

TM 11-5820-763-15

TECHNICAL MANUAL

OPERATOR'S, ORGANIZATIONAL, DIRECT SUPPORT,

GENERAL SUPPORT, AND DEPOT MAINTENANCE MANUAL

RADIO SET GROUP OA-6997V/MRC-85[v]2

'HEADQUARTERS, DEPARTMENT OF THE ARMY
OCTOBER 1971

WARNING

DANGEROUS VOLTAGES EXIST IN THIS EQUIPMENT

Be careful when working on the 120/208-volt ac lines, and the 24- and 120-volt dc alarm-monitor connections.

DON'T TAKE CHANCES!

THIS MANUAL IS AN AUTHENTICATION OF THE MANUFACTURER'S COMMERCIAL LITERATURE WHICH, THROUGH USAGE, HAS BEEN FOUND TO COVER THE DATA REQUIRED TO OPERATE AND MAINTAIN THIS EQUIPMENT. SINCE THE MANUAL WAS NOT PREPARED IN ACCORDANCE WITH MILITARY SPECIFICATION, THE FORMAT HAS NOT BEEN STRUCTURED TO CONSIDER LEVEL OF MAINTENANCE NOR TO INCLUDE A FORMAL SECTION ON DEPOT MAINTENANCE STANDARDS.

TECHNICAL MANUAL
 No. 11-5320-763-15

**HEADQUARTERS
 DEPARTMENT OF THE ARMY
 WASHINGTON, D.C., 22 October 1971**

Operator's, Organizational, Direct Support, General Support
 and Depot Maintenance

RADIO SET GROUP OA-6997V/MRC-85(V)2

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Figure 1-1. Radio Set Group OA-6997/ MRC-85(V)2 (Operations Van).

CHAPTER 1

GENERAL INFORMATION

1-A.1. Scope

a. This manual describes Radio Set Group OA-6997V/MRC-85(V)2. It includes installation and operation instructions and covers operator, organizational, direct support (DS), general support (GS), and depot maintenance.

b. A maintenance allocation chart appears in appendix B.

NOTE

Appendix B is current as of 26 August 1971.

1-A.2. Indexes of Publications

a. **DA Pam 310-4.** Refer to 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-A.3. Forms and Records

a. **Reports of Maintenance and Unsatisfactory Equipment.** Use equipment forms and records in accordance with instructions in 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 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).

d. **Reporting of Equipment Manual Improvements.** The reporting of errors, omissions, and recommendations for improving this publication by the individual user is encouraged. Reports should

be submitted on DA Form 2028 (Recommended Changes to Publications) and forwarded direct to Commanding General, US Army Electronics Command, ATTN : AMSEL-MA-NMP-M Fort Monmouth NJ 07703.

1-1. Description and Purpose

1-2. General

1-3

Radio Set Group OA-6997V/MRC-85(V)2, hereinafter referred to as the operations van (fig. 1-1), is an integral part of a mobile forward propagation tropospheric scatter (FPTS) facility, designated Radio Set AN/MRC-85. When used in conjunction with other components of Radio Set AN/MRC-85 (fig. 1-2), the operations van provides simultaneous transmission and reception of fm signals within the frequency spectrum of 755 to 985 mc.

1-4

The operations van, consisting of a modified M-373A2 semitrailer van and various electronic equipments (fig. 1-3), is designed so that it may be transported over all types of roads and terrain. Located on the exterior of the operations van (figs. 1-4 and 1-5) are the landing gear, leveling jacks, bench levels, and cable entrance boxes. Storage space is provided under the van for transporting ladders, platforms, leveling jack shoes, tarpaulin bows, and a spare tire. Storage space is also provided within the operations van for transporting waveguide and transit cases.

1-5

Electronic equipment in the operations van converts voice frequency and dc teletype signals supplied from subscriber truck lines, to frequency modulated rf signals which are used to drive associated electronic equipment in the power amplifier van. Additional equipment in the operations van converts frequency modulated rf signals, from associated electronic equipment in the power amplifier van, to voice frequency and dc teletype

signals which are routed to subscriber trunk lines for operating telephone and teletype equipment.

1-6

Monitoring facilities within the operations van provide indications of malfunctioning equipment in the diesel generator, power amplifier, and operations vans.

1-7. Operations Van Exterior

1-8

When in tow, the operations van is supported at the front by a fifth wheel and king pin assembly. A pintle hook, located at the rear of the operations van, is provided for towing a trailer when required. Tie-down sockets at the sides and ends of the van are used to secure the operations van during shipment. Air intake and exhaust ports are provided for use by two operations van air conditioner units. Air conditioner air return and supply ports are used when the air conditioning system is connected to the power amplifier van. The underside of the operations van has provisions for stowing items during movement from one location to another. Also stowed there is a tool box containing tire tools, leveling jack bars,

and camloc wrenches. Chock blocks, to prevent the operations van from rolling when the landing gear and leveling jack assemblies are not in position, are stored in carriers under the van.

1-9

A description and purpose of components located on the operations van exterior is given in the following paragraphs (See figs. 1-4 and 14.)

1-10. Air Conditioner Air Return and Supply Ports

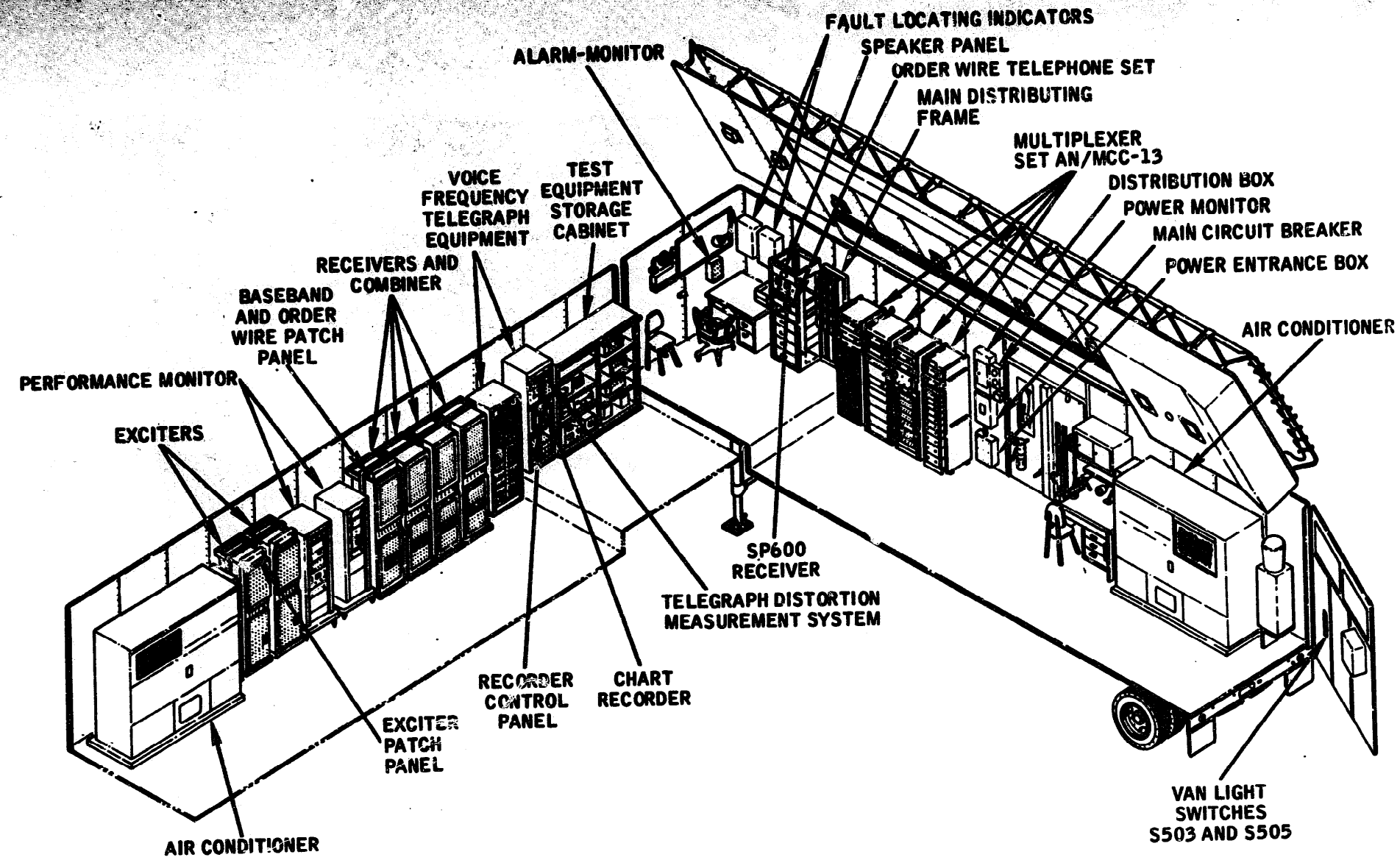
The air conditioner air return and supply port provide an interconnecting point between the operations van air conditioning system and the power amplifier van. Air conditioning ducts when installed between these ports and the power amplifier van air conditioner ports, extend air conditioning facilities to the power amplifier van

1-11. Audio and Alarm Box

The audio and alarm box is a covered junction box containing four binding posts and two electrical connectors which provide terminations for a signal cable from the diesel generator van and external telephone connections.



Figure 1-2. Operations Van Relationship to Radio Set AN/MRC-85.



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Figure 1-3. Operations Van Interior.

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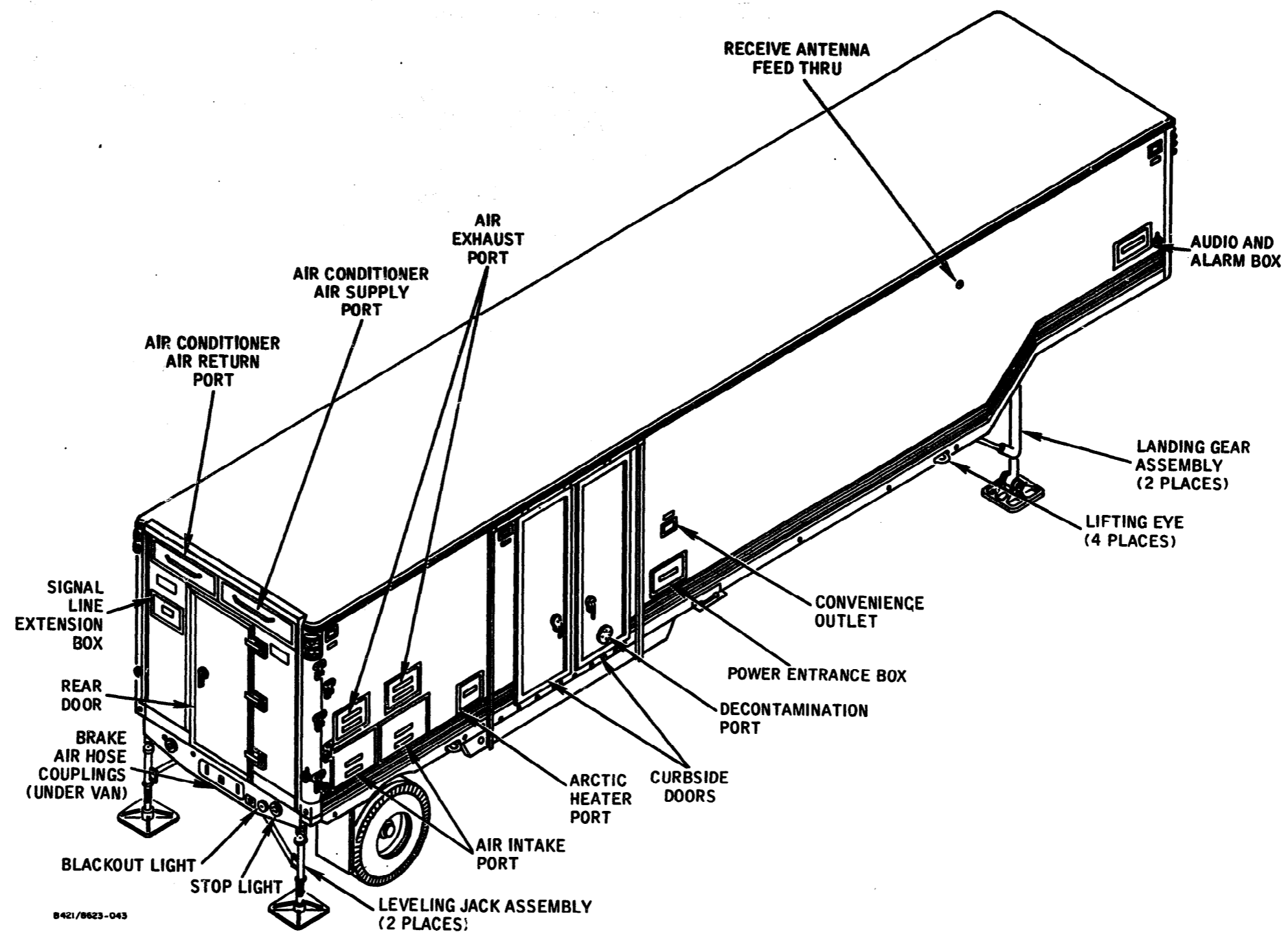


Figure 1-4. Operations Van Exterior Curbside View.

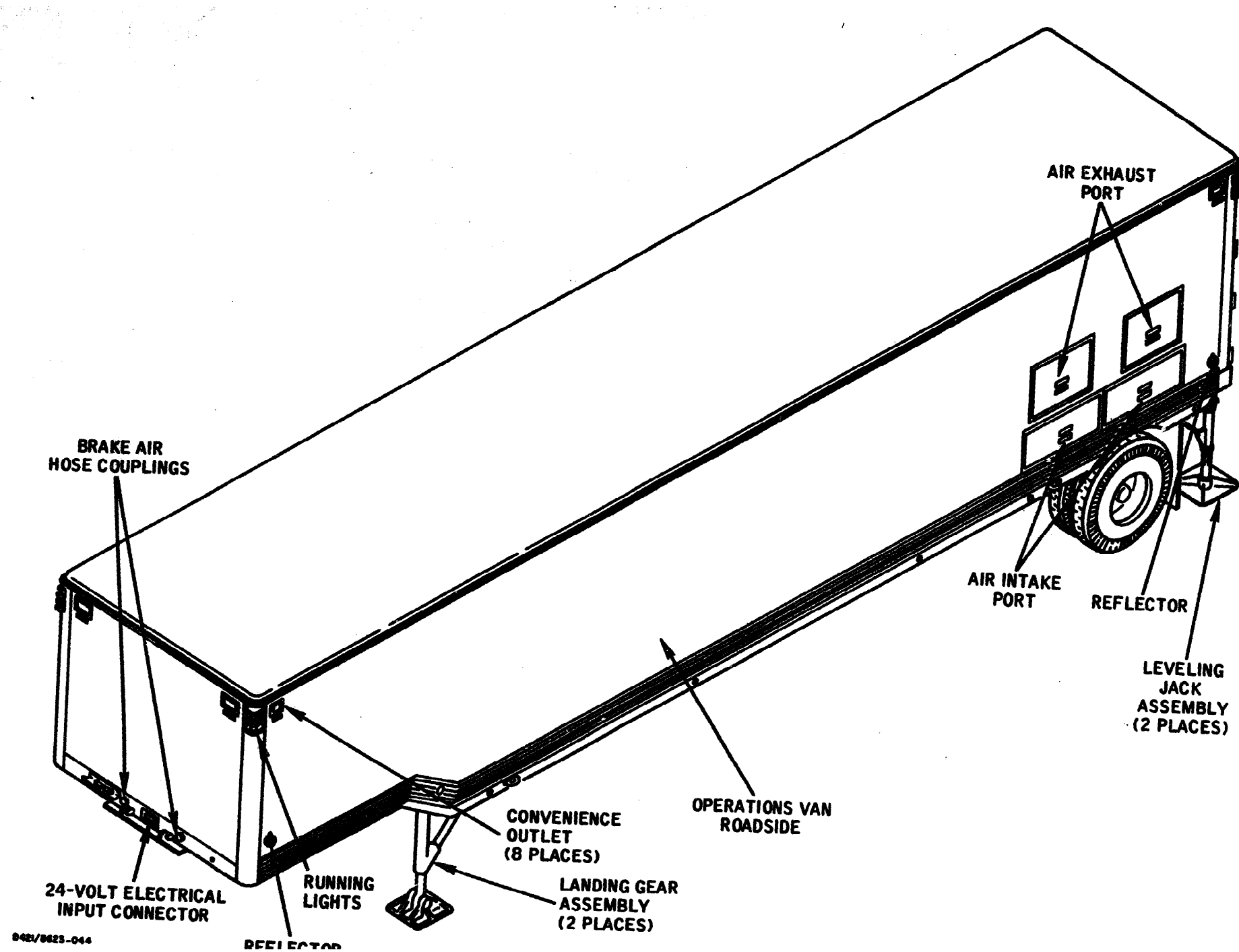


Figure 1-5. Operations Van Exterior Roadside View.

1-12. Air Intake and Exhaust Parts

Two air intake and two air exhaust ports are located on each side of the operations van for use by the two air conditioner units within the van. Air supplied through the intake ports is used to cool the air conditioner condenser coils or to provide ventilation for the van. The exhaust ports are used to remove warm air from the air conditioner units.

1-13. Brake Air Hose Couplings

Brake air hose couplings provide connection between the prime mover air brake system and the operations van air brake system. Couplings on the rear of the van supply air to the brake system of vehicles towed in tandem. When not in use, the brake air hose couplings are connected to dummy couplings to prevent foreign matter from entering the air brake system.

1-14. Curbside Doors

Two hinged doors separated by a removeable center post provide a **large** access opening (approximately 60 inches by 80 inches) into the operations van.

1-15. Landing Gear Assembly

The landing gear assemblies are adjustable support equipment which support the front end of the operations van when it is not connected to a towing vehicle. They are also used to raise or lower the front of van during leveling operations.

1-16. Leveling Jack Assembly

The leveling jack assemblies, in conjunction with the landing gear assemblies, provide a means for leveling the operations van. They are also used to provide support for the rear of the operations van when it is not connected to a towing vehicle.

1-17. Lifting Eyes

Eight retractable lifting eyes are provided for lifting or tying down the operations van during shipment.

1-18. Lights and Reflectors

Running lights, stop lights, a blackout light, and reflectors are provided in compliance with safety regulations.

1-19. Power Entrance Box -

The power entrance box is a panel-covered box containing two ground studs and an electrical connector which provide a termination point for

the power cable from the diesel generator van and a means of grounding the operations van.

1-20. Rear Door

A rear door provides an access opening (approximately 20 inches by 70 inches) into the operations van.

1-21. Receive Antenna Feed Thru

The receive antenna feed thru is an insulated conductor mounted in the curbside wall of the operations van, providing a means of connecting the SP600 receiver to an external antenna.

1-22. Signal Line Extension Box

The signal line extension box is a panel-covered junction box containing twelve electrical connectors terminating signal and regulated ac power cables from the power amplifier van.

1-23. 24-Volt DC Electrical Input Connector

The 24-volt dc electric81 input connector interconnects 24 volts dc from the prime mover to the operations vans.

1-24. Operations Van Interior

1-25.

The following paragraphs provide a description and purpose of each equipment located inside the operations van (see fig. 1-3).

1-26. Air Conditioner

An air conditioner consisting of two independent units is provided to supply heating and cooling facilities for maintaining a constant temperature of approximately 75° F within the operations van. Both units are operated from a single control box located on the front of one of the units. The cooling facility can be extended to the power amplifier van by the use of interconnecting ducts.

1-27. Alarm-Monitor

The alarm-monitor box contains circuits for monitoring the status of power units in the diesel generator van. Lamps and buzzers provide visual and audible indications of malfunctioning equipment. Two front panel-mounted toggle switches control operation of the diesel generator alarm circuits.

1-28. Baseband and Order Wire Patch Panel

The baseband and order wire patch panel has telephone jacks on its front panel and receptacles for cable terminations on its rear panel. The base-

band and order wire patch panel provides testing, monitoring, and patching facilities for the baseband and order wire circuitry in the operations van.

1-29. chart Recorder

The chart recorder is comprised of identical dual ink recorders. The chart recorder is rack mounted test equipment used for monitoring receiver performance.

1-30. Distribution Box

The distribution box contains 20 circuit breakers as follows: two 100-ampere, S-phase, 60-cycle, thermal overload protected and manually operated circuit breakers; four 120-volt ac, 20-ampere, single-phase, 60-cycle, thermal overload protected and manually operated circuit breakers; fourteen 120-volt ac, 15-ampere, single-phase, 60-cycle, thermal overload protected and manually operated circuit breakers. The circuit breakers control the distribution of power to individual equipments and circuitry in the operations van.

1-31. Exciters

Two fin exciters provide driving power for power amplifiers in the power amplifier van. Input to the exciters is supplied by the multiplex set and the voice order wire equipment.

1-32. Exciter Patch Panel

The exciter patch panel has 6 connectors for cable terminations. It provides means for patching the exciter output through to the power amplifier van or for patching the exciter output back into the exciter dummy load.

1-33. Fault Locating Indicators

Two fault locating indicators provide visual and audible indications of malfunctions and deviations from normal operation of equipment in the operations van and the power amplifier van.

1-34. Main Circuit Breaker

The main circuit breaker is a manually operated circuit breaker with a 208-volt ac, 200-ampere, 3-phase, 60-cycle service rating. It is designed to provide thermal overload protection which automatically removes power from the operations van when the 200-ampere rating is exceeded.

1-35. Main Distributing Frame

The main distributing frame (MDF) is a 5-foot open rack containing 15 terminal blocks arranged in 5 rows of 3 columns and is designed to dis-

tribute signals to and from the subscriber trunk lines. The terminal blocks on the mdf are the intraconnecting points between electronic equipments in the operations van and the subscriber trunk lines.

1-36. Multiplexer Set

Multiplex Set AN/MCC-13 is a fully transistorized frequency division multiplex equipment designed to provide for the transmission and reception of 72 4-kc voice frequency channels.

1-37. Order Wire Telephone Set

The order wire telephone set is a three-panel unit which provides a voice order wire circuit for the FPTs facility. The order wire telephone set is for the use of operations and maintenance personnel for intrasystem communications.

1-38. Performance Monitor

The performance monitor (Radio Test Set AN/MRM-8) contains test equipment (mounted in two racks) used for making performance tests or adjustments on equipment in the operations van. Racks No. 1 and No. 2 are used together for making maintenance checks and adjustments when the operations van equipment is out of service.

1-39. Power Monitor

The power monitor is a panel containing a voltmeter, frequency meter, and a switch. It is used to monitor all three phases of primary ac input power.

1-40. Receiver SP-600

The SP-600 receiver is a rack-mounted general coverage (0.65 to 54 mc) receiver used for testing and adjusting equipment.

1-41. Receivers

Four identical fm receivers are provided to demodulate the 70-mc rf signals from parametric amplifiers in the power amplifier van and amplify the resulting baseband and order wire signals. Combiners within the receivers provide an output signal with a high signal-to-noise ratio and apply the signal to other equipment in the operations van for further processing.

1-42. Recorder Control

The recorder control is a panel containing two identical electrical circuits which select the time constant and input to each channel of the chart recorder.

1-43. Speaker Panel

The speaker panel is a rack-mounted panel containing a 5-inch speaker and impedance matching transformer for use with the SP-600 receiver.

1-44. Telegraph Distortion Measurement System

The telegraph distortion measurement system (TDMS) is rack-mounted test equipment consisting of a power supply, transmitter, and receiver. This equipment is used for testing and adjusting the voice frequency telegraph (VFTG) equipment.

1-45. Voice Frequency Telegraph Equipment

The voice frequency telegraph (VFTG) equipment is a frequency division multiplex system which provides for the transmission and reception of 48 teletype channels.

1-46. Test Equipment

Miscellaneous test equipment required for maintenance of the operations van is stored in test equipment storage cabinets.

1-47. Support Items

Numerous support items such as a broom, chairs, a flat top desk, etc., are supplied with the operations van. These items, used by operating and maintenance personnel, are not a direct functional part of the operations van.

1-48. Items Comprising an Operable Equipment

Table 1-3 (Items Supplied) lists the items comprising an operable equipment. A listing of equipment required but not supplied is given in table 1-4.

Table 1-1. Leading Particulars

Primary power requirement ⁹	AC : 120/208-volt, 60-cycle, 3-phase, 4-wire, 18-kilowatt (nominal) AC regulated: 120-volt, 60-cycle, single-phase DC : 24-volt
AC lighting _____	Two overhead rows of six 75-watt, 115-vac lamps each
Body type _____	Modified M373A2 Army Ordnance semitrailer van
Cabling requirements _____	Signal and power cabling requirements are covered in Chapter 2, table 2-1 and in cabling diagrams of Chapter 6
DC emergency lighting _____	Three overhead 24-volt lamps
Dimensions (approx) _____	35 feet long, 8 feet wide, 11 feet high
Storage conditions _____	Operations van must be sealed with pressure sensitive tape and coated with preservative oil
Transportability _____	Via airlift in C-124, C-130, or C-133 aircraft Via rail flatcar Via sea transport
Weight (approx) _____	Ground ; M-48, M-62, M221 truck tractor or XM198A1 trailer converter dolly 27,000 lbs fully loaded

Table 1-2. Capabilities and Limitations

Frequency range _____	Limited by facility requirements to 755—985 mc
Coverage _____	72 telephone circuits and 1 voice order wire circuit or 68 telephone circuits, 48 teletypewriter circuits and 1 voice order wire circuit
Telephone connections _____	2-wire or 4-wire
Telephone impedance _____	600 ohms
Telephone signaling _____	Dial or ring-down
Type of transmission _____	Single-sideband fm
Type of modulation _____	Frequency
Power output (exciter) _____	10 to 20 watts
Type of reception _____	Quadruple space diversity and polarization diversity
Environmental considerations:	
Temperature (operating and nonoperating) _____	-65°F to 125°F
Relative humidity _____	95 percent maximum
Barometric pressure:	
Operating _____	Sea level to 10,000 feet
Nonoperating _____	Sea level to 40,000 feet

Table 1-2. Capabilities and Limitations- Continued

Air conditioning capacity:	
Cooling	168,000 btu/hr
Heating	81,600 btu/hr
Front towing suspension	King pin and fifth wheel plate
Rear towing suspension	Single axle with dual wheels, 9.00 x 20, 10-ply tires
Towing speeds:	
Highway	55 mph
Cross country	15 mph
Turning ability	Maximum -90° angle with respect to towing vehicle

TM 11-5820-763-15
Table 1-3.. Equipment Supplied

Official Nomenclature	Common Name	Federal Stock No. or Mfr. Part No.	Qty	Description and Purpose
Radio Set Group OA-6997V/ MRC-85(V)2	Operations van	Wickes 8750571-501	1	Electronic equipment van consisting of exciters and receivers, telegraph terminal equipment, and patching and test equipment; used as integral part of Radio Set AN/MRC-85(V)
Semitrailer Van V-205/ MRC-85(V)	Van	Miller 3169880	1	Modified M373A2 Army Ordnance semitrailer van used to house and transport electronic equipment comprising the operations van
Air Conditioner M68 A/E32C-11	Air conditioner	Ellis and watts MIL-AC-68	1	Air conditioning facility for operations and power amplifier vans
Alarm-Monitor BZ-106/ MRC-85(V)2	Alarm-monitor	Wickes 8750623	1	Visual and audible alarm panel. Monitors status of power in diesel generator van
	Audio and alarm box	Wickes 8750622-501	1	Junction box which terminates cables from diesel generator van
Panel, Patching, Communication SB-2319/MRC-85(V)2	Baseband and order wire patch panel	Graybar GB627A	1	Jack field used for patching and testing baseband and order wire signals
Transmitter Group OA-3155/ FRC-39A(V)	Exciter	Radio Engineering Laboratories, Inc. Type 952	2	Low level transmitter used to drive power amplifiers
Panel, Patching, Communication SB-2320/MRC-85(V)2	Exciter patch panel	Wickes 8750666	1	Provides patching facilities for exciters
Alarm Monitor BZ66/FRC-39A(V)	Fault locating indicator	Radio Engineering Laboratories, Inc. Type 958	2	Monitors status of electronic circuitry in operations and power amplifier vans
	Main circuit breaker	Square D Co. ML3426S	1	Controls application of primary ac power and provides overload protection to operations van equipment
Main Distributing Frame, Telephone TA-593/MRC-85(V)2	Main distributing frame (MDF)	Wickes 8760027-501	1	Open rack containing 15 terminal blocks used as interconnecting points between subscriber cable and operations van equipment

TM 11-5820-763-15
Table 1-3. Equipment Supplied (cont)

Official Nomenclature	Common Name	Federal Stock No. or Mfr. Part No.	Qty	Description and Purpose
Multiplexer Set AN/MCC-13	Multiplexer set	Lenkurt 790-07929-01	1	Fully transistorized frequency division multiplex equipment which provides 72 4-kc voice frequency channels for transmission over radio relay facilities
Receiver-Transmitter, Order Wire OA-7008/MRC-85(V)2	Order wire telephone set	Graybar GB320	1	Telephone facility for use by maintenance personnel
Test Set, Radio AN/MRM-8	Performance monitor	Radio Engineering Laboratories, Inc. Type 1005B	1	Test equipment for monitoring performance of equipments associated with Radio Set AN/MRC-85
Panel, Power Distribution SB-2324/MRC-85(V)2	Distribution box	Square D QOC30S	1	Box containing circuit breakers which control application of primary ac power and provide overload protection to operations van equipment
	Power entrance box	Wickes 8760021-501	1	Junction box providing input connections for 120/208-volt, 60-cycle, 3-phase power
Meter Assembly, Electrical ME-289A/MRC-85(V)2	Power monitor	Wickes 8750575-501	1	Primary ac input power frequency and voltage monitoring panel
Amplifier-Power Supply Group OA-3157/FRC-39A(V)	Receiver	Radio Engineering Laboratories, Inc. Type 959	2	Demodulates 70-mc signal from power amplifier van and combines 4 signals for best signal-to-noise ratio signal
Connector Assembly, Electrical	Signal line extension box	Wickes 7750540-502	1	Cable termination box between power amplifier and operations van
Loudspeaker, Permanent Magnet LS-515/MRC-85(V)2	Speaker panel	Wickes 7750534-501	1	Panel-mounted, 5-inch speaker used with SP600 receiver
	Test equipment storage cabinet	Wickes 8750643-501	1	Provides for storage of test equipment and miscellaneous items
Multiplexer Group OA-7008/MRC-85(V)2	Voice frequency telegraph (VFTG) equipment	Northern Radio Co. Type 283 Model 1	1	Twelve channel frequency division multiplex system for use on voice frequency circuits
Test Set, Telegraph AN/MRM-9	TDMS equipment	Radiation TDMS	1	Test equipment for monitoring VFTG equipment
	Broom	Wickes 5701174-1	1	
	Bulletin board	Wickes 5701016	1	
	Chair, rotary	Wickes 7750575-501	1	
	Chair, straight	Wickes 8750576-502	2	
	Clock	Wickes 574005	1	
	Coat hanger	Wickes 7760000	2	

**Test Set, Telegraph
AN/MRM-9 (cont)**

Flashlight MX212A/U

Desk, flat top	Wickes 7700548	1
Desk lamp	Wickes 5701053-2	1
Desk tray	Wickes 570117-1	1
Driving stud, ground rod	Wickes 5701176-1	1
Dolly	Wickes 3030	1
Dolly	Wickes 3033	1
Drinking water dispenser	General Electric JSA3E	1
Fire extinguisher	Wickes 7700580	1
First aid kit	Wickes 7750584-501	1
Ladder, 12 ft aluminum	Miller 2949943	1
Ladder, personnel	Miller 2949945	3
Platform, passageway section	Miller 2948930	1
Platform, vestibule	Miller 2949980	1
Tarpaulin	Miller 2949943	1
Tarpaulin bow, curved	Miller 2949900	2
Tarpaulin bow, straight	Miller 2974932	13
Tool box, undervan	Miller 2949917	1
Wrench		4
Nut wrench		1
Hub wrench		1
Handle		1
Jack bar		2
Flashlight		1
Ground rods	Wickes 5701175-1	6
Ground rod clamp	Wickes 570122	1
Lantern, electric	Wickes 5750419-501	1
Pencil sharpener	Wickes 5701119	1
Pioneer kit	Miller 3164998	1
Pick, mattock		1
Shovel		1
Axe		1
Tool box, mechanics	Kennedy 1018 and 1022	2
Typewriter	Wickes 5701238	1
Utility cabinet	Wickes 8750581	1
Utility shelf	Wickes 7750524-1	1
Vise	Wickes 5701110	1
Waste basket	Wickes 5701111-2	1
Work table	Wickes 5750426-501	1
Transit case no. 4 containing:	Wickes 8750602-501	1
Coil, collector	Eimac MC230	1
Coil, body	Eimac MC228	3
Coil, body	Eimac MC229	3

Storage for klystron tube coils used
with power amplifiers in power am-
plifier van

Table 1-3. Equipment Supplied (cont.)
 TM 11-5820-763-15

Official Nomenclature	Common Name	Federal Stock No. or Mfr. Part No.	Qty	Description and Purpose
	Coil, body	Eimac Y234	3	
	Coil, prefocus	Eimac MC201	1	
	Transit case no. 5	Wickes 8750602-502	1	Same as transit case no. 4
	Transit case no. 6	Wickes 8750602-503	1	Same as transit case no. 4
	Transit case no. 7	Wickes 8750598-1	1	Storage for miscellaneous connectors, couplings, adapters, etc.
	Receiver SP600	5820-505-2241	1	Test receiver
	Chart recorder	Esterline Angus AWL602	1	Two channel recorder used for monitoring receiver performance
	Recorder control	Wickes 8750585-501	1	Panel with controls for selecting input to chart recorder
	Typewriter	Wickes 5701238	1	
	Vacuum cleaner	Wickes 5760039-501	1	
The following items may be shipped with the operations van or supplied separately.				
Generator, Signal, AN/USM-44A	Signal generator	6625-539-9685	1	
Detector, Standing Wave Type 219	Signal generator calibrator	Boonton No. 245D	1	
Oscillator, Model 650A	Standing wave detector	6625-812-4879	1	
	Standing wave indicator	Borg-Warner M41-001	1	
	Oscillator	6625-539-8584	1	
	Thermistor mount	HP478A	1	
	Transistor tester	SEC 219B	1	
Test Set, Electron Tube TV-2C/U or TV-7B/U	Tube tester	6625-772-6106	1	
Multimeter WV-98A	Multimeter	6625-589-0124	1	
Multimeter ME-30A/U	Multimeter	6625-643-1670	1	
	Vacuum tube voltmeter W/BNC probe	Boonton No. 91C	1	
Generator, Noise Model 70A	Noise generator w/power supply	6625-556-8146	1	
	Ammeter, clamp-on	Weston 300A	1	
	Amplifier w/frequency con- verters 7571/7572/7573	Berkely Model 7570	1	
	Frequency counter	Berkeley Model 7170	1	
	Frequency selective volt- meter	SEC No. 125	1	
	Microwave power meter	HP431A	1	

Table 1-3. Equipment Supplied (cont.)
 TM 11-5820-763-15

Multimeter AN/PSM-60	Multimeter	6625-724-8582	3	
	Generator, Sweep, Wide Band	6625-086-7165	1	
800B	Oscilloscope	Tektronix 503 or	1	
	Relay test adapter	HP130B	1	
	Waveguide assembly consisting of:	Radiation, Inc.	1	Waveguide run used between power amplifiers and antennas
	Support, upright, 83-3/4 in. long	Wickes 7700520-2	10	
	Support, upright, 72 in. long	Wickes 7700520-3	2	
	Support, upright, 62 in. long	Wickes 7700520-4	8	
	Cross rail, 10 in. long	Wickes 7700522-1	8	
	3-1/8 elbow assembly, sweep 90°, 50 ohm	Wickes 7700549-1	2	
	3-1/8 elbow assembly, sweep 90°, 50 ohm	Wickes 7700549-2	4	
	1-5/8 elbow assembly, mitre 90°, 50 ohm	Wickes 7700550-1	4	
	1-5/8 elbow assembly, mitre 90°, 50 ohm	Wickes 7700550-2	8	
	3-1/8 rf transmission line, 50 ohm, 70-13/16 in. long	Wickes 7750673-1	1	
	3-1/8 rf transmission line, 50 ohm, 30-1/2 in. long	Wickes 7750623-3	1	
	3-1/8 rf transmission line, 50 ohm, 17-5/8 in. long	Wickes 7750623-3	1	
	3-1/8 rf transmission line, 50 ohm, 14-9/16 in. long	Wickes 7750623-4	1	
	3-1/8 rf transmission line, 50 ohm, 6 in. long	Wickes 7750623-5	4	
	1-5/8 rf transmission line, 50 ohm, 105-3/4 in. long	Wickes 7750623-11	1	
	1-5/8 rf transmission line, 50 ohm, 101-1/32 in. long	Wickes 7750623-12	1	
	1-5/8 rf transmission line, 50 ohm, 85-5/8 in. long	Wickes 7750623-13	1	
	1-5/8 rf transmission line, 50 ohm, 80-5/8 in. long	Wickes 7750623-14	1	
	1-5/8 rf transmission line, 50 ohm, 20-13/16 in. long	Wickes 7750623-15	1	
	1-5/8 rf transmission line, 50 ohm, 4-7/8 in. long	Wickes 7750623-16	1	

Table 1-3. Equipment Supplied (cont) T M 11 - 5 8 2 0 - 7 6 3 - 1 5

Official Nomenclature	Common Name	Federal Stock No. or Mfr. Part No.	Qty	Description and Purpose
	Waveguide, WR975, sect., 11-5/8 in. long	I-T-E Circuit Breaker Co. 604500-901	6	
	Waveguide, WR975 str. sect. tuner, 11 ft 11-5/8 in. long	I-T-E Circuit Breaker Co. 604605	2	
	Waveguide, WR975 str. sect. 5 ft 0 in. long	I-T-E Circuit Breaker Co. 604500-917	2	
	Waveguide, WR975 str. sect. at 2 ft 0 in. long	I-T-E Circuit Breaker Co. 604500-909	4	
	Waveguide, WR975 str. sect. 1 ft 0 in. long	I-T-E Circuit Breaker Co. 604500-913	6	
	Waveguide, WR975 step twist, 5 ft 0 in. long	I-T-E Circuit Breaker Co. 604707-901	2	
	Waveguide, WR975 flex section, 8.84 in. long	I-T-E Circuit Breaker Co. 604505-901	8	
	Waveguide, WR975 E- plane bend 24 in. rad.	I-T-E Circuit Breaker Co. 604501-901	4	
	Waveguide, WR975 H- plane 24 in. rad.	I-T-E Circuit Breaker Co. 604502-901	6	
	Tuning stub assembly filter body	Antenna Systems, Inc. 42270	4	
	Tuning stub assembly diplexer body	Antenna Systems, Inc. 42496	8	

Table 1-4. Equipment Required but Not Supplied

Federal Stock No.	Description	Qty
	Prime mover for towing operations van. Any of the following types of prime mover may be used: M-48, M-52, M-221 truck-tractor; or XM198A1 dolly, trailer converter, 8 ton, 2 wheel	1
	Passage way platform section (Miller 2948930)	1
	Vestibule frame (Wickes 7700614)	1
	Vestible covering (Wickes 7760014)	1
	Passageway frames (Wickes 7700614)	1
	Passageway covering (Wickes 8750661)	1
	Air duct hose (Wickes 8750626)	2
	Air conditioning transition frame (Wickes 7750546)	4
	Sandpaper, No. 0000	As required
	Brush, soft-bristled	1
	Brush, paint, Federal Specification TT-C-598	1
	Caulking compound, MIL-F-3268B	As required
	Cloth, lint-free	As required
	Cleaning solvent, Federal Specification P-S-661	As required
	Tape, pressure sensitive, Type III, Class I, Federal Specification PPP-T-60	As required
	Grease, automotive and artillery, MIL-G-10924B	As required
	Lubricating oil, general purpose, Federal Specification VV-L-820B	As required
	Fluid, hydraulic brake, Federal Specification VV-F-451A	As required
	Paint, semi-gloss, strata blue color no. 15045 per Federal Standard 595	As required
	Paint, semi-gloss, red, color no. 21105 per Federal Standard 595	As required
	Paint, semi-gloss, light green, color no. 24533 per Federal Standard 595	As required
	Paint, semi-gloss, light gray, color no. 26293 per Federal Standard 595	As required
	Paint, lusterless, yellow, color no. 13085 per Federal Standard 595	As required
5110-288-6520-CX	Cutter, tube, 1/8 to 1 in.	1
5120-696-8750	Gage, thickness, 0.004 to 0.053 in.	1
5110-223-4971-CX	Frame, hand, hacksaw	1
5110-277-4588	Blade, hand, hacksaw	As required
	Calipers, inside, 0 to 18 in.	1
	Hammer, sledge	1

CHAPTER 2

INSTALLATION

2-1. Introduction

This chapter furnishes the information needed to install the operations van. Section I discusses installation planning data; Section II covers lo-

gistics such as receiving data, material handling equipment, and cable requirements. Installation procedures are given in section III. section IV provides information needed in preparing the operations van for reshipment.

Section I. INSTALLATION PLANNING

2-2. Siting

2-3.

The problem of siting, as it will affect the operations van, must be considered in relation to associated equipment. The consideration cannot be generalized to the operations van alone as it is only one part of the communications facility. The following paragraphs provide general information on the selection of a suitable location for the operations van within a typical site layout. For more detailed information, refer to the applicable detailed site plan.

2-4. Location

2-5.

Figure 2-1 provides dimensions of a typical Radio Set AN/MRC-85 installation. This figure may be used in locating the van hardstand (para 2-36) with respect to other vans in the facility, in preparing the cable trenches, and in providing a suitable area of compacted gravel in the site area.

2-6.

If the location of the operations van within the site is not dictated by site planning, i.e., previously prepared hardstands, cable trenches, etc., determine the best location for the fulfillment of the operations van requirements as to reliability, and then determine what is required to extend services to the subscriber.

2-7. Limitations With Respect to Logistics and Operation

2-8.

In selecting a location for the operations van it is important to consider the following logistic and operational factors:

- a. Type and location of roads.
- b. Earth moving and clearing requirements.
- c. Weather data.
- d. Corrosion conditions.
- e. Material handling facilities at the site.
- f. Potable water availability.
- g. Distance between the operations van and power amplifier van (limit by duct lengths). (See fig. 2-1.)

2-9. Equipment Considerations

2-10. Sheltering

2-11.

The semitrailer van provides a weatherproof shelter for the equipments comprising the operations van. When it is desirable to further protect the operations van from the elements, the following means are provided:

- a. Installation of a covered passageway between the operations and power amplifier vans (para 2-66).

b. Installation of a covered vestibule (para 2-60).

c. Installation of a tarpaulin sunroof (para 2-72).

2-12. Primary AC Power

2-13.

Primary ac power requirements for the operations van are listed in table 1-1.

2-14. Cabling

2-15.

Signal and power cabling for the operations van, except subscriber cabling, is shipped with the operations, power amplifier, or diesel generator vans. Cables shipped with the operations van are listed in table 1-3. Refer to the applicable technical manual for a list of cables required for operation but shipped in another van. Subscriber cabling will be determined by site location and requirements.

2-16. Grounding

2-17. Neutral Power Line and Ground Strip

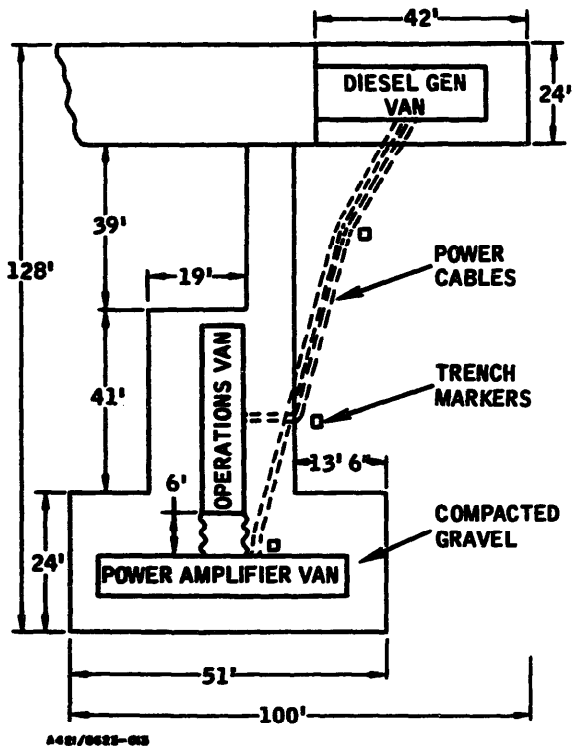


Figure 2-1. Typical Site Layout.

2-18

The neutral wire of the primary ac input power is physically connected to the operations van ground strip at the power entrance box.

2-19

The ground strip runs from the power entrance box around the operations van interior near the floor level. For grounding of equipments within the operations van connect the ground lead of the specific equipment to the grounding strip.

2-20. Ground Rods

2-21

Six 5-foot ground rods with couplings and a driving stud are supplied with the operations van to provide an external ground. The ground rods must be coupled together and driven their full length into the ground where possible but in no case less than 10 feet. Where it is not possible to drive the ground rods to a depth of at least 10 feet an alternate method using a ground plate may be used. Refer to paragraph 2-68 or 2-70 for grounding instructions.

2-22. Local or Remote Control Requirements

2-23. Local Control Requirements

2-24

All equipment comprising the operations van covered in this technical manual is locally controlled by panel mounted controls except for van brake systems and 24-volt dc lights. Refer to chapter 3 for location and function of controls.

2-25. Remote Control Requirements

2-26

The stop, running, clearance, and emergency lights on the operations van require 24 volts dc for operation. The brake system requires approximately 70 psi of air pressure for operation. An M-48, M-52, or M-221 truck tractor will supply the necessary voltage and air pressure needed for operation. They also contain the necessary controls for operating the van lights and brake systems.

2-27. Special Installation Requirements

2-28. Equipment Transported in Power Amplifier Van

2-29

The following equipment, transported in the

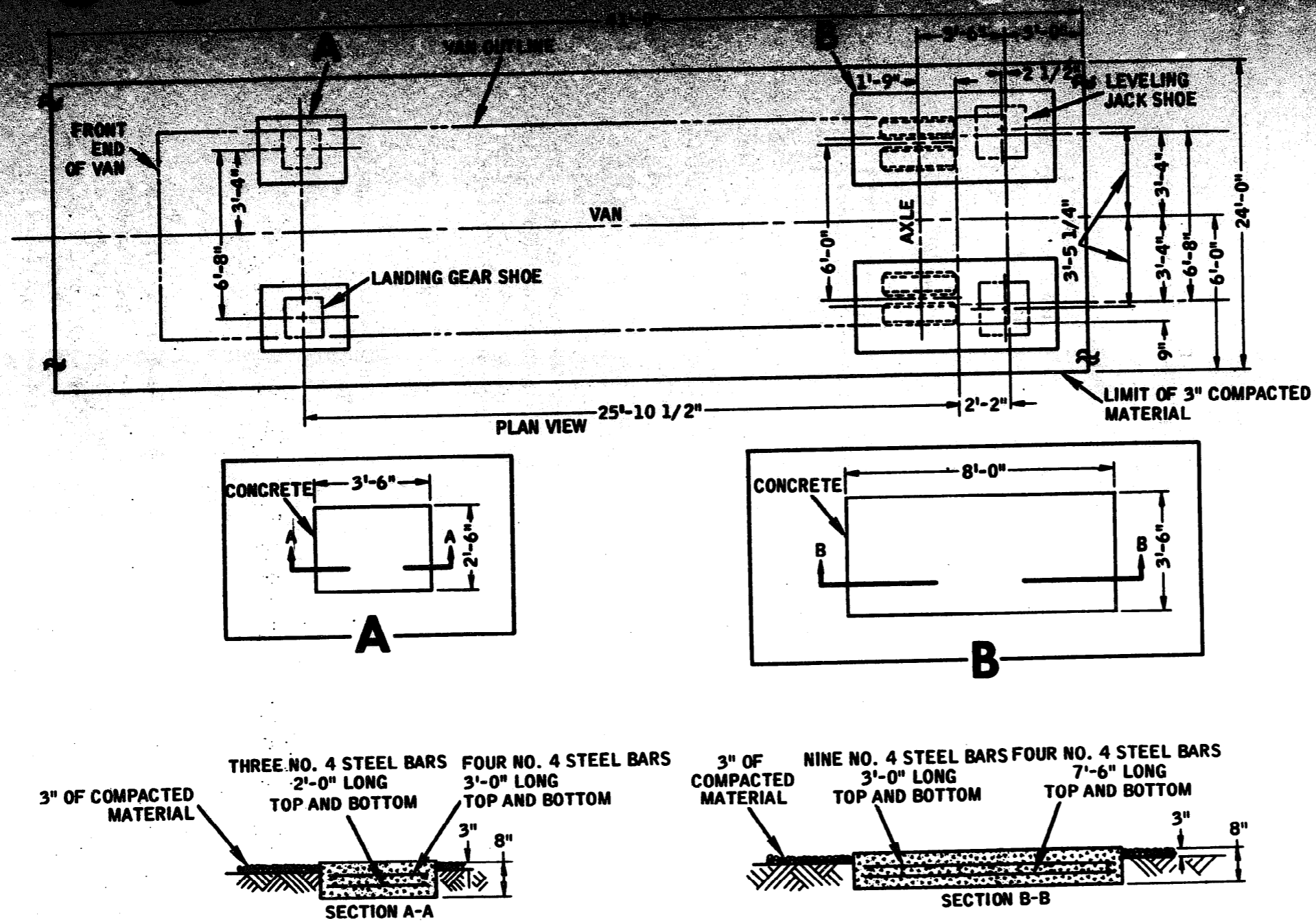


Figure 2-2. Typical Hardstand Layout.

power amplifier van, is required for installation of the operations van:

- a. Two air duct hoses.
- b. A passageway weatherhood.
- c. Two transition duct frames.
- d. A vestibule covering.
- e. A passageway platform.

2-30. Equipment Transported in Diesel Generator Van

2-31.

The following equipment, transported in the diesel generator van, is required for installation of the operations van:

- a. A passageway frame.
- b. A passageway platform.
- c. A vestibule frame.
- d. A 100-foot power cable.
- e. A 100-foot signal cable.

2-32. Allied Construction Requirements

2-33. Trenches and Ground Cover

2-34. Trenches

A trench, 2-feet deep and 1 1/2-feet wide, should

be provided for the power and signal cable. Refer to the applicable detailed site plan for trench construction details.

2-35. Ground Cover

At least three inches of crushed gravel or other suitable compactable material should be spread around the operations van.

2-36. Typical Hardstand Layout

2-37.

After the position has been selected, the operations van should be installed on steel reinforced, concrete hardstands. The hardstands (fig. 2-2) must be constructed with the following characteristics :

a. All concrete used must have a minimum compressive strength of 2500 psi, 28 days after pouring.

b. The reinforcing steel used must be of structural grade, new billet, plain bar type (fs + 18,000 psi). All bars should be tack welded together.

c. A minimum of 3 inches of concrete must cover all steel bars.

d. Compacted material around the hardstands may be coral, gravel, or other suitable material found locally.

Section II. LOGISTICS

2-38. Receiving Data

2-39.

The operations van is shipped as a complete operational unit except for those items listed in table 1-4. In addition, waveguide components and transit cases used with other components of Radio Set AN/MRC-85 are stored in the operations van for shipment and are listed in table 1-3.

2-40.

Floor plan arrangement of the operations van is shown in figure 2-3, with waveguide and transit cases removed.

2-41. Transportation and Material Handling Equipment

2-42.

Overall dimensions of the operations van permit transportation by rail, water, or by C-124, C-130, or C-133 aircraft. A prime mover is required to

move the operations van overland. Other material handling equipment used depends upon what is available at a particular site and must be determined by the installer.

2-43. Cable Requirements

2-44.

Table 2-1 lists all power and signal cables interconnecting the operations van with the power amplifier van, diesel generator van, and subscribers.

2-45. Unpacking and Unit Identification

2-46.

Components comprising the operations van are shipped operationally installed and need not be unpacked. However, transit cases and waveguide components used with other components of Radio Set AN/MRC-85 and shipped in the operations van must be removed. Refer to figures 6-10 and 6-25 for identification and location of components.

2-47. Removal of Transit Cases, Waveguide Components, and Sunroof Tarpaulin

2-48.

Remove transit cases, waveguide components, and sunroof tarpaulin from the operations van as follows :

CAUTION

A minimum of four men is required to unpack this equipment.

a. Remove the two screws at the top and the screws at the bottom of the curbside door center post. Remove the post from the operations van.

b. Remove the retaining straps and hardware securing transit case number 7, stowed near the curbside doors, and remove the transit case from the operations van.

c. Remove the retaining straps and hardware

securing the sunroof tarpaulin in the stowage position between the air conditioners, and remove the tarpaulin through the rear door.

d. Remove the retaining straps and hardware from transit case number 4, strapped to the roadside air conditioning unit, and remove the case through the rear door.

e. Remove the retaining straps and hardware from transit cases number 5 and number 6, strapped to the curbside air conditioning unit, and remove the cases through the rear door.

f. Remove waveguide components as follows (see fig. 2-4) :

CAUTION

Exercise care when handling the waveguide components to prevent denting them.

Figure 2-3. Operations Van Floor Plan.
(Located in back of manual.)

Table 2-1. Cable Requirements

Cable Assembly	Function	From-	To-	Length (ft)	Termination
		Power amplifier van signal line extension box, terminal:	Operations van signal line extension box, terminal:		
W301 (RG-9B/U)	Exciter no. 2 output	J421	J521	6.5	Connector, Andrew Corp Type 44W
W302 (RG-9B/U)	Exciter no. 1 output	J420	J520	6.5	Connector, Andrew Corp Type 44W
W303 (RG-9B/U)	Receiver no. 1 input	J401	J501	20	Connector, UG21E/U
W304 (RG-9B/U)	Receiver no. 2 input	J402	J502	20	Connector, UG21E/U
W305 (RG-9B/U)	Receiver no. 3 input	J403	J503	20	Connector, UG21E/U
W306 (RG-9B/U)	Receiver no. 4 input	J404	J504	20	Connector, UG21E/U
W307 (RG-9B/U)	Test cable	J417	J517	20	Connector, UG21E/U
W308 (25 pairs, no. 19AWG)	Fault indicator no. 1 alarm signals	J406	J506	20	Connector, MS3106E-36-10PW
W309 (25 pairs, no. 19AWG)	Fault indicator no. 2 alarm signals	J407	J507	20	Connector, MS3106E-36-10PW
W310 (10 conductors, no. 12AWG)	Regulated ac power input	J405	J505	20	Connector, MS3106E-28-20S
		Diesel generator power output panel, terminal:	Operations van audio and alarm box, terminal:		
W311 (14 conductors, no. 18AWG)	Alarms	J604	J10	100	Connector, MS3106E-22-195
		Diesel generator power output panel, terminal:	Operations van power entrance box, terminal:		
W314 (350 MCM, type G, 3 conductors)	Primary ac power input	J603	J513	100	Female insert, 6 contact, Pyle National part no. 22M-CB-1028-18S
W310 (10 conductors, no. 12AWG)	Regulated ac power input	J405	J505	20	Connector, MS3106E-28-20S
		Diesel generator power output panel, terminal:	Operations van audio and alarm box, terminal:		
W311 (14 conductors, no. 18AWG)	Alarms	J604	J10	100	Connector, MS3106E-22-195

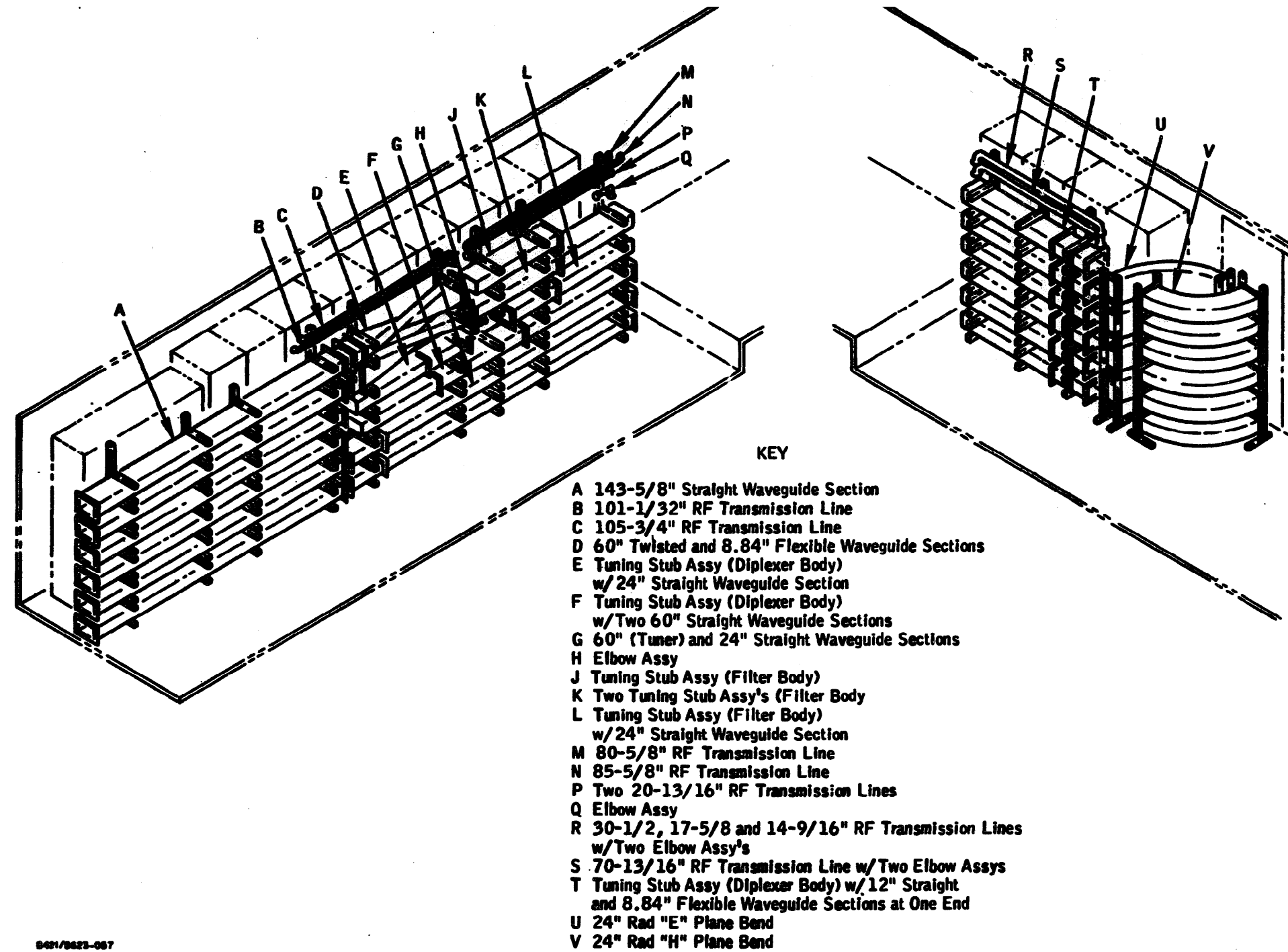
Table 2-1. Cable Requirements (cont)

Cable Assembly	Function	From-	To-	Length (ft)	Termination
w314 (350 MCM, typeG, 3 conductors)	Primary ac power input	Diesel generator power output panel, terminal: J603	Operations van power entrance box, terminal: J513	100	Female insert, 6 contact, Pyle National part no. 22M-CB-1028-18S

NOTE

Carefully examine each waveguide section as it is removed and report any damage, including small dents, to the proper authority.

- (1) Unscrew the rack fasteners at each end of the topmost waveguide section WR-975 H-plane bend 24-inch radius (V).
- (2) Disengage the waveguide section from the upright support and remove the waveguide section from the operations van.
- (3) Repeat steps 1 and 2 for the other five sections of WR-975 H-plane bend 24-inch radius waveguide.
- (4) Unscrew the rack fastener at each end of the topmost waveguide section WR-975 E-plane bend 24-inch radius (U).
- (5) Disengage the waveguide section from the upright support and remove the waveguide section from the operations van.
- (6) Repeat steps 4 and 5 for the other three sections of WR-975 E-plane bend 24-inch radius waveguide.
- (7) Unscrew the 16 rack fasteners which hold the eight 62-inch upright supports to the floor and remove the upright supports from the operations van.
- (8) Disengage the clamps on the two end upright supports of the uppermost rf transmission line (R).
- (9) Remove the rf transmission line from the operations van.
- (10) Disengage the clamps on the two end upright supports of the next lower section of the rf transmission line (S) and remove the rf transmission line from the operations van.
- (11) Loosen the rack fasteners on the three upright supports of the waveguide section located immediately below the rf transmission line removed in step 10 (T).
- (12) Remove the waveguide section from the operations van.
- (13) Repeat steps 11 and 12 for the remaining 5 sections of waveguide on the upright supports.
- (14) Unscrew the floor and ceiling rack fasteners which hold the three upright supports in place and remove the three upright supports from the operations van.
- (15) On the roadside of the operations van, disengage the topmost clamps from the three foremost upright supports.
- (16) Remove the top rf transmission line (M) from the operations van.
- (17) Disengage the clamps on the next lower section (N) of rf transmission line and remove the section of rf transmission line from the operations van.
- (18) Disengage the two clamps holding the next lower section of rf transmission line (P) onto the two foremost upright supports and remove the section of rf transmission line from the operations van.



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Figure 2-4. Operations Van Waveguide Storage.

(19) Disengage the clamp holding the elbow assembly (Q) on to the foremost upright support and remove the elbow assembly from the operations van.

(20) Loosen the rack fasteners holding the next section of waveguide (J) onto the second and third upright supports and remove the waveguide section from the operations van.

(21) Loosen the rack fastener holding the next section of WR-975 waveguide (K) onto the first, second, and third upright supports and remove the waveguide section from the operations van.

(22) Loosen the rack fasteners holding the next section of WR-975 waveguide (L) onto the first and second upright supports and remove the waveguide section from the operations van.

(23) Disengage the clamp holding the elbow assembly (H) onto the third upright support and remove the elbow assembly from the operations van.

(24) Disengage the topmost clamp holding the rf transmission line section (C) onto the fourth, fifth, and sixth upright supports and remove the rf transmission line section from the operations van.

(26) Disengage the next lower clamp holding the rf transmission line section (B) onto the fourth, fifth, and sixth upright supports and remove the rf transmission line section from the operations van.

(26) Loosen the rack fasteners holding the WR-975 step twist waveguide section (D) onto the fourth and fifth upright supports and remove the waveguide section from the operations van.

(27) Loosen the rack fasteners holding the next lower section of WR-975 step twist waveguide (D) onto the fourth and fifth upright supports and remove the section of waveguide from the operations van.

(23) Loosen the rack fasteners holding the next lower waveguide section tuning stub assembly (E) onto the fourth and fifth upright supports and remove the tuning stub assembly from the operations van.

(29) Loosen the rack fasteners on the first five upright supports of the next section of WR 975 waveguide, (F) and remove the waveguide section from the operations van.

(30) Repeat step 29 for the next two lower sections of waveguide.

(31) Loosen the ceiling and floor rack fasteners securing the 'first five upright supports from the operations van.

(32) Loosen the rack fasteners holding the topmost section of WR-975 straight waveguide section (A) onto the rear four upright supports, and remove the waveguide section from the operations van.

(33) Repeat step 32 for the next five lower waveguide sections.

(34) Loosen the rack fasteners securing the rear four upright supports to the floor.

(36) Loosen the rack fasteners securing the rear and fourth-from-rear upright supports to the ceiling, and remove the supports from the operations van.

(36) Loosen the rack fasteners securing the second and third-from-rear upright supports to the roadside air conditioning unit and remove the supports from the operations van.

(37) Using a screwdriver, close the protective plate covers of each of the floor cargo tie-downs.

g. Install the curbside door center post by performing the reverse of step a.

2-49. Removal of Sealing Tape and Preservative

2-50

Remove all sealing tape which has been placed over openings of the operations van. Using cleaning solvent (Federal Specification P-S-661) clean adhesive from all parts from which tape is removed. Remove preservative lubricating oil from steps of ladders and walking surfaces of platforms with cleaning solvent.

Section III. INSTALLATION PROCEDURES

2-51

A minimum of four men is required to install the operations van. Refer to TM 11-5820-763-25P

for description and location of components stored in and on the operations van.

2-52. Emplacement

2-53. Positioning

2-54.

To position the operations van, proceed as follows :

a. Tow the operations van onto its previously prepared concrete hardstand (fig. 2-2).

b. Carefully position the van so that the landing gear and leveling jack assemblies are centered over their respective hardstand pads.

c. Set the hand air-brake controls in the prime mover.

d. Remove the chock blocks from their carriers and place one block under each set of the operations van's dual wheels.

e. Remove the crank handle from its support. (See fig. 2-5.)

NOTE

Before operating the crank handle carefully read the landing gear instruction plates attached to either side of the van near the landing gear control crankshafts.

f. Push the crank handle onto the landing gear control crankshaft until the crank handle engages the pin.

NOTE

When the landing gear assembly crank handle is inserted in the *gear box* the full limit, the gear box will operate the landing gear through low-speed travel. High-speed travel adjustments to the landing gear are made by removing the landing gear crank handle to the "out position."

g. Set the ratchet on the crank handle shaft to the right and rotate the crank handle counterclockwise until the landing gear shoe is firmly seated on the ground.

h. Repeat steps e through g for the other landing gear assembly.

i. Close the shut-off cocks on the service and emergency air lines at the rear of the prime mover.

NOTE

Air pressure in the air reservoir automatically applies brakes to the operations van when air hose connections be-

tween the prime mover and operations van are broken.

j. Uncouple the two air-brake hoses from the SERVICE and EMERGENCY air hose couplings at the front of the operations van.

k. Fit the dummy couplings onto the operations van air hose couplings to prevent dust and dirt from entering the air line system.

l. Disconnect the 24-volt dc intervehicular cable from the electrical connector at the front of the operations van.

m. Release the operations van king pin from the prime mover fifth wheel by pulling out the jaw lock handle on the prime mover.

n. Drive the prime mover forward until the operations van becomes disengaged from the prime mover.

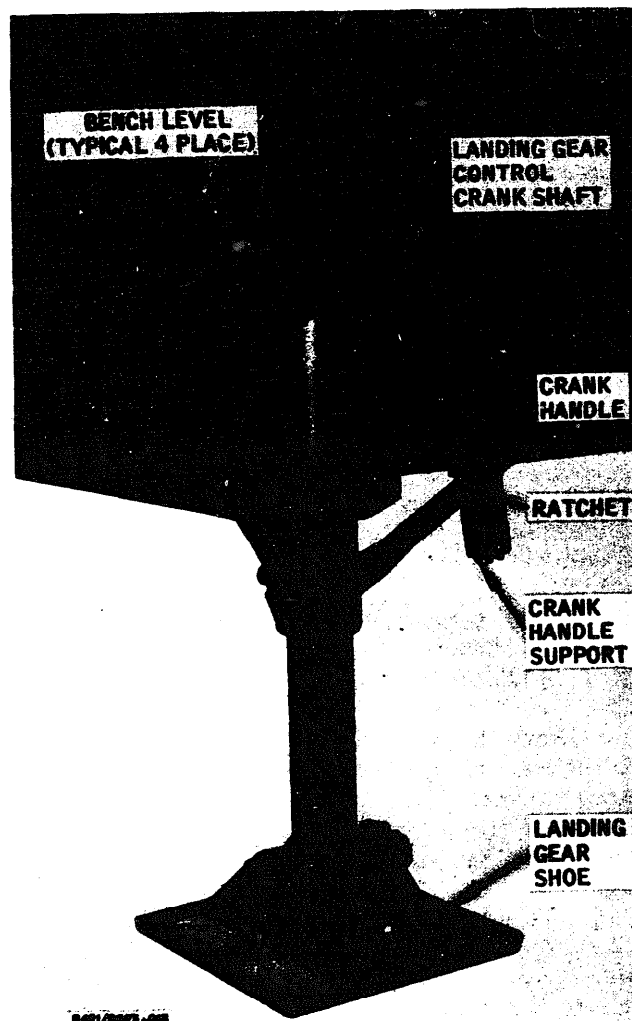


Figure 2-5. Landing Gear Assembly Adjustment.

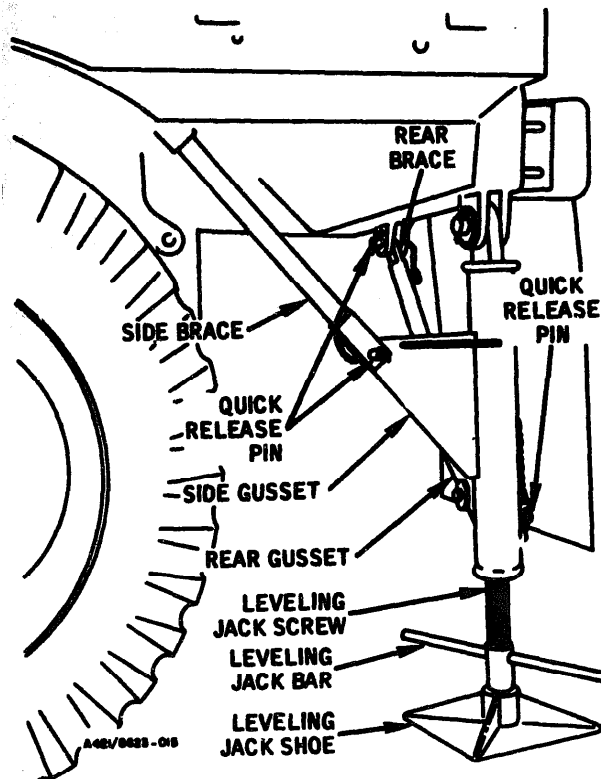


Figure 2-6. Leveling Jack Assembly Adjustment.

2-55. Leveling

2 - 5 6 .

To level the operations van, perform the following procedures :

- a. Remove the quick-release pins holding the rear brace in towards the rear center of the operations van. (See fig. 2-6.)
- b. Slowly lower the leveling jack assembly.
- c. Remove the quick-release pin holding the side brace and allow the side brace to swing down from its storage position. With the quick-release pin, attach the side brace to the side gusset of the leveling jack assembly.
- d. Swing the rear brace up and secure it with the quick-release pin.
- e. Remove a leveling jack bar from the tool box located on the curbside of the skid base.
- f. Remove a leveling jack shoe from its storage position on top of the skid base towards the rear roadside of the operations van.
- g. Center the leveling jack shoe directly under the leveling jack screw.
- h. Insert the leveling jack bar through the slot

in the leveling jack screw and turn until the screw is firmly seated in the shoe.

- i. Repeat steps a through h for the other leveling jack assembly.

NOTE

A bench level is located near each of the landing gear control crankshafts and on the front and rear center exterior of the operations van.

- j. While observing the bench levels, alternately adjust the two leveling jack assemblies and the two landing gear assemblies until the operations van is level.

- k. Return the crank handles and leveling jack bars to their stowage positions.

2-57. Installation

2-58. Personnel Ladder Installation

NOTE

Personnel ladders are utilized when the passageway platform or vestibule are not installed.

2-59.

To install the personnel ladders, refer to figure 2-7 and proceed as follows:

- a. Remove a personnel ladder from its under-van stowage position and place it at the curbside door.
- b. Turn both lock handles on the personnel ladder inward towards the steps.
- c. Insert the two lock assemblies on the personnel ladder into the lock assembly holes on the operations van.
- d. Turn both lock handles outward to lock the personnel ladder in place.
- e. To install a personnel ladder at the rear door, repeat steps a through d.

2-60. Vestibule Installation

2-61

To install the vestibule, refer to figure 2-8 and perform the following procedural steps:

NOTE

A minimum of two men is required to install the vestibule.

- a. Remove the vestibule platform from its under-van stowage position.

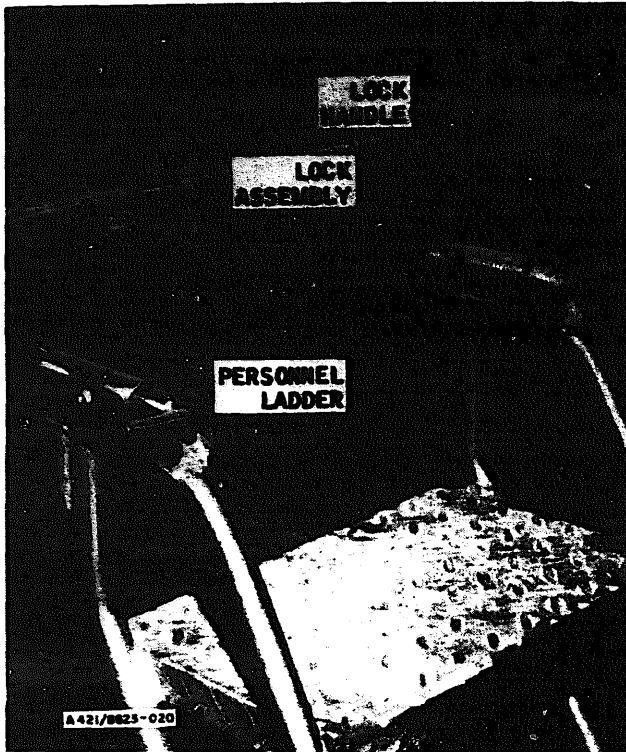


Figure 2-7. Personnel Ladder Installation.

- b. If a personnel ladder is installed below curbside doors of the operations van, remove it by performing the reverse of paragraph 2-59.
- c. Position the vestibule platform so that its lock pins are in line with the slotted holes below the curbside door of the operations van.
- d. Raise the vestibule platform and insert the lock pins into the slotted holes.
- e. Slide the vestibule platform down so that the lock pins lock into the slots. Insure that the vestibule platform is held securely in place.
- f. Install a personnel ladder on the rear of the vestibule platform as described in paragraph 2-59.

NOTE

The vestibule framing and fittings and vestibule framed roof are stored in the diesel generator van. The vestibule covering is stored in the power amplifier van.

- g. Insert the three support poles into the three base flanges on the vestibule platform and tighten the set screws.

- h. Place the vestibule framed roof on the three support poles and tighten the set screws.
- i. Insert five pivot pins into the five hinged flanges where they mate with the single mounting assemblies.
- j. Place the vestibule covering over the vestibule framed roof and around the support poles. Fasten it at the top and side of the vestibule mounting frame by snapping the cover grommets over the studs.
- k. Fasten the vestibule covering along the front and side of the vestibule platform.

2-62. Passageway Platform Installation

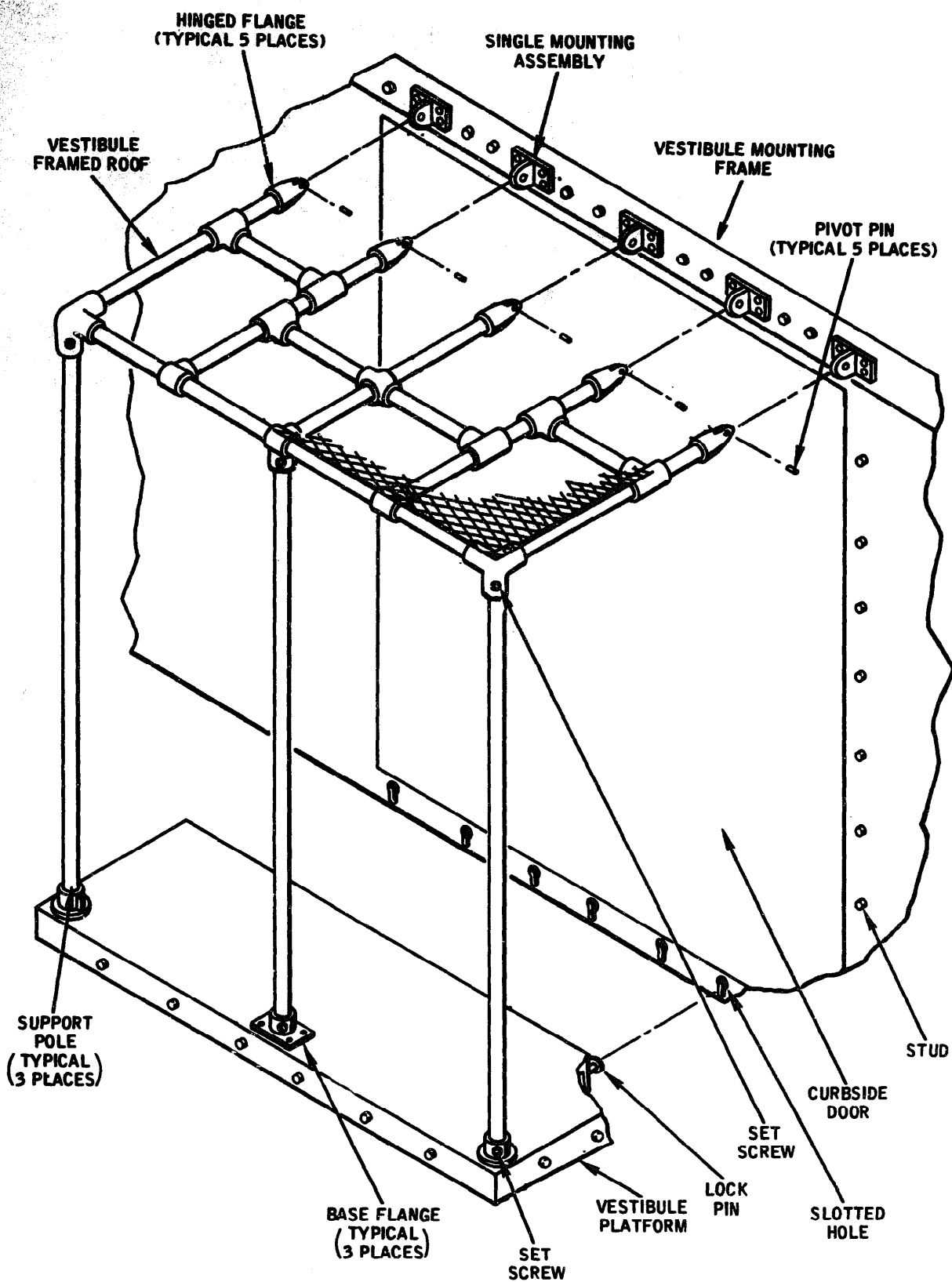
2-63.

For installation of the passageway platform the operations van and power amplifier van must be in the positions shown in figure 2-1 with the rear door of the operations van aligned with the road side door of the power amplifier van. To install the passageway platform, refer to figure 2-9 and Perform the following procedures :

- a. Remove the passageway platform from the diesel generator van.
- b. Place the passageway platform at the operations van rear door so that its locking pins are in line with the slotted holes below the door.
- c. Raise the passageway platform and insert the locking pins into the slotted holes.
- d. Slide passageway platform down so that the locking pins lock into the slotted holes.
- e. Obtain the passageway platform from the power amplifier van.
- f. Place the passageway platform at the power amplifier van roadside door so that its locking pins are in line with the slotted holes below the door.
- g. Repeat steps c and d.
- h. Install the hinged portion of the spread-plate on one of the platforms and swing the plate onto the other platform.

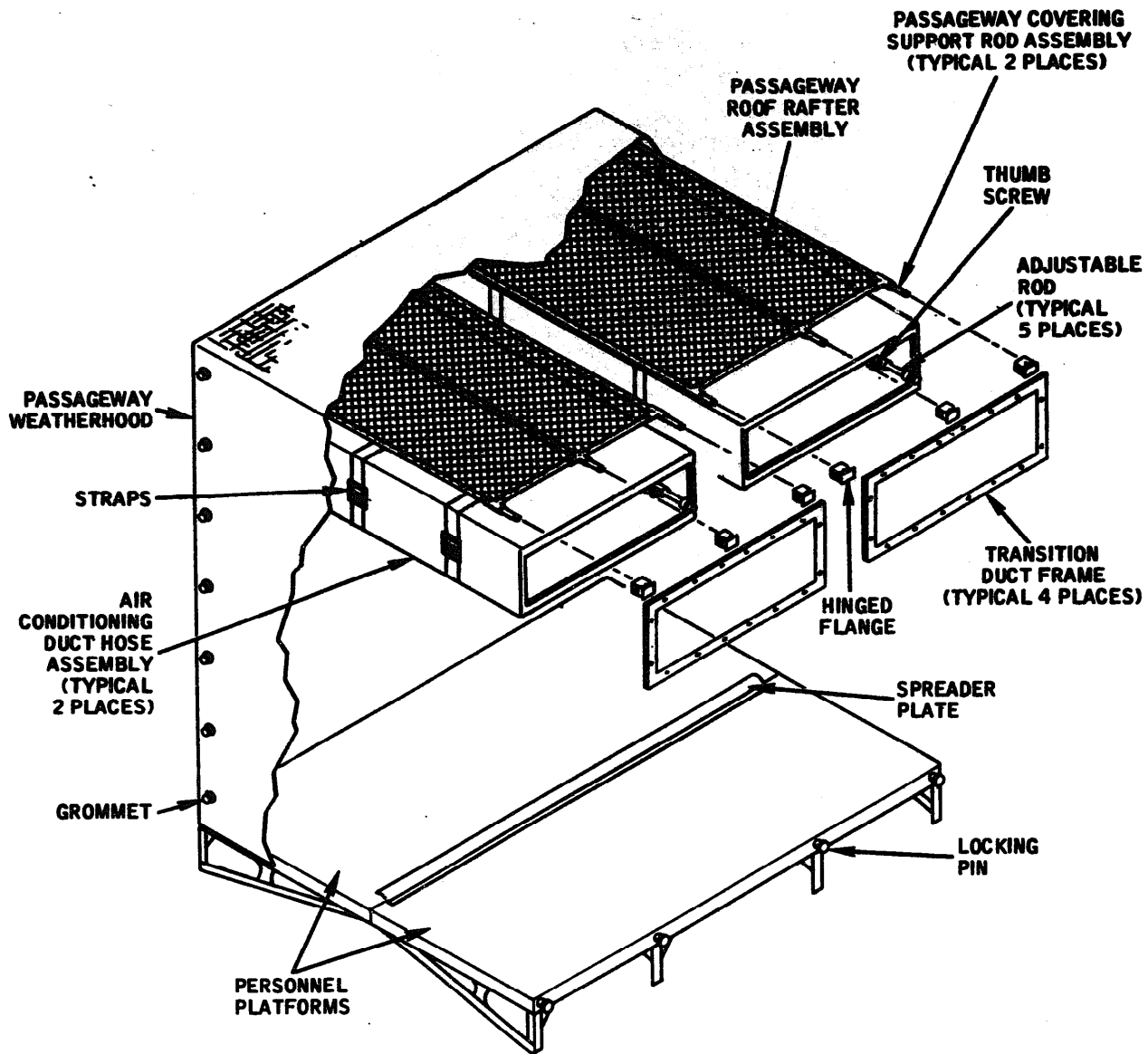
NOTE

The spreader plate provides continuity between platforms for movement of personnel and equipment.



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Figure 2-8. Vestibule Installation.



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Figure 2-9. Passageway and Air Conditioner Ducts Installation.

2-64 Air Conditioner Ducts Installation
2-65.

Both the operations and the power amplifier vans are equipped with air conditioner return and supply ports. The air conditioners are located in the operations van and, in order to extend air conditioning to the power amplifier van, ducts must be installed between the two vans. The interconnecting air conditioner ducts are installed after the

vans have been positioned at a terminal site, an the interconnecting passageway platform is in place. To install the interconnecting air conditioner ducts, refer to figure 2-9 and perform the following procedures :

- a. Loosen the camloc fasteners on the covers of the air conditioner air return and supply ports located on the rear of the operations van (fig. 1-4) and on the roadside of the power amplifier van above the doors. Remove the covers.

b. Remove the four transition duct frames from the inside of the front doors of the power amplifier van. (Store the covers removed in step a in the positions from which the transition duct frames are removed.)

c. Install the transition duct frames on the ports from which the covers were removed.

d. Remove the ten adjustable rods from the canvas bag stored on top of the operations van roadside air conditioner unit.

e. Loosen the thumbscrew on one of the adjustable rods.

f. Insert one end of the adjustable rod into a socket on one of the transition duct frames on the operations van.

g. Insert the other end of the adjustable rod to the corresponding socket of the transition duct frame directly opposite on the power amplifier van and tighten the thumbscrew.

h. Repeat steps e through g for the other nine adjustable rods.

i. Remove the two air conditioner duct hose assemblies from the power amplifier van.

j. Wrap one of the air conditioner duct hose assemblies around one set of five adjustable rods.

k. Fasten the strap at each end of the air conditioner duct hose assembly.

l. Snap the grommet fasteners over the studs mounted along the length of the air conditioner duct hose assembly.

m. Repeat steps j through l for the other air conditioner duct hose assembly.

2-66. Passageway Weatherhood Installation

2-67

To install the passageway weatherhood, remove it from storage in the power amplifier van, refer to figure 2-9, and perform the following procedures :

a. Obtain the two passageway covering support rod assemblies from the diesel generator van.

b. Place the three rod ends of one of the passageway covering support rod assemblies into the hinged flanges, above the operations van air conditioner air return and supply ports (fig. 1-4) and secure with pins provided with the assemblies.

c. Mount the other end of the passageway covering support rod assembly into the hinged flanges directly opposite above the power amplifier van air conditioner duct port.

d. Repeat steps a through c for the other passageway covering support rod assembly.

e. Spread the passageway weatherhood, over the passageway covering support rod assemblies so that the grommets are aligned with the studs on the operations and power amplifier vans. Snap the grommets over the studs.

2-68. Ground Rod Assembly Installation

2-69

To establish an electrical ground for the operations van, screw the driving stud to a ground rod and proceed as follows:

NOTE

The ground rod assembly must be driven to a minimum depth of 10 feet.

a. Using a sledge hammer, drive the entire length of ground rod assembly into the ground.

b. Remove the driving stud from the ground rod.

c. Screw the driving stud to another ground rod section and attach this ground rod section to the one driven into the ground in step a. Repeat step a.

d. Repeat steps b and c until all the ground rods are driven into the ground. Remove the driving stud.

e. Connect one end of the grounding cable to one of the GND terminals on the power entrance box. (See fig. 2-10).

f. Extend the grounding cable from the operations van to the ground rod assembly allowing enough slack for the cable to hang straight down from the power entrance box.

g. Bury the grounding cable approximately 12 inches below the surface, leaving enough cable exposed at its end to make a connection to the ground rod assembly.

h. Attach the grounding cable to the ground rod assembly with the ground rod clamp.

2-70. Alternate Grounding Installation

2-71

Where it is not possible to drive the grounding

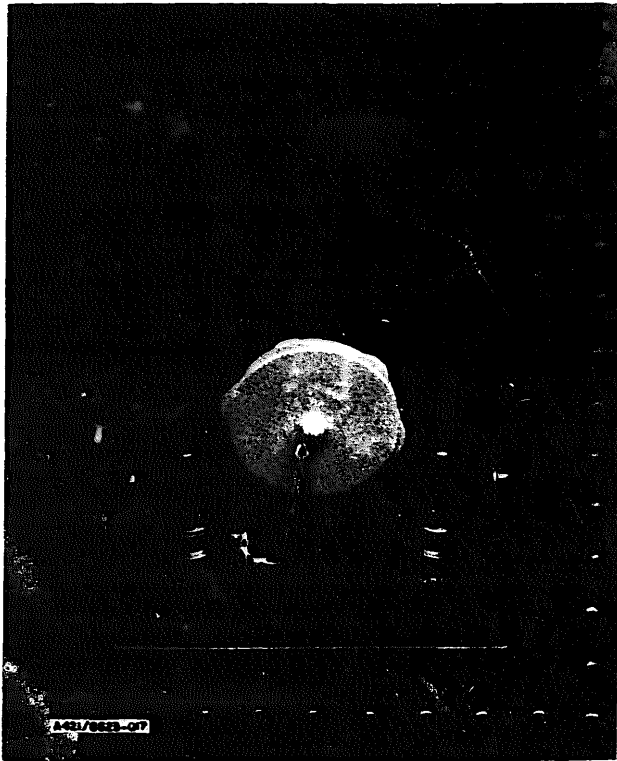
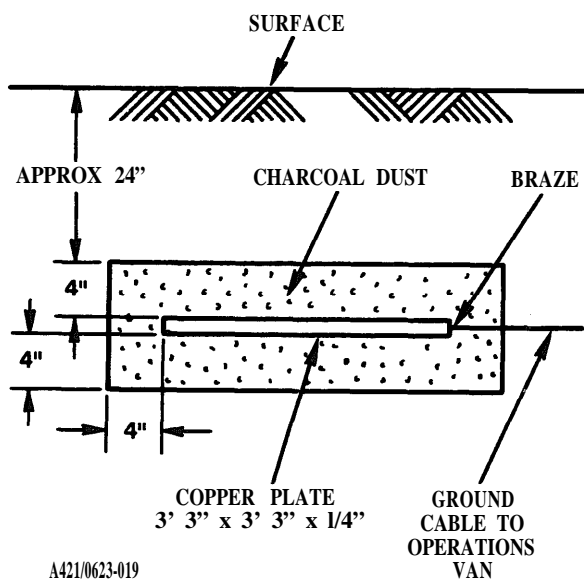


Figure 2-10. Power Entrance Box.

rod to a minimum depth of 10 feet because of soil conditions, install a copper plate as shown in figure 2-11 to provide a sufficient ground for the operations van.



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Figure 2-11. Alternate Grounding Installation.

NOTE

The installation of a copper plate may be modified as deemed necessary, based upon the conditions at a particular site.

2-72. Tarpaulin Sunroof Installation

2-73

To install the tarpaulin sunroof on the operations van, refer to figure 2-12 and proceed as follows:

NOTE

Four men are required to install the tarpaulin sunroof.

a. Using the 12-foot ladder to gain access, position two men on the roof of the operations van.

b. Remove the tarpaulin bow assemblies from under the operations van and install one of the offset tarpaulin bow assemblies over the bow blocks at the front of the van. Tighten the fastener.

c. Similarly, install the other offset tarpaulin bow assembly at the rear of the operations van.

d. Install the thirteen straight tarpaulin bow assemblies over the remaining bow blocks as described in step b.

e. Place the sunroof tarpaulin, removed from operations van in paragraph 2-48, on the operations van roof.

f. Unfold the sunroof tarpaulin and place it over the tarpaulin bow assemblies so that the center lashing ropes at the front and rear are directly opposite the hooks.

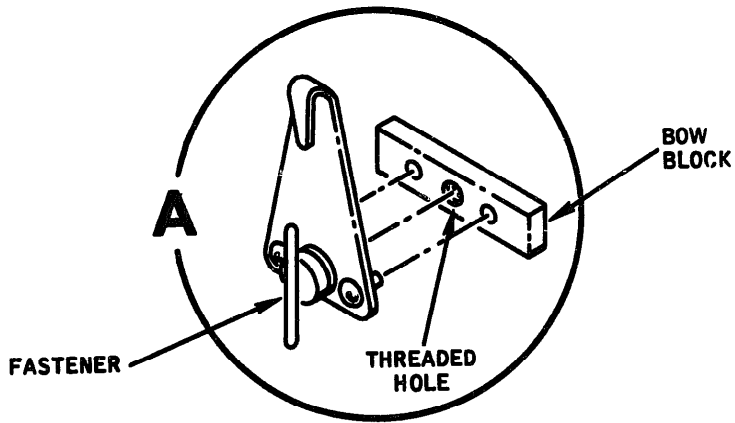
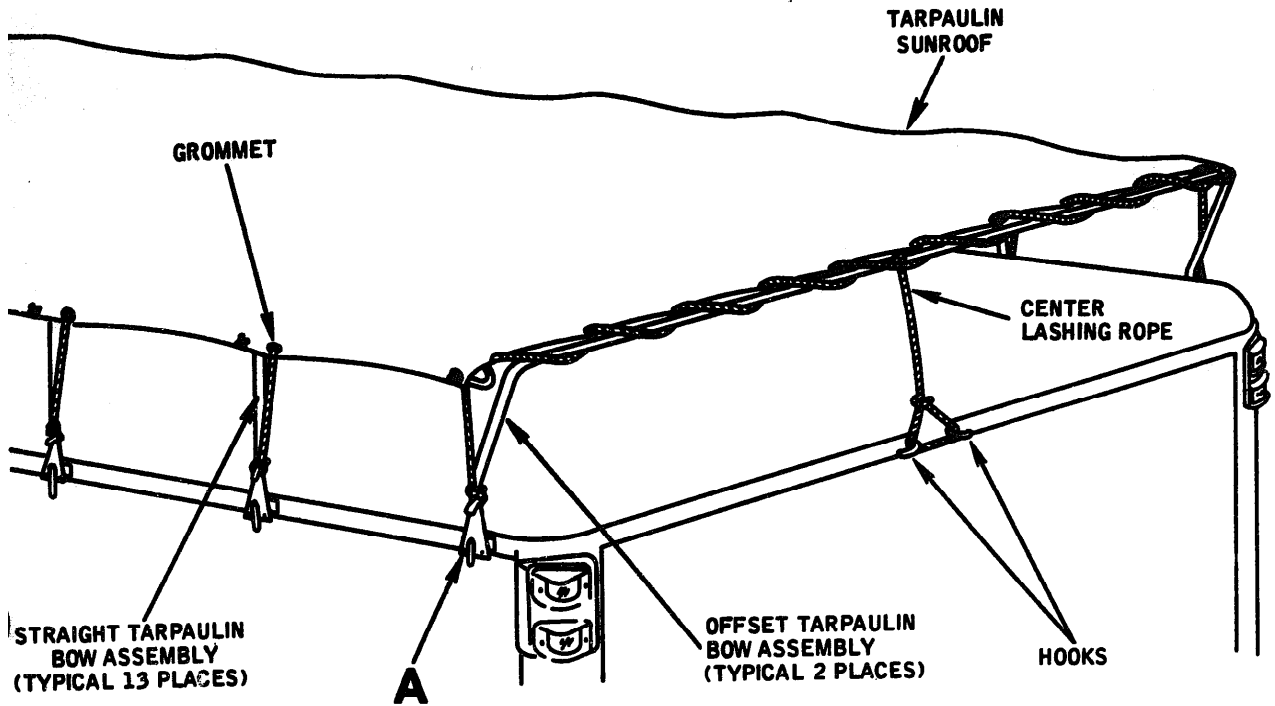
g. Tie the front center lashing rope to its associated hook.

h. Lash the front edge of the sunroof tarpaulin to the offset tarpaulin bow assembly.

i. Tie the ends of the rope to the base of the offset tarpaulin bow assembly at either side of the operations van.

j. Working from front to rear, pull the sunroof tarpaulin taut and tie the lashing ropes extending from the grommets to the associated tarpaulin bow assembly.

k. Secure the rear edge of the sunroof to the offset tarpaulin bow assembly as described in steps h and i.



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Figure 2-12. Tarpaulin Sunroof Installation.

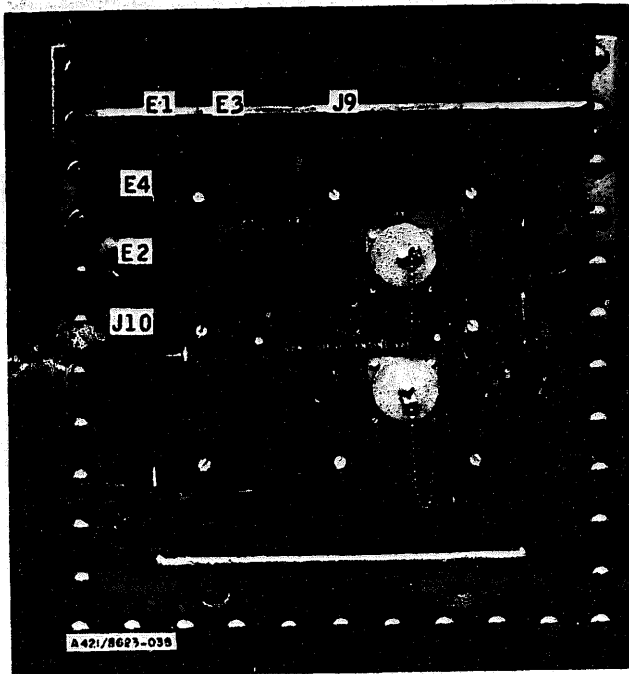


Figure 2-13. Audio and Alarm Box.

2-74. Interconnecting Cabling Installation

2-75

The cables required to interconnect the operations van with the power amplifier van, diesel generator van, and subscriber are listed in table 2-1. Interconnecting cable diagrams are included in Chapter 6 of this technical manual. Refer to figure 2-10, 2-13, and 2-14 for location of connectors and connect the cables as described in table 2-1.

2-76. Postinstalllation Tuneup and Test

2-77

There are no postinstallation alignments, adjustments, tuneup, or tests required for the operations van except those described in individual equipment technical manuals, a list of which is included in appendix A to this technical manual.

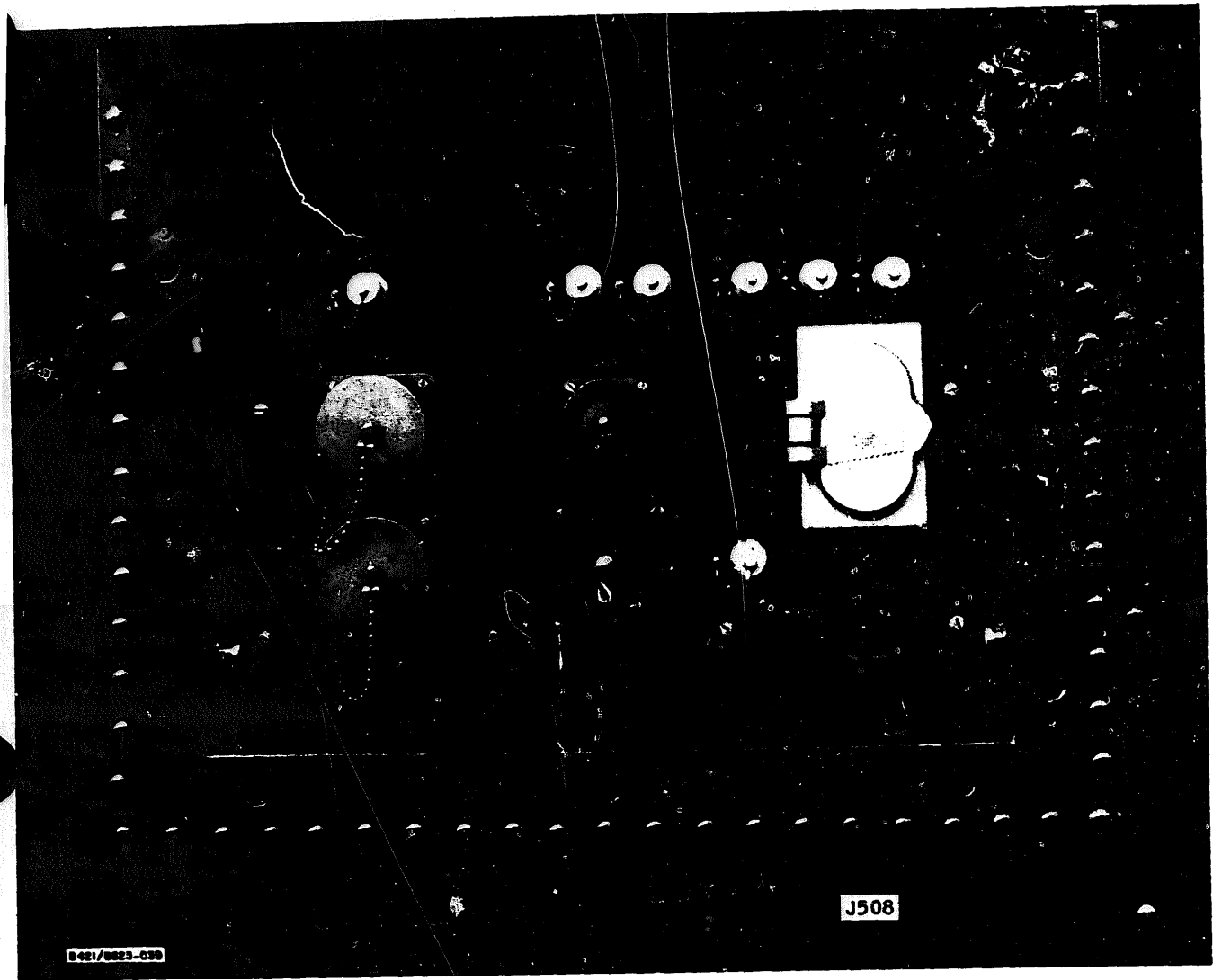


Figure 2-14. Signal Line Extension Box.

Section IV. PREPARATION FOR RESHIPMENT

2-78. Introduction

The instructions necessary to prepare the operations van for reshipment are presented in this section. Before preparing the equipment for reshipment, review the information provided in paragraphs 2-38 through 250 in Section II of this chapter.

2-79. Methods and Conditions of Reshipment

2-80. Methods of Reshipment

2-81

The operations van is transportable by air, sea, or rail flat car, or may be towed overland by a prime mover.

2-82. Conditions of Reshipment

2-83

The decontamination port on the forward curbside door must be loosened to prepare the operations van for aircraft reshipment. This is done to equalize pressure within and outside the operations van.

2-84

When the operations van is to be reshipped by sea, a preservative oil must be applied to all exposed metal parts to retard corrosion.

2-85

Space limitations may require that the operations

van be shipped on its skid base. To prepare the operations van for such shipment, refer to paragraph 2-98.

2-86.

Perform the preventive maintenance routines (table 5-0.1) pertaining to operations van external components. Special emphasis should be placed on those routines pertaining to lubrication and mechanical adjustment and tests. Repair or replace all defective components. Refer to Chapter 5 of this technical manual for maintenance instructions.

2-87. Removal and Storage of Components

2-88.

The following paragraphs provide information necessary to remove and store the components comprising the operations van.

2-89.

Insure that the primary ac power to the operations van and to equipments in the van is removed before preparing the equipment for re-shipment. Refer to Chapter 3, Section II, of this technical manual for turn-off procedure.

2-90. Removal and Storage of Interconnecting Cabling

2-91.

Remove only those cables listed in table 2-1 and place them in their respective storage containers (see table 1-3).

NOTE

Connect the 24-volt dc intervehicular cable from the prime mover to the 24-volt dc input connector at the front of the operations van to provide interior lighting of the van.

2-92. Operations Van Interior

2-93.

Before storing components in the operations van, insure that the following precautions are observed:

a. Check that all hardware, such as nuts, bolts, screws, and washers, is attached to associated components.

b. Check that all equipment in the van is securely fastened to the mountings to prevent movement during shipment.

c. Insure that weather stripping around covers and doors is intact and inserviceable condition.

2-94.

To remove and store components in the operations van, proceed as follows:

a. Remove the two screws at the top and bottom of the curbside door center post.

b. Remove the post.

c. Install transit case number 4 between the roadside air conditioner and rear wall. Secure with retaining straps.

d. Secure transit cases numbers 5 and 6 to the curbside air conditioner.

e. Place test equipment dolly and service cart in storage position and secure with attached knob assemblies.

NOTE

Waveguide components are not part of the operations van but are stored in the van during shipment.

f. Install waveguide components in the operations van by performing the reverse of the procedures contained in paragraph 2-48 step f.

g. Perform the reverse of the procedures contained in paragraph 2-72 to remove the tarpaulin sunroof from the roof of the van.

h. Install the tarpaulin sunroof in its storage position between the two air conditioners by performing the reverse of the procedures contained in paragraph 2-48 step c.

i. Install transit case number 7 in its storage position near the curbside doors, and secure with retaining straps and associated hardware.

j. Replace curbside door center post and secure with two screws at top and bottom.

k. Disassemble, clean, and install the ground rod assembly in its storage position on the curbside doors and secure with associated hardware.

2-95. Operations Van Exterior

2-96.

Various items are normally stored beneath the operations van during shipment (refer to para 2-97 for exceptions). To remove and store these items, proceed as follows:

CAUTION

Insure that landing gear shoes are resting firmly on the ground, wheel chocking blocks are in place, and crank handles on landing gear assemblies are in the "out" position before performing the following procedures.

a. To remove and store the passageway weatherhood, perform the reverse of the procedures contained in paragraph 2-66.

b. To remove and store the air conditioner ducts, perform the reverse of the procedures contained in paragraph 2-64.

c. To remove and store the passageway platforms, perform the reverse of the procedures contained in paragraph 2-62.

d. To remove and store the vestibule, perform the reverse of the procedures contained in paragraph 2-60.

e. To remove and store the personnel ladders, perform the reverse of the procedures contained in paragraph 2-58.

f. To connect a prime mover to the operations van, perform the reverse of the procedures contained in paragraph 2-54 steps *i* through *n*.

g. To retract and store the landing gear and leveling jack assemblies, perform the reverse of the procedures contained in paragraphs 2-54 steps *e* through *h* and paragraph 2-56 steps *a* through *k*.

h. Close all covers and doors and seal with waterproof, pressure sensitive tape conforming to Type III, Class I of Federal Specification PPP-T-60.

i. Check that all reflectors, running lights, stop lights, turn indicators, and tail lights are in operating condition.

NOTE

For rail shipment exterior lamp are reflector lenses must be completely covered with kraft paper and tape conforming to Type III, Class I of Federal Specification PPP-T-60.

2-97. Special Mountings**2-98. Skid Base****2-99.**

The operations van is normally shipped as a completely assembled unit. However, due to limited overhead clearance, shipment by certain types of aircraft may necessitate removal of the undervan suspension system and certain stowed items. To facilitate loading under such conditions, the operations van is equipped with a permanently mounted skid base. Although removal procedures for the suspension system, and for items which extend below the skid base, are obvious, reference to the vehicle support leveling jacks, suspension assembly, retractable support, and storage of undervan equipment figures in TM 11-5820-763-25P may be useful.

2-100. Waveguide Mountings**2-101.**

Waveguide components are not a part of, but are shipped with, the operations van. Waveguide supports, retainer clamps, and attaching hardware are provided as a part of the waveguide assembly and are installed in the operations van to secure waveguide components during shipment.

2-102.

For location and installation of waveguide components shipped with the operations van, refer to figure 2-4 and perform the reverse of the procedures contained in paragraph 2-48 step *f*.

CHAPTER 3
OPERATION

3-1. Introduction

This chapter furnishes the information needed to operate the operations van. Section I lists and illustrates the controls and indicators necessary

for proper operation. Section II describes the correct method of applying power, and provides operating and normal power removal procedures. Section III contains emergency operation procedures.

Section I. CONTROLS AND INDICATORS

3-2. General

3 - 3

The controls and indicators associated with the operations van are covered in this section. For illustrations and description of controls and indicators on the individual equipments not covered in this publication, refer to the applicable equipment technical manuals listed in Appendix A.

indicators located on the operations van exterior. These controls and indicators are illustrated in figures 3-1 through 3-6 except where noted in table 3-1.

3-4. Operations Van Exterior

3 - 5

Table 3-1 lists and describes all controls and

3-6. Operations Van Interior

3 - 7

Tables 3-2 through 3-5 list describe all controls and indicators located inside the operations van which are not covered by equipment manuals. These controls and indicators are illustrated in figures 3-7 through 3-11.

Table 3-1. Operations Van Exterior, Controls and Indicators

<i>Name</i>	<i>Function</i>
Air reservoir drain cock (fig. 3-1)	Drains moisture from the air reservoir and relieves air pressure in air brake system
Brake lining adjusting screw (fig. 3-1)	Adjust brake linings to compensate for wear
Bench level (fig.3-2)	Indicates horizontal inclination
Blackout stop light (fig. 3-3)	Functions as stop indicator under blackout conditions
Landing gear assembly (fig. 3-4)	Supports and adjusts level of operations van
Crank handle	Controls operation of landing gear
Ratchet	Selects desired direction of landing gear travel
Leveling jack assembly (fig. 3-5)	Adjusts level of operations van
Leveling jack screw (fig. 3-5)	Controls operation of leveling jack
Roadside radius rod (fig. 3-1)	Adjusts axle alignment
Running lights (fig. 4-1)	Function as clearance indicators
Spare tire carrier (fig. 3-6) :	
Operating shaft	Raise and lower spare tire carrier
Ratchet	Controls operation of operating shaft
Shutoff cocks (fig. 3-1)	Control air supply to trailer towed in tandem
Tail lights, (fig. 3-3)	Function as stop and clearance indicators

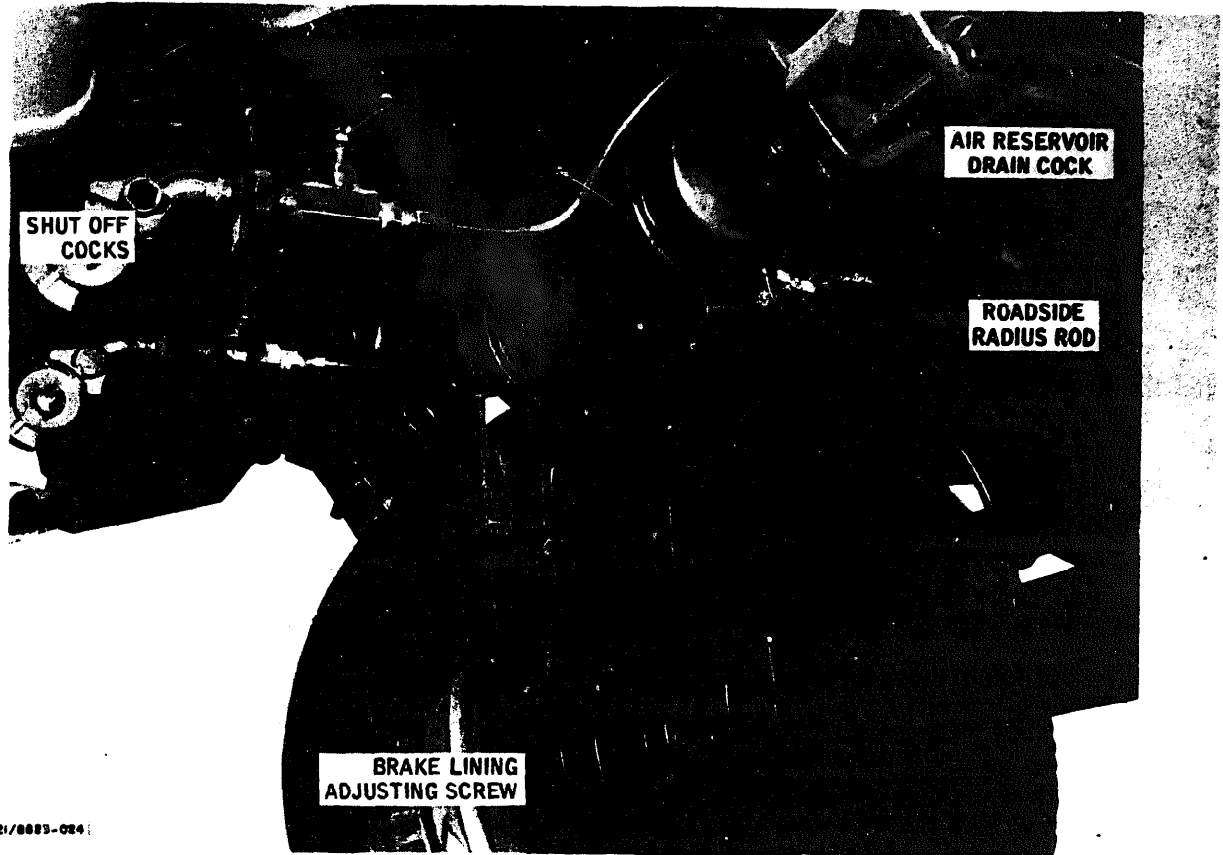


Figure 3-1. Under Van Controls.

Table 3-2. AC Power, Controls and Indicators

Name	Reference Designation	Function
VAN LIGHTS circuit breaker 1	CB501	Applies primary ac power to operations van interior light switches
VFTG RECORDER & AUX EQUIP circuit breaker 2	CB502	Applies primary ac power to voice frequency telegraph group rack no. 2.
VAN LIGHTS circuit breaker 3	CB503	Applies primary ac power to operations van interior light switches
MUX circuit breaker 4	CB504	Applies primary ac power to multiplexer equipment racks
CONVENIENCE OUTLET (EXTERNAL) circuit breaker 5	CB505	Applies primary ac power to weatherproof duplex outlets on exterior operations van
MUX circuit breaker 6	CB506	Applies primary ac power to multiplexer equipment racks
CONVENIENCE OUTLET (EXTERNAL) circuit breaker 7	CB507	Applies primary ac power to weatherproof duplex outlets on exterior of operations van
CONVENIENCE OUTLET (INTERNAL) circuit breaker 8	CB508	Applies primary ac power to convenience outlets in operations van interior
SPARE circuit breaker 9	CB509	Spare, 20 amperes
VFTG circuit breaker 10	CB510	Applies primary ac power to voice frequency telegraph group rack no. 1

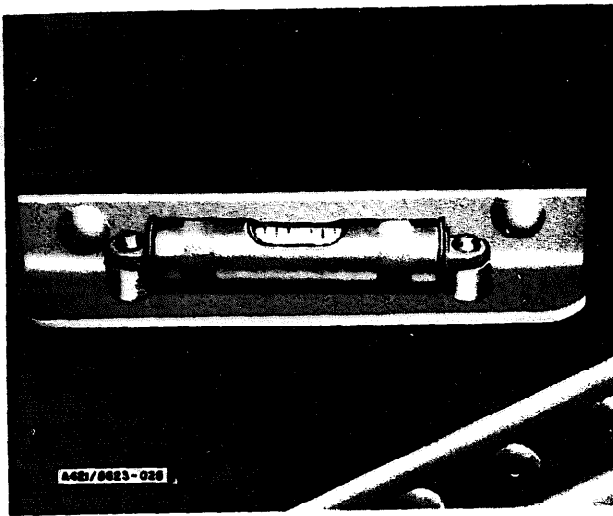


Figure 3-2. Bench Level.

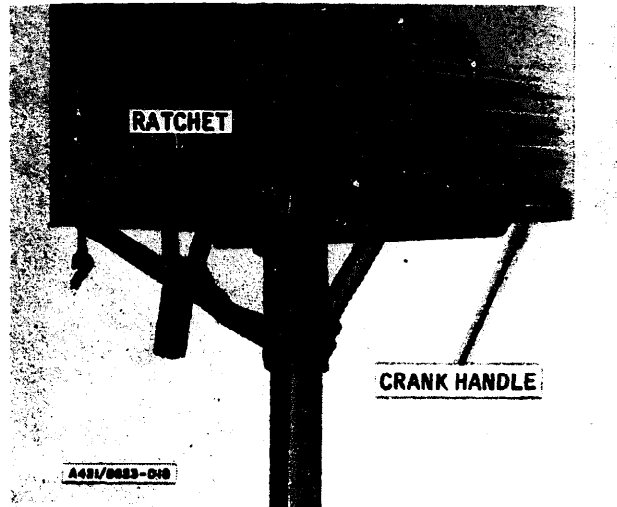


Figure 3-4. Landing Gear Assembly.

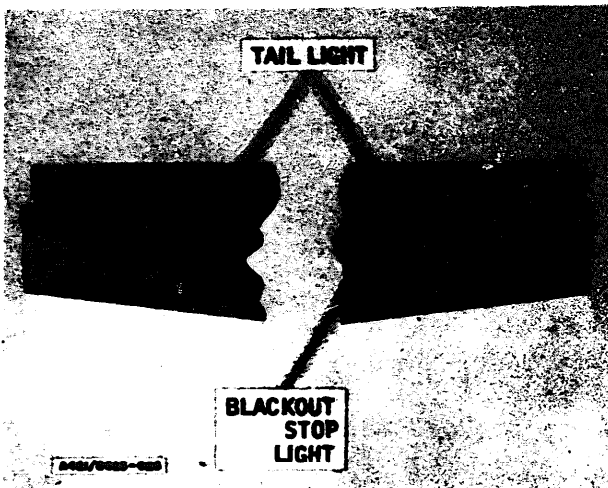


Figure 3-3. Stop Indicators.

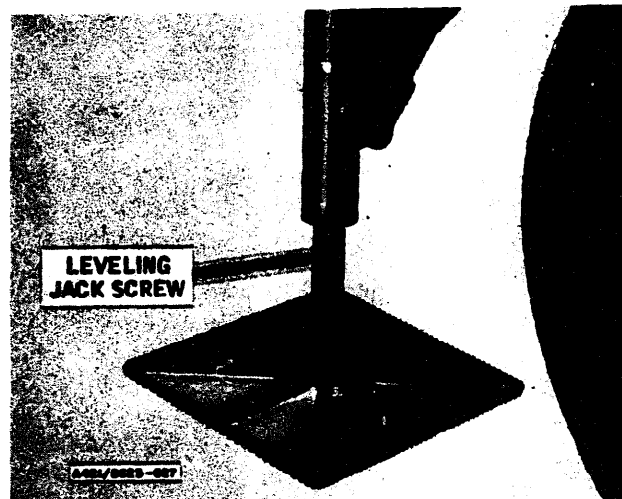


Figure 3-5. Leveling Jack Assembly.

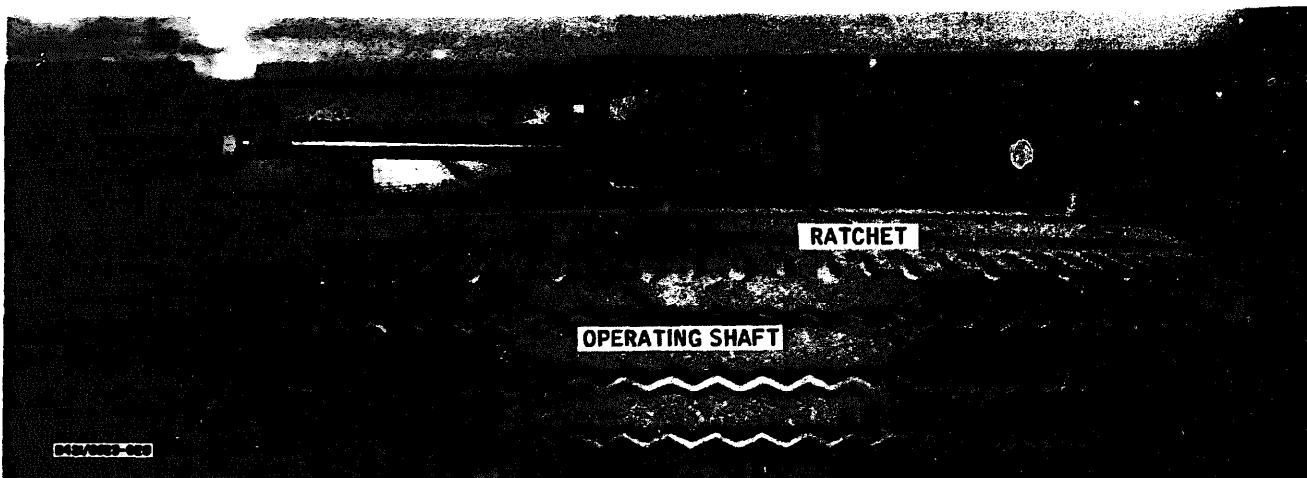


Figure 3-6. Spare Tire Carrier.



Figure 3-7. Distribution Box.

Table 3-2. AC Power, Controls and Indicators (cont)

Name	Reference Designation	Function
INDICATOR FAULT LOCATING NO. 2 circuit breaker 11	CB511	Applies primary ac power to fault locating indicator
PERF MON.BAY NO 2 circuit breaker 12	CB512	Applies primary ac power to performance monitor bay no. 2
PERF MON BAY NO 1 circuit breaker	CB513	Applies primary ac power to performance monitor bay no. 1
SPARE circuit breaker 14	CB514	Spare, 20 amperes
INDICATOR FAULT LOCATING NO 1 circuit breaker 15	CB515	Applies primary ac power to fault locating indicator no. 1
AUDIO & TEL SET circuit breaker 16	CB516	Applies primary ac power to convenience outlet far order wire telephone equipment rack
SPARE circuit breaker 17	CB517	Spare, 20 amperes
TEST EQUIP RACK & J509 circuit breaker 18	CB518	Applies primary ac power to convenience outlet for test equipment rack and to J509 on signal line extension box
AIR CONDITIONER NO 1 circuit breaker 19	CBS19	Applies primary ac power to air conditioner no. 1
AIR CONDITIONER NO 2 circuit breaker 26	CB526	Applies primary ac power to air conditioner no. 2
MAIN CIRCUIT BREAKER (fig. 3-8)		Applies primary ac power to equipment in operations v a n
Van lights switch (fig. 3-8)	S502	Applies primary ac power to operations van interior lights
Van lights switch (fig. 1-3)	S503	Applies primary ac power to operations van interior lights
Van lights switch (fig. 3-8)	S504	Applies primary ac power to operations van interior lights
Van lights switch (fig. 1-3)	S505	Applies primary ac power to operations van interior lights
<u>Power Monitor (fig. 3-9)</u>		
FREQUENCY meter	M501	Measures frequency of input power phases as selected by POWER MONITOR switch S501
POWER MONITOR switch	S501	Selects phase of input power to be monitored by meters M501 and M502
VOLTAGE meter	M502	Measures voltages of input power phase as selected by POWER MONITOR switch S501

Table 3-3. Alarm-Monitor, Controls and Indicators (fig. 3-10)

Name	Reference Designation	Function
DS1 24V BATTERY CHARGE DC indicator lamp	DS1	Indicates that 24-volt battery for diesel no. 1 in diesel generator van is charging
DS2 24V BATTERY CHARGE DC indicator lamp	DS2	Indicates that 24-volt battery for diesel no. 2 in diesel generator van is charging

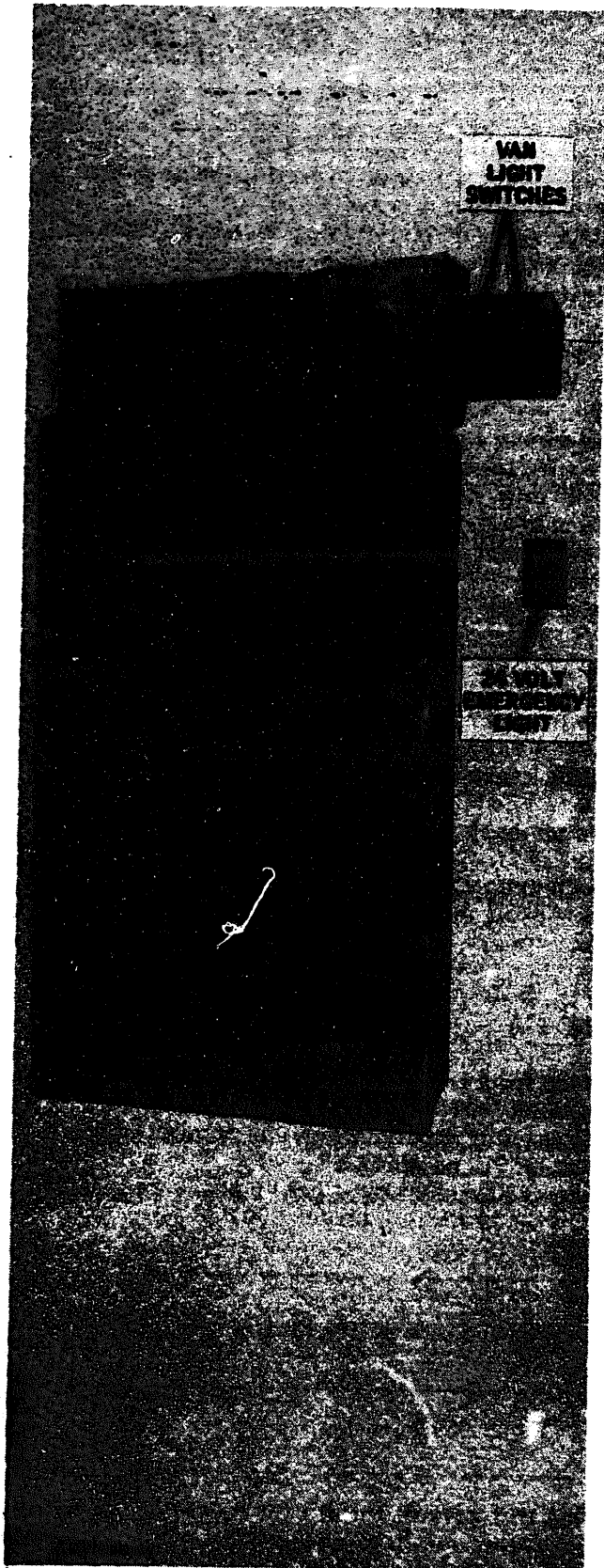


Figure 3-8. Main Circuit Breaker and Van Light Switches.

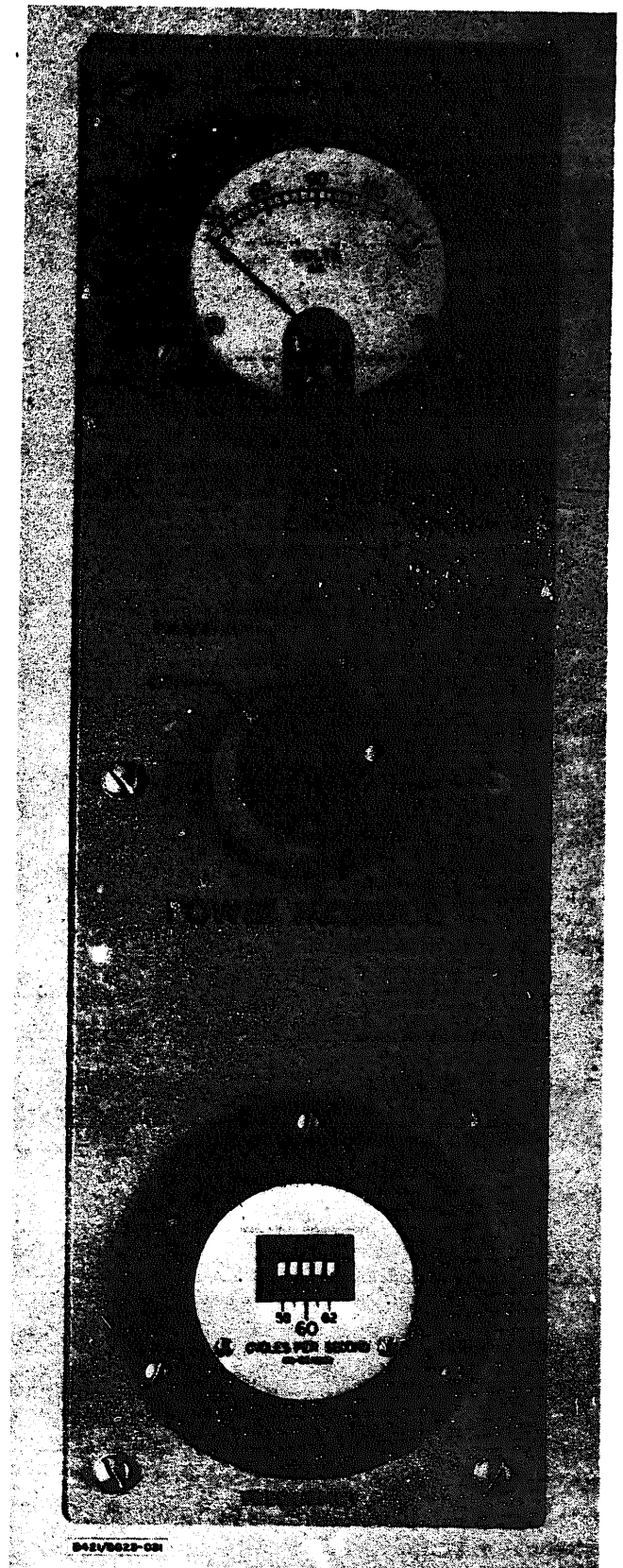


Figure 3-9. Power Monitor.

Table 3-3. Alarm-Monitor, Controls and Indicators (fig. 3-10) (cont.)

Name	Reference Designation	Function
DS3 120V BATTERY CHARGE DC indicator lamp	DS3	Indicates that 120-volt battery in diesel generator van is charging
DS4 GEN NO. 1 ON BUSS indicator lamp	DS4	Indicates that generator no. 1 of diesel generator van is connected to power distribution system
DS5 BASE ON BUSS indicator lamp	DS5	Indicates that base power is available at diesel generator van for application to power distribution system
DS6 GEN NO. 2 ON BUSS indicator lamp	DS6	Indicates that generator no. 2 in diesel generator van is connected to power distribution system
DS7 BASE POWER ON LINE indicator lamp	DS7	Indicates that base power is connected to the power distribution system in the diesel generator van
S1 DIESEL NO. 1 ALARM switch	S1	Controls operation of buzzer DS8 associated with generator no. 1
S2 DIESEL NO. 2 ALARM switch	S2	Controls operation of buzzer DS9 associated with generator no. 2
Buzzer	DS8	Indicates that generator no. 1 is defective
Buzzer	DS9	Indicates that generator no. 2 is defective

Table 3-4. 24-Volt Emergency Lighting, Controls and Indicators

Name	Function
24 VOLT EMERGENCY LIGHT switch (fig. 3-8)	Applies 24 volts dc to emergency lights

Table 3-5. Recorder Control, Controls and Indicators (fig. 3-11)

Name	Reference Designation	Function
CAL-CH. 1 control	R1	Calibrates recorder channel no. 1
TIME CONSTANT switch	S1	Selects time delay for recorder channel no. 1
RECEIVER switch	S3	Selects input for recorder channel no. 1
TIME CONSTANT switch	S2	Selects time delay for recorder channel no. 2
CAL-CH. 2 control	R3	Calibrates recorder channel no. 2
RECEIVER switch	S4	Selects input for recorder channel no. 1

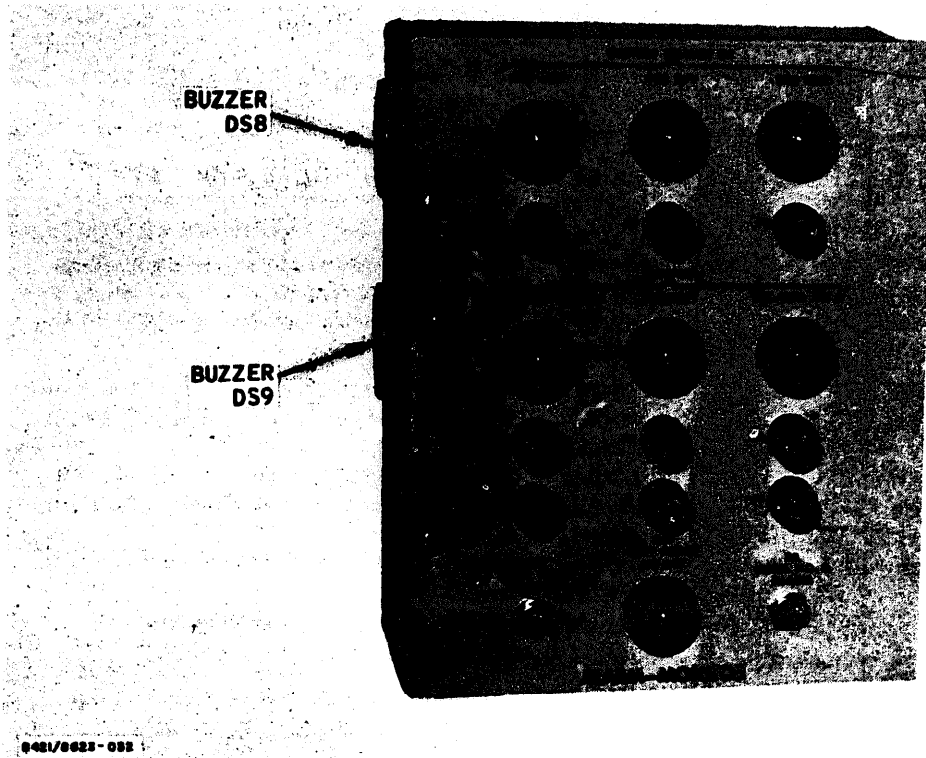


Figure 3-10. Alarm-Monitor

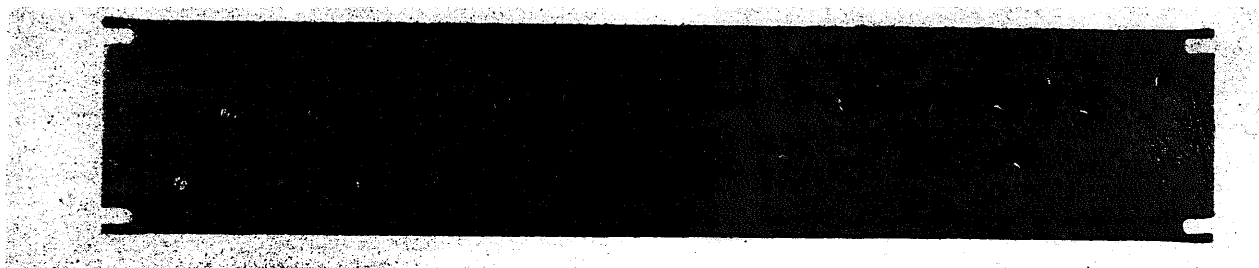


Figure 3-11. Recorder Control.

Section II. OPERATING INSTRUCTIONS

3-8. General

This section provides operating instructions for the operations van. For operating instructions pertinent to individual equipment not covered herein, refer to the applicable equipment manuals listed in the Introduction of this manual.

3-9. Primary AC Power Turn On

3-10

The turn-on procedure for the operations van is as follows :

NOTE

Before performing the following procedures, insure that all individual equipments comprising the operations van are in the off condition.

a. Set the MAIN CIRCUIT BREAKER located on curbside wall to ON.

b. Rotate POWER MONITOR switch through each position. The FREQUENCY meter should indicate between 58 and 62 cycles per second. The VOLTAGE meter should indicate between 114 and 126 volts ac at each position.

NOTE

Circuit breakers are located on the distribution box unless otherwise indicated.

c. Set VAN LIGHTS circuit breakers to ON and operate van lights switches S502 and S504 located under the power monitor or van lights switches S503 and S505 located on rear wall of the operations van. Check that each bank of ceiling lamps light.

d. Set DIESEL NO. 1 ALARM and DIESEL NO. 2 ALARM switches on alarm-monitor panel to on. (Lift up to turn on.)

e. Set AIR CONDITIONER NO 1 circuit breaker and AIR CONDITIONER NO 2 circuit breaker to ON.

f. Set the two CONVENIENCE OUTLETS (EXTERNAL) circuit breakers to ON.

g. Set CONVENIENCE OUTLETS (INTERNAL) circuit breaker to ON.

h. Set INDICATOR FAULT LOCATING NO 1 and INDICATOR FAULT LOCATING NO 2 circuit breakers to ON.

i. Set VFTG RECORDER & AUX EQUIP circuit breakers to ON.

j. Set the two MUX circuit breakers to ON.

k. Set AUDIO & TEL SET circuit breaker to ON.

l. Set PERF MON BAY NO 1 and PERF MON BAY NO 2 circuits breakers to ON.

m. Set TEST EQUIP RACK & J609 circuit breaker to ON.

n. Refer to the applicable equipment manuals listed in the Introduction to this manual and perform the turn-on procedures for the individual equipments.

3-11. Primary AC Power Turn Off

CAUTION

Perform the turn-off procedures for individual equipments before removing primary ac power from the operations van.

3-12

To turn off the primary ac power perform the reverse of the procedure outlined in paragraph 3-10.

3-13. Emergency Primary AC Power Turn Off

CAUTION

Only in extreme emergency should the MAIN CIRCUIT BREAKER be set to the OFF position before individual equipments have been shut down.

3-14

To completely shut down the operations van in case of emergency such as arcing, fire, etc., set MAIN CIRCUIT BREAKER located next to the curbside doors to the OFF position.

Section III. EMERGENCY OPERATION

3-15. General

3-16.

This section contains instructions pertaining to alternate methods of operation which may be accomplished by patching at the baseband and order wire patch panel when there is a partial failure or malfunctioning of components within the operations van. Patching facilities incorporated in other equipments comprising the operations van are described in associated technical manuals listed in Appendix A to this manual.

3-17.

The following general considerations should be observed relative to patching at the baseband and order wire patch panel:

NOTE

All patches must be coordinated with the subscriber or distant terminal.

a. Never insert a plug in LIFT jacks unless patching of the associated equipment is desired.

b. When a patch has been made, attach a tag to the patch cords listing the name of the individual making the patch, the time and date that patch was made, and the reason for making the patch.

c. Always remove patch cords from baseband and order wire patch panel after defective equipment has been repaired and restored to service.

3-18. Baseband Amplifier No. 1 Failure

3-19.

Failure of baseband amplifier no. 1 located in receiver no. 1 will remove baseband signals to the multiplexer equipment. Normal operation of the system may be resumed by patching at the baseband and order wire patch panel (fig. 3-12) as follows :

a. Insert one end of a patch cord with double plug into either REC 2 BB MON, REC 3BB MON, or REC 4 BB MON jacks.

b. Insert the other end of the patch cord into MUX IN BB LIFT jacks.

3-20. Order Wire Amplifier No. 1 Failure

3-21.

Failure of order wire amplifier no. 1 located in receiver no. 1 will remove order wire signals supplied to the order wire telephone equipment. Normal operation may be resumed by patching at the baseband and order wire patch panel (fig. 3-13) as follows:

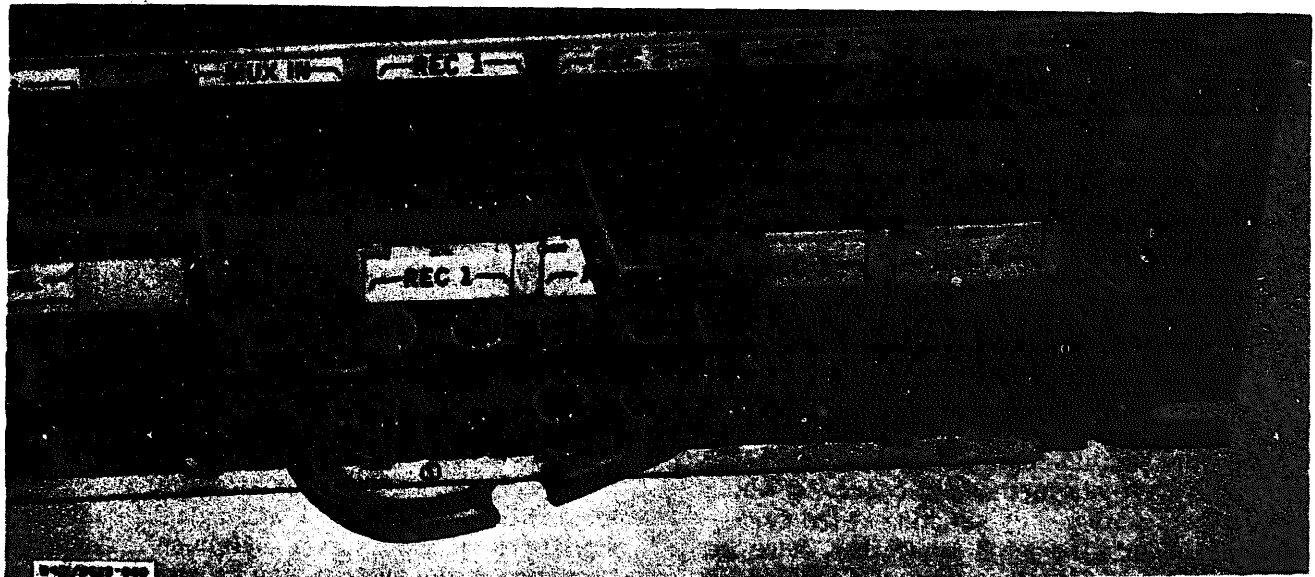


Figure 3-12. Patching Faulty Baseboard Amplifier.

a. Insert one end of a patch cord with double plug into either REC 2 OW MON, REC 3 OW MON, or REC 4 OW MON jacks.

b. Insert the other end of the patch cord with double plug into OW IN LIFT jacks.

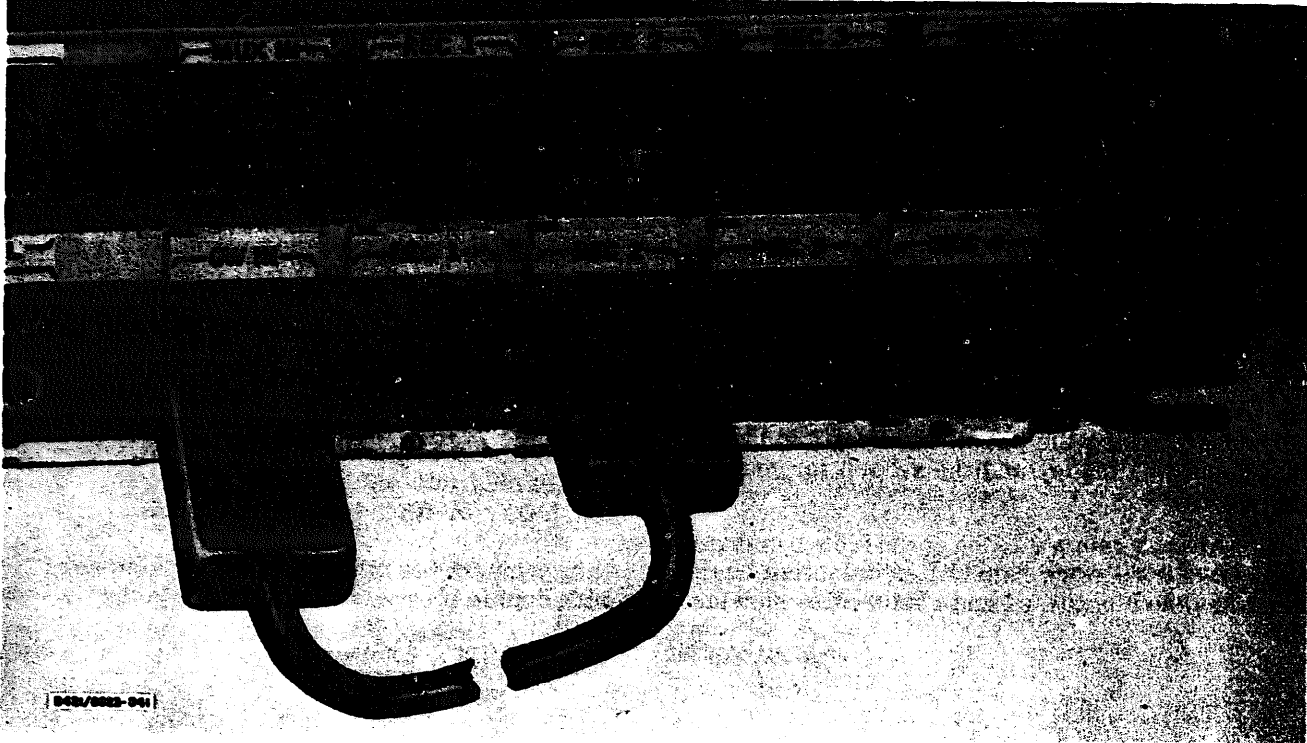


Figure 3-13. Patching Faulty Order Wire Amplifier.

CHAPTER 4

PRINCIPLES OF OPERATION

4-1

INTRODUCTION

This chapter presents the principles of operation of the operations van. Section I contains a functional system operation analysis of the equip-

ment. Section II contains a functional electronic circuit operation analysis of equipment not covered in other technical manuals. A simplified discussion of signal distribution is also given in this section. The functional operation of mechanical assemblies is covered in Section III.

Section I. FUNCTIONAL SYSTEM OPERATION

4-2. General

This section contains information concerning the functional systems operation of equipment comprising the operations van. The functional block and schematic diagrams in Chapter 6 of this manual will help you to understand the following discussion.

4-3. Operation

4-4. Transmitting

4 - 5

Voice frequency and teletypewriter signals from the subscriber lines are supplied to the main distributing frame (MDF). The voice frequency transmitting signals are isolated from the receiving signals by 4-wire terminating assemblies in the multiplexer set and are supplied to the channel multiplexers for conversion to signals within a particular portion of the baseband frequency.

4 - 6

Four of the 72-voice frequency channels are reserved for teletypewriter circuits. The dc signals from subscriber teletypewriter circuits are supplied through the MDF to frequency shift tone keyers where the signals are converted to audio frequency signals. Twelve of the teletypewriter circuits are combined in each of the four voice frequency channels and are supplied to the channel multiplexers for conversion to signals within a particular portion of the baseband frequency.

4 - 7

The channel multiplexer outputs are routed to the group multiplexers where they are multiplexed and supplied to the supergroup modulators. The signals are modulated in the supergroup modulators and supplied to the transmit line hybrid. The signals are combined in the transmit line hybrid with a pilot (synchronizing) signal from the common equipment group into a single band of frequencies and routed to the line equipment shelf assembly. In the line equipment shelf assembly, extraneous signals are removed. The desired signals are amplified to a specific level and supplied through the baseband and order wire patch panel to exciters 1 and 2.

4 - 8

Signals from the order wire telephone set are supplied directly through the baseband and order wire patch panel to the exciters.

4 - 9

The multichannel voice and teletypewriter signals (baseband) and order wire signals are processed in each exciter to yield a IO-20 watt rf signal in the uhf band for driving the power amplifiers located in the power amplifier van. A pilot tone is also generated within the exciters and is mixed with the modulating data to provide a means of monitoring the exciters and receivers.

4-10. Receiving

4-11

The *i-f* frequency from the power amplifier van

is routed through the signal line extension box to the receivers. The baseband signals are separated from the order wire signals in the receiver and supplied to separate combiner circuits within the receivers. The output signals from the receivers are combined to yield a signal having a better signal-to-noise ratio than the best signal from any of the four receivers individually. The order wire signals are supplied to the order wire telephone set through the baseband and order wire patch panel and the MDF.

4-12.

The baseband signals containing numerous sub-carrier frequencies including a pilot signal are supplied via the baseband and order wire patch panel and the MDF to the receive line hybrid. In the receive line hybrid, the pilot signal is filtered from the baseband signals and is supplied to the common equipment group. The baseband signals are passed through the receive line hybrid to the equipments in the demultiplexer and processed to produce 72 voice frequency channel outputs containing 68 telephone and 48 teletypewriter signals.

4-13.

The 68 telephone signals from the channel demultiplexers are supplied to the 4-wire terminating assembly and distributed to the subscriber via the MDF and the subscriber lines. The 48 teletypewriter signal outputs of the channel demultiplexers (contained in 4 channels) are supplied via the MDF to 48 frequency shift tone converters and there converted to dc pulses. The dc pulses are transmitted to teletypewriters via the MDF and the subscriber lines.

4-14.

The common equipment group generates the pilot signal supplied to the transmit line hybrid. It also provides the required carriers which drive the multiplexer and demultiplexer equipments.

4-15.

Three group interconnect filter assemblies provide facilities for interconnecting up to three U-channel voice frequency groups. These facilities are used for "thru group" connections.

4-16. Primary AC Power Distribution

4-17. Unregulated Primary AC Power

4-18.

Unregulated 120/208-volt, 3-phase ac power from

the diesel generator van is supplied through J513 on the power entrance box and is controlled by the 200 ampere main circuit breaker. With the main circuit breaker in the ON position, unregulated primary ac power is applied to the distribution box which contains the remaining circuit breakers. Each circuit breaker is numbered and labeled, denoting capacity and function.

4-19. Regulated Primary AC Power

4-20.

Regulated 120-volt, 60-cps, single-phase ac operating power for the exciters and receivers is supplied from the 10-kw power amplifier, 120-volt regulator (in the power amplifier van) to the operations van through J505 on the signal line extension box. The 120-volt regulator limits variations in the required 120 vac to $\pm 1\%$. Malfunctions in the 120-volt regulator will cause it to automatically apply unregulated ac power from the power amplifier van to the exciters and receivers and sound an alarm on the fault indicator. For a functional operation discussion of the regulated primary ac power circuit, refer to TM 11-5820-757-15.

4-21. Alarm and Monitoring

4-22.

Alarm and monitoring facilities for the operations van, in addition to those provided in individual equipments, are contained in the alarm-monitor, power monitor, fault indicator, and chart recorder.

4-23. Alarm-Monitor

4-24.

When a fault, such as a power failure or excessive battery charge rate, occurs in the diesel generator van, a voltage is applied to audible and visual indicators in the alarm-monitor via the signal cable and connector J10 of the audio and alarm box. Indicators provide an immediate indication regarding the location and type of trouble and also the status of equipment in the diesel generator van.

4-25. Power Monitor

4-26.

When primary ac power is applied to the power distribution panel, each phase of the primary ac power may be monitored with respect to neutral by FREQUENCY and VOLTAGE meters located on the front panel of the power monitor.

4-27. Fault Indicators

4 - 2 8

Two fault indicators continuously monitor the operation of the exciters, receivers, and associated electronic equipment (via the signal line extension box) in the power amplifier van. When a fault occurs, the defective equipment activates an audible and visual alarm on the fault indicator.

Section II. FUNCTIONAL OPERATION OF ELECTRONIC CIRCUITS

4-31. General

This section provides detailed theory of operation of the major circuits and panels comprising the operations van. The schematic diagrams contained in chapter 6 of this manual will help you understand the detailed description given in this section. Equipments (comprising the operation van) not discussed in this section are covered in separate technical manuals listed in appendix A to this manual.

4-32. Detailed Functioning

4-33. Voice Frequency Channel Operation

4 - 3 4

The operations van provides communications facilities for either 72 or 68 telephone circuits. Each circuit may be wired for either 2-wire or 4-wire operation depending on subscriber requirements. A typical voice frequency channel is shown in figure 4-1.

4-35. Transmitting

Voice frequency signals from the subscriber are cross connected on the main distributing frame (MDF) to the input terminals of terminal board 1A1TB1 in the multiplexer set. Voice frequency signals from the 4-wire circuits are supplied to the channel multiplexers where the signals are translated in a particular frequency within the baseband spectrum. Voice frequency signals from the 2-wire circuits are supplied to 4-wire terminating assemblies which isolate the transmit signals from the receive signals and supply the transmit signals to the channel multiplexers where they are processed in the same manner as the signals supplied from the 4-wire circuits.

4 - 3 6

The combined output signals (baseband) of the

4-29. Chart Recorder

4-30

A combiner associated with each receiver supplies voltages which represent the signal levels present in the receivers. The voltages are applied to the recorder control panel which selects the input to the chart recorder. The chart recorder records the voltages thereby providing a permanent record of receiver sensitivity.

multiplexer set are supplied from the output terminals of terminal board 2A1TB3 to the baseband and order wire patch panel via the MDF. The baseband and order wire patch panel contains normal through jacks which connect the baseband signals to the input of each exciter. The exciters process the baseband signal for application to the power amplifiers in the power amplifier van.

4-37. Receiving

Baseband signals from the receivers are routed through the baseband and order wire patch panel and MDF to the input terminals of terminal board 4A1TB2 in the multiplexer set. The multiplexer set demodulates the baseband signals producing 72 voice frequency channels. Signals within the voice frequency channels associated with the 4-wire circuits are routed from the output terminals of terminal board 1A1TB1 through the MDF to the subscriber. Signals within the voice frequency channels associated with the 2-wire circuits are routed through a 4-wire terminating assembly, terminals of terminal board 1A1TB1, and the MDF to the subscriber.

4-38. Voice Frequency Telegraph Operation

4-39

A voice frequency telegraph circuit utilizing a tone keyer and tone converter is shown in figure 4-2. The voice frequency telegraph (VFTG) equipment provides facilities for 48 telegraph or teletypewriter channels. Since the operation of all 48 channels is identical, only one channel is discussed in the following paragraphs. All values given in this discussion are approximate.

4-40. Transmitting

Mark and space dc pulses from the subscriber telegraph or teletypewriter equipment are cross

connected on main distributing frame (MDF) terminal boards TB1B and TB3B to the keyer input terminals on TB1A of the VFTG equipment. The tone keyer is an oscillator with a normal output (center) frequency between 300 and 3000 cps. Mark and space signals applied to the input of the tone keyer produce a tone signal whose frequency is shifted 42.5 cps above (mark) and 42.5 cps below (space) the center frequency. The output tone signals of the 48 keyers are combined to form 4 groups of 12 teletype signals each. Each group of 12 teletype signals is routed from the output terminals of TB1A of the VFTG equipment through cross connections on the MDF to one channel input in the multiplexer set. In the multiplexer set, the voice channel containing the 12 teletype signals is processed in the same manner as those channels containing voice frequency signals (pars 4-35).

Figure 4-1. Voice Frequency Channel, Simplified Schematic Diagram. (Located in back of manual.)

4-41. Receiving

Each voice frequency channel from the multiplexer set containing telegraph or teletypewriter tone signals is cross connected on the MDF to input terminals on TB2A of the VFTG equipment. The tone signals are then supplied to the input terminals of tone converters and are demodulated. The resultant signal of each tone converter is applied to a balanced dc amplifier. The output of the dc amplifier drives a polar relay producing mark and space dc pulses. The dc pulses are routed from the output terminals on TB2A of the VFTG equipment and cross connected on the MDF to the subscriber.

4-42. Voice Frequency Order Wire Channel Operation

4 - 4 3 .

The voice frequency order wire channel (fig. 4-3) provides intersite communications facilities for maintenance personnel.

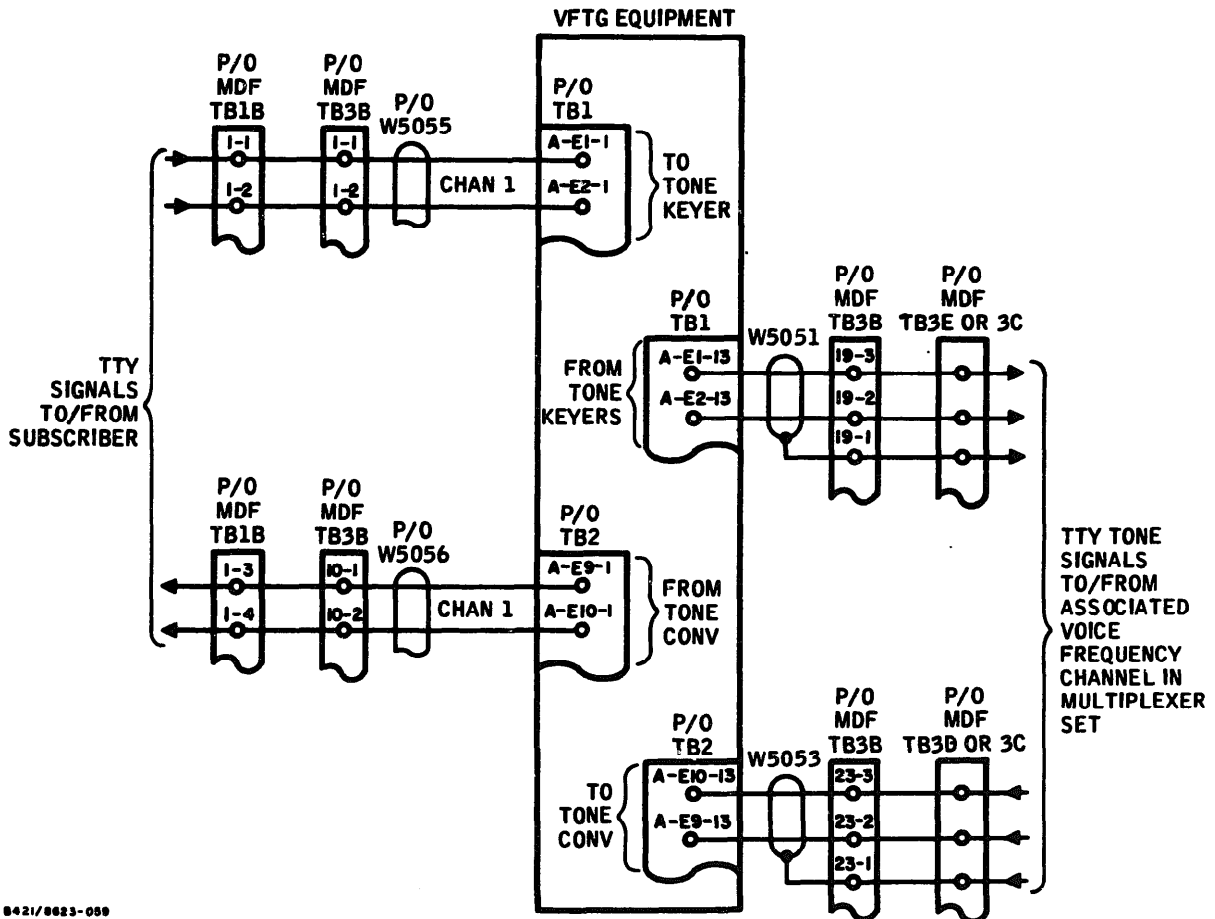


Figure 4-2. Voice Frequency Telegraph Channel, Simplified Schematic Diagram.

4-44. Transmitting

Voice frequency signals applied to the handset of the order wire telephone set are amplified and supplied to terminals of terminal board 1A1TB2 (TBB) and PAD jack 1A1J39. The signals applied to terminal board 1A1TB2 (TBB) are routed through terminals on MDF terminal board TB2B to local order wire telephone sets. The signals applied to PAD jack 1A1J39 are routed through the baseband and order wire patch panel to input jacks 1A2J5 on the excitors. The excitors process the order wire signal for application to the power amplifiers in the power amplifier van.

4-45.

Depressing the order wire telephone set SIG pushbutton switch opens the voice circuit and applies a 2600-cps signal tone from the signal tone transmitter to the output terminals of terminal board 1A1TB2 (TBB) and PAD jack 1A1J39. The 2600-cps signal tone follows the same path as the voice signal: (para 4-44).

4-46. Receiving

Order wire signaling tones and voice frequency signals from the receivers are routed through the baseband and order wire patch panel to order wire telephone set AMP jack 1A1J38. Order wire signaling tones and voice frequency signals from local order wire telephone sets are routed through terminals on MDF terminal board TB2B to the order wire telephone set input terminals on 1A1TB2 (TBB). The voice frequency order wire signals are amplified in the order wire telephone set and applied to an associated handset or speaker. The signaling tones are converted in the order wire telephone set signal tone receiver to 20 cps. The 20-cps signal actuates a buzzer within the order wire telephone set and, simultaneously, closes an external signaling relay which applies the 20-cps signal to an external buzzer or bell via terminals of terminal board 1A1TB1 (TBA) and MDF terminal board TB2B.

4-47. Alarm and Monitoring**4-48. Alarm-Monitor**

4 - 4 9 .

The alarm-monitor (see fig. 6-3) contains alarm circuits that indicate the status of the base power, the two diesel generators, and the power switch-board equipment in the diesel generator van.

4-50.

When the battery charge rate for the 24-volt unit batteries associated with diesel generator number 1 in the diesel generator van is high, 24 volts dc appears at terminal 1 of terminal board TB1 and is applied to indicator lamp DS1 24V through fuse F1. Indicator lamp DS1 24V BATTERY CHARGE DC is connected to dc ground in the diesel generator van through terminal 11 of terminal board TB1.

4-51.

When the battery charge rate for the 24-volt unit batteries (associated with diesel generator number 2 in the diesel generator van) is high, 24 volts dc appears at terminal 2 of terminal board TB1 and is applied to indicator lamp DS2 24V BATTERY CHARGE DC through fuse F2. Indicator lamp DS2 24V BATTERY CHARGE DC is connected to dc ground in the diesel generator van through terminal 11 of terminal board TB1.

4-52.

When the battery charge rate for the 120-volt station batteries in the diesel generator van is high, 120 volts dc appears at terminal 3 of terminal board TB1 and is applied to indicator lamp DS3 120V BATTERY CHARGE DC through fuse F3. Indicator lamp DS3 120V BATTERY CHARGE DC is connected to dc ground in the diesel generator van through terminal 12 of terminal board TB1.

4-53.

When generator number 1 in the diesel generator van is connected to the primary ac power distribution system, 120 volts dc appears at terminal 6 of terminal board TB1 and is applied to indicator lamp DS4 GEN NO. 1 ON BUSS through fuse F4. Indicator lamp DS4 GEN NO. 1 ON BUSS is connected to dc ground in the diesel generator van through terminal 12 of terminal board TB1.

4-54.

When generator number 2 in the diesel generator van is connected to the primary ac power distribution system, 120 volts dc appears at terminal 8 of terminal board TB1 and is applied to indicator lamp DS6 GEN NO. 2 ON BUSS is connected to dc ground in the diesel generator van through terminal 12 of terminal board TB1.

4 - 5 5

When 120/208-volt, 60-cycle, three-phase, base power is connected to the primary ac power distribution system, 120 volts dc appears at terminal 7 of terminal board TB1 and is applied to indicator lamp DS5 BASE ON BUSS through fuse F5. Indicator lamp DS5 BASE ON BUSS is connected to dc ground in the diesel generator van through terminal 12 of terminal board TB1.

4-56

When base power is available at the diesel generator van power distribution panel for application to the primary ac power distribution system, 120-volt ac, 60-cycle, single-phase power appears at terminal 4 of terminal board TB1 and is applied to indicator lamp DS7 BASE POWER ON LINE through fuse F7. Indicator lamp DS7 is connected to neutral (ac ground) in the diesel generator van through terminal 5 of terminal board TB1.

4-57

When generator number 1 in the diesel generator van is defective, 24 volts dc appears at terminal 9 of terminal board TB1 and is applied to diesel number 1 alarm buzzer DS8 through fuse F8 and the normally closed contacts of switch S1 DIESEL NO. 1 ALARM. Throwing switch S1 from its normal position (up) opens the switch contacts and de-energizes the buzzer. Buzzer DS8 is connected to dc ground in the diesel generator van through terminal 11 of terminal board TB1.

4-58

Operation of diesel number 2 alarm buzzer DS9, associated with generator number 2, is identical to that described for diesel number 1 alarm buzzer DS8. The circuit components are fuse F9 and switch S2 DIESEL NO. 2 ALARM.

4-59. Power Monitor

4 - 6 0

The power monitor (see fig. 6-1) provides a means of monitoring the frequency and phase-to-neutral voltage of the 120/208-volt, 60-cps, three-phase, primary ac power applied to the operations van. POWER MONITOR switch S1 connects FREQUENCY meter M1 and VOLTAGE

meter M2 between the phase to be monitored and neutral. when switch S1 is in the OFF position both meters are disconnected from the primary voltage.

4-61. Recorder Control

4-62

The recorder control panel contains two identical circuits (see fig. 6-4) which provide the means of connecting any one of the four receivers to a channel input time constant for each channel input to the chart recorder.

4-63

Voltages representing the rf signal strength levels present in receivers 1 through 4 are applied from the noise amplifiers of the receivers to jacks J1 through J4 on the recorder control panel. The dc signal strength level present in the combiner of receiver 1 is applied to jack J5.

4-64

RECEIVER switches S3 and S4 on the recorder control panel select the signals to be supplied to recorder channel number 1 and recorder channel number 2 respectively. The selected signals are fed through terminal boards TB1 and TB2 to recorder channel number 1 and recorder channel number 2. Variable resistors CAL CH 1 R1 and CAL CH 2 R3 are used to calibrate the input to the chart recorder. TIME CONSTANT switches S1 and S2 select the recording time constant for each channel by inserting or removing capacitors C1 or C2.

4-65

Setting TIME CONSTANT switches S1 and S2 to the IN position selects a recording time constant of approximately 12 seconds for each recorder channel. The long time constant tends to limit large variations of short duration on the chart recorder. This permits observation of overall variations in signal strength over long periods of time (depending on chart speed). The TIME CONSTANT switches are normally set to the IN position when recording signal strength levels.

4-66

Setting TIME CONSTANT switches S1 and S2 to the OUT position selects a fast time constant, determined by recorder ballistics, for each recorder channel. The fast time constant permits the recorder to record large input variations of

Figure 4-3. Voice Frequency Order Wire Channel, Simplified Schematic Diagram.

(Located in back of manual.)

short duration. The TIME CONSTANT switches are normally used for test and calibration procedures.

4-67. Patch Panel Operation

4-68. Baseband and Order Wire Patch Panel

4 - 6 9

The baseband and order wire patch panel illustrated in Chapter 5, figure 5-1, is used for patching and testing the baseband and order wire circuits. With respect to baseband signal, it is electrically located between the multiplex equipment and the baseband terminals of the exciters and receivers; with respect to order wire signals, it is electrically located between the order wire telephone set and the order wire terminals of the exciters and receivers.

4 - 7 0

The baseband and order wire patch panel provides the following functions:

- a. Connects the multiplexer output (baseband) to exciters 1 and 2.
- b. Connects the local and operations van order wire signals to exciters 1 and 2.
- c. Connects the baseband and order wire outputs of the four receivers to the demultiplexer equipment and order wire equipment respectively.
- d. Test point for baseband and order wire signal monitoring and troubleshooting.

4-71

A monitor jack is connected in parallel with each lift jack to permit monitoring of the baseband and order wire signals without interrupting the associated circuit. These jacks also permit patching of their related equipment.

4 - 7 2

The lift jacks are connected to the input or output of their related equipment and permit patching or testing of the equipment. These jacks function as follows :

- a. Inserting a dual plug (fig. 3-13) into the REC BB LIFT jacks will lift (remove from service) the baseband signal of the associated receiver and remove the receiver baseband combiner from the combiner buss (see fig 4-4).

NOTE

Inserting a dual plug into REC 1 BB LIFT jacks removes normal baseband amplifier number 1 output to the multiplexer receiving equipment. To avoid an interruption in service when using these jacks, insert a patch cord between either REC 2 BB MON, REC 3 BB MON or REC 4 BB MON jacks and MUX IN B B L I F T j a c k s .

- b. Inserting a dual plug into the REC OW LIFT jacks will lift the order wire signal of the associated receiver and remove the receiver order wire combiner from the combiner buss (see fig. 4-5).

Inserting a dual plug into REC 1 OW LIFT jacks removes normal order wire amplifier number 1 output to the order wire telephone equipment. To avoid an interruption in service when using these jacks insert a patch cord between either REC 2 OW MON, REC 3 OW MON, or REC 4 OW MON jacks and OW IN L I F T j a c k s .

- c. Inserting a dual plug into the EXC BB LIFT jacks will lift the baseband circuit of the associated exciter and bridge 135 ohms across the operating circuit thereby maintaining proper circuit impedances (see fig. 4-6).

- d. Inserting a dual plug into the EXC OW LIFT jacks will lift the order wire circuit of the associated exciter and bridge 600 ohms across the opened leads from the hybrid (see fig. 4-7).

4-73

The MUX IN, MUX OUT, OW IN, and OW OUT jacks may be used for back-to-back tests of the multiplexing and order wire equipment. For performance of these tests refer to the applicable equipment technical manual listed in appendix A to this manual.

NOTE

Using the lift jacks during operation will remove the associated equipment from the operating circuit.

4-74

The baseband and order wire patch panel also houses two hybrid transformers mounted in connectors J31 and J32. These transformers match

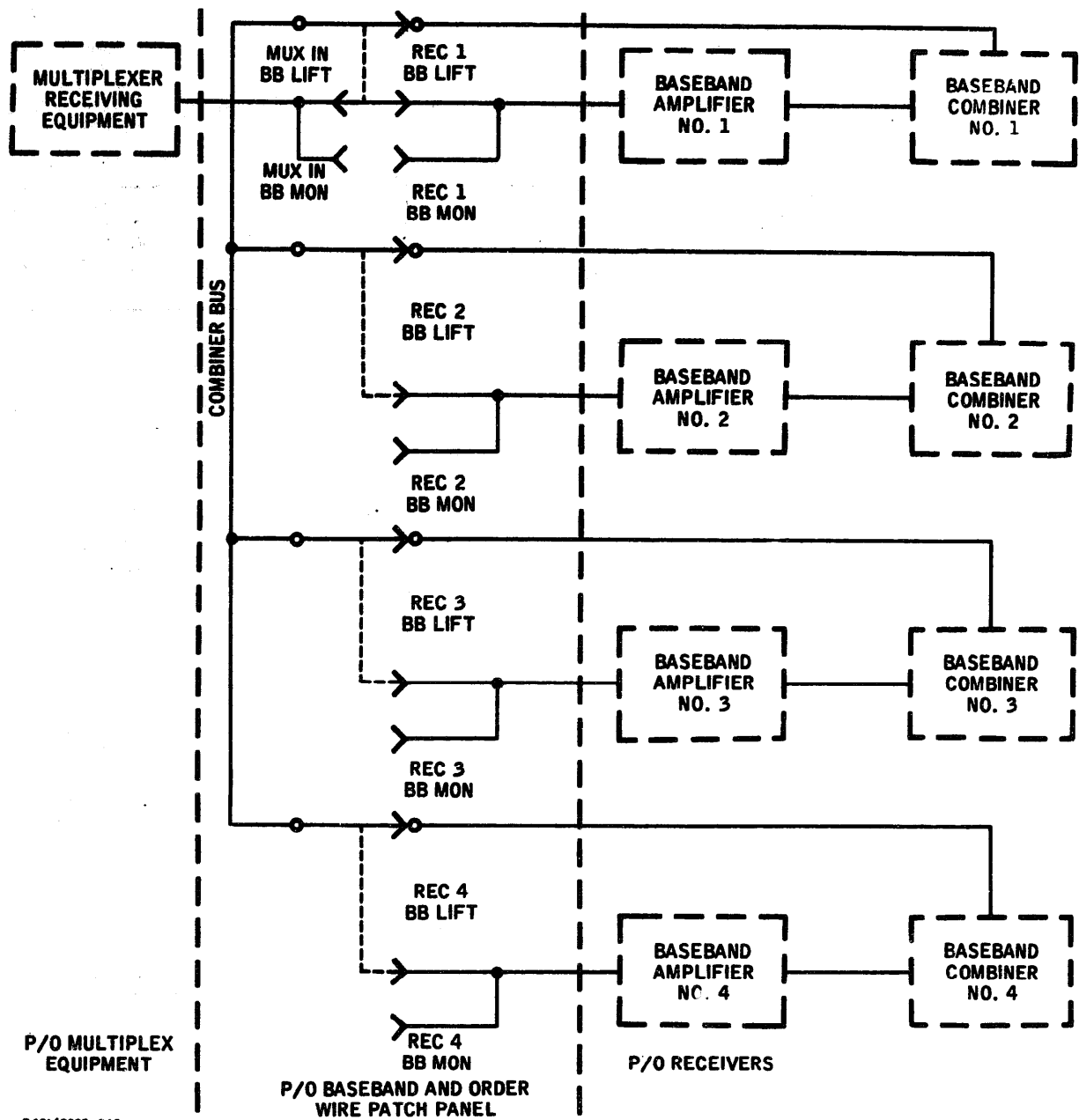


Figure 4-4. Baseband Patching, Receiving.

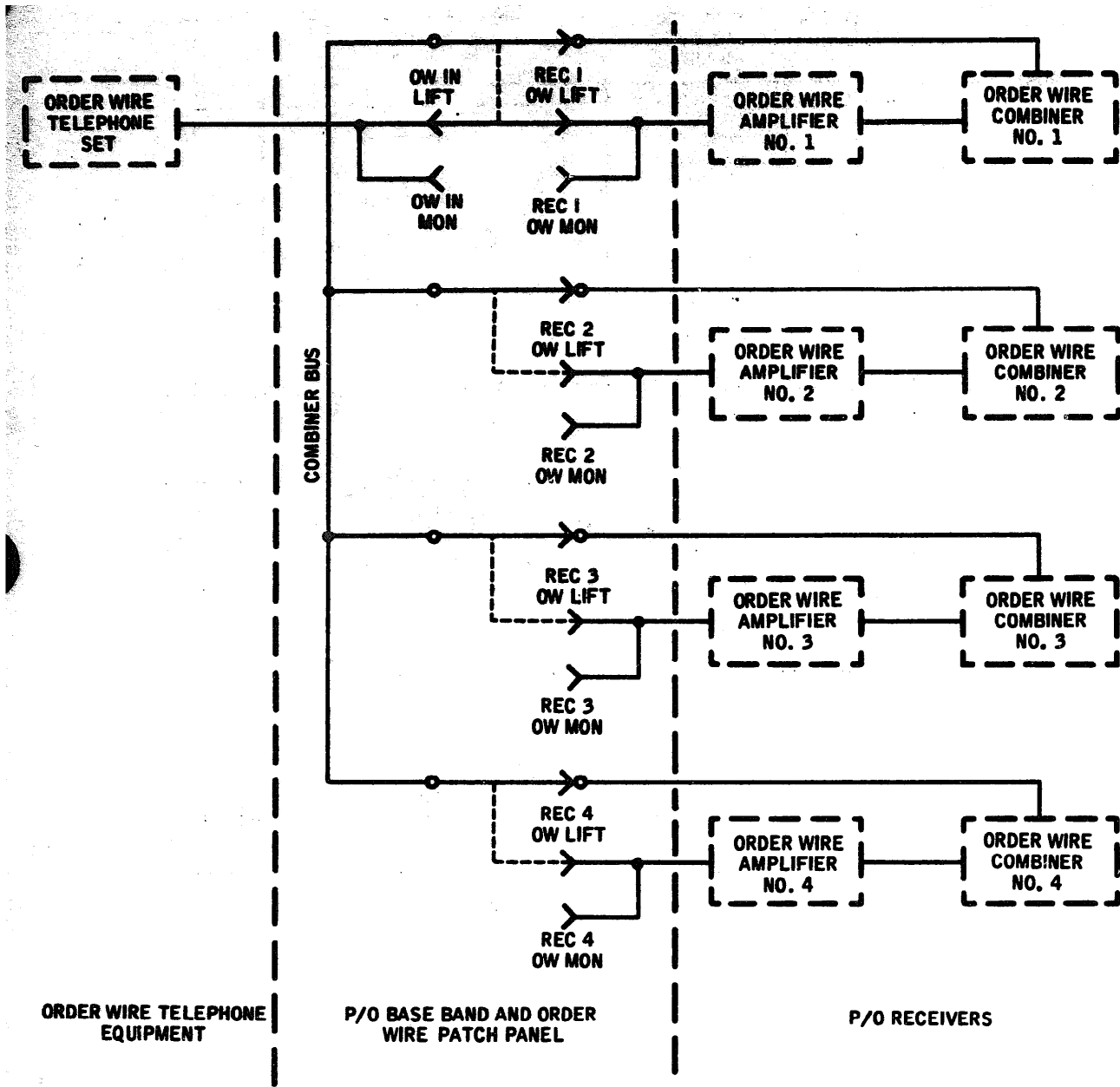
the 600-ohm output impedance of the order wire telephone set to the input impedance of each exciter.

4-75. Exciter Patch Panel

4-76

The exciter patch panel (fig. 4-8) provides a means of patching the rf output of the exciters to test equipment, a dummy load, or to the power

amplifiers located in the power amplifier van. The rf outputs of exciter 1 and exciter 2 are supplied to connector EXCITER OUTPUT 1 and connector EXCITER OUTPUT 2 on the exciter patch panel. A patch cable (W505) connects the rf output of exciter 1 from EXCITER OUTPUT 1 to either EXCITER DUMMY LOAD 1 or PWR AMP. IN 1. A patch cable (W507) connects the rf output of exciter 2 from EXCITER OUTPUT 2 to either EXCITER DUMMY LOAD 2 or PWR AMP. IN 2.



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Figure 4-5. Order Wire Patching, Receiving.

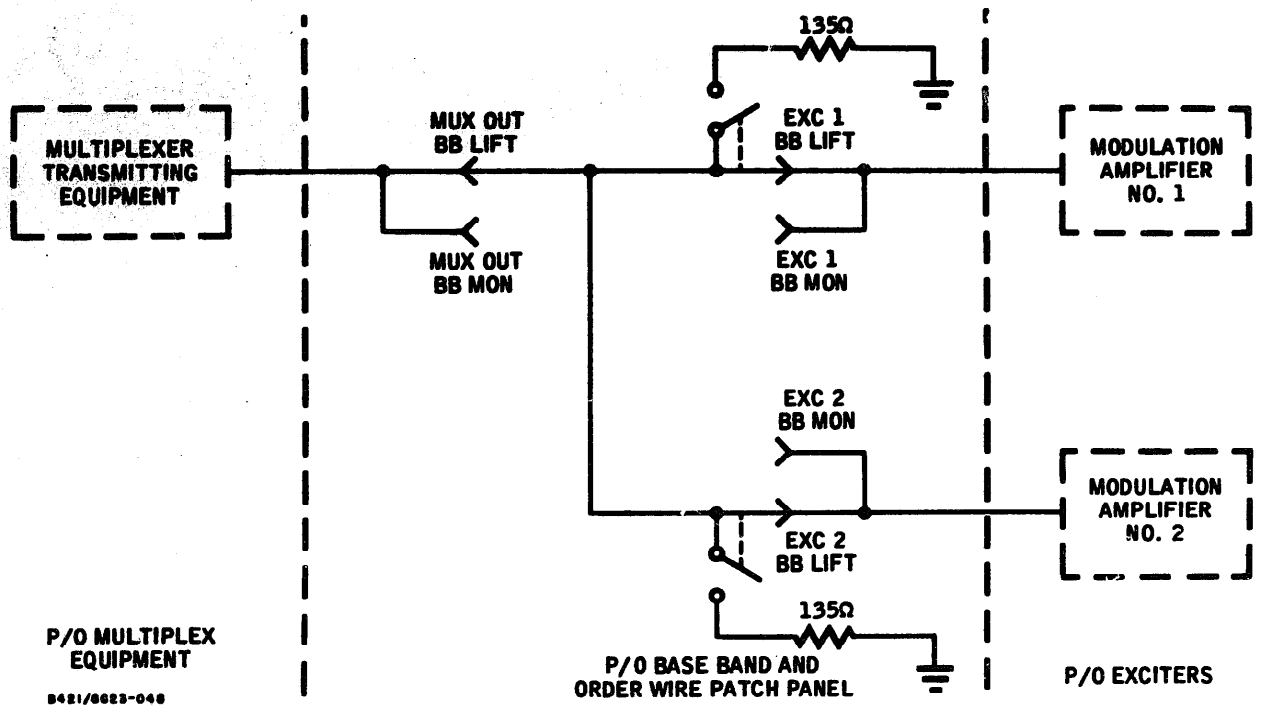


Figure 4-6. Baseband Patching, Transmitting.

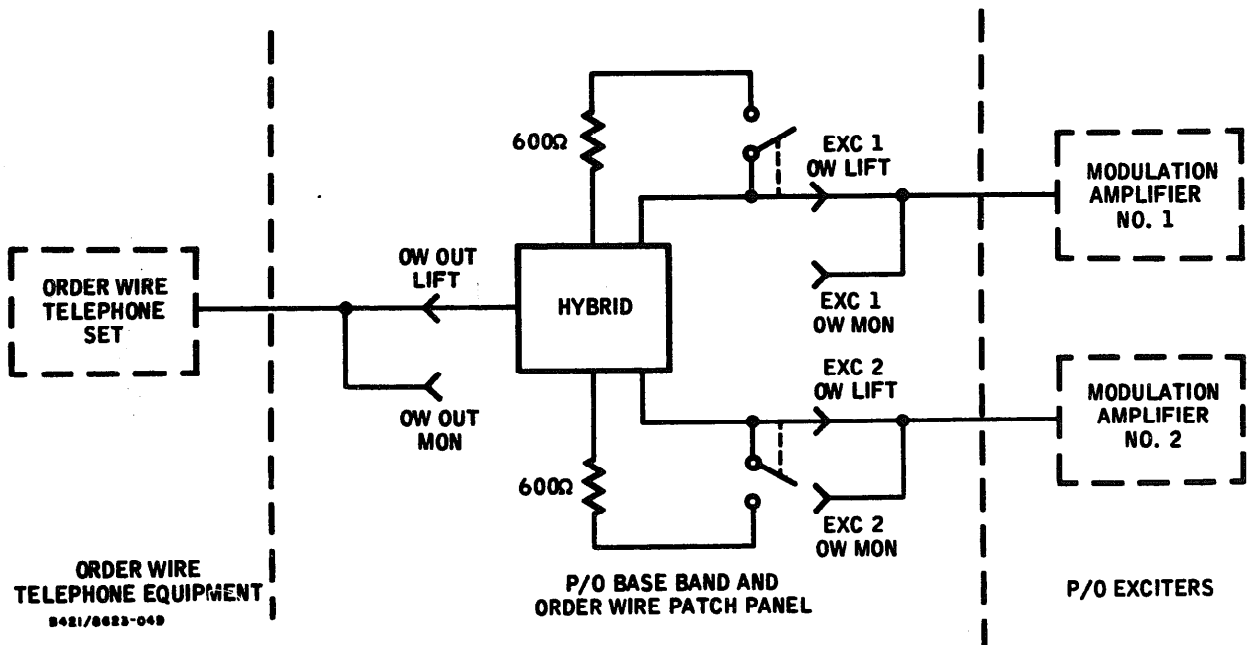


Figure 4-7. Order Wire Patching, Transmitting.



Figure 4-8. Exciter Patch Panel.

Section III. FUNCTIONAL OPERATION OF MECHANICAL ASSEMBLIES

4-77. General

This section contains a description of the functional operation of operations van mechanical assemblies. For a description of the functional mechanical operation of other equipment in the operations van, refer to the applicable equipment technical manual listed in Appendix A to this manual.

4-78. Air Brake System

4-79

When the operations van air brake system (fig. 4-9) is properly connected to the service brake system of the prime mover, the prime mover brake pedal operates the brakes on both vehicles. The service brakes are of the air-over-hydraulic type, with automatic breakaway protection. With the air hose couplings connected to the prime mover air system and the prime mover air shutoff cocks open, air fills the operations van air system to a pressure equivalent to that of the prime mover.

4-80. Brake Application

4-81

When the prime mover brake pedal is depressed, air pressure is directed through the service air line of the operations van to the emergency relay valve. This valve causes compressed air to be released from the air reservoir to the brake air chamber which is attached to the master cylinder. As the brake air chamber is pressurized, the motion of its diaphragm is transferred to the master cylinder piston which in turn causes the

wheel cylinder pistons to move outward, forcing the brakeshoes against the brakedrum.

4-82. Brake Release

4-83

When the prime mover brake pedal is released, a drop in pressure in the service air line of the operations van causes the emergency relay valve to release the compressed air from the brake air chamber. This allows the brake mechanism and the retracting springs in the brake air chamber to pull the brakeshoes away from the drum.

4-84. Air Hose Couplings

4-85

Air hose couplings are mounted on the front ends of the service and emergency air lines for connecting the operations van air brake system to the prime mover brake system. Another set of air hose couplings is provided at the rear of the operations van for connecting the operations van brake system to vehicles towed in tandem. When the air hose couplings are not connected, they are fitted with dummy couplings to prevent foreign matter from entering the system. Hooks are provided to mount the dummy couplings when they are not being used.

4-86. Air Cleaners

4-87

An air cleaner is connected into both the service and the emergency air lines to prevent moisture and foreign matter from entering the air brake system. Each air cleaner is provided with a drain plug and a replaceable filter element.

4-88. Air Reservoir

4-89

The air reservoir is a metal tank mounted in strap brackets on the center rear of the chassis. It is connected by an air line to the emergency relay valve to operate the operations van brakes. It is fitted with a drain cock to drain accumulated moisture and to release the air pressure in the brake system in the event of locked brakes, or when making repairs or adjustments on the brakes.

4-90. Emergency Relay Valve

4-91

The emergency relay valve (fig. 4-10) is mounted under the center rear of the operations van chassis. It speeds brake action by releasing air from the air reservoir directly to the brake air chamber. This eliminates loss of time that would result in sufficient air for brake operation had to travel from the prime mover to the brake air chamber. In addition, this valve controls the air flow to and from the air reservoir, and in the event of sudden loss of pressure in the emergency line (such as the operations van breaking away from the prime mover), automatically applies the brakes. The emergency relay valve is actuated by changes in air pressure in the service air line. These changes in air pressure are in direct proportion to the pressure applied to the brake pedal of the prime mover.

4-92

The emergency relay valve body consists of two sections separated by a check valve diaphragm and a relay valve diaphragm, and connected by three internal valves and a number of air passages. Ports are provided for connections to the emergency air line, service air line, air reservoir and brake air chamber, and to exhaust compressed air used for brake applications.

4-93

To provide service brake application, air entering the service air line inlet on top of the emergency relay valve flows down through a passage to the cavity on top of the relay valve diaphragm. Air pressure acting upon this diaphragm causes it and the plunger to move downward, closing the exhaust valve and opening the inlet valve. This allows air to flow from the air *reservoir to the brake air chamber. A small port permits air to

reach the underside of the relay valve diaphragm. This equalizes the' pressure on the diaphragm and holds the brake application in direct relation to the pressure applied on the prime mover brake pedal.

4-94

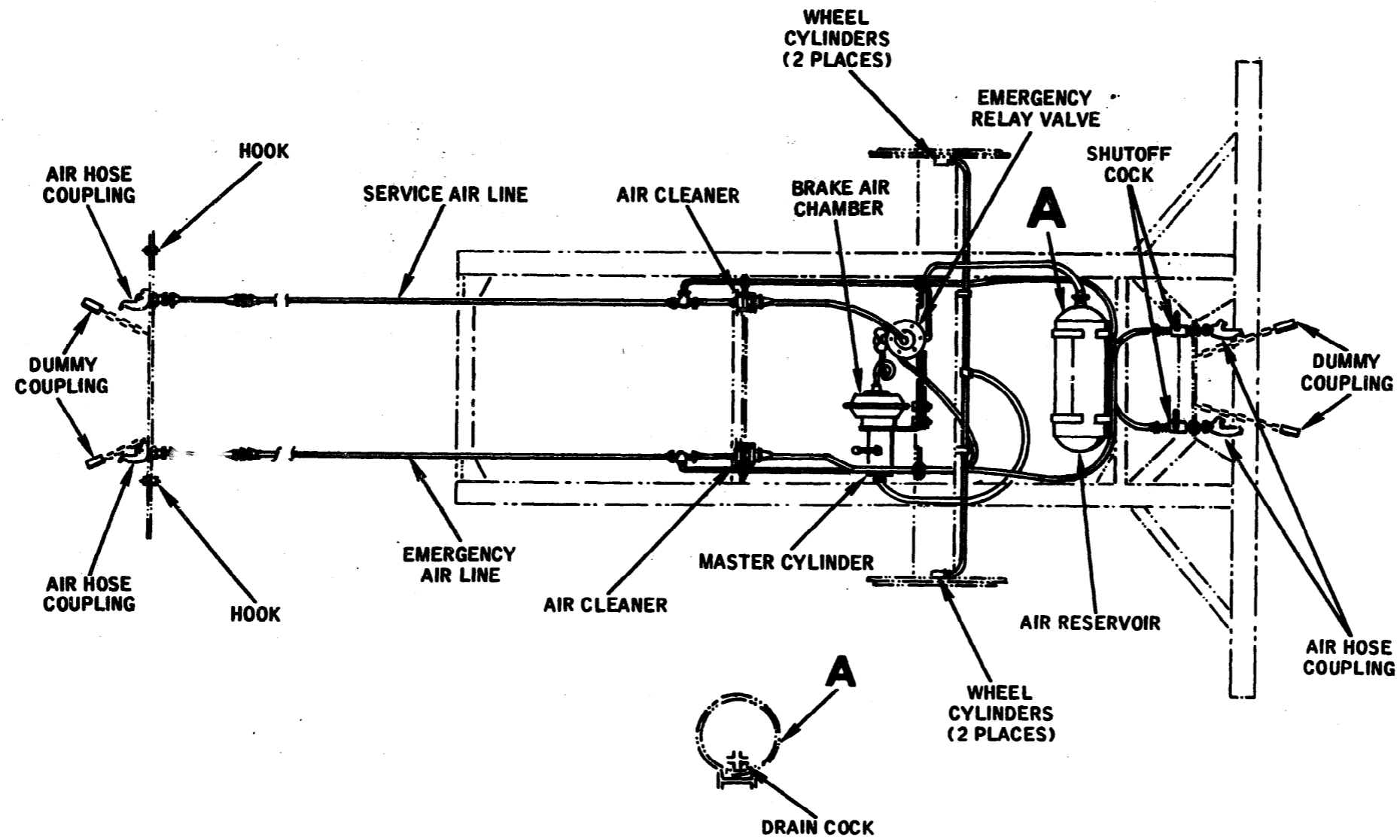
Releasing the prime mover brake pedal lowers the air pressure in the service air line, causing the relay valve diaphragm return spring and the air pressure under the relay valve diaphragm to lift the diaphragm and plunger. This action closes the inlet valve and opens the exhaust valves, thus permitting the air in the brake air chamber to enter the emergency relay valve and flow up through the hollow plunger and out the exhaust port. Whether all the air is released, or to what extent the brakes are applied, is determined by the amount of brake pedal application at the prime mover.

4-95

To fill the air reservoir on the operations van, air from the prime mover flows through the emergency air line inlet port near the bottom of the emergency relay valve, up a passage on one side of this valve, through the normally open check valve in the upper portion, down another passage on the other side of the emergency relay valve to a cavity at the bottom, and out through a line 'to the air reservoir.

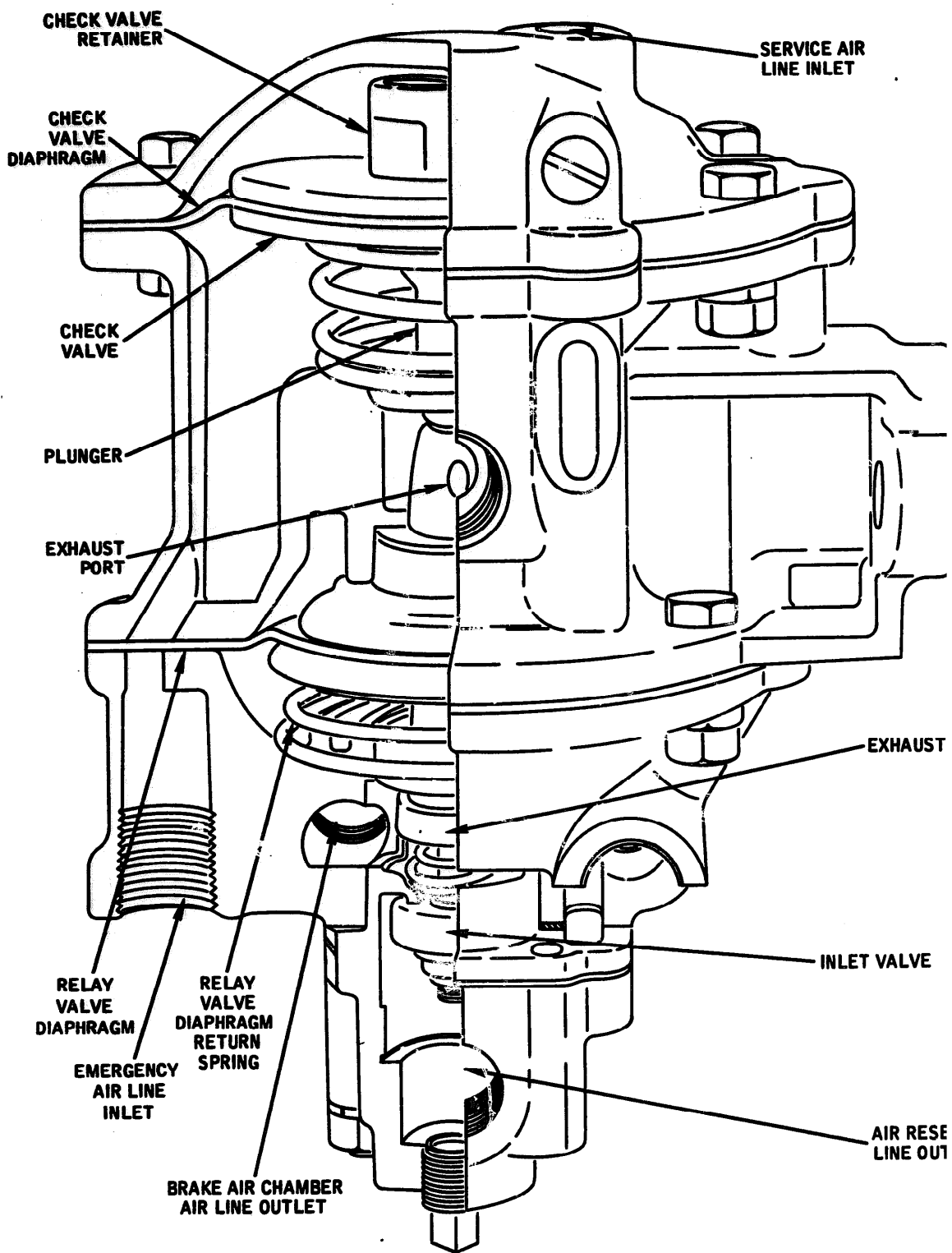
4-96

This roundabout passage of the air provides for operating the emergency feature of the emergency relay valve. If anything should cause a pressure drop-in the emergency air line, such as the operations van breaking away from the prime mover, the emergency air hose coupling being detached, or a serious leak developing in the emergency air line, the air in the air reservoir flows back through the passage of the emergency relay valve. In so doing, it closes the check valve at the top of the unit and applies pressure to the top of the check valve diaphragm. All diaphragms, connecting linkage and valves are pressed downward, closing the exhaust valve, opening the inlet valve and releasing air from the air reservoir to the brake air chamber to set the service brakes. The brakes may be released after an emergency application by hooking up the emergency air hose coupling or by bleeding off the air through the air reservoir petcock.



0421/0423-034

Figure 4-9. Operations Van Brake System.



9421/8823-036

Figure 4-10. Emergency Relay Valve.

4-97. Brake Air Chamber

4-98.

The brake air chamber (fig. 4-11), mounted to the front of the master cylinder, converts air pressure into mechanical motion to operate the master cylinder. The brake air chamber contains a diaphragm which is secured between the edges of the body and cover. The diaphragm is airtight and divides the brake air chamber into a nonpressure and a pressure side. The pressure side of the brake air chamber has only one opening, a threaded tube inlet to admit compressed air from the emergency relay valve. The nonpressure side is open to the atmosphere through a breather and inspection hole.

4-99.

A compression spring in the nonpressure side of the brake air chamber holds a push rod against the diaphragm and forces both the push rod and diaphragm into the pressure side of the brake air chamber when the prime mover brake pedal is released. One end of the push rod protrudes from the nonpressure side of the brake air chamber into the master cylinder. A rubber boot protects the push rod and piston end from foreign matter.

4-100.

When compressed air is admitted into the pressure side of the brake air chamber, the diaphragm forces the push rod into the nonpressure side. As the push rod moves rearward, it contacts the master cylinder piston, displacing the piston and causing a build-up of hydraulic pressure. When the air pressure is relieved, the compression spring returns the push rod to released position, which in turn forces the diaphragm toward the pressure side of the chamber.

4-101. Master Cylinder

4-102.

The master cylinder (fig. 4-11) is attached to the brake air chamber and is mounted on a bracket under the center rear of the operations van chassis. The master cylinder converts movement of the brake air chamber push rod into hydraulic pressure to apply the brakes. Pressure applied from the push rod displaces a piston inside the master cylinder, creating hydraulic pressure in proportion to the push rod pressure. The body of the master cylinder is divided into two chambers. The upper chamber serves as a reser-

voir for brake fluid, the lower chamber as a horizontal cylinder. The reservoir chamber is fitted with a filler opening and cap at the top. An inlet port and a bypass port connect the reservoir and cylinder.

4-103.

The cylinder bore is fitted with a piston with a rubber primary cup at its head, a piston return spring and a check valve. The piston end of the cylinder is sealed with a secondary cup to prevent fluid from leaking out; the other end has a threaded opening through which fluid passes to and from wheel cylinders.

4-104.

When the brake air chamber push rod presses against the master cylinder piston, the piston moves toward the threaded opening. A very slight movement causes the piston and cup to close the bypass port. When the pressure stroke starts, fluid is forced through the threaded opening into wheel cylinders.

4-105.

When push rod pressure is released, the piston return spring in the cylinder pushes the piston back toward its former position and fluid returns to the master cylinder from the wheel cylinders. Any loss of fluid in the master cylinder is compensated by fluid which flows from the reservoir through the inlet port and the bypass port.

4-106.

With the piston in released position, the primary cup is held against the piston and the bypass port is open. This prevents pressure from building up due to expansion of the fluid, or permits additional fluid to enter the cylinder to make up for loss or contraction. Brake air chamber push rod travel must be kept within definite limits to prevent blocking of the bypass port. (Refer to Chapter 5, para 5-73.)

4-107. Wheel Brake Mechanism

4-108.

The wheel brake mechanism (fig. 4-12) is located within the brakedrum and is supported by a spider which bolts to the axle flange. Each wheel brake mechanism has two brakeshoes, surfaced with brake lining. Two wheel cylinders are mounted between the ends of the two shoes. Hydraulic pressure moves the wheel cylinder pistons

outward, causing the brakeshoe linings to press against the inside of the brakedrum. Four shoe retracting springs draw and hold the brakeshoes

away from the brakedrum when the hydraulic pressure is released. The brakeshoe guide bolts regulate movement of the brake shoes.

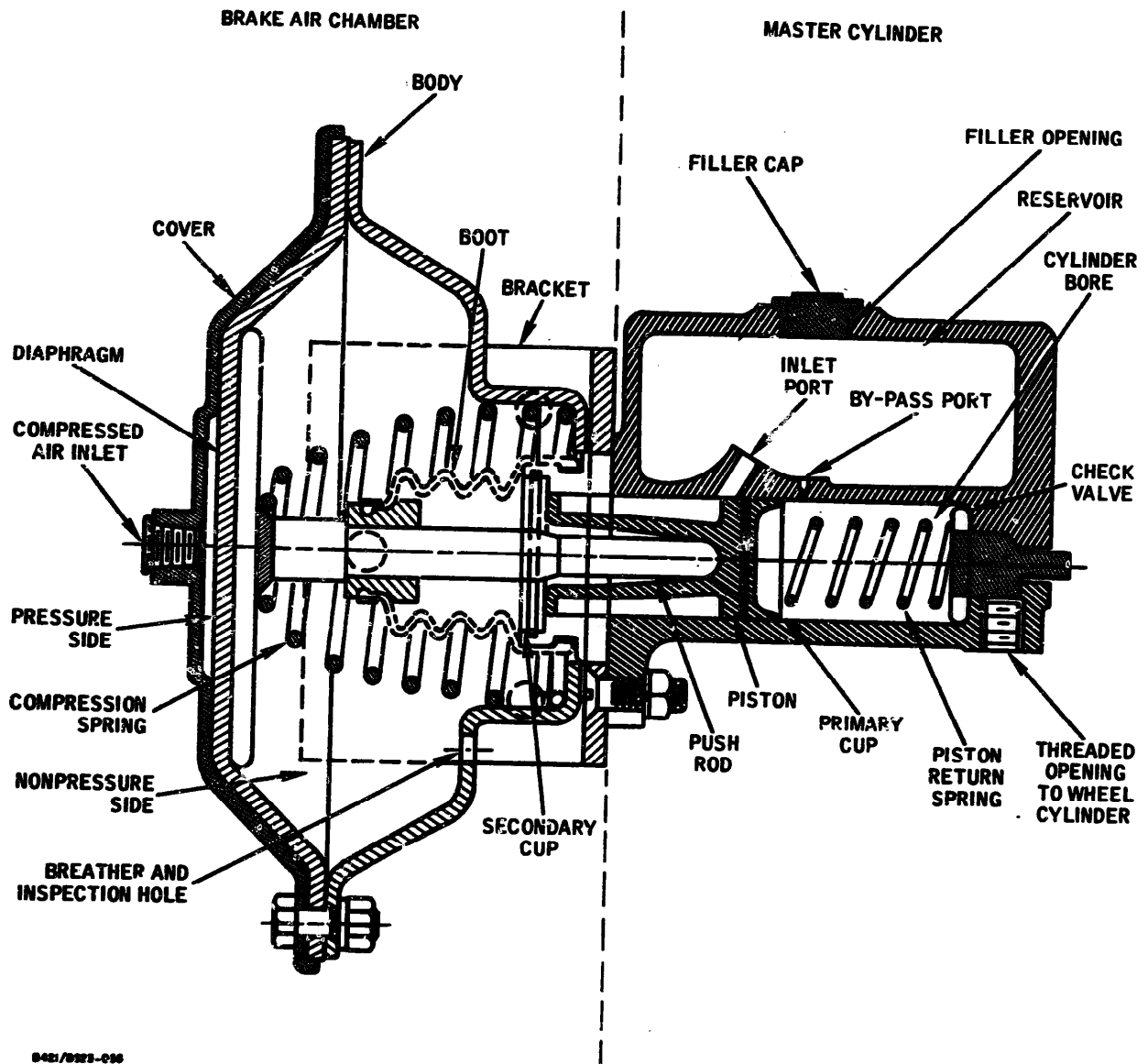


Figure 4-11. Chamber and Master Cylinder

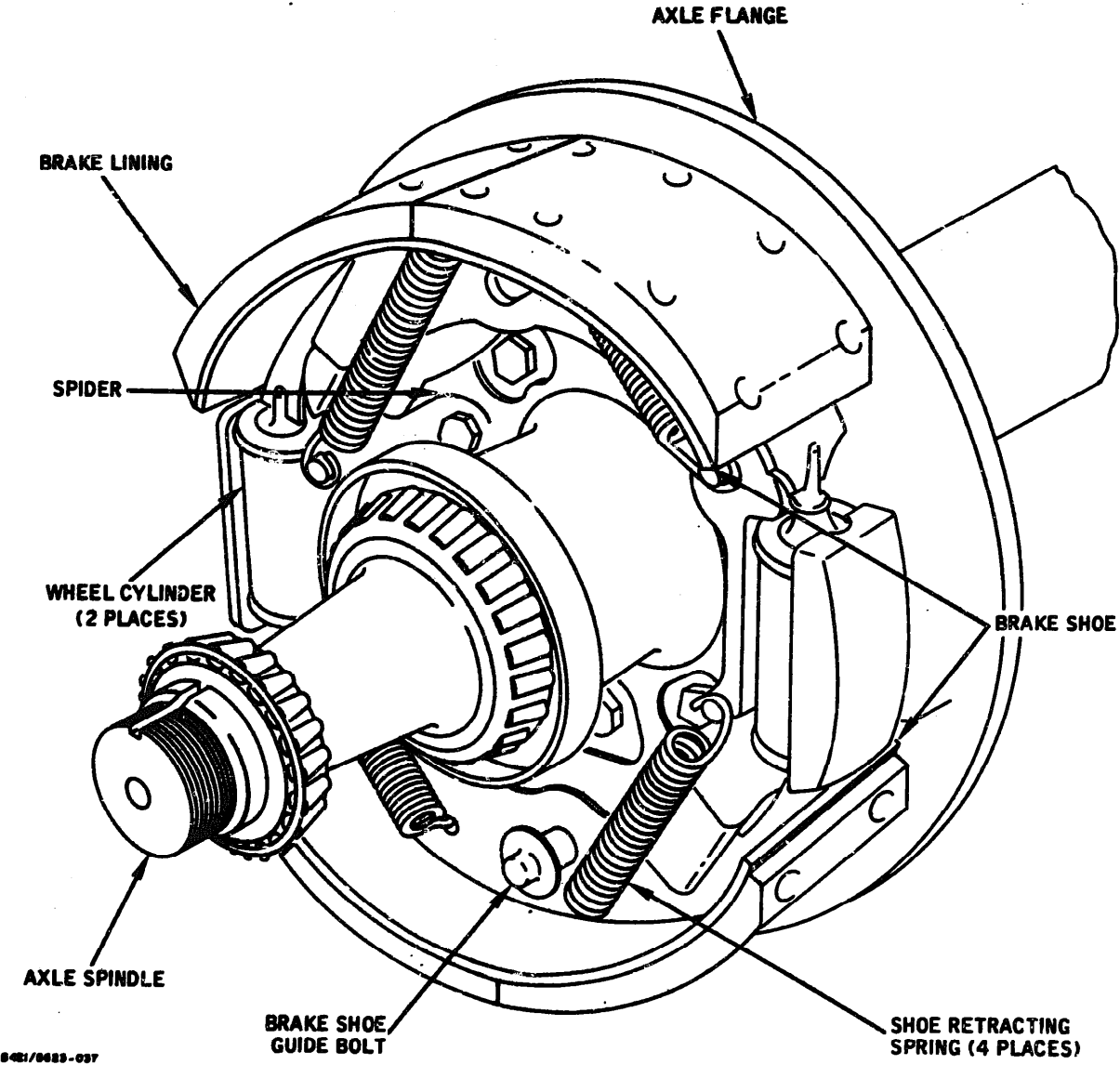


Figure 4-12. Wheel Brake Mechanism

CHAPTER 5
MAINTENANCE

5-1. Introduction

This chapter contains the instructions required to maintain the operations van (Radio Set Group OA-6997(V)/MRC-85(V)2). Section I of this chapter establishes standardized work methods and simplified step-by-step job instructions for preventive maintenance of this equipment. Sec-

tion II contains instructions for organizational/depot maintenance procedures which supplement those given in Section I. Also included in Section II are removal and replacement procedures for the equipment. Section III, Special Maintenance, contains data for maintenance not normally accomplished at organizational/field level.

Section I. PREVENTIVE MAINTENANCE

5-1.1. General

These routines are supplemented with the instructions in Section II. Table 5-0.1 lists the preventive maintenance routines, along with a recommended schedule for accomplishment. The intervals are based on continuous operation of the equipment.

5-1.2

This section contains the routines required for preventive maintenance of the operations van.

Table 5-0.1. Preventive Maintenance Routines

Routine	Interval	Paragraph
Power Monitor Meter Checks	Daily	5-1.3
Operations Van Power Turn-On and Turn-Off Procedure	As required	5-1.5
Winding and Setting Clock	Weekly	5-1.7
Roadside Radios Rod Adjustment	Before connection to towing vehicle, then every 10,000 miles	5-1.9
Operations Van Leveling	As required	5-1.11
Inspection and Cleaning of Operations Van Interior	Weekly	5-1.13
Operations Van Exterior Inspection and Cleaning	Weekly	5-1.17
Pioneer Kit Inspection and Cleaning	Monthly	5-1.21
First Aid Kit Inspection	Monthly	5-1.25
Lantern and Flashlight Inspection	Monthly	5-1.27
Fire Extinguisher Inspection	Monthly	5-1.29
Tarpaulin Inspection and Cleaning	Monthly	5-1.31
Tire Inspection	Monthly	5-1.35
Lubrication	Semiannually	5-1.37
Replenishing Hydraulic Brake Fluid	Semiannually	5-1.41
Air Brake System Moisture Drainage	Semiannually	5-1.45
Air Cleaners Inspection and Cleaning	Semiannually	5-1.47
Air Brake System Inspection	Semiannually	5-1.51
Bleeding Brakes	Semiannually	5-1.55
Stop and Running Lights Inspection	Semiannually	5-1.59
Emergency Lighting Inspection	Semiannually	5-1.61

5-1.3. Power Monitor Meter Checks

a. Turn power monitor switch on the power monitor to PHASE A. The VOLTAGE meter should read between 114 volts ac and 126 volts ac.

5-1.4

The purpose of this routine is to determine that the primary ac power input to the operations van is within acceptable limits. Proceed as follows:

b. Turn the power monitor switch to PHASE B. The VOLTAGE meter should read the same as in step a.

c. Turn the power monitor switch to PHASE C. The VOLTAGE meter should read the same as in step a.

d. Observe the FREQUENCY meter. The FREQUENCY meter should read between 58 cycles per second and 62 cycles per second.

e. Turn the power monitor switch to OFF.

5-1.5. Operations Van Power Turn-On and Turn-Off Procedure

5-1.6

The purpose of this routine is to turn on or turn off the primary ac power which energizes the various components of the operations van. Proceed as follows:

a. Turn-on procedure is as follows:

CAUTION

Do not apply primary power to the operations van until steps a(1) through a(4) have been performed.

(1) Set all circuit breakers in distribution box to OFF.

(2) Check that the SELECTOR SWITCH on air conditioner remote control box is set to OFF.

(3) Check that power switches on the remaining equipment in the operations van are set to OFF.

(4) Check that power cable is connected to the operations van.

NOTE

Circuit breakers are located in distribution box unless otherwise indicated.

(5) Set MAIN CIRCUIT BREAKER located on curbside wall to ON.

(6) Rotate the power monitor switch on the power monitor through each position. Check that FREQUENCY meter indicates approximately 60 cycles per second and VOLTAGE meter indicates approximately 120 volts ac at each position.

(7) Set VAN LIGHTS circuit breakers to ON and operate light switches S502 and S504 located under power monitor of S503 and S505 on rear wall of operations van. Check that each bank of ceiling lamps illuminates.

(8) Set S1 DIESEL NO. 1 ALARM switch and S2 DIESEL NO. 2 ALARM switch on alarm-monitor to ON.

(9) Set AIR CONDITIONER NO. 1 circuit breaker and AIR CONDITIONER NO. 2 circuit breaker to ON.

(10) Set CONVENIENCE OUTLET (EXTERNAL) circuit breakers to ON. Primary ac power should now be available at weatherproof duplex outlets on operations van exterior walls.

(11) Set CONVENIENCE OUTLET (INTERNAL) circuit breaker to ON. Primary ac power should now be available at convenience outlets on operations van interior walls.

(12) Set INDICATOR, FAULT LOCATING NO. 1 circuit breaker and INDICATOR, FAULT LOCATING NO. 2 circuit breaker to ON.

(13) Set VFTG circuit breaker and VFTG RECORDER AND AUX EQUIP breaker to ON.

(14) Set MUX circuit breaker to ON.

(15) Set AUDIO and TEL SET circuit breaker to ON.

(16) Turn PERF. MON BAY NO. 1 circuit breaker and PERF. MON BAY NO. 2 circuit breaker to ON.

(17) Set TEST EQUIPMENT RACK & J509 circuit breaker to ON.

NOTE

Primary ac power is now available throughout operations van.

b. To turn off a single equipment, the procedure is as follows:

(1) Perform the turn off procedure for the selected equipment.

(2) Set associated circuit breaker located on the distribution box to OFF.

c. To turn off entire operations van, the procedure is as follows:

(1) Perform the turn off procedure for the individual equipments.

(2) Set all circuit breakers on distribution box to OFF.

(3) Set MAIN CIRCUIT BREAKER located on curbside wall of operations van to OFF.

5-1.7. Winding and Setting Clock

5-1.8

The purpose of this routine is to wind the clock and set it to a time standard. Receiver (Hammarlund SP-600 (or equivalent), Federal stock No. 5820-505-2255 is required.

- a. Loosen locking nut, located on left side of clock, which secures hinged bezel.
- b. Swing bezel to left.
- c. Attack key to square winding shaft protruding through clock.
- d. Wind clock being careful not to overwind.
- e. Remove key.
- f. Tune receiver to time standard such as WWV (5 mc, 10 mc, 15 mc).
- g. Adjust hands on clock to coincide with time indicated by the time standard.
- h. Close bezel.
- i. Secure bezel with locking nut.

5-1.9. Radius Rod Adjustment

5-1.10

The purpose of this routine is to adjust the operations van roadside radius rod. The materials required for this adjustment are a wheel nut wrench, a steel measuring tape, and an open end wrench.

WARNING

Before performing this routine, insure that both landing gear shoes are resting firmly on the ground, crank handles on both gear boxes are in the out position, and wheel chocking blocks are in place.

NOTE

The nuts on the curb side of the opera-

tions van are marked R and have right-hand threads; the nuts on the roadside are marked L and have left-hand threads. The nuts must be turned in the opposite direction from the normal forward rotation of the wheel to be loosened or removed.

- a. Using the wheel nut wrench, loosen the six outer hexagon wheel nuts and the six square wheel cap nuts on each side of the operations van.
- b. Remove two bars in operations van tool box.
- c. Insert bars through threaded shaft of leveling jacks.
- d. Rotate bars, raising the operations van, until tires clear the ground.
- e. Remove outer wheel hexagon nuts and then remove outer wheels.
- f. Remove inner wheel square cap nuts and then remove inner wheels.

g. Using the measuring tape, measure distance between the center point of the king pin and center point of each end of the axle spindle. (See fig. 5-0.1.)

h. If distances measured in step e are not within 1/16 inch of the other, loosen the locking bolt at each end of roadside rod and adjust roadside radius rod left or right as necessary until this condition is satisfied. (See fig. 5-0.2.)

i. Tighten locking bolts.

j. Replace the inner wheels and the square cap nuts.

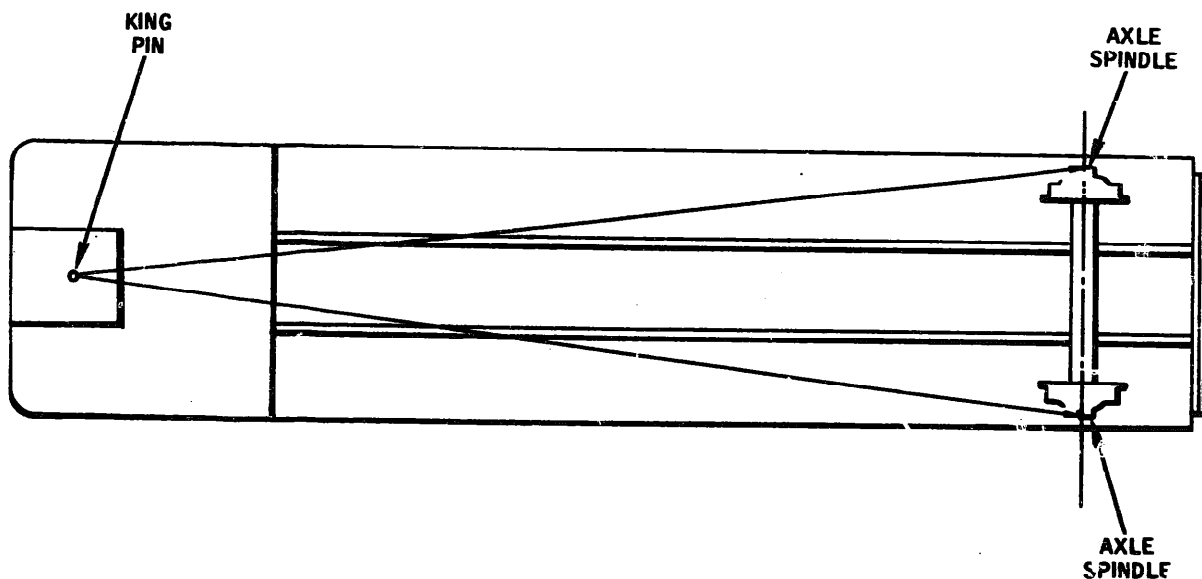


Figure 5-0.1. Roadside Radius Rod Measurements.



Figure 5-0.2. Roadside Radius Rod.

k. Replace the outer wheels and the hexagon nuts.

l. Tighten the wheel nuts.

m. Lower the operations van by performing the reverse of steps *b* through *d*.

5-1.11. Operation Van Leveling

5-1.12

The purpose of this routine is to level the operations van. Leveling jack bars are required for this procedure.

WARNING

Before performing this routine, insure that both landing gear shoes are resting firmly on the ground and wheel chocking blocks are in place.

a. Remove the two leveling jack bars clamped in operations van tool box by unscrewing wing nut that holds clamp and bars.

b. Insert bars through hole in the threaded shaft of leveling jacks.

c. Remove landing gear crank handles from their supports.

d. Insert each landing gear crank handle into its two-speed gear box.

e. Select speed of travel. Pull out landing gear crank handle for low-speed travel. Push in landing gear crank handle for high-speed travel.

f. Set ratchet on landing gear crank handle to operate in desired direction.

g. Observe bench levels mounted on front, rear, and both sides of the operations van. Rotate landing gear crank handles and operate leveling jack bars until bench levels indicate that operations van is level.

h. Remove landing gear crank handles and insert them into their supports.

i. Replace leveling jack bars in operations van tool box.

5-1.13. Inspection and Cleaning of Operations Van Interior

5-1.14. General Information

a. The purpose of this routine is to provide a general inspection and cleaning procedure for the operations van interior.

b. Avoid the displacement of wires, parts and

cables during inspection and cleaning. Where cleaning space is limited, carefully use a vacuum cleaner as a blower to dislodge dust and foreign matter.

c. In the performance of this routine, you are expected to remove all dirt, dust and corrosion found during inspection.

d. Solvent is only to be used for removing corrosion.

WARNING

Prolonged contact of skin with cleaning solvent, or inhalation of fumes is dangerous. Adequate ventilation must be provided.

e. Where dry cleaning is necessary, you must determine whether a cleaning cloth, brush, or vacuum cleaner is required. (In some instances, you may have to use all three.)

5-1.15. Materials Required

a. Vacuum cleaner, hand type.

b. Clean, dry, lint-free cloths.

c. Brush.

d. Solvent, Federal Specification P-S-661.

e. Sponge.

f. Soap and water solution.

5-1.16. Procedure

WARNING

To prevent burns or shock, avoid contact with exposed wires, terminals, and heated parts such as glass envelopes of tubes, power transformers and high-wattage resistors.

<i>Inspect—</i>	<i>For—</i>	<i>Inspect—</i>	<i>For—</i>
Walls and overhead	Evidence of leakage Damaged paneling	Desk	Damaged surface Insecure mounting
Floor	Damaged linoleum Loose or damaged tie-downs	Chairs	Ripped or torn upholstery Improper operation Loose or missing hardware
Workbench	Insecure mounting Damaged surface Improper operation of vise	Storage areas	Insecure mounting Loose or missing hardware Physical damage Illegible markings on nameplates
Wiring	Frayed, broken, or burned insulation Pinched or broken leads Disconnected leads	Panels and covers	Loose or missing hardware Physical damage Illegible marking on nameplates
Connectors and receptacles	Insecure mounting Bent or missing pins Damaged shells	Fuse and fuseholder	Missing fuses Improper fuse rating Damaged fuseholder Insecure mounting
Cables	Damaged insulation Improper routing Kinking or twisting Loose or damaged cable clamps	Indicator lamps and sockets	Missing lamps Damaged socket Damaged or missing lenses Insecure mounting
Terminal boards	Breaks, cracks, or loose terminals Insecure mounting	Toggle switches and circuit breakers	Damaged connections Insecure mountings Improper switching action
Panel controls	Loose or missing controls Improper switching action	Rotary switches	Broken or cracked wafers Loose or broken contacts Improper tracing of contact surfaces Improper switching action Insecure mounting
Panel meters	Cracked, broken, or missing meter glass Damaged or frozen connections Illegible index or scale markings		

5-1.17. Operations Van Exterior Inspection and Cleaning

5-1.18. General Information

a. The purpose of this routine is to inspect and clean the exterior of the operations van.

b. Solvent is only to be used for removing corrosion.

c. The approximate time required for the performance of this routine is 1 man-hour.

5-1.19. Materials Required

a. Soap and water solution.

b. Garden hose with pressure nozzle.

c. Sponge.

d. Solvent, Federal Specification P-S-611.

WARNING

Prolonged contact of skin with cleaning solvent, or inhalation of fumes is dangerous. Adequate ventilation must be provided.

e. Clean, dry cloths.

5-1.20. Procedure

WARNING

Before performing this routine, insure that both landing gear shoes are resting firmly on the ground, crank handle on both gear boxes are in the out position, and wheel chocking blocks are in place.

a. Inspect the operations van exterior for rust, corrosion, paint blisters and scratches. Remove rust and corrosion as necessary.

b. Clean underside of operations van by rinsing with clean water. Remove excess grease and oil with solvent.

c. Apply soap solution to exterior walls with a sponge and rinse well with clean water.

d. Inspect operations van exterior for loose or damaged connectors, covers, panels and stowed equipment.

5-1.21. Pioneer Kit Inspection and Cleaning

5-1.22. General Information

a. The purpose of this routine is to inspect and clean the pioneer kit.

b. Report all abnormal conditions encountered in the performance of this routine to the Maintenance Supervisor.

c. Solvent is only to be used for removing corrosion.

d. The approximate time required for the performance of this routine is 10 minutes.

5-1.23. Materials Required

a. Preservative lubricating oil, Federal Specification VV-L-8208.

b. Clean, dry cloths.

c. Solvent, Federal Specification P-S-661.

WARNING

Prolonged contact of skin with cleaning solvent, or inhalation of fumes is dangerous. Adequate ventilation must be provided.

5-1.24. Procedure

a. Remove pioneer kit from curbside wall of operations van and inspect the shovel, axe and pick for cracked or broken handles.

b. Remove all dirt and rust and apply a thin coat of preservative lubricating oil to exposed metal parts.

c. Replace pioneer kit in its mounting brackets.

5-1.25. First Aid Kit Inspection

5-1.26

The purpose of this routine is to determine whether the first aid kit contains the required items. Proceed as follows:

a. Remove first aid kit from its mounting bracket on forward wall of operations van.

b. Inspect first aid kit for the following contents:

- 5 gauze bandages, 1 in. × 10 yds
- 8 gauze bandages, 2 in. × 10 yds
- 3 gauze bandages, 3 in. × 10 yds
- 4 surgical gauze, 1 sq yd each
- 4 U.S.P. absorbent cotton, 1/2 oz
- 2 Wet-Pruf adhesive tape, 3-cut
- 100 Curad adhesive bandages, 3/4 inch
- 1 tincture merthiolate (Lilly), 2 oz
- 1 aromatic spirits of ammonia, 2 oz
- 1 boric acid (4% sol.), 1-1/2 oz
- 1 castor oil, 2 oz
- 2 petrolatum with 3% sodium bicarbonate, 3 oz
- 12 gauze pads, 2 in. × 2 in.

- 15 gauze pads, 3 in. × 3 in.
- 1 triangular bandage, 40 in.
- 1 tourniquet
- 12 cotton wound applicators, 6 1/2 in.
- 2 metal wall hooks
- 12 tongue depressors
- 2 small wooden splints
- 2 large wooden splints
- 1 graduated medicine glass
- 1 medicine dropper
- 3 paper drinking cups
- 1 scissor
- 1 tweezer
- 1 first aid handbook

c. Replace first aid kit in its mounting bracket.

5-1.27. Lantern and Flashlight Inspection

5-1.28

The purpose of this routine is to determine whether the lantern and flashlight are operative. Proceed as follows:

a. Remove lantern from its mounting bracket on operations van forward wall.

b. Remove batteries.

c. Inspect lantern for corrosion and damaged or missing parts.

d. Install batteries.

e. Turn on lantern and observe lamp. The lamp should be brilliant.

f. Replace lantern in its mounting bracket.

g. Repeat steps a through f for flashlight.

5-1.29. Fire Extinguisher Inspection

5-1.30

The purpose of this routine is to determine whether the fire extinguisher is fully charged. A spring scale (0-25 pound capacity) is required.

a. Remove fire extinguisher from its mounting bracket.

b. Place fire extinguisher on spring scale and observe its weight. The fire extinguisher should weigh 15-1/2 pounds. Recharge with CO₂ as necessary.

c. Install fire extinguisher in its mounting bracket.

5-1.31. Tarpaulin Inspection and Cleaning

5-1.32. General Information

a. The purpose of this routine is to determine whether the tarpaulin is in serviceable condition.

b. The approximate time required for the performance of this routine is 24 hours.

5-1.33. Materials Required

a. Bar of issue soap.

b. Approved fungus-mildew resistant solution, MIL-D-10860.

c. Brush.

5-1.34. Procedure

a. Shake out tarpaulin thoroughly to remove all loose dirt. Air tarpaulin for several hours.

b. Inspect tarpaulin for mildew and remove any mildew with a dry brush.

c. Inspect tarpaulin for evidence of rotting and damaged fabric. Replace tarpaulin if necessary.

d. Remove oil and grease from tarpaulin by scrubbing with issue soap and warm water. After washing, rinse well with clean water and dry.

e. Inspect tarpaulin for loose or broken grommets and rips or tears in the fabric.

f. If tarpaulin is serviceable, re-treat with approved fungus-mildew resistant solution.

5-1.35. Tire Inspection

5-1.36

The purpose of this routine is to determine whether the tires, including spares, are in satisfactory condition. A tire gauge is required.

WARNING

Before performing this routine, insure that both landing gear shoes are resting firmly on the ground, crank handles on both gear boxes are in the out position, and wheel chocking blocks are in place.

a. Carefully inspect tires for penetrating objects, stones, cuts, abrasions, evidence of unusual wear, and missing valve caps.

b. Remove any penetrating objects or stones from tires.

c. Remove valve caps and gauge tires for proper pressure under any of the following conditions:

(1) Standby, 60 psi.

- (2) Highway driving, 70 psi.
- (3) Cross-country driving, 50 psi.

d. Inflate or deflate tires to correct pressure as necessary.

e. Replace valve caps.

5-1.37. Lubrication

5-1.38. General Information

a. The purpose of this routine is to lubricate all moving parts and exposed metal surfaces of the operations van.

b. The approximate time required for the performance of this routine is 1 man-hour.

5-1.39. Materials Required

a. Automotive lubricating grease, Federal Specification VV-G-632.

b. Preservative lubricating oil, Federal Specification VV-L-8208.

c. One quart solvent, Federal Specification P-S-661.

WARNING

Prolonged contact of skin with cleaning

solvent, or inhalation of fumes is dangerous. Adequate ventilation must be provided.

d. Clean, dry, lint-free cloths.

e. Grease gun, hand.

f. Oiler, hand.

g. Wrench, open-end, 5/16-inch.

5-1.40. Procedure

WARNING

Before performing this routine, insure that both landing gear shoes are resting firmly on the ground, crank handles on both gear boxes are in the out position, and wheel chocking blocks are in place.

a. Clean lubricating fittings with solvent and dry with a clean cloth before lubricating.

b. Using a grease gun containing automotive lubricating grease, fill grease fittings on landing gears (fig. 5-0.3), locks of personnel ladders (fig. 5-0.4), and pintle hooks (fig. 5-0.3).

c. Wipe off all excess grease on exterior of grease fittings and surrounding areas with a clean cloth.

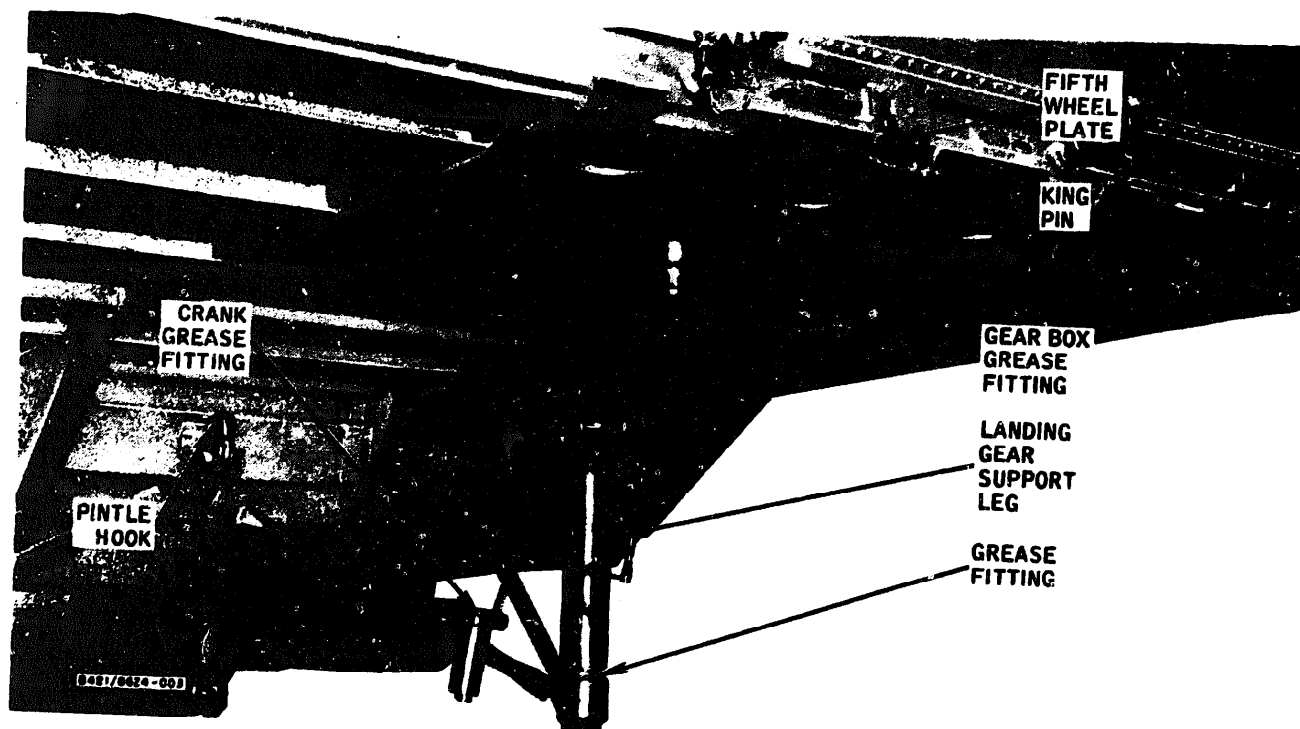


Figure 5-0.3. Operations Van Forward Lubrication Points

d. Using a hand oiler, lubricate leveling jack screws (fig. 5-0.5) with preservative lubricating oil.

e. Lubricate all door hinges, latches, and the landing gear crankshaft with preservative lubricating oil.

f. Apply automotive lubricating grease by hand to cover king pin and fifth wheel plate (fig. 5-0.3).

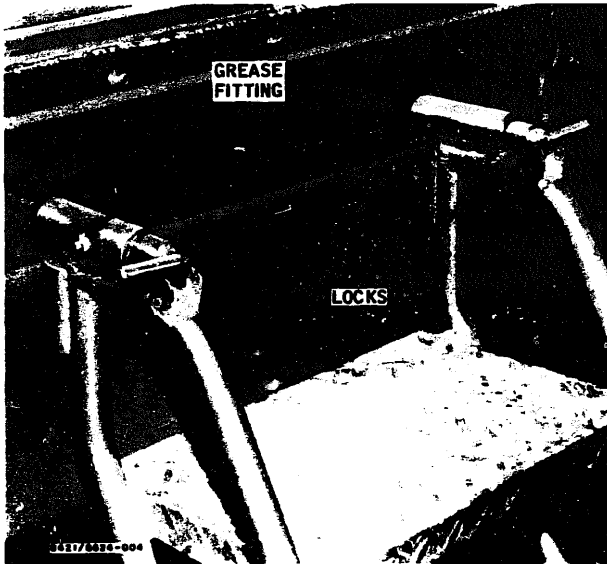


Figure 5-0.4. Personnel Ladder Lubrication Points.

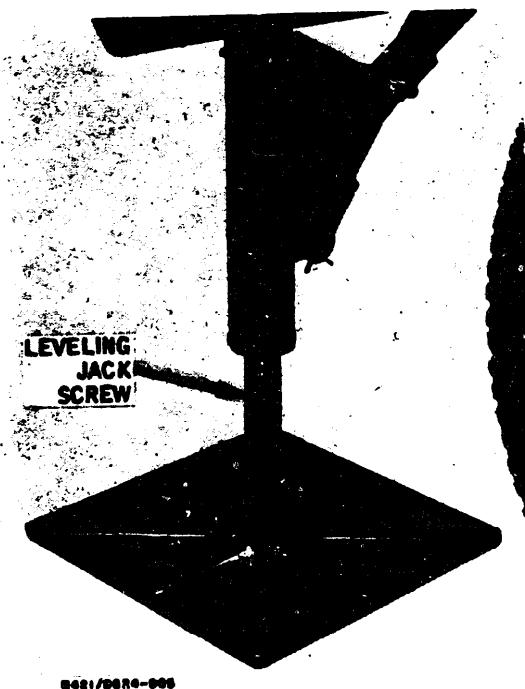


Figure 5-0.5. Leveling Jack Screw

g. Remove hubcaps and lightly coat inside of caps with grease. Replace hubcaps.

h. Apply lubricating oil to all unfinished metal surfaces of operations van, tools, tool box, and equipment stored under van, with exception of ladders, folding steps and walking surfaces of platforms.

5-1.41. Replacing Hydraulic Brake Fluid

5-1.42. General Information

a. The purpose of this routine is to replenish the hydraulic brake fluid.

b. The approximate time required for the performance of this routine is 30 minutes.

5-1.43. Materials Required

a. Two quarts hydraulic brake fluid, Federal Specification VV-F-451A.

b. Wrench, open-end, adjustable.

c. Clean container.

d. Clean, dry, lint-free cloth.

5-1.44. Procedure

WARNING

Before performing this routine, insure that both landing gear shoes are resting firmly on the ground, crank handles on both gear boxes are in the out position, and wheel chocking blocks are in place.

a. Check all hydraulic brake fluid fittings and hoses for evidence of leakage.

b. Wipe area around master cylinder filler cap (fig. 5-0.6) with a clean cloth.

c. Unscrew connector nut from filler cap and remove vent tube and hose.

d. Remove filler cap.

WARNING

Hydraulic brake fluid is harmful to the skin and eyes. Use extreme caution when handling this fluid.

e. Observe that the level of the hydraulic brake fluid is within 1/2 inch of top of master cylinder brake fluid reservoir. If necessary, fill master cylinder hydraulic brake fluid reservoir with hydraulic brake fluid to required level, using a clean container.

f. Inspect gasket on filler cap for brakes, abras-

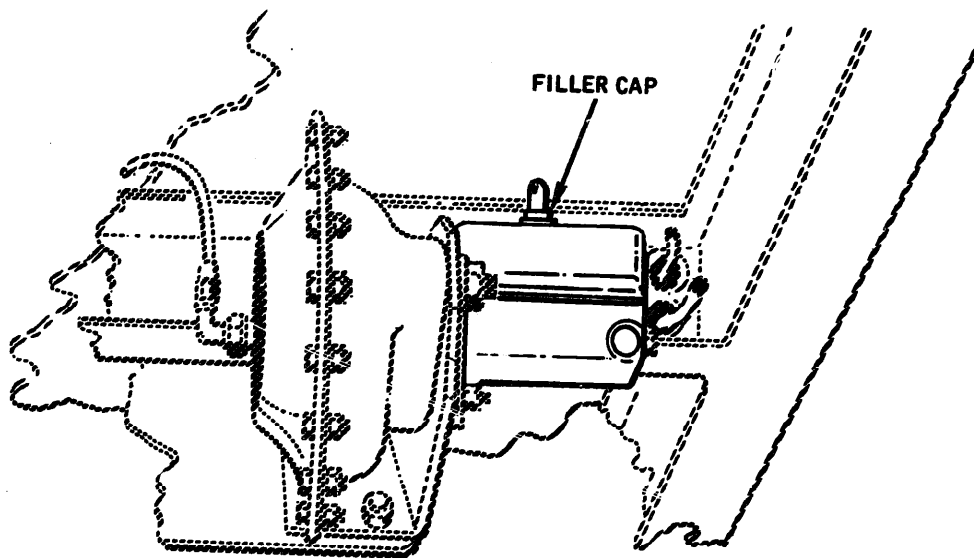


Figure 5-0.6. Master Cylinder

ions, and evidence of unusual wear. Replace gasket if necessary.

g. Replace filler cap.

h. Install vent tube and hose and secure by screwing connector nut onto filler cap.

5-1.45. Air Brake System Moisture Drainage

5-1.46.

The purpose of this routine is to drain accumulated moisture from the operations van air brake system. An adjustable, open-end wrench is required.

WARNING

Before performing this routine, insure that both landing gear shoes are resting firmly on the ground, crank handles on both gear boxes are in the out position, and wheel chocking blocks are in place.

a. Open drain cock on air reservoir (fig. 5-0.7).

b. Remove drain plug from bottom of the emergency relay valve (fig. 5-0.7) using adjustable wrench.

c. Replace drain plug at bottom of emergency relay valve when accumulated moisture has been drained.

d. Close drain cock on air reservoir.

5-1.47. Air Cleaners Inspection and Cleaning

5-1.48. General Information

a. The purpose of this routine is to clean and inspect the operations van brake system air cleaners.

b. The approximate time required for the performance of this routine is 20 minutes.

c. Two men are required to perform this routine; one man stationed in the cab at the prime mover and one man at the operations van.

5-1.49. Materials Required

a. One pint solvent, Federal Specification P-S-601.

b. One pint soap and water solution.

c. Clean, dry, lint-free cloths.

d. Wrench, open-end, adjustable.

e. Brush.

f. Prime mover.

5-1.50. Procedure

WARNING

Before performing this routine, insure that both landing gear shoes are resting

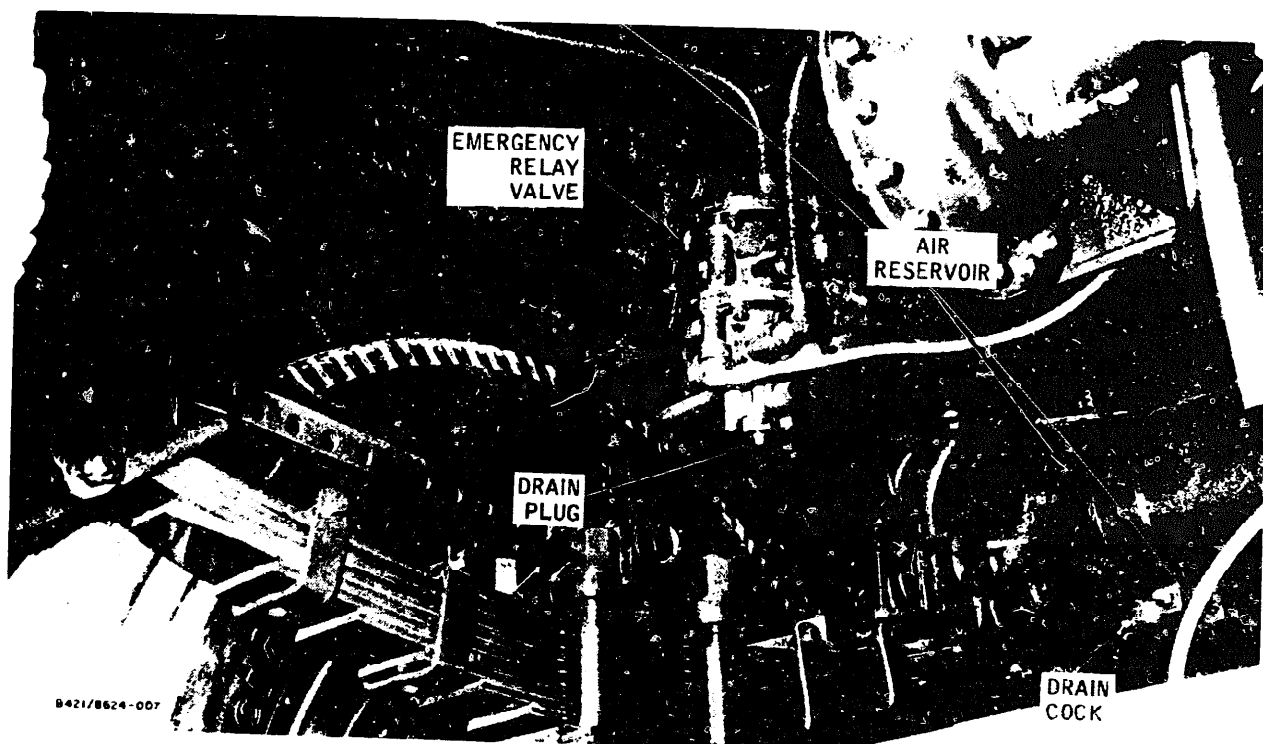


Figure 5-0.7. Air Brake System Moisture Drainage Points.

firmly on the ground, crank handles on both gear boxes are in the out position, and wheel chocking blocks are in place.

a. Remove drain plug (fig. 5-0.8) from air cleaner, using adjustable wrench.

b. Install drain plug in air cleaner after accumulated moisture has been drained.

c. With an adjustable wrench, firmly hold the body of air cleaner to keep it from turning. Unscrew cover nut from body.

d. Remove cover nut and its associated sealing washer, spring, centering washer and filter element.

WARNING

Prolonged contact of skin with cleaning solvent, or inhalation of fumes is dangerous. Adequate ventilation must be provided.

e. Clean all metal parts, including inside of body of air cleaner, with solvent.

f. Clean filter element by rinsing it with solvent. Replace filter element if it is damaged or impregnated with oil or gummy deposits.

g. Check sealing washer before installing it on cover nut and replace if it is unserviceable.

h. Place spring, centering washer, and filter element on cover nut; press these parts into body of air cleaner, and screw cover nut onto body.

i. Repeat procedure outlined in steps *a* through *h* for other air cleaner.

j. Connect operations van brake system to prime mover brake system and apply brakes.

k. Apply soap solution to air cleaner connections.

l. Observe for presence of soap bubbles which indicate air leakage. No leakage is permitted. Tighten fittings or replace parts as required.

m. Release brakes.

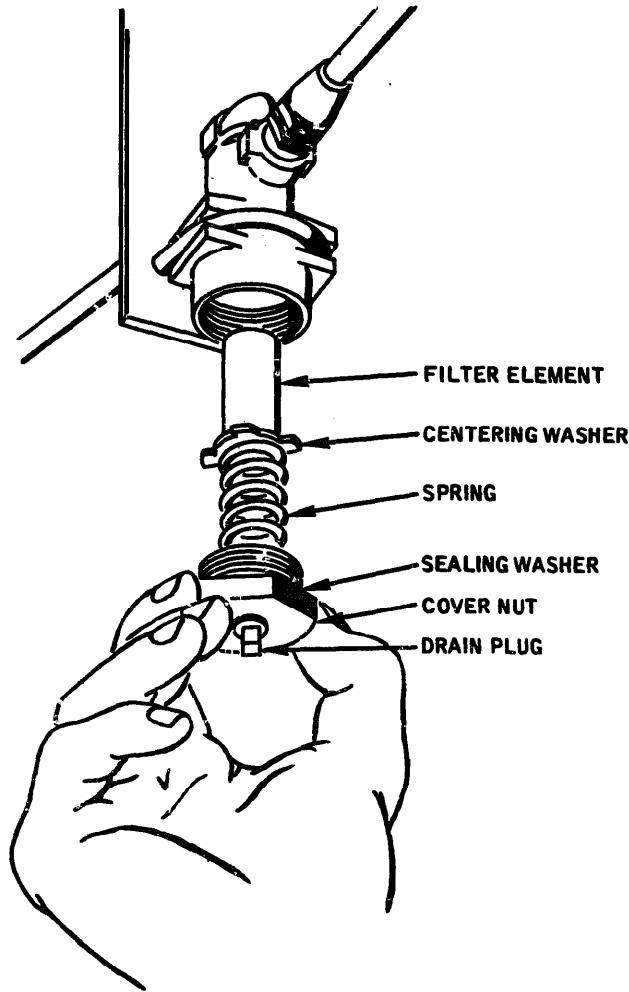
n. Disconnect prime mover brake system from operations van brake system.

5-1.51. Air Brake System Inspector

5-1.52. General Information

a. The purpose of this routine is to determine whether there are any leaks in the operations van air brake system.

b. The approximate time required for the performance of this routine is 20 minutes.



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Figure 5-0.8. Air Cleaners Inspection.

5-1.53. Materials Required

- a. Prime mover.
- b. One quart soap solution.
- c. One brush.

5-1.54. Procedure

WARNING

Before performing this routine, insure that both landing gear shoes are resting firmly on the ground, crank handles on both gear boxes are in the out position, and wheel chocking blocks are in place.

- a. Connect prime mover brake **system** to operations van brake system.

- b. Coat all air hoses, air hose fittings, and air hose couplings with soap solution.

- c. Observe for presence of soap bubbles which indicate air leakage. No leakage is permitted. Tighten fittings and couplings or replace parts as required.

- d. Disconnect prime mover brake system from operations van brake system.

5-1.55. Bleeding Brakes

5-1.56. General Information

- a. The purpose of this routine is to remove any air that has accumulated in the operations van brake hydraulic system.

- b. The approximate time required for the performance of this routine is 30 minutes.

- c. Two men are required to perform this routine; one stationed in the cab at the prime mover and one man at the operations van.

5-1.57. Materials Required

- a. Prime mover.
- b. Clean 1-quart glass jar.
- c. One quart hydraulic brake fluid, Federal Specification VV-F-451A.
- d. Clean, dry, lint-free cloths.
- e. Wrench, open-end, adjustable.
- f. Bleeder tube.
- g. Paragraph 5-1.41, Replenishing Hydraulic Brake Fluid.

5-1.58. Procedure

WARNING

Before performing this routine, insure that both landing gear shoes are resting firmly on the ground, crank handles on both gear boxes are in the out position, and wheel chocking blocks are in place.

- a. Connect operations van brake system to prime mover brake system.

WARNING

Hydraulic brake fluid is harmful to the skin and eyes. Use extreme caution when handling this fluid.

- b. Fill clean glass jar approximately three quarters full with hydraulic brake fluid.

c. Remove rubber cap from bleeder valve (fig. 5-0.9). Clean bleeder valve and surrounding area with a clean cloth.

d. Attach bleeder tube to bleeder valve and submerge other end of tube in hydraulic brake fluid contained in glass jar.

e. Perform procedures given in paragraphs 5-1.41 through 5-1.44.

CAUTION

Do not pump the master cylinder dry.

f. While brake pedal on prime mover is being pumped slowly up and down, open bleeder valve by turning valve counterclockwise.

g. Observe flow of hydraulic brake fluid into jar. When bubbles cease, and stream is a clean solid mass, close bleeder valve firmly.

h. Remove bleeder tube from bleeder valve and replace rubber cap on valve.

i. Repeat procedure outlined in steps c through h at other bleeder valve.

j. Disconnect prime mover brake system from operations van brake system.

5-1.59. Stop and Running Lights Inspection

5-1.60

The purpose of this routine is to determine whether the operations van stop and running lights are in operating condition. Two men are required to perform this routine ; one man stationed in the cab of the prime mover and one man at the operations van. Proceed as follows :

a. Inspect stop and running lights for damaged or missing lenses.

b. Connect prime mover 24-volt electrical system to 24-volt dc input connector located on lower front wall of operations van.

c. Apply operations van brakes from prime mover.

d. Observe stop lights located on rear of operations van. Both stop lights should illuminate. Replace lamp if necessary.

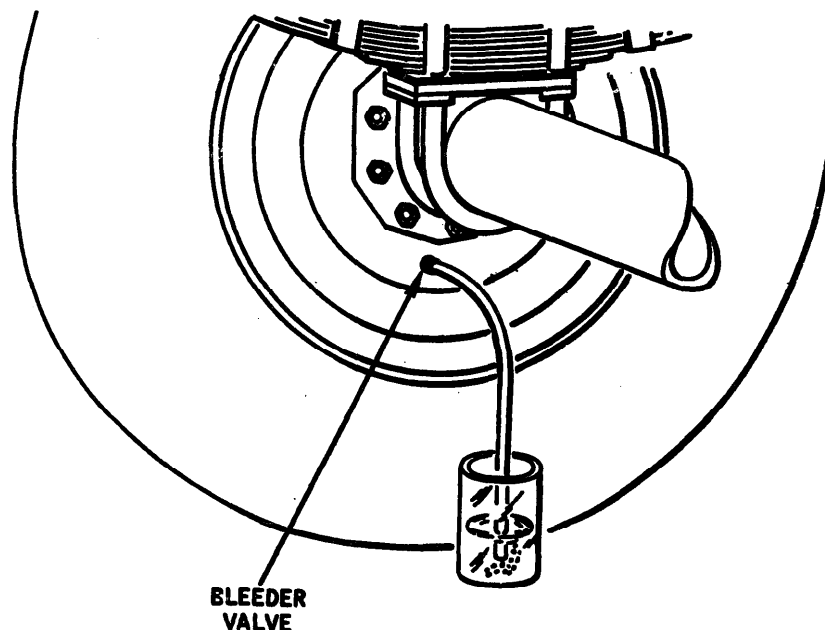
e. Release operations van brakes.

f. Check operation of turn indicators.

g. Check operation of black out lights.

h. Turn on operations van running lights from prime mover.

i. Observe running lights located at upper four corners of operations van. The running lights should illuminate. Replace lamps if necessary.



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Figure 5-0.9. Bleeding Brakes.

j. Turn off operations van running lights and disconnect prime mover 24-volt electrical system.

5-1.61. Emergency Lighting Inspection

5-1.62.

The purpose of this routine is to determine whether the operations van 24-volt emergency lighting is in operating condition. Proceed as follows :

a. Inspect emergency lights for damaged or missing lenses.

b. Connect prime mover 24-volt electrical connector to 24-volt dc input connector located at lower front wall of operations van.

c. Turn on 24-volt emergency light switch located on the interior curbside wall of operations van. The three overhead emergency lights should illuminate. Replace lamps if necessary.

d. Disconnect prime mover 24-volt electrical connector.

Section II. ORGANIZATIONAL/DEPOT MAINTENANCE

5-2. General

This section provides organizational/depot maintenance instructions at an equipment level. These instructions supplement the procedures contained in Section I. In performing organizational/depot maintenance according to these instructions, reference should be made to the schematics contained in Chapter 6 and to the diagrams contained in TM 11-5820-763-25P.

5-3. Test Equipment

Text

The test equipment required to perform the organizational/depot maintenance instructions given in this section is listed in table 5-1. The test equipment operating characteristics given are those which are applicable to the testing of this equipment and do not necessarily represent the maximum capabilities of the test equipment.

5-5. Performance Test Standards

5 - 6 .

Performance test standards for the operations van are covered in Section I, preventive maintenance. For performance test standards of individual equipments not covered therein, refer to the applicable equipment technical manuals listed in Appendix A to this manual.

5-7. Test Points

5 - 8 .

Table 5-2 lists and describes all test points and patch jacks for the operations van that are not described in other technical publications. All jacks are front panel mounted on the baseband and order wire patch panel and are illustrated in figure 5-1.

5-9. DC Voltage Requirements and Sources

5 - 10 .

The dc voltage requirements and sources for the operations van are listed in table 5-3.

Table 5-1. Test Equipment

Federal Stock No.	Nomenclature	Characteristics
6626-724-8682	Multimeter AN/PSM-6()	AC Voltage: 0 vac to 250 vac DC Voltage : 0 vdc to 50 vdc 0 vdc to 250 vdc DC Resistance: Zero ohms to 1,000 ohms

Table 5-2. Test Points and Patch Jacks

Name	Reference Designation	Function
CONV BAL	J40,J41,J68, J59	Provides three single plug outputs for double plug input
CONV UNBAL EXC 1 BB LIFT	J39,J60 J54, J55	Provides three double plug outputs for single plug input Removes baseband input to exciter 1 and terminates baseband to exciter 1 in 135 ohms. Also provides baseband patching facilities for exciter 1
EXC 2 BB LIFT	J56,J57	Removes baseband input to exciter 2 and terminates baseband to exciter 2 in 135 ohms. Also provides baseband patching facilities for exciter 2

Table 5-2. Test Points and Patch Jacks - Continued

Name	Reference Designation	Function
EXC 1 BB MON	J35,J36	Provides baseband monitoring and patching facilities for exciter 1
EXC 2 BB MON	J37,J38	Provides baseband monitoring and patching facilities for exciter 2
EXC 1 OW LIFT	J92,J93	Removes order wire input to exciter 1 and terminates order wire to exciter 1 in 600 ohms. Also provides order wire patching facilities for exciter 1
EXC 2 OW LIFT	J94, J95	Remove8 order wire input to exciter 2 and terminates order wire to exciter 2 in 600 ohms. Also provides order wire patching facilities for exciter 2
EXC 1 OW MON	J73,J74	Provides order wire monitoring and patching facilities for exciter 1
EXC 2 OW MON	J75,J76	Provides order wire monitoring and patching facilities for exciter 2
MULTIPLE BAL	J77,J78,J96,J96,J97	Provides double plug outputs for a single plug input
MULTIPLE UNBAL	J79,J98	Provides single plug outputs for a double plug input
MUX IN BB LIFT	J61,J62	Removes baseband input to multiplex receiving equipment, Also provides baseband patching facilities for receivers
MUX OUT BB LIFT	J52,J53	Removes baseband input to exciters. Also provides baseband patching facilities for exciters
MUX IN BB MON	J42,J43	Provides facilities for monitoring baseband output to multiplex receiving equipment
MUX OUT BB MON	J33,J34	Provides facilities for monitoring baseband output of multiplex transmitting equipment
OW IN LIFT	J99, J100	Removes order wire input to order wire equipment. Also provides order wire patching facilities for receivers
OW OUT LIFT	J90, J91	Removes order wire input to exciters. Also provides order wire patching facilities for exciters
OW IN MON	J80,J81	Provides monitoring facilities for order wire input to order wire equipment
OW OUT MON	J71,J72	Provides monitoring facilities for order wire output of order wire equipment
REC 1 BB LIFT	J63,J64	Removes receiver 1 baseband output to multiplex receiving equipment. Also removes baseband combiner 1 in receiver 1 from combiner buss
REC 2 BB LIFT	J65, J66	Provides patching facilities for baseband output of receiver 2. Also removes baseband combiner 2 in receiver 2 from combiner buss
REC 8 BB LIFT	J67,J68	Provides patching facilities for baseband output of receiver 3. Also removes baseband combiner 3 in receiver 3 from combiner buss
REC 4 BB LIFT	J69,J70	Provides patching facilities for baseband output of receiver 4. Also removes baseband combiner 4 in receiver 4 from combiner buss
REC 1 BB MON	J44, J45	Provides monitoring facilities for receiver 1 baseband output
REC 2 BB MOM	J46, J47	Provides monitoring and patching facilities for receiver 2 baseband output
REC 3 BB MON	J48, J49	Provides monitoring and patching facilities for receiver 3 baseband output
REC 4 BB MON	J50, J51	Provides monitoring and patching facilities for receiver 4 baseband output
REC 1 OW LIFT	J101, J102	Removes receiver 1 order wire output to order wire equipment. Also removes order wire combiner 1 in receiver 1 from combine buss
REC 2 OW LIFT	J103,J104	Provides patching facilities for order wire output of receiver 2. Also removes order wire combiner 2 in receiver 2 from combiner buss
REC 3 OW LIFT	J105,J106	Provides patching facilities for order wire output of receiver 3. Also removes order wire combiner 3 in receiver 3 from combiner buss
REC 4 OW LIFT	J107,J108	Provides patching facilities for order wire output of receiver 4. Also removes order wire combiner 4 in receiver 4 from combiner buss
REC 1 OW MON	J82, J83	Provides monitoring facilities for receiver 1 order wire output
REC 2 OW MON	J84, J85	Provides monitoring and patching facilities for receiver 2 order wire output
REC 3 OW MON	J85,J87	Provides monitoring and patching facilities for receiver 3 order wire Output
REC 4 OW MON	J88,J89	Provides monitoring and patching facilities for receiver 4 order output

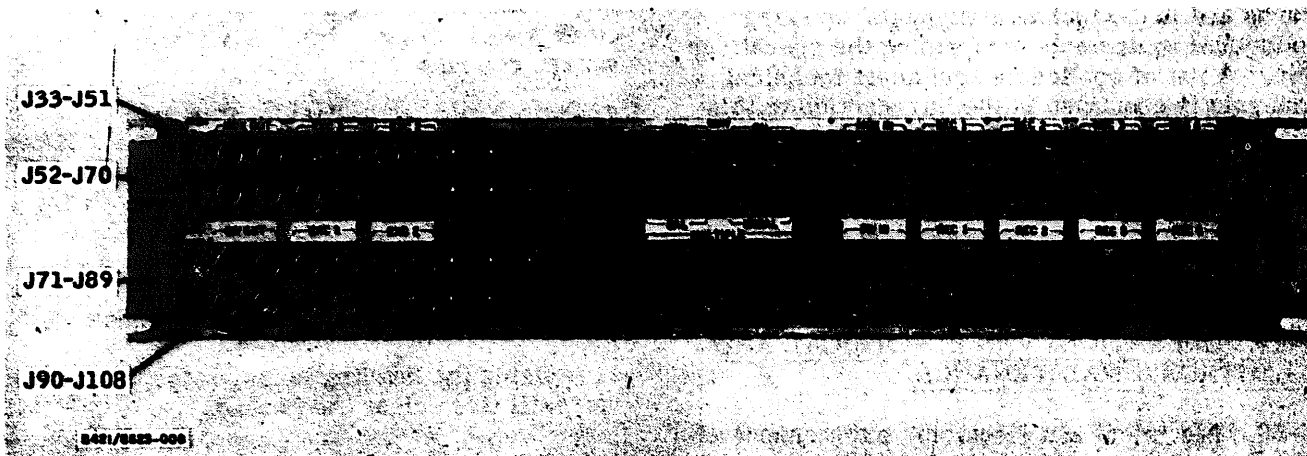


Figure 5-1. Baseband and Order Wire Patch Panel.

Table 5-3. DC Voltage Requirements and Sources

Unit	Voltage	Source
Operations van (emergency lighting)	24	Prime mover
Alarm-monitor	24	Diesel generator van
Alarm-monitor	120	Diesel generator van

5-II. Preventive Maintenance

5-12.

Routine maintenance procedures that will help prevent troubles which would interfere with the performance of the operations van equipment are contained in Section I.

5-13. Troubleshooting

5-14.

Tables 5-4 and 5-5 contain troubleshooting information for locating and correcting some of the troubles which may develop in the operations van.

5-15.

These tables cannot cover all possible troubles and deficiencies that may occur under the many conditions of operation. If a specific trouble is not covered, isolate the assembly in which the trouble occurred and then locate the defective component using conventional troubleshooting techniques.

5-16. Alignment or Adjustment

5-17.

No electrical alignment or adjustment of the operations van is necessary other than that con-

5-16

tained in Section I and in the technical manuals covering individual equipments comprising the operations van. A list of applicable equipment technical manuals is contained in Appendix A to this manual.

5-18.

Alignment or adjustment of operations van mechanical assemblies after repair and/or replacement is covered in paragraphs 5-22 through 5-64.

5-19. Operations Van Electrical and Electronic Maintenance

5-20.

Electrical and electronic maintenance of the operations van consists of insuring that all equipment comprising the van is functioning properly. Proper operation of individual equipments in the operations van will be insured by observing the maintenance procedures contained in the associated technical manuals listed in Appendix A to this manual. Electrical and electronic maintenance of the remaining equipment is limited to removal and replacement of components.

5-21. Operations Van Mechanical Maintenance

5-22.

When mechanical maintenance requires the removal or replacement of components, refer to the applicable assembly breakdown illustrated in TM 11-5820-763-25P along with the removal and installation procedures given in the following paragraphs.

WARNING

Before performing maintenance on the operations van exterior, insure that both landing gear shoes are resting firmly on the ground, crank handles on both gear boxes are in the "out" position, and wheel chocking blocks are in place.

5-23. Removal and Replacement of Tires and Wheels**5-24.**

Refer to the Axle Assembly and Suspension Assembly figures in TM 11-5820-763-25P when performing the following procedures.

5-25. Removal of Wheel From Hub

The wheels of the operations van are removed from the hub as follows :

a. Using the wheel nut wrench, loosen six outer wheel hexagon nuts and six inner wheel square cap nuts.

NOTE

The nuts on the curbside wheels marked R have right-hand threads; the nuts on the roadside wheels marked L have left-hand threads. The nuts are loosened by turning them in the opposite direction from the normal rotation of the wheel.

b. Using the leveling jacks, raise operations van until tires clear the ground.

c. Remove outer wheel hexagon nuts and then remove outer wheel from hub.

d. Remove inner wheel square cap nuts and then remove inner wheel from hub.

Table 5-4. Primary AC Power, Troubleshooting Chart

Symptom	Possible Cause	Recommended Correction
1. No indication on FREQUENCY meter and/or VOLTAGE meter of power monitor	1a. Defective power cable and/or connections between diesel generator van and operations van	1a. Check power entrance cable and connectors (see fig. 6-1). Repair or replace as necessary
	1b. Main circuit breaker or connections defective	1b. Repair or replace as necessary.
	1c. POWER MONITOR switch, FREQUENCY meter, VOLTAGE meter or internal wiring defective	1c. De-energize equipment and make continuity tests of power monitor. Repair or replace components as necessary
2. Overhead light(s) inoperative	2a. Burned out bulb(s)	2a. Replace bulb(s)
3. Air conditioner(s) inoperative	2b. VAN LIGHTS circuit breakers or connections defective	2b. Repair or replace as necessary
	2c. Light switches or sockets defective	2c. Repair or replace as necessary
	3a. AIR COND NO 1 or AIR COND NO 2 circuit breakers defective	3a. Repair or replace as necessary
4. Equipment connected to convenience outlet(s) inoperative	3b. Defective connecting cables and/or connectors	3b. Check cables and connectors (see fig. 6-1)
	3c. Defective air conditioner	3c. Refer to equipment technical manual
	4a. Associated circuit breaker on distribution box defective	4a. Repair or replace as necessary
5. Alarm-monitor DS1 24 V BATTERY CHARGE DC and/or DS2 24 V BATTERY CHARGE DC indicator lamps fail to light when unit batteries in diesel generator van are Charging	4b. Defective connecting cables and/or convenience outlet	4b. Using multimeter, check for presence of 120 volts ac at convenience outlet. If 120 volts ac is not present, de-energize equipment and make continuity check. Repair or replace defective components
	4c. Equipment connected to convenience outlet defective	4c. Refer to applicable equipment technical manual
	5a. Lamps defective	5a. Replace lamps
	5b. Fuse F1 and/or F2 defective	5b. Replace fuse(s)
	5c. Interconnecting cabling to diesel generator van defective	5c. Using multimeter, check for the presence of +24 volts dc between terminals 1 and 11 on TB1. If 24 volts dc is not present, check interconnecting cabling to diesel generator van (see fig. 6-3)
6. Alarm-monitor DS3 120V BATTERY CRARGE DC indicator lamp fails to	5d. Unit batteries in diesel generator van not charging	5d. Refer to diesel generator van technical manual for corrective maintenance
	6a. Lamp defective	6a. Replace lamp
	6b. Fuse F3 defective	6b. Replace fuse

Table 5-4. Primary AC Power, Troubleshooting Chart (cont)

Symptom	Possible Cause	Recommended Correction
light when station batteries in diesel generator van are charging	6c. Interconnecting cabling to diesel generator van defective	6c. Using multimeter, check for the presence of +120 volts dc between terminals 3 and 12 on TB1. If 120 volts dc is not present, check interconnecting cable to diesel generator van for damage (see fig. 6-3)
	6d. Station batteries in diesel generator van not charging	6d. Refer to diesel generator van technical manual for corrective maintenance
7. Alarm-monitor DS4 GEN NO. 1 ON BUSS or DS6 GEN NO. 2 ON BUSS indicator lamp fails to light when the associated generator in the diesel generator van is supplying primary ac power to the operations van	7a. Lamps defective	7a. Replace lamps
	7b. Fuse F4 or F6 defective	7b. Replace fuse
	7c. Interconnecting cabling to diesel generator van defective	7c. Using multimeter, check for the presence of +120 volts dc between terminals 6 and 12 or 8 and 12 on TB1. If 120 volts dc is not present, check interconnecting cabling to diesel generator van (see fig. 6-3)
	7d. Generator not connected to primary buss	7d. Refer to diesel generator van technical manual for corrective maintenance
8. Alarm-monitor DS5 BASE ON BUSS indicator lamp fails to light when base power is supplied from the diesel generator van to the operations van	8a. Lamp defective	8a. Replace lamp
	8b. Fuse F5 defective	8b. Replace fuse
	8c. Interconnecting cabling to diesel generator van defective	8c. Using multimeter, check for the presence of +120 volts dc between terminals 7 and 12 of TB1. If 120 volts dc is not present, check interconnecting cabling to diesel generator van (see fig. 6-3)
	8d. Base power not connected to primary power buss	8d. Refer to diesel generator van technical manual for corrective maintenance
9. Alarm-monitor DS7 BASE POWER ON LINE indicator lamp fails to light when base power supplied to the diesel generator van is in standby status	9a. Lamp defective	9a. Replace lamp
	9b. Fuse F7 defective	9b. Replace fuse
	9c. Interconnecting cabling to diesel generator van defective	9c. Using multimeter, check for the presence of 120-volt ac, 60-cycle, single-phase voltage between terminals 4 and 11 on TB1. If 120 volts ac is not present, check interconnecting cabling to diesel generator van (see fig. 6-3)
	9d. Base power not available	9d. Refer to diesel generator van technical manual for corrective maintenance

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<p>10. Alarm-monitor buzzer DS8 or DS9 fails to operate when the generator supplying primary ac power to the operations van is defective.</p>	<p>10a. Fuse F8 or F9 defective 10b. S1 DIESEL NO. 1 ALARM or S2 DIESEL NO. 2 ALARM switches defective</p>	<p>10a. Replace fuse 10b. Using multimeter, check for the presence of +24 volts dc between terminal of switch S1 and S2 or terminal 11 on TB1. If 24 volts dc is not present, check interconnecting cabling to diesel generator van (see fig. 6-3) 10c. Replace buzzer</p>
<p>10c. Buzzer defective</p>		

Table 5-5. Mechanical and 24-Volt DC, Troubleshooting Chart

Symptom	Possible Cause	Recommended Correction
<p>1. Brakes will not release</p>	<p>1a. Emergency relay valve in applied position 1b. Intervehicular air hose couplings improperly connected to prime mover 1c. Operations van brake control in prime mover is in applied position 1d. Restriction in air service and emergency line tubes, air tubes, or inter-vehicular air hose 1e. Shut off valves closed on prime mover 1f. Weak or broken brakeshoe return spring</p>	<p>1a. If operations van brake system is not coupled to prime mover, open drain cock on air reservoir. If operations van is coupled to prime mover, pressurize brake system 1b. Insure that couplings are secure 1c. Move brake control to release position 1d. Check all tubes and the hose for restrictions 1e. Open valves 1f. Replace spring (para 5-54)</p>
<p>2. No brakes or weak brakes</p>	<p>2a. Shut off valves closed on-prime mover 2b. Intervehicular air hose improperly connected to prime mover 2c. Air reservoir drain cock open 2d. Low air pressure 2e. Defective emergency relay valve 2f. Clogged air cleaner</p>	<p>2a. Open valves 2b. Insure that couplings are secure 2c. Close drain cock (fig. 3-1) 2d. Check air pressure of prime mover; check for restriction of air, check for air leakage. (Refer to preventive maintenance, para 5-1.1.) 2e. Make leakage test (para 5-47) 2f. Clean or replace filter element. (Refer to preventive maintenance para 5-1.1.)</p>

Table 5-5. Mechanical and 24-Volt DC, Troubleshooting Chart (cont)

Symptom	Possible Cause	Recommended Correction
3. Landing gear crank handle difficult to turn	<p>2g. Air in hydraulic brake system</p> <p>2h. Leaks in hydraulic system</p> <p>2i. Grease or brake fluid on brake lining</p> <p>2j. Worn brake lining</p> <p>2k. Worn-out brake lining</p> <p>3a. Lack of lubrication or improper lubricant on landing gear</p> <p>3b. Bent landing gear crankshaft or bevel gear shaft</p> <p>3c. Bent or dented landing gear lower leg</p> <p>3d. Damaged landing gear bearings</p>	<p>2g. Bleed hydraulic brake system. (Refer to preventive maintenance, para 5-1.55.)</p> <p>2h. Tighten loose connectors; replace damaged tubing or connectors</p> <p>2i. Replace brake lining (para 5-33); check oil seal and replace if necessary (para 5-32)</p> <p>2j. Adjust brakes (para 5-37)</p> <p>2k. Replace brake linings (para 5-33)</p> <p>3a. Lubricate landing gear (para 5-1.37)</p> <p>3b. Replace defective item (para 5-63)</p> <p>3c. Replace leg (para 5-63)</p> <p>3d. Replace bearings (para 5-63)</p>
4. Operations van not tracking properly	<p>4a. Axle misaligned</p> <p>4b. Broken spring leaf</p>	<p>4a. Adjust roadside radius rod. (Refer to preventive maintenance Para 5-19.)</p> <p>4b. Replace spring leaf (para 5-54)</p>
5. All 24-volt dc lights inoperative	<p>5a. Intervehicular cable not properly plugged into 24-volt input receptacle</p> <p>5b. Dirty or corroded contacts on 24-volt dc input receptacle or on plug of intervehicular cable</p> <p>5c. 24V DC EMERGENCY LIGHT switch defective</p> <p>5d. No current from prime mover</p>	<p>5a. Pull out plug of intervehicular cable, and insert fully into receptacle</p> <p>5b. Clean as necessary</p> <p>5c. Repair or replace light switch as necessary</p> <p>5d. Check prime mover circuit breakers and wiring</p>
6. One or more 24-volt dc lights inoperative	<p>6a. Burned out lamp(s)</p> <p>6b. Dirty or corroded lamp socket</p> <p>6c. Dirty or corroded contact in receptacle or on plug of intervehicular cable</p> <p>6d. Broken, grounded, or shorted cable, or loose connectors</p>	<p>6a. Replace lamp(s)</p> <p>6b. Remove lamp and clean contacts</p> <p>6c. Clean as necessary</p> <p>6d. Check cables and replace as necessary; tighten loose connectors</p>
7. Dim or flickering 24-volt dc lamps	<p>7a. Defective lamp(s)</p> <p>7b. Dirty or corroded lamp socket or cable connections</p> <p>7c. Loose or poor ground</p>	<p>7a. Replace lamp(s)</p> <p>7b. Clean as necessary</p> <p>7c. Clean and tighten terminals on ground wire at rear of 24-volt dc input receptacle</p>

5-26. Removal of Tire from Wheel

Remove the tire from wheel as follows:

- a. Remove wheel from hub (para 5-25).
- b. Deflate tire by unscrewing tube valve with the valve cap and removing valve.
- c. Place small end of a tire tool in slot between split ring and wheel rim, and pry split ring from its groove in wheel rim.
- d. Turn wheel over and place it on blocks so that it is raised approximately 6 inches above the ground.
- e. Force tube valve stem into tire through stem slot in wheel rim.
- f. Stand on casing to force tire off rim.
- g. Remove tire flap and tube from tire.
- h. Wash wheel thoroughly with clean water and allow wheel to dry.
- i. Inspect mounting stud holes for excessive wear.
- j. Check wheel and split ring for evidence of distortion.
- k. Check condition of paint and repaint as necessary.

5-27. Replacement of Tire on Wheel

Replace the tire on wheel as follows :

- a. Put tube into tire and insert flap.
- b. Place wheel on blocks sufficiently high to raise rim an inch or more off the ground.
- c. Lower tire onto wheel with valve stem aligned with stem slot in wheel rim.
- d. Stand on tire to force it on rim.
- e. Position split ring on wheel and start end under rim.
- f. As a portion of ring goes into place, stand on this position and stamp ring progressively into place.
- g. Inflate tire slightly and pound casing all around to make tube fit smoothly inside casing.
- h. Inflate tire to approximately 50 psi.

5-28. Replacement of Wheels on Hub

Install wheel on hub as follows :

- a. Position inner wheel on six mounting studs.

- b. Install six inner wheel square cap nuts and hand tighten.

- c. Using the wheel nut wrench, alternately tighten nuts on opposite sides to insure uniform tightness.

- d. Position outer wheel over inner wheel cap nuts, insuring that valve stem of outer wheel is not aligned with valve stem of inner wheel.

- e. Install the six outer wheel hexagon nuts and hand tighten.

- f. Using the wheel nut wrench, alternately tighten nuts on opposite sides to insure uniform tightness.

- g. Lower operations van until tires touch the ground.

- h. Recheck nuts to make certain they are tight.

5-29. Removal and Replacement of Hub and Wheel Brake Mechanism

WARNING

Before performing the following procedures, release the air pressure from air brake system by opening the air reservoir drain cock

5-30

Refer to the Axle Assembly figure in TM 11-5820-763-25P when performing the following procedures.

5-31. Removal and Disassembly of Hub and Brakedrum

Remove the hub and brakedrum from axle as follows :

- a. Remove wheels from hub (para 5-25).
- b. Remove the six screws and lockwashers securing hubcap to hub, and remove the hubcap and gasket.
- c. With a screwdriver or chisel, lift bentover portion of washer to release outer bearing adjusting nut.
- d. Remove outer bearing adjusting nut, using wheel bearing adjusting nut wrench.
- e. Slide off washer, remove inner bearing adjusting nut and slide off thrust washer.
- f. To loosen hub and drum assembly, rock slightly on axle spindle. Remove outer bearing cone.

g. Pull hub and drum assembly from axle and remove oil seal and inner bearing cone.

h. Remove the 10 nuts and lockwashers from which fasten brakedrum to adapter. Lift off inspection hole cover.

i. Separate adapter from hub.

j. Press or drive out the six serrated wheel mounting studs from hub using a hammer and a block of wood.

k. Inspect bearing cups, oil seal and wiper for cracks, chipped spots, or wear. Insure that bearing cups fit tightly into hub. If inspection reveals replacement is necessary, proceed as follows :

NOTE

Do not remove bearing cups or wipers from hub unless inspection indicates replacement is necessary.

(1) With end of hub placed on blocks, drive out bearing cup and wiper with a hammer and a brass drift or a block of wood.

(2) Turn hub over and drive out other bearing cup and wiper as in step (1).

WARNING

Prolonged contact of skin with, cleaning solvent or inhalation of fumes is dangerous. Adequate ventilation must be provided.

CAUTION

Do not dry or spin bearings with compressed air.

l. Clean all metal parts with cleaning solvent and dry parts thoroughly. Inspect each part carefully for cracks, pitting, excessive wear or other indications of damage. Replace faulty parts.

m. Check diameter of the brakedrum surface with a caliper. If the diameter of the braking surface is greater than 16.625 inches, replace the brakedrum as described in paragraph 5-35.

NOTE

For normal operation, bearings should be lubricated at 12,000 miles or at annual intervals, whichever occurs first.

n. Pack bearings by hand or with a mechanical ring packer, using Automotive Lubricating Specification VV-6-632 or equivalent. Force the lubricant between rollers and cone to insure sufficient lubrication.

5-32. Removal and Disassembly of Brake Mechanism

Remove brake mechanism from axle and disassemble as follows :

a. Remove hub and brakedrum from axle (para 5-31).

b. Remove the four retracting springs, the shoe guide bolt, lockwashers, and shoe guide washer attaching each brakeshoe.

CAUTION

In removing the brakeshoe, use care to disengage shoe from slot in wheel cylinder push rod without drawing push rod out of wheel cylinder.

c. Disengage each brakeshoe from wheel cylinder push rods.

CAUTION

Do not allow brake fluid to come in contact with brake lining either by dripping or from soiled hands.

d. Disconnect cylinder tube assembly from each wheel cylinder at rear of backing plate.

e. Remove two hex-head screws and lockwashers holding wheel cylinder to backing plate assembly, and lift off wheel cylinder and spark shield.

f. Pull out anchor pin.

g. Rack off adjusting stud until adjusting wheel can be removed.

h. Remove retaining ring from end of adjusting stud.

i. Tap out worm sleeves, worms, O-rings, and adjusting studs, taking care not to misplace small items.

WARNING

Prolonged contact of skin with cleaning solvent or inhalation of fumes is dangerous. Adequate ventilation must be provided.

j. Clean all metal parts removed from brake mechanism with cleaning solvent and dry parts thoroughly. Visually inspect all parts for cracks, distortion, or other damage. Replace any faulty parts.

k. Inspect brakeshoe linings for wear. If braking surface is worn nearly to attaching hardware, replace linings (para 5-33).

5-33. Relining Brakeshoes

Reline brakeshoes as follows :

- a. Remove brakeshoes (para 5-32).

WARNING

Prolonged contact of skin with cleaning solvent or inhalation of fumes is dangerous. Adequate ventilation must be provided.

- b. Remove attaching hardware and linings from each brakeshoe and clean brakeshoe face thoroughly with solvent.

NOTE

If brakedrums have been machined, install shims (the thickness of metal removed between brakeshoes and lining).

- c. Place new linings on each brakeshoe, aligning the bolts with the holes in the brakeshoes.
- d. Secure lining to brakeshoe with nuts, insuring that lining is in contact with brakeshoe surface at all points.

5-34. Assembly and Replacement of Brake Mechanism on Axle

Assemble and install brake mechanism on axle as follows :

- a. Slide O-ring into groove on adjusting stud and install adjusting stud, worm, worm sleeve, washer and retaining ring in backing plate.
- b. Place adjusting wheel in slot in backing plate and engage adjusting screw.
- c. Turn adjusting stud until adjusting screw is started in backing plate.
- d. Install anchor pins in backing plate.
- e. Using the ten screws and self-locking nuts, attach backing plate assembly and dust shield to axle flange.
- f. Position each wheel cylinder and spark shield on backing plate assembly. Working from rear of dust shield, secure with two screws and lockwashers.
- g. Connect cylinder connection tube to wheel cylinders.
- h. Install each brakeshoe with lining, making certain that notched end of shoe is properly engaged with notch in wheel cylinder push rod.
- i. Attach each brakeshoe to the backing plate

assembly with shoe guide bolt, shoe guide washer, and lockwasher.

- j. Install four retracting springs.
- k. Install hub and brakedrum assembly (para 5-35).
- l. Adjust brakes (para 5-37).
- m. Bleed brake system. (para 5-1.55).
- n. Install wheels (para 5-28).

5-35. Assembly and Replacement of Hub and Brakedrum on Axle

Assemble and install the hub and brakedrum on the axle as follows :

- a. If bearing cups have been removed (para 5-31), place hub on solid surface, position bearing cup seat with large end of tapered bore up and carefully tap bearing cup until it is securely seated in place.
- b. Position inner bearing cone inside bearing cup and press or carefully tap oil seal and wiper into place, using a block of wood. Do not hammer directly on seal.
- c. Attach adapter to hub with six serrated wheel studs, and position brakedrum on adapter.
- d. Install the inspection hole cover on brakedrum and secure with a serrated bolt, nut, and lockwasher.
- e. Secure brakedrum adapter with the remaining 9 serrated bolts, nuts, and lockwashers.

WARNING

Prolonged contact of skin with cleaning solvent or inhalation of fumes is dangerous. Adequate ventilation must be provided.

- f. Wash spindle with cleaning solvent (Federal Spec P-S-661) and dry.
- g. Apply thin coating (not over 1/16-inch thick) of lubricant to inside surface of hub and outside of axle spindle.
- h. Slide hub on axle being careful not to damage oil seal.
- i. Position outer bearing cone in cup of hub and install thrust washer and inner bearing adjusting nut.
- j. Adjust bearings (para 5-36).
- k. Replace gasket and hubcap. Secure to hub with six screws and lockwashers.

- l.* Adjust brakes (para 5-37).
- m.* Bleed brake system (para 5-1.55).
- n.* Install wheels (para 5-28).

5-36. Bearing Adjustment

Adjust bearings as follows:

a. Remove the six screws and lockwashers securing hubcap to hub and remove hubcap and gasket.

b. With screwdriver or chisel, lift bent-over portion of outer bearing adjusting nut washer and remove washer and nut.

NOTE

Wheels do not have to be removed to adjust bearings.

c. While rotating the brakedrum tighten inner bearing adjusting nut with wheel bearing adjusting nut wrench until hub binds on spindle. Back off approximately one-eighth of a turn.

d. Check adjustment by grasping brakedrum and attempting to rock on spindle. If bearings are properly adjusted, movement of brakedrum in relation to top edge of backing plate will be scarcely visible, with brakedrum turning freely. If axial movement is excessive (more than 1/32 in.), further adjustment is required.

e. Slide outer bearing adjusting nut washer over spindle, install outer bearing adjusting nut, and tighten against washer. Bend flanges of washer over nut to prevent loosening.

f. Install hubcap and gasket. Secure with six lockwashers and screws.

5-37. Brake Adjustment

Adjust brakes as follows :

CAUTION

Do not adjust brakes when brakedrums are hot. Always check wheel bearing adjustment (para 5-36) before adjusting brakes.

- a.* Remove wheel from hub (para 5-25).
- b.* Remove hex nut which holds cover on inspection hole in brakedrum and remove cover.
- c.* Rotate brakedrum until inspection hole is aligned with brake adjusting stud.
- d.* Invert a 0.010-inch feeler gage between

brakedrum and brake lining. Turn adjusting stud until a slight drag on feeler gage is obtained.

- e.* Install inspection hole cover with hex nut.
- f.* Install wheel on hub (para 5-28).
- g.* Repeat steps *a* through *f* on other wheel.

5-38. Brake Hydraulic System

5-39

Refer to the Brake Installation figure in TM 11-5820-763-25P when performing the following procedures.

5-40. Removal of Master Cylinder

To remove master cylinder proceed as follows :

- a.* Release air pressure from system by opening drain cock on air reservoir.
- b.* Disconnect master cylinder-to-tee flexible hose from rear of cylinder.
- c.* Remove three nuts and lockwashers which attach master cylinder to bracket and brake air chamber.
- d.* While holding air chamber, move master cylinder to the left enough to detach rubber boot. Remove master cylinder.

5-41. Replacement of Master Cylinder

Install master cylinder as follows :

- a.* Position master cylinder over the three studs and against bracket, insuring that brake air chamber push rod is properly seated in master cylinder position.
- b.* Install rubber boot over lip on master cylinder bore.
- c.* Secure master cylinder in place with three nuts and lockwashers, and connect master cylinder-to-tee hose to rear of master cylinder.
- d.* Close drain cock on air reservoir.
- e.* Fill master cylinder with hydraulic brake fluid. Refer to paragraph 5-1.37 for lubrication procedures.
- f.* Check brake air chamber push rod travel (para 5-45).

5-42. Brake Air System

5 - 4 3

Refer to the Brake Installation figure in TM 11-5820-763-25P when performing the following procedures.

5-44. Removal of Brake Air Chamber

Remove brake air chamber as follows:

- a.* Release air pressure from system by opening drain cock on air reservoir.
- b.* Disconnect air chamber-to-emergency relay valve tube.
- c.* Remove three hex nuts and lockwashers attaching brake air chamber to master cylinder and bracket.
- d.* While holding master cylinder in position, pull brake air chamber from it, being careful not to damage rubber boot while separating the assemblies.

5-45. Replacement of Brake Air Chamber

To replace brake air chamber proceed as follows:

- a.* Carefully insert brake air chamber push rod into master cylinder and install rubber boot over lip on master cylinder.
- b.* Using three hex nuts and lockwashers, secure brake air chamber to master cylinder and bracket.
- c.* Connect air chamber-to-emergency relay valve tube.
- d.* Close drain cock on air reservoir and connect air hose couplings to prime mover.
- e.* With prime mover brakes released, insert a small rod as far as possible through one of two inspection holes on roadside of brake air chamber. Mark on the rod the depth of penetration.
- f.* Apply prime mover brakes and again mark rod penetration.
- g.* Measure the distance between the two marks. This measurement indicates the amount of push rod travel and should be a minimum of 1/2 inch and a maximum of 7/8 inch.

CAUTION

Insufficient brake air chamber push rod travel **will result in damage to rubber** c a p **master cylinder. Excessive travel** will result in ineffective brakes. If necessary, adjust brakes as described in paragraph 5-37.

5-46. Removal of Emergency Relay Valve

Remove emergency relay valve as follows:

a. Release air pressure from system by opening drain cock on air reservoir.

b. Disconnect air chamber-to-emergency relay valve tube, air filter-to-emergency relay valve tube and air reservoir-to-emergency relay valve tube at the emergency relay valve.

c. Remove two hex head screws, lockwashers, and nuts attaching emergency relay valve to bracket and lift off valve.

5-47. Replacement of Emergency Relay Valve

Replace emergency relay valve as follows:

a. Position emergency relay valve against bracket and secure with two hex head screws, lockwashers, and nuts.

b. Connect air reservoir-to-emergency relay valve tube, air filter-to-emergency relay valve tube, and air chamber-to-emergency relay valve tube to emergency relay valve.

c. Close drain cock on air reservoir and connect air hose couplings to prime mover.

d. With air brake system connected and pressurized, apply soap solution to flanges of the emergency relay valve and to nuts which secure the various tubes to the valve.

e. If bubbles appear, tighten all nuts on flanges and tubes.

NOTE

Leakage in steps *e* through *h* should not exceed 1-inch soap bubbles in approximately 3 seconds. If excess leakage is found, replace emergency relay valve.

f. Coat exhaust check valve with soap solution and apply brakes.

g. Release brakes and apply coating of soap solution to exhaust port.

h. Close shut off cock on prime mover, disconnect the EMERGENCY air hose coupling from the prime mover, and coat exhaust port with soap solution.

5-48. Removal of Air Filter

Remove air filter as follows:

a. Release air pressure from the air brake system by opening drain cock on air reservoir.

b. Unscrew nuts which secure the two air lines to air filter.

c. Remove two hex nuts and washer from U-bolt which attaches air filter.

d. Withdraw U-bolt and remove air filter.

5-49. Replacement of Air Filter

Replacement of the air filter is the reverse of removal (para 5-48).

5-50. Replacement of Air Line

Replace air line as follows:

a. Relieve pressure in the air system by opening drain cock on air reservoir.

b. Remove tubing fittings from couplings and unscrew fittings from tubing.

c. Using hacksaw or tube cutter, cut new tubing to desired length, making sure the end is smooth, uncrimped, and cut squarely with the tube wall insure that interior of tubing is clean and free of foreign matter.

NOTE

Serviceable fittings may be reused, but all sleeves must be replaced.

d. Place nut and new sleeve on tubing and insert end of tubing into fitting.

e. Holding tube in place, tighten nut until sufficient pressure is placed on sleeve to prevent leakage.

f. Connect tube fittings, couplings and any tube supporting hardware.

g. Connect prime mover air brake system to operations van air brake system and pressurize.

h. Coat all connections with soap solution, and observe for soap bubbles. Tighten connections as necessary.

5-51. Suspension Assembly

5-52

Refer to the Suspension Assembly figure in TM 11-5820-763-25P when performing the following procedures.

5-53. Removal and Disassembly of Spring Assembly

Remove and disassemble spring assembly as follows:

a. Extend leveling jacks and landing gear until tires barely touch the ground.

b. Loosen the four nuts on U-bolt on the side of the operations van opposite from which spring assembly is to be removed.

c. Remove the four nuts and lockwashers from U-bolts on side from which spring assembly is to be removed.

d. Remove the two long bolts and rollers which retain each end of spring assembly in the spring hanger bracket.

e. Extend leveling jacks enough to enable spring assembly to be removed from spring hanger bracket. Remove spring assembly.

NOTE

Normally the spring assembly is only disassembled into separate leaves to replace broken or cracked leaves.

f. Clamp spring in vise near center bolt to hold leaves in tension.

g. File or grind peened ends off clip bolts and center bolt and remove hex nuts.

h. Remove four clip bolts and center bolt.

i. Gradually relieve tension of leaves by releasing vise. Separate leaves.

WARNING

Prolonged contact of skin with cleaning solvent or inhalation of fumes is dangerous. Adequate ventilation must be provided.

j. Clean each leaf with cleaning solvent (Federal Spec P-S-661) and inspect each leaf for cracks and breaks. Replace defective leaves.

5-54. Replacement of Spring Assembly

Replace spring assembly as follows :

a. Assemble leaves in proper order, starting with top (larger) leaf.

b. Align holes for center bolt and insert bolt through hole.

NOTE

Leaf clips must be tight enough to hold leaves in alignment without restricting free movement.

c. Place leaves in vise and press leaves tightly together.

d. Install hex nut on center bolt, tighten Securely, and peen end of bolt.

e. Install two clip spacers, clipbolts, and hex nuts in each small leaf clip and huge leaf clip on springs. Peen ends of bolts over nuts.

f. With operation van jacked up, position spring assembly with nut of center bolt in recess of spring seat and bent ends of spring leaf in spring hanger bracket.

g. Install the two bolts and rollers in the spring hanger brackets under the spring leaf near the bent ends.

h. Install two U-bolts, four lockwashers, and four nuts tighten nuts.

i. Tighten U-bolt nuts on spring assembly on opposite side of operations van.

5-55. Removal of Radius Rod

Remove radius rods follows:

a. Remove nuts from screw attaching each end of radius rod.

b. Pull out screws and remove cupped retainers, rubber bushings, spindles, and flat retainers.

WARNING

Prolonged contact of skin with cleaning solvent or inhalation of fumes is dangerous. Adequate ventilation must be provided.

c. Remove radius rod and clean all metal parts with cleaning solvent (Federal Spec P-S-661).

d. Visually inspect for bent, badly worn, deteriorated, or otherwise damaged parts. Replace faulty parts.

5-56. Replacement of Radius Rod

Replace radius rod as follows:

a. Position radius rod in spring hanger bracket and radius rod bracket.

b. Position one flat retainer on each side of radius rod knuckles.

c. Slide a spindle into place at each end of radius rod.

d. Install rubber bushings and cupped retainers.

e. Secure each end of radius rod with screw and nut.

f. Adjust roadside radius rod (para 5-1.9).

5-57. Removal and Replacement of Axle Assembly

5-58.

Refer to the Axle Assembly figure in TM 11-5820-763-25P when performing the following procedures.

5-59. Removal of Axle

To remove the operations van axle, proceed as follows:

a. Extend leveling jacks and landing gear high enough so that tires do not touch the ground. Place blocks under both sides of axle.

b. Open air reservoir drain cock to relieve air pressure in air brake system.

c. Remove wheels (para 5-25).

d. Remove hubs and brakedrums (para 5-31).

e. Remove brake assemblies (para 5-32).

f. Disconnect hydraulic line at tee on rear center of axle and at each brake assembly.

g. Remove two hex nuts and lockwashers from each spring U-bolt and remove axle assembly from under operations van.

WARNING

Prolonged contact of skin with cleaning solvent or inhalation of fumes is dangerous. Adequate ventilation must be provided.

h. Remove grease from spindles with cleaning solvent (Federal Spec P-S-661) and check bearing and seal seats for roughness. File or grind smooth all high spots, burrs, or roughness.

5-60. Replacement of Axle

Replace axle as follows:

a. Install brake assemblies on axle (para 5-34).

b. Raise axle assembly and block up so that nut of spring center bolt is seated in recess of axle spring seat.

c. Attach axle assembly with four U-bolts, eight lockwashers and nuts.

d. Connect hydraulic brake line to tee at each brake assembly.

e. Install hubs and brakedrums (para 5-35).

f. Install wheels (para 5-28).

g. Adjust roadside radius rod and adjust and bleed brakes (para 5-1.9 and 5-1.55, resp.).

5-61. Landing Gear Assembly

5 - 6 2 .

Refer to the Retractable Support figure in TM 11-5820-763-25P when performing the following procedures.

5-63. Removal and Disassembly of Landing Gear

Remove and disassemble the landing gear as follows :

a. With the operations van connected to prime mover, raise landing gear until gear shoes are barely touching the ground.

b. Remove the nine hex head screws attaching each gear box to operations van frame.

c. Remove hex head screws attaching each landing gear brace to landing gear leg and remove landing gear box cover and gasket.

e. Remove nut and bolt securing bevel gear shaft.

f. Drive out bevel gear shaft and pull out crankshaft. Do not drive out bushings unless they require replacement.

g. Remove locknut and lift off spring clip, 18-tooth bevel gear, machine key, and bearing cone. Cup will remain in gear box and should not be driven out unless excessively worn or damaged.

h. Remove pipe plug, spring and gib.

i. Pull shouldered shaft and lower leg out of bottom of upper leg casting, and slide off thrust bearing.

j. Remove shouldered shaft by sliding 18-tooth bevel gear and machine key over the end of the shouldered shaft and turning.

k. Remove the 18-tooth bevel gear and machine key from the shouldered shaft.

l. Push in the two nut retaining pins and remove the elevating nut and pins from lower leg.

m. Remove landing gear shoe from lower leg.

WARNING

Prolonged contact of skin with cleaning solvent or inhalation of fumes is dangerous. Adequate ventilation must be provided.

n. Clean all parts with cleaning solvent (Federal Spec P-S-661) and inspect each part for excessive wear or damage. Replace faulty parts.

5-64. Assembly and Replacement of Landing Gear

a. Attach landing gear shoe to lower leg with hex head bolt, two flat washers, pin, and self-locking nut.

b. Position elevating nut in end of lower leg and secure elevating nut with two nut retaining pins inserted from inside bore of elevating nut.

c. Thread bottom end of shouldered shaft into elevating nut and install thrust bearing on upper end.

d. Slide shouldered shaft and lower leg assembly into upper leg, rotating lower leg so that key way is aligned with pipe hole.

e. Insert gib, spring, and pipe plug.

f. Install upper bearing cone, machine key, 18-tooth bevel gear and spring and secure with locknut.

g. Position 12-tooth bevel gear, washer, and spur gear in gear box.

h. Slide bevel gear shaft and woodruff key into position and secure shaft with nut and bolt.

i. Position other spur gear and slide crankshaft into place and attach gear with grooved pin.

j. Place locking ball and spring in hole.

k. Attach gasket and gear box cover with four screws and lockwashers.

Section II. SPECIAL MAINTENANCE

5-65. Scope

This section contains maintenance instructions for correcting malfunctioning assemblies where the scope of repair is normally beyond the ca-

pability of the organizational/depot level. Where applicable, reference should be made to the applicable parts assembly TM 11-5820-763-25P for the location of parts of the particular assembly

requiring maintenance. The information contained in this section is also intended for use by depot personnel.

5-66, Mechanical Tolerances

Table 5-6 gives the minimum and maximum clearances, in inches of new and rebuilt parts. It also gives wear tolerances which indicate that point to which a part or parts may be worn before replacement. Normally, all parts are considered serviceable provided they have not been worn beyond the dimensions shown under wear tolerance or are not damaged from corrosion.

5-67. Operations Van Mechanical Maintenance

5-68.

Refer to the Axle Assembly figure in TM 11-5820-

763-25P when performing the following procedures.

5-69. Brakedrum Maintenance

Refinish brakedrum as follows:

- a. Remove brakedrum from hub (pars 5-31).
- b. Place brakedrum on lathe and check diameter for braking surface. Refer to table 5-6.
- c. Refinish brakedrum braking surface if necessary.
- d. If refinishing requires removal of more than one-sixteenth of an inch of metal (1/8-inch in diameter), replace drum with a new one (para 5-35).

Table 5-6. Mechanical Tolerances

Item	Measurement	New Part	Wear Tolerance
Brakedrum	Diameter of braking surface	16.500-16.510	16.625
Radius rods	Bore	1.252-1.254	1.256
Radius rod spindles	Outside diameter	1.2515-1.2485	1.2465

Note. All tolerances are in inches.

CHAPTER 6
CIRCUIT DIAGRAMS

6-1. Purpose

6 - 2 .

This chapter illustrates by schematic, cabling, and block diagrams all circuits and interconnecting cabling peculiar to the operations van.

6-3. Scope

6 - 4 .

The components covered in this chapter are only those for which a separate technical manual has not been prepared. For circuit diagrams of individual equipments not included herein, refer to the applicable technical manual listed in Appendix A to this manual.

6-5. Arrangement

6 - 6 .

The schematic and cabling diagrams are arranged according to logical breakdown. For example, major circuitry such as primary ac power is followed by individual schematic diagrams of each panel. Figures 6-10 through 6-25 are parts location diagrams.

6-7. Circuit Diagram Reference Data

6 - 8 .

All graphic electrical and electronic symbols conform to MIL-STD-15-1A. All abbreviations used conform to MIL-STD-12C with the following exceptions:

CH	Channel
MUX	Multiplex
PERF	Performance
VFTG	Voice Frequency Telegraph Group

6 - 9 .

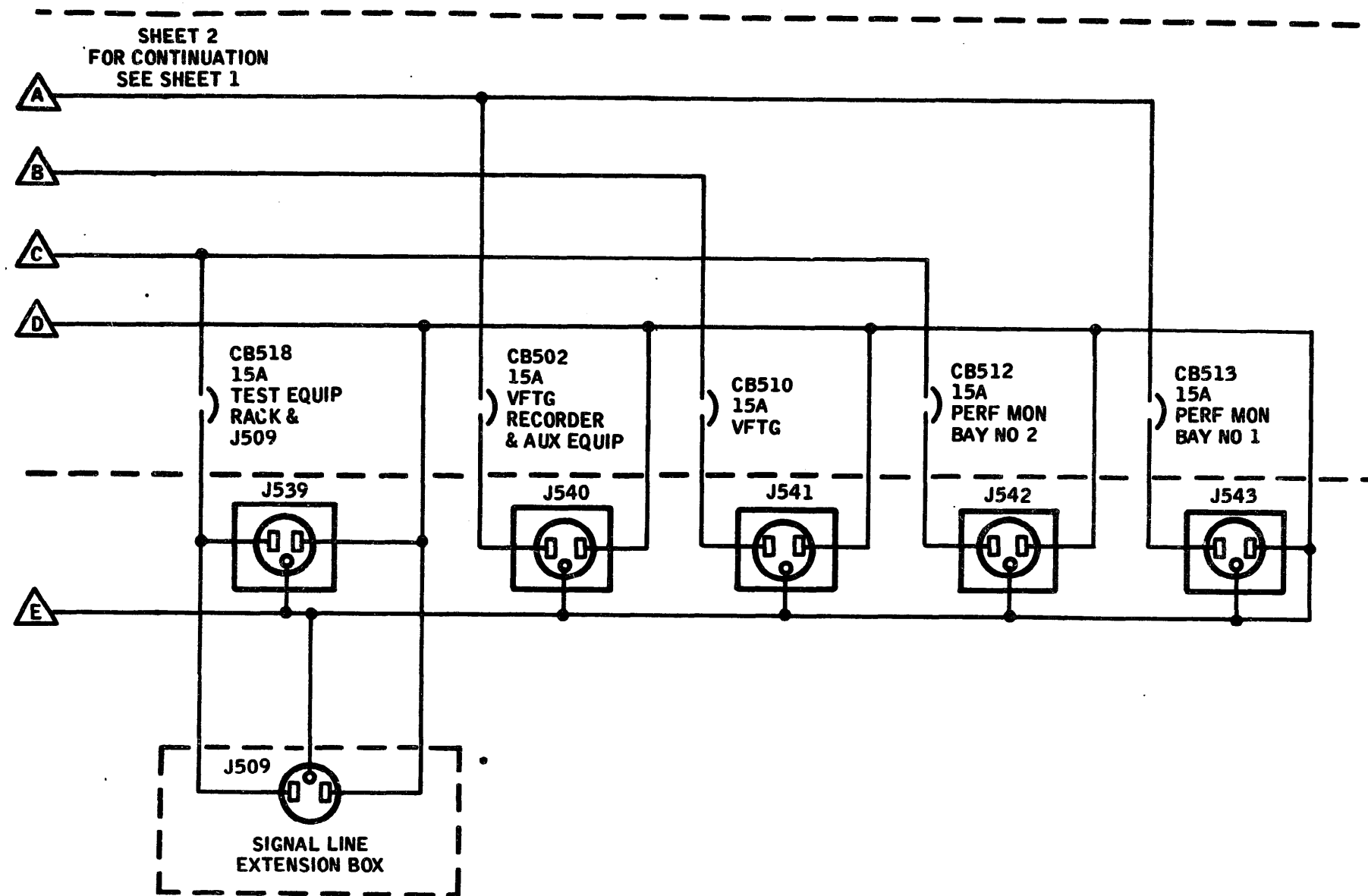
The following statements are applicable to the circuit diagrams contained in this chapter.

a. Component values are indicated as follows: resistances are in ohms unless otherwise noted (K - 1000 ohms, MEG - 1,000,000 ohms); capacitances are in microfarads unless otherwise noted (uuf - micromicrofarads); inductances are in microhenrys unless otherwise noted (MH - millihenrys, H - Henrys).

b. DC resistance of coils, chokes, and transformers in excess of one ohm are indicated adjacent to the component.

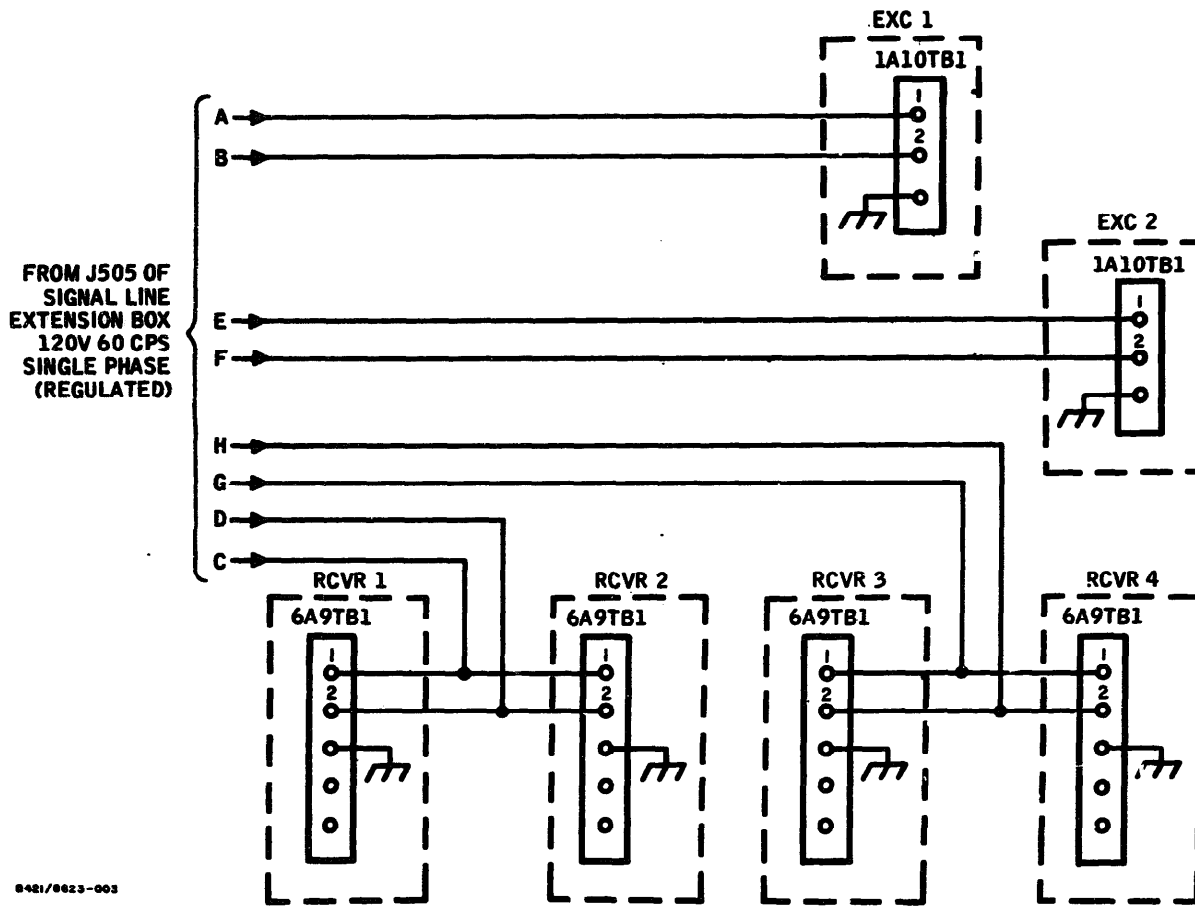
c. All wires shown directly terminated inside assembly or subassembly blocks, without connectors, are solder connected.

Figure 6-1. Primary AC Power, Schematic Diagram
(Sheet 1 of 2).
(Located in back of manual.)



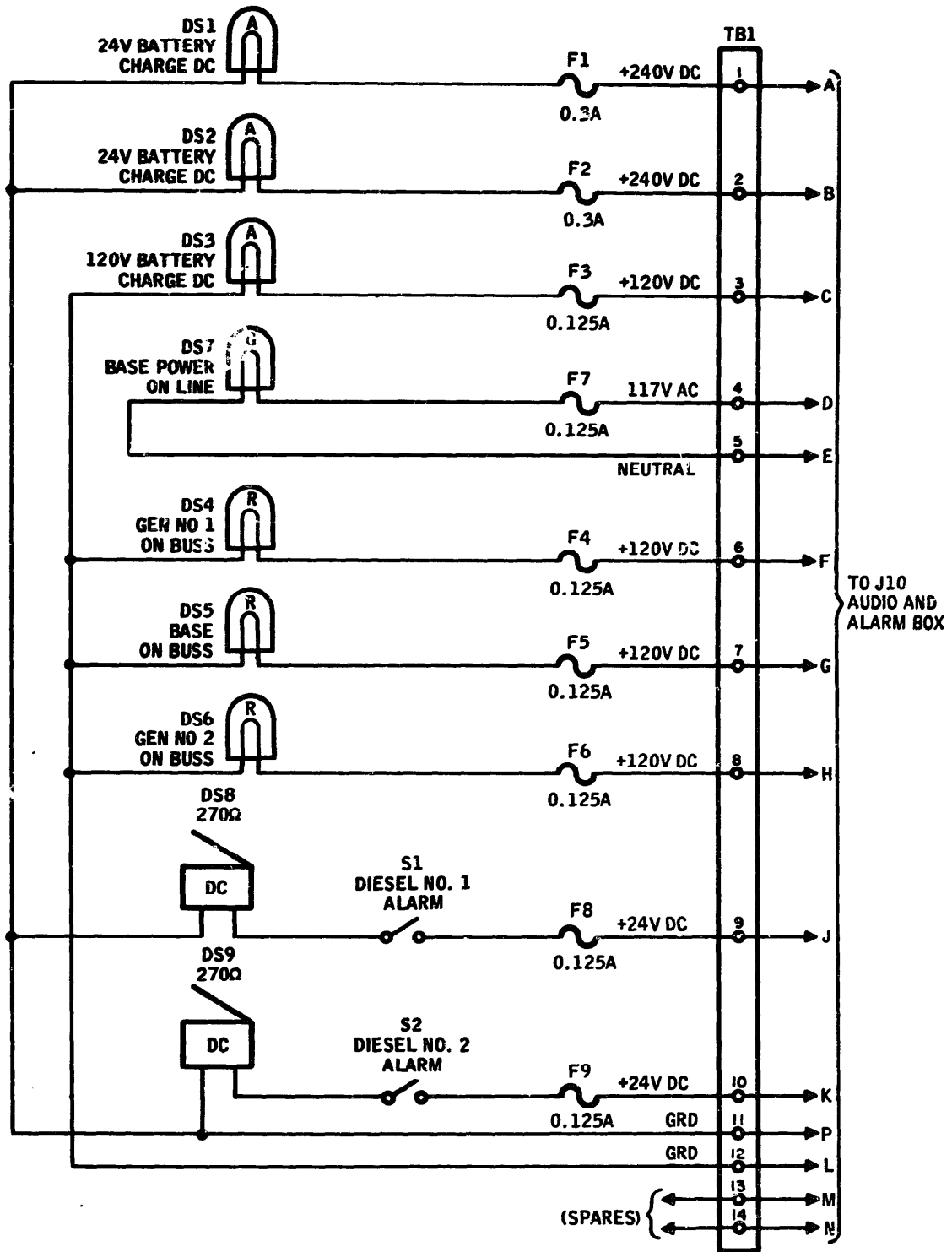
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Figure 6-1(2). Primary AC Power, Schematic Diagram (Sheet 2 of 2).



6421/8623-003

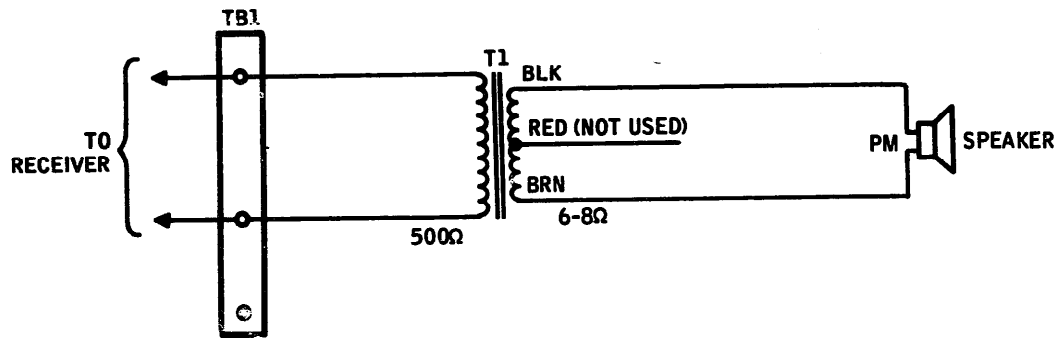
Figure 6-2. Regulated Primary AC Power, Schematic Diagram.



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Figure 6-3. Alarm-monitor, Schematic Diagram.

Figure 6-4. Recorder Control, Schematic Diagram.
(Located in back of manual.)



6421/0623-005

Figure 6-5. Speaker Panel, Schematic Diagram.

Figure 6-6. Baseband Order Wire Patch Panel Cabling Diagram (Sheet 1 of 2).

(Located in back of manual.)

Figure 6-6. Baseband and Order Wire Patch Panel Cabling Diagram (Sheet 2 of 2).

(Located in back of manual.)

Figure 6-7. Interequipment Cabling Data (Sheet 1 of 21).

(Located in back of manual)

Figure 6-7. Interequipment Cabling Data (Sheet 2 of 21).

(Located in back of manual.)

Cable No.	Equipment and terminal (MDF terminations listed by row and terminal; 20-1 is row 20, terminal 1)		Cable type or wire and color	Function
	From-	To-		
W501	Exciter 1: 1A10J4	Exciter 2: 1A12J6	RG58CU	RF input to power amplifier no. 1
W502	Exciter 1: 1A12J6	Exciter 2: 1A10J4	RG58CU	
W503	Signal line extension box: J520	Exciter patch panel: PWR. AMP. IN 1	44W	Exciter no. 1 rf output
W504	Exciter 1: J3	Exciter patch panel: Exciter output 1	RG9BU	Patch cable
W505	Exciter patch panel: Exciter output 1	Exciter patch panel: PWR. AMP. IN 1	RG9BU	Exciter no. 2 rf output
W506	Exciter 2: J3	Exciter patch panel: Exciter output 2	RG9BU	Patch cable
W507	Exciter patch panel: Exciter output 2	Exciter patch panel: PWR. AMP. IN 2	RG9BU	RF input to power amplifier no. 2
W508	Signal line extension box: J521	Exciter patch panel: PWR. AMP. IN 2	44W	Exciter no. 1 high frequency baseband input
W509	Exciter 1: 1A10J1	Exciter 2: 1A9J18	RG58CU	
W510	Exciter 1: 1A9J18	Exciter 2: 1A10J1	RG58CU	Exciter no. 1 baseband monitor
W511	Exciter 1: 1A2J2	Baseband and order wire patch panel: J3.	RG108AU	
W512	Exciter 1: 1A2J5	Baseband and order wire patch panel: J4.	RG108AU	Exciter no. 3 high frequency baseband input
W513	Exciter 2: 1A2J2	Baseband and order wire patch panel: J5.	RG108AU	
W514	Exciter 2: 1A2J5	Baseband and order wire patch panel: J6	RG108AU	Exciter no. 2 baseband monitor
W515	MDF block 2B:	Baseband and order wire patch panel:	RG59BU	
	20-1*	J29*		Multiplexer set unbalanced input
	20-2	J29		
W516	MDF block 2B:	Baseband and order wire patch panel:	RG59BU	Order wire telephone set output
	22-1*	J30*		
	22-2	J30		Order wire telephone set input
W517	Order wire telephone set: PAD	Baseband and order wire patch panel: J2	RG108AU	
W518	Order wire telephone set: AMP	Baseband and order wire patch panel: J8	RG108AU	Receiver no. 1 baseband combiner lift
W519	Receiver 1: 6J1	Baseband and order wire patch panel: J9	RG62U	
W520	Receiver 1: 6J3	Baseband and order wire patch panel: J11	RG62U	Receiver no. 1 order wire combiner lift
W521	Receiver 1: 6J5	Baseband and order wire patch panel: J13	RG62U	
W522	Receiver 1: GA2TR1-	Baseband and order wire patch panel:	RG108AU	Receiver no. 1 baseband monitor
	25*	J10		
	26	J10		Receiver no. 1 order wire monitor
	27	J10		
W523	Receiver 1: 6A2J3	Baseband and order wire patch panel: J12	RG108AU	Receiver no. 2 baseband combiner lift
W524	Receiver 2: 6J1	Baseband and order wire patch panel: J14	RG62U	
W525	Receiver 2: 6J3	Baseband and order wire patch panel: J16	RG62U	Receiver no. 2 order wire combiner lift
W526	Receiver 2: 6J5	Baseband and order wire patch panel: J18	RG62U	
W527	Receiver 2: 6A2TB1-	Baseband and order wire patch panel:	RG108AU	Receiver no. 2 order wire monitor
	25*	J15*		
	26	J15		Receiver no. 2 baseband monitor

* Shield

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Figure 6-7. Interequipment Cabling Data (Sheet 3 of 21).

Cable No.	Equipment and terminal (MDF terminations listed by row and terminal; 20-1 is row 20, terminal 1)		Cable type or wire and color	Function
	From--	To--		
W588	Receiver a: GA2J3	Baseband and order wire patch panel: J17	RG108AU	Receiver no. 2 order wire monitor
W529	Receiver 3: 6J1	Baseband and order wire patch panel: J19	RG62U	Receiver no. 3 baseband combiner lift
W530	Receiver 3: 6J3	Baseband and order wire patch panel: J21	RG62U	Receiver no. 3 order wire combiner lift
W531	Receiver 3: 6J5	Baseband and order wire patch panel: J23	RG62U	Receiver no. 3 order wire monitor
W532	Receiver 3: 6A2TB1- 25* 26 27	Baseband and order wire patch panel: J20* J20	RG108AU	Receiver no. 3 baseband monitor
W533	Receiver 3: 6A2J3	Baseband and order wire patch panel: J22	RG108AU	Receiver no. 3 order wire monitor
W534	Receiver 4: 6J1	Baseband and order wire patch panel: J24	RG62U	Receiver no. 4 baseband combiner lift
W535	Receiver 4: 6J3	Baseband and order wire patch panel: J26	RG62U	Receiver no. 4 order wire combiner lift
W536	Receiver 4: 6J5	Baseband and order wire patch panel: J28	RG62U	Receiver no. 4 order wire monitor
W537	Receiver 4: 6A2TB1- 25* 26 27	Baseband and order wire patch panel: J25* J25 J25	RG108AU	Receiver no. 4 baseband monitor
W538	Receiver 4: 6A2J3	Baseband and order wire patch panel: J27	RG108AU	Receiver no. 4 order wire monitor
W539	Receiver 1: 6A7J36	Receiver 2: 6A7J37	RG58CU	
W540	Receiver 2: 6A7J36	Receiver 3: 6A7J37	RG58CU	
W541	Receiver 3: 6A7J36	Receiver 4: 6A7J37	RG58CU	
W542	Receiver 1: 6A7J10	Recorder control panel: J5	RG108AU	Recorder input
W543	Receiver 1: 6A8J22	Recorder control panel: J1	RG108AU	Recorder input
W544	Receiver 2: 6A8J22	Recorder control panel: J2	RG108AU	Recorder input
W545	Receiver 3: 6A8J22	Recorder control panel: J3	RG108AU	Recorder input
W546	Receiver 4: 6A8J22	Recorder control panel: J4	RG108AU	Recorder input
W547	Signal line extension box: J501	Receiver 1: 6J7	RG9BU	Receiver no. 1 rf input
W548	Signal line extension box: J502	Receiver 2: 6J7	RG9BU	Receiver no. 2 rf input
W549	Signal line extension box: J503	Receiver 3: 6J7	RG9BU	Receiver no. 3 rf input
W550	Signal line extension box: J504	Receiver 4: 6J7	RG9BU	Receiver no. 4 rf input
W551	Signal line extension box: J517	VFTG: Bracket on rack	RG9BU 15 ft	Test cable
W552	Exciter patch panel: EXCITER DUMMY LOAD in 1	Exciter 1: 1A6J1	RG9BU	Input to exciter no. 1 dummy load
W553	Exciter patch panel: EXCITER DUMMY LOAD in 2	Exciter 2: 1A6J1	RG9BU	Input to exciter no. 2 dummy load
W554	Fault indicator 1, 5TB1: 1 2 4 5 7 8 10 11 13 14 16 17 19	Signal line extension panel, J506: A B C D E F G H J K L M N	12 pr w/shield: White Blue White Orange White Green White Brown White Gray Red Blue Red	Flt chg ovid Flt chg ovid Cab temp Cab temp Alm pwr sup Alm pwr sup VSWR VSWR Low fwd pwr Low fwd pwr Flt reg Flt reg Recycle

1 Shield

EL5820-763-15-TM-2

Figure 6-7. Interequipment Cabling Data (Sheet 4 of 21).

Cable No.	Equipment and terminal (MDF terminations listed by row and terminal; 20-1 is row 20, terminal 1)		Cable type or wire and color	Function				
	From-	To-						
W554 (cont)	Fault indicator 1, 5TB1	Signal line extension panel, J506 (cont):	12 pr w/shield (cont):	Recycle Dehydrator Dehydrator Low cool level Low cool level Low cool temp Low cool temp High cool temp High cool temp				
	(cont):	0			Orange			
	31	P			Red			
	32	Q			Green			
	22	R			Red			
	23	S			Brown			
	25	T			Red			
	26	U			Gray			
	28	V			Black			
	29	W			Blue			
W555	Fault indicator 1, 5TB1:	Exciter 1, 1A2TB1:	12 pr w/shield:	Mod transfer Mod transfer Mod Mod Very high VSWR Very high VSWR RF RF				
	34	25			White			
	35	24			Blue			
	37	21			White			
	38	20			Orange			
	40	18			White			
	41	17			Green			
	43	15			White			
	44	14			Brown			
	W556	Fault indicator 1, 5TB1:			Receiver 1, 6A2TB1:	6 pr w/shield:	Radio pilot Radio pilot Noise amp Noise amp Thres trans Thres trans	
46		14	White					
47		15	Blue					
49		16	White					
50		17	Orange					
52		18	White					
53		19	Green					
W557		Fault indicator 1, 5TB1:	Receiver 2, 6A2TB1:	6 pr w/shield:	Radio pilot Radio pilot Noise amp Noise amp Thres trans Thres trans			
		55	14					White
		56	15					Blue
	58	16	White					
	59	17	Orange					
	7	18	White					
	8	19	Green					
	W558	Fault indicator 2, 5TB1:	Signal line extension box, J507:			25 pr w/shield:	Fil chg ovld Fil chg ovld Cab temp Cab temp Alm pwr sup Alm pwr sup VSWR VSWR Low, fwd power Low, fwd power Fil reg Fil reg Recycle Recycle Low cool level Low cool level Low cool temp Low cool temp Low cool temp High cool temp High cool temp	
		1	A					White
		2	B					Blue
4		c	White					
5		D	Orange					
7		E	White					
8		F	Green					
10		G	White					
11		H	Brown					
13		J	White					
14		K	Gray					
16		L	Red					
17		M	Blue					
19		N	Red					
20		O	Orange					
22		R	Red					
23		S	Brown					
25		T	Red					
26		U	Gray					
28		V	Black					
29		W	Blue					
W559		Fault indicator 2, 5TB1:	Exciter 2, 1A2TB1:	12 pr w/shield:	Mod transfer Mod transfer Mod			
		34	25					White
		35	24					Blue
		37	21					White

* Shield

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Figure 6-7. Interequipment Cabling Data (Sheet 5 of 21).

Cable No.	Equipment and terminal (MDF terminations listed by row and terminal; 20-1 is row 20, terminal 1)		Cable type or wire and color	Function
	From--	To--		
W559 (cont)	Fault indicator 2, 5TB1 (cont): 38 40 41 43 44	Exciter 2, 1A2TB1 (cont): 20 18 17 15 14	12 pr w/shield (cont): Orange White Green White Brown	Mod Very high V8WR Very high VSWR RF RF
W560	Fault indicator 2, 5TB1: 46 47 49 50 52 53	Receiver 3, 6A2TB1: 14 15 16 17 18 19	6 pr w/shield: White Blue White Orange White Green	Radio pilot Radio pilot Noise amp Noise amp Thres trans Thres trans
W561	Fault indicator 2, 5TB1: 55 56 58 59 7 8	Receiver 4, 6A2TB1: 14 15 16 17 18 19	6 pr w/shield: White Blue White Orange White Green	Radio pilot Radio pilot Noise amp Noise amp Thres trans Thres trans
W565	MDF, block 2B: 20-2 20-1*	AN/MCC-13 rack 2, 2A1TB3: 261 262*	RG59BU	
W566	MDF, block 2B: 22-2 22-1*	AN/MCC-13 rack 4, 4A1TB2: 175 176*	RG59BU	
W567	Exciter 1: 1A10J5	Exciter 1: 1A12J8	RG58CU	
W568	Exciter 1: 1A12J7	Exciter 1: 1A10J6	RG58CU	
W569	Exciter 2: 1A10J6	Exciter 2: 1A12J7	RG58CU	
W570	Exciter 2: 1A12J8	Exciter 2: 1A10J5	RG58CU	
W571				
W572	Located in power amplifier van			
W573				
W574	Alarm-monitor TB1:	Audio and alarm box J10:	Type B per MIL-W-16878	
W575				
	1 2 3 4 5 6 7 8 9 10 11 12 13 14 MDF, block 2B: 26-1 26-2 26-3 26-4	A B C D E F G H J K P L M N E1 E2 E3 E4		24 vdc battery charge 24 vdc battery charge 120 vdc battery charge Base power on line AC ground Gen no. 1 on buss Base on buss Gen no. 2 on buss Diesel no. 1 alarm Diesel no. 2 alarm DC ground DC ground Spare Spare Ext tel con Ext tel con Ext tel con Ext tel con

* Shield

EL5820-673-15-TM-4

Figure 6-7. Interequipment Cabling Data (Sheet 6 of 21).

Cable No.	Equipment and terminal (MDF terminations listed by row and terminal; 20-1 is row 20, terminal 1)		Cable type or wire and color	Function	
	From--	To--			
W576	RReceiver 1: 6A2J1	RReceiver 1, 6A2TB1: 23	R RG9BU	(Channel no.:	
W577	RReceiver 2: 6A2J1	RReceiver 2, 6A2TB1: 23	R RG9BU		
W578	RReceiver 3: 6A2J1	RReceiver 3, 6A2TB1: 23	R RG9BU		
W579	RReceiver 4: 6A2J1	RReceiver 4, 6A2TB1: 23	R RG9BU		
W581	IMDF, block 3E:	AAN/MCC-13 rack 1, 1A1TB1-2-3:	20 AWG solid 20 ft lg gray jacket:		
	1-1	1	white		} 1
	1-2	2	Blue		} 2
	1-3	17	white		
	1-4	18	Orange		} 3
	1-5	33	white		
	1-6	34	Green		} 4
	2-1	49	white		
	2-2	50	Brown		} 5
	2-3	65	White		
	2-4	66	Gray		} 6
	2-5	81	Red		
	2-6	82	Blue		} 7
	3-1	97	Red		
	3-2	98	Orange		} 8
	3-3	113	Red		
	3-4	114	Green		} 9
	3-5	129	Red		
	3-6	130	Brown		} 10
	4-1	145	Red		
	4-2	146	Gray	} 11	
	4-3	161	Black		
	4-4	162	Blue	} 12	
	4-5	177	Black		
	4-6	178	Orange	} 13	
	5-1	193	Black		
	5-2	194	Green	} 14	
	5-3	209	Black		
	5-4	210	Brown	} 15	
	5-5	225	Black		
	5-6	226	Gray	} 16	
	6-1	241	Yellow		
	6-2	242	Blue	} 17	
	6-3	257	Yellow		
	6-4	258	Orange	} 18	
	6-5	273	Yellow		
	6-6	274	Green	} 19	
	7-1	289	Yellow		
	7-2	290	Brown	} 20	
	7-3	305	Yellow		
	7-4	306	Gray	} 21	
	7-5	321	Violet		
	7-6	322	Blue	} 22	
	8-1	337	Violet		
	8-2	338	Orange	} 23	
	8-3	353	Violet		
	8-4	354	Green	} 24	
	8-5	369	Violet		
	8-6	370	Brown	} Spares	
			Violet		
			Gray		

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Figure 6-7. Interequipment Cabling Data (Sheet 7 of 21).

Cable No.	Equipment and terminal (MDF terminations listed by row and terminal; 20-1 is row 20, terminal 1)		Cable type or wire and color	Function
	From--	To--		
W582	MDF, block 3E:	AN/MCC-13 rack 1, 1A2TB1-2-3:	20 AWG solid 20 ft lg gray jacket:	Channel no.:
	9-1	1	White	} 25
	9-2	2	Blue	
	9-3	17	White	} 26
	9-4	18	Orange	
	9-5	33	White	} 27
	9-6	34	Green	
	10-1	49	White	} 28
	10-2	50	Brown	
	10-3	65	White	} 29
	10-4	66	Gray	
	10-5	81	Red	} 30
	10-6	82	Blue	
	11-1	97	Red	} 31
	11-2	98	Orange	
	11-3	113	Red	} 32
	11-4	114	Green	
	11-5	129	Red	} 33
	11-6	130	Brown	
	12-1	145	Red	} 34
	12-2	146	Gray	
	12-3	161	Black	} 35
	12-4	162	Blue	
	12-5	177	Black	} 36
	12-6	178	Orange	
	13-1	193	Black	} 37
	13-2	194	Green	
	13-3	209	Black	} 38
	13-4	210	Brown	
	13-5	225	Black	} 39
	13-6	226	Gray	
	14-1	241	Yellow	} 40
	14-2	242	Blue	
14-3	257	Yellow	} 41	
14-4	258	Orange		
14-5	273	Yellow	} 42	
14-6	274	Green		
15-1	289	Yellow	} 43	
15-2	290	Brown		
15-3	305	Yellow	} 44	
15-4	306	Gray		
15-5	321	Violet	} 45	
15-6	322	Blue		
16-1	337	Violet	} 46	
16-2	338	Orange		
16-3	353	Violet	} 47	
16-4	354	Green		
16-5	369	Violet	} 48	
16-6	370	Brown		
		Violet	} Spares	
		Gray		
W583	MDF, block 3E:	AN/MCC-13 rack 1, 1A3TB1-2-ε:	20 AWG solid 20 ft lg gray jacket:	Channel no.:
	17-1	1	White	} 49
	17-2	2	Blue	
	17-3	17	White	} 50
	17-4	18	Orange	

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Figure 6-7. Interequipment Cabling Data (Sheet 8 of 21).

Cable No.	Equipment and terminal (MDF terminations listed by row and terminal; 20-1 is row 20, terminal 1)		Cable type or wire and color	Function
	From-	To-		
W583 (cont)	MDF, block 3E (cont):	AN/MCC-13 rack 1, 1A3TB1-2-3 (cont):	20 AWG solid 20 ft lg gray jacket (cont):	Channel no. (cont):
	17-5	33	White	51
	17-5	34	Green	
	18-1	49	white	52
	18-2	50	Brown	
	18-3	65	white	53
	18-4	66	Gray	
	18-5	81	Red	54
	18-5	82	Blue	
	19-1	97	Red	55
	19-2	98	Orange	
	19-3	113	Red	56
	19-4	114	Green	
	19-5	129	Red	57
	19-6	130	Brown	
	20-1	145	Red	58
	20-2	146	Gray	
	20-3	161	Black	59
	20-4	162	Blue	
	20-5	177	Black	60
	20-6	178	Orange	
	21-1	193	Black	61
	21-2	194	Green	
	21-3	209	Black	62
	21-4	210	Brown	
	21-5	225	Black	63
	21-6	226	Gray	
	22-1	241	Yellow	64
	22-2	242	Blue	
	22-3	257	Yellow	65
	22-4	258	Orange	
	22-5	273	Yellow	66
	22-6	274	Green	
	23-1	289	Yellow	67
	23-2	290	Brown	
	23-3	305	Yellow	68
	23-4	306	Gray	
23-5	321	Violet	69	
23-6	322	Blue		
24-1	337	Violet	70	
24-2	338	Orange		
24-3	353	Violet	71	
24-4	354	Green		
24-5	369	Violet	72	
24-6	370	Brown		
		Violet	} Spares	
		Gray		
W584	MDF, block 3D:	AN/MCC-13 rack 1, 1A1TB1-2-3:	20 AWG solid 20 ft lg gray jacket:	Channel no. :
	1-1	3	White	} 1
	1-2	4	Blue	
	1-3	19	white	} 2
	1-4	20	orange	
	1-5	35	white	} 3
	1-6	36	Green	
	2-1	51	White	} 4
2-2	52	Brown		

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Figure 6-7. Interequipment Cabling Data (Sheet 9 of 21).

Cable No.	Equipment and terminal (MDF terminations listed by row and terminal; 20-1 is row 20, terminal 1)		Cable type or wire and color	Function
	From-	TO-		
W584 (cont)	MDF, block 3D (cont):	AN/MCC-13 rack 1, 1A1TB1-2-3 (cont):	20 AWG solid 20 ft lg gray jacket (cont):	Channel no. (cont):
	2-3	67		
	2-4	68	Gray	} 5
	2-5	83	Red	} 6
	2-6	84	Blue	
	3-1	99	Red	} 7
	3-2	100	Orange	
	3-3	115	Red	} 8
	3-4	116	Green	
	3-5	131	Red	} 9
	3-6	132	Brown	
	4-1	147	Red	} 10
	4-2	146	Gray	
	4-3	163	Black	} 11
	4-4	164	Blue	
	4-5	179	Black	} 12
	4-6	180	Orange	
	5-1	195	Black	} 13
	5-2	196	Green	
	5-3	211	Black	} 14
	5-4	212	Brown	
	5-5	227	Black	} 15
	5-6	228	Gray	
	6-1	243	Yellow	} 16
	6-2	244	Blue	
	6-3	259	Yellow	} 17
	6-4	260	Orange	
	6-5	275	Yellow	} 18
6-6	276	Green		
7-1	291	Yellow	} 19	
7-2	292	Brown		
7-3	307	Yellow	} 20	
7-4	308	Gray		
7-5	323	Violet	} 21	
7-6	324	Blue		
8-1	339	Violet	} 22	
8-2	340	Orange		
8-3	355	Violet	} 23	
8-4	356	Green		
8-5	371	Violet	} 24	
8-6	372	Brown		
		Violet	} Spares	
		Gray		
W585	MDF, block 3D:	AN/MCC-13 rack 1, 1A2TB1-2-3:	20 AWG solid 20 ft lg gray jacket:	Channel no.:
	9-1	3	white	} 25
	9-2	4	Blue	
	9-3	19	white	} 26
	9-4	20	Orange	
	9-5	35	White	} 27
	9-6	36	Green	
	10-1	51	White	} 28
10-2	52	Brown		
10-3	67	white	} 29	
10-4	68	Gray		
10-5	83	Red	} 30	
10-6	84	Blue		

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Figure 6-7. Interequipment Cabling Data (Sheet 10 of 21).

Cable No.	Equipment and terminal (MDF terminations listed by row and terminal; 20-1 is row 20, terminal 1)		Cable type or wire and color	Function
	From--	To--		
W585 (cont)	MDF, block 3D (cont):	AN/MCC-13 rack 1, 1A2TB1-2-3 (cont):	20 AWG solid 20 ft lg gray	Channel no. (cont):
	11-1	99	jacket (cont):	
	11-2	1090	Orange	} 31
	11-3	115	Red	
	11-4	116	Green	} 32
	11-5	131	Red	
	11-6	132	Brown	} 33
	12-1	147	Red	
	12-2	148	Gray	} 34
	12-3	163	Black	
	12-4	164	Blue	} 35
	12-5	179	Black	
	12-6	180	Orange	} 36
	13-1	195	Black	
	13-2	196	Green	} 37
	13-3	211	Black	
	13-4	212	Brown	} 38
	13-5	227	Black	
	13-6	228	Gray	} 39
	14-1	243	Yellow	
	14-2	244	Blue	} 46
	14-3	259	Yellow	
	14-4	260	Orange	} 41
	14-5	275	Yellow	
	14-6	276	Green	} 42
	15-1	291	Yellow	
	15-2	292	Brown	} 43
	15-3	307	Yellow	
	15-4	308	Gray	} 44
	15-5	323	Violet	
15-6	324	Blue	} 45	
16-1	339	Violet		
16-2	340	Orange	} 46	
16-3	355	Violet		
16-4	356	Green	} 47	
16-5	371	Violet		
16-6	372	Brown	} 48	
		Violet		
		Gray	} Spares	
W586	MDF, block 3D:	AN/MCC-13 rack 1, 1A3TB1-2-3:	20 AWG solid 20 ft lg gray	Channel no.:
	17-1	3	Jacket:	
	17-2	4	White	} 49
	17-3	19	Blue	
	17-4	20	White	} 50
	17-5	35	Orange	
	17-6	36	White	} 51
	18-1	51	Green	
	18-2	52	White	} 52
	18-3	67	Brown	
	18-4	68	White	} 53
	18-5	83	Gray	
	18-6	84	Red	} 54
	19-1	99	Blue	
19-2	100	Red	} 55	
19-3	115	Orange		
19-4	116	Red	} 56	
		Green		

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Figure 6-7. Interequipment Cabling Data (Sheet 11 of 21).

Cable No.	Equipment and terminal (MDF terminations listed by row and terminal; 20-1 is row 20, terminal 1)		Cable type or wire and color	Function
	From-	To-		
W586 (cont)	MDF, block 3D (cont):	AN/MCC-13 rack 1, 1ASTB1-2-3(cont):	20 AWG solid 20 ft lg gray jacket (cont):	Channel no. (cont):
	19-5	131	Red	57
	19-6	132	Brown	
	20-1	147	Red	58
	20-2	148	Gray	
	20-3	163	Black	59
	20-4	164	Blue	
	20-5	179	Black	60
	20-6	180	Orange	
	21-1	195	Black	61
	21-2	196	Green	
	21-3	211	Black	62
	21-4	212	Brown	
	21-5	227	Black	63
	21-6	228	Gray	
	22-1	243	Yellow	64
	22-2	244	Blue	
	22-3	259	Yellow	65
	22-4	260	Orange	
	22-5	275	Yellow	66
	22-6	276	Green	
	23-1	291	Yellow	67
	23-2	292	Brown	
	23-3	307	Yellow	68
	23-4	308	Gray	
	25-5	323	Violet	69
23-6	324	Blue		
24-1	339	Violet	70	
24-2	340	Orange		
24-3	355	Violet	71	
24-4	256	Green		
24-5	371	Violet	72	
24-6	372	Brown		
		Violet	Spares	
		Gray	Channel no.:	
W587	MDF, block 3C:	AN/MCC-13 rack 1, 1A1TB1-2-3:	20 AWG solid 20 ft lg gray jacket:	
	1-1	13	white	1
	1-2	14	Blue	
	1-3	29	White	2
	1-4	30	Orange	
	1-5	45	White	3
	1-6	46	Green	
	2-1	61	White	4
	2-2	62	Brown	
	2-3	77	White	5
	2-4	78	Gray	
	2-5	93	Red	6
	2-6	94	Blue	
	3-1	109	Red	7
	3-2	110	Orange	
	3-3	125	Red	8
3-4	126	Green		
3-5	141	Red	9	
3-6	142	Brown		
4-1	157	Red	10	
4-2	158	Gray		

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Figure 6-7. Interequipment Cabling Data (Sheet 12 of 21).

Cable No.	Equipment and terminal (MDF terminations listed by row and terminal; 20-1 is row 20, terminal 1)		Cable type or wire and color	Function
	From-	To -		
W587 (cont)	MDF, block 3C (cont):	AN/MCC-13 rack 1, 1A1TB1-2-3 (cont):	20 AWG solid 20 ft lg gray jacket (cont):	Channel no. (cont):
	4-3	173	Black	11
	4-4	174	Blue	12
	4-5	189	Black	
	4-6	190	Orange	13
	5-1	205	Black	
	5-2	206	Green	14
	5-3	221	Black	
	5-4	222	Brown	15
	5-5	237	Black	
	5-6	238	Gray	16
	6-1	253	Yellow	
	6-2	254	Blue	17
	6-3	269	Yellow	
	6-4	270	Orange	18
	6-5	285	Yellow	
	6-6	286	Green	19
	7-1	301	Yellow	
	7-2	302	Brown	20
	7-3	317	Yellow	
7-4	318	Gray	21	
7-5	333	Violet		
7-6	334	Blue	22	
8-1	349	Violet		
8-2	350	Orange	23	
8-3	365	Violet		
8-4	366	Green	24	
8-5	381	Violet		
8-6	382	Brown	Spares	
		Violet		
		Gray		
W588	MDF, block 3C:	AN/MCC-13 rack 1, 1A2TB1-2-3:	20 AWG solid 20 ft lg gray jacket:	Channel no.
	9-1	13	White	25
	9-2	14	Blue	
	9-3	29	White	26
	9-4	30	Orange	
	9-5	45	White	27
	9-6	46	Green	
	10-1	61	White	28
	10-2	62	Brown	
	10-3	77	White	29
	10-4	78	Gray	
	10-5	93	Red	30
	10-6	94	Blue	
	11-1	109	Red	31
	11-2	110	Orange	
	11-3	125	Red	32
	11-4	126	Green	
	11-5	141	Red	33
11-6	142	B r o w n		
12-1	157	Red	34	
12-2	158	Gray		
12-3	173	Black	35	
12-4	174	Blue		
12-5	189	Black	36	
12-6	190	Orange		

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Figure 6-7. Interequipment Cabling Data (Sheet 13 of 21).

Cable No.	Equipment and terminal (MDF terminations listed by row and terminal; 20-1 is row 20, terminal 1)		Cable type or wire and color	Function
	From-	To-		
W588 (cont)	MDF, block SC (cont):	AN/MCC-13 rack 1, 1A2TB1-2-3 (cont):	20 AWG solid 20 ft lg gray jacket (cont):	Channel no. (cont)
	13-1	205	Green	37
	13-2	206	Black	38
	13-3	221	Brown	
	13-5	237	Black	39
	13-6	238	Gray	
	14-1	253	Yellow	40
	14-2	254	Blue	
	14-3	269	Yellow	41
	14-4	270	Orange	
	14-5	285	Yellow	42
	14-6	286	Green	
	15-1	301	Yellow	43
	15-2	302	Brown	
	15-3	317	Yellow	44
	15-4	318	Gray	
15-5	333	Violet	45	
15-6	334	Blue		
16-1	349	Violet	46	
16-2	350	Orange		
16-3	365	Violet	47	
16-4	366	Green		
16-5	381	Violet	48	
16-6	382	Brown		
		Violet		
		Gray	} Spares	
W589	MDF, block 3C:	AN/MCC-13 rack 1, 1A3TB1-2-3:	20 AWG solid 20 ft lg gray jacket:	Channel no.:
	17-1	13	White	49
	17-3	29	Blue	
	17-4	30	White	50
	17-5	45	Orange	
	17-6	46	White	51
	18-1	61	Green	
	18-2	62	White	52
	18-3	77	Brown	
	18-4	78	White	53
	18-5	93	Gray	
	18-6	94	Red	54
	19-1	109	Blue	
	19-2	110	Red	55
	19-3	125	Orange	
	19-4	126	Red	56
19-5	141	Green		
19-6	142	Red	57	
20-1	157	Brown		
20-2	158	Red	58	
20-3	173	Gray		
20-4	174	Black	59	
20-5	189	Blue		
20-6	190	Black	60	
21-1	205	Orange		
21-2	206	Black	61	
21-3	221	Green		
21-4	222	Black	62	
		Brown		

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Figure 6-7. Interequipment Cabling Data (Sheet 14 of 21).

Cable No	Equipment and terminal (MDF terminations listed by row and terminal; 20-1 is row 20, terminal 1)		Cable type or wire and color	Function
	from-	To-		
W589 (cont)	MDF, block 3C (cont):	AN/MCC-13 rack 1, 1A3TB1-2-3 (cont):	20 AWG solid 20 ft lg gray jacket (cont):	Channel no. (cont):
	21-5	237	Black	} 63
	21-6	238	Gray	
	22-1	253	Yellow	} 64
	22-2	254	Blue	
	22-3	269	Yellow	} 65
	22-4	270	Orange	
	22-5	285	Yellow	} 66
	22-6	286	Green	
	23-1	301	Yellow	} 67
	23-2	302	Brown	
	23-3	317	Yellow	} 68
	23-4	318	Gray	
	23-5	333	Violet	} 69
	23-6	334	Blue	
	24-1	349	Violet	} 70
	24-2	350	Orange	
	24-3	365	Violet	} 71
	24-4	366	Green	
	24-5	381	Violet	} 72
	24-6	382	Brown	
			Violet	} Spare
			Gray	
	AN/MCC-13:	AN/MCC-13:	20 AWG solid 15 ft lg gray jacket	Multiplexer set interconnections
W5000	4A1TB1	1A1TB1-3		
W5001	4A1TB1	1A1TB2-3		
W5002	4A1TB1	1A2TB1-2		
W5003	4A1TB1	1A2TB2-3		
W5004	4A1TB1	1A3TB1-2		
W5005	4A1TB2	1A3TB2-3		
W5006	2A1TB1	1A1TB1-2		
W5007	2A1TB1	1A1TB2-3		
W5008	2A1TB1	1A2TB1-2		
W5009	2A1TB1	1A2TB2-3		
W5010	2A1TB1	1A3TB1-2		
W5011	2A1TB2	1A3TB2-3		
W5012	3A1TB1	2A2TB1	RG187U 12 ft lg gray jacket	Multiplexer set interconnections
W5013	3A1TB1	2A2TB1		
W5014	3A1TB1	2A2TB1		
W5015	3A1TB1	2A2TB1		
W5016	3A1TB1	2A2TB1		
W5017	3A1TB1	2A2TB1		
W5018	3A1TB1	2A2TB1		
W5019	3A1TB1	2A2TB1		
W5020	3A1TB1	2A2TB1		
W5021	3A1TB1	2A2TB1		
W5022	3A1TB1	2A2TB1		
W5023	3A1TB1	2A2TB1		
W5024	3A1TB2	2A2TB2		
W5025	3A1TB2	2A1TB2		
W5026	3A1TB2	2A1TB2		
W5027	4A2TB1	3A1TB1		
W5028	4A2TB1	3A1TB1		
W5029	4A2TB1	3A1TB1		
W5030	4A2TB1	3A1TB1		
W5031	4A2TB1	3A1TB1		

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Figure 6-7. Interequipment Cabling Data (Sheet 15 of 21).

Cable No.	Equipment and terminal (MDF terminations listed by row and terminal; 20-1 is row 20, terminal 1)		Cable type or wire and color	Function
	From-	To-		
W5032	AN/MCC-13 (cont): 4A2TB1	AN/MCC-13 (cont): 3A1TB1		
W5033	4A2TB1	3A1TB1		
W5034	4A2TB1	3A1TB1		
W5035	4A2TB1	3A1TB1		
W5036	4A2TB1	3A1TB1		
W5037	4A2TB1	3A1TB1		
W5038	4A2TB1	3A1TB1		
W5039	4A2TB2	3A1TB2		
W5040	3A1TB2	2A2TB3		
W5041	3A1TB3	2A2TB3		
W5042	4A2TB2	3A1TB2		
W5043	4A2TB3	3A1TB3		
W5044	4A2TB3	3A1TB3		
W5045	MDF, block 2B: 10-4 10-5 10-6*	AN/MCC-13 rack 4, 4A1TB2: 160 161 162*	RG108AU 18 ft lg	Thru group send
W5046	MDF, block 2B: 11-4 11-5 11-6*	AN/MCC-13 rack 4, 4A1TB2: 163 164 165*	RG108AU	Thru group send
W5047	MDF, block 2B: 12-4 12-5 12-6*	AN/MCC-13 rack 4, 4A1TB2: 166 167 168*	RG108AU 18 ft lg	Thru group send
W5048	MDF, block 2B: 15-4 15-5 15-6*	AN/MCC-13 rack 4, 4A1TB3: 247 248 249*	RG108AU 18 ft lg	Thru group rec
W5049	MDF, block 2B: 16-4 16-5 16-6*	AN/MCC-13 rack 4, 4A1TB3: 250 251 252*	RG108AU 18 ft lg	Thru group rec
W5050	MDF, block 2B: 17-4 17-5 17-6*	AN/MCC-13 rack 4, 4A1TB3: 253 254 255*	RG108AU 18 ft lg	Thru group rec
W5051	MDF, block 3B: 19-2 19-3 19-1*	VFTG rack 1, block 1: A-E1-13 A-E2-13	20 AWG 28 ft lg: White Blue	
W5052	MDF, block 3B: 21-2 21-3 21-1*	VFTG rack 1, block 1: B-E3-13 B-E4-13	20 AWG 28 ft lg: White Blue	
W5053	MDF, block 3B: 23-2 23-3 23-1*	VFTG rack 1, block 2: A-E9-13 A-E10-13	20 AWG 28 ft lg: White Blue	
W5054	MDF, block 3B: 25-2 25-3 25-1*	VFTG rack 1, block 2: B-E11-13 B-E12-13	20 AWG 28 ft lg: White Blue	

* Shield

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Figure 6-7. Interequipment Cabling Data (Sheet 16 of 21).

Cable No.	Equipment and terminal (MDF terminations listed by row and terminal; 20-1 is row 20, terminal 1)		Cable type or wire and color	Function
	From-	To-		
W 5055	MDF, block 3B:	VFTG rack 1, block 1:	20 AWG, solid 28 ft 1g:	TTY DC SEND channel
	1-1	A-E1-1	White	} 1
	1-2	A-E2-1	Blue	
	1-3	A-E1-2	White	} 2
	1-4	A-E2-2	Orange	
	1-5	A-E1-3	White	} 3
	1-6	A-E2-3	Green	
	2-1	A-E1-4	White	} 4
	2-2	A-E2-4	Brown	
	2-3	A-E1-5	White	} 5
	2-4	A-E2-5	Gray	
	2-5	A-E1-6		} 6
	2-6	A-E2-6	Blue	
	3-1	A-E1-7	Red	} 7
	3-2	A-E2-7	Orange	
	3-3	A-E1-8	Red	} 8
	3-4	A-E2-8	Green	
	3-5	A-E1-9	Red	} 9
	3-6	A-E2-9	Brown	
	4-1	A-E1-10	Red	} 10
	4-2	A-E2-10	Gray	
	4-3	A-E1-11	Black	} 11
	4-4	A-E2-11	Blue	
	4-5	A-E1-12	Black	} 12
	4-6	A-E2-12	Orange	
	5-1	B-E3-1	Black	} 13
	5-2	B-E4-1	Green	
	5-3	B-E3-2	Black	} 14
	5-4	B-E4-2	Brown	
	5-5	B-E3-3	Black	} 15
	5-6	B-E4-3	Gray	
	6-1	B-E3-4	Yellow	} 16
6-2	B-E4-4	Blue		
6-3	B-E3-5	Yellow	} 17	
6-4	B-E4-5	Orange		
6-5	B-E3-6	Yellow	} 18	
6-6	B-E4-6	Green		
7-1	B-E3-7	Yellow	} 19	
7-2	B-E4-7	Brown		
7-3	B-E3-8	Yellow	} 20	
7-4	B-E4-8	Gray		
7-5	B-E3-9	Violet	} 21	
7-6	B-E4-9	Blue		
8-1	B-E3-10	Violet	} 22	
8-2	B-E4-10	Orange		
8-3	B-E3-11	Violet	} 23	
8-4	B-E4-11	Green		
8-5	B-E3-12	Violet	} 24	
8-6	B-E4-12	Brown		
			Violet	} Spares
			Gray	
W5056	MDF, block 3B:	VFTG rack 1, block 2:	20 AWG solid 28 ft 1g gray jacket	TTY DC REC channel no.:
	10-1	A-E9-1	White	} 1
	10-2	A-E10-1	Blue	
	10-3	A-E9-2	White	} 2
	10-4	A-E10-2	Orange	
	10-5	A-E9-3	White	} 3
	10-6	A-E10-3	Green	

Figure 6-7. Interequipment Cabling Data (Sheet 17 of 21).

Cable No.	Equipment and terminal (MDF terminations listed by row and terminal; 20-1 is row 20, terminal 1)		Cable type or wire and color	Function
	From--	To--		
W5056 (cont)	MDF, block 3B (cont):	VFTG rack 1, block 2 (cont):	20 AWG solid 28 ft lg gray jacket (cont):	TTY DC REC channel no. (cont):
	11-1	A-E9-4	White	} 4
	11-2	A-E10-4	Brown	} 5
	11-3	A-E9-5	White	
	11-4	A-E10-5	Gray	} 6
	11-5	A-E9-6	Red	
	11-6	A-E10-6	Blue	} 7
	12-1	A-E9-7	Red	
	12-2	A-E10-7	Orange	} 8
	12-3	A-E9-8	Red	
	12-4	A-E10-8	Green	} 9
	12-5	A-E9-9	Red	
	12-6	A-E10-9	Brown	} 10
	13-1	A-E9-10	Red	
	13-2	A-E10-10	Gray	} 11
	13-3	A-E9-11	Black	
	13-4	A-E10-11	Blue	} 12
	13-5	A-E9-12	Black	
	13-6	A-E10-12	Orange	} 13
	14-1	B-E11-1	Black	
	14-2	B-E12-1	Green	} 14
	14-3	B-E11-2	Black	
	14-4	B-E12-2	Brown	} 15
	14-5	B-E11-3	Black	
	14-6	B-E12-3	Gray	} 16
	15-1	B-E11-4	Yellow	
	15-2	B-E12-4	Blue	} 17
	15-3	B-E11-5	Yellow	
	15-4	B-E12-5	Orange	} 18
	15-5	B-E11-6	Yellow	
	15-6	B-E12-6	Green	} 19
	16-1	B-E11-7	Yellow	
	16-2	B-E12-7	Brown	} 20
	16-3	B-E11-8	Yellow	
	16-4	B-E12-8	Gray	} 21
	16-5	B-E11-9	Violet	
	16-6	B-E12-9	Blue	} 22
	17-1	B-E11-10	Violet	
	17-2	B-E12-10	Orange	} 23
	17-3	B-E11-11	Violet	
	17-4	B-E12-11	Green	} 24
	17-5	B-E11-12	Violet	
	17-6	B-E12-12	Brown	} Spares
			Violet	
			Gray	
W5057	MDF, block 3A: 19-2 19-3 19-1*	VFTG rack 1: C-E5-13 C-E6-13	20 AWG 28 ft lg: White Blue	
W5058	MDF, block 3A: 21-2 21-3 21-1*	VFTG rack 1, block 1: D-E7-13 D-E8-13	20 AWG 28 ft lg: White Blue	
W5059	MDF, block 3A: 23-2 23-3 23-1*	VFTG rack 1, block 2: C-E13-13 C-E14-13	20 AWG 28 ft lg: White Blue	

* Shield

EL5820-763-15-TM-16

Figure 6-7. Interequipment of Cabling (Sheet 18 of 21).

Cable No.	Equipment and terminal (MDF terminations listed by row and terminal; 20-1 is row 20, terminal 1)		Cable type or wire and color	Function
	From-	To-		
W5060	MDF, block 3A: 25-2 25-3 25-1*	VFTG rack 1, block 2: D-E15-13 D-E16-13	20 AWG 28 ft lg.: White Blue	
W5061	MDF, block 3A: 1-1 1-2 1-3 1-4 1-5 1-6 2-1 2-2 2-3 2-4 2-5 2-6 3-1 3-2 3-3 3-4 3-5 3-6 4-1 4-2 4-3 4-4 4-5 4-6 5-1 5-2 5-3 5-4 5-5 5-6 6-1 6-2 6-3 6-4 6-5 6-6 7-1 7-2 7-3 7-4 7-5 7-6 8-1 8-2 8-3 8-4 8-5 8-6	VFTG rack 1, block 1: C-E5-1 C-E6-1 C-E5-2 C-E6-2 C-E5-3 C-E6-3 C-E5-4 C-E6-4 C-E5-5 C-E6-5 C-E5-6 C-E6-6 C-E5-7 C-E6-7 C-E5-8 C-E6-8 C-E5-9 C-E6-9 C-E5-10 C-E6-10 C-E5-11 C-E6-11 C-E5-12 C-E6-13 D-E7-1 D-E8-1 D-E7-2 D-E8-2 D-E7-3 D-E8-3 D-E7-4 D-E8-4 D-E7-5 D-E8-5 D-E7-6 D-E8-6 D-E7-7 D-E8-7 D-E7-8 D-E8-8 D-E7-9 D-E8-9 D-E7-10 D-E8-10 D-E7-11 D-E8-11 D-E7-12 D-E8-12	20 AWG solid 28ft lg gray jacket: White Blue White Orange White Green White Brown White Gray Red Blue Red Orange Red Green Red Brown Red Gray Black Blue Black Orange Black Green Black Brown Black Gray Yellow Blue Yellow Orange Yellow Green Yellow Brown Yellow Gray Violet Blue Violet Orange Violet Green Violet Brown Violet Gray	Channel no.: } 25 } 26 } 27 } 28 } 29 } 30 } 31 } 32 } 33 } 34 } 35 } 36 } 37 } 38 } 39 } 40 } 41 } 42 } 43 } 44 } 45 } 46 } 47 } 48 } Spares
W5062	MDF, block 3A: 10-1 10-2	VFTG rack 1, block 1: C-E13-1 C-E14-1	20 AWG solid 28ft lg gray jacket: White Blue	Channel no.: } 25

* Shield

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Figure 6-7. Interequipment of Cabling (Sheet 19 of 21).

Cable No.	Equipment and terminal (MDF terminations listed by row and terminal; 20-1 is row 20, terminal 1)		Cable type or wire and color	Function
	From-	To-		
W5062 (cont)	MDF, block 3A (cont):	VFTG rack 1, block 1 (cont):	20 AWG, solid 28 ft lg gray jacket (cont):	Channel no. (cont):
	10-3	C-E13-2	White	} 26
	10-4	C-E14-2	Orange	
	10-5	C-E13-3	White	} 27
	10-6	C-E14-3	Green	
	11-1	C-E13-4	White	} 28
	11-2	C-E14-4	Brown	
	11-3	C-E13-5	White	} 29
	11-4	C-E14-5	Gray	
	11-5	C-E13-6	Red	} 30
	11-6	C-E14-6	Blue	
	12-1	C-E13-7	Red	} 31
	12-2	C-E14-7	Orange	
	12-3	C-E13-8	Red	} 32
	12-4	C-E14-8	Green	
	12-5	C-E13-9	Red	} 33
	12-6	C-E14-9	Brown	
	13-1	C-E13-10	Red	} 34
	13-2	C-E14-10	Gray	
	13-3	C-E13-11	Black	} 35
	13-4	C-E14-11	Blue	
	13-5	C-E13-12	Black	} 36
	13-6	C-E14-12	Orange	
	14-1	B-E15-1	Black	} 37
	14-2	B-E16-1	Green	
	14-3	B-E15-2	Black	} 38
	14-4	B-E16-2	Brown	
	14-5	B-E15-3	Black	} 39
	14-6	B-E16-3	Gray	
	15-1	B-E15-4	Yellow	} 40
	15-2	B-E16-4	Blue	
	15-3	B-E15-5	Yellow	} 41
	15-4	B-E16-5	Orange	
	15-5	B-E15-6	Yellow	} 42
	15-6	B-E16-6	Green	
	16-1	B-E15-7	Yellow	} 43
	16-2	B-E16-7	Brown	
	16-3	B-E15-8	Yellow	} 44
	16-4	B-E16-8	Gray	
	16-5	B-E15-9	Violet	} 45
	16-6	B-E16-9	Blue	
	17-1	B-E15-10	Violet	} 46
	17-2	B-E16-10	Orange	
	17-3	B-E15-11	Violet	} 47
	17-4	B-E16-11	Green	
	17-5	B-E15-12	Violet	} 46
	17-6	B-E16-12	Brown	
			Violet	} Spares
			Gray	
W5063	VFTG, E-28:	TDMS TRANS TB-12:	16 ft:	
			White	
W5064	VFTG, E-28:	6 TDMSREC TB-12:	16 ft:	
	1		Blue	
	3	2	White	
	4		Blue	

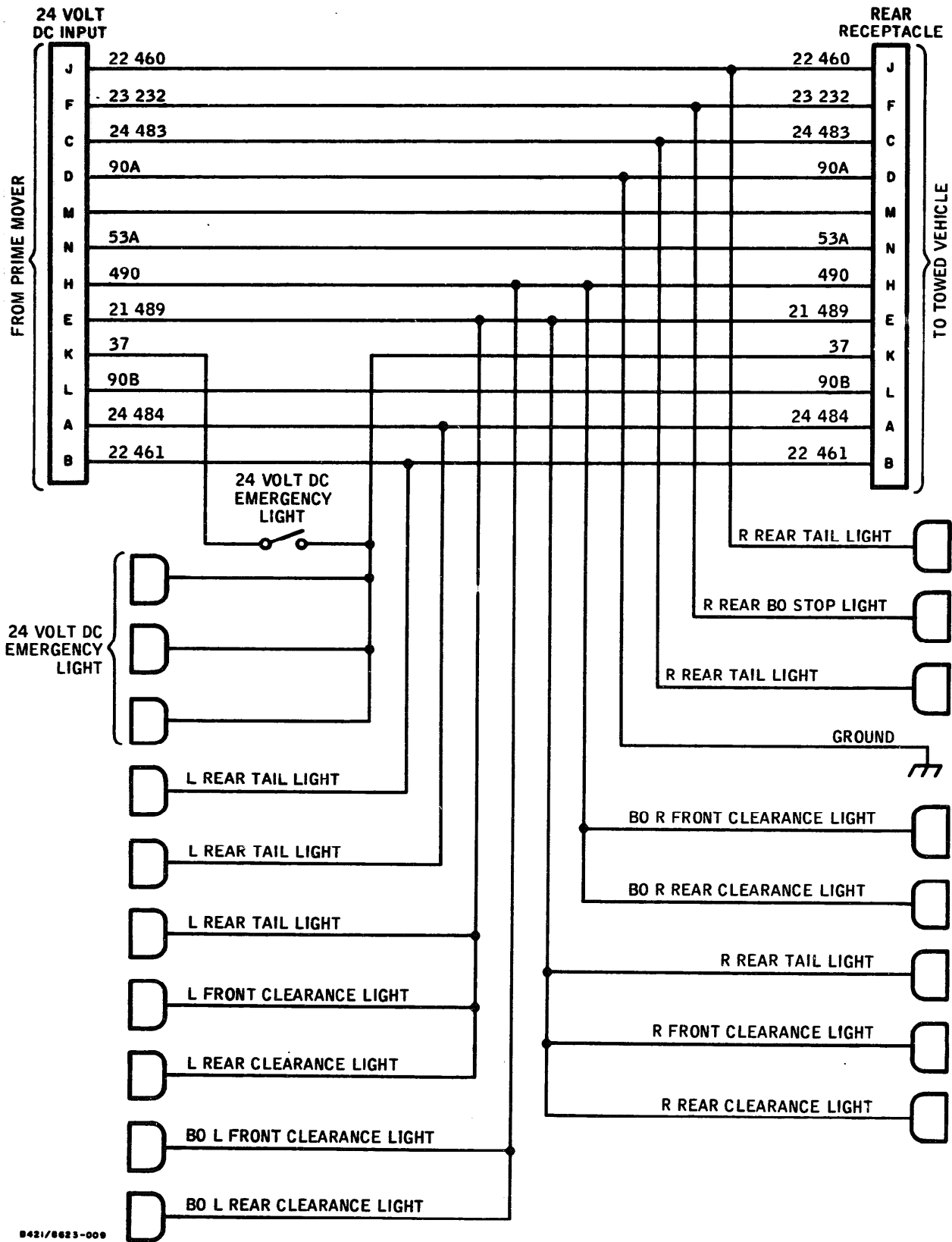
EL5820-763-15-TM-18

Figure 6-7. Interequipment of Cabling (Sheet 20 of 21).

Cable No.	Equipment and terminal (MDF terminations listed by row and terminal; 20-1 is row 20, terminal 1)		Cable type or wire and color	Function
	From--	To--		
W5065	MDF, block 2B: 1-1 1-2 1-3 1-4 1-5 1-6 2-1 2-2 2-3 2-4 2-5 2-6 3-1 3-2 3-3 3-4 3-5 3-6 4-1 4-2 4-3 4-4 4-5	Order wire tel set, block 2B: 7-1 7-2 7-3 7-4 7-5 7-6 8-1 8-2 8-3 8-4 8-5 8-6 9-1 9-2 9-3 9-4 9-5 9-6 10-1 10-2 10-3 10-4 10-5 10-6	20 AWG solid 12 ft lg gray jacket: white Blue white Orange White Green White Brown white Gray Red Blue Red Orange Red Green Red Brown Red Gray Black Blue Black Black Orange	Multiplexer set interconnections
W5066	AN/MCC-13 rack 3, 3AITB2	AN/MCC-13 rack 2, 2A2TB2	12 ft lg White	
W5067	TDMS TRANS TB-12-9	AN/MCC-13 rack 2 Rack ground	12 ft lg	
W5068	Exciter 1: TB1	Exciter 2: TB1	Black	
	6 7 8 9 10	6 7 8 9 10	White Red White Blue	

EL5820-763-15-TM-19

Figure 6-7. Interequipment of Cabling (Sheet 21 of 21).

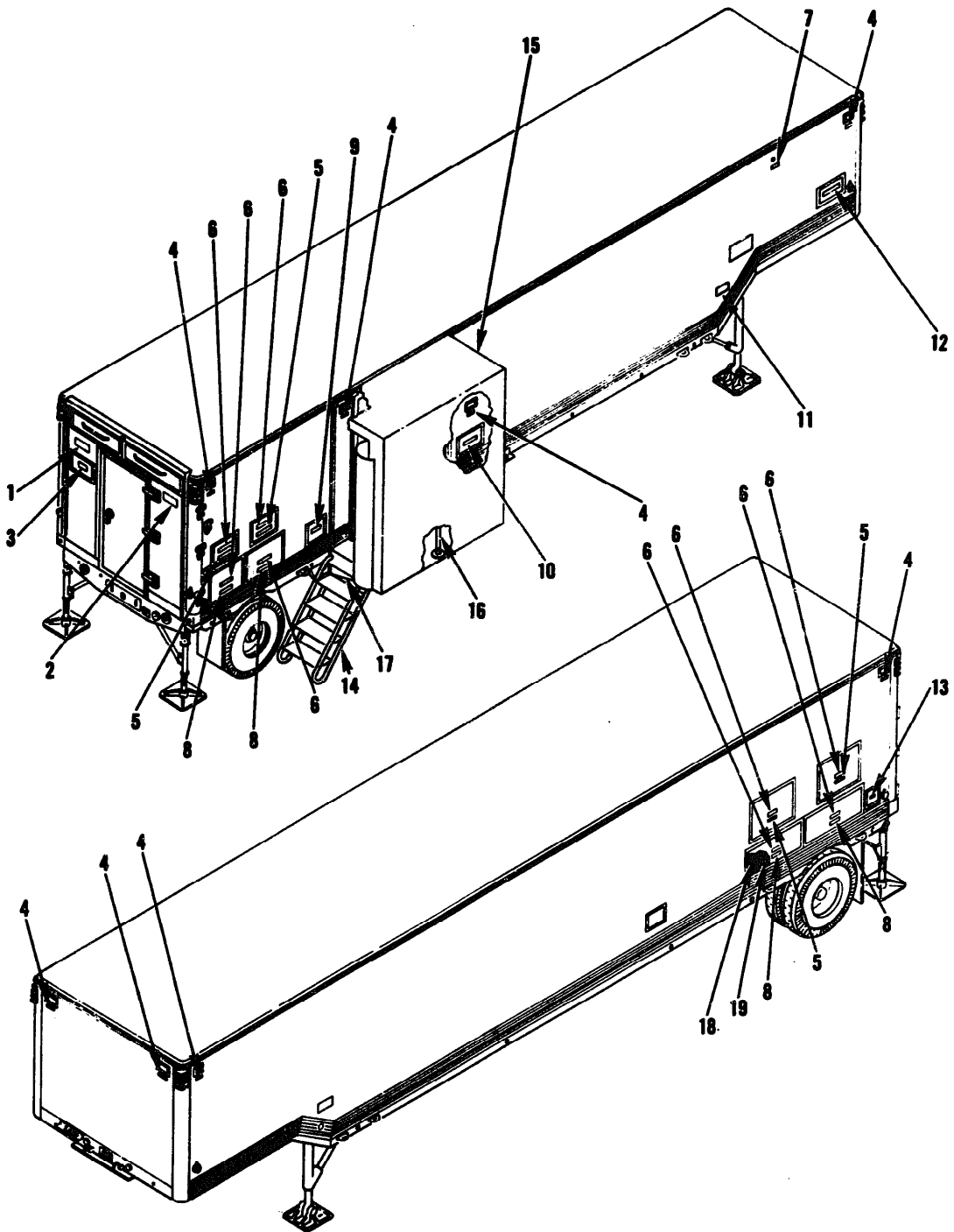


8421/8823-000

Figure 6-8. 24 V DC Cabling Diagram.

Figure 6-9(1). Operations Van Functional Block Diagram (Sheet 1 of 2). (Located in back of manual.)

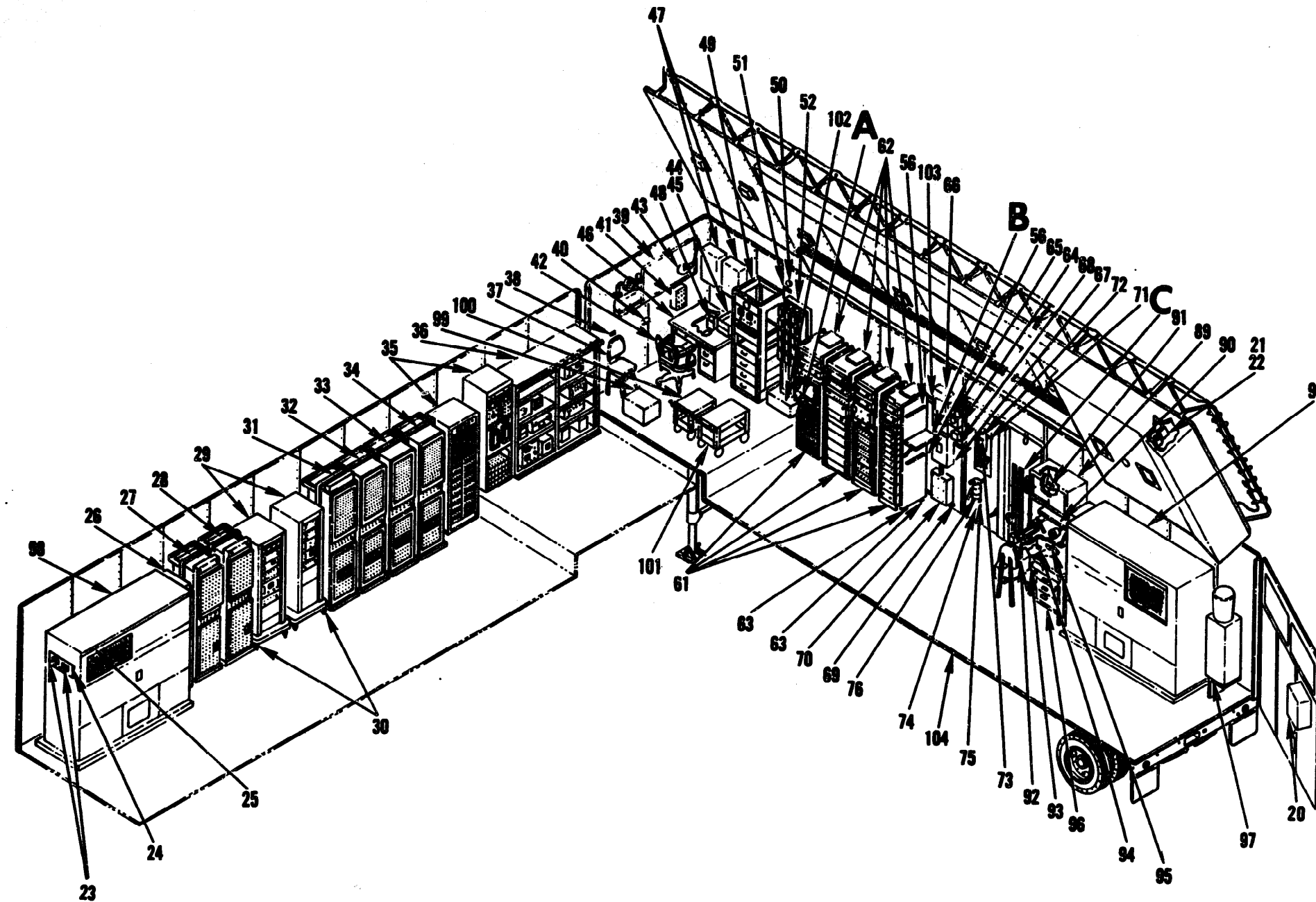
Figure 6-9(2). Operations Van Functional Block Diagram (Sheet 2 of 2). (Located in back of manual.)



K421/0023-101

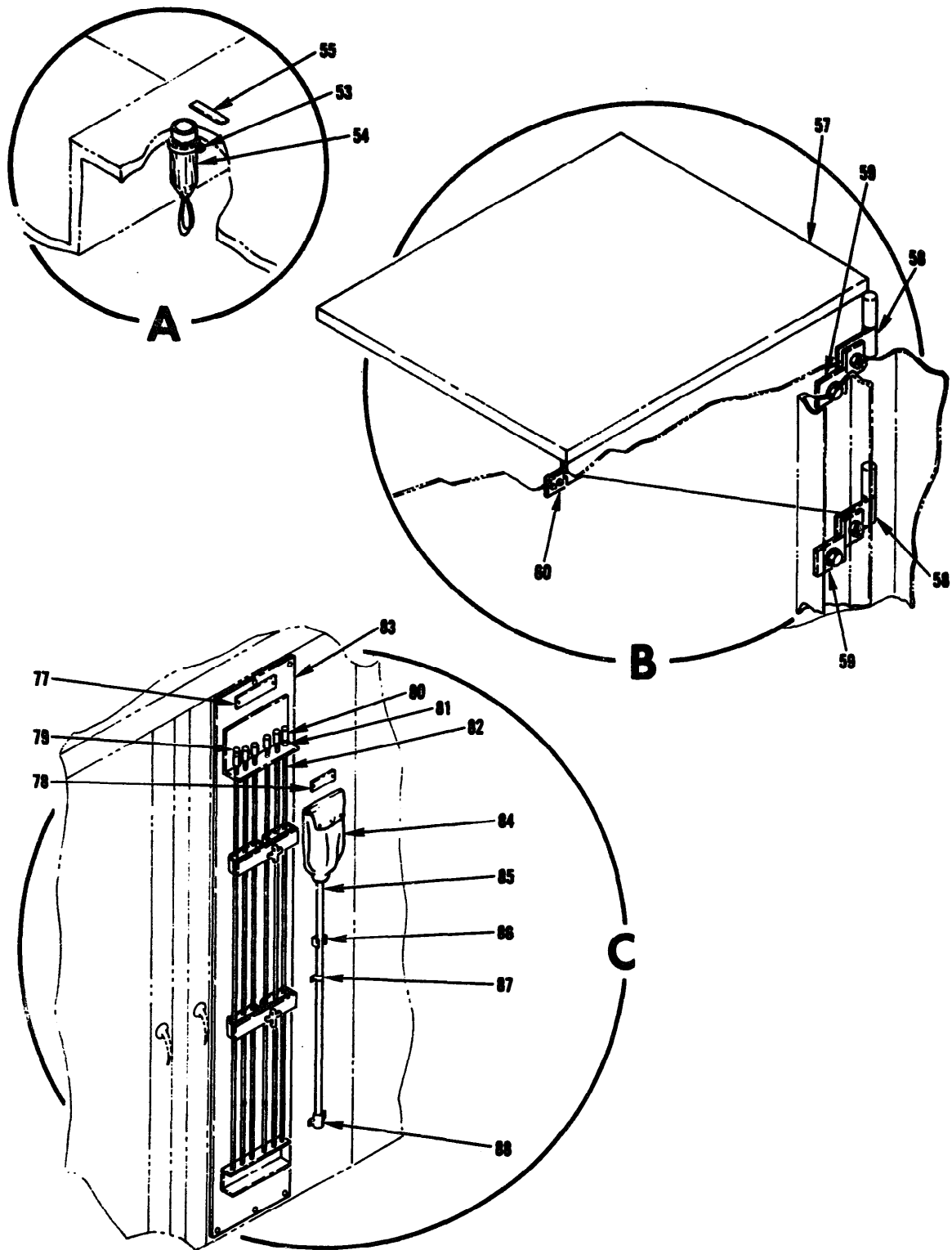
Figure 6-10(1). Radio Set Group OA-6997V/MRC-85(V)2 (Sheet 1 of 3).

Aspect 1



K42/8823-102

Figure 6-10(2). Radio Set Group OA-6997/MRC-85(V)2 (Sheet 2 of 3).



K42/0823-103

Figure 6-10(3). Radio Set Group OA-6997V/MRC-85(V)2 (Sheet 3 of 3).

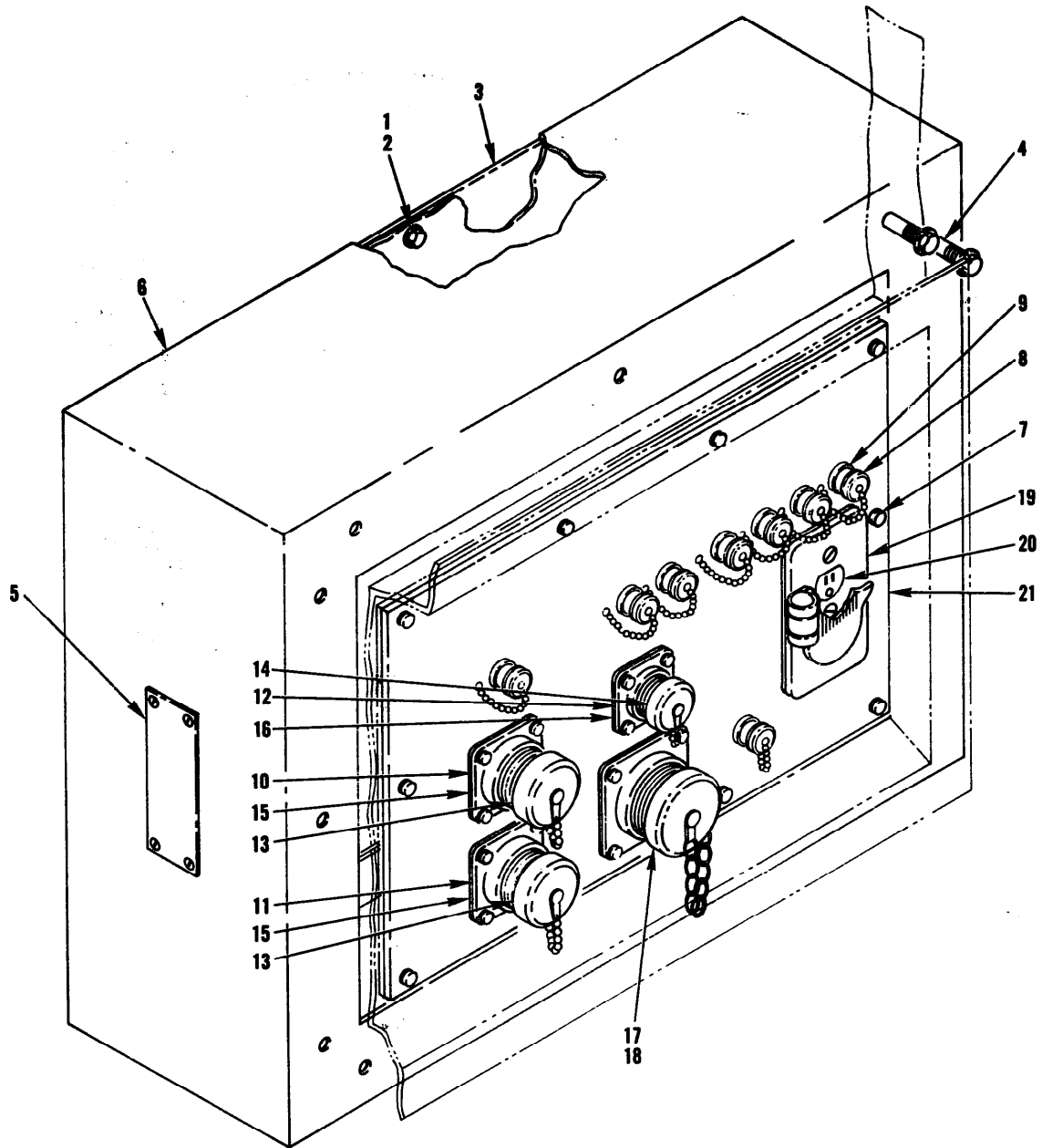
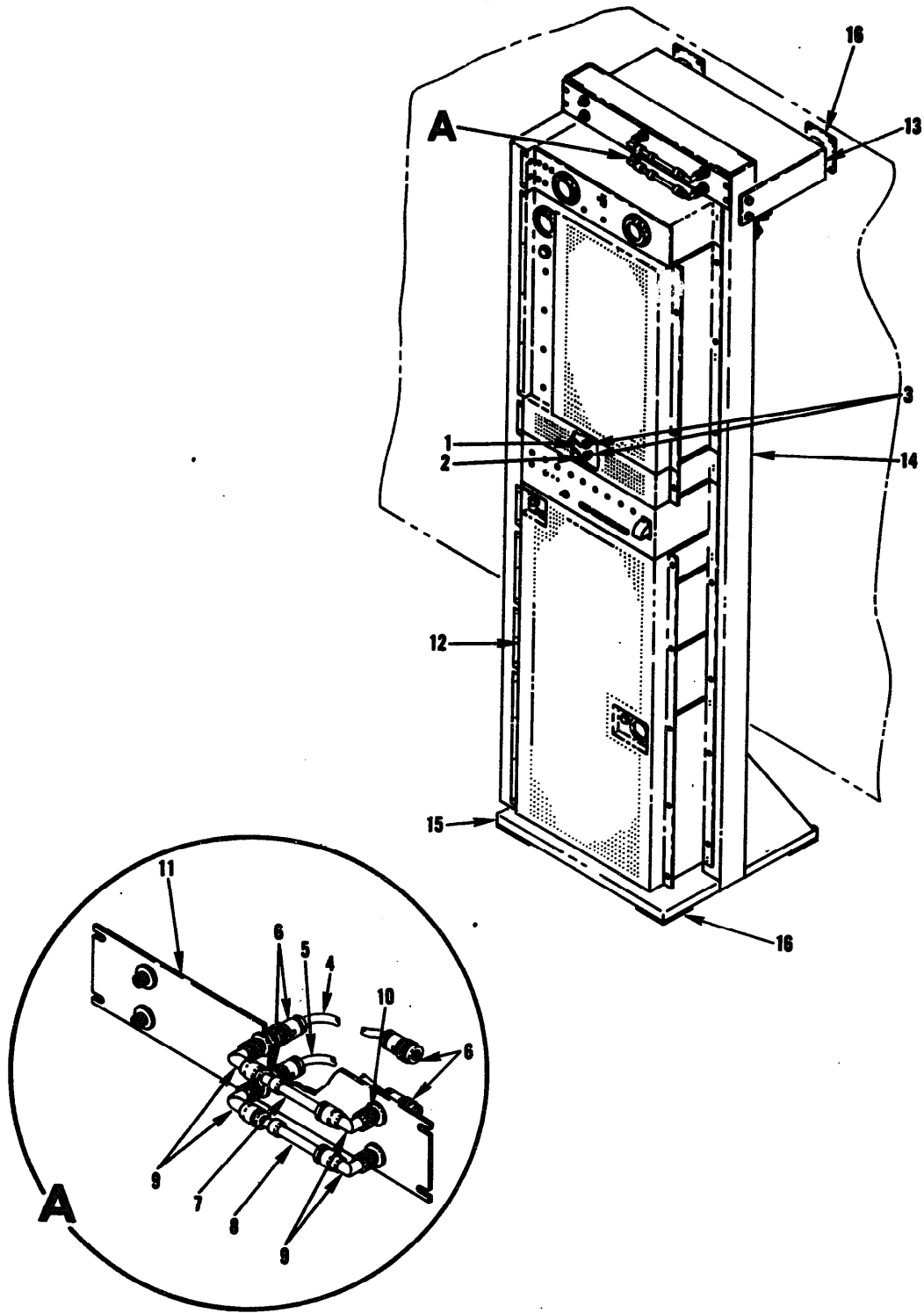
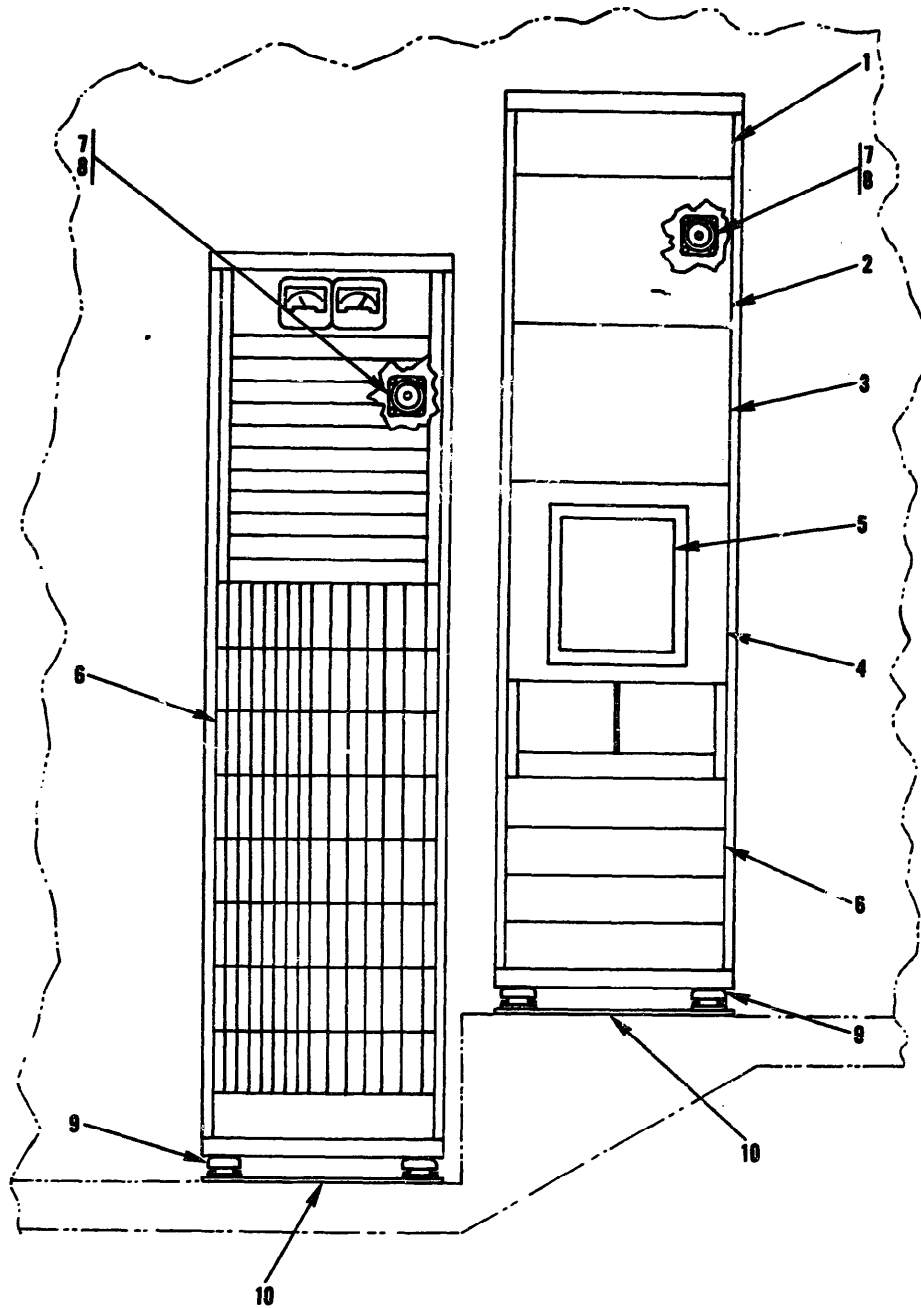


Figure 6-11. Signal Line Extension Panel.



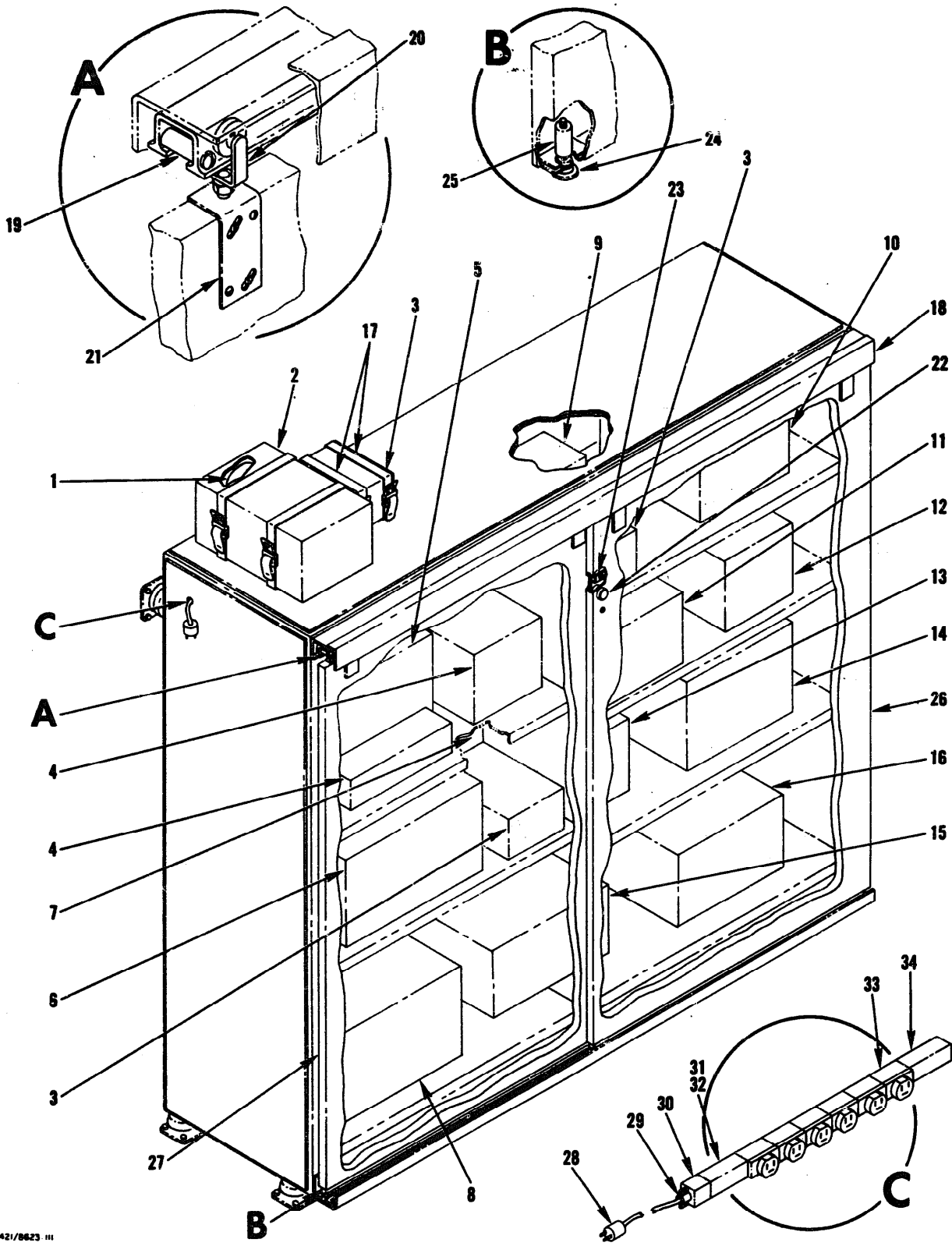
4421/0623 07

Figure 6-12. Transmitter Group.



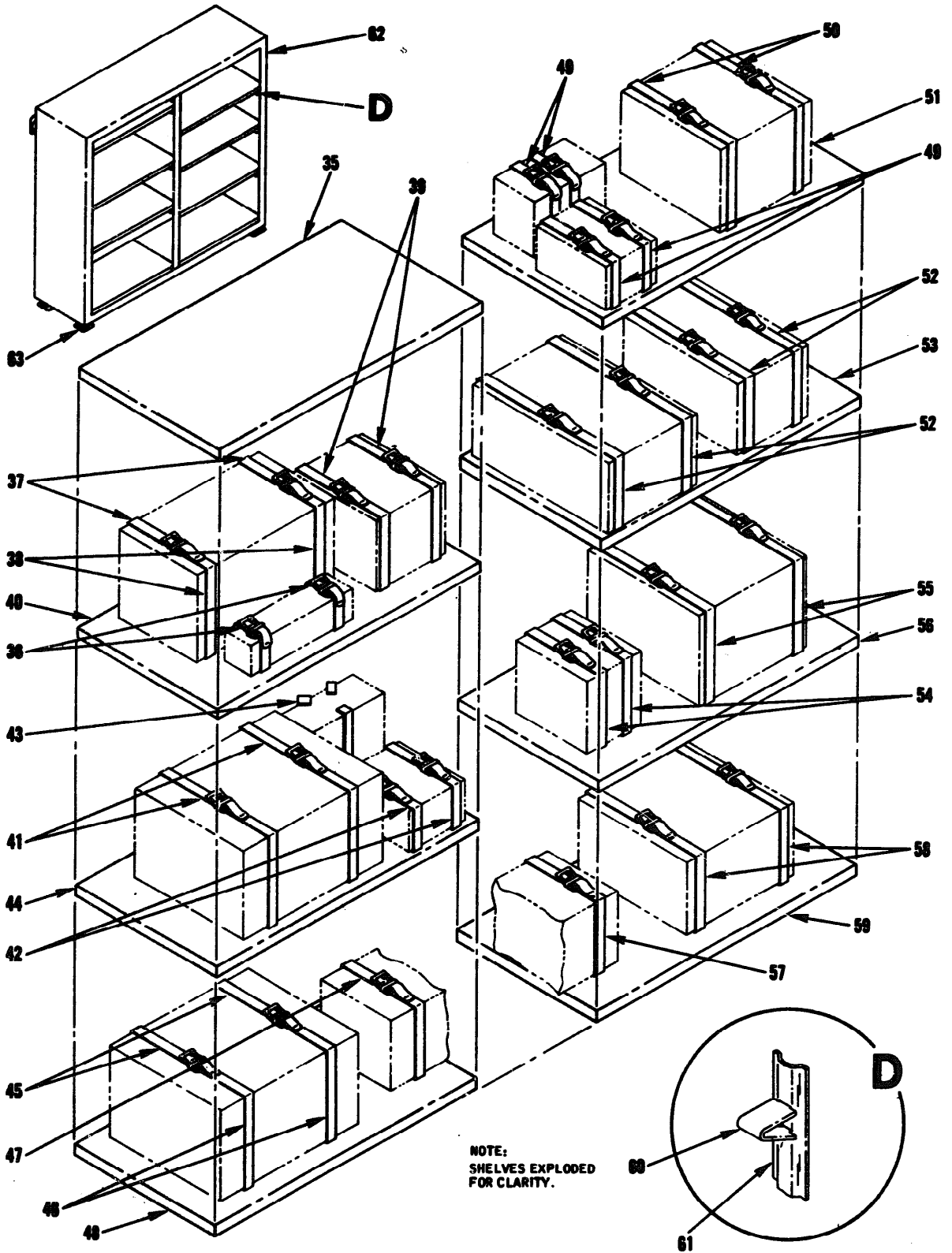
K421/8623-09

Figure 6-13. Voice Frequency Terminal Assembly.



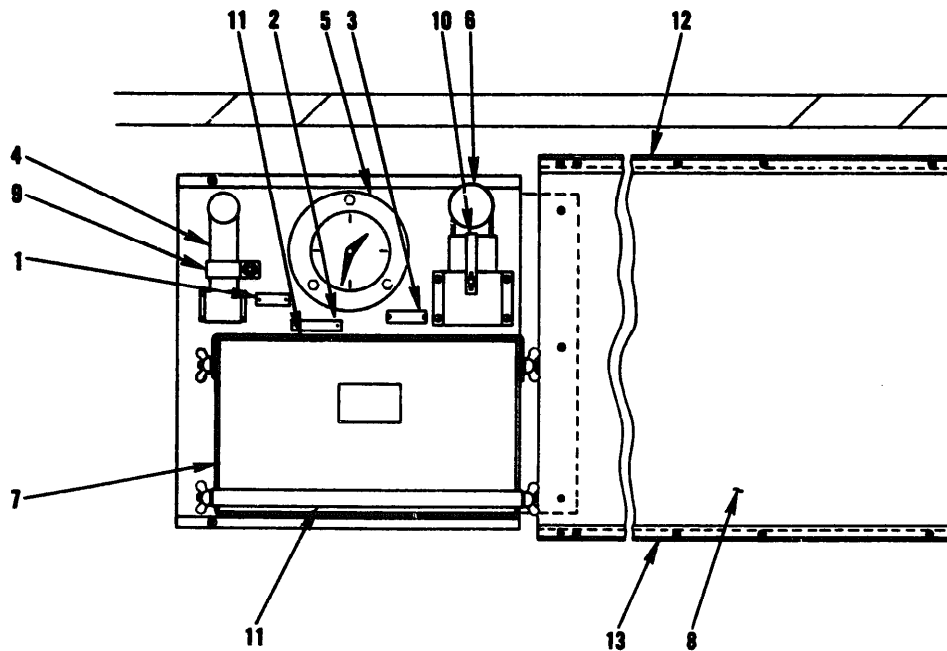
K421/0623 III

Figure 6-14(1). Test Equipment and Cabinet assembly
(Sheet 1 of 2).



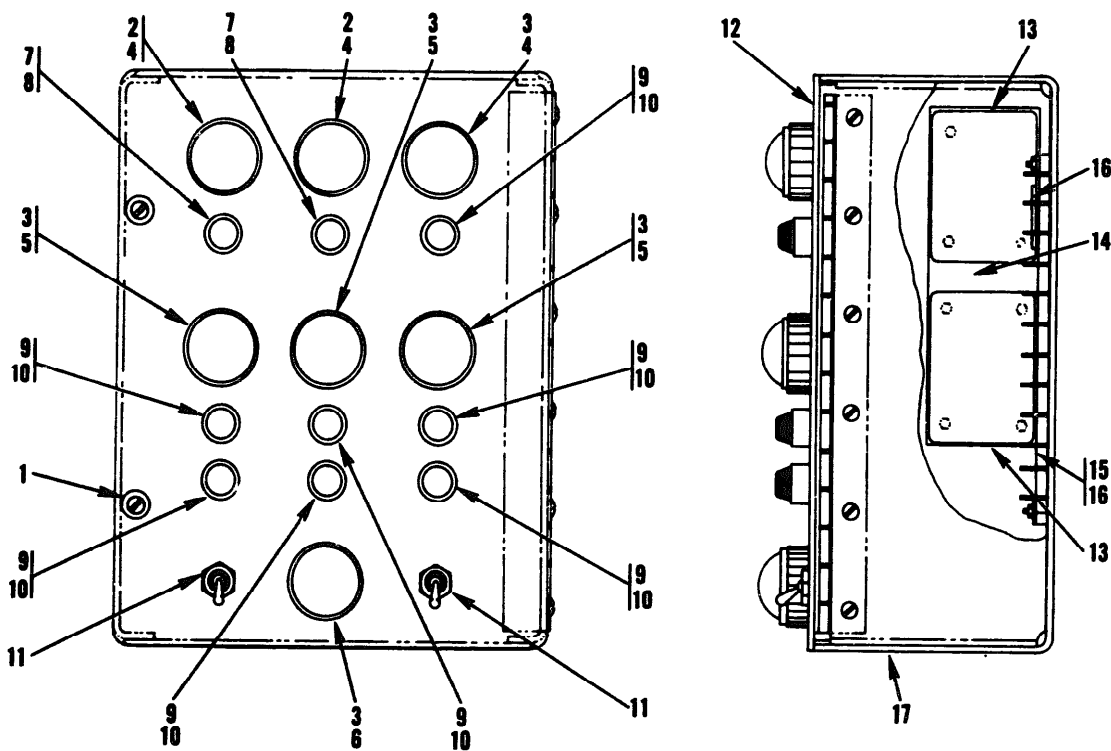
642/0623-147

Figure 6-14(2). Test Equipment and Cabinet Assembly
(Sheet 2 of 2).



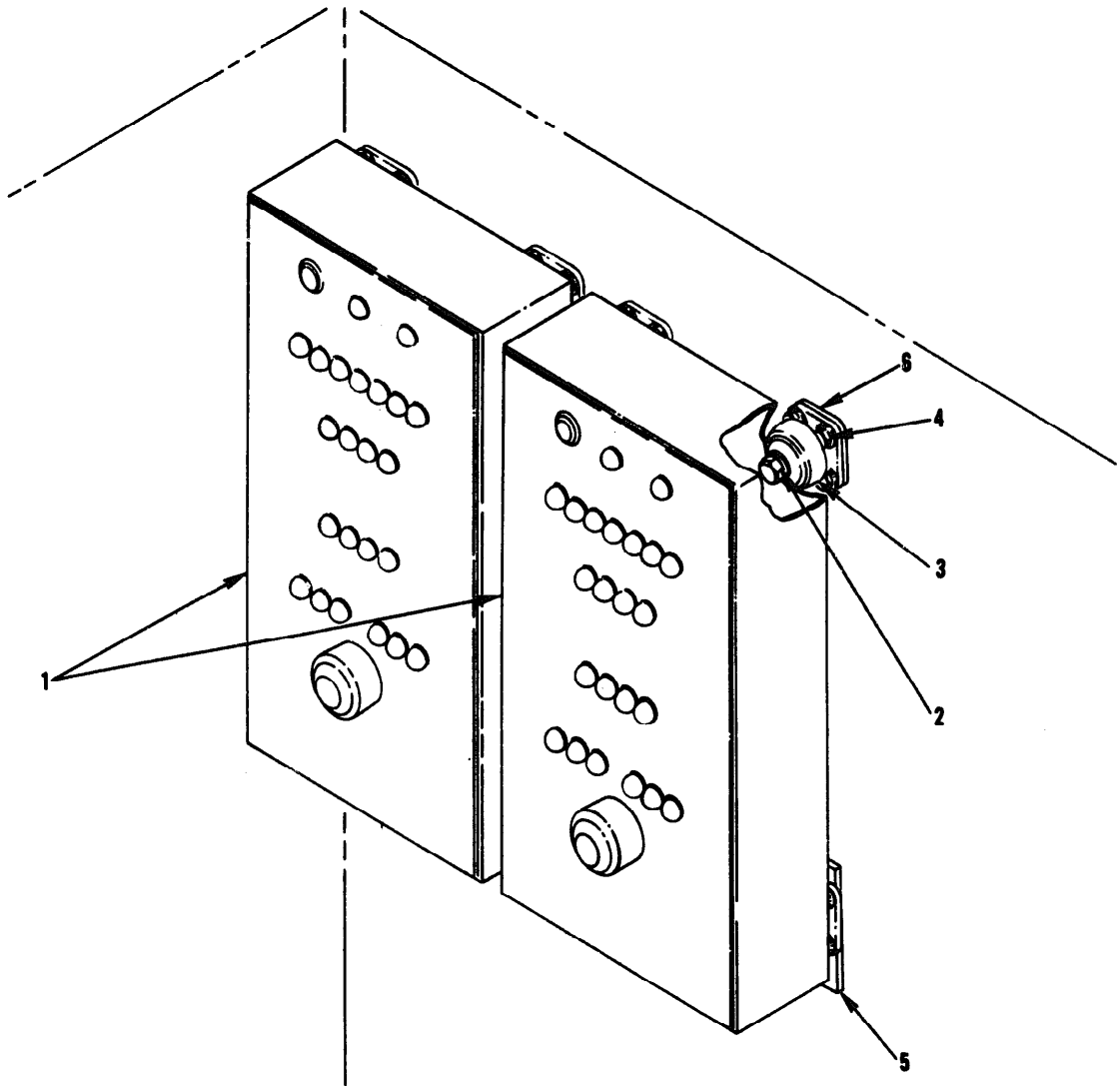
J42/8623-112

Figure 6-15. Accessory and Bulletin Board Assembly.



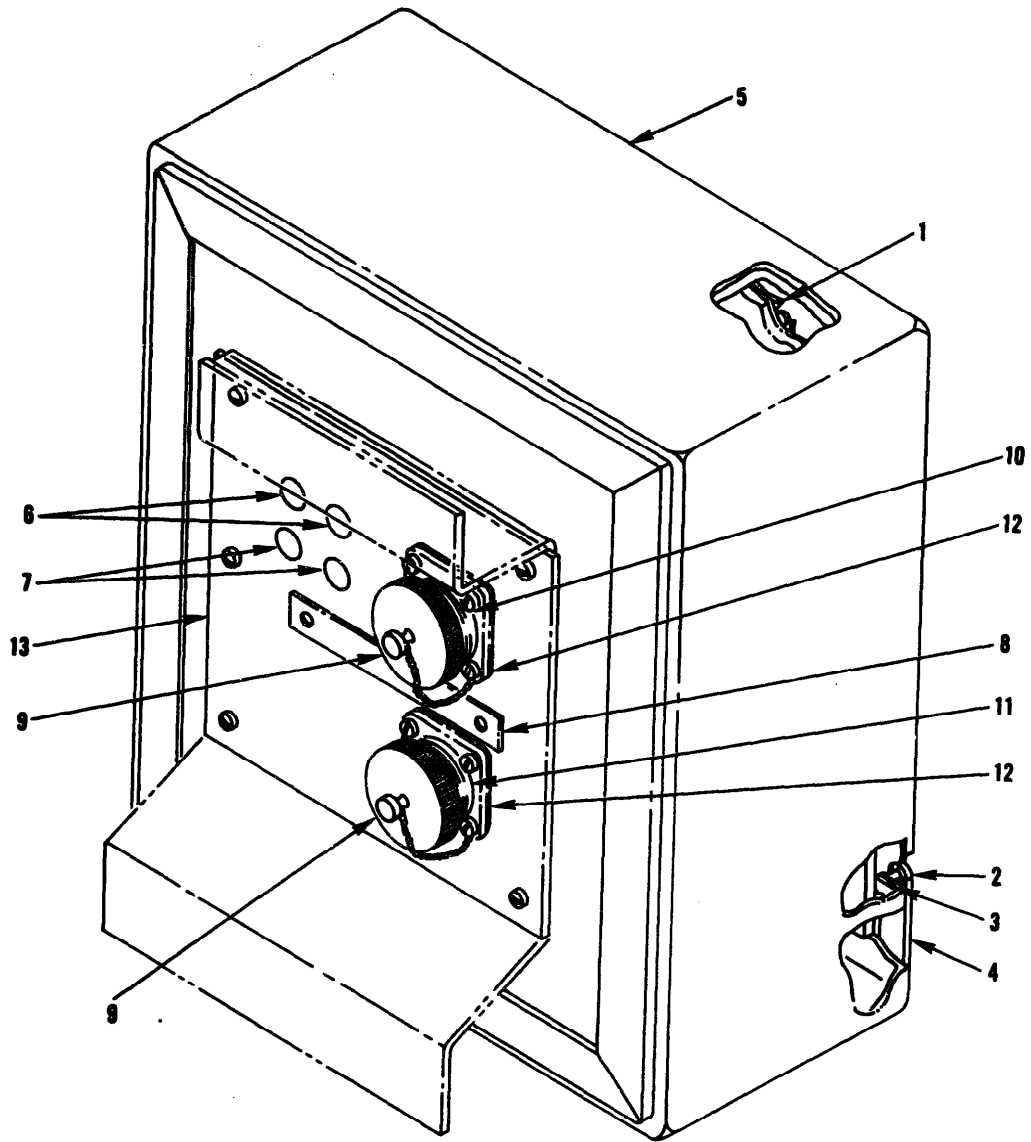
J42/8623-113

Figure 6-16. Alarm-Monitor BZ-106/MRC-85(V)2.



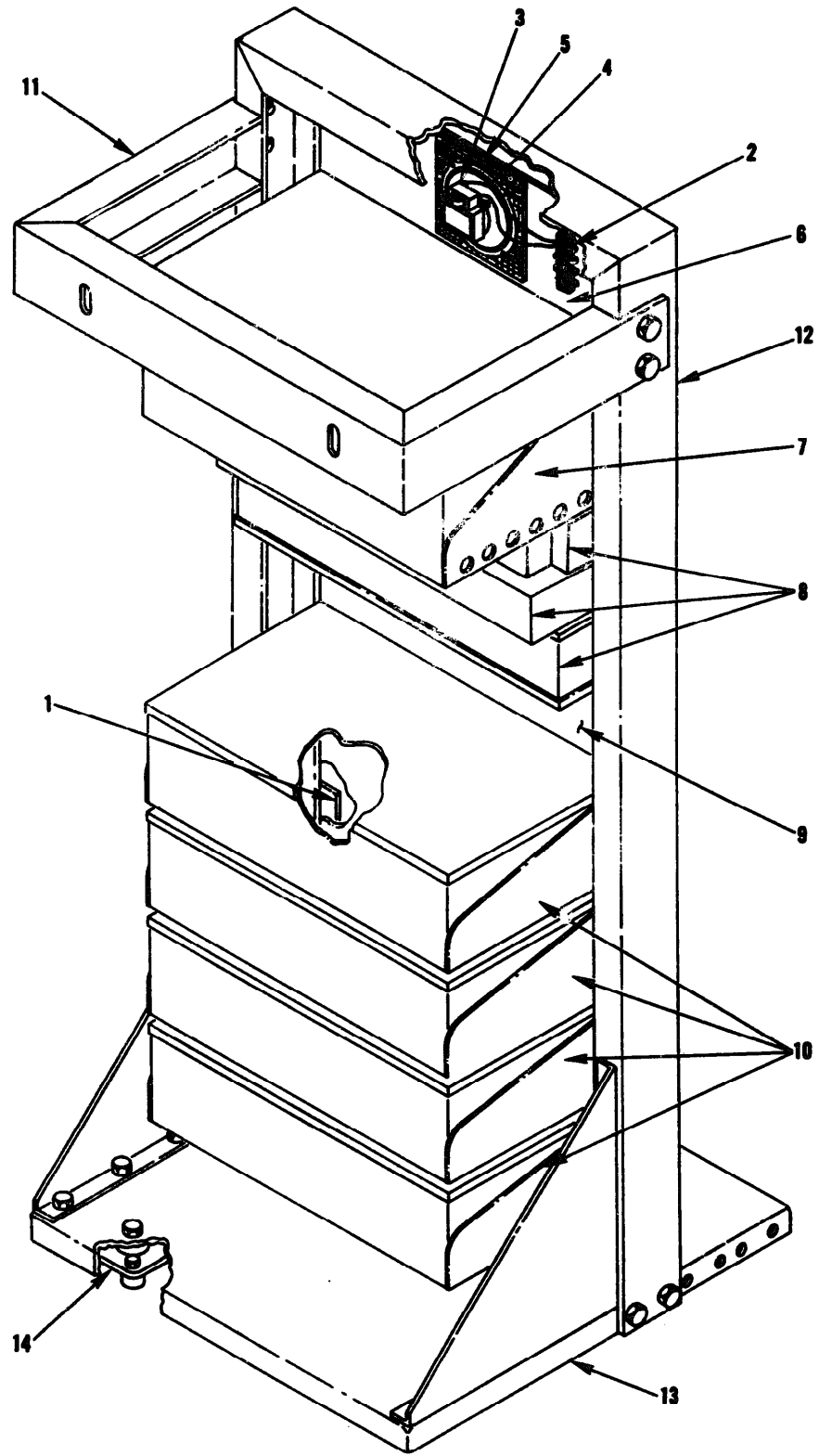
J421/6623-115

Figure 6-17. Alarm-monitor Assembly.



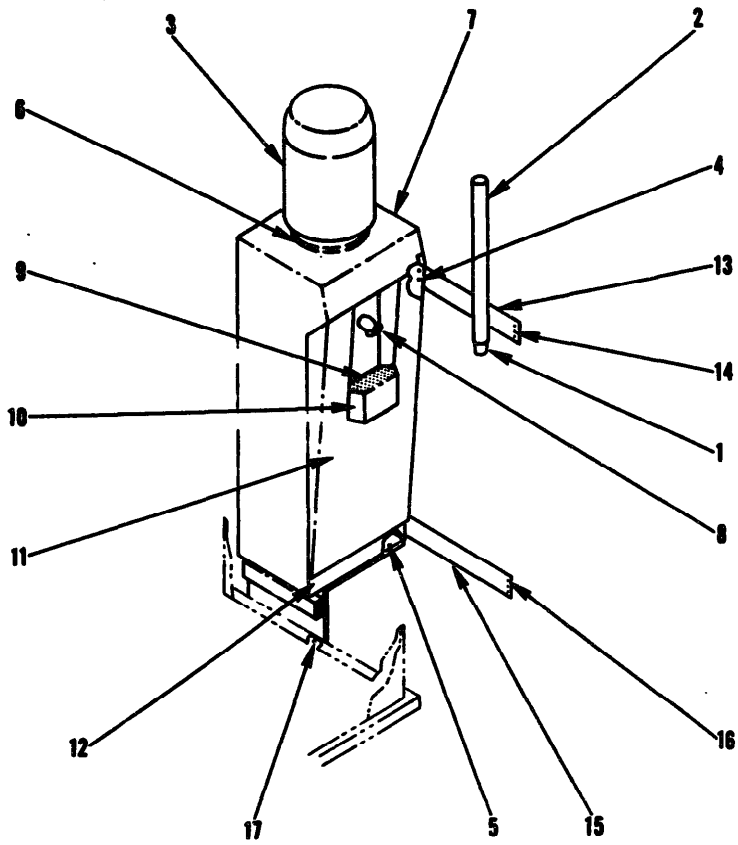
K42/8523-116

Figure 6-18. Audio and Alarm Box Assembly.



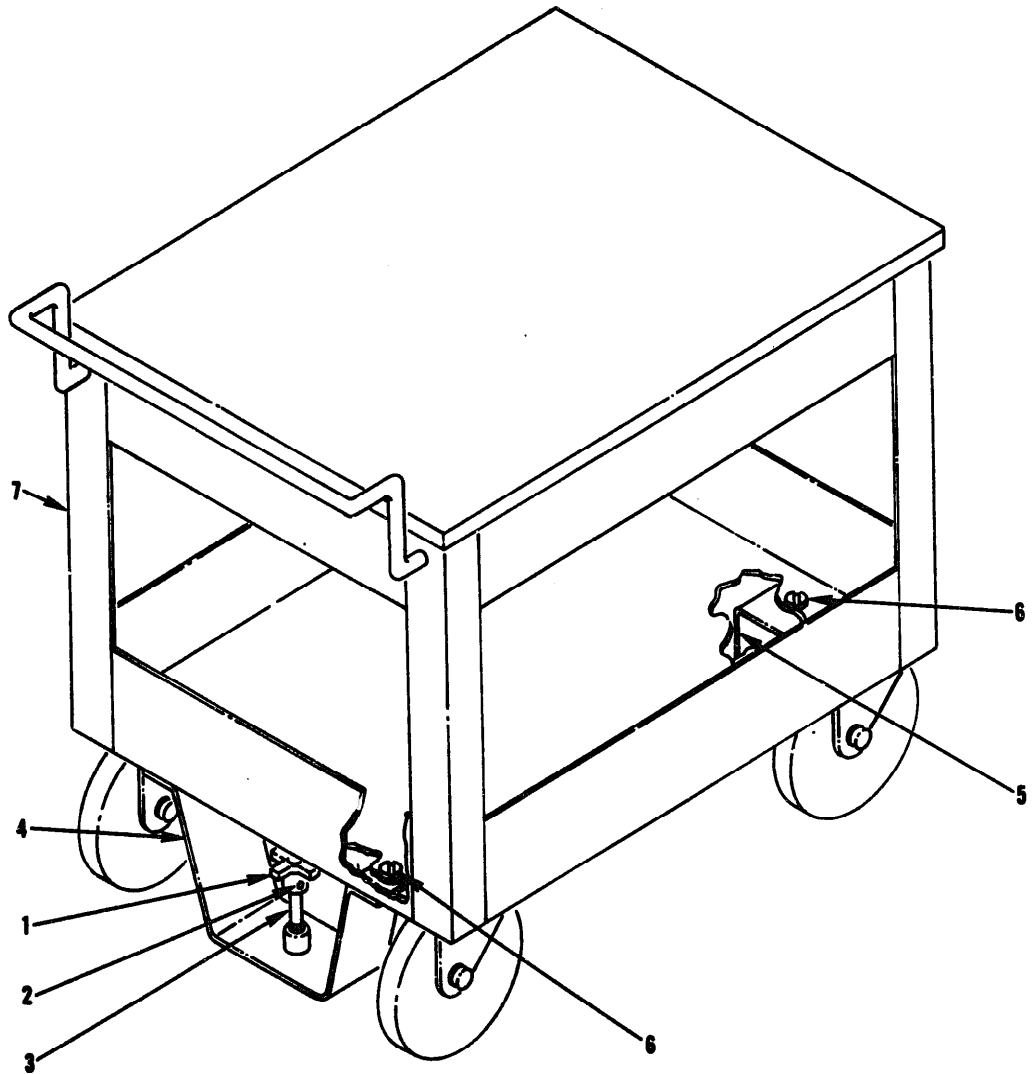
K421/0623-117

Figure 6-19. Order Wire and Telephone Set Assembly



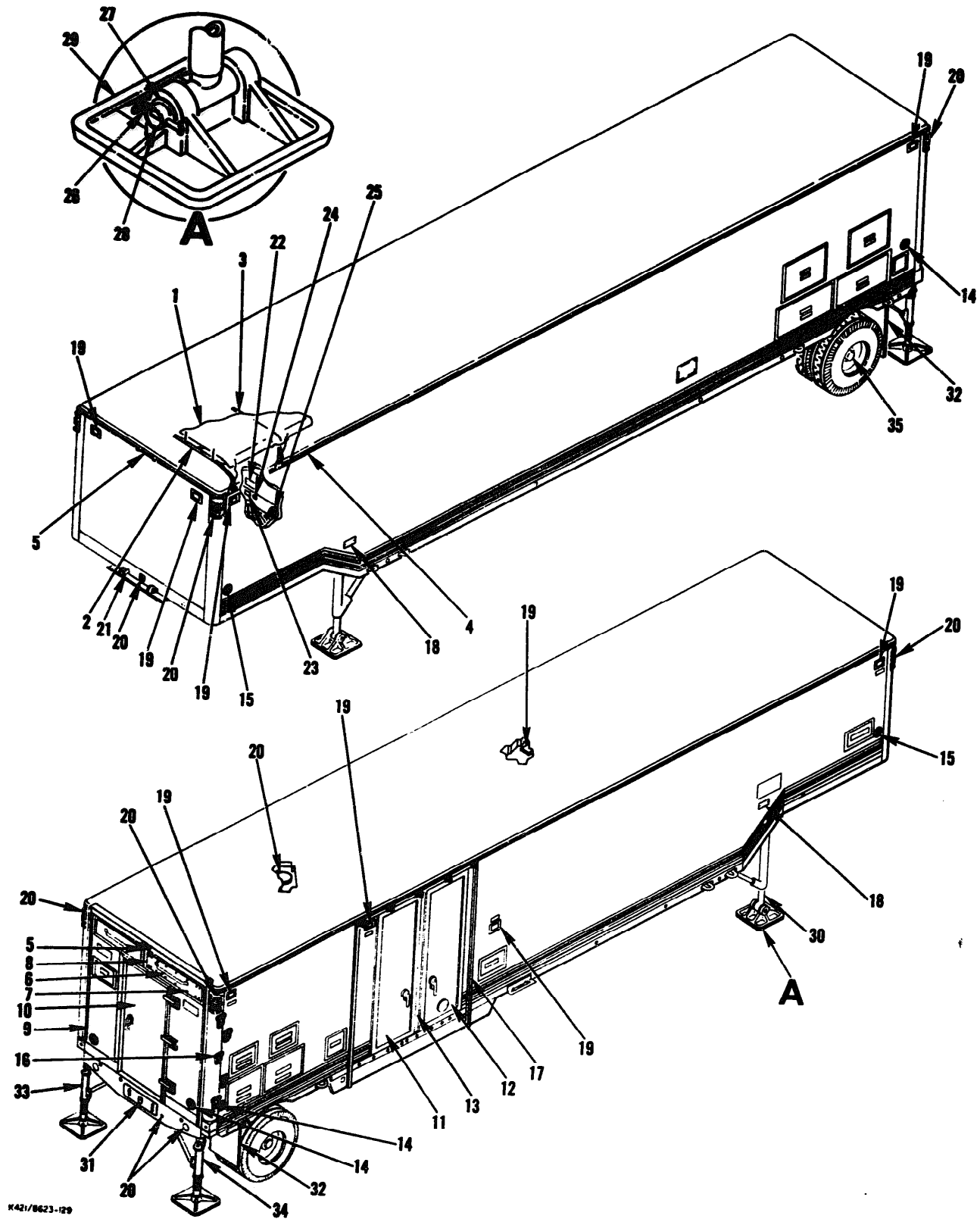
4210623-126

Figure 6-20. Drinking Water Dispenser Assembly.



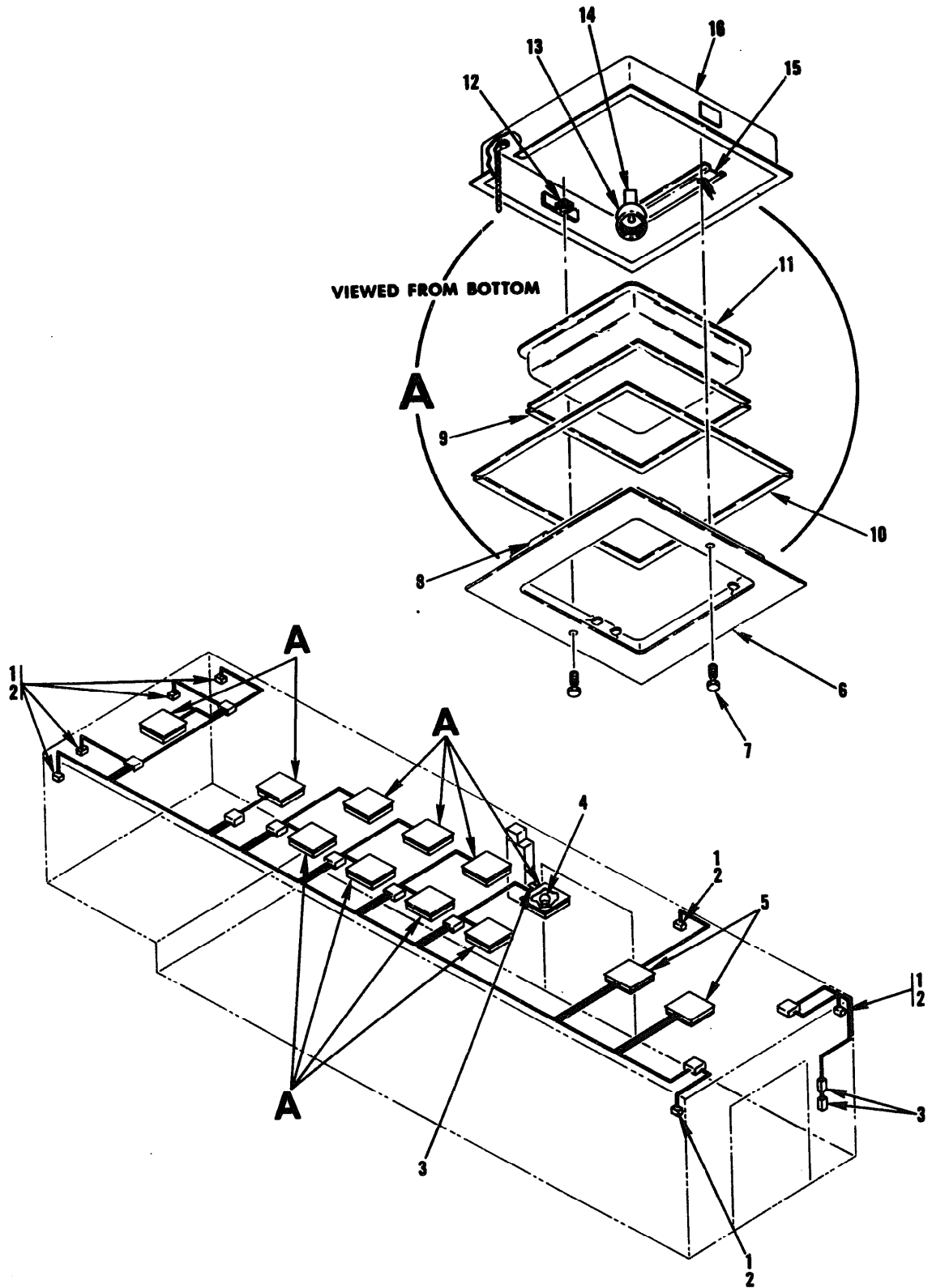
4421/0623-127

Figure 6-21. Test Equipment Dolly Assembly.



K421/0623-129

Figure 6-22. Semitrailer, Van V-205/MRC-85(V).



K42/8623-134

Figure 6-23. 115 Volt Electrical Installation.

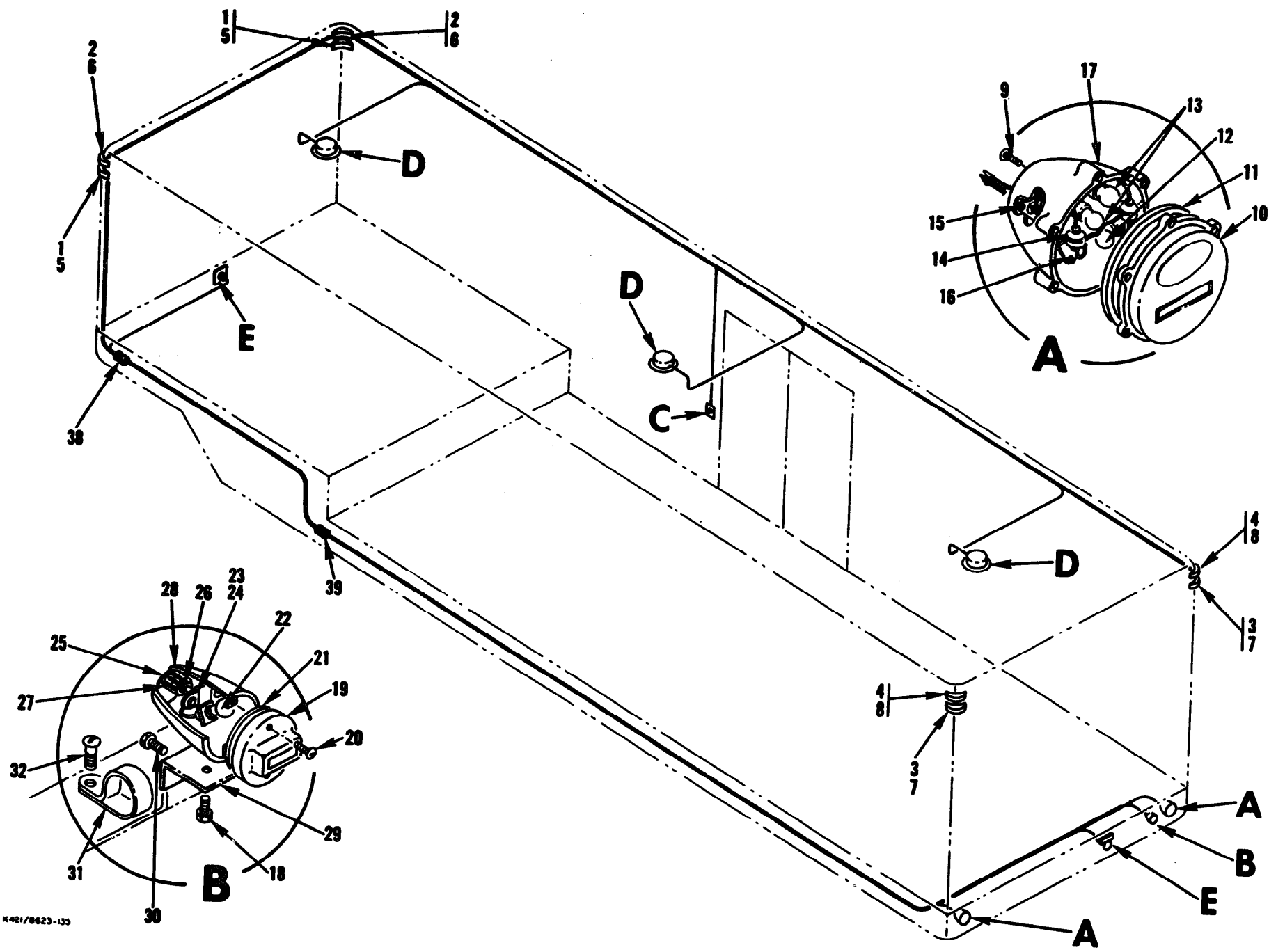
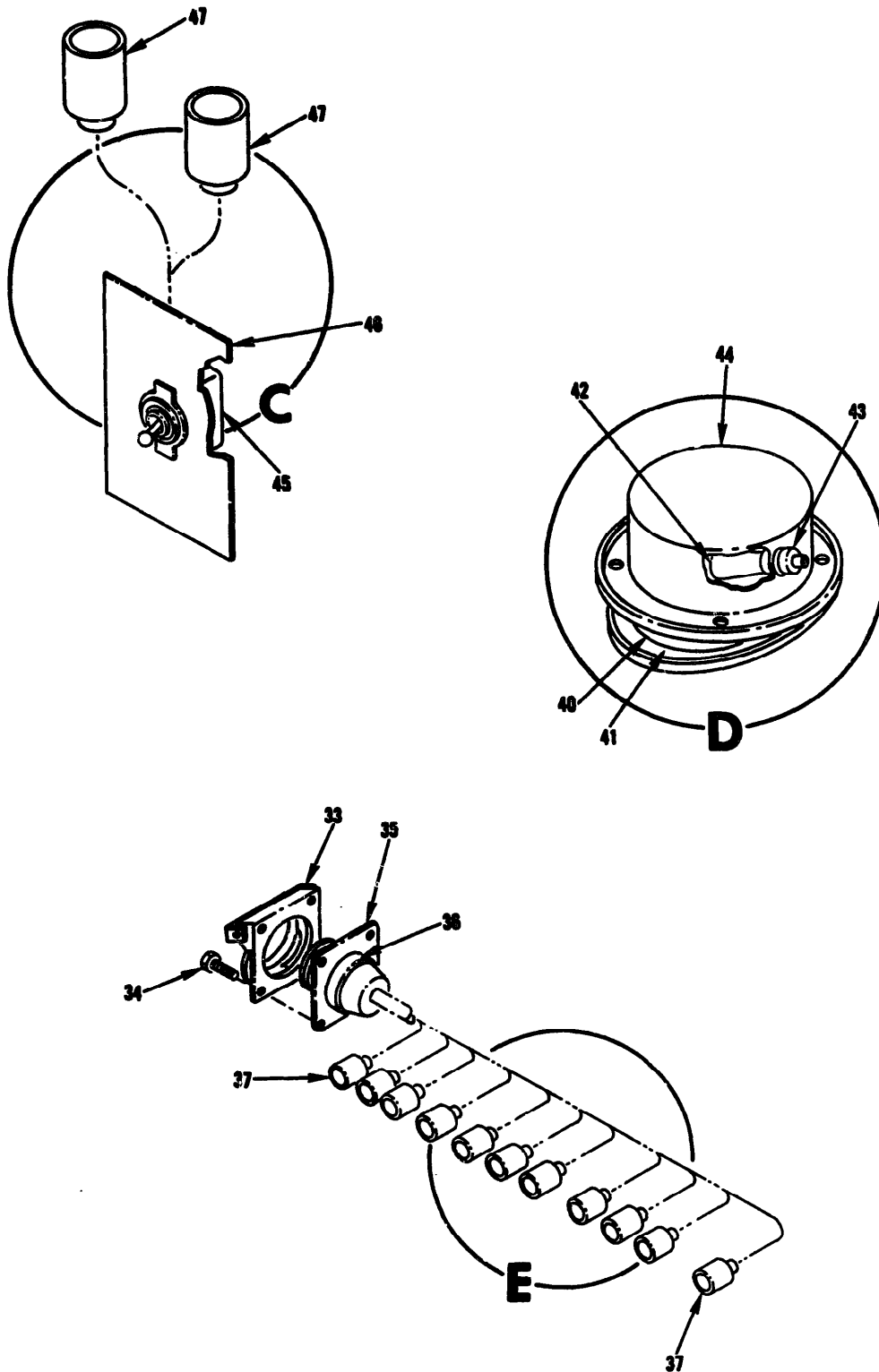


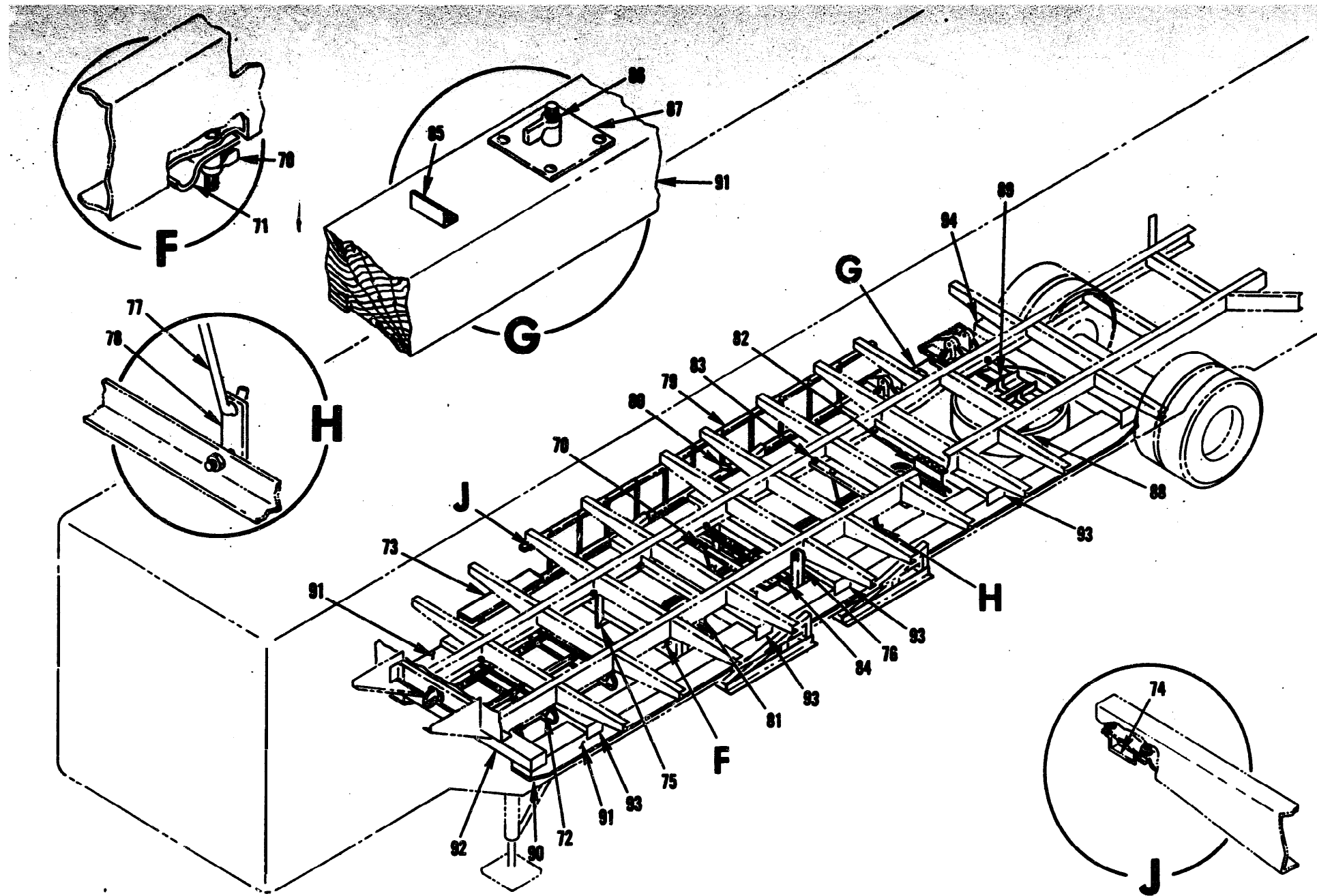
Figure 6-24(1). 24 Volt Electrical Installation (Sheet 1 of 2).



1421/0023-136

Figure 6-24(2). 24 Volt Electrical Installation (Sheet 2 of 2).

Figure 6-25. Securing and Storage Facilities
(Sheet 1 of 2).
(Located in back of manual.)



H42/0623-145

Figure 6-25(2). Securing and Storage Facilities (Sheet 2 of 2).

APPENDIX A

REFERENCES

The following publications contain information applicable to the operation and maintenance of Radio Set Group OA-6997(V)/MRC-85(V)2:

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 Index of Modification Work Orders
TM 11-5820-741-15	Operator, Organizational, DS, GS, and Depot Maintenance Manual Including Repair Parts and Special Tool Lists: Alarm Monitor BZ-66/FRC-39A(V), BZ-80/MRG-98, and Fault Indicator, Type 958A (Radio Engineering Laboratories)
TM 11-5820-742-15	Operator, Organizational, DS, GS, and Depot Maintenance Manual: Test Set, Radio AN/FRM-7, AN/FRM-13, AN/GRM-57, AN/MRM-8, and Radio Engineering Laboratories Performance Monitor Type 1005C
TM 11-5820-742-25P	Organizational, DS, GS, and Depot Maintenance Repair Parts and Special Tools List: Test Set, Radio AN/MRM-8
TM 11-5820-745-15	Operator, Organizational, DS, GS, and Depot Maintenance Manual Including Repair Parts and Special Tool Lists: Multiplexer Group OA-7008/MRC-85(V)2 Northern Radio Type 283, Model 1)
TM 11-5820-747-15	Operator, Organizational, DS, GS, and Depot Maintenance Manual Including Repair Parts and Special Tool Lists: Receiver-Transmitter, Order-Wire OA-7006/MRC-85(V)2 (Graybar Type GB320)
TM 11-5820-754-15	Operator, Organizational, DS, GS, and Depot Maintenance Manual: Amplifier-power Supply Group OA-2975/FRC-39A(V), OA-3157/FRC-39A(V), OA-7078/FRC39A(V)1, OA-7095/GRC and OA-6576(V)/GRC (Radio Engineering Laboratories Types 959, 959A, 959B, 1012, and 1012A)
TM 11-5820-754-25P	Organizational, DS, GS, and Depot Maintenance Repair Parts and Special Tools List: Amplifier-Power Supply Groups OA-7095/GRC and OA-6576(V)/GRC
TM 11-5820-755-15	Operator, Organizational, DS, GS, and Depot Maintenance Manual: Transmitter Group OA-3155/FRC-39A(V) and OA-7079/FRC-39A(V)1 (Radio Engineering Laboratories, Inc. Types 952 and 952A)
TM 11-5820-755-25P	Organizational, DS, GS, and Depot Maintenance Repair Parts and Special Tools List: Transmitter Group OA-3155/FRC-39A (V)
TM 11-5820-757-15	Operator, Organizational, DS, GS, and Depot Maintenance Manual: Amplifier-Power Supply Groups OA-2973/FRC-39A(V) and OA-4408/MRC-98 (Radio Engineering Laboratories, Inc. Types 954 and 954B)
TM 11-5820-762-15	Operator, Organizational, DS, GS, and Depot Maintenance Manual: Radio Set Groups OA-6988/MRC-85(V)1 and OA-7007/MRC-85(V)2
TM 11-5820-762-25P	Organizational, DS, GS, and Depot Maintenance Repair Parts and Special Tools List: Radio Set Group OA-7007/MRC-85(V)2

APPENDIX B

MAINTENANCE ALLOCATION

Section I. INTRODUCTION

B-1. General

This appendix provides a summary of the maintenance operations covered in the equipment literature. It authorizes categories of maintenance for specific maintenance functions on repairable items and components and the tools and equipment required to perform each function. This appendix may be used as an aid in planning maintenance operations.

B-2. Maintenance Functions

Maintenance functions will be limited to and defined as follows:

a. *INSPECT.* To determine serviceability of an item by comparing its physical, mechanical, and electrical characteristics with established standards.

b. *TEST.* To verify serviceability and to detect incipient electrical or mechanical failure by use of special equipment such as gages, meters, etc. This is accomplished with external test equipment and does not include operation of the equipment and operator type tests using internal meters or indicating devices.

c. *SERVICE.* To clean, to preserve, to charge, and to add fuel, lubricants, cooling agents, and air. If it is desired that elements, such as painting and lubricating, be defined separately, they may be so listed.

d. *ADJUST.* To rectify to the extent necessary to bring into proper operating range.

e. *ALIGN.* To adjust two or more components or assemblies of an electrical or mechanical system so that their functions are properly synchronized. This does not include setting the frequency control knob of radio receivers or transmitters to the desired frequency.

f. *CALIBRATE.* To determine the corrections to be made in the readings of instruments or

test equipment used in precise measurement. Consists of the comparison of two instruments one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared with the certified standard.

g. *INSTALL.* To set up for use in an operational environment such as an encampment site, or vehicle.

h. *REPLACE.* To replace unserviceable items with serviceable like items.

i. *REPAIR.* To restore an item to serviceable condition through correction of a specific failure or unserviceable condition. This function includes, but is not limited to welding, grinding, riveting, straightening, and replacement of parts other than the trial and error replacement of running spare type items such as fuses, lamps, or electron tubes.

j. *OVERHAUL.* Normally, the highest degree of maintenance performed by the Army in order to minimize time work in process is consistent with quality and economy of operation. It consists of that maintenance necessary to restore an item to completely serviceable condition as prescribed by maintenance standards in technical publications for each item of equipment. Overhaul normally does not return an item to like new, zero mileage, or zero hour condition.

k. *REBUILD.* The highest degree of material maintenance. It consists of restoring equipment as nearly as possible to new condition in accordance with original manufacturing standards. Rebuild is performed only when required by operational considerations or other paramount factors and then only at the depot maintenance category. Rebuild reduces to zero the hours or miles the equipment or component thereof, has been in use.

l. *SYMBOLS.* The uppercase letter placed in

the appropriate column indicates the lowest level at which that particular maintenance function is to be performed.

B-3. Explanation of Format

a. Column 1, group number. Column 1 lists group numbers, the purpose of which is to identify components, assemblies, subassemblies and modules with the next higher assembly.

b. Column 2, functional group. Column 2 lists the noun names of components, assemblies, subassemblies and modules on which maintenance is authorized.

c. Column 3, maintenance functions. Column 3 lists the maintenance category at which performance of the specific maintenance function is authorized. Authorization to perform a function at any category also includes authorization to perform that function at higher categories. The codes used represent the various maintenance categories as follows :

<i>Code</i>	<i>Maintenance Category</i>
C-----	Operator/Crew
O-----	Organizational Maintenance
F-----	Direct Support Maintenance
H-----	General Support Maintenance
D-----	Depot Maintenance

d. Column 4, tools and test equipment. Column

4 specifies, by code, those tools and test equipment required to perform the designated function. The numbers appearing in this column refer to specific tools and test equipment which are identified in table 1.

e. Column 5, Remarks. Self-explanatory.

B-4. Explanation of Format of Table 1, Tool and Test Equipment Requirements

The columns in Table 1, Tool and Test Equipment Requirements are as follows :

a. Tools and Equipment. The numbers in this column coincide with the numbers used in the tools and equipment column of the Maintenance Allocation Chart. The numbers indicate the applicable tool for the maintenance function.

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

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

d. Federal Stock Number. This column lists the Federal stock number of the specific tool or test equipment.

e. Tool Number. Not used.

SECTION II. MAINTENANCE ALLOCATION CHART

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTIONS										TOOLS AND EQUIPMENT	REMARKS	
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL			REBUILD
1	RADIO SET GROUP OA-699TU/MRC-85(V)2	0	F										1,2 1,2	Visual
1A	ALARM MONITOR BZ-106/MRC-85(V)2	0	F										1,2 1,2	Visual
1B	MAIN DISTRIBUTION FRAME TA-593/MRC-85(V)2	0	F										1,2 1,2	Visual
1C	POWER DISTRIBUTION PANEL SB-2324/MRC-85(V)2	0	F										1,2 1,2	Visual
1D	METER ASSEMBLY, ELECTRICAL ME-289P/MRC-85(V)2	0	F						F				1,2 1,2	Visual
1E	SIGNAL LINE EXTENSION BOX, WICKES, 7750590-502	0	F										1,2 1,2	Visual
1F	COMMUNICATION PATCH PANEL SB-2319/MRC-85(V)2	0	F										1,2 1,2	Visual
1G	COMMUNICATION PATCH PANEL SB-2320/MRC-85(V)2	0	F										1,2 1,2	Visual

TABLE I. TOOL AND TEST EQUIPMENT REQUIREMENTS					
TOOLS AND EQUIPMENT	MAINTENANCE CATEGORY	NOMENCLATURE		FEDERAL STOCK NUMBER	TOOL NUMBER
		Recommended in Manual	Available on Site		
1	F, H, D	MULTIMETER, AN/FEM-6	MULTIMETER, AN/FEM-6	6625-643-1686	
2	F, H, D		TOOL KIT, ELECTRONIC EQUIPMENT TK-100/G	5180-605-0079	

(Prefix each Reference Number with the Chapter Number denoted by the Column.)
 (KEY: Numbers preceded by "f" are illustrations; "t" are tables; others are paragraphs.)

OFFICIAL NOMENCLATURE Common Name	Chapter 2 Installation	Chapter 3 Operation	Chapter 4 Principles of Operation	Chapter 5			Chapter 6 Circuit Diagrams
				Org/Depot Maintenance	Align- ment	Special Maintenance	
AirConditioner AIR CONDITIONER M68A/E32C-11	64, 96, f9	--	--	--	16, 19	--	f1
AIR CONDITIONER M68A/E32C-11 Air Conditioner	64, 96, f9	--	--	--	16,19	--	f1
ALARM-MONITOR BZ-66/FRC-39A(V) Fault Locating Indicator	--	--	28, 47	--	16, 19	--	f1, f9
Alarm-Monitor ALARM-MONITOR BZ-106/MRC-85(V)2	--	f10, t3	24, 47	--	16, 19	--	f3
ALARM-MONITOR BZ-106/MRC-85(V)2 Alarm-Monitor	--	f10, t3	24, 47	--	16,19	--	f3
AMPLIFIER-POWER SUPPLY GROUP OA-3157/FRC-39A(V) Receiver	--	--	10	--	16,19	--	f2, f9
Baseband and Order Wire Patch Panel PANEL, PATCHING, COMMUNICA- TIONS SB-2319/MRC-85(V)2	--	19, f12, f13	37, 68, f4, f5, f6, f7	f1, t2	--	--	f6, f9
CONNECTOR ASSBEMBLY, ELECTRICAL Signal Line Extension Box	75, f14	--	11	--	--	--	f1, f9
Distribution Box * PANEL, POWER DISTRIBUTION S B - 2 3 2 4 / M R C - 8 5 (V) 2	--	10, f7, t2	18	--	--	--	f1
TRANSMITTER GROUP OA-3155/FRC-39A(V)	t1	--	75	--	16,19	--	f2, f9

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OFFICIAL NOMENCLATURE Common Name	Chapter 2 Installation	Chapter 3 Operation	Chapter 4 Principles of Operation	Org/Depot; Maintenance	Chapter 5		Chapter 6 circuit Diagrams
					Align- ment	Special Maintenance	
Exciter Patch Panel PANEL, PATCHING, COMMUNICA- TIONS SB-2320/MRC-85(V)2	--		75, f8	t2	--	--	f7, f9
Fault Locating Indicator ALARM-MONITOR BZ-66/FRC-39A(V)	--		28, 47		16, 19	--	f1, f9
LOUDSPEAKER, PERMANENT MAG- NET LS-515/MRC-85(V)2 Speaker Panel	--	--			16, 19	--	f5
Main Distributing Frame (MDF) MAIN DISTRIBUTING FRAME, TELE- PHONE TA-593/MRC-85(V)2			5, f2	--	--	--	f7, f9
MAIN DISTRIBUTING FRAME, TELE- PHONE TA-593/MRC-85(V)2 Main Distributing Frame (MDF)	--	--	5, f2	--	--	--	f7, f9
METER ASSEMBLY, ELECTRICAL ME-289A/MRC-85(V)2 Power Monitor	--	f9, t2	26, 60		16, 19	--	f1
MULTIPLEXER GROUP OA-7008/MRC-85(V)2 Voice Frequency Telegraph (VFTG) Equipment	--	--	3, 38, f2		16, 19	--	f1, f9
Multiplexer Set MULTIPLEXER SET AN/MCC-13		--	3		16, 19	--	f1, f9
MULTIPLEXER SET AN/MCC-13 Multiplexer Set		--	3		16, 19	--	f1, f9

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OFFICIAL NOMENCLATURE Common Name	Chapter 2 Installation	Chapter 3 Operation	Chapter 4 Principles of Operation	Chapter 5			Chapter 6 Circuit Diagrams
				Org/Depot Maintenance	Align- ment	Special Maintenance	
Order Wire Telephone Set RECEIVER-TRANSMITTER, ORDER WIRE OA-7006/MRC-85(V)2	--	--	3, 42, f3	--	16, 19	--	f9
PANEL, PATCHING, COMMUNICA- TIONS SB-2319/MRC-85(V)2 Baseband and Order Wire Patch Panel	--	19, f12, f13	37, 38, f4, f5, f6, f7	f1, t2	--	--	f6, f9
PANEL, PATCHING, COMMUNICA- TIONS SB-2320/MRC-85(V)2 Exciter Patch Panel	--	--	75, f8	t2	--	--	f7, f9
PANEL, POWER DISTRIBUTION SB-2324/MRC-85(V)2 Distribution Box	--	10, f7, t2	18	--	--	--	f1
Performance Monitor TEST SET, RADIO AN/MRM-8	--	--	--	--	16, 19	--	f1
Power Monitor METER ASSEMBLY, ELECTRICAL ME-289A/MRC-85(V)2	--	10, f9, t2	26, 60	--	16, 19	--	f1
Receiver AMPLIFIER-POWER SUPPLY GROUP OA-3157/FRC-39A(V)	t1	--	10, f3	--	16, 19	--	f2, f9
RECEIVER-TRANSMITTER, ORDER WIRE OA-7006/MRC-85(V)2 Order Wire Telephone Set	--	--	3, 42	--	16, 19	--	f9
SEMITRAILER VAN V-205/MRC-85(V) Van	2, 10	--	--	t4	21	67, t6	--
Signal Line Extension Box CONNECTOR ASSEMBLY, ELECTRI- CAL	75, f14	--	11	--	--	--	f1, f9

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OFFICIAL NOMENCLATURE Common Name	Chapter 2 Installation	Chapter 3 Operation	Chapter 4 Principles of Operation	Chapter 5			Chapter 6 Circuit Diagrams
				Org/Depot Maintenance	Align- ment	Special Maintenance	
Speaker Panel LOUDSPEAKER, PERMANENT MAG- NET LS-515/MRC-85(V)2	--	--	--	--	16, 19	--	f5
TEST SET, RADIO AN/MRM-8 Performance Monitor	--	--	--	--	16, 19	--	f1
TRANSMITTER GROUP OA-3155/FRC-39A(V) Exciter	t1	--	75	--	16, 19	--	f2, f9
Van SEMITRAILER VAN V205/MRC-85(V)	2, 10	--	--	t4	21	67, t6	--
Voice Frequency Telegraph (VFTG) Equipment MULTIPLEXER GROUP OA-7006/MRC-85(V)2	--	--	3, 38, f2	--	16, 19	--	f1, f9

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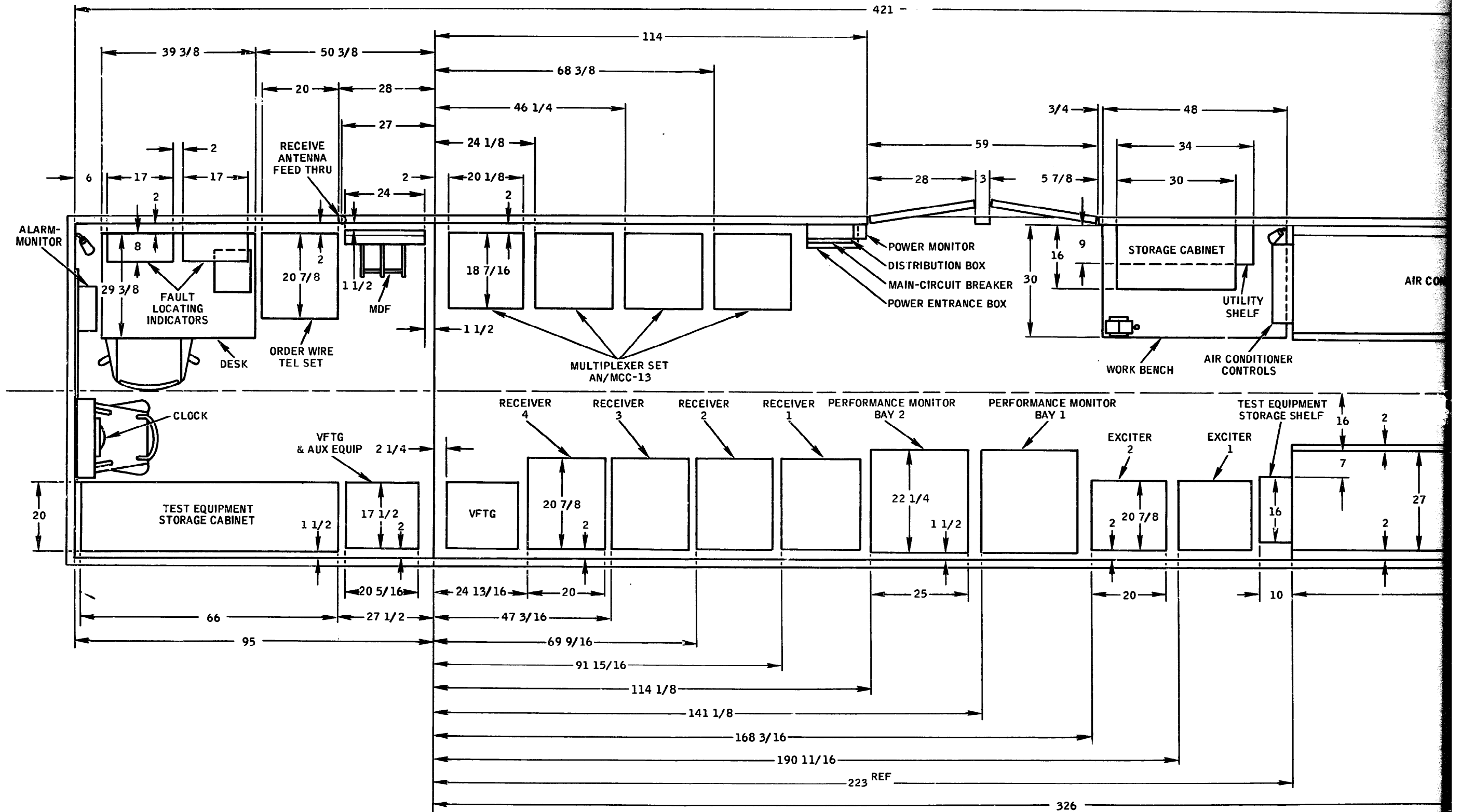


Figure 2-3. Operating Van Floor Plan.

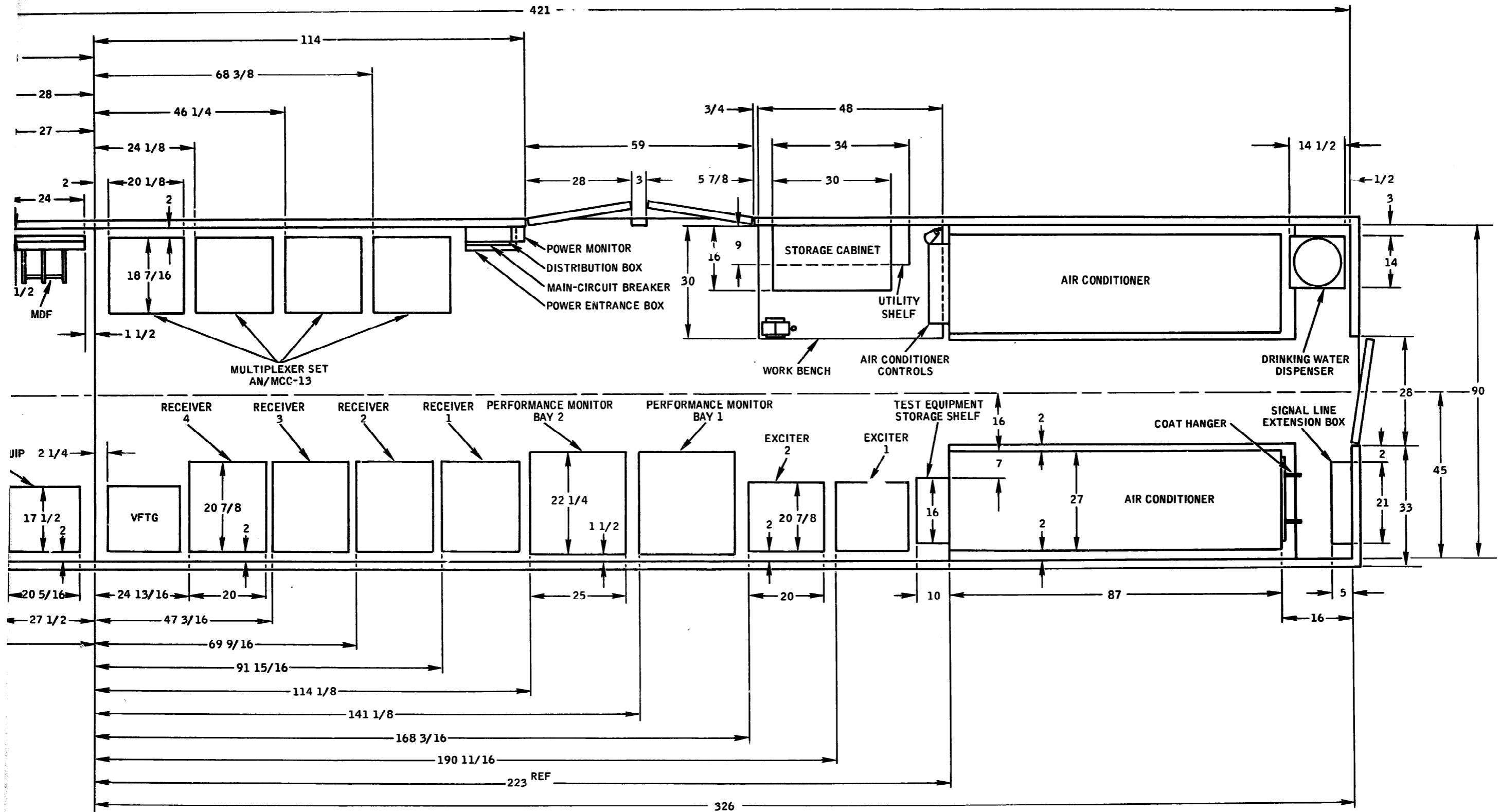


Figure 2-3. Operating Van Floor Plan.

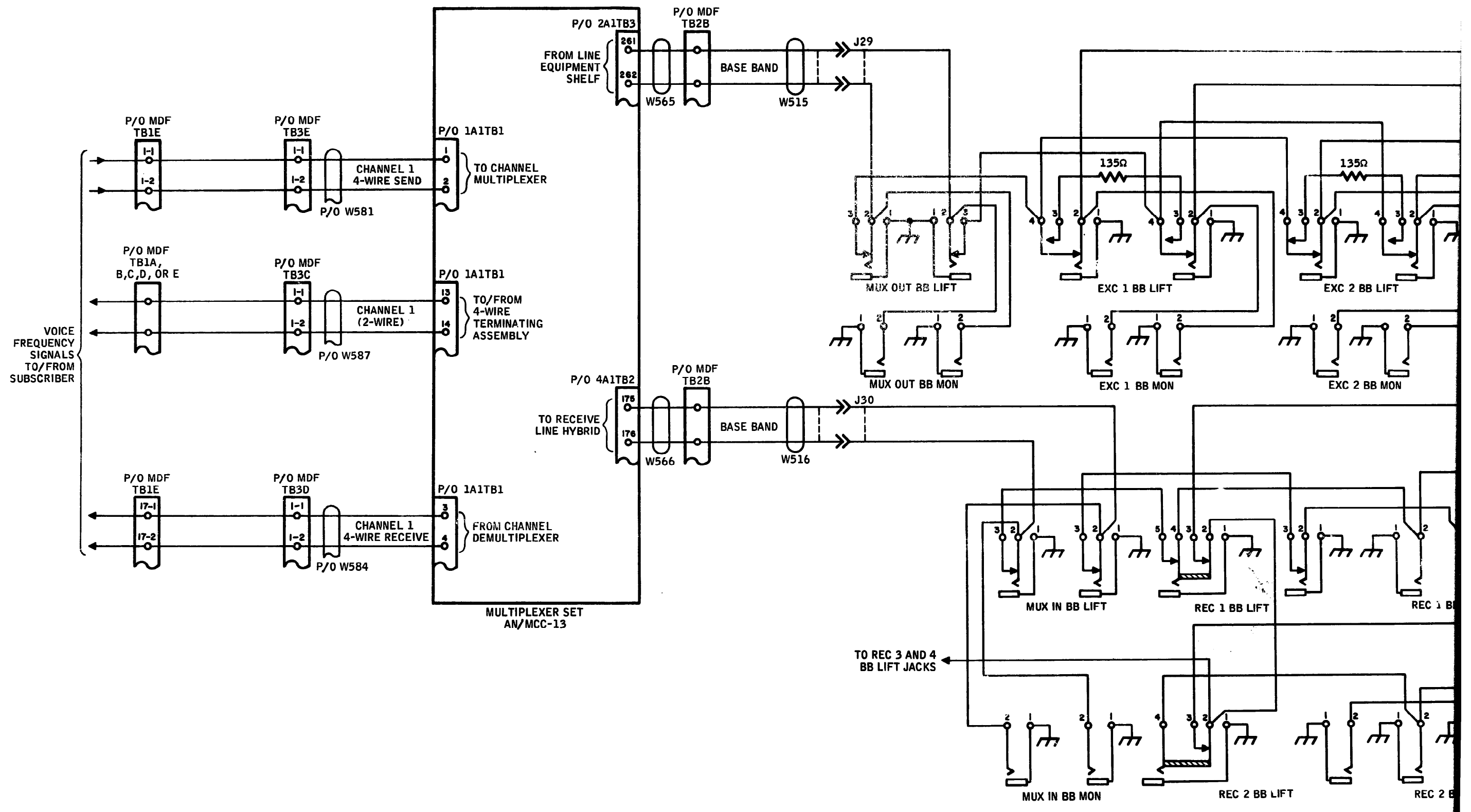


Figure 4-1. Voice Frequency Channel, Simplified Schematic Diagram.

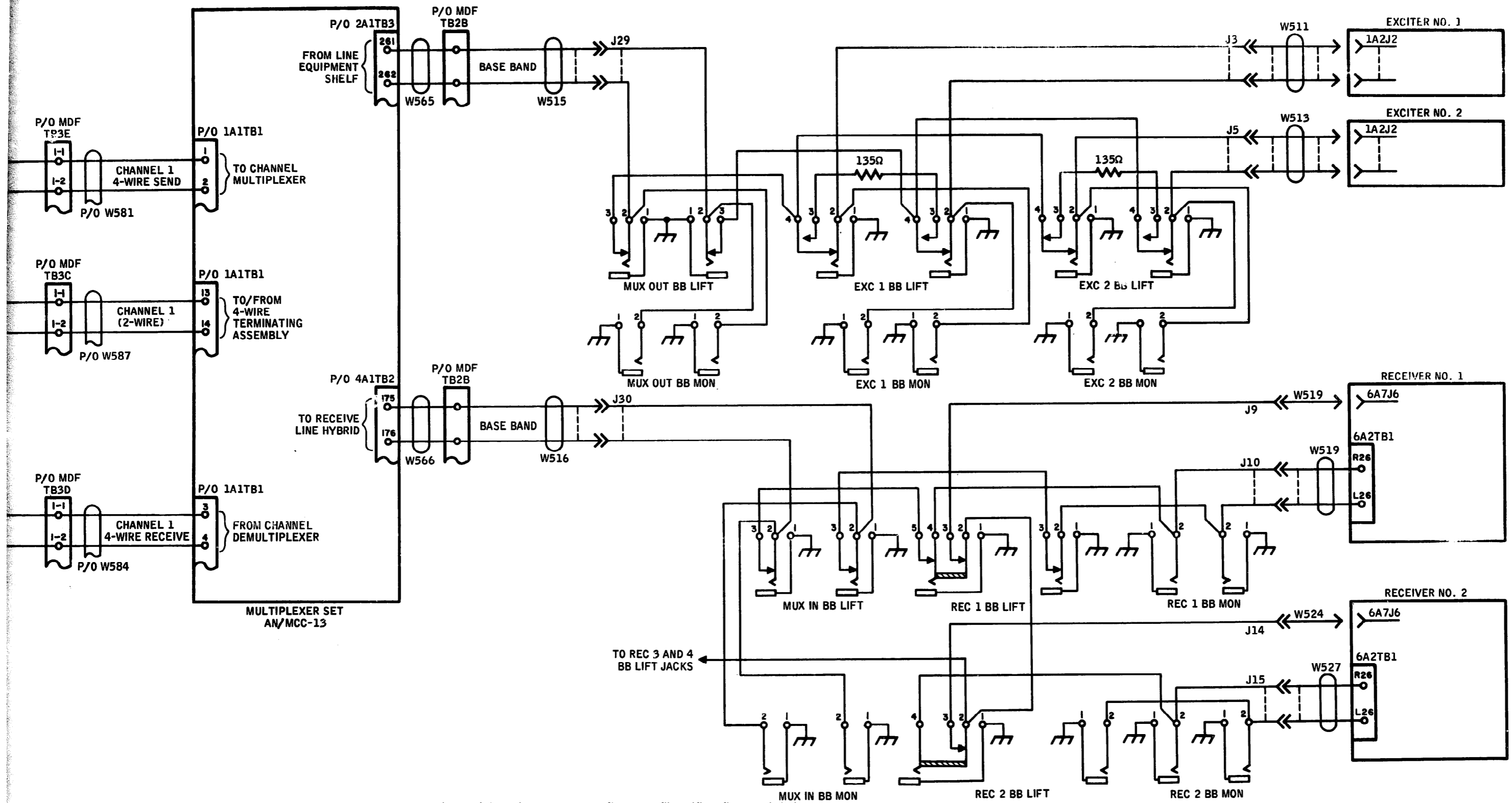
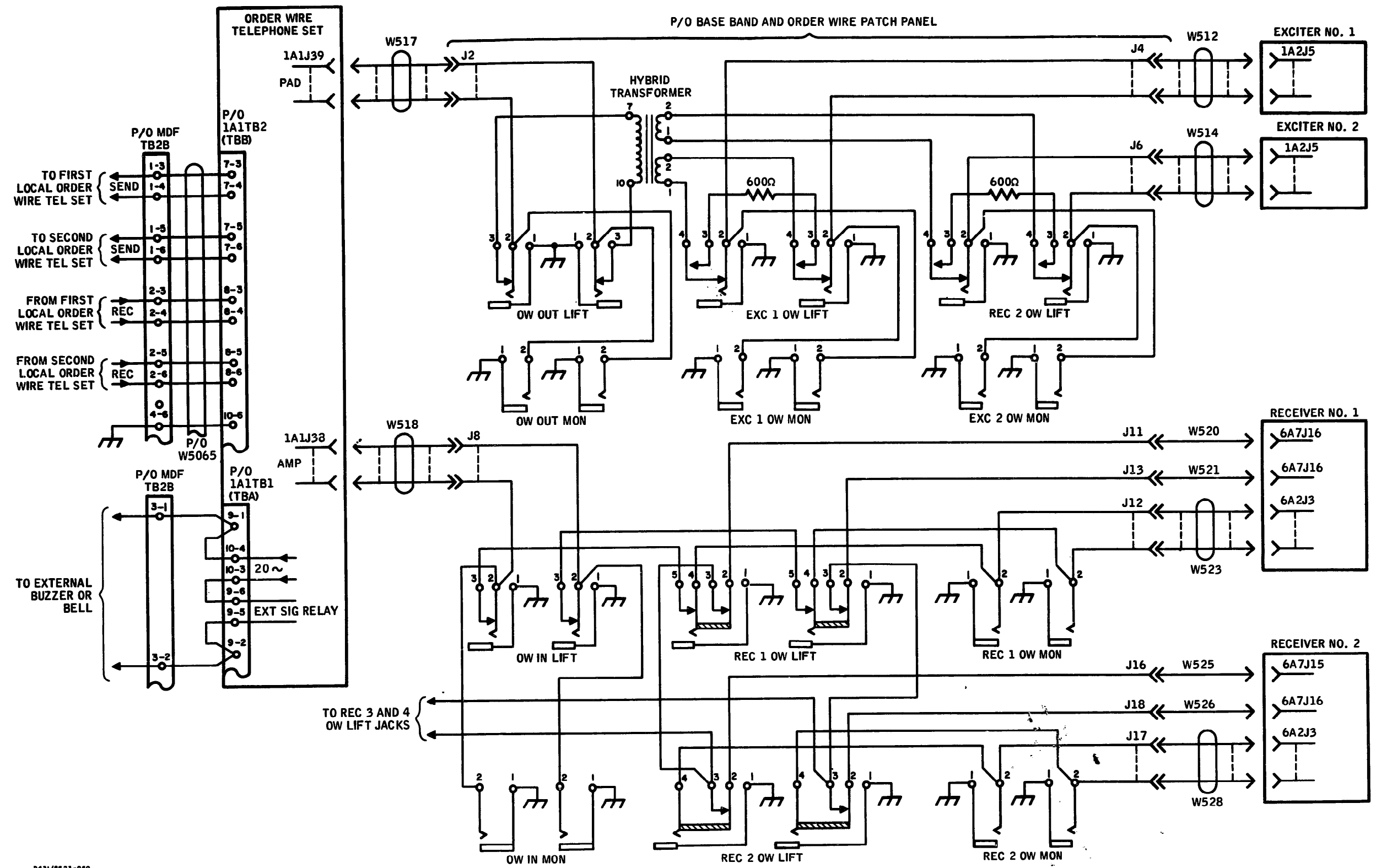
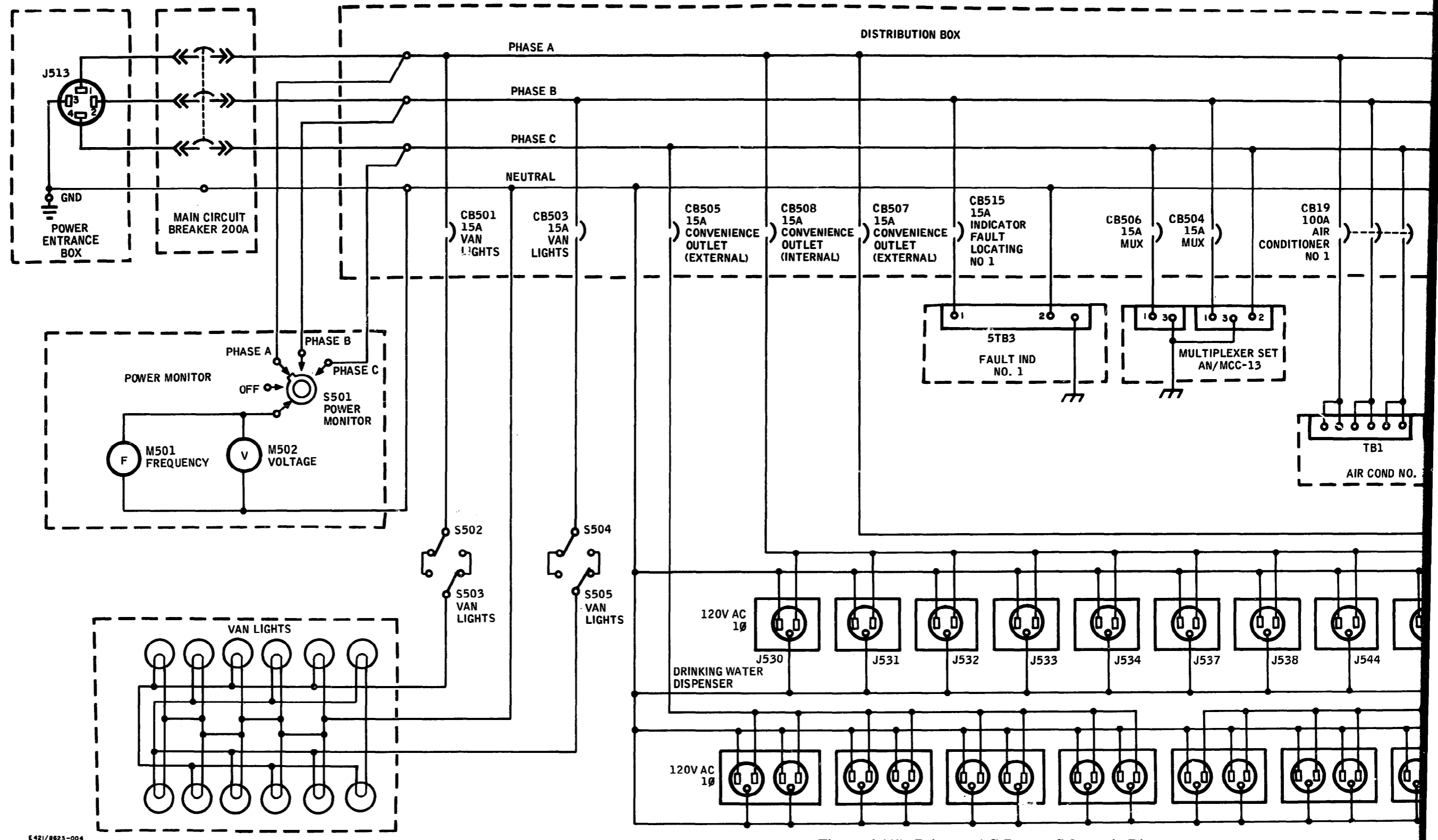


Figure 4-1. Voice Frequency Channel, Simplified Schematic Diagram.



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Figure 4-3. Voice Frequency Order Wire Channel, Simplified Schematic Diagram.



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Figure 6-1(1). Primary AC Power, Schematic Diagram
(Sheet 1 of 2).

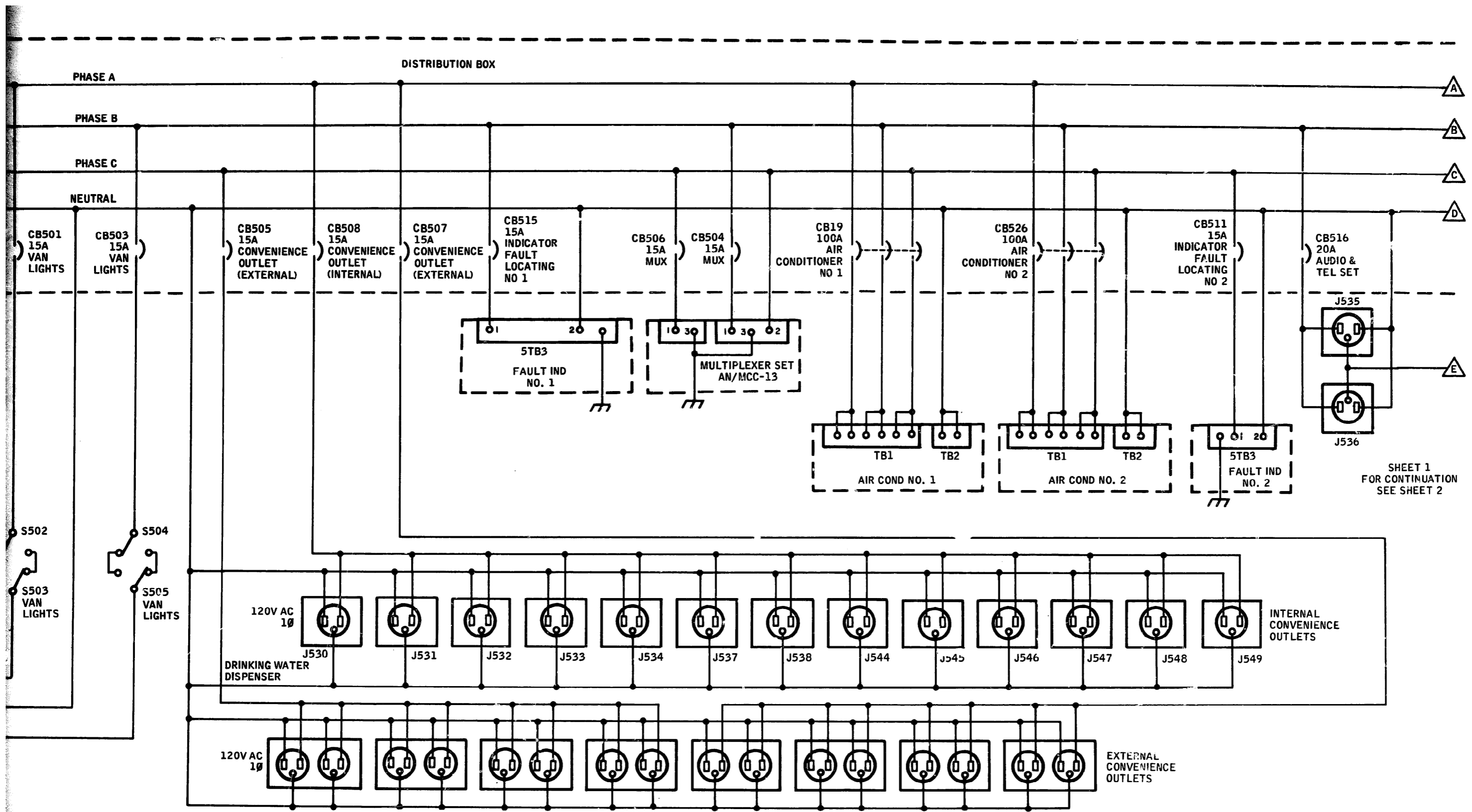
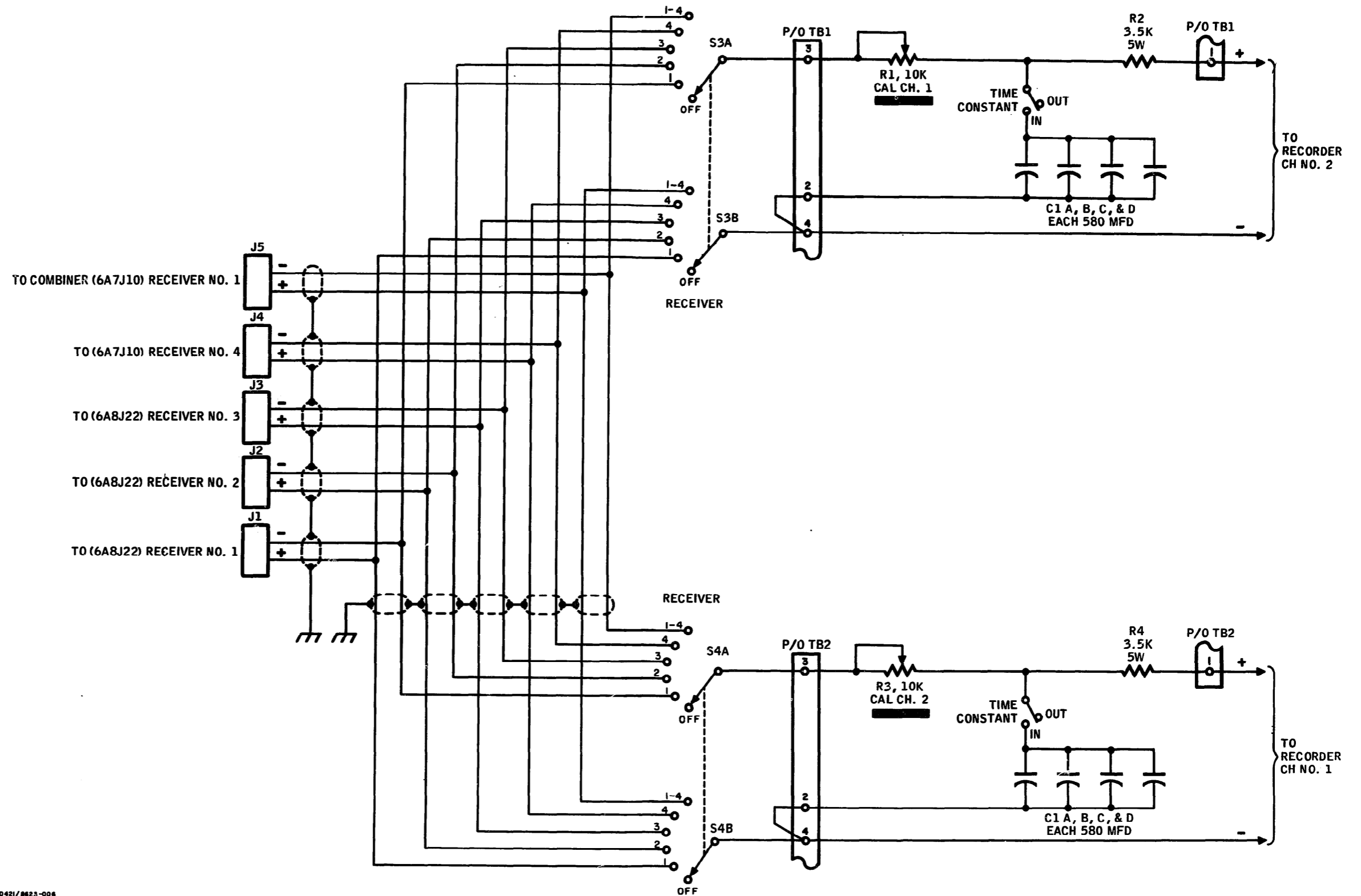
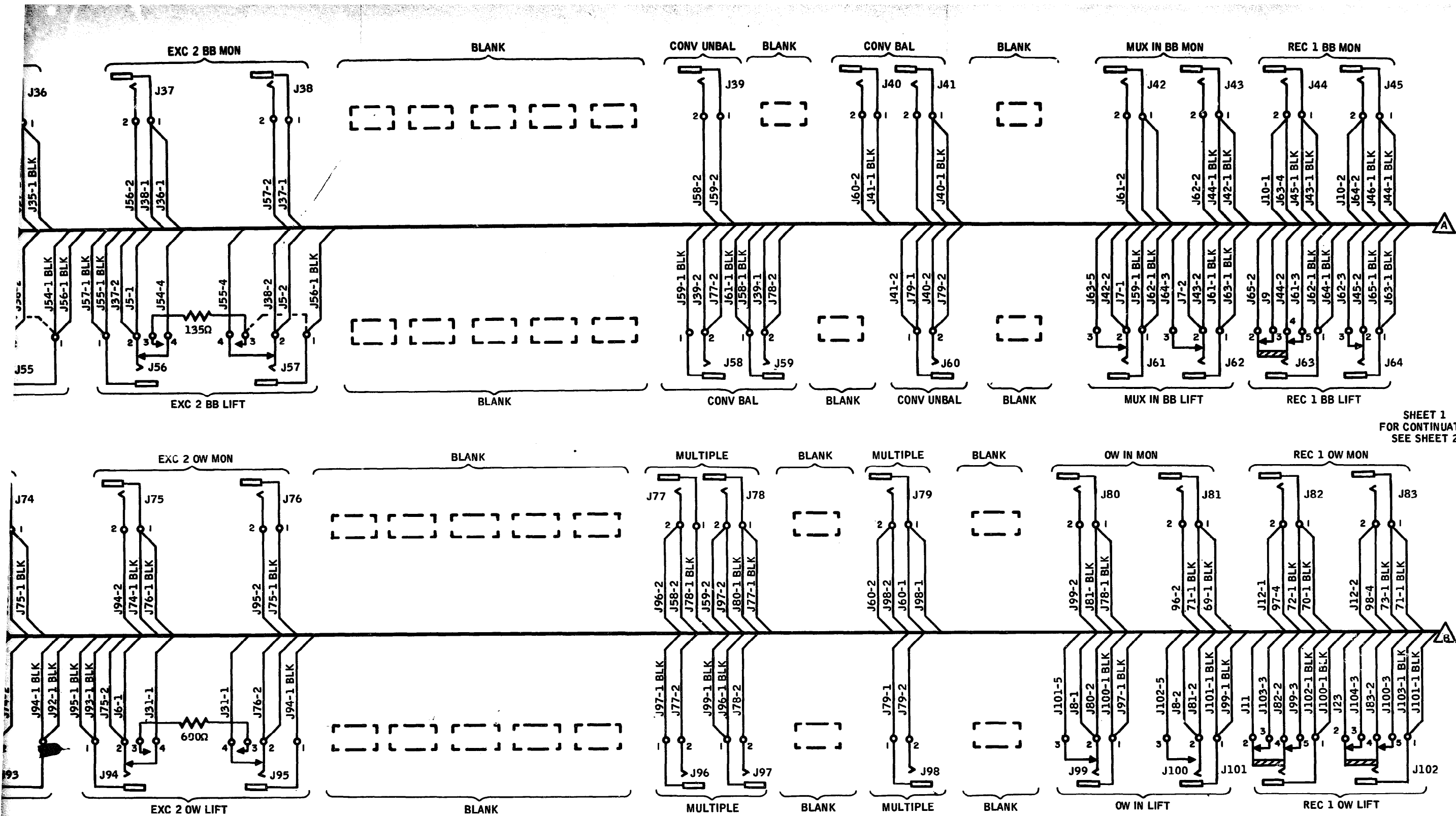


Figure 6-1(1). Primary AC Power, Schematic Diagram.
(Sheet 1 of 2).



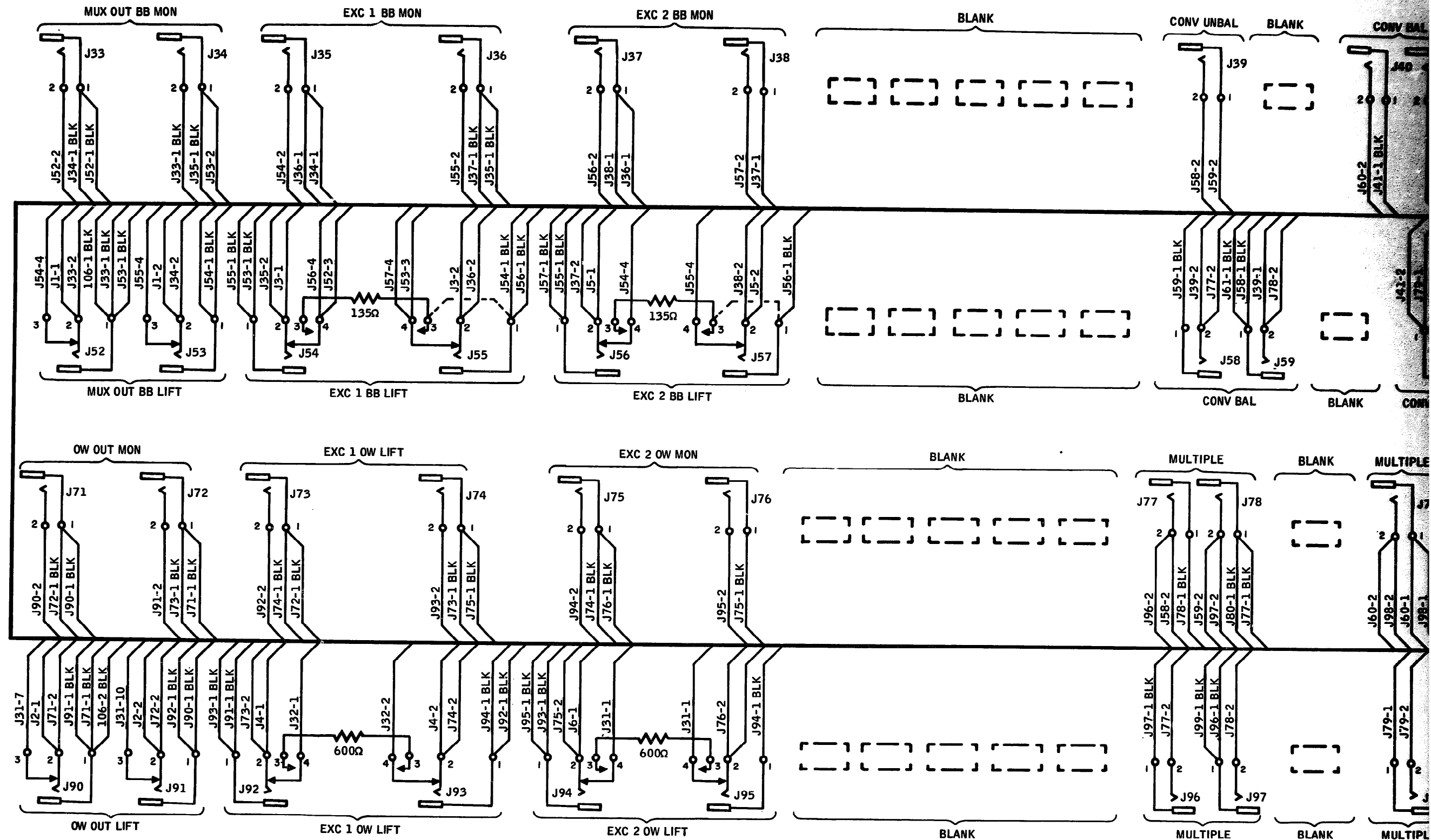
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Figure 6-4. Recorder Control, Schematic Diagram.



SHEET 1
FOR CONTINUATION
SEE SHEET 2

Figure 6-6(1). Baseband Order Wire Patch Panel Cabling Diagram
(Sheet 1 of 2).



6421/0023-007

Figure 6-6(1). Baseband Order Wire Patch Panel Cabling Diagram
(Sheet 1 of 2).

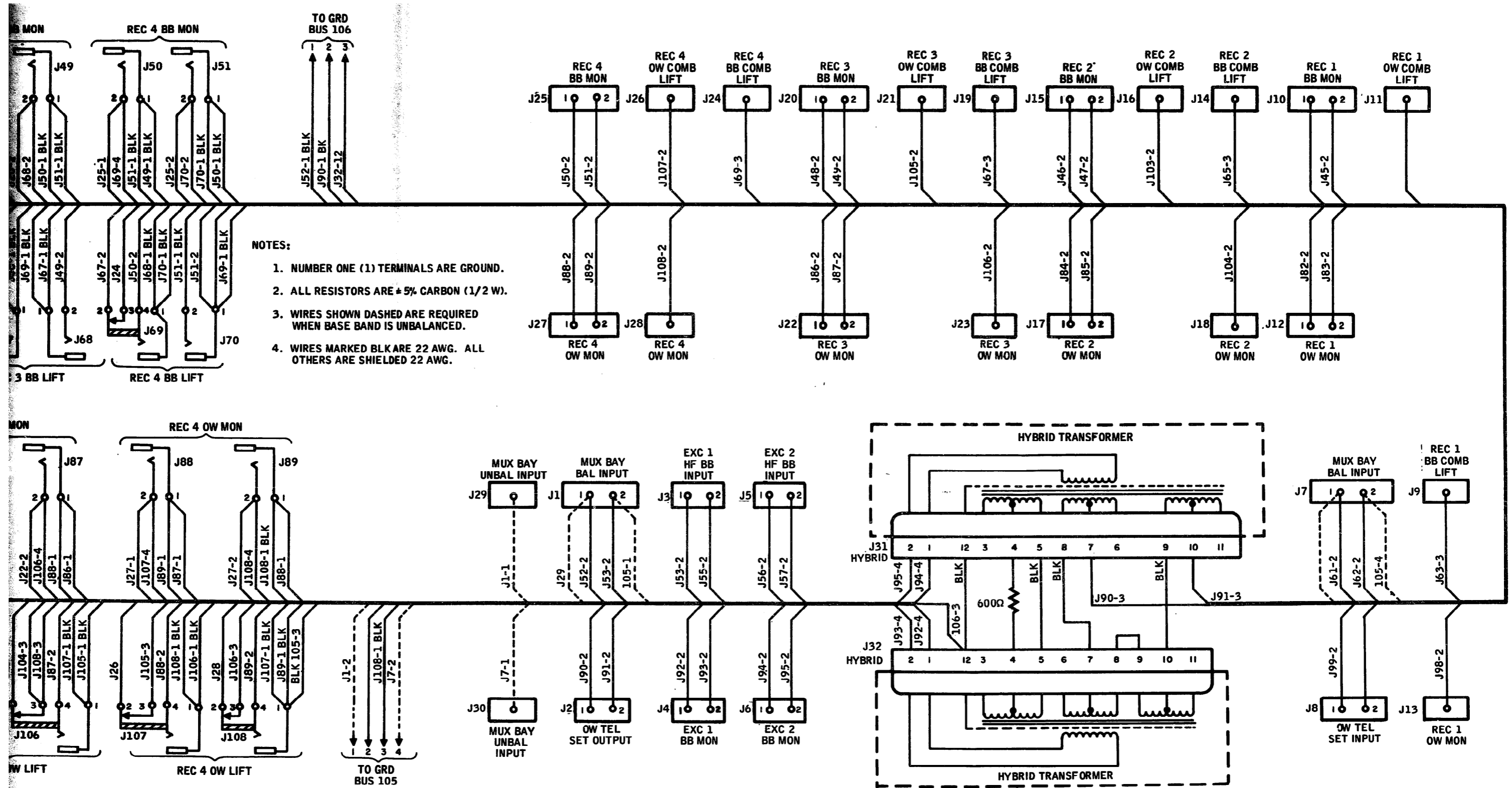


Figure 6-6(2). Baseband and Order Wire Patch Panel Cabling Diagram (Sheet 2 of 2).

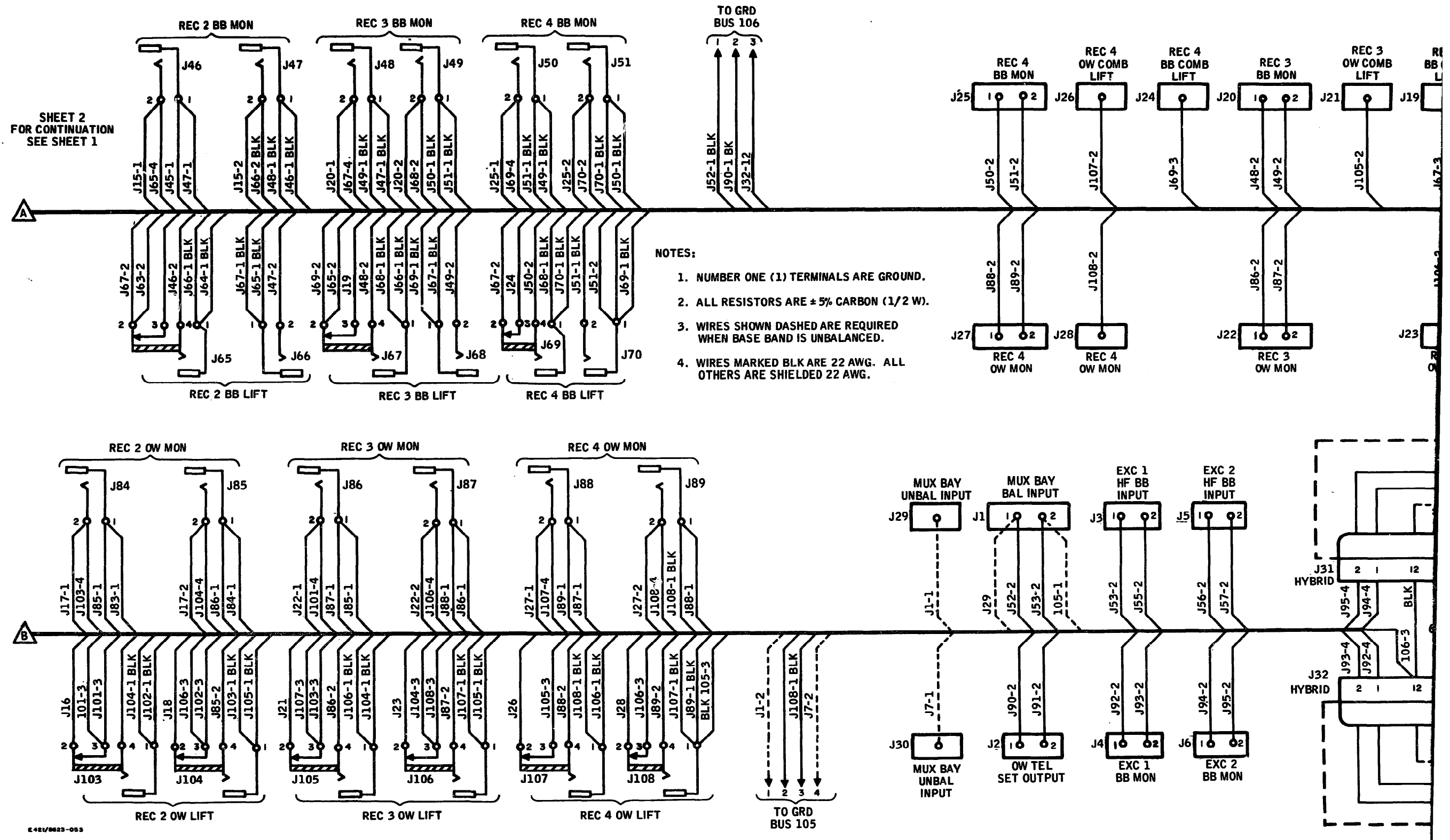


Figure 6-6(2). Baseband and Order Wire Patch Panel Cabling Diagram (Sheet 2 of 2).

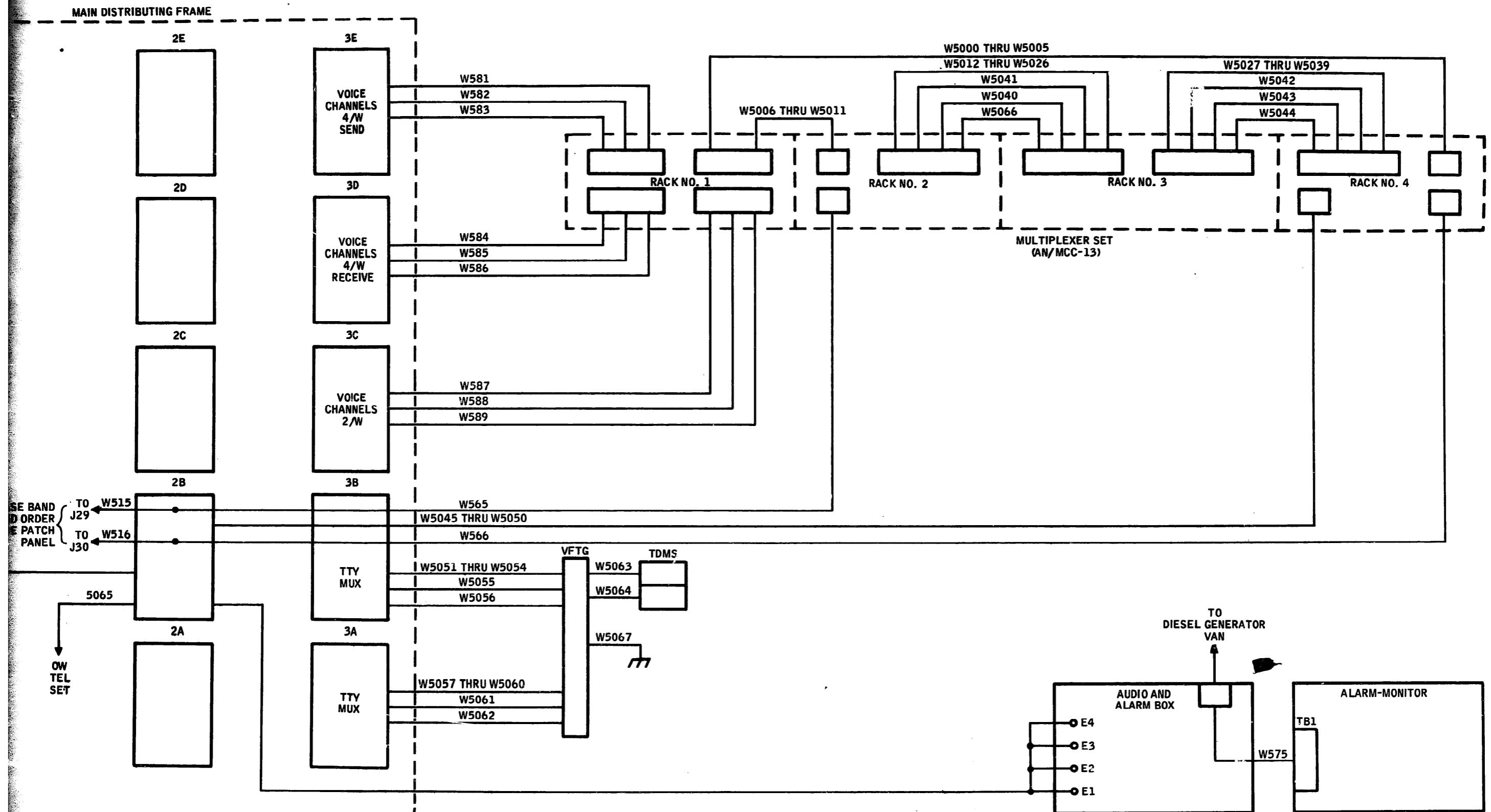


Figure 6-7(1). Interequipment Cabling Data (Sheet 1 of 21).

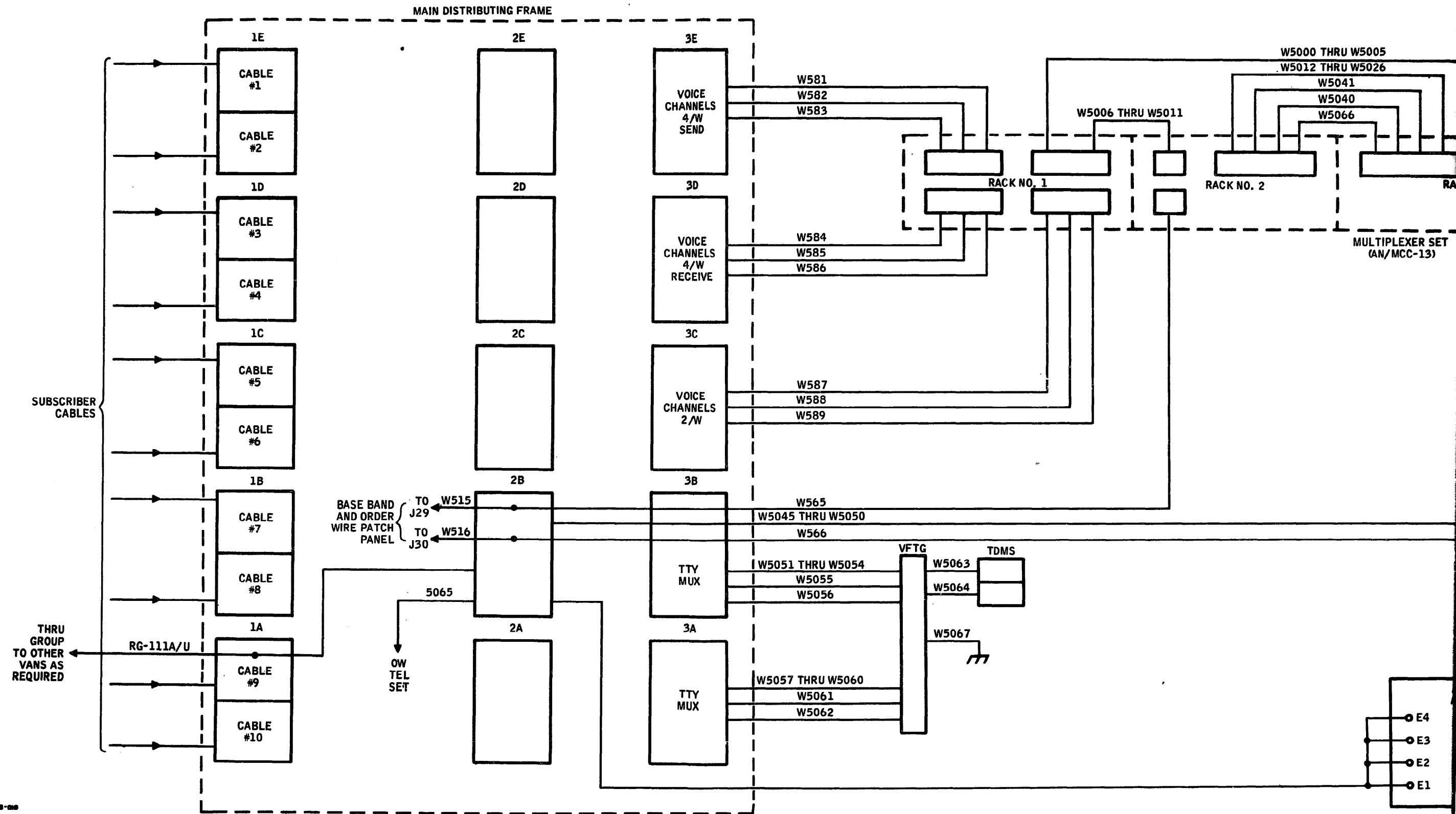
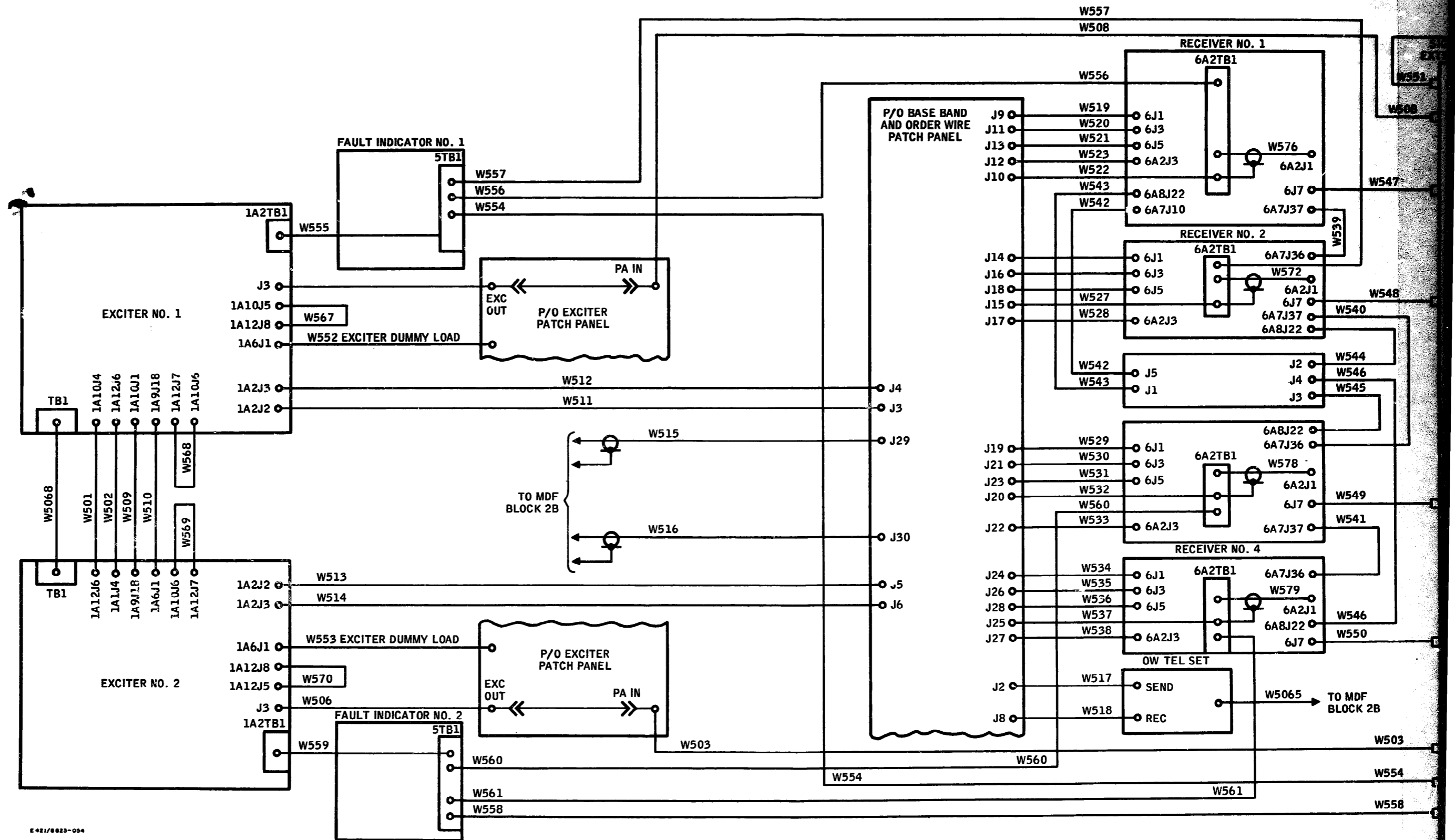
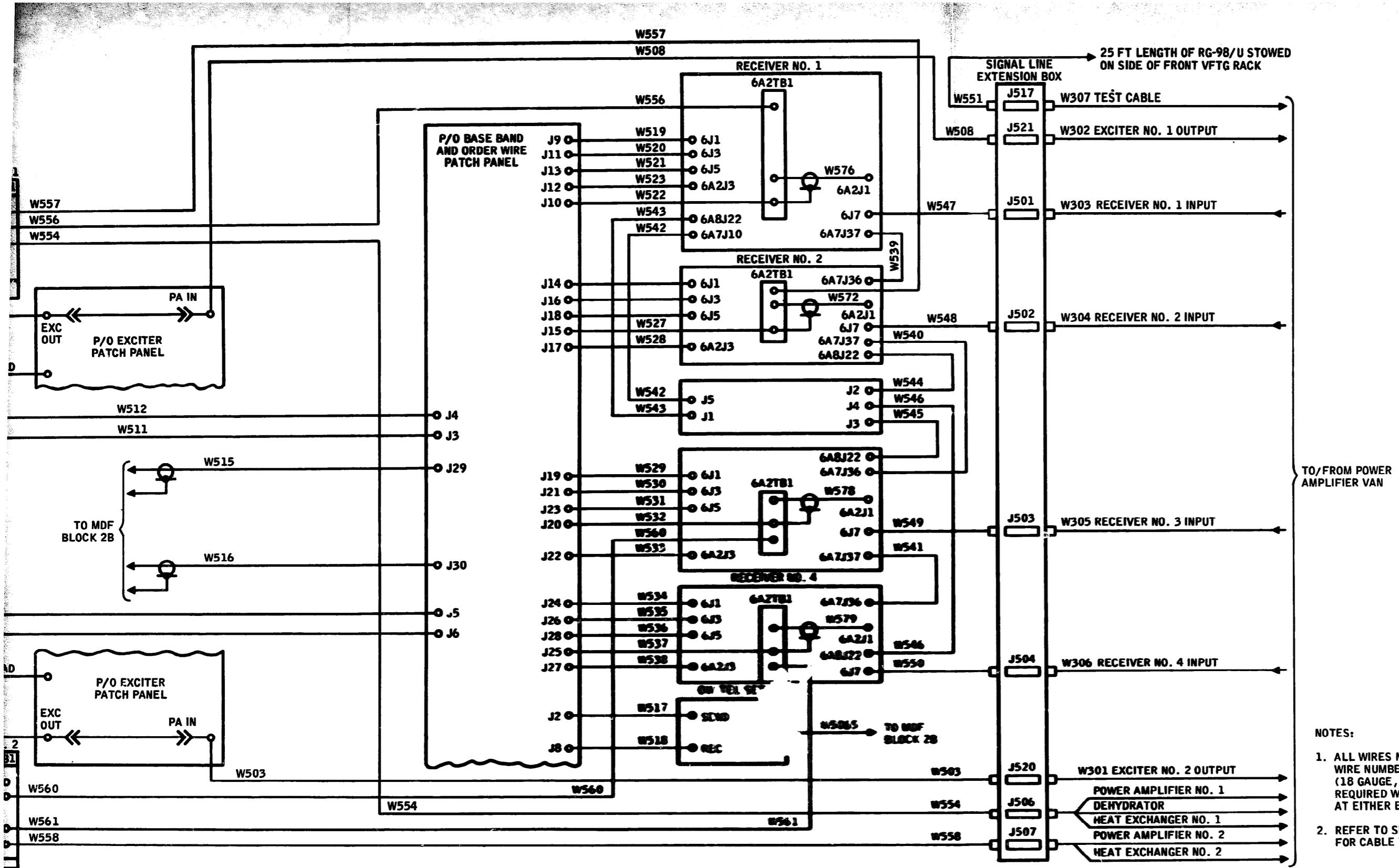


Figure 6-7(1). Interequipment Cabling Data (Sheet 1 of 21).



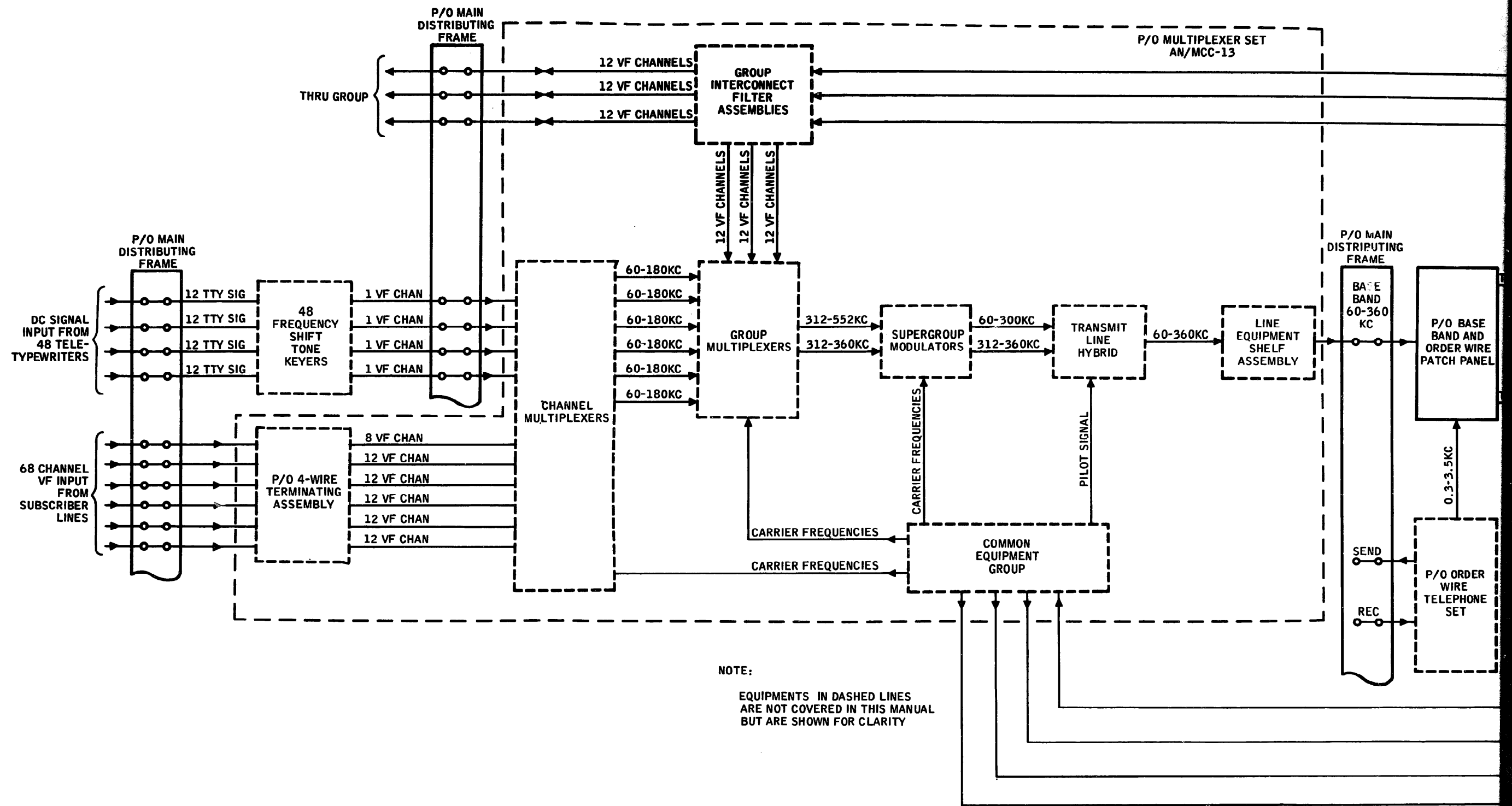
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Figure 6-7(2). Interequipment Cabling Data (2 of 21).
(Sheet 1 of 2).



NOTES:

1. ALL WIRES NOT ASSIGNED WIRE NUMBERS ARE JUMPERS (18 GAUGE, RED, LENGTH AS REQUIRED WITH SPADE LUGS AT EITHER END.)
2. REFER TO SHEET 3 THROUGH 21 FOR CABLE TERMINATIONS.



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Figure 6-9(1). Operations Van Functional Block Diagram

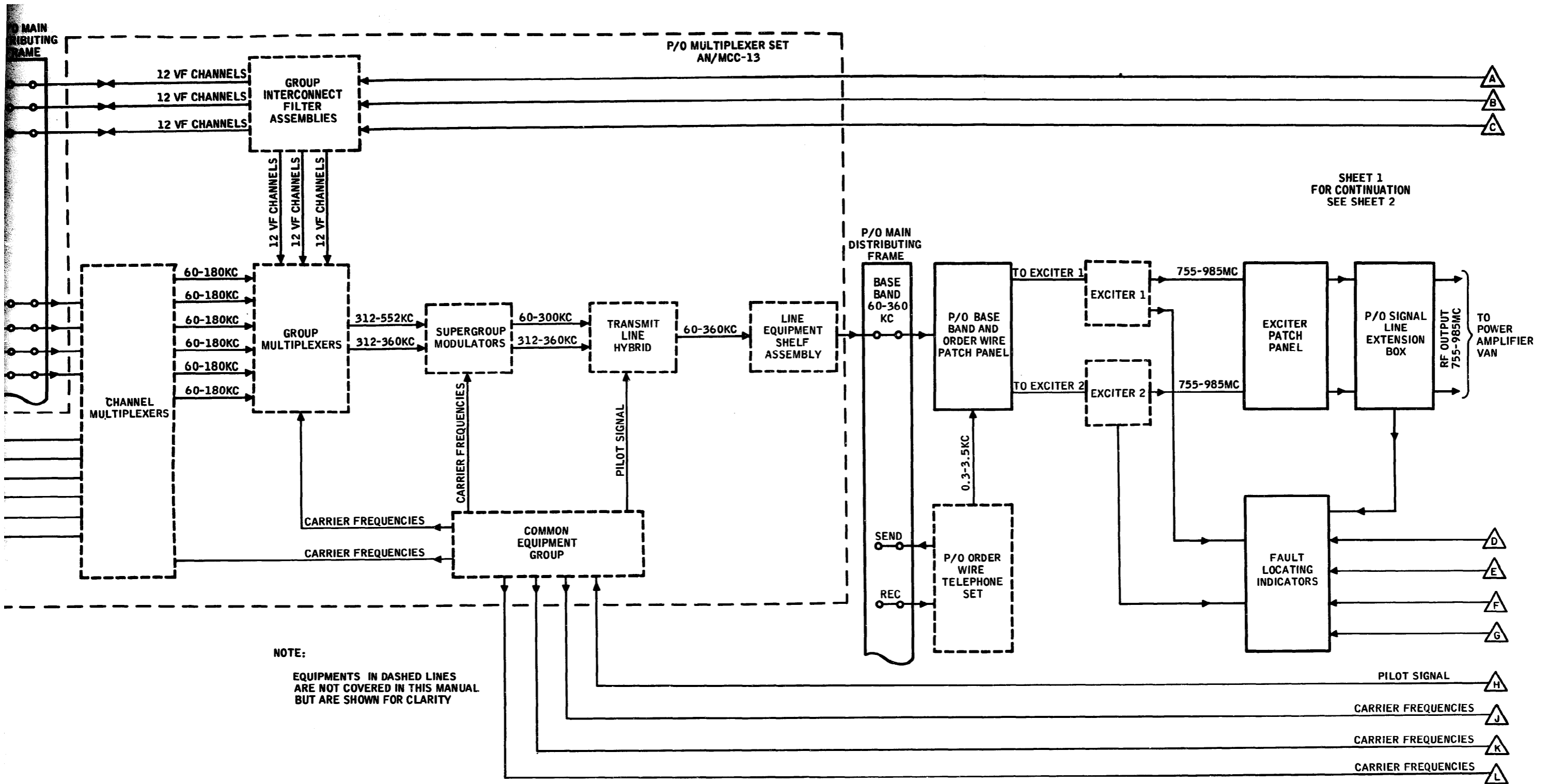


Figure 6-9(1). Operations Van Functional Block Diagram

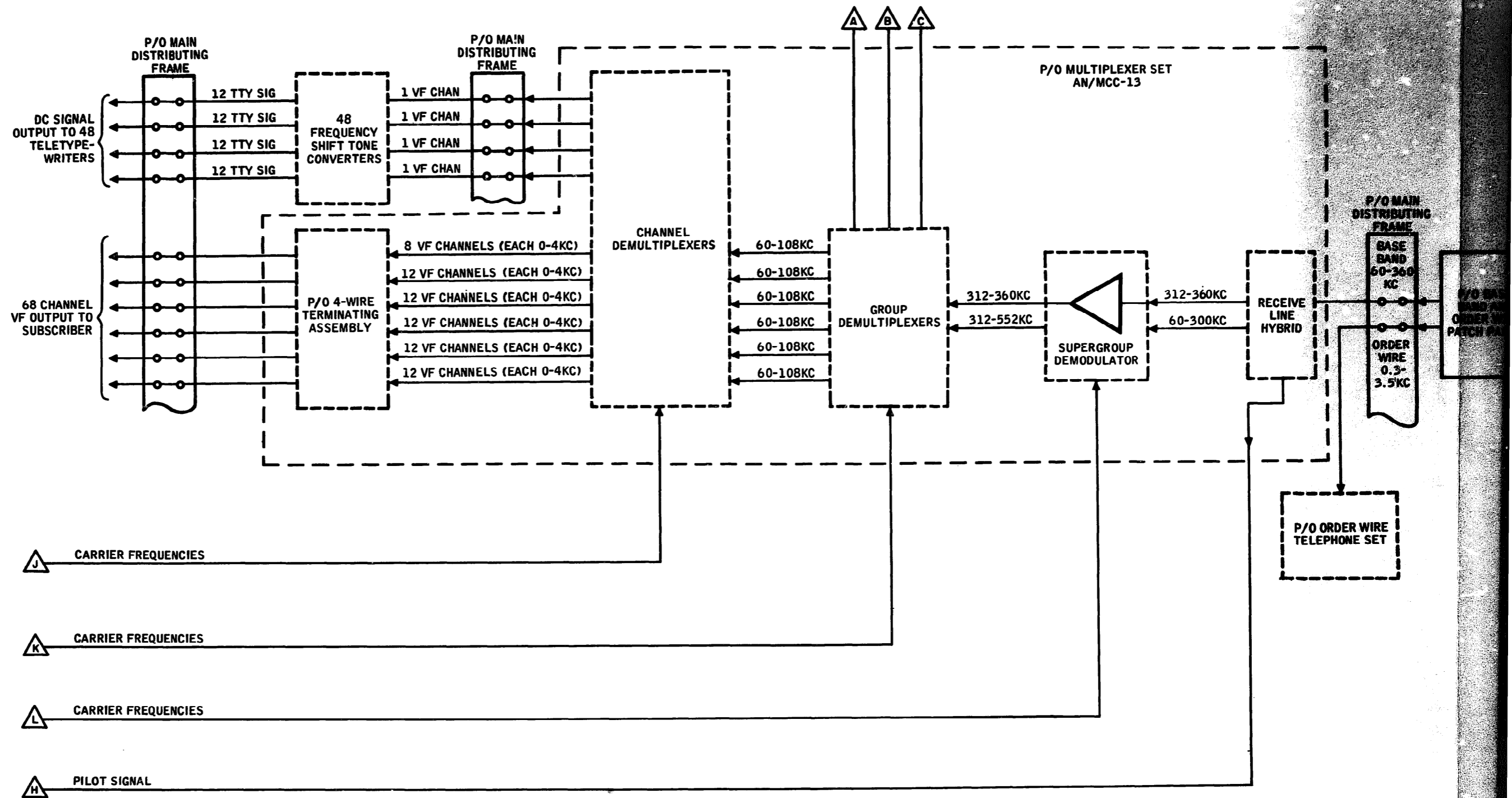


Figure 6-9(2). Operations Van Functional Block Diagram (Sheet 2 of 2).

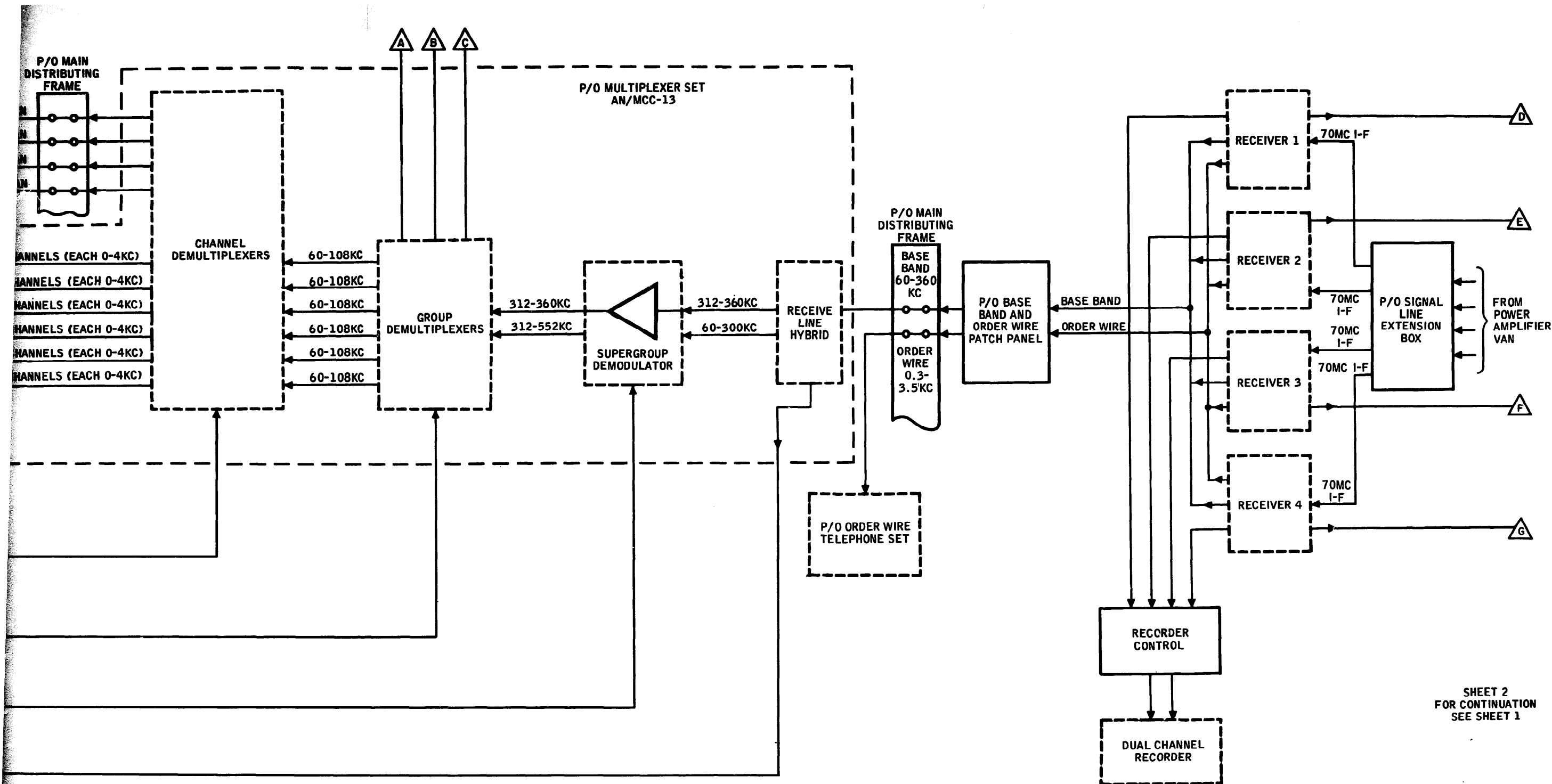
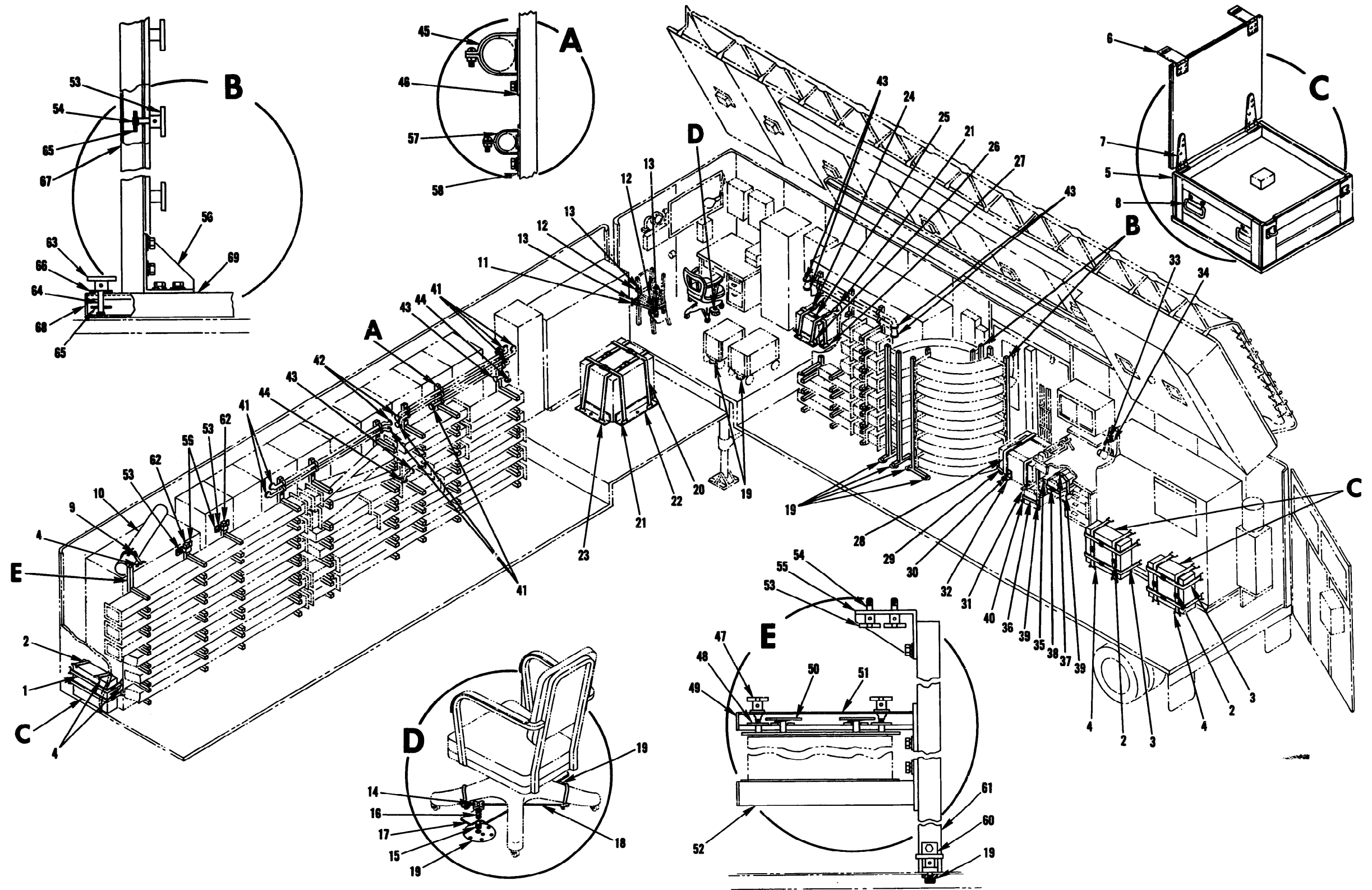


Figure 6-9(2). Operations Van Functional Block Diagram (Sheet 2 of 2).

SHEET 2
FOR CONTINUATION
SEE SHEET 1



L 42/8623-1/1

Figure 6-25(1). Securing and Storage Facilities (Sheet 1 of 2).

By Order of the Secretary of the Army:

W. C. WESTMORELAND,
General, United States Army,
Chief of Staff.

Official:

VERNE L. BOWERS,
Major General, United States Army,
The Adjutant General.

Distribution:

Active Army:

CNGB (1)	USATECOM (2)
USASA (2)	USAESC (25)
USAMB (10)	USA Cp Carroll Depot (3)
ACSC-E (2)	USASTRATCOM-Sig-Gp, Japan (3)
USACDCEC (5)	USASTRATCOM-Comm Op Bn, Korea (2)
USACDCCEA (1)	USA Depot Cam Ranh Bay (3)
USACDCCEA	USA Depot, Long Binh (3)
Ft Huachuca (1)	USA Depot, Qui Nhon (3)
OS Maj Comd (2)	Units org under fol TOE:
USASTRATCOM (5)	(2 cys each unit)
USASTRATCOM (PAC) (10)	11-15
USASTRATCOM-SIG-GP-T (5)	11-45
USASTRATCOM-CONUS (5)	11-97
LOGCOMDS (5)	11-98
Eighth USA (10)	11-158
USARV (10)	11-302
USASUPCOM-CRB (5)	11-303
USASUPCOM-QN (5)	11-347
USASUPCOM-SGN (5)	11-357
USARYIS (5)	11-367
ICC (3)	11-368
1st Sig Bde (10)	11-377
Sig FLDMS (PAC) (1)	11-500(AA-AC)
SAAD (10)	29-118
TOAD (10)	29-134
LEAD (7)	29-136
USACSA (2)	29-137

NG: None.

USAR: None.

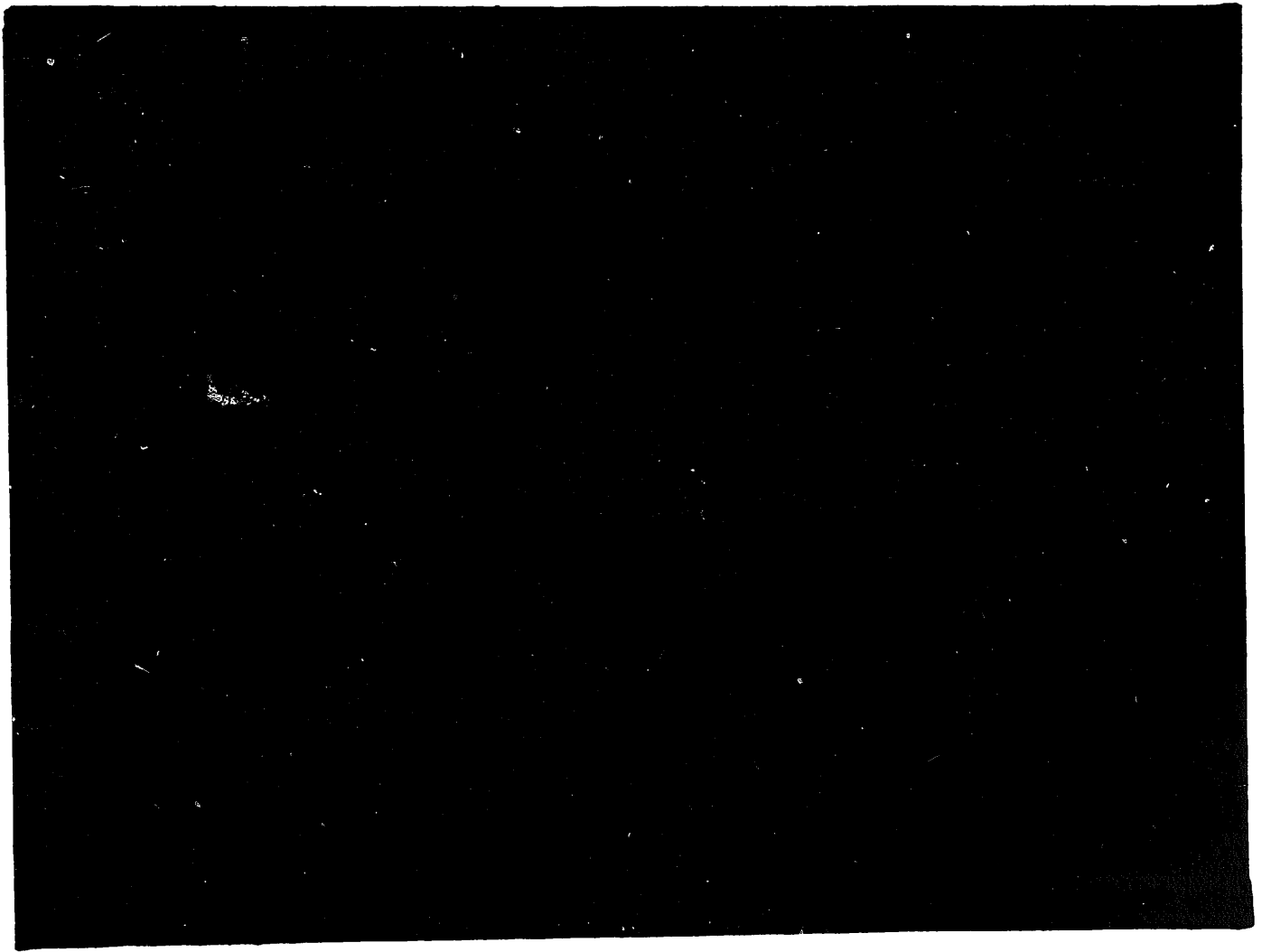
For explanation of abbreviations used, see AR 310-50

END

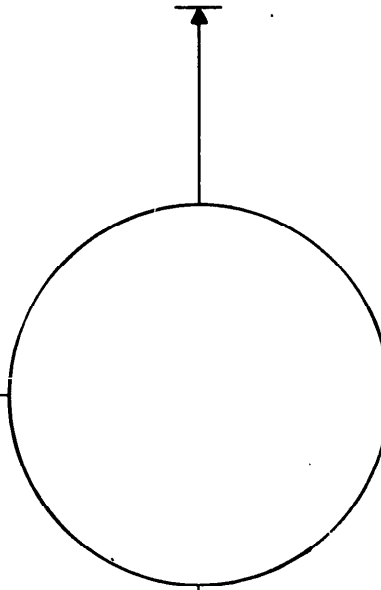
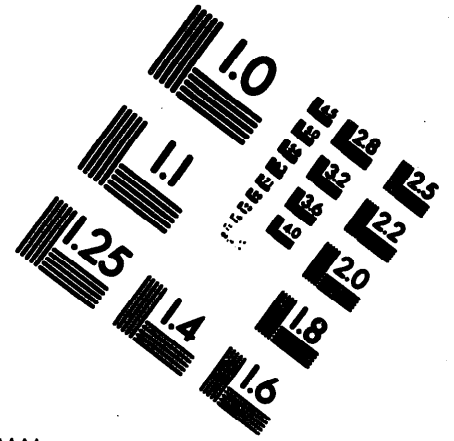
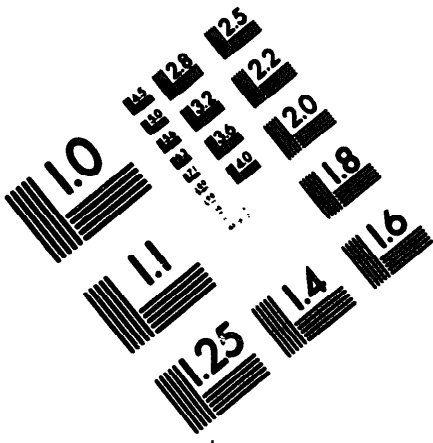
11-26-82

DATE





DEPARTMENT OF THE ARMY
MICROFORM
TEST TARGET



1.0 mm (e= .81 mm)

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abcdefghijklmnopqrstuvwxyz \$%& /%# 1/2 1/4 3/4 —=+ x&@*

1.5 mm (e= 1.09 mm)

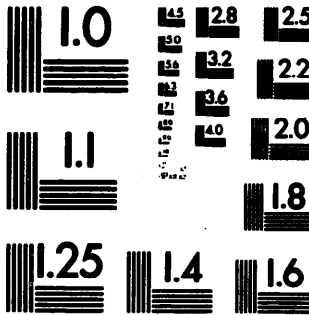
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abcdefghijklmnopqrstuvwxyz \$%& /%# 1/2 1/4 3/4 —=+ x&@*

2.0 mm (e= 1.37 mm)

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abcdefghijklmnopqrstuvwxyz
1234567890 \$%& /%# 1/2 1/4 3/4 —=+ x&@*

2.5 mm (e= 1.77 mm)

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abcdefghijklmnopqrstuvwxyz
1234567890 \$%& /%# 1/2 1/4 3/4 —=+ x&@*



1.0 mm (e= .81 mm)

ABCDEFGHIJKLMN OPQRSTUVWXYZ 1234567890
abcdefghijklmnopqrstuvwxyz \$%& /%# 1/2 1/4 3/4 —=+ x&@*

1.5 mm (e= 1.09 mm)

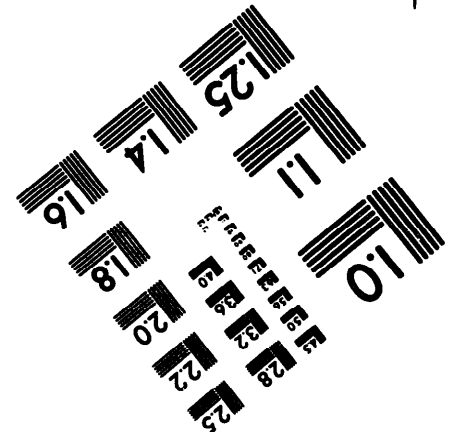
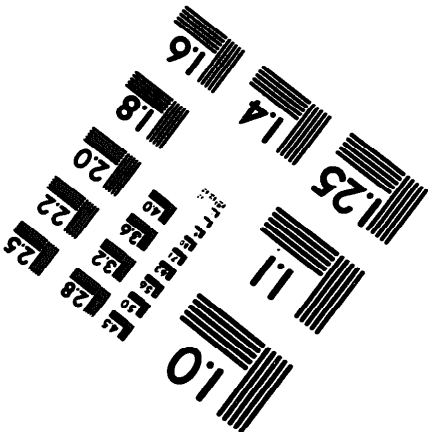
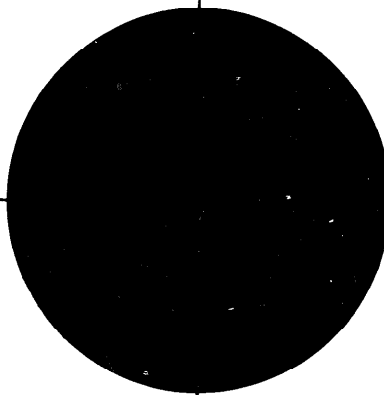
ABCDEFGHIJKLMN OPQRSTUVWXYZ 1234567890
abcdefghijklmnopqrstuvwxyz \$%& /%# 1/2 1/4 3/4 —=+ x&@*

2.0 mm (e= 1.37 mm)

ABCDEFGHIJKLMN OPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
1234567890 \$%& /%# 1/2 1/4 3/4 —=+ x&@*

2.5 mm (e= 1.77 mm)

ABCDEFGHIJKLMN OPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
1234567890 \$%& /%# 1/2 1/4 3/4 —=+ x&@*



250 MM