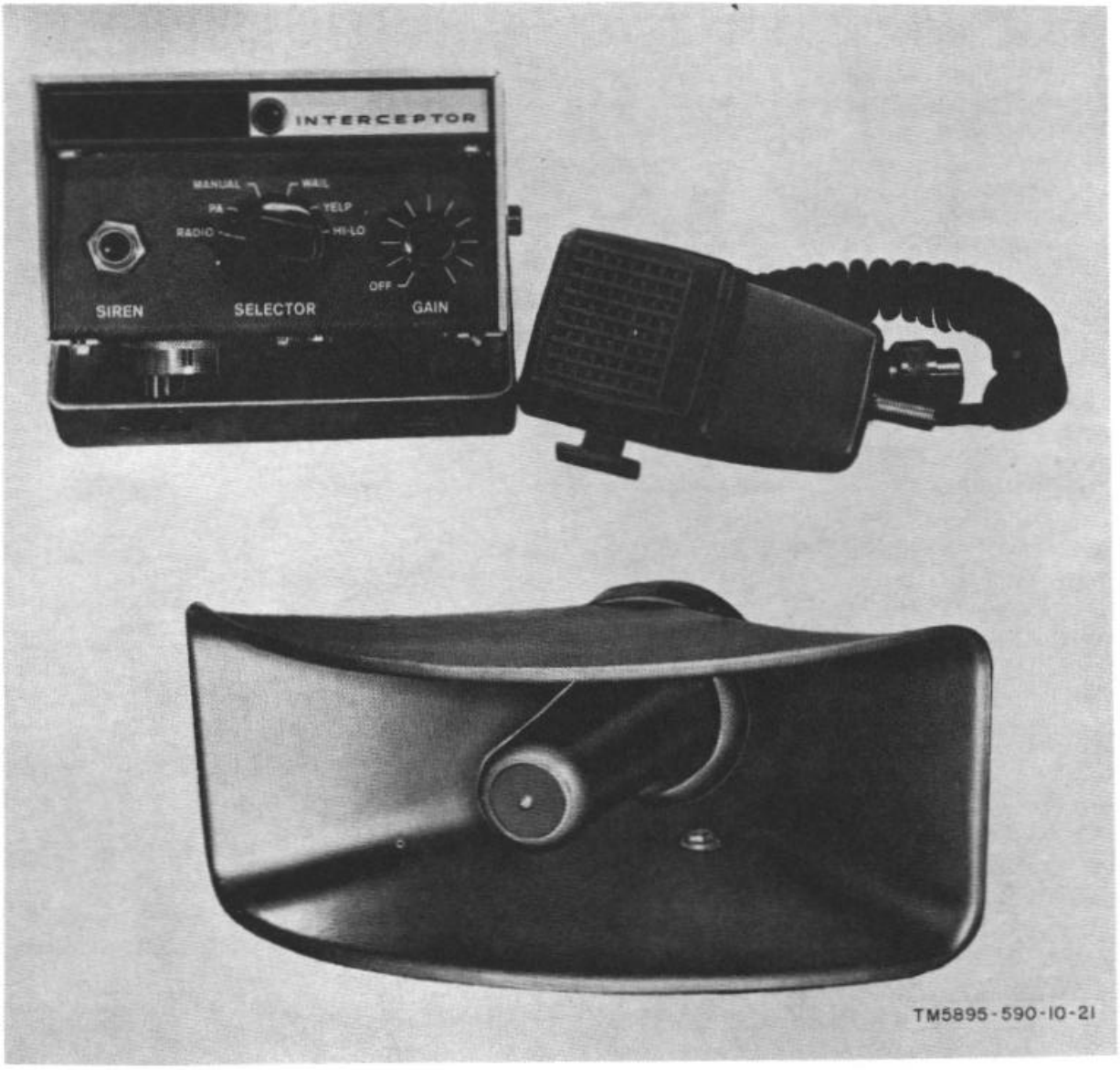


Figure 1-17. Public Address Set AN/GIH-4.

carrying handles and a monitor meter and meter switch are mounted on the ssb transceiver front panel. A front panel dust cover conceals a blower fan and air filter also mounted on the front panel. Electrical connections are through a connector at the rear panel. The control unit is an edge-lighted, console-type unit adapted for installation in the 19-inch rack containing the ssb transceiver. The front panel of the ssb control unit contains all controls necessary for operation. An electrical connector is mounted on the rear panel. The power-inverter mounting consists of four shock mounts with grounding straps, a flanged bed, an inverter, and two holddown clamps. The power-inverter mounting supports the receiver-transmitter in addition to the inverter. The inverter which supplies 115 volts ac at 400 Hz, is mounted at the rear of the mounting. The ssb antenna coupler is shelf-mounted on the side walls of the equipment shelter. The antenna entrance insulator

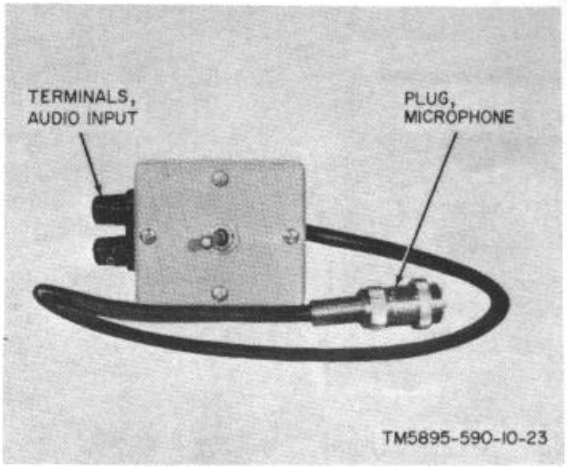


Figure 1-18. Attenuator, Fixed CN-1238/U.

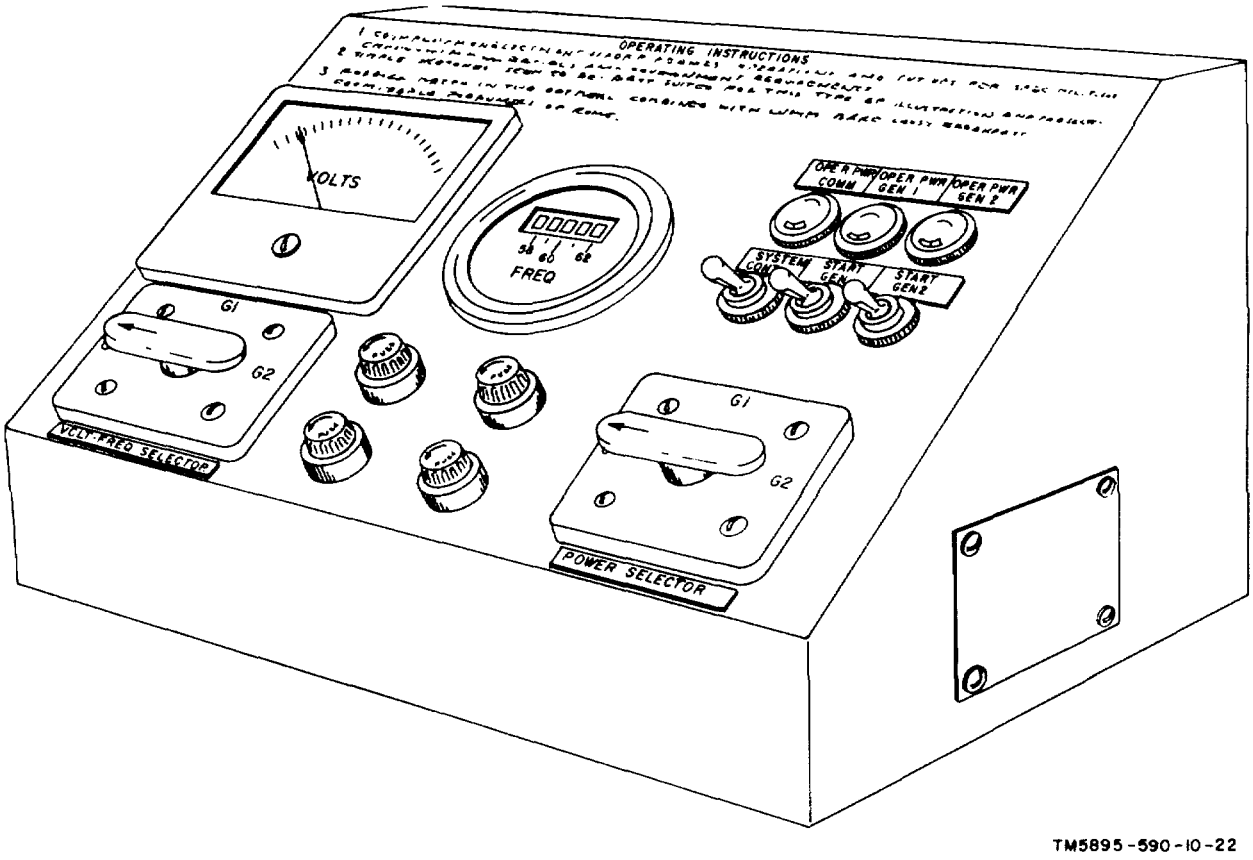


Figure 1-19. Engine generator remote control panel

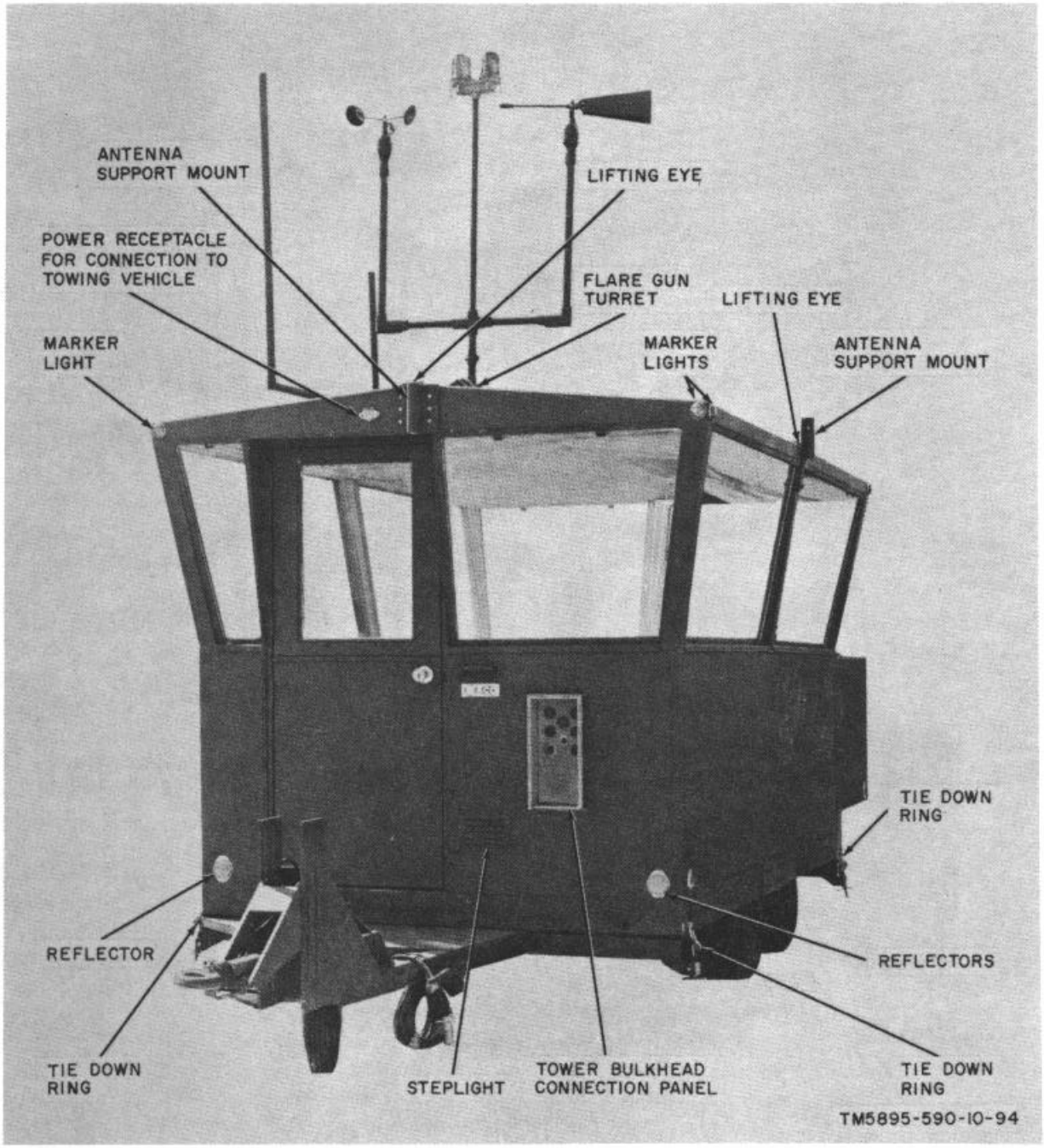


Figure 1-20. Front oblique view of control tower cab mounted on trailer, AN/FSQ-75(V)3 only.

is located in the equipment shelter side walls. The two ssb transceivers and ssb control units are housed in equipment rack 1 (fig. 5-1) in the equipment shelter for ground-to-air communication. Refer to TM 11-5821-248-12 for a detailed description of the ssb transceiver.

e. Power Supply PP6045/FSQ-75(V) (fig. 3-17 and 3, fig. 1-5). The 27.5-volt power

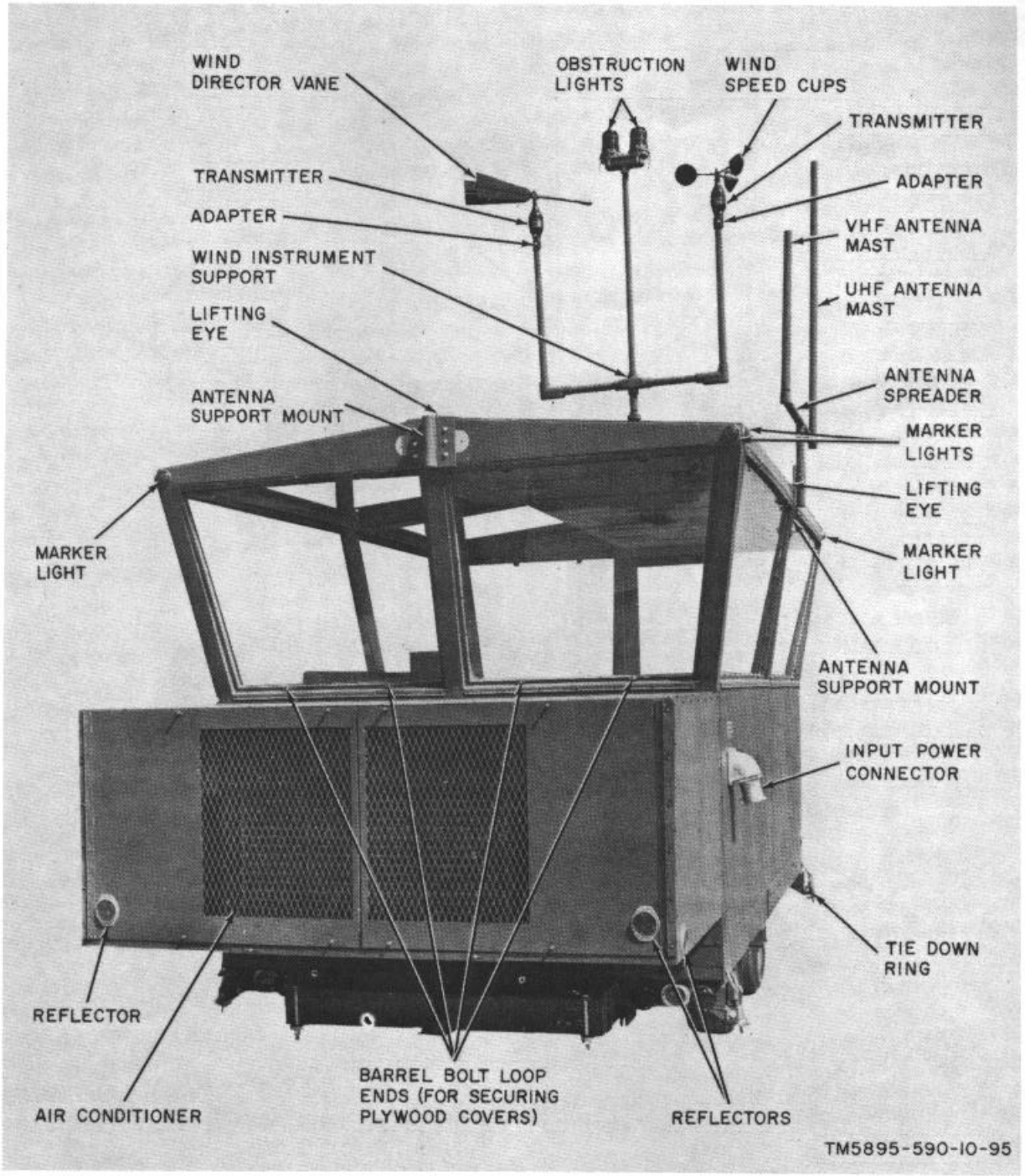


Figure 1-21. Rear oblique view of control tower cab mounted on trailer, AN/FSQ-75(V)3 only.

supply consists of a front panel which contains all operational controls and indicators and a chassis mounting the component parts of the power supply. The unit is enclosed in a cabinet. A blower fan provides air circulation for heat dissipation. All wiring connections

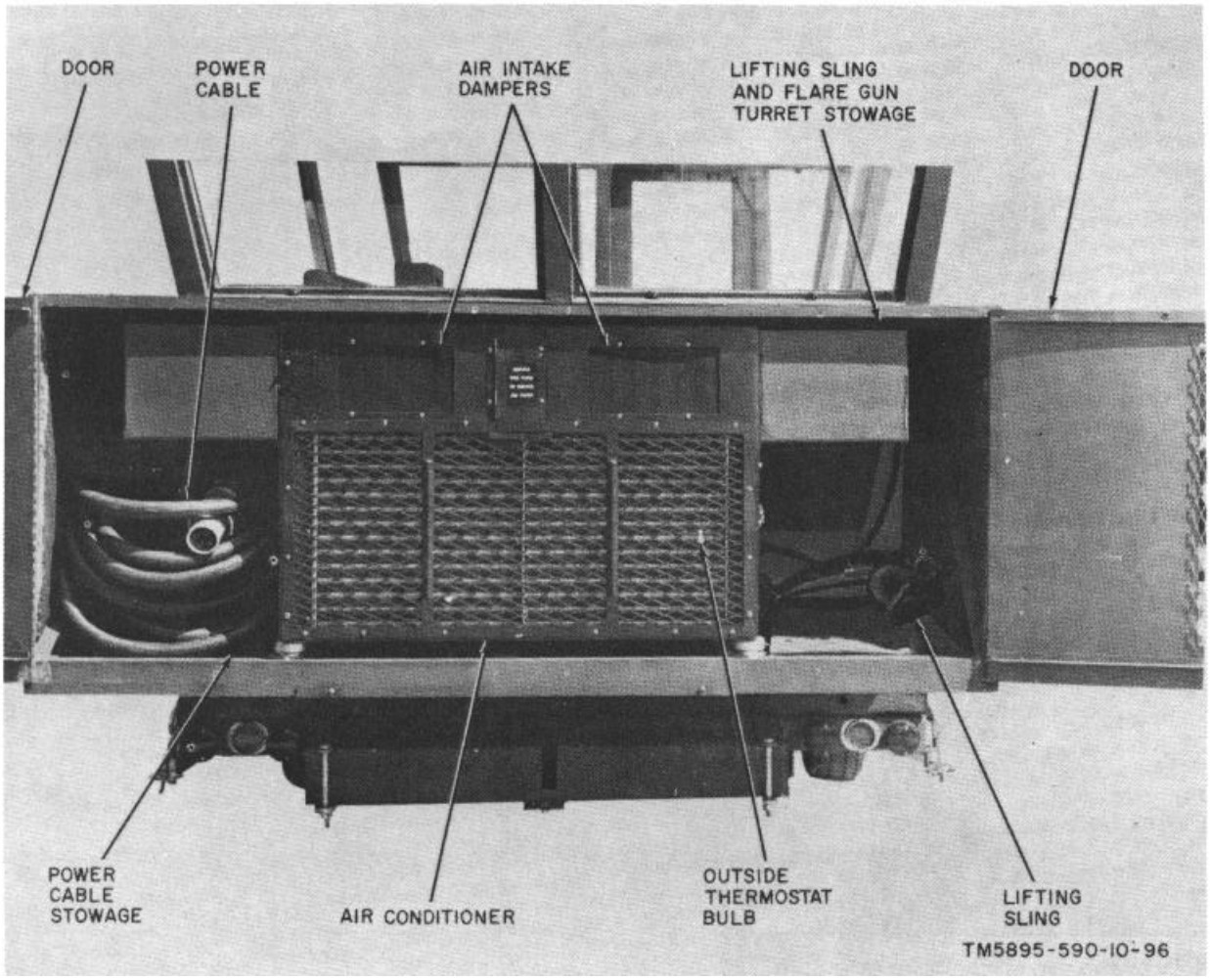


Figure 1-22. Rear view of control tower cab mounted on trailer (air conditioner and storage access doors open).

are made to terminal boards at the rear of the unit.

f. Panel, Test Point SB-3182/FSQ-75(V) (fig. 3-21 and 4, fig. 1-5). The FM RF body is functionally identical to the SB-181/FSQ75(V) (c above), except that four RF line sections are mounted on the SB-3182/FSQ75(V).

g. Receiver-Transmitter, Radio RT-524/ VRC (5, fig. 1-5). The frequency-modulated (FM) transceiver provides for the transmission and reception of frequency-modulated signals in the frequency range of 30 to 75.95 MHz. All operating controls are on the front panel. A blower inside the case aids in dissipating heat. The set has a self-obtained loudspeaker on the front panel. An antenna jack at the top right of the front panel provides for connection to Antenna AS1729/VRC which is used for both reception and transmission. Four transceivers are shock-mounted in equipment rack 2 in the equipment shelter. Refer to TM 11-5820-401-10 for a detailed description of the fm transceiver.

h. Panel, Power Distribution. SB-3179/ FSQ-75(V) (fig. 3-20 and 6, fig. 1-5). The 27.5-volt power combining unit permits the combination of four 27.5-volt power supplies

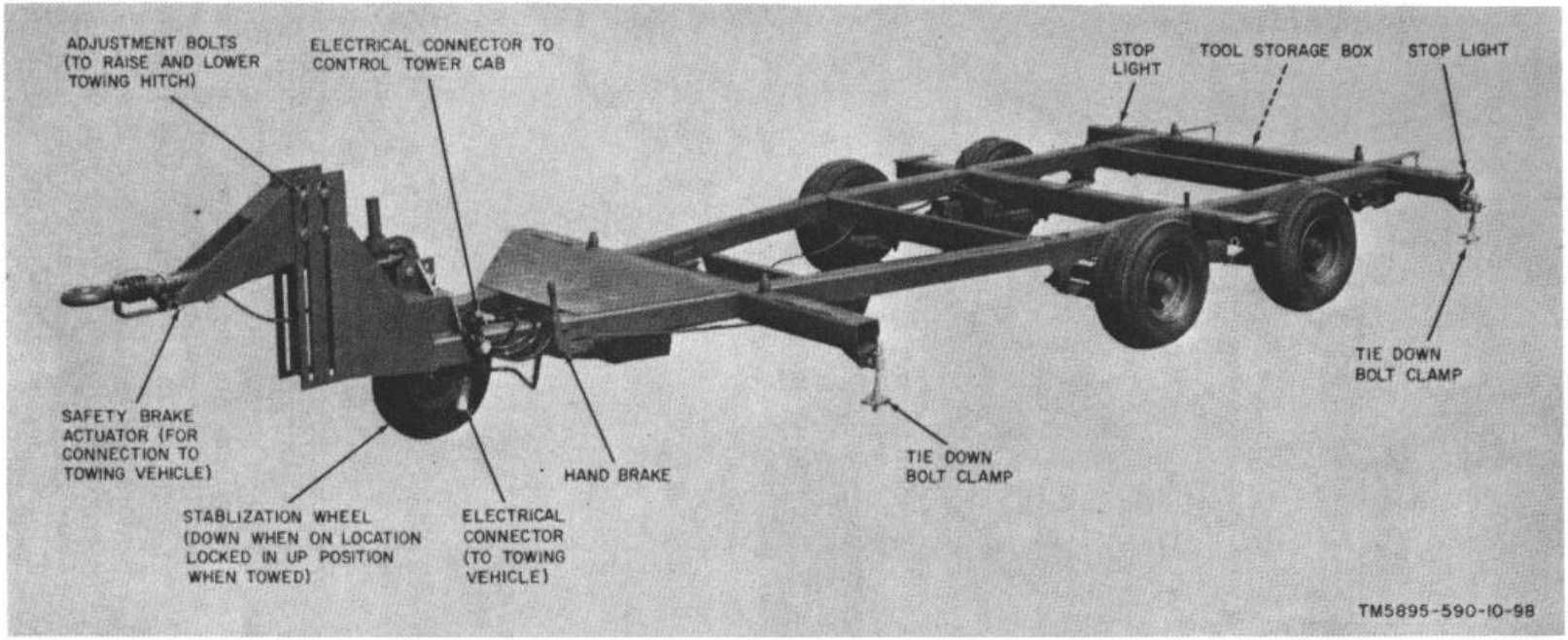


Figure 1-23. Trailer, overall view, AN/FSQ-75(V)3 only.

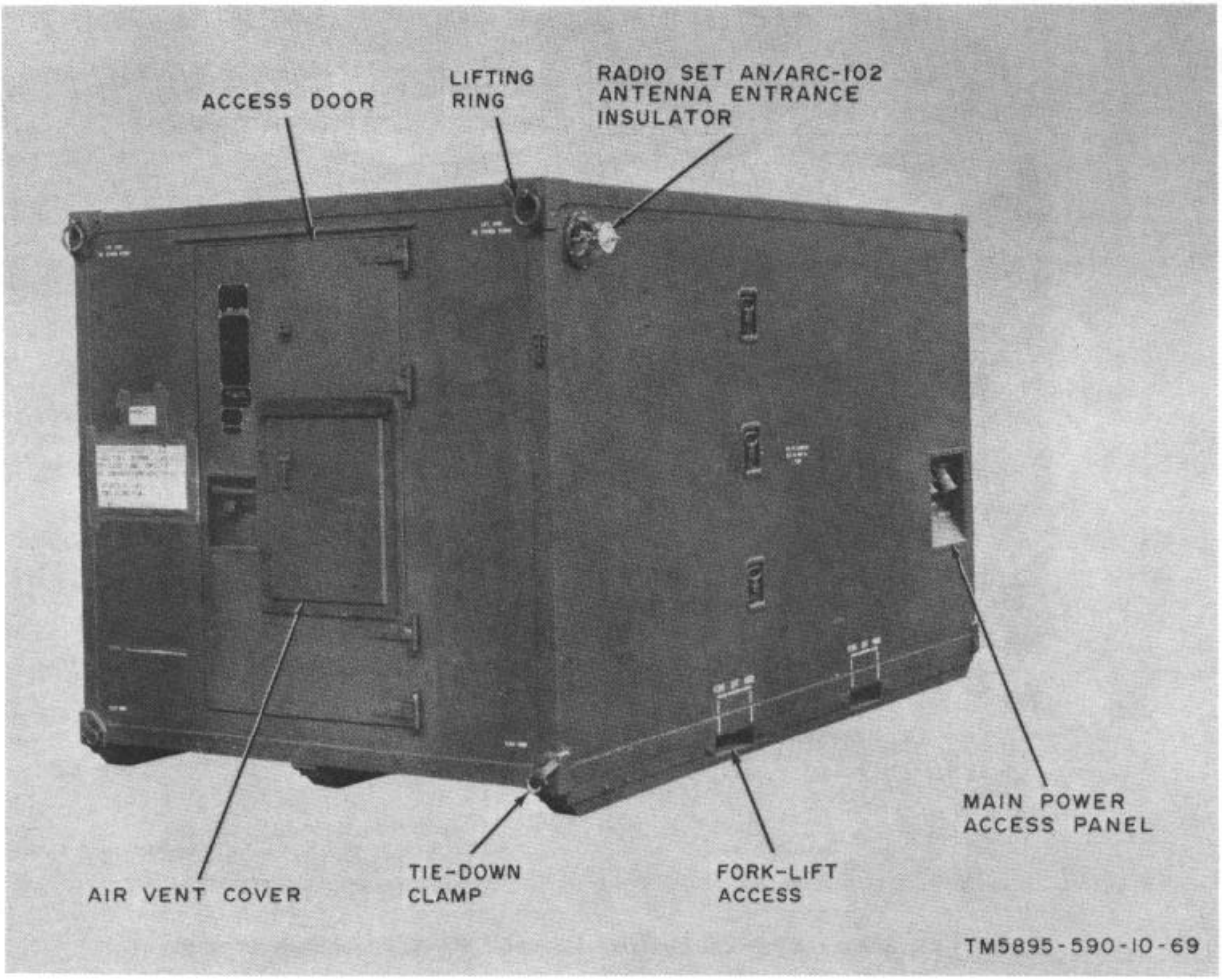


Figure 1-24. Shelter, Electrical Equipment S-417/FSQ-75(V), oblique front view.

to provide isolated outputs. A front panel mounts indicator lamps and fuses. Other electrical components are mounted on a chassis extending to the rear of the front panel. A hinged door in the front panel provides access to internal fuses. The unit is installed in a standard 19-inch rack (rack No. 2 of the equipment shelter).

i. Transmitters, Radio T-1082/FSQ-75(V) and T-1083/FSQ-75(V) (7 and 9, fig. 1-5). The uhf and vhf transmitters are identical in outward appearance. Each is mounted in a standard 19-inch rack. The upper front panel contains two meters and a selector control. Below is a hinged door which serves as an indicator, fuse, and switch-mounting panel. Alignment and adjustment controls are located behind the hinged door. The T-1082/ FSQ-75(V) covers the vhf range of 118 to 136 MHz, and the T-1083/FSQ-75(V) covers the uhf range of 22'5 to 400 MHz. These transmitters can be converted in the field to either vhf or uhf operation. Refer to TM 11-5820736-12, for additional information on the T1082/FSQ-75(V) and the T-1083/FSQ75 (V).

j. Receiver, Radio R-1545/FSQ-75(V) (8, fig. 1-5). The vhf receiver is a rack-mounted unit comprised of a front panel and a vertical chassis enclosed in a cabinet. The receiver

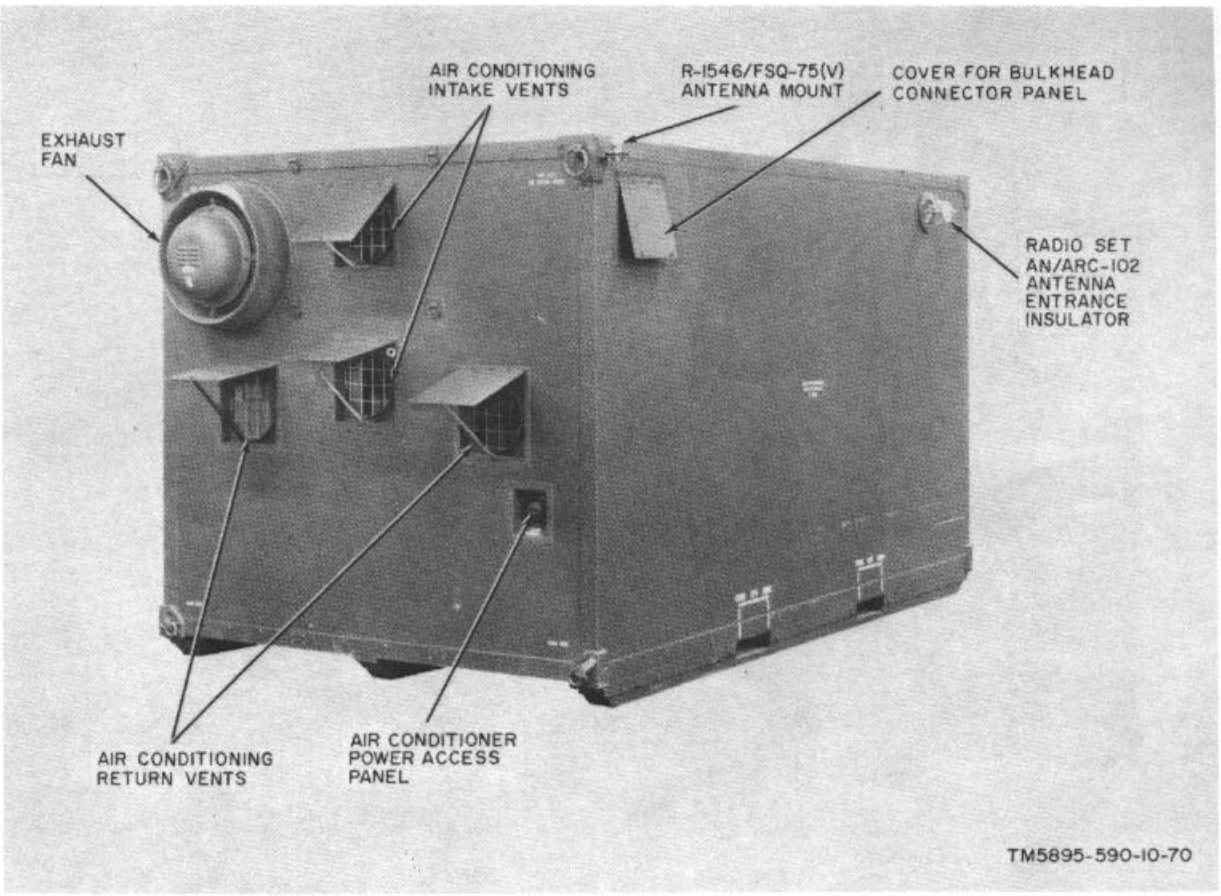


Figure 1-25. Shelter, Electrical Equipment S-417/FSQ-75(V), oblique rear view.

operates in the vhf range of 108 to 152 MHz using a single crystal. Refer to TM 11-5820732-12 for a detailed description of the R1545,/FSQ-75(V).

k. Receiver Test Panel FA-3700/3 (fig. 1-26 and 3-18). The receiver test panel consists of a front panel which contains one row of 12 phone jacks and a second row of 24 test jacks. A combination of 1 phone jack and 2 test jacks provides monitoring facilities for each of 12 audio receiving channels. All wiring is at the rear of the receiver test panel. Four mounting slots are located on the front panel. The receiver test panel is physically located at a cutout in the shelter demarcation panel (fig. 1-26).

l. Receiver, Radio R-1547/FSQ-75(V) (6, fig. 1-6). The uhf receiver consists of a chassis and a vertical front panel enclosed in a cabinet and mounted in a standard 19-inch rack. The unit is a single-channel, uhf receiver capable of amplitude-modulated (am.) voice signal reception in the frequency range of 225 to 399.9 MHz. Refer to TM 11-5820-735-12, for a detailed description of the uhf receiver.

m. Receiver, Radio R-1546/FSQ-75(V) (3, fig. 1-6). The If receiver provides for the reception of aural radio range, radiotelephone, and continuous wave (cw) signals in the frequency range of 200 to 400 kHz and 1.3 to 30 MHz. The If receiver is rack-mounted in the equipment shelter. Receiver-status indications and facilities for monitoring the If receiver audio output are provided on the recorder/navaid status panel (fig. 34) located at controller position 2. Refer to TM 11-5825-249-12 for a detailed description of the If receiver.

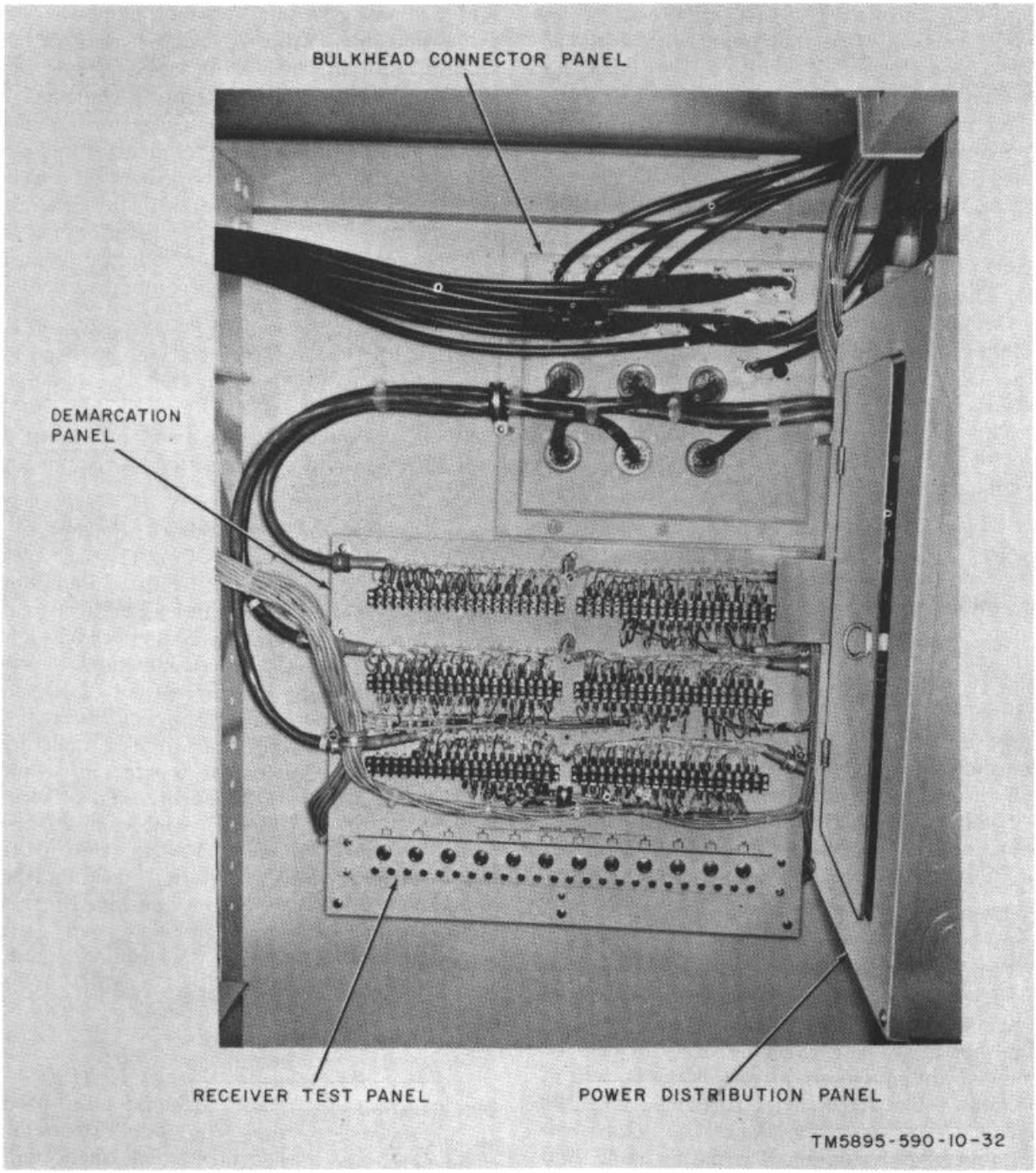


Figure 1-26. Shelter demarcation panel, bulkhead connector panel, and receiver test panel.

n. Panel, Fuse SB-3180/FSQ-75(V) (4, fig. 1-6). The 48-volt dc fuse panel contains five fuseholders mounted in the standard 19-inch rack. Four of the fuses are used for protection of four individual circuits, and the fifth fuseholder contains a spare fuse. All wiring interconnection is made at a terminal board at the rear of the panel.

o. Power Supply PP-6044/FSQ-75(V) (fig. 3-15 and 5, fig. 1-6). The 48-volt power supply consists of a front panel with a hinged door and a chassis. The unit is designed for installation in a standard 19-inch rack. A fuseholder and a power switch are located on the hinged door. Two 48-volt power supplies are housed in equipment rack 7 in the equipment shelter.

p. Panel, Protection-Power Distribution SB-3178/FSQ-75(V) (fig. 3-16 and 7, fig. 1-16). The 48-volt power combining unit mounts in 19-inch equipment rack 7. The front panel includes indicator lamps, fuses, and a switch. Other electrical components are mounted on a chassis extending to the rear of the front panel. This equipment serves to combine the outputs of several 48-volt dc power supplies to provide three isolated outputs.

q. Recorder Group, OA-8432/FSQ-75(V) (8, fig. 1-6). The recorder consists of ten major units: four record amplifiers, one monitor amplifier, one monitor panel, two power supply/bias oscillators (11, fig. 1-6), and two tape transports. The recorder has four basic voice-recording channels, and a fifth channel available for recording voice time announcements and time ticks. The components of the recorder are mounted in equipment racks 7 and 8 in the equipment shelter. Refer to TM 11-5835-236-12 for additional coverage of the recorder.

r. Reproducer Group, Sound OA-8427/FSQ-75(V) (fig. 1-27). The reproducer is a portable unit which consists of a tape transport and an amplifier panel with a five-channel amplifier. Reproducer equipment is housed in a carrying case and is normally maintained on a mobile table. The carrying case lid may be removed and stowed in a rack at the bottom of a mobile table. Accessories furnished with the reproducer include a foot control switch assembly, a pair of headphones, a power cable, and an audio head demagnetizer. Refer to TM 11-5835-237-12 for a detailed description of the reproducer.

s. Monitor-Converter, Audio Frequency-Radio Frequency ID-1572/FSQ-75(V) (figs. 1-28 and 3-22). The modulation monitor is housed in an aluminum cabinet with a cover and a carrying handle. A 6-foot, ac power cord is permanently attached at the rear of the chassis. Storage space for accessories is provided inside the cover. Operating controls are mounted on the front panel. The unit is used to sample the vhf and uhf frequencies and amplitude variations of signals present on a coaxial transmission line or vertical antenna, and convert them for visual presentation on an oscilloscope. The modulation monitor is portable and is used within the equipment shelter.

t. Test Set, Radio TS-2682/FSQ-75(V) (fig. 1-29). The receiver test set is used to test vhf receivers. The unit consists of components mounted in an aluminum cabinet. All controls are mounted on a front panel. An 8foot cable provides connection to equipment under test.

u. Test Set, Radio Frequency Power AN/USM-298 (fig. 1-30 and 3-23). The RF wattmeter is a portable unit carried in an aluminum carrying case which also carries the direct current (dc) cable, the power-vswr chart, and measuring elements. A microammeter is shock-mounted within the housing. A slotted adjustment screw allows zero setting of the meter. Below the meter is a rectangular aperture through which projects the top face of a line section casting with a measuring element socket in the center. A special cable connects the microammeter to the dc jack at the side of the line section, and to the external jack on the upper right-hand side of the housing. By this arrangement, the microammeter can be attached to an auxiliary RF line section mounted permanently on the SB-3181/FSQ-75(V) and SB-3182/FSQ-75(V) panels (*c* and *f* above) in the equipment racks.

v. Attenuator, Fixed CN-1239/U (fig. 1-31). The 6-decibel (db) attenuator is used during receiver testing. The 6-db attenuator components are housed in a small metal enclosure complete with a coaxial input connector on one side and a coaxial output connector on an adjacent side. The 6-db attenuator is designed for insertion between the output of a signal generator and the antenna input jack of a receiver under test.

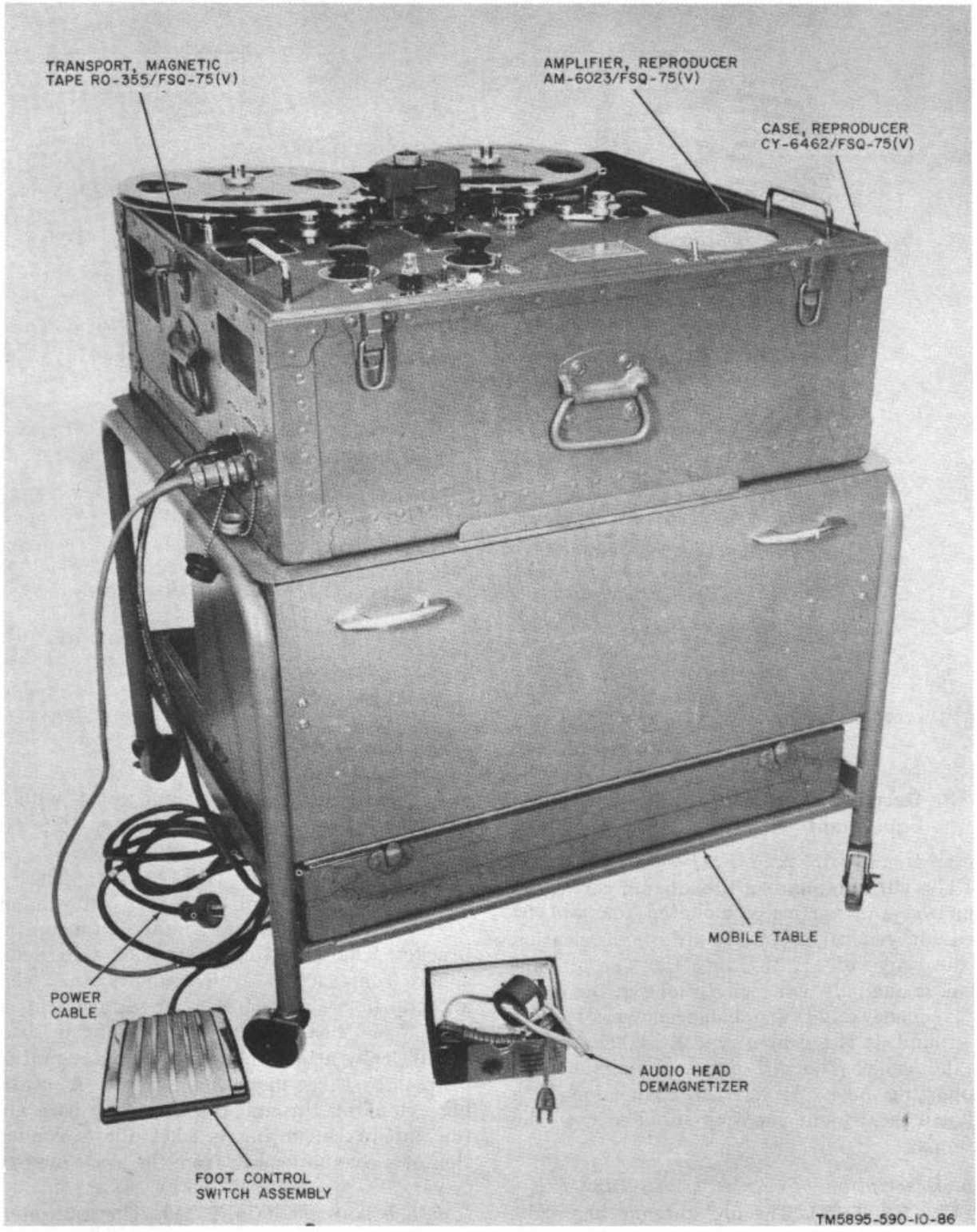


Figure 1-27. Reproducer Group, Sound OA-8427/FSQ-75(V).

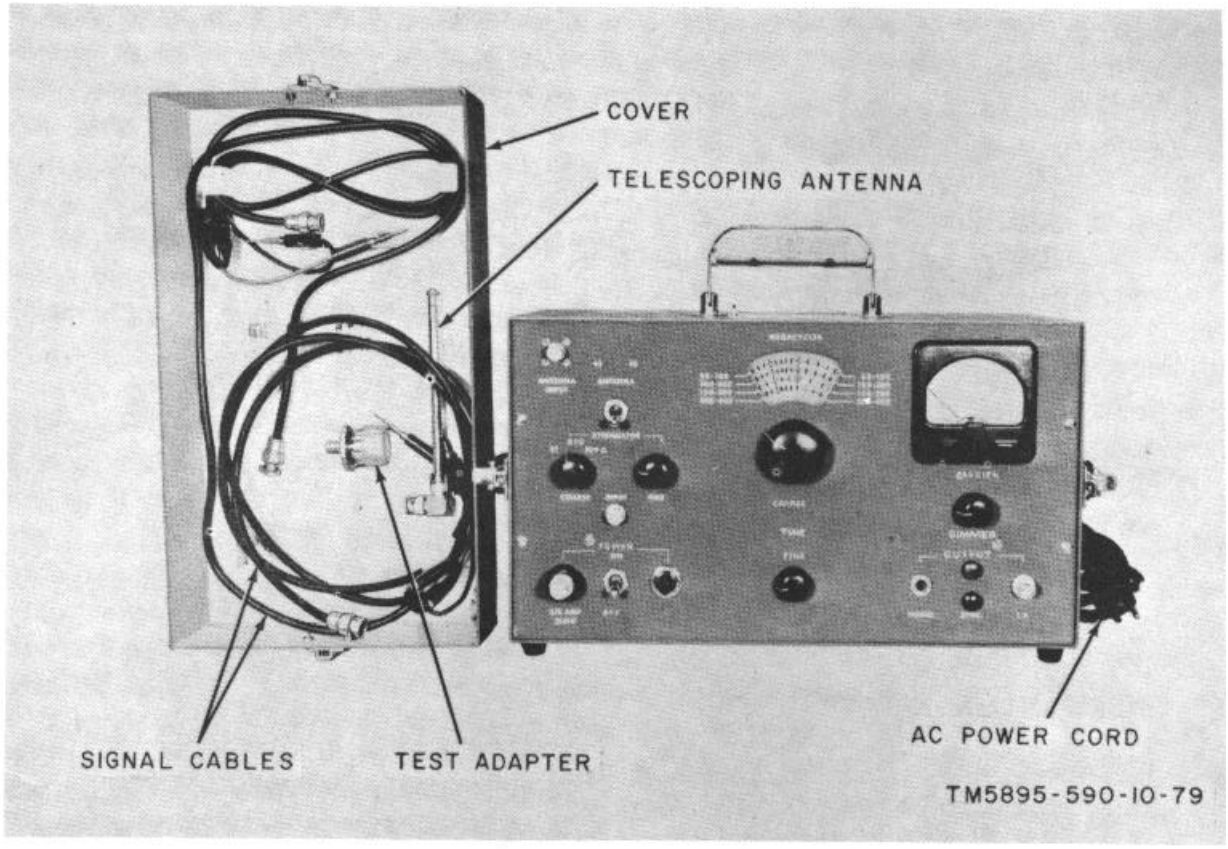


Figure 1-28. Monitor-Converter, Audio Frequency-Radio Frequency ID-1572/FSQ-75(V).

1-13. Description of Exterior and Portable Equipment

a. Antenna AS-2223/FSQ-75(V) (fig. 28). The vhf antenna is a broadband, vertically-polarized and vertically mounted coaxial-type used for general ground-to-air communication in the range of 117 to 140 MHz. The uhf antenna is one half wave length long at the median frequency, and is unbalanced with respect to ground. It is fed by a type RG-8/U, 52-ohm coaxial cable. The vhf antenna mounts on a supporting pole adapted for connection to a 1 1/4 inch straight coupling supplied with the antenna.

b. Description of Antenna AS-2222/FSQ-75(V) (fig. 1-32). The uhf antenna has eight element rods extending from a central hub and is used for general ground-to-air communication. The antenna is of the discone type and mounts on top of a pipe mast with a maximum diameter of 1 3/4 inches. It is fed by type R8/U, 52-hm coaxial cable.

c. Antenna M-3B (fig. 1-33). The If antenna is made up of a 102-inch whip antenna, a mounting base, and an antenna mounting bracket. The mounting base is of split hemisphere construction which allows the whip antenna to be positioned after attachment to the upper hemisphere. The mounting base is physically attached to the antenna mounting bracket by three mounting screws. A center lug extending through the mounting base and the antenna mounting bracket allows connection of a coaxial lead-in from the associated receiver.

d. Ssb Antenna (fig. 2-11). The ssb antenna is a 50- to 60-foot long wire made up from seven strands of No. 22 gage phosphor-bronze wire. The ssb antenna is field constructed and

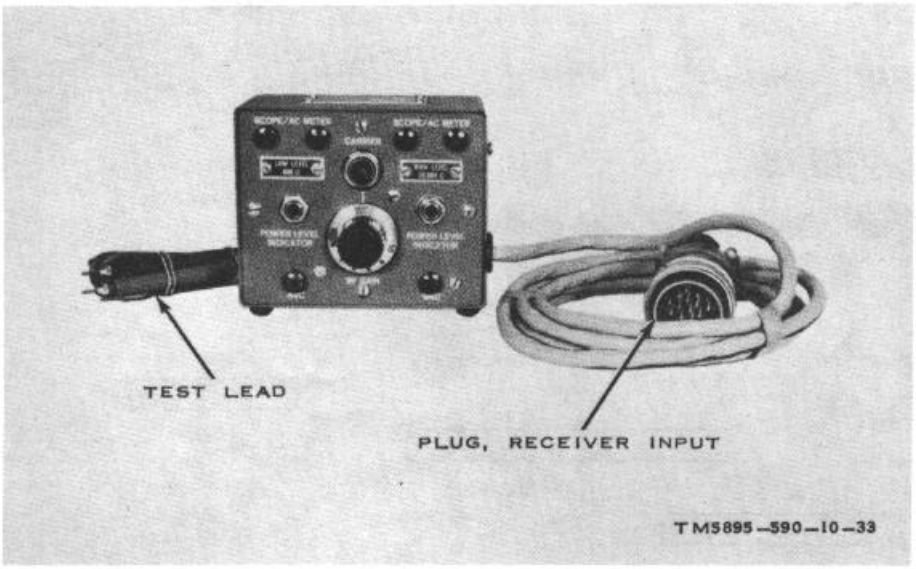


Figure 1-29. Test Set, Radio TS-2682/FSQ-75(V).

supported at one end through a ceramic insulator at a shelter lifting ring. The other end is supported through a ceramic insulator to a pole, or any available structure. The free end of the ssb antenna is attached at a lug on the antenna entrance insulator in the equipment shelter wall. Two ssb antennas are used with the two Radio Sets AN/ARC-102.

e. Cable Assembly, Radio Frequency CG.3450/FSQ-75(V). The CG-3450/FSQ-75(V) is a 150-foot length of RG-8/U cable terminated in coaxial cable connectors. The cable is used with both the uhf and vhf antenna hookups.

f. Cable Assemblies, Special Purpose, Electrical CX-10859/FSQ-75(V) through CX10864/FSQ-75(V). These cables are 20-conductor, 100-foot cables terminated in connectors. The cables are used for interconnection between the control tower and equipment shelter bulkhead connector panels. When installed, the six cables are enclosed in protective zipper tubing.

g. Cable Assembly, Radio Frequency CG3469/U. The CG-3469/U is a 3-foot length of RG-12/U cable terminated in a clip (fig. 2-12) at the antenna-mount end. It connects the If antenna to the equipment shelter bulkhead connector panel (RCP jack) coaxial fitting.

h. Auxiliary Equipment. Fire extinguisher first aid kit, and Binoculars MK-32 are included as auxiliary items with the AN/FSQ75(V)(*). The fire extinguisher and the first aid kit are used in emergency only, while the binoculars are used to enhance visibility of distant objects.

1-14. Additional Equipment Required

Equipment	Purpose
Air conditioner, shelter, Thermo-King S18-104TMS with flexible ducts and duct hose clamps.	Cooling of equipment shelter.
Engine generator, Holgar, 30 kw, CE 301AC/WK1.	System power source.
Control, Monitor Power Supply C-7885/FSQ-75 (V).	Distribution and switching from three sources.
Headset	Monitor receiver audio output.
Flight progress director strip holder.	Insertion of flight progress strips.
Shelter, Repair AN/ASM-146.	Facility for equipment maintenance and repair.
Shelter, Storage AN/ASM-147.	Facility for storage of spare units and parts.

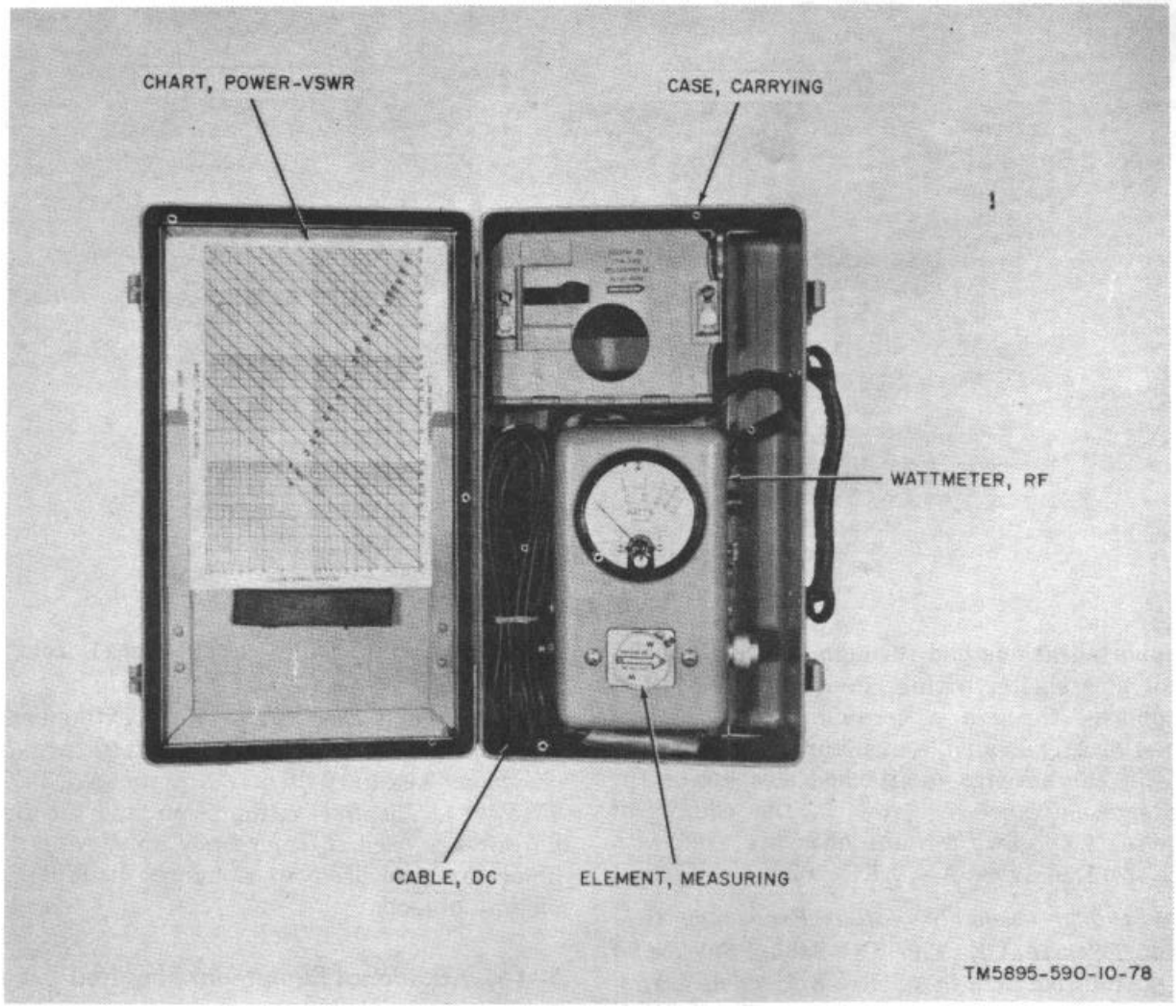


Figure 1-30. Test Set, Radio Frequency Power AN/USM-298.

1-15. Differences in Models

a. There are three different models of the air traffic control system covered in this manual. The major difference in the AN/FSQ-75(V)1 and the AN/FSQ-75(V)2 is in the configuration of the radio group used with the air traffic control system. The air traffic control system is designated as the AN/FSQ-75(V)1 when Radio Group OZ-2(V)1/FSQ-75(V) is used, and as the AN/FSQ-75(V)2 when Radio Group OZ-2(V)2/FSQ-75(V) is used. The functional difference in the two models is in the number of uhf and vhf communication channels available. Radio group 1 provides four uhf and four vhf channels, while radio group 2 provides five uhf and three vhf channels. To accommodate this variation, the number of uhf and vhf transmitters, receivers, antennas, and cable assemblies differs in each configuration. The list below details the equipment difference between the two configurations:

Item	AN/F5Q-76(V) 1	AN/FSQ 75(V)2
Receiver, Radio R-1545/FSQ-75 (V).	4	3
Receiver, Radio R-1547/FSQ-75 (V).	4	5

Item	AN/FSQ-76(V)1	AN/FSQ-75(V)2
Transmitter, Radio T-1082/ FSQ-75(V).	4	8
Transmitter, Radio T-1083/FS8 75 (V).	4	5
Antenna AS-2223/FSQ-75(V)...	6	5
Antenna AS-2222/FSQ-75(V)...	6	8
Cable Assembly, Radio Fre-	12	13

b. The physical difference in the two configurations is evident only in equipment rack 4, (fig. 5-1) the bulkhead connector panel in the equipment shelter, and the antenna configuration. Figure 5-1 depicts equipment rack 4 used with radio group 2. In radio group 1, one Transmitter, Radio T-1083/FSQ-75 (V) and one Receiver, Radio R-1547/FSQ-75(V) are replaced by Transmitter, Radio T-1082/FSQ-75(V) and Receiver, Radio R-1545/FSQ-75(V), respectively. The shelter bulkhead connector panel configuration is changed as shown in figures 2-5 and 2-6 to accommodate the difference in the number of antennas.

c. The major difference between the AN/FSQ-75(V)3 and the other two models of the air traffic control system is the configuration of the console group used. Also, a control tower cab is furnished as a part of the air traffic

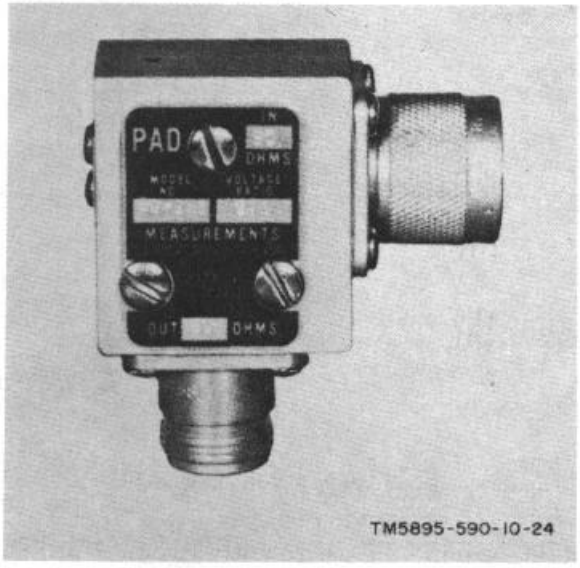


Figure 1-31. Attenuator, Fixed CN-1239/U.

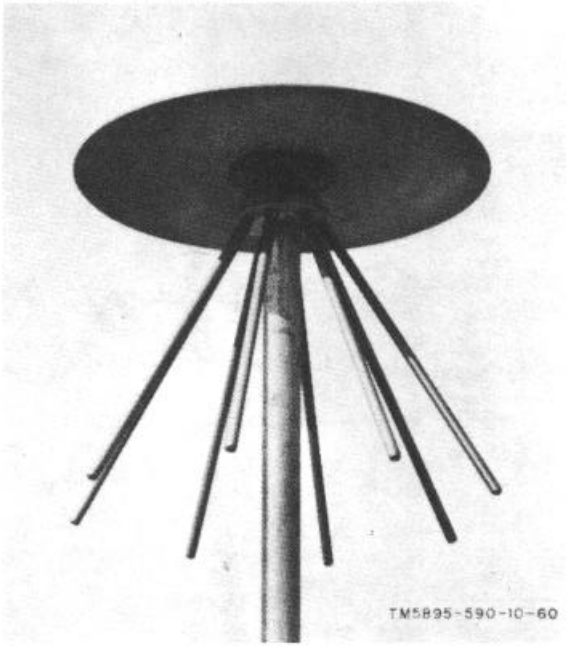


Figure 1-32. Antenna AS-2222/FSQ-75(V).

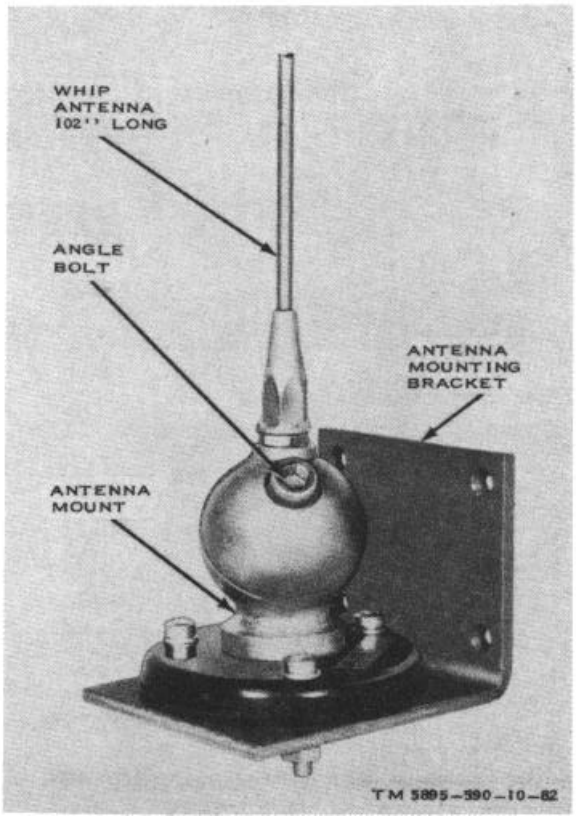


Figure 1-33. Lf antenna.

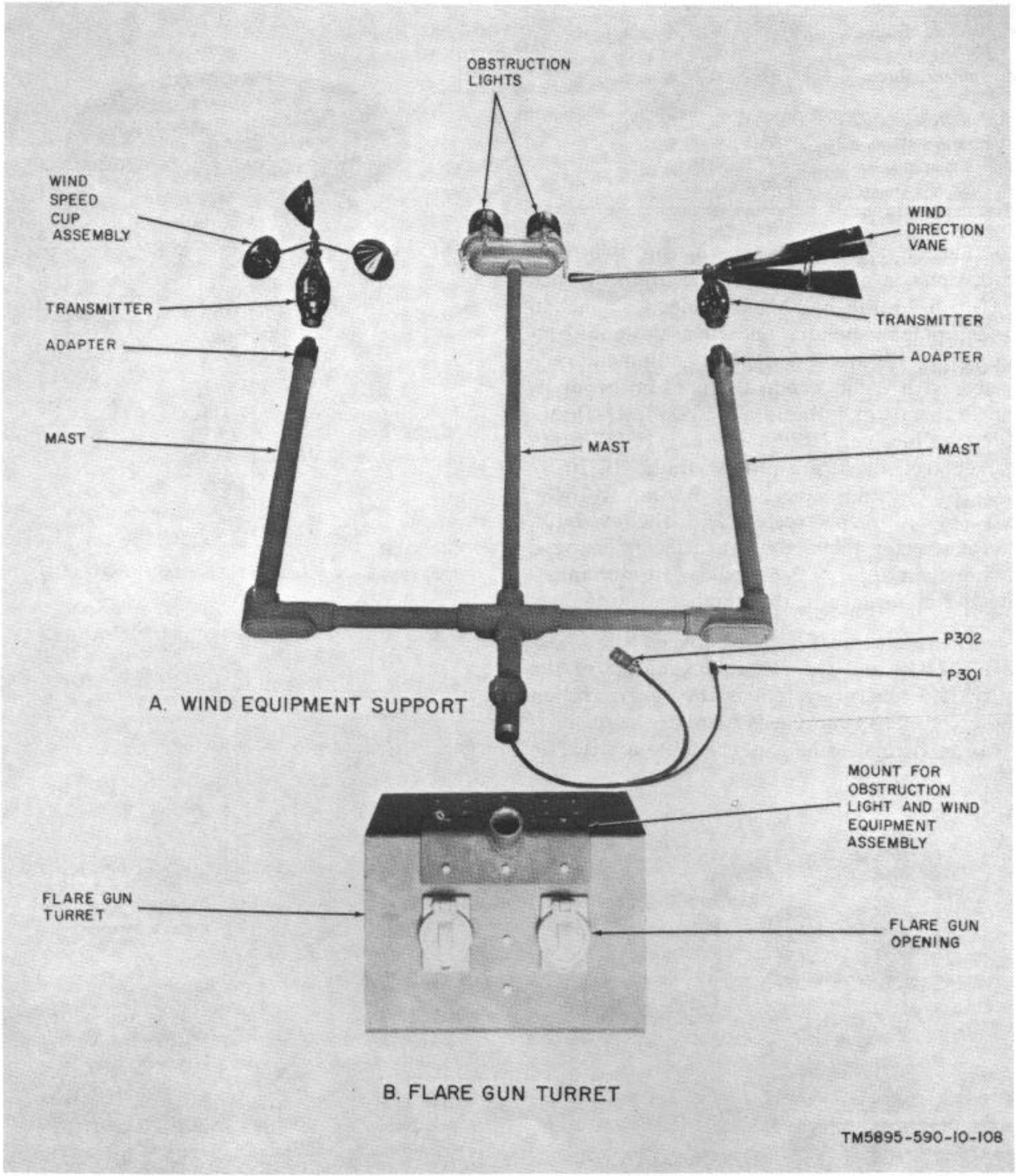


Figure 1-34. Flare gun turret and wind equipment support, AN/FSQ-75(V)3 only.

control system, and two trailers are furnished with the seven AN/FSQ-75(V)3 systems to facilitate movement of the control tower cabs.

Radio group 2, used with the AN/FSQ-75(V)2, is also used with the AN/FSQ-75(V)3; however, Console Group, Air Traffic

Control OJ-67(V)2/FSQ-75(V) is used with AN/FSQ-75(V)3 Console Group, Air Traffic Control OJ-67(V)1/FSQ-75(V) is used with the AN/FSQ-75(V)1 and the AN/FSQ75(V)2. The OJ-67(V)2/FSQ-75(V) provides the same functional capability as the OJ-67(V)1/FSQ-75(V); however, there are but five consoles forming two aircraft controller positions. The OJ-67(V)1/FSQ-75(V) is comprised of seven consoles which form three aircraft controller positions.

1-16. Possible Extended Use of AN /FSQ-75(V)3

The AN/FSQ-75(V)3 may be supplemented by additional equipment to provide a third controller position, as in the AN/FSQ75(V)1 and AN/FSQ-75(V)2 configurations. The additional equipment consists of consoles 6 and 7. Physical space limitations preclude location of the additional equipment inside the control tower cab; therefore, a suitable shelter must be provided for the third controller position and cabling must be provided to connect jacks J12 through J15 and J18 at the rear of console 3 to interconnection jacks on console 6 (fig. 5-2). The system will operate satisfactorily when the third controller position is remoted up to 500 feet distant from the controller positions located in the control tower cab when No. 19 wire is used. Twisted, shielded pairs must be used to carry audio signals, and twisted pairs must be used to carry control signals; however, a limiting factor is that the telephone equipment can be remoted only 100 feet.

CHAPTER 2

INSTALLATION

***Warning*: During installation of this equipment, conform to all safety requirements set forth in TB SIG 291. Injury or DEATH could result from failure to comply with safe practices.**

Section I. SERVICE UPON RECEIPT OF EQUIPMENT

2-1. Siting Instructions

a. The air traffic control system may be set up at sites that vary considerably in terrain, climate, and accessibility; therefore, only instructions of a general nature are given for siting purposes. The governing factor in siting is the location of the control tower. The control tower must be constructed at a point, and elevated to a height, where all runways and aprons of an airfield are in clear view of controller personnel at the operating consoles. The considerations for antenna location (*c* below) must be taken into account for the antennas mounted on the control tower roof. Once the control tower site has been selected, location and layout of the equipment, repair, and storage shelters and auxiliary equipment can be considered. The location of these units is dictated by the tactical situation, site terrain, cable lengths, and other factors outlined in the following paragraphs.

b. When selecting a site for the equipment shelter, consider the following factors:

(1) The location of the equipment shelter is dependent on the tactical situation and cabling limitations. One hundred feet of control cable and 70 feet (100 feet with the AN/FSQ-75(V)3) of power cable is furnished to interconnect the equipment shelter with the control tower. The cable must be run from the control tower cab to the base of the control tower; therefore, the height of the control tower must be considered when calculating cable lengths. The equipment shelter must be located on firm, dry ground with good drainage. If these conditions are nonexistent, the site must be prepared and leveled where possible. When materials are available, the equipment shelter should be placed on concrete blocks, or wooden beams.

(2) The maintenance and storage shelters are not furnished as a part of the system but are used with the system and should be located in the proximity of the equipment shelter. The two shelters should be sited as described in (1) above. Since these shelters do not interconnect to the control tower, distance to the control tower is not a limiting factor; however, the shelters receive power from a power control cabinet and the length of the power cable furnished for interconnection is a limiting factor in siting. Accessibility of the maintenance and storage shelters is a prime consideration.

c. When selecting a site for the antennas, consider the following factors:

Note.

Certain antennas used with the air traffic control system are located on the control tower roof; location of these antennas must be considered during control tower siting. The following discussion applies to the remaining antennas which are pole-mounted and the location of which must be determined during initial planning.

(1) Radio signals are absorbed and sometimes reflected by nearby obstructions, such as hills, metal buildings, bridges, or telephone lines that extend above the height of the antenna. Transmitted signals have a greater

range when the antenna is as high above ground as possible. Transmission and reception are best over water or level ground.

(2) Because of line-of-sight propagation characteristics of vhf and uhf frequencies, and the distances involved in the communications conducted between ground facilities and aircraft in flight, vhf and uhf antennas should be elevated as much as practicable over surrounding structures. Antennas support structures should provide a minimum separation of 8 feet between antennas to reduce distortion of radiation patterns and interference. Where adjacent channel frequencies differing by one megahertz or less are to be used at the same site, the associated transmitting antennas should be mounted on structures separated by a minimum distance of 80 feet. If this requirement cannot be complied with, the associated antennas should be located as far apart as possible to minimize potential interference.

(3) Where a large number of radio sets are in operation, careful layout of the numerous antennas is essential. Improper layout will cause mutual interference between the various radio sets, reducing the intelligibility of the incoming signals. Mutual interference from nearby transmitters can be reduced by separating the receiving antennas from the interfering transmitting antennas as much as possible. Other means of reducing interference include the orienting of antennas to take advantage of their directional patterns, selecting operating frequencies properly, tuning transmitters accurately, and aligning receivers accurately.

d. When selecting a site for the power equipment, consider the following factors:

(1) The power equipment consists of two engine generators, a power control cabinet, an engine generator remote control panel, and various interconnecting power cables (fig. 2-1 and 2-2).

(2) Fifty feet of cable are provided to interconnect the power control cabinet to a commercial power source. If commercial power is not available, the engine generators must be located within 20 feet of the power control cabinet which, in turn, must be within 50 feet of the equipment shelter. A 120-foot cable interconnects the power control cabinet with the engine generator remote control panel in the control tower. With this cable, control tower height must again be taken into account. Siting of the power equipment must be based on these cable lengths.

(3) The engine generators and the power control cabinet should be situated on firm, dry ground with adequate drainage, and the site prepared and leveled where possible.

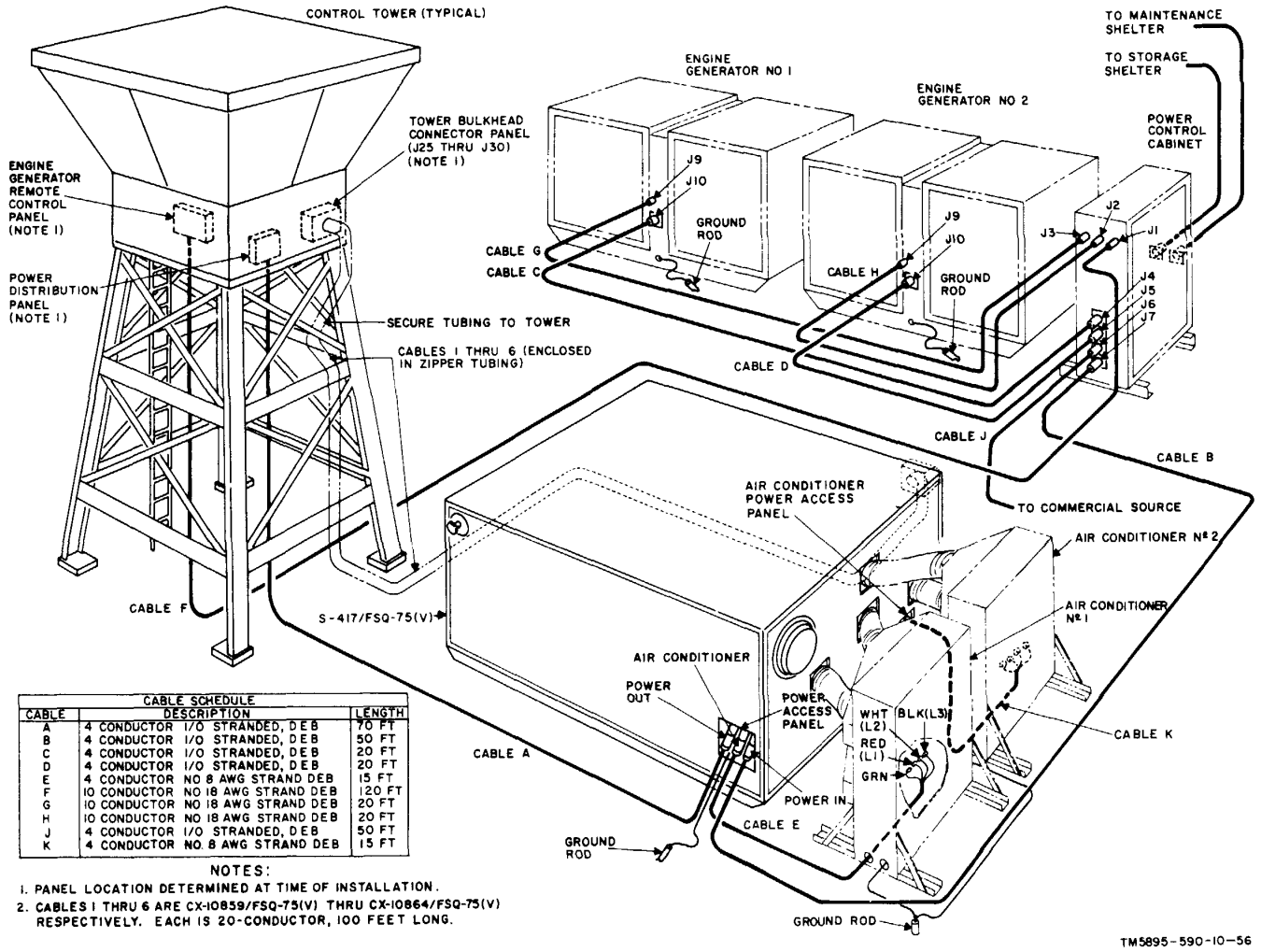
(4) Every effort should be made to elevate the power cabling by blocks, or other means, to keep the cables away from any ground where water may accumulate. Cables connecting to the control tower panels (fig. 2-1 and 2-2) should be clamped to the control tower structure at appropriate points to relieve weight and prevent strain on the connectors.

(5) To avoid a hazard to personnel moving about the area, attach white engineer tape (1-inch wide) at several points along suspended cables to at least head height.

2-2. Packaging Data

Packaging data for the AN/FSQ-75(V)1 and AN/FSQ-75(V)2 systems (*a* below) is the same. Packaging of the AN/FSQ-75(V)3 is considerably different, since this system includes a control tower cab. The five consoles that make up Console Group, Air Traffic Communication OJ-67(V)2/FSQ-75(V) are installed in the control tower cab and shipped as a part of the control tower cab. Packing data for this system is provided in b below.

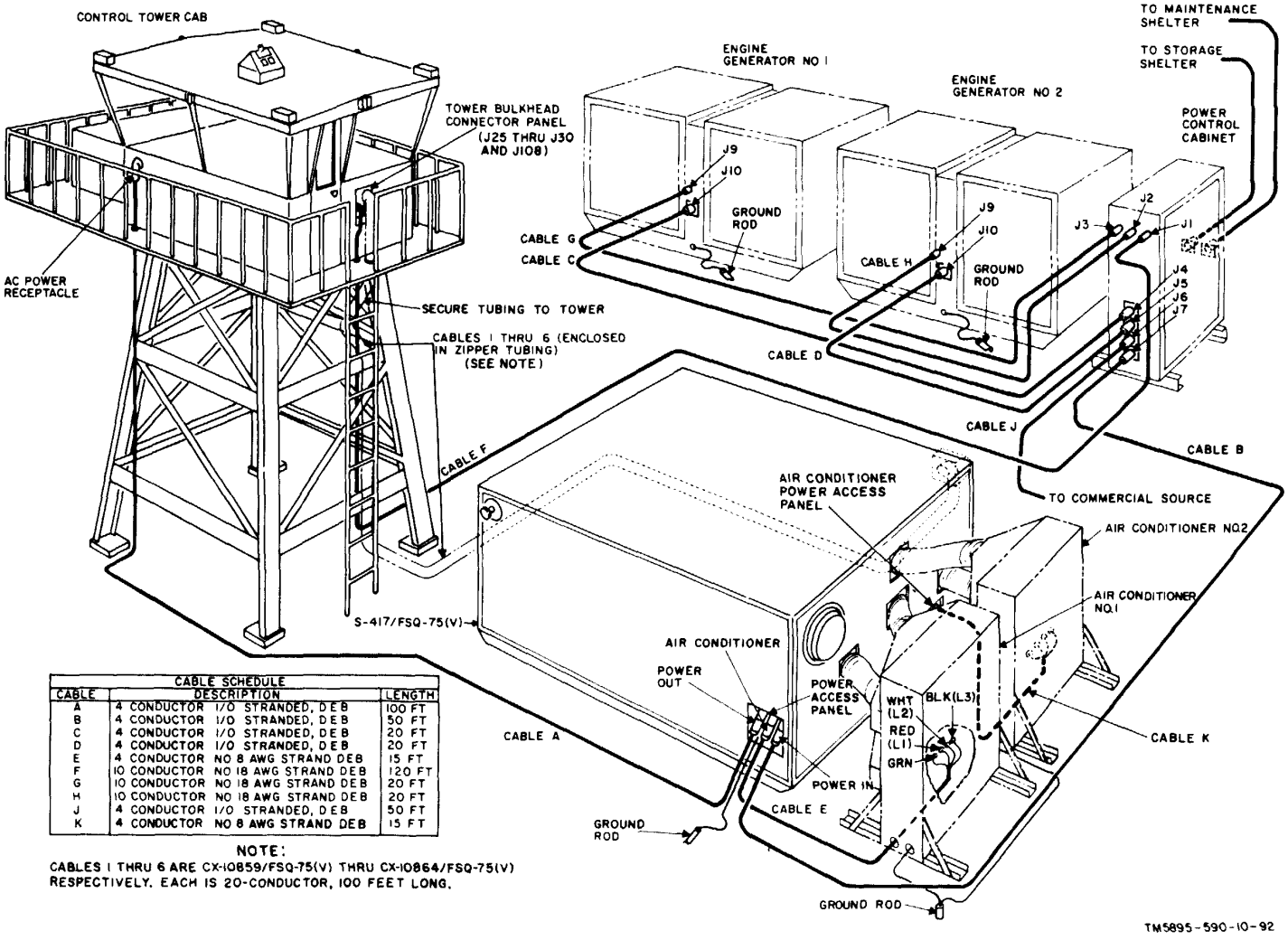
a. Packaging Data for AN/FSQ-75(V)1 and AN/FSQ-75(V)2 Systems. The components of the AN/FSQ-75(V)1 and the AN/ FSQ-75(V)2 are packaged in 35 individual cartons, plus the equipment shelter, for shipment. The chart below lists the contents of the various cartons. The equipment shelter is designated carton 1 and, because of its bulk size, is not shipped in a disposable container. Components normally mounted in equipment shelter racks and shelves are secured in place with fastening devices; loose items are boxed an stowed. Components in the racks are blocked, braced, tied, or strapped with nylon filament tape for protection from movement, vibration, undue stress, and transportation hazards. All equipment shelter doors and louvers are closed and secured with aluminum foil tape. Antenna



CABLE SCHEDULE		
CABLE	DESCRIPTION	LENGTH
A	4 CONDUCTOR 1/0 STRANDED, DEB	70 FT
B	4 CONDUCTOR 1/0 STRANDED, DEB	50 FT
C	4 CONDUCTOR 1/0 STRANDED, DEB	20 FT
D	4 CONDUCTOR 1/0 STRANDED, DEB	20 FT
E	4 CONDUCTOR NO 8 AWG STRAND DEB	15 FT
F	10 CONDUCTOR NO 18 AWG STRAND DEB	120 FT
G	10 CONDUCTOR NO 18 AWG STRAND DEB	20 FT
H	10 CONDUCTOR NO 18 AWG STRAND DEB	20 FT
J	4 CONDUCTOR 1/0 STRANDED, DEB	50 FT
K	4 CONDUCTOR NO. 8 AWG STRAND DEB	15 FT

NOTES:
1. PANEL LOCATION DETERMINED AT TIME OF INSTALLATION.
2. CABLES 1 THRU 6 ARE CX-10859/FSQ-75(V) THRU CX-10864/FSQ-75(V) RESPECTIVELY. EACH IS 20-CONDUCTOR, 100 FEET LONG.

Figure 2-1. System interconnecting cabling, AN/FSQ-75(V)1 and AN/FSQ-75(V)2.



CABLE SCHEDULE		
CABLE	DESCRIPTION	LENGTH
A	4 CONDUCTOR 1/0 STRANDED, DEB	100 FT
B	4 CONDUCTOR 1/0 STRANDED, DEB	50 FT
C	4 CONDUCTOR 1/0 STRANDED, DEB	20 FT
D	4 CONDUCTOR 1/0 STRANDED, DEB	20 FT
E	4 CONDUCTOR NO 8 AWG STRAND DEB	15 FT
F	10 CONDUCTOR NO 18 AWG STRAND DEB	120 FT
G	10 CONDUCTOR NO 18 AWG STRAND DEB	20 FT
H	10 CONDUCTOR NO 18 AWG STRAND DEB	20 FT
J	4 CONDUCTOR 1/0 STRANDED, DEB	50 FT
K	4 CONDUCTOR NO 8 AWG STRAND DEB	15 FT

NOTE:
CABLES 1 THRU 6 ARE CX-10859/FSQ-75(V) THRU CX-10864/FSQ-75(V) RESPECTIVELY. EACH IS 20-CONDUCTOR, 100 FEET LONG.

Figure 2-2. System interconnecting cabling, AN/FSQ-75(V)3 only.

and power cable openings are covered with caps, sheet metal plates, or plugs. Cartons 2 through 36 are placed within three Conex shipping containers. These cartons are not placed in the Conex containers in any particular sequence, but are packed to make maximum utilization of available space. A packing list inserted in a slot on the interior of the Conex container access door lists the contents of the individual cartons included in the container. Each Conex container is sealed before shipment.

Carton No.	Carton contents	Dimensions (In.)	Volume (cu ft)	Unit weight (lb)
1	Equipment shelter containing: Equipment rack 1: RF body (2 ea). Ssb transceiver (2 ea). 27.5-volt power supply (3 ea). Equipment rack 2: FM RF body. Fm transceiver (4 ea). 27.5-volt power combining unit. 27.5-volt power supply. Equipment rack 3: RF body (2 ea). Vhf transmitter (2 ea). Vhf receiver (2 ea). Equipment rack 4: RF body (2 ea). Vhf transmitter (2ea)[a]. (1 ea)[b]. Vhf receiver (2ea)[a]. (1 ea)[b]. Uhf transmitter (1 ea)[b]. Uhf receiver (1 ea)[b]. Equipment rack 5: RF body (2 ea). Uhf transmitter (2 ea). Uhf receiver (2 ea). Equipment rack 6: RF body (2 ea). Uhf transmitter (2 ea). Uhf (2 ea). Equipment rack 7: Lf receiver. 48-volt dc fuse panel. 48-volt power supply (2 ea). 48-volt power combining unit. Recorder power supply/bias oscillator (2 ea). Equipment rack 8: Recorder. Aerological equipment (parts of). Ssb Microphone (2 ea). Ssb antenna coupler (2 ea). Binoculars MK-32. Signal light gun. 6-db attenuator. 120-foot zipper tubing kit. Interconnecting cables (control tower to equipment shelter). Interconnecting cables (console to bulk-head connector panel) (6 ea). Microphone input attenuator. Telephone handsets (3 ea). Microphone (3 ea).	147 by 87 by 83	614	5,805

Carton No	Carton contents	Dimensions (in.)	Volume (eu ft)	Unit weight (lb)
	Headset (6 ea). Signal entrance box. CO^2 fire extinguisher. Alarm/pa system. Modulation monitor. RF wattmeter. Flexible duct (4 ea). Ssb antenna kit (2 ea). Fm antenna (4 ea). Uhf antenna (6 ea)[a]. (8 ea)[b]. Vhf antenna (6 ea)[a]. (5 ea)[b]. Lf antenna. Console mounting hardware.			
2	Console 1 containing: Speaker assembly. Receiver mixing and channel selector (3 ea). Receiver volume control (3 ea). Transmitter selector (3 ea). Common equipment box. Six-channel amplifier group. Receiver selector transformer (3 ea). Microphone-headset panel. Buzzer alarm. Blower assembly.	52 by 31 by 31	28.4	355
3	Console 2 including: Aerological panel assembly. Transmitter keying unit (3 ea). Master switch panel. Four-channel amplifier group. Blower assembly.	52 by 33 by 29	28.7	350
4	Console 3 including: Flight-progress director strip holder (52 ea). Clock. Ac/dc distribution unit (3 ea). Interlocking unit (3 ea). Mixing amplifier.	52 by 31 by 31	29.0	315
5	Console 4 including: Ssb control panel. Recorder/navaid status panel. Ssb microphone-headset panel. Transmitter keying unit (3 ea). 23/46-volt power supply. Blower assembly. 10-foot interconnecting cable (6 ea).	52 by 31 by 31	29.0	400
6	Console 5 including: Speaker assembly. Auxiliary switch panel. Receiving mixing channel selector (3 ea). Receiver volume control (3 ea). Transmitter selector (3 ea). Microphone-headset panel. Six-channel amplifier group. Receiver transformer panel. Receiver selector transformer (3 ea). Buzzer alarm.	52 by 31 by 31	29.0	350

Carton No.	Carton contents	Dimensions (in.)	Volume (cu ft)	Unit weight (lb.)
7	Console 6 including: Speaker assembly. Auxiliary switch panel. Receiver mixing and channel selector (3 ea). Receiver volume control (3 ea). Transmitter selector (3 ea). Microphone-headset panel. Six-channel amplifier group. Receiver selector transformer (3 ea). Buzzer alarm. Blower assembly.	52 by 31 by 31	29.0	325
8	Console 7 including: Transmitter keying unit (3 ea).	52 by 31 by 31	29.0	326
9	Air conditioner	70 by 48 by 26	50.0	700
10	Air conditioner	70 by 48 by 26	50.0	700
11	Duct hose clamp (4 ea) Plenum (2 ea).	44 by 30 by 26	20.0	160
12	Duct hose clamp (4 ea) Plenum (2 ea).	44 by 30 by 26	20.0	160
13	Reproducer	40 by 32 by 28	21.0	260
14	Writing shelf (3 ea) First aid kit. Mixing amplifier test jig. Receiver test set. Six-channel amplifier test jig. Four-channel amplifier test jig. Six-channel amplifier group test adapter. Four-channel amplifier group test adapter.	48 by 25 by 18	18.0	190
15	Antenna mounting kit	42 by 21 by 18	9.5	130
16	Antenna mounting kit	30 by 20 by 16	5.6	70
17	Recording tape (140 rolls)	36 by 27 by 25	14.0	360
18	Stand for air conditioner	61 by 9 by 5	1.6	95
19	Stand for air conditioner	61 by 9 by 5	1.6	95
20	Control tower power distribution panel	35 by 20 by 19	7.3	131
21	Masonite sheet 4 by 4 feet (2 ea)	48 by 48 by 1/2	0.7	45
22	Ground rod	144 by 1 by 1	0.09	19
23	Ground rod	96 by 1 by 1	0.05	18
24	Site installation supplies	52 by 19 by 18	10.2	175
25	Coaxial cable RG-8/U (2,000 ft)	33 by 33 by 15	9.4	250
26	Coaxial cable RG-8/U (395 ft)	14 by 14 by 12	1.2	46
27	Coaxial cable RG-8/U (300 ft)	14 by 14 by 12	1.2	35
28	Interconnecting cables (power)	43 by 42 by 13	13.5	350
29	Interconnecting cables (power) (2 sets)	43 by 42 by 13	13.5	390
30	Initial running spares	52 by 19 by 18	10.0	102
31	Engine generator	102 by 67 by 45	180.0	4,025
32	Engine generator	102 by 67 by 45	180.0	4,025
33	Electrolyte (3 gal)	26 by 22 by 22	7.5	135
34	Electrolyte (3 gal)	26 by 22 by 22	7.5	135
35	Maintenance shelter	149 by 87 by 83	617	4,200
36	Storage shelter	149 by 87 by 83	617	3,350
37	Power control panel	36 by 30 by 54	30.5	415
38	Engine generator remote control panel	35 by 19 by 21	7.1	10.5

[a] Number shipped with AN/FSQ-75 (V) 1.
[b] Number shipped with AN/FSQ-75(V)2 and FSQ-75(V)3.

b. Packaging Data for AN/FSQ-75(V)s. The components of the AN/FSQ-75(V)S are packaged in 31 individual cartons plus the equipment shelter and the control tower cab. The equipment shelter is designated carton 1 and the control tower cab is designated carton 2. The equipment shelter and the control tower cab are not shipped in disposable cartons because of their bulk size. The equipment shelter is packaged for shipment as described in *a* above. The control tower cab is shipped with plywood panels mounted in place over all-glass panels. In addition to the normal mounting, the panels are secured in place with aluminum foil tape. The panels are also banded with nylon filament tape. All access doors are closed and secured with aluminum foil tape. All openings are covered with caps, plugs, or sheet metal plates. Components mounted in the consoles are secured in place with fastening devices and are blocked, braced, tied, or strapped with nylon filament tape for protection from transportation hazards. The flare gun turret, the lifting sling, and the power cord are shipped in their normal storage areas (fig. 1-22). Cartons 3 through 31 are placed in 3 CONEX shipping containers as described in *a* above.

Carton No.	Carton contents	Dimensions (in.)	Volume (cu ft)	Unit weight (lb)
1	Equipment shelter containing: Equipment rack 1: RF body (2 ea). Ssb transceiver (2 ea). 27.5-volt power supply (3 ea). Equipment rack 2: Fm RF body. FM transceiver (4 ea). 27.5-volt power combining unit. 27.5-volt power supply. Equipment rack 3: RF body (2 ea). Vhf transmitter (2 ea). Vhf receiver (2 ea). Equipment rack 4: RF body (2 ea). Vhf transmitter. Vhf receiver. Uhf transmitter. Uhf receiver. Equipment rack 5: RF body (2 ea). Uhf transmitter (2 ea). Uhf receiver (2 ea). Equipment rack 6: RF body (2 ea). Uhf transmitter (2 ea). Uhf receiver (2 ea). Equipment rack 7: Lf receiver. 48-volt dc fuse panel. 48-volt power supply (2 ea). 48-volt power combining unit. Recorder power supply. Equipment rack 8: Recorder. Aerological equipment (parts of). Ssb microphone (2 ea). Ssb antenna coupler (2 ea). Binoculars MK-32. Signal light gun.	147 by 87 by 83	614	5,805

Carton No.	Carton contents	Dimensions (in.)	Volume (ca ft)	Unit weight (lb)
	6-db attenuator. 120-foot zipper tubing kit. Interconnecting cables (control tower cab to equipment shelter). Microphone input attenuator. Telephone handsets (2 ea). Microphone (2 ea). Headset (5 ea). Signal entrance box. CO^2 fire extinguisher. Modulation monitor. RF wattmeter. Flexible duct (4 ea). Ssb antenna kit (2 ea). Fm antenna (4 ea). Uhf antenna (8 ea). Vhf antenna (6 ea). Lf antenna. Console mounting hardware. First aid kit. Mixing amplifier test set. Receiver test set. Six-channel amplifier test jig. Four-channel amplifier test jig. Six-channel amplifier group test adapter. Four-channel amplifier group test adapter.			
2	Control tower cab containing: Console 1: Speaker assembly. Receiver mixing and channel selector (3 ea). Receiver volume control (3 ea). Transmitter selector (3 ea). Common equipment box. Six-channel amplifier group. Receiver selector transformer (3 ea). Buzzer alarm. Blower assembly. Microphone-headset panel. Console 2: Aerological panel assembly. Transmitter keying unit (3 ea). Master switch panel. Four-channel amplifier group. Blower assembly. Console 3: Clock. Flight progress strip holder (52 ea). Ac/dc distribution unit (3 ea). Interlock unit (3 ea). Mixing amplifier. Console 4: Ssb control panel. Recorder/navaid status panel. Ssb microphone headset panel. Transmitter keying unit (3 ea). 23/46-volt power supply. Blower assembly.	187 by 96 by 92	960	8,250

Carton No.	Carton contents	Dimensions (in.)	Volume (cu ft)	Unit weight (lb.)
	Console 5: Speaker assembly. Auxiliary switch panel. Receiver mixing and channel selector (3 ea). Receiver volume control (3 ea). Transmitter selector (3 ea). Microphone-headset panel. Receiver transformer panel. Receiver selector transformer (3 ea). Six-channel amplifier group. Buzzer alarm.			
3	Air conditioner	70 by 48 by 26	50.0	700
4	Air conditioner	70 by 48 by 26	50.0	700
5	Duct hose clamp (4 ea) Plenum (2 ea).	44 by 30 by 26	20.0	160
6	Duct hose clamp (4 ea) Plenum (2 ea).	44 by 30 by 26	20.0	160
7	Reproducer	40 by 32 by 28	21.0	260
8	Antenna mounting kit	42 by 21 by 18	9.5	130
9	Antenna mounting kit	30 by 20 by 16	5.6	70
10	Recording tape (140 rolls)	36 by 27 by 25	14.0	360
11	Stand for air conditioner	61 by 9 by 5	1.6	95
12	Stand for air conditioner	61 by 9 by 5	1.6	95
13	Masonite sheet 4 by 4 feet (2 ea)	48 by 48 by 1/2	0.7	45
14	Ground rod	144 by 1 by 1	0.09	19
15	Ground rod	96 by 1 by 1	0.05	13
16	Site installation supplies	52 by 19 by 18	10.2	175
17	Coaxial cable RG-8/U (2,000 ft)	33 by 33 by 15	9.4	250
18	Coaxial cable RG-8/U (395 ft)	14 by 14 by 12	1.2	45
19	Coaxial cable RG-8/U (300 ft)	14 by 14 by 12	1.2	35
20	Interconnecting cables (power)	43 by 42 by 13	13.5	350
21	Interconnecting cables (power) (2 sets)	43 by 42 by 13	13.5	390
22	Initial running spares	62 by 19 by 18	10.0	102
23	Engine generator	102 by 67 by 45	180.0	4,025
24	Engine generator	102 by 67 by 45	180.0	4,025
25	Electrolyte (3 gal)	26 by 22 by 22	7.5	135
26	Electrolyte (3 gal)	26 by 22 by 22	7.5	135
27	Ground rod	96 by 1 by 1	0.05	15
28	Maintenance shelter	149 by 87 by 83	617	4,200
29	Storage shelter	149 by 87 by 83	617	3,350
30	Wind equipment support	60 by 60 by 12	25	75
31	Power control panel	36 by 30 by 54	30.5	415

2-3. Unpacking Instructions

a. General. Be careful in unpacking. Do not thrust tools into the interior of any container or wrapping.

b. Equipment Shelter. Remove the caps, covers, plates, and plugs from all openings. Remove all aluminum foil tape on the equipment shelter exterior. Open the equipment shelter door and dismantle the wooden blocking and bracing frames. Remove all nylon filament tape, ties, and blocking material used to secure components within the equipment shelter. Remove the wire used to tie down the shock mounts on the fm and ssb transceivers in equipment racks 1 and 2 (fig. 5-1). Remove all excess packing material from the equipment shelter.

c. Control Tower Cab of (AN/FSQ-75(V)3 Only). Remove the caps, covers, plates and plugs from all openings. Remove all aluminum foil tape from the equipment shel-

ter exterior before lifting the control tower cab into place. Do not remove the nylon filament banding tape holding the plywood window panels in place, nor the tape and blocking materials holding console equipments in place, until the control tower cab has been lifted into place on its supporting structure. When the control tower cab has been secured in place, remove the nylon filament tape holding the plywood window panel covers in place. Remove the plywood covers and store them in a secure area for future use. Open the control tower cab access door and remove blocking materials and tape securing the console components in place. Remove all packing material from the control tower cab.

d. Conex Containers.

Caution: **When removing the boxes of recording tape, be sure to immediately place the tapes in their designated storage area.**

Before unpacking the Conex containers, an installation sequence should be devised to avoid leaving boxes, which are not to be unpacked immediately, in exposed locations. After an installation priority has been established, boxes may be removed from the Conex containers as needed by referring to the packing list. Some boxes will have to be removed to reach those needed. Store the unused boxes or items where they are not exposed to inclement weather. Leave all components in the weatherproof coverings until they are ready for use. Check all cartons against the packing list as removed. When all components have been removed from the conex container, remove all excess packing material and store the conex container in an appropriate location.

2-4. Checking Unpacked Equipment

a. Inspect the equipment for damage that may have occurred during shipment. If the equipment has been damaged, fill out and forward DD Form 6 (para 1-3*b*).

b. Check to see that the equipment is complete as listed on the packing slip. If a packing slip is not available, check the equipment against the basic issue items list (app B). Report all discrepancies in accordance with instructions given in TM 38-750. The air traffic control system should be placed in service even though a minor assembly or part that does not affect proper functioning is missing.

c. Check to see whether the equipment has been modified. If the equipment has been modified, the MWO number will appear on the front panel near the nomenclature plate. Check to see whether all MWO's current at the time equipment is placed in use have been applied.

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

Section II. INSTALLATION OF EQUIPMENT

2-5. Tools, Test Equipment, and Materials Required for Installation

Item	Purpose	Applicable publication
Tool Kit, Electronic Equipment TK-100/G.	General installation.	
Tool Kit, Electronic Equipment TK-101/G.	General installation.	
Tool Kit, Electronic Equipment TK-105/G.	General installation.	
Tool Kit TK-164( )G	General installation.	
Attenuator, Fixed CN-1238/U	General transmitter test.	
Attenuator, Fixed CN-1239/U	Receiver level checks.	
Dummy Load DA-75/U	General transmitter test.	
R.F. Signal Generator AN/URM 25F.	General receiver test.	TM 11-5551E.
Generator, Signal AN/USM-44A	Uhf and vhf receiver tests.	TM 11-6625-508-10.

Item	Purpose	Applicable publication
Generator, Signal AN/URM-48	General receiver test.	TM 11-1257.
Meter, Audio Level ME-356/U	Audio output level tests.	
Monitor-Convertor, Audio Frequency-Radio Frequency ID-1572/FSQ-75(V).	Transmitter modulation tests.	TM 11-5895-590-10.
Multimeter AN/URM-105	General voltage and resistance checks.	TM 11-6625-203-12.
Multimeter TS-352B/U	General voltage and resistance checks.	TM 11-6625-366-15.
Oscillator, Audio SG-19/U	General audio level checks.	
Oscilloscope AN/USM-140A	Transmitter modulation tests.	TM 11-6625-535-15.
Resistor, load, 3.3 ohms, 1-watt, non-inductive.	Recording level adjustments.	
Resistor, load, 300 ohms, 2 watts, non-inductive.	Ssb receiver adjustment.	
Adapter, Test MX-8091/FSQ-75(V).	Six-channel amplifier group adjustments.	TM 11-5820-733-12.
Adapter, Test MX-8092/FSQ-75(V).	Four-channel amplifier group adjustments.	TM 11-5820-768-12.
Test Set, Radio Frequency Power AN/USM-298.	Transmitter power output test.	TM 11-5895-590-10.
Battery, type C, 1-1/2 volts	Aerological equipment.	

2-6. Installation Instructions

***Warning*: During installation of this equipment conform to all safety requirements set forth in TB SIG 291. Injury or DEATH could result from failure to comply with safe practices.**

a. General. Certain components of the air traffic control system must be assembled before operational use. All components are installed within the control tower or the equipment shelter, with the exception of certain items of Aerological Measuring Set ML-629/FSQ-75(V) obstruction lights, antenna supports, antennas, interconnecting cables, and the power equipment. Assembly and installation of these items is covered in the following paragraphs.

Note.

The following installation procedures must be made by direct support or higher category maintenance personnel, or by special teams charged with the responsibility for installing a group of the air traffic control systems. Pole and crossarm details, together with lighting rod and grounding system and cable stringing details are shown in figures 2-3 and 2-4. However, no definitive instructions for this type of installation is furnished.

b. Installation of Antenna Supports on AN/FSQ-75(V)3 Control Tower Cab. Four antenna support mounts (figs. 1-20 and 121) are a part of the structural framework of the control tower cab furnished with the AN/FSQ-75(V)3. Each of these antenna support mounts is designed to mount an antenna spreader which, in turn, can furnish mounting for two antenna masts, (one for a uhf antenna and one for a vhf antenna). Normally, receiving antennas will be mounted on the control tower cab. Five uhf and three vhf receivers are used with the AN/FSQ-75(V)3 (in addition to the four fm transceivers). However, one antenna is used to feed two receivers when possible; therefore, three uhf antennas (for the five uhf receivers) and two vhf antennas (for the three vhf receivers) are used with the AN/FSQ-75(V)3. Two of the antenna supports will be used to mount one uhf and one vhf antenna each. A third support will mount one uhf antenna. The four fm antennas will normally be mounted on the top four corners of the control tower cab (fig. 24) or to handrails on the control tower support. Perform the following steps when installing antenna supports.

(1) Insert the base of the antenna spreader into the antenna support mount on the control tower cab.

(2) Secure the antenna spreader in place by inserting the provided 3/8-inch bolt through the predrilled hole in the antenna support mount and the antenna spreader. Secure with the washer and the nut provided.

(3) Screw a uhf mast (1 1/4-inch pipe, 60 inches long) (fig. 2-15) into the pipe coupling on one end of the antenna spreader.

(4) Screw a vhf mast (1 1/4-inch pipe, 30 inches long) into the coupling on the other end of the antenna spreader.

c. Installation of Flare Gun Turret and Wind Equipment Support on AN/FSQ75(V)3 Control Tower Cab. Perform the following procedures when installing the flare gun turret and the wind equipment support.

(1) Remove the flare gun turret (B, fig. 1-34) from its storage area (fig. 1-22) at the rear of the control tower cab.

(2) Remove the screws that secure the cover of the flare gun turret mount on the roof of the control tower cab.

(3) Remove the cover and store it for future use.

(4) Place the flare gun turret on the mount.

(5) Note that there are only two openings through which flare guns may be inserted.

(6) Rotate the flare gun turret so that flares will be fired in the desired direction when the flare gun turret is used.

(7) Secure the flare gun turret in place with the eight nuts and bolts provided.

(8) Thread P301 and P302 (fig. 1-34 and 2-14) through the mount opening on top of the flare gun turret.

(9) Screw the wind equipment support into the mount on top of the flare gun turret.

(10) Note that windspeed and direction transmitter adapters are affixed to the masts on the wind equipment support.

(11) Attach the cups to the windspeed transmitter and the vane to the wind direction transmitter as instructed e below.

(12) Connect the windspeed transmitter to the adapter. Note that the transmitter is keyed so that it mounts only in one orientation.

(13) Tighten the setscrews that secure the transmitter to the adapter.

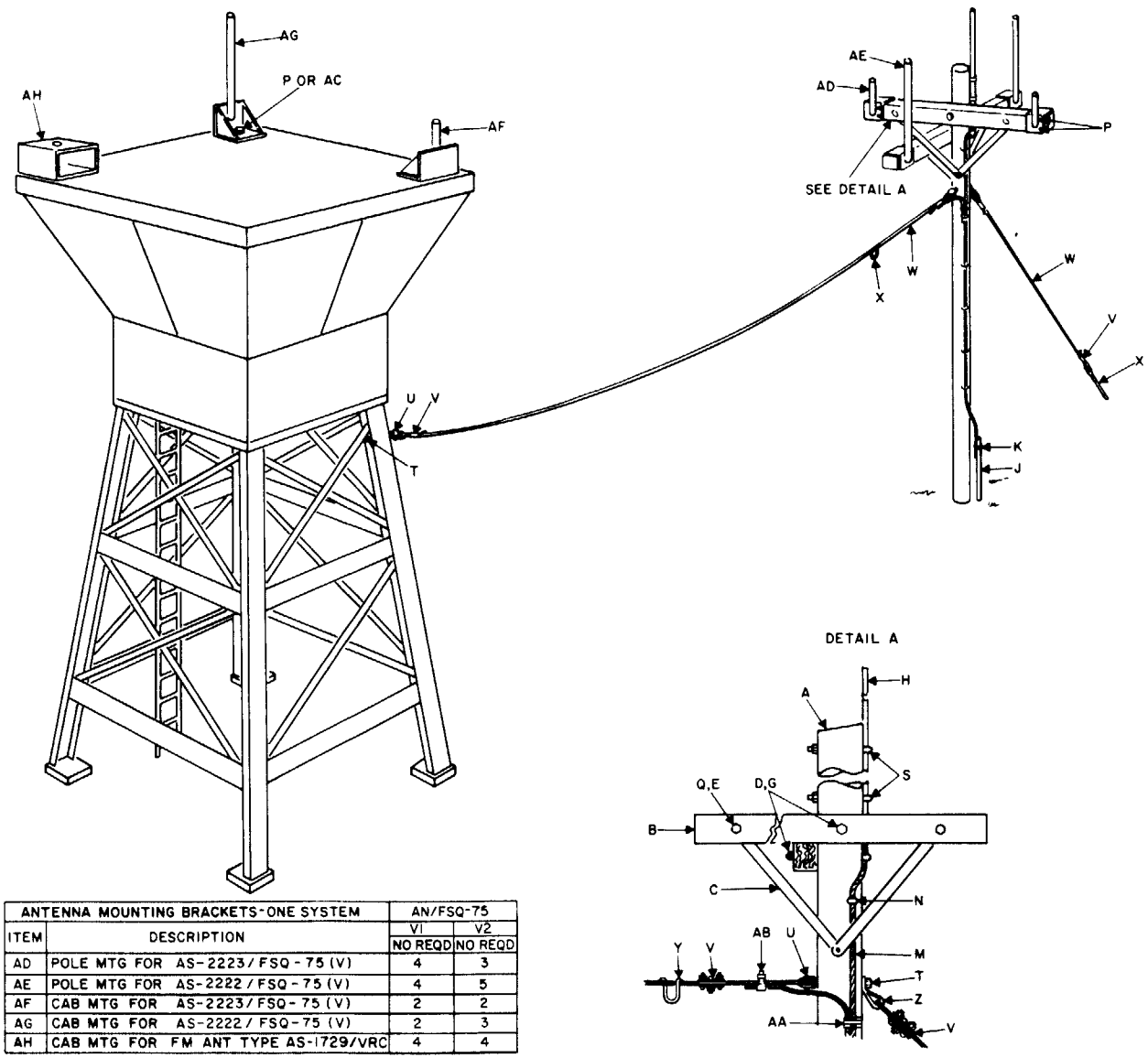
(14) Connect the wind direction transmitter to its adapter; check to see that the scribed line on the body of the transmitter is lined up with the scribed line on the adapter.

(15) Inside the control tower cab, connect P301 and P302 to J301 and J302, respectively (fig. 2-16).

d. Installation of Antennas. As shown in figures 2-3 and 2-4, antennas are mounted either on poles, or on the control tower roof. Normally, transmitting antennas are polemounted, and receiving antennas are atop the control tower. Installation of the antennas consists cf assembling each individual antenna, attaching it to the appropriate antenna mounting bracket or mast, and connecting the coaxial lead-in to the shelter bulkhead connector or the antenna entrance insulator. The coaxial lead-ins to the individual receivers and transmitters from the bulkhead connector or antenna entrance insulators are prefabricated and installed within the equipment shelter as a part of the shelter interconnecting cabling (fig. 51). Antenna mounting brackets or supports are installed as shown in figures 2-3 and 24. The shelter bulkhead connector pael nis shown in figures 2-5 and 2-6. Each antenna jack is identified as to the transmitter or receiver it feeds. Because the fm antenna serves both a transmit and receive function, only one antenna jack is required. Additionally, some of the vhf and uhf receiving antennas serve two receivers. These are identified at the shelter bulkhead connector panel. Inside the equipment shelter, the coaxial cable from the two receiver connectors is fed through a tee connector (fig. 5-1(2)) to the two receivers. Each antenna lead-in should be raised off the ground on poles, if possible, to minimize damage which might result from lying unprotected on the ground. Antenna lead-ins should be taped to a support near the coaxial connector to relieve tension on the connector. A drip loop in the cable is advisable to prevent water from affecting the connectors.

(1) *Installation of vhf antennas* (fig. 2-8 and 2-9). Install the vhf antennas as follows:

(*a*) Top radiating element E101 and insulator E102 are inverted when shipped. Remove the three 1 3/4-inch bolts that hold the

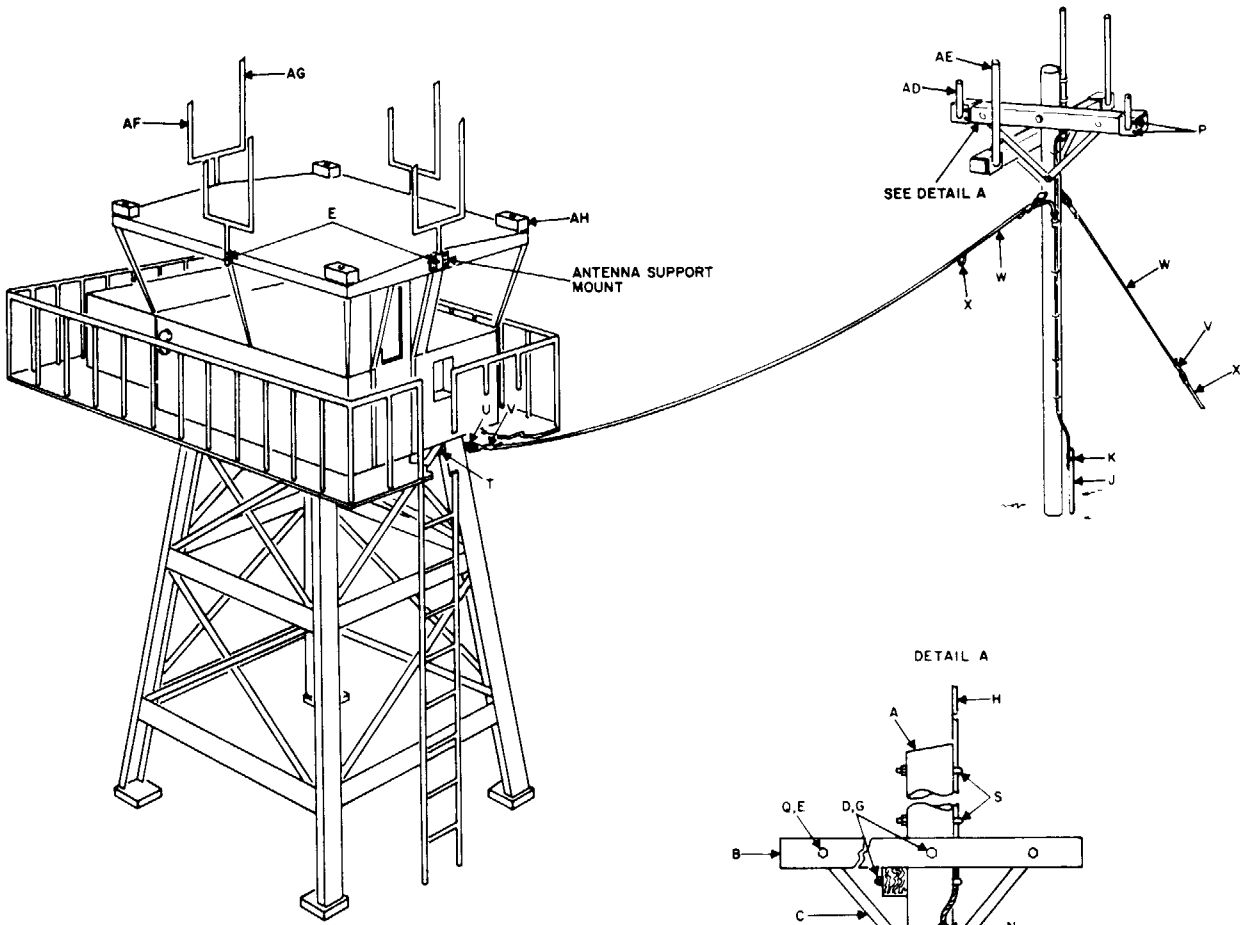


MATERIAL LIST FOR ONE SYSTEM		
ITEM	NO REQD	DESCRIPTION
A	2	POLE, 30' TO 50' (FURNISHED AND ERECTED BY ARMY)
B	4	CROSSARM, FIR, 3-1/2" X 4-1/2" X 5'-7"
C	8	BRACE, CROSSARM, FLAT, 1-1/4" X 1/4" X 28", JOSLYN J-7128
D	4	BOLT, MACHINE, 5/8" X 12" W/NUT, JOSLYN J-8812
E	8	BOLT, CARRIAGE, 3/8" X 4-1/2" W/NUT, JOSLYN J-8634 1/2
F	4	SCREW, LAG, 1/2"X4" LG, JOSLYN J-8754
G	14	WASHER, SQUARE, 2-1/4" X 2-1/4" X 3/16" W/3/16 HL JOSLYN J-1076
H	2	ROD, LIGHTNING, COPPERWELD STEEL, 1/2" X 10', JOSLYN J-8330
I	2	CLAMP, LIGHTNING ROD, 1/2" JOSLYN J-8491 AB
J	2	ROD, GROUND, COPPERWELD STEEL, 5/8" X 10', JOSLYN J-8338
K	2	CLAMP, GROUND ROD, 5/8" JOSLYN J-8492 AB
M	100'	GROUND WIRE, NO 6, SOFT DRAWN BARE COPPER
N	100	STAPLES, STEEL, 3/16" INSIDE 1-1/2" LG, JOSLYN J-1671
P	32	BOLT, MACHINE, 3/8" X 5" W/NUT, JOSLYN J-8605
Q	68	WASHER, ROUND, 1" OD W-7/16" HOLE, JOSLYN J-1084
S	4	J-BOLT, STL, COLD ZINC COATED 3/8" X 7", W/NUT
T	4	BOLT, MACHINE, 5/8" X 10" W/NUT JOSLYN J-8810
U	4	NUT, THIMBLEYE, 5/8" JOSLYN J-6510
V	8	GUY CLAMP, 3 BOLT, 6" LONG JOSLYN J-931
W	400'	WIRE, GUY STL GALV 3/8" 7-STR SM., CLASS A
X	2	ANCHOR, SCREWTYPE, 3/4" X 5'6" 6" DIA. SCR., JOSLYN J-6526
Y	80	CABLE RING, NATIONAL, REG. 1-1/2" RING SIZE
Z	2	GUY ATTACHMENT, ONE BOLT, JOSLYN J-6502
AA	2	CONNECTOR, NO 6 COPPER TO COPPER, JOSLYN J-3606
AB	2	CONNECTOR, NO 6 COPPER TO 3/8" STL STRAND JOSLYN J-3610
AC	36	SCREW, LAG, 3/8" X 3", JOSLYN J-8743
		SEALANT, SILICON CONSTR TYPE, G.E. NO SE-1202
		CAULKING GUN

ANTENNA MOUNTING BRACKETS-ONE SYSTEM		AN/FSQ-75	
		V1	V2
ITEM	DESCRIPTION	NO REQD	NO REQD
AD	POLE MTG FOR AS-2223/FSQ-75 (V)	4	3
AE	POLE MTG FOR AS-2222/FSQ-75 (V)	4	5
AF	CAB MTG FOR AS-2223/FSQ-75 (V)	2	2
AG	CAB MTG FOR AS-2222/FSQ-75 (V)	2	3
AH	CAB MTG FOR FM ANT TYPE AS-1729/VRC	4	4

TM5895-590-10-57

Figure 2-3. Typical antenna mounting details, AN/FSQ-75(V)1 and AN/FSQ-75(V)2.



ANTENNA MOUNTING BRACKETS-ONE SYSTEM		AN/FSQ-75(V)3
ITEM	DESCRIPTION	NO REQD
AD	POLE MTG FOR AS-2223/FSQ-75(V)	3
AE	POLE MTG FOR AS-2222/FSQ-75(V)	5
AF	CAB MTG FOR AS-2223/FSQ-75(V)	2
AG	CAB MTG FOR AS-2222/FSQ-75(V)	3
AH	CAB MTG FOR FM ANT TYPE AS-1729/VRC	4

MATERIAL LIST FOR ONE SYSTEM		
ITEM	NO REQD	DESCRIPTION
A	2	POLE, 30' TO 50' (FURNISHED AND ERECTED BY ARMY)
B	4	CROSSARM, FIR, 3-1/2" X 4-1/2" X 5'-7"
C	8	BRACE, CROSSARM, FLAT, 1-1/4" X 1/4" X 28", JOSLYN J-7128
D	4	BOLT, MACHINE, 5/8" X 12" W/NUT, JOSLYN J-8812
E	12	BOLT, CARRIAGE, 3/8" X 4-1/2" W/NUT, JOSLYN J-8634 1/2
F	4	SCREW, LAG, 1/2"X4" LG, JOSLYN J-8754
G	14	WASHER, SQUARE, 2-1/4" X 2-1/4" X 3/16" W/3/16 HL JOSLYN J-1076
H	2	ROD, LIGHTNING, COPPERWELD STEEL, 1/2" X 10', JOSLYN J-8330
I	2	CLAMP, LIGHTNING ROD, 1/2" JOSLYN J-8491 AB
J	2	ROD, GROUND, COPPERWELD STEEL, 5/8" X 10, JOSLYN J-8338
K	2	CLAMP, GROUND ROD, 5/8" JOSLYN J-8492 AB
M	100'	GROUND WIRE, NO 6, SOFT DRAWN BARE COPPER
N	100	STAPLES, STEEL, 3/16" INSIDE 1-1/2" LG, JOSLYN J-1671
P	32	BOLT, MACHINE, 3/8" X 5" W/NUT, JOSLYN J-8605
Q	68	WASHER, ROUND, 1" OD W-7/16" HOLE, JOSLYN J-1084
S	4	J-BOLT, STL, COLD ZINC COATED 3/8" X 7", W/NUT
T	4	BOLT, MACHINE, 5/8" X 10" W/NUT JOSLYN J-8810
U	4	NUT, THIMBLEYE, 5/8" JOSLYN J-6510
V	8	GUY CLAMP, 3 BOLT, 6" LONG JOSLYN J-931
W	400'	WIRE, GUY STL GALV 3/8" 7-STR SM., CLASS A
X	2	ANCHOR, SCREWTYPE, 3/4"X5'6" 6" DIA. SCR., JOSLYN J-6526
Y	80	CABLE RING, NATIONAL, REG. 1-1/2" RING SIZE
Z	2	GUY ATTACHMENT, ONE BOLT, JOSLYN J-6502
AA	2	CONNECTOR, NO 6 COPPER TO COPPER, JOSLYN J-3606
AB	2	CONNECTOR, NO 6 COPPER TO 3/8" STL STRAND JOSLYN J-3610
AC	36	SCREW, LAG, 3/8" X 3", JOSLYN J-8743
		SEALANT, SILICON CONSTR TYPE, G.E. NO SE-1202
		CAULKING GUN

TM5895-590-10-93

Figure 2-4. Typical antenna mounting details, AN/FSQ-75(V)3 only.

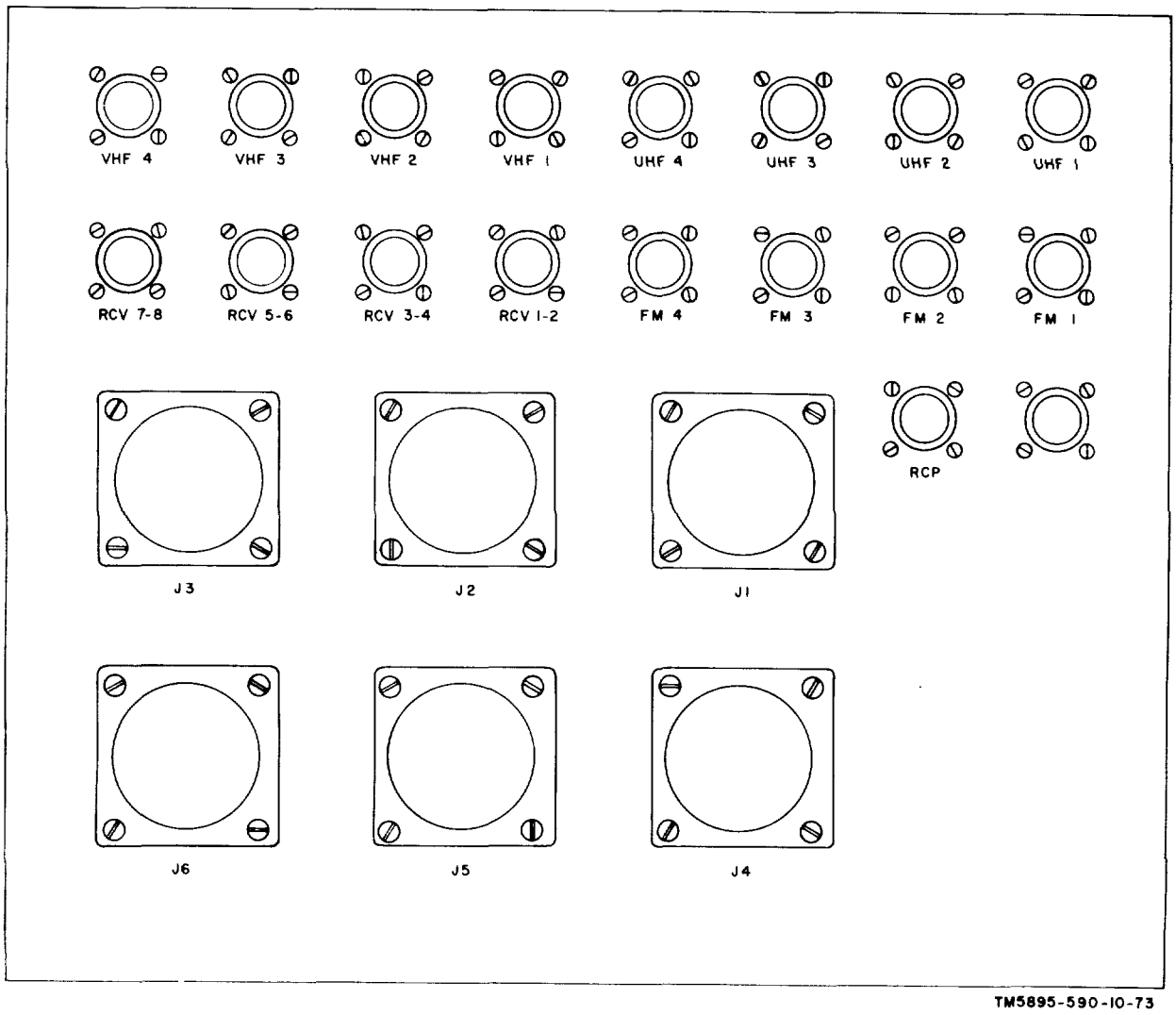


Figure 2-5. AN/FSQ-75(V)1 shelter bulkhead connector panel.

upper (radiating) assembly to the lower section of the vhf antenna. Reverse this upper portion so that connector J101 is facing down.

(*b*) Thread Cable Assembly, Radio Frequency CG-3450/FSQ-75(V) through straight coupling MP109 and the mounting pipe (part of E103) which make up part of the lower antenna section.

(*c*) Attach the coaxial cable connector to mating connector J101 at the bottom of the upper antenna section.

(*d*) Attach the upper assembly to the lower section by inserting and securing the three 1 3/4-inch bolts (fig. 2-9) through ceramic insulator E102.

(*e*) Run the coaxial cable from the vhf antenna down the pipe mast. Attach the vhf antenna to the pipe mast by straight pipe coupling MP109. Connect the free end of the coaxial cable to the jack of the associated communications receiver or transmitter at the shelter bulkhead connector panel (fig. 2-5 or 2-6).

(*f*) Repeat (*a*) through (*e*) above for each vhf antenna.

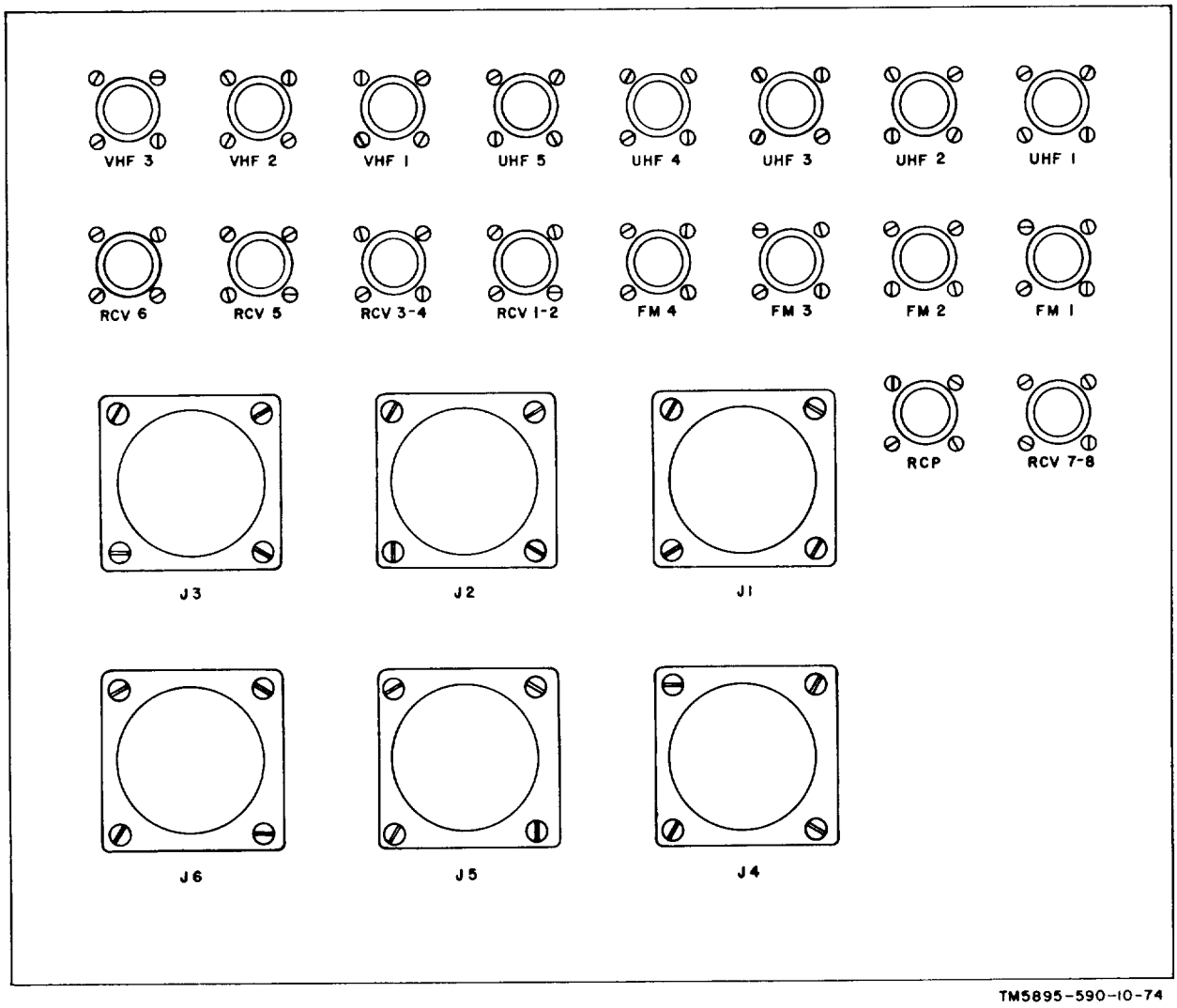


Figure 2-6. AN/FSQ-75(V)2 shelter bulkhead connector panel.

(2) *Installation of uhf antennas* (fig. 2-10). Install the uhf antennas as follows:

(*a*) Remove the uhf antenna from the shipping container and screw the eight elements (rods) into the hub of the uhf antenna.

(*b*) The antenna is mounted on a bracket or mast as shown in figure 2-3 or 2-4. Run the coaxial cable to the uhf antenna, through the applicable mast, and attach it to the UG-680/U connector at the uhf antenna.

(*c*) Set the uhf antenna onto the mast and tighten the three setscrews that secure the antenna hub to the mast.

(*d*) Connect the free end of the coaxial cable to the jack of the associated communications receiver or transmitter at the shelter bulkhead connector panel (fig. 2-5 or 2-6).

(*e*) Repeat (*a*) through (*d*) above for each uhf antenna.

(3) *Installation of ssb antennas* (fig. 2-11). Install the ssb antennas as follows:

(*a*) Fabricate an ssb antenna as shown in figure 2-11. Pull the wire taut before final tightening of the clamps at each end of the wire.

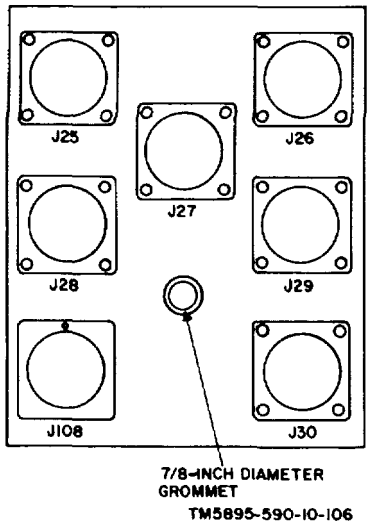


Figure 2-7. Control tower bulkhead connector panel AN/FSQ-75(V) 3 only.

(*b*) Connect the free end of the ssb antenna lead to the antenna entrance insulator feedthrough terminal, and the clevis to the shelter lift ring on the curbside wall of the equipment shelter.

(*c*) Repeat (*a*) above for the second ssb antenna.

(*d*) Connect the free end of the antenna lead to the antenna entrance insulator feedthrough terminal, and the clevis to the shelter lift ring on the roadsitie wall of the equipment shelter.

(4) *Installation of If antenna* (fig. 212). Install the If antenna as follows:

(*a*) Assemble the If antenna mounting as shown in figure 2-12.

(*b*) After the mounting bolts have been tightened securely, the antenna receptacle in the upper hemisphere can be adjusted to a vertical position by the angle bolt and nut.

(*c*) Loosen the screw in the center stud and slide the lead clip of the center conductor of Cable Assembly, Radio Frequency CG3469/U under the washer. Tighten the screw.

(*d*) Attach the shield braid to the grounding clip. Ground the clip at one of the mounting screws.

(*e*) Connect the other end of Cable Assembly, Radio Frequency CG-3469/U to the RCP jack on the shelter bulkhead connector panel (fig. 2-5 or 2-6).

(*f*) Screw the 102-inch whip antenna securely into the antenna receptacle in the upper hemisphere and tighten the locknut.

(5) *Installation of fm antennas*. Four fm antennas (AS-1729/VRC) must be installed to operate the four fm transceivers. These fm antennas will normally be mounted either on the top four corners of the control tower cab or on handrails affixed to the control tower supporting structure, depending on the particular installation. Mounts are supplied for required installation. See TM 11-5820-401-20 for installation instructions for for the fm antennas.

Note.

Aerological Measuring Set ML-629/FSQ-75 (V) is used with all three models of the AN/FSQ75(V) (*); however, the control tower cab furnished with the AN/FSQ-75(V)3 is prewired to route signals from the connectors of the windspeed and direction transmitters (mounted in the flare gun turret mount) to the aerological panel assembly in console 2. Therefore, installation procedures are different from those given in c above for this equipment when it is mounted on the control tower cab furnished with the AN/FSQ75 (V) 3.

e. Installation of Aerological Equipment. The aerological equipment consists of windspeed and wind direction transmitters, a windspeed and wind direction indicator, a power supply and distribution assembly, and an altitude setting barometer. Installation of the windspeed and wind direction transmitters is described in this manual; all other components are mounted in the aerological panel assembly and are installed in the console group before shipment. The location of the windspeed and direction transmitters will vary (AN/FSQ-75(V)1 and AN/FSQ-75(V)2) depending on local site conditions, but will normally be on the control tower roof. Typical mounting arrangements are shown in figure 2-13 and 2-14. The transmitters must be installed in an area free from wind-deflecting obstruction in all directions to provide accurate indications. Location of the cup wheel and the wind vane must insure that these units are not subjected to erratic wind conditions. A 50-foot length of seven-conductor cable is supplied to intercon-

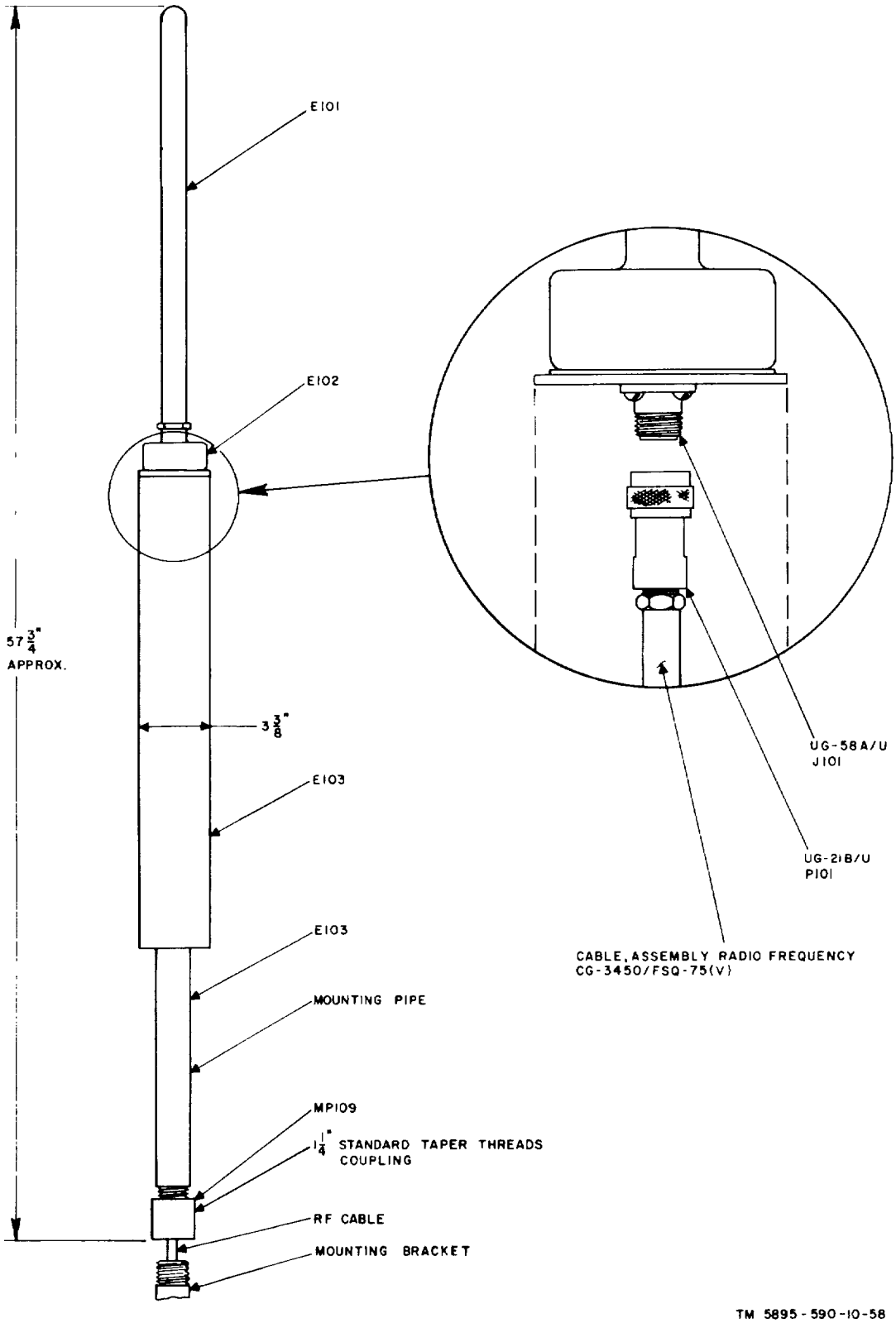


Figure 2-8. Vhf antenna mounting details.

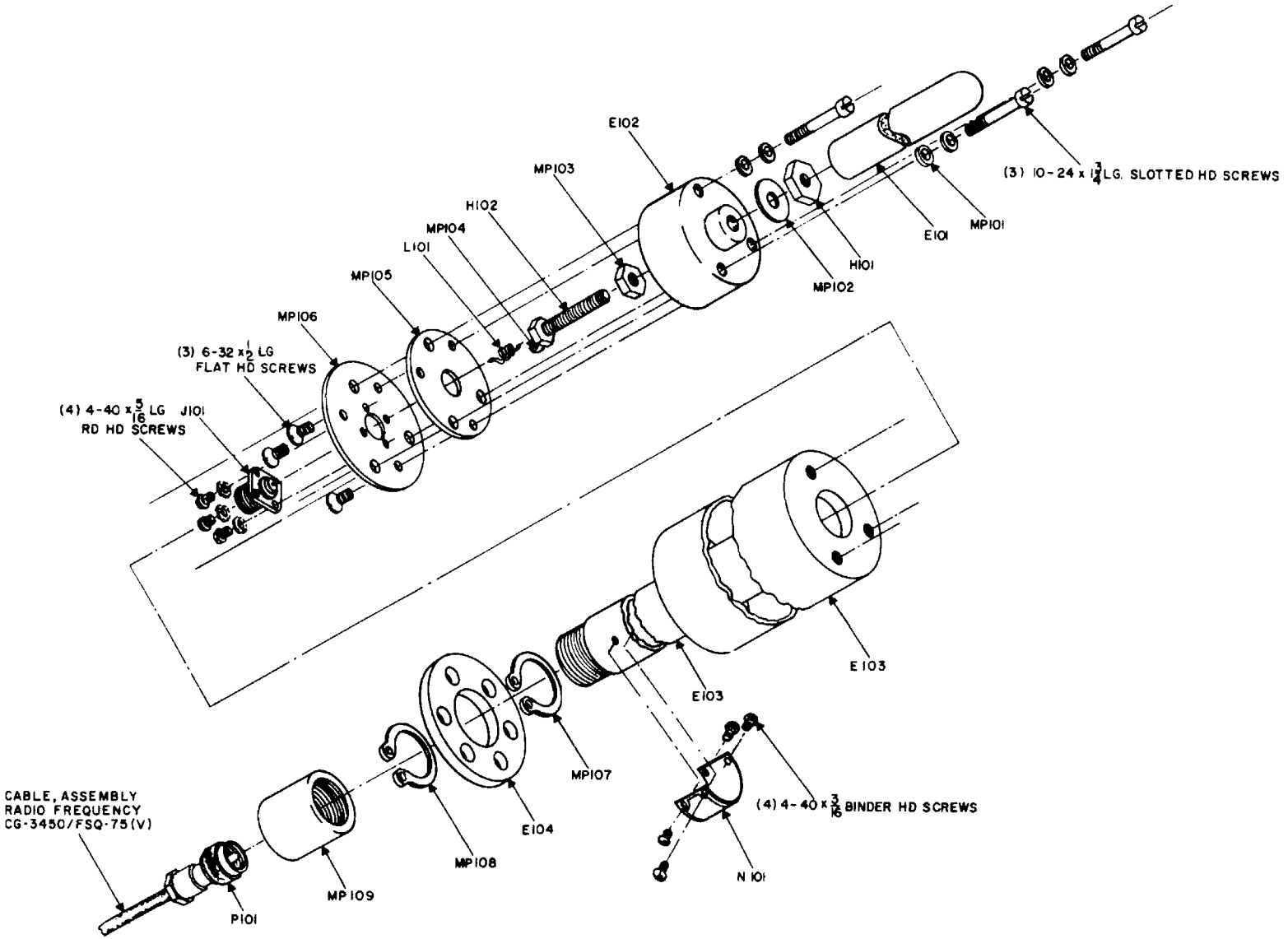


Figure 2-9. Vhf antenna component assembly.

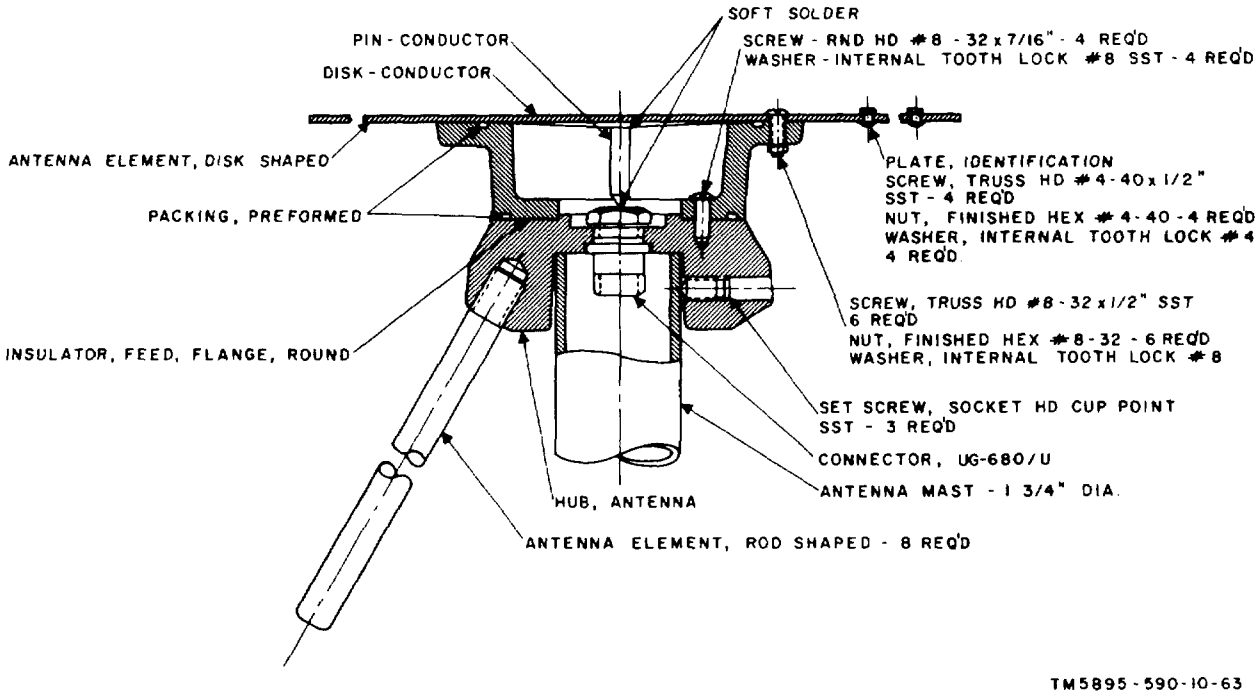


Figure 2-10. Uhf antenna assembly and mounting details.

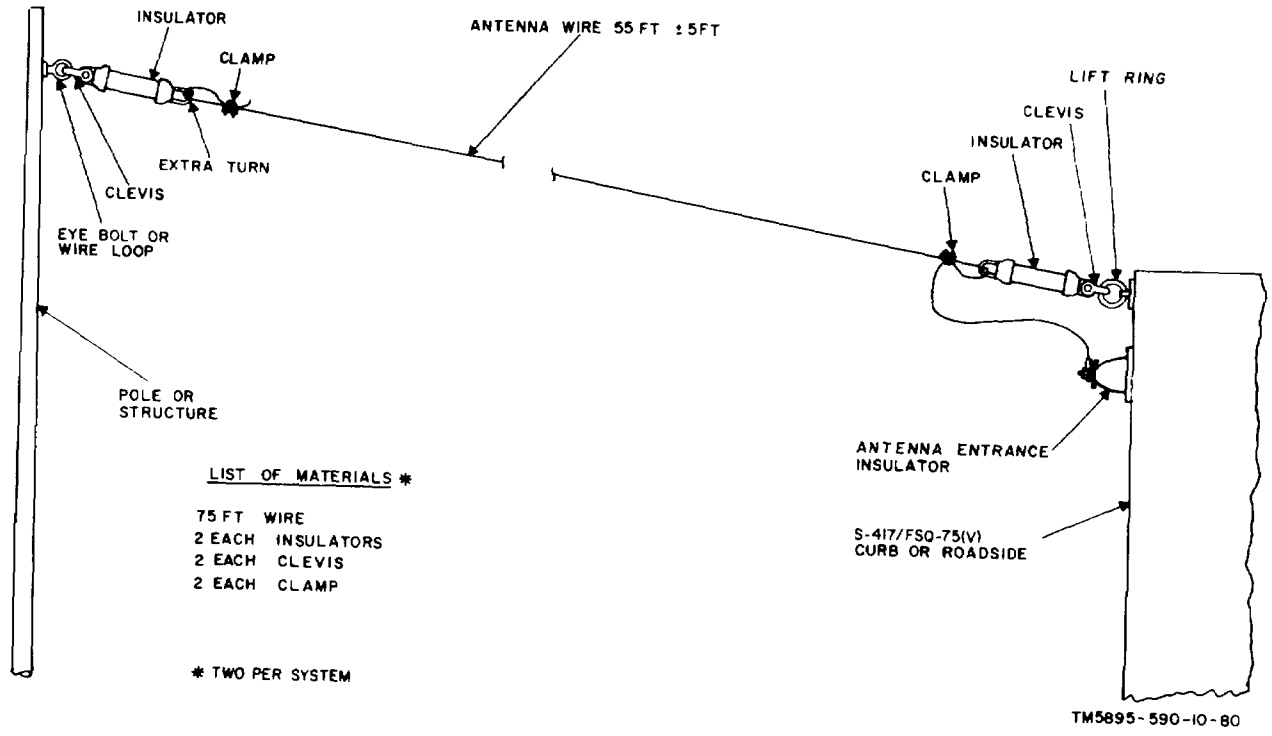


Figure 2-11. Ssb antenna installation.

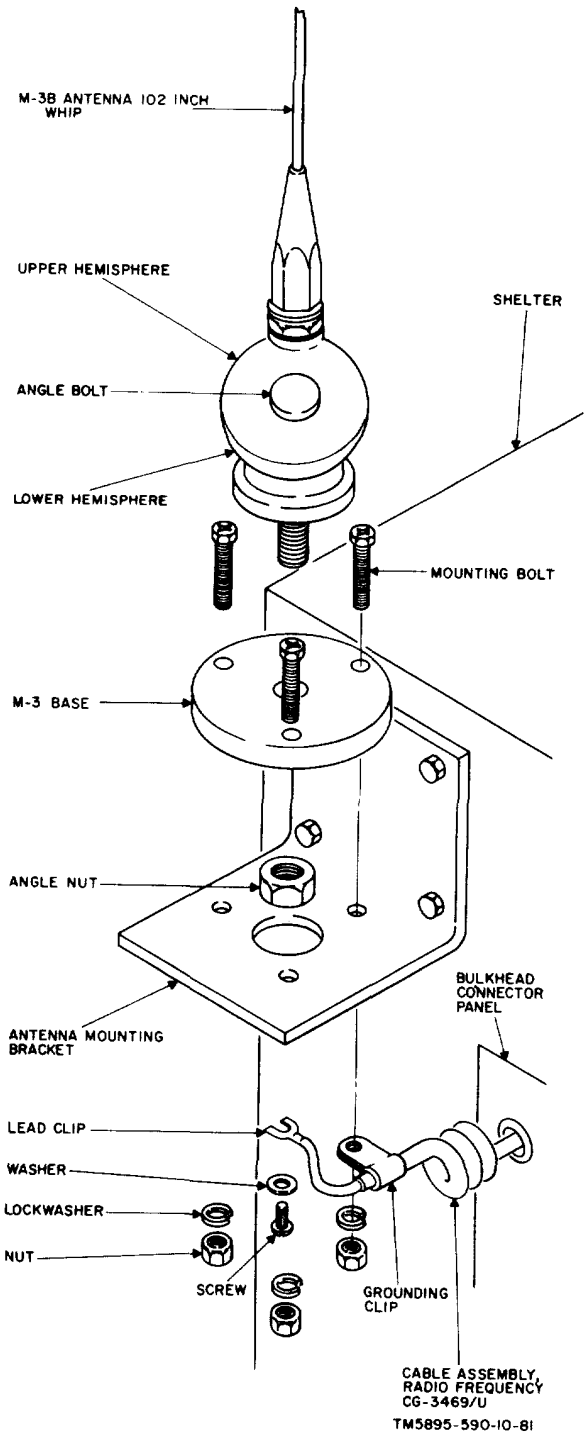


Figure 2-12. Lf antenna assembly and installation.

nect the transmitters and associated indicators mounted in console 2 in the control tower; however, this cable length is not a limitation if conditions necessitate greater separation. A longer cable may be used provided the loop resistance of the windspeed transmitter-indicator circuit does not exceed 4.6 ohms. Maximum distances recommended with several common wire sizes are: 10-gauge wire, 2,000 feet; 12-gauge wire, 1,500 feet; 14-gauge wire, 1,000 feet; and 16-gauge wire, 500 feet. Any cable splices must be soldered and taped. To reduce radio interference and afford mechanical protection to the conductors, the conductors should be run through conduit and the transmitter supporting masts electrically grounded.

(1) *Windspeed transmitter*.

(*a*) Be careful in unpacking the cup wheel and the transmitter body; this is especially important in the case of the cup wheel which can be easily thrown out of balance and calibration if subjected to rough handling.

(*b*) Inspect the components for loose screws and possible damage in shipment. Remove the adapter from the lower housing shell (fig. 2-13) and install the adapter on the supporting pipe.

(*c*) Use the two lengths of conductor cord soldered to the adapter connector to splice it to the connecting cable when that cable is installed.

(*d*) With the adapter installed, remove the capnut from the top of the transmitter body shaft and place the cup wheel in position on the shaft. Tighten the lateral setscrew in the cup wheel hub and replace the capnut firmly.

(*e*) Place the transmitter on the adapter and rotate until proper engagement of the coupling connectors takes place, indicated by a sudden lowering of the transmitter body to its full seated depth on the adapter. Lock the transmitter body in place on the adapter by tightening the hexagonal lockscrews in the body.

(2) *Wind direction transmitter*. Be careful in unpacking the wind vane and the transmitter body which make up the wind direction

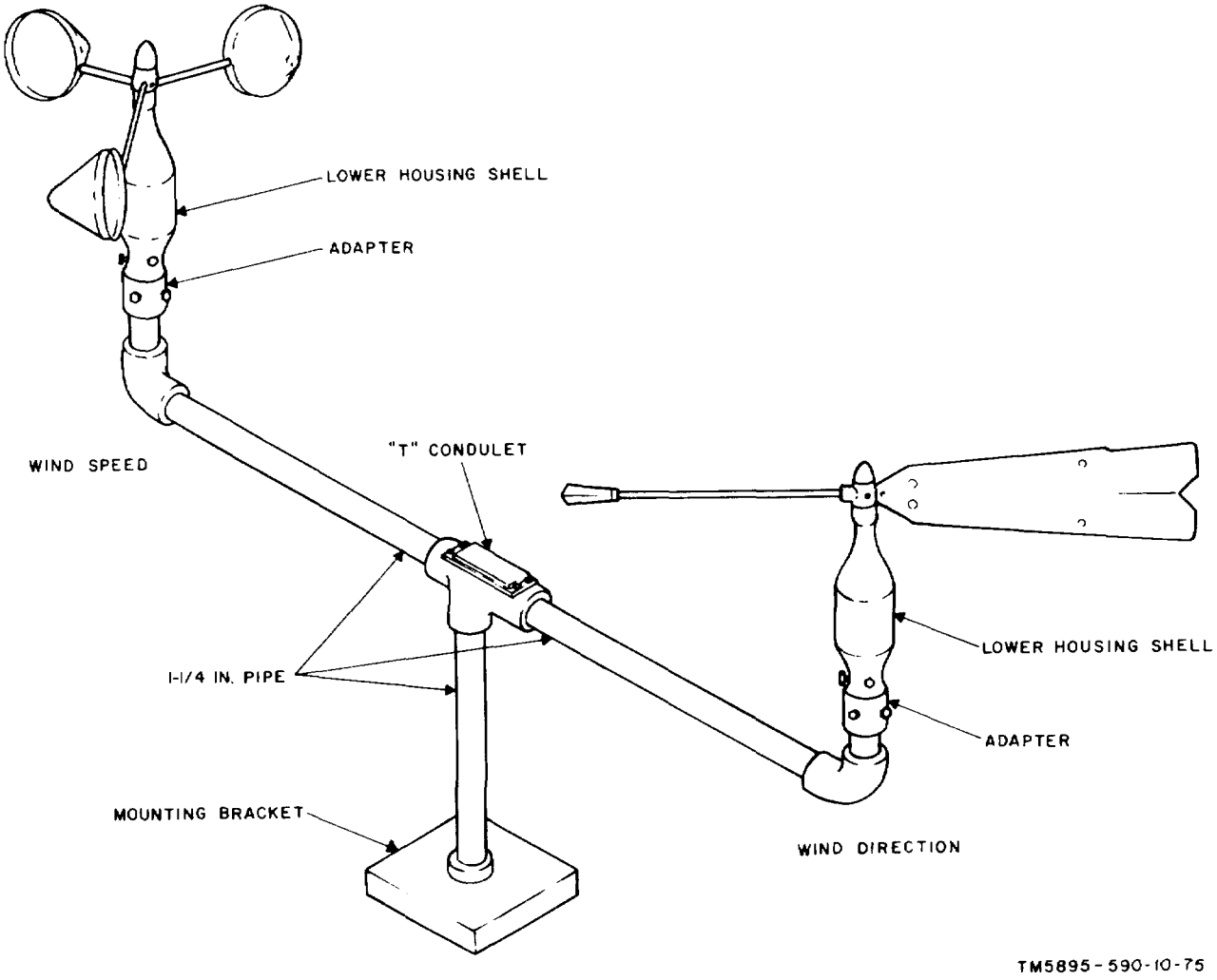


Figure 2-13. Windspeed and wind direction transmitters mounting details.

transmitter; this is particularly important in the case of the wind vane which can easily be misaligned if subjected to rough handling.

(*a*) Inspect the equipment for loose screws and possible damage in shipment. Remove the adapter from the lower housing shell and place it on the supporting mast (fig. 2-13).

(*b*) Rotate the adapter until the orientation mark scribed on the side of the adapter is adjacent to either true or magnetic north, depending on station operating directives. Lock the adapter firmly in place with the two hexagonal capscrews.

(*c*) Use the five-conductor cable attached to the adapter to splice to the main connecting cable, as outlined in windspeed transmitter installation instructions. Wires are lettered A through E; splice like-lettered wires to each other.

(*d*) Remove the capnut from the transmitter shaft and place the wind vane in position on the shaft. Tighten the locking screw on the wind vane hub; be sure that the screw grips firmly on the flat side of the transmitter shaft.

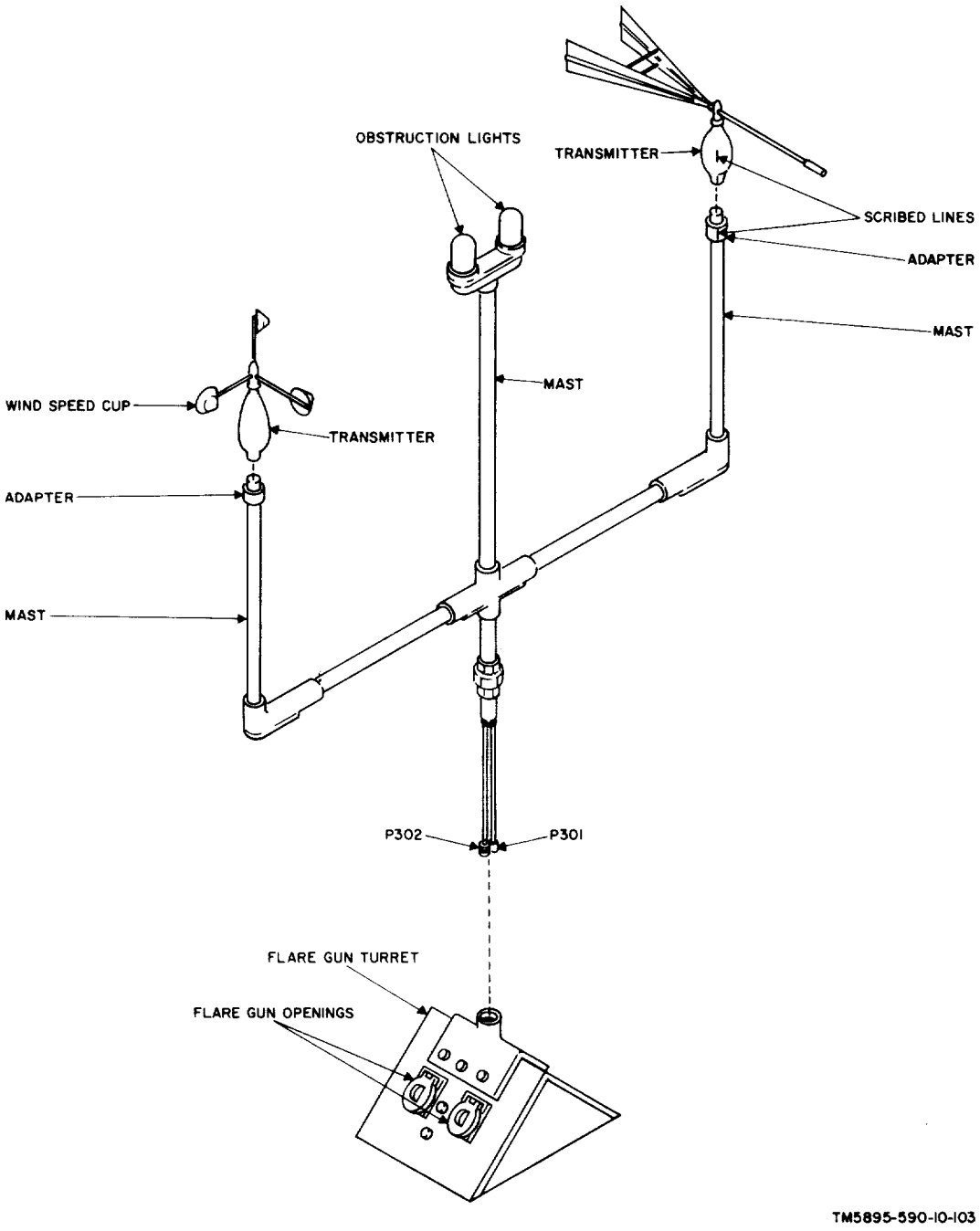


Figure 2-14. Wind equipment support installation AN/FSQ-75(V)3 only.

(*e*) Replace the capnut and tighten it securely. Check the alignment of the vane tail.

Note.

If the vane tail is unsymmetrical or skewed with respect to the arrow of the vane, correct the deformity by gradually applying pressure to the tip of the tail until yielding is observed at the point where the ail is secured to the arrow. Do not bend the tail sharply at this point; form a smooth curve by applying small successive pressures.

(*f*) Mount the transmitter on the adapter and secure it to the adapter as described for the windspeed transmitter in

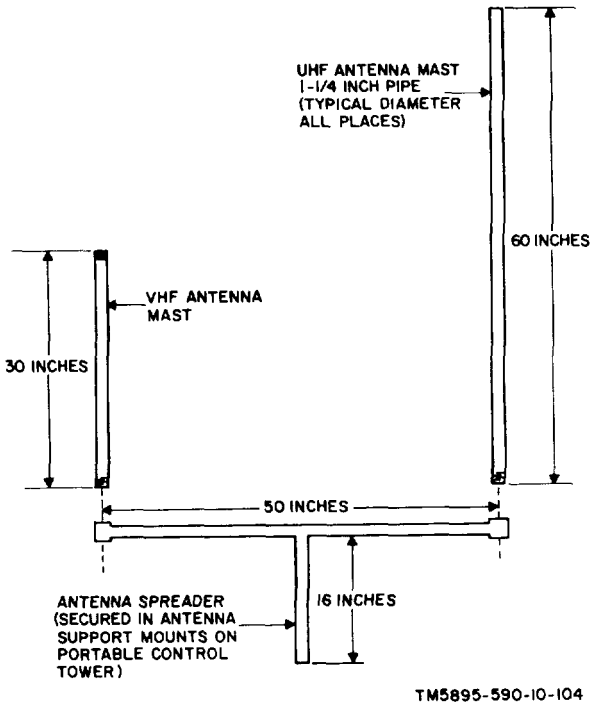


Figure 2-15. Antenna support installation AN/FSQ-75(V)3 only.

stallation ((1)(*e*) above). In this case, however, the alignment marks on the transmitter body will match the mark on the adapter when properly positioned for engagement of the coupling connectors, and the transmitter will be properly oriented.

(*g*) Securely tighten the locking screws to secure the transmitter body to the adapter.

(3) *Connections at transmitters.*

(*a*) Pull the wires attached to the transmitters through their supporting masts to the T-condulet on the mounting (fig. 2-13).

(*b*) Splice the wires at this point to the main seven-conductor cable. Wires are identified by letters A through G; connect wires to each other.

(*c*) Route the main cable into the control tower to the vicinity of console 1. The free end of this cable will be connected during installation of the console group.

f. Installation of Ground Rods. Ground rods must be installed at appropriate locations before power is connected to any equipment. Select grounding sites that will not interfere

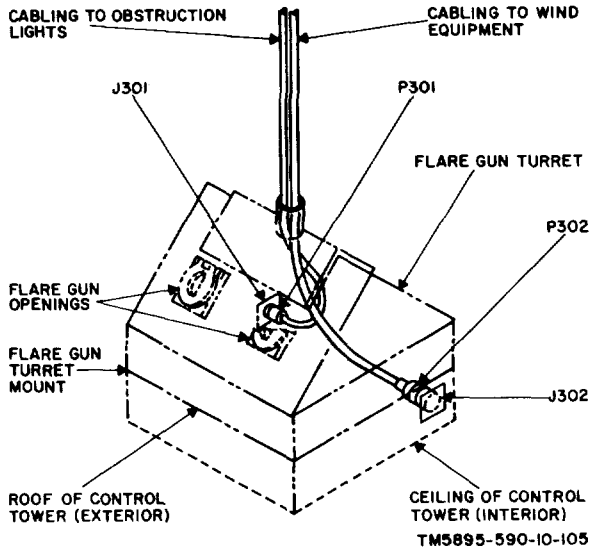


Figure 2-16. Flare gun turret mount, interior stew AN/FSQ-75(V) 3 only.

with entrance doors, telephone wires, or power cables. Ground rods should be installed as follows:

(1) Select the lowest, dampest site within 10 feet of the equipment ground connection point, preferably in clay or loamy soil, and scoop out a small hole about 6 inches deep.

(2) Remove any paint or grease from the ground rod.

(3) Drive the ground rod into the hole until it extends approximately 12 inches above ground level.

(4) Saturate the ground around the rod with water.

(5) Prepare an appropriate length of ground cable.

(6) Connect one end of the ground cable to the ground rod and the other end to the ground connection point on the equipment to be grounded.

g. Installation of Cabling Between Control Tower and Equipment Shelter. Six 100-foot cable assemblies, terminated with connectors, carry all audio, control signals, and dc power between the equipment shelter and the control tower. The six individual cable assemblies are enclosed in zipper tubing before installation and connection. Prepare the cable assemblies for installation as follows:

(1) Locate a clear area which will allow uncoiling of the cable assemblies to their full length and group them together.

(2) Starting at a point 18 inches from one end, install the zipper tubing around the cable assemblies as shown in figure 2-17. Be sure to leave enough cable end open to allow the cables to be separated sufficiently to reach all connectors at the control tower and equipment shelter bulkhead connector panels.

(3) Equipment shelter bulkhead connector panels are shown in figures 2-5 and 2-6 for the AN/FSQ-75(V)1 and the AN/FSQ-75(V)2, respectively. Their location is indicated in figure 1-25. Figure 2-7 shows the AN/FSQ-75(V)3 control tower bulkhead connector panel; its location is indicated in figure 120. The 7/8-inch grommet located on the control tower cab bulkhead connector panel is provided for routing telephone wires to the common equipment box, and the speaker wire from the alarm/pa system. Jack J108 mates with P3 of cable F (fig. 2-2) and connects to the engine generator remote control panel in the control tower cab (fig. 1-4). The remaining jacks on the control tower bulkhead connector panel mate with cables interconnecting the tower bulkhead connector panel and the shelter bulkhead connector panel (fig. 2-2). Interconnect the control tower bulkhead connector panel and the equipment shelter bulkhead connector panel as follows (fig. 2-1 and 2-2):

(*a*) Cable Assembly, Special Purpose, Electrical CX-10859/FSQ-75(V) between jacks J1 of the equipment shelter and J25 of the control tower.

(*b*) Cable Assembly, Special Purpose, Electrical CX-10860/FSQ-75 (V) between jacks of J2 of the equipment shelter and J26 of the control tower.

(*c*) Cable Assembly, Special Purpose, Electrical CX-10861/FSQ-75(V) between jacks J3 of the equipment shelter and J27 of the control tower.

(*d*) Cable Assembly, Special Purpose, Electrical CX-10862/FSQ-75(V) between jacks J4 of the equipment shelter and J28 of the control tower.

(*e*) Cable Assembly, Special Purpose, Electrical CX-10863/FSQ-75 (V) between jacks J5 of the equipment shelter and J29 of the control tower.

(*f*) Cable Assembly, Special Purpose, Electrical CX-10864/FSQ-75(V) between jacks J6 of the equipment shelter and J30 of the control tower.

(*g*) On the AN/FSQ-75(V)3 only, connect P3 on cable, F from the power control cabinet to J108 at the control tower cab.

(4) Secure the cables to the control tower structure to eliminate strain on the connectors due to the weight of the cables.

h. Installation of Console Group OJ-67(V) 1/FSQ-75(V).

Note.

Console Group OJ-67(V)21/FSQ-75(V) is installed in the control tower cab (fig. 1-3) with all interconnecting cabling connected and the tower demarcation panel wiring connected to the control tower bulkhead connector panel; therefore, the installation instructions furnished below do not apply to the AN/ FSQ-75(V)3. If the power cord from console 5 is not connected at the time of delivery, plug it into the duplex ac outlet in the ac plugmold strip run along the control tower floor behind the console group. Also check to see that the power cord for the signal light gun transformer, located on the control tower floor behind console 5 (fig. 14), is plugged into a convenient ac duplex outlet on the ac plugmold along the control tower floor behind the console group.

(1) Installation of the console group consists of:

(*a*) Locating consoles 1 through 7 within the control tower.

(*b*) Interconnecting the individual console cabinets.

(*c*) Connecting the console group demarcation panel to the control tower bulkhead connector panel.

(*d*) Connecting ac power to the console group.

(*e*) Connecting the aerological equipment.

(2) During installation, refer to figure 5-2 for location of all units within the console group. The control tower configuration is variable from site to site; therefore, a detailed description of placement for the console group is not furnished. The main consideration in placement is to provide controller personnel with a clear field of view of the areas over

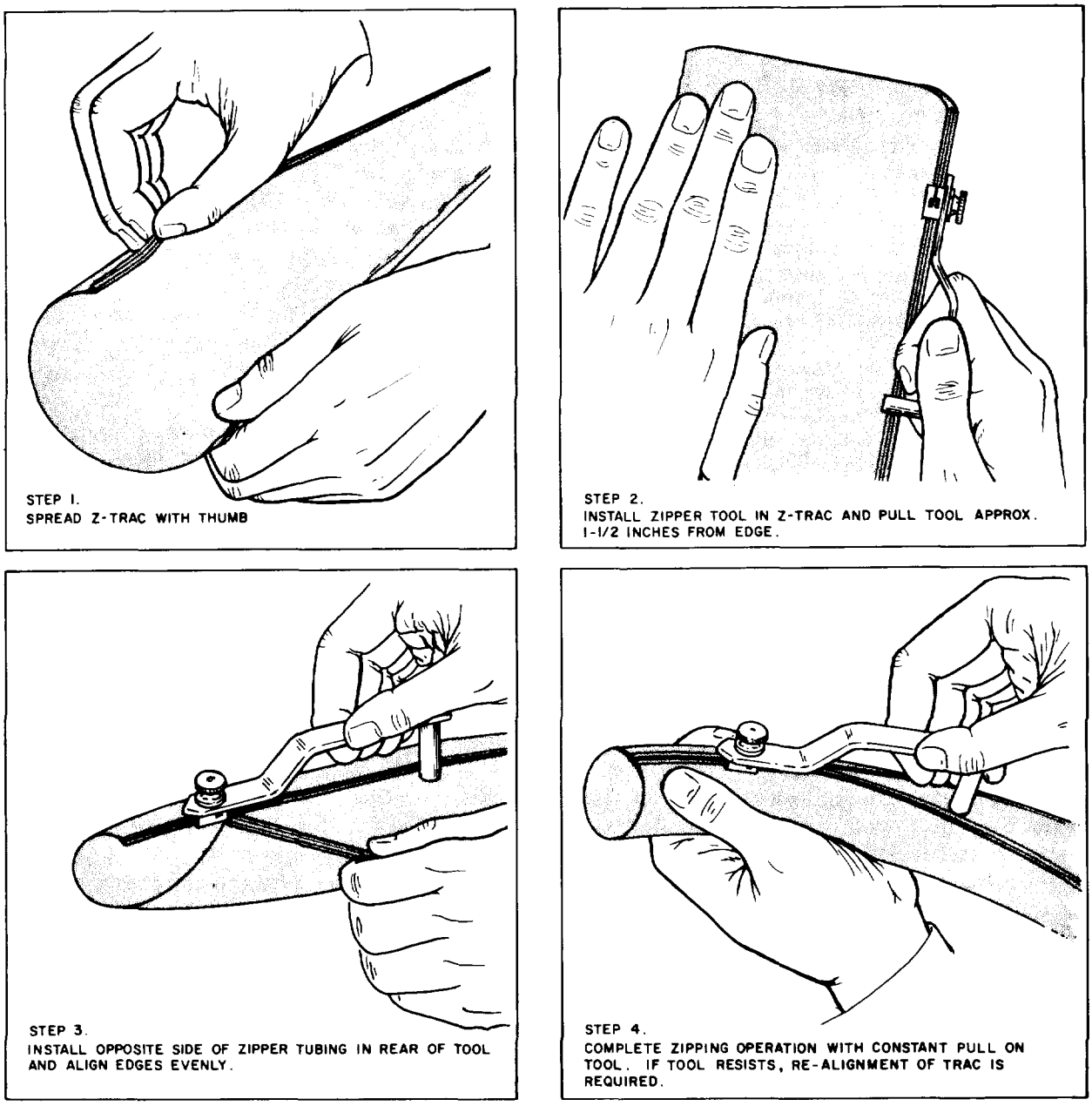


Figure 2-17. Installation of zipper tubing.

which they will exercise control. The console group must not be placed directly against a wall since blockage of the blower fan intakes at the rear of five individual consoles will impair operation. In general, 3 feet of unobstructed space is required between the rear of

the console group and any wall to provide good equipment ventilation and maintenance access. When a suitable location has been selected for the console group, locate the individual consoles as shown in figure 5-2.

(*a*) Group consoles 1 through 5 as indicated to provide two controller positions, and consoles 6 and 7 to provide the third controller position.

Note.

Reference designators have been assigned to each unit in the console group to facilitate identification. Each of the seven individual consoles within the group is identified by a number from 1 to 7. Each unit within the console is assigned a reference designator starting with Al and carrying through in consecutive order for all units within the console. For example, the receiver transformer panel in console 5 is identified as unit 5A5. The demarcation panel on the right side of console 5 is designated unit 5A8.

(*b*) Remove the front and rear cover panels on consoles 1 through 5 and bolt the consoles together. Repeat the procedure for consoles 6 and 7.

(*c*) Interconnect the individual consoles as shown in figure 5-2(2). All interconnection is made at the console side panels and involves connecting plugs from one console to the side panel jacks of the next console. Rear panels of each console must be removed to reach the connectors. Interconnection to controller position 3 is made between the jack panels at the rear of console 3 and the jack panel inside console 6 (fig. 5-2). Cable routing should not block access to the rear of the consoles.

(*d*) Attach the six 10-foot cables between console demarcation panel 5A8 (fig. 5-2) and the control tower bulkhead connector panel. Cables 1 through 6 attach to jacks J25 through J30, respectively, on this panel.

(*e*) Route the two ac power cables from the control tower power distribution panel to the twist-lock receptacles provided at the side of consoles 5 and 7 (not shown). A grounding plug is provided with the cable, eliminating the necessity of any additional ground cables.

(*f*) On consoles 1 through 5, interconnect the plugmold strips on adjacent consoles with the ac jumpers provided (not shown). Also interconnect the plugmold strips of consoles 6 and 7.

(*g*) Route the cable for the aerological equipment, which had been brought to the vicinity of the console (*e*(3) (*c*) above), through the opening at the rear of console 1, and then into console 2. Connect the five leads (A, B, C, D, and E) from the wind direction transmitter to terminals A, B, C, D, and E on terminal board TB1 (power supply and distribution assembly) (fig. 5-2) in console 2. Connect the two leads marked A and B from the windspeed transmitter to terminals F and G of TB1, respectively.

(*h*) Connect the ac power cord of terminal board TB1 (power supply and distribution assembly) into the plugmold strip at the rear of console 2.

i. Installation of Connecting Group, Telephone AN FCA-17. Components of the connecting group are installed in the consoles when delivered. For the AN/FSQ-75(V)1 and AN/FSQ-75(V)2 systems, installation consists of locating and mounting the signal entrance box and attaching interconnecting cables. The signal entrance box may be mounted either on an interior or exterior tower wall. Access to incoming telephone lines and length of interconnecting cabling is the primary consideration. Installation consists of attaching the entrance box to the wall at an appropriate location using the four mounting lugs provided. When the signal entrance box has been securely mounted, proceed with installation of the connecting group as described in TM 11-5805-467-12. For the AN/FS075(V)3 system, the signal entrance box is located on an interior wall (fig. 1-4). Interconnecting cabling within the control tower is installed when the system is delivered for use. Installation consists only of connecting the FSQ-75(V)3 system, the signal entrance box and routing the cabling through the grommet in the tower bulkhead connector panel to the desired remote locations. Refer to TM 11-5805-467-12 for specific wiring instructions.

j. installation of Power Equipment.

Caution:

Check to see that all circuit breakers and/or switches on the power control cabinet, booth engine generators, the engine generator remote control panel, the control tower power distribution panel, and the equipment shelter power distribution panel are set to OFF before any power connections are made.

After placement of the power equipment (engine generators and power control cabinet) and installation of the ground rods, interconnect cables A through H and J and K, as shown on figure 2-1, when installing the AN/FSQ-75(V)1 and AN/FSQ-75(V)2 systems, and as shown in figure 2-2 when installing the AN/FSQ-75(V)3 system. All power cables are prefabricated with the required connectors on both ends. The engine generator remote control panel and the control tower power distribution panel locations are determined at the time of installation of the AN/FSQ-75(V)1 and AN/FSQ-75(V)2 systems because of variation in control tower configurations. The control tower power distribution panel must be mounted before connections are made. The engine generator remote control panel is provided with rubber mounting feet and may be placed at -any convenient location within the control tower. Cable F is run directly from J1 on the power control cabinet to the mating receptacle on the engine generator remote control panel. In the AN/FSQ-75(V)3, the power distribution panel is a part of the control tower cab (fig. 2-19(1)) and the engine generator remote control panel is bolted to the end of console 5 (fig. 14). Cable F runs from JI on the power control cabinet, and P3 on the opposite end of the cable mates with J108 on the control tower bulkhead connector panel (fig. 2-7). Five feet of 10-conductor cable connects J108 to P8, which mates with J8 on the engine generator remote control panel. Power cable A (fig. 2-2) (furnished with the control tower cab) connects between the POWER OUT receptacle on the equipment shelter directly to the power feedthrough receptacle on the control tower cab (fig. 1-21) and to the MAIN circuit breaker in the control tower power distribution panel. Figure 2-18 depicts the surface wiring system which distributes ac power to the various equipments within the equipment shelter. Figure 2-19 depicts the surface wiring system which distributes ac power within the control tower cab furnished with the AN/FSQ-75(V) 3.

k. Installation of Control Tower Cab (AN/FSQ-75(V)3 Only). The control tower cab is normally transported to the desired site on the trailer furnished with the AN/FSQ-75(V)3. When hoisting the tower cab into place on the supporting structure, perform the following general procedures.

(1) Disconnect the power connector (receptacle shown in fig. 1-20) which connects power to the tower cab from the towing vehicle.

(2) Disengage the trailer tiedown bolts from the tiedown rings on the control tower cab (fig. 1-20 and 1-21).

(3) Remove packaging material, as necessary to permit opening of the access door which covers the lifting sling and flare gun turret stowage area (fig. 1-22).

(4) Open the access door and remove the lifting sling.

(5) Close the access door and secure it by tightening the locking screws provided in the door.

(6) Note that four lifting hooks are a part of the lifting sling.

(7) Attach a lifting hook to each of the four lifting eyes which are a structural part of the roof of the control tower cab (fig. 2-20).

(8) Attach the hoist device to the metal ring which ties the four cables of the lifting sling together and hoist the control tower cab into place on the supporting structure.

(9) Use the method provided at the specific site location to secure the control tower cab to the supporting structure.

(10) Disengage the lifting sling from the hoisting device and the lifting eyes on the control tower cab.

(11) Stow the lifting sling in its normal stowage area at the rear of the control tower cab (fig. 1-22).

l. Mounting Control Tower Cab on Trailer, AN/FSQ-75(V)3 Only. When mounting the control tower cab on the trailer furnished with the AN/FSQ-75(V)3, proceed as follows:

Caution:

Check to see that all equipment mounted in the control tower cab is securely fastened in place before hoisting the control tower cab to prevent equipment from coming loose and falling during the hoisting operation.

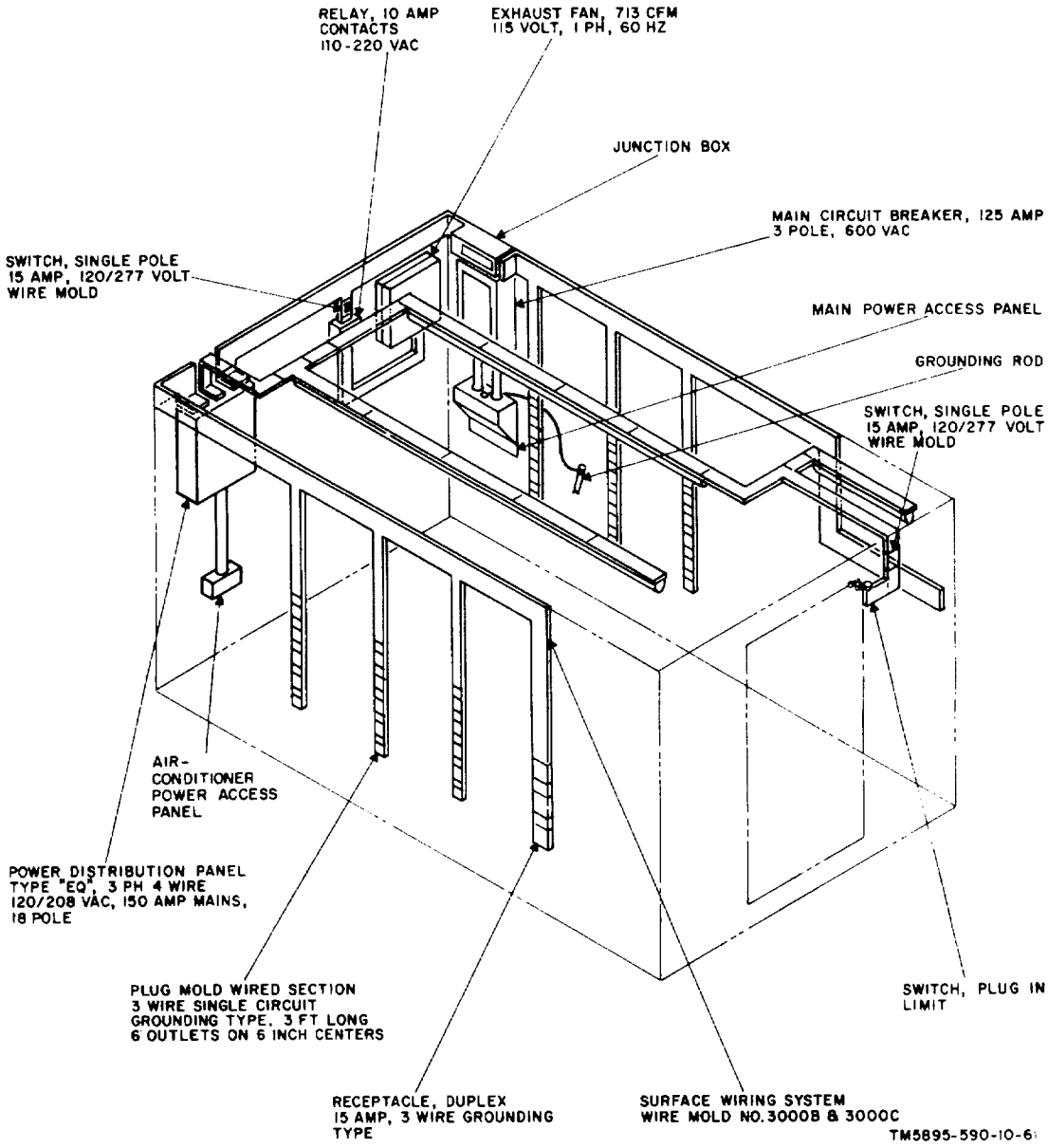


Figure 2-18. Equipment shelter primary power and grounding connections.

(1) Check to see that all exterior doors on the control tower cab are closed and securely fastened.

(2) Check to see that the stabilization wheel on the trailer (fig. 1-23) is locked in the down position.

(3) Remove the lifting sling from its storage area (fig. 1-22).

(4) Attach the lifting sling to the lifting eyes on the control tower cab as shown in figure 2-20 and lift until tension is on lifting sling.

(5) Attach the lifting eyes on the lifting sling to the hoist device.

(6) Remove any attaching or latching device that secures the control tower cab to the supporting structure.

(7) Carefully hoist the control tower cab into place over the trailer.

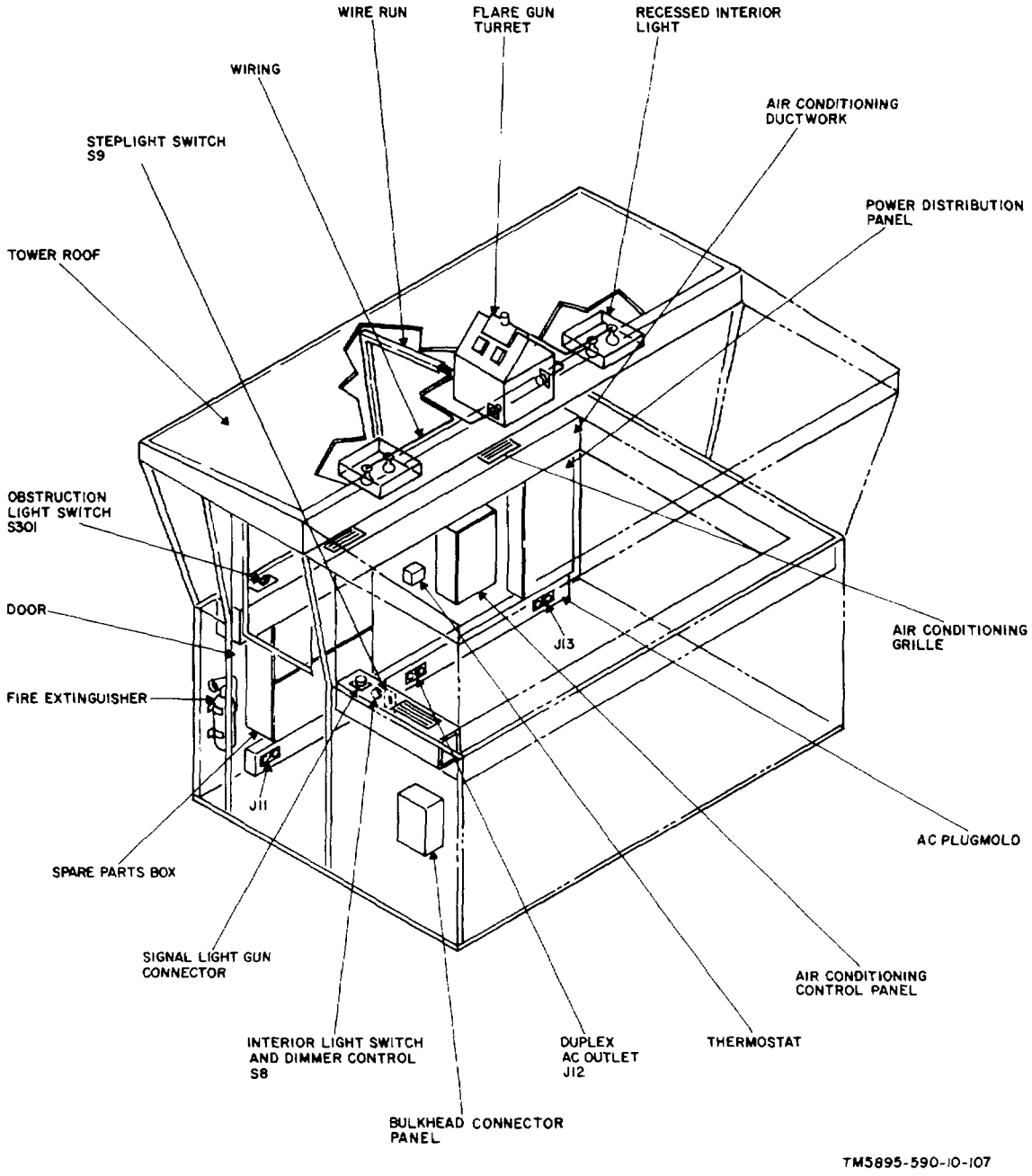


Figure 2-19 (1). Control tower cab interior, AN/FSQ-75(V)3 only (part 1 of 2).

(8) Gently lower the control tower cab into place on the trailer.

(9) Engage the tiedown bolt clamps on the trailer in the tiedown rings on the control tower cab (fig. 1-20).

(10) Tighten the tiedown bolts to secure the control tower cab in place.

(11) Remove the lifting sling and replace in its storage area (fig. 1-22).

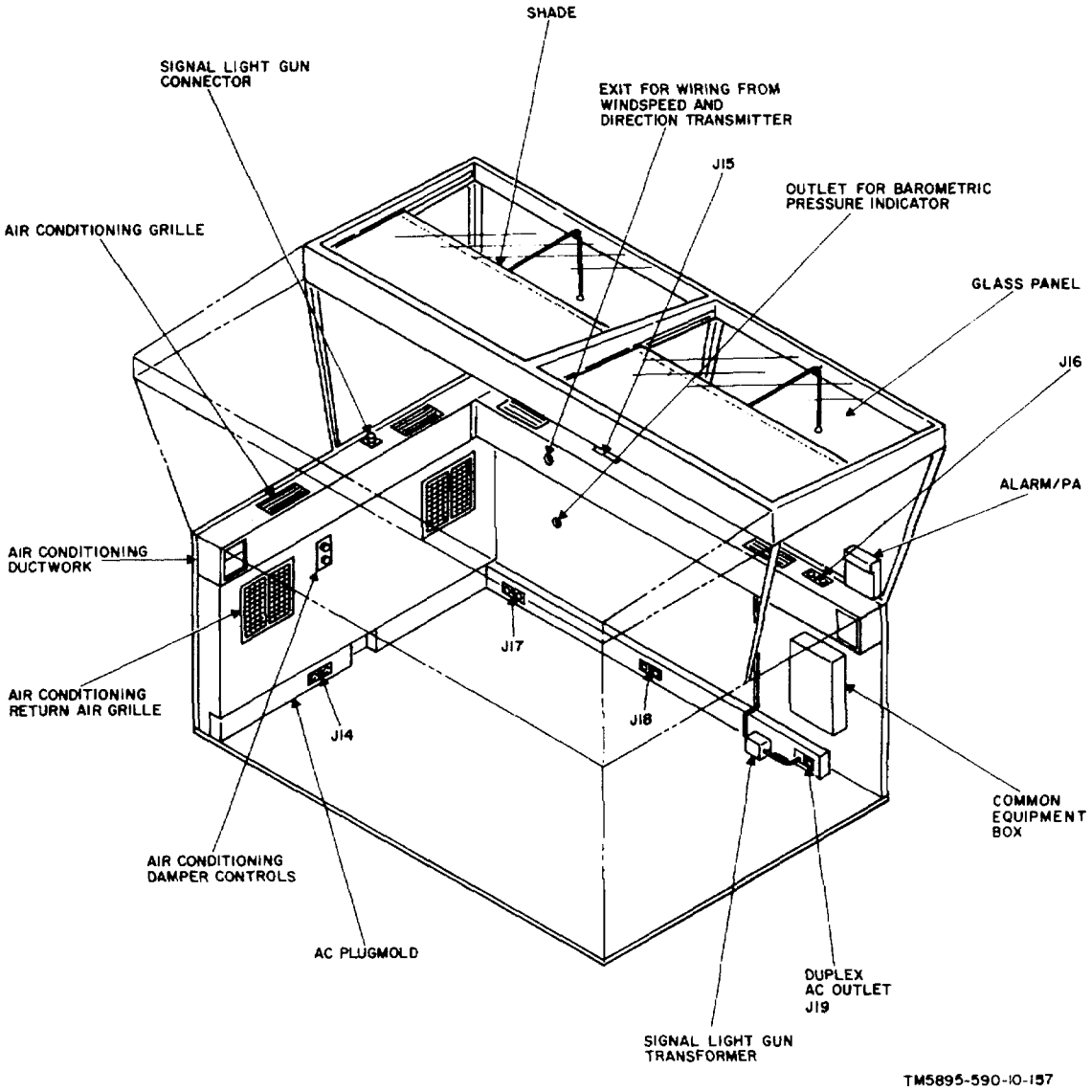


Figure 2-19 (2). Control tower cab interior AN/FSQ-75(V) 3 only (part 2 of 2).

m. Attaching Trailer to Towing Vehicle, AN/FSQ-75(V)3 Only. When attaching the trailer to a towing vehicle, perform the following procedures:

(1) Engage the trailer hitch over the mating connector on the towing vehicle. If necessary, loosen the adjustment bolts (fig. 1-23) and raise or lower the trailer hitch. Tighten the adjustment bolts after raising or lowering the hitch.

(2) Connect the safety brake actuator to the towing vehicle.

(3) Connect the small electrical connector (part of the electrical cable on the trailer) to the jack on the top, front, and exterior wall of the control tower cab (fig. 1-20).

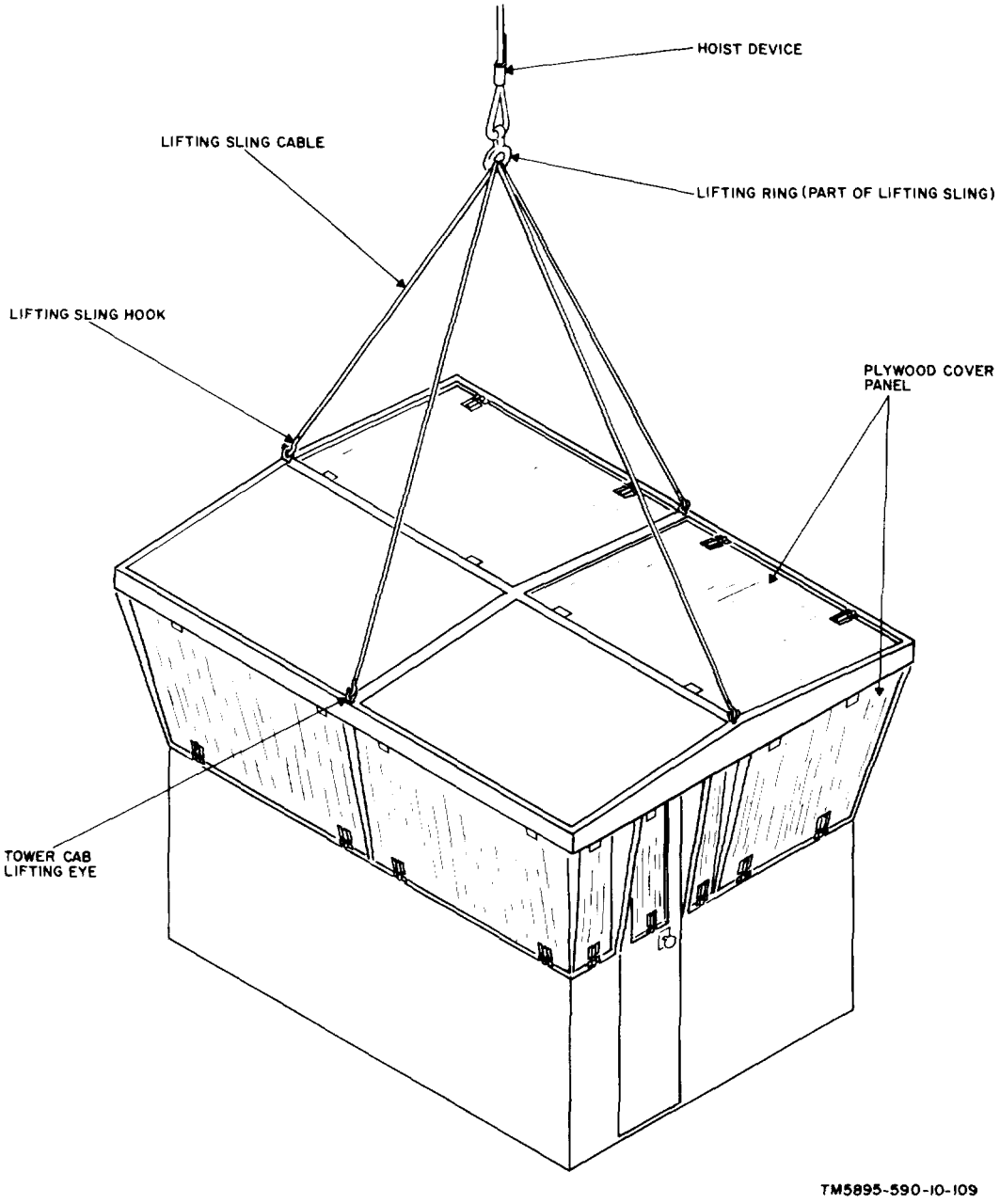


Figure 2-20. Control tower cab with lifting sling attached, AN/FSQ-75(V) 3 only.

(4) Connect the plug on the other end of the cable to a 12-volt dc outlet on the towing vehicle.

(5) Raise the trailer stabilization wheel (fig. 1-23) and lock it in the up position if desired

(6) Check to see that the handbbrake is disengaged before towing.

2-7. Installation of Pluckout Items, Fuse Location

Pluckout items, such as tubes, crystals, relays, and fuses are installed in the various items of system equipment before equipment packaging for shipment. Fuse data for the equipment comprising the AN/FSQ-75(V)(*) is itemized in the chart below. The fuseholders for blower assembly fuses in consoles 1, 2, 4, and 6 in the AN/FSQ-75(V)1 and AN/FSQ-75 (V) 2 systems project through the rear of the consoles and can be reached only from the rear of the consoles. The fuseholders which contain the blower assembly fuses associated with consoles 1, 2, and 4 in the AN/FSQ-75(V)3 have been reversed so that they can be reached from the front of the consoles when the necessary equipment is pulled forward in the console racks.

Component	Panel designation or circuit	Fuse No.	Amperes	Volts
	Control tower			
Common equipment box (fig. 5-2).	Ac input	F1	5	250
	Ac input	F2	5	250
Six-channel amplifier group power supply (2 ea) (fig. 5-2).	1A SLOW	F301	1	125
Four-channel amplifier group power supply (2 ea) (fig. 5-2).	.7A SLOW	F301	0.7	125
Ac/dc distribution unit (fig. 3-8).	23 and 46VAC, or 48VDC output.	F601 through F614	1	125
Mixing amplifier (fig. 3-11).	.175A	F1	.175	250
23 /46-volt power supply (fig. 3-12).	5 AMP SLOW	F501	5	125
Console 1 blower assembly	AC input	F1	2	125
Console 2 blower assembly	AC input	F1	2	125
Console 4 blower assembly	AC input	F1	2	125
Console 6 blower assembly	AC input	F1	2	125
Alarm 'pa system	Dc input	F1	10	32
Engine generator remote control panel (fig. 3-14).	Generator 2 meter input	UA, F1	4	250
	Generator 1 meter input	UB, F2	4	250
	Commercial meter input	UC, F3	4	250
	Engine generator start circuit	UD, F4	10	250
	Equipment shelter			
27.5-volt power supply (fig. 3-17).	Ac input	F1	30	250
27.5-volt power combining unit (fig. 3-20).	27 5-volt	F1 through F7	15	32
	27.5-volt output (behind door).	F-8 through F10	40	32
Vhf transmitter .	HIGH VOLTAGE	F401	6	250
	LOW VOLTAGE	F402	0.75	250
	BLOWER	F403	0.75	250
Uhf transmitter	HIGH VOLTAGE	F401	6	260
	BLOWER VOLTAGE	F402	0.75	250
	BLOWER	F403	0.75	250
Vhf receiver	1 AMP SLOW	F1	1	250
Uhf receiver	115V 2A	F301	2	250
	0.25 AMP	F302	0.25	250
Lf receiver (on rear panel).	Ac input	F1	1	125
	Ac input	F2	1	125
48-volt dc fuse panel (4, fig. 1-6)	RCDR/ST RUN	F1	0.5	125
	NAV-AID MON ON	F2	0.5	125
	NAV-AID MON RY CTL	F3	0.5	125
	RCDR/ST FAIL	F4	0.6	125

Component	Panel designation or circuit	Fuse No.	Amperes	Volts
48-volt dc power supply (fig. 3-15).	5 AMP	F1	5	250
48-volt power combining unit (fig. 3-16).	Ac input	F701	1	250
	48VDC output	F702 through F704	10	125
	ALARM	F705	0.5	250
Recorder power supply/bias oscillator.	.7 AMP SLOW	F101	0.7	125
	2 AMP SLOW	F102	2.0	126
Recorder tape transport	3A	F301	3.0	125
Recorder record amplifier	1 AMP SLOW	F401	1.0	125
Recorder monitor amplifier	1/16 AMP SLOW	F501	0.07	125
	3 AMP SLOW	F502	3.0	125
Reproducer amplifier	SLOW 1/2A	F701	0.5	125
Reproducer tape transport	1 1/4A SLOW	F601	1.25	125
Modulation monitor (fig. 3-22).	3/8 AMP SLOW	F1	3/8	125

Section III. INITIAL CHECKING AND ADJUSTMENT OF EQUIPMENT

2-8. Initial Preparation

Certain initial checks and adjustments of equipment may be most efficiently performed during installation. These checks and adjustments are detailed in paragraphs 2-9 through 2-20. Before initiating these procedures, perform the preliminary and starting procedures (paras 3-32 and 3-34).

Notes:

1. The following procedures must be performed by direct support or higher category maintenance personnel or by special teams charged with the responsibility for installing a group of the air traffic control systems.

2. The console group used with the AN/FSQ-75(V)3 provides only two controller positions which are made up of consoles 1 through 5; therefore, any reference to controller position 3 or console 6) or 7 is not applicable to the AN/FSQ-75(V)3.

a. Select and energize the external power source as detailed in paragraph 3-36.

b. In the equipment shelter, set the master circuit breaker (fig. 3-27) to ON and the ON-OFF switch on the two 48-volt power supplies (fig. 3-15) to ON.

c. At the equipment shelter power distribution panel (fig. 3-28), set the following circuit breakers to ON: MAIN (CB1), LIGHTS (CB3), VENTILATOR (CB14), AIR CONDITIONER (CB2 and CB13), and RACK 6 and 7 (CB6).

d. At the control tower power distribution panel (fig. 3-24) in the AN/FSQ-75(V)1 and AN/FSQ-75(V)2, set the following circuit breakers to ON: MAIN (CB1), LIGHTS (CB4), AIR COND. (CB2 and CB3), ELECT. EQUIP. CB5), and CONV. OUTLETS (CB6). In the AN/FSQ-75(V)3 (fig. 3-25), set the following circuit breakers to ON: MAIN, top COMM SPARE, CONVENIENCE OUTLET, LIGHT CIRCUIT, COMPRESSOR MOTOR, CONDENSER FAN MOTOR, and EVAPORATOR FAN MOTOR.

e. At console 4, set the 23/46-volt power supply ON-OFF switch (fig. 3-12) to ON, and attach a Microphone, Magnetic M-145/U to the MIC jacks on the microphone-headset panels (fig. 3-6) at consoles 1, 5, and 6.

2-9. Transmitter Selector Initial Check

a. Set the 12 transmitter selector switches (fig. 3-1) on the transmitter-receiver-volume control panels at consoles 1, 5, and 6 to the off (up) position, and check to see that the 12 associated transmitter indicator lamps are lighted.

b. At console 1, set the transmitter selector switch for channel 1 to the on (down) position.

Note

Switches are designated as channel 1 (far left) through 12 (far right).

c. Depress the microphone push-to-talk switch, and check to see that the transmitter indicator lamp for channel 1 becomes brighter at all three controller positions while all other transmitter indicator lamps continue to glow at the reduced level of brilliance.

d. Release the microphone push-to-talk switch, and return the transmitter selector switch to the off (up) position.

e. Repeat the procedures of *b*, *c*, and *d* above for the transmitter selector switches associated with channels 2 through 12.

f. Repeat the procedures of *b* through *e* above at consoles 5 and 6.

2-10. Buzzer Alarm Check

a. At console 1, set the transmitter selector switch for channel 1 to the on (down) position.

b. Depress the microphone push-to-talk switch, and check to see that the buzzer remains silent.

c. At console 5, set the transmitter selector switch for channel 1 to the on (down) position.

d. Depress the console 5 microphone push to-talk switch while continuing to hold the console 1 microphone push-to-talk switch depressed. The buzzer at console 5 should sound.

e. Release the microphone push-to-talk switch at both consoles. The buzzer should be silenced.

f. Depress the microphone push-to-talk switch at console 5 and then at console 1. The buzzer at console 1 should sound.

g. Release the microphone push-to-talk switch at both consoles. The buzzer should be silenced.

h. Repeat the procedures of a through *g* above for channels 2 through 12.

i. Repeat the procedures of *a* through *h* above for consoles 5 and 6.

j. Repeat the procedures of *a* through *h* above for consoles 1 and 6.

k. Set all transmitter selector switches to the up (off) position.

l. Disconnect the microphones.

2-11. Clock Adjustment

(fig. 3-3)

a. Remove the front cover of the clock at console 3 by pulling it forward.

b. Rotate the M thumb gear upward until the proper 1-minute and 10-minute settings are obtained.

Note.

Set the minute drum to 1 minute before the desired synchronizing time.

c. Rotate the H thumb gear upward until the proper 1-hour and 10-hour settings are obtained.

d. Turn on the ac power by pressing the reset/stop pushbutton switch. Allow the clock to run until the desired synchronizing time appears on the drums. At the instant the seconds dial registers 00, stop the clock by ,pressing the reset/stop pushbutton switch and holding it down.

e. When the timepiece being used as the standard by which to set the clock reaches the desired synchronizing time, apply power to the clock by releasing the reset/stop pushbutton switch.

Note

The red flag indicator will return automatically to its normal (up) position when the reset/stop pushbutton switch is released

2-12. Aerological Equipment Conversion

The wind direction portion of the Aerological equipment is calibrated so that the needle will point to N (north) when the arrow vane on the wind direction transmitter is directly over the scribed line on the side of the wind direction transmitter housing (para 26*e* (2) (*b*)). If during installation the transmitter housing is oriented to true north, the indicator readings will be in terms of true geographic compass points. Similarly, if the transmitter housing is oriented to magnetic north, the indicator readings will be magnetic. If magnetic readings are desired when the transmitter has been oriented to true north, either the transmitter must be reoriented or the calibration of the indicator changed. To change the calibration, first determine the magnetic deviation from true north and proceed as follows:

a. Disconnect the connectors at the rear of the aerological panel assembly, and open the indicator case by removing the four screws

that hold the mounting flange on the rear case assembly.

b. Connect wires B and C together on the cord attached to the plug on the rear of the case.

c. With two to four flashlight cells in series, apply 3 to 6 volts dc to the wire marked A and to the junction of wires B and C. Connect the wire marked A to the positive side of the battery. The indicator pointer should move to north (N) on the dial.

d. Remove the indicator pointer by lifting directly upward on the hub. The pointer is held in place by a friction fit on a tapered shaft.

e. Replace the pointer loosely on the shaft. With the hub of the pointer freely pivoting on the shaft, position the tip of the pointer over the desired indication on the dial (corresponding to magnetic north) and secure it in position by pressing lightly but firmly on the hub.

f. Reassemble the mounting flange on the rear case assembly, and reconnect the indicator connectors in the normal circuit configuration.

2-13. 27.5-Volt Power Supply Adjustment

a. At the equipment shelter power distribution panel (fig. 3-28), set the RACK 1 TOP OUTLET (CB5), RACK 1 CENTER OUTLET (CB7), RACK 1 BOY OUTLET (CB9), RACK 2 (CB11), and RACK 3 (CB10) circuit breakers to ON.

b. Set the ON-OFF switch (fig. 3-17) on each of the four 27.5-volt power supplies to ON.

c. Adjust each of the four 27.5-volt power supplies as follows:

(1) Set the VOLTAGE ADJUST control for an indication of 27.5 volts on the D-C VOLTS meter.

(2) Set the CURRENT ADJUST control completely counterclockwise.

(3) Set the ON-OFF switch to OFF.

(4) Remove the four front panel mounting screws that secure the 27.5-volt power supply to the equipment rack, and slide the unit forward sufficiently to attach an 8-gauge jumper wire between terminals 1 and 4 of terminal board TB2. Return the unit to the rack.

(5) Set the ON-OFF switch to ON.

(6) Turn the CURRENT ADJUST control clockwise until an indication of 25 amperes appears on the D-C AMPERES meter.

(7) Set the ON-OFF switch to OFF, remove the jumper wire installed in (4) above, and then return the ON-OFF switch to ON.

d. Turn on the two ssb transceivers as described in the starting procedure (para 3-34).

e. Turn on the four fm transceivers as described in the starting procedure (para 3-34).

f. Observe the current indication on the D-C AMPERES meter of each of the four power supplies, and adjust the VOLTAGE ADJUST control of each power supply until all indications are equal.

g. Turn off the SG-19/U and fm transceivers as described in paragraph 3-45.

2-14. Transmitting Audio Level Adjustments

a. Locate the four-channel amplifier group in console 2 (10, fig. 5-2).

b. Disengage the locking device on the lower front edge of the amplifier module that is identified as MIC POS 1, and remove the amplifier module.

c. Interconnect the amplifier module to the vacated slot with Adapter, Test MX-8092/ FSQ-75(V) (see TM 11-5820-768-12).

d. Energize the two power supplies of the four-channel amplifier group by setting the power switches to ON. Use Multimeter TS 352B/U to verify that the output as measured between the -28V and GND. test jacks is -28 volts dc on each power supply. Also confirm that there is no differential voltage (O volt) when the TS352B/U is connected between the DIV jacks on the two power supplies.

e. Connect the microphone input attenuator (fig. 1-18) PHONE plug into the MIC jack on the microphone-headset panel at controller position 1.

f. Connect the TS-352B/U across Oscillator, Audio SG-19/U output terminals, and adjust it for a 2.0-volt root-mean-square (rms), 1,000-Hz output.

g. Connect the SG-19/U to the AUDIO jack on the microphone input attenuator.

h. Set the DB input attenuator on the MIC POS 1 amplifier module to 15, and the OUTPUT LEVEL (DB) control to 4.

i. Set the channel selector switch on the meter panel of the four-channel amplifier group to CH 1.

j. Adjust vernier output level control R724 on the bottom of the MIC POS 1 amplifier module for a VU meter indication of 0.

Note

The transmitting channel to be initially adjusted in the following procedures can be selected arbitrarily from any of the twelve available channels. For this procedure, channel 1 is selected as a typical example.

k. Connect the TS-52B/U to the two TMTR 1 test jacks directly below the LEVEL control on the interlock unit (fig. 3-9) at console 3.

l. Set the channel 1 transmitter selector switch at the transmitter-receiver-volume control panel (fig. 3-1), console 1, to the down (on) position.

m. Set the microphone input attenuator switch (fig. 1-18) to CLOSED.

n. Adjust the TMTR 1 channel LEVEL control on the interlock unit for an indication of 0.78 volt on the TS-352B/U.

Warning

Dangerous voltages are present at exposed terminal boards on the rear of the mixing amplifier.

o. Locate the mixing amplifier (fig. 3-11) in console 3, remove the four mounting screws, and pull the entire unit forward from the console until the controls at the rear of the amplifier (not shown) are accessible.

p. Adjust the two controls marked SP at the left of terminal boards TB1 and TB2 (11, fig. 5-2(2)) fully clockwise.

q. Connect Meter, Audio Level ME-356/U to terminals 13 and 14 of TB1, and adjust the SP control at the left of terminal board TB1 counterclockwise for an indication of +3 decibels (referred to 1 milliwatt in 600 ohms) (dBM) on the ME 56/U.

r. Disconnect the ME-356/U, and connect it to terminals 13 and 14 of TB2.

s. Adjust the SP control at the left of terminal board TB2 for an indication of -5 dbm on the ME-356/U.

t. Unkey the transmitter channel by setting the microphone input attenuator switch to the opposite (off) position and the transmitter selector switch to the up (off) position.

u. Repeat the procedures in *k* through *n* above for each of the other 11 transmitting channels. Use the appropriate TMTR test jacks on the interlock units.

v. Disconnect the test equipment, and reinstall the MIC POS 1 amplifier module in the four-channel amplifier group after all 12 transmitting channels have been adjusted.

w. Repeat the procedures in *b* and *c* above for the MIC POS 2 amplifier module.

x. Repeat the procedures in *e*, *g*, and *h* above, except connect the microphone input attenuator PHONE plug into the MIC jack on the microphone-headset panel at console 5 and adjust the DB input attenuator on the MIC POS 2 amplifier module.

y. Set the channel selector switch on the four-channel amplifier group meter panel to CH 2.

z. Repeat the procedure in *j* above for the MIC POS 2 amplifier module.

aa. Repeat the procedures in *k* through *u* above, except in *p* through *s*, make adjustments adjacent to terminal boards TB3 and TB4.

ab. Disconnect all test equipment after adjustment of the 12 transmitting channels.

ac. Repeat the procedures in *b* and *c* above for the MIC POS 3 amplifier module.

ad. Repeat the procedures in *e*, *g*, and *h* above, except connect the microphone input attenuator PHONE plug into the MIC jack on the microphone-headset panel at console 6 and adjust the DB input attenuator on the MIC POS 3 amplifier module.

ae. Set the channel selector switch on the four-channel amplifier group meter panel to CH 3.

af. Repeat the procedure in *j* above for the MIC POS 3 amplifier module.

ag. Repeat the procedures in *k* through *u* above, except in *p* through *s*, make adjustments adjacent to terminal boards TB5 and TB6.

ah. Disconnect all test equipment after the 12 transmitting channels have been adjusted, and return the four-channel amplifier group to the normal operating configuration.

2-15. Receiving Audio Level Adjustments (fig. 3-1)

a. Controller Position 1 (Speaker).

(1) Set the three SPEAKER controls on the transmitter-receiver-volume control panel at console one to 10.

Note

Switches are associated from left to right with channels 1 through 12.

(2) Set the channel 1 P-S switch to S.

(3) Locate the six-channel amplifier group in console 1 at controller position 1 (9, fig. 5-2(1)), disengage the locking device at the lower front edge of the amplifier module identified as SPKR CHNLS 1-4, and remove the amplifier module.

(4) Interconnect the amplifier module to the vacated slot with Adapter, Test MX-8091/ FSQ-75(V) (see TM 11-5820-733-12).

(5) Energize the two power supplies of the six-channel amplifier group by setting the power switches to ON. Use Multimeter TS-352B/U to verify that the output monitored between the -28V and GND test jacks on each power supply is -28 volts dc. Also confirm that there is no differential voltage (0 volt) when the TS-352B/U is connected between the DIV jacks on the two power supplies.

(6) Connect Meter, Audio Level ME-356/U to the output terminals of Oscillator, Audio SG-19/U. Adjust the SG-19/U for a 27-dbm signal output at 1 kHz.

(7) Connect the SG-19/U to the terminals marked RECEIVER OUTPUTS 1 on the demarcation panel at console 5 (fig. 1-4).

(8) Adjust the ME-356/U for a 600-ohm output impedance and, with a phone plug, connect the leads to the EQUIPMENT OUTPUT jack on the six-channel amplifier group test adapter (not shown).

(9) Adjust the INPUT LEVEL control on the SPKR CHNLS 1-4 amplifier module for a + 20-dbm indication on the ME-356/U.

(10) Disconnect the six-channel amplifier group test adapter, and reinstall the amplifier module into the six-channel amplifier group chassis.

(11) Adjust the channel 1 through 4 SPEAKER control to 5.

(12) Connect the ME-356/U to the console 5 demarcation panel terminals marked POS 1 RECORDING.

Warning

Dangerous voltages are present at exposed terminal boards at the rear of the mixing amplifier.

(13) At the rear of the mixing amplifier (in console 3), adjust the LS control at the left of terminal board TB2 for a -5-dbm indication on the ME-356/U.

(14) At the transmitter-receiver-volume control panel, return the channel 1 P-S switch to the center (off) position and set the channel 5 P-S switch to S.

(15) Repeat the procedures of (3) and (4) above for the SPKR CHNLS 5-8 amplifier module.

(16) Connect the SG-19/U (set as in (6) above) to the terminals marked RECEIVER OUTPUTS 5 on the console 5 demarcation panel.

(17) Repeat the procedures of (8) through (10) above, except that the INPUT LEVEL control on the SPKR CHNLS 5-8 amplifier module is to be adjusted.

(18) Leave the channel 5 P-S switch in the S position and the SG-19/U set as in (6) above.

(19) Repeat the procedures of (11), (12), and (13) above, except adjust the channel 5 through 8 SPEAKER control and the LS control at the left of terminal board TB1.

(20) At the transmitter-receiver-volume control panel, return the channel 5 P-S switch to the center (off) position and set the channel 9 P-S switch to S.

(21) Repeat the procedures of (3) and (4) above for the SPKR CHNLS 9-12 amplifier module.

(22) Connect the SG-19/U (set as in (6) above) to the terminals marked RECEIVER OUTPUTS 9 on the console 5 demarcation panel.

(23) Repeat the procedures of (8), (9), and (10) above, except that the INPUT LEVEL control on the SPKR CHNLS 9-12 amplifier module is to be adjusted.

(24) Leave the channel 9 P-S switch in the S position and the SG-19/U set as in (6) above.

(25) Repeat the procedures of (11), (12), and (13) above, except adjust the channel 9 through 12 SPEAKER control and the HP control at the left of terminal board TB1.

(26) Disconnect the SG-19/U, and set the channel 9 P-S switch to the center (off) position.

b. Controller Position 1 (Phones).

(1) At the controller position 1 transmitter-receiver-volume control panel (fig. 3-1), set the three PHONE controls to 10 and the channel 1 P-S control to P.

(2) Connect Meter, Audio Level ME356/U to the output terminals of Oscillator, Audio SG-19/U. Adjust the SG-19/U for a 27-dbm signal at 1,000 Hz.

(3) Connect the SG-19/U to the terminals marked RECEIVER OUTPUTS 1 on the console 5 demarcation panel.

(4) Disengage the locking device on the lower front edge of the six-channel amplifier group amplifier module marked PHONES 1 through 12. Remove the amplifier module.

(5) Interconnect the amplifier module to the vacated slot in the six-channel amplifier group with Adapter, Test MX-8091/FSQ75 (V). Energize the six-channel amplifier group) (a(I(5) above).

(6) Connect Meter, Audio Level ME-356/U, adjusted for 600-ohm output impedance, to the PHONES jack on the microphone headset panel at console 1.

(7) Adjust the INPUT LEVEL control on the PHONES 1 through 12 module for a O-dbm indication on the ME-356/U.

(8) Connect the ME-356/U across the terminals of the console 5 demarcation panel (marked POS 1 RECORDING).

(9) Set the three PHONE controls on the transmitter-receiver-volume control panel of console one to 5.

(10) At the mixing amplifier in console 3, adjust the HP control at the left of terminal board TB2 for a -5 dbm indication on the ME-356/U.

(11) Disconnect all test equipment, and reinstall the amplifier module into the six channel amplifier group chassis. Lock it in place.

c. Controller Position 2 (Speaker). Repeat the procedures of a above from controller position 2 (consoles 4 and 5), making the adjustments to the six-channel amplifier group in console 5. The adjustments and measurements at the mixing amplifier are to be made on controls adjacent to or at terminal boards TB3 and TB4. Avoid the dangerous voltages present at exposed terminal boards at the rear of the mixing amplifier.

d. Controller Position 2 (Phones). Repeat the procedures of b above, making the adjustments on the six-channel amplifier group in console 5. The PHONES jack for controller position 2 is on the microphone-headset panel in console 5. The adjustments and measurements at the mixing amplifier are to be made on controls adjacent to or at terminal boards TB3 and TB4.

e. *Controller Position 3 (Speaker).* Repeat the procedures of a above from controller position 3 (consoles 6 and 7), making the adjustments to the six-channel amplifier group in console 6. The adjustments and measurements at the mixing amplifier are to be made on controls adjacent to or at terminal boards TB5 and TB6.

f. Controller Position 3 (Phones). Repeat the procedures of 1b above, making the adjustments on the six-channel amplifier group in console 6. The PHONES jack for position 3 is on the microphone-headset panel in console 6. The adjustments and measurements at the mixing amplifier are to be made on controls adjacent to or at terminal boards TB5 and TB6. At the completion of this adjustment, return all equipment to the normal operating configuration.

2-16. Receiving Channels Adjustment

a. In the equipment shelter, set the receiver associated with channel 1 operation to the frequency specified in the station frequency plan and energize the receiver as detailed in the receiver technical manual referenced in appendix A.

b. Detach the antenna from the channel 1 receiver antenna jack, and connect Generator, Signal AN/USM-44A through Attenuator,

Fixed CN-1239/U (fig. 1-1) to the receiver antenna jack.

c. Adjust the AN/USM-44A for a 5-microvolt rf signal at the receiver frequency, modulate the rf signal 30 percent with a 1,000-Hz signal, and apply this input to the receiver ANTENNA JACK.

d. At the receiver test panel (fig. 1-26 and 3-18), connect Meter, Audio Level ME-356/ U, adjusted for a 600-ohm output impedance, to the channel 1 test jacks.

e. Adjust the receiver AUDIO GAIN control for a 0.5 watt output as indicated on the ME-356/U.

f. Disconnect the ME-356/U from the receiver test panel.

g. At console 1, set the three SPEAKER and PHONE controls on the transmitter receiver-volume control panel (fig. 3-1) to 5.

h. Set the channel 1 P-S switch to S.

i. Connect the ME-356/U across the demarcation panel terminals marked POS 1 RECORDING.

j. Check to see that the ME-356/U has an indication of -5 dbm ±2.

k. Check for a loud, audible signal at the console speaker.

l. Set the channel 1 P-S switch to P.

m. Check the ME-356/U for an indication of -5 dbm ±2.

n. Return the channel 1 P-S switch to the center (off) position.

o. Connect the ME-356/U across the demarcation panel terminals marked POS 2 RECORDING.

p. Repeat the procedures of *g*, *h*, and *j* through *m* above from controller position 2.

q. Connect the ME-356/U across the demarcation panel terminals marked POS 3 RECORDING.

r. Repeat the procedures of *g, h*, and *j* through m above from controller position 3.

s. Repeat all the procedures of a through r above for each of the receiving channels from 2 through 8.

t. Repeat all the procedures of *a* through *r* above for receiving channels 9 through 12, except that in performing the procedures of *b* and *c*, use fm Generator, Signal AN/URM-48. Set it to provide a 5-microvolt signal at 1,000 Hz with a frequency deviation of 8 kHz, and apply its output through Attenuator, Fixed CN-1239/U to the antenna jack. In following the procedures of e above, turn the receiver SQUELCH control to OLD-OFF.

2-17. Recording Channels Adjustment

a. Detach the antenna from channel 12 fm transceiver antenna jack J21.

b. Attach Generator, Signal AN/URM-48 to J21 through Attenuator, Fixed CN-1239/ U (fig. 1-31).

c. Set the AN/URM-48 to provide a 5microvolt, 1,000-Hz signal with a frequency deviation of 8 kHz.

d. Energize the recorder, load tape transport No. 1 with recording tape, and place the tape transport in the record mode as detailed in TM 11-5835-236-12.

e. Set the tape transport monitor head assembly selector switch to 3.

f. At the monitor panel, set the METER SELECTOR switch to 3.

g. Set the GAIN control on record amplifier No. 3 for a zero indication on the monitor panel VOLUME UNITS meter.

Note

Do not change the setting of the record amplifier GAIN control after it set for OVU.

h. Connect Meter, Audio Level ME-356/U in parallel with a 3.3-ohm, 1-watt, nonconductive resistor to the headset jack on the monitor panel.

i. Adjust the monitor amplifier GAIN control for a + 7-dbm indication on the ME-356/U.

j. Repeat the procedures of e, f, and g above twice with the monitor head assembly selector switch set to 1 and then to 2 and the METER SELECTOR switch set to 1 and then to2.

k. Disconnect the test equipment, and return the recorder to its normal operating configuration.

l. Place tape transport No. 1 in the record mode and tape transport No. 2 in the standby mode as instructed in TM 11-5835-236-12.

m. Check to see that the RUN indicator lamp on the recorder/navaid status panel (fig. 3-4) at console 4 is illuminated.

n. Manually rotate the lower tape guide idler arm on tape transport No. 1 clockwise

until tape movement stops. The RUN indicator lamp on the recorder/navaid status panel remains illuminated and the FAIL indicator lamp also illuminates. A buzzer at the recorder/navaid status panel sounds. Simultaneously, tape transport No. 2 starts operation.

o. Press the SILENCE pushbutton switch on the recorder/navaid status panel. The buzzer alarm silences. Both the RUN and FAIL indicator lamps remain illuminated.

p. Release the lower tape guide idler arm and rotate the take-up reel sufficiently to remove tape slack. The FAIL indicator lamp goes off and the RUN indicator lamp remains illuminated. Tape transport No. 2 continues to operate, and tape transport No. 1 becomes the standby transport.

q. Actuate the power supply No. 1 TRANSFER SWITCH so that power supply No. 1 is operational. Leave power supply No. 2 in standby condition.

r. Remove fuse F102 (marked 2 APM SLOW) from power supply No. 1. The FAIL indicator lamp on the recorder/navaid status panel lights and the buzzer alarm sounds. Simultaneously, power supply No. 2 becomes the operational power supply as indicated by lighting of its OPERATE indicator lamp.

s. Depress the recorder/navaid status panel SILENCE pushbutton switch; the buzzer is silenced. The FAIL indicator lamp remains illuminated.

t. Return the recorder to a standby condition (TM 11-5835-236-12).

2-18. Ssb Transceiver Adjustments

a. Transmitter Adjustment.

(1) Insert a 150-watt, 2 to 50-MHz element in the socket of the RF body (fig. 3-19 for ssb transceiver 1.

(2) Attach the (fig. 3-23) to jack J411 on the RF body.

(3) Perform the starting procedure for the ssb transceiver as detailed in TM 11-5821-248-12.

(4) Connect Oscillator, Audio SG-19/U to the AUDIO jacks on the microphone input attenuator (fig. 1-18), and connect the PHONE plug of the microphone input attenuator to the SSB 1 MIC jack on the ssb microphone-headset panel (fig. 3-7) at console 5.

(5) Adjust the SG-19/U for a 0.25volt rms, 1,000-Hz signal

(6) At the ssb control unit for transceiver 1 (11, fig. 5-1), set the mode selector switch to AM and the frequency select knobs for a 15.1-MHz frequency dial indication.

(7) Set the microphone input attenuator switch to CLOSED, and allow time for the ssb antenna coupler to tune.

Note

A red TUNE indicator lights at the ssb control panel on console 4 (fig. 3-5) when the ssb antenna coupler starts to tune. The TUNE indicator goes out, and a green OPERATE indicator lights when the tuning cycle is complete.

(8) Observe the wattmeter for a power output of 95 watts minimum. Release the push-to-talk switch.

(9) Repeat the procedures of (6), (7), and (8) above at 25.1-MHz.

(10) Adjust or realign the ssb transceiver as necessary to provide the minimum power output as detailed in TM 11-5821-248-12.

(11) Repeat the procedures of (1) through (10) above ssb transceiver 2.

(12) Disconnect all test equipment, and return both ssb transceivers to their normal configuration. Set the ssb control units to the frequencies specified in the station frequency plan.

b. Receives Adjustment.

(1) Disconnect the ssb antenna coupler from ssb transceiver 1 by removing the antenna connection at ANT jack J4 on the ssb transceiver.

(2) Connect a 300-ohm load across the PHONE jack on the ssb transceiver front panel.

(3) Remove the ssb transceiver front panel dust cover, and set the AUDIO control to the maximum clockwise position.

(4) At the ssb control unit for ssb transceiver 1, set the RF SENS control to the maximum clockwise position.

(5) Set the ssb control unit mode selector switch to AM and the frequency selector

knobs for a frequency dial indication of 15.1 MHz.

(6) Perform the starting procedure for the ssb transceiver as instructed in TM 115821-248-12.

(7) Connect R.F. Signal Generator AN/ URM-25F to ANT jack J4 on the ssb transceiver, and adjust its output for a 3-microvolt, 15.1-MHz RF signal, modulated 30 percent with a 1,000-Hz audio voltage.

(8) Connect Meter, Audio Level ME356/U across the 300-ohm load installed in (2) above.

(9) Check to see that the ME-356/U indication is not less than 6 db.

(10) Set the frequency at the ssb control unit to 25.1 MHz, and check the indication on the ME-356/U. It should not be less than 6 db.

(11) Set the ssb control unit mode selector switch to USB and the frequency selector knobs for 15.1 MHz.

(12) Adjust the AN/URM-25F for a cw output.

(13) At the ssb microphone-headset panel (fig. 3-7) in console 4, connect a headset to the SSB 1 PHONE jack.

(14) Adjust the frequency of the AN/ URM-25F to obtain a zero beat in the headset earphone.

(15) Remove the headphones, and adjust the AN/URM-25F for a 1-microvolt output.

(16) Increase the signal generator frequency until a peak is observed on the AN/ URM-25F meter. The peak value should be at least 10 db greater than the value observed during the zero beat condition.

(17) Repeat the procedures of (13) through (16) above at 25.1 MHz.

(18) Repeat the procedures of (11) through (17) above, except in (11) set the mode selector switch to LSB, and in (16) decrease the AN/URM-25F frequency to obtain the peak indication.

(19) Remove the test equipment, and reconnect the ssb antenna coupler.

(20) Repeat the procedures of (1) through (19) above for ssb transceiver 2.

(21) Return the ssb transceiver to the standby condition

2-19. Uhf and Vhf Transmitter Modulation Percentage Adjustments

a. Attach Oscillator, Audio SG-19/U to the AUDIO jack on the microphone input attenuator (fig. 1-18).

b. Set the SG-19/U for a 2.0-volt rms output at 1,000 Hz.

c. Connect the PHONE plug on the microphone input attenuator to the MIC jack on the microphone-headset panel (fig. 3-6) at console 1.

d. At the equipment shelter power distribution panel (fig. 3-28), set the RACK 4 (CB12) and RACK 5 (CB8) circuit breakers to ON.

e. Check to see that the channel 1 transmitter is set to the frequency specified in the station frequency plan. Also, make sure that the transmitter is aligned as detailed in the transmitter technical manual referenced in appendix A.

f. Condition the transmitter for remote operation as detailed in the technical manual.

g. At the RF body (fig. 3-19) or fm rf body (fig. 3-21), as appropriate, disconnect the RG-8/U coaxial cable from the jack and load the transmitter by attaching Dummy Load DA-75/U to the jack.

h. Determine the element to be used with the RF wattmeter as dictated by the transmitter operating frequency and power output. Connect the rf wattmeter to jack J411 on the RF body or fm RF body, and insert the selected element in the element socket.

i. Set the RF wattmeter (fig. 3-23) to the 100-watt scale.

j. At the controller position 1 transmitter receiver-volume control panel (fig. 3-1), set the transmitter selector switch for channel 1 to the on (down) position.

k. Set the microphone input attenuator (fig. 1-18) switch to CLOSED, and check the rf wattmeter for an indication of 45 watts minimum (35 watts minimum for channels 9 through 12).

l. Realign or adjust the transmitter, if necessary, to obtain the minimum indication.

m. Set the microphone input attenuator switch to the opposite (open) position.

n. Return the transmitter selector switch to the off (up) position.

o. Repeat the procedures of e through *h* and *j* through *n* above for transmitting channels 2 through 12.

p. Connect coaxial cable assembly W2 from the ATTENUATOR INPUT jack on the front panel of the modulation monitor (fig. 1-28 and 3-22) to rf probe E1. Both W2 and E1 are supplied with the modulation monitor.

q. Insert the free end of the rf probe into the mating receptacle on the rf body (fig. 8 19) for the channel 1 transmitter.

r. Connect coaxial cable W3 supplied with the modulation monitor from the I.F. OUTPUT jack to the vertical terminals of Oscilloscope AN/USM-140A.

s. Connect auxiliary test leads from the modulation monitor SYNC. OUTPUT jacks to the sync input of the AN/USM-140A.

t. Be sure that the POWER ON-OFF switch is set to OFF.

u. Set the ANTENNA-ATTENUATOR switch to ATTENUATOR.

v. Connect the line cord to a convenient 117-volt ac, 60-Hz power source.

w. Set the POWER ON-OFF switch to ON. Allow the equipment to warm up for 15 minutes.

x. Set the modulation monitor TUNE COARSE and TUNE FINE controls to the fundamental frequency of the transmitter being checked.

y. Adjust the ATTENUATOR COARSE and ATTENUATOR FINE controls to produce a redline indication on the CARRIER meter of the modulation monitor.

Note

The ATTENUATOR COARSE control has three positions with relative attenuation of X1, X10, and X100. Additional attenuation can be obtained by rotating the rf probe in the rf body to change the degree of coupling to the pickup link.

z. The intermediate frequency (if.) output will produce a vertical deflection proportional to the relative amplitude of the transmitter carrier, and the sync output will synchronize the horizontal sweep of the AN/USM-140A to the fundamental frequency of the transmitter modulation.

aa At the transmitter-receiver-volume control panel (3-1), set the channel 1 transmitter selector switch to the on (down) position.

ab. Set the microphone input attenuator (fig. 1-18) switch to CLOSED, and adjust the AN/USM-140A to display at least two full waves of modulation. Make a linear measurement of the peak and the trough of modulation as shown in figure 2-21. Use any convenient scale or increment.

ac. Set the microphone input attenuator switch to the opposite (open) position.

ad. Calculate the percentage of modulation by substituting the peak measurement (P) and the trough measurement (t) in the formula:

$$\frac{P-t}{P+t} \times 100 = \%\ \text{of modulation}$$

ae. While keying the transmitter by setting the microphone input attenuator switch to CLOSED, adjust the transmitter MOD GAIN control to achieve a 90 percent modulation result from the calculations of ad above.

af. Unkey the transmitter by setting the microphone input attenuator switch to its opposite (open) position.

Ag. Using the appropriate RF body and transmitter selector switch, adjust channels 2 through 8 by repeating the procedures *of q, x, y*, and *aa* through *af* above for each channel.

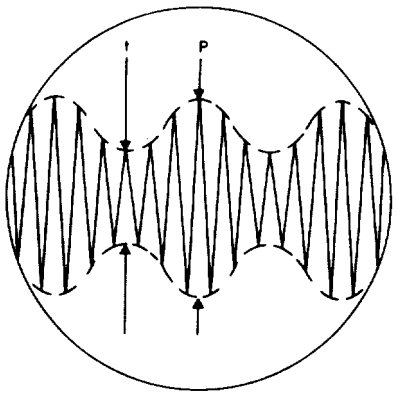


Figure 1-21. Modulation measurements from oscilloscope patter

Note

Percentage modulation adjustment is not performed on channels 9 through 12.

2-20. Lf Receiver Adjustments

a. Energize and tune the If receiver as detailed in TM 11-5825-249-12 to the frequency specified in the station operating plan.

b. Establish and record the optimum tuning dial setting for the guarded frequency as described in TM 11-5825-249-12.

c. Disconnect the antenna from the If receiver, and connect the AN/URM-25F through Attenuator, Fixed CN-1239/U (fig.1-31) to the antenna jack. Set the AN/URM-25F for a 5-microvolt output at the If receiver operating frequency, modulated 30 percent with a 1,000-Hz signal.

d. Connect Meter, Audio Level ME-356/U to terminals 79 and 80 at the demarcation panel.

e. Adjust the If receiver AUDIO GAIN control for a +20-dbm indication on the ME-356/U.

f. At the recorder/navaid status panel (fig. 3-4) on console 4, connect a headset to the NAVAID RECEIVER PHONES jack and adjust the VOLUME control for a usable audio level. The ON indicator lamp should light.

g. At the AN/URM-25F, set the output to 2.5 microvolts.

h. At the recorder/navaid status panel, the OFF indicator lamp should light and the ON indicator lamp should go out. connect the antenna to the If receiver.

i. Disconnect all test equipment, and reconnect the antenna to the if receiver.

CHAPTER 3

OPERATION

Warning

Before operating this equipment, make certain all requirements of TB SIG 291 are met. Injury or DEATH could result from improper or careless operation.

Section I. OPERATOR'S CONTROLS AND INDICATORS

3-1. General

This section describes the functions of equipment operating controls, indicators, and jacks used by the control tower controllers and crew who operate controls and conduct inspections in the equipment shelter during actual operations.

3-2. Damage from Improper Settings

The following operating precautions must be observed during operation of equipment in the control tower and the equipment shelter to avoid damage to either operated or associated, peripheral, equipment.

a. In starting an engine generator from the engine generator remote control panel (fig. 1-19), do not leave the START GEN. 1 or START GEN. 2 switch in the energized position if the associated OPER. PWR. GEN. 1 or OP,ER. PWR. GEN. 2 indicator lamp does not light within 30 seconds. Damage to the engine generator will result if this precaution is not observed.

b. When inserting a measuring element in the element socket of the RF body or the fm RF body, make sure that the measuring element has a power rating higher than the power output of the transmitter being checked. If an element with a lower power rating is used, the measuring element will burn out.

c. Do not attempt to set the time on the clock while the motor is operating. Always press the reset/stop pushbutton switch before turning either the M- or H-thumb gear. Stop the clock only while the seconds drum is in the blue quadrant. Damage to the clock mechanism will result if this precaution is not observed. DO NOT attempt to rotate the M- or H-thumb gears downward. The torque applied to the drive shaft through this reverse motion may be sufficient to damage the clock mechanism. In addition, do not stop the clock for resetting while the mechanism is cycling. Stopping the clock while the mechanism is cycling will score the drive shafts.

3-3. Transmitter-Receiver-Volume Control Panel, Controls and Indicators

(fig. 3-1)

The three transmitter-receiver-volume control panels (consoles 1, 5, and 6) each contain three transmitter selector panels, three receiver volume control panels and there receiver mixing and channel selector panels. The channels are numbered 1 through 12, respectively, from left to right.

Control or Indicator	Function
Receiver indicator lamp	When illuminated, indicates signal is being received on associated receiving channel.
P-S lever switch	Center position disconnects channel audio input to speaker and headset; P position connects channel audio output to headset; D position connects channel audio output to speaker.
Receiver identification strip holder	Indicates receiver operating frequency for associated channel (as written in per station operations plan).

Control or Indicator	Function
SPEAKER control	Adjusts speaker volume level for four corresponding channels.
PHONE control	Adjusts operator's headset volume level for four corresponding channels.
Transmitter indicator lamp	Dim glow indicates that channel is available for use; bright glow indicates channel is in use.
Transmitter selector switch	Down position selects desired transmitter channel; up position unkeys transmitter and disconnects microphone output from that channel.
Frequency identification strip	Indicates transmitter operating frequency for asso ciated channel (as written in per station operating plan).

3-4. Aerological Indicator Panel, Control and Indicators
(fig. 3-2)

The aerological indicator panel contains three indicators of the ML-629/FSQ-76(V) equipment assembled on a single panel on console 2.

Control or Indicator	Function
WIND SPEED indicator	Indicates wind speed in knots.
WIND DIRECTION indicator	Indicates wind direction with respect to north.
DIM light control	Adjusts panel illumination of ALTIMETER SETTING indicator.
ALTIMETER SETTING indicator.	Indicates barometric pressure in inches of mercury.

3-5. Clock, Controls and Indicator
(fig. 33)

Refer to paragraph 3-2c for clock operating precautions. The clock is mounted on console 3.

Control or Indicator	Function
M-thumb gear	Sets minutes drums.
H-thumb gear	Sets hours drums.
LIGHTS dimmer switch	Adjusts illumination of clock time display.
Reset/stop pushbutton switch	When pressed and held down, stops clock motor. When pressed and released, resets indicator flag after power failure.
Indicator flag	Indicates interruption of power to clock when red flag is down.

3-6. Recorder/Navaid Status Panel, Controls, Indicators, and Jack
(fig. 3-4)

The recorder/navaid status panel is mounted on console 4.

Control or Indicator or jack	Function
RECORDER section:	
DIM control	Adjust brightness of panel indicator lamps.
RUN indicator lamp (green)	Lights when recorder is operative.
FAIL indicator lamp (red)	Lights to indicate malfunction of recorder.
SILENCE pushbutton switch	When pressed, silences recorder failure alarm.
NAVAID RECEIVER section:	
VOLUME control	Adjusts volume level of If receiver in headset.
PHONES jack	Headset connection point for monitoring If receiver.
ON indicator lamp (green)	Lights when If receiver is receiving a signal above a predetermined level.
OFF indicator lamp (red)	Lights when If receiver input signal level is below a predetermined level.

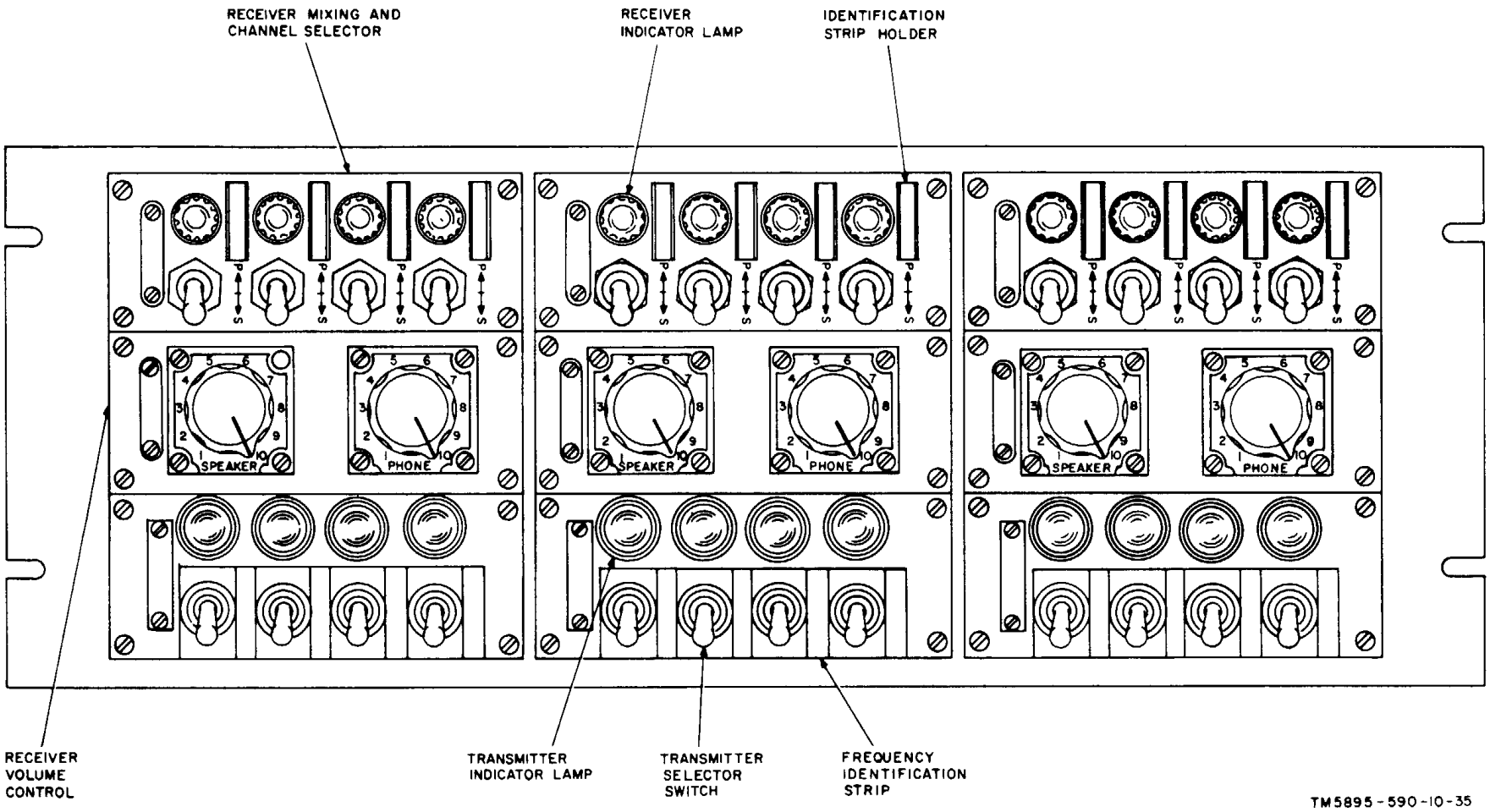
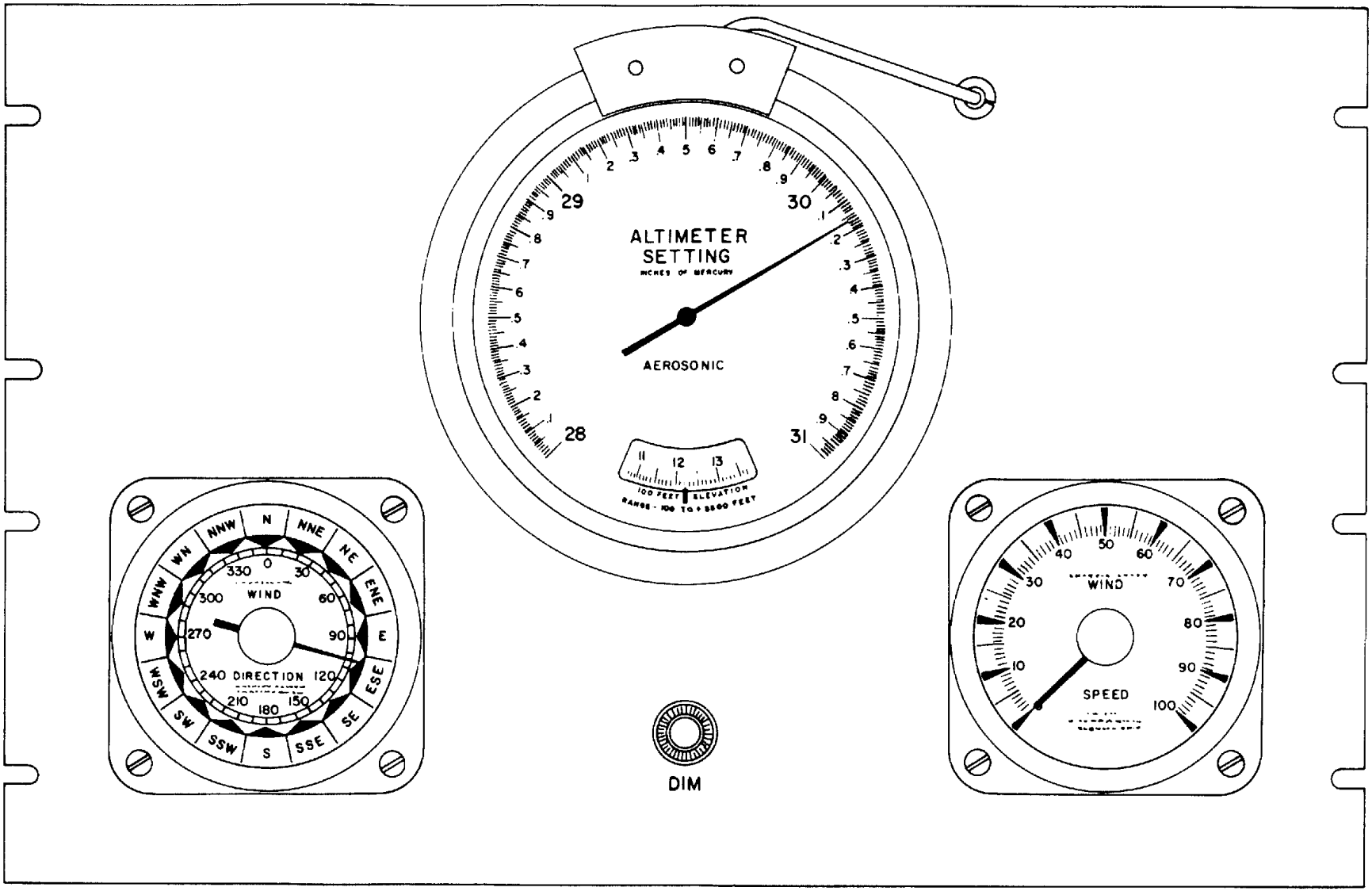


Figure 3-1. Transmitter-receiver volume control panel, controls and indicators.



TM5895-590-10-36

Figure 3-2. Aerological indicator panel, control and indicators.

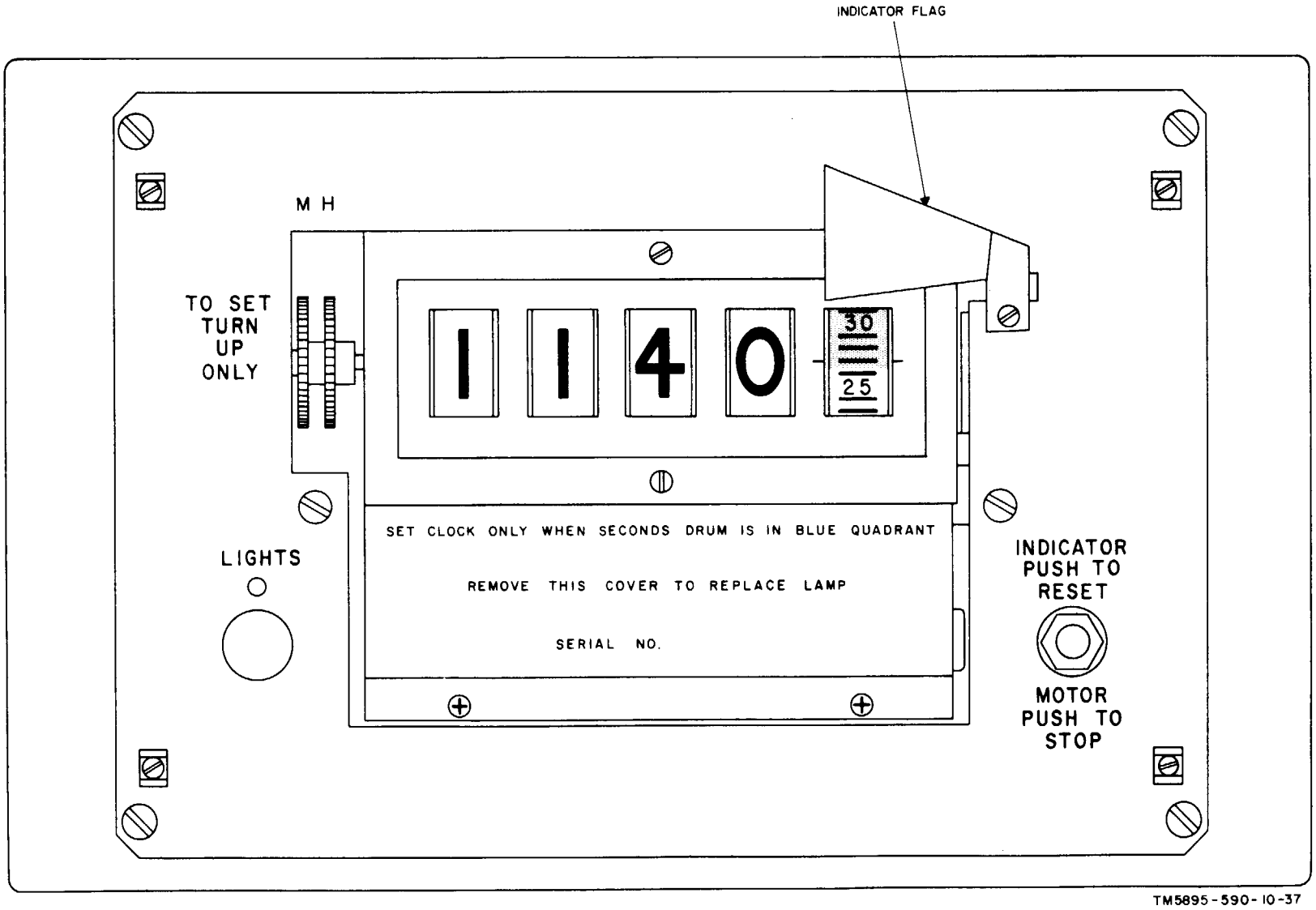


Figure 3-3. Clock, controls and indicators.

3-7. Ssb Control Panel, Control and Indicators

(fig. 3-5)

The ssb control panel is mounted on console 4.

Control or indicator	Function
VOL control (2 each)	Permits adjustment of associated speaker audio output level.
TUNE indicator lamp (red) (2 each)	Lights when ssb antenna coupler is in tuning cycle. Indicates that transmitter should not be keyed.
OPERATE indicator lamp (green) (2 each)	Lights when ssb transceiver is ready for operation (antenna coupler has cycled to correctly tuned position).

3-8. Microphone-Headset Panel, Jacks

(fig. 3-6)

There is one microphone-headset panel per controller position. They are mounted on consoles 1, 5, and 6.

Jack	Function
MIC jack	Connection point for operator's microphone plug.
PHONES jack	Connection point for operator's headset plug.

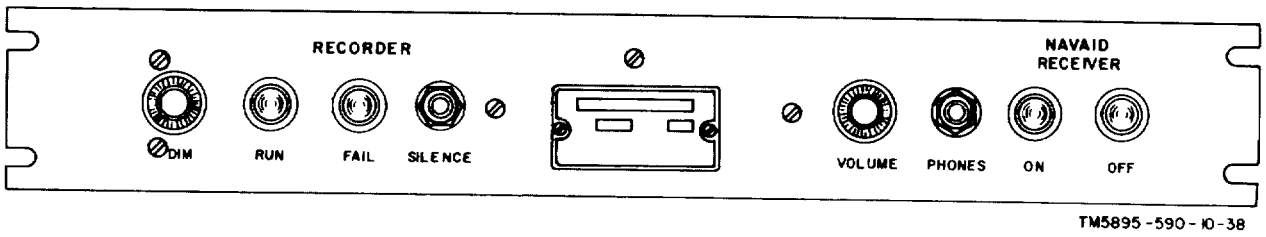


Figure 3-4. Recorder/navaid status panel, controls, indicators and jack.

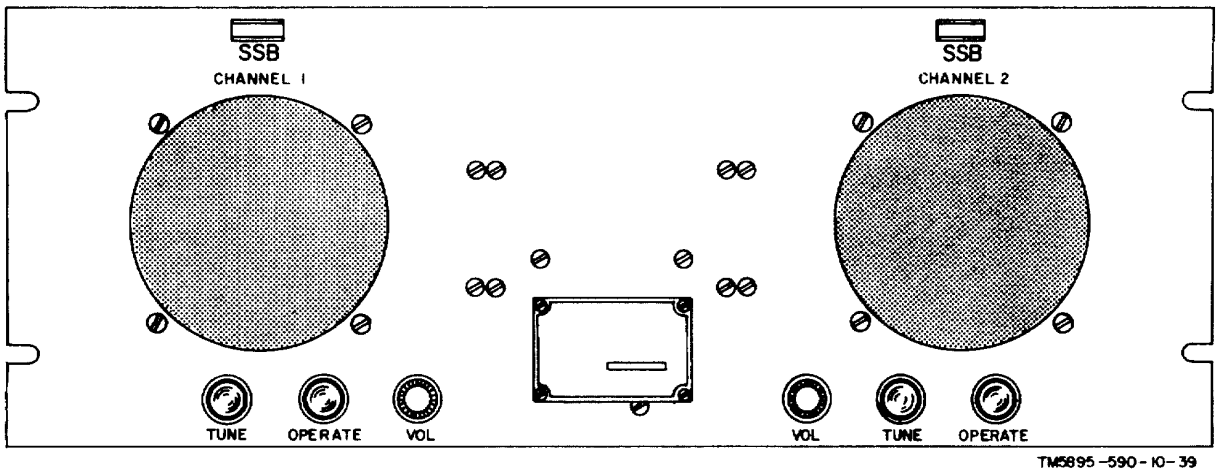


Figure 3-5. Sob control panel, control and indicators.

3-9. Ssb Microphone-Headset Panel, Jacks
(fig. 3-7)

The ssb microphone-headset panel is mounted on the single sideband control console, 4.

Jack	Function
SSB 1 MIC jack	Connection point for operator's microphone plug for control of ssb channel 1.
SSB 1 PHONE jack	Connection point for operator's headset plug for aural monitoring of ssb channel 1.
SSE 2 MIC jack	Connection point for operator's microphone plug for control of ssb channel 2.
SSB 2 PHONE jack	Connection point for operator's headset plug for aural monitoring of ssb channel 2.

3-10. Ac/Dc Distribution Unit, Indicators
(fig. 3-8)

The three ac/dc distribution units are mounted above each other on the front of console 3.

Indicating lamp fuseholder	Lights when fuse in associated equipment power circuit is open.
Circuit identification strip holder	Identifies equipment circuit fused.

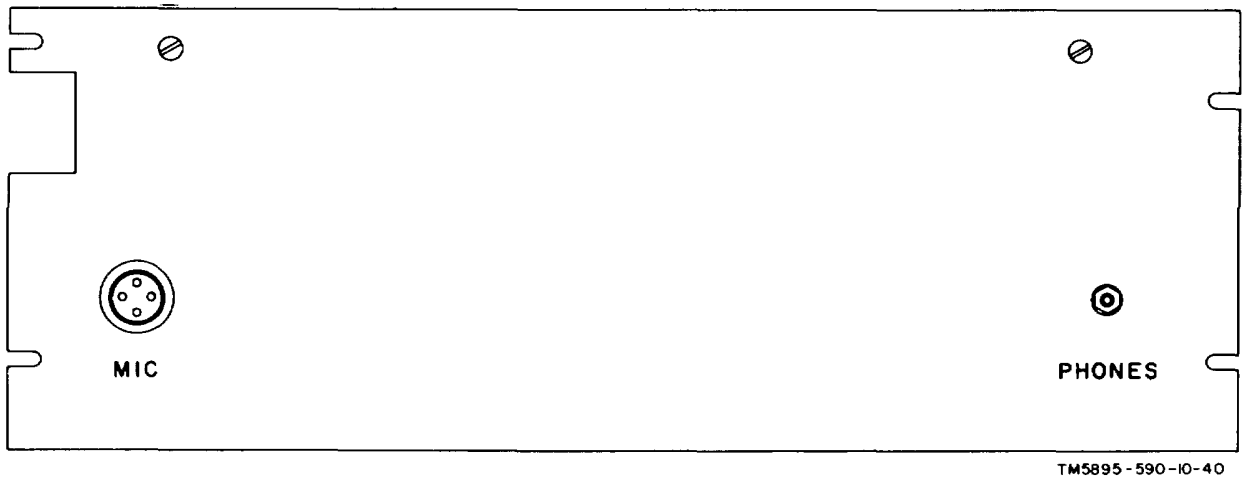


Figure 3-6. Microphone-headset panel, jack'.

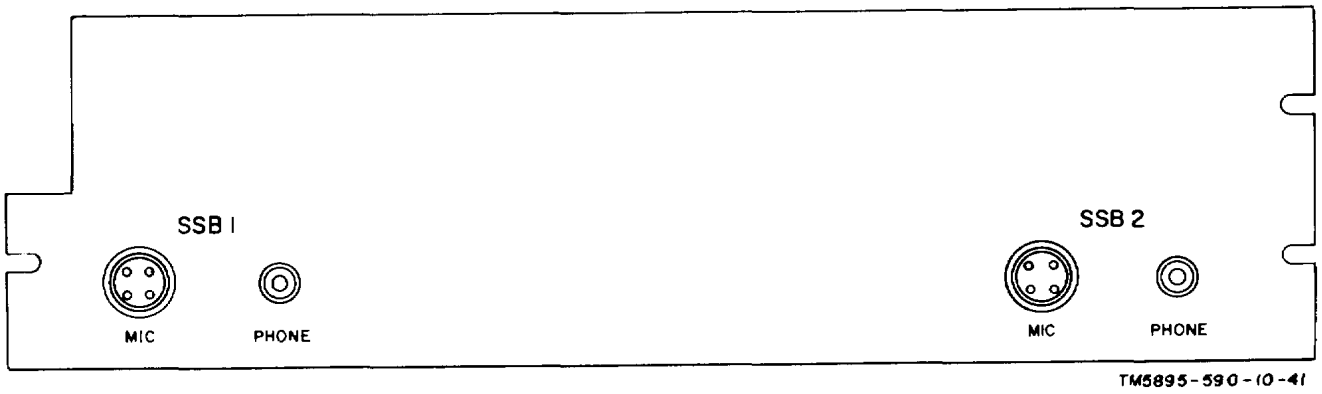


Figure 3-7. Ssb microphone-headset panel, jacks.

3-11. Interlock Unit, Controls and Jacks
(fig. 3-9)

The three interlock units are mounted inside console 3.

Control or jack	Function
LEVEL control	Adjusts microphone audio level.
Test jacks (TMTR 1 through TMTR 12)	Provide test points for meter measurement of microphone audio level (2 jacks per channel).
Channel identification strip holder	Identifies transmitter channel number.

3-12. Receiver Transformer Panel, Jacks (fig. 310)

The receiver transformer panel is mounted in console 5. Each pair of test jacks provides a measurement point of receiver audio input level.

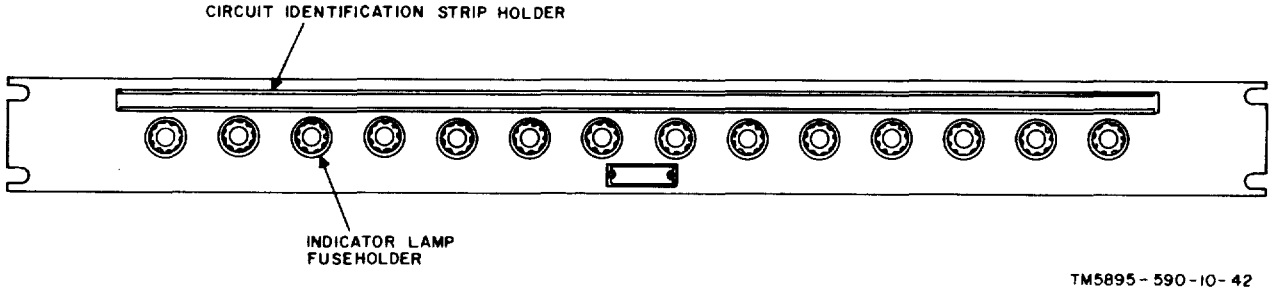


Figure 3-8. Ac/Dc distribution unit, indicators.

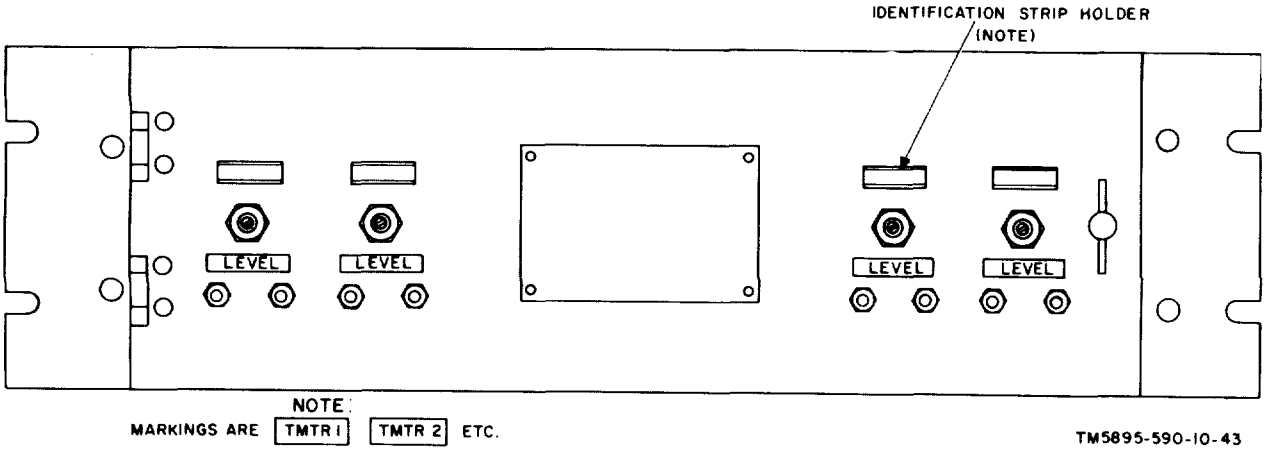


Figure 3-9. Interlock unit, controls and jacks.

3-13. Mixing Amplifier, Controls and Indicators
(fig. 3-11)

The mixing amplifier is mounted in console 3.

Control or indicator	Function
POWER ON-OFF switch	Applies external power to power supply module.
POWER indicator lamp	Lights when power supply module is energized.
ON-OFF switch (6, 1 per modulator)	Applies power from power supply module to individual amplifier module.
.175A indicating fuseholder	Lights when fuse opens while power is on.

3-14. 23/46Volt Power Supply, Control and Indicator
(fig. 3-12)

The 23/46-volt power supply is mounted in console 4.

Control or indicator	Function
ON-OFF switch	Applies external power to unit.
POWER indicator lamp	Lights when unit is energized.

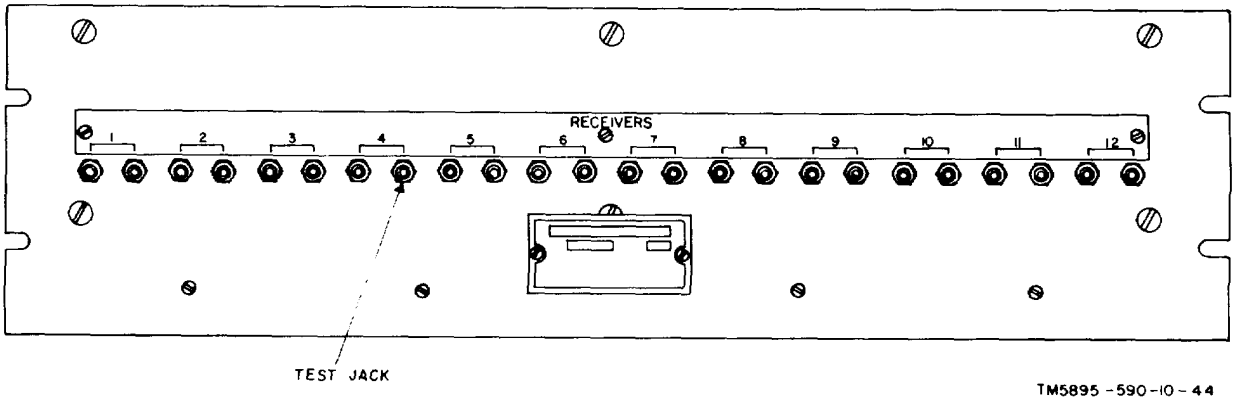


Figure 3-10. Receiver transformer panel, jacks.

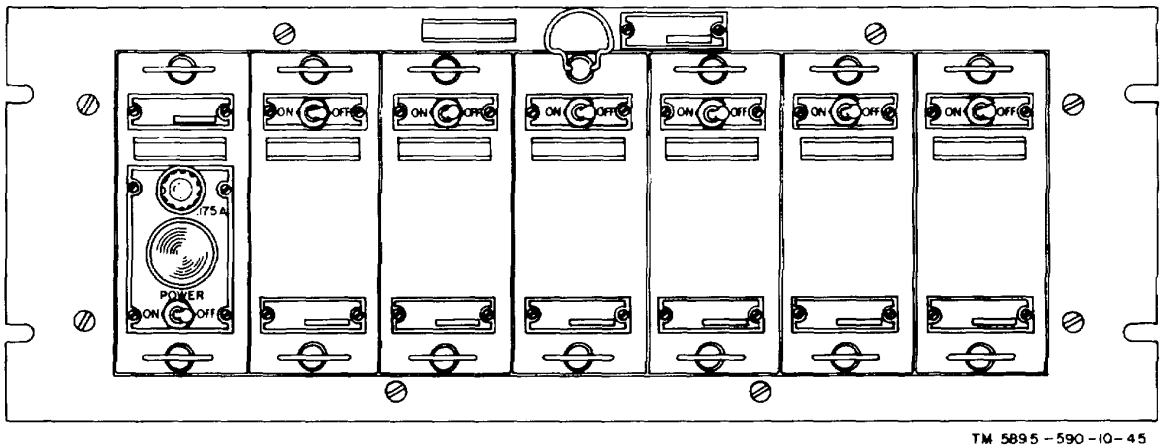


Figure 3-11. Mixing amplifier, controls and indicators.

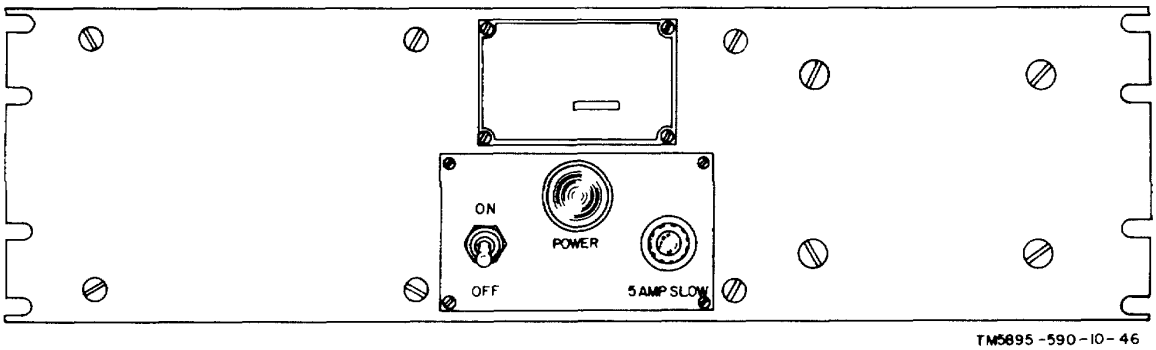


Figure 3-12. 23/46-volt power supply, control and indicator.

3-15. Alarm/Pa System, Controls and Indicator

(fig. 3-13)

Control or indicator	Function	
GAIN control	In any position other than OFF, applies power to the amplifier. Adjusts audio volume when SELECTOR switch is set to RADIO or PA.	
	Sw pos	Action
SELECTOR (6-position rotary switch)	RADIO	Amplifies incoming radio messages. (Not used in AN/FSQ75 (V) (*).)
	PA	Amplifies microphone voltage for public address operations.
	MANUAL	Operates siren when SIREN pushbutton switch is pressed.
	WAIL	Causes siren to produce a continuous wailing (rise and fall in frequency) sound.
	YELP	Causes siren to produce a continuous, rapid, warbled tone.
	HI-LO	Causes siren to produce a distinctive two-tone sound.
SIREN pushbutton switch	Operates the siren tone when SELECTOR switch is set to MANUAL.	
Indicator lamp	Lights when GAIN control is moved from OFF position.	

3-16. Engine Generator Remote Control Panel, Controls and Indicators

(fig. 3-14)

Refer to the operating precaution in paragraph 3-2a before using this equipment.

Control or Indicator	Function	
VOLTS meter	Indicates output voltage of power source selected by VOLT-FREQ. SELECTOR switch.	
FREQ. meter	Indicates output frequency of power source selected by VOLT FREQ. SELECTOR switch.	
	Sw pos	Action
VOLT.FREFQ. SELECTOR (3-position rotary switch).	C	Applies commercial power to VOLTS and FREQ. meters for monitoring of voltage and frequency.
	G1	Applies engine generator 1 output power to VOLTS and FREQ. meters for monitoring of voltage and frequency.

Control or indicator	Function
	Sw pos Action
	G2 Applies engine generator 2 output power to VOLTS and FREQ. meters for monitoring of voltage and frequency.
	Sw pos Action
POWER SELECTOR (3-position rotary switch)	C Activates bus to place commercial power on line.
	G1 Activates bus to place generator 1 output on line.
	G2 Activates bus to place generator 2 output on line.
SYSTEM CONT. PWR. switch	Places power source selected by POWER SELECTOR switch on line.
START GEN. 1 switch	Remotely starts and stops engine generator 1.
START GEN. 2 switch	Remotely starts and stops engine generator 2.
OPER. PWR. COMM. indicator lamp.	Indicates commercial power is available.
OPER. PWR. GEN. 1 indicator lamp.	Indicates engine generator 1 is operating.
OPER. PWR. GEN. 2 indicator lamp	Indicates engine generator 2 is operating.

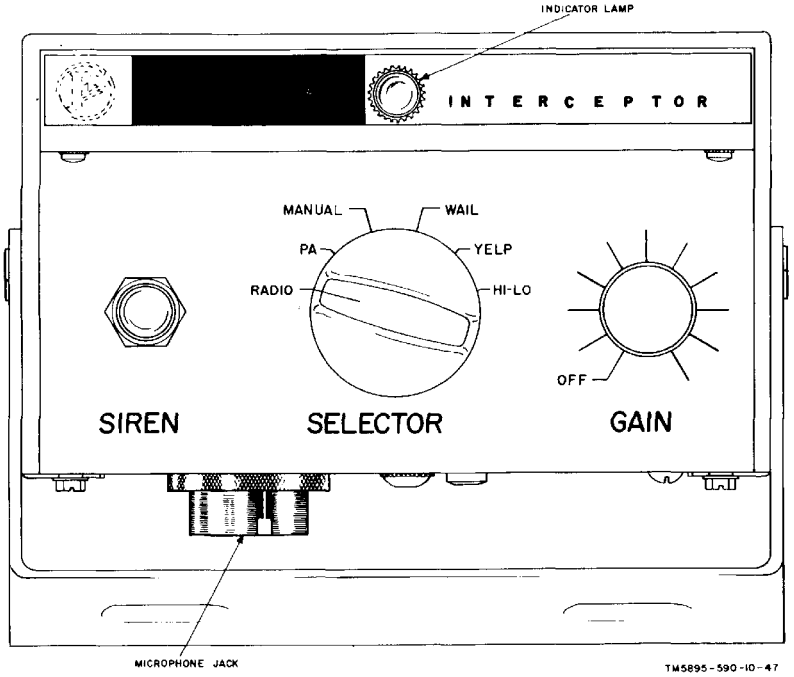


Figure 3-13. Alarm/pa system, controls and indicator.

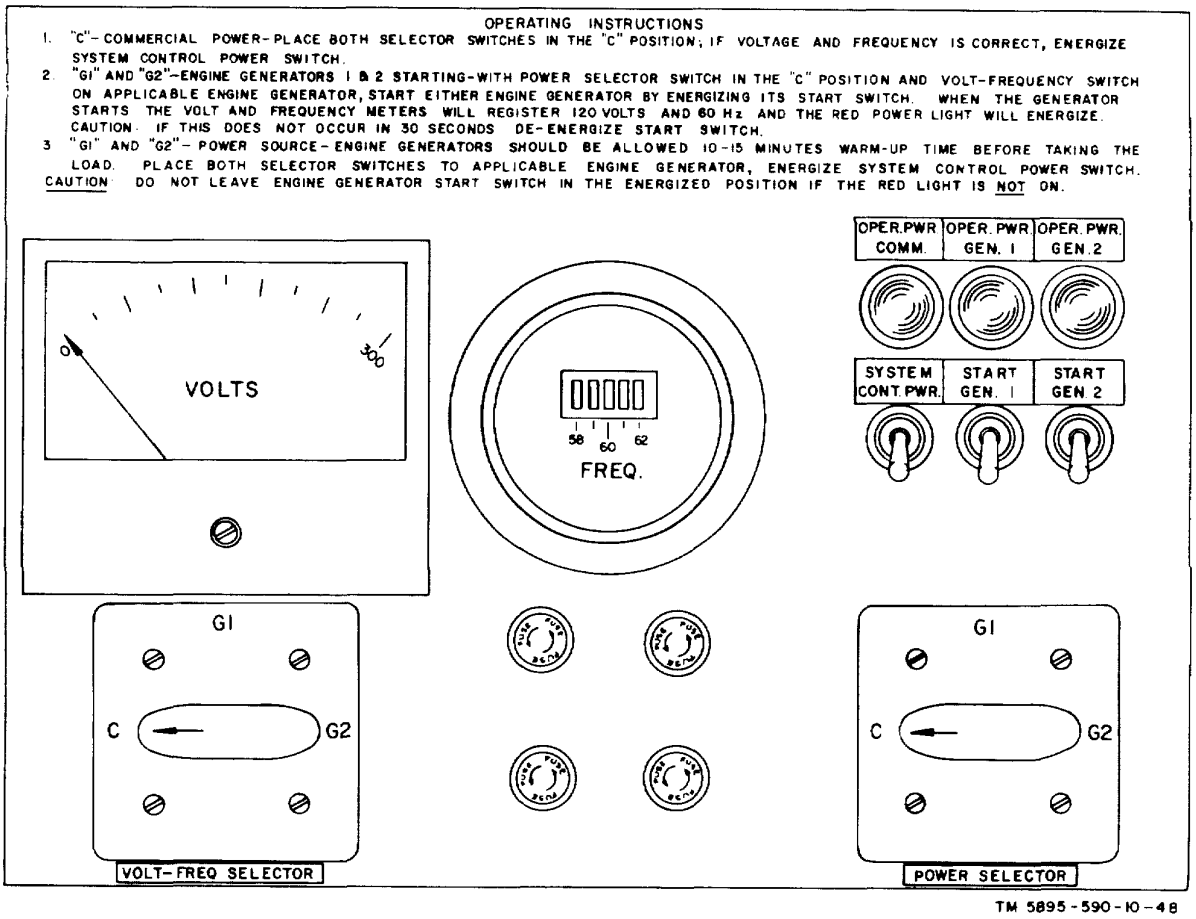


Figure 3-14. Engine generator remote control panel, controls and indicators.

3-17. 48-Volt Power Supply, Control and Indicators

(fig. 3-15)

The two 48-volt power supplies are located in rack 7 in the equipment shelter.

Control or indicator	Function
ON-OFF switch	Applies primary line power to power supply.
POWER indicator lamp	Lights when unit is energized.
5 AMP indicating fuseholder	Lights to indicate that fuse is open.

3-18. 48-Volt Power Combining Unit, Control and Indicators (fig. 3-16)

The 48-volt power combining unit is mounted in rack 7 of the equipment shelter.

Control or indictor	Function
ALARM SILENCE-NORMAL switch	When set to NORMAL, audible alarm functions; when set to SILENCE, audible alarm is turned off although ALARM indicator lamp remains lighted.
ALARM indicator lamp (red)	Lights to indicate failure of any input.
48 V DC INPUT indicator lamps (2 used in AN/FSQ-76(V) (*))	Lights when 48 volts dc is applied to unit.

Control or indictor	Function
NORMAL indicating fuseholder	Lights when fuse in power input circuitry opens.
Circuit identification strip	Identifies circuit in which associated fuse provides protection.

3-19. 27.5-Volt Power Supply, Controls and Indicators (fig. 3-17)

Three of the four 27.5-volt power supplies are contained :n rack 1 and one is contained 'in rack 2 of the equipment shelter.

Control or indicator	Function
ON-OFF switch	Applies as input power to power supply.
AC indicator lamp	Lights when ac power is applied to the internal circuits through the ON-OFF switch.
VOLTAGE ADJUST control	Adjusts power supply output voltage.
CURRENT ADJUST control	Adjusts power supply output current.
D-C VOLTS meter	Indicates output voltage.
D-C AMPERES meter	Indicates current drawn from power supply.

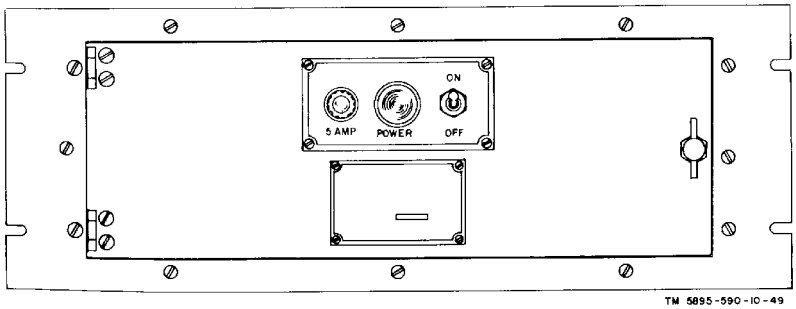


Figure 3-15. 48-volt power supply, control and indicators.

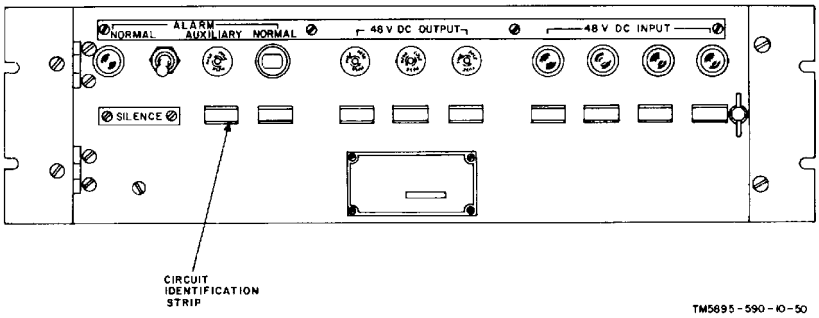


Figure 3-16. 48-volt power combining unit, control an indicators.

3-20. Receiver Test Panel, Jacks

Jack	Function
Test jacks (24)	Test points for measurement of audio output voltage of associated receiver (2 test points per channel).
Phone jacks (12)	Headset connection points for aural monitoring of associated receiver audio output.

3-21 . RF Body, Jacks (fig. 3-19)

Refer to the operating precautions in paragraph 3-2b before using this equipment. There are 10 each of the RF bodies; 2 each are in racks 1, 3, 4, 5, and 6 of the equipment shelter.

Jack	Function
Element socket	Receptacle for various measuring elements used with the RF wattmeter. Elements are changed depending on frequency and power range required.
Coaxial jack	Connection point for measurement of associated transmitter power and modulation.

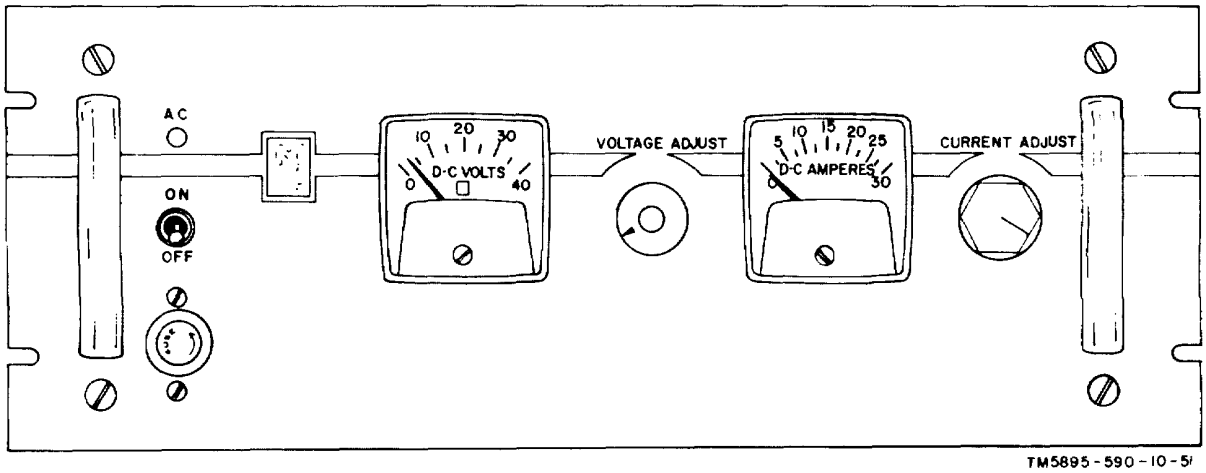


Figure 3-17. 27.5-volt power supply, controls and indicators.

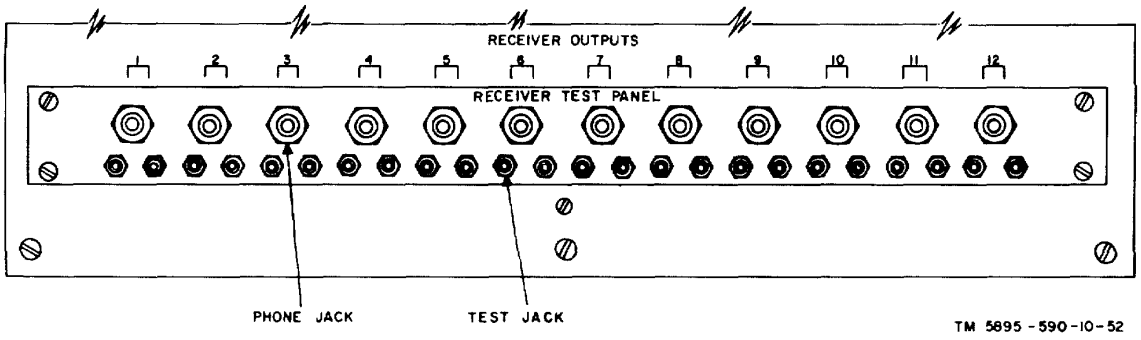


Figure 3-18. Receiver test panel, jacks.

3-22. 27.5-Volt Power Combining Unit, Indicators

(fig. 3-20)

The 27.5-volt power combining unit is mounted in rack 2 of the equipment shelter. Four indicator lamps show when corresponding 27.5-volt power supply output power is available at input circuits of the combining unit.

3-23. FM RF Body, Jacks

(fig. 3-21)

Refer to the operating precautions in paragraph :32b before using this equipment. The FM RF body is mounted in rack 2 of the equipment shelter.

Jack	Function
Element socket	Receptacle for elements used with the RF wattmeter. Elements are selected depending on frequency and power range required.
Coaxial jack	Connection point for measurement of associated fm transmitter power and modulation.

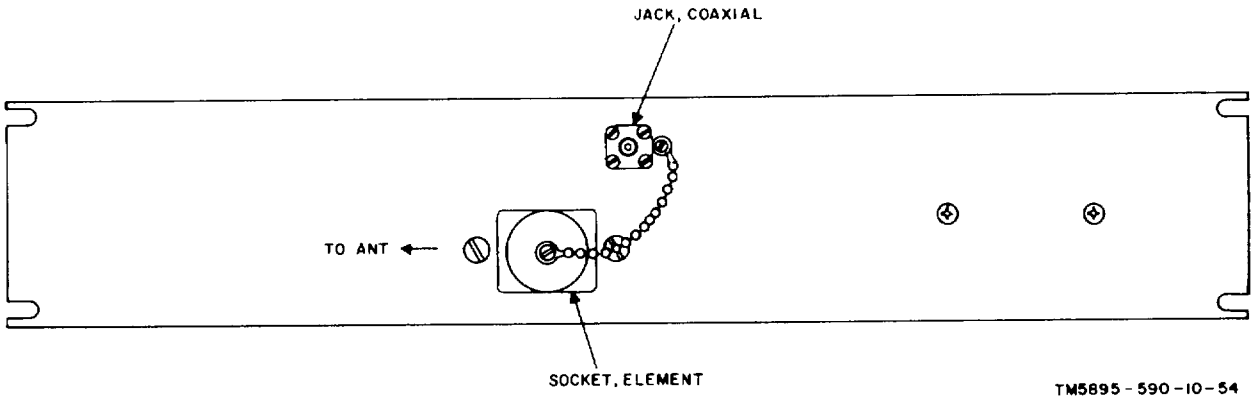


Figure 3-19. RF body.

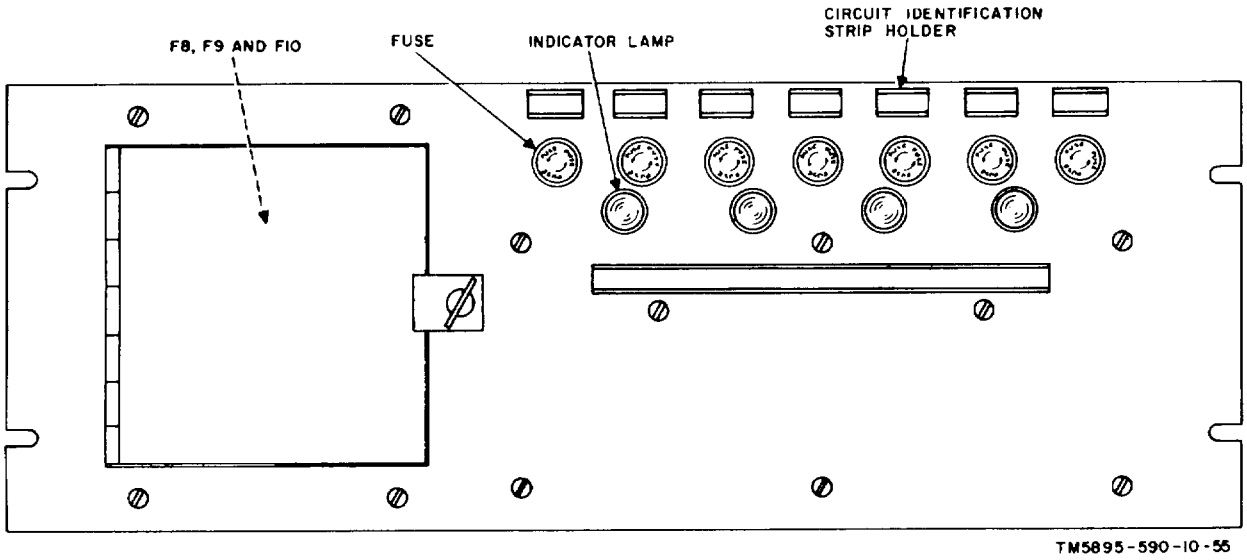


Figure 3-20. 27.5-volt power combining unit, indicator.

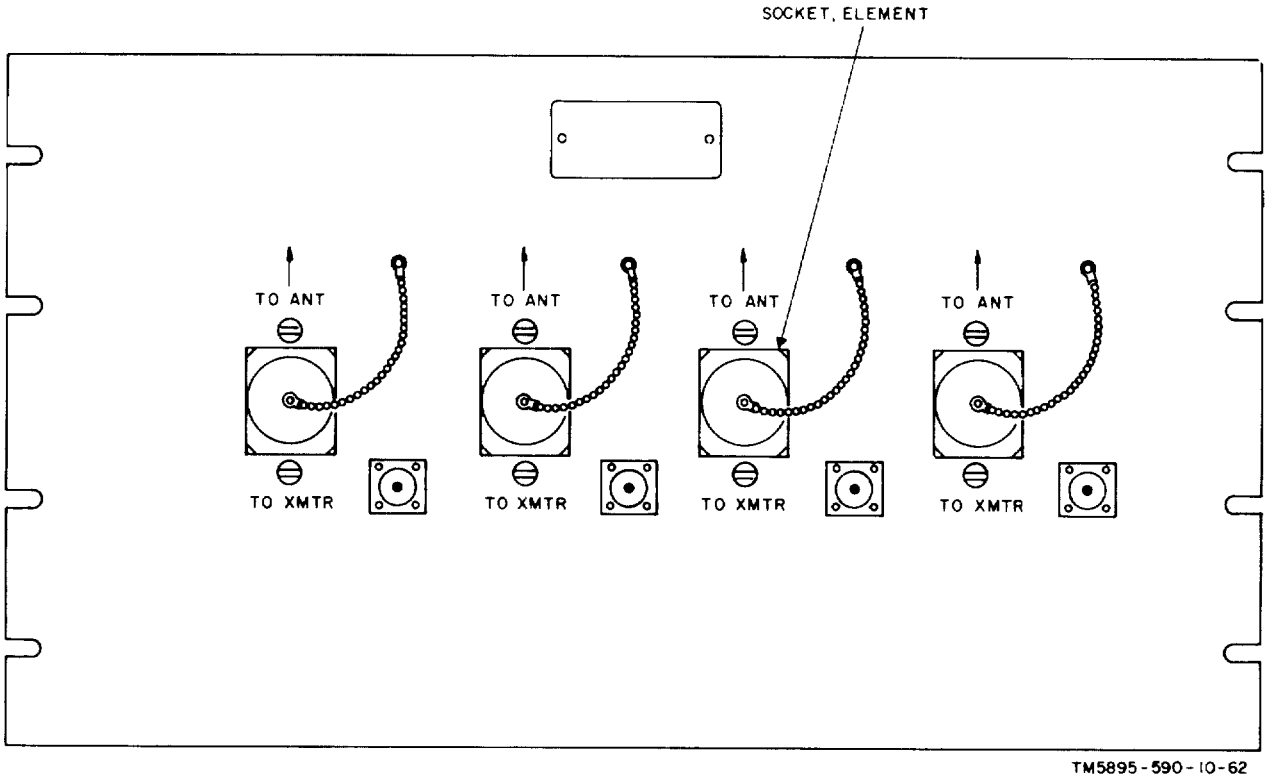


Figure 3-21. FM RF body, jacks.

3-24. Modulation Monitor, Controls, Indicators and Jacks

(fig. 3-22)

Control, indictor, or Jack	Function
POWER ON-OFF switch	Applies input power when switch is at ON.
ANTENNA INPUT jack	Connection point for telescoping antenna for remote monitoring.
ANTENNA-ATTENUATOR switch	Connects input from either telescoping antenna or rf probe to internal circuitry.
ATTENUATOR COARSE (3-position rotary switch).	Sw pos: X1 — Action: No signal attenuation. Sw pos: X10 — Action: Signal attenuated by factor of 10. Sw pos: X100 — Action: Signal attenuated by factor of 100.
POWER indicator lamp	Lights when modulation monitor is energized.
POWER 3/8 AMP SLOW indicator	Lights when input power fuse opens.
ATTENUATOR FINE control	Fine adjustment of relative attenuation inserted in input signal path.
ATTENUATOR INPUT jack	Connection point for rf probe for local monitoring of modulation.
MEGACYCLES dial	Indicates frequency in MHz to which modulation monitor is tuned.
TUNE COARSE control	Provides coarse adjustment of modulation monitor frequency setting.

Control, indictor, or Jack	Function
TUNE FINE control	Provides fine adjustment of modulation monitor frequency setting.
CARRIER meter	Provides redline indication of proper setting of RF carrier level.
DIMMER control	Controls intensity of internal illumination of CARRIER meter and MEGACYCLES dials.
AUDIO OUTPUT jack	Connection point for aural monitoring of transmitter modulation.
SYNC OUTPUT jack	Provides output for synchronizing an oscilloscope when oscilloscope is used for viewing modulation waveform.
I. F. OUTFIT jack	Provides output for viewing transmitter modulation waveform on an oscilloscope.

3-25. RF Wattmeter, Controls, Indicators and Jacks

(fig. 3-23)

Indicator or jack	Function
WATTS meter	Indicates power in watts.
Dc connector	External jack for connection to auxiliary line section (coaxial jack) on rf body mounting.
RF connectors (2)	Jacks for connection to internal line section.
Element socket	Measuring base for insertion of plug-in elements.

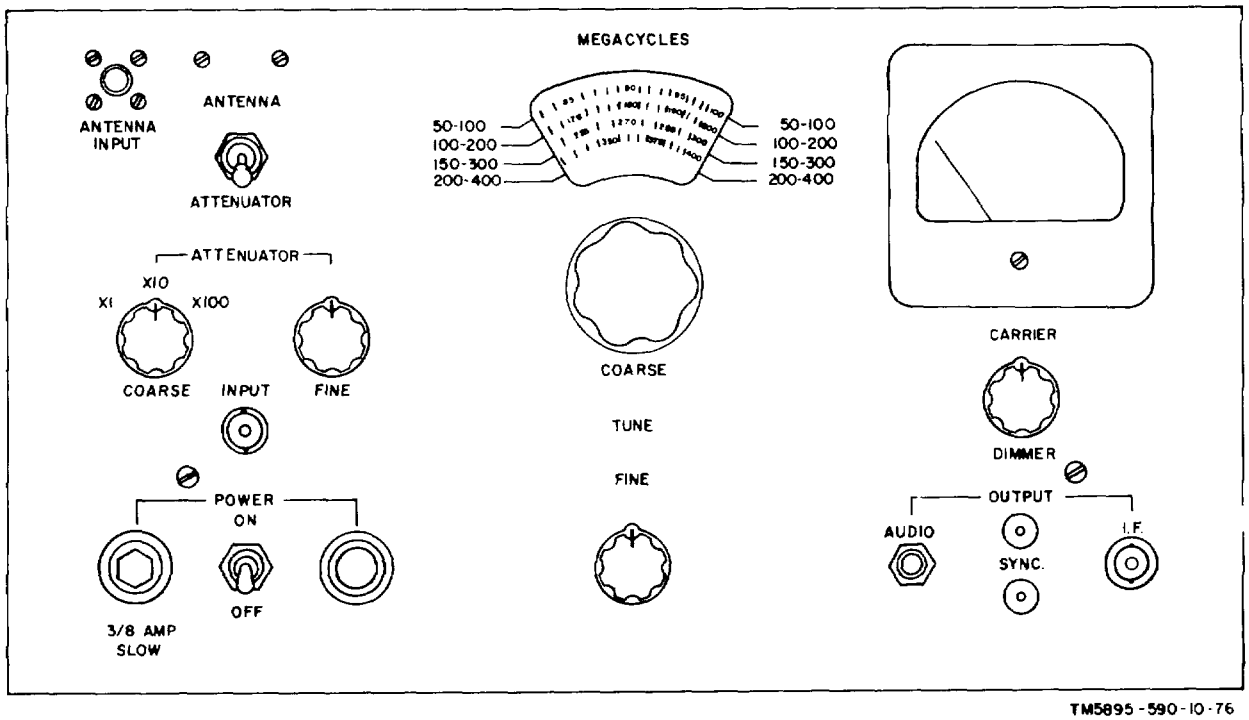


Figure 3-22. Modulation monitor, controls, indicators, and jacks.

3-26. Control Tower Power Distribution Panel, AN/FSQ-75(V)1 and AN/FSO75(V)2 Circuit Breakers

(fig. 3-24)

Circuit breaker	Function
MAIN (CB)	Provides control and 100-ampere overload protection for 120and 208-volt ac input power source. Controls the application of ac power to circuit breakers CB2 through CB8.
AIR COND. (CB2)	Provides control and 20-ampere overload protection for circuits of one air conditioner.
AIR COND. (CB3)	Provides control and 20-ampere overload protection for circuits of other air conditioner.
LIGHTS (CB4)	Provides control and 15-ampere overload protection for control tower lighting circuits.
ELECT. EQUIP. (CB5).	Provides control and 15-ampere overload protection for console group circuit.
CONV. OUTLETS (CB6)	Provides control and 15 ampere overload protection for control tower convenience outlet circuits.
SPARE (CB7)	Unused 15-ampere control.
SPARE (CB8)	Unused 15-ampere control.

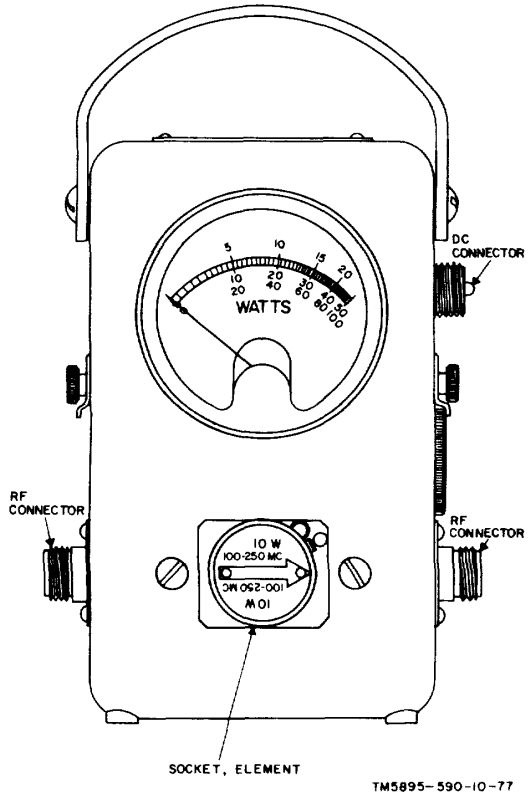


Figure 3-23. RF wattmeter, indicator and jacks.

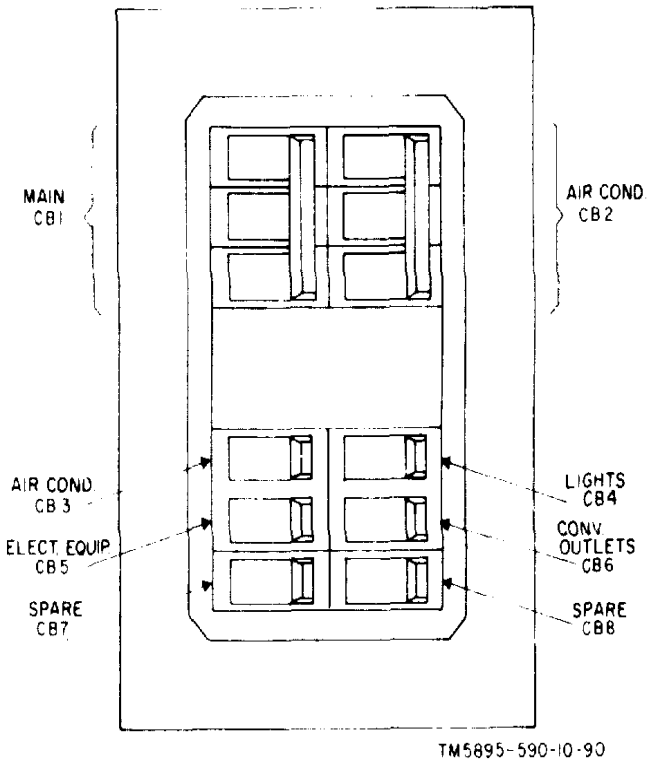


Figure 3-24. Control tower power distribution panel, AN/FSQ-75(V)1 and AN/FSQ-75(V)2.

3-27. Control Tower Cab Power Distribution Panel, AN/FSQ-75(V)3, Circuit Breakers
(fig.3-25)

Circuit breaker	Function
MAIN	Provides control and 200-ampere overload protection for 120and 208-volt ac input power source. Controls application of ac power to all other circuit breakers in the power distribution panel.
COMPRESSOR MOTOR	Controls application of ac power air conditioner compressor motor and provides 30 ampere overload protection.
CONDENSER FAN MOTOR	Controls application of ac power to air conditioner condenser fan motor and provides 15-ampere overload protection.
EVAPORATOR FAN MOTOR	Controls application of ac power to air conditioner evaporator fan motor and provides 15-ampere overload protection.
HEATER SPARE (2)	Not used. Provide for future connection of control tower heading equipment and provides 30-ampere overload protection.
LIGHT CIRCUIT	Controls application of ac power to interior control tower lights and provides 15 ampere overload protection.
CENVENIENCE OUTLET	Controls application of ac power to ac plugmold along floor to curbside of control tower, to duplex ac outlets on top of air conditioner ductwork, and to obstruction lights. Provides 20-ampere overload protection.
COMM SPARE (4)	Top circuit breaker controls application of ac power to ac plugmold running along floor on roadside of control tower behind console group, Furnishes ac power for console group and signal light gun. Provides 30-ampere overload protection. Remaining three breakers are not used; however, if used they will furnish 30-ampere overload protection.
SPARE (4)	Not used. Each will provide 1-ampere overload protection if used.

3-28. Control Tower Cab Air-Conditioner Control Panel, AN/FSO-75(V)3 Only, Controls and Indicators
(fig. 3-26)

Control or indicator	Function
MODE SELECTOR (3-position rotary switch)	Provides selection capability for mode of air conditioner operation desired.
	Pos: FAN — Evaporator fan operates and circulates uncooled air throughout control tower.
	Pos: OFF — All air conditioner operation is disabled.
	Pos: COOL — Air conditioner compressor and condenser fan operate to circulate cooled air throughout control tower.
COMPRESSOR OPERATING indicator	Lights when compressor is operating.
CONDENSER FAN OPERATING indicator	Lights when condenser fan is operating.
EVAPORATOR FAN OPERATING indicator	Lights when evaporator fan is operating.

Control or Indicator	Function
COOLING NOT REQUIRED indicator	lashes on and off if MODE SELECTOR switch is set to COOL and ambient temperature is below 55° F. Remains off at all other times.
COMPRESSOR pushbutton circuit breaker	When pressed, compressor motor overload relay is set; if switch has popped out, indicates compressor motor overload relay is tripped. Pressing switch resets overload relay.
CONDENSER FAN pushbutton circuit breaker	When pressed, indicates condenser fan motor overload relay is set; if switch has popped out, indicates overload relay is tripped. Pressing switch resets the overload relay.
EVAPORATOR FAN pushbutton circuit breaker	When pressed, indicates evaporator fan motor overload relay is set; if switch has popped out, indicates overload relay is tripped. Pressing switch resets overload relay.
CONTROL CIRCUIT FUSE	Protects control circuitry.

3-29. Equipment Shelter Master Circuit Breaker

(fig. 3-27)

The master ON-OFF circuit breaker provides control and 125-anpere overload protection for the 120 and 208-volt ac input power source. It controls the application of ac power to the control tower power distribution panel and the equipment shelter power distribution panel.

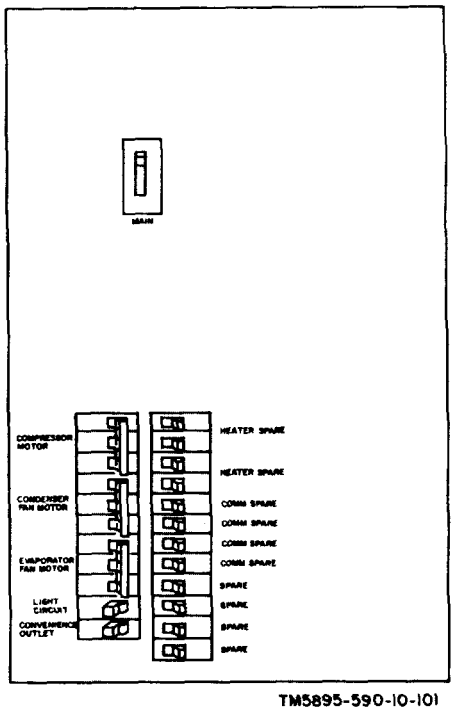


Figure 3-25. Control tower cab power distribution panel, AN/FSQ75(V)3 only.

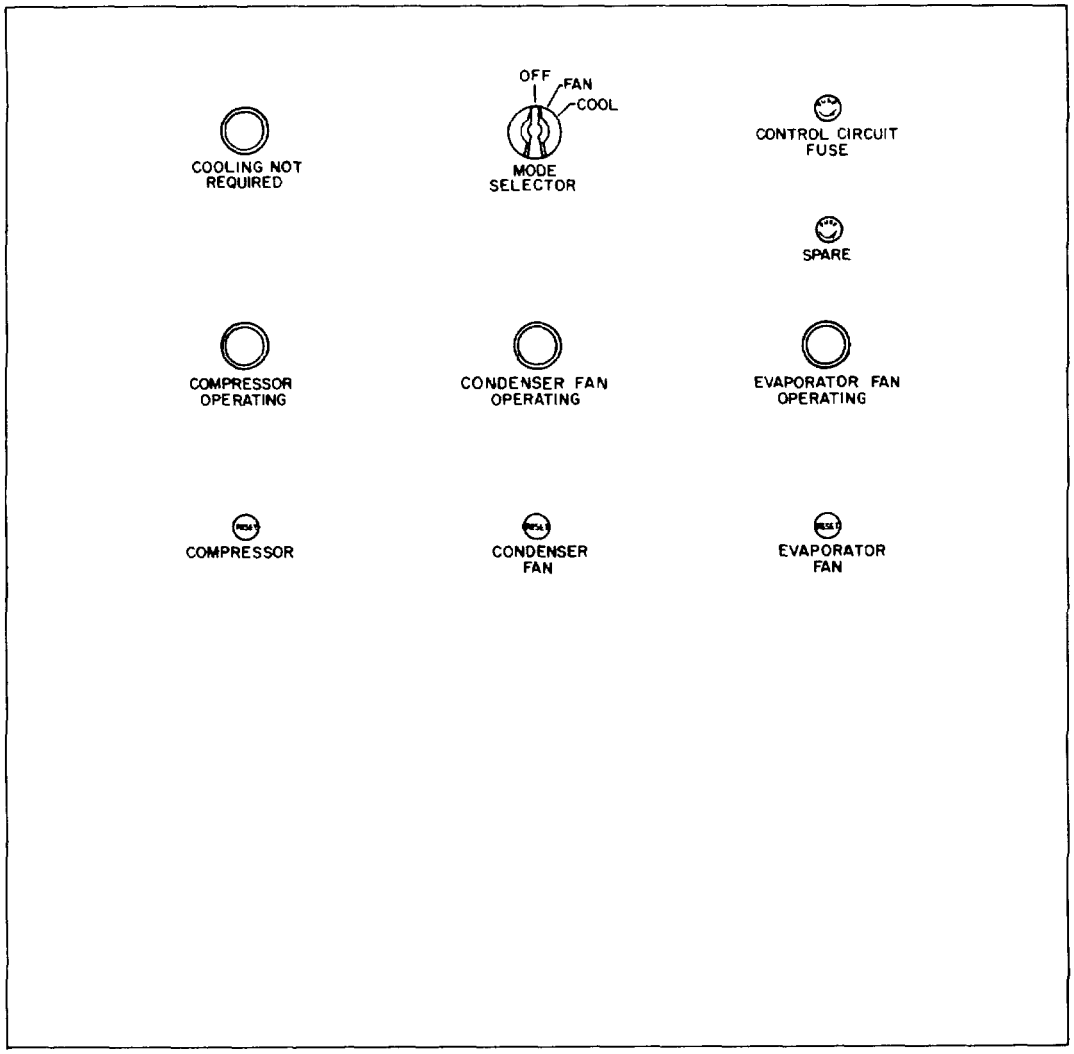


Figure 3-26. Control tower cab air conditioner control panel (AN/FSQ-75(V)3 only).

3-30. Equipment Shelter Power Distribution Panel

(fig. 3-28)

Circuit breaker	Function
MAIN circuit breaker (CB1)	Provides control and 100-ampere overload protection for 120-and 208-volt ac input power source. Controls application of ac power to circuit breakers CB2 through CB16.
AIR CONDITIONER circuit breaker (CB2)	Provides control and 20-ampere overload protection for air conditioner circuit.
LIGHTS (CB3)	Provides control and 15-ampere overload protection for fluorescent light circuit.
SPARE (B4)	Unused 15 ampere control.
RACK 1 TOP OUTLET (CB5)	Provides control and 30-ampere overload protection for highest of three duplex receptacles in rear of rack 1.

Circuit breaker	Function
RACK 6 and 7 (CB6)	Provides control and 20-arpere overload protection for wiremold strip receptacles in rear of racks 6 and 7.
RACK 1 CENTER OUTLET (CB7)	Provides control and 30-ampere overload protection for center of three duplex receptacles in rear of rack 1.
RACK 5 (CB8)	Provides control and 20-ampere overload protection for wiremold strip receptacles in rear of rack 5.
RACK 1 BOTTOM OUTLET (CB9)	-Provides control and 30-ampere overload protection for bottom of three duplex receptacles in rear of rack 1.
RACK 3 (CB10)	Provides control and 20-ampere overload protection for wiremold strip receptacles in rear of rack 3.
RACK 2 (CR11)	Provides control and 30-ampere overload protection for wiremold strip receptacles in rear of rack 2.
RACK 4 (CB12)	Provides control and 20-ampere overload protection for wiremold strip receptacle in rear of rack 4.
AIR CONDITIONER (CB13)	Provides control and 20-ampere overload protection for air conditioner circuit
VENTILATOR (CB14).	Provides control and 15-ampere overload protection for ventilating circuit.
WORK BENCH (CR16)	Provides control and 15-ampere overload protection for wiremold outlets above workbench.
SPARE (CB18)	Unused 15-ampere control.

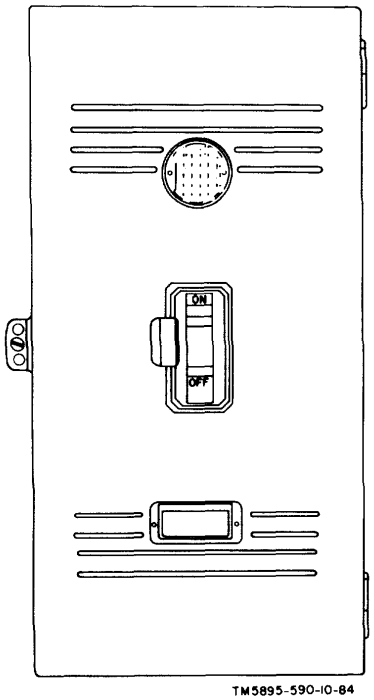


Figure 3-27. Equipment shelter master circuit breaker.

3-31. Mixing Amplifier Test Jig, Control and Jacks
(fig. 3-29)

Control or jack	Function
CHANNEL SELECTOR (4-position rotary switch)	Applies audio input to associated channel circuits in amplifier module.
AUDIO IN jacks	Connection points for audio signal generator input.
AUDIO OUT jacks	Connection points for meter measurement of audio gain.

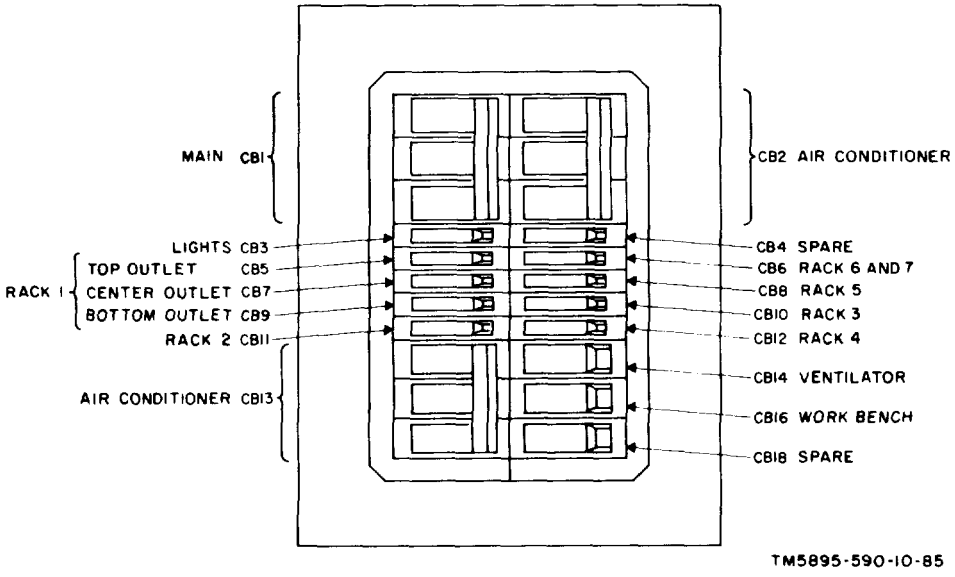


Figure 3-28. Equipment shelter power distribution panel.

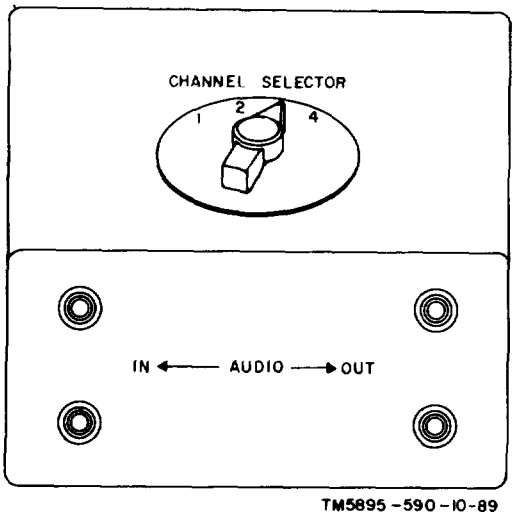


Figure 3-29. Mixing amplifier teat jig, control and jacks.

Section II. OPERATION UNDER USUAL CONDITIONS

3-32. General

The AN/FSQ-75(V)1 and AN/FSQ-75(V)2 air traffic control systems are intended for operation from three controller positions within the control tower. The AN/FSQ-75(V)3 system is intended for operation from two controller positions within the control tower cab. Operation of all transmitters, except those in the ssb transceivers, can be effected from any or all controller position. Operation of the ssb transceiver is initiated only at controller position 2. Receiver monitoring capability is the same as for transmitter control except that monitoring of If receiver audio signals and recorder operational status is provided only at controller position 2. Operational control of the alarm/pa system and selection and monitoring of the operating and standby power sources is provided at separate panels within the control tower.

3-33. Preliminary Starting Procedure

Before energizing the air traffic control system, the following controls should be placed in the positions specified to establish the system in a pre-operational, shutdown condition

Component	Control	Position
Receiver mixing and channel selector (fig 3-1).	P-S lever switches	Center (off).
Receiver volume control	SPEAKER control	5.
	PHONE control	5.
Transmitter selector	Lever switches	Off (up).
Six-channel amplifier group	ON-OFF power switch (power supplies).	OFF.
	INPUT LEVEL control (amplifiers).	Predetermined setting (para 2-15).
Four-channel amplifier group	ON-OFF power switch (power supplies).	OFF.
	DB. input attenuator. (amplifiers).	Predetermined setting (para 2-14).
Interlock unit (fig 3-9)	LEVEL controls	Predetermined setting (para 2-14).
Mixing amplifier (fig 3-11)	POWER ON-OFF switch (power supply).	OFF.
	ON-OFF. switch (amplifiers)	OFF.
Recorder/navaid status panel (fig 3-4).	DIM control	Maximum counterclockwise.
	VOLUME control	Predetermined setting (para 2-20).
23/46-volt power supply (fig 3-12).	ON-OFF	switch OFF.
Ssb transceiver	Mode selector switch	OFF.
	RF. SENS control	Predetermined setting (para 2-18b).
	Frequency selector knobs (4)-	As required.
27.5-volt power supply (fig 3-17)	ON-OFF switch	OFF.
	VOLTAGE ADJUST control	Predetermined setting (para 2-13).
	CURRENT ADJUST control	Predetermined setting (para 2-13).
FM. transceiver	BAND. switch	As required.
	LIGHT ON-OFF switch	OFF.
	SPEAKER ON-OFF switch	OFF.
	MC-TUNE control	As required.
	KC-TUNE control	As required.
	POWER switch	OFF BREAKER-RESET.
	SQUELCH. switch	As required to prevent background noise when no signal is present.
	VOLUME. control	As required for comfortable listening level.
Vhf and uhf transmitters	POWER ON-OFF switch	OFF.
	LOCAL-REMOTE switch	REMOTE.

Component	Control	Position
	PLATE ON-OFF switch	OFF.
	MULTIMETER SWITCH	OFF.
Equipment shelter master circuit breaker (fig. 3-27).	ON-OFF circuit breaker	OFF.
Equipment shelter power distribution panel.	MAIN and all other circuit breakers.	OFF.
Recorder	LINE SWITCH (tape transport)	OFF (down).
	FAST FORWARD-NORMAL FAST REWIND switch.	NORMAL.
	REPRODUCE-STOP-RECORD switch.	STOP.
	LINE SWITCH (power supplies)	OFF.
	OSCILLATOR OUTPUT control	Predetermined setting (para 2-17).
	GAIN control (record amplifier)	Predetermined setting (para 2-17).
	GAIN control (monitor amplifier)	Predetermined setting (para 2-17).
	METER SELECTOR switch (monitor panel).	Predetermined setting (para 2-17).
	MONITOR INPUT SELECTOR switch.	M.
Control tower power distribution panel (fig. 3-24).	All circuit breakers	OFF.
Vhf receiver	POWER ON-OFF switch	OFF.
	RF GAIN control	As required.
	RF GAIN switch	LOC.
	AF GAIN control	As required.
	MUTING switch	REMOTE.
Uhf receiver	POWER switch	OFF.
	RF GAIN control	As required.
	AUDIO QUIETING DB control.	As required.
	SQUELCH ON-OFF switch	As required.
Lf receiver	OFF-B+OFF-REC switch	OFF.
	AUDIO GAIN control	Predetermined setting (para 2-20).
	TONE control	As required.
	TUNEABLE-XTAL switch	As required.
	CW OSC control	As required.
	RF GAIN control	As required.
	AVC-MVC-CW switch	AVC.
48-volt power supply (fig. 3-15)	ON-OFF switch	OFF.
48-volt power combining unit (fig. 3-16).	ALARM SILENCE-NORMAL switch.	NORMAL.
Alarm/pa system (fig. 3-13)	GAIN control	Fully counterclockwise.
	SELECTOR switch	PA.
Engine generator remote control panel (fig. 3-14).	SYSTEM CONT. PWR. switch	Off (down).
	START GEN. 1 switch	Off (down).
	START GEN. 2 switch	Off (down).
	POWER SELECTOR switch	As desired.
	VOLT-FREQ. SELECTOR switch	As desired.
Air conditioner control panel (AN/FSQ-75(V)3 only) (fig. 3-26).	MODE SELECTOR switch	OFF.

3-34. Starting Procedure

With the controls set as outlined in the preliminary starting procedure (para 3-33), perform the following:

Note

Start and set the clock anytime after power is applied to the control tower. Use the procedures of paragraph 2-11.

Step	Component	Control	Position	Indication
1	Engine generator remote control panel (fig. 3-14).	POWER SELECTOR switch	C, G1 or G2 (depending on power source available or desired).	None.
		SYSTEM CONT. PWR. switch	ON	OPER. PWR. COMM., OPER. PWR. GEN. 1, or OPER. PWR. GEN. 2 indicator lamp lights, depending on power source selected.
2	Equipment shelter master circuit breaker (fig. 3-27).	Master circuit breaker ON-OFF switch.	ON	None.
3	Control tower power distribution panel (AN/FSQ-75(V)1 and AN/FSQ-75(V)2) (fig. 3-24).	MAIN circuit breaker	ON	None.
		LIGHTS circuit breaker	ON	Control tower lights illuminate.
		AIR COND. circuit breaker	ON	One air conditioner unit for control tower operates.
		AIR COND. circuit breaker	ON	Second air conditioner unit for control tower operates.
		CONV. OUTLETS circuit breaker.	ON	None.
		ELECT. EQUIP. circuit breaker	ON	WIND SPEED and WIND DIRECTION indicators illuminate, and console blowers operate.
	Control tower cab power distribution panel (AN/FSQ-75 (V) 3) (fig. 3-25).	MAIN circuit breaker	ON	None.
		EVAPORATOR PAN MOTOR circuit breaker.	ON	None.
		CONDENSER FAN MOTOR circuit breaker.	ON	None.
		COMPRESSOR MOTOR circuit breaker.	ON	None.
		LIGHT CIRCUIT circuit breaker	ON	None.
		CONVENIENCE OUTLET circuit breaker.	ON	None.
		Top COMM SPARE circuit breaker.	ON	WIND SPEED and WIND DIRECTION indicators illuminate, and console blowers operate.
4	Control tower thermostat (AN/FSQ-75 (V) 3 only).	Temperature	Set to desired temperature	None.

Step	Component	Control	Position	Indication
5	Control tower cab air conditioner control panel (AN/FSQ-75(V)3 only) (fig. 3-26).	MODE SELECTOR switch	COOL	COMPRESSOR OPERATING CONDENSER FAN OPERATING, and EVAPORATING indicators illuminate, and air conditioner operates. If COOLING NOT REQUIRED indicator flashes on and off, set MODE SELECTOR switch to FAN. Uncooled air circulates throughout the control tower cab.
6	Control tower cab (AN/FSQ-75(V)3 only).	AIR CONDITIONER RIGHT DAMPER and LEFT DAMPER controls (fig. 2-19 (2)).	Horizontal or vertical	When controls are set to horizontal position, fresh air is circulated through cooling system. When controls are set to vertical position, available air is recirculated through cooling system.
7	Control tower cab (AN/FSQ-75(V)3 only).	DIMMER control	ON (when required)	Recessed interior lights illuminate. Set control for desired brightness of interior lighting.
8	Obstruction lights (AN/FSQ75(V)3 only).	On-off switch (fig. 2-19 1).	ON (when required)	Obstruction lights illuminate.
9	Equipment shelter power distribution panel (fig. 3-28).	MAIN circuit breaker	ON	None.
		LIGHTS circuit breaker	ON	Equipment shelter fluorescent lights illuminate.
		VENTILATOR circuit breaker	ON	Exhaust fan operates.
		AIR CONDITIONER circuit breakers (2).	ON	Air conditioner starts; exhaust fan shuts off.
		All other circuit breakers	ON	None.
10	27.5-volt power supply	ON-OFF switch	ON	AC indicator lamp lights, and DC VOLTS meter indicates 27.5 volts dc.
11	AN/ARC-102	Mode selector switch on ssb control unit.	AM	Frequency indicator dial lights, and green OPERATE indicator lamp on the ssb control panel at console 4 lights.
		Meter switch on ssb transceiver	PA MA	None (front panel meter will indicate 300 when transmitter is keyed.)
12	FM transceiver	POWER switch	HIGH	Front panel dial indicators light.
13	Vhf and uhf transmitters	POWER ON-OFF switches	ON	Green POWER indicators at each transmitter light.

Step	Component	Control	Position	Indication
		MULTIMETER SWITCH	RF PWR	None. MULTIMETER indicates 50 when transmitter is keyed.
14	Vhf receiver	POWER switch	ON	POWER indicator lamp lights.
15	Uhf receiver	POWER switch	ON	Green POWER indicator lights.
16	Lf receiver	OFF-BY+OFF-REC. switch	B+OFF; wait 15 seconds, then set to REC.	Front panel carrier lamp lights, then goes out.
17	48-volt power supply	ON-OFF switch (fig. 3-15)	ON	POWER indicator lamp lights.
18	Recorder	LINE SWITCH (power supplies).	ON	POWER indicator lamps lights.
		LINE SWITCH (tape transports).	ON	POWER indicator lamps light. RUN indicator lamp on recorder/navaid status panel (console 4) lights.
19	23/46-volt power supply	ON-OFF switch (fig. 3-12)	ON	POWER indicator lamp lights. Transmitter indicator lamps (fig. 3-1) at consoles light at reduced brilliance.
20	Six-channel amplifier group.	ON-OFF power switch (power supplies).	ON	Red D.C. indicator lamp lights.
21	Four-channel amplifier group.	ON-OFF power switch (power supplies).	ON	Red D.C. indicator lamp lights.
22	Mixing amplifier.	POWER ON-OFF switch (power supply)	ON	POWER indicator lamp lights.
		ON-OFF switch (amplifiers)	ON	None.
23	Alarm/pa system	GAIN control	Clockwise	Red indicator lamp on amplifier front panel lights.

3-35. Operation

Controller operation of the AN/FSQ-75(V) may be most logically divided into the following phases: selection and monitoring of the main power source, verification that the starting procedure of paragraph 3-34 has been accomplished, verification that the console operating accessories are properly connected, uhf-vhf transmitter selection and control, uhf-vhf receiver selection and monitoring, single-sideband operation, If receiver monitoring, recorder status monitoring, telephone connecting group operation, alarm/pa operation, and miscellaneous monitoring and relay of time and weather information. In normal daily operations, the controller, on assuming his duties, will perform the following:

a. Make sure that the main power source is delivering the correct output to the system by setting the VOLT-FREQ. SELECTOR switch on the engine generator remote control panel to C, G1, or G2 to correspond to the setting of the POWER SELECTOR switch and checking the VOLTS and FREQ. meters for indications of 120 volts and 60 Hz, respectively.

Note

If the system is in an operational status and the controller is merely assuming duties from another controller, omit the procedures of *b* and *c* below. If the system is in a non-operational status, perform *b* and *c*.

b. Check to see that the microphones and headsets are in place and properly connected for use at the particular controller position console.

c. Verify that the starting procedures of paragraph 3-34 has been performed.

d. To establish communication on the uhf-vhf channels, proceed as detailed in paragraphs 3-37 and 3-38.

e. To establish communication on the single-sideband channels, proceed as detailed in paragraph 3-39.

f. To change the main power source, proceed as detailed in paragraph 3-36.

g. To operate the alarm/pa system, proceed as detailed in paragraph 3-40.

h. To set or reset the clock, proceed as detailed in paragraph 2-11.

i. To monitor the If receiver, proceed as detailed in paragraph 3-42.

j. To monitor the recorder, proceed as detailed in paragraph 3-43.

k. To operate the telephone connecting group, proceed as directed in paragraph 3-44.

l. To shut down the equipment, perform the stopping procedure of paragraph 3-45.

3-36. System Power Source Selection

a. General. The engine generator remote control panel allows monitoring and control of the power system from the control tower. Switching to a standby power source in case of failure of the operational power source is performed by the operator at the engine generator remote control panel in the control tower. In normal operation, one power source is always activated and a standby source is energized because the lighting and air-conditioning, as well as the electronic equipment, operates from the main power source. After initial connection and activation of the primary and standby power sources, the operator monitors the operational power source and, when required by failure of the main source, switches to a standby source. The engine generator remote control panel contains all necessary controls and indicators to perform these functions.

b. Start and Selection of Engine Generator as System Power Source.

(1) Set the POWER SELECTOR switch to C and the VOLT-FREQ. SELECTOR switch on the engine generator remote control panel to G1 (if engine generator 1 is to be used) or to G2 (if engine generator 2 is to be used).

Caution

If the indications in (2) below do not occur within 30 seconds, return the START GEN. switch to the off (down) position.

(2) Actuate the START GEN. switch for the selected engine generator. When the engine generator starts, check to see that the VOLTS and FREQ. meters indicate 120 volts and 60 Hz, respectively, and the OPER. PWR. GEN. red indicator lamp for the selected engine generator lights.

(3) If the remaining engine generator is to be operated in standby mode, repeat the procedures in (2) above to activate the other engine generator.

(4) Allow 10 to 15 minutes warmup time after starting before switching the load to the selected engine generator.

(5) Set the POWER SELECTOR switch to G1 or G2, depending on the engine generator that is selected as the primary source.

Caution

In (6) below, do not leave the START GEN. switch in the on (up) position if the associated OPER. PWR. indicator lamp does not light within 30 seconds.

(6) Set the SYSTEM CONT. PWR. switch to the on (up) position to connect the selected engine generator to the load. The other engine generator will continue to operate and can be monitored as described in *e* below.

c. Selection of Commercial Power as Main Power Source.

(1) Set the VOLT-FREQ. SELECTOR switch to C.

(2) Set the POWER SELECTOR switch to C.

(3) Check the VOLTS and FREQ. meters for indications of 120 volts and 60 Hz, respectively.

(4) Set the SYSTEM CONT. PWR. switch to the on (up) position, and check to see that the OPER. PWR. COMM. indicator lamp lights.

d. Transfer to Standby Power Source.

(1) Determine which standby source is to be used.

(2) Check to see that the OPER. PWR. indicator lamp for the selected source is lighted.

(3) Set the VOLTS FREQ. SELECTOR switch to the C, G1, or G2 position, depending on the standby source that is to be used.

(4) Check the VOLTS and FREQ. meters for indications of 120 volts and 60 Hz, respectively.

(5) If the indications are correct, set the POWER SELECTOR switch to the standby power source. Leave the SYSTEM CONT. PWR. switch in the on (up) position.

e. Monitoring Operational or Standby Power Source.

(1) Monitor any source of power by setting the VOLTS-FREQ. SELECTOR switch to C, G1, or G2, depending on the source to be monitored.

(2) Check to see that proper operation is indicated by illumination of the red OPER. PWR. indicator for the selected source and that an indication of 120 volts and 60 Hz is displayed on the VOLTS and FREQ. meters, respectively.

3-37. Uhf and Vhf Transmitter Selection and Control

a. General. Selection and control of the uhf and vhf transmitting channels is accomplished at any of the three controller positions provided by the console group in the AN/ FSQ-75(V)1 and AN/FSQ-75(V)2 systems or at either of two controller positions provided by the console group in the AN/FSQ75(V)3 system. Selection and control is initiated at the three transmitter selector units on the transmitter-receiver-volume control panel (fig. 3-1) at each controller position. The channel selector switches are numbered 1 through 12 from the left to the right side of the panel. Each selector switch has an associated frequency identification strip which is marked with the operating frequency of that channel. All channel indicator lamps glow at reduced brilliance until a channel is selected and activated. When a channel is activated at one control position, the associated channel indicator lamp glows at an increased brilliance at all control positions, indicating that the channel is in use. It is not desirable for more than one controller to use the same channel simultaneously. To prevent this, a buzzer alarm provides an audible alarm at a controller's position when he attempts to transmit on a channel that is already in use at another controller position.

b. Channel Selection.

(1) Locate the transmitter selector switch and the indicator lamp for the desired transmitting channel.

(2) Check the indicator lamp for the desired channel to determine that it is glowing at a reduced brilliance.

(3) Set the associated transmitter selector switch to the on (down) position. Additional transmitting channels can be used simultaneously by setting additional selector switches to the (down) position.

(4) Activate the channel by pressing the microphone push-to-talk switch. The associated channel indicator lamp glows at an increased brilliance, indicating that the channel is in use.

(5) Communicate by speaking clearly and distinctly into the microphone.

(6) Terminate transmission by releasing the microphone push-to-talk switch.

(7) When communication is complete, release the channel for use at other positions by setting the transmitter selector switch to the off (up) position. The channel indicator lamp returns to a reduced brilliance.

3-38. Uhf and Vhf Receiver Selection and Monitoring

a. General. Selection and monitoring of the 12 receiving channels is accomplished at any of the 3 controller positions provided by the console group in the AN/FSQ-75(V)1 and AN/FSQ-75(V)2 or from either of the 2 controller positions provided by the console group in the AN/FSQ-75(V)3. Selection and monitoring is controlled from the three receiver mixing and channel selectors and the three receiver volume controls that are grouped on the transmitter-receiver-volume control panel (fig. 31) at each controller position. The P-S lever switches are numbered 1 through 12 from the left to the right side of the panel. Each switch has an associated frequency identification strip which is marked with the operating frequency of that channel. A received signal of a predetermined level causes the associated channel receiver indicator lamp to illuminate. By activating the associated channel selector switch, the controller causes the received audio signal to be fed to one of three console-mounted speakers associated with that channel or to the controller's headset. Volume controls provide control of the audio output level of the speaker or headset.

b. Channel Selection and Monitoring.

(1) Observe the channel indicator lamps on the transmitter-receiver-volume control panel (fig. 3-1). A lighted lamp indicates that a signal above a predetermined level is present on the associated channel.

Note

To monitor the channel on the controller's headset, follow the procedures of (2) and (3) below. To monitor the input on the speaker, follow the procedures of (4) and (5) below.

(2) Monitor the channel by setting the P-S lever switch to P. Audio signals will be heard on the headset earphone.

Note

Three PHONE controls are provided. The left-hand PHONE control regulates the audio level for channels 1 through 4, the center PHONE control for channels 5 through 8, and the right-hand PHONE control for channels 9 through 12. The PHONE controls are set to provide a comfortable, usable audio level at the headset.

(3) Regulate the audio level with the associated channel PHONE control.

(4) Monitor the channel by setting the P-S lever switch to S. Audio signals will be heard from the speaker.

Note

Three speakers and SPEAKER volume controls are used for aural presentation of received signals. The left-hand speaker and controls are used with channels 1 through 4, the center speaker and control with channels 5 through 8, and the right-hand speaker and control with channels 9 through 12.

(5) Regulate the speaker volume level with the associated channel SPEAKER control.

(6) When communications are complete, return the P-S lever switch to the center (off) position.

3-39. Single-Sideband Operation

a. General. The single-sideband equipment provides 2 transmitting and receiving channels in addition to the 12-channel control system. Operational control and monitoring of the ssb channels is effected only at controller position 2. Control is exercised from two panels an ssb control panel (fig. 3-5) containing indicators that show the operational status of each ssb transceiver, a speaker for each channel, and a volume control for each channel;

and an ssb microphone-headset panel (fig. 3-7) that houses the necessary jacks for a separate microphone and headset for each channel. On both the ssb control panel and ssb microphone-headset panel, all controls, indicators and jacks for ssb channel 1 are grouped on the left-hand side of these panels and those for channel 2 on the right-hand side.

b. Operation. Operation of the single-sideband channels is identical; therefore, the following procedure for ssb channel 1 applies when operating ssb channel 2, except that the controls, indicators, and jacks marked SSB 2 would be used.

(1) Connect the ssb microphone to the SSB 1 MIC jack on the ssb microphone-headset panel.

(2) Check the red TUNE and green OPERATE indicator lamps on the ssb control panel. If the red TUNE indicator lamp lights, the ssb transceiver is in a tuning cycle and must not be keyed. If the green OPERATE indicator lamp lights, the ssb transceiver and antenna coupler are ready for operation. Proceed to (3) below only when the OPERATE indicator lamp lights.

(3) Activate the channel by pressing the ssb microphone push-to-talk switch.

(4) Communicate by speaking clearly and distinctly into the ssb microphone.

(5) Terminate transmission by releasing the ssb microphone push-to-talk switch.

Note

Received signals will normally be heard on the speaker of the ssb control panel. To monitor the signals on a headset, omit the procedures of (6) below. Connection of a headset to the ssb microphone-headset panel will interrupt the speaker audio output automatically.

(6) Monitor the speaker audio output by setting the VOL control for a comfortable, usable audio output level.

(7) To monitor received signals on the headset earphone, connect a headset to the SSB 1 PHONES jack on the ssb microphone headset panel.

(8) Monitor received signals by setting the VOL control for a comfortable, usable audio output level on the headset earphone.

3-40. Alarm/Pa System Operation

a. The operator initiates operation of the public address pa portion of the alarm/pa system by connecting the microphone to the microphone jack on the bottom front of the amplifier chassis (fig. 3-13). The microphone is not required for other audible alarm purposes. In the AN/FSQ-75(V)(*), no receiver is connected to the alarm/pa system, although a capability exists for reception.

b. Public Address Operation.

(1) Check to see that the microphone is connected to the amplifier.

(2) Rotate the GAIN control clockwise until - the red indicator lamp illuminates.

(3) Set the SELECTOR switch to PA.

(4) Press the microphone push-to-talk switch, and speak into the microphone at a normal voice level.

(5) Adjust the GAIN control to a position below the point at which feedback occurs while speaking into the microphone.

Note

The maximum clockwise position of the GAIN control will be determined in most cases by the point at which feedback or squeal occurs. This point depends on speaker placement and proximity of reflect ing surface such as buildings, vehicles, etc.

(6) To end communication, release the microphone push-to-talk switch.

c. Alarm System Operation. Four different aural alarms, as described in paragraph 3-15, may be sounded with the siren. For WAIL, YELP, or HI--LO sounds, the GAIN control must be in any position except OFF and the SELECTOR switch in the desired position. For direct siren operation, the SELECTOR switch must be set to MANUAL and the SIREN pushbutton switch pressed.

3-41. Clock Operation

Operation of -the clock is automatic once it has been energized; however, several precautions (para 3-2*c*) must be observed during resetting and stopping procedures. Refer to paragraph 3-5 for functioning of controls and indicators, and to paragraph 2-8 for clock-setting procedures.

3-42. Lf Receiver Monitoring

a. General. If receiver monitoring is accomplished only at controller position 2. When the If receiver is energized and tuned to an indicator on the recorder/navaid status panel (fig. 3-4) will light when If reception above a predetermined level is present. The signals ale monitored by a headset.

b. Monitoring.

(1) Connect a headset to the PHONES jack on the recorder/navaid status panel.

(2) With the If receiver energized (para 3-34) and tuned to an operational frequency, check the recorder/navaid status panel and the ON indicator lamp. The OFF indicator signifies an absence of signals above the predetermined level while the ON indicator shows the presence of signals above the predetermined level.

(3) When the ON indicator lamp lights, the received audio signals are heard in the headset earphone.

(4) Adjust the volume of the audio signals by setting the VOLUME control to provide a comfortable, usable audio output level in the earphone.

Note

The intensity level on the ON and OFF indicator lamps is adjusted by the DIM control. The DIM control also affects the RUN and MAIIL indicators associated with the recorder.

3-43. Recorder Status Monitoring

a. General. Indicators on the recorder/ navaid status panel provide both visual and audible indications of the operational status of the recorder. The RUN and FAIL indicator lamps and a buzzer alarm provide the monitoring capability.

b. Recorder Monitoring. With the recorder operational, the RUN indicator lamp lights and the buzzer remains silent. No controller action is required as long as this condition exists. Failure of a power supply or a tape transport of the multichannel recorder causes the FAIL indicator lamp to light and the buzzer to sound. The RUN indicator lamp will remain lighted. After indication of a failure, proceed as follows:

(1) Press the SILENCE pushbutton switch on the recorder/navaid status panel. The buzzer becomes silent, and the RUN and FAIL indicator lamps remain lighted.

(2) Notify maintenance personnel of the malfunction as soon as practicable.

Note

When the failure occurs, the recorder automatically switches over to a standy power supply or tape transport, and the recording capability is not interrupted.

(3) When maintenance personnel have remedied the malfunction, the FAIL indicator goes out and the RUN indicator remains lighted.

3-44. Telephone Connecting Group Operation

Note

Only two controller positions are provided by the console group made up of consoles 1 through 5 in the AN/FSQ-75(V)3; therefore, any reference to console 6 or 7 or controller position 3 is not applicable to the AN/FSQ-75(V)3.

The connecting group is designed to provide talk and signaling capability over as many as 10 magneto-type telephone lines with TALKOFF-RING lever switches at each of the 3 controller positions. One of the ten magneto-type lines is designated as a priority line and has a special alarm, an well as precedence features for incoming calls. In addition, there is a common battery line, with dial, at the master switch panel. The master switch panel is in console 2, and the auxiliary switch panels are in consoles 5 and 6. For detailed operation of the connecting group, refer to TAM 11-5805-467-12.

3-45. Stopping Procedure

The air traffic control system may be disabled by setting the equipment shelter and control tower circuit breakers to OFF or by setting the SYSTEM CONT. PWR. switch on the engine generator remote control panel to the off (down) position. Use this disabling procedure only as an emergency measure because the individual component controls should be set to their respective off positions before restarting. The normal stopping procedure for the individual components is furnished as follows:

Component	Control	Position
Alarm/lpa system	GAIN control	Fully counterclockwise (OFF).
Mixing amplifier	POWER ON-OFF switch (power supply).	OFF.
	ON-OFF switch (amplifiers)	OFF.
Six-channel amplifier group	ON-OFF power switch (power supplies).	OFF.
Four-channel amplifier group	ON-OFF power switch (power supplies).	OFF.
23/46-volt power supply	ON-OFF power switch	OFF.
Recorder	LINE SWITCH (tape transports).	OFF.
	LINE SWITCH (power supplies)	OFF.
48-volt power supply	ON-OFF switch	OFF.
Lf receiver	OFF-B+OFF-REC	OFF.
Uhf receiver	POWER switch	OFF.
Vhf receiver	POWER switch	OFF.
Vhf and uhf transmitters	POWER ON-OFF switches	OFF.
FM transceiver	POWER switch	OFF BREAKER-RESET
Ssb transceiver	Mode selector switch (at control unit).	OFF.
27.5-volt power supply	ON-OFF switch	OFF.
Equipment shelter power distribution panel.	All circuit breakers [a]	OFF.
Equipment shelter master circuit breaker.	ON-OFF switch circuit breaker [b].	OFF.
Control tower power distribution panel.	All circuit breakers [c]	OFF.
Engine generator remote control panel.	SYSTEM CONT. PWR. switch [d].	Off (down).
	START GEN. 1 and START GEN. 2 switches [e].	Off (down).

[a] If minimal service is to be maintained, or if personnel remain in the equipment shelter, leave the MAIN, AIR CONDITIONER, VENTILATOR, and LIGHTS circuit breakers at ON.

[b] If minimal service is to be maintained, or if personnel remain in the control tower and/or equipment shelter, leave this circuit breaker at ON.

[c] If minimal service is to be maintained, or if personnel remain in the AN/FSQ-75(V)1 or AN/FSQ-75(V)2 control towers, leave the MAIN, both AIR COND, the LIGHTS, and the ELECT. EQUIP. circuit breakers set to ON. In the AN/FSQ-75(V)3 control tower cabs, leave the MAIN, COMPRESSOR MOTOR, CONDENSER FAN MOTOR, EVAPORATOR FAN MOTOR, LIGHT CIRCUIT, CONVENIENCE OUTLET, and top COMM SPARE circuit breakers set to ON.

[d] If minimal service is to be maintained or if personnel remain either in the control tower or the equipment shelter, leave this switch in the on (up) position.

[e] Operation of these switches shuts off electric fuel pumps at the engine generators, causing them to stop as soon as the fuel in the engines is consumed.

Section III OPERATION UNDER UNUSUAL CONDITIONS.

3-46. Operation Under Emergency Conditions

a. The redundancy of equipments and controller positions in the air traffic control system allows considerable adaptability to many emergency situations. The prime consideration in any emergency is to keep as many of the communication channels in operation as possible. A complete emergency plan cannot be

detailed herein because the station frequency plan, which is variable from site to site, is involved. Each controller should become fully familiar with the station frequency plan because this plan dictates his plan of action in an emergency. In general, transmitters or receivers may be interchanged in case one or more fails to provide continued coverage on the primary communication channels. Because the transmitters and receivers are set to specific operating frequencies, interchanging may necessitate inserting a different crystal and re-tuning the equipment. These procedures are detailed in the technical manual listed for the specific equipment involved in appendix A.

b. In the case of a partial failure of a receiver or a transmitter (that is, a transmitter operating at less than specified power or degradation of receiver sensitivity), notify organizational maintenance personnel and continue to operate the equipment at reduced capability until repairs can be made. Set the RF and audio gain controls of the receivers to compensate for the loss of sensitivity as much as possible.

c. Because numerous antennas of the same type all terminate at the equipment shelter bulkhead connector panel, substitution can be made readily by interchanging coaxial connectors at this point. A defective or damaged antenna on a primary channel can be replaced by one originally assigned to a secondary or unused channel. The station frequency plan dictates the course of action.

d. Failure of the control circuitry at any one controller position can be overcome by assuming the position duties at one of the other controller positions. This procedure results only in an increased workload at the second controller position rather than a loss of communication capability.

e. If a total loss of control capability occurs between the equipment shelter and the control tower (*for example*, the six interconnecting signal cables are cut), the transmitters and receivers can be operated from within the equipment shelter. A field telephone set up between the points will allow relay of information between the control tower and the equipment shelter. The technical manual listed in appendix A for the specific equipment gives procedures for setting the equipment for local operation.

f. Standby main power sources are provided for use in case of failure of the main power source. Standby equipment should be maintained in an operable condition at all times to assure ability to assume the load during an emergency. Where a malfunction in the power system renders the power source incapable of handling the full load, equipments not in use can be shut down temporarily to reduce current drain, and operation can be continued on only those equipments that are used on the primary communication channels. Secondary power sources, such as the 48-volt power supplies, the 27.5-volt power supplies, and the power source for the recorder all have standby units which provide continued operation in case of a failure in the operating unit. Unused equipments operating from the power source may be turned off to reduce current drain on the standby unit until the power source is again operating at full capacity. No standby unit is provided for the 23/46-volt power supply, but this unit serves only to illuminate indicator lamps at the transmitter selector panels at each controller position. Loss of this power supply would result only in controller inconvenience and not in loss of operational capability.

g. Both the equipment shelter and the control tower acre provided with two air-conditioning units for equipment protection and operator comfort. If one or both of these units fail, shut down all unused equipments to reduce heat dissipation into the area. Keep necessary equipment in operation, and attempt to provide adequate air circulation with fans or other means until the defect is remedied.

3-47. Recognition and Identification of Jamming

Under tactical conditions, the receivers may be jammed by the enemy. Enemy jamming is accomplished by transmitting a strong signal on one or more of the system operating frequencies, making it difficult or impossible to hear the desired signals. Unusual noises or strong interference heard on the receivers

may be attributed to enemy jamming, signals from a friendly station, noise from a local source, oi0 a defective receiver. To determine where the interference is originating, disconnect the antenna. If the interference continues, the receiver is defective. Enemy jamming signals may be classed as continuous wave or modulated. A jamming signal intended to block a single frequency is called spot jamming. The enemy may also use one or more transmitters to jam a block or band of frequencies. This method is referred to as barrage jamming.

a. Continuous Wave Jamming. Cw jamming is transmitted as a steady carrier. This signal beats with another signal and produces a steady tone at the speaker or headset. Cw jamming signals may also be keyed by using a random on and off signal or by using actual code characters keyed at the same rate or a little faster than the signal being received.

b. Modulated Jamming. Modulated jamming signals may consist of noise, laughter, singing, music, various tones, or any unusual sound, or combination of sounds. Various types of rnodulated jamming signals are explained below.

(1) *Spark.* This is one of the simplest, most effective, and most easily produced jamming signals. This type signal sounds rough, raspy, and sometimes similar to the operation of an electric motor with sparking brushes. The signal is broad and will interfere with a large number of communication channels.

(2) Sweep-through. This signal is the result of sweeping or moving a carrier back and forth across the frequency being jammed at a slow or rapid rate. The numerous signals of varying amplitude and frequency produce a sound like that of a low-flying airplane passing overhead. This type of jamming is effective over a broad range of frequencies. When varied rapidly, it is effective against all types of voice signals.

(3) *Stepped tones or bagpipes*. This signal usually consists of several separate tones. The tones are transmitted in a first increasing and then decreasing pitch sequency, repeated over and over. The audible effect is similar to the sound of a Scottish bagpipe.

(4) *Noise.* Noise is random both in amplitude and frequency. It is considered one of the better types of jamming modulation. It produces a sound similar to that heard when a receiver is not tuned to a station and the volume or1 gain control is turned to maximum.

(5) *Gulls.* This signal consists of a quick rise and slow fall of a variable audio-frequency. The sound is similar to the cry of the sea gull.

(6) *Tone.* This signal consists of a single audio-frequency of varying tone. It produces a howling sound of varying pitch.

3-48. Anti-jamming Procedures

When it is known that a receiver is being jammed, the controller should alert command personnel immediately and continue to monitor the desired frequency. If the station operating plan allows, a change to another channel may be warranted. If more than one or all channels are being jammed, procedures may be initiated to provide maximum intelligence of jammed signals. Because these procedures vary depending on the receiver being used, consult the appropriate technical manual listed in appendix A for specific details.

CHAPTER 4

OPERATOR'S MAINTENANCE

Section I. GENERAL REQUIREMENTS

4-1. Scope of Operator's Maintenance

a. The following is a list of maintenance duties normally performed by the operators of the air traffic control system. These procedures do not require any special tools or test equipment.

b. Operator's maintenance consists of the following:

(1) Inspection of accessible components.

(2) Cleaning of accessible components.

(3) System operational checks.

4-2. Materials Required for Operator's Maintenance

Materials required for operator's maintenance consist of clean, dry, lint-free rags, a soft brush, and cleaning compound (FSN 7930-395-9542). A vacuum cleaner capable of both suction and blower functions is a useful supplemental item.

Section II. PREVENTIVE MAINTENANCE

4-3. Operator's Preventive Maintenance

a. Preventive maintenance is the systematic care, servicing, and inspection of equipment to prevent the occurrence of trouble, to reduce downtime, and to assure maximum system operational capability. Preventive maintenance is the responsibility of all categories of maintenance concerned with the air traffic control system and includes the inspection, testing, and repair or replacement of components that inspections and tests show have failed or would probably fail before the next scheduled service period. Preventive maintenance checks and services are performed at periodic intervals, unless otherwise directed by the commanding officer.

b. The maintenance checks and services procedures detailed in this manual outline specific functions to be performed at periodic intervals. These checks and services are to maintain serviceability, that is, to maintain all the equipment in the air traffic control system in good general (physical) condition and in good operating condition. To assist the operator in maintaining serviceability, the charts indicate what to check, how to check, and what the normal conditions are; the References column lists the paragraph, illustration, and/ or publications that contain additional information. If a defect or malfunction cannot be corrected by the operator, remedial action by higher category maintenance personnel is required.

c. The preventive maintenance checks and service charts have been prepared to reflect the situation existing in the air traffic control system where the communication equipment is remotely operated from the control tower. This separation necessitates utilization of two individuals in performing many of the maintenance tasks. Throughout these charts, maintenance functions have been marked with C, O, or both C and O in the sequence number column. The C refers to the crew (personnel who operate controls and conduct inspections in the equipment shelter), and the) to the

control tower operators who operate the system from the control tower or cab.

d. Records and reports of these checks and services, and maintenance forms and records to be used and maintained on the air traffic control system are specified in TM 38-750. Paragraph 1-3 contains additional information concerning the submission of specific forms.

4-4. Cleaning

All exterior surfaces of the equipment should be free of dirt, grease, and fungus. Perform the following procedures when specified in the preventive maintenance checks and services charts.

Warning

Prolonged breathing of clearing compound fumes is dangerous: make certain that adequate ventilation is provided. Cleaning compound is flammable; do not use near a flame. Avoid contact with the skin; wash off any that spills on your hands.

a. Remove moisture and loose dirt with a clean, soft cloth. If necessary, dampen a cloth with cleaning compound (FSN 7930-395-9542) and then wipe the parts with a dry, clean cloth.

b. Remove grease, fungus, and dirt from the exterior surfaces with a clean cloth, dampened (not wet) with cleaning compound. Wipe dry with a clean, dry, lint-free cloth.

c. Remove rust and corrosion from metal surfaces by lightly sanding with fine sandpaper. Brush two thin coats of paint on the bare metal to protect it from further corrosion. Refer to the applicable cleaning and refinishing practices specified in TM 9-213 and TB SIG 364.

4-5. Daily Preventive Maintenance Checks and Services

Sequence No.	Item to be inspected	Procedure	References
		EXTERIOR AREA	
1_C	Equipment shelter skin	Inspect the equipment shelter skin or punctures, tears, dents, and abrasions.	None.
2_C	Power cable	Check to see that power cabling is raised clear of any ground water.	Fig. 2-1 and 2-2.
3_C	Antennas	Check to see that antenna lead-ins are raised off ground.	None.
		CONTROL TOWER	
4_O	Engine generator remote control panel.	Check to see that primary and standby power sources are operative.	Para 3-36.
5_C	Power	If air traffic control system is in shutdown status, energize control tower and equipment shelter lighting and cooling. If air traffic control system is in operational status, check to see that lighting and cooling is operative.	Para 3-34.
6_O	Console group	Check for completeness and general condition.	None.
7_O	Console group	Clean all dirt and moisture from component panels and operating accessories, if necessary.	Para 4-4.
		EQUIPMENT SHELTER	
8_C	General shelter	Check for completeness and general condition.	None.
9_C	General shelter	Clean dirt or moisture from component panels if necessary.	Para 4-4.

Sequence No.	Item to be inspected	Procedure	References
10_C	Air conditioning.....	Check temperature for effectiveness of air conditioner or ventilator, as applicable.	None.
11_C	Rf body and FM RF body.	Check to see that all RF body element sockets not in use are closed with their protective covers.	Fig. 3-19 and 3-21.
		OVERALL AIR TRAFFIC CONTROL SYSTEM	
$12_{C, O}$	General	Perform starting procedure if air traffic control system is in shut-down status. If it is operational, check to see that all indications of starting procedure, including operation of pilot lamps and indicator lamps, are correct.	Para 3-34.
13_O	Clock.....	Check clock for correct time, and reset it necessary.	Para 2-11.
14_O	Alarm/pa system	Check alarm/pa system in pa mode for voice quality, noting excessive hum and feedback.	Para 3-40.
15_O	Flight strip director.....	Check that sufficient number of flight strip cards and holders are on hand for a day's operation.	None.
16_C	Six-channel amplifier group.	Check and service six-channel amplifier group.	TM 11-5820-733-12.
17_C	Four-channel amplifier group.	Check and service four-channel amplifier group.	TM 11-5820-768-12.
18_C	Connecting group	Check and service connecting group.	TM 11-5805-467-12.
19_C	Ssb transceiver	Check and service ssb transceiver	TM 11-5821-248-12.
20_C	FM transceiver	Check and service FM transceiver	TM 11-5820-401-10.
21_C	Uhf and vhf transmitter	Check and service uhf and vhf transmitters.	TM 11-5820-736-12.
22_C	Uhf receiver	Check and service uhf receiver	TM 11-5820-735-12.
23_C	Vhf receiver.....	Check and service vhf receiver	TM 11-5820-732-12.
24_C	Lf receiver.....	Check and service If receiver.....	TM 11-5825-249-12.
25_C	Recorder	Check and service recorder.....	TM 11-5835-236-12.
26_C	Reproducer	Check and service reproducer.....	TM 11-5835-237-12.
27c,o	Operating controls and indicators.	During sequence No. 28 and 29, check all switches, knobs, dials, and indicators for improper operation, looseness, or binding.	None.
28_O	Uhf-vhf communication	Establish two-way communication on each operational uhf and vhf channel. Monitor each channel for voice quality, noting excessive hum, spurious signals, or distortion.	Para 3-37 and 3-38.
29	Ssb communication.....	Establish two-way communication on each operational ssb channel. Monitor each channel for voice quality, noting excessive hum, spurious signals, or distortion.	Para 3-39.

4-6. Weekly Preventive Maintenance Checks and Services

Sequence No.	Item to be inspected	Procedure	References
		EXTERIOR AREA	
1_C	Power cabling.....	Inspect power cabling for damage or loose connections. Cables should be free of fraying, cracks, strain, and damaged connectors.	Fig. 2-1.
2_C	Ground rods	Check all ground rod connections to see that they are tight and free of dirt, rust, and corrosion.	Fig. 2-1.
3_C	Antennas	Visually check all antennas for security of mounting; check supporting structures for safety hazards, damage, and improper tension of guy wires.	None.
4_C	Aerological equipment.....	Visually check wind speed and direction transmitters for signs of damage.	None.
5_C	Mounting devices	Check all skids or mounting blocks under power equipments, air conditioning equipment, and shelters for improper installation, signs of looseness or damage.	None.
6_C	Gaskets	Inspect weatherproofing gaskets on power equipment and shelters. Check entrance doors, power entrance boxes, and antenna entrance panels and insulators. Check to see that gaskets are free of paint and grease. There should be no leaks, loose edges, or signs of excessive wear.	None.
7_C	External equipment	Check all equipments exposed to weather for dirt, corrosion, rust and fungus growth. Clean as necessary.	Para 4-44.
8_C	Control tower cab, AN/FSQ-75(V)3 only.	Perform thorough visual inspection for structural damage such as cracked glass panels, punctures in structure, water leaks, and any other signs of deterioration.	None.
9_C	Control tower air cab conditioner control panel, AN/FSQ-75(V)3 only.	Visually inspect indicator lamps, fuse, and switches. Check to see that all are operative and firmly seated.	None.
10_C	Control tower cab air conditioner return air grille filters and cool air outlet grilles, AN/FSQ-75(V)3 only.	Clean or replace filters as necessary. Check to see that cool air grilles are clean and operative.	None.
11_o	Control tower cab obstruction lights, AN/FSQ-75(V)3 only.	Set on-off switch to on, and check to see that obstruction lights illuminate.	None.

Sequence No.	Item to be inspected	Procedure	References
12_O	Control tower cab interior lights, AN/FSQ-75(V)3 only.	Set DIMMER control to on, and check to see that both lights illiminate. Rotate DIMMER control, and check to see that brilliance is properly controlled.	None.
13_C	Bulkhead connector panel	Check all cable connections for signs of looseness or damage. Tighten if necessary.	None.
14_O	Consoles	Make visual inspection of all pilot lamps, indicator lamps, and fuses.	None.
15_C	Air filters	Check air filters in consoles for cleanliness. Clean or replace as necessary.	None.
16_O	Alarm/pa system	Check alarm/pa system in all alarm modes for correct siren operation. By pa system, warn personnel that a test is to be performed.	Para 3-40.
17_C	Six-channel amplifier group.	Check and service six-channel amplifier group.	TM 11-5820-733-12.
18_C	Four-channel amplifier group.	Check and service four-channel amplifier group.	TM 11-5820-768-12.
19_C	Connecting group	Check and service connecting group.	TM 11-5805-467-12.
20_O	Recorder/navaid status panel.	Check operation of recorder failure alarm.	Para 2-17*d* and *l* through *t*.
		EQUIPMENT SHELTER	
21_C	Ssb transceiver and ssb control unit.	Check and service ssb transceiver and ssb control unit.	TM 11-5821-248-12.
22_C	Ssb antenna coupler	Check and service ssb antenna coupler.	TM 11-5812-271-15.
23_C	FM transceiver	Check and service FM transceiver	TM 11-5821-248-12.
24_C	Uhf and vhf transmitters	Check and service uhf and vhf receiver.	TM 11-5820-736-12.
25_C	Uhf receiver	Check and service uhf receiver	TM 11-5820-735-12.
26_C	Vhf receiver	Check and service vhf receiver	TM 11-5820-732-12.
27_C	Lf receiver	Check and service lf receiver	TM 11-5825-249-12.
28_C	Recorder	Check and service recorder	TM 11-5835-236-12.
29_C	Reproducer	Check and service reproducer	TM 11-5835-237-12.

4-7. Operator's Integrated System Equipment Troubleshooting

Troubleshooting the integrated system equipment is based on the starting procedures and operational checks in the daily preventive maintenance checks and services. When the starting or operating procedures give an abnormal indication, refer to the troubleshooting chart in paragraph 4-8 or 4-9. When, however, trouble occurs in an equipment covered in individual equipment technical manuals, refer to those manuals for applicable procedures. These troubles are not listed in the operator's troubleshooting chart of paragraph 4-8. In paragraph 4-9, procedures for troubleshooting items peculiar to the AN/FSQ-75(V)3 control tower cab are given. Use that chart when

all indications of the starting procedure (para 3-34) are verified and the starting procedure cites the AN/FSQ-75(V)3 only. Perform the checks and corrective measures indicated in these charts. Reference to a specific operating procedure directly related to the equipment is provided in the *Symptom* column of the charts, thereby enabling the operator to determine that the equipment has been operated correctly. If the malfunction is not remedied by the measures specified in the *Corrective action* column of the charts, higher category maintenance is required. It is assumed in these checks that adequate external power is being supplied and that the equipment is properly interconnected into the system.

4-8. Operator's Troubleshooting

Item No.	Symptom	Probable trouble	Corrective action
		GENERAL SYSTEM OPERATION	
1	27.5-volt power supply AC indicator lamp does not light (para 3-34, step 10).	Defective AC indicator lamp or blown fuse.	Refer to higher category maintenance personnel.
2	D-C VOLTS meter of 27.5-volt power supply has incorrect or no indication although AC indicator lamp lights.	Incorrect voltage adjustment or defective power supply.	Refer to higher category maintenance personnel.
3	Ssb transceiver frequency indicator dial and ssb control panel OPERATE indicator do not illuminate (para 3-34, step 11).	No dc input power	Check dc power connection. Refer to TM11-5821-248-12 for further checks and corrective measures.
4	Frequency indicator of ssb control unit dial lights, but OPERATE indicator lamp on ssb control panel does not light (para 3-34, step 11).	*a*. Defective indicator lamp.	*a*. Refer to higher category maintenance personnel.
		b. Defective ssb antenna coupler ... _	*b*. Same as a above.
		c. Defective control circuitry.....	*c*. Same as a above.
5	Frequency indicator dial lamp of ssb control unit does not light although OPERATE indicator lamp of ssb control panel lights (para 3-34, step 11).	Defective dial lamp	Refer to TM 11-5821-248-12 for further checks and corrective measures.
6	Meter does not indicate 300 when ssb transmitter is keyed (para 3-34, step 11).	*a*. Defective ssb transceiver or transceiver control circuit.	*a*. Refer to TM11-5821-248-12 for further checks and corrective measures.
		b. Defective keying circuit.....	*b*. Refer to higher category maintenance personnel.
7	FM transceiver dial indicators do not light (para 3-34, step 12).	No dc input power	Check power connection. Refer to TM11-5820-401-10 for further checks and corrective measures.
8	Vhf or uhf transmitter POWER indicator does not light (para 3-34, step 13).	No ac input power	Check power cord connection. Refer to TM11-5820-736-12 for further checks and corrective measures.

Item No.	Symptom	Probable trouble	Corrective action
9	MULTIMETER displays no power indication when uhf or vhf transmitter is keyed (para 3-34, step 13).	Defective transmitter or transmitter control circuit.	Select and key same transmitter from another controller position. If meter indication is now correct, replace microphone with spare unit. If meter still does not provide an indication, refer to TM 11-5820-736-12. Refer to higher category maintenance personnel.
10	MULTIMETER displays incorrect indication when uhf or vhf transmitter is keyed (para 3-34, step 13).	Defective transmitter.....	Refer to TM 11-5820-736-12 for further checks and corrective measures. Refer to higher category maintenance personnel.
11	Vhf receiver POWER indicator lamp does not light (para 3-34, step 14).	No ac input power	Check power cord connection. Refer to TM 11-5820-732-12 for further checks and corrective measures.
12	Uhf receiver POWER indicator does not light (para 3-34, step 15).	No ac input power	Check power cord connection. Refer to TM 11-5820-735-12 for further checks and corrective measures.
13	Lf receiver carrier lamp does not light when OFF-B+OFF-REC. switch is set to B+OFF (para 3-34, step 16).	No ac input power	Check power cord connection. Refer to TM 11-5825-249-12 for further checks and corrective measures.
14	48-volt power supply POWER indicator lamp does not light (para 3-34, step 17).	Defective indicator lamp or fuse or no ac input power.	Check power cord connection. Refer to higher category maintenance personnel.
15	Recorder power supply POWER indicator and recorder/navaid status panel RUN indicator lamps do not light (para 3-34, step 18).	No ac input power	Check power cord connection. Refer to TM 11-5835-236-12 for further checks and corrective measures.
16	POWER indicator lights but RUN indicator does not light (para 3-34, step 18).	*a*. Defective RUN indicator lamp, or recorder/navaid status panel DIM control set too far counterclockwise. *b*. Interunit cabling defective.	*a*. Set DIM control fully clockwise. If fault persists, refer to higher category maintenance personnel. *b*. Same as *a* above.
17	Recorder RUN indicator lights but POWER indicator lamp does not light (para 3-34, step 18).	Defective lamp in recorder power supply, defective recorder supply fuse, or defective power supply.	Refer to TM 11-5835-236-12 for further checks and corrective measures.
18	Recorder tape transport POWER indicator lamp does not light (para 3-34, step 18).	Defective recorder tape transport lamp or fuse.	Refer to TM 11-5835-236-12 for further checks and corrective measures.
19	23/46-volt power supply POWER indicator lamp does not light (para 3-34, step 19).	Defective indicator lamp or fuse, or no ac power input.	Check ac power cord connection. Refer to higher category maintenance personnel.

Item No.	Symptom	Probable trouble	Corrective action
20	POWER indicator lamp lights but console transmitter selector indicator lamps do not light (para 3-34, step 19).	Defective transmitter selector units or ac distribution unit.	Refer to higher category maintenance personnel.
21	Six-channel amplifier group DC indicator lamp does not light (para 3-34, step 20).	No ac input power	Check ac power cord connection. Refer to TM 11-5820-733-12 for further checks and corrective measures.
22	Four-channel amplifier group D.C. indicator lamp does not light (para 3-34, step 21).	No ac input power	Check ac power cord connection. Refer to TM 11-5820-768-12 for further checks and corrective measures.
23	Mixing amplifier POWER indicator lamp does not light (para 3-34, step 22).	Defective indicator lamp or fuse, or no ac power input.	Check ac power cord connection. Refer to higher category maintenance personnel.
24	Alarm/pa system amplifier red indicator lamp does not light (para 3-34, step 23).	Defective indicator lamp or fuse, or no dc power input.	Check power cord connection. Refer to higher category maintenance personnel.
		ALARM/PA SYSTEM OPERATION	
25	No output in any mode (para 3-40).	Amplifier unit defective. Speaker defective.	Advance GAIN control to higher volume setting. If fault persists, refer to higher category maintenance personnel.
26	Pa inoperative although siren operation is normal (para 3-40*b*).	Defective initial stage in amplifier unit. Defective SELECTOR switch or defective microphone.	Refer to higher category maintenance personnel.
27	No output or low output in pa operation (para 3-40*b*).	Improper adjustment of GAIN control, defective microphone, or defective speaker.	Adjust GAIN control to higher setting. If this does not correct the trouble, replace microphone with a spare unit. If fault persists, refer to higher category maintenance personnel.
28	Siren inoperative in all modes although PA operation is normal (para 3-40*c*).	Defective oscillator stage in amplifier unit. Defective SELECTOR switch.	Refer to higher category maintenance personnel.
29	Excessive feedback in pa operation (para 3-40*b*).	Improper adjustment of volume control.	Adjust GAIN control to a point just below where feedback occurs.
30	Low sound output or fuzzy siren tone (para 3-40*b* and *c*).	Oscillator balance misadjusted.	Refer to higher category maintenance personnel.
		RECORDER STATUS MONITORING	
31	Pressing recorder/navaid status panel SILENCE pushbutton switch does not silence recorder failure alarm (para 3-43).	SILENCE pushbutton switch or circuitry defective.	Refer to higher category maintenance personnel.

Item No.	Symptom	Probable trouble	Corrective action
		UHF AND VHF TRANSMITTER OPERATION	
32	Transmitting channel indicator glows at increased brilliance with transmitter selector switch at the respective controller position set to the off (up) position (para 3-37).	Transmitter selector switch at another controller position in down (on) position.	Return transmitter selector switch at other controller position to off (up) position if not in use. If fault is not corrected, refer to higher category maintenance personnel.
33	Channel indicator lamp remains at reduced brilliance when transmitter selector switch is set to the on (down) position (para 3-37).	Defective transmitter selector unit, 23/46-volt power supply, or keying unit.	Check power cords for connection. Refer to higher category maintenance personnel.
34	Transmitter not keyed when microphone push-to-talk switch is operated (para 3-37).	Loose or improper microphone plug connection, defective microphone, or defect in transmitter control circuit.	Check plug at microphone headset panel. If trouble - persists, replace microphone with a spare unit. If fault is still not corrected, refer to higher category maintenance personnel.
35	Distorted transmitter output (para 3-37)	Defective microphone or transmitter stages.	Replace microphone with a spare unit. If fault is not corrected, refer to higher category maintenance personnel.
36	Transmitter remains keyed when microphone push-to-talk switch is released (para 3-37).	Defective microphone or transmitter control circuit.	Replace microphone with a spare unit. If fault is not corrected, refer to higher category maintenance personnel.
		UHF AND VHF RECEIVER OPERATION	
37	No audio output in headset or speaker.	Defective P-S lever switch, receiver, antenna, or mixing amplifier.	Refer to higher category maintenance personnel.
38	No audio input to headset with P-S lever switch set to P and channel indicator lamp illuminated (para 3-38). (Speaker output normal.)	Improper setting of PHONE control, or headset improperly connected or defective.	Check PHONE control for proper setting, and adjust if necessary. Also check headset plug connection at microphone-headset panel. If fault persists, replace headset with a spare unit. If fault is still not corrected, refer to higher category maintenance personnel.
39	No regulation of headset audio output level (para 3-38).	Defective PHONE control maintenance personnel.	Refer to higher category
40	No speaker audio output with P-S lever switch set to S and channel indicator lamp illuminated (para 3-38). (Headset output normal.)	Improper setting of SPEAKER control, or defective speaker or receiver mixing and channel selector.	Check SPEAKER control for proper setting and adjust if necessary. If fault persists, refer to higher category maintenance personnel.
41	No regulation of speaker audio level (para 3-38).	Defective SPEAKER volume control.	Refer to higher category maintenance personnel.

Item No.	Symptom	Probable trouble	Corrective action
42	Audio signals heard on speaker and/or headset when P-S lever switch is set to the off (center) position (para 3-38).	Defective P-S lever switch on receiver mixing and channel selector.	Refer to higher category maintenance personnel.
43	Receiver audio output not muted when respective transmitter is keyed (para 3-38).	Defective interlock unit.....	Refer to higher category maintenance personnel.
		SINGLE SIDEBAND OPERATION	
41	Red TUNE indicator lamp continually lighted (para 3-39).	Defective ssb antenna coupler or interconnecting wiring.	Refer to higher category maintenance personnel.
45	Green OPERATE indicator lamp does not light when red TUNE indicator lamp is off (para 3-39).	Defective indicator lamp or defective ssb antenna coupling unit.	Refer to higher category maintenance personnel.
46	Ssb transceiver does not key (para 3-39).	Improper microphone connection, or defective ssb microphone or control circuit.	Check microphone plug at ssb microphone-headset panel. If necessary, replace ssb microphone with a spare unit. If fault is not corrected, refer to higher category maintenance personnel.
47	Ssb transceiver keys, but no modulation is present (para 3-39).	Defective ssb microphone or audio line to ssb transceiver.	Replace ssb microphone with a spare unit. If fault is not corrected, refer to higher category maintenance personnel.
48	Ssb transceiver remains keyed when ssb microphone push-to-talk switch is released (para 3-39).	Defective ssb microphone or control circuit.	Replace ssb microphone with a spare unit. If fault is not corrected, refer to higher category maintenance personnel.
49	No speaker audio output (para 3-39)	Headset plugged into PHONE jack at ssb microphone headset panel or VOL control improperly adjusted.	Disconnect headset if connected. Check VOL control setting. If fault is not corrected, refer to higher category maintenance personnel.
50	No audio monitored at headset (para 3-39) (Speaker operation normal.)	VOL control improperly adjusted or defective headset.	Adjust VOL control for increased volume. If fault persists, replace headset with a spare unit. If fault is still not corrected, refer to higher category maintenance personnel.

49. Operator's Troubleshooting, AN/FSQ-75(V)3 Control Tower Cab

Item No.	Symptom	Probable trouble	Corrective action
1	Obstruction lights fail to light when switch is set to on.	*a.* Light bulls defective ..... *a.*	Request organizational maintenance personnel to replace lamps.
		b. Switch defective..... *b.*	Refer to higher category maintenance personnel.

Item No.	Symptom	Probable trouble	Corrective action
		c. Wiring defective	*c.* Refer to higher category maintenance personnel.
2	Interior lights in control tower cab fail to light when DIMMER control is set to on.	*a.* Light bulbs defective	*a.* Request organizational maintenance personnel to replace light bulbs.
		b. Switch defective	*b.* Refer to higher category maintenance personnel.
		c. Wiring defective	*c.* Refer to higher category maintenance personnel.
3	DIMMER control for control tower cab interior lights fails to control brilliance of lights.	Control defective	Refer to higher category maintenance personnel.
4	Air circulation system fails to operate satisfactorily in control tower cab.	*a.* Return air duct filters dirty.	*a.* Request organizational maintenance personnel to clean or replace filters.
		b. Air outlet volume controls not adjusted properly.	*b.* Request organizational maintenance personnel to adjust volume of air permitted to exist from the grilles in the air conditioning ductwork.
		c. Air conditioner not operating properly.	*c.* Refer to higher category maintenance personnel.
5	Air conditioner fails to operate when MODE SELECTOR switch on air conditioner control panel is set to COOL.	*a.* EVAPORATOR FAN, CONDENSER FAN or COMPRESSOR RESET pushbutton circuit breaker in overload (out) position.	*a.* Depress pushbutton circuit breakers. If any return to overload (out) position, refer to higher category maintenance personnel.
		b. MODE SELECTOR switch defective.	*b.* Refer to higher category maintenance personnel.
		c. Wiring defective	*c.* Refer to higher category maintenance personnel.
		d. Overload relays defective	*d.* Refer to higher category maintenance personnel.
6	Control tower cab air conditioner evaporator fan fails to operate when MODE SELECTOR switch is set to FAN.	*a.* EVAPORATOR FAN pushbutton circuit breaker in overload condition.	*a.* Depress pushbutton circuit breaker to in position. If it returns to overload (out) position, refer to higher category maintenance personnel.
		b. Switch defective	*b.* Refer to higher category maintenance personnel.
		c. Wiring defective	*c.* Refer to higher category maintenance personnel.
		d. Overload relay defective	*d.* Refer to higher category maintenance personnel.
7	Air circulation system does not operate as specified for settings of RIGHT and LEFT DAMPER controls.	*a.* Damper filters dirty	*a.* Request organizational maintenance personnel to clean or replace filter.
		b. RIGHT and LEFT DAMPER controls not operating properly.	*b.* Refer to TM 5-4120-259-15 or further checks and maintenance by organizational personnel.
8	Evaporator fan operates when MODE SELECTOR switch on air conditioner control panel is	*a.* Indicator lamp loose in socket or defective.	*a.* Request organizational maintenance personnel to replace lamp, if defective, or replace in socket, if loose.

Item No.	Symptom	Probable trouble	Corrective action
	set to FAN but EVAPORATER FAN OPERATING indicator fails to light.	*b*. Lamp socket defective	*b*. Refer to higher category maintenance personnel.
9	Air conditioner operates properly when MODE SELECTOR switch is set to COOL but	*a*. Indicator lamp loose in socket or defective.	*a*. Request organizational maintenance personnel to replace lamp, if defective, or replace in socket, if loose.
	EVAPORATOR FAN OPERATING, CONDENSER FAN OPERATING, or COMPRESSOR OPERATING indicator fails to light.	*b*. Lamp socket defective	*b*. Refer to higher category maintenance personnel.

CHAPTER 5

DEMOLITION OF MATERIAL TO PREVENT ENEMY USE

5-1. Authority for Demolition

Demolition of the equipment will be accomplished only upon the order of the commander. Specific destruction procedures for many individual equipments are contained in individual technical manuals (appx A), but the methods used below will be effective for them as well as for the control towers, control tower cabs, shelters, etc that are peculiar to the AN/FSQ-75(V) (*). The destruction procedures outlined in paragraph 5-2, 5-3, and 5-4 will be used to prevent further use of the equipment.

5-2. Methods of Destruction

Any of the methods of destruction given below may be used. The time available will be a major determining factor for the method used. The tactical situation will determine in what manner the destruction order will be carried out.

a. Smash. Smash the controls, glass cab panels, switches, speakers, air conditioners, vital engine-generator parts, and meters; use sledges, axes, handaxes, pickaxes, hammers or crowbars.

b. Cut. Cut all interconnecting cables, antenna cables, guy wires, and power cables in a number of places; use axes, handaxes, or matches.

Warning

Observe extreme caution when using explosives and incendiary devices. Do not use these items unless the need is extremely urgent.

c. Burn. Pack rags, clothing, or canvas under and around the shelters, antenna poles, and wooden towers. Saturate them with gasoline, oil, or diesel fuel and ignite. Burn cables, recording tape, forms, records, and technical manuals; use gasoline, kerosene, oil, flame-throwers, or incendiary grenades.

d. Bend. Bend all panels, consoles, antenna elements and cabinets.

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

f. Dispose. Scatter the destroyed parts, or throw them into streams.

5-3. Priorities for Destruction

In destruction of the air traffic control system, give top priority to destruction of frequency determining components, recorder tapes, records, operating directives, and logs and instructions which are of a classified nature and subject to security regulations. Further destruction shall be carried out on the various categories of equipment in the sequence listed below:

a. Transmitters (give top priority to crystals and frequency determining components).

b. Receivers (give top priority to crystals and frequency determining components).

c. Control units (this would apply to all transmitter and receiver selector units at the controller positions. Obliterate all frequency identification markings at positions. Give top priority to the interlock unit and ac/dc distribution units in console 3 which are common to all controller positions).

d. Engine generator sets, power control cabinet, and power supplies.

e. Antennas.

f. Cable systems (cut the signal cables from the control tower to the equipment shelter, rf

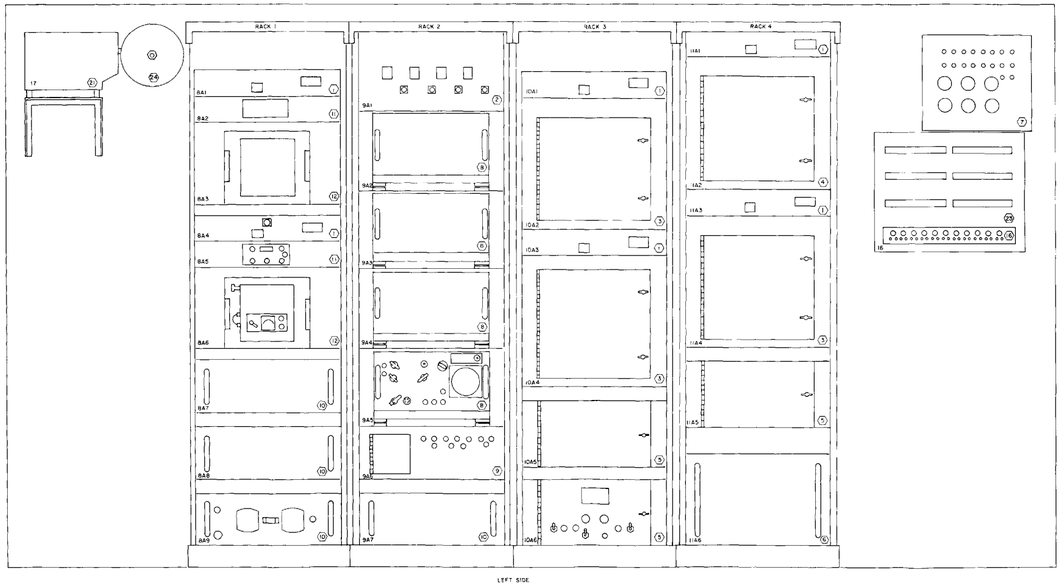
transmission lines, and power cabling in a number of places). If time permits, slash the interior wiring in the equipment shelter and then in the seven control consoles.

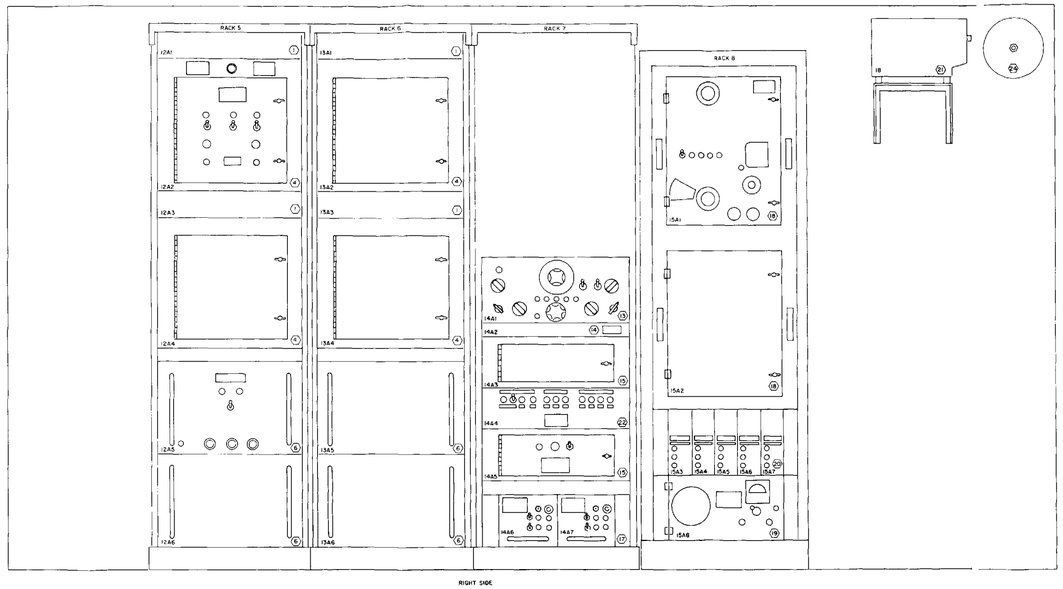
g. Operating accessories (microphones, headsets, etc).

h. Recording and reproducing equipment.

5-4. Spare Parts

The priority for the destruction of component parts of the system necessary to render the system inoperable must also be followed in the destruction of similar components in spare parts storage areas.





LEGEND

1	PANEL, TEST POINT SB-3181/FSQ-75(V)	10 EA
2	PANEL, TEST POINT SB-3182/FSQ-75(V)	1 EA
3	TRANSMITTER, RADIO T-1082/FSQ-75(V)	3 EA (SEE NOTE)
4	TRANSMITTER, RADIO T-1083/FSQ-75(V)	5 EA (SEE NOTE)
5	RECEIVER, RADIO R-1545/FSQ-75(V)	5 EA (SEE NOTE)
6	RECEIVER, RADIO R-1547/FSQ-75(V)	5 EA (SEE NOTE)
7	BULKHEAD CONNECTOR PANEL, SHELTER	1 EA
8	RECEIVER-TRANSMITTER RT-524/VRC	4 EA
9	PANEL, POWER DISTRIBUTION SB-3179/FSQ-75(V)	1 EA
10	POWER SUPPLY PP-6045/FSQ-75(V)	4 EA
11	CONTROL, RADIO SET C-3940/ARC-94	2 EA
12	RECEIVER-TRANSMITTER RT-698/ARC-102	2 EA
13	RECEIVER, RADIO R-1546/FSQ-75(V)	1 EA
14	PANEL, FUSE SB-3180/FSQ-75(V)	1 EA
15	POWER SUPPLY PP-6044/FSQ-75(V)	2 EA
16	RECEIVER TEST PANEL	1 EA
17	POWER SUPPLY-OSCILLATOR PP-6040/FSQ-75(V)	2 EA
18	TRANSPORT, MAGNETIC TAPE RO-355/FSQ-75(V)	2 EA
19	MONITOR, RECORDER O-1158/FSQ-75(V)	1 EA
20	AMPLIFIER, AUDIO FREQUENCY AM-6020/FSQ-75(V)3	EA
21	COUPLER, ANTENNA CU-1658/A	2 EA
22	PANEL, PROTECTION-POWER DISTRIBUTION SB-3178/FSQ-75(V)	1 EA
23	SHELTER DEMARCATION PANEL	1 EA
24	ANTENNA ENTRANCE INSULATOR	2 EA

NOTE

FOR RADIO GROUP OZ-2(V)1/FSQ-75(V), CHANGE QUANTITY OF ITEMS 4 AND 6 TO 4 EACH AND QUANTITY OF ITEMS 3 AND 5 TO 4 EACH AND RACK NO.4 IS CHANGED TO BE IDENTICAL WITH THE CONFIGURATION OF RACK NO.3 AS SHOWN.

TM5895-590-10-65

Figure 5-1(1). Equipment shelter rack layout and interconnecting cabling (part 1 of 2).

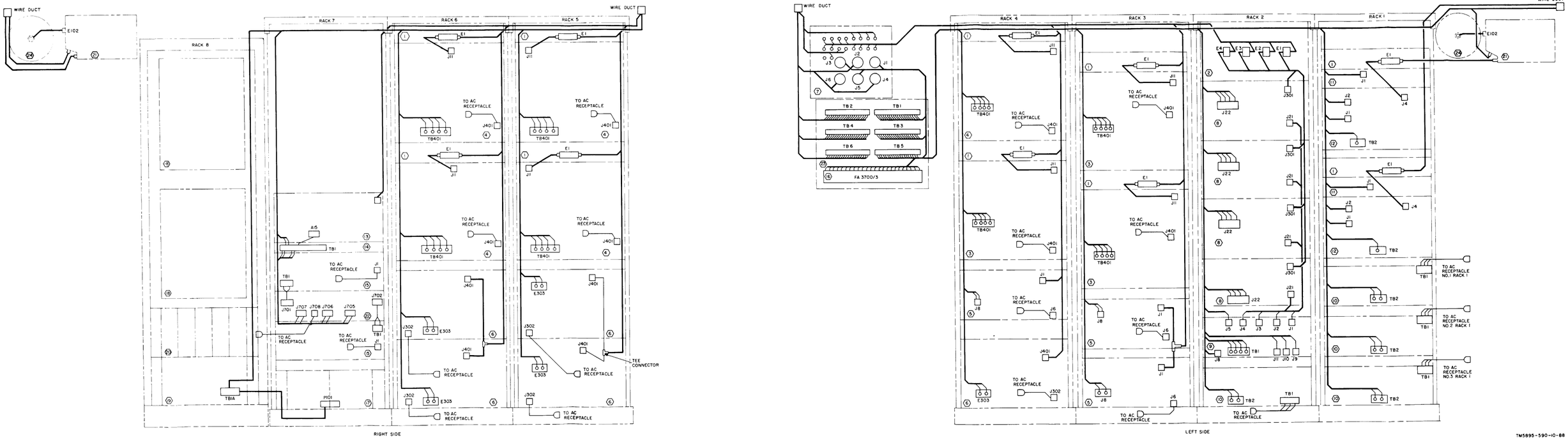
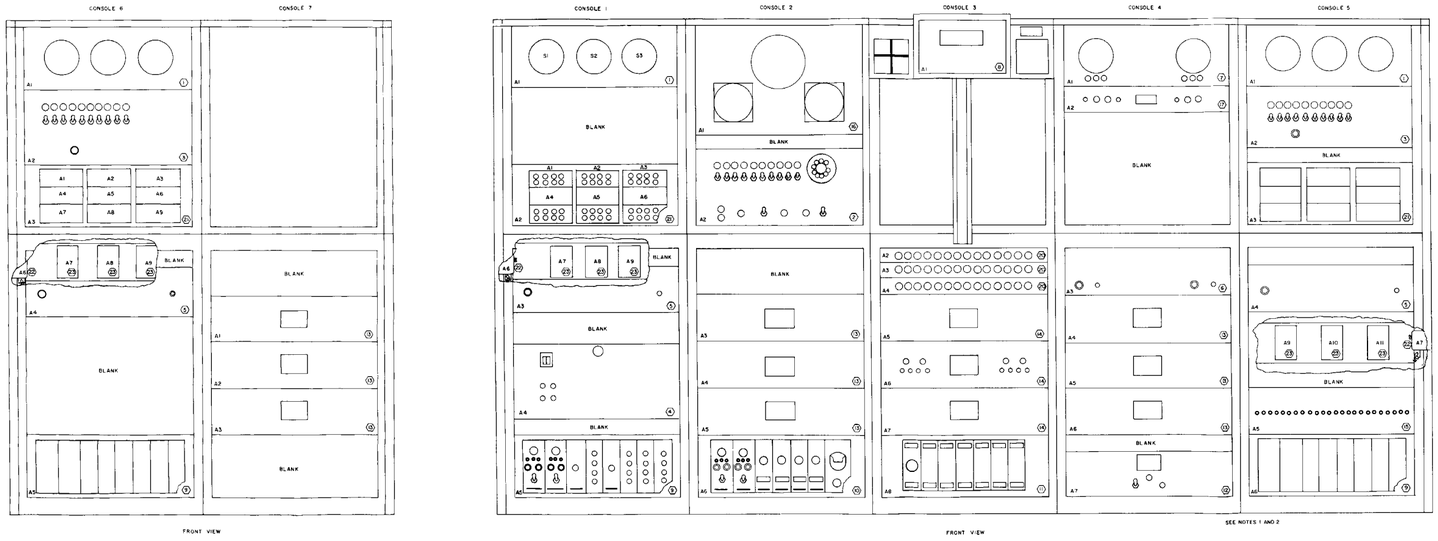


Figure 5-1(2). Equipment shelter rack layout and interconnecting cabling (part 2 of 2).



LEGEND

1	SPEAKER ASSEMBLY LS-563/FSQ-75(V)	3 EA
2	TELEPHONE SWITCH PANEL TA-792/FCA-17	1 EA
3	TELEPHONE SWITCH PANEL TA-793/FCA-17	2 EA
4	TELEPHONE COMMON EQUIPMENT TA-794/FCA-7	1 EA
5	PANEL, MICROPHONE HEADSET SB-3188/FSQ-75(V)	3 EA
6	PANEL MICROPHONE-HEADSET SB-3187/FSQ-75 (V)	1 EA
7	LOUDSPEAKER ASSEMBLY LS-565/FSQ-75(V)	1 EA
8	CLOCK, DIRECT READING WX-8090/FSQ-75 (V)	1 EA
9	AMPLIFIER GROUP, AUDIO FREQUENCY OG-72/FSQ-75 (V)	3 EA
10	AMPLIFIER GROUP, AUDIO FREQUENCY OG-73/FSQ-75 (V)	1 EA
11	AMPLIFIER-MIXER GROUP OG-71/FSQ-75 (V)	1 EA
12	POWER SUPPLY PP-6048/FSQ-75(V)	1 EA
13	CONTROLLER, CHANNEL SELECTOR C-7685/FSQ-75(V)	9 EA
14	CONTROLLER, FREQUENCY SELECTOR C-7686/FSQ-75(V)	3 EA
15	PANEL, TRANSFORMER IMPEDANCE MATCHING SB-3197/FSQ-75(V)	1 EA.
* 16	AEROLOGICAL MEASURING SET ML-629/FSQ-75(V)	1 EA
17	MONITOR-INDICATOR, RECORDER, RECEIVER IO-570/FSQ-75(V)	1 EA
18	JACK MOUNTING PANEL	1 EA.
19	CONSOLE DEMARCATION PANEL	1 EA.
20	PANEL,POWER DISTRIBUTION SB-3177/FSQ-75(V)	3 EA.
21	TRANSMITTER-RECEIVER-VOLUME CONTROL MOUNTING PANEL	3 EA
22	BUZZER BZ-166/FSQ-75 (V)	3 EA
23	TRANSFORMER, VOLTAGE, STEP-UP TF-553/FSQ-75 (V)	9 EA.

* CERTAIN COMPONENTS OF THE ML-629/FSQ-75(V) ARE MOUNTED EXTERNAL TO THE CONSOLE GROUPING SHOWN IS AEROLOGICAL PANEL ASSEMBLY

NOTES

1. CONSOLES 1 THROUGH 5, AND CONSOLES 6 AND 7 AS SHOWN WITH INTERCONNECTING CABLING ARE APPLICABLE TO THE AN/FSQ-75(V)1 AND AN/FSQ-75(V)2 CONFIGURATIONS.
2. FOR THE AN/FSQ-75(V)3 CONFIGURATION, ONLY CONSOLES 1 THROUGH 5, ARE APPLICABLE AND CONSOLE 3 CONNECTORS J12, J13, J14, J15 AND J18 ARE AVAILABLE FOR FUTURE CONNECTION OF A REMOTE CONTROLLER POSITION.

TM5895-590-10-84

Figure 5-2(1). Console layout and interconnecting cabling (part 1 of 2).

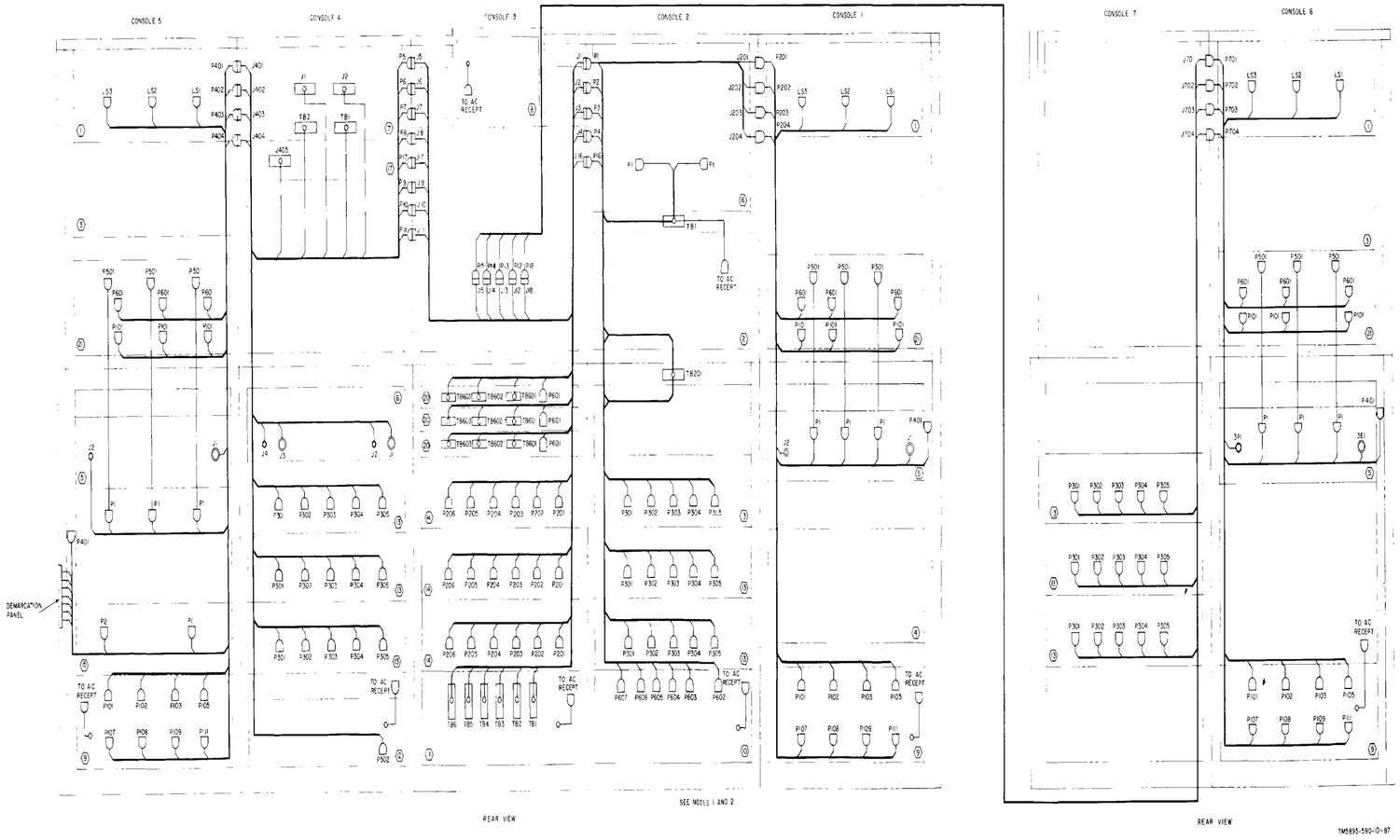


Figure 5-2(2). Console layout and interconnecting cabling (part 2 of 2).

APPENDIX A

REFERENCES

The following publications contain information applicable to the operation of Air Traffic Control Communication Set AN/FSQ-75(V) (*):

DA Pam 310-4	Index of Technical Manuals, Technical Bulletins, Supply Manuals (types 7, 8, and 9), Supply Bulletins, and Lubrication Orders.
DA Pam 310-7	U.S. Army Equipment of Modification Work Orders.
SB 11-573	Painting and Preservation Supplies Available for Field Use for Electronics Command Equipment.
SB 38-100	Preservation, Packaging, and Packing Materials, Supplies, and Equipment Used by the Army.
TB SIG 291	Safety Measures To Be Observed When Installing and Using Whip Antennas, Field Type Masts, Towers, Antennas, and Metal Poles That Are Used With Communication, Radar, and Direction Finder Equipment.
TB SIG 364	Field Instructions for Painting and Preserving Electronic Command Equipment.
TM 5-4120-259-15	Operator, Organizational, Direct and General Support, and Depot Maintenance Manual: Air Conditioner: Base Mounted, Air Cooled, 208-Volt, 3-Phase, 60 Cycle, Ac, Single Package, 36,000 BTU/HR (York Corp Model MA 3-F23A FSN 4120-926-1116.
TM 9-213	Painting Instructions for Field Use.
TM 11-1257	Signal Generator AN/URM-48.
TM 11-5551E	R. F. Signal Generator AN/URM-25F.
TM 11-5805-467-12	Operator and Organizational Maintenance Manual: Telephone Connecting Group AN/FCA-17.
TM 11-5820-401-10	Operator's Manual: Radio Sets AN/VRC-12 and AN/VRC-43,-44,-45,-46,-47,-48, and -49.
TM 11-5820-732-12	Operator and Organizational Maintenance Manual: Receiver, Radio R-1545/FSQ-75 (V).
TM 11-5820-733-12	Operator and Organizational Maintenance Manual: Amplifier Group, Audio Frequency OG-72/FSQ-75(V), Adapter, Test MX-8091/FSQ-75(V), and Fixture, Test, Amplifier-Power Supply MX-0093/FSQ-75(V).
TM 11-5820-735-12	Operator and Organizational Maintenance Manual: Radio Receiver R-1547/FSQ-75 (V).
TM 11-5820-736-12	Operator and Organizational Maintenance Manual: Radio Transmitters T-1082/FSQ-75(V) and T-1083/FSQ-75(V).
TM 11-5820-768-12	Operator and Organizational Maintenance Manual: Amplifier Group, Audio Frequency OG-73/FSQ-75(V), Adapter, Test MX-8092/FSQ-75(V), and Fixture Test, Amplifier-Power Supply MX-8094/FSQ-75(V).

TM 11-5821-248-12	Organizational Maintenance Manual: Radio Set AN/ARC-102.
TM 11-5821-271-15	Organizational, DS, GS, and Depot Maintenance Manual: Couplers, Antenna CU-1658/A and CU-1669/GRC.
TM 11-5825-249-12	Operator and Organizational Maintenance Manual: Receiver Radio R-1546/FSQ-75(V).
TM 11-5835-236-12	Operator and Organizational Maintenance Manual: Recorder Group OA-8432/FSQ-75(V).
TM 11-5835-237-12	Operator and Organizational Maintenance Manual: Reproducer Group, Sound OA-8427/FSQ-75(V).
TM 11-6625-203-12	Operator and Organizational Maintenance Multimeter AN/URM-105, Including Multimeter ME-77/U.
TM 11-6625-366-15	Organizational, DS, GS, and Depot Maintenance Manual: Multimeter TS-352B/U.
TM 11-6625-508-10	Operator's Manual: Signal Generators AN/USM-44 and AN/USM-44A.
TM 11-6625-535-15	Operator, Organizational, DS, GS, and Depot Maintenance Manual: Oscilloscope AN/USM-140A.
TM 38-750	Army Equipment Record Procedures.

APPENDIX B

BASIC ISSUE ITEMS

Section I. INTRODUCTION

B-1. Scope

This appendix lists items for Air Traffic Control Communication Sets AN/FSQ-75(V)1 and AN/FSQ-75(V)2, the component items comprising this equipment, and the items that accompany this equipment or are required for installation or operation.

B-2. Explanation of Columns

The following is a list of explanations of columns in section II.

a. Source, Maintenance, and Recoverability Codes (SMR) Column.

(1) Source code (A). The selection status and source for the listed item is the first code indicated in this column. The source code used and its explanation is:

Code	Explanation
P	Applies to repair parts that are stocked in or supplied from GSA/DSA, or Army supply system, and authorized for use at indicated maintenance categories.

(2) Maintenance code (B). The lowest category of maintenance authorized to install the item is indicated by the second code in this column. The maintenance category code and its explanation is-

Code	Explanation
O	Organizational Maintenance (3) Recover-ability code (C). The recoverability code is the third code in the column. It indicates whether unserviceable items should be returned for recovery or salvage. Recoverability code and its explanation is as follows:

Note

When no code is indicated in the recoverability column, the part will he considered expendable.

Code	Explanation
U	Applies to repair parts specifically selected for salvage by reclamation units because of precious metal content, critical materials, high dollar value, reusable casings or castings.

b. Federal Stock Number Column. This column indicates the Federal stock number for the item.

c. Description Column. This column includes the Federal item name and any additional description of the item which may be required. A part number or other reference number is followed by the applicable five-digit Federal Supply Code for Manufacturers. Model designators, which indicate different models of equipment, are included in this column. Model column 1 refers to AN/FSQ-75 (V)1; 2 refers to AN/FSQ-75(V)2.

d. Unit of Issue Column. The unit used as a basis of issue (e.g., ea, pr, ft, yd, etc.) is given in this column.

e. Quantity Incorporated in Unit Pack Column. Not used.

f. Quantity Incorporated in Unit Column. The total quantity of the item used in the equipment is given in this column.

g. Quantity Authorized Column. This column lists the quantity of the item supplied for initial operation of the equipment and/or the quantities authorized to be kept on hand by the operator for maintenance of the equipment.

h. Illustrations Column.

(1) *Figure number (A)*. The number of the illustration in which the item is shown is indicated in this column.

(2) *Item or symbol number (B)*. Not used.

B-3. Federal Supply Codes

This paragraph lists the Federal supply code with the associated manufacturer's name.

80058 ---- Joint Electronics Designation

SECTION II. BASIC ISSUE ITEMS

(1)			BASIC ISSUE ITEMS LIST								(4)	(5)	(6)	(7)	(8)	
(A) SOURCE CD	(B) MAINT. CD	(C) REC CODE CD	(2) FEDERAL STOCK NUMBER	MODEL 1	2	3	4	5	6	(3) DESCRIPTION	UNIT OF ISSUE	QTY INC IN UNIT PACK	QTY INC IN UNIT	QTY AUTH	ILLUSTRATIONS (A) FIGURE NUMBER	ILLUSTRATIONS (B) ITEM SYMBOL NUMBER
										AIR TRAFFIC CONTROL COMMUNICATION SET AN/FSQ-75(V)1: (This is a nonexpendable item) (Model column 1)					1-1	
										AIR TRAFFIC CONTROL COMMUNICATION SET AN/FSQ-75(V)2: (This is a nonexpendable item) (Model column 2)					1-1	
										TECHNICAL MANUAL TM 11-5895-590-10	ea					
										Requisition through pinpoint account number if assigned; otherwise through nearest Adjutant General facility.						
										A quantity of one technical manual is packed with each set. Where a valid need exists, additional copies may be requisitioned and kept on hand.						
PF	O	R	5995-935-5170	X						CABLE ASSEMBLY, RADIO FREQUENCY CG-3450/FSQ-75-(V): 80058	ea				2-8	
PF	O	R	5995-935-5170		X					CABLE ASSEMBLY, RADIO FREQUENCY CG-3450/FSQ-75(V): 80058	ea				2-8	
PF	O	R	5995-935-5171	X	X					CABLE ASSEMBLY, RADIO FREQUENCY CG-3469/U: 80058	ea				2-12	
PF	O	R		X	X					CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL CX-10859/FSQ-75(V): 80058	ea				2-1	
PF	O	R	5995-935-5176	X	X					CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL CX-10860/FSQ-75(V): 80058	ea				2-1	
PF	O	R	5995-935-5169	X	X					CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL CX-10861/FSQ-75(V): 80058	ea				2-1	
PF	O	R	5995-056-7130	X	X					CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL CX-10862/FSQ-75(V): 80058	ea				2-1	
PF	O	R	5815-034-7494	X	X					CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL CX-10863/FSQ-75(V): 80058	ea				2-1	

SECTION II. BASIC ISSUE ITEMS

(1)			BASIC ISSUE ITEMS LIST								(4)	(5)	(6)	(7)	(8)	
(A) SOURCE CD	(B) MAINT. CD	(C) REC CODE CD	(2) FEDERAL STOCK NUMBER	MODEL 1	2	3	4	5	6	(3) DESCRIPTION	UNIT OF ISSUE	QTY INC IN UNIT PACK	QTY INC IN UNIT	QTY AUTH	ILLUSTRATIONS (A) FIGURE NUMBER	ILLUSTRATIONS (B) ITEM SYMBOL NUMBER
PF	O	R	5995-935-5168	X	X					CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL CX-10864/FSQ-75(V): 80058	ea		1	1	2-1	
				X	X					CONSOLE GROUP, AIR TRAFFIC CONTROL OJ-67/FSQ-75(V)	ea				1-2	
				X	X					CONTROL-MONITOR C-7823/FSQ-75(V)	ea				1-19	
				X	X					CONTROL, POWER SUPPLY C-78&5/FSQ-75(V)	ea				2-1	
P	O		5965-6356-1925	X	X					MICROPHONE, CARBON M-144/U: 80058	ea		2	2	1-16	
P	O			X	X					MICROPHONE, MAGNETIC M-145/U: 80058	ea		3	3	1-16	
				X						RADIO GROUP OZ-2(V)1/FSQ-75(V)	ea				1-5, 1-6	
					X					RADIO GROUP OZ-2-(V)2/FSQ-75(V)	ea				1-5, 1-6	
										THE FOLLOWING ACCESSORIES, TOOLS, OR TEST EQUIPMENT ARE TO BE ISSUED WITH THIS EQUIPMENT						
				X	X					MONITOR-CONVERTER, AUDIO FREQUENCY-RADIO FREQUENCY ID-1572-/FSQ-75(V)	ea				1-28	
				X	X					TEST SET, RADIO TS-2682/FSQ-75(V)	ea				1-29	
										NO BASIC ISSUE ITEMS ARE MOUNTED IN OR ON THIS EQUIPMENT						

INDEX

By Order of the Secretary of the Army:

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USACDCEC (10)
USACDCCEA (1)
USACDCCEA FT Huachuca (1)
USAMC (2)
Eighth US Army (5)
LBAD (10)
SAAD (15)
TOAD (10)
LEAD (7)
AAF (Vietnam) (6)
USARV (10)

NG: State AG (3)

USAR: None

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

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PREVIOUS EDITIONS ARE OBSOLETE.

P.S.--IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS.

The Metric System and Equivalents

Linear Measure

1 centimeter = 10 millimeters = .39 inch
1 decimeter = 10 centimeters = 3.94 inches
1 meter = 10 decimeters = 39.37 inches
1 dekameter = 10 meters = 32.8 feet
1 hectometer = 10 dekameters = 328.08 feet
1 kilometer = 10 hectometers = 3,280.8 feet

Weights

1 centigram = 10 milligrams = .15 grain
1 decigram = 10 centigrams = 1.54 grains
1 gram = 10 decigram = .035 ounce
1 decagram = 10 grams = .35 ounce
acres
1 hectogram = 10 decagrams = 3.52 ounces
1 kilogram = 10 hectograms = 2.2 pounds
1 quintal = 100 kilograms = 220.46 pounds
1 metric ton = 10 quintals = 1.1 short tons

Liquid Measure

1 centiliter = 10 milliters = .34 fl. ounce
1 deciliter = 10 centiliters = 3.38 fl. ounces
1 liter = 10 deciliters = 33.81 fl. ounces
1 dekaliter = 10 liters = 2.64 gallons
1 hectoliter = 10 dekaliters = 26.42 gallons
1 kiloliter = 10 hectoliters = 264.18 gallons

Square Measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch
1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches
1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47

1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

Approximate Conversion Factors

To change	*To*	*Multiply by*	*To change*	*To*	*Multiply by*
inches	centimeters	2.540	ounce-inches	Newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29,573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	Newton-meters	1.356	metric tons	short tons	1.102
pound-inches	Newton-meters	.11296			

Temperature (Exact)

°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

PIN: 014726-000