ARMY TM 11-5895-389-12
NAVY NAVELEX 0967-LP-377-7010
AIR FORCE TO 31R5-2TSC54-11

OPERATOR'S AND ORGANIZATIONAL MAINTENANCE MANUAL

SATELLITE COMMUNICATION TEMINAL AN/TSC-54
(NSN 5895-00-937-4993)

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

DEPARTMENTS OF THE NAVY, AND AIR FORCE

JUNE 1977

WARNING

Operator and maintenance personnel should be familiar with the safety requirements before attempting installation or operation of the equipment covered in this manual. Failure to follow requirements and observe safety precautions could result in injury or DEATH.

WARNING

HIGH VOLTAGE is used in this equipment. DEATH ON CONTACT may result if safety precautions are not observed. DON'T TAKE CHANCES - DANGEROUS VOLTAGES EXIST IN THE FOLLOWING UNITS:
Electronic Equipment Shelter S-378/TSC-54 ..... 208 volts ac.
Trailer Mounted Diesel Engine Generator set ..... 208 volts ac.
Antenna-receiver-transmitter Group
OA-8244/TSC-54 ..... 13,000 volts dc

WARNING

Under no circumstances should any personnel reach within or enter an equipment enclosure for the purpose of servicing or adjusting the equipment without the immediate presence or assistance of another person capable of rendering aid.

WARNING

DANGEROUS EXHAUST GASES ARE PRODUCED - Exhaust gases produced by diesel engine generator sets are poisonous. Inhalation may result in illness or DEATH. Provide adequate ventilation if the generator sets are operated in enclosure or covered areas. Exhaust gas pickup by the air conditioner should be carefully avoided.

WARNING

When filling the diesel generator sets fuel tanks, do not smoke or use an open flame in the immediate vicinity. Always provide metal-to-metal contact between the container and the fuel tank. This will prevent a spark from being generated as fuel flows over the metallic surfaces. Do not fill the generator fuel tank while the diesel engine is in operation. Failure to observe these warnings may result in DEATH to personnel.

WARNING

The shelter must be ventilated at all times when occupied by personnel. Open the exhaust vent and air intake doors, and operate the blower fans for ventilation.

WARNING

Operator and maintenance personnel should be familiar with the requirements of TB SIG 291 before attempting installation of the antenna.

WARNING

For the successful execution of methods of equipment destruction involving the use of demolition materials, all personnel should become thoroughly familiar with the pertinent provisions of FM 5-25.

WARNING

Do not operate the generator set without a suitable ground connection. Electrical defects in the unit, loadlines, or load equipment can cause DEATH by electrocution when contact is made with an ungrounded system.

WARNING

Under no circumstances should the cesium beam frequency standard C-field be adjusted, the phase lock opened, or the time changed without a directive from the U.S. Naval Observatory (NAVOBSY).

TM 11-5895-389-12
NAVELEX 0967-LP-377-7013
TO 31R5-2TSC54-11
C3

Change
No. 3

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC, *27 January 1983*

Operator and Organizational Maintenance Manual
SATELLITE COMMUNICATION TERMINAL AN/TSC-54
(NSN 5895-00-937-4993)

This change contains information related to the use of safety belt and safety strap that must be utilized whenever the elevation handcrank is utilized or performing work on elevation drive motor. TM 11-5895-389-12/NAVELEX 0967-LP-377-7010/TO 31R5-2TSC54-11, 22 June 1977, is changed as follows:

1. New or changed material is indicated by a vertical bar in the margin of the page.
2. Remove and insert pages as indicated below:

Remove	*Insert*
None	A

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

By Order of the Secretary of the Army:

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

Official:

ROBERT M. JOYCE
Major General, United States Army
The Adjutant General

DISTRIBUTION:

To be distributed in accordance with DA Form 12-51, Operator Maintenance requirements for AN/TSC-54.

WARNING

Always use safety strap around mast attached to safety belt when using handcrank to control antenna elevation or when working on the elevation drive.

U.S GOVERNMENT PRINTING OFFICE 1982-6640-15/1113

Change 3 A

TM 11-5895-389-12
NAVELEX 0967-LP-377-7012
TO 31RS-2TSC54-11
C2

Change No. 2

DEPARTMENTS OF THE ARMY,
THE NAVY, AND THE AIR FORCE
WASHINGTON, DC, *14 July 1980*

Operator and Organizational Maintenance Manual
SATELLITE COMMUNICATION TERMINAL AN/TSC-54
(NSN 5895-00-937-4993)

TM 11-5895-389-12/NAVELEX 0967-T,P-377-70101TO 31R5-2TSC54-11, 22 June 1977, is changed as follows:

1. A vertical bar appears opposite changed material.
2. Remove old pages and insert new pages as indicated below:

Remove	*Insert*
iii and iv	iii and iv
1-4.1 through 1-10	1-4.1 through 1-10
1-19 and 1-20	1-19 and 1-20
1-25and 1-2	1-25 and 1-26
2-17 and 2-18	2-17and-18
2-19 and 2-20	2-19 and 2-20
3-1 through3-2.1	3-1 through 3-2.11(3-2 2 blank)
3-33 and 3-34	3-33 and 3-34
3-43 and 3-44	3-43 through 3-44.2
3-65 and 3-66	3-65 and 3-66
3-77 and 3-78	3-77 and 3-78
None	C-72.1
C-76 11(C-7f 2 blank)	C-76.1 and.C-76 2
C-100 andC-1002	C-100.1 andC-100 2
C-109andC-10	C-109andC-110

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

By Order of the Secretaries of the Army, the Navy, and the Air Force:

E. C. MEYER
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Chief of Staff

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Major General, United States Army
The Adjutant General

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Chief of Staff

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BRYCE POE II
General, USAF, Commander, Air Force Logistics Command

Distribution
To be distributed in accordance with DA Form 12-51, Operator maintenance requirements for ANITSC-54.

TECHNICAL MANUAL
No. 11-5895389-12
NAVELEX 0967-LP-377-7010
TECHNICAL ORDER
No. 31R5-2TSC54-11

HEADQUARTERS
DEPARTMENTS OF THE ARMY,
THE NAVY, AND THE AIR FORCE
WASHINGTON, DC *22 June 1977*

OPERATOR'S AND ORGANIZATIONAL MAINTENANCE MANUAL
SATELLITE COMMUNICATION TERMINAL AN/TSC-54
(NSN 5895-00-937-4993)

REPORTING OF ERRORS

You can improve this manual by recommending improvements using DA Form 2028-2 located in the back of the manual. Simply tear out the self addressed form, fill it out as shown on the sample, fold it where shown, and drop it in the mail

If there are no blank DA Forms 2028-2 in the back of your manual, use the standard DA Form 2028 (Recommended Changes to Publications and Blank Forms) and forward to the Commander, US Army Communications and Electronics Materiel Readiness Command, ATTN: DRSEL-ME-MQ, Fort Monmouth, NJ 07703

For Air Force, submit AFTO Form 22 (Technical Order System Publication Improvement Report and Reply) in accordance with paragraph 6-5, Section VI, T.O. 00-5-1. Forward direct to prime ALC/MST.

For Navy, mail comments to the Commander, Naval Electronic Systems Command, Training and Publications Management Office, ELEX 04F3, P.O. Box 80337, San Die go, California 92138.

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

***This manual supersedes TM 11-5895-389-12/NAVSHIPS 0967-377-7010 T0 31 RS2TSC54-11,13 May 1970, Including all changes.**

LIST OF ILLUSTRATIONS

LIST OF TABLES

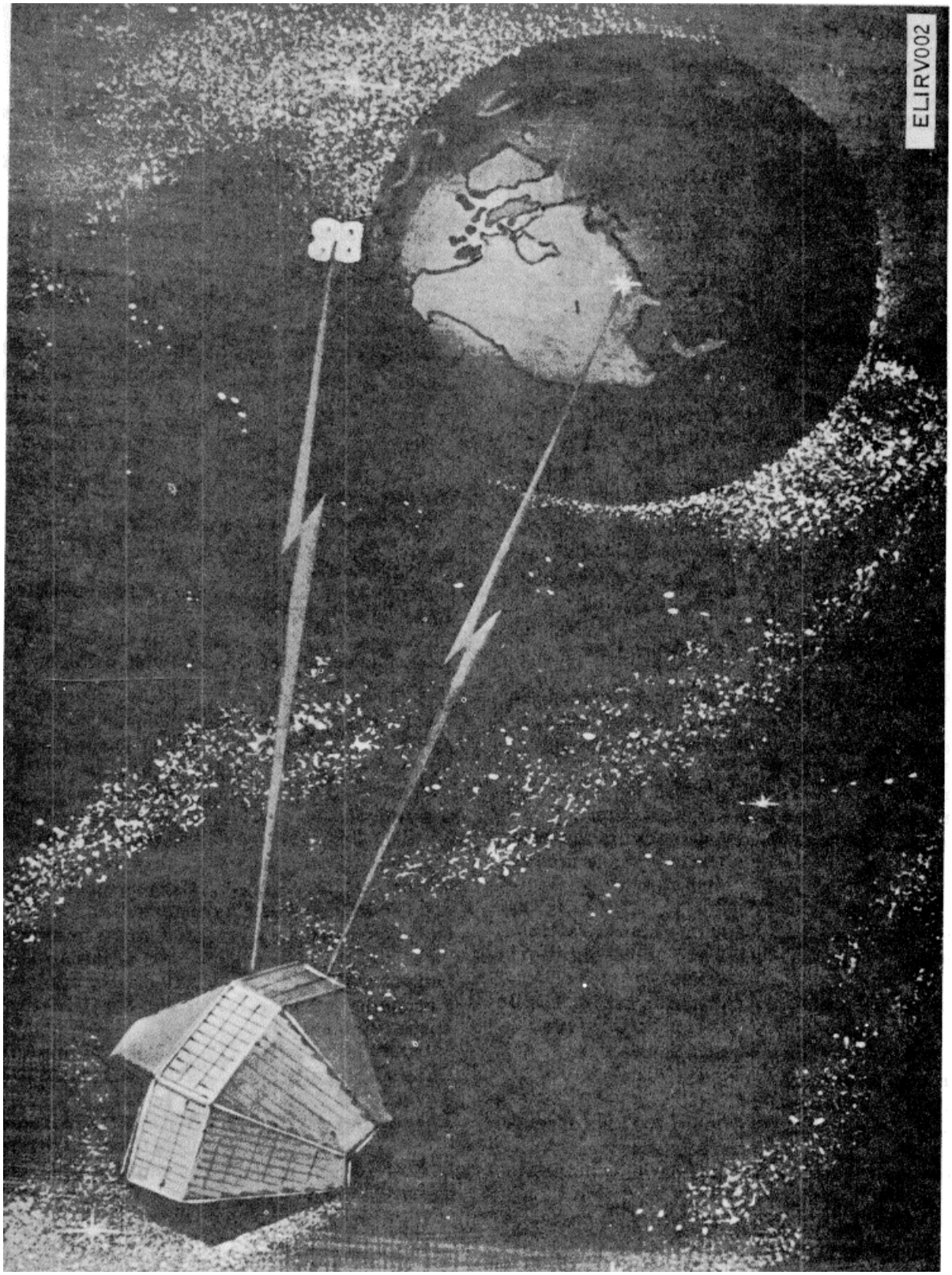


Figure 1-2. Microwave radio link between satellite and AN/TSC-54 terminals.

1-5. Tabulated Data

The technical characteristics of Satellite Communication Terminal AN/TSC-54 are given below.

a. AN/TSC-54 Technical Characteristics.

Primary power requirements	45 kilowatts (kw), *3* phase, 400 Hertz (Hz), 120 volt alternating current (vac), line-to- neutral each phase.

b. Antenna

Radiated power	5 kW.
Efficiency	75 percent.
Gain:	
Transmit	52 decibels (dB).
Receive	51.2 dB.
Beamwidth	0.5 degree.
Type	Aluminum reflector cloverleaf design, using four modified parabolic reflectors, each vertex fed using DIELGUIDE[a]
Reflector size	324 square feet.

c. Operation.

Receive	Digital scan autotrack or pencil point beam.
Transmit	A pencil point beam.

d. Transmitter (HPA).

Power input	-13 dBm
Power output	8 kw maximum
Type of modulation	Frequency modulation(fm) or phase modulation (pm).
Final amplifier bandwidth	500 megahertz (MHz).
Frequency range	7.9 to 8.4 gigahertz (GHz).
Frequency selection	Continuous in 1 kilohertz (kHz) steps.

e. Communication Demodulators.

Automatic frequency control and acquisition range	Within 150kHz of center frequency.
Acquisition modes	Automatic or manual.

f Beacon Demodulator.

Automatic frequency control and acquisition range	Within 150 kHz of center frequency
Acquisition modes	Automatic or manual.

g Communications Signals.

External user wideband	300 Hz to 23 kHz.
External user to orderwire voice bandwidth	300 Hz to 3,400 Hz.
External user teletypewriter	+6 volt polar, +60 volt polar or +130 volt neu- tral at various line currents and with either sense
Orderwire teletypewriter	Teletypewriter Set AN/UGC77.
User telephone lines	26 pairs available.
User teletypewriter lines	8 full duplex.
Loop power	±6 volt polar.

h .Transport Capability.

Air	C-130 E-type cargo aircraft or H-37 type helicopter.
Ground	2-1/2 ton cargo truck or other suitable military vehicle.
Water	Cargo vessel.

i. LPA Technical Characteristics.

Output power	800 watts minimum (30 dB adjustable).
Output C/KT	110 dB-Hz minimum.
Frequency range	7.9 to 8.4 GHz (tunable).
Instantaneous bandwidth (2 dB)	40 MHz minimum.
Gain stability	± 0.5 dB maximum/24 hours.
Phase linearity	Within 0.175 radians/30 MHz and within 0.262 radians/40 MHz.

[a] DIELGUIDE is a manufacturer's trade name.

Harmonic output ..... 60 dB down (from fundamental).
Spurious outputs..... 80 dB down (from fundamental).
Hum modulation ..... 60 dB less than rated output.
Residual AM ..... 65 db below output power level.
Spectral purity..... 21 dB below carrier when measured from 10 Hz to 300 kHz.
20 dB below carrier when measured from 300 kHz to 20 MHz.
Spurious content..... Measured in any 3 kHz bandwidth. -54 dB, 12 kHz to 20 kHz. - 60 dB, 20 kHz to 60 kHz. -68 dB, 60 kHz to 300 kHz.
Frequency ..... 400 3% Hz
Power ..... 6 Kw (approximate)
Load VSWR ..... 1.5:1 continuous.
Prime power input:
Voltage ..... 1201208 +5% volts ac, 3-phase, 4-wire

1-6. Items Comprising an Operable Satellite Communication Terminal AN/TSC-54

Table 1-1 lists the items of the ANITSC-54 (power) which comprise an operable equipment. The listed weights and measurements are applicable when the terminal is ready for transit.

Table 1-1. Items Comprising an Operable Equipment

NSN	Item	Qty	Height (in.)	Depth (in.)	Width (in.)	Weight (lb.)
5895-00-937-4993	Satellite Communication Terminal ANITSC-54 Consisting of:					
5895-00-937-5161	Communications Terminal Group OW- 11TSC-54	1	92	210	96	7550
	Consisting of: AC Filter Assembly SM-D-571201 Including:					
5915-00-891-2659	Filter RF739		3			
	Base Console Assembly	1				
	Distribution Box Assembly SM-D-570967	1				
	External DC Power Distribution Box Assembly SM-C-571291	1				
	Frequency Conversion Subsystem SM-F-768199 Including:	1				
5895-00-127-4825	Electrical Frequency Synthesizer 0- 1658/MSC-46	6				

Table 1-1. Items Comprising an Operable Equipment-Continued

NSN	Item	Qty	Height (in.)	Depth (in.)	Width (in.)	Weight (lb.)
5895-00-100-4314	Electronic Frequency Converter CV-3084/MSC-46	3				
5895-00-100-4311	Electronic Frequency Converter CV-30851MSC-46N	3				
5820-00-155-8574	Radio Frequency Amplifier AM-6631fMSC-46	1				
	Radio Frequency Cable Assembly SM-C-705041-2	1				
	Radio Frequency Wiring Harness SM-D-705035	1				
	Test Translator Assembly SM-F-753378	1				
	Primary Power Distribution Panel Assembly SM-D-570735	1				
	Primary Power Distribution Panel Assembly SM-D-778541	1				
	Primary Power Filter Assembly SM-D-572681	1				
	Primary Power Monitor Panel Assembly SM-D-571085	1				
5820-00-937-1689	Radio Communication Sub-system an/UCR-61	1				
5895-00-937-4985	Satellite Communications Console OJ-17/TSC-54 Including:	1				
5895-00-926-7373	Antenna Control C-7243/ TSC-54	1				
	Cable Assembly SM-C-778669-001	1				
	Cable Assembly SM-C- 778669- 002	1				
	Cable Assembly SM-C-778669-003	1				
	Cable Assembly SM-C-778669-004	1				
	Cable Assembly SM-D-570193	1				
	Cable Assembly SM-D-570195	1				
	Cable Assembly (Low SM-D-572299	1				
	Cable Assembly (Low Noise) W970-1-12	1				
6625-00-575-6749	Cesium Beam Frequency Standard HP 5061A	1				
6625-00-068-8476	Cesium Beam Power Supply HP 5085A	1				
	Cesium Environmental Control Enclosure SM-D-778524	1				
	Frequency Distribution Assembly SM-D-778523	1				
5820-00-155-8572	Group Delay Equalizer CN- 14251MXC-46	2				
	Link Terminal Timing Central TD-851/URC-61	1				
6110-00-937-6438	Power Distribution Panel Assembly SB-2892/TSC-54	1				

Table 1-1. Items Comprising an Operable Equipment-Continued

NSN	Item	Qty	Height (in.)	Depth (in.)	Width (in.)	Weight (lb.)
5820-00-937-11687	Remote Indicator Panel ID-1444/URC-61 RF Control and Power Monitor Assembly SM-D-778538	1				
5935-00-009-1188	RF Distribution Amplifier Assembly TIP 5087A	1				
5895-00-1018-6913	Static Frequency Converter CV-3192/TSC-54	1				
	Test Translator Control Assembly SM-D- 778525	1				
	Time Transfer Unit CM-427 (XB)- 1)/TRC	1				
5895-00-937-5162	Zero Set Control C-72421 TSC-54	1				
5895-00-937-4989	Satellite Communications Console OJ- 18ITSC-)54 Including	1				
5895-00-937-4990	Audio Frequency Control Monitor-Amplifier C-72451 TSC-54	1				
5895-00-937-4991	Beacon Demodulator MD-7051TSC-54	1				
5895-00-937-4992	Communications Demodulator MD-706/TSC-54	2				
5895 -00-926-7374	Communication Patching Switchboard SB-2895/TSC-54	1				
5895-00-937-4988	Communication System Control C-7244/TSC-54	1				
5895-00-937-4994	Converter-Keyer-Echo Suppressor CV-2202/TSC-54	1				
	Fan Control Assembly SM-D-573057	1				
	Communication Patching panel SB 2893/TSC-54	1				
	Line Isolation Assembly SM-D-778530	1				
5895-00-937-4986	Power Supply PP-46501 TSC-54	1				
5890-00-937-4987	Power Supply PP-4651 TSC-54	1				
5820-00-926-7376	Radio Transmitter Modulator MD-707/TSC-54	1				
5915-00-116-3841	RFI Filter JN17-361	4				
5805-00-937-5073	Telephone Set (Modified) TA-717/TSC-54	4				
5805-00-937-5072	Telephone Set (Modified) TA-717/TSC-54	1				
	Teletypewriter Assembly SM-D-778527 Including:	1				
5815-00-401-1779	Teletypewriter Set AN/UGC-77	1				
5815-00-851-5252	Teletypewriter Patching Panel SB-2894/TSC-54	1				
5895 00-937-537.3	Antenna-Receiver-Transmitter Group OA-8244/TSC-54 Consisting of.	1	112	274	96	7360
	Cable Assembly SM-D-571915	1				
	Cable Assembly SM-D-571916	1				
	Cable Assembly SM-D-571917	1				

Table 1-1. Items Comprising an Operable Equipment-Continued

NSN	Item	Qty	Height (in.)	Depth (in.)	Width (in.)	Weight (lb.)
	Cable Assembly SM-D-571918	1				
	Cable Assembly SM-D-571924	1				
5995-00-086-8586	Cable Assembly W970-1-50	1				
5995-00-935-0244	Cable Assembly CX-10464/TSC-54	1				
5995-00-935-0243	Cable Assembly CX-10465/TSC-54	1				
5995-00-935-0252	Cable Assembly CX-10466/TSC-54	1				
	Elevation Cable Wrap Assembly SM-D-573146 Including	1				
5915-00-867-9332	RFI Filter 1212-502	5				
5895-00-926-7375	Mast Assembly AB-1006/TSC-54 Including	1				
6105-00-351-7961	Control Motor Assembly SM-A-571434	1				
5895-00-299-0259	DC Brake Assembly (Modified) SM-D-573503	1				
	Elevation Data Box Resolver Assembly SM-D-571196	1				
5895-00-256-6053	Elevation Data Box Synchro Assembly SM-D-571198	1				
5895-00-242-4246	Elevation Drive Gearbox Assembly SM-E-571100	1				
	Elevation Head Assembly SM-D-572393	1				
	Elevation Shaft Assembly SM-D-571928	1				
5895-00-733-3056	Gear Head Assembly SM-E-572632	1				
5895-00-242-4153	Launcher Amplifier Assembly SM-D-569745 Mast Assembly SM-E-570-672 Mode Filter Assembly SM-D-569740 Power Amplifier Load Box Assembly SM-D-778480	1				
5895-00-299-0133	Power Divider Assembly SM-D-569744	1				
5985-00-168-9438	Waveguide Assembly SM-D-569743					
5895-00-299-0134	Servo Amplifier Unit I SM-E-572362	1				
5895-00-256-5874	Servo Amplifier Unit II SM-D-570343	1				
5895-00-937-5371	Pedestal Antenna AB-978/TSC-54 Including	1				
	Azimuth Drive Assembly SM-E-572395	1				
	Cable Assembly SM-D-573854	1				
	Distribution Box Assembly SM-D-573130	1				

Table 1-1. Items Comprising an Operable Equipment--Continued

NSN	Item	Qty	Height (in.)	Depth (in.)	Width (in.)	Weight (lb.)
	High Voltage Cage Assembly SM-D-574067	1				
	Intercomm and Air Monitor Panel Assembly SM-D-778666	1				
	Power Amplifier Load Box Assembly SM-D-778480	1				
6130-00-191-1961	Power Supply Assembly NP28-2-R1	1				
6130-00-168-8584	Power Supply Assembly NP28PLR1	1				
6130-00-191-1862	Power Supply Assembly NP285R1	1				
6130-00-299-0108	Power Supply Assembly SM-D-572828	2				
	Relay Box Assembly SM-D-572408	1				
5895-00-299-0134	Servo Amplifier Unit I SM-E-752362	1				
5895-00-256-5874	Servo Amplifier Unit II SM-E-570343	1				
	Transmitter and Exciter Assembly SM-E-573000	1				
	Transmitter Control Panel Assembly SM-D-572614	1				
	Transmitter Liquid Cooler Plumbing Assembly SM-D-573896	1				
	Pedestal Frame Assembly SM-E-571989	1				
6130-00-191-1799	Power Supply Assembly SM-E-571389	1				
	Including:					
	Modified Power Supper Assembly SM-D-574286-1	1				
	Power Supply A5700	1				
	Purity Loop Flow Filter Assembly LBADD33102	1				
5895-00-937-5374	Reflector Assembly AS-1986/TSC-54	1				
	Including:					
5995-00-181-9927	Cable Assembly SM-C573026	1				
5995-00-181-9972	Cable Assembly SM-C-573501	1				
	Interlock Switch Assembly SM-D-778796	1				
	Interlock Switch Assembly SM-D-778797	1				
6625-00-083-1445	Power Divider Assembly D2-8TN	1				
	RF Equipment Assembly SM-E-572569	1				

Table 1-1. Items Comprising an Operable Equipment - Continued

NSN	Item	Qty	Height (in.)	Depth (in.)	Width (in.)	Weight (lb.)
	Including:					
	Parametric Amplifier AM-6676/TSC54	2				
59'800-405-0473	Waveguide Assembly SM-D-570235	1				
5985-00-405-4610	Waveguide Assembly SM-D-570235	2				
5985-00168-9466	Waveguide Assembly SM-D-570237	2				
598500-405-4609	Waveguide Assembly SM-D-570238	2				
598500-168-9457	Waveguide Assembly SM-D-570247	1				
5985-00-168-9474	Waveguide Assembly SM0D-570280	1				
598500-1689467	Waveguide Assembly SM-D-570281	1				
598500-168-9469	Waveguide Assembly SM-D-570282	1				
5895001689468	Waveguide Assembly SM-D-570283	1				
5985-00-405-0469	Waveguide Tee Assembly 40172	2				
5985-00-595-5273	Waveguide Assembly SM-A-7781891					
598501-030-5338	RF Amplifier Group OG-163/G consists of:					
	Cable Assembly SM-C883301	1	720			
	RF Amplifier AM-929/G	1	32	54	19	
	Control Indicator C-10252/G	1	7	3	19	

1-7. Reference Designators and Common Names

a. Reference designators have been assigned to aid in the identification and location of components of the AN/TSC-54. For example, as shown in figure 1-3, Zero Set Control *C-7242/TSC-54* is designated lA2Al; thus, the zero set control (Al) is located in the Satellite Communications Console OJ-17/TSC- 54 (1A2) which is part of Communications Terminal Group OW-ll/TSC-54 (unit No. 1).

b. Common names have been established for various components of the AN/TSC-54 to provide consistency and simplicity throughout this series of maintenance manuals. A list of these compo- nents is given below. The applicable nomenclature, common name and reference designator is indicated for each component. The list also includes components which have been listed for the purpose of only identifying a common name or a reference

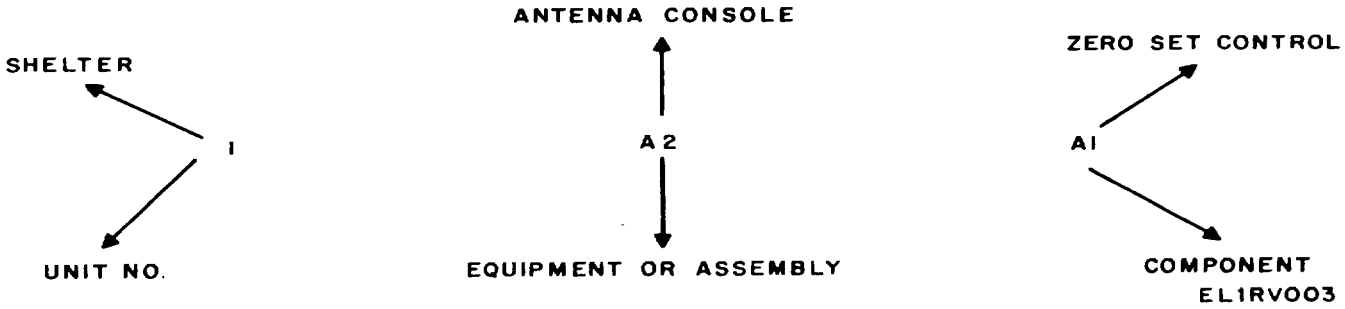


Figure 1-3. Typical assignment of reference designators.

Nomenclature	Common name	Reference designator
Satellite Communication Terminal AN/TSC-54	ANITSC-54 (terminal)	
Communications Terminal Group OW- 1 1TSC-54	Operations control van (OCV)	1
Air Conditioner Model 620-2	Air conditioner	111A1
Satellite Communications Console OJ- 17/TSC-54	Antenna console	1A2
Zero Set Control C- 7242/TSC- 54	Zero set control	1A2A1
Power Distribution Panel Assembly SB-2892/TSC-54	Power distribution panel	1A2A4
Antenna Control C-7243/TSC- 54	Antenna control panel	1A2A5
Panel, Indicator ID- 1444/URC-61	Indicator panel	1A2A9
Link Terminal Timing Central TD0851/TRC-61	Link terminal timing central	1A2A10
Fan Assembly SM-D- 573654	Fan Assembly	1A2A21
Frequency Distribution Assembly SM-D-778523	Frequency distribution unit	1A2A22
Cesium Beam Frequency Standard HP 5061A	Cesium beam frequency standard	1A2A24
Cesium Beam Power Supply HP 5085A	Cesium beam power supply	1A2A25
Test Translator Control Assembly SM-D-778525	Test translator control	1A2A26
RF Control and Power Monitor Assembly SM-D-778538	Power monitor and control	1A2A27
Time Transfer Unit CM- 427(XB- 1)IURC	Time transfer unit	1A2A29
Group Delay Equalizer C N- 145/MSC- 46(V)	Group delay equalizer	1A2A30 and1A2A31
RF Distribution Amplifier Assembly HP 5087A	Distribution amplifier	1A2A33
Cesium Environmental Control Enclosure SM-D-778524	Cesium environmental enclosure	1A2A34
Static Frequency Converter CV-3192/TSC-54	Static frequency converter	1A2A35
Control-Indicator C- 10252/G SM-D-883248	Remote control panel	1A2A36
Cable Assembly SM-C-778669001		1A2W1
Cable Assembly SM-C-778669002		1A2W2
Cable Assembly SM-C-778669003		1A2W3
Cable Assembly SM-C-778669004		1A2W4
Cable Assembly SM-C-778669005		1A2W5
Cable Assembly SM- C-778669005		1A2W6
Satellite Communications Console OJ-18/TSC-54	Communication console	1A3
Communications Demodulator MD-706/TSC-54	Comm demod	1A3A3 and 1A3A5
Beacon Demodulator MD-7051TSC-54	Beacon dmod	1A3A4
Power Supply PP-4650/TSC-54	Comm demods power supply	1A3A9
Power Supply PP-4651/TSC-54	Beacon demod/baseband power supply	1A3A10
Communication Patching Switchboard SB-2895/TSC-54	Baseband patch panel	1A3A12
Communication System Control C-72441TSC-54	Baseband control panel	1A3A13
Radio Transmitter Modulator MD-707/TSC-54	Modulator	1A3A14
Audio Frequency Control Monitor-Amplifier C-7245/TSC-54	Baseband amplifier	1A3A15
Converter-Keyer-Echo Suppressor CV-20202/TSC-54	Converter-keyer-echo suppressor	1A3A16
Storage Equipment Cabinet Drawer CH-563/TSC-54	Storage drawer	1A3A18
Fan Control Assembly SM-D-573057	Fan control assembly	1A3A19
Fan Assembly SM-D-573654	Fan Assembly	1A3A20
Communication Patching Panel SB-2893/TSC-54	If. patch panel	1A3A22
Teletypwriter Assembly SM-D-778527	Teletypewriter assembly	1A3A23
Out-of-Band Noise Monitor Panel	OBNmonitor panel	1A3A24
Teletypewriter Set AN/UGC-77	Teletypewriter	
Teletypewriter Patching Panel SB-28941TSC-54	Tty patch panel	1A3A25
Line Isolation Unit CU- 1819/T	LIU panel	1A3A26
RFI Filter JN 17-361		1A3FI,1 through 1A3FL3
Base Console Assembly SM-A-572670		1A4
Radio Communication Subsystem AN/URC-61	URC-61	1A6
AC Filter Assembly SM-D-571201		1A9
Distribution Box Assembly SM-D-570967	External signal distribution box	1A10
Primary Power Distribution Panel Assembly SM- D-570735	Primary power distribution Assembly	1A12
Primary Power Filter Assembly SM-D-572681	Primary power filter	1A13
External DC Power Distribution Box Assembly SM-C-571291	External power distribution box	IA14
Primary Power Distribution Panel Assembly SM-D-778541	Primary power distribution panel	1A15
Primary Power Monitor Panel Assembly SM-D-571085	Primary power monitor panel	1A16
Shelter Heater SM-D- 778532	Shelter heater	1A17
Frequency Conversion Subsystem SM-F-758199	Frequency conversion subsystem	1A19
Telephone Set (Modified) TA-71 717/TSC-54		1HT15
Cable Assembly SM C 883459		1W14
Cable Assembly SM C-883460)		1W15

Nomenclature	Common name	Reference designator
Antenna-Receiver-Transmitter Group OA-8244/TSC-54	Antenna group	2
Platform Assembly SM-E-572392		2A1
Power Supply Assembly SM-E-571389		2A2
Pedestal Antenna AB-978/TSC-54	Antenna pedestal	2A3
Transmitter Liquid Cooler Plumbing Assembly SM-D-573896		2A3A3
Transmitter Control Panel Assembly SM-D-572614	Transmitter control panel	2A3A7
Relay Box Assembly SM-D-572408		2A3A9
Transmitter and Exciter Assembly SM-E-573000		2A3A10
High Voltage Cage Assembly SM-D-574067		2A3A11
Distribution Box Assembly SM-D-573130	Primary power distribution panel	2A3A14
Servo Amplifier Unit I SM-E-572362		2A3A17
Servo Amplifier Unit II SM-D-570343		2A3A18
Azimuth Drive Assembly SM-E-572395		2A3A22
Waveguide Interface Panel SM-D-778581		2A3A23
Intercomm and Air Monitor Panel Assembly SM-D-778666	Intercom/air monitor panel	2A3A24
Power Amplifier Load Box Assembly SM-D-778480		2A3A25
Power Supply Assembly NP28-2-5R1		2A3PS1
Power Supply Assembly NP28PLR1		2A3PS2
Power Supply Assembly NP285R1		2A3PS3
Power Supply Assembly SM-D-572828		2A3PS4 and 2A3PS5 2A3W29
RF Coax Switch SM-A-883145-1		2A3S2
Cable Assembly SM-D-573854		
Mast Assembly AB-1006/TSC-54	Mast	2A4
Servo Amplifier Unit I SM-E-572362		2A4A3
Servo Amplifier Unit II SM-E-570343		2A4A4
Elevation Synchro and Limit Switch Assembly SM-D-571198		2A4A6
Elevation Data Box Resolver Assembly SM-D-571196		2A4A7
Launcher Divider Assembly SM-D-569745		2A4A8
Power Amplifier Load Box Assembly SM-D-778480		2A4A9
DC Brake Assembly (Modified) SM-D-573503		2A4A11
Control Motor Assembly SM-A-571434		2A4B1
Mode Filter Assembly SM-D-569740		2A4FL1
Waveguide Assembly SM-D-596743		2A4W4
Elevation Cable Wrap Assembly SM-D-573146		2A5
RFI Filter 1212-502		2A5FL1 through 2A5FL5
Reflector Assembly AS-1968/TSC54	Antenna	2A9
RF Equipment Assembly SM-E-572569	RF box	2A9A1
Parametric Amplifier AM-6676/TSC-54	Parametric amplifier	2A9A1A2 and 2A9A1A3
Waveguide Tee Assembly 40172		2A9A12 and 2A9A13
Power Divider Assembly D2-8TN		2A9A14
Interlock Switch Assembly SM-S-778796		2A9A15
Interlock Switch Assembly SM-D-778697		2A9A16
Cable Assembly SM-C-573026		2A9W1
Cable Assembly SM-C-573501		2A9W2
Waveguide Assembly SM-D570235		2A9W4
Waveguide Assembly SM-D-570236		2A9W5 and 2A9W6
Waveguide Assembly SM-D-570247		2A9W7
Waveguide Assembly SM-D-570234		2A9W8 and 2A9W11
Waveguide Assembly SM-D-570238		2A9W9 and 2A9W10
Waveguide Assembly SM-D-570282		2A9W12
Waveguide Assembly SM-D-570281		2A9W13
Waveguide Assembly SM-D-570280		2A9W14
Waveguide Assembly SM-D-570283		2A9W15
Purity Loop Flow Filter Assembly LBADD33102	Purity loop flow filter	2A10
RF Amplifier AM-6929/G	LPA	2A11

Nomenclature	Common name	Reference designator
Cable Assembly SM-D-571915		2W3
Cable Assembly SM-D-571916		2W4
Cable Assembly SM-D571917		2W5
Cable Assembly SM-D-571918		2W6
Cable Assembly CX-10466/TSC 4		2W7
Cable Assembly CX-10464/TS-54		2W9
Cable Assembly CX-10465/TSS54		2W10
Cable Assembly SM-D-571924		2W13
Cable Assembly (Low Noise) W9701-50		2W16
Waveguide Assembly SM-A-7781891		2W17 and W18
Cable Assembly SM-C-883446		2W20
Cable Assembly SM-C-G883302001		2W21
Cable Assembly SM-C-883448		2W22
Cable Assembly SM-C-883449		2W23
Cable Assembly SM-C-883302-002		W16
Cable Assembly SM-C-883301		W19
Electronic Equipment Shelter S-387/TS-54	Equipment shelter	
Transportable Antenna Dolly Set V-395/TSC54	Antenna dolly set	
Transportable Shelter Dolly Set V-394/TS54	Shelter dolly set	

Section III. EQUIPMENT DESCRIPTION AND APPLICATION

1-8. Description of AN/TSC-54 (fig. 1-4)

The AN/TSC-54 is a self-contained, mobile communications complex providing independent military communications operation in remote and unimproved strategic areas consistent with terminal visibility to available near-synchronous, and medium altitude satellites. The AN/TSC-54 basically consists of the following:

a. Antenna system.

b. Transmitting system.

c Receiving system.

d. Miscellaneous items such as patching facilities, environmental controls, and other ancillary items.

e. Mobility equipment to provide wheeled transport of the major items comprising the terminal over limited distances of surfaced roads or for movement at the site.

1-9. Description of Shelter Dolly Set (fig. 1-5)

The shelter dolly set provides land mobility for the equipment shelter. The shelter dolly set consists of a front and rear dolly assembly which contain hydraulic lifting jacks. The hydraulic lifting jacks (one at each wheel) are operated individually and are used for lifting and leveling the equipment shelter on sloping ground or uneven terrain.

a. The front and rear dolly assemblies are basically identical, except that the front dolly assembly contains the steering assembly, and the rear dolly assembly contains the stoplights, tail- lights, and a hand-operated manual parking brake for each rear wheel.

b. The front and rear dolly assemblies may be coupled together and towed by any vehicle having a pintle height of from 6 to 48 inches above the ground. When decoupled, the dolly assemblies may be attached to mating devices on the shelter. By using the hydraulic lifting jacks, the equipment shelter may be lifted to the appropriate road clearance height and attached to a towing vehicle. It may be towed at highway speeds up to 60 miles per hour (mph) and on secondary roads or cross country at a speed of 20 mph.

1-10. Description of Equipment Shelter (fig. 1-6)

The equipment is a lightweight shelter adapted for both truck and helicopter transportation. It is fully insulated, watertight, and airtight. The shelter contains the components of the required to provide the voice and teletypewriter communications of the AN/TSC-54.

a. The body of the shelter is constructed of a lamination of foamed plastic bonded between aluminum alloy skins. The shelter walls, roof, and floor contain mounting members with threaded inserts that are used to secure permanently installed equipment, and equipment stowed for transport. Equipment shock absorption is ac- complished by the use of rubber skids mounted on the bottom of the shelter.

b. All equipment racks are bonded direct to the body of the shelter and a ground bus connects all the equipment racks together and to a common grounding point on the shelter body. In addition, the common grounding point is connected to a grounding stud on the exterior of the shelter.

c. Air intake and exhaust openings are provided on the front and rear of the shelter. The openings are equipped with watertight covers and air filters.

d. Entry panels are provided in the side of the shelter for interconnection of circuits between the various units comprising the AN/TSC-54. During operation, landlines are connected to the signal entrance panel at the upper left-hand corner on the front of the shelter.

e. Connections from the antenna group are also made to connectors located on the front of the equipment shelter. Watertight covers are provided for the entry panels during overland or air travel.

f. One side of the equipment shelter is designated the curbside, and the other side is designated the roadside. The curbside is the left side when facing the outside front of the shelter. The roadside is the right side when facing the outside of the shelter.

g. Entrance to the equipment shelter is provided by a doorway on the curbside of the shelter. Folding steps, which provide access to the shelter roof, are also located on-the curbside of the shelter. The shelter roof contains several screw eyes that are used for equipment tiedown of the dolly set which is stored on the shelter roof during transit.

1-11. Description of Operations Control Van Components (fig. 1-7)

a. Antenna console (1A2) consists of two racks of equipment which contain the following components:

(1) Zero set control (1A2A1) permits compensation for antenna misorientation that may occur

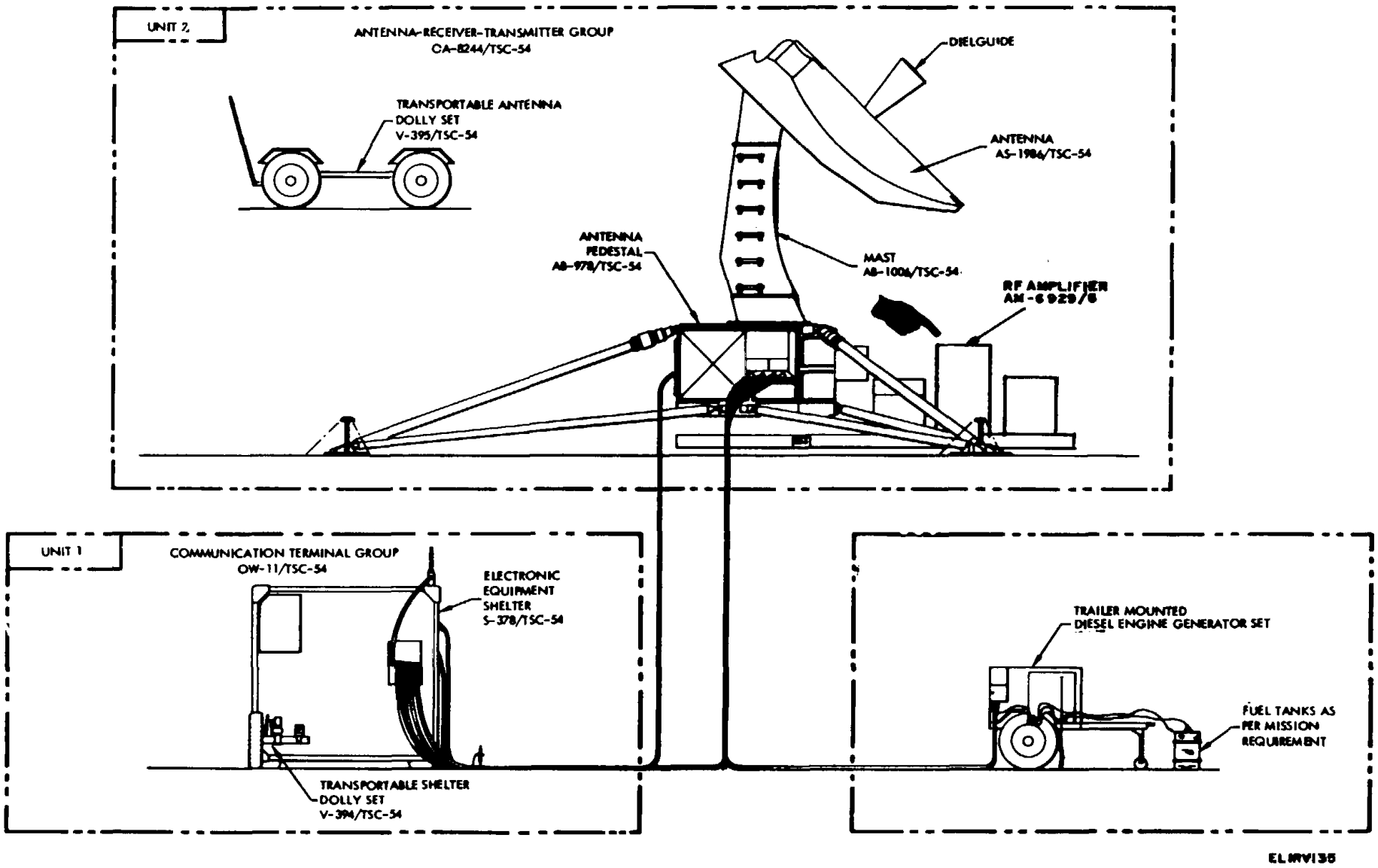


Figure 1-4. AN/TSC-54 equipment configurations.

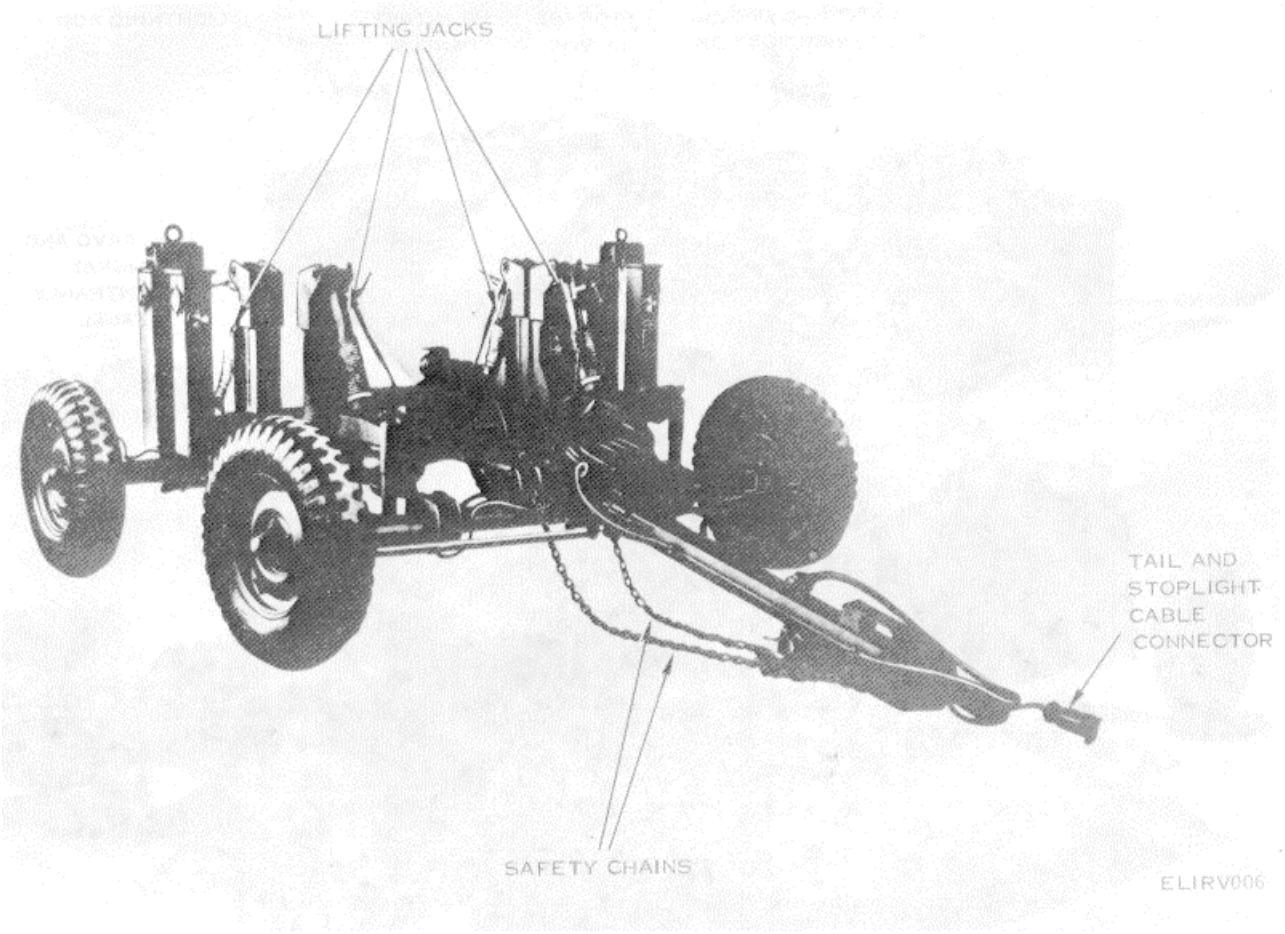


Figure 1-5. Transportable shelter dolly set V-394/TSC-54.

during installation. If the azimuth digital readout indicator does not record the proper value after the antenna is positioned on the site, the zero set control is used to correct the azimuth digital reading.

(2) The frequency distribution unit (1A2A22) houses the FE-12 frequency standard which is used as a redundant frequency source. It also provides amplified 1 MHz and 5 MHz outputs to the distribution amplifier (1A2A33).

(3) Distribution amplifier (1A2A33) accepts the 1-MHz and 5-MHz signals from either source and provides buffered multiple outputs of 1 MHz to the rest of the terminal. The distribution amplifier has six 5-MHz and four 1-MHz outputs.

(4) Power distribution panel (1A2A4) contains five power supplies, antenna status indicators, and power control switches. The power supplies provide regulated and unregulated de voltages to the shelter and the antenna pedestal. Also, an emergency switch is provided to turn off system power in case of a malfunction.

(5) Antenna control panel (1A2A5) contains logic modules that process operator commands, synchro assemblies that complete the antenna control section servo loops, and all the antenna operating controls except for the power control switches located on power distribution panel ((4) above). Status indicators are also, provided to monitor the operation of beacon demod (1A3A4) (b (3) below).

(6) Indicator panel (1A2A9) and link terminal timing central (1A2A10) are both part of the URC-61 (1A6). Refer to IM 11-5820-614-12 (available at Satellite Communications Agency, Ft. Monmouth, NJ) for a detailed description of the indicator panel and link terminal timing central.

(7) Cesium environmental enclosure (1A2A34) provides thermal isolation for the cesium beam frequency standard (1A2A24) ((8) below) and the

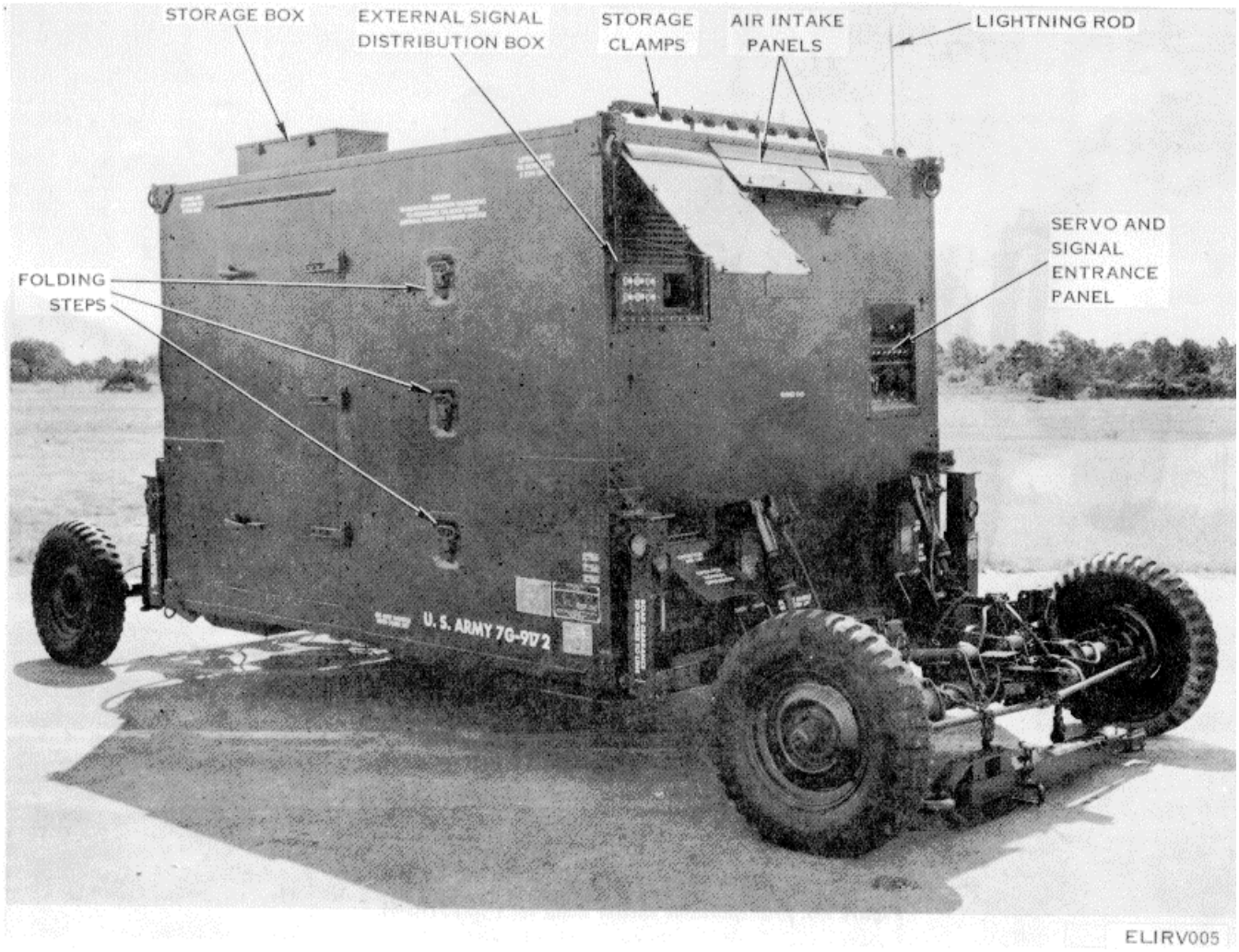


Figure 1-6(1). Electronic equipment shelter S-378/TSC-54

cesium beam power supply (1A2A25) ((9) below) from all other equipment mounted in the 1A2 and 1A3 racks. It contains a fan to circulate external (shelter ambiant) air through input/output louvers and an air flow switch that causes the BLOWER FAIL indicator lamp located on a control panel provided with the housing to illuminate in the event of fan failure. A switch is also located on the control panel to interrupt charging of the cesium beam power supply batteries when the AN/TSC-54 is being air transported.

(8) Cesium beam frequency standard (1A2A24) is a compact, self-contained frequency standard which uses a cesium beam tube resonator to stabilize the output frequency of a quartz crystal oscillator. Solid-state components and the closed-loop, self-checking control circuit provide an accuracy of ± 1 part in 1011. Output frequencies are MHz, 100 kHz, and 1 pps signals which are applied to the frequency distribution unit for distribution to major components for timing and vco reference frequencies.

(9) Cesium beam power supply (1A2A2§ provides uninterrupted regulated 24 volts dc at 2-ampere rate output. A reserve-charge feature permits charging the batteries to full capacity providing 18 ampere-hours of standby power.

(10) Test translator control (1A2A26) control the functions of the Self-Test Translator. Also included are facilities for switching of the redundant Low Noise and Parametric Amplifier System Meters are provided for monitoring relative gain o the RF system and the Test Translator Mixer Current.

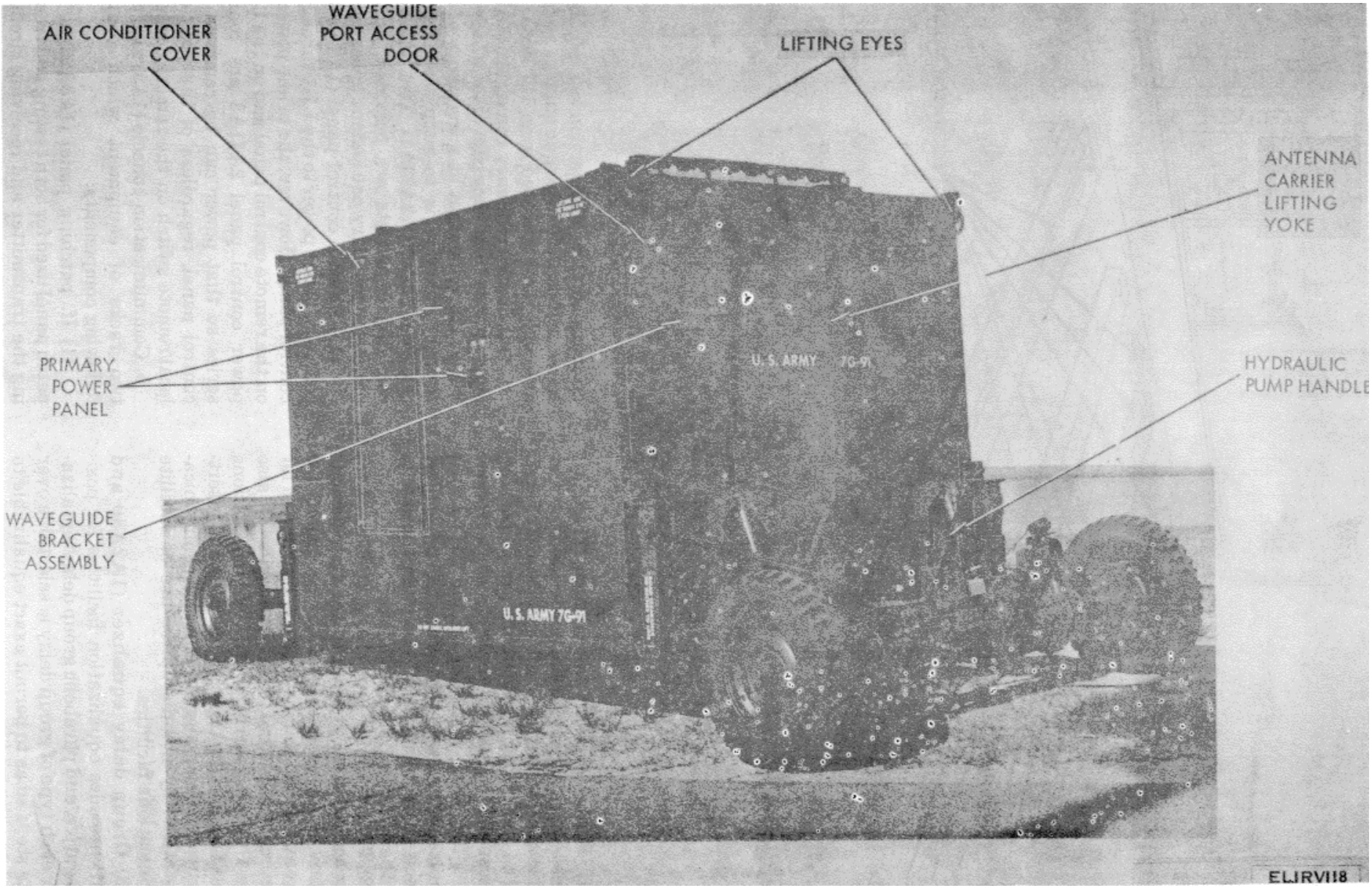


Figure 1-6(2). Electric equipment shelter S-378/TSC-54 (Sheet 2 of 3).

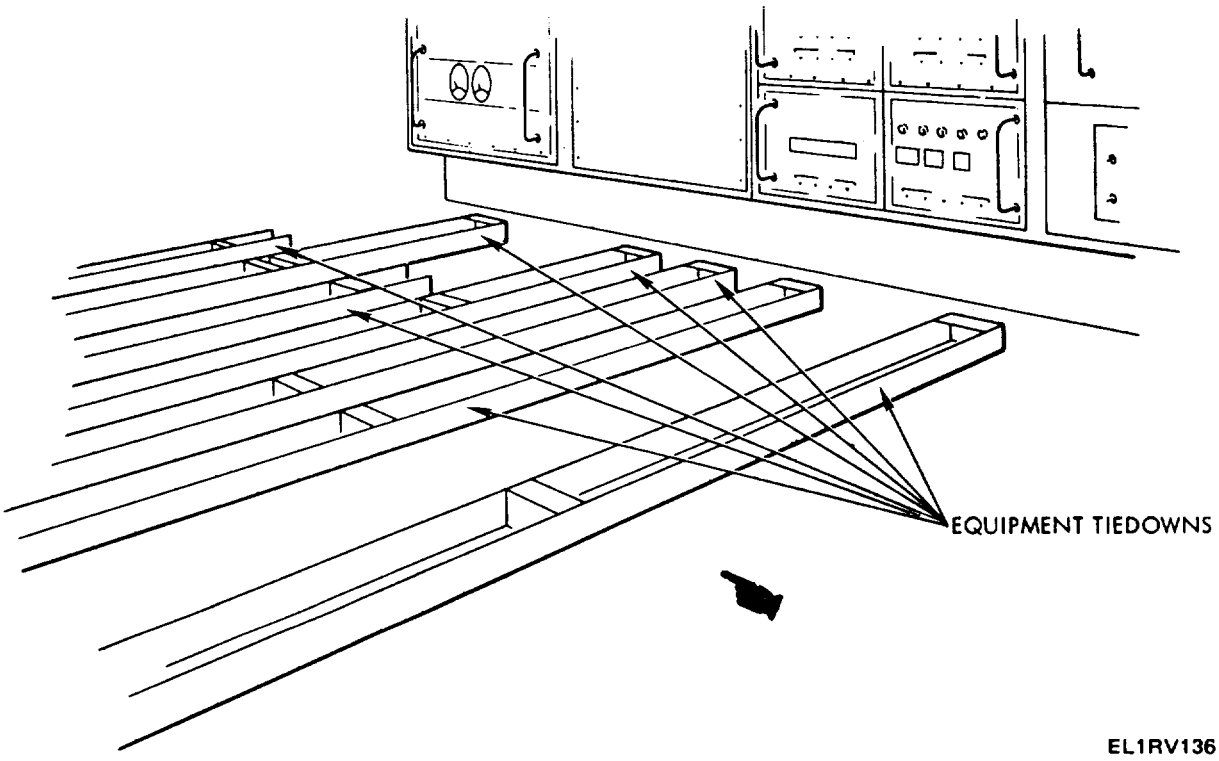


Figure 1-6(3). Electronic equipment shelter S-378/TSC-54

(11) Power monitor and control (1A2A27) provides a status, fault alarm, power monitor and limited control of the transmitter in the sheltered area. The indicators and controls are in parallel with those located in the transmitter control panel (para. 1-12a). An rf power meter of on line transmitter output power assembly. A4 is provided for precise monitoring of rf power in the ocv of either the HPA or LPA transmitter.

(12) Time transfer unit (1A2A29) is used for comparison of time standards through various communications systems and has provisions for synchronizing communications equipment and for calibrating other local time standards. It also performs as an interface with communications modems for effecting time comparisons and inserting accurate timing signals at major communications stations by non-disruptive use of satellite communications facilities.

(13) Group delay equalizer (1A2A30 and 1A2A31) provides equalization facilities for positive, negative, and parabolic group delay equalization for each type of group delay is selectable over discrete steps so as to permit exact equalizable to be obtained. Overall insertion loss is 0 dB. The unit has a self-. contained power supply, and amplifier assembly, and operated from 117 VAC.

(14) Static frequency converter (1A2A35) is a single phase frequency converter which delivers a 2 KW, 120 vac output at a frequency of 60 Hz. Its primary function is to supply 60 Hz power to teletypewriter (lA3A23A1). Two 115 vac 60 Hz convenience outlets are provided, on the front panel, for ancillary equipment operation.

(15) Remote control panel (1A2A36) provides control of prime power to the LPA through a power control panel. However, the prime power switches on the remote control panel and on the LPA prime power control panel 2AllA3 are connected in series so that power can be removed at either control panel, regardless of the position of the local/remote switch on the remote control panel.

b. Communication console (1A3) also consists of two racks of equipment which contains the following components:

(1) lf. patching panel (1A3A22) is a coaxial patch panel used for both testing and troubleshoot- ing the transmitter and receiving circuits.

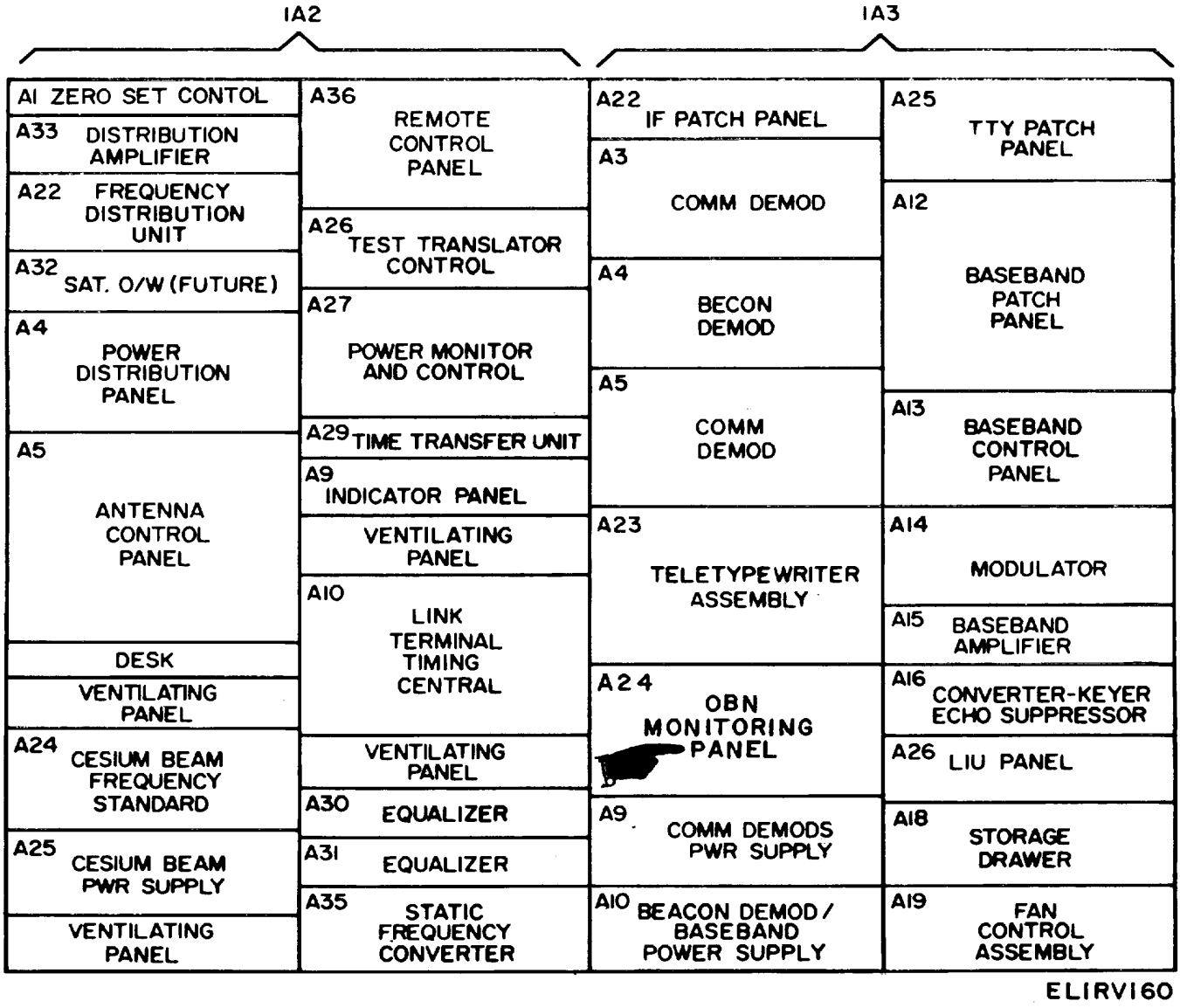


Figure 1-7(1). Operations control van component location (sheet 1 of 5).

(2) Comm demod (1A3A3 of 1A3A5) is a phase- locked demodulator which is used to extract the base- band signal from the incoming frequency modulated or phase modulated signal, and produce an auxiliary output signal. The auxiliary output signal is used for automatic tracking of the satellite if the beacon demod (1A3A4) fails. Comm demod (1A3A3 of 1A3A5) is operated in one of eight receive modes. The particular mode of operation is controlled by the position of a se- lector switch.

(3) Beacon demod (1A3A4) operates as a satellite tracking receiver and is similar to comm demod (1A3A3 or 1A3A5) ((2) above). It detects the satellite signal, locks on it, and produces an output signal to control the position of the antenna. Also the beacon demod provides a satellite identification signal. In the manual mode of operation, an aural signal is provided to the orderwire handset to facilitate frequency acqui- sition.

(4) Teletypewriter (1A3A23A1) is a compact key- board send-receive set that originates and monitors messages in a telegraphic network. The characters or functions which form a message are originated by de- pressing individual keys on the keyboard. The result- ing message is monitored by the local and selected typing units in the network.

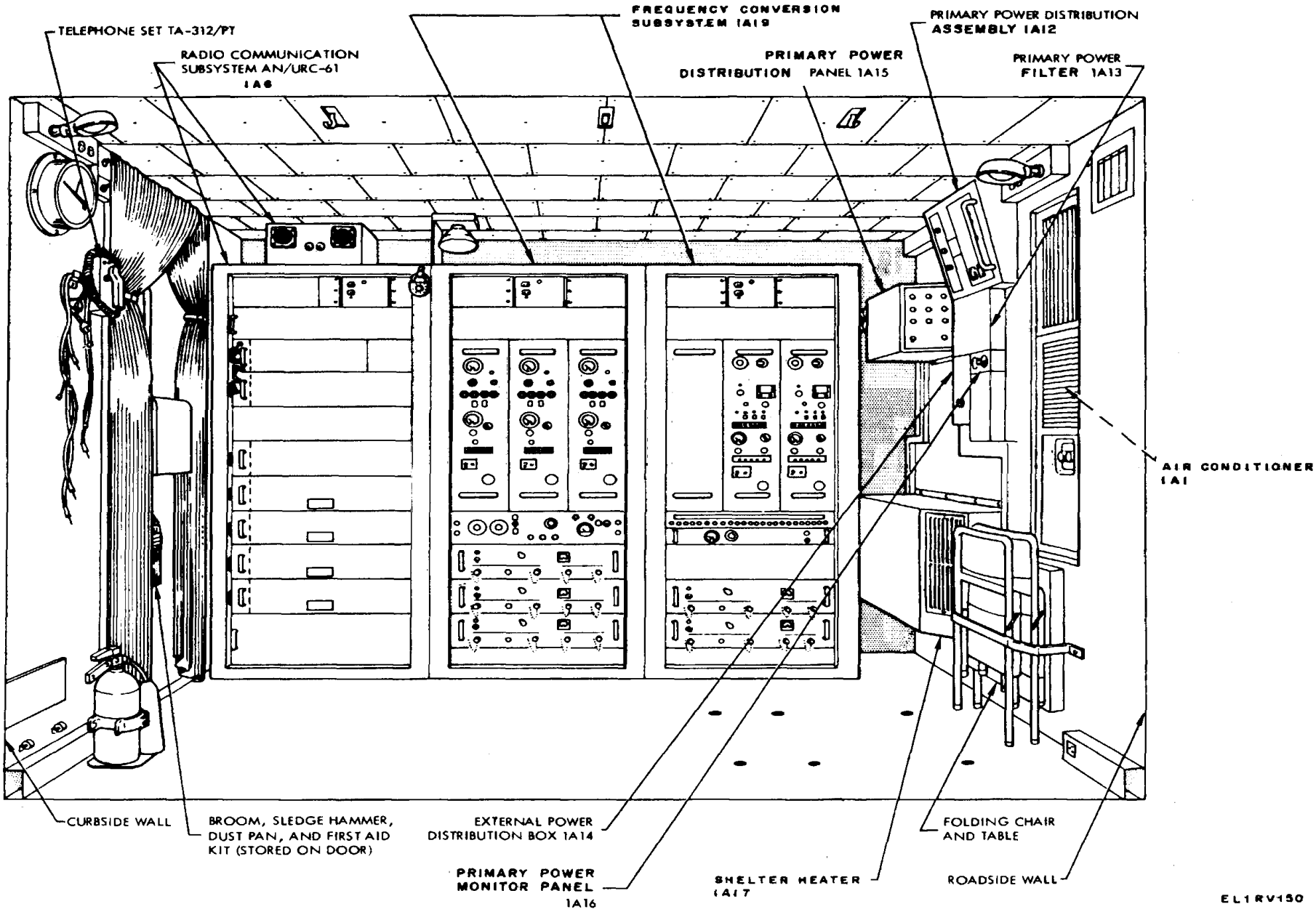


Figure 1-7(2). Operations control van component location (sheet 2 of 5).

Input and output signals of the teletypewriter are routed through tty patching panel (1A3A25) and baseband patching panel (1A3A12). Refer to NAVSHIPS 0967-059-9010 and NAVSHIPS 0967-059-9030 for a detailed description of teletypewriter.

(5) Comm demod power supply (1A3A9) consists of two power supply sections (one for each of the comm demods 1A3A3 or 1A3A5). Each of the power supply sections contains four regulated power supplies which provide + 28 vdc, + 5 vdc, and - 15 vdc to their respective demodulators. The regulated power supplies contain overload current protection circuits, and each is individually con-trolled by an input power circuit breaker.

(6) Beacon demod/baseband power supply (1A3A10) consists of two power supply sections (one for beacon demod (1A3A4) and the other for components of the baseband section). The beacon demod power supply section is similar to comm demod power supplies (5) above). The baseband power supply section contains five regulated power supplies which provide +28 vdc, -28 vdc, -24 vdc, +12 vdc, and +3 vdc necessary for operation of the baseband subsystem.

(7) Tty patching panel (1A3A25) and baseband patching panel (1A3A12) contain normal through and terminal jacks, and permit access (testing) to the teletypewriter loops and baseband components through cable patching.

(8) Baseband control panel (1A3A13) contains the switching circuits and controls for telegraph and voice functions of the AN/TSC-54.

(a) A switch provides a selection of several types of filters to improve signal levels during degraded transmission and reception. A clipper circuit is also used for this purpose.

(b) A telephone handset is provided for order wire (terminal user) communications and selection of order wire or external user is controlled by a switching arrangement.

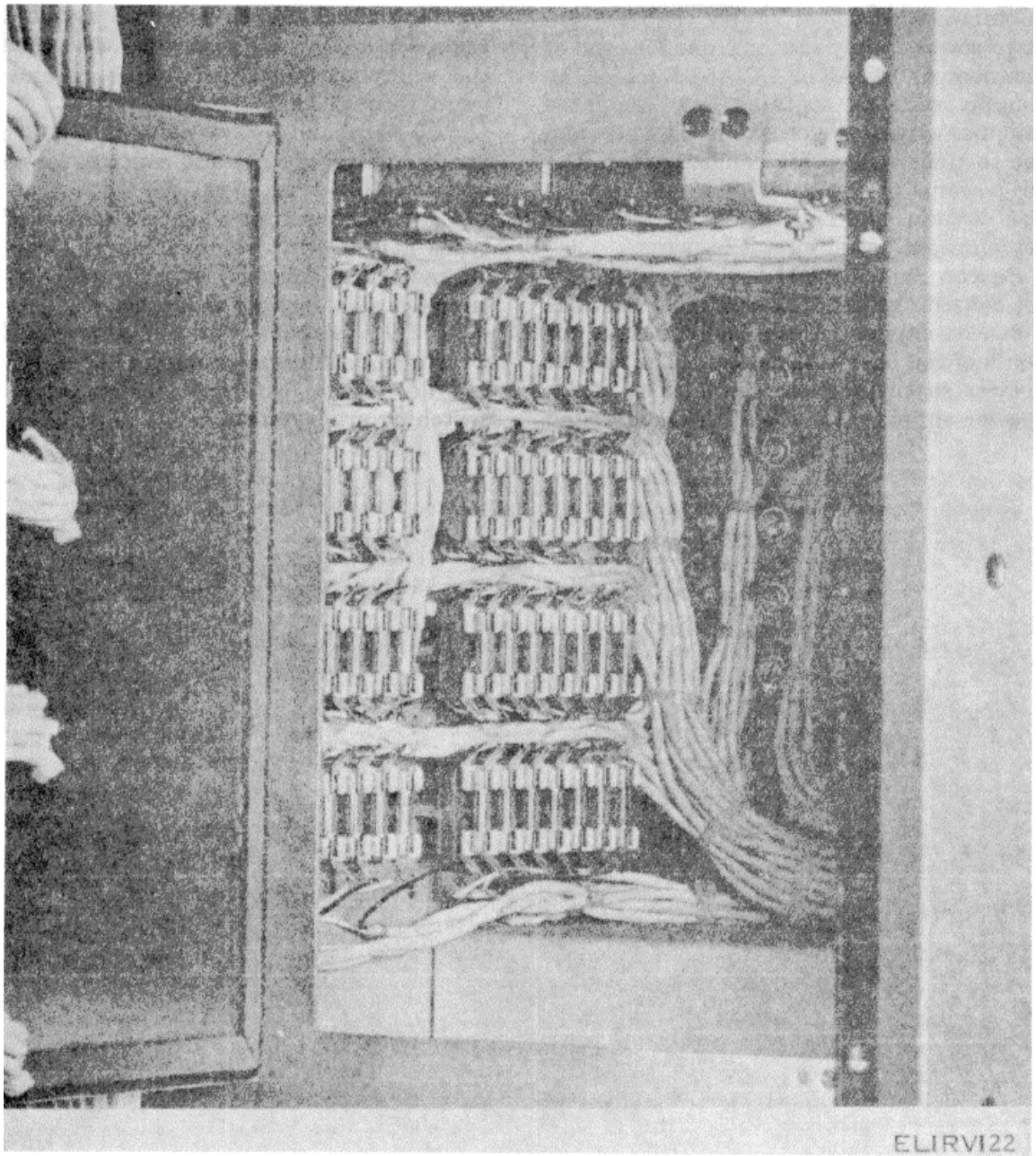


Figure 1-7(3). Operations control van component location (sheet 3 of 5).

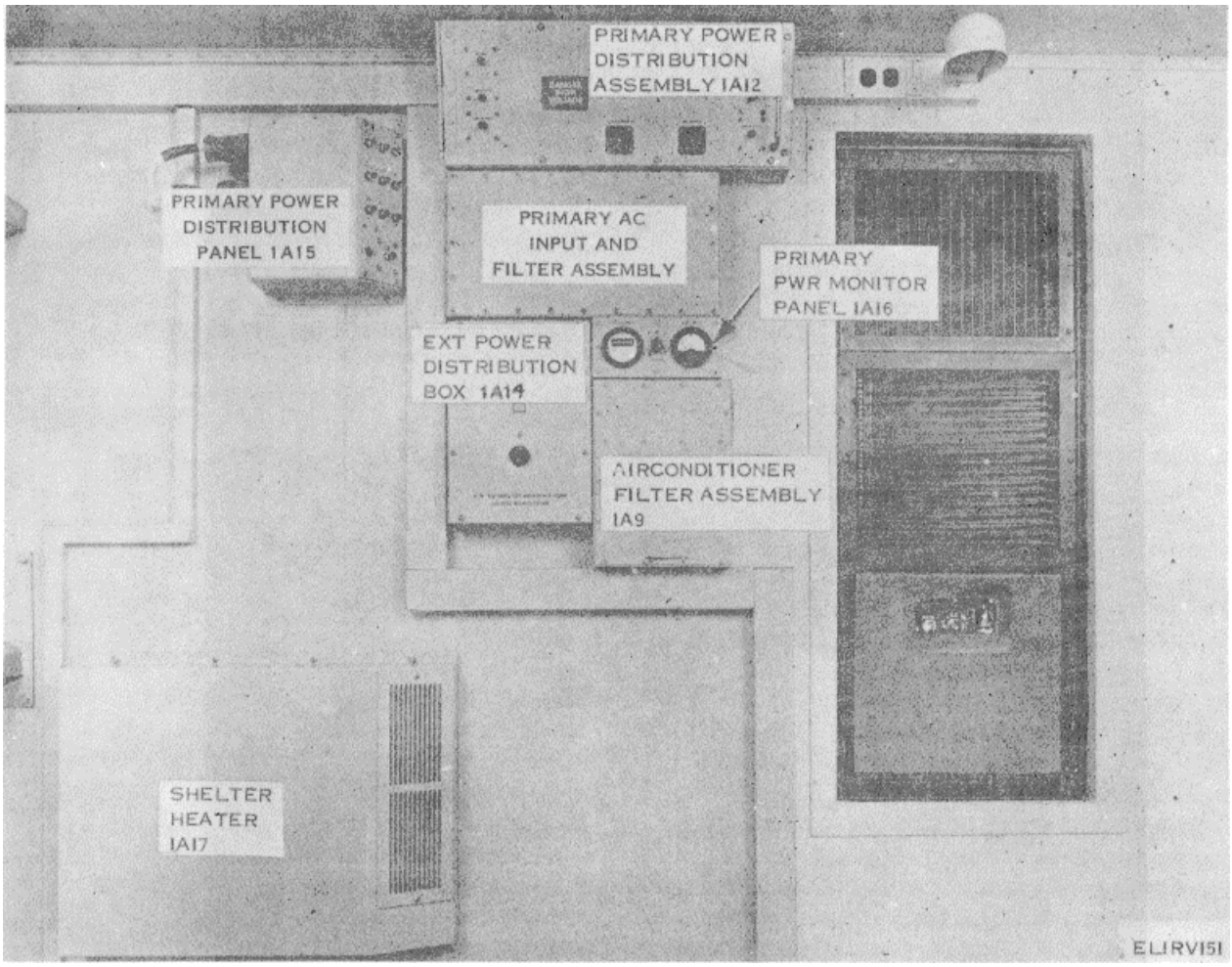


Figure 1-7(4). operations control van component location (sheet 4 of 5).

(c) Two meters are provided on the front panel for monitoring teletypewriter loop currents and plus or minus 6 vdc “internal battery” for the telegraph lines.

(9) Modulator (1A3A14) produces a 70 MHz fm or pm (angle modulation) signal and provides 12 preset peak frequency deviations. Additional switches provide manual control of the peak frequency deviations and status indicators, located on the front panel, indicate and isolate component malfunctions.

(a) The local oscillator for the modulator is a 10 MHz voltage controlled oscillator (vco). The vco is modulated by baseband signals, and its output is multiplied by a factor of 7 to produce a 70 MHz modulated output signal.

(b) A 100 kHz signal from the frequency distribution unit is used to provide phase lock stability for the VCO.

(10) Baseband amplifier (1A3A15) consists of signal conditioning and monitoring circuits and essentially contains the following:

(a) Order wire send and receive amplifiers amplify teletypewriter and voice signals in the send (transmit) direction, and amplify demodulated signals in the receive direction.

(b) User send and receive amplifiers amplify teletypewriter and voice signals in the send direction, and amplify demodulated signals in the receive direction.

(c) Send and receive amplifiers provide adjustable gain, pre-emphasis, and de-emphasis.

(d) A clipping circuit is provided for use during degraded transmission and reception.

(e) A 1 kHz test tone generator is provided for baseband and system loop tests. (11) Converter-keyer-echo suppressor (1A3A16) contains nine plug-in modules:

Figure 1-7(5). Operations control van component location (sheet 5 of 5).

(a) Three frequency shift keyers (fsk) which are used in the send direction of the teletypewriter loop.

(b) Three tone converters which are used in the receive direction of the teletypewriter loop.

(c) Three echo suppressor modules which are used in the voice channel for the receiver, transmitter, and disabler circuits.

(12) LIU panel (1A3A26) contains three isolators and a plus or minus 6 vdc power supply. Each isolator contains two relay assemblies (one for each direction of transmission). These isolators provide isolation and short protection between the outside lines and the AN/TSC54 components. Conversion between the various types of telegraph signals and low level polar is provided. The power supply generated the "internal battery" for the low level polar system.

(13) Storage drawer (1A3A18) provides storage space for handtools, the age disabler, a power supply bypass cable, and four dry cell batteries.

(14) Fan control assembly (1A3A19) contains three motor assemblies and two toggle switches. One toggle switch controls the three blower motors on the fan control assembly, and the other toggle switch controls four blower motors on fan assemblies (1A2A21 and 1A3A20. Fan assembly (1A3A20) is mounted behind the patch panel and fan assembly (1A2A21) is mounted behind the top blank panel on the right hand side of the antenna console. Fan assemblies (1A2A21 and 1A3A20) contain louvered openings on the outside of the ocv.

c. Frequency conversion subsystem (1A19) for AN/

TSC54 provides frequency conversion for the transmit and receive carriers required for AN/TSC54 operation.

(1) The subsystem up-converter (U/C) provides a means by which three individual up-converters can heterodyne 70 MHz If. input carriers to any frequency in the 7.9 to 8.4 GHz transmit band. The individually up-converted carriers are then combined in a passive wave-guide device (signal combiner) for further amplification in the power amplifier subsystem of the AN/TSC54. Each upconverter is a completely solid state device, utilizing circuits and modular construction to reduce size and maximize performance and reliability. The individual modules and assemblies are easily removable for maintenance purposes.

(2) The subsystem down-converter (D/C) provides a means by which three rf carriers appearing in the 7.25 to 7.75 GHz receive band are individually heterodyned to 70MHz kF signals. The receive carriers are distributed simultaneously, by means of a passive wave-guide device, to the input of each down-converter. By means of frequency selection controls, any receive carrier may be down-converted to a 70 MHz if signal. Each down-converter is a completely solid state device utilizing the same construction technique utilized in an upconverter. Two receive band input filters are supplied integral to each down-converter. One filter is used to pass the lower half of the receive band; the other is installed to operate in the upper half of the receive band.

(3) Dual conversion is utilized in each down-converter to minimize deterioration of the translated signal and to maximize the rejection of spurious frequencies near the If. carrier.

(4) Each FM demodulator sends an out of band noise signal to the OBN monitor panel to provide continuous indications of circuit quality for each FM channel.

d. URC61 (1A6) consists of an equipment console, an attached component (containing switches and time totalizing meter), and the indicator panel and link terminal timing central. The URC61 may be substituted for modulator (1A3A14) (b(9) above), and comm demod (1A3A3 or 1A3A5) *(b(2)* above). Refer to TM 11582061412 (available at Satellite Communications Agency, Ft. Monmouth, NJ) for a detailed description of the ANIRUC61.

e. Air Conditioner (1A1) is a combination unit for heating and cooling the shelter. The unit consists of two sections, the evaporator section and the condenser section. It is rated at 18, 000 British thermal units per hour (btu/hr) cooling and 12, 000 btu/hr heating. Refer to TM 5412030815 for a detailed description of the air conditioner.

f. Shelter heater 1A17 contains 12 heating elements and 2 blower fans. Heating is controlled by an external thermostat located in primary power distribution panel (1A15) (i. below). Heating is provided by air circulated over the heating elements and distributed throughout the shelter by the blower fans. An over-temperature thermostat is contained within the heater enclosure to interrupt heater power should the temperature reach 3700F. Also, the heater enclosure contains airflow control switches to interrupt heater power as a result of blower failure or restricted airflow.

g. Primary power distribution assembly (1A12) is located on the roadside of the equipment shelter and contains circuit breakers which provide overload protection to the electronic equipment, shelter lights, and equipment connected to the shelter outlets. Two-time totalizing meters record the application of power to critical and sensitive power circuits.

h. Primary power filter (1A13) is located directly below the primary power distribution assembly (g above) and contains four line filters for the 3-phase, 4-wire input power.

i. Primary power distribution panel (1A15) is located directly to the left of primary power distribution panel (g above) and contains circuit

breakers which provide overload protection for the frequency conversion. subsystem (3 up-converters, 3 down converters, distribution amplifier, test translator, and cabinet blowers), and for a personnel heater. It also contains the ON-OFF thermo-stat bypass switch for the personnel heater.

j. Primary power monitor panel (1A16) is located to the right and directly below the primary power filter *(h* above). The meters contained on this panel provide the console operator with a direct visual means of monitoring the 400 Hz primary power source line frequency and phase voltage supplied to the system.

k. External power distribution box (1A14) is located directly below primary power filter assembly *(h* above). It contains four batteries (D cells), which provide power for emergency lighting if a generator set fails. The emergency light is illuminated when a power failure relay in primary power distribution panel *(g* above) is de-energized.

l. External signal distribution box (1A10) is located at the upper right corner on the front of the shelter behind 1A3A12. Two signal entrance panels on the external signal distribution box contain terminal and jacks for all user send and receive lines. Each through line within the distri-bution box has a radio frequency interference (rfi) filter, and is protected by a fuse and a lightning arrester. A 26-pair connector to the external signal distribution box provides for connection of a 26-pair cable for user lines.

m. The shelter also contains the following miscellaneous items:

(1) A 24-hour type chronometer clock is located on the interior wall on the curbside of the shelter. The, clock is set to indicate the desired time and has an 8-day running time between windings.

(2) Lighting for the shelter is supplied by three swivel-type light fixtures each containing a 60-watt incandescent lamp. An antiglare, heat resistant, concial shaped plastic shield covers each light fixture.

(3) Housekeeping equipment, fire extinguisher, and a first aid kit are located in the front section of the shelter near the shelter door.

(4) A shelter blackout circuit is also provided and is activated by a switch connected through the door interlock so that the lights are extinguished when the shelter door is opened. A blackout curtain is hung and tied back at the shelter doorway.

(5) One slide out desk is located in the antenna console. A typewriter may be placed on the desk if necessary.

1-12. Description of Antenna Dolly Set

(fig. 1-8)

The antenna dolly set provides land mobility for the antenna group. The antenna dolly set is similar to the shelter dolly set, except that the platform assembly is supplied as part of the antenna dolly set.

1-13. Description of Antenna Group

(fig. 1-9)

The antenna group consists of antenna pedestal *(a* below), mast *(b* below), antenna *(c* below), and a platform assembly.

a. The antenna pedestal (2A3) contains circuits and control panels associated with the receiver, transmitter, and antenna. The antenna pedestal is mounted on a platform assembly, and, when installed, is anchored to the ground with three outrigger assemblies. The outriggers assemblies incorporate screw-type, manually operated, mechanical jacks for leveling the antenna pedestal. Primary power is applied to the antenna pedestal from a trailer mounted diesel engine generator set. This power is routed through a control panel on the antenna pedestal, and through a cable to a power connector on the front of the equipment shelter (para 1-9a(5)).

b. The mast (2A4) provides support for the antenna *(c* below). The mast structure contains ports to provide access to component assemblies within the mast. Steps on the sides of the mast, to which a service platform may be mounted, facilitate maintenance of the antenna. In the down position, the mast is hinged to the antenna pedestal. A cover protects the exposed interior of the mast and antenna pedestal in this position. The mast is erected by the use of gear assemblies similar to conventional jackscrews. When fully erected, the mast is fastened to the antenna pedestal by means of quick-release pins.

c. The antenna (2A9) consists of a reflector and component assemblies as outlined in (1)through (4) below:

(1) The antenna reflector consists of four 10-foot parabolic dishes integrally assembled as a cloverleaf reflector. The overall reflective surface area is approximately equal to a single 18-foot dish. The elevation axis is offset to increase the antenna pointing accuracy by compensating for mast bending as a result of wind loading. The same wind forces that bend the mast structure, twist the offset reflector support tube in the opposite direction. These effects tend to cancel each other, and result in minimum disturbance by wind loading.

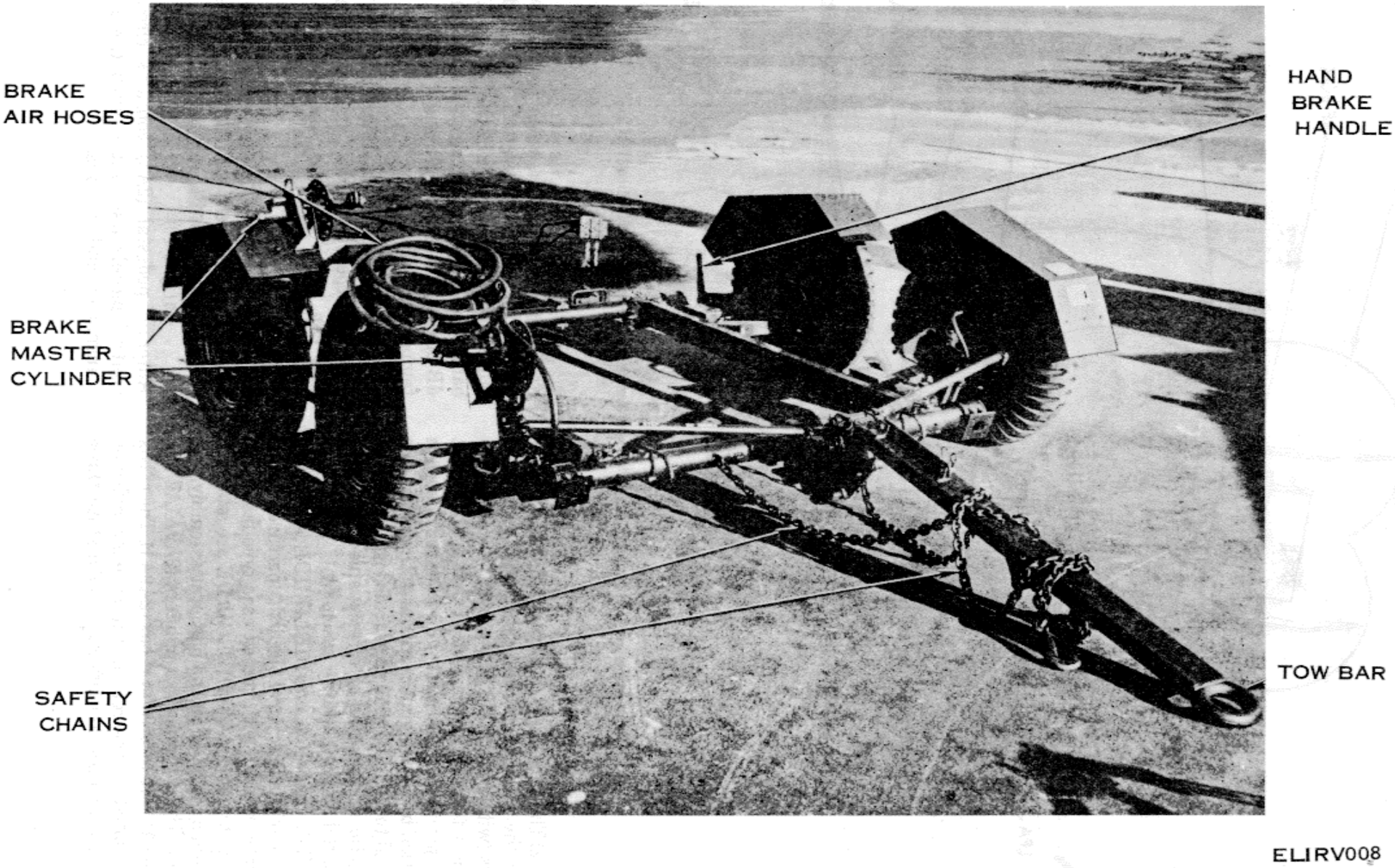


Figure 1-8. transportable antenna doll set V-395/TSC-54.

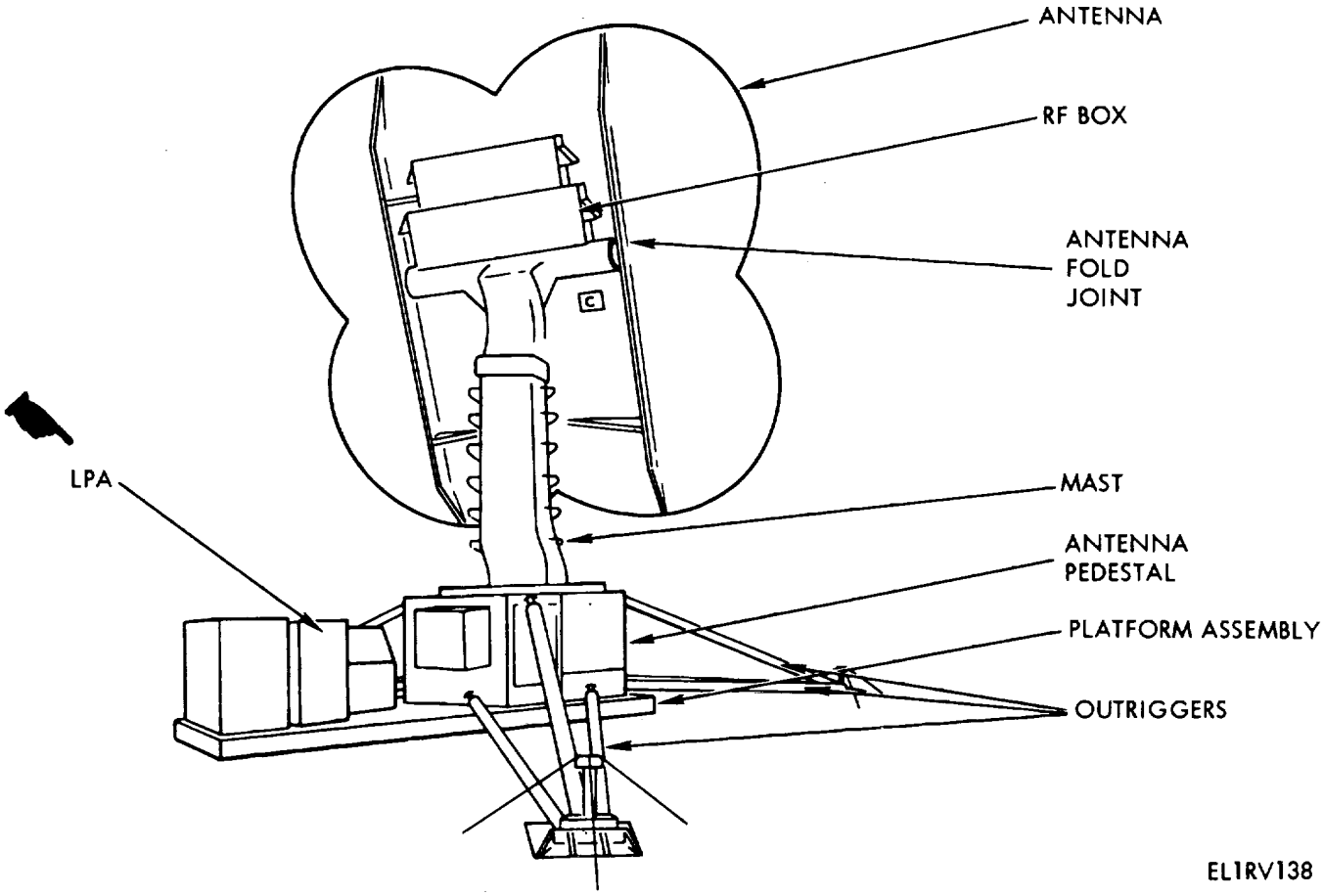


Figure 1-9(1). Antennae-receiver-transmitter group QA-8244/TSC-54 (sheet 1 of 2)

(2) The antenna folds on two fold joints parallel with the mast which do not affect the antenna feeds (with DIELGUIDE removed) because they connect to the antenna section that is not folded. The parabolic dishes (1) above) are locked in position by latching mechanisms with the use of a special tool. In the transit or folded condition, the reflector is supported by a removable post that is mounted on the platform assembly.

(3) In operation, one DIELGUIDE is installed at each of the four parabolic dish apertures, and is secured in place with transit case type fasteners. During transport, the DIELGUIDE are stored in containers located on the platform assembly.

(4) The parametric amplifiers (2A9A1A2 and 2A9A1A3) are located in rf box (2A9A1). The rf box is mounted on the rear of the antenna reflector. Each parametric amplifier is a solid state three stage un-cooled amplifier which provides 30 dB of gain to the receiver rf signals, cw, am., fm, and pulse modulated carriers in the 7.25 to 7.75 GHz band. The fixed tuned parametric amplifier has a 2 dB bandwidth of 0.50 GHz and a maximum noise temperature of 135°K.

d. The low power amplifier (LPA, 2A11) is a general purpose low power, air cooled transmitter that can serve as either the main or backup transmitter.

1-14. Description of Antenna Pedestal Components
(fig. 1-10)

Antenna pedestal (2A3) contains circuits and control panels associated with the receiver, transmitter, and antenna.

a. Transmitter control panel (2A3A7) contains meters, switches, and status indicators that are required to turn on and monitor the transmitter. Test points are also provided to allow for adjust-ment and troubleshooting of the transmitter. Operating controls on this panel are in parallel with the transmitter controls on the power monitor control which permit limited operation of the transmitter from the ocv.

b. Primary power distribution panel (2A3A14) serves as the routing point for the application of power from the generator set to the antenna group and the ocv. Meters provide monitoring of the power, and front panel circuit breakers provide individual circuit protection.

c. Air monitor and intercomm panel (2A3A8) contains the gages which monitor and control pressurization of the system microwave components. The six position intercom control head is also located on the panel.

1-15. Description of Operating Accessories

Operating accessories of the AN/TSC-54 are those items necessary for installation, operation, or maintenance, and are normally stored in transit cases in the shelter, or on the antenna platform assembly. Accessories of major significance are described in a and *b* below so that identification and use of the items may be facilitated.

a. Storage container assembly SM-C-574240 is used to store the DIELGUIDEs during transit, and the antenna horn protective cover assemblies during operation. Two storage container assemblies are provided, and each stores two DIELGUIDEs or two protective covers. Storage container assemblies SM-C-574240 is illustrated in figure 1-11.

b. Storage container assemblies SM-C-574241 and SM-C-574242 (fig. 1-12 and 1-13) are used to store equipment required for installation and orientation of the antenna group.

1-16. Equipment Application

(fig. 1-14)

a. The AN/TSC-54 provides one voice and two telegraph links for application to the modulator 1A3A14. The voice link is controlled by S1 and is available to either the order wire user or the external user through landlines. The voice and telegraph signals are applied to the baseband section. The baseband section contains patch panels, amplifiers, filters, meters, and controls which provide signal conditioning. The composite signal output (containing voice and TTY) from the baseband section is applied to the modulator.

b. The AN/TSC-54 provides one voice and two telegraph signals for application to the AN/URC-61. These signals are applied through patch panels, in the baseband section, directly to the AN/URC-61.

c. The voice and telegraph capabilities of the AN/TSC-54 can be increased when used with the AN/TCC-79. The AN/TCC-79 provides a maximum of 72 multiplex channels for transmission through the AN/TSC-54.

d. The modulator, the URC-61 and the AN/TCC-79 provided modulated 70 MHz signals to the transmitter section. The transmitter section contains three upconverters, a traveling wave tube driver, and a high power klystron amplifier. The 70 MHz signals from the modulator, the AN/URC-61, and the AN/TCC-79 are separately upconverted in the transmitter section and radiated to the satellite from the antenna in the frequency range from 7.9 to 8.4 GHz.

e. The radiated signal is received by the satellite, reduced in frequency, and transmitted back to earth in the frequency range from 7.25 to 7.75 GHz. The signal is received at the AN/TSC-54 antenna, and is applied to the receiver section.

(1) The receiver section contains a high gain parametric amplifier, a traveling wave tube amplifier, and three down converters. The low level signal received from the antenna is amplified and down converted to 70 MHz. The 70 MHz outputs from the down converters can be applied to either comm demod 1A3A3, comm demod 1A3A5, beacon demod 1A3A4, URC-61 or used with the ANITCC-79.

(2) In contingency modes of operation (the AN/TSC-54 operating without the AN/TCC-79) comm demod 1A3A3 is used to complete the communications link and comm demod 1A3A5 is placed in standby. If comm demod 1A3A3 fails, comm demod 1A3A5 is substituted for it. In the event of multiple carrier reception or the failure of both comm demod and the URC-61 are both operable.

(3) Comm demod 1A3A3 or 1A3A5, or the AN/URC-61 demodulates the 70 MHz signal, and applies voice and teletypewriter signals to the baseband section. The baseband section divides the composite signal into voice and teletypewriter signals and routes them to their respective users.

(4) The 70 MHz applied to the beacon demod is demodulated and the resulting signal is applied as an auto track signal to the antenna control section. The antenna control section provides the communication and servo signals required to position and control the antenna in azimuth and elevation.

The antenna control section positions the antenna

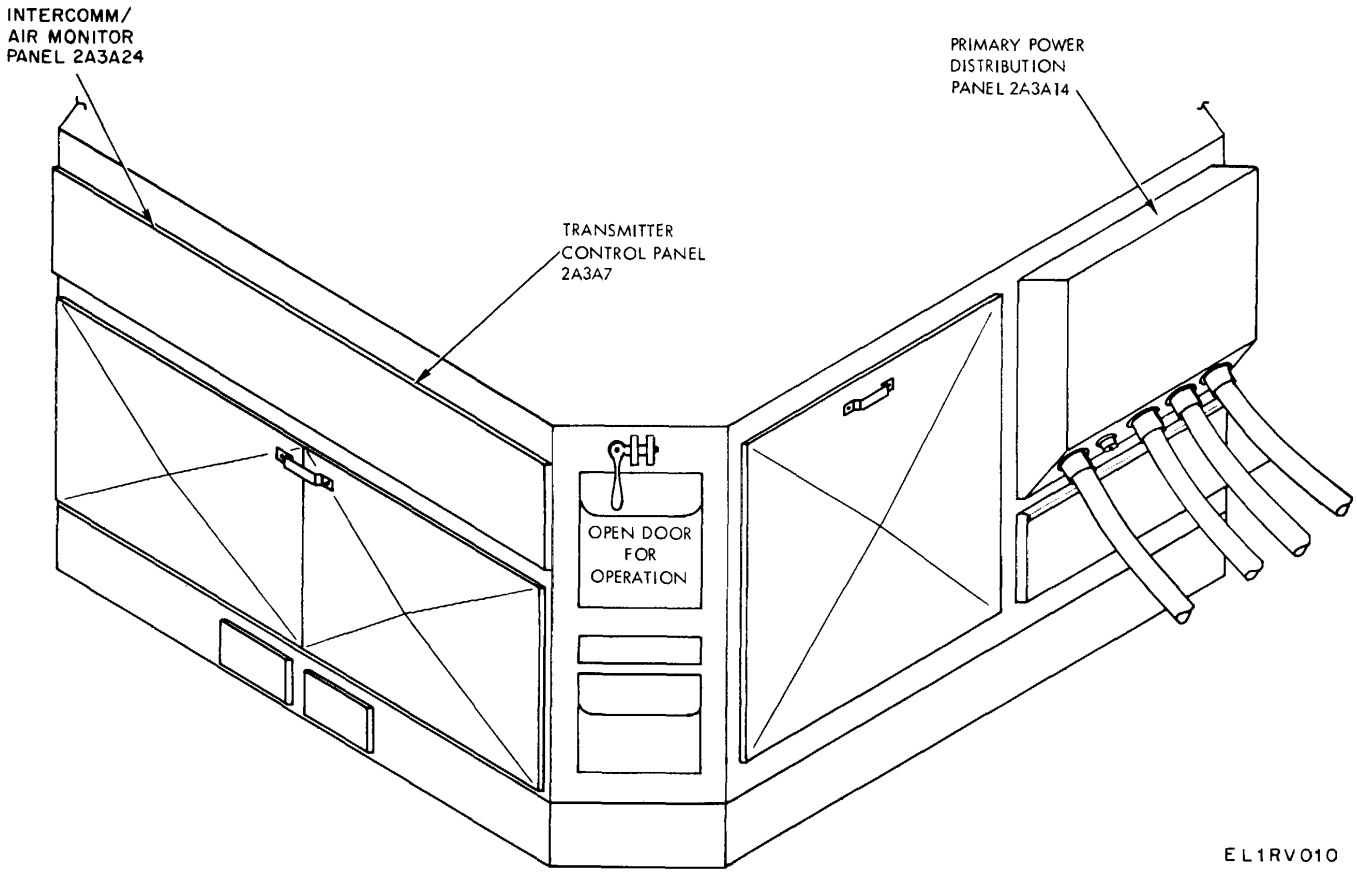


Figure 1-10. Antenna pedestal (2A3) component location.

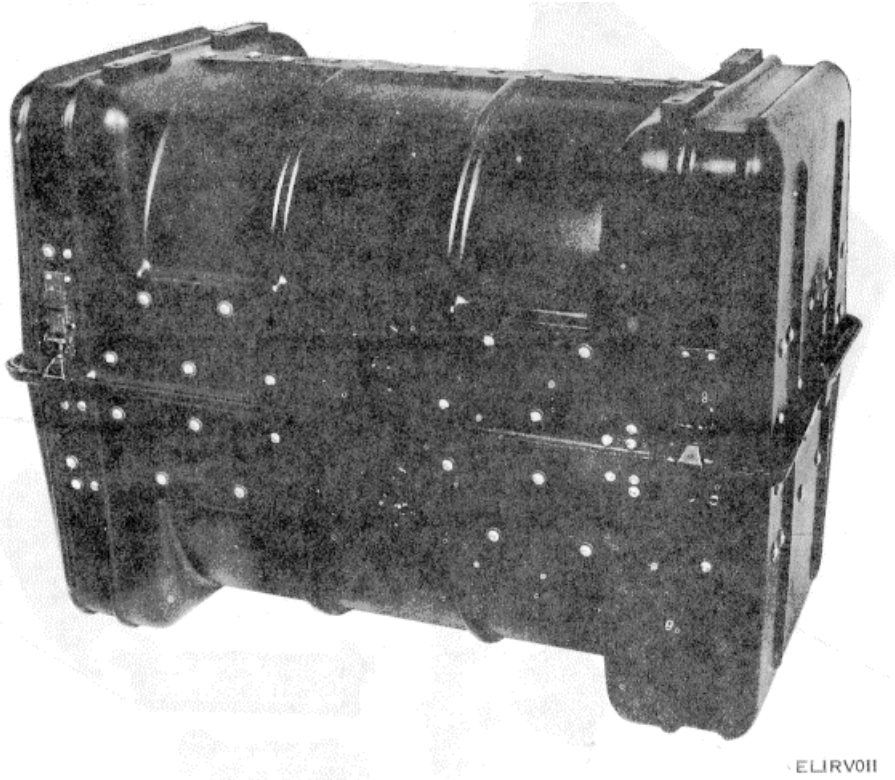


Figure 1-11. Storage container assembly SM-C-574240

in a bar scan search mode until a satellite is acquired, and then locks on the satellite by the auto track from the beacon demod. When the antenna is locked on the satellite, it continues to track automatically. A manual mode for tracking the satellite is also provided.

(5) In semi-permanent modes (AN/TSC-54 used with the AN/TCC-79) equipment operation is the same as 1 through 4 tactical modes except the AN/TCC-79 is used to complete the communications link to provide greater voice and teletype writer channel capabilities. A 70 MHz signal from the down converter is applied to the AN/TCC-79 demodulator through AN/TSC-54 interconnecting cables. The demodulated composite is further processed through the AN/TCC-79 demultiplex circuits. The demultiplexed voice and teletypewriter signals are routed through the AN/TCC-79 to their respective users. For a detailed analysis of the AN/TCC-79 refer to IM 11-5895-796-12-3 (available at Satellite Communications Agency, Ft. Monmouth, NJ). f. The AN/TSC-54 transmitter and receiver are operated at different frequencies; therefore, simultaneous transmission and reception is possible, and signals from the satellite may be received on one of the communications channels.

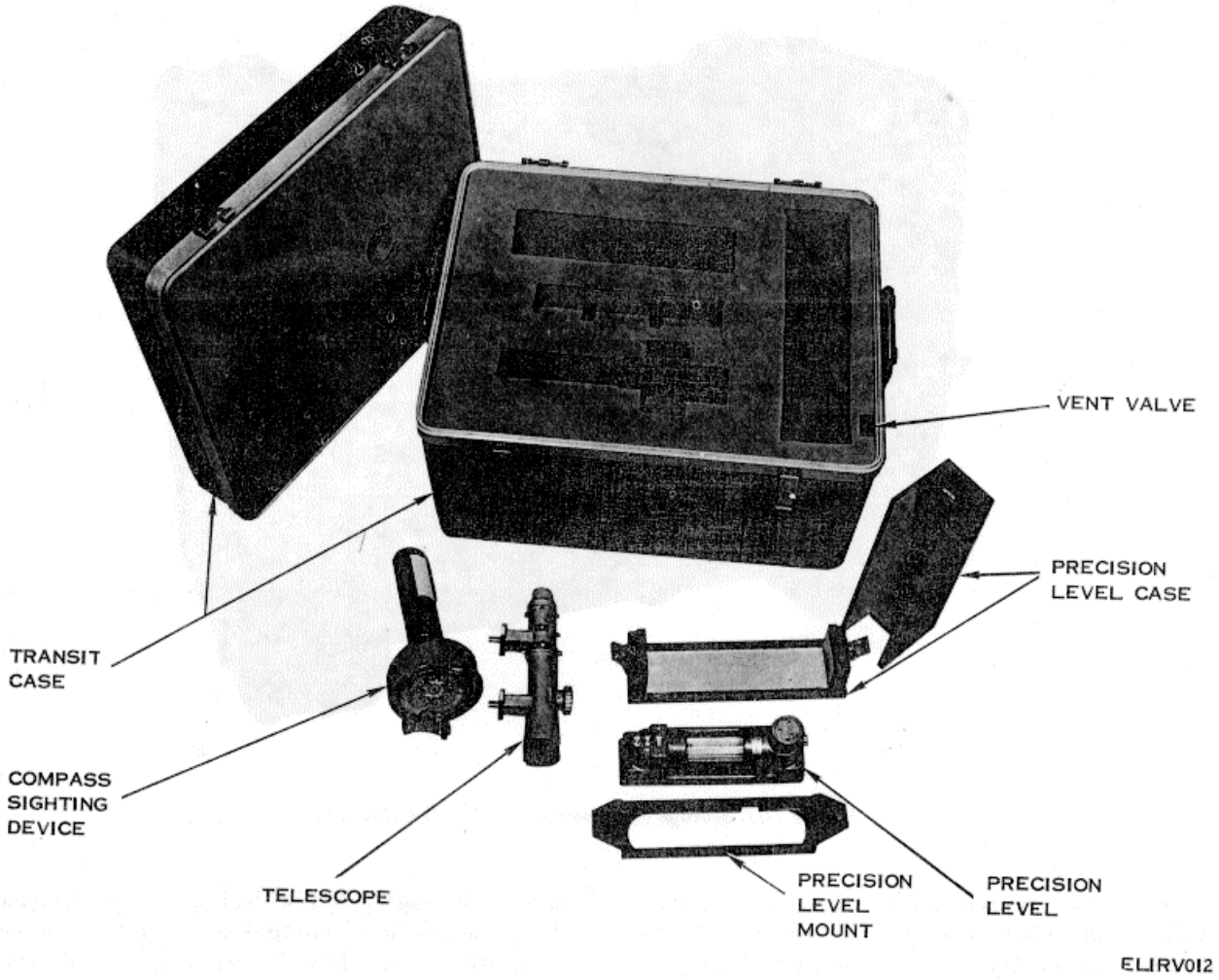


Figure 1-12. Storage container assembly SM-C574241.

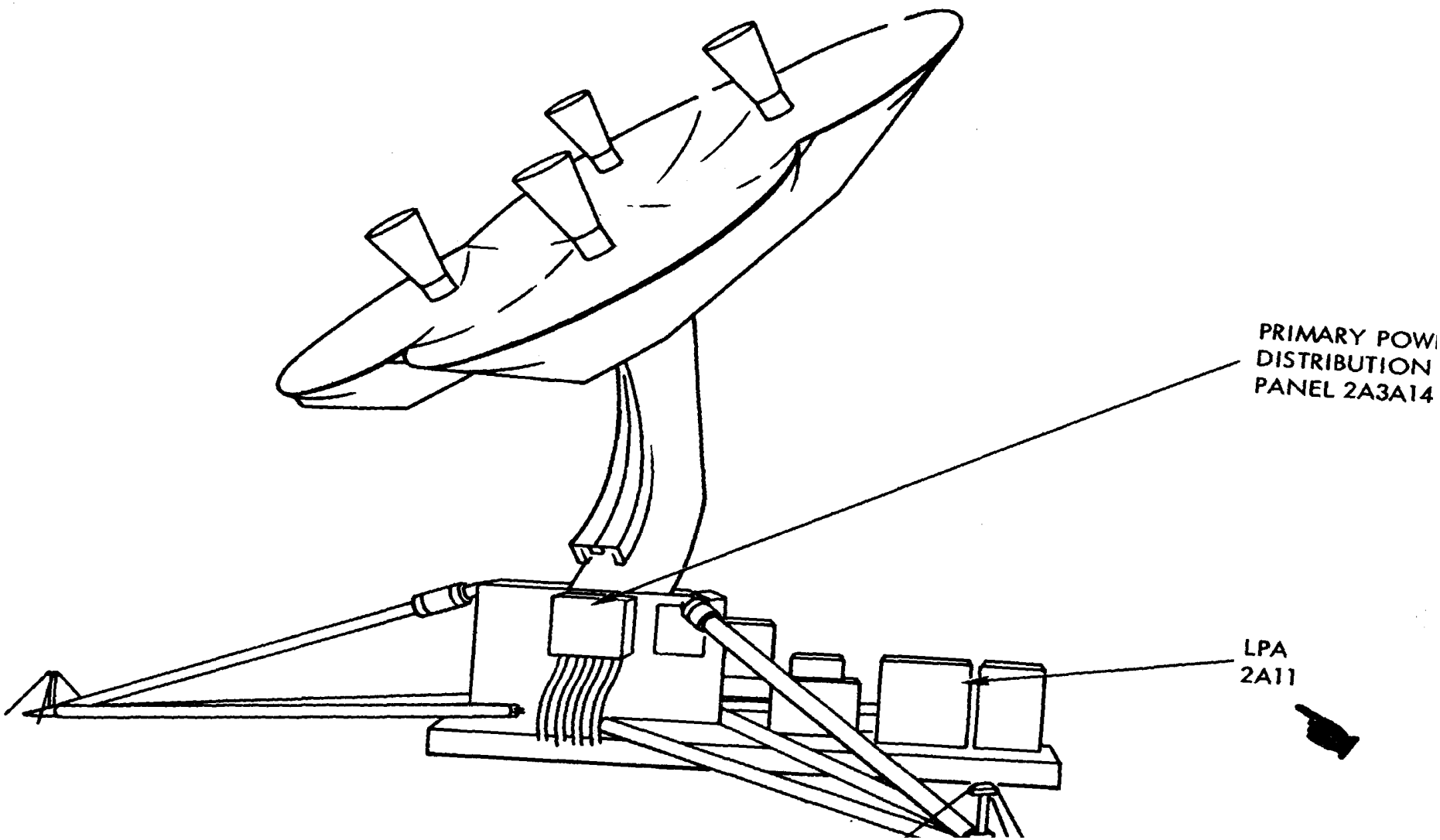
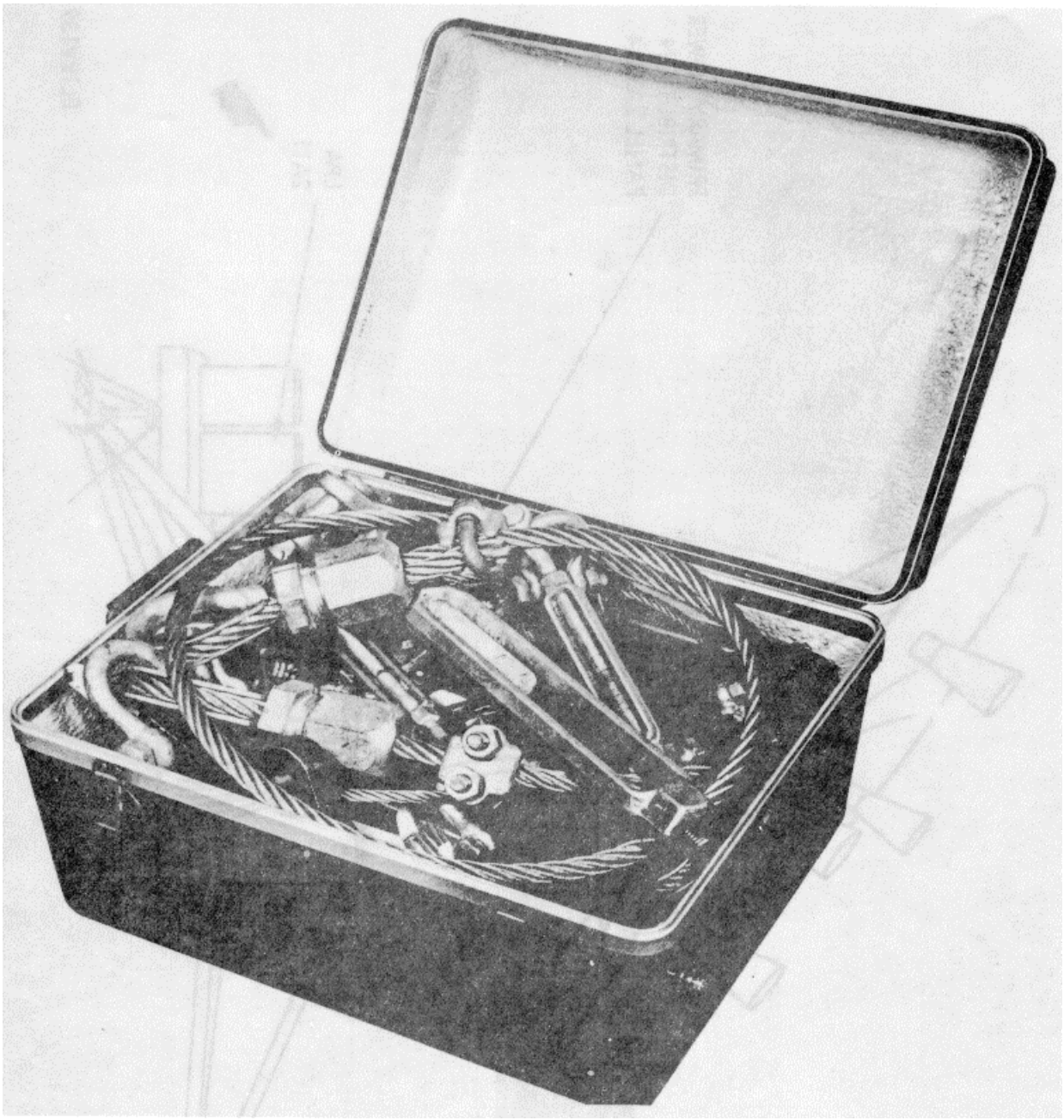


Figure 1-9(2). Antenna-receiver-transmitter group OA-8244/TSC-54 (sheet 2 of 2).



F5N5120-540-2343	5-TON HYDRAULIC JACK	SM-C-573526	GROUND ANCHOR
SM-C-569839	RIGID SHAFT COUPLING	SM-C-573532	GROUNDING CABLE
SM-A-5717I33101	COUPLING	SM-C-573541	TENSION INDICATOR
SM-A-571733-102	DRIVING STUD	SM-C-573562	GROUND CLIP
SM-A-571733-103	CLAMP	SM-A-573969-1	ELECTRIC DRILL
SM-C-571991	GROUNDING CABLE	SM-C-574008	WRENCH
SM-B-572310	SPECIAL BOLT	SM-C-574066	LIFTING CABLE
SM-D-572619	CRANK HANDLE	SM-C-574081	DIPSTICK
SM-D-573048	400/60 CPS CONVERTER	SM-C-574140	DRIVING HEAD
SM- D-573158	LIFTING BRACKET	SM-A-574160-1	HEXAGONAL WRENCH
SM-D-573394	LIFTING CABLE		

Figure 1-13. ELI RV013

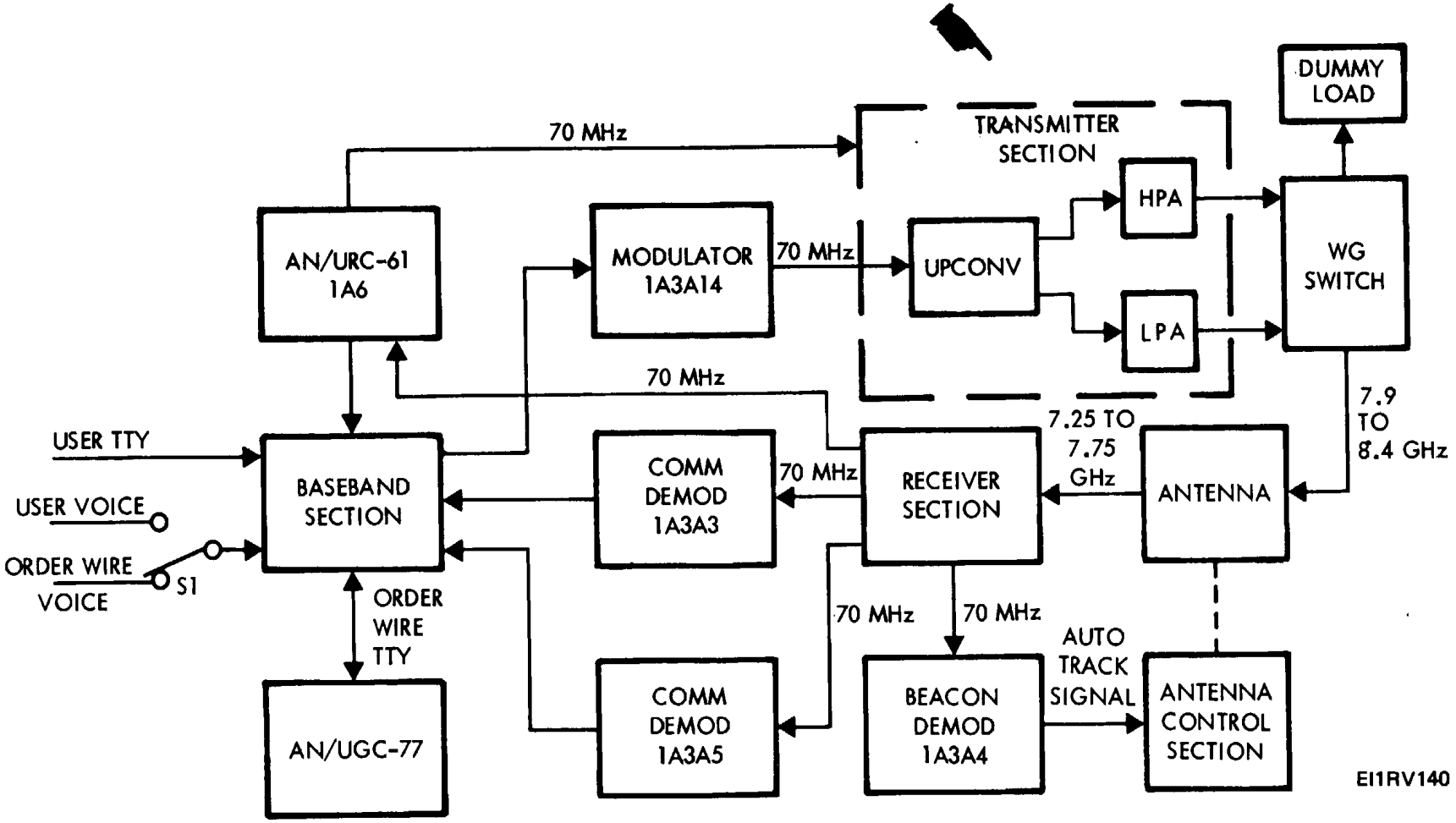


Figure 1-14. AN/TSC-54, simplified block diagram.

CHAPTER 2

SERVICE UPON RECEIPT AND INSTALLATION

Section I. SERVICE UPON RECEIPT OF EQUIPMENT

2-1. a. The configuration of Satellite Communication Terminal AN/TSC-54 depends on the particular mode of transportation used. The major units of the AN/TSC-54 should have their dolly sets and wheels installed when towed in over terrain or flown in by a C-130E aircraft. However, when airlifted by helicopter, the equipment shelter (unit 1) and the antenna-receiver-transmitter group (unit 2) should be set down at their approximate operating positions with their dolly sets removed.

b. The AN/TSC-54 is designed as a ready-to-go system; therefore, detailed unpacking procedures do not apply. Instructions for removing equipment from the carrier and for siting and installing the equipment are given in section II of this chapter.

2-2. Checking Delivered Equipment

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

b. Check to see that the delivered units have their full complements of normally stored equip-ment, tools, transit cases, and accessories as listed paragraph 1-6. Report all discrepancies in accor-dance with TM 38-750. Place equipment in service even though a minor assembly or part that does not affect proper equipment functioning is miss-ing.

c. If the equipment has been used or reconditioned, see whether it has been changed by a modification work order (MWO). If the equipment has been modified, the MWO number should appear on the front panel near the nomenclature plate. Check to see whether the MWO number (if any) and appropriate notations concerning the modifications have been written into the equip-ment manuals.

NOTE

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

d. Visually inspect the diesel fuel drums for evidence of damage or leakage. Move damaged fuel drums clear of the immediate working area; position the fuel drums to minimize the leakage.

e. If the shelter skin has been punctured during transportation to the site, patch the punctures as soon as possible to prevent moisture from seeping into the laminated panels of the shelter.

2-3. General Siting Considerations

The location for operation of Satellite Communications Terminal AN/TSC-54 depends on the tactical situation, terrain, proximity and direction of enemy positions, and other local considerations. A typical terminal layout, with dimensional data, is shown in figure 2-1. When selecting a site, consider the following requirements:

a. The need to place the units where they cannot be readily seen or affected by enemy electronic countermeasures.

b. The desirability of unobstructed line-of-sight positioning of the antenna with respect to orbital paths of all available and active communication satellites.

c. Easy access to messenger service and terminal support vehicles.

d. Adequate supply of coolant water for opera-tion of the generator sets.

e. The necessity for a relatively clear area large enough to accommodate the three units within allowable cable lengths; a supporting ground surface that is sufficiently firm, level, and well drained; and nearby terrain or vegetation growth features that can be used to protect the equipment from direct exposure to snow, dust, rain, and wind during inclement weather.

f. Because of the lengths of power and signal interconnecting cables, the maximum distance that may exist between the terminal equipment and the associated power equipment is a major consideration. To obtain the most efficient use of cable lengths, the cable runs should be planned in detail before the equipment is installed.

g. Avoid locating the equipment near electrical interference sources such as radar sets, field hospitals operating X-ray and diathermy equip-ment, and power transmission lines.

h. The site area selected for placement of the AN/TSC-54 should have a diameter of at least 100 feet, or larger, to permit towing and vehicular movement.

2-4. General Installation Instructions

a. If the AN/TSC54 is to be located at a fixed communication site, select a level and dry area with firm ground and good drainage. When positioning the equipment shelter, tie a ½ inch rope (at least 15 feet long) to each of the two rear towing eyes, and position a man at each rope to

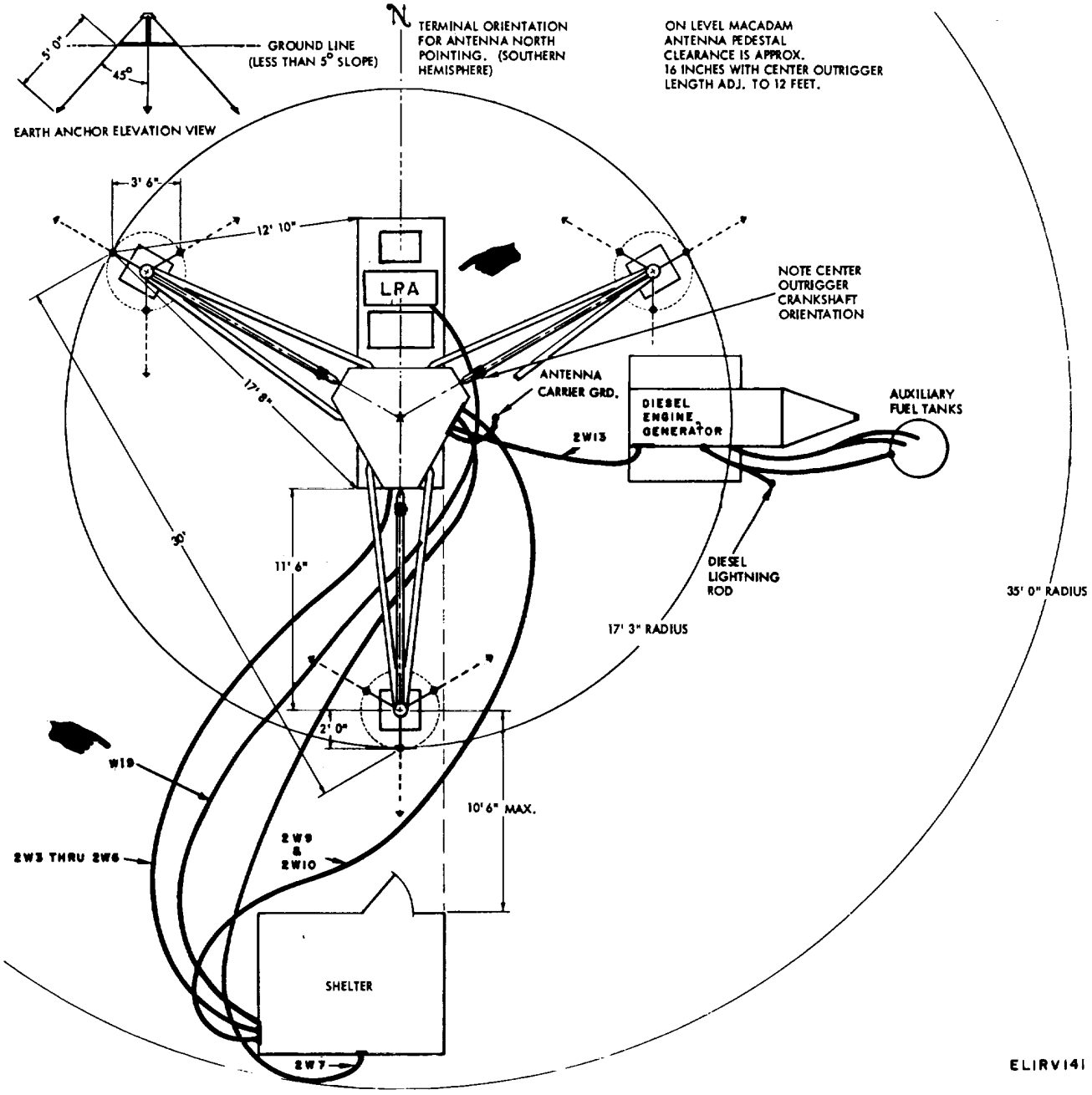


Figure 2-1. Site layout dimensional

guide the shelter as it is lowered into position.

b. If the equipment shelter is to be loaded on a truck, use the sling and tiedown assembly to secure the equipment shelter in position in figure 2-2.

NOTE

Tighten all of the turnbuckles in the sling assembly at the same time to prevent twisting of the shelter in the truck body.

(1) Slide 2 X 4 boards between the rear shelter wall and the cab side of the truck bed to protect the towing eyes of the shelter and the cab side of the truck bed.

(2) If the shelter skin is punctured during loading or securing operations, patch the punctures as soon as possible to prevent moisture seepage into the laminated panels of the shelter.

c. It may be necessary or desirable to install a sun shield (tarpaulin) on the equipment shelter when operating in warm climates. It may also be

desirable to install a, canvas covered walkway between the equipment shelter and the antenna-receiver-transmitter group. Installation of a can-vas covered walkway follows standard canvas tent procedures and minor modification to the exterior of the shelter will have to be made to utilize the sun shield. Install the sun shield on the equipment shelter as outlined in (1) through (5) below.

(1) Secure the bracketry to the equipment shelter and insert the eyebolts into the rivnuts.

(2) Spread the tarpaulin over the shelter and insert the bracket ends into the grommets on one side of the shelter only.

(3) Secure the tie ropes to the eyebolts, allowing the bracket to set up at an angle of approximately 45°.

(4) Insert pins into the grommets on the other side of the shelter and pull the tie ropes through the eyebolts until the tarpaulin is taut.

(5) Secure all tie ropes.

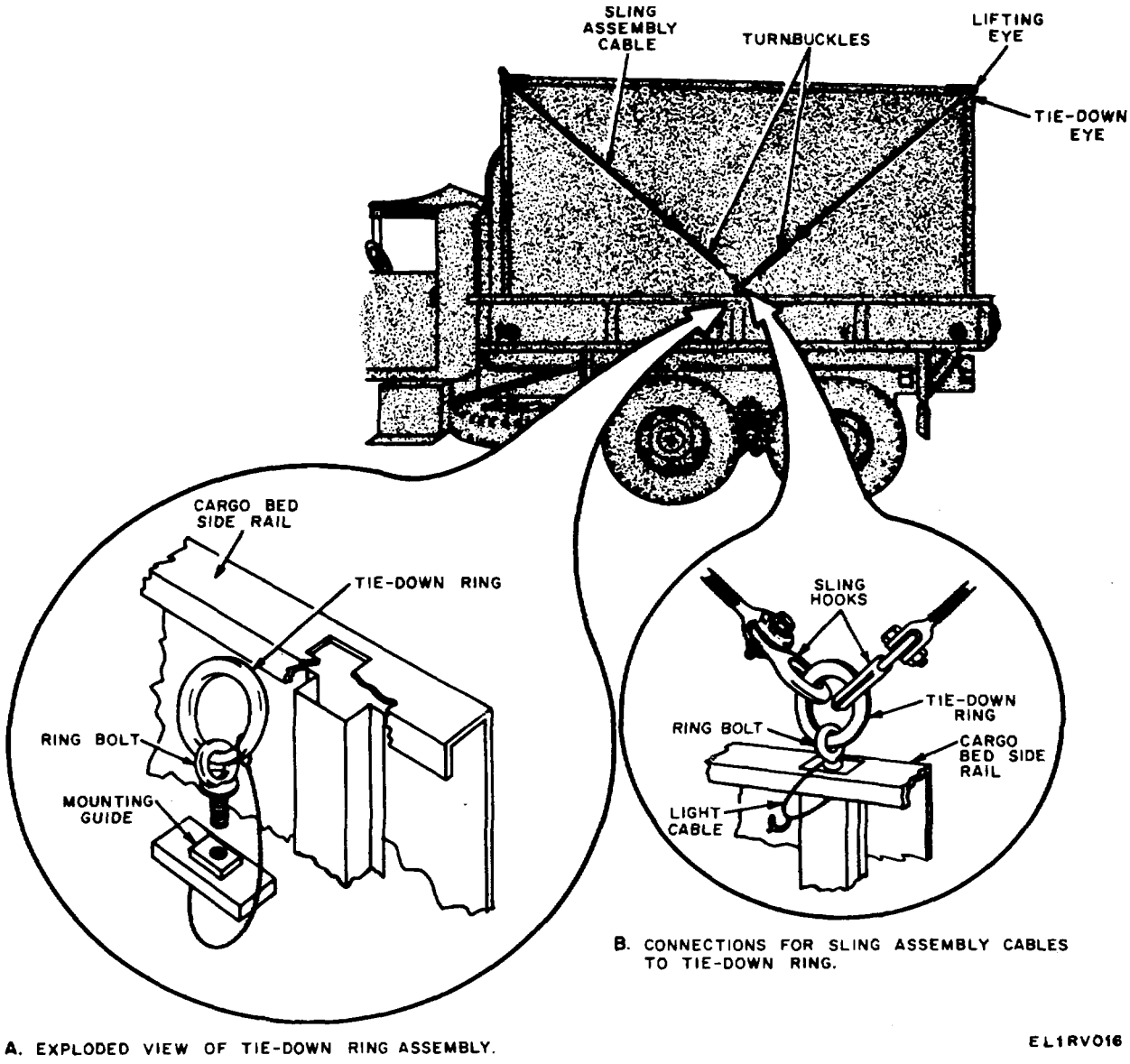


Figure 2-2. Equipment shelter secured in place on truck.

2-5. Unloading Equipment from Helicopters

The unloading procedures of helicopter trans ported equipment are readily apparent upon visual inspection. Refer to the appropriate technical manual (app A) for detailed unloading instructions.

Section II. EQUIPMENT INSTALLATION

2-6. Tools, Test Equipment, and Materials Required for Installation

a. The AN/TSC-54 is self-contained; therefore, all tools, test equipment, and materials required for installation are carried with the terminal. These items are stored in transit cases, storage compartments, or are secured in mounting fixtures on the units. The antenna-receiver-transmitter out-rigger assemblies are shipped with the equipment shelter. All other items required to install the antenna are stored with the antenna group. Figure 2-3 shows the storage arrangement on the antenna group and figure 2-4 shows the special tools that are required for installation.

b. Five transit cases are strapped to the floor in the equipment shelter and contain test equipment and other items required to maintain the terminal. A sledge hammer for driving, ground rods and earth anchors is carried inside the shelter door; an axe is also provided for siting the equipment.

c. A generator set such as the PU-401/M must be provided for ac power of 45 KW, 3, 400 Hz, 120 vac line to neutral. All tools for installing the generator set are carried with the terminal except the special wrench, for connecting the primary power cable, which is attached to the generator set.

2-7. Manpower Requirements

A six-man crew, including the supervisor, is required to install the AN/TSC-54. Only three men are required for terminal operation. With an experienced crew, the AN/TC-54 can be installed within 2 hours after delivery. Close monitoring and directing of the operation by the supervisor will assure maximum utilization of manpower.

2-8. Situating Equipment

Normally, the sequence of unit arrival is not critical because preliminary installation of each unit does not depend on the immediate access of the other units. If a priority is established, the equipment shelter should arrive first, because it contains the outriggers and the sledge hammer. The shelter can be followed by the antenna group and diesel generator set because most of the mechanical assembly can be performed while waiting for the application of primary power. The AN/TSC-54 is essentially a ready-to-go system; unpacking is performed in conjunction with the installation. Installation information for the LPA is provided in TM 11-5895-963-12/NAVELEX 0967-LP-592-7010/TO 31R5-2G-241.

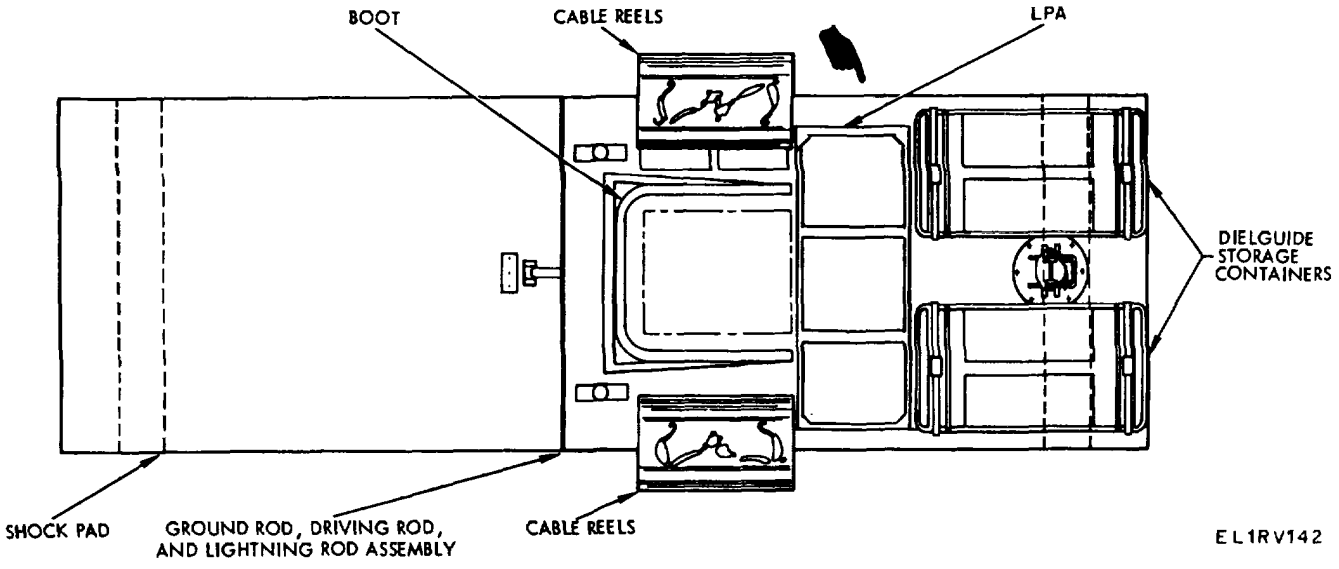


Figure 2-3. Change 1 2-4

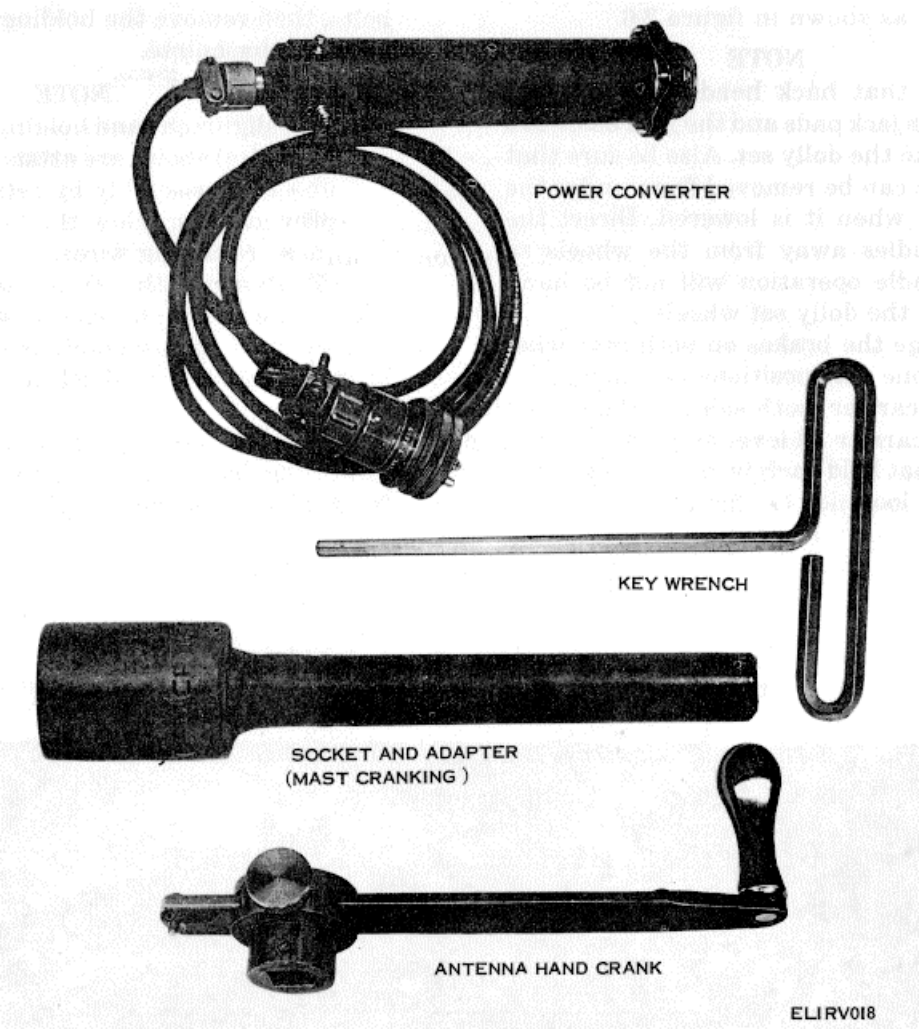


Figure 2-4. Special tools required for antenna group installation.

a. Place the complete system, with ancillary equipment, in the cleared site area. Align the antenna dolly set so that the towed end or lunette is toward true north in the northern hemisphere and away from true north in the southern hemisphere.

b. Position the equipment shelter about 30 feet from the rear of the antenna carrier with the door of the shelter facing the antenna. Position the generator set clear of the antenna and shelter, preferably at the edge of the site clearing to reduce area noise.

2-9. Storage of Equipment not in Use

Equipment not immediately required for operation of the AN/TSC-54, should be placed in the storage containers provided and stored in a convenient place.

2-10. Installing Antenna Group

a. Disconnect the airbrake hoses from the rear wheels of the antenna dolly set and disconnect the brake light cables. Coil the disconnected hoses and cables, and secure them to the right front wheel fender with the tiedown straps as shown in figure 2-5.

b. Loosen the shipping tiedown turnbuckles and remove the shipping tiedown assembly.

c. Remove the DIELGUIDE transit cases, the instrumentation box, equipment transit cases, and cable reels from the antenna carrier. Set the transit cases and cable reels about 20 feet from the antenna carrier to allow clearance for installation of the three outriggers (fig. 2-1). cd. Remove the front dolly assembly as follows:

(1) Remove the two hydraulic jacks from their transit case and place them under the front dolly set jack pads as shown in figure 2-6.

NOTE

Be sure that hack heads are centered under the jack pads and the jack bases are parallel to the dolly set. Also be sure that the jacks can be removed from under the platform when it is lowered. Direct the jack handles away from the wheels so that handle operation will not be hampered by the dolly set wheels.

(2) Engage the brakes on both rear wheels.

(3) With one man positioned at each jack, raise the antenna carrier (both sides at the same time, keeping the carrier as level as possible) until the three bolts that hold each front air shock absorber can be easily loosened (A, fig. 2-7).

(4) Unscrew the small alignment bolt until it is free of the carrier plate. Remove the two large bolts, then remove the holding pin from the shock absorber base plate.

NOTE

The alignment and holding bolts removed in step (4) above, are attached to the shock absorber assembly by retaining wires to prevent loss; allow the bolts to hang by these retaining wires.

(5) Remove the front shock absorbers by sliding the shock absorber toward the rear of the carrier until the assembly is clear of the holding brackets. Store the shock absorbers in a secure place.

(6) After the shock absorber assemblies have been removed, remove the two pins that hold the front axle to the carrier platform (B, fig. 2-7).

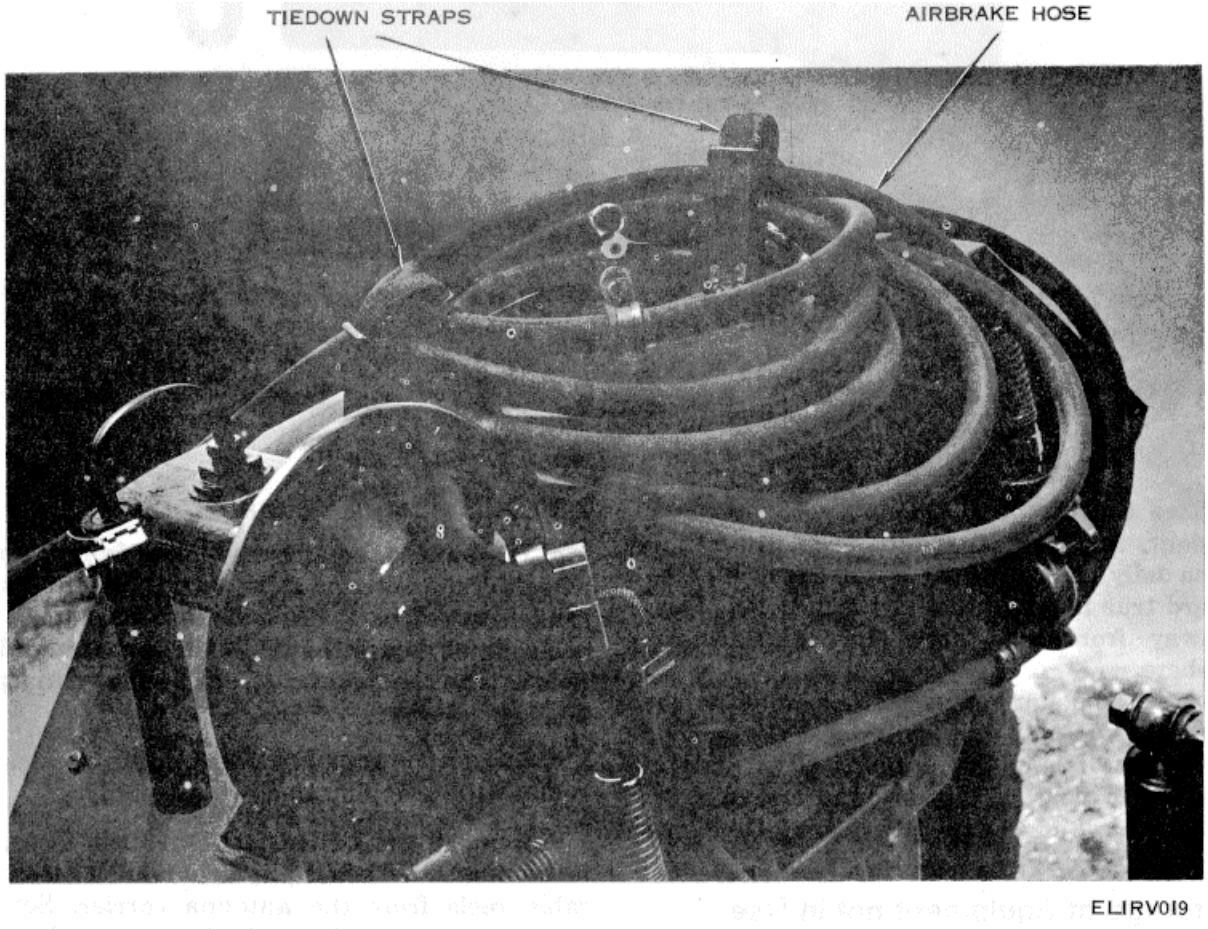


Figure 2-5. Antenna dolly set intervehicular cable storage location

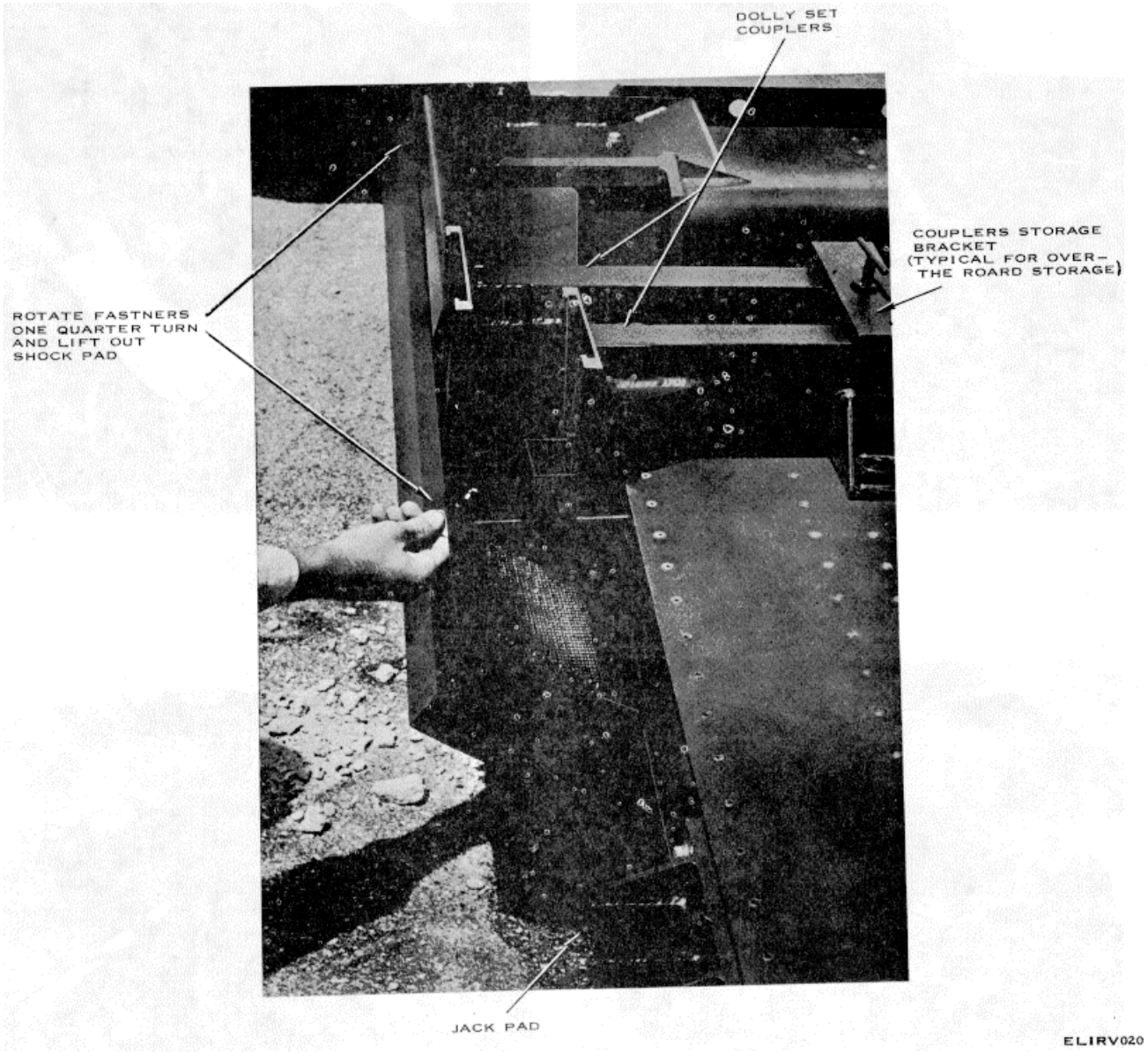


Figure 2-6. Antenna dolly set storage features and shock pad removal procedure.

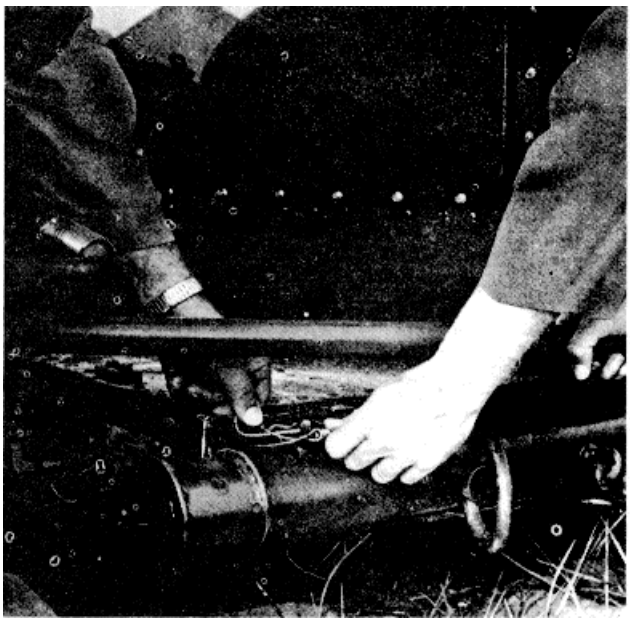
(7) Remove the front dolly set by pressing down on the axle until it clears the holding brackets (C, fig. 2-7). Be sure to pull the wheels straight out; roll the wheels clear of the carrier and store them with the shock absorber assemblies.

(8) Remove one shock absorber pad from the storage clamps on the side of the carrier (fig. 2-6) and attach it under the front end of the carrier. The dashed lines on figure 2-3 show the functional position of the two shock pads. Position the shock pad with its honeycomb side facing up.

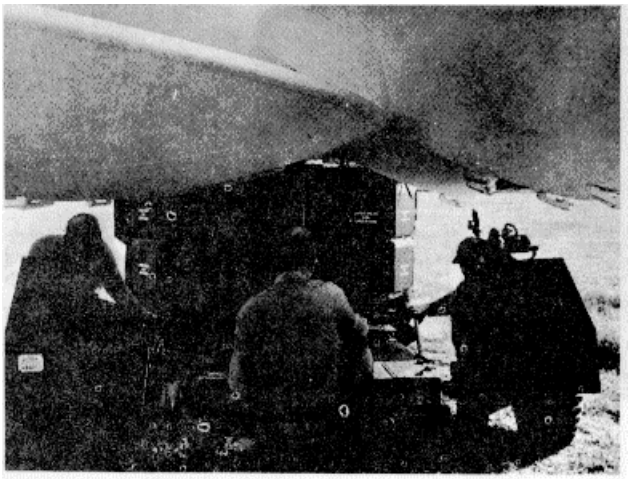
WARNING

Failure to lower the platform evenly may cause the antenna pedestal to slip sideways and damage the equipment or cause serious physical injury.

VIEW A



VIEW B



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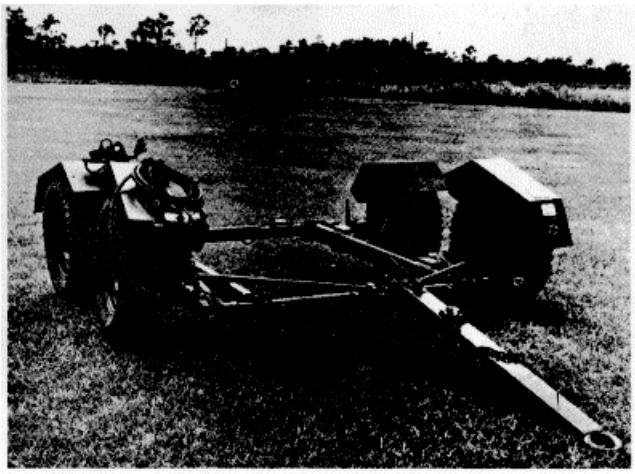

VIEW D

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Figure 2-7. Antenna dolly set removal procedures.

(9) Release the hydraulic pressure valve on the jacks and lower the platform evenly and gently into the shock pads; remove the jacks.

e. Remove the rear dolly assembly as follows:

(1) Move the two jacks to the rear of the antenna carrier and in the same way as for removing the front assembly, place the jacks under the rear platform jack pads.

(2) Release the brakes on both rear wheels.

(3) With a man positioned at each jack, raise the rear end of the carrier (both sides at the same time, keeping the carrier as level as possible), until - the three bolts that hold each of the rear shock absorbers can be loosened.

(4) Unscrew the small alignment bolt until it is free of the carrier. Remove the two large holding bolts and the shock absorber retaining pin.

(5) Remove the rear shock absorber assemblies by sliding them forward until they clear the holding brackets. Store these assemblies with the dolly sets.

(6) Remove the two pins that hold the rear axle assembly to the carrier.

(7) Remove the rear dolly set by pressing down on the axle until it clears the holding brackets. Roll the wheels straight out and clear of the carrier, and store them with the other removed assemblies.

(8) Remove the second shock pad from the side of the platform and attach it under the rear of the platform. Position the shock pad with its honeycomb side facing up.

WARNING

Failure to lower the platform evenly, may cause the antenna pedestal to slip sideways and damage the equipment or cause serious physical injury.

(9) Release the hydraulic pressure valve on the jacks and lower the platform evenly and gently onto the rear shock pad.

(10) Free the hydraulic jacks and move them back under the front platform jack pads. The jacks are now in position for raising the platform as needed to facilitate the attachment of the outriggers.

(11) Remove the driving rod, six 5-foot grounding rod sections, and the lightning rods from under the heat exchanger.

(12) Obtain the dolly set couplers from the storage brackets on the carrier platform (fig. 2-6).

(13) Secure the two dolly assemblies together with the dolly set couplers, (D, fig. 2-7).

2-11. Installation of Outriggers

Install the outriggers as follows:

a. Unfasten the outrigger storage clamps on top of the shelter and remove the nine outrigger sections.

b. Use at least two men and move a center outrigger section (a section with a ground pad and jackscrew) to each of the three locations around the pedestal; place each section on the ground with the ground pad end pointing outward.

NOTE

Be sure to locate the center outrigger sections correctly. The orientation of the jackscrew on one of the outriggers is reversed as shown in figure 2-1.

c. Locate the remaining two outrigger sections for each center outrigger.

d. Inspect all the quick-release pins and swivel bushings to be sure they are free of dirt and rust, and are lubricated.

e. Obtain the handcrank from its storage place in the transit case.

f. Station two men on each side of the first center outrigger to be attached.

g. Raise the inboard end of the center outrigger up to the slot in the pedestal pickup point and, when properly aligned, secure it in place with the attached quick-release pin.

NOTE

After installing a quick-release pin, secure it by putting the handle at a right angle to the pin shaft; to release, turn the handle parallel to the pin shaft and pull outward.

h. Attach the two remaining center outriggers by repeating the procedure outlined in g above.

i. Use the handcrank (e above) and adjust the center outrigger jackscrews for minimum length.

CAUTION

When minimum length has been obtained, back off at least one turn of the handcrank to keep the gears from binding and to allow for ease of further adjustment. Never use an electric drill to retract or extend the outrigger jackscrew.

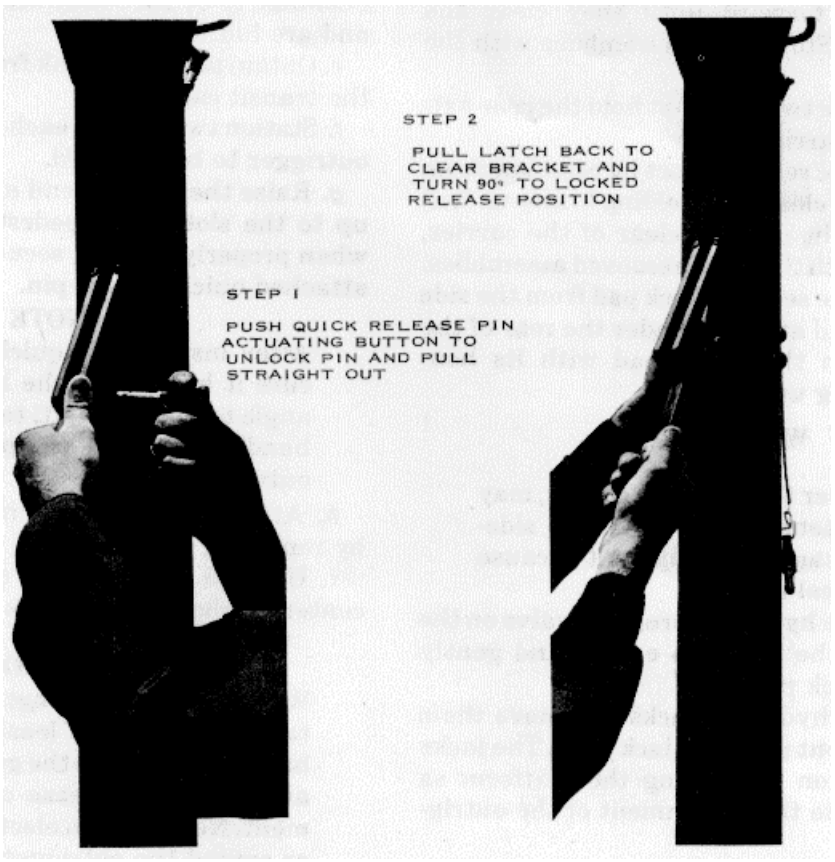
j. Attach the remaining six outrigger sections to the lower pickup points on the pedestal with the attached quick-release pins. With one man adjusting the ground pad assembly as necessary, attach the two lower outrigger sections to the ground pad assembly with the attached quick-release pins.

CAUTION

Do not extend or contract the center outrigger section jackscrew or allow the weight of the pedestal to rest on the outrigger pad until both lower outrigger sections are installed and secured. Undue stress will be placed on the center outrig- ger pad coupling joint and cause it to rupture if this precaution is not followed.

k. After all sections of the outriggers are properly installed and secured with quick-release pins, use the handcrank on the center outrigger jackscrew and lower each outrigger assembly unit until the ground pad rests firmly on the ground. The weight of the pedestal should now rest on the outriggers.

l. Release the mast support post from the mast by pulling out the quick-release pin that holds the locking lever, and then pulling down and twisting the locking lever 90° (fig. 2-8, steps 1 and 2).



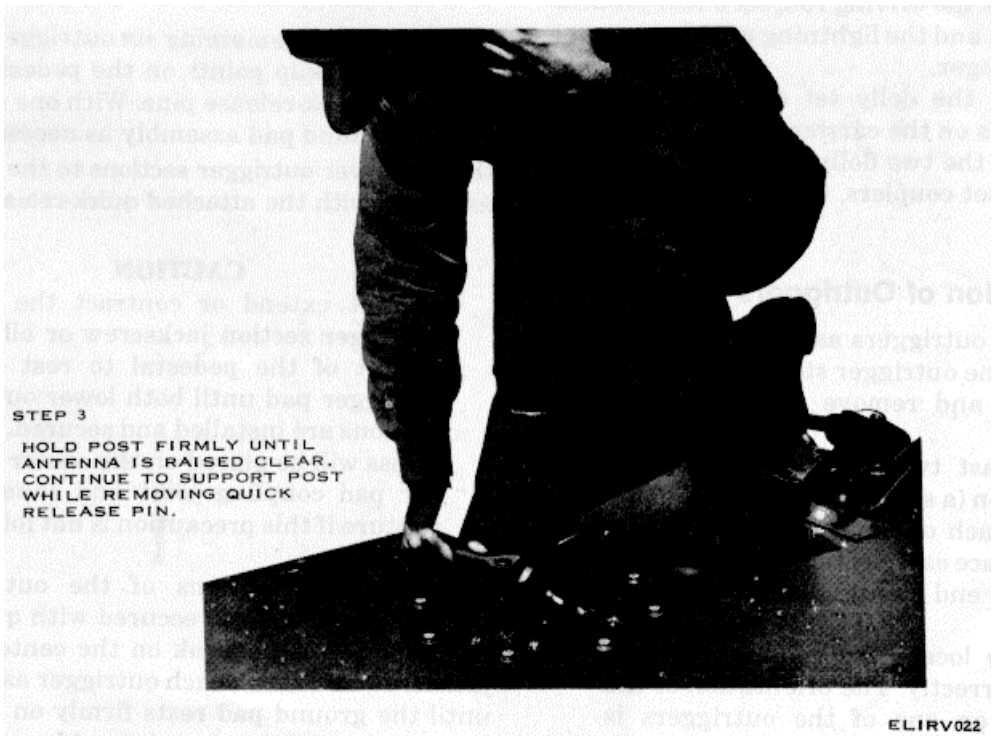


Figure 2-8. Antenna support post removal.

NOTE

If it is necessary to raise the platform slightly with the hydraulic jacks to release the three T-bar clamps, be sure that the weight of the pedestal remains on the outriggers and that the jacks are raised only enough to free the three T-bar clamps.

m. Release the three T-bar clamps that secure the pedestal to the platform.

n. If hydraulic jacks were required (m above), lower the platform onto the shock pads, remove the hydraulic jacks, and store them in the appropriate transit case.

o. With one man at each outrigger jackscrew crankhandle, raise the pedestal (continually keeping it level) about 2 inches above the platform.

NOTE

Rough leveling checks of the antenna can be made by using the level located on the pedestal base plate and by attaching the precision level (fig. 1-12) to the mount on the pedestal base plate (fig. 2-9). Never attempt to level the antenna while the earth anchors are securely tightened.

2-12. Grounding of Equipment

(fig. 2-10)

To reduce the hazard of electrical shock, the shelter, antenna-receiver-transmitter group, and the generator set must be properly grounded before connecting one to the other. Select sites for the ground rods that will not interfere with normal operation and maintenance of the generator set, entrance to the shelter, or with field wire or power and signal cables. Install the ground rods as follows:

a. Obtain the ground strap, couplers, driving stud, and clamp from the transit case.

b. Obtain two 5-foot grounding rod sections from the carrier. Assemble one coupler and driving stud on one of the grounding rod sections.

c. Attach the grounding strap to the ground lug on the side of the pedestal power distribution box, to indi-

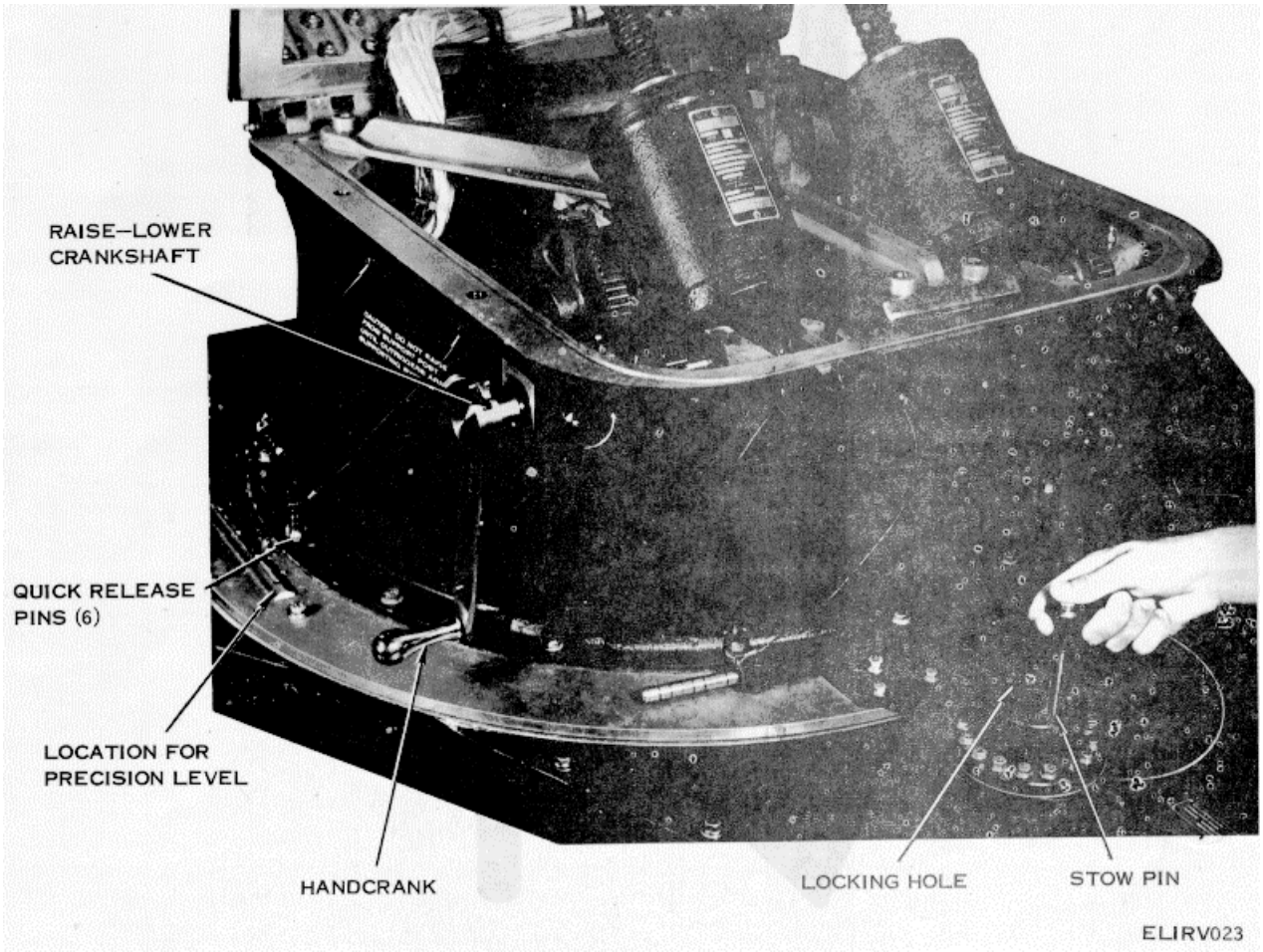


Figure 2-9. Mast mating.

cate an arc within which the grounding rod may be driven.

d. Use the sledge hammer and drive the first grounding rod into the ground; leave enough of the rod above ground level to allow for removing the drive bolt and attaching the second grounding rod section.

e. Remove the drivebolt, and screw in the second grounding rod section.

f. Screw on a coupling and drivebolt, and continue driving the grounding rod into the ground. Leave enough of the second section above ground level to permit installation of the ground strap.

g. Unscrew the drivebolt and the coupling from the grounding rod.

h. After inserting the end of the ground strap into the clamp, attach the ground strap and clamp to the top of the grounding rod.

i. Obtain two additional 5-foot grounding rod sections from the carrier. Assemble one coupler and driving stud on one of the grounding rod sections.

j. Attach the grounding strap to the E2 ground lug

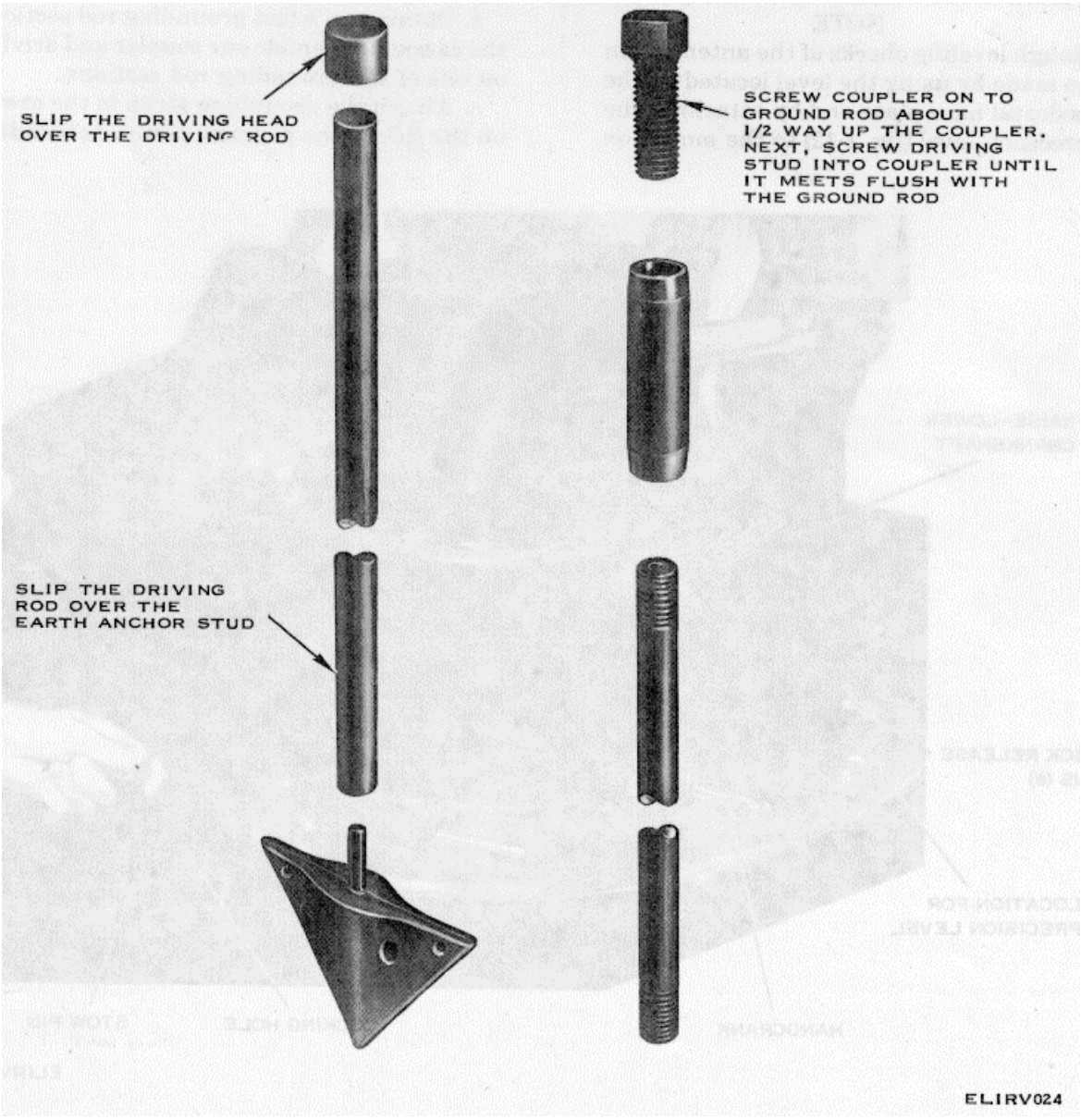


Figure 2-10. Typical ground rod and earth anchor driving hardware.

on the primary power distribution panel, to indicate an arc within which the grounding rod may be driven.

k. Repeat the procedures outlined in *d* through *h* above.

2-13. Installation of Generator Set Lightning Rod

Install the generator set lighting rod as follows:

a. Obtain the ground strap, couplers, driving stud, and clamp from the transit case.

b. Obtain two 5-foot grounding rod sections and two lightning rod sections from the carrier. Assemble one coupler and driving stud on one of the grounding rod sections (fig. 2-10).

c. Attach the grounding strap to the ground stud on the generator set (fig. 2-11) to indicate an arc within which the lightning rod may be driven.

d. Use the sledge hammer and drive the first grounding rod section into the ground; leave enough of the rod above ground level to allow for removing the drive bolt and attaching the second grounding rod section.

e. Remove the drivebolt, and screw in the second grounding rod section.

f. Screw on a coupling and drivebolt, and continue driving the grounding rod into the ground. Leave enough of the second section above ground level to allow for removal of the drivebolt and for attachment of the lightning rod.

g. Unscrew the drivebolt from the coupling.

h. Screw the two sections of lightning rod together.

i. Slide the grounding clamp onto the threaded section of the lightning rod.

j. Screw the lightning rod into the coupling.

k. Insert the grounding strap into the clamp, and tighten the clamp on the lightning rod to make positive electrical contact.

WARNING

High voltages are used in the antenna group. To reduce the hazard of electrical shock, be sure the antenna pedestal is properly grounded before being electrically connected to the generator set. Install the ground rod and ground strap before connecting the power cable between the generator set and the antenna pedestal.

NOTE

Cabling requirements are dependent upon the logistic support at the particular site. Refer to TM 11-5895-825-12 for the cabling required when the SA-1901/TSC-54 and CV-3061/TSC-54 are used with the AN/TSC-54.

2-14. Cable Connections

a. Each system cable is marked with an identify- ing wire (W) number and P1 and P2 connector designations. The cable connectors are conventional plug-in and screw-tight types.

b. Terminal lug connections on the generator set load box (fig. 2-12) are secured with the special wrench attached to the generator set. The connections are L1 to L1, L2 to L2, L3 to L3, and L0 to L0; the shield is connected to the ground stud on the generator set. Figures 2-13 through 2-15 show the cable connections between the antenna pedestal and the shelter.

c. Unreel the cables and connect them in accordance with figures 2-12 through 2-15 and the following cable list which identifies the terminations for each of the cable connectors.

d. Tighten the mounting brackets that secure the flexible waveguide between the LPA and pedestal.

Cable No., function, and length	Cable connector P1	Cable connector P2
W3 (scan pulse No. 1) 50’0"	Shelter servo and signal entrance panel J4.	Pedestal signal entrance panel J2.
W4 (scan pulse No. 2) 50’0"	Shelter servo and signal entrance panel J5.	Pedestal signal entrance panel J3.
WS (scan pulse No. 3) 50’0"	Shelter servo and signal entrance panel J6.	Pedestal signal entrance panel J4.
W6 (scan pulse No. 4) 50’0"	Shelter servo and signal entrance panel J7.	Pedestal signal entrance panel J5.
W7 (prime power) 50’0"	Pedestal primary power distribution panel J2.	Shelter primary power panel J13.
W9 (servo control) 50’0"	Shelter servo and signal entrance panel J12.	Pedestal primary power distribution panel J5.
W10 (comm. control) 50’0"	Shelter servo and signal entrance panel J11.	Pedestal primary power distribution panel J6.
W13 (prime power) 100’0"'	Pedestal primary power distribution panel J1.	Generator set load box terminals L1, L2, L3, L0 and ground stud.

Cable No., function and length	Cable connector P1	Cable connector P2
W16 (power meter) 50'0"	Pedestal signal entrance panel J8.	Shelter servo and signal entrance J24.
W17 (transmit) 50'0" (waveguide)	Shelter waveguide entrance panel CP1.	Pedestal waveguide entrance panel CP1.
W18 (receive) 50'0" (waveguide)	Shelter waveguide entrance panel CP2.	Pedestal waveguide entrance panel CP2.
W19 (remote control panel/LPA) 60'0"	LPA entrance J4.	Shelter servo and signal entrance panel J23.
2W20 (LPA RF input) 6'6"	Pedestal signal entrance panel CP3	LPA rf input 2A11CP11
2W21 (LPA control) 4'6"	Pedestal signal entrance panel J13	LPA entrance panel 2A11J3
2W22 (LPA power) 13'0"	Pedestal primary power distribution panel J16	LPA entrance panel 2A11J2
2W23 (LPA ground) 13'0"'	Pedestal primary power distribution panel E1	LPA entrance panel 2A11E1

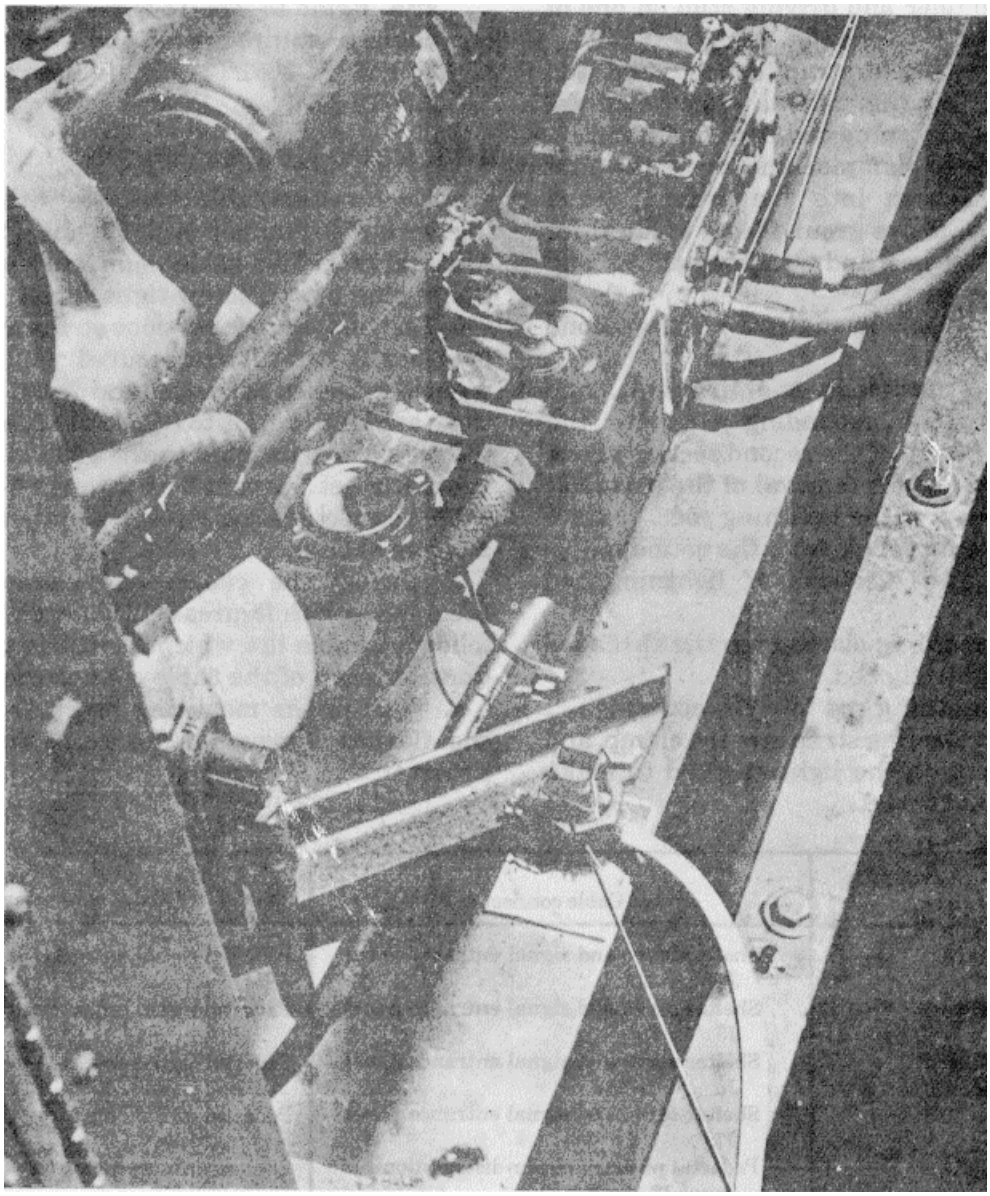


Figure 2-11. Typical generator set ground terminal connections.

CAUTION

Loose cable connections and fittings can be dangerous and can possibly destroy a cable. Special care must be taken to ensure that all cables are tightly secured. Double check all cable connections prior to switching on the generator set or applying power to the AN/TSC-54. Care must also be taken to protect cable runs from abrasions or damage by vehicles. Erect a barrier around the equipment cables if necessary.

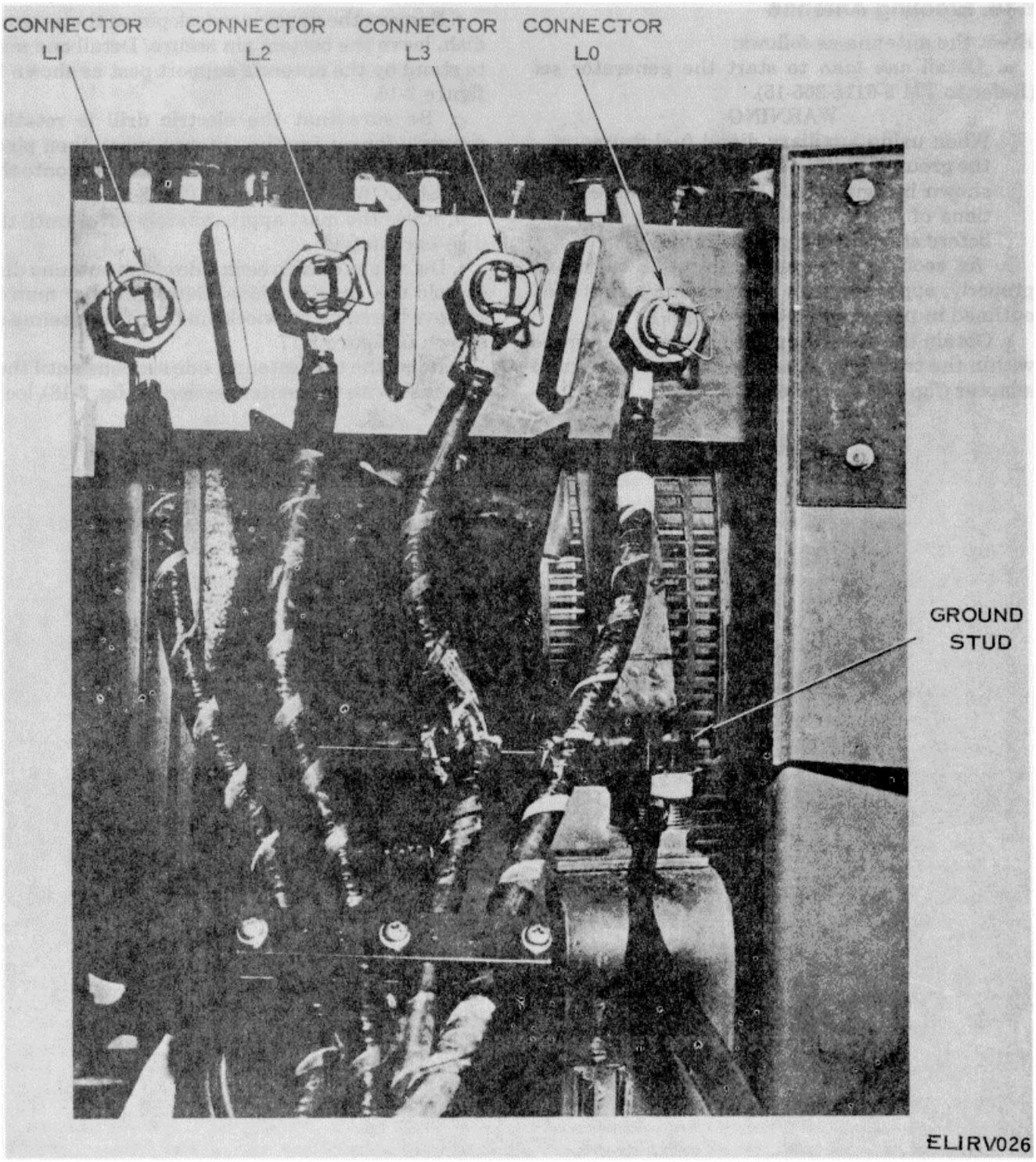


Figure 2-12. Typical generator set load box connections.

2-15. Signal Connections

Binding post connections for external telephone or telegraph communication circuit wires will be made in accordance with the requirements of the planned communication system at each individual AN/TSC-54 operating site.

2-16. Erecting Antenna

Erect the antenna as follows:

a. Detail one man to start the generator set (Refer to TM 5-6115-365-15).

WARNING

When using auxiliary diesel fuel drums, the grounding strap MUST be installed as shown in figure 2-1. Check both connec- tions of the grounding strap each time before starting the generator set.

b. As soon as the generator set is operating properly, apply power to the antenna pedestal as outlined in paragraph 3-6 *a* through j.

c. Obtain the electric drill from its storage space within the transit case, and install the socket and adapter (fig. 2-4) on the electric drill.

d. Plug the electric drill power cable into the ac-to-dc power converter; then plug the power converter into the convenience outlet on the antenna pedestal.

e. Remove the protective cover from the fold by removing the eight quick-release pins; store the cover in a convenient location.

f. Remove the upper stowlock pin on the antenna dish, leave the bottom pin secure. Detail one man to stand by the antenna support post as shown in figure 2-16.

g. Be sure that the electric drill is rotating properly for raising the antenna mast, then place the socket end of the electric drill adapter onto the RAISE-LOWER crankshaft (fig. 2-9).

h. Raise the mast approximately 60° or until the dish ears unfold.

i. Detail one man to each side of the antenna dish to hold the dish sections. Detail another man to remove the lower stowlock pin from the antenna as shown in figure 2-17.

j. Raise the two antenna side sections until they are flush with the center section (A, fig. 2-18), lock

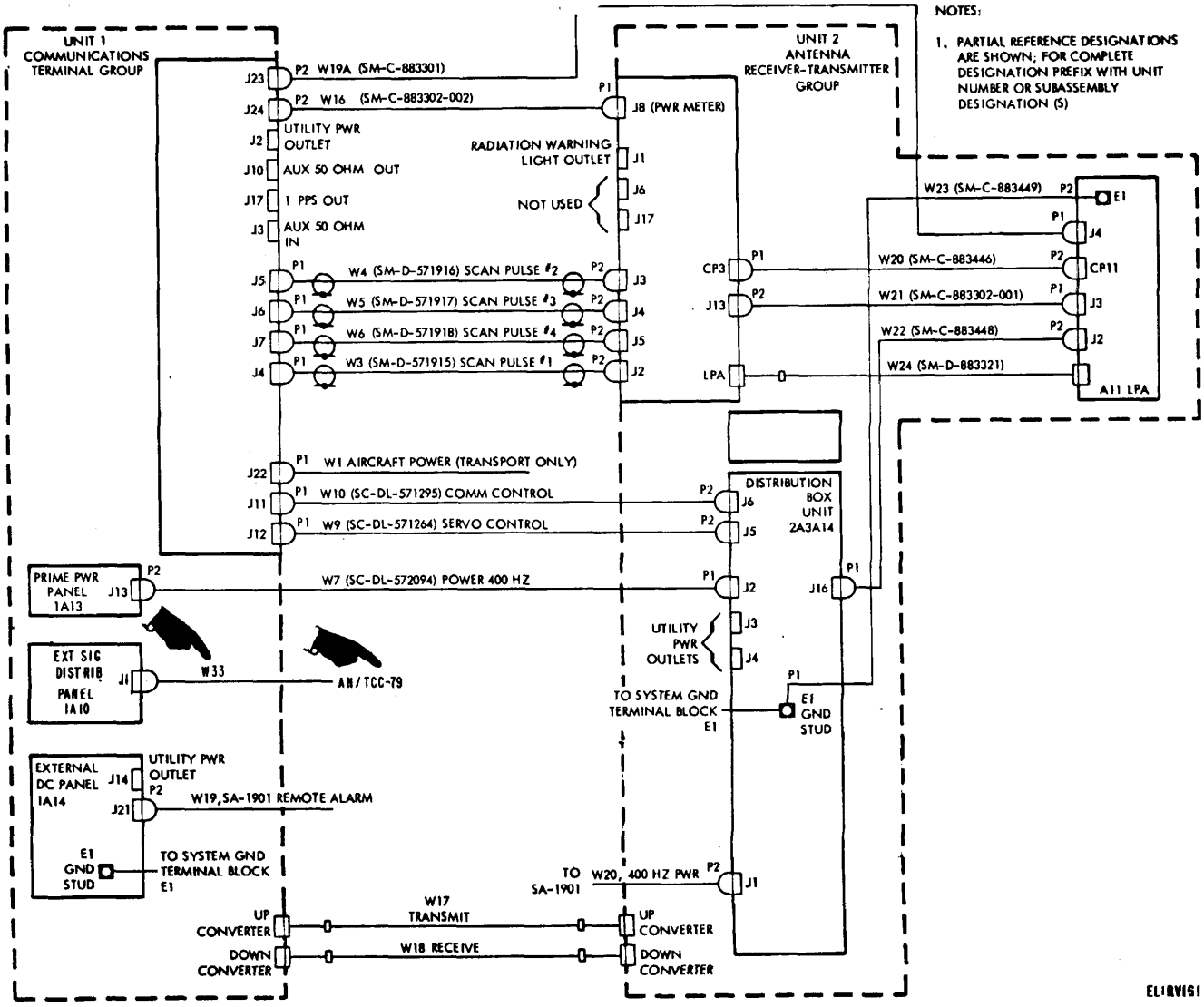


Figure 2-13. AN/TSC-54, cabling diagram.

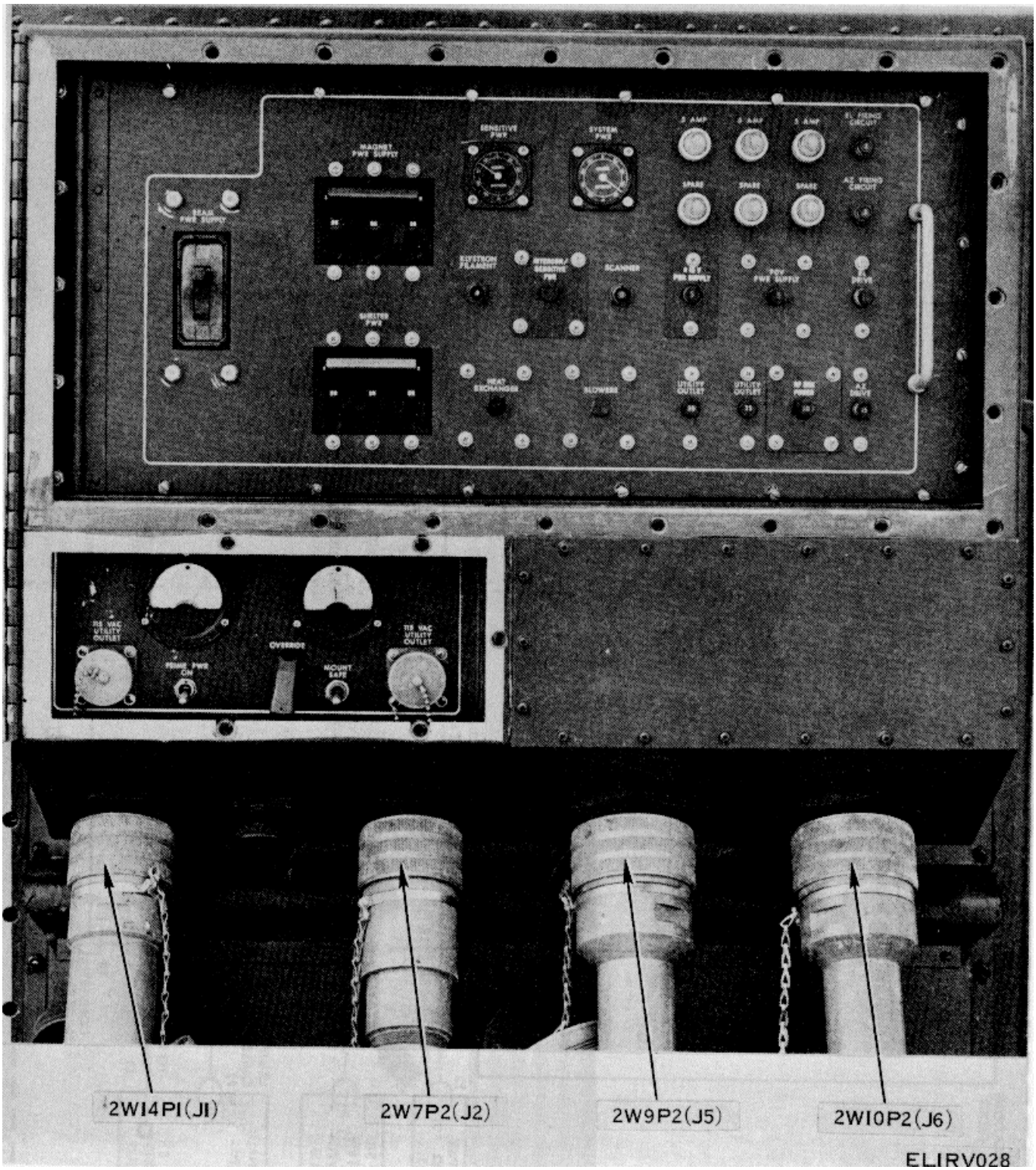


Figure 2-14. Primary power distribution panel (2A3A14) cable connections

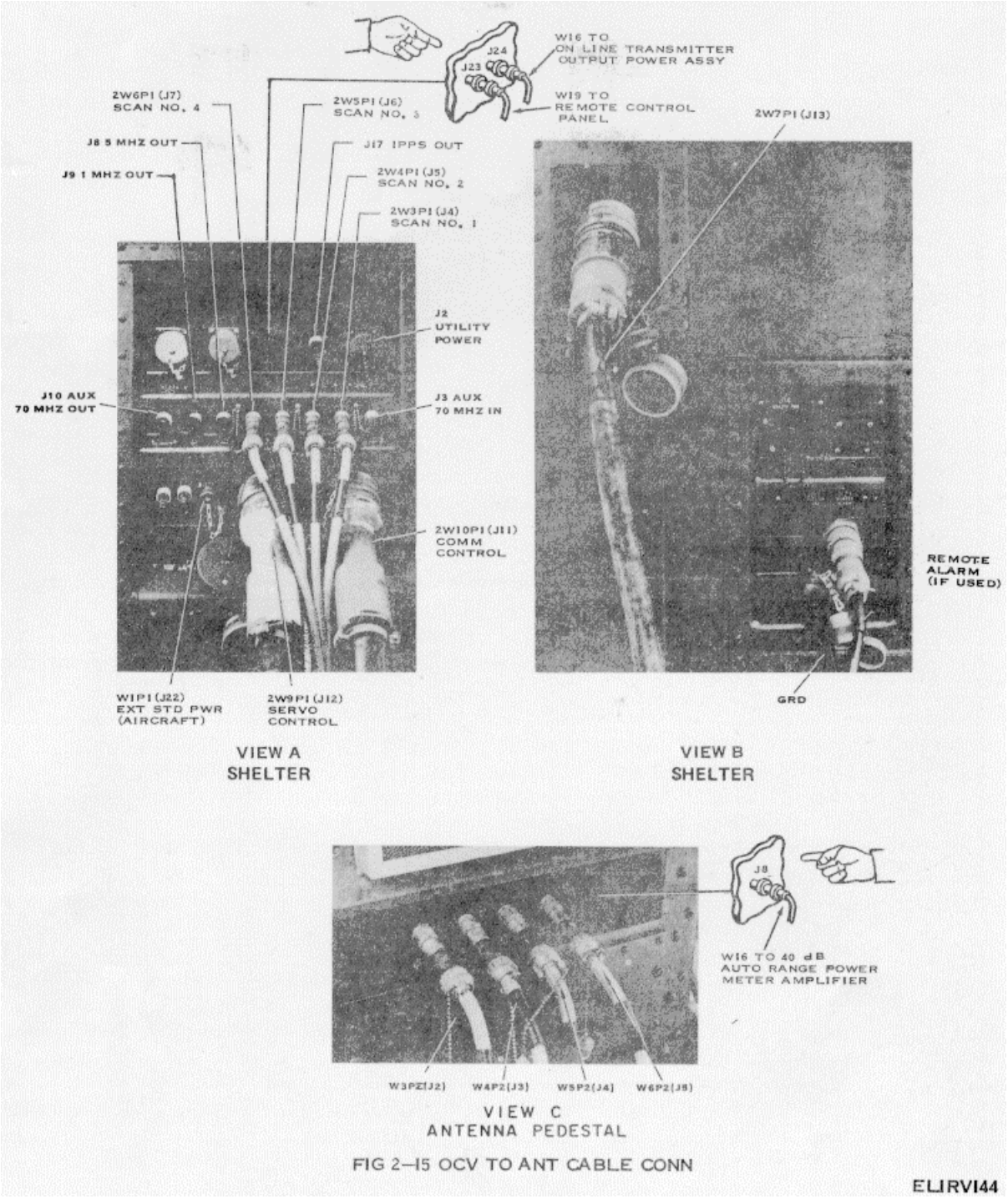


Figure 2-15. OCV-to-antenna cable connections.

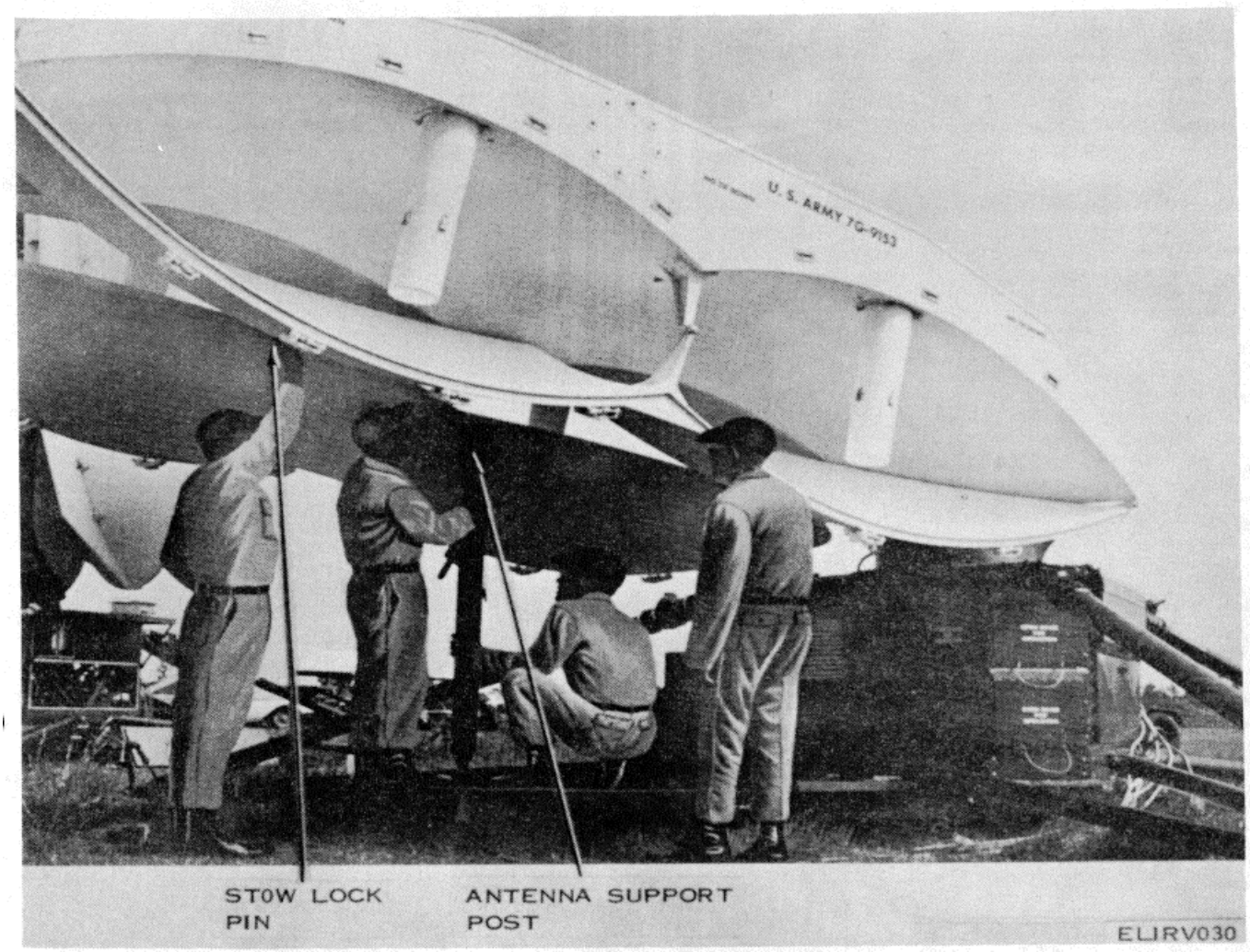


Figure 2-16. Mast raising for opening antenna side sections.

the side sections in the fully open position by securing the bottom latches on each side (B, fig. 2-18). Use the hexagonal wrench stored in stored container SM-C-574242 (fig. 1-13) to lock the key latches.

k. Reverse the electric drill rotation, and lower the mast To a horizontal position back onto the antenna support post.

I. Use the hexagonal wrench to lock the remaining key latches to complete securing the antenna sections in the open configuration.

m. Screw in the lightning rod on the top of the antenna dish (B, fig. 2-19).

n. Remove the electric drill from the RAISE-LOWER crankshaft and place it nearby in a safe place.

2-17. Installation of DIELGUIDE

Install the DIELGUIDE as follows:

CAUTION

When removing the protective canister, be extremely careful to prevent damaging the feed horn O-ring seals. Moisture will accumulate and cause damage to the wave guide if the O-ring seal is broken.

a. Remove the protective canister from each of the four feed horns by unlatching the four securing latches and carefully pulling down on the canister (A, fig. 2-19). The latches can be used to grip the canister dur-ing removal.

b. Obtain and position the two transit cases contain-ing the DIELGUIDEs close to the antenna.

CAUTION

Handle the DIELGUIDEs carefully; do not al-low them to become dented.

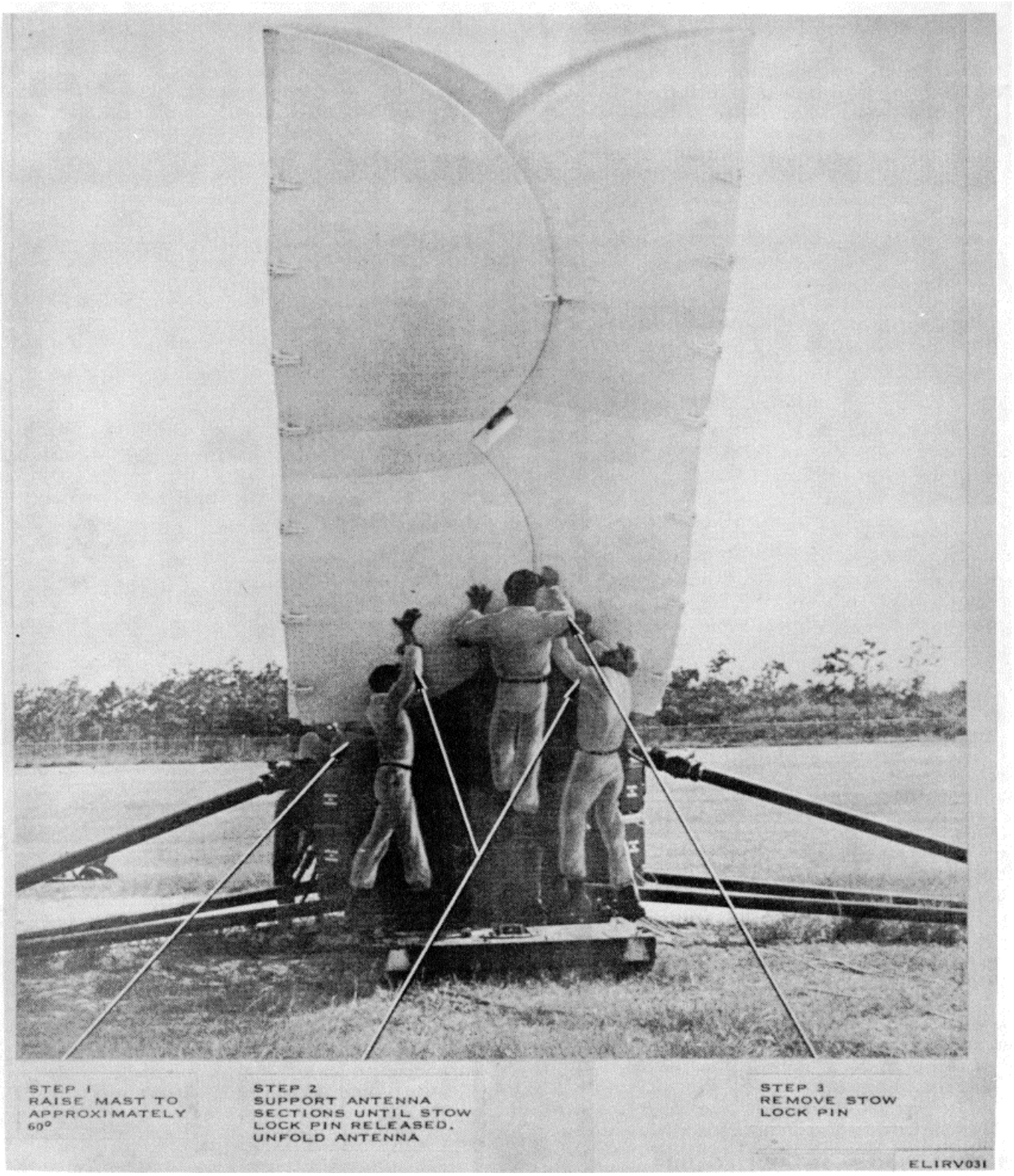


Figure 2-17. Antenna reflector unfolding.

CHAPTER 3

OPERATING INSTRUCTIONS

WARNING

Before operating the terminal, make certain that all safety requirements as listed in the front of this manual have been met. Injury or DEATH can result from improper or careless operation.

Section I. MODES OF OPERATION AND OPERATOR'S CONTROLS AND INDICATORS

3-1. General

This section describes the modes of operation and the function of the controls and indicators of Satellite Communications Terminal AN/TSC-54. Refer to the appropriate equipment publication (app. A) for detailed information concerning the controls and indicators of the communication equipment.

NOTE

When LPA and HPA are both off-line be sure that antenna is pointed away from satellite to prevent accidental accessing of satellite.

3-1.1. Modes of Operation

a. Pre-standby Mode. When the terminal is powered up for standby operation and an interlock is open, the terminal is automatically placed in the pre-standby mode. The STANDBY MODE CON-TROL switch/indicator on antenna control panel 1A2A5 (fig. 3-6) is extinguished as are all other mode control indicators, and power is removed from the antenna drive motors.

b. Standby Mode. When the terminal is powered up and all interlocks are closed, the terminal is automatically placed in the standby mode. The STANDBY MODE CONTROL switch-indicator is illuminated and power is applied to the antenna drive motors. The terminal is ready for normal operation.

c. Manual Mode. In manual mode, the antenna is operated manually to acquire and track a satellite, or to back the antenna out of electrical limits. The slew controls are used for coarse adjustments and the position rate hand wheels are used for fine adjustments. The antenna position is adjusted for a maximum reading on the signal strength meter.

d. Rate Augment Mode. This mode of operation provides a semi-automatic tracking capability when operating in the manual mode. In addition to moving the antenna manually using the POSITION RATE controls, the antenna is moved automatically in small increments.

e. Bar Scan Mode. This mode of operation is used during search and acquisition of a satellite. In bar scan mode, the antenna sweeps a specified sector about a point where acquisition is expected. The size and shape of the sector is adjustable between 0 and 5 degrees in both azimuth and elevation using the bar scan controls on the antenna control panel.

f. Acquisition/Auto-track Mode. This mode is the normal mode of operation, using the manual mode to manually position the antenna to directly face the satellite. When the antenna is facing the satellite, the SIGNAL DETECT indicator illuminates. Within 4 seconds, the BEACON TRACK ACQ and the PHASE LOCK indicators illuminate and the SIGNAL DETECT indicator extinguishes, indicating that acquisition of the satellite has been accomplished. When this occurs, pressing the ACQUISITION/ AUTO-TRACK switch/indicator causes the terminal to enter the autotrack mode and the antenna automatically tracks the satellite. If tracking of the satellite is lost, the terminal returns to the last mode that existed, before acquisition.

g. Forced Track Mode. This mode is used when the satellite tracking beacon signal fails. The communications signal with a high modulation index is used by the antenna control system to track the satellite.

h. Follow-Up Disable Mode. Prepares the terminal for a transfer of surveillance to a second satellite while continuing to track the first satellite.

i. Pencil Beam Mode. This mode is used only in the manual mode of operation and uses the satellite signal directly without the error modulation.

j. Narrow Beam Mode. This mode is used to improve the quality of a weak tracking signal or a signal containing extraneous noise.

3-2. Operations Control Van Controls and Indicators

The names and functions of the controls and indicators, of the various components and units located in the ocv shelter are shown and described in the figures, tables, and/or sub-para-graphs listed below.

Component/Unit	*Figure*	*Table*
Miscellaneous shelter controls	3-1	subparagraph *a*
Shelter heater (1A17)	3-2	subparagraph *b*
Cesium beam frequency standard (1A2A24)	3-3	3-1
Cesium beam power supply (1A2A25)	3-4	3-2
Power distribution panel (1A2A4)	3-5	3-3
Antenna control panel (1A2A5)	3-6	3-4
IF patch panel (1A3A22)	3-7	3-5
Comm demod (1A3A3 or 1A3A5)	3-8	3-6
Beacon demod (1A3A4)	3-9	3-7
Static frequency converter (1A2A35)	3-10	3-8
Test translator control (1A2A26)	3-11	3-9
Cesium environmental enclosure (1A2A34)	3-12	3-10
Comm demod power supply (1A3A9)	3-13	3-11
Beacon demod/baseband power supply (1A3A10)	3-14	3-12
Tty patch panel (1A3A25)	3-15	3-13
Baseband patch panel (1A3A12)	3-16	3-14
Baseband control panel (1A3A13)	3-17	3-15
Modulator (1A3A26)	3-18	3-16
Baseband amplifier (1A3A15)	3-19	3-17
Converter-keyer-echo suppressor (1A3A16)	3-20	3-18
LIU panel (1A3A26)	3-21	3-19
Fan control assembly (1A3A19)	3-22	3-20
Power monitor and control (1A2A27)	3-23	3-21
Distribution amplifier (1A2A33)	3-24	3-22
Frequency distribution unit (1A2A22)	3-25	3-23
Time transfer unit (1A2A29)	3-26	3-24
Frequency conversion subsystem (1A19)	3-27	3-25
External signal distribution box (1A10)	3-28	3-26
Primary power distribution assembly (1A12)	3-29	3-27
External power distribution box (1A14)	3-30	3-28
Primary power distribution panel (1A15)	3-31	3-29
Primary power monitor panel (1A 16)	3-32	3-30
Air conditioner (1A1)	3-33	3-31
Zero set control (1A2A1)	3-34	3-32
OBN monitor panel (1A3A24)	3-34.1	3-32.1
Remote control panel (1A2A36)	3-39.1	3-38

a. Miscellaneous Equipment Shelter Controls. These consist of two toggle switches, utility outlets, and an emergency light, all located on the curbside wall of the shelter to the left of the doorway.

(1) The LIGHTS toggle switch controls the application of power to the shelter when the NON-CRITICAL POWER SHELTER LIGHTS circuit breaker is set to the on position.

(2) In the BLACKOUT position, the BLACKOUT-BLACKOUT BYPASS toggle switch activates the circuit which extinguishes the shelter lights when the shelter door is opened. In the BLACKOUT BYPASS position, the above mentioned circuit is deactivated and the shelter lights remain illuminated when the door is opened.

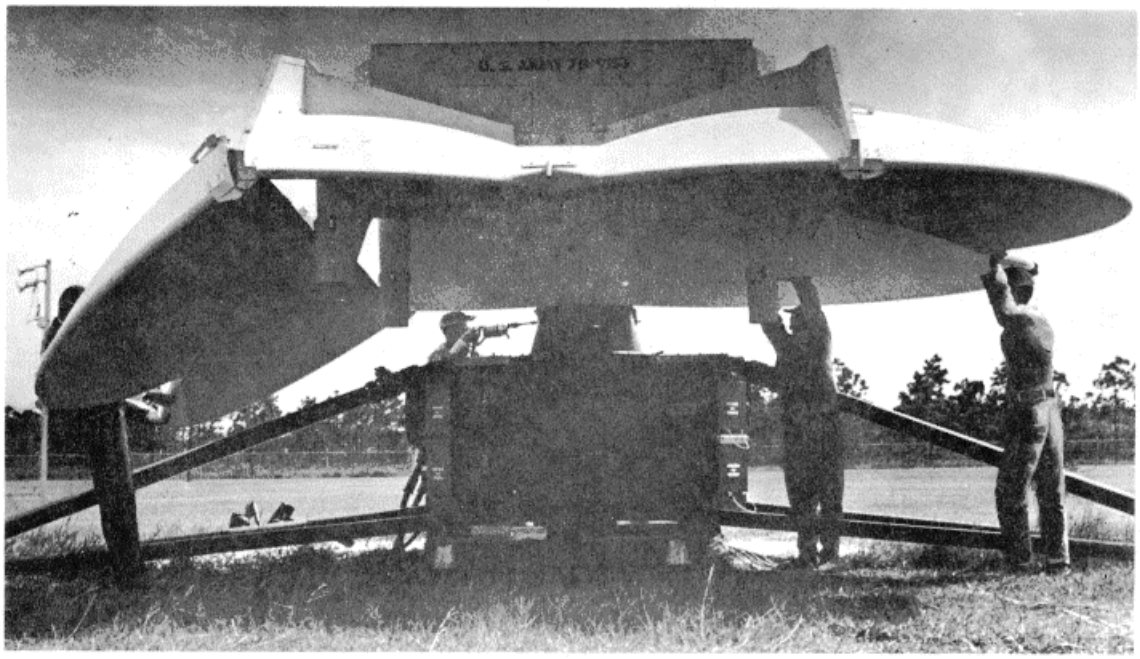
(3) The utility outlets are used to connect hand tools or trouble lights to 115 vac.

(4) The light located above and to the left of the clock provides emergency lighting for the shelter in case primary power to the shelter fails.

b. Shelter Heater (1A1 7). Shelter heater 1A17 contains no switches or indicators. The ON-OFF thermo-stat bypass switch and the HEATER POWER circuit breakers are located on the power distribution panel 1A15.

punctured, or damaged in any manner. Remove a DIELGUIDE from its transit case just prior to installing the DIELGUIDE on the feedhorn.

c. Remove the protective cover. Install the DIELGUIDEs on the feedhorns by carefully



VIEW A

USE SPECIAL TOOL, TURN COUNTERCLOCKWISE TO LIMIT AND THEN CLOCKWISE TO LATCH

VIEW B

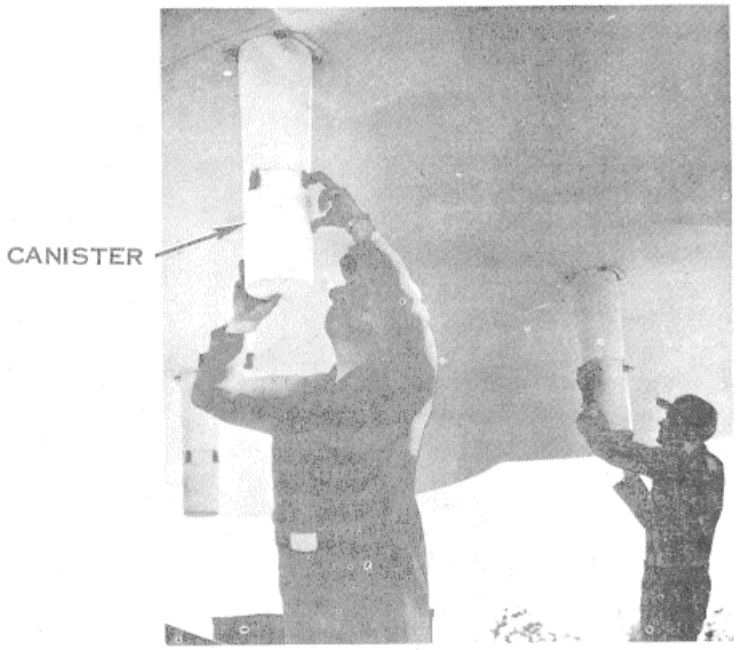
ELIRV032

Figure 2-18. Antenna reflector latching.

aligning each DIELGUIDE with the alignment pin, and then slowly sliding it onto the feedhorn.

d. When a DIELGUIDE is fully seated, secure it with the four securing latches (a above).

e. Be sure that the electric drill is rotating in the proper direction for raising the mast, then connect



VIEW A

VIEW B

Figure 2-19. Antenna DIELGUDIE and lightning rod installation.

it to the RAISE-LOWER crankshaft on the mast (fig. 2-9).

f. Raise the mast to within ½ inch of mast-to-base mating.

g. Remove the lower quick-release pin on the antenna support post (fig. 2-8, step 3) and remove the post from the platform. Store the antenna support post in a convenient storage area.

h. Remove the electric drill, and then use the handcrank to raise the mast until it mates with the pedestal base.

i. When the mast is fully seated on the pedestal mast base, secure it with the six attached quick-release pins.

j. Climb the mast and turn the elevation gearbox vent valve (fig. 2-20) to the OPEN position.

2-18. Installation of Earth Anchors

CAUTION

Installation of the earth anchors should be deferred only when anticipated weather conditions permit such action. Installation of the earth anchors can be deferred until after the system is fully erected and operational. When the earth anchors are to be installed, proceed as follows:

a. Obtain the nine earth anchors from the transit case, driving rod from the antenna carrier, and the sledge hammer from its assigned storage space in the shelter door.

b. Distribute three earth anchors to each outrigger ground pad.

c. Insert an earth anchor into the hollow end of the driving rod, and slip the driving head over the opposite end of the rod as illustrated in figure 2-10.

d. With the cable attached, position the earth anchor with the flat side facing the end of outrigger and inclined at a 45° angle toward the outrigger ground pad.

e. Use the sledge hammer and drive the earth anchor approximately 5 feet into the ground: leave enough cable above ground level to attach a turnbuckle.

f. Lead the anchor cable through the turnbuckle eye, take up the cable slack by making an eye with the cable, and seize the cable with wire rope clamps.

g. Follow the same procedure outlined inf above, and drive the other two earth anchors 120° to each side of the first earth anchor. Do not tighten the earth anchor turnbuckles at this time; leave earth anchor cables slack until antenna leveling is completed (para 2-19).

h. Drive the remaining earth anchors around the other two outrigger ground pads in the same manner as outlined in *e, f* and g above.

2-19. Antenna Leveling Procedure

Leveling the antenna is one of the most important steps in setting up the AN/TSC-54 terminal for operation. The antenna must be level for the ephemeris data to be usable. Therefore, the leveling procedure outlined in *a* through p below must be strictly followed. Because of possible ground settling at a new site, the antenna level should be checked each day until setting has ceased.

CAUTION

If re-leveling of the antenna is necessary, loosen all ground anchor cables before adjusting any outrigger jackscrew. Failure to do so may cause an outrigger to bend or rupture.

a. Install the precision level and mount (fig. 1-12) on its mounting surface on the pedestal (fig. 2-9).

b. With the antenna in the stow lock position (face of antenna pointing south in northern hemisphere, north in southern hemisphere), adjust the front outriggers (using the handcrank on the outrigger jackscrew) until the level bubble is centered.

c. Remove the stowlock pin by pressing down on the top and pulling out.

d. Release the azimuth brake (fig. 2-20).

e. Manually crank the antenna 90° clockwise to 270° or west (east in southern hemisphere).

f. Adjust the side outriggers, with the hand-cranks, until the level bubble is centered.

g. Manually crank the antenna 180° counterclockwise to 90° or east (west in southern hemisphere) and center the bubble by adjusting the appropriate outriggers.

h. Manually crank the antenna 180° clockwise, and center the bubble by adjusting the appropriate outriggers.

i. Repeat the procedures outlined in g and *h* above until the level bubble is centered.

j. Manually crank the antenna 90° counterclockwise back to the stowlock position; check the level bubble.

k. Manually crank the antenna in either direction until the stowlock plate clears the stowlock bracket.

l. When the antenna pedestal is level, set the azimuth brake.

m. Tension the earth anchor cables as described in paragraph 2-20.

NOTE

When the pedestal is level, the level bubble should not move as the antenna is rotated through 360°.

n. Check to be sure that antenna leveling h as not changed.

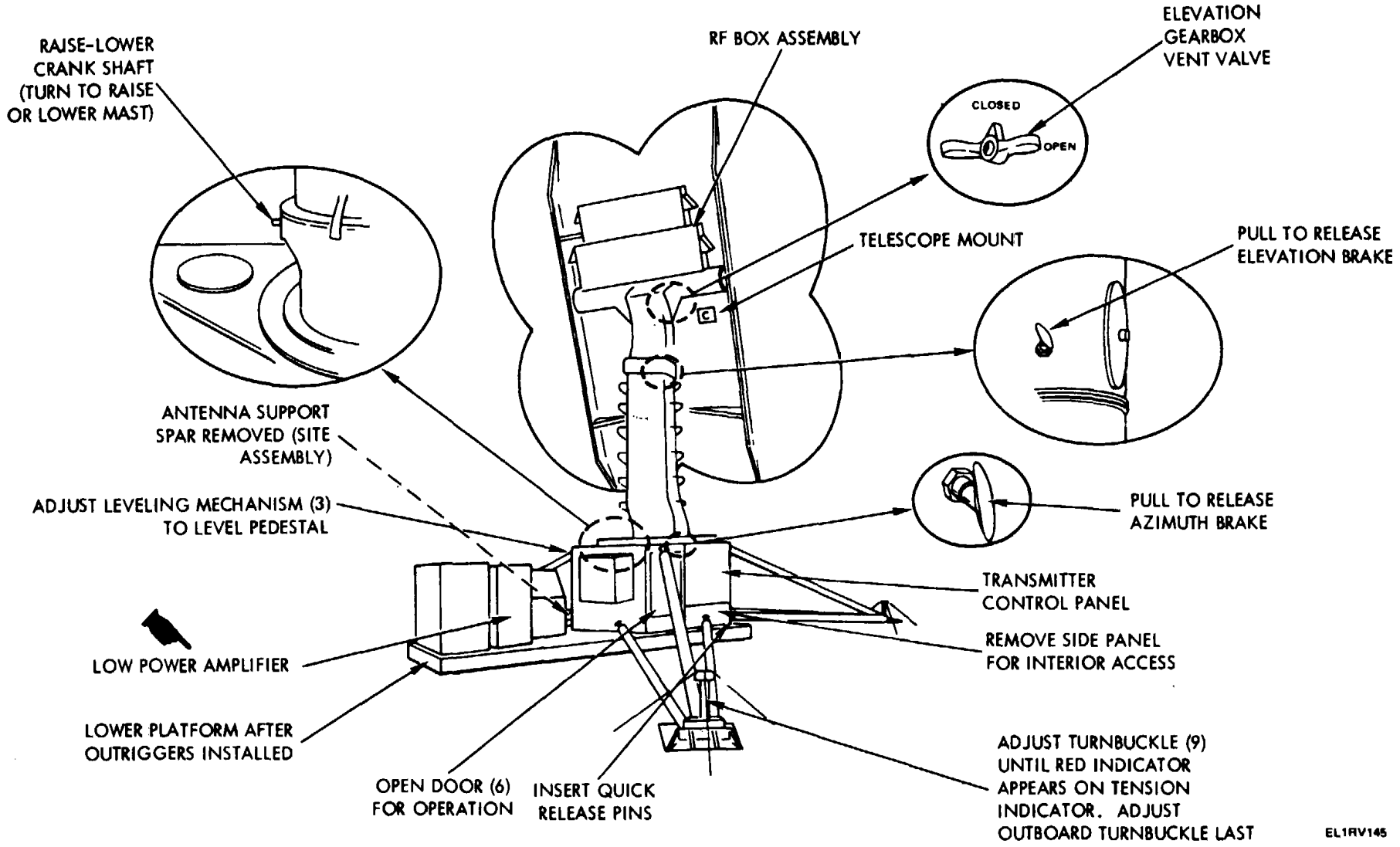


Figure 2-20. Antenna group latching features.

o. Remove the precision level and mounting bracket and store them in the appropriate transit case.

p. Remove the stowlock plate by removing the quick-release pins that attach the stowlock plate to the mast ring (fig. 2-9). Lift the plate up to clear the center retaining pins; stow the plate in a secure place.

WARNING

Be sure to remove the stowlock plate. Failure to do so may result in serious physical injury or equipment damage.

2-20. Tensioning Earth Anchor Cables

If the earth anchors were previously installed (para 2-18), the anchor cables must be correctly tensioned. If the earth anchor installation was delayed until after final leveling, perform the procedures in paragraph 2-18 and then proceed as follows:

a. Tension the cables until the red groove is just visible (fig. 2-21). Gradually and progressively tighten all the cables around the antenna pedestal so that the pedestal settles evenly.

b. Tighten the anchor cables on each ground pad evenly to prevent bending the anchor post.

c. Make a quick check of the pedestal to be sure that antenna leveling has not been disturbed. Relevel the pedestal if necessary.

2-21. Installation of Purity Loop Flow Filter

The outboard assembly should be installed for normal operation of the transmitter.

a. Obtain the outboard assembly and three hoses and power cable from the shelter.

b. Locate the two mounting holes on the antenna platform (fig. 2-22).

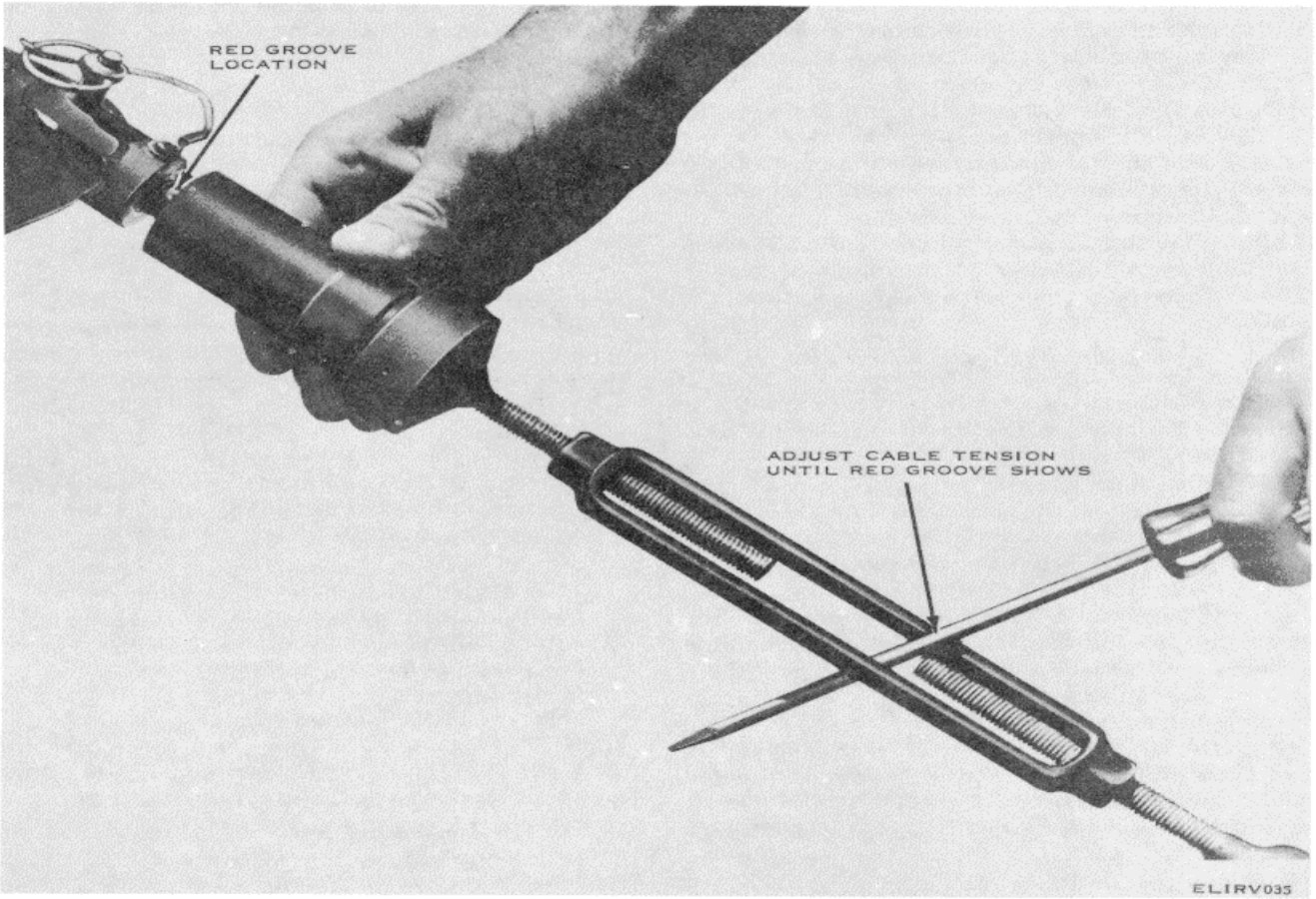


Figure 2-21. Earth anchor cable tensioning

c. Remove the tie-down strap anchor from the location shown.

d. Align the mounting holes with those in the bottom of the outboard assembly.

e. Secure the outboard assembly with the bolt and tie-down strap anchor.

f. Connect the three hoses and power cable between the heat exchanger panel and the out-board assembly.

g. Verify that heat exchanger reservoir is filled to the proper level.

2-22. Installation of Operations Control Van

The shelter is positioned about 30 feet from the rear of the antenna-receiver-transmitter group for ease of 50-foot power and signal cable installations. Once the shelter is properly positioned, install it as follows:

CAUTION

Check to be sure that the ground surface under the shelter is clear of protruding stones and debris, or the underside skin of the shelter may be damaged as the shelter is lowered.

a. Lower and level the shelter as follows:

(1) Visually check the slope of the ground surface. The shelter can be leveled in two ways if the ground surface slopes too much. The surfaces directly under the shelter skids can be built up with flat stones, or the hydraulic jacks on the low-ground side of the shelter can be extended partially to achieve a level attitude, ((6) below).

(2) Retract the yellow locknuts on the four hydraulic lifting jacks.

(3) Close the two main valves at the front of the hydraulic pumps on the front and rear axle assemblies.

(4) On each axle assembly, slowly open the two line valves to allow the pressures to equalize.

(5) With a man stationed at each axle assembly, slowly open the front and rear main valves and gently lower the shelter to the ground. If the shelter tilts too much after being lowered to the ground surface, perform the procedure outlined in (6) below.

(6) Close the two main hydraulic valves and the two line valves on the high side or end, and then actuate the hydraulic pump to raise the lower side or end to achieve a level attitude. Close all the line valves, and hand tighten each of the four yellow locknuts against the top of its associated jack casing.

b. Ready the shelter as follows:

(1) Remove the transit cases from their assigned storage space in the shelter; cover or store them in a secure area.

(2) Remove the tie-down straps and mooring eyes from the shelter floor and store them in the equipment storage box on the antenna carrier platform.

(3) Installation of Air Conditioner.

WARNING

Before removing any mounting screws from the flange securing the air conditioner and cover to the shelter, ensure that adequate personnel or equipment handling device(s) are available to lift and maneuver the air conditioner (approxi-mate weight 270 pounds). Failure to observe this warning may result in serious injury or death to personnel.

(a) Loosen and remove all but two (top center and bottom center) of the screws securing the air conditioner and cover to the shelter.

(b) Position personnel inside and outside of the shelter such that they can support the total weight of the air conditioner.

(c) Loosen and remove the remaining, screws.

(d) Remove and set aside the cover.

(e) Slowly slide the air conditioner from the opening in the side of the shelter until it is approximately two-thirds of the way out.

(f) With all personnel on the outside of the shelter supporting the air conditioner; gently lower it to the ground.

(g) Rotate the air conditioner 180° until the fan opening faces away from the shelter.

(h) Lift the air conditioner into the opening and allow it to come to rest on the support bracket (angle irons) at the bottom of the opening.

(i) Align the mounting holes. Install and tighten all of the mounting screws.

(j) Secure the cover on the screws provided at the rear, and on the same side, of the shelter.

(k) Connect the AC power cable on the inside of the shelter.

WARNING

High voltages are used in the shelter equipment. To reduce the hazard of electrical shock, the shelter must be properly grounded before being electrically connected to the antenna pedestal.

(4) Drive the shelter ground rod directly below the shelter grounding stud on the roadside of the shelter. Connect a ground strap between the ground rod and the shelter grounding stud. If practical, thoroughly saturate the ground surrounding the ground rod with water.

(5) Connect the shelter-to-antenna pedestal signal and power cables according to the chart in paragraph 2-14.

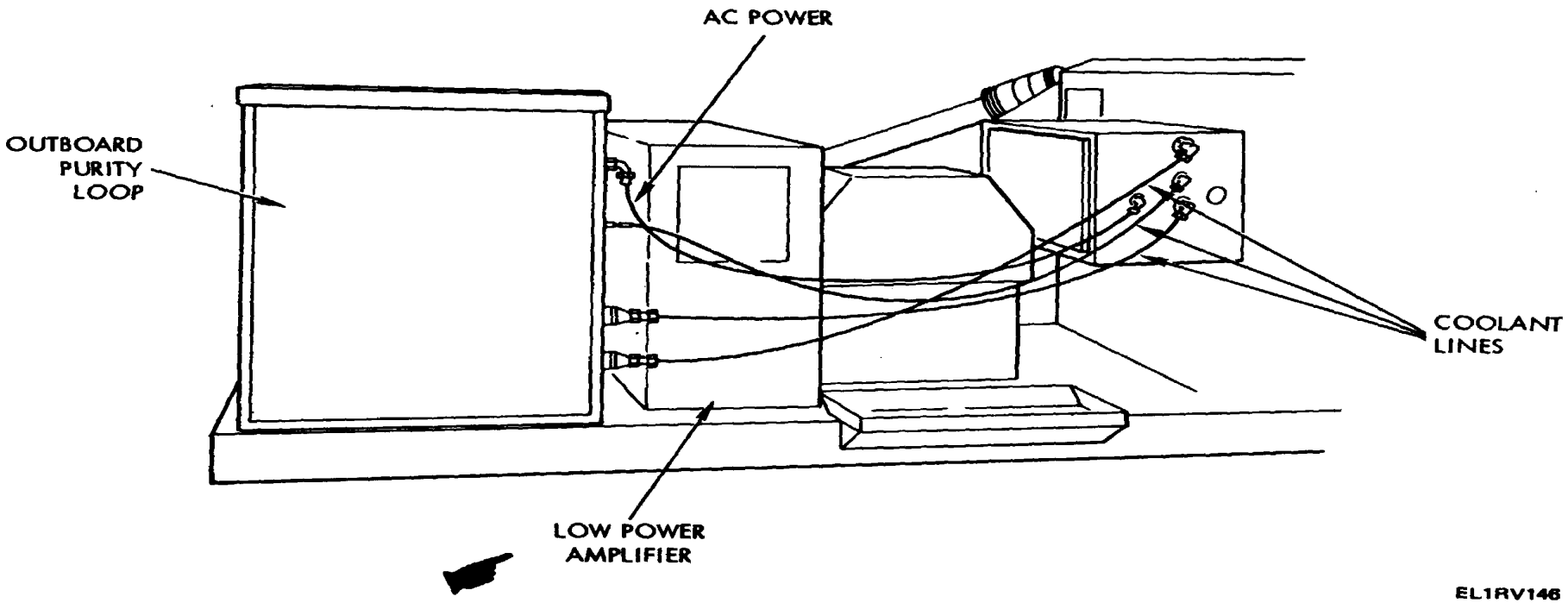


Figure 2-22. Purity loop filter (2A10) installation location.

(6) If the dehydrator is not available refer to paragraph 3-33a and pressurize the waveguide as instructed.

(7) Open the shelter air intake and exhaust panels.

(8) Apply power to the equipment as outlined in paragraph 3-6.

2-23.1. Installation Checkout Procedure

The installation procedure for the helicopter airlift configuration is essentially the same as that for the road-transportable configuration except as follows:

a. The dolly sets have been removed from the antenna carrier and shelter; therefore, the an-tenna carrier dolly set removal and shelter lowering procedures are omitted.

b. The lifting slings and equipment must be, removed and stored after an airlift.

2-23.1 Installation Checkout Procedure

Following installation at a selected site, Satellite Communications Terminal AN/TSC-54 must be checked out for proper operation before turning the terminal over to the operating crew. To check out the terminal after installation, perform the system operational checkout procedure (para 3-21).

SECTION III. INITIAL SYSTEM TRUE NORTH-SOUTH ALIGNMENT

2-24. General.

a. Following installation (para 2-4 through 2-23) and installation checkout (para 2-23.1), Satellite Communication Terminal AN/TSC-54 should be electrically oriented with respect to a true north or a true south direction. Antenna orientation can be established by using the hand bearing compass provided with the AN/TSC-54 and then the known magnetic variation at the site can be offset by means of Zero Set Control C-7242/TSC-54, or the antenna can be aligned by a star-sighting method.

b. Two methods of orientation are available because at times, the azimuth (true north) cannot be properly established by use of the hand-bearing magnetic compass. Unknown declination angles, local magnetic interference, and other problems can prevent correct orientation. In such cases, antenna azimuth orientation can be established by visually aligning the antenna reflector with relation to the North Star or the Southern Cross. A corrective adjustment can then be made with the zero-set controls to make the azimuth digital readout correspond with known ephemeris data of a satellite being tracked. The hand-bearing com-pass and the two methods for establishing antenna azimuth orientation are described in paragraphs 2-24, 2-25, and 2-26.

2-25. Hand-Bearing Magnetic Compass

a. The hand-bearing magnetic compass provided with each AN/TSC-54 is a hand-held sighting device which gives a direct magnetic reading. The compass has a magnet suspended from a liquid-dampened compass card that allows freedom of movement in a horizontal plane. The suspended magnet aligns itself with the earth's magnetic field, and thus points to magnetic north and magnetic south.

(1) The compass has a lubber's line marked on the case; this is a fixed reference line that, when lined up with the face edge of the antenna dish, shows the bearing of the dish with reference to the compass card.

(2) The compass card is marked by degrees in a 360° circle with north as 000. The system of degrees is used when using the hand bearing compass with the AN/TSC-54.

(3) The hand-bearing compass is 9 inches long and weighs 2 pounds; flashlight batteries in the handle illuminate the card from beneath for night use. Bearings are taken through a V-sight mounted on top of a prism which reflects and greatly magnifies the numericals and lubber's line.

b. The earth has been surveyed and charts of magnetic influence constructed showing Agonic and Isogenic lines. Agonic lines designate an imaginary line passing through points on the earth's surface where a compass needle is in equilibrium in a true north-and-south plane, showing no magnetic declination. Isogonic lines designate an imaginary line joining places on the earth's surface at which the variation of the magnetic needle from true north is the same.

c. The compass is affected by two influences which prevent it from pointing to the geographic (true) North Pole. One of these errors is caused by the earth's magnetic field which causes the magnetic pole to be in a different location from the geographic pole. This, the angle of difference between magnetic north and true north is called variation and is expressed in degrees and minutes of arc. Variation does not normally remain constant for any given location (either increases or decreases at a constant yearly rate); therefore, all compass readings must be corrected for variation.

(1) When present, variation is either easterly

(the compass magnet is pulled toward the 90° mark), or westerly (the compass magnet is pulled toward the 270° mark). If the magnetic pole is to the west of geographic (true) north at the location, variation is west; if the magnetic pole is to the east of location, variation is east. When variation is west, the amount of variation should be added to the compass reading to find the true north; when variation is east, the amount should be subtracted from the compass reading to determine the true north direction.

(2) Assume, for example, the variation of the AN/TSC-54 is 6° westerly. This means that the compass needle, while pointing to magnetic north is, because of the earth's magnetic influence, actually pointing 6° west of true north to 354°. Thus, an additional correction must be made to compensate for this 6° error so that true north is established.

NOTE

Procedures for electrically offsetting compass variation are included in the antenna north-south alignment procedure (para 2-25).

d. The second influence which induces errors in magnetic compass readings is deviation. Deviation is caused by the proximity of magnetic metals to the compass. When excessive deviation is encountered, antenna north-south alignment using the hand bearing compass is impractical; therefore, no consideration is given to compensation methods for deviation. The star-sighting method for antenna north-south alignment (para 2-27) can be used.

2-26. Compass-Bearing Method for Antenna Alignment

a. Set the MOUNT SAGE toggle switch to the up position.

b. Set the zero set control ON/OFF toggle switch to on (up position).

c. Rotate the AZIMUTH INDICATOR ZERO ADJUST handcrank control until the AZIMUTH position digital readout indicator on antenna control panel 1A2A5 indicates 180°.

d. Release the manual azimuth brake on the antenna.

e. Manually crank the antenna 90° clockwise to 270° to face the antenna reflector approximately west and align the antenna reflector upper and lower edges approximately parallel with the north-south line.

NOTE

Be sure that the antenna is at 0° elevation.

f. Check the earth's magnetic variation chart for the local magnetic variation; note the amount of variation in degrees easterly or westerly.

g. Position one man at the antenna rotating handcrank.

h. Take the hand bearing magnetic compass and walk at least 100 feet south of the antenna. Raise the compass to a comfortable eye-level position (fig. 2-23).

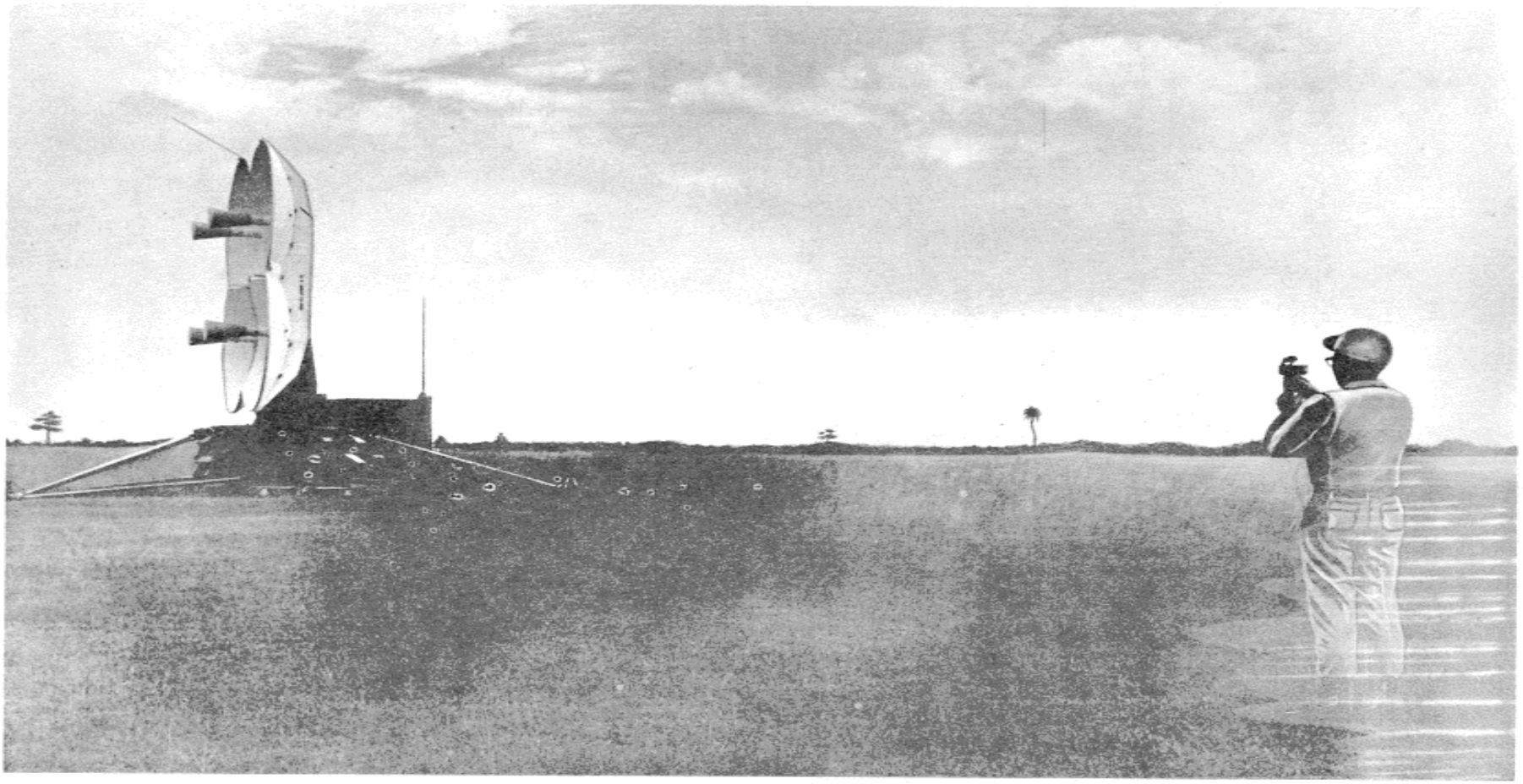


Figure 2-23. Antenna alignment using hand-bearing magnetic compass

i. Align the compass lubber's line with the north-south edge of the antenna reflector; allow the compass card to stabilize.

j. Direct the man positioned at the antenna rotating handcrank (g above) to crank the antenna either clockwise or counterclockwise as necessary to exactly align the edges of the antenna 'reflector with the compass-sighted north-south line.

NOTE

When the requirements of *j* above are met, the 000-degree index of the compass card and the lubber's line should perfectly align with the edges of the antenna reflector.

k. Return the compass and chart to their normal storage locations.

1. Rotate the AZIMUTH INDICATOR ZERO ADJUST handcrank control for a 270.0 reading on the AZIMUTH position digital readout indicator. mn. If the local variation (f above) is westerly, rotate the AZIMUTH INDICATOR ZERO AD-JUST handcrank control counterclockwise to sub-tract the degrees of westerly deviation from the AZIMUTH position digital readout; if the local variation is easterly, rotate the handcrank control clockwise to add the degrees of easterly variation to the AZIMUTH position digital readout. , /. Set the zero set control ON/OFF toggle switch to OFF; insure that the switch guard is down.

NOTE

The procedure described in a through n above also applies to southern hemi-sphere orientation, except the antenna is pointed south and the digital readout in c above should be 0°

2-27. Star-Sighting Method for Antenna Alignment

a. At Northern Hemisphere sites, locate the geographical North Pole as shown in A, figure 2-24. Locate the Big Dipper (Ursa Major), and note that an imaginary line crossing the two lowest stars points directly to the lowest star of the Little Dipper (Ursa Minor). This is the North Star (Polaris). If the distance of the two lowest stars of Ursa Major is taken as one unit, it is then five more units to the North Star. The geographical North Pole is located directly below the North Star.

b. At Southern Hemisphere sites, locate the geographical South Pole as shown in B, figure 2-24. Locate the Southern Cross (Crux) and the two stars below it that are designated as pointers.

Extend the horizontal inter-sector of the Southern Cross westward; also extend westward the perpendicular bisector of the line joining the two proximate pointer stars. Mentally determine the intersecting point of the two extended imaginary lines. If the distance between the east and west stars of the Southern Cross is taken as one unit, it is then four and one-half more units to the intersection of the two extended lines. The geographical South Pole is located directly below this intersecting point.

2-28. Aligning Antenna

Be sure that the antenna pedestal is properly leveled (para 2-19), and set the antenna to 0° in elevation. The alignment procedure outlined in a through below applies in either the northern or southern hemisphere.

a. Rotate the antenna until the DIELGUIDEs point east.

b. Position a man at the antenna pedestal to illuminate the edges of the antenna with a flashlight.

c. Sight along the plane formed by the edges of the four parabolas of the antenna as shown in figure 2-19. Adjust the line of sight so that it is not hampered by the DIELGUIDEs or other antenna hardware. Make minor adjustments to the an-tenna position until the sighting plane points directly at the geographical North Pole or to the geographical South Pole (para 2-25).

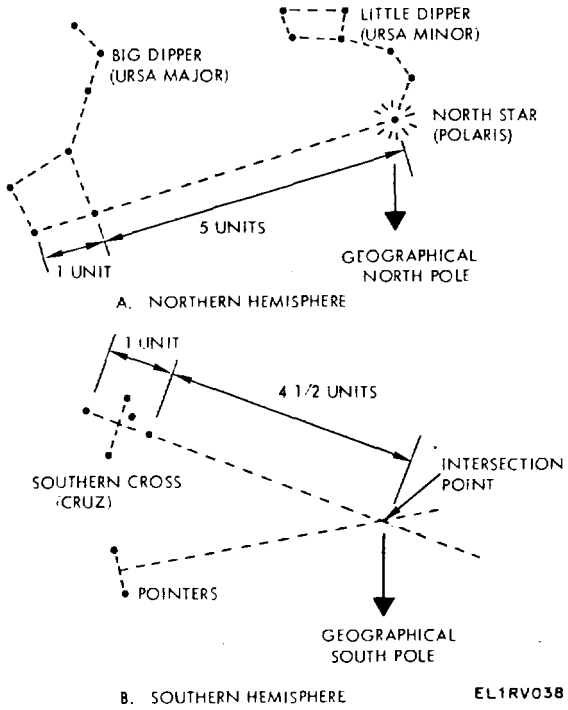


Figure 2-24. Star-sighting method for locating earth's geographical poles.

d Set the zero set control ON/OFF toggle switch to ON, and adjust the AZIMUTH INDICATOR ZERO ADJUST handcrank control for an AZIMUTH position digital indicator readout of 090.0. e. Set the ON/OFF toggle switch to OFF; be sure that the switch guard is down.

NOTE

A further correction of the alignment can be made as prescribed in f and g below after a satellite has been acquired.

f. At the appropriate time during satellite tracking, compare the azimuth date given in the ephemeris table with the reading on the AZIMUTH position digital readout indicator.

g. If the ephemeris date and digital readout noted in *e* above differ, repeat the procedure outlined in d above, except adjust the AZIMUTH INDICATOR ZERO ADJUST handcrank control until the AZIMUTH position digital readout indicator reflects the correct ephemeris data.

2-29. Installing Antenna Service Platform

CAUTION

The lifting davit should not be installed unless its use is required. Immediately after use, it should be removed from the service platform. Failure to observe the above caution could result in serious damage to the antenna reflector or to the RF equipment enclosure during operations.

a. Obtain the mast cranking adapter, hoist and tackle block (fig. 2-25) from the maintenance kit.

b. Install the portable access ladder on the hooks provided on the antenna pedestal.

c. Position the antenna in azimuth such that the mast ladder rings are directly above the portable access ladder:

d. Climb the mast and attach the tackle block to the ring provided at the rear of the torque tube.

e. Attach the hoist to the bracket provided at the base of the mast.

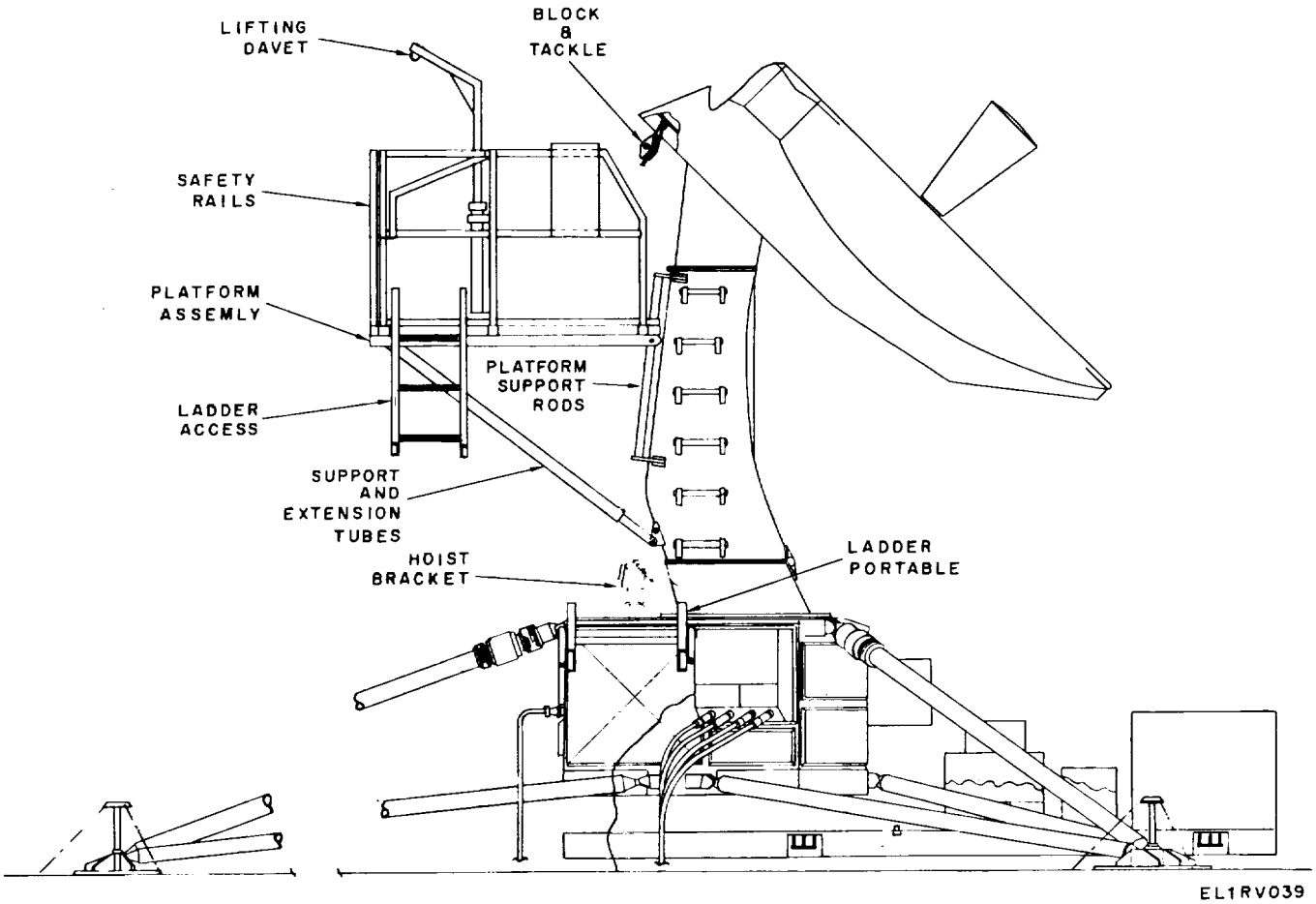


Figure 2-25. Antenna service platform installation.

CAUTION

Do not attempt to move the antenna with the hoist attached to the bracket.

f. Position the platform on the ground behind the antenna such that the two attaching brackets are nearest the antenna.

g. Thread the hoist cable through the tackle block and down to the U-bolt on the platform.

NOTE

The hoist must be lubricated prior to each use.

h. Observe the match marks, attach the platform support rods (SM-D-778570) to the mast using the attached pins. WARNING

Personnel working on the ground are cautioned not to stand under the platform during erection.

i. Position one man at the rear of the platform to guide the platform in the desired direction.

j. Crank the hoist until the platform is approximately five feet off the ground.

k. Attach the support tubes (SM-D-778550) to the brackets at the rear of the platform.

I. Insert the extension tubes (SM-D-778531) into the support tubes. Do not pin.

m. Attach the extension tubes to the brackets at the base of the mast.

n. Hand crank the hoist until the platform is at the desired height on the mast.

o. Attach the platform brackets to the support rods on the mast.

p. Level the platform and align the holes in the support and extension tubes.

q. Insert the pins in the support tubes.

r. Identify and install the safety rails on the platform in the holes provided.

s. Remove and store the hoist and tackle block in the maintenance kit.

t. Slowly move the antenna up in elevation and verify that the two limit switches stop antenna motion when they engage in the panels on the safety rails.

CAUTION

If the safety rails are removed during operations, the platform must be lowered at least three holes from the top of the platform support rods. Failure to observe this caution can result in serious damage to the equipment enclosure.

u. Reverse the procedures in a through t above for removal of the service platform.

CHAPTER 3

OPERATING INSTRUCTIONS

WARNING

Before operating the terminal, make certain that all safety requirements as listed in the front of this manual have been met. Injury or DEATH can result from improper or careless operation.

Section I. MODES OF OPERATION AND OPERATOR'S CONTROLS AND INDICATORS

3-1. General

This section describes the modes of operation and the function of the controls and indicators of Satellite Communications Terminal AN/TSC-54. Refer to the appropriate, equipment publication (app. A) for detailed information concerning the controls and indicators of the communication equipment.

NOTE

When LPA and HPA are both off-line be sure that antenna is pointed away from satellite to prevent accidental accessing of satellite.

3-1.1. Modes of Operation

a. Prestandby Mode. When the terminal is powered up for standby operation and an interlock is open, the terminal is automatically placed in the prestandby mode. The STANDBY MODE CON-TROL switch/indicator on antenna control panel 1A2A5 (fig. 3-6) is extinguished as are all other mode control indicators, and power is removed from the antenna drive motors.

b. Standby Mode. When the terminal is powered up and all interlocks are closed, the terminal is automatically placed in the standby mode. The STANDBY MODE CONTROL switch-indicator is illuminated and power is applied to the antenna drive motors. The terminal is ready for normal operation.

c. Manual Mode. In manual mode, the antenna is operated manually to acquire and track a satellite, or to back the antenna out of electrical limits. The slew controls are used for coarse adjustments and the position rate handwheels are used for fine adjustments. The antenna position is adjusted for a maximum reading on the signal strength meter.

d. Rate Augment Mode. This mode of operation provides a semi-automatic tracking capability when operating in the manual mode. In addition to moving the antenna manually using the POSITION RATE controls, the antenna is moved automatically in small increments.

e. Bar Scan Mode. This mode of operation is used during search and acquisition of a satellite. In bar scan mode, the antenna sweeps a specified sector about a point where acquisition is expected. The size and shape of the sector is adjustable between 0 and 5 degrees in both azimuth and elevation using the bar scan controls on the antenna control panel.

f. Acquisition/Autotrack Mode. This mode is the normal mode of operation, using the manual mode to manually position the antenna to directly face the satellite. When the antenna is facing the satellite, the SIGNAL DETECT indicator illuminates. Within 4 seconds, the BEACON TRACK ACQ and the PHASE LOCK indicators illuminate and the SIGNAL DETECT indicator extinguishes, indicating that acquisition of the satellite has been accomplished. When this occurs, pressing the ACQUISITION/ AUTOTRACK switch/indicator causes the terminal to enter the autotrack mode and the antenna automatically tracks the satellite. If tracking of the satellite is lost, the terminal returns to the last mode that existed, before acquisition.

g. Forced Track Mode. This mode is used when the satellite tracking beacon signal fails. The communications signal with a high modulation index is used by the antenna control system to track the satellite.

h. Follow-Up Disable Mode. Prepares the terminal for a transfer of surveillance to a second satellite while continuing to track the first satellite.

i. Pencil Beam Mode. This mode is used only in the manual mode of operation and uses the satellite signal directly without the error modulation.

j. Narrow Beam Mode. This mode is used to improve the quality of a weak tracking signal or a signal containing extraneous noise.

3-2. Operations Control Van Controls and Indicators

The names and functions of the controls and indicators, of the various components and units located in the ocv shelter are shown and described in the figures, tables, and/or subpara-graphs listed below.

Component/Unit	*Figure*	*Table*
Miscellaneous shelter controls	3-1	subparagraph a
Shelter heater (1A17)	3-2	subparagraph b
Cesium beam frequency standard (12AA24)	3-3	3-1
Cesium beam power supply (1A2A25)	3-4	3-2
Power distribution panel (1A2A4)	3-5	3-3
Antenna control panel (1A2A5)	36	3-4
IF patch panel (1A3A22)	3-7	3-5
Comm demod (1A3A3 or 1A3A5)	3-8	3-6
Beacon demod (1A3A4)	3-9	3-7
Static frequency converter (1A2A35)	3-10	3-8
Test translator control (1A2A26)	3-11	3-9
Cesium environmental enclosure (1A2A34)	3-12	3-10
Comm demod power supply (1A3A9)	3-13	3-11
Beacon demod/baseband power supply (1A3A10)	3-14	3-12
Tty patch panel (1A3A25)	3-15	3-13
Baseband patch panel (1A3A12)	3-16	3-14
Baseband control panel (1A3A13)	3-17	3-15
Modulator (1A3A26)	3-18	3-16
Baseband amplifier (1A3A15)	3-19	3-17
Converter-keyer-echo suppressor (1A3A16)	3-20	3-18
LIU panel (1A3A26)	3-21	3-19
Fan control assembly (IA3A19)	3-22	3-20
Power monitor and control (12AA27)	3-23	3-21
Distribution amplifier (1A2A33)	3-24	3-22
Frequency distribution unit (1A2A22)	3-25	3-23
Time transfer unit (1A2A29)	3-26	3-24
Frequency conversion subsystem (1A19)	3-27	3-25
External signal distribution box (1A10)	3-28	3-26
Primary power distribution assembly (1A12)	3-29	3-27
External power distribution box (1A14)	3-30	3-28
Primary power distribution panel (1A15)	331	3-29
Primary power monitor panel (1A16)	3-32	3-30
Air conditioner (1A1)	3-33	3-31
Zero set control (1A2A1)	3-34	3-32
Remote control panel (1A2A36)	3-39.1	3-38

a. Miscellaneous Equipment Shelter Controls. These consist of two toggle switches, utility outlets, and an emergency light, all located on the curbside wall of the shelter to the left of the doorway.

(1) The LIGHTS toggle switch controls the application of power to the shelter when the NONCRITICAL POWER SHELTER LIGHTS circuit breaker is set to the on position.

(2) In the BLACKOUT position, the BLACKOUT-BLACKOUT BYPASS toggle switch activates the circuit which extinguishes the shelter lights when the shelter door is opened. In the BLACKOUT BYPASS position, the above mentioned circuit is deactivated and the shelter lights remain illuminated when the door is opened.

(3) The utility outlets are used to connect hand tools or trouble lights to 115 vac.

(4) The light located above and to the left of the clock provides emergency lighting for the shelter in case primary power to the shelter fails. *b. Shelter Heater (1A17).* Shelter heater 1A17 contains no switches or indicators. The ON-OFF thermostat bypass switch and the HEATER POWER circuit breaker are located on the power distribution panel 1A15.

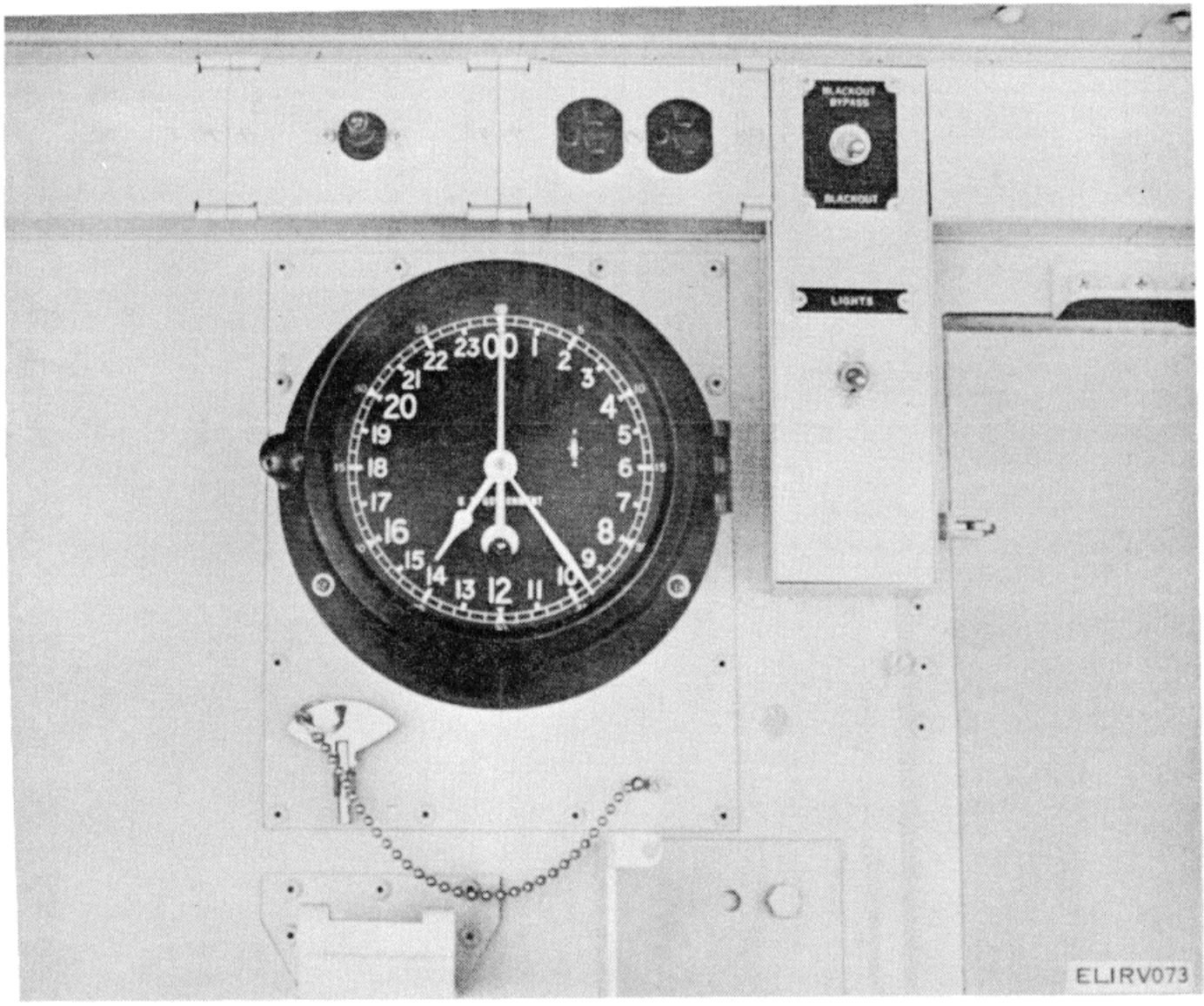


Figure 3-1. Miscellaneous shelter controls.

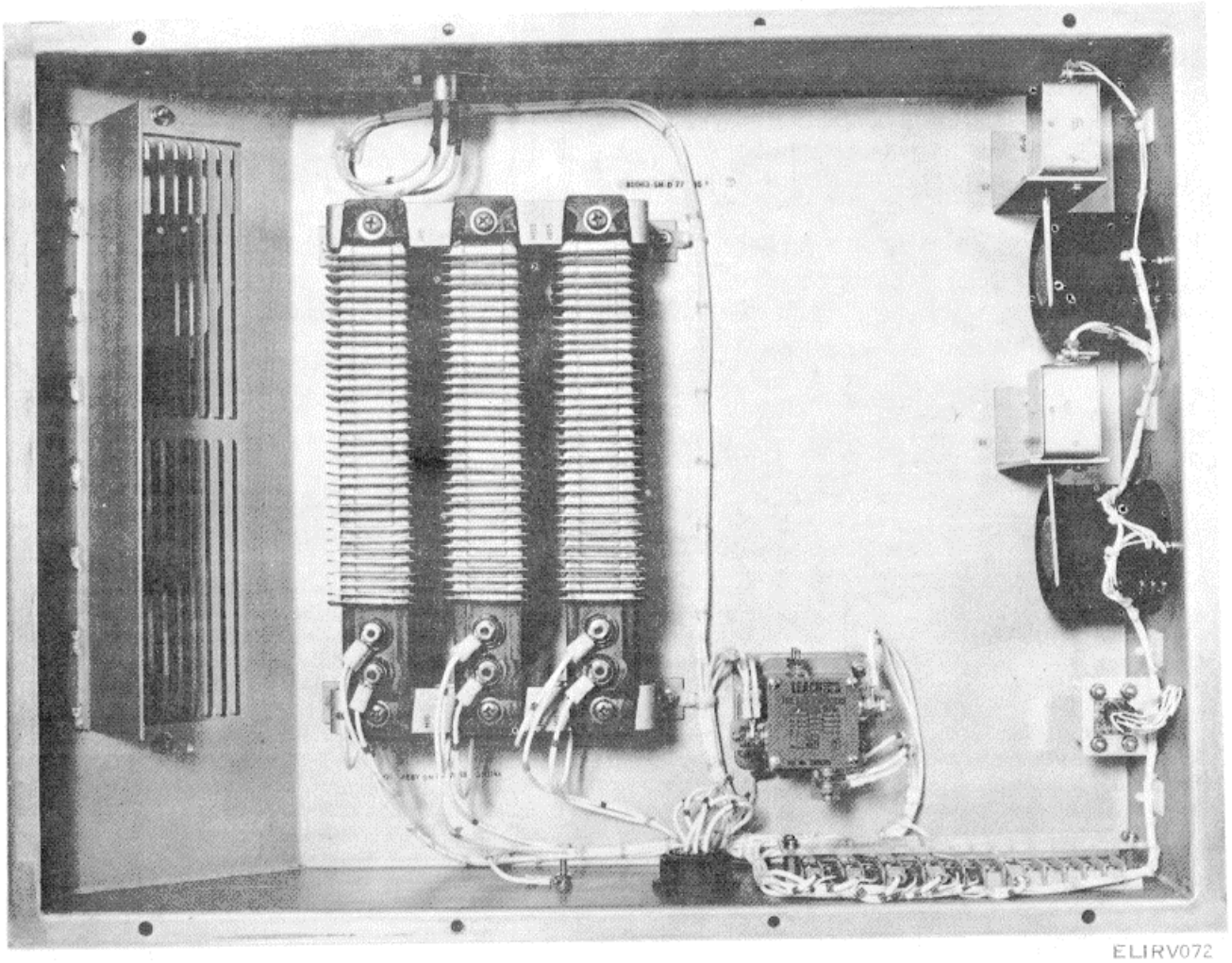


Figure 3-2. Shelter heater (1A17).

Table 3-1. Cesium Beam Frequency Standard (1A2A24) Controls and Indicators

Control or indicator	Function
BATTERY indicator	Flashes (amber) to indicate that frequency is operating with power from internal batteries. Lights steadily when internal batteries are being fast charged.
24 Hour Digital Clock	Provides accurate time standard.
1 PPS jack	Provides 10 volt, 20 µs, 1 pps into 50 ohms from digital clock.
LOOP GAIN control	Adjusts ac amplifier gain.
LOGIC RESET pushbutton switch	Pressed to illuminate CONTINUOUS OPERATION after dc power interruption, repair, or adjustment.
OSC FREQUENCY controls:	
X10^{-10} potentiometer	Provides fine crystal oscillator frequency adjustment range of 500 parts in 10^{-10}.
COARSE potentiometer	Provides coarse crystal oscillator frequency adjustment of ±500 parts in 10^{-9}.
CIRCUIT CHECK meter	Monitors circuit function selected by CIRCUIT CHECK switch.
12 position CIRCUIT CHECK switch:	
BATTERY CIRCUIT	Permits monitoring of internal battery voltage.
SUPPLY	Permits monitoring of regulated power supply.
ION PUMP I	Permits monitoring of ion pump current (cesium beam tube vacuum).
OSC OVEN	Permits monitoring of quartz crystal oscillator oven power.
CS OVEN	Permits monitoring of cesium beam tube power.
5 MHz	Permits monitoring of the level of 5 MHz output.
MULT	Permits monitoring of harmonic generator diode bias.
BEAM I	Permits monitoring of cesium beam tube current.

Table 3-1. Cesium Beam Frequency Standard (1A2A24) Controls and Indicators - Continued

Control or indicator	Function
CONTROL	Permits monitoring of the level of quartz crystal oscillator dc control voltage.
2ND HARMONIC	Permits monitoring of second harmonic.
1 MHz	Permits monitoring of the level of 1 MHz output.
100 kHz	Permits monitoring of the level of 1 kHz output.
CIRCUIT CHECK meter	Monitors circuit function selected by CIRCUIT CHECK switch.
BEAM I METER adjust	Adjusts for on-scale meter reading.
DIVIDER MODE switch	Allows operation of regenerative dividers in start or auto start modes. Switch normally returns to AUTO START. To manually start dividers, switch is momentarily set to START, then released.
Three Position MODE switch:	
OPER	Permits quartz crystal oscillator to be locked to cesium beam frequency.
LOOP OPEN	Permits all circuits to operate with cesium beam loop open.
CS OFF	Permits only quartz crystal oscillator circuits energized. Power removed from cesium beam tube. Ion pump operating.
TIME CONSTANT toggle switch:	
SHORT	Permits normal operation of frequency standard loop time constant.
LONG	Permits maximum short term stability.
C FIELD potentiometer	Provides minor adjustment of magnetic field inside cesium beam tube to set hyperfine transition frequency.
5 MHz FILTER adjust	Access hole for adjusting 5 MHz crystal filter.
Two position MOD switch:	
ON	Activates 137 Hz modulation of microwave signal applied to cesium beam tube.
OFF	Prevents modulation of microwave signal applied to cesium beam tube.
ZEEMAN MOD INPUT jack	Accepts Zeeman frequency during C Field adjustment.
ALARM indicator	Illuminates (amber) to indicate any of the following troubles: a. Quartz crystal oscillator not locked to primary cesium resonance peak. b. Incorrect cesium beam tube current. c. Insufficient quartz crystal oscillator dc correction voltage.
CONTINUOUS OPERATION indicator	Illuminates (green) to indicate that all circuits are operating properly.
5 MHz, 1 MHz, and 100 kHz output jacks	Provides these frequencies to be paralleled with rear-panel outputs.
TIME SCALE SELECTOR thumbwheel switch	Selects synthesized frequency input to harmonic generator.
TIME SCALE SELECTOR HI-LO switch	Used in conjunction with thumbwheel switch to select synthesized frequency.
CLOCK SET STOP switch	Digital clock is stopped when switch is depressed, starts when released.
CLOCK SET FAST switch	Digital clock second hand is accelerated when switch is depressed, resumes normal, operation when released.
CLOCK SYNC switch	Synchronizes digital clock with an external clock when depressed; clock remains synchronized when released.
CLOCK TIME DELAY switch	Selects time delay between an external reference pulse and the internal 1 pulse-per-second clock pulse. Adjustable in decade steps from 1 μsec to 1 μsec.
0-1 μSEC TIME DELAY control	Allows continuous adjustment of clock pulse delay over any 1 μsec range.
OVEN TEMP NORM-LO switch	Selects operating temperature for the cesium beam tube oven.
OVEN OFF-ON switch	Controls application of power to the cesium beam tube oven.
AC AMPLIFIER GAIN switch	Selects HI or LO gain of amplifier.
115/230 VOLT ac line switch	Set to expose correct numbers ("115" or "230") for ac line voltage used (located on rear panel).

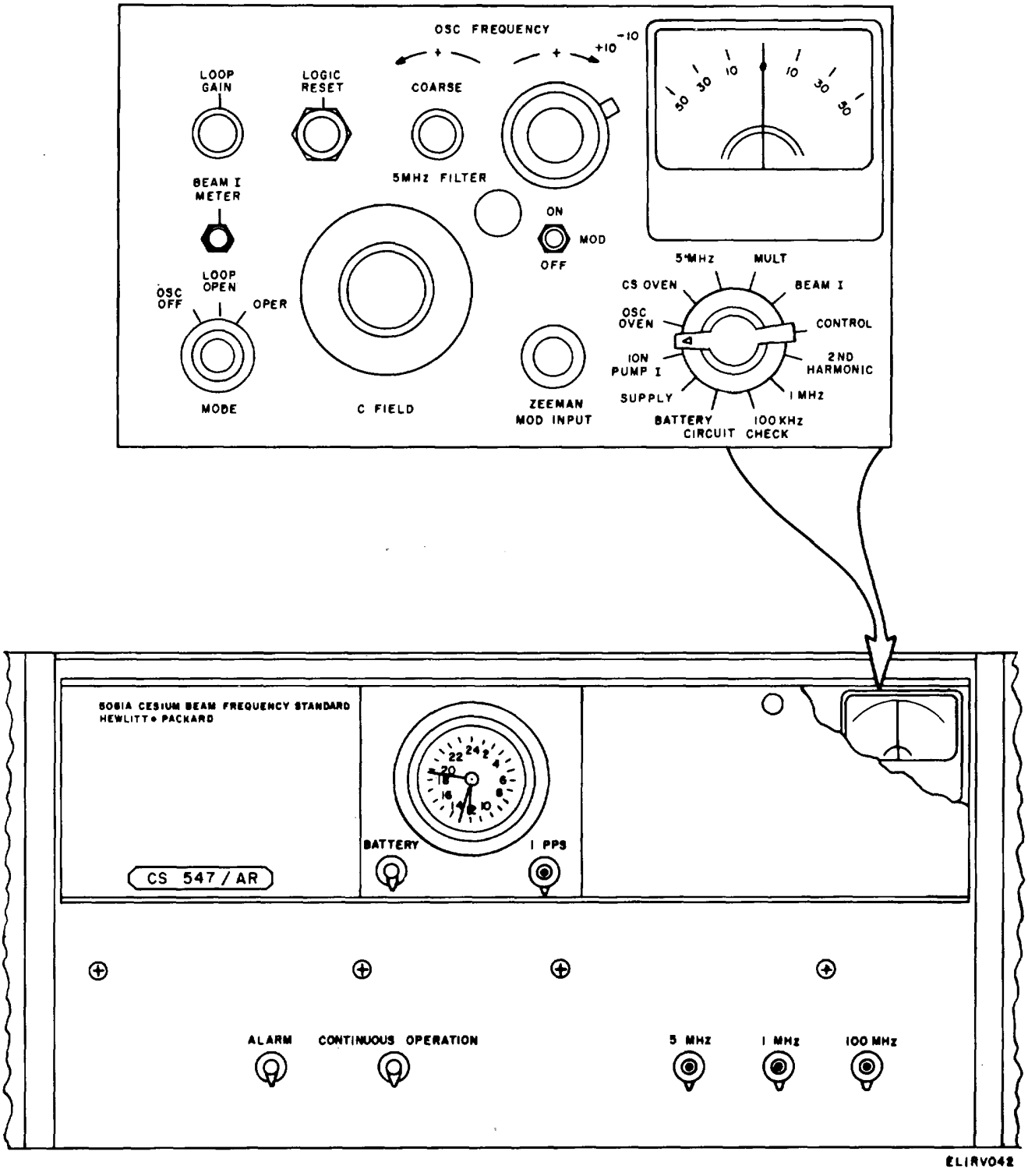


Figure 3-3. Cesium beam frequency standard (1A2A24) controls and indicators.

Table 3-2. Cesium Beam Power Supply (1A2A25) Controls and Indicators

Control or indicator	Function
FUSE FAILURE lights (2)	Illuminate to indicate when power supply is not operating from ac line power due to fuse failure.
BATTERY VOLTAGE meter	Indicates voltage of internal standby batteries.
BATTERY CURRENT meter	Indicates the charging or discharging current through the internal standby batteries.
AC POWER light	Illuminates (white) when standby power supply is operating on ac line power.
AC INTERRUPT light	Illuminates (amber) when ac power to the standby power supply has been interrupted and internal batteries have supplied standby power to the load.
RESET pushbutton switch	Must be pressed to turn off ac interrupt light.
CHARGE/FLOAT toggle switch:	
Charge position	Applies constant charge to batteries.
Float position	Applies a continuous trickle charge to the batteries.
48 HR MAX light	Illuminates (amber) when CHARGE/FLOAT switch is in charge position.
EXTERNAL BATTERY CURRENT potentiometer	Controls surge currents when external batteries are connected to standby power supply.

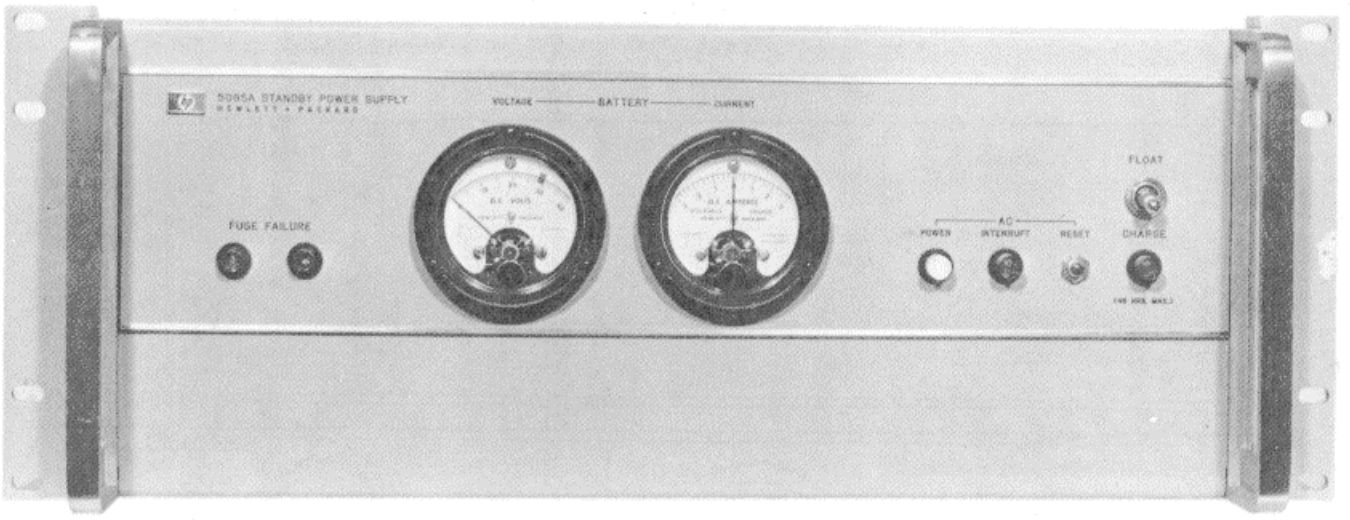


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Figure 3-4. Cesium beam power supply (1A2A25) controls and indicators.

Table 3-3. Power Distributor Panel (1A2A4) Controls and Indicators

Control, indicator or connector	Function
CRITICAL POWER OFF/ON keylock switch	Controls the application of ac input power to AN/URC-61; Consoles 1A2, 1A3 and 1A19.
ANTENNA STATUS indicators:	
AZ BRAKE	Illuminates (red) to indicate that antenna azimuth brakes are applied.
EL BRAKE	Illuminates (red) to indicate that antenna elevation brakes are applied.
OVERLOAD	Illuminates (red) to indicate that one of the antenna drive motors is overloaded.
MOUNT SAFE	Illuminates (red) to indicate that the transmitter is disabled and the antenna cannot be operated.
STOW	Illuminated (red) to indicate that the antenna is in the stow condition and cannot be operated.
ANTENNA DRIVE	Illuminates (red) to indicate that power is not available to the antenna drive motors.
EMERGENCY OFF pushbutton switch	Used to remove all ac power from the antenna-receiver-transmitter group and the shelter in case of an emergency.
POWER SUPPLIES:	
+28V UNREG ON indicator	Illuminates (white) to indicate that +28 vdc unregulated power supply is on.
+28V UNREG ON toggle switch	Controls the application of ac power to the +28 vdc unregulated power supply.
+28V ON indicator	Illuminates (white) to indicate that +28 vdc regulated power supply is on.

Table 3-3. Power Distribution Panel (1A2A4) Controls and Indicators - Continued

Control indicator or connector	Function
+28 V ON toggle switch	Controls the application of ac power to the +28 vdc regulated power supply.
-28V ON indicator	Illuminates (white) to indicate that -28 vdc regulated power supply is on.
-28V ON toggle switch	Controls the application of ac power to the -28 vdc regulated power supply.
+1OV ON indicator	Illuminates (cloudy) to indicate that +10 vdc regulated power supply is on.
+1OV ON toggle switch	Controls the application of ac power to the +10 vdc regulated power supply.
-1OV ON indicator	Illuminates (cloudy) to indicate that +10 vdc regulated power supply is on.
-1OV ON toggle switch	Controls the application of ac power to the -10 vdc regulated power supply.
DISTRIBUTION:	
+28V UNREG PEDESTAL ON toggle switch	Controls the application of +28 vdc unregulated power to antenna pedestal 2A3.
+28V UNREG SHELTER ON toggle switch	Controls the application of +28 vdc unregulated power to shelter.
BLOWER indicator	Illuminates (white) to indicate an open fuse in the chassis blower power circuit.
(½ AMP indicating fuse)	
VOLTAGE TEST pin jacks:	
-28V, +28V and COMMON	Used to measure or monitor the outputs of the +28 vdc and -28 vdc power supplies.
+1OV, -1OV, and COMMON	Used to measure or monitor the outputs of +10 vdc and -10 vdc power supplies.
+28V UNREG and COMMON	Used to measure or monitor the output of +28 vdc unregulated power supply.

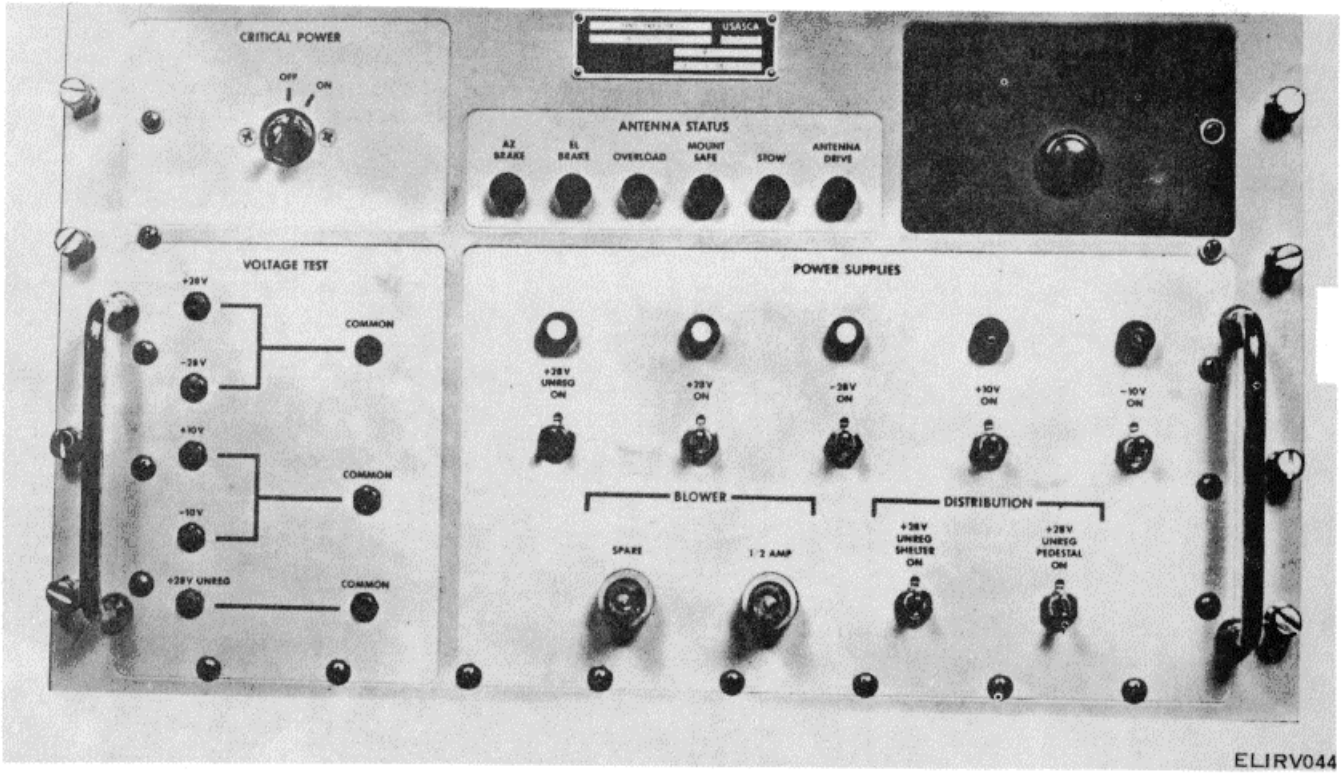

Figure 3-5. Power distribution panel (1A2A4) controls and indicators.

Table 3-4. Antenna Control Panel (1A2A5) Controls and Indicators

Control or indicator	Function
AZIMUTH:	
Digital readout indicator	Indicates position of antenna in degrees and 0.1° units of azimuth.
Analog indicator:	
Large pointer	Indicates position of antenna azimuth in 5° units.
Small pointer	Indicates amount of pedestal cable wrap caused by rotation of antenna. Cable wrap indicator allows 300° of travel either side of stow position.

Table 3-4. Antenna Control Panel (1A2A5) Controls and Indicators - Continued

Control or indicator	Function
LIMITS:	
SERVO switch-indicator	Switch: when pressed, enables servo limit override, permitting antenna operation at reduced speed. Indicator: illuminates (amber) when antenna has entered azimuth servo limits.
ELECTRIC switch-indicator	Switch: enables antenna to be backed out of the electric limit. Indicator: illuminates (red) when antenna has reached electrical limits.
SIGNAL STRENGTH:	
Meter	Indicates the relative strength of the signal received from a satellite.
SENSITIVITY adjust rotary control	Adjusts sensitivity of SIGNAL STRENGTH meter.
ZERO SET adjust rotary control	Adjusts zero setting of SIGNAL STRENGTH meter.
400 CPS REF toggle switch	Applies 120 volts, 400 Hz to scan generator, module contact boards, synchros, and resolvers.
ELEVATION:	
Digital readout indicator	Indicates position of antenna in degrees and 0.1° units of elevation.
Analog indicator	Indicates position of antenna elevation in 5° units.
LIMITS:	
SERVO switch-indicator	Switch: when pressed enables servo limit override, permitting antenna operation at reduced speed. Indicator: illuminates (amber) when antenna enters elevation servo limits.
ELECTRIC pushbutton switch-indicator	Switch: when pressed enables antenna to be backed out of electric limit.
BEACON RECEIVER indicators:	
SIGNAL DETECT	Illuminates (white) to indicate that a satellite signal has been detected.
POSITION MEMORY	Illuminates (white) to indicate that antenna will return to the position of initial satellite signal detection to attempt phase lock; upon phase lock, position memory is inhibited.
PHASE LOCK indicator	Illuminates (green) to indicate that demodulator being used for tracking is phase locked.
MODE CONTROL switch-indicators:	
STANDBY	When pressed places antenna control in standby mode. Indicator illuminates (amber).
PROGRAM	Operates in conjunction with SUPPLEMENTAL CONTROL PROGRAM START switch to initiate a programmed mode of operation (illuminated white).
ACQUISTION-AUTO TRACK	When pressed during manual mode the system enters acquisition mode, and the ACQUISITION indicator illuminates (blue). When satellite signal is phase locked, the ACQUISITION indicator extinguishes and AUTOTRACK indicator illuminates (green).
FORCED TRACK	When pressed, initiates a mode of operation in which the beacon demodulator envelope detector error signal is used for the antenna control error signal. Indicator illuminates (amber).
MANUAL	When depressed, initiates the manual mode of operation. Antenna positioning handwheels are enabled so that the antenna can be manually positioned. Indicator illuminates (white).
BAR SCAN	Initiates a scanning operation (search mode) with the scanning pattern resulting from the output of the azimuth sawtooth and elevation step voltage scan generator (illuminates white).
RATE AUGMENT	When pressed, enables AZIMUTH and ELEVATION POSITION RATE handwheels. The antenna is then positioned at a fixed rate depending on the setting of the handwheels; used during manual tracking to eliminate continuous handwheel operation while observing signal strength. Indicator illuminates (white).
AZIMUTH:	
POSITION RATE handwheel	Manually positions the antenna in azimuth. The antenna rotates 1 degree per revolution of the handwheel.
SLEW control	Manually slews the antenna either clockwise or counterclockwise at a rate dependent on the offset from the center detent position.
ELEVATION:	
SLEW control rotary switch	Used to manually slew the antenna UP or DOWN at a rate dependent on the setting from the center detent position.
POSITION RATE handwheel	Used to manually position the antenna in elevation. The antenna rotates 1 degree per revolution of the handwheel.
BAR SCAN CONTROL selector rotary switches:	
AZ SECTOR	Determines the maximum azimuth sector the antenna will sweep during bar scan.
EL SECTOR	Determines the maximum elevation sector the antenna will sweep during bar scan.

Table 3-4. Antenna Control Panel (1A2A5) Control and Indicators - Continued

Control or indicator	Function
AZ RATE	Determines the speed at which the antenna scans within the AZ SECTOR sector setting.
EL INCREMENT	Determines the elevation angle change between two consecutive azimuth scans.
SUPPLEMENTAL CONTROL switch-indicators	
PENCIL BEAM	Disables the digital scanning of the receive feed when manually tracking a satellite; indicator illuminates white.
FOLLOW-UP DISABLE	Disables the digital readout indicators when the antenna is automatically tracking (illuminates amber). The azimuth and elevation handcrank controls may be operated to set the digital indicators to the predicted coordinates of the next acquisition without disturbing autotracking of an already acquired satellite. When the MANUAL indicator switch is depressed, or when phase lock is lost, the antenna will position to the digital indicator settings.
PROGRAM START	Operates in conjunction with the MODE CONTROL PROGRAM pushbutton switch to initiate programmed tracking (illuminates white).
NARROW BAND	Improves tracking capability under certain degraded signal conditions, indicator illuminates white.
Three-position receiver select rotary switch (fig. 3-6, sheet 2)	
COMM 1	Selects error signal from comm demod 1A3A3.
COMM 2	Selects error signal from comm demod 1A3A5.
BEACON	Selects error signal from beacon demod 1A3A4.

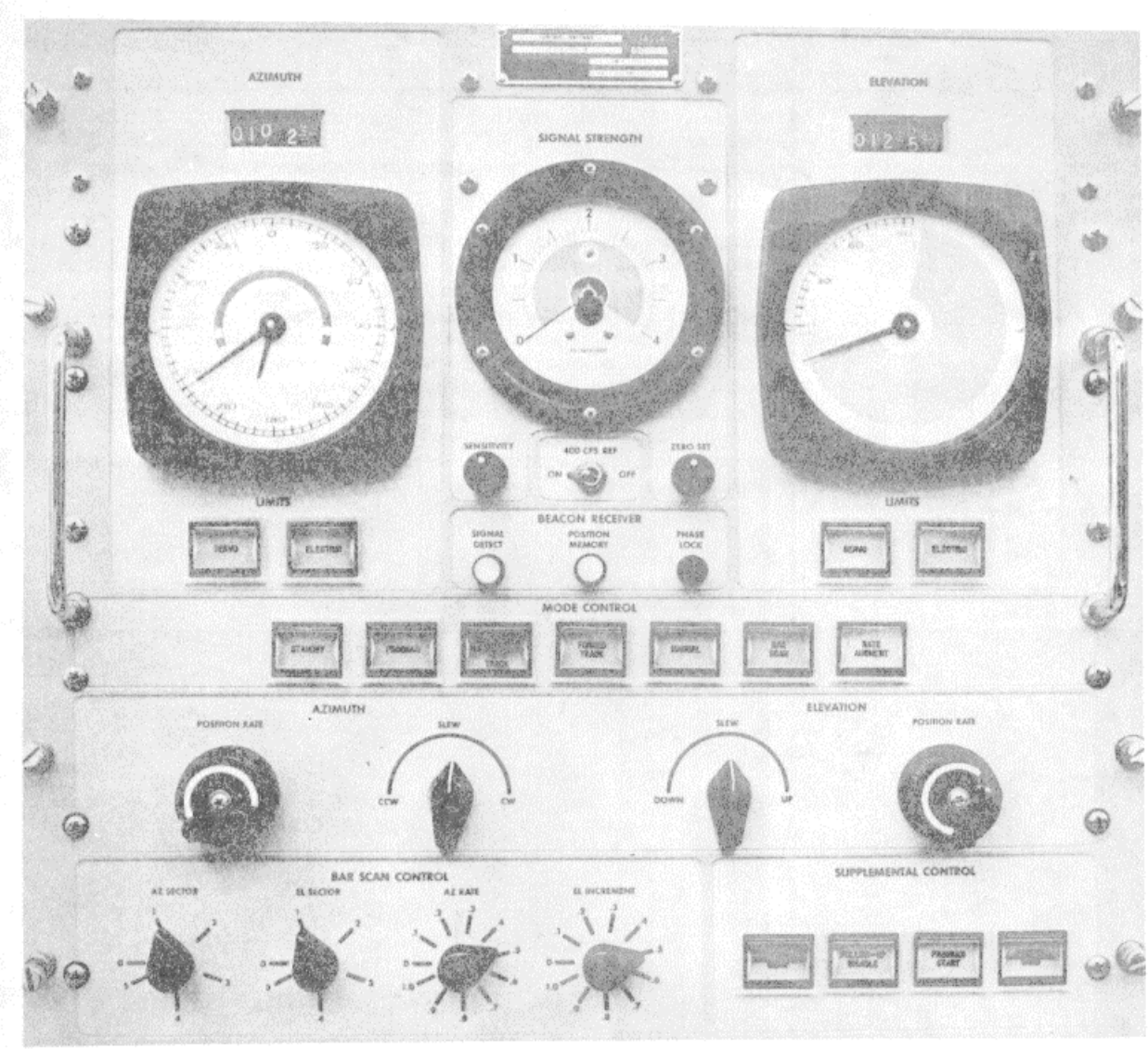

Figure 3-6(1). Antenna control panel (1A2A5) control and indicators (sheet 1 of 2).

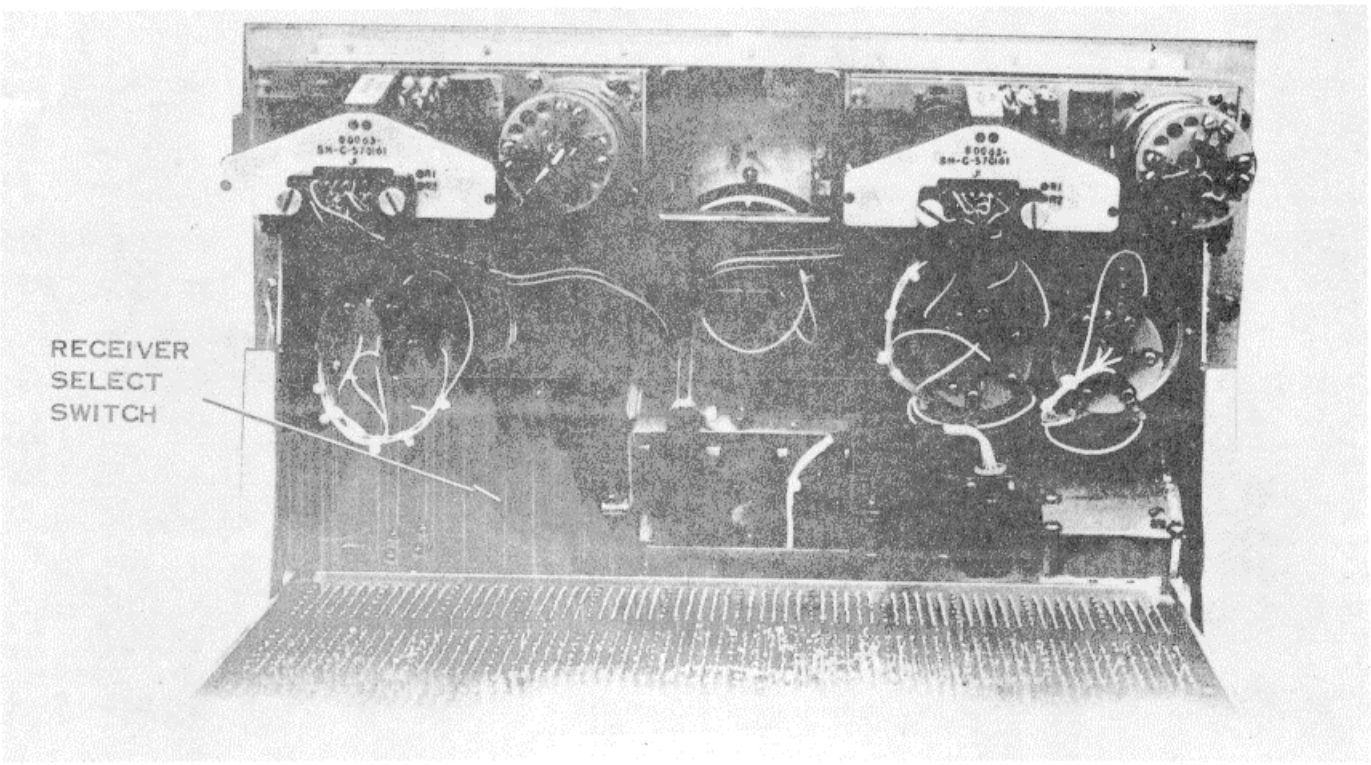

Figure 3-6(2). Antenna control panel (1A2A5) controls and indicators (sheet 2 of 2).

Table 3-5. If. Patch Panel (1A3A22) Controls and Indicators - Continued.

Connector jack	Function
XMT:	
AUX	Provides a patching connection from shelter pedestal interface panel 1J3 jack (50Ω).
USC-28	Provided for future use.
MOD TEST	Provides a patching connection from power divider for test signal output of modulator 1A3A14; normally terminated with a 50(coaxial termination.
MODULATOR	Provides a patching connection from modulator 1A3A14 through power divider (DC1).
TCC-79	Provides a patching connection for the transmit signal from the AN/TCC-79 through external distribution box connector J15.
URC-61	Provides patching connection from the URC-61 modulator; normally patched through the group delay equalizer.
EQL:	
OUT	Provides patching connection to the transmit group delay equalizer.
OUT	Provides patching connection from the transit group delay equalizer.
UP CONV-1	Provides a patching connection to upconverter 1.
UP CONV-2	Provides a patching connection to upconverter 2.
UP CONV-3	Provides a patching connection to upconverter 3.
RCV:	
AUX	Provides a patching connection to the shelter pedestal interface panel 1J10 (50Ω).
USC-28	Provided for future use.
COMM-2 DEMOD	Provides a patching connection to comm demod 2, 1A3A5.
COMM-1 DEMOD	Provides a patching connection to comm demod 1, 1A3A3.
BEACON DEMOD	Provides a patching connection to beacon demod 1A3A4.

Table 3-5. If. Patch Panel (1A3A22) Controls and Indicators - Continued

Connector jack	Function
TCC-79	Provides a patching connection to AN,rCC-79 through external distribution box J16.
URC-61	Provides a patching connection to AN/URC-61 demodulator.
EQL:	
IN	Provides patching connection to the receive group delay equalizer.
OUT	Provides a patching connection from the receive group delay equalizer.
DN CONV-1	Provides a patching connection from downconverter 1.
DN CONV-2	Provides a patching connection from downconverter 2.
DN CONV-3	Provides a patching connection from downconverter 3.

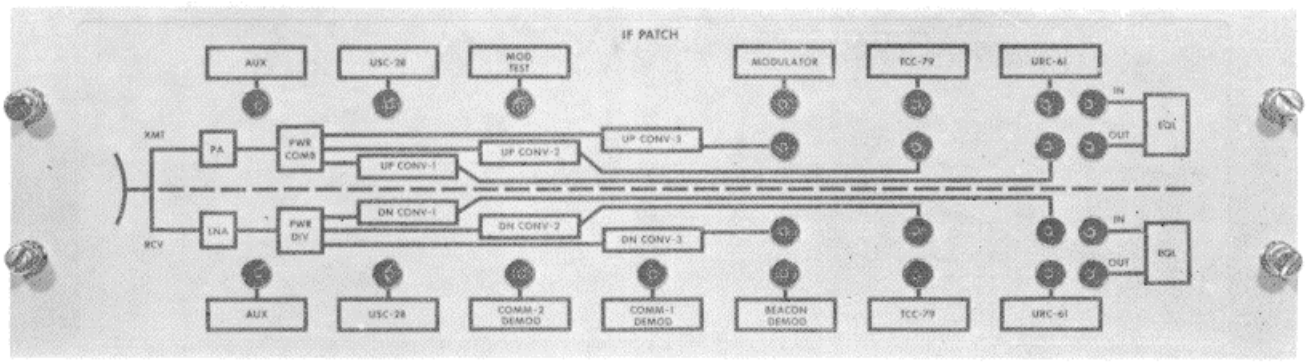

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Figure 3-7. If. patch panel (1A3A422) controls and indicators.

Table 3-6. Comm Demod (1A3A3 or 1A3A5) Controls and Indicators

Control or indicator	Function
SIGNAL STRENGTH decibel meter	Indicates received signal strength and is used in manual tuning of 48.6 MHz vco.
BASEBAND LEVEL decibel meter	Indicates audio level output of the comm demod.
VCO TUNING frequency meter	Monitors frequency offset of the 48.6 MHz vco.
LOCK indicator	Illuminates (green) to indicate the demodulator is phase locked.
+ 28V indicator	Illuminates (white) to indicate that +28 vdc regulated power is applied.
+ 15V indicator	Illuminates (white) to indicate that +15 vdc regulated power is applied.
-28V indicator	Illuminates (white) to indicate that -28 vdc regulated power is applied.
-15 indicator	Illuminates (white) to indicate that -15 vdc regulated power is applied.
+28V UNRGD indicator	Illuminates (white) to indicate that +28 vdc unregulated power is applied.
Eight-position RECEIVE MODE rotary switch:	

Switch pos	Mode	If.	If. bandwidth
V1	Fm	21.4 MHz	75 kHz
V2	Fm	21.4 MHz	75 kHz
V3	Fm	1.4 MHz	4 kHz
V4	Fm	1.4 MHz	10 kHz
V5	Fm	21.4 MHz	150kHz
V6	Fm	21.4 MHz	300 kHz
V7	Fm	21.4 MHz	560 kHz
V8	Fm	21.4 MHz	1000 kHz

BASEBAND ATTENUATION DB toggle switches:	
2	Attenuates output of comm demod by 2 dB.
4	Attenuates output of comm demod by 4 dB.
8	Attenuates output of comm demod by 8 dB.
16	Attenuates output of comm demod by 16 dB.
TUJING MODE AFC-MAN toggle switch:	
AFC	Permits automatic frequency control of the vco.
MAN	Operates in conjunction with the VCO MANUAI, TUNING dial control to permit manual tuning of the vco.
VCO MANUAL TUNING dial control	Permits manual adjustment of the vco.

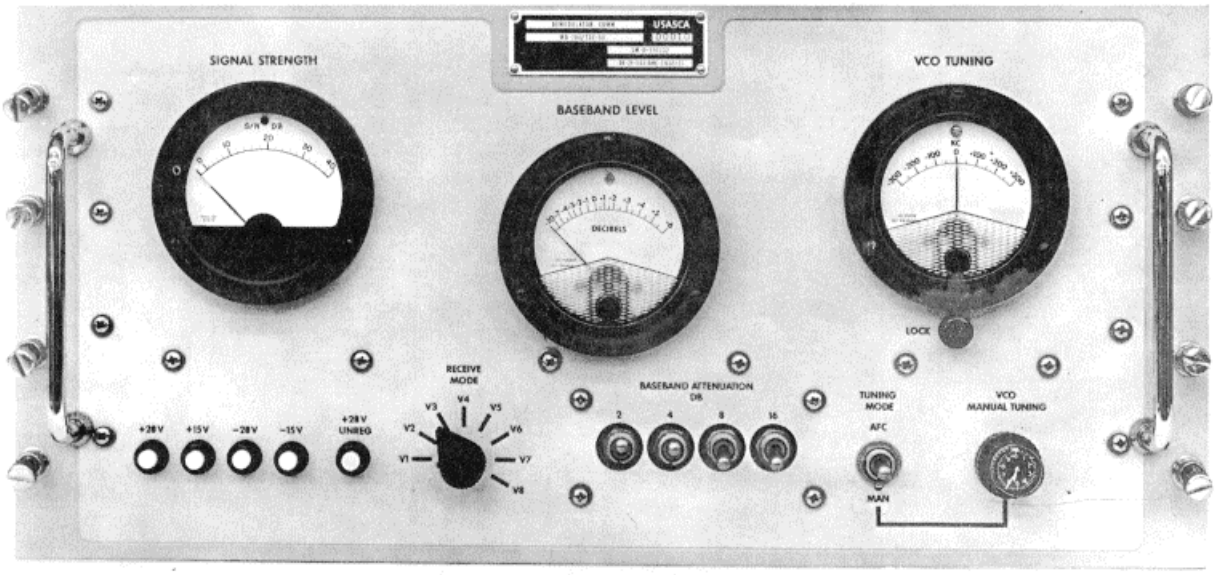

Figure 3-8. Comm demod (1A3A3 or 1A3A5) controls and indicators.

Table 3-7. Beacon Demod (1A3A4) Controls and Indicators

Control or indicator	Function
SIGNAL STRENGTH decibel meter	Indicates received signal strength and is used in manual tuning 48.6 MHz vco.
BEACON TRACK ACQ indicator	Illuminates (green) to indicate that main loop is in a phase locked condition.
BEACON SIGNATURE DISPLAYED	Illuminates (white) to indicate that beacon identification loop has detected the satellite identification frequency.
VCO TUNING meter	Monitors frequency offset of the 48.6 MHz vco.
+28V indicator	Illuminates (white) to indicate that +28 vdc regulated power is applied.
+ 15V indicator	Illuminates (white) to indicate that + 15 vdc regulated power is applied.
-28V indicator	Illuminates (white) to indicate that -28 vdc regulated power is applied.
-15V indicator	Illuminates (white) to indicate that -15 vdc regulated power is applied.
+28V UNREG indicator	Illuminates (white) to indicate that +28 vdc unregulated power is applied.
Three-position mode rotary switch:	
NORMAL	Selects beacon demod operation as a satellite tracking receiver.
LAST DITCH BEACON	Selects narrow bandwidth and allows satellite tracking under degraded signal conditions.
LAST DITCH COMM	Selects proper bandwidth when tracking on a narrowband communications signal in place of the beacon signal.
TUNING MODE toggle switch:	
AFC	Permits automatic frequency control of vco.
MAN	Operates in conjunction with the VCO MANUAL TUNING dial controls to permit manual tuning of the vco
VCO MANUAL TUNING rotary controls:	
COARSE	Permits a coarse manual adjustment of the vco.
FINE	Permits a fine manual adjustment of the vco.

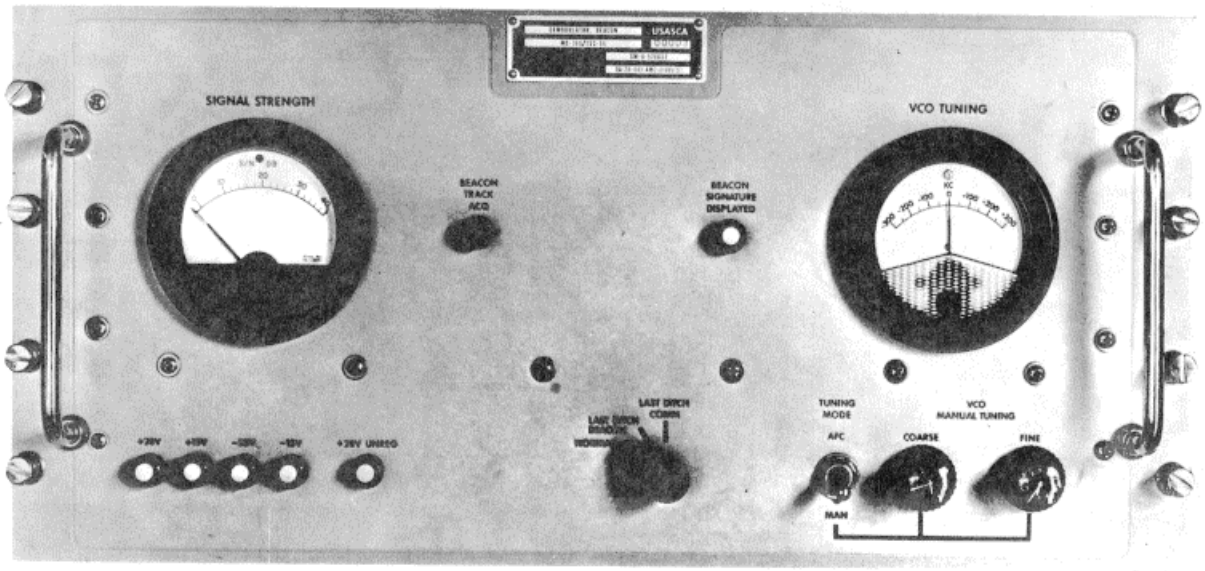

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Figure 3-9. Beacon demod (1A3A4) controls and indicators.

Table 3-8. Static Frequency Converter (1A2A35) Controls and Indicators

Connector or indicator	Function
60 Hz PANEL OUTLET ON/OFF circuit breaker	Controls the application of 60 Hz power to the panel outlets.
400 Hz INPUT POWER ON/OFF circuit breaker	Controls the application of 400 Hz input power.
60 Hz OUTPUT POWER ON/OFF circuit breaker	Controls the 60 Hz output power.

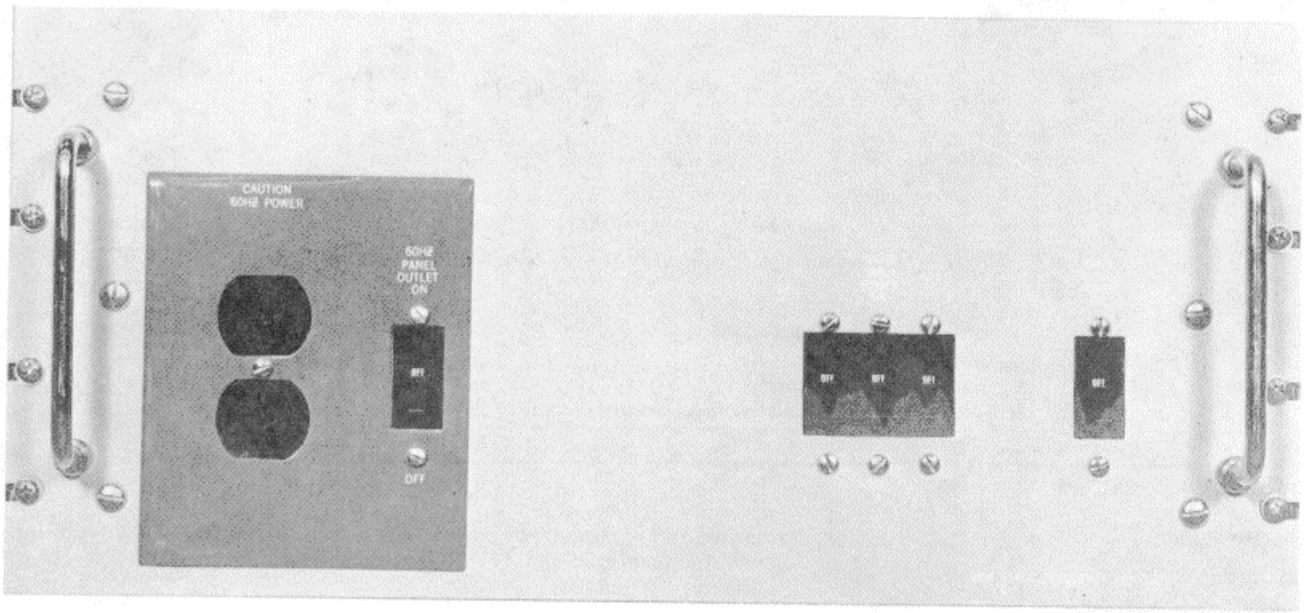

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Figure 3-10. Static frequency converter (1A2A35) controls and indicators.

Table 3-9. Test Translator Control (1A2A26) Controls and Indicators

Control, indicator or connector	Function
MIXER CURRENT meter	Permits monitoring of the test translator mixer currents.
FWD/RVS toggle switch	Provides switch capability to monitor forward and reverse mixer currents.
Coaxial pushbutton indicator switch A1	Controls on and off line switching of LNA-1 and LNA-2.
Coaxial pushbutton indicator	Controls on and off line switching of TWT-1 and TWT-2.
Coaxial pushbutton indicator switch A2	Controls switching of TWT-1 and TWT-2 outputs to either the downconverter or the detector amplifier gain monitor circuits.
GAIN MONITOR meter	Permits monitoring of the off line LNA and TWT gain.
TEST TRANSLATOR/PILOT GENERATOR toggle switch	Provided for future use.
INJECTION SIGNAL ON/OFF split lense pushbutton indicator switch	Provides +28 VDC power to the test translator RF oscillator.
ATTENUATION switches:	
1	Attenuates output of test translator by 1 dB.
2	Attenuates output of test translator by 2 dB.
4	Attenuates output of test translator by 4 dB.
8	Attenuates output of test translator by 8 dB.
16	Attenuates output of test translator by 16 dB.
INJECTION POINT rotary switch:	Provides five different injection points for the test translator signal.
position one	Injects the test translator signal through external probes to the receive antenna.
position two	Injects the test translator signal at the input of the on-line LNA.
position three	Injects the test translator signal at the input of the off-line LNA.
position four	Injects the test translator signal at the input of TWT-1.
position five	Injects the test translator signal at the input of TWT-2.

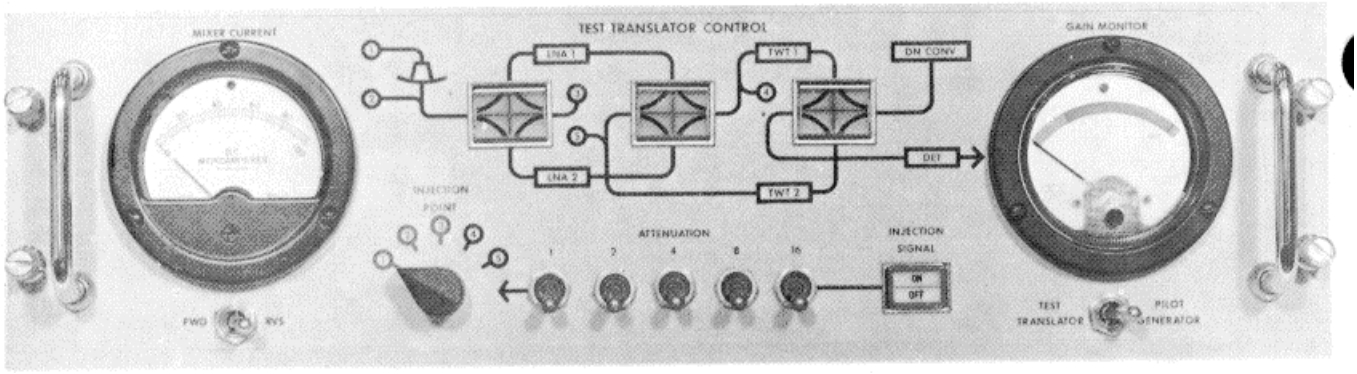

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Figure 3-11. Test translator control (1A2A26) controls and indicators.

Table 3-10. Cesium Environmental Enclosure (1A2A34) Controls and Indicators

Connector or indicator	Function
POWER AIRCRAFT/NORMAL toggle switch:	
AIRCRAFT	Permits aircraft ac power to be made available to the cesium beam standard during aircraft transport of the AN/TSC-54 and interrupts charging of the standby power supply batteries.
NORMAL	Permits charging of the standby power supply batteries when AN/TSC-54 is in normal operation.
BLOWER FAIL indicator	Illuminates (red) to indicate insufficient air flow within the electrical equipment housing.

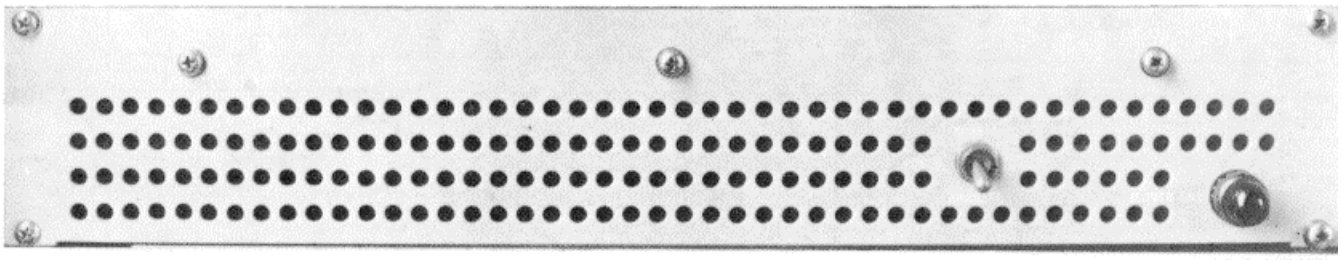

Figure 3-12. Cesium environmental enclosure (1A2A34) controls and indicators.

Table 3-11. Comm Demod Power Supply (1A3A9) Controls and Indicators

Control or indicator	Function
COMM DEM. NO. 1 POWER SUPPLY:	
+ 28V ON toggle switch	Controls the application of ac power to power supply PS1 which applies a regulated +28 vdc to comm decomd 1A3A3.
+ 15V toggle switch	Controls the application of ac power to power supply PS2 which supplies a regulated + 15 vdc to comm demod 1A3A3.
-15V ON toggle switch	Controls the application of ac power to power supply PS3 which supplies a regulated -15 vdc to comm demod 1A3A3.
-28V ON toggle switch	Controls the application of ac power to power supply PS4 which supplies a regulated -28 vdc to comm demod 1A3A3.
+28V and COMMON test jacks	Used to measure comm demod +28 vdc regulated power.
+15V and COMMON test jacks	Used to measure comm demod +15 vdc regulated power.
-15V and COMMON test jacks	Used to measure comm demod -15 vdc regulated power.
-28V and COMMON test jacks	Used to measure comm demod -28 vdc regulated power.
COMM DEM NO. 2 POWER SUPPLY:	
+ 28V ON toggle switch	Controls the application of ac power to power supply PS5 which supplies a regulated +28 vdc to comm demod 1A3A5.
+ 15V ON toggle switch	Controls the application of ac power to power supply PS6 which supplies a regulated
+15 vdc to comm demod 1A3A5.	
-15V ON toggle switch	Controls the application of ac power to power supply PS7 which supplies a regulated -15 vdc to comm demod 1A3A5.
-28V ON toggle switch	Controls the application of ac power to power supply PS8 which supplies a regulated -28 vdc to comm demod 1A3A5.
+28V and COMMON test jacks	Used to measure comm demod +28 vdc regulated power.
+ 15V and COMMON test jacks	Used to measure comm demod + 15 vdc regulated power.
-15V and COMMON test jacks	Used to measure comm demod -15 vdc regulated power.
-28V and COMMON test jacks	Used to measure comm demod -28 vdc regulated power.

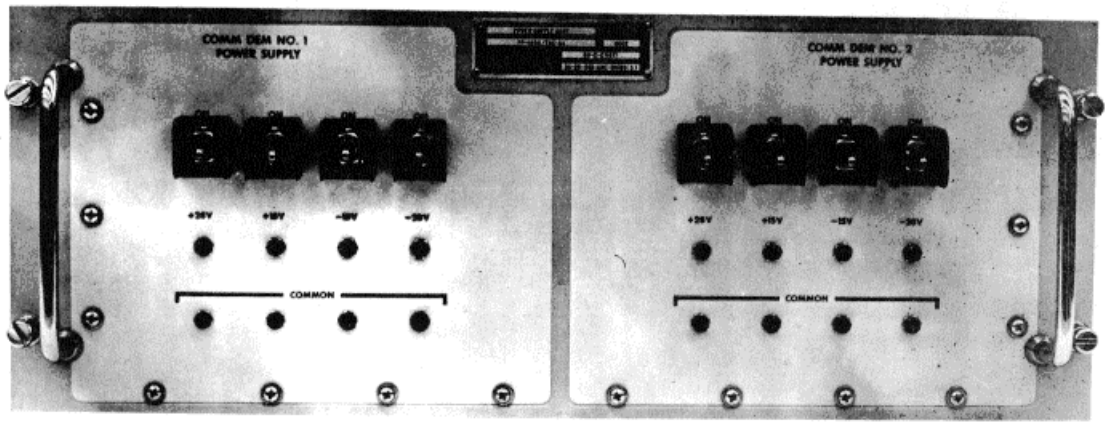

Figure 3-13. Comm demod power supply (1A3A9) controls and indicators

Table 3-12. Beacon Demod-Baseband Power Supply (lA3A10) Controls and Indicators

Control, indicator or connector	Function
BEACON DEM POWER SUPPLY:	
+ 28V ON toggle switch	Controls the application of ac power to power supply PS4 which supplies a regulated +28 vdc to beacon demod.
+ 15V ON toggle switch	Controls the application of ac power to power supply PS3 which supplies a regulated + 15 vdc to beacon demod.
-15V ON toggle switch	Controls the application of ac power to power supply PS2 which supplies a regulated -15 vdc to beacon demod.
-28V ON toggle switch	Controls the application of ac power to power supply PS 1 which supplies a regulated -28 vdc to beacon demod.
+28V and COMMON test jacks	Used to measure beacon demod + 28 vdc regulated power.
+ 15V and COMMON test jacks	Used to measure beacon demod + 15 vdc regulated power.
-15V and COMMON test jacks	Used to measure beacon demod -15 vdc regulated power.
-28V and COMMON test jacks	Used to measure beacon demod -28 vdc regulated power.
BASEBAND POWER SUPPLY:	
+ 3V ON circuit breaker	Controls the application of ac power to power supply PS5 which supplies a regulated +3 vdc to baseband circuits.
+3V indicator	Illuminates (white) to indicate power supply PS5 is providing a regulated +3 vdc output
+ 12V -24V ON toggle switch	Controls the application of ac power to power supplies PS6 and PS7 which supply regulated + 12 and -24 vdc regulated outputs to baseband circuits
+ 12V indicator	Illuminates (white) to indicate that power supply PS6 is providing + 12 vdc regulated output.
-24V indicator	Illuminates (white) to indicate that power supply PS7 is providing -24 vdc regulated output.
+ 28V -28V ON toggle switch	Controls the application of ac power to power supplies PS8 and PS9 which supply 8 and -28 vdc to baseband circuits.
+28'V indicator	Illuminates (white) to indicate that power supply PS8 is providing +28 vdc regulated output.
+ 3V and COMMON test jacks	Used to measure baseband -3 vdc regulated power.
+ 12V and COMMON test jacks	Used to measure baseband + 12 vdc regulated power.
-24V and COMMON test jacks	Used to measure baseband - 24 vdc regulated power.
+28V and COMMON test jacks	Used to measure baseband +28 vdc regulated power.
+28V and COMMON test jacks	Used to measure baseband -28 vdc regulated power.

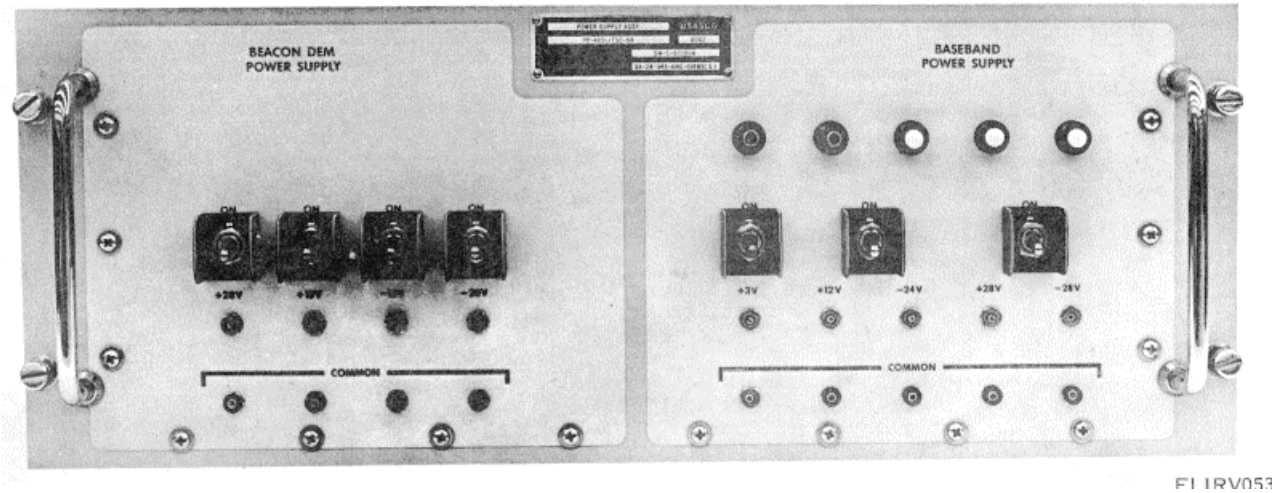

Figure 3-14. Beacon demod-baseband power supply (1ASA10) controls and indicators.

NOTE

The patch cord jacks on the patch panels are arranged in LINE, EQUIP, MON, or MISC designated horizontal rows and generally have similar functions. Each LINE and EQUIP jack provides a normal-through connection so that when a patch cord is inserted, the normal-through connection is broken and the signal input is available for patching to other circuits. LINE and EQUIPjacks not used

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in the normal-through circuits provide for patch cord access to their associated lines or equipments. Each MON jack, which is a monitoring point for the circuit jack immediately above it, provides a convenient point for patching the monitor equipment into the signal circuits without interrupt- ing normal operation. The MISC jacks provide access points for associated test equipment and test signals. Unmarked jacks are spares that are used for the expansion of equipment facilities.

Table 3-13. Tty Patch Panel (1A3A25) Controls and Indicators

Connectors	Function
EQUIPjack LINEjack	
TX TTY SEL SW	Send normal-through circuits; patching jacks for signal from line isolator unit-1 and
LIU-1 3995 Hz	signal to the NORMAL position terminal of baseband control panel TTY MODE
3995 Hz USER TX	USET level switch, respectively.
RX TTY SEL SW	Receive normal-through circuits; patching jacks for signal to line isolator unit-1 and
LIU-1 3995 Hz	signal from 3995 Hz frequency shift converter, respectively.
3995 Hz USER TX	Send normal-through circuits; patching jacks for signal from line isolator unit-2 and
TX TTY SEL SW	
LIU-2 3805 Hz	signal to the NORMAL position terminal of TTY MODE ORDER WIRE level
3805 Hz OW TX	switch, respectively.
RX TTY SEL SW	Receive normal-through circuits; patching jacks for signal to line isolator unit-2 and
LIU-2 3805 Hz	signal from 3805 Hz frequency shift converter, respectively.
3805 Hz OW RX	
TX	Patching jack for signal from line isolator unit-3.
LIU-3	
SPARE USER	
RX	Patching jack for signal to line isolator unit-3.
SPARE USER	
TX KEYER CONV	Send normal-through circuits; patching jacks for signal from LAST DITCH position
TTY SEL SW 1275 Hz	terminals of TTY MODE ORDERWIRE and USER lever switches and signal to
1275 Hz L/D TX	1275 Hz frequency shift keyer, respectively.
RX KEYER CONV	Receive normal-through circuits; patching jacks for signal from LAST DITCH
TTY SEL SW 1275 Hz	position terminals of TW Y MODE ORDERWIRE and USER level switches and
1275 Hz LID TX	signal to 1275 Hz frequency shift keyer, respectively.
TX	Patching jack for signal from UGC-77 keyboard output.
UGC-77	
KEYER PTR	
RX	Patching jack for signal to the UGC-77 page printer input.
UGC-77	
KEYER PTR	
TX URG-61 OW	Send normal-through circuits; patching jacks for signal from URG-61 DC LINES
URC-61 OW TX	OW SEND IN binding posts on external signal distribution box and signal input to ANIURG-61.
RX 1 URG-61 OW	Receive normal-through circuits; patching jacks for signal to URG-61 DC LINES OW RCV OUT binding posts on external signal distribution box and signal from AN/URC-61 receiver -1, respectively.
TX URC-61 USER	Send normal-through circuits; patching jacks for signal from URC-61 DC LINES
URC-61 USER TX	USER SEND IN binding post on external signal distribution box and signal input to AN/URC-61, respectively.
RX 1 URC-61 USER	Receive normal-through circuits; patching jacks for signal to URC-61 DC LINES
URC-61 USER RX 1	USER RCV OUT binding post on external signal distribution box and signal form AN/URC-61 receiver-i, respectively.
TX URC-61	Send normal-through circuits; patching jacks for signal from URC-61 DC LINES
URC-61 DIG DATA	DIG DATA SEND IN binding post on external signal distribution box and signal
DIG DATA TX	input to AN/URC-61, respectively.

Table 3-13. Tty Patch Panel (1A3A25) Controls and Indicators - Continued

Connectors		Function
EQUIPjack	LINEjack	
RX 1	URC-61	Receive normal-through circuits; patching jacks for signal to URC-61 DC LINES
URC-61	RX 1	DIG DATA RX-1 OUT binding posts on external signal distribution box and
DIG DATA		signal from AN/URC-61 receiver-i, respectively.
RX 1	CLOCK	Receive normal-through circuits; patching jacks for signal to URC-61 DC LINES
CLOCK	RX1	DIG DATA CLOCK RX-1 OUT binding post on external signal distribution box and signal from AN/URC-61 receiver-i, respectively.
RX 2	OW	Patching jack for signal from AN/URC-61 receiver-2
OW	RX2	
RX 2	USER	Patching jack for signal from AN/URC-61 receiver-2.
USER	RX2	
RX 2	DIG DATA	Patching jack for signal from AN/URC-61 receiver-2.
DIG DATA	RX2	
RX 2	CLOCK	Patching jack for signal from AN/URC-61 receiver-2.
CLOCK	RX 2	
MISC jack		
NO. 1		Patching jack for signal from SPARE LOW LEVEL LINES-1 binding post on
Low Level Spare Users:		external distribution box.
NO. 2		Patching jack for signal from SPARE LOW LEVEL LINES-2 binding post on external distribution box.
NO. 3		Patching jack for signal from SPARE LOW LEVEL LINES-3 binding post on external distribution box.
NO. 4		Patching jack for signal from SPARE LOW LEVEL LINES-4 binding post on external distribution box.
NO. 5		Patching jack for signal from SPARE LOW LEVEL LINES-5 binding post on external distribution box.
NO. 6		Patching jack for signal from SPARE LOW LEVEL LINES-6 binding post on external distribution box.
UG-77		
SYNC		Patching jack for SYNC signal from UG-77 teletypewriter.
±6V		
METER		Patching jack for dc teletype signals to EDGE METER on baseband control panel.
±6V		
OUTPUT		Patching jack for +6 V test signals.
±6 V		
SEL		Button switch which selects +6 V or -6 V test signal at +6 V output jack.

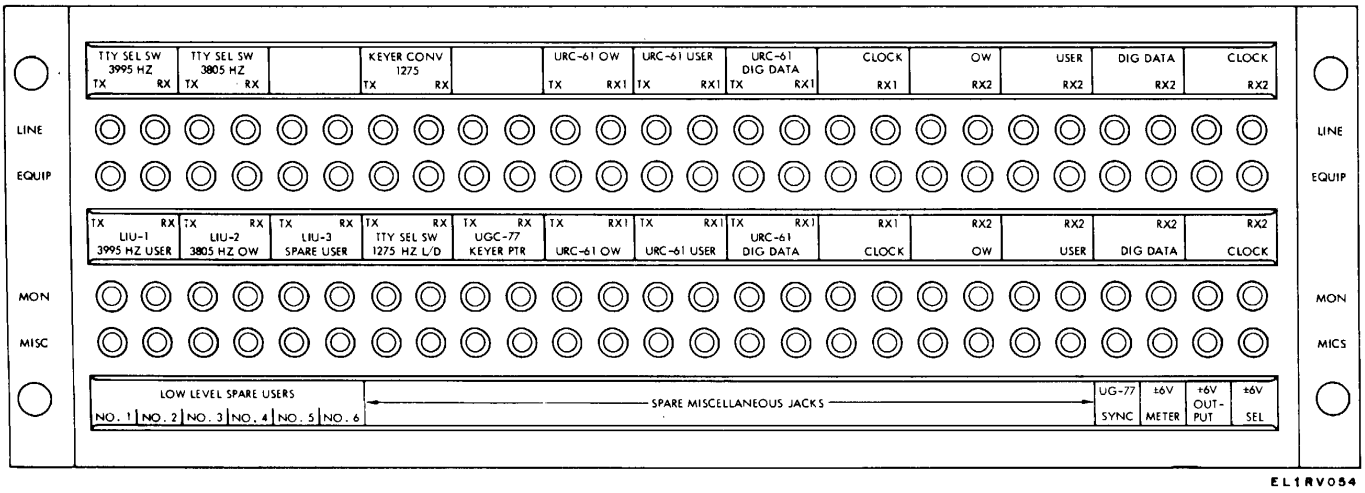


Figure 3-15. Tty patch panel (1A3A25) controls and indicators

Table 3-14. Baseband Patch Panel (1A3A12) Controls and Indicators

Connectors		Function
EQUIP jack	LINE jack	
COMM AMPL	MODULATOR	Send normal-through circuit; patching jacks for output from line amplifier and to modulator, respectively
IKC TEST TONE		Send patching jack for output from 1 kHz test tone oscillator.
VOICE MODE	COMM AMPL	Send normal-through circuit; patching jacks for signal selected by baseband panel MODE SELECT switch and input to voice channel of the send line amplifier, respectively
3995C/S KEYER	COMM AMPL 3995C/S	Send normal-through circuit; patching jacks for 3,995 Hz frequency-shift keyer and input to 3,995 Hz fsk channel of send line amplifier, respectively.
3805C/S KEYER	COMM AMPL 3805C/S	Send normal-through circuit; patching jacks for signal from 3805 Hz frequency-shift keyer and input to 3,805 Hz fsk channel of send line amplifier, respectively.
1275C/S	VOICE/TTY FIL	Send normal-through circuit; patching jacks for signals from 1275 Hz frequency-shift keyer and input to voice/tty notch filter, respectively.
COMM AMPL	DEMODULATOR 1	Receive normal-through circuits; patching jacks for input-to-receive line amplifier and output from comm demod 1A3A3, respectively.
	DEMODULATOR 2	Receive patching jacks for substituting comm demod 2 for comm demod 1.
VOICE MODE SEL SW	COMM AMPL VOICE	Receive normal-through circuit; patching jacks for input to MODE SELECT switch and output from voice channel of receiver line amplifier, respectively.
3995C/S CONVERTER	COMM AMPL 3995C/S	Receive normal-through circuit; patching jacks for input to 3,995 Hz frequency shift converter and output from 3,995 Hz channel of receive line amplifier, respectively-
3805C/S CONVERTER	COMM AMPL 3805C/S	Receive normal-through circuit; patching jacks for input to 3,805 Hz frequency-shift converter and output from 3,805 Hz channel of receive line amplifier, respectively
1275C/S	VOICE/TTY FIL	Receive normal-through circuit; patching jacks for input to 1,275 Hz frequency-shift converter and filtered output from voice/tty notch filter, respectively.
VOICEI=TY FIL LINE	VOICE/TY FIL TP	Send through-filter circuit; patching jacks and test points for signal from baseband control panel CLIPPER IN-OUT lever switch and notch-filtered (VI mode) signal-to-send amplifier, respectively.
TRUNCATED FIL	TRUNCATED FIL	Send through-filter circuit; patching jacks for signal from CLIPPER IN-OUT lever switch and truncate-filtered (V2 mode) signal-to-send line amplifier, respectively-
NORMAL FIL	NORMAL FIL	Send through-filter circuits; patching jacks for signal from CLIPPER IN-OUT lever switch and normally filtered (V3 mode) signal-to-send line amplifier, respectively-
WIDEBAND EXT	VOICE MODE SEL SW WIDEBAND	Send normal-through circuits; patching jacks for signal from WIDEBAND EXT SEND J4 on external signal distribution box and signal to MODE SELECT switch (V5 mode) on the baseband control panel, respectively.
VOICE/TTY FIL TP	VOICE/TIY FIL LINE	Receive through-filter circuit; test points and patching jacks for signal from receive line amplifier voice normal-through circuit and notch-filtered (V1 mode) signal-to-receive echo suppressor input normal-through circuit, respectively.
TRUNCATED FIL	TRUNCATED FIL	Receive through-filter circuit; patching jacks for signal-from-receive line amplifier voice normal-through circuit and truncate-filtered (V2 mode) signal-to-receive echo supressor input normal through circuit, respectively.
NORMAL FIL	NORMAL FIL	Receive through-filter circuit; patching jacks for signal from receive line amplifier voice normal-through circuit and normally-filtered (V3 mode), signal-to-receive echo suppressor input normal-through circuit, respectively.
WIDEBAND EXT	VOICE MODE SEL SW WIDE BAND	Receive normal-through circuits; patching jacks for signal from MODE SELECT switch (V5 mode) and signal to WIDEBAND EXT RECEIVE J5 on external signal distribution box, respectively.
ECHO SUPPR	DERIVATIVE	Send normal-through circuit; patching jacks for output of transmit echo suppressor and signal to CLIPPER IN-OUT lever switch, respectively.
VOICE SOURCE SEL SW	ECHO SUPPR TRANSMIT	Send normal-through circuit; patching jacks for signal-from-baseband control panel VOICE lever switch and signal-to-transmit echo suppressor, respectively.
ORDERWIRE AMP	VOICE SOURCE SEL SWITCH O/W	Send normal-through circuit; patching jacks for voice (handset) signal-from order-wire amplifier and signal to ORDERWIRE position terminal of VOICE lever switch, respectively.
USER AMP	VOICE SOURCE SEL SWITCH USER	Send normal-through circuit; patching jacks for signal from user line amplifier and signal position terminal of VOICE lever switch respectively

Table 3-14. Baseband Patch Panel (1A3A12) Controls and Indicators - Continued

Connectors		Function
EQUIP jack	LINEjack	
USER VOICE NO. 1	USER AMP	Send normal-through circuit; patching jacks for user voice signal from USER VOICE LINES SEND 1 binding posts on external signal distribution box and signal to user line amplifier, respectively.
USER VOICE NO. 3 IN/OUT	HYBRID COIL 2W OUT/IN	Send normal-through circuit; patching jacks for signals to and from VOICE LINES 2 WIRE 3 SEND/RCV binding post on external signal distribution box and signals from and to common winding of baseband hybrid transformer, respectively-
ECHO SUPPR RECEIVER	VOICE MODE SEL SW	Receive normal-through circuit; patching jacks for signal-to-receive echo suppressor and signal from MODE SELECT switch, respectively.
VOICE SOURCE SEL SW	ECHO SUPPR RECEIVER	Receive normal-through circuit; patching jacks for signal to VOICE lever switch and output from receive echo suppressor, respectively.
ORDERWIRE AMP	VOICE SOURCE SEL SWITCH O/W	Receive normal-through circuit; patching jacks for signal (via orderwire amplifier) to handset and signal from ORDERWIRE position terminal of VOICE lever switch respectively
USER AMP	VOICE SOURCE SEL SWITCH USER	Receive normal-through circuit; patching jacks for signal-to-receive line amplifier and voice signal from USER position terminal of VOICE lever switch, respectively
USER VOICE NO. 2	USER AMP	Receive normal-through circuit; patching jacks for signal to VOICE LINES USER 2 RCV OUT vinding posts on external signal distribution box and output from receive line amplifier, respectively.
HYBRID COIL IN	HYBRID COIL	Patching jacks for signals to and from send and receive windings, respectively, of hybrid coil circuit.
USER VOICE NO. 4	URC-61 VOICE	Send normal-through circuit; patching jacks for voice signal from USER VOICE LINES AUX INPUT 4 binding posts on external signal distribution box and input to AN/URC-61, respectively.
	TA-312	Patching jack for signal from TA-312 telephone set.
USER VOICE NO. 7	SATELLITE OW	Send normal-through circuit; patching jack for signal from VOICE LINES SAT OW 7 SEND IN binding posts on external signal distribution box and signal to the satellite orderwire panel (not connected at this time), respectively.
USER VOICE NO. 9	CCS INTERCOMM	Send normal-through circuit; patching jack for signal from VOICE LINES CCS INTERCOMM 9 SEND IN an external signal box and signal to CCS Intercomm, r respectively
USER VOICE NOS. 11 and 13		Send patching jacks for signals from VOICE LINES 11 and 13 spare binding posts on external signal distribution box.
USER VOICE NO. 5	URC-61 RX 1 VOICE	Receive normal-through circuits; patching jacks for voice signal to VOICE LINES URC-61-5 RCV 1 OUT binding post on external signal distribution box and signal from AN/URC, respectively
USER VOICE NO. 6	URC-61 RX 2 VOICE	Receive normal-through circuits; patching jacks for voice signal to VOICE LINES URC-61-6 RCV 2 OUT binding posts on external signal distribution box and signal from AN/URC-61, respectively.
USER VOICE NO. 8	SATELLITE OW	Receive normal-through circuits; patching jacks for signal to VOICE LINES SAT OW 8 RCV OUT binding posts on external signal distribution box and signal from satellite orderwire panel (not connected at this time), respectively .
USER VOICE NO. 10	CCS INTERCOMM	Receiver normal-through circuits; patching jacks for signals to VOICE LINES CCS INTERCOMM 10 RCV OUT binding posts on external signal distribution box and signal from CCS INTERCOMM, respectively.
USER VOICE NOS. 12 and 14		Receive patching jacks for signals to VOICE LINES 12 and 14 SPARE binding posts on external distribution box.
USER VOICE NOS. 15, 17 and 19		Send patching jacks for signals from VOICE LINES 15, 17 and 19 SPARE binding posts on external signal distribution box.
USER VOICE NOS. 21, 23, and 25		Send patching jacks for signals from VOICE LINES 21,23, and 25 SPARE binding posts on external signal distribution box.
USER VOICE NOS. 16, 18, and 20		Receive patching jacks for signals to VOICE LINES 16,18, and 20 SPARE binding posts on external signal distribution box.
USER VOICE NOS. 22, 24, and 26		Send patching jacks for signals to VOICE LINES 22, 24, and 26 SPARE binding posts on external signal distribution box.

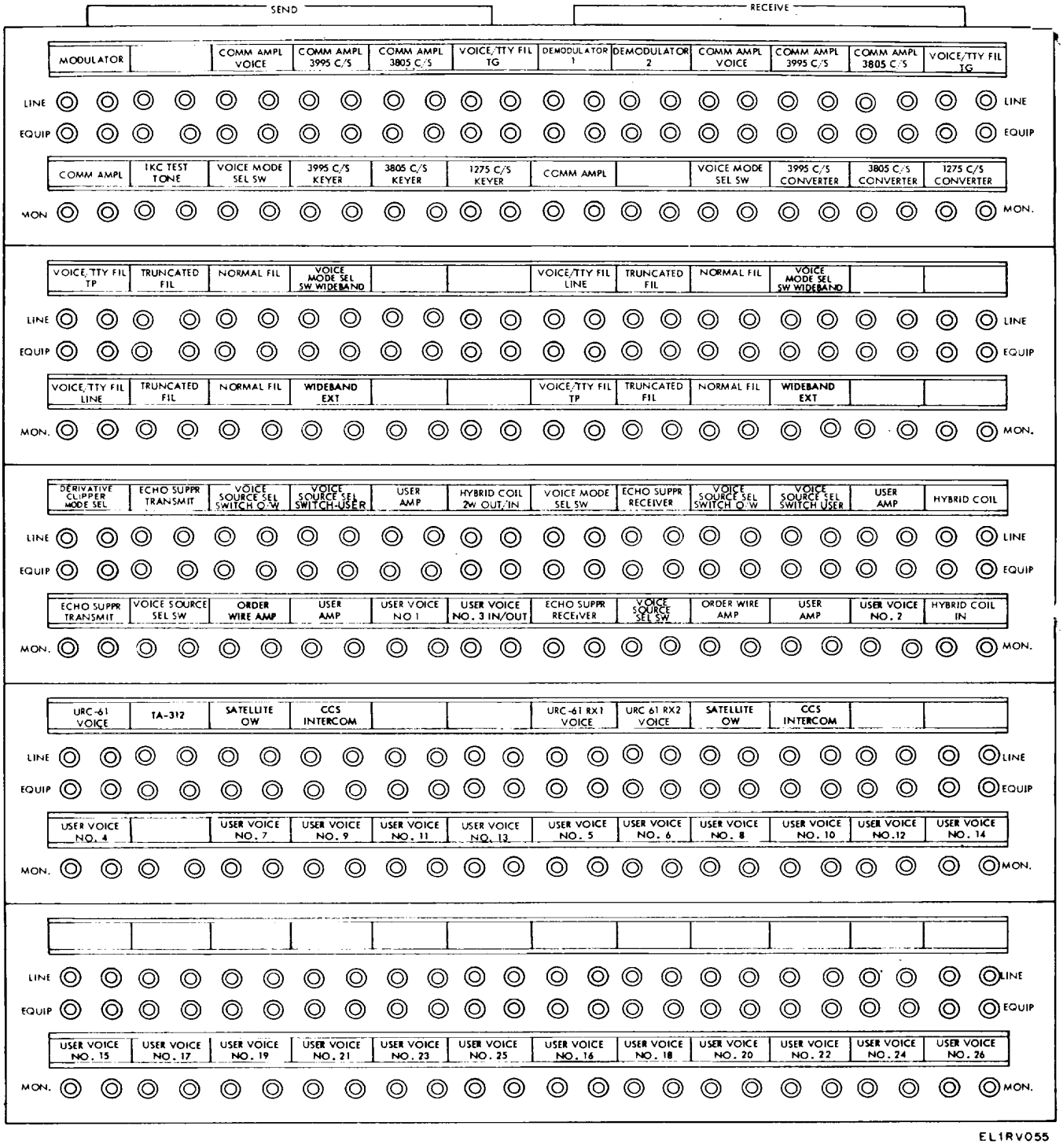


Figure 3-16. Baseband patch panel (1A3A12), controls and indicators.

Table 3-15. Baseband Control Panel (1A3A13) Controls and Indicators

Controls/indicators or connector	Function
VOLTMETER	Monitors low-level dc signals appearing at de patch panel.
LOOP CURRENT milliammeter	Used to monitor teletypewriter mode loop current.
MONITOR INPUT jack	Monitors signals on milliammeter from input to line isolation unit.
Six-position MODE SELECT rotary switch:	
TEST	Selects 1 kHz narrowband filter on receive functions only.
V1	Selects voice/tty filter on send and receive functions.
V2	Selects truncated filter on send and receive functions.
V3	Selects normal filter on send and receive functions.
NC	No connection.
V5	Selects external wideband circuit.
TTY MODE ORDERWIRE lever switch:	
NORMAL	Selects 3,805 Hz tty circuit.
OFF	Opens user orderwire tty circuit.
LAST DITCH	Selects 1,275 Hz tty circuit.
TTY MODE USER lever switch:	
NORMAL	Selects 3,995 Hz tty circuit.
OFF	Opens user tty circuit
LAST DITCH	Selects 1,275 Hz tty circuit.
VOICE USER/ORDERWIRE lever switch:	
USER	Provides the voice communications channel for the external user.
CENTER	Opens user tty circuit
ORDERWIRE	Provides the voice communications channel for the orderwire user.
CLIPPER IN/OUT lever switch:	
IN	Used to insert a clipper circuit in the voice line of the tr ansmitting circuits during degraded signal conditions.
OUT	Used to bypass the clipper circuit during normal signal conditions.
ORDERWIRE HANDSET jack	Provides for connection of handset to baseband amplifier 1A3A15.

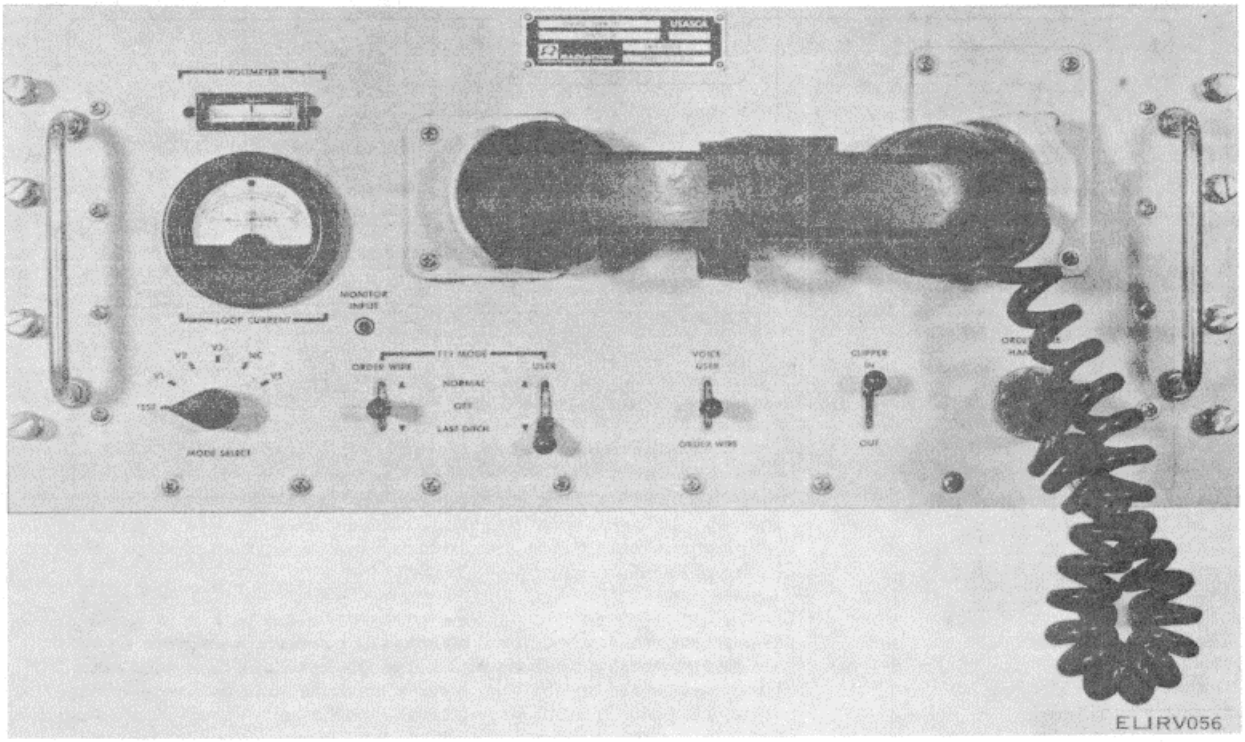


Figure 3-17. Baseband control panel (1A3A13) controls and indicators

Table 3-16. Modulator (1A3A14) Controls and Indicators

Controls or indicators	Function
DEVIATION CONTROL switches:	
Thirteen-position PRESET MODE rotary switch:	
V1 through V12	Selects preset deviations.
MANUAL ADJUST	Provides for manual control of deviation.
Eight-position MANUAL ADJUST 10 DB rotary switch	Provides modulation amplifier gain in multiples of 10 dB from +20 to -50 dB.
Eleven-position MANUAL ADJUST 1 DB rotary switch	Provides modulation amplifier gain in multiples of 1 dB from 0 to +10 dB.
Three-position DEVIATION meter rotary switch:	
6KC	Selects 6 kHz for full-scale deflection of DEVIATION meter.
60 KC	Selects 60 kHz for full-scale deflection of DEVIATION meter.
600 KC	Selects 600 kHz for full-scale deflection of DEVIATION meter.
DEVIATION meter	Indicates peak frequency deviation of 70 MHz modulated output.
FAULT indicators:	
DC POWER	Illuminates (red) to indicate a short across the power supply.
70 MC OUTPUT	Illuminates (red) to indicate that the 70 MHz signal is not present.
10 MC VCO	Illuminates (red) to indicate that 10 MHz signal is not p resent.
÷100	Illuminates (red) to indicate that the +100 output signal is not present.
100 KC REF	Illuminates (red) to indicate that the 100 kHz reference is not present.
ϕ LOCK	Illuminates (red) to indicate that the phase lock is lost.

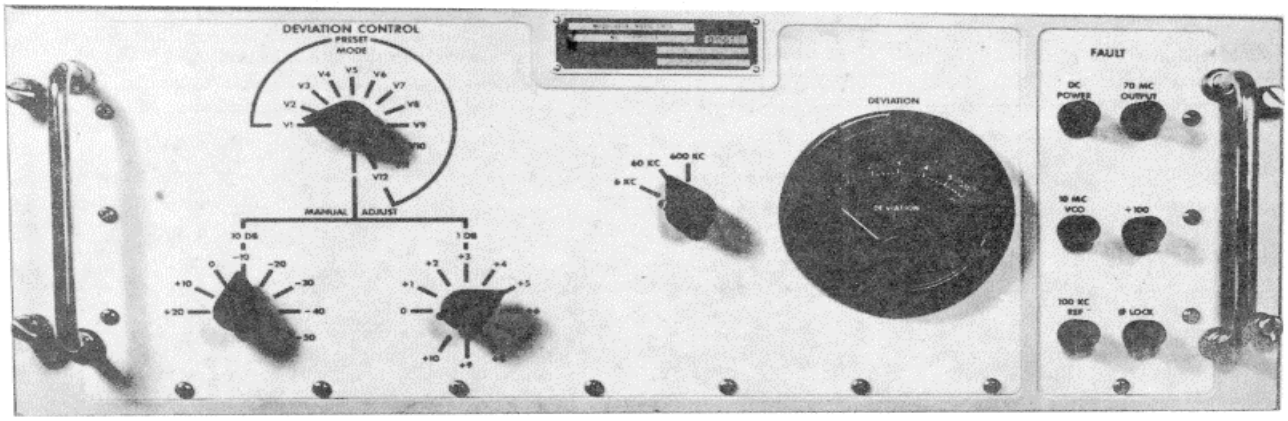


Figure 3-18. Modulator (1A3A14) controls and indicators.

Table 3-17. Baseband Amplifier (1A3A15) Controls and Indicators

Controls or indicators	Function
USER LINE AMPL:	
LEVEL meter	Indicates input and output vu levels of the external user send and receive baseband amplifiers
Four-position SEND/RECEIVE rotary switch:	
SEND IN	Meter indicates input signal level to the baseband user send amplifier.
SEND OUT	Meter indicates output signal level of the baseband user send amplifier.
RECEIVE IN	Meter indicates input signal level to the baseband user receive amplifier.
RECEIVE OUT	Meter indicates output signal level of the baseband user receive amplifier.
LEVEL rotary controls:	
SEND	Adjusts the output signal level of the baseband user send amplifier.
RECEIVE	Adjusts the output signal level of the baseband user receive amplifier.
SEND LINE AMPL:	
Meter	Indicates signal levels (vu) of the send line baseband amplifiers.

Table 3-17. Baseband Amplifier (1A3A15) Controls and Indicators - Continued

Controls or indicators	Function
Four-position rotary switch:	
VOICE	Meter indicates signal level of voice (user or orderwire) send line amplifier.
3805	Meter indicates signal level of orderwire tty send line amplifier.
3995	Meter indicates signal level of user tty send line amplifier.
COMP	Meter indicates signal level of composite signal (voice, orderwire tty, and user tty) of send line amplifier. When in COMP position, operation of ON-OFF-MC lever switch to the ON or MC position substitutes the 1 kHz test tone generator output for the send line amplifier output and the SEND LINE AMPL meter reads the 1 kHz test tone generator output.
Level rotary controls:	
VOICE	Adjusts the gain of voice send line amplifier.
3805	Adjusts the gain or derive tty send line amplifier.
3995	Adjusts the gain of user tty send line amplifier.
COMP	Adjusts the gain of composite send line amplifier.
1 KC TEST:	
TONE indicator	Illuminates (white) to indicate that the 1 kHz test tone generator is operating
UNCAL indicator	Illuminates (amber) to indicate that the 1 kHz test tone output is un uncalibrated.
Attenuator control dial	Adjusts the uncalibrated output of the test tone generator in the range from + 10 to -35 dB
MAN/PRESET toggle switch	
MAN	Places the test tone generator in the uncalibrated mode. The 1 kHz test tone output level is adjusted with the attenuator control dial
PRESET	Places the test tone generator in the calibrated mode. The 1 kHz test tone output level is preset to 0 dB
ON/OFF/MC lever switch:	
ON	Provides a 1 kHz test tone output.
OFF	Disables the 1 kHz test tone output.
MC	A momentary contact position which provides a 1 kHz test tone output.
EMPHASIS SELECT:	
Six-position rotary switch:	
V1	Provides pm reemphasis and deemphasis.
V2	Provides flat preemphasis and deemphasis.
V3	Provides reemphasis and deemphasis during wideband operation.
V4	Provides pm preemphasis and flat deemphasis.
V5 and V6	Are not used in present system configuration.
ORDERWIRE NORM/BEACON DEM lever switch:	
ORDERWIRE NORM	Provides normal orderwire operation.
BEACON DEM	Beacon demod aural output as an audio aid in manual satellite frequency acquisition.
RECEIVE LINE AMPL:	
Meter	Indicates signal levels (vu) of the receive line baseband amplifiers.
Four-position rotary switch:	
VOICE	Meter indicates signal level of voice (user orderwire) receive line amplifier.
3805	Meter indicates signal level of orderwire receive line amplifier.
3995	Meter indicates signal level of user tty receive line amplifier.
COMP	Meter indicates signal level of composite signal (voice, orderwire tty, and user tty) of send receive amplifier
Level rotary controls:	
VOICE	Adjusts the gain of voice receive line amplifier.
3805	Adjusts the gain of orderwire tty receive line amplifier.
3995	Adjusts the gain of user tty receive line amplifier.
COMP	Adjusts the gain of composite receive line amplifier.
ORDERWIRE AMPL:	
LEVEL meter	Indicates input and output levels (vu) of the orderwire send and receive baseband amplifier
Two-position SEND/RECEIVE rotary switch	
SEND	Meter indicates input signal level of the baseband orderwire send amplifier.
RECEIVE	Meter indicates input signal level of the baseband orderwire receive amplifier.
SEND	Adjusts the input signal level of the baseband orderwire send amplifier.
RECEIVE	Adjusts the input signal level of the baseband orderwire receive amplifier.

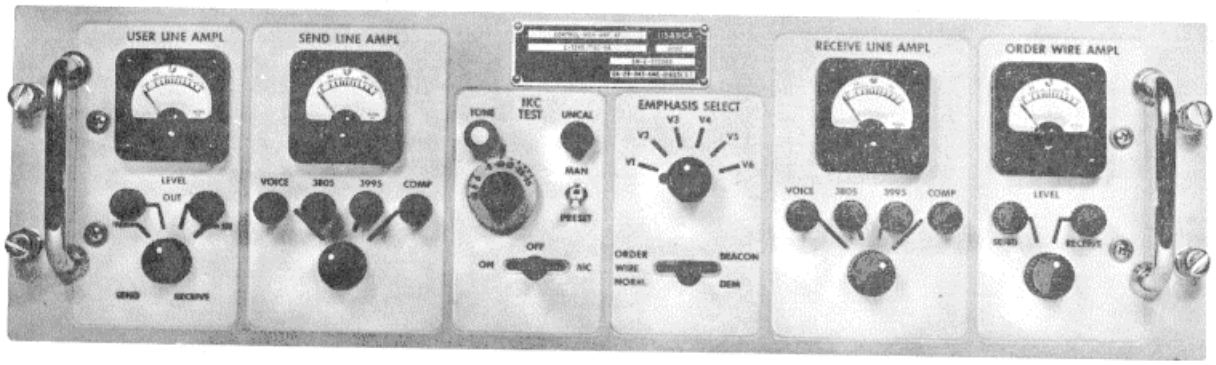
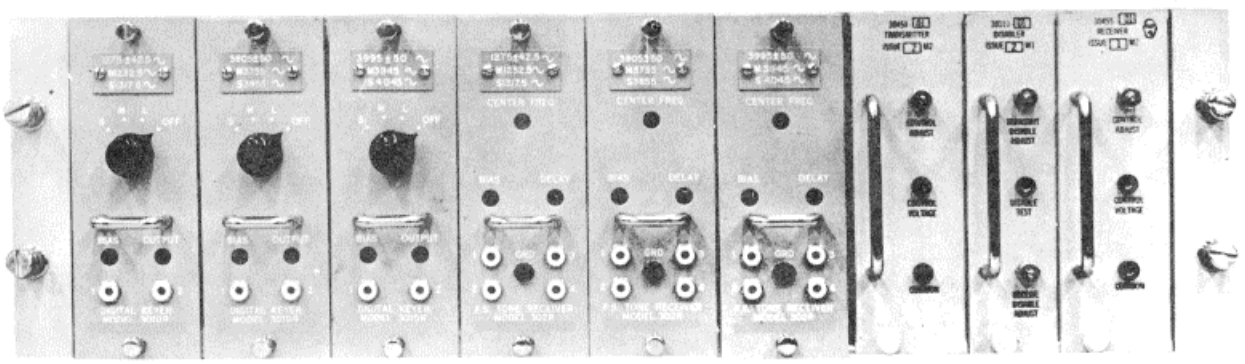


Figure 3-19. Baseband amplifier (1A3A15) controls and indicators.

Table 3-18. Converter-Keyer-Echo Suppressor (1A3A16) Controls and Indicators

Controls or indicators	Function
Frequency shift, keyer units:	
Four-position rotary switch:	
S	Provides a steady space output for test purposes.
M	Provides a steady mark output for test purposes.
L	Permits normal operation of the frequency shift keyer (fsk).
OFF	Prevents the frequency shift keyer from producing on output.
BIAS screwdriver adjustment	Not connected.
OUTPUT screwdriver adjustment	Adjusts level of fsk tone output signal.
1 test jack	Used to measure or monitor + 12 vdc power.
2 test jack	Not connected.
Frequency shift converter units:	
CENTER FREQ screwdriver adjustment	Adjusts center frequency response point of converter phase-shifter network.
BIAS screwdriver adjustment	Adjusts the level of converter trigger circuit normalized output.
DELAY	Adjusts time constant of resistor-capacitor network in delay amplifier to establish delay of binary pulse
1 test jack	Used to monitor filtered fsk tone input.
2 test jack	Used to monitor low-level keyer output.
3 test jack	Used to monitor discriminatory output.
4 test jack	Used to monitor high-level space and mark output.
GRD test jack	Used to monitor tone receiver unit signals.
Echo suppressor transmitter units:	
CONTROL ADJUST screwdriver adjustment	Adjusts level at which input signal will trigger the control circuit.
CONTROL VOLTAGE and COMM test jacks	Used to monitor control voltage level during adjustment.
Echo suppressor disabler unit:	
TRANSMIT DISABLE ADJUST Screwdriver adjustment	Adjusts level of the conditioning tone obtained from the transmit voice path.
RECEIVE DISABLE ADJUST Screwdriver adjustment	Adjusts level of the conditioning tone obtained from the receive path.
DISABLE TEST test jack	Provides for connection of voltmeter (-) test lead to check negative dc disable voltage level of transmitter or receiver unit (voltmeter (+) test lead must be connected to COMMON pin jack on associated transmitter or receiver unit



ELIRV059

Figure 3-20. Converter-keyer Panel (1A3A26) controls and indicators.

Table 3-19. LIU Panel (1A3A26) Controls and Indicators

Controls or indicators	Function
+6 VDC ballast indicators:	
ds 1	Illuminates (red) to indicate a short circuit in the +6 VDC supply line isolation
unit one	
ds 2	Illuminates (red) to indicate a short circuit in the +6 VDC supply line of line
isolation unit two	
ds 3	Illuminates (red) to indicate a short circuit in the +6 VDC supply of line
isolation unit three.	
ds 4	Illuminates (red) to indicate a short circuit in the +6 VDC test supply line.
ds 5	Illuminates (red) to indicate a short circuit in the + 6 VDC supply line of
converter one.	
ds 6	Illuminates (red) to indicate a short circuit in the +6 VDC supply line of
converter two.	
ds 7	Illuminates (red) to indicate a short circuit in the +6 VDC supply line of
converter three.	
--6 VDC ballast indicators:	
ds 1	Illuminates (red) to indicate a short circuit in the—6 VDC supply line of line
isolation unit	one.
ds 2	Illuminates (red) to indicate a short circuit in the—6 VDC supply line of line
isolation unit	two.
ds 3	Illuminates (red) to indicate a short circuit in the—6 VDC supply line of line
isolation unit	three.
ds 4	Illuminates (red) to indicate a short circuit in the—6 VDC test supply line.
ds 5	Illuminates (red) to indicate a short circuit in the—6 VDC supply line of
converter	
one.	
ds 6	Illuminates (red) to indicate a short circuit in the—6 VDC supply line of
converter two	
ds 7	Illuminates (red) to indicate a short circuit in the -6 VDC supply line of
converter three	
POWER ON toggle switch	Controls application of ac power to line isolation unit 1A3A26.
REC BAT:	
Two	position toggle switch:
EXINT	Selects internal battery source for neutral out-station-receive side.
EXT	Selects external battery source for neutral out-station-receive side.
MODE SELECT:	
Four-position rotary switch:	
NEUT 60	Adapts unit for operation with a neutral, 20-, milliampere out-station line.
NEUT 60	Adapts unit for operation with a neutral, 60-mil liampere out-station line.
POL LOWHI	Adapts unit for operation with a polar + 60 volt, 2-milliampere out-station
line.	
POL LOW	Adapts unit for operation with a polar -6 volt, 1-milliampere out-station line.
REC SIG:	
Two-position toggle switch:	
NORM	Set to NORM for normal sense inputs.
REV	Set to REV for reversed sense inputs.

Table 3.19. LIU Panel (1A3A26) Controls and Indicators - Continued

Controls or indicators	Function
PWR ON/OFF toggle switch	Controls application of ac power to the line isolator unit.
SEND BAT:	
Two-position toggle switch:	
INT	Selects internal battery source for neutral out-station send side.
EXT	Selects external battery source for neutral out-station send side.
REC LOOP ADJ	Adjusts out-station-receive side current in all positions of MODE SELECT switch except POL LOW
SEND LOOP ADJ	Adjusts out-station-send side current in all positions of MODE SELECT switch except POL LOW
REC MON	Provides monitoring capability of out-station-receive side voltage or current. In all position of MODE SELECT switch except POL LOW
SEND MON	Provides monitoring capability of out-station-send side voltage or current. In all position of MODE SELECT switch except POL LOW
PWR lamp	Illuminates (clear) when ac power is applied to unit.
BLOWN FUSE indicators:	
+ 130	Illuminates (red) when associated fuse blows.
+60	Illuminates (red) when associated fuse blows.
-60	Illuminates (red) when associated fuse blows.

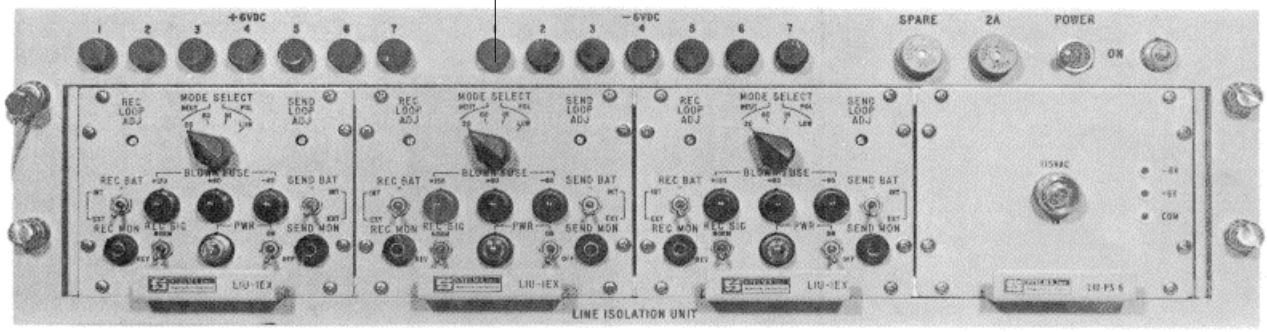


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Figure 3-21. LIU panel (1A3A26) controls and indicators.

Table 3-20. Fan Control Assembly (A3A19) Controls and Indicators

Controls	Function
INTERNAL toggle switch	Controls application of ac power to blower motors of fan control assembly 1A3A19.
EXTERNAL toggle switch and 1A3A20	Controls application of ac power to blower motors of fan assemblies 1A2All

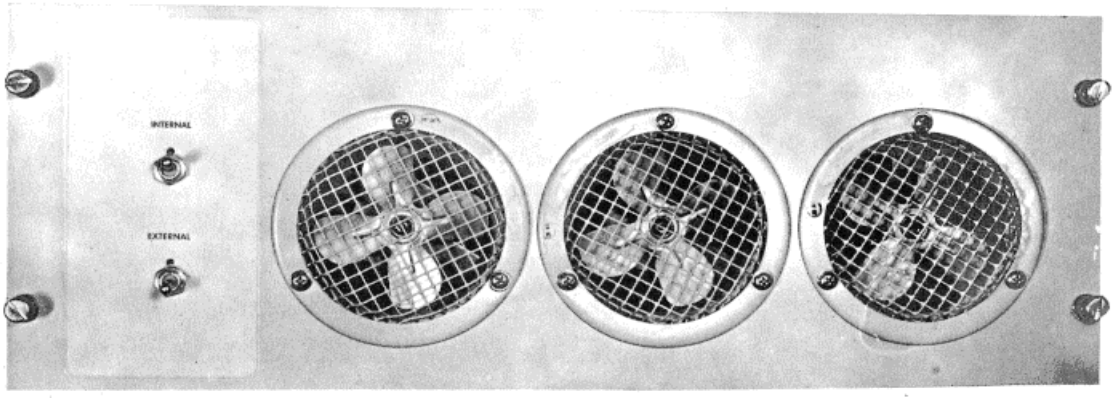

Figure 3-22. Fan control assembly (1A3A19) controls and indicators.

Table 3-21. Power Monitor and Control (1AMA27) Controls and Indicators

Controls or indicators	Function
XMTR ON toggle switch	Applies 28 vdc to control relays for application of ac power to transmitter.
PREHEAT indicator	Illuminates (white) to indicate that transmitter is in a preheat condition (9 minute delay).
STBY indicator	Illuminates (blue) to indicate that transmitter is in a standby condition.
XMT indicator	Illuminates (green) to indicate that transmitter is radiating or operating into a dummy load.
BEAM ON toggle switch	Controls application of high voltage power to final amplifier (klystron).
1-10 KW indicator	Illuminates (white) to indicate that RF output meter is monitoring power in the 0-1 kW range (low power range).
10-10 KW indicator	Illuminates (white) to indicate that RF output meter is monitoring power in the 1-10 kW range (high power range).
RF OUTPUT meter	Provides indications in accordance with meter SEL switch setting.
RF OUTPUT pushbutton indicator switches:	
DECREASE	Permits decreasing transmitter drive and output power and illuminates (white) while depressed.
INCREASE	Permits increasing transmitter drive and output power and illuminates (white) while depressed.
METER SEL rotary switch:	
ZERO	Permits zero adjustment of RF OUTPUT meter.
FORWARD	Provides an indication of forward power on both RF OUTPUT meter and rf power meter 1A2A27A4. (High range full-scale reading is 1 kW for RF OUTPUT meter; there are 8 range settings from 3 watts to 10 kW on rf power meter.)
REVERSE	Provides an indication of reverse power on both RF OUTPUT meter and rf power meter. (High range full-scale readings 1 kW; low range full-scale reading is 100 milliwatts for RF OUTPUT meter.)
DRIVE	Provides an indication of reverse power on both RF OUTPUT meter and rf power meter. (High range full-scale reading is 1 watt; low range full-scale reading is 100 milliwatts for RF OUTPUT meter.)
METER ZERO rotary control	Controls zero adjustment of RF OUTPUT meter.
LOCAL/PED keylock switch:	
LOCAL	Permits turn-on of transmitter from RF Power Monitor and Control Panel 1A2A27.
PED	Permits turn/on of transmitter. Permits turn-on of transmitter from Transmitter Control Panel 2A3A7.
COAX SWITCH BLOWN FUSE indicator	Illuminates (red) to indicate that an overload condition has occurred due to a malfunction in coax switch S5.
MOD PWR ON toggle switch	Applies power to Modulator 1A3A14.
XMIT FAULT/ALARM DISABLE split-lens indicator switch:	
XMIT FAULT	Illuminates (white) to indicate that transmitter is malfunctioning.
ALARM DISABLE	Permits disabling audible alarm circuit and illuminates (white) to indicate that a fault has occurred and audible alarm has been disabled.
INTERLOCK indicator	Illuminates (red) to indicate that transmitter interlock circuit is open.
LOW COOL TEMP indicator	Illuminates (yellow) to indicate that transmitter coolant has not reached operating temperature.
LOW WG PRESS	Illuminates (yellow) to indicate that waveguide pressure is low.
DUMMY LOAD	Illuminates (red) to indicate that transmitter output is diverted to dummy load.
ON LINE TRANSMITTER OUTPUT POWER assembly 1A2A27A4 consisting of:	Selects high or low range for display on range indicators. Selection is made automatically on 8 of 10 ranges depending on the setting of RANGE switch and status of HPA and LPA.
RANGE switch	Transmitter on-line / Ranges available LPA: 3KW/34.8 dBw; 1 KW/30 dBw; 300 W/24.8 dBw; 100 W/20 dBw; 30 W/14.8 dBw; 10 W/10 dBw; 3 W/4-8 dBw; 1 W/0 dBw HPA: 30KW/44.8 dBw; 1OKW/40 dBw; 3 KW/34.8 dBw; 1 KW/30 dBw

Table 3-21. Power Monitor and Control (1A2A27) Controls and Indicators - Continued

Controls or indicators	Function
RANGE switch (cont.)	Transmitter On-Line — Ranges Available 300 W/24.8 dBw 100 W/20 dBw 30 W/14.8 dBw 10 W/10 dBw
HPA OFFF LINE/METER ZERO toggle switch	position, permits monitoring of HPA RF power level into its dummy load (above or below levels preset at meter 1A2A27A4M1 activates audible alarm). In METER ZERO position disconnects RF input to meter; con nects termination for meter zoning.
Audible ALARM	Alarm activates when transmitted power has exceeded limits set on meter.
RF power meter/relay	Indicates RF level of LPA or HPA transmitter. Has upper and lower trip point set controls that activate relay when RF power raises above or falls below preset trip levels.

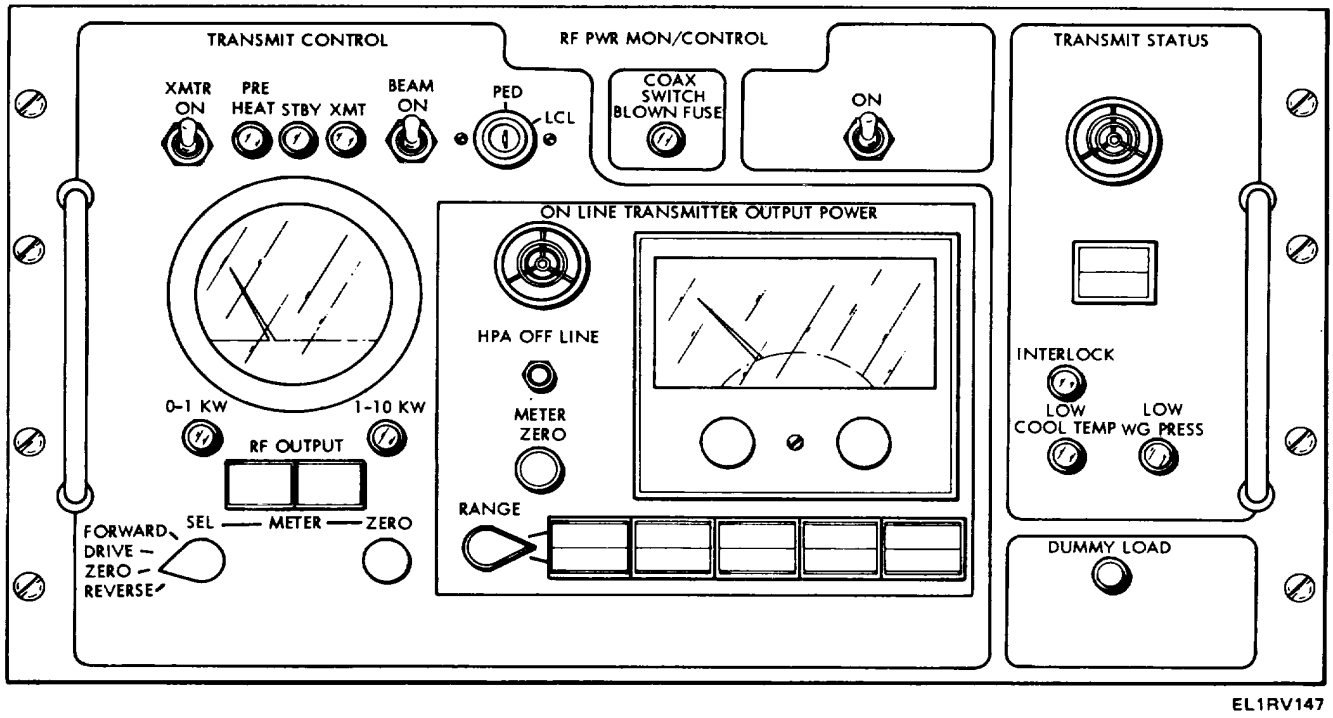

Figure 3-23. Power monitor and control (1A2A27) controls and indicators

Table 3-22. Distribution Amplifier (IA2A33) Controls and Indicators

Controls or indicators	Function
AC OPERATION lamp	Illuminates (white) to indicate that the input power is ac.
DC OPERATION lamp	Illuminates (white) to indicate that the input power is dc.
CIRCUIT CHECK meter	Indicates input level, output level or supply voltage level when used with CIRCUIT CHECK switch
CIRCUIT CHECK switch	Enables selection of input or output channels, or a supply voltage and displays reading on CIRCUIT CHECK meter

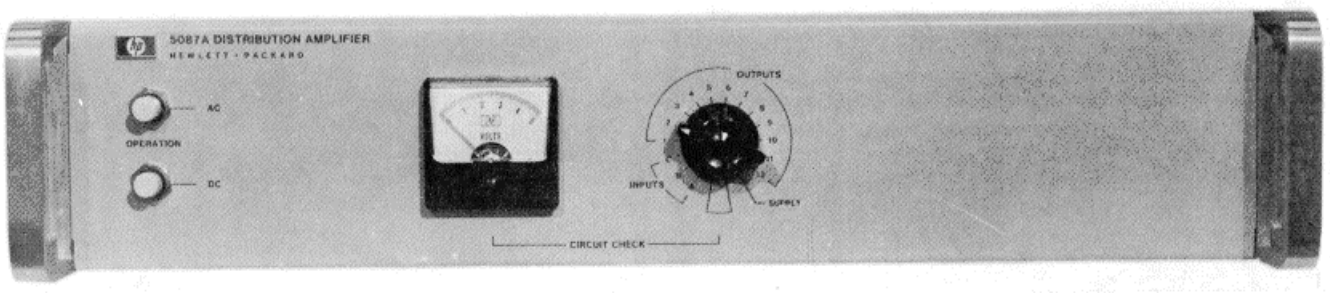

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Figure 3-24. Distribution amplifier (1A2A33) controls and indicators.

Table 3-23. Frequency Distribution Unit (1A2A22) Controls and Indicators

Controls, indicators or connector	Function
Nine-position CIRCUIT CHECK selector switch:	
1	Off position.
2	Applies external battery input to meter: normal indication is in the red area of the meter
3	Applies + 17 volt regulator output to meter; normal indication is in the red area.
4	Applies outer oven element voltage to meter; after warmup, normal indication is in red area of the meter when power is applied to heater element.
5	Applies inner oven element voltage to meter; after warmup, normal indication is in red area of the meter when power is applied to heater element.
6	Applies a voltage to the meter that is proportional to the 5 MHz output signal level; normal indication is in red area of meter.
7	Applies a voltage to the meter that is proportional to the 5 MHz output signal level; normal indication is in red area of meter.
8	Applies a voltage to the meter that is proportional to the 100 kHz output signal level; normal indication is in the red area of the meter.
9	Off position.
POWER	
+28 v indicator	Illuminates (white) to indicate that +28 vdc power supply PS1 is on.
+28 v ON-OFF toggle switch	Controls the application of ac power to +28 vdc power supply PS1.
FINE FREQ. ADJ. digital readout indicator	Provides a cumulative indication, in parts per 1010, of adjustment of FINE FREQ. ADJ. rotary control
FINE FREQ. ADJ. rotary control	Used to adjust output frequency of 5 MHz oscillator. Rotary control is mechanically linked to the FINE FREQ. ADJ. digital readout indicator.
FREQ REF SELECT pushbotton indicator switches	
XTAL STD	Illuminates (white) to indicate that the backup frequency standard is on line.
CESIUM STD	Illuminates (white) to indicate that the primary frequency standard is on line.
5 MHZ XTAL OUTPUT	Used to monitor or calibrate backup frequency standard.
1 MHZ OUTPUT MONITOR	Used to measure or monitor 1 MHz output of the primary frequency standard.

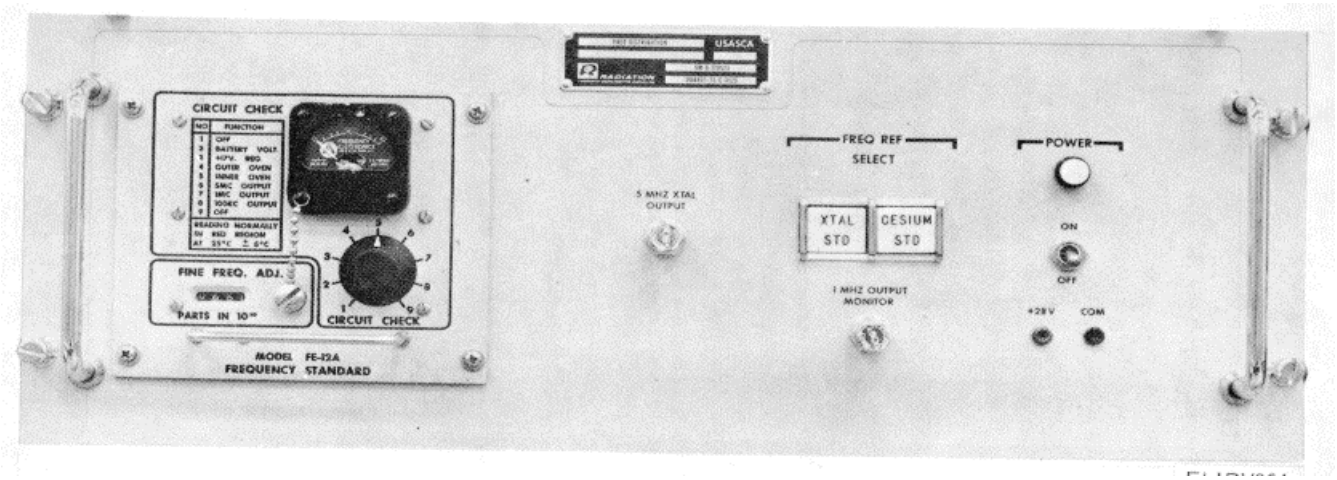

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Figure 3-25. Frequency distribution unit (1A2A22) controls and indicators.

Table 3-24. Time Transfer Unit (1A2A29) Controls and Indicators

Controls or indicators	Function
Power on indicator	Illuminates (amber) to indicate that 115 vac power supply is on.
AC POWER toggle switch	Controls the application of ac power to TTU.
SYNC 1PP 10 SEC pushbutton	Synchronizes 1 pulse per 10 second period.
1PP 10 SEC indicator	Illuminates (blue) every 10 second after SYNC 1PP is activated.
ARM START pushbutton	Resets circuit for generating start pulse.
XMIT COMP indicator	Illuminates (green) to indicate signal transmission is complete.
RESET pushbutton	Resets transmit and receive circuits and indicators.
RCE COMP indicator	Illuminates (red) to indicate signal reception is complete.
CLOCK POLARITY screwdriver switch:	
NEG	Permits signal for negative clock.
POS	Permits signal for positive clock.
Function selector switch:	
COMPOSITE	Permits time transfer from satellite terminal A to terminal B.
TAU	Permits range measurement.
XMIT	Permits counter to begin accumulating during transmit signal.
RCV	Permits counter to begin accumulating during receive signal.
STOP	Causes accumulator to stop and display count in a whole multiple of one second.
TEST BOTH	Tests to assure that both XMIT COMP AND RCV COMP indicators illuminate and that accumulator is accumulating counts
TEST XMIT	Tests to assure that XMIT COMP indicator illuminates, and that accumulator is accumulating counts
STOP	Causes accumulator to stop and display count in a whole multiple of one half second.
TEST RCV	Tests to assure that RCV COMP indicator illuminates, and that accumulator is accumulating counts
Rear Panel:	
Transmit noise threshold toggle switch:	
Down (open)	Provides 0.7 volt transmit signal noise threshold.
Up (closed)	Provides bypass of noise threshold diode.
Communication noise threshold toggle switch:	
Down (open)	Provides 0.7 volt comm. signal noise threshold.
Up (closed)	Provides bypass of noise threshold diode.
Monitor noise threshold toggle switch:	
Down (open)	Provides 0.7 volt monitor signal noise threshold.
Up (closed)	Provides bypass of noise threshold diode.

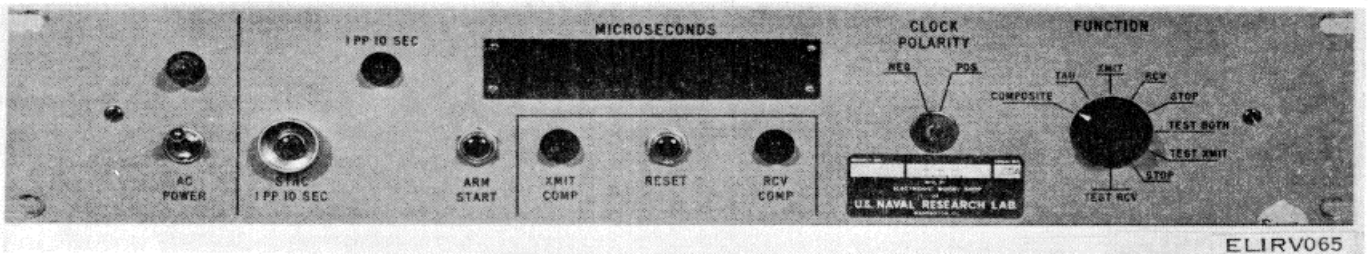

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Figure 3-26. Time transfer unit (1A2A29) controls and indicators.

Table 3-25. Frequency Conversion Subsystem (IA19) Controls and Indicators

Controls, indicators or connector	Function
Up-converter	
RF OUTPUT LEVEL ADJ attenuator	Adjusts the upconverter output signal level.
RF OUTPUT switch:	
ON LINE	Connects upconverter output to signal combiner input.
OFF LINE	Disconnects upconverter output from signal combiner input and provides proper termination for upconverter output and signal combiner input.
POWER METER ZERO ADJ potentiometer	Provides zero adjustment of RF POWER meter.
POWER MONITOR ATTENUATOR	Calibrates RF POWER meter circuit.
RF POWER meter	Indicates power level of RF signal.
RF POWER METER INPUT connector	Used to accept RF signal.
Three position POWER METER RANGE switch:	
- 0DBM	Sets full-scale sensitivity of RF POWER meter at - OdBm.
10 DBM	Sets full-scale sensitivity of RF POWER meter at 10 dBm.
-20 DBM	Sets full-scale sensitivity of RF POWER meter at - 20 dBm.
RF TEST OUTPUT connector	Provides 7.9 to 8.4 GHz test output.
RF POWER MONITOR connector	Provides access to RF power monitor unit.
RF LO SAMPLE connector	Provides sample of 7.2 to 7.7 GHz local oscillator signal for test purposes.
If. LO SAMPLE connector	Provides sample of 630 MHz local oscillator signal for test purposes.
FAULT INDICATORS.	
RF LEVEL	Illuminates (red) to indicate low or high RF signal level.
RFLO	Illuminates (red) to indicate when RF phase-locked oscillator is out-of phase lock. Flashes (red) to indicate unacceptable levels and quantities of phase noise bursts are being generated at the associated frequency synthesizer or the frequency generation subsystem elements.
If. LO	Illuminates (red) when If phase-locked oscillator is out-of-phase lock.
TRANSMIT FREQUENCY SELECTOR MHZ switch	Selects upconverter transmit frequency.
STATUS meter	Monitors level of signal or voltage selected by status selector switch.
TRANSMIT FREQ FINE TUNE control	Provides fine tuning of RF local oscillator frequency by manual turning of
Seven position rotary status shaft. selector switch:	
70 MHZ IF	Permits monitoring of 70 MHz If. input signal.
700 MHZ IF	Permits monitoring of 700 MHz If. signal.
+ 24V	Permits monitoring of power supply output.
RF LO TUNE	Permits monitoring of RF phase-locked oscillator tuning voltage.
STD LVL	Permits monitoring of 10 MHz input from frequency synthesizer.
RF LO	Permits monitoring of output of RF phase-locked oscillator.
If. LO	Permits monitoring of output of IF phase-locked oscillator.
AUDIBLE ALARM DEFEAT switch	Deactivates RD AUDIBLE ALARM when pressed and held.
If. LEVEL ATRENUATOR switches	Provides attenuation of 0 to 21 dB in 1 dB steps to compensate for 70 MHz If. input levels between - 10 and + 10 dBm.
POWER ON indicator	Illuminates (white) to indicate presence of 24 volt dc power.
POWER ON-OFF circuit breaker	Controls application of ac power to unconverter.
RF AUDIBLE ALARM	Sounds to indicate high or low RF output level.
Down-Converter	
RF POWER meter	Indicates power level of signal connected to RF POWER METER INPUT connector.
RF POWER METER INPUT connector	Provides access to RF POWER meter.
POWER METER RANGE switch:	
20 DBM	Sets full-scale sensitivity of RF POWER at - 20 dBm

Table 3-25. Frequency Con version Subsystem (1A19) Controls and Indicators-Continued

Controls, indicators or connector	Function
- 10 DBM	Sets full-scale sensitivity of RF POWER at - 10 dBm.
0 DBM	Sets full-scale sensitivity of RF POWER at 0 dBm.
POWER METER ZERO ADJ potentiometer	Provides zero adjustment of RF POWER meter.
RF TEST INPUT connector	Provides for insertion of RF test signal in downconverter.
RF LO SAMPLE connector	Provides sample of 6.55 to 7.05 GHz local oscillator signal for test purposes.
If. LO SAMPLE connector	Provides sample of 630 MHz local oscillator signal for test purposes.
70 MHZ SAMPLE connector	Provides sample of 70 MHz downconverter If. output for test purposes.
FAULTINDICATORS	
RF LO	Illuminates (red) to indicate when RF phase-locked oscillator is out-of phase lock. Flashes (red) to indicate unacceptable levels and quanti ties of phase noise bursts are being generated at the associated frequency synthesizer or other related system element.
If. LO indicator	Illuminates (red) when If. phase-locked oscillator is out-of-phase lock.
STATUS meter	Monitors level of signal or voltage selected by STATUS SELECTOR switch.
RECEIVE FREQUENCY FINE TUNE control	Provides fine tuning of RF phase-locked oscillator.
Seven-position STATUS SELECTOR switch:24V	Selects 24 volt signal to be monitored by STATUS meter.
	STATUS meter.
	STATUS meter.
If. LO	Selects output signal of If. phase locked oscillator to be monitored by STATUS METER.
700 MHZ IF	Selects 700 MHz If. signal to be monitored by STATUS METER.
70 MHZ IF.	Selects 70 MHz If. output signal to be monitored by STATUS METER.
RF LO TUNE	Selects RF phase locked oscillator frequency control voltage to be monitored by STATUS METER.
AUDIBLE ALARM DEFEAT switch	Deactivates LO AUDIBLE ALARM when pressed and held.
RECEIVE FREQUENCY SELECTOR MHZ switch	Selects downconverter receive frequency.
POWER ON indicator	Illuminates (white) to indicate presence of 24 volt dc power.
POWER ON-OFF circuit breaker	Controls application of ac power to downconverter.
LO AUDIBLE ALARM	Sounds when RF or If. phase-locked oscillator is out of phase lock.
Frequency Synthesizer:	
POWER indicator	Illuminates (white) to indicate the presence of operating voltages.
POWER ON-OFF toggle switch	Controls application of ac power to frequency synthesizer.
METER FUNCTION switch:	
+5V	Selects + 5 volt dc output power supply to be monitored by meter.
-12V	Selects - 12 volt dc output power supply to be monitored by meter.
+ 14V	Selects + 14 volt dc output power supply to be monitored by meter.
Front panel meter	Monitors voltage selected by METER FUNCTION switch.
REFERENCE FREQUENCY-INT STD OUT connector	Provides access to internal frequency standard.
REFERENCE FREQUENCY SYNTH IN connector	Provides access to frequency synthesizer input circuit.
REFERENCE FREQUENCY EXT STD OUT connector	Provide access to synthesizer input from extern al frequency standard.
MONITOR-1 MHZ out connector	Provides access to output of 1 MHz circuits for test purposes.
MONITOR-SAMPLE OUT connector	Provides access to frequency synthesizer output circuit for test purposes.
EXT STD IN connector	Provides facility for connecting frequency synthesizer to external frequency standard.
5 MHZ OUT connector	Provides access to output of 5 MHz circuits for test purposes.
10 MHZ OUT connector	Provides access to output of 10 MHz circuits for test purposes.
VAR OUT connector	Provides facility for connecting output of frequency synthesizer to associated up or down converter.
Test Translator:	
LEVEL SET ATTEN control:	
ATTEN 1	Adjusts output level of test translator in 10 dB steps between 0 and 55 db.
ATTEN 2	Adjusts output level of test translator in 0.1 dB steps between 0 and 10 dB.
725 MHZ indicator	Illuminates (white) to indicate operation of 725 MHz local oscillator circuit.
Two position LO SELect toggle switch:	
725 MHZ	Permits operation of 725 MHz oscill ator circuit.
200 MHZ	Permits operating of 200 MHz oscillator circuit.
200 MHZ indicator	Illuminates (white) to indicate operation of 200 MHz local oscillator circuit.

Table 3-25. Frequency Conversion Subsystem (1A19) Controls and Indicators - Continued

Controls/indicators	Function
Eight-position STATUS SELECT switch:	
24V	Permits monitoring of 24 volt power supply output.
725 MHz LO	Permits monitoring of phase-locked oscillator tuning voltage.
200 MHz LO	Permits monitoring of input level of X40 frequency multiplier.
725 MHZ CONV INPUT	Permits monitoring of input level of conversion strip line assembly.
200 MHZ CONV INP	Permits monitoring of input level of conversion strip line assembly.
STD LVL	Permits monitoring of level of frequency standard.
5 MHZ INTL STD	Permits monitoring of internally generated 5 MHz signal.
70 MHZ INTL STD	Permits monitoring of internally generated 70 MHz signal.
Two-position 70 MHZ ON toggle switch:	Applies power to internal 70 MHz test signal circuit.
Two-position 5 MHZ ON toggle switch:	Applies power to internal 5 MHz test signal circuit.
STATUS meter	Monitors level of signal or voltage selected by STATUS SELECT switch.
POWER ON indicator	lluminates (white) to indicate presence of 24 volts dc power.
POWER ON-OFF circuit breaker	Controls application of ac power to test translator.
70 MHZ TEST OUTPUT connector	Provides access to 70 MHz test output.
RF INPUT connector	Provides access to test translator 7.9 to 8.4 GHz RF input.
RF OUTPUT connector	Provides access to test translator 7.25 to 7.75 GHz RF output.

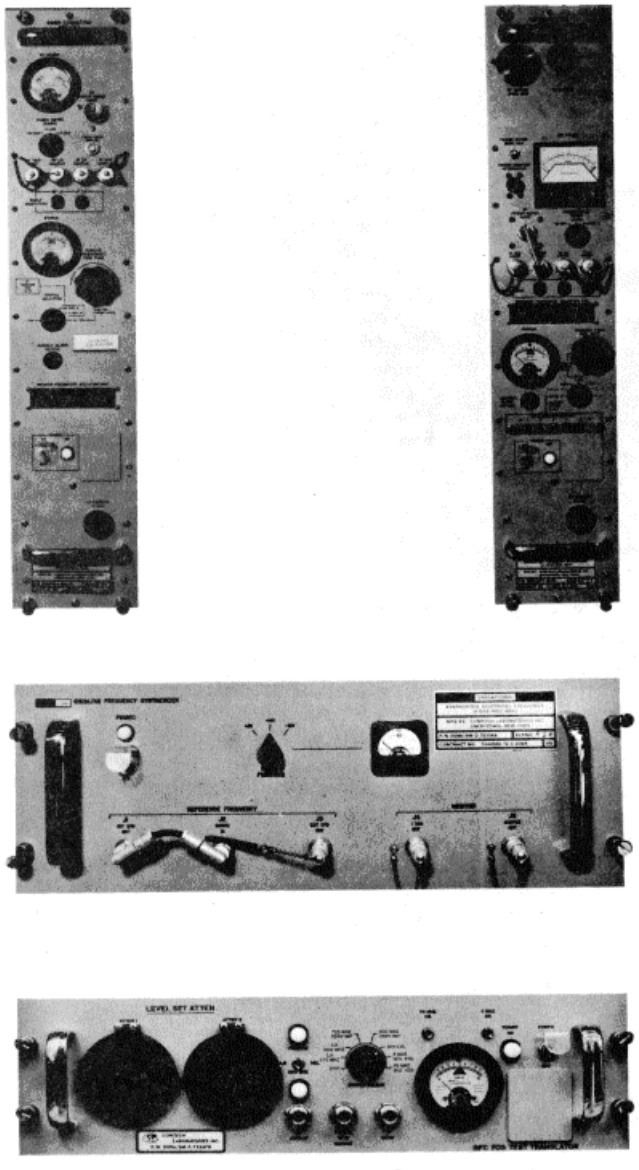


Figure 3-27. Frequency conversion subsystem (1A19) controls and indicators.

Table 3-26. External Signal Distribution Box (1A1O) Controls and Indicators

Controls/indicators	Function
VOICE binding post pairs:	External connecting points for listed function:
USER 1 SEND IN	User voice No. 1 send.
USER 2 RCV OUT	User voice No. 2 send.
2 WIRE 3 SEND/RCV	User voice No. 3 transmit/receive operation.
URC-61 4 SEND IN	AN/URC-61 voice, user voice No. 4 send.
URC-61 5 RCV 1 OUT	AN/URC-61 voice, user voice No. 5 receive (receiver No. 1)
URC-61 6 RCV 2 OUT	AN/URC-61 voice, user voice No. 6 receive (receiver No. 2)
SAT OW 7 SEND IN	Satellite order wire user voice No. 7 send.
SAT OW 8 RCV OUT	Satellite order wire user voice No. 8 receive.

Table 3-26. External Signal Distribution Box (1A10) Controls and Indicators - Continued

Controls/indicators	Function
CCS INTERCOM 9 SEND IN	User voice No. 9 send.
CCS INTERCOM 10 RCV OUT	User voice No. 10 receive.
SPARE 11 and 13	Spare user voice transmit.
SPARE 12 and 14	Spare user voice receive.
SPARE 15,17, and 19	Spare user voice transmit.
SPARE 16, 18, and 20	Spare user voice receive.
SPARE 21, 23, and 25	Spare user voice transmit.
SPARE 22, 24, and 26	Spare user voice receive.
SPARE LOW LEVEL lines 1 through 6	Spare user DC lines.
LIU TTY USERS:	
LIU-1 SEND IN	LIU'1 3995 Hz user send.
LIU-1 REC OUT	LIR-1 3995 Hz user receive.
LIU-2 SEND IN	LIU-2 3805 Hz user send.
LIU-2 SEND OUT	LIU-2 3805 Hz user receive.
LIU-3 SEND IN	LIU-3 spare user send.
LIU-3 RCV OUT	LIU-3 spare user receive.
URC-61 DC:	
OW SEND IN	Used to provide AN/URC-61 order wire user inputs.
OW REC OUT	Used to provide AN/URC-61 order wire user outputs.
USER SEND IN	Used to provide AN/URC-61 voice user inputs.
USER RCV OUT	Used to provide AN/URC-61 voice user outputs.
DIG DATA SEND IN	Used to provide AN/URC-61 digital data inputs.
DIG DATA RX1 OUT	Used to provide AN/URC-61 digital data outputs.
DIG DATA CLOCK RX1 OUT	Used to provide AN/URC-61 digital data clock outputs.
MISC:	
SPARE 1 and 2	Spare intercom jacks for intercommunication with shelter intercom station.
TEL	Handset A-1 plug-in for local intercommunication with shelter intercom station.
Wideband external pairs:	
600Ω WIDE BAND XMT (J1)	Used to provide external wideband signal send.
600Ω WIDE BAND RCV (J2)	Used to provide external wideband signal receive.
TCC-79 XMT (J15)	Used to transmit 70 MHz from CCSS.
TCC-79 RCV (J16)	Used to receive 70 MHz from OCV.
URV-28 XMT (J9)	For future use.
URC-28 RCV (J10)	For future use.

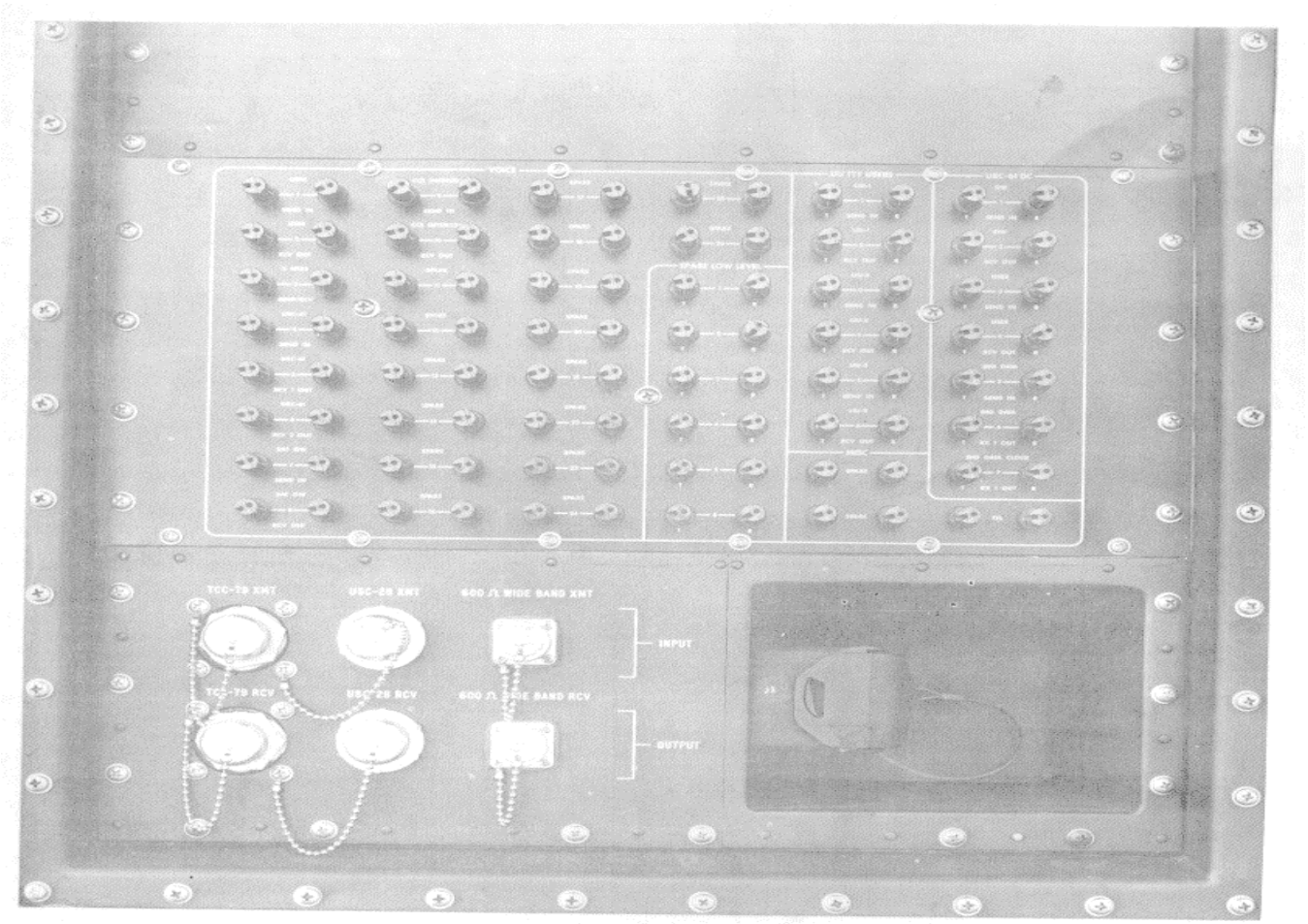


Figure 3-28. External signal distribution box (1A12) controls and indicators.

Table 3-27. Primary Power Distribution Assembly (1A14) Controls and Indicators

Controls/indicators	Function
35 ampere AIR COND circuit breaker	Controls the application of power to the air conditioner 1A1.
5 ampere SHELTER LIGHTS circuit breaker	Controls the application of power to the shelter lights.
15 ampere CONSOLE POWER circuit breaker (two)	Controls the application of power to satellite communication consoles 1A2 and 1A3
7.5 ampere SENSITIVE POWER circuit breaker	Controls the application of power to the electrical equipment housing 1A2A34 and frequency distribution unit 1A2A22
35 ampere SHELTER OUTLET circuit breaker (two)	Controls the application of power to convenience outlets.
5 ampere AN:URC-61 circuit breaker	Controls the application of power to AN/URC61. Controls the application of power to AN/URC-61.
CRITICAL POWER hours meter	Record the total time that critical power has been applied.
SENSITIVE POWER hours meter	Records the total time that sensitive power has been applied.

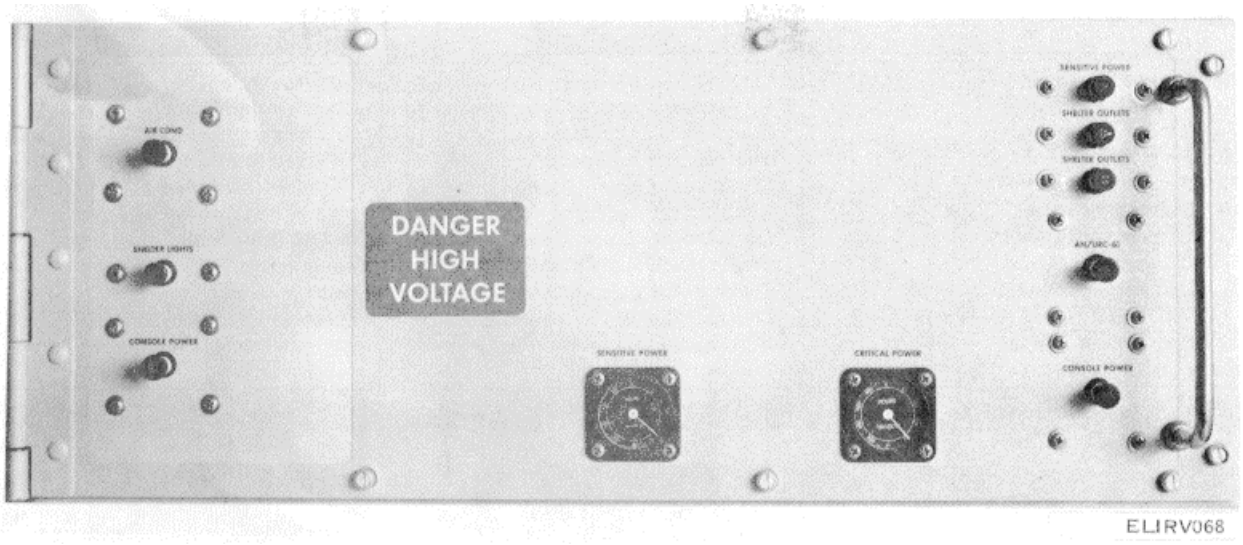


Figure 3-29. Primary power distribution assembly (1A12) controls and indicators.

Table 3-28. External Power Distribution Box (1A14) Controls and Indicators

Controls/indicators	Function
SA-1901 ALARM spring-return switch	Illuminates (white) when the alarm horn (also located on 1A14) sounds as a result of a malfunction in the SA-1901 Power Distribution-Switching Unit (when used with the AN,SC-54), and is the switch used to silence the alarm horn.

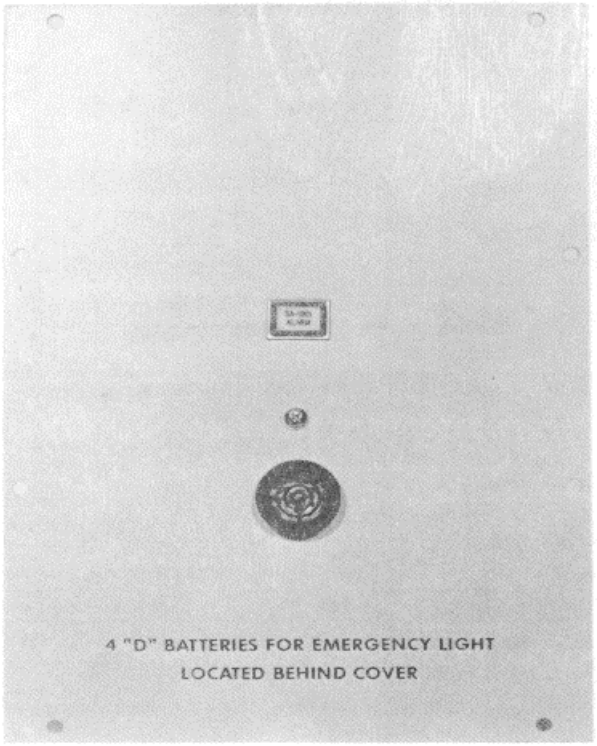


Figure 3-30. External power distribution box (1A14) controls and indicators.

Table 3-29. Primary Power Distribution Panel (1A15) Controls and Indicators

Controls/indicators	Function
U/C NO. 1 circuit breaker	Controls the application of power to upconverter number 1.
U/C NO. 2 circuit breaker	Controls the application of power to upconverter number 2.
U/C NO. 3 circuit breaker	Controls the application of power to upconverter number 3.
D/C NO. 1 circuit breaker	Controls the application of power to downconverter number 1.
D/C NO. 2 circuit breaker	Controls the application of power to downconverter number 2.
D/C NO. 3 circuit breaker	Controls the application of power to downconverter number 3.
DIST AMPL circuit breaker	Controls the application of power to the distribution amplifier.
BLO circuit breaker	Controls the application of power to the frequency conversion subsystem blowers.
TEST XTLR circuit breaker	Controls the application of power to the test translator.
HEATER POWER circuit breaker	Controls the application of power to the personnel heater.
ON-OFF thermostat bypass toggle switch	Permits manual override of personnel heater thermostat to prevent heater shut-down

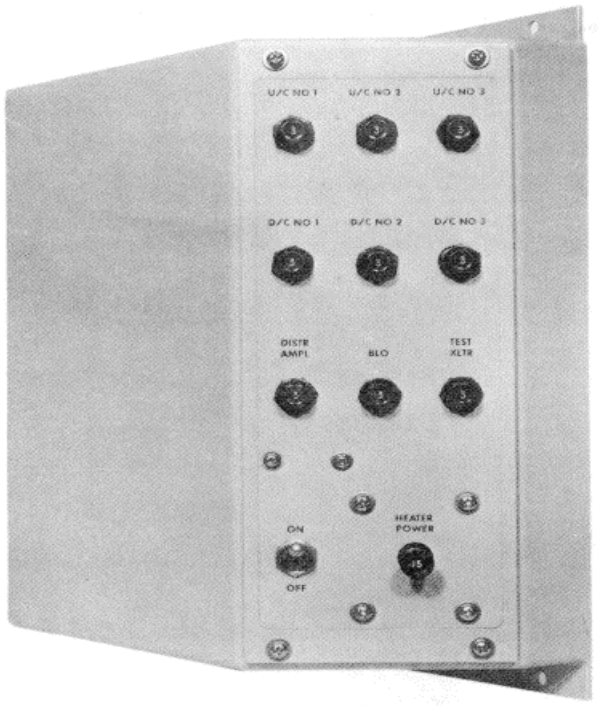


Figure 3-31. Primary distribution panel (1A15) controls and indicators.

Table 3-30. Primary Power Monitor Panel (1A16) Controls and Indicators

Controls/indicators	Function
FREQUENCY meter	Indicates 400 Hz primary power source line frequency.
VOLTAGE meter	Indicates 400 Hz primary power source line voltage.
PHASE rotary switch:	
A	Selects phase A of the 3-phase 4-wire primary power source line voltage to be monitored.
B	Selects phase B of the 3-phase 4-wire primary power source line voltage to be monitored.
C	Selects phase C of the 3-phase 4-wire primary power source line voltage to be monitored.

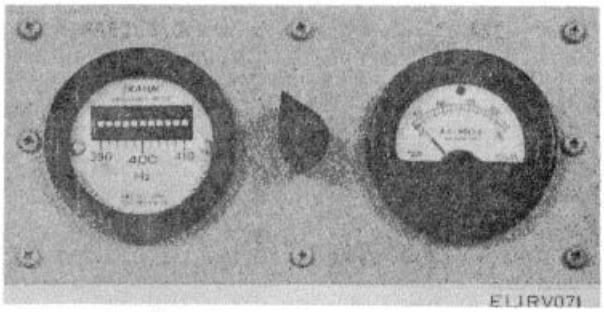


Figure 3-32. Primary power monitor panel (1A16) controls and indicators.

Table 3-31. Air Conditioner (1A1) Controls and Indicators

Controls/indicators	Function
TEMP rotary control	Provides thermostatic control for cooling or heating. The manual set range is from +40° to 90°F.
Five-position selector switch:	
OFF	Turns the air conditioner off. If the air conditioner is shutdown for short periods, the line power should be left on to keep the crankcase heater energized and thus prevent the refrigerant from condensing in the crankcase and mixing with the oil.
VENTILATE	Provides ventilation of the shelter area. For 100° fresh air ventilation, the fresh air damper is opened by releasing the pull chain, and closing the evaporator return air damper. Pressure relief must be provided in the shelter area.
COOL	Provides cooling of the shelter area. Temperature to be maintained is set by the TEMP rotary control.
LO HEAT	Provides low heating (6,000 btu/hr) of the shelter area Temperature to be maintained is set by the TEMP rotary control.
HI HEAT	Provides high heat (12,000 btu/hr) of the shelter area. Temperature to be maintained is set by the TEMP rotary control.
Fresh air damper pull chain	Operates the fresh air intake damper. When the chain is released, the damper is open.
Return air grille control lever	Operates the return air intake damper. When the lever is in the up position, the damper is open.

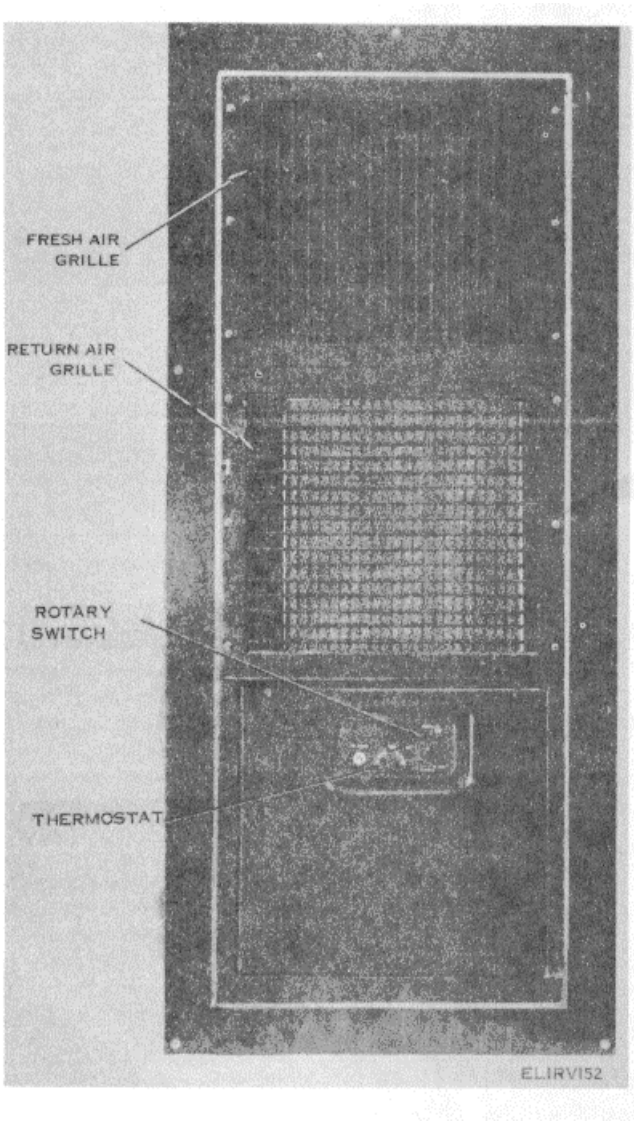


Figure 3-33(1). Air condition (1A1) controls and indicators (sheet 1 of 2).

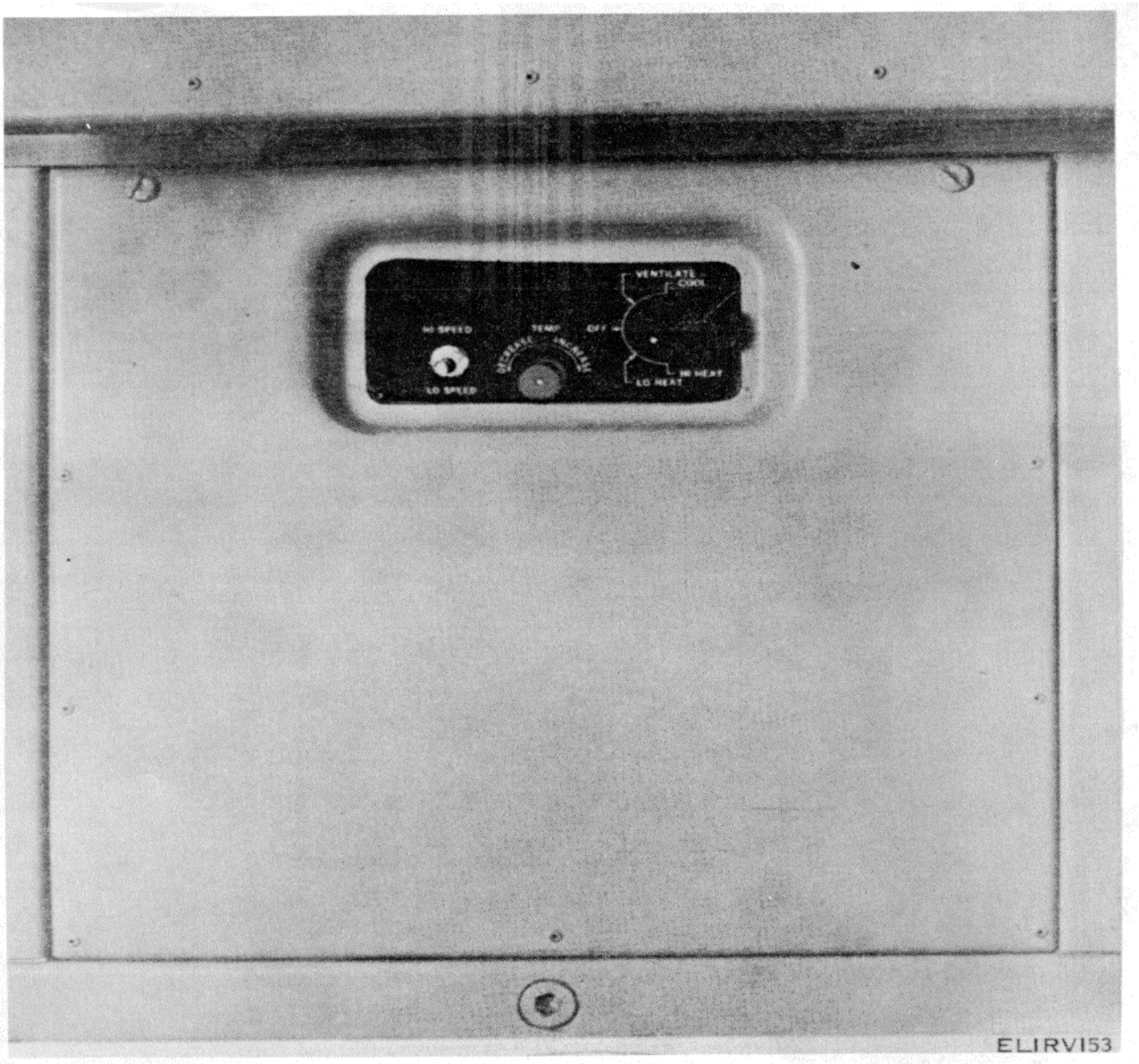


Figure 3-33(2). Air conditioner(1A) controls and indicators (sheet 2 of 2).

Table 3-32. Zero Set Control (1A2A1) Controls and Indicators.

Controls/indicators	Function
ON-OFF toggle switch	Applies + 28 vdc to energize a magnetic clutch which provides linkage between the AZIMUTH INDICATOR ZERO ADJUST handcrank control and resolvers.
AZIMUTH INDICATOR ZERO ADJUST handcrank control	Adjusts the resolvers to allow for deviation from true north on the at antenna control-panel 1A2A5.

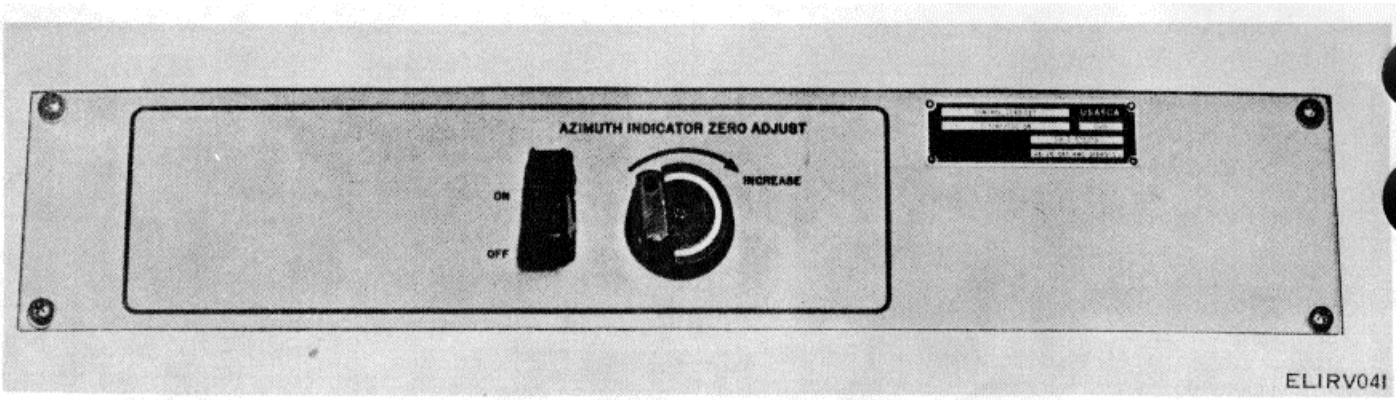


Figure 3-34.. Zero set control (A21A1) controls and indicators.

Table 3-32.1. OBN Monitor Panel(1A3A24) Controls and Indicators

Controls/indicators	Function
Fuse Fl	Provides equipment protection.
POWER ON lamp	When lit, indicates power is applied to OBN monitor panel.
POWER ON/OFF switch	When in ON position, applies power to OBN monitor panel. When in OFF position, removes power from monitor panel.
CIRCUITS switch	Selects OBN signal from open of eight channels to be indicated on meter.
METER	Indicates OBN signal level of channel selected by CIRCUITS switch.
VISUAL ALARM lamp	When lit, indicates OBN signal level is out of tolerance for one or more of eight channels.
AUDIO ALARM buzzer	Audible alarm that sounds when OBN signal level is out of tolerance. Alarm may be disabled by setting AUDIO DISABLE switch to OFF position.
AUDIO DISABLE ON/OFF switch	When set to OFF, inhibits AUDIO ALARM buzzer from sounding.

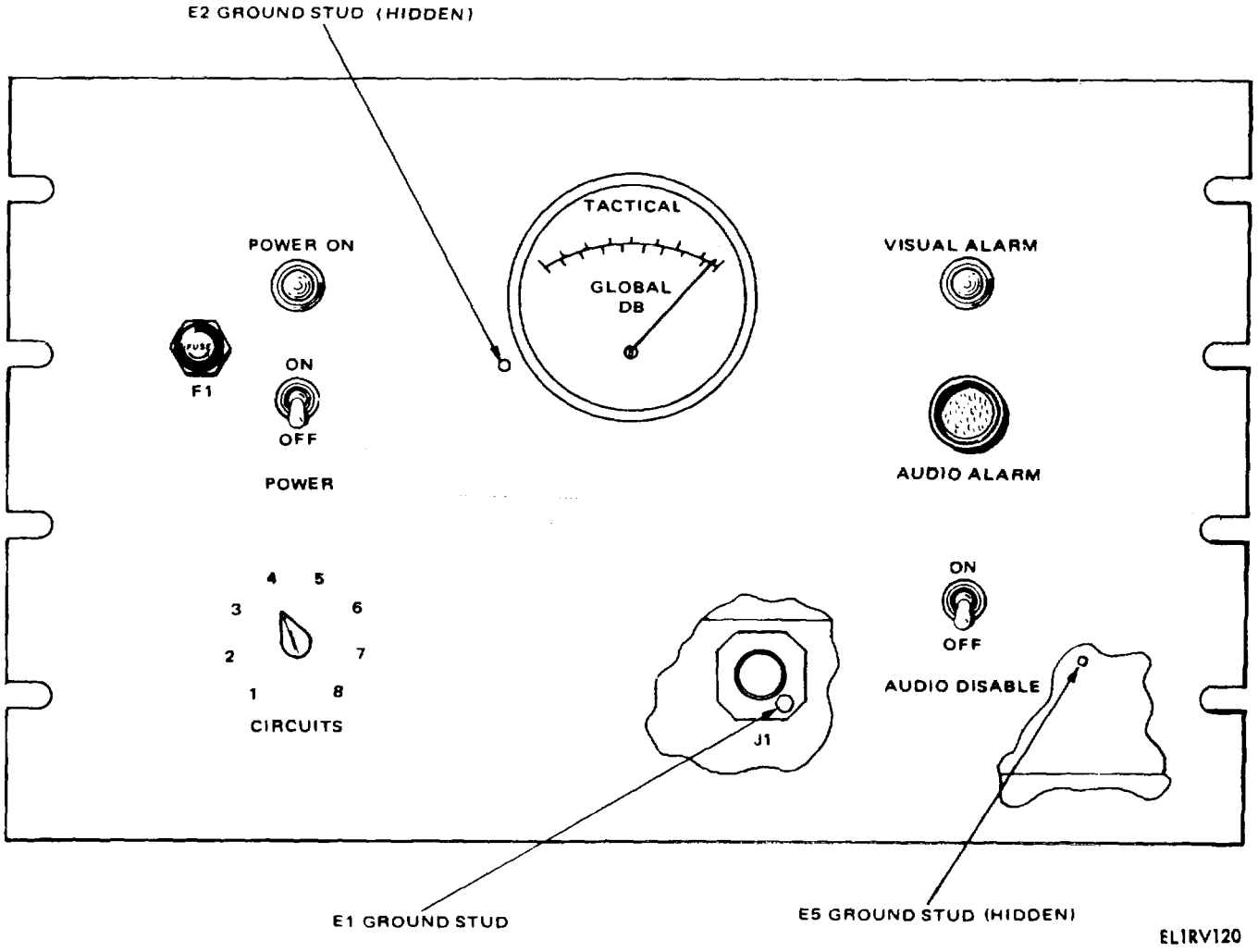


Figure 3-34.1. OBN monitor panel (1A3A24) controls and indicators.

3-3. Antenna Pedestal and LPA Controls and Indicators

The names and functions of the controls and indicators of the various components and units located in the antenna pedestal and LPA are shown and described in the figures and tables listed below.

Component/Unit	Figure	Table
Transmitter control panel (2A3A7)	3-35	3-33
Intercomm/air monitor panel (2A3A24)	3-36	3-34
Parametric amplifier (2A9AA2) or (2A9A1A3)	3-37	3-36
Primary power distribution panel (2A3A14) 3-39	3-37	
LPA panel assembly (2A1 A5)	3-39.2	3-39
Prime power control panel (2A11A3) 3-39.3	3-40	
Klystron power supply indicator panel(2A11A1)	3-39.4	3-41
Klystron adjustment panel (2A11A4) 3-39.5	3-42	

Table 3-33. Transmitter Control Panel(2A3A 7) Controls and Indicators

Controls/indicators	Function
PEDESTAL CONTROL indicator	Illuminates (green) to indicate that the transmitter is controlled from transmitter con- trol panel 2A3A7.
PREHEAT indicator	Illuminates (white) to indicate that system is in a preheat condition (9-minute delay).
STANDBY indicator	Illuminates (amber) to indicate that transmitter is in a standby condition.
TRANSMIT indicator	Illuminates (green) to indicate that transmitter is radiating or operating into the dummy load.
DUMMY LOAD indicator	Illuminates (red) to indicate that transmitter output power is applied to the dummy load.
POWER METER LOW RANGE indicator	Illuminates (amber) to indicate that RF POWER meter indication is on low range.
LOW COOL TEMP indicator	Illuminates (amber) to indicate that transmitter liquid coolant has not reached operating temperature.
LOW LIQUID WARNING indicator	Illuminates (amber) to indicate that coolant should be added to heat exchanger.
WG PRESSURE indicator	Illuminates (amber) to indicate that wave guide pressure is low.
+ 28V REG indicator	Illuminates (white) to indicate that + 28 vdc regulated power is applied to the transmitter.
LAMP TEST toggle switch	Controls the application of power to fault indicators for testing lamps.
LOW PARTICLE FIL, COOL. FLOW	Illuminates (amber) to indicate a low rate of coolant flow through the outboard full flow filter in the heat transfer system.
LOW RF POWER indicator	Illuminates (amber) to indicate that transmitter is operating with low RF power output.
- 28V REG indicator	Illuminates (white) to indicate that - 28 vdc regulated power is applied to transmitter.
INTERLOCK indicator	Illuminates (red) to indicate that interlock circuit is open.
WG ARC KLYSTRON indicator	Illuminates (red) to indicate that the protective circuitry has placed transmitter in standby because of a waveguide arc or protective circuitry malfunction.
WG ARC ISOLATOR indicator	Illuminates (red) to indicate that the protective circuitry has placed the transmitter in standby status because of a waveguide arc or protective circuitry malfunction.
HIGH COOL TEMP indicator	Illuminates (red) to indicate that the heat exchanger liquid coolant has reached an excessive operating temperature or that the protective circuitry is malfunctioning.

Table J-53. Transmitter Control Panel (2ASA7) Controls and Indicators - Continued

Controls/indicators	Function
LOW LIQUID indicator	Illuminates (red) to indicate that the protective circuitry has placed the transmitter in preheat condition because of a low liquid level in the heat exchanger or that the protective circuitry is malfunctioning.
HIGH BEAM CURRENT indicator	Illuminates (red) to indicate excessive klystron filament voltage, malfunctioning high voltage circuit, or defective protective circuitry.
COLLECTOR FLOW indicator	Illuminates (red) to indicate malfunctioning of the heat exchanger or protective circuitry.
FILAMENT COOLING indicator	Illuminates (red) to indicate malfunctioning of the blower motor or associated circuitry.
BODY & MAG FLOW indicator	Illuminates (red) to indicate a clogged filter or malfunctioning protective circuitry.
WG & DUMMY LOAD FLOW indicator	Illuminates (red) to indicate a malfunctioning of the flow switch or protective circuitry.
ANTENNA SECTOR LIMIT indicator	Illuminates (red) to indicate that the antenna has exceeded sector limit or malfunctioning protective circuit.
HIGH BODY CURRENT indicator	Illuminates (red) to indicate malfunctioning high voltage circuits, klystron, or protective circuitry.
LOW MAGNET CURRENT indicator	Illuminates (red) to indicate malfunctioning magnet power supply or protective circuitry.
HIGH VSWR ISOLATOR indicator	Illuminates (red) to indicate high vswr condition, malfunctioning power detector, or defective protective circuitry.
HIGH VSWR KLYSTRON indicator	Illuminates (red) to indicate high vswr condition, malfunctioning power detector, or defective protective circuitry.
FAULT TEST toggle switch:	
VSWR TEST	Simulates faults to test high vswr klystron and high vswr isolator protective circuitry.
ARC TEST	Simulates faults to test wg arc klystron and wg arc isolator protective circuitry. RESET toggle switch Applies signal to reset fault and protective circuitry.
XMIT OUTPUT toggle switch:	
INCREASE	Permits increasing transmitter drive and output power.
DECEASE	Permits decreasing transmitter drive and output power.
RF POWER meter	Provides indications in accordance with power meter selector switch setting.
RF POWER meter selector switch:	
METER ZERO	Permits zero adjustment of RF POWER meter.
FWD	Provides an indication of forward power on RF POWER meter. (High range full- scale reading is 10 kw; low range full scale reading is 1 kw.)
REV	Provides an indication of reverse power on RF POWER meter. (High range full- scale reading is 1 kw; low range full-scale reading is 100 watts.)
DRIVE	Provides an indication of reverse power on RF POWER meter. (High range full- scale reading is 1 watt; low range full-scale reading is 100 milliwatts.)
RF METER ZERO rotary control	Permits zero adjustment of RF POWER meter.
LINE VOLTS meter	Measures three-phase line voltage when the klystron beam voltage is applied.
Four-position LINE VOLTS meter selector switch:	
OFF	Opens LINE VOLTS meter circuit.
PH A	LINE VOLTS meter indicates phase A line voltage.
PH B	LINE VOLTS meter indicates phase B line voltage.
PH C	LINE VOLTS meter indicates phase C line voltage.
TWT elapsed time indicator	Indicates the amount of time in hours that the traveling wave tube (twt) has been operating.
KLYSTRON FILAMENT elapsed time	Indicates the amount of time in hours that power is applied to the klystron filaments.
KLYSTRON CURRENT elapsed time indicator	Indicates the amount of time in hours that the klystron tube has been operating.
VOLTAGE-CURRENT TEST meter	Measures twt cathodes current and klystron beam voltage.
TEST meter selector switch:	
TWT CATHODE CUR.	Meter indicates cathode current.
KLYSTRON BEAM VOLTS	Meter indicates beam voltage.
OFF Opens TEST meter circuit.	
BEAM POWER, ON-OFF toggle switch	Controls application of beam power to klystron.
XMIT POWER, ON-OFF toggle switch	Controls application of power to transmitter.
CURRENT TEST meter	Measures klystron beam, body, and magnet current.
TEST meter selector switch:	
OFF Opens TEST meter circuit.	
KLYSTRON BEAM CUR.	TEST meter indicates klystron beam current.
KLYSTRON BODY CUR.	TEST meter indicates klystron body current.
MAGNET CUR	TEST meter indicates klystron magnet current.

Table 3-33. Transmitter Control Panel (2ASA7) Controls and Indicators - Continued

Controls/indicators	Function
MAG CUR. ADJUST rotary control	Adjusts klystron magnet current.
CONTROL BIAS MONITOR and CONTROL BIAS MONITOR COMMON test jacks	Used to measure control bias voltage level.
+28V REG, PS COMMON, and -28V REG test jacks	Used to measure +28 vdc and -28 vdc regulated power.
Test Points:	
TP6	Used to monitor isolator high vswr fault signal to latch circuit No. 2.
TP7	Used to monitor low RF power fault signal output level of low RF sensing circuit.
TP8	Used to monitor klystron waveguide arc fault signal to latch circuit No. X
TP9	Used to monitor kylstron high vswr fault signal to latch circuit No. 2.
TP10	Used to monitor klystron forward and reverse power reference levels to detector amplifiers.
TP11	Used to monitor isolator forward and reverse power reference levels to detector amplifiers.
TP13	Used to monitor klystron low magnet current fault signal to latch circuit No. 3.
TP14	Used to monitor klystron high body current fault signal to latch circuit No. 3.
TP15	Used to monitor klystron high beam current fault signal to latch circuit No. 3.

Figure 3-35. Transmitter control panel (2ASA7) controls and indicators.

Table 3-34. Intercomm Air Monitor Panel (1ASA24) Controls and Indicators

Controls/indicators	Function
HUMIDITY chamber	Desiccant site glass wet air indicator.
Air flow control valves:	
HUMIDITY	Controls the flow of dry air to desiccant chamber.
DRVR-RCVR	Controls the flow of dry air to drive and receive microwave components.
TRANSMITTER LPA	Controls the flow of dry air to the LPA microwave components.
RCVR Controls the flow of dry air to receive microwave components.	
TRANSMITTER DRIVER	Controls the flow of dry air to the driver microwave components.
TRANSMITTER HIPA	Controls the flow of dry air to the high power amplifier components.
RECEIVERS 1, 2, 3, and 4 toggle switches	Activates individual intercomm positions.
RECEIVERS INT	Used in conjunction with RECEIVERS 1 thru 4 for conference communication.
RECEIVERS NAV	Not connected.
VOL control rotary switch	Controls the volume to the headsets.
Transmit-Interphone six-position rotary switch:	
PVT Selects private interphone line with another connected station.	
INT	Selects interphone line for conference communication.
Pos 1 thru 4	Selects individual receive station.
J1 thru J4 connectors	Head set connections to control head.

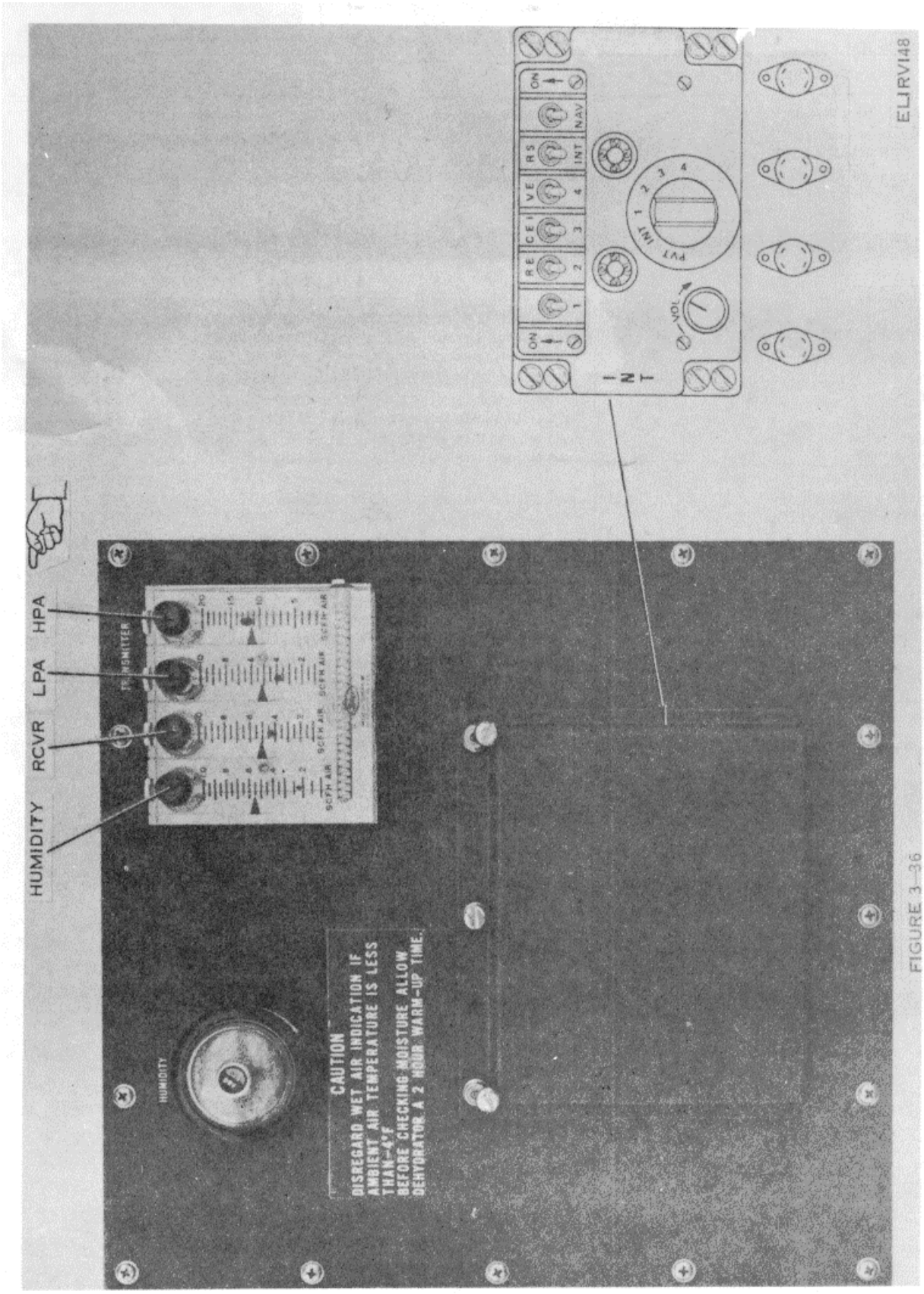


Figure 3-36. Intercomm/air monitor panel (2A3A24) controls and indicators

Table 3-35. Parametric Amplifier (2A9A1A2 or 2A9A1A3) Controls and Indicators

Controls/indicators	Function
POWER ON toggle switch, CB1	Control the applications of ac power to parametric amplifier.
POWER ON indicator, DS1	Illuminates to indicate CB1 is set to on and voltage is present.
VARACTOR BIAS CONTROL:	
1ST adjust control	Adjusts bias of first amplifier stage.
2ND adjust control	Adjusts bias of second amplifier stage.
3RD adjust control	Adjusts bias of third amplifier stage.
1ST toggle switch:	
ON	Engages first amplifier stage into system.
BYPASS	Allows first amplifier stage to be bypassed.
2ND toggle switch:	
ON	Engages second amplifier stage into system.
BYPASS	Allows second amplifier stage to be bypassed.
3RD toggle switch:	
ON	Engages third amplifier stage into system.
BYPASS	Allows third amplifier stage to be bypassed.
TP1 test jacks	Used to measure first stage bias voltage.
TP2 test jacks	Used to measure second stage bias voltage.
TP3 test jacks	Used to measure third stage bias voltage.
Used to measure third stage bias voltage.	
RETURN, TP4 jack	Used for the return line of TP1, TP2, and TP3.
PUMP POWER MONITOR STAGES:	
1ST, TP5 test jack	Used to measure first stage relative pump power voltage.
2ND, TP6 test jack	Used to measure second stage relative pump power voltage.
3RD, TP7 test jack	Used to measure third stage relative pump power voltage.
RETURN, TPs jack	Used for the return line of TP5, TP6, and TP7.
GUN OSCILLATOR VOLTAGE STAGES:	
1ST, TP9 test jack	Used to measure first stage oscillator voltage.
2ND, TP10 test jack	Used to measure second stage oscillator voltage.
3RD, TP11 test jack	Used to measure third stage oscillator voltage.
RETURN, TP12 jack	Used for the return line of TP9, TP10. and TP11.
RETURN, TP12 jack	Use for the return on TP9, TP10, and TP11.

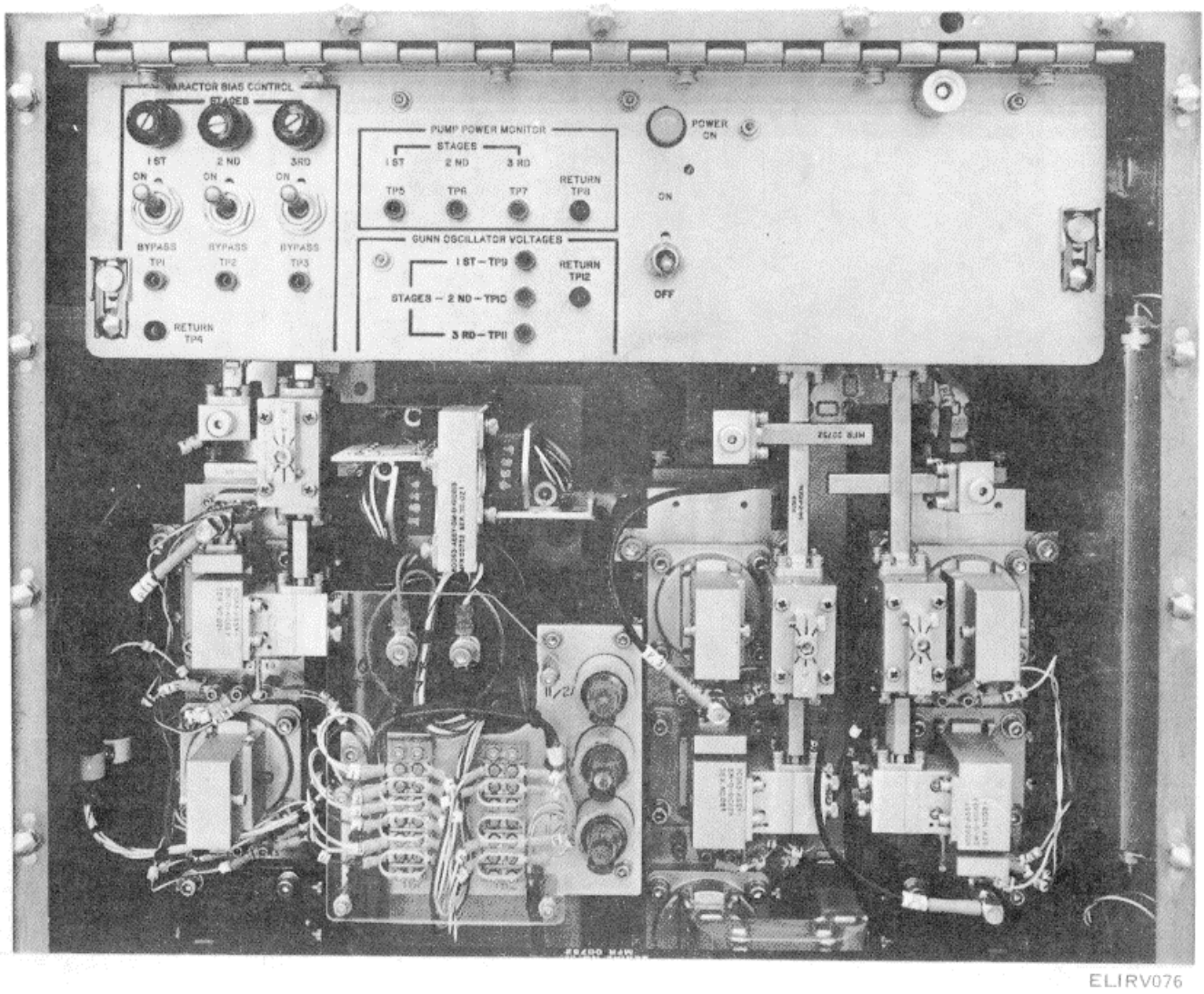


Figure 3-37. Parametric amplifier (2A9A1A2 or 2A9A1A3) controls and indicators.

Table 3-36. High Voltage Cage (2A3A11) Controls and Indicators

Control, indicator or connector	Function
KLYSTRON FILAMENT CONTROL	Controls level of klystron filament voltage.
DC VOLTS meter	Indicates level of klystron filament voltage.
KLYSTRON FILAMENT and KLYSTRON FILAMENT COM test jacks	Used to test level of klystron filament voltage.

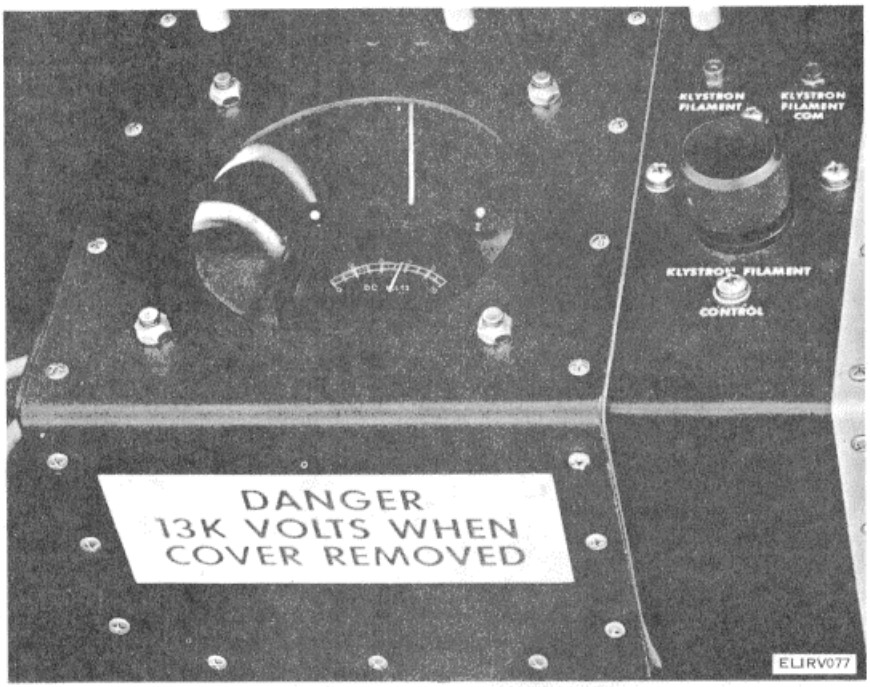


Figure 3-38. High voltage cage (2A3A11) controls and indicators.

Table 3-37. Primary Power Distribution Panel (2A3A14) Controls and Indicators

Control, indicator or connector	Function
BEAM PWR SUPPLY circuit breaker	Controls application of ac power to the control contactor for the beam power supply.
MAGNET PWR SUPPLY contactor	Controls application of ac power to the magnet power supply.
SENSITIVE PWR hours meter	Indicates the amount of time in hours that sensitive power has been applied to the components in the antenna-receiver-transmitter group.
SYSTENM PWR hours meter	Indicates the amount of time in hours that system power has been applied to the AN/TSC-54.
5 AMP indicating fuses	Illuminates white to indicate an open fuse in associated sensor relay circuit.
EL FIRING CIRCIUIT circuit breaker	Controls application of ac timing power to elevation de power amplifier (scr).
AZ FIRING CIRCUIT circuit breaker	Controls application of ac timing power to azimuth de power amplifier (scr).
EL DRIVE circuit breaker	Controls application of ac power to elevation drive motor and EL FIRING CIRCUIT circuit breaker.
90 V PWR SUPPLY 5 ampere circuit	Controls application of ac power to bridge rectifier in servo No. 1.
+ 15V PWR SUPPLY 5 ampere circuit breaker	Controls application of ac power to the -15 vdc and +15 vdc power supplies.
SCANNER 3 ampere circuit breaker	Controls application of ac power to the waveguide scanner assembly.
INTERCOM,SENSITIVE PWR 7 ampere	Controls application of ac power to SCANNER circuit breaker, SENSITIVE PWR elapsed time meter, sensitive power supplies, the frequency translator in the RF box assembly and intercom.
KLYSTRON FILAMIENT 3 ampere circuit	Controls application of ac power to control relays for klystron blower and klystron filament control transformer.
SHIELTER PWR contactor	Controls application of ac power to the shelter circuits.
HEAT EXCIIANGER 20 ampere circuit	Controls application of ac power to the control contactor for the heat exchanger and coolant heater units.
BLOWERS 15 ampere circuit breaker	Controls application of ac power to blowers in the antenna pedestal and in the RF box assembly.
UTILITY OUTLET 35 ampere circuit	Controls application of ac power to the 115 VAC UTILITY OUTLET on the meter panel and on the antenna pedestal.
RF BOX POWER 5 ampere circuit	Controls application of ac power to the RF box assembly.
AZ DRIVE 15 ampere circuit breaker	Controls application of ac power to the azimuth drive motor and AZ FIRING CIRCUIT circuit breaker.
VOLTAGE meter	Indicates voltage level of ac power.
FREQUENCY meter	Indicates frequency level of ac power.
115 VAC UTILITY OUTLET (two)	Provide for plug in of external equipment power cords.
PRIME PWR ON toggle switch	Controls momentary application of ac power to coil of the prime power contactor, and thus controls application of power to the AN/TSC-54.

Table 3-37. Primary Power Distribution Panel (2A3A14) Controls and Indicators - Continued

Control, indicator or connector	Function
OVERRIDE switch	Permits bypassing of ac power around voltage sensor and frequency sensor interlock relays direct to PRIME PWR ON.
MOUNT SAFE toggle switch	When set to the up position, the switch opens the beam power and servo interlocks and prevents both the radiation of transmitter energy and any movement of the antenna. Switch also completes a dc power path to illuminate a MOUNT SAFE indicator located in the shelter.
EMERGENCY OFF switch located on right-hand end of power distribution box)	Permits emergency interruption of power, denergizes the prime contactor and immediately removes power from the AN/TSC-54.

Table 3-38. Remote Control Panel (1A2A36), Controls and Indicators

Control, indicator, or connector	Function
FAULT section:	
LPA FAULT/ALARM DISABLE (momentary action, split position indicator-switch)	When LPA FAULT section illuminates, an LPA fault has occurred. When pressed and released indicator extinguishes if fault has been corrected. When ALARM DISABLE is pressed and released, alarm silences and indicator extinguishes.
Audible alarm.	Provides audible signal when a fault condition occurs.
LAMP TEST (momentary toggle switch)	When held down, all lamps on control panel are illuminated.
POWER section:	
AC (neon lamp)	When illuminated, indicates ac power is applied to LPA.
ON (3-position momentary toggle switch)	ON - applies prime power to controls, filament, driver and blower, starts filament warmup cycle. Center - neutral position. Down - removes prime power.
FILAMENT PREHEAT (indicator)	Illuminates during filament warmup time. Beam turn-on is inhibited.
RDY (indicator)	Illuminates when filament warmup is complete. Beam power can be applied.
BEAM (indicator and 3-position momentary toggle switch)	ON - applies beam voltage to klystron through beam control circuits and BEAM indicator illuminates. Center - neutral position. Down - removes beam voltage and extinguishes indicator.
RF POWER section:	
Meter (RF power)	Measures RF power in three ranges (15, 150, and 1500 watts) according to setting of RANGE switch.
RF DRIVE/ON (3-position momentary toggle switch and indicator)	ON - enables RF drive power to be applied to TWT (indicator illuminates). Center - neutral position. Down - disables RF drive to TWT.
DRIVE INCREASE/DECREASE (3-position momentary toggle switch)	INCREASE - increases amount of RF drive power applied to LPA. Center - neutral position. DECREASE - decreases amount of RF drive power applied to LPA.
RANGE 15/150/1500 (3-position rotary switch)	15 - sets range of meter to O to 15 watts. 150 - sets range of meter to 0 to 150 watts. 1500 - sets range of meter to 0 to 1500 watts.
OUTPUT/ZERO (2-position rotary switch)	OUTPUT - measures klystron output power in watts. ZERO - enables zeroing potentiometer.
Zeroing potentiometer	Allows RF POWER meter to be zeroed for each setting of RANGE switch.
TRANSMIT section:	
HPA ON LINE (indicator) (3-position momentary toggle switch)/STANDBY (indicator)	HPA ON LINE - connects HPA to antenna and HPA ON LINE indicator illuminates. Center position - neutral. STANDBY - connects HPA to dummy load and STANDBY indicator illuminates.
LPA ON LINE (indicator)/(3-position toggle switch)/STANDBY (indicator)	LPA ON LINE - connects LPA to antenna and LPA ON LINE indicator illuminates. Center position - neutral. STANDBY - connects LPA to dummy load and STANDBY indicator illuminates.
CONTROL section:	
PEDESTAL/SHELTER (keylock switch)	Transfers LPA control functions to pedestal (LPA control panel) or shelter (remote control panel).

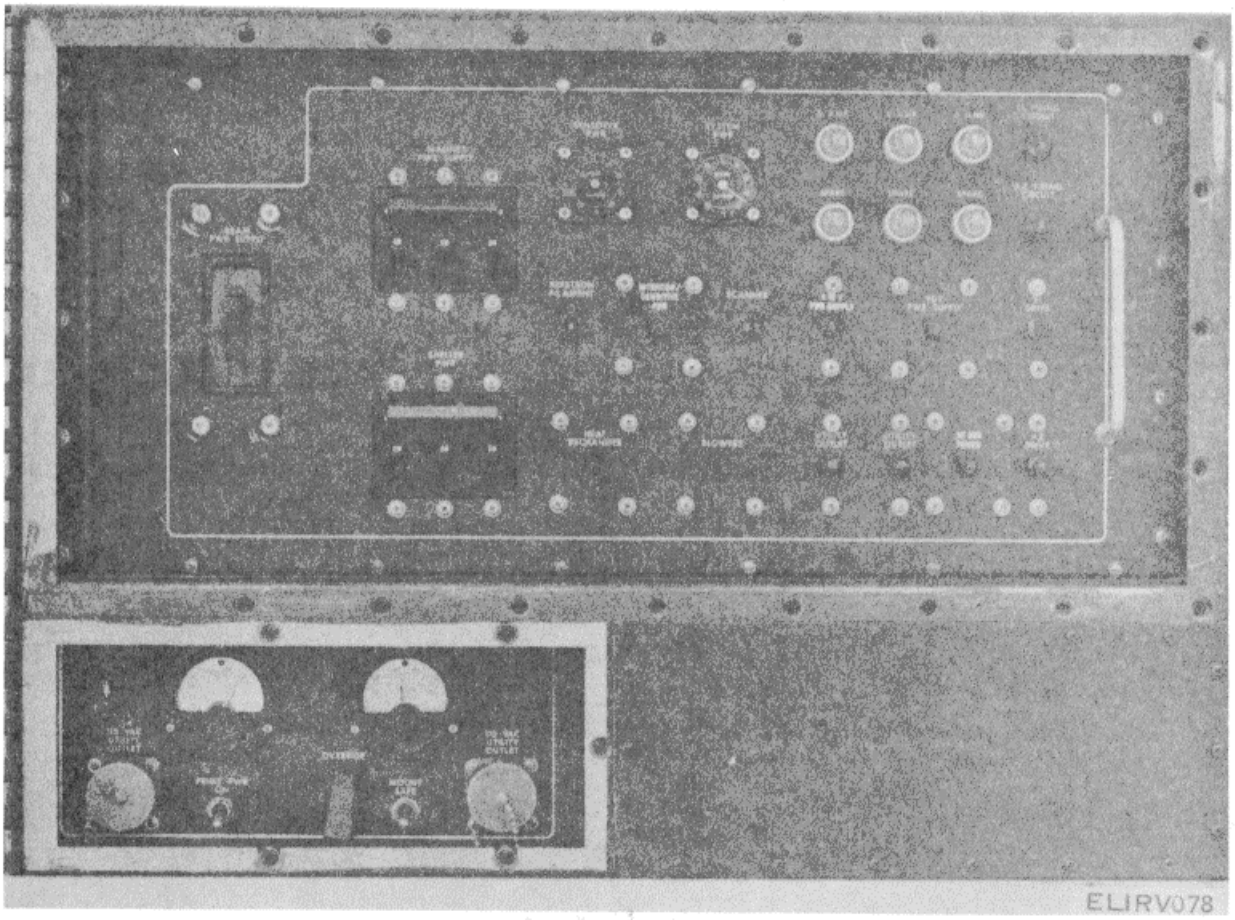


Figure 3-39. Primary power distribution panel (2A3A14) controls and indicators.

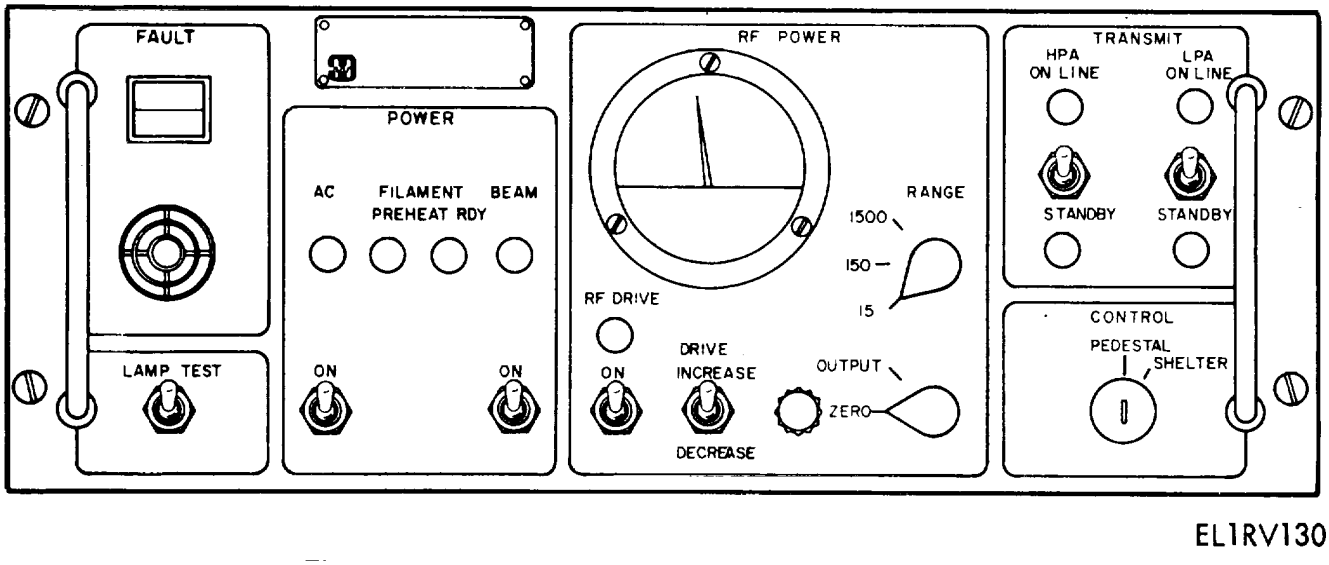
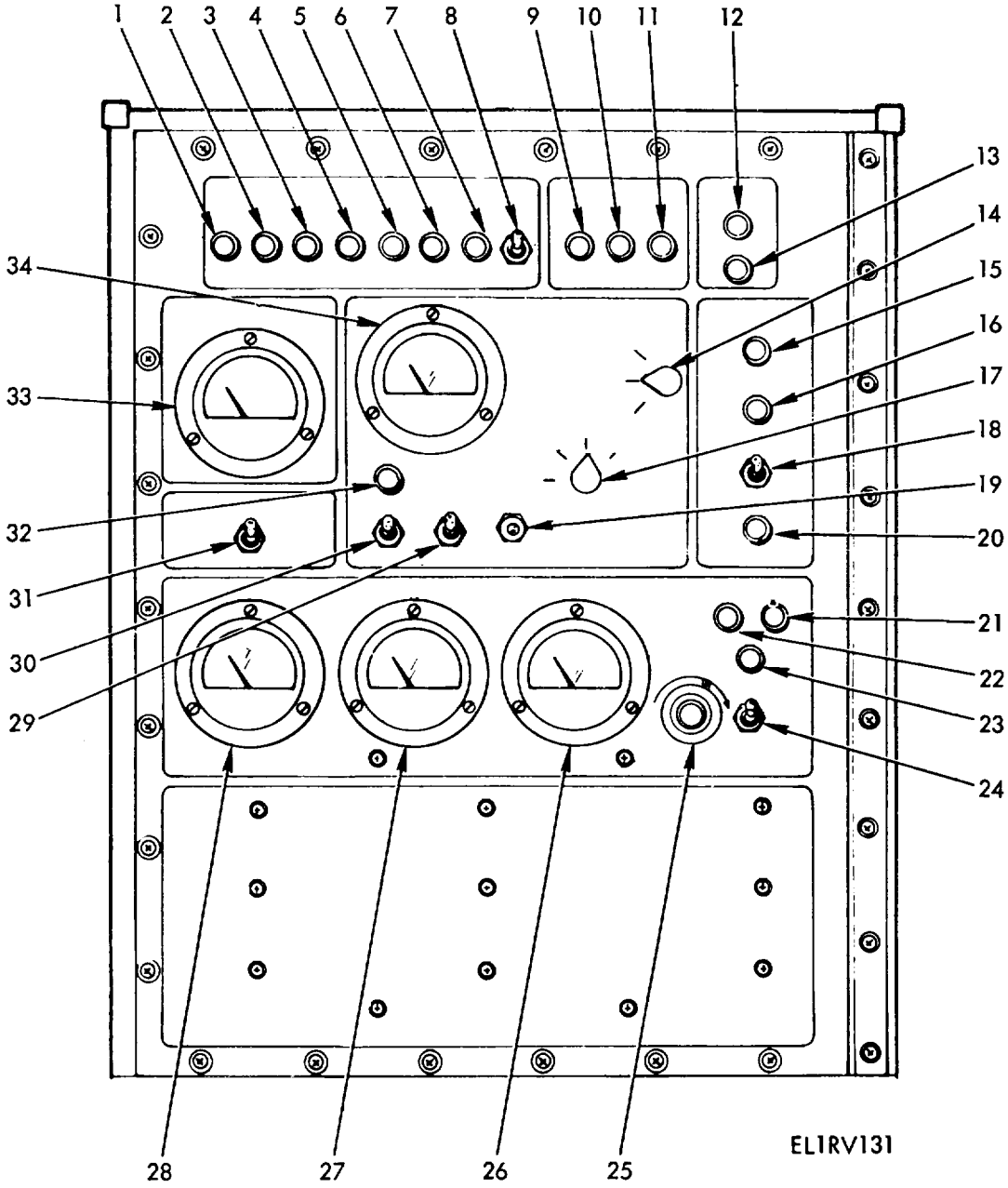


Figure 3-39.1. Remote control panel (1A2A36), controls and indicators.

Table 3-39. LPA Panel Assembly (2A11A5), Controls and Indicators

Control, indicator, or connector	Function
FAULT section:	
KLYSTRON:	
BODY CURRENT (indicator)	Illuminates when klystron body current exceeds limit set on BODY CURRENT
meter. Excessive body current also inhibits beam power.	
REVERSE POWER (indicator)	Illuminates when reverse power at klystron output is excessive. KIystron RF
output power is inhibited when reverse power is excessive.	
COLLECTOR	
FAN (indicator)	Illuminates when there is insufficient airflow to klystron collector (beam power is
inhibited).	
TEMP (indicator)	Illuminates when collector temperature exceeds normal limits (beam power is
inhibited).	
POWER SUPPLY (indicator)	Illuminates if a malfunction occurs in klystron power supply.
REFLECTED POWER (indicator)	Illuminates when RF output is inhibited due to excessive RF power reflected back
from antenna.	
WAVEGUIDE SW (indicator)	Illuminates when LPA W/G switch is between on-line and dummy load positions.
RESET (momentary toggle switch)	Resets FAULT SECTION logic circuits to no fault position.
INTERLOCK section:	
EQUIP (indicator)	Illuminates when interlock switches are open.
ELEV (indicator)	Illuminates when LPA is on-line and antenna elevation angle is too low.
MOUNT (indicator)	Illuminates when LPA is on-line and mount safe switch is open.
CONTROL section:	
SHELTER (indicator)	Illuminates when shelter LPA controls and indicators are active.
PEDESTAL (indicator)	Illuminates when pedestal LPA controls and indicators are active.
TWT section:	
CATHODE CURRENT (meter)	Indicates TWT cathode current.
LAMP TEST (momentary toggle switch)	When held in down position all indicators illuminate.
RF POWER section:	
RF DRIVE/ON (3-position momentary toggle switch and indicator)	ON - applies RF drive to TWT (indicator illuminates). Center - neutral. Down - removes RF drive to TWT (indicator extinguishes).
Wattmeter	Reads klystron drive, reflected or output power depending upon setting of function switch. Meter reads in 3 ranges (15 mW, 150 W and 1500 W) according to setting of RANGE switch.
RANGE (rotary switch)	MW 150 - establishes range of wattmeter as 0-15 milliwatts. 150 W - establishes range of wattmeter as 0-150 watts.
1500 W - establishes range of wattmeter as 0-1500 watts.	
Function switch.	METER ZERO - allows wattmeter to be zeroed - reads klystron drive power in range selected by RANGE switch. REFLECTED - reads power reflected back to klystron in range selected by RANGE switch. OUTPUT - reads klystron output power in range selected by RANGE switch. DRIVE - reads power level input to klystron.
DRIVES (3-position, momentary action toggle switch)	INCREASE - increases amount of drive power to klystron. Center - neutral position. DECREASE - decreases amount of drive power to klystron.
METER ZERO (potentiometer)	Zeros RF POWER meter when function switch is set to METER ZERO.
TRANSMIT section:	
HPA ON LINE indicator	Illuminates when HPA is connected to antenna.
LPA ON LINEILPA STANDBY (two indicators and 3-position toggle switch)	LPA ON LINE - LPA is on-line; i.e., connected to antenna; LPA ON LINE indicator illuminates. Center - neutral position. LPA STANDBY - LPA is off-line; i.e., connected to dummy load; LPA STANDBY indicator illuminates.
KLYSTRON section:	
BEAM CURRENT (meter)	Indicates klystron collector current.
BODY CURRENT (meter and trip point adjust control)	Meter indicates klystron body current; trip point adjust control sets body current trip point defined in data sheets supplied with klystron.
BEAM VOLTAGE (meter)	Indicates klystron beam voltage.
VOLTAGE INCREASE (potentiometer)	Potentiometer used to set beam voltage level (indicated on BEAM VOLTAGE meter) into klystron.
FILAMENT:	
PREHEAT (indicator)	Illuminates during filament warmup time. Beam turn-on is inhibited.
READY (indicator)	Illuminates after warmup time is complete. Beam power can be applied.
BEAM ON (momentary toggle switch and Indicator)	ON - applies beam voltage to klystron via beam control circuits and illuminates BEAM indicator.



1 KLYSTRON BODY CURRENT FAULT indicator
2 KLYSTRON REVERSE POWER FAULT indicator
3 KLYSTRON COLLECTOR FAN FAULT indicator
4 KLYSTRON COLLECTOR TEMP FAULT indicator
5 KLYSTRON POWER SUPPLY FAULT indicator
6 REFLECTED POWER indicator
7 WAVEGUIDE SW indicator
8 RESET switch
9 EQUIP INTERLOCK indicator
10 ELEV INTERLOCK indicator
11 MOUNT INTERLOCK indicator
12 SHELTER CONTROL indicator
13 PEDESTAL CONTROL indicator
14 RF POWER RANGE SELECTOR switch
15 HP ON LINE TRANSMIT indicator
16 LPA ON LINE TRANSMIT indicator
17 RF POWER SELECTOR switch
18 LPA STANDBY switch
19 METER ZERO adjust
20 LPA STANDBY indicator
21 FILAMENT READY indicator
22 FILAMENT PREHEAT indicator
23 FILAMENT BEAM indicator
24 FILAMENT ON switch
25 KLYSTRON VOLTAGE INCREASE control
26 KLYSTRON BEAM VOLTAGE meter
27 KLYSTRON BODY CURRENT meter
28 KLYSTRON BEAM CURRENT meter
29 RF POWER DRIVE control switch
30 RF DRIVE ON switch
31 LAMP TEST switch
32 RF DRIVE ON indicator
33 TWT CATHODE CURRENT meter
34 RF POWER meter

Figure 3-39.2. LPA panel assembly (2A1A5) controls and indicators.

Table 3-40. Prime Power Control Panel (2A11A3), Controls and Indicators

Control, indicator or connector	Function
	Center - neutral.
	Down - removes beam voltage and extinguishes indicator.
POWER section:	
AC POWER (indicator)	Illuminates when ac power is applied.
(3-position momentary toggle switch)	ON - applies prime power to unit.
	Center - neutral.
	Down - removes prime power.
BREAKERS	
LOW VOLTAGE PS	ON - applies ac to low voltage power supplies.
(circuit breaker switch)	Down - removes ac from lower voltage power supplies.
TWT (elapsed time meter/circuit breaker	Indicates elapsed running time of TWT.
switch)	ON - applies input power to TWT.
	Down - removes power from TWT.
BEAM (elapsed time meter/circuit breaker	Indicates elapsed running time of klystron beam power.
switch)	ON - applies ac to beam portion of klystron power supply.
	Down - removes ac from beam portion of klystron power supply.
FILAMENT (elapsed time meter/circuit	Indicates elapsed running time of klystron filament.
breaker switch)	ON - applies ac to filament and controls portion of klystron power supply.
	Down - removes ac from filament and controls portion of klystron power supply.
BLOWER (circuit breaker switch).	ON - applies ac to klystron blower motor.
	Down - removes ac from klystron blower motor.

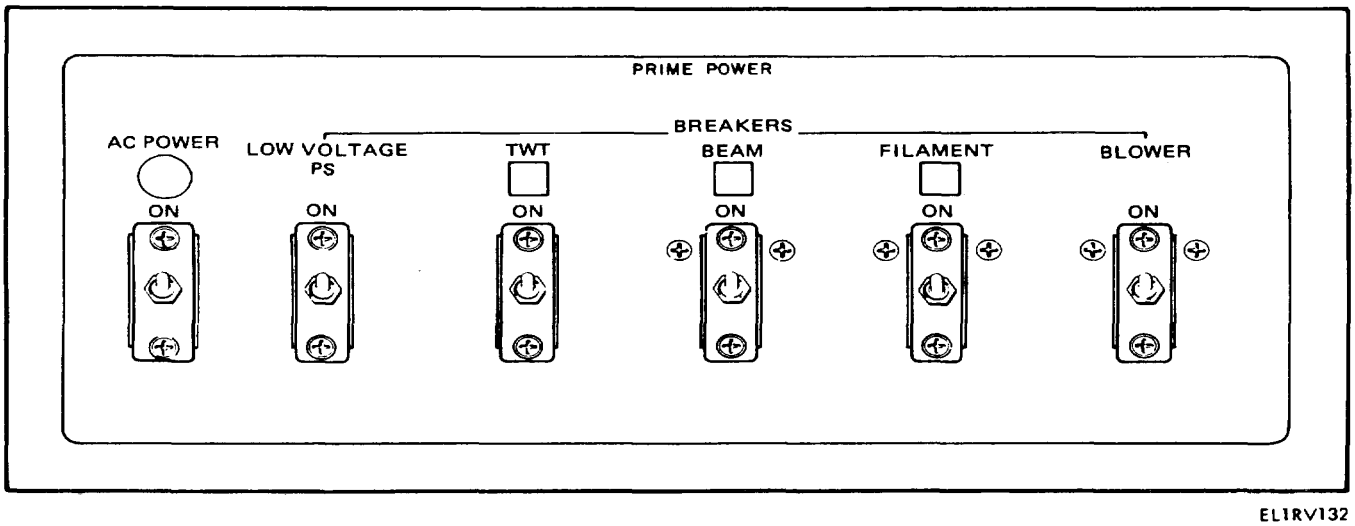


Figure 3-39.3. Prime power control panel (2A11A3), controls and indicators.

Table 3-41. Klystron Power Supply Indicator Panel (2A11A1), Controls and Indicators

Control, indicator or connector	Function
CPS HI V/CPS NORMAL circuit breaker	Provides overload protection. When tripped to CPS HI V position, indicates over-voltage condition on control power supply. CPS NORMAL is normal (closed) circuit breaker position.
FAULTS:	
AIRFLOW (indicator)	Illuminates when airflow is insufficient (blower stops).
A LOCK (indicator)	Illuminates when beam power supply logic phase lock to 400 Hz is lost.
0 SEQ (indicator)	Illuminates when 3 phase 400 Hz ac phase sequence is incorrect.
F PS HI V (indicator)	Illuminates when filament power supply exceeds threshold level.
B PS HI CUR.	Illuminates when beam power supply beam current goes above normal level.
FAULT RESET (pushbutton switch)	When depressed, resets indicator lamp latching circuits (∅ LOCK, ∅ SEQ, and F PS HI V).
LAMP TEST (pushbutton switch)	When pressed, illuminates FAULT lamps on this panel.
Meter	Indicates filament voltage, 0 to 10 V dc.

Table 3-42. Klystron Adjustment Panel (2A11A4), Controls and Indicators

Control, indicator, or connector	Function
Frequency chart control knob.	Selects frequency and cavity tuning range.
Cavity adjusts 1 through 5.	Selecting cavity tuning for respective CAV listed on frequency chart.
Cavity adjust lock.	Locks setting of cavity adjust control.

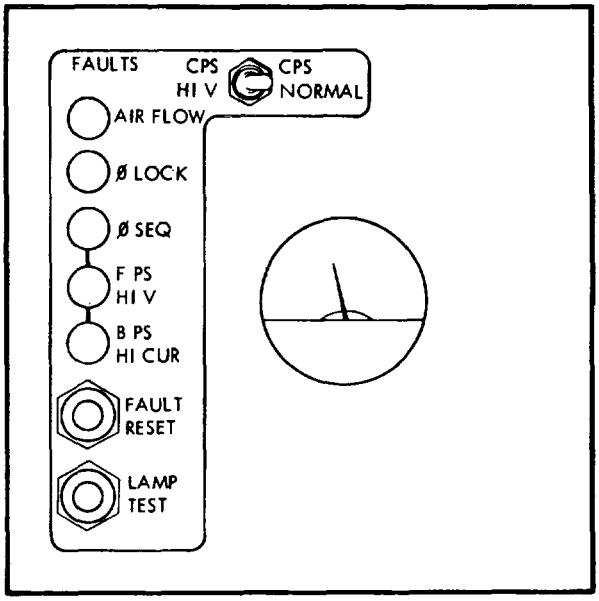


Figure 3-39.4. Klystron power supply indicator panel (2A11A1), controls and indicators.

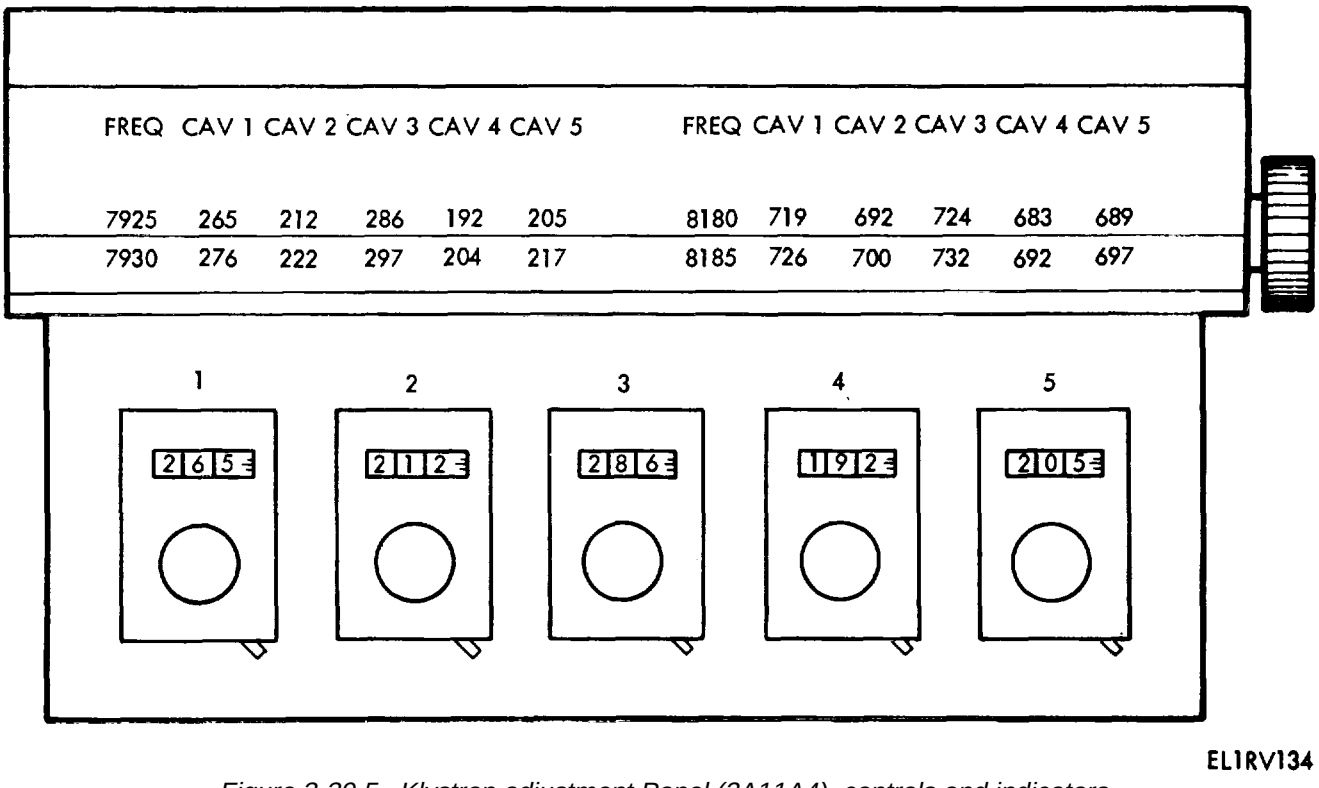


Figure 3-39.5. Klystron adjustment Panel (2A11A4), controls and indicators.

Section II. ESTABLISHING SYSTEM POWER

3-4. General

Except for initial installation, the starting procedure for Satellite Communication Terminal AN/TSC-54 depends on the operating time in any given 24-hour period. The starting procedure given in paragraph 3-6 is based on activating a terminal when it is initially received at the operating site. Paragraph 3-7 describes the normal turnoff procedure to be used at the operating site.

3-5. Preoperational Procedures

Preoperational procedures of Satellite Communication Terminal AN/TSC-54 consist of a visual and mechanical inspection of the equipment to assure that the components are properly seated or fastened and that drive shafts and mechanisms are free and clean so that their performance will not be hindered. Electrical connections should be inspected for tightness and the normal ohmeter tests should be con- ducted to assure proper functioning of the safety-to-personnel circuits.

WARNING

In the event any one of the preoperational procedures or tests is inconclusive or a malfunction is present, do not energize any portion of the equipment until 100% normal operation is assured. These devices are part of the personnel safety system and must function properly.

3-6. Initial Turn-On Procedure

The following procedure is used to energize the AN/TSC-54 terminal following system installation or complete shutdown for maintenance procedures. Under normal operating conditions, the terminal is not shut down. The terminal contains many redundant circuits which permit normal operation even while malfunctions are being corrected. Therefore, after the system has been initialized, system operation depends on daily circumstances. The TRANSMIT switch on the LPA control panel (fig. 3-39.2) selects whether the HPA or LPA is placed on line, when system operation is controlled at the pedestal. When the operation is controlled from the shelter, the selection of the HPA or LPA is determined by the TRANSMIT HPA ON LINE or TRANSMIT LPA ON LINE switch located on the remote control indicator panel (fig. 3-39.1). Only one amplifier is on-line at any given time. When the LPA is on-line, the HPA feeds a system dummy load. When the HPA is on-line, the LPA feeds a dummy load internal to the LPA. To initialize the terminal, perform the following procedure.

a. Connect the primary power cables as outlined in paragraph 2-1.

b. Start the generator set as described in the appropriate manual (app A).

c. Open the access doors on the transmitter control panel (fig. 3-35) and primary power distribution panel (fig. 3-39).

d. Open the six pedestal air vent doors marked OPEN DOOR FOR OPERATION.

e. Open the shelter air vent doors.

f. Check to be sure that the primary power distribution panel voltage meter (fig. 3-39) indicates 120, the frequency meter indicates 400, and that all primary power circuit breakers are in the off position.

g. Log the running time indicated on the SENSITIVE PWR and SYSTEM PWR elapsed time meters.

h. On the primary power distribution panel (fig. 3-39), check to be sure that the MOUNT SAFE toggle switch is in the up position and that the OVERRIDE toggle switch is in the down position.

i. Activate and release the PRIME PWR ON toggle switch to the up (ON) position.

j. Set both 25 ampere UTILITY OUTLET circuit breakers to the ON position.

NOTE

Power is not available at the pedestal for use of the electrical drill (para 2-16) required during installation of the equipment.

k. Set the following circuit breakers to the ON positions:

(1) EL FIRING CIRCUIT.
(2) AZ FIRING CIRCUIT.
(3) EL DRIVE.
(4) AZ DRIVE.
(5) RF BOX POWER.
(6) 90V POWER SUPPLY.
(7) SCANNER.
(8) INTERCOM/SENSITIVE PWR.
(9) BLOWERS.
(10) KLYSTRON FILAMENT.
(11) HEAT EXCHANGER.
(12) SHELTER PWR.
(13) +15V POWER SUPPLY.
(14) MAGNET PWR SUPPLY.
(15) BEAM PWR SUPPLY.

l. In the RF box (2A9A1) set the circuit breakers

CB1, CB2, CB3 and CB4 to ON.

m. On the parametric amplifiers (2A9A12, A3, fig. 3-37), set circuit breaker CB1 to ON.

n. Set the following shelter circuit breakers (fig. 3-29 and 3-31) to the ON positions.

(1) SENSITIVE POWER.
(2) AN/URC-61.
(3) AIR COND.
(4) SHELTER LIGHTS.
(5) SHELTER OUTLETS.
(6) CONSOLE POWER.
(7) U/C No. 1.
(8) U/C NO. 2.
(9) U/C NO. 3.
(10) D/C NO. 1.
(11) D/C NO. 2.
(12) D/C NO. 3.
(13) DIST AMPL.
(14) BLO
(15) TEST XTLR.

o. Use the key and turn CRITICAL POWER ON-OFF keyswitch on the power distribution panel (fig. 3-5) to ON.

p. Set the antenna control panel 400 CPS REF ON-OFF toggle switch (fig. 3-6) to ON.

q. Set all shelter power supply panel switches to the ON position and observe that the associated indicator illuminates.

r. Set the RF PWR MONITOR/CONTROL (fig. 3-23) MOD POWER ON toggle switch to ON.

s. Use the key and turn the RF PWR MONITOR/CONTROL TRANSMIT CONTROL PED-LOCAL keyswitch (fig. 3-23) to the PED position at the antenna pedestal.

t. Observe that the +28V REG. -28V REG, and PEDESTAL CONTROL indicators on the transmitter control panel (fig. 3-35) illuminate.

u. On transmitter control panel (fig. 3-35), activate and release the XMIT POWER ON-OFF toggle switch to ON and observe that the heat exchanger fan starts rotating and that the following indicators will illuminate:

(1) BODY & MAG FLOW (RED).
(2) WG & DUMMY LOAD FLOW (RED).
(3) COLLECTOR FLOW (RED).
(4) LOW RF POWER (RED).
(5) LOW COOL TEMP (RED).
(6) INTERLOCK (MOUNT SAFE switch ON) (RED).

NOTE

The LOW COOL TEMP indicator may not illuminate if the transmitter has been inoperative for only a short period of time.

v. The LPA can be energized at the pedestal or in the shelter. To energize the LPA in the shelter, refer to w above. To energize the LPA at the pedestal perform the following steps:

(1) Before placing the equipment into operation, perform the following before power is applied:

(a) Check to see that all covers are in place and that air vent covers are open.

(b) Check to see that all cable connectors are properly seated and tightened.

(c) Insure that all circuit breakers are in the off position (down).

(d) Turn potentiometers fully counterclockwise.

(e) Insure that all momentary action switches are in the center position.

(f) Remove klystron power supply access cover on LPA enclosure, and check to see that blower switch is set to ON.

(2) On remote control panel 1A2A36 (fig. 3-39.1) in shelter, turn the CONTROL-PEDESTAL/SHELTER keyswitch to PEDESTAL.

(3) On the LPA prime power control panel 2A11A3 (fig. 3-39.3), set the AC POWER switch to ON; verify that AC POWER indicator illuminates.

(4) Set the LOW VOLTAGE PS, TWT, BEAM, FILAMENT and BLOWER circuit breakers to ON; verify that CONTROL-PEDESTAL and LPA STANDBY indicators on the LPA control panel (fig. 3-39.2) are illuminated. Also verify that PREHEAT indicator is illuminated and that approximately 1 minute later the TWT CATHODE CURRENT meter indicator is at the upper end of the scale (right side); verify that LPA enclosure blowers are operating.

(5) Momentarily set the LAMP TEST switch to the down position and verify that all fault indicator lamps illuminate.

(6) With LAMP TEST switch released, on LPA control panel verify that all FAULT indicators are extinguished. If a fault indicator is illuminated, momentarily set FAULT-RESET switch to the down position and release. If fault indication still exists, refer to TM 11-5895-963- 34/NAVELEX 0967-LP-592-7030/TO 31R5-2G-242 for troubleshooting information.

(7) Verify that EQUIP, ELEV, and MOUNT-INTERLOCK indicators are extinguished.

(8) Set RF POWER-METER ZERO, DRIVE/REFLECTED/OUTPUT function switch to METER ZERO.

(9) Set RF POWER-RANGE switch to 15.

(10) Using the METER ZERO control, adjust for zero indication on RF POWER meter.

(11) Set RF POWER-RANGE switch to 1500.

(12) Set RF POWER-METER ZERO/

DRIVE/REFLECTED/OUTPUT function switch to OUTPUT.

(13) Allow a 6-mninute warmup period, and then verify that the FILAMENT-PREHEAT indicator extinguishes and the FILAMENT- READY indicator illuminates.

(14) Using KLYSTRON-BODY CURRENT meter adjust control, set trip adjustment point for 50-milliampere indication.

(15) Adjust KLYSTRON-VOLTAGE INCREASE control to 0.0 (no units).

NOTE

This 0.0 setting is performed at initial turn-on and need not be adjusted again except for slight changes.

(16) Momentarily set BEAM-ON switch to ON; verify that BEAM indicator illuminates and FILAMENT-READY indicator extinguishes.

(17) Using KLYSTRON-VOLTAGE INCREASE control, adjust for a 6.8 KV (or for the voltage marked on the tube-data sheet of replacement tubes) indication on the BEAM VOLTAGE meter. Lock the control at this setting and verify that the BEAM CURRENT meter indicates approximately 680 milliamperes.

CAUTION

Ensure that RF POWER-RANGE switch is set to 1500 position to protect RF head from excessive input drive power which will cause burn-out of RF head.

(18) Momentarily set RF DRIVE switch to ON and release; verify that RF DRIVE indicator illuminates.

(19) Using the RF POWER-DRIVE INCREASE/ DECREASE switch, momentarily hold in INCREASE position until desired operational output is indicated on RF POWER meter.

NOTE

While performing (19) above and (20) and (21) below, the operator may have to set the RF POWER-RANGE switch to a lower value scale. When operating near the upper or lower RF power limits, if DRIVE switch does not initiate a change in RF level indicated on RF POWER meter, momentarily hold DRIVE switch in position opposite to that of the desired RF level (e.g., if increase is desired, hold DRIVE switch in DECREASE position momentarily.

CAUTION

Before changing the setting of the RF POWER/DRIVE/REFLECTED/OUTPUT function switch to the positions required in (19) above and (20) below, be that the RF POWER-RANGE switch is set to the 1500 position to protect the meter movement from undue stress.

(20) Set RF POWER-METER ZERO/DRIVE/ REFLECTED/OUTPUT function switch to REFLECTED; verify that the power level indication is no more than 1/10 of the transmitted power.

(21) Set RF POWER-METER ZERO/DRIVE/ REFLECTED/OUTPUT function switch to DRIVE; verify that the power level is within operational specifications. Return function switch to OUTPUT.

(22) Momentarily set RF DRIVE switch to off (down); verify that the RF DRIVE indicator extinguishes.

(23) Momentarily set TRANSMIT switch to LPA ON LINE; verify that the LPA STANDBY indicator extinguishes and the LPA ON LINE indicator illuminates.

(24) Momentarily set RF DRIVE switch to ON; verify that the RF DRIVE indicator illuminates.

w. If the LPA was energized at the pedestal, go to x below; however, to energize the LPA in the shelter, proceed as follows:

(1) Before placing the equipment into operation, perform the following before power is applied:

(a) Check to see that all covers are in place and that air vent covers are open.

(b) Check to see that all cable connectors are properly seated and tightened.

(c) Insure that all circuit breakers are in the off position (down).

(d) Turn potentiometers fully counterclockwise.

(e) Insure that all momentary action switches are in the center position.

(f) Remove klystron power supply access cover on LPA enclosure, and check to see that blower switch is set to ON position.

(2) At remote control panel (fig. 3-39.1), set CONTROL keyswitch to SHELTER.

(3) On the LPA prime power control panel (fig. 3-39.3), set AC POWER switch and LOW VOLTAGE PS, TWT, BEAM, FILAMENT and BLOWER circuit breakers to ON; verify that AC POWER indicator illuminates.

(4) On remote control panel (fig. 3-39.1), verify that LPA STANDBY and FILAMENT-PREHEAT indicators are illuminated. Verify that PREHEAT indicator is illuminated and that approximately 1 minute later the LPA control panel, TWT CATHODE CURRENT meter indicator (fig. 3-39.2) is at the upper end of the scale (right side); verify that the LPA enclosure blowers are operating.

(5) Momentarily set the LAMP TEST switch to the down position and verify that all fault indicator

lamps illuminate.

(6) With LAMP TEST switch released, on remote control panel verify that all FAULT indicators are extinguished. If a fault indication does appear, momentarily set FAULT-RESET switch on LPA control panel to the down position and release. If fault still exists, refer to TM 11-5895-963-34/NAVELEX 0967-LP-592-7030/TO 31R5-2G-242 for troubleshooting information.

(7) Verify that LPA control panel EQUIP, ELEV, and MOUNT-INTERLOCK indicators are extinguished.

(8) Set RF POWER-OUTPUT/ZERO switch to ZERO.

(9) Set RF POWER-RANGE switch to 15.

(10) Adjust RF POWER control for zero indication on the meter.

(11) Set RF POWER-RANGE switch to 1500.

(12) Set RF POWER-OUTPUT/ZERO switch to OUTPUT.

NOTE

After approximately 6 minutes, the POWER-FILAMENT-PREHEAT indicator extinguishes and the RDY indicator illuminates.

(13) On LPA control panel (fig. 3-39.2) use KLYSTRON-BODY CURRENT meter adjust control to set trip point for a 50-milliampere indication.

(14) Momentarily set POWER-BEAM switch to ON; verify that the RDY indicator extinguishes and the BEAM indicator illuminates.

CAUTION

Ensure that RF POWER-RANGE switch is set to the 1500 position to protect the RF head from excessive input drive power which will cause burn-out of the RF head.

(15) Momentarily set RF DRIVE switch to ON; verify that RF DRIVE indicator illuminates.

(16) Set and hold DRIVE INCREASE/DECREASE switch to increase until desired operational level is indicated on meter.

(17) Set RF DRIVE switch to off (down); verify that RF DRIVE indicator extinguishes.

(18) Set TRANSMIT-LPA ON LINE/STANDBY switch to LPA ON LINE; verify that LPA ON LINE indicator illuminates and STANDBY indicator extinguishes.

NOTE

Pedestal mounted waveguide switch (fig. 3-40) is operable electrically by LPA panel assembly 2AllA5 and remote control panel 1A2A36 (LPA or HPA ON LINE switches) and mechanically by rotating shaft mounted on the waveguide switch assembly.

(19) Set RF DRIVE switch to ON; verify that RF DRIVE indicator illuminates.

(20) Select LPA or HPA for on-line operation in accordance with established communications procedures.

x. Operate the equipment in accordance with established communications procedures or as directed by the DCA controller.

NOTE

Allow at least 30 minutes for the equipment to warmup and the circuits to stabilize before starting normal operation.

NOTE

If a fault condition arises while HPA is on-line (and LPA is off-line but undergoing preventive or corrective maintenance routines), the fault may be transient induced. If the fault condition is indicated by a loss of RF output, before assuming an HPA fault exists, check for HPA RF power by momentarily setting HPA OFF LINE switch 1A2A27A4S2 to HPA OFF LINE. If RF power indication is normal, then there is no HPA malfunction. If indication is still abnormal (an HPA malfunction does exist), a higher category of maintenance is required for corrective maintenance.

3-7. System Turn-Off Procedure

Under normal operating conditions, the terminal is not shutdown. The terminal contains many redundant circuits which permit normal operation even while malfunctions are being corrected. However, if the terminal must be shutdown, proceed as follows:

a. If the LPA is to be shutdown at the pedestal, start at *h* below.

b. If the LPA is to be shutdown at the shelter, on the remote control panel (fig. 3-39.1), momentarily set the DRIVE-INCREASE/DECREASE switch to DECREASE until the RF drive level is 0.0 watt as indicated on the RF POWER meter.

c. Set RF DRIVE switch to off (down); verify that the RF DRIVE indicator extinguishes.

d. As applicable, set TRANSMIT-LPA ON LINE/ STANDBY or HPA ON LINE STANDBY switch to STANDBY; verify that ON LINE indicator extinguishes and STANDBY indicator illuminates.

e. Set POWER-BEAM switch to off (down); verify that BEAM indicator extinguishes.

f. Set POWER-AC switch to off (down); verify that AC indicator extinguishes.

g. If the LPA was shutdown at the shelter, continue procedure starting with q below.

h. On LPA control panel (fig. 30.2), hold the DRIVE-INCREASE/DECREASE switch down until the

meter indicates 0 watt.

i. Momentarily set RF DRIVE switch to off (down); verify that the RF DRIVE indicator extinguishes.

j. Momentarily set TRANSMIT switch to LPA STANDBY; verify that the LPA STANDBY indicator illuminates.

k. Momentarily set BEAM switch to off (down); verify that the BEAM indicator extinguishes, FILAMENT-READY indicator illuminates, and BEAM VOLTAGE, BEAM CURRENT, and BODY CURRENT meters indicate zero.

l. On prime power control panel (fig. 3-39.3) set BEAM, FILAMENT and BLOWER circuit breaker switches to off (down) in that order; on LPA control panel (fig. 3-39.2), verify that the KLYSTRON-COLLECTOR FAN and POWER SUPPLY indicators illuminate.

NOTE

Disable alarm on remote control panel 1A2A36 in shelter (as applicable) before proceeding.

m. On prime power control panel (fig. 3-39.3), set TWT circuit breaker to off (down); verify that LPA control panel TWT CATHODE CURRENT meter indicates zero.

n. On prime power control panel, set LOW VOLTAGE PS switch to off (down); verify that all indications, except AC POWER, extinguish on control panel and on prime power control panel.

o. On the remote control panel (fig. 3-39.1), verify that all indicators are extinguished, except AC ON indicator.

p. Set CONTROL switch to SHELTER; set AC ON switch to OFF. Both control panel AC indicators extinguish.

q. Set the RF PWR MON/CONTROL BEAM ON-OFF toggle switch (fig. 3-23) or the transmitter control panel BEAM POWER ON-OF toggle switch (fig. 3-35) to OFF.

CAUTION

A delay of approximately 5 minutes must be observed before proceeding to *r* below or the equipment may be damaged.

r. Set the RF PWR MON/CONTROL XMTR toggle switch or the transmitter control panel XMIT POWER ON-OFF toggle switch to OFF.

CAUTION

In other than an emergency situation, the EMERGENCY OFF pushbutton switch should be used with discretion. For unusual operating conditions, do not activate the EMERGENCY OFF pushbutton switch until all other procedures have been completed. Failure to observe this precaution may result in damage to the transmitter.

s. Use the key and turn the power distribution panel CRITICAL ON-OFF keyswitch (fig. 3-5) to OFF and press the EMERGENCY OFF pushbutton switch.

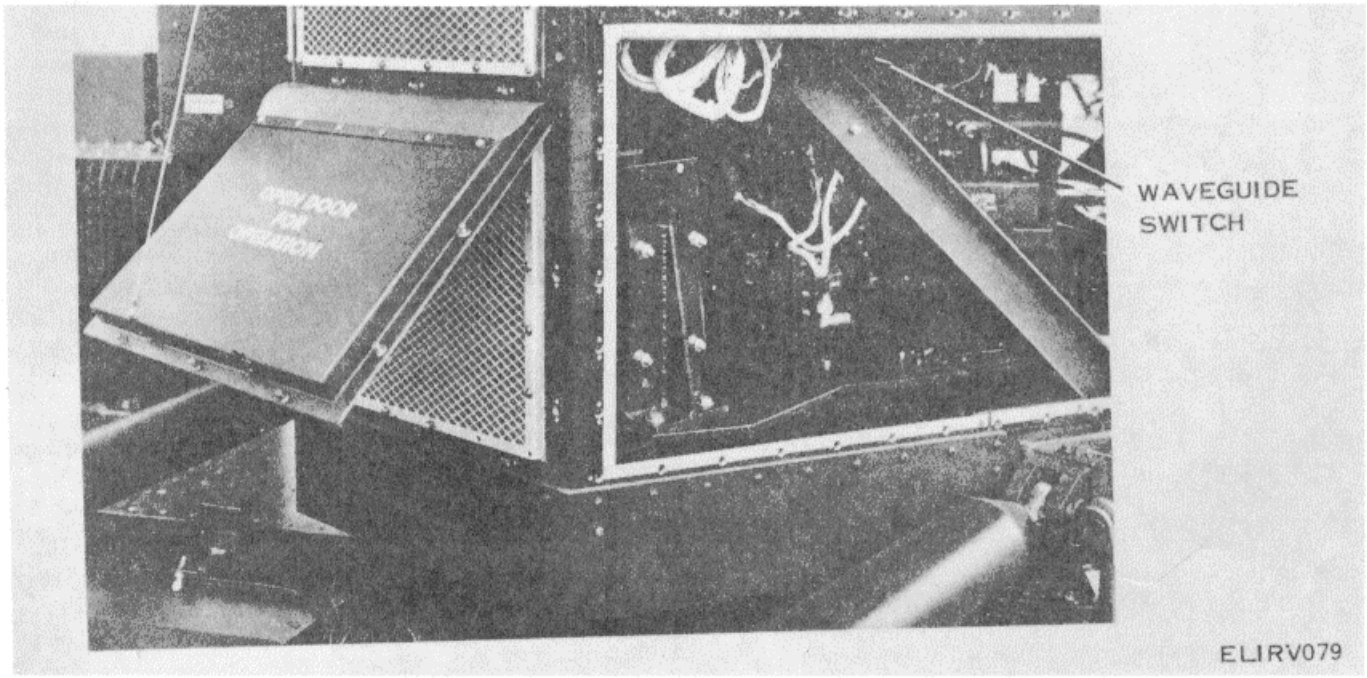


Figure 3-40. Waveguide dummy load switch location.

Section III. Operation

3-8. General Operating Instructions

a. Satellite Communication Terminal AN/TSC- 54 should be operated in accordance with the standard operating procedures established at the communication site. Refer to the appropriate instruction and programming manuals (app. A) for detailed information on the application of equipment. General operational data for the equipment is given in paragraphs 3-9 through 3-23. Operational data for the LPA is given in TM 11-5895-963-12/NAVELEX 0967-LP-592-7010/TO 31R5-2G- 241.

b. Communication channels can be established following power application and preliminary setup of operating controls (para 3-6), and after completion of the system operational checkout procedure (para 3-21). Normal operating procedures can be performed following acquisition of the scheduled communication, satellite (para 3-14). Optional types accomplished by the use of patch cord and various cables on equipment switching and patching panels.

c. Immediate reporting of jamming plus accurate and complete recording of any distortion is an important responsibility of AN/TSC-54 operating personnel. The initial report of unusual interference alerts command that countermeasures are being used; detailed records inform the higher authorities regarding the countermeasures capability of the enemy. Follow the standard instructions given in local operating procedures for reporting and recording evidence of enemy countermeasures efforts.

3-9. Normal Patching Procedures

During user voice operation, no patching arrangements are present on the baseband patch panel. An external four-wire landline user can be connected to USER VOICE LINES SEND 1 terminals and the USER VOICE LINES RE- CEIVE 2 terminals on the external signal distribution box as shown in figure 3-41. The terminal pairs are connected through protection circuits to the baseband patch panel inside the shelter as shown in figure 3-42. One pair of terminals is connected to the SEND side of the voice patch panel, and the other pair is connected to the RECEIVE side. Operation of the AN/TSC-54 allows the user voice No. 1 signal to be processed through the baseband to the modulator. The appropriate patches must be made on the communications patching panel (fig. 3-7) in order to process the modulator signal through the upconverter to the transmitter, antenna, and through a satellite to a distant terminal. The distant terminal transmitted signal is received by the AN/TSC-54 and processed through the receiver subsystem to the communication patching panel where it is normally patched to comm demod No. 1. The output of comm demod No. 1 is normalled through the baseband subsystem patch panel as indicated on figure 3-42.

a. To assure effective operational use of the baseband patch panel, it is necessary to understand its function when a dual patch cord is inserted into the SEND and RECEIVE sides of the patch panel. LINE jacks on the SEND side of the patch panel can be considered input jacks to the component labeled just above a jack pair on the panel and EQUIP (equipment) jacks can be considered output jacks from the component labeled immediately below the jack pair.

(1) Inserting a patch cord into a pair of LINE (input) jacks breaks the normalled-through connection from the pair of EQUIP (output) jacks directly below. Inserting a patch cord into a pair of EQUIP (output) jacks breaks the normalled-through connection to the LINE(input) jack directly above. For example, when the TA-312 handset is inserted into the USER VOICE NO. 1 jacks on the SEND side of the patch panel, the user voice can be heard in the handset receiver and can be talked to through the handset. However, the user is disconnected from the USER AMP LINE jacks directly above because the user circuit is interrupted. If the TA-1 is inserted into the USER AMP jacks on the SEND side of the patch panel, the USER VOICE NO. 1 jacks are disconnected and the handset can be used to transmit a voice signal through the baseband subsystem to the modulator. Again the user is disconnected and communication is interrupted.

(2) MON (monitor) jacks allow line monitoring without breaking the circuit; however, patching a handset into the MON jacks causes the signal levels to drop because of an impedance mismatch. When monitoring, the baseband level meters located on the control amplifier should be checked for a 0 vu reading. Maintain the 0 vu reading by adjusting the level control associated with the particular MON jacks being used.

For example, if the USER AMP MON jacks are used, the USER LINE AMP OUT control on the baseband and amplifier should be adjusted for 0 vu, and then re-adjusted when the patch cord is removed. Normal send and receive operational paths are shown in figure 3-38.

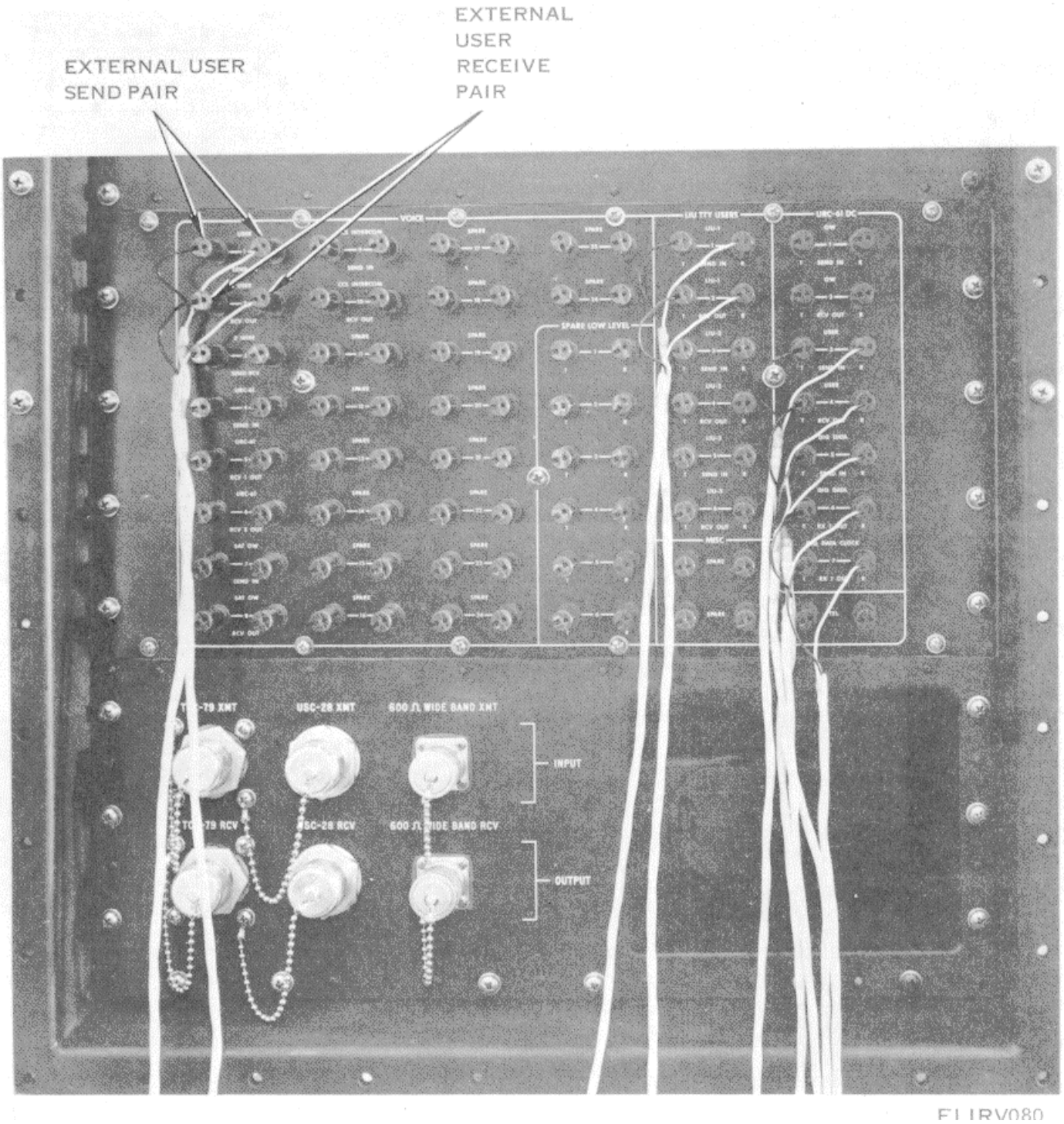


Figure 3-41. External signal distribution (1A10), four wire user voice connections.

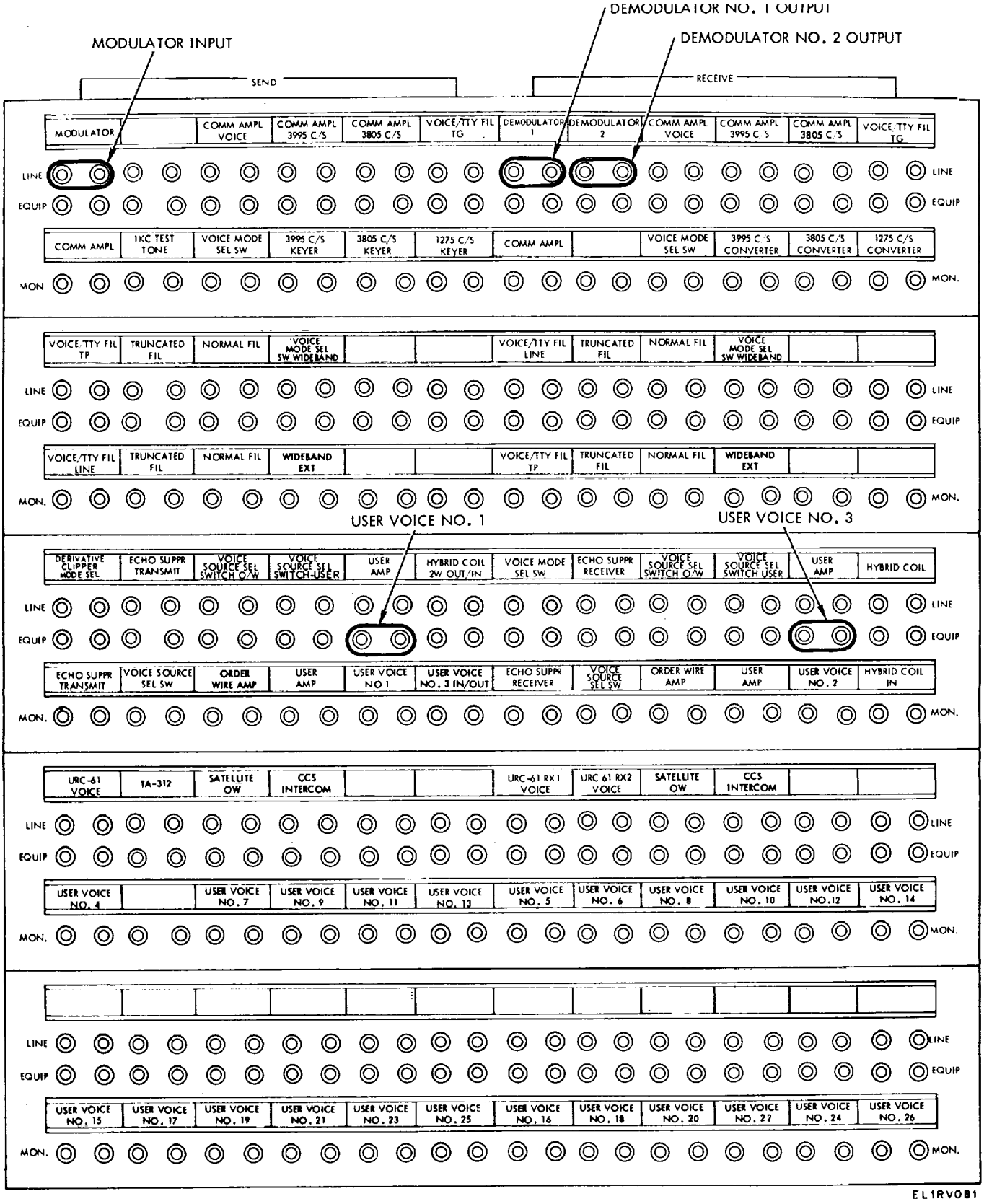


Figure 3-42. Jack locations for user voice No. 1 and No. 3, modulator input and comm demod outputs.

(3) Starting at the SEND side USER VOICE NO. 1 EQUIP jacks, the signal is normalled-through the USER AMP input to the VOICE SOURCE SEL SW-USER input. The output of the VOICE SOURCE SEL SW-USER is normalled to the ECHO SUPPR TRANSMIT input, and the output of the ECHO SUPPR TRANSMIT is normalled to the input of the DERIVATIVE CLIPPER MODE SEL switch. The output of the DERIVATIVE CLIPPER MODE SEL switch does not appear on the switchboard, but the input of NORMAL FIL does. This LINE jacks pair is not normalled to the jacks below. The NORMAL FIL is connected between the upper pair of LINE jacks and the lower pair of EQUIP jacks. The output of NORMAL FIL is applied through the VOICE MODE SEL SW to its output pair of EQUIP jacks and then is normalled to input of the COMM AMPL VOICE LINE jacks. The output of the COMM AMPL VOICE LINE jacks is normalled to the input of the MODULATOR LINE jacks.

(4) On the RECEIVE side of the panel, conditions are reversed from those on the SEND side. If the handset is patched into the DEMODULATOR 1 LINE jacks, the received signal from the demodulator is heard in the handset receiver and the signal is disconnected from the COMM AMPL EQUIP jacks. If the handset is patched into the COMM AMPL VOICE EQUIP jacks, no signal is heard. However, speaking into the handset causes deflection of the vu meters and allows voice communication with the external landline user through the RECEIVE side of the panel. Under these conditions, the DEMODULATOR 1 output is disconnected and user communication is interrupted.

(5) LINE jacks on the RECEIVE side of the panel can be considered output jacks and EQUIP jacks can be considered input jacks. Signal flow can be traced on figure 3-43 from DEMODULATOR 1 output through the USER VOICE NO. 2. The USER VOICE NO. 3 EQUIPjacks are connected to USER VOICE LINES RECEIVE 2 terminals on the external signal distribution box (fig. 3-41).

b. No patches are required on the teletypewriter patch panel for normal dc user operation. An external dc user is connected to the signal entrance panel as shown on figure 3-44.

(1) The dc user input pair of terminals is routed through the line isolation unit to the LIU-1 jack on Tx side of the teletypewriter patch panel. The LIU-1 jack is normalled to TTY SEL SW 3995 Hz jack, which closes the series loop through the keyer. Patching into a LINE or EQUIP jack interrupts the signal loop. Whenever this patch arrangement is made, the external user is disconnected and the local loop is closed. The normalled- operation signal loop can be traced on figure 3-45.

(2) The dc loop on the RECEIVE side of the panel starts at the 3995 Hz converter where the fsk tone signal is converted to a dc signal. The signal is routed through the TTY MODE SEL SW to the TTY SEL SW 3995 Hz LINE jack. The loop is normalled to the LIU-1-3995 Hz USER jack as shown in figure 3-45. The signal is routed from these jacks through the line isolation unit to the dc user output pair of terminals on the signal entrance panel as shown in figure 3-44.

c. The local orderwire facility includes Teletypewriter AN/UGG-77 for teletypewriter operation and a handset operation through the order- wire amplifier in the baseband amplifier chassis. The orderwire can be switched into use by positioning the required switches located on the baseband control panel as listed below:

(1) Local orderwire function: *(a)* MODE SELECT switch to V3 position.

(b) TTY MODE ORDERWIRE switch to NORMAL position.

(c) VOICE USER-ORDERWIRE lever switch to ORDERWIRE position.

(d) CLIPPER IN-OUT lever switch to OUT position.

(2) External user orderwire function:

(a) MODE SELECT switch to V3 position.

(b) TTY MODE USER switch to NORMAL position.

(c) VOICE USER-ORDERWIRE lever switch to USER position.

(d) CLIPPER IN-OUT level switch to OUT position.

d. During normal operation, the TTY MODE ORDERWIRE and USER switches are set to their NORMAL positions so that orderwire and user out-of-band tty channels are available at all times. For voice operation, the VOICE USER- ORDERWIRE lever switch is set to the USER position, so that the user has the one available voice channel and the orderwire does not. With the switch set to ORDERWIRE position, the user is disconnected and the local orderwire has use of the one available voice channel. On the emphasis select panel of the baseband amplifier the toggle switch should be set to the ORDERWIRE NORM position during orderwire operation.

3-10. Transmitter Operational Checkout Procedure

The transmitter checkout procedure *(a* through y below) should be performed on a daily basis and also each time the transmitter is returned to an operational status after necessary repairs or required maintenance. A comprehensive LPA transmitter checkout can be performed by a higher category of maintenance. Operator checks of LPA transmitter are limited to turn-on procedures

(para 3-6). Repairs or required maintenance.

a. Apply power to the equipment (para 3-6).

b. Approximately 1 minute after the equipment status indicators (para 3-6v) illuminate, the transmitter control panel PREHEAT indicator on the pedestal (fig. 3-35) should illuminate.

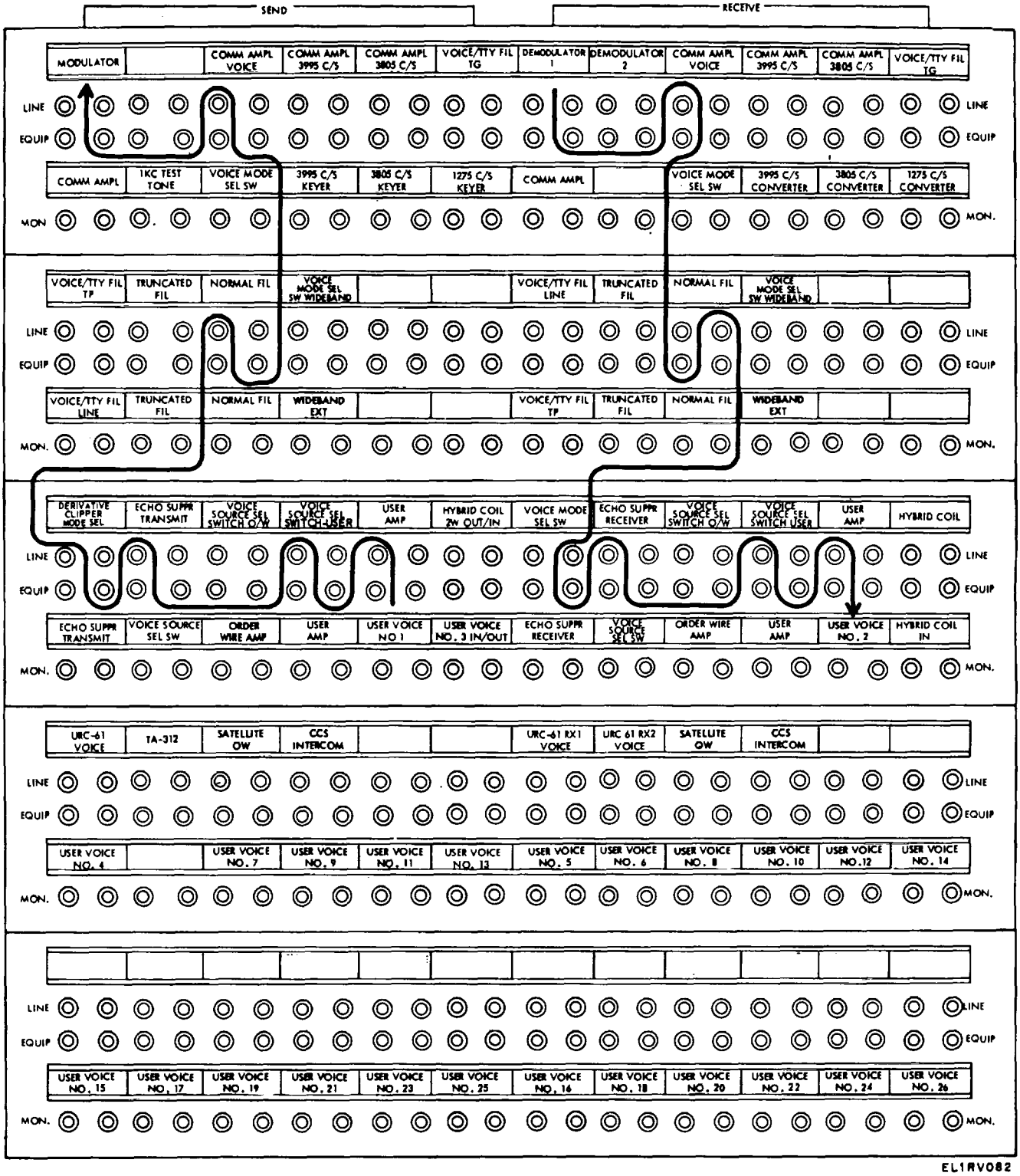


Figure 3-43. User voice send and receive signal path through baseband patch panel (1A3A12).

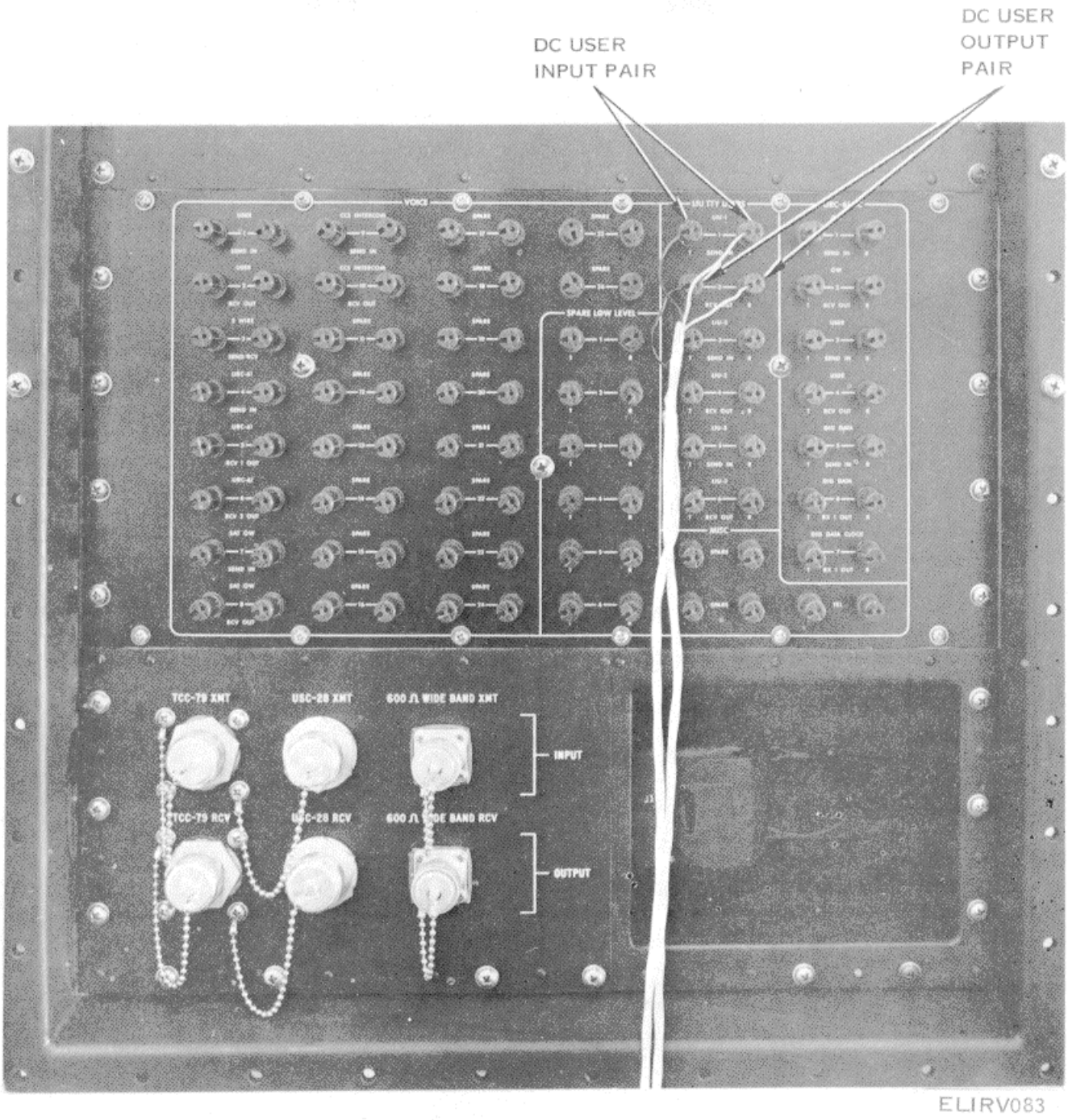


Figure 3-44. External signal distribution box (1A10), normal operation user teletypewriter connections.

c. Set the MOUNT SAFE switch (3-6h) to OFF.

d. Set the RESET toggle switch to the up position and observe that all fault (red) indicators extinguish. Release the RESET switch.

e. Set the WAVEGUIDE DUMMY LOAD switch (fig. 3-40) to the DUMMY LOAD position. The DUMMY LOAD indicator on the transmitter control panel should illuminate (red).

NOTE

The indicators should remain extinguished until a fault in the equipment occurs, or the heater exchanger is turned off.

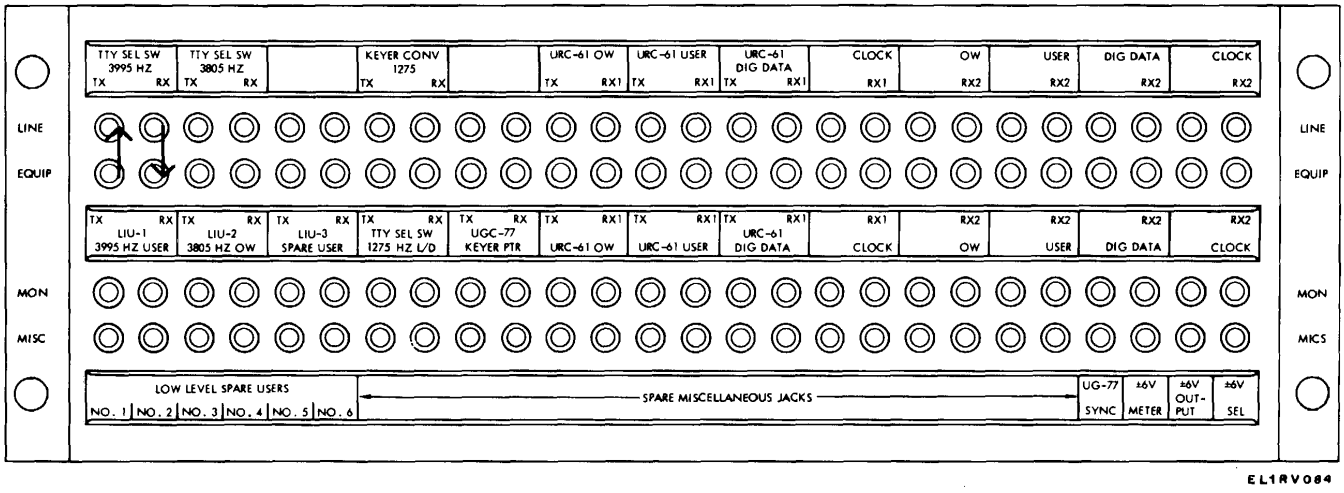


Figure 3-45. User teletypewriter send and receive signal path through tty patch panel (1A3A25).

f. Set the left-hand TEST selector switch to MAGNET CUR and adjust the associated rotary control for the desired indication (detailed on the reference table to the left of the transmitter control panel) on the left-hand TEST meter.

g. Set the right-hand TEST selector switch to TWT CATHODE CUR and observe that the associated TEST meter indicates within the established limits.

h. Set the VSWR TEST-ARC TEST toggle switch to the VSWR TEST position and note that the HIGH VSWR KLYSTRON and HIGH VSWR ISOLATOR indicators illuminate.

i. Set the RESET toggle switch to the up position and observe that the indicators specified in *f* above extinguish. Release the RESET switch.

j. Set the VSWR TEST-ARC TEST toggle switch to the ARC TEST position and note that the WR ARC KLYSTRON and WG ARC ISOLATOR indicators illuminate.

k. Set the FAULT TEST toggle switch (fig. 3-35) to the up position and observe that the HIGH BEAM CURRENT, LOW MAGNET CURRENT, and HIGH BODY CURRENT indicators illuminate.

l. Set the RESET toggle switch to the up position; the fault indicators specified in *f* and *i* above should extinguish.

m. Approximately 8 minutes after the PRE-HEAT indicator illuminates *(b* above), the STANDBY indicator should illuminate.

n. Set the RF POWER selector switch to METER ZERO and adjust the associated rotary control for a zero indication of the RF POWER meter.

NOTE

Before RF Drive can be applied to the transmitter in the shelter, the appropriate patches must be made on the communications patching panel (para 3-9), with the upconverter actuated, on line and tuned to the proper transmit frequency (para 3-13).

o. Set the RF POWER selector switch to DRIVE and hold the XMIT OUTPUT INCREASE- DECREASE toggle switch in the DECREASE position until the RF POWER meter indicates zero.

p. Set the left-hand TEST selector switch to KLYSTRON BODY CUR.

g. Set the right-hand TEST selector switch to KLYSTRON BEAM VOLTS.

r. Set the LINE VOLTS selector switch to PH A.

s. Set the BEAM POWER ON-OFF toggle switch to ON and observe the following:

(1) STANDBY indicator extinguishes.

(2) Transmit indicator illuminates.

(3) LINE VOLTS meter indicates 120.

(4) The left-hand TEST meter indicates the correct klystron body current; if not within the desired limits, adjust the associated rotary control until the proper reading is obtained.

(5) The right-hand TEST meter indicates the correct klystron beam voltage.

t. Set the LINE VOLTS selector switch to PH B and PH C, in turn, and note that the LINE VOLTS meter indicates 120 at each position.

u. Set the RF POWER selector switch to METER ZERO and adjust the associated rotary control for a zero indication on the RF POWER meter.

NOTE

The RF POWER meter is extremely sensitive and must be zeroed each time it is used.

v. Set the RF power selector switch to FWD and place the XMIT OUTPUT INCREASE-DECREASE toggle switch to the INCREASE position to obtain the proper indication on the RF POWER meter.

NOTE

The RF POWER meter input circuits include an automatic switching device that reduces the sensitivity of the meter at 1 kw. Thus, full-scale deflection of the meter on the low scale represents 1 kw and full-scale deflection of the meter on high scale represents 10 kw.

w. Set the RF POWER selector switch to REV and note that the RF POWER meter indicates within the prescribed limits.

x. In the shelter on the RF PWR MON/ CONTROL panel 1A2A27 (fig. 3-23), set the PED/LOCAL keyswitch to LO-CAL.

y. On the RF PWR MON/CONTROL 1A2A27 ON LINE TRANSMITTER OUTPUT POWER assembly perform the following:

NOTE

A discrepancy in readings may be observed when switching from the upper to the lower scale, or vice versa. This is due to the accuracy tolerances of auto range power meter amplifier 2A3A10A18 and losses of attenuator 2A3A10A13 and cable 2A3A10W17 of the range selection circuit. Initial calibration should be performed on the scale most often used. After changing scales the meter must be recalibrated.

(1) Zero the meter by pressing the HPA OFF LINE/METER ZERO toggle switch and adjusting the METER ZERO control.

(2) Located on the meter bezel, below the meter face are the lower fault limit adjust control (left side) and

the upper fault limit adjust control (right side). Each control moves a meter face pointer. Adjust the upper and lower fault limits of the RF power meter to within ±0.5 dB of the power output indication obtained in *v* above.

z. Press and hold RF OUTPUT DECREASE push-button switch until the audible alarm is heard.

aa. When the power output drops below the lower fault limit setting (y(2) above), proceed to *ab* below.

ab. Set the BEAM POWER ON-OFF toggle switch to OFF and observe that the TRANSMIT indicator extinguishes and that the STANDBY indicator illuminates.

3-10.1. Antenna Control Operational Checkout Procedure

The antenna control checkout procedure in *a* through *bn* below should be performed each time the antenna control is returned to an operational status after necessary repairs have been made, required maintenance has been completed, or directed by the DCA controller. If any step fails to produce the indicated result, remove all power from the terminal and notify the next higher category of maintenance. Check out the antenna control system as follows:

a. Apply the necessary power by setting the operating controls on the primary power distribution panel (fig. 3-39) as follows:

(1) PRIM PWR switch to ON.
(2) EL FIRING CIRCUIT breaker to ON.
(3) AZ FIRING CIRCUIT breaker to ON.
(4) EL DRIVE circuit breaker to ON.
(5) AZ DRIVE circuit breaker to ON.
(6) 90V PWR SUPPLY circuit breaker to ON.
(7) SHELTER PWR circuit breaker to ON.
(8) MOUNT SAFE switch to OFF (up).

b. Remove stow pin from the stow position (inside hole) and insert stow pin in the operate position (outside hole).

c. Operate the CONSOLE POWER circuit breakers on the power distribution panel (fig. 3-29) to ON.

d. Place 400 CPS REF circuit breaker on the antenna control panel (fig. 3-6) to ON.

e. Observe the MODE CONTROL STANDBY switch/indicator on the antenna control panel is illuminated.

f. Set the RECEIVER SELECT switch (located behind the antenna control panel) to BEACON.

g. Press MODE CONTROL MANUAL switch/ indicator.

h. Slew the antenna to a position of 0 degree in azimuth and 45 degrees in elevation.

i. On the antenna control panel (fig. 3-6), set the BAR SCAN CONTROL switches as follows:

(1) AZ SECTOR to 3.
(2) EL SECTOR to 3.
(3) AZ RATE to 0.5.
(4) EL INCREMENT to 1.0.

j. Set the beacon demod mode switch (fig. 3-9) to NORMAL.

k. Set the modulator DEVIATION CONTROL (fig. 3-18) to PRESET MODE VI.

l. On the antenna control panel (fig. 3-6), press the MODE CONTROL BAR SCAN switch/indicator. Both MANUAL and BAR SCAN indicators are illuminated and the antenna is scanning.

NOTE

The analog position indicators should indicate that a 3-degree square sector is being swept about the 0-degree azimuth and 45-degree elevation coordinates. The AZIMUTH and ELEVATION digital position indicators should remain at 0 degree and 45 degrees, respectively.

m. Press the MODE CONTROL ACQUISITION/ AUTOTRACK switch/indicator to ACQUISITION. The ACQUISITION indicator illuminates.

n. Press the MODE CONTROL MANUAL switch/ indicator. The MANUAL indicator remains illuminated and the BAR SCAN and ACQUISITION indicators extinguish..

o. Rotate the AZIMUTH and ELEVATION POSITION RATE handwheels, CW and CCW, and note that the antenna moves smoothly in both directions.

p. Slew the antenna toward the zenith until the position indicators read 85 degrees.

q. Using the ELEVATION handwheel, raise the antenna until the ELEVATION SERVO LIMITS switch/indicator illuminates. The ELEVATION position indicators should read 90 ±1 degrees.

r. Press the ELEVATION SERVO LIMITS switch.

s. Using the ELEVATION handwheel, raise the antenna until the ELEVATION ELECTRIC LIMITS switch/indicator illuminates. The ELEVATION position indicators should read 95 ±1 degrees.

t. Press the ELEVATION ELECTRIC LIMITS switch to back the antenna out of electric limit.

u. Using the ELEVATION POSITION RATE handwheel, lower the antenna to 88 degrees.

v. Slew the antenna down to 8 degrees.

w. Using the ELEVATION POSITION RATE handwheel, lower the antenna until the ELEVATION SERVO LIMITS switch/indicator illuminates. The ELEVATION position indicators should read 2.5 ±1 degrees.

x. Using the ELEVATION handwheel, lower the antenna until the ELEVATION ELECTRIC LIMITS switch/indicator illuminates. The ELEVATION position indicators should read 0 ±1 degree.

y. Press the ELEVATION POSITION RATE ELECTRIC LIMITS switch to back the antenna out of electric limit.

z. Using the ELEVATION POSITION RATE handwheel, raise the antenna to 5 degrees.

aa. Using the AZIMUTH SLEW control, slew the antenna 295 degrees ccw (65 degrees on analog indicator).

ab. Using the AZIMUTH POSITION RATE handwheel, rotate the antenna until the AZIMUTH SERVO LIMITS switch/indicator illuminates. The AZIMUTH position indicators should read 300 ±1 degrees.

ac. Press the AZIMUTH SERVO LIMITS switch.

ad. Using the AZIMUTH POSITION RATE handwheel, rotate the antenna ccw until the AZIMUTH ELECTRIC LIMITS switch/indicator illuminates. The AZIMUTH position indicators should read 305 ±1 degrees.

ae. Press AZIMUTH ELECTRIC LIMITS switch to back the antenna out of electric limit.

af. Using the AZIMUTH POSITION RATE handwheel, rotate the antenna 15 degrees ccw (70 degrees on analog indicator).

ag. Slew the antenna cw to zero degrees in azimuth (analog indicator).

ah. Using the AZIMUTH SLEW control, slew the antenna 295 degrees cw. Analog indicator reading will indicate actual azimuth position.

ai. Using the AZIMUTH POSITION RATE handwheel, rotate the antenna cw until the AZIMUTH SERVO LIMITS switch/indicator illuminates. The AZIMUTH position indicators should read 300 ±1 degrees.

aj. Press the AZIMUTH SERVO LIMITS switch.

ak. Using the AZIMUTH POSITION RATE handwheel, rotate the antenna cw until the AZIMUTH ELECTRIC LIMITS switch/indicator illuminates. The AZIMUTH position indicators should read 305 ±1 degrees.

al. Press AZIMUTH ELECTRIC LIMITS switch to back the antenna out of electric limit.

am. Slew the antenna to 0 degree azimuth and 45 degrees elevation.

an. Press the MODE CONTROL RATE AUGMENT switch/indicator. The indicator will illuminate.

ao. Using the POSITION RATE controls, move the antenna cw, ccw, up and down.

ap. Press MODE CONTROL MANUAL switch/ indicator. The RATE AUGMENT indicator extinguishes.

aq. On the primary power distribution panel (fig. 3-39), set the AZ DRIVE circuit breaker to OFF.

The AZ BRAKE, EL BRAKE and ANTENNA DRIVE indicators illuminate.

ar. Set AZ DRIVE circuit breaker to ON. MODE CONTROL STANDBY indicator illuminates and ANTENNA DRIVE indicator extinguishes.

as. On the antenna control panel (fig. 3-6), press MODE CONTROL MANUAL switch/indicator. The indicator illuminates and AZ BRAKE and EL BRAKE indicators extinguish.

at. On the primary power distribution panel (fig. 3-39), set the EL DRIVE circuit breaker to OFF. The EL BRAKE, AZ BRAKE and ANTENNA DRIVE indicators should illuminate.

au. Set EL DRIVE circuit breaker to ON. MODE CONTROL STANDBY indicator illuminates and ANTENNA DRIVE indicator extinguishes.

av. On the antenna control panel (fig. 3-6), press MODE CONTROL MANUAL switch/indicator. The indicator illuminates and AZ BRAKE and EL BRAKE indicators extinguish.

aw. On the power distribution panel (fig. 3-5), set the +28 V circuit breaker to OFF (down). The AZ BRAKE and EL BRAKE indicators should illuminate and MODE CONTROL MANUAL indicator extinguishes.

ax. Se the +28 V circuit breaker to ON (Up). The MODE CONTROL STANDBY indicator illuminates.

ay. On the antenna control panel (fig. 3-6), press the MODE CONTROL MANUAL switch/ indicator. The indicator illuminates.

az. On the power distribution panel (fig. 3-5), set the -28 V circuit breaker to OFF (down). The AZ BRAKE and EL BRAKE indicators should illuminate and MODE CONTROL MANUAL indicator extinguishes.

ba. Set the -28 V circuit breaker to ON (up). The MODE CONTROL STANDBY indicator illuminates.

bb. On the antenna control panel (fig. 3-6), press the MODE CONTROL MANUAL switch. The indicator illuminates.

bc. On the power distribution panel (fig. 3-5), set the + 10 V circuit breaker to OFF. The AZ BRAKE and EL BRAKE indicators should illuminate. MODE CONTROL MANUAL indicator extinguishes.

bd. Set the +10 V circuit breaker to ON. The MODE CONTROL STANDBY indicator illuminates.

be. On the antenna control panel (fig. 3-6), press the MODE CONTROL MANUAL switch/ indicator. The indicator illuminates.

bf. On the power distribution panel (fig. 3-5), set the -10 V circuit breaker to OFF. The AZ BRAKE and EL

BRAKE indicators should illuminate and MODE CONTROL MANUAL indicator extinguishes.

bg. Set the -10 V circuit braker to ON. The MODE CONTROL STANDBY indicator illuminates.

bh. On the antenna control panel (fig. 3-6), press the MODE CONTROL MANUAL switch/indicator. The indicator illuminates.

bi. On the primary power distribution panel (fig. 3-39), set 90 V PWR SUPPLY circuit breaker to OFF. The AZ BRAKE and EL BRAKE indicators should illuminate. The MODE CONTROL MANUAL indicator extinguishes.

bj. Set the 90 V PWR SUPPLY circuit breaker to ON. The MODE CONTROL STANDBY indicator illuminates.

bk. On antenna control panel (fig. 3-6), press MODE CONTROL MANUAL switch/indicator. The indicator illuminates.

bl. On the primary power distribution panel (fig. 3-39), set MOUNT SAFE switch to ON (down). The MOUNT SAFE indicator should illuminate.

bm. Set MOUNT SAFE switch to OFF (up).

bn. On antenna control panel (fig. 3-6), press MODE CONTROL MANUAL switch/indicator. The indicator illuminates.

bo. Insure that antenna is at zero degree in azimuth.

bp. Insert the stow pin in the stow hole. The STOW indicator should illuminate.

bq. On antenna control panel (fig. 3-6), set 400 CPS REF circuit breaker to OFF. The MODE CONTROL MANUAL indicator should extinguish.

br. Checkout procedure is complete. Remove all power from the terminal.

3-11. Baseband Calibration Procedures

During four-wire user voice operation and order-wire voice operation, the echo suppressors on both the transmitting and receiving signal paths must be by-passed before the baseband circuits of the AN/TSC-54 are calibrated. Calibrate the baseband circuits in the following manner:

a. Set the baseband control panel VOICE USER-ORDERWIRE lever switch (fig. 3-17) to USER.

b. Set the CLIPPER IN-OUT level switch to OUT.

c. Set the MODE SELECT switch to V3.

d. Set the baseband amplifier EMPHASIS SELECT switch (fig. 3-19) to V1; the SEND LINE AMPL selector switch to VOICE, ON-OFF-MC lever switch to ON, and the MAN-PRESENT toggle switch to PRESET.

e. Make the patching arrangement as illustrated in figure 3-46.

f. Set the baseband amplifier USER LINE AMPL selector switch to SEND IN and observe that the associated LEVEL meter indicates 0 vu.

g. Set the USER LINE AMPL selector switch to SEND OUT and adjust the associated rotary control for a 0 vu indication on the associated LEVEL meter.

h. Adjust the SEND LINE AMPL VOICE rotary control for a 0 vu indication on the SEND LINE AMPL meter.

i. Remove the patch cord from the USER LINE AMPL (SEND)jack (e above) and insert it into the COMM AMPL EQUIP (RECEIVE) jack as illustrated in figure 3-47.

j. Set the baseband amplifier RECEIVE LINE AMPL selector switch (fig. 3-19) to COMP and adjust the associated rotary control for a 0 vu indication on the RECEIVE LINE AMPL meter. Do not readjust the rotary control.

k. Remove the patch cord from the COMM AMPL EQUIP (RECE IVE)jack *(i* above) and insert it into the USER AMP LINE (SEND) jack.

l. Connect a patch cord from the COMM AMPL EQUIP (RECEIVE) jack to the COMM AMPL EQUIP (SEND) jack.

NOTE

The send side of the baseband has now been partially calibrated and is being used to provide a known input signal to the receive side for calibration purposes.

m. Adjust the baseband amplifier SEND LINE AMPL COMP rotary control *(i* above) for a 0 vu indication on the RECEIVE LINE AMPL meter.

NOTE

Under any circumstances do not place the SEND LINE AMPL selector switch to the COMP position or inaccurate readings will result.

n. Set the RECEIVER LINE AMPL selector switch to VOICE and adjust the associated rotary control for a 0 vu indication on the RECEIVE LINE AMPL meter.

o. Set the USER LINE AMPL selector switch to RECEIVE IN and observe that the USER LINE AMPL LEVEL meter indicates 0 to -1.5 vu.

p. Set the USER LINE AMPL selector switch to RECEIVE OUT and adjust the associated rotary control for a 0 vu indication on the associated LEVEL meter.

q. Remove the patch cords inserted in *k* and *l* above. Do not remove the echo suppressor bypass patch cord.

3-12. Basic Modulator-Demodulator Operating Procedure

Specific operating procedures for the modulator and

communication demodulators is largely dependent on operational decisions at the transmitting site. Basic operating procedures to be followed however, are given in *a* through *f* below.

a. Be sure that all FAULT indicators located on the right-hand side of the modulator (fig. 3-18) are extinguished.

b. Set the deviation meter range selector switch to the proper range for the deviation to be selected.

c. Set the DEVIATION CONTROL PRESET MODE select switch to the desired position.

d. Check to be sure that all power indicators on Comm Demod 1A3A3 or 1A3A5 (fig. 3-8) are illuminated.

e. Set the RECEIVE MODE selector switch to the desired position.

f. Set the TUNING MODE AFC-MAN toggle switch to AFC and observe that the BASEBAND LEVEL decibels meter indicates 0 dB. If the meter does not indicate zero, set the BASEBAND ATTENTUATION DB toggle switches, one at a time, .to the up position until the meter does indicate 0 dB.

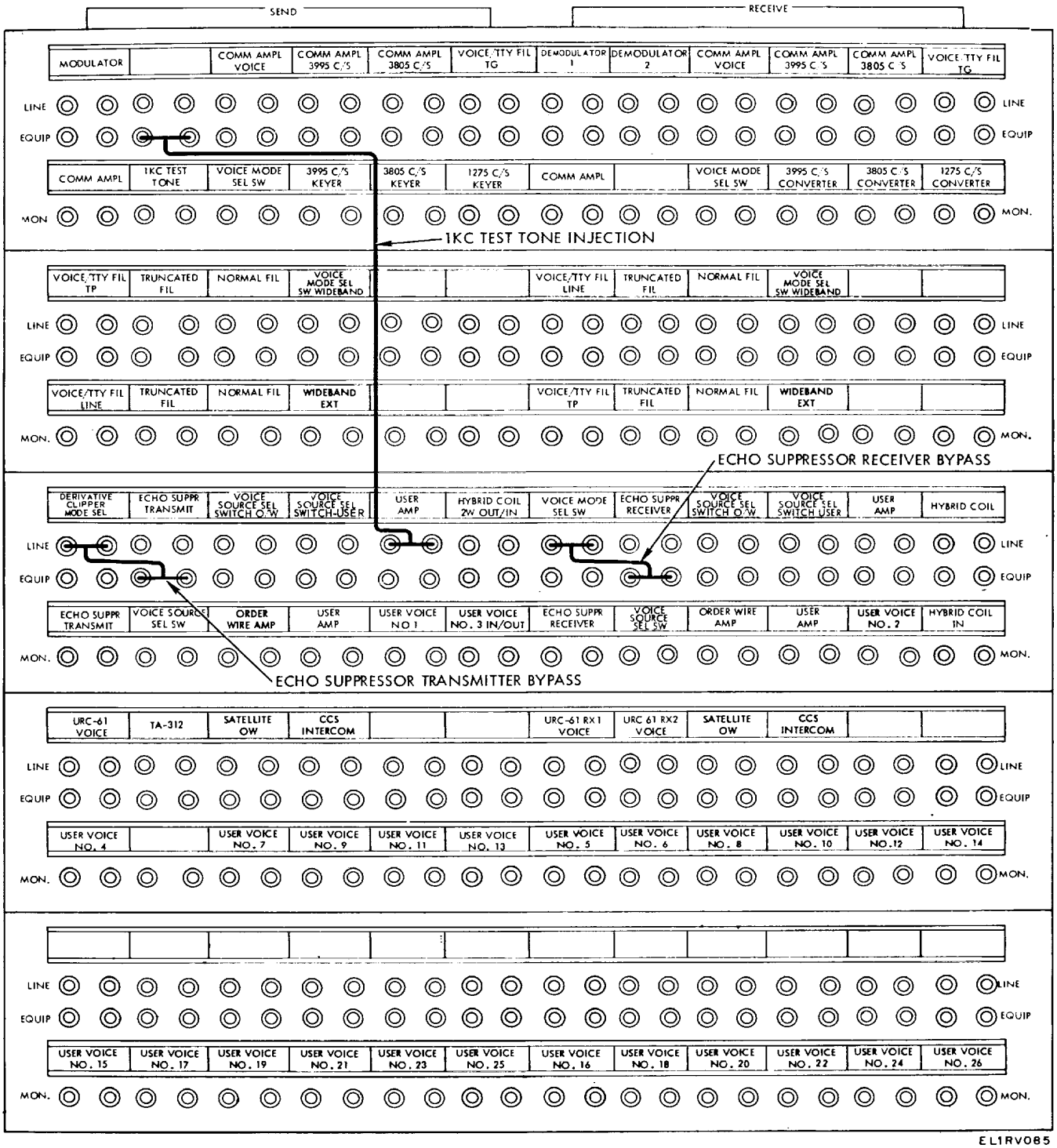


Figure 3-46. Patching arrangement for injecting 1kHz test tone and bypassing the echo suppressors.

NOTE

The TUNING MODE AFC-MAN toggle switch may be set to the MAN position and the VCO MANUAL TUNING dial control adjusted for a peak indication on the SIGNAL STRENGTH meter. Once the signal has been peaked, return the TUNING MODE AFC-MAN toggle switch to the AFC position.

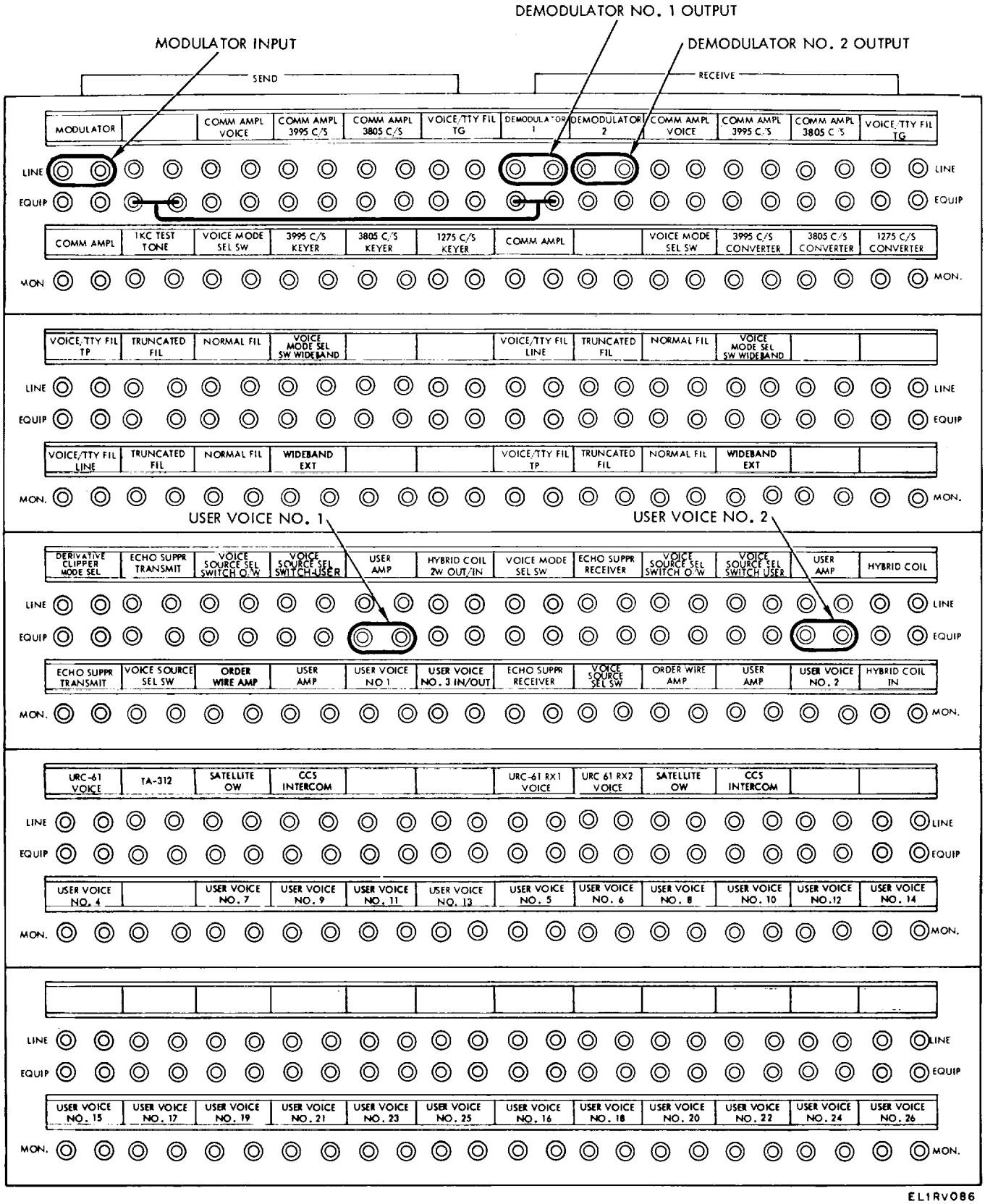


Figure 3-47. Patching arrangement to apply 1-kHz test tone to receive line amplifier

3-13. Selection of Transmitting-Receiving Frequency

a. On the upconverter set the RF OUTPUT switch to OFF-LINE.

b. Set TRANSMIT FREQUENCY SELECTOR MHz switch to the desired operating frequency.

c. Press and hold AUDIBLE ALARM DEFEAT pushbutton and hold until step d is complete.

d. Set status selector switch to RF LO TUNE and adjust TRANSMIT FREQ FINE TUNE control for a center scale indication on STATUS meter.

e. Release AUDIBLE ALARM DEFEAT pushbutton; the audible alarm should be silent and the RF LO indicator should extinguish.

NOTE

Should RF LO FAULT INDICATORS light go on at momentary loss of rf oscillator phase lock, when phase lock is reestablished, light may flash for a short period before extinguishing.

f. Set status selector switch to 70 MHz IF and set IF LEVEL ATTENUATOR switches for center scale indication on STATUS meter (70 MHz input must be applied).

g. Set STATUS selector switch to each position and observe the following indications on the STATUS meter.

(1) 70 MHz If.	Blue Scale
(2) 700 MHz If.	Blue Scale
(3) + 24V	Green Scale
(4) RF LO TUNE	Red Scale

h. Set RF POWER meter upper and lower limits to position pointers at the 1 dB points on either side of the desired output level.

i. Depress and hold AUDIBLE ALARM DEFEAT bushbutton until step *j* is completed.

j. Adjust RF OUTPUT LEVEL ADJ to obtain the desired power level on the RF POWER meter.

k. Release the AUDIBLE ALARM DEFEAT pushbutton.

l. Set the RF OUTPUT switch to ON-LINE.

m. Set the MODE SELECTOR switch to the position corresponding to the data requirement.

n. On the downconverter set RECEIVE FREQUENCY SELECTOR MHz switch to the desired operating frequency.

o. Depress and hold AUDIBLE ALARM pushbutton until step o is complete.

p. Set STATUS selector switch to RF LO TUNE and adjust RECEIVE FREQUENCY FINE TUNE control for a center scale indication on the status meter.

q. Release AUDIBLE ALARM DEFEAT pushbutton should be silent and the LO RF indicator should extinguish.

r. Set STATUS SELECTOR switch to each position and observe the following indications on the STATUS meter.

(1) + 24 V	Green Scale
(2) STD LVL	Blue Scale
(3) RF LO	Blue Scale
(4) IF LO	Blue Scale
(5) 700 MHz If. 0 to 3	
(6) 70 MHz If. Varies with input signal level	

s. Set MODE SELECTOR switch to corresponding data requirements.

3-14. Satellite acquisition

After the AN/TSC-54 has reached operational status acquire a selected satellite as follows:

a. Check to be sure the SIGNAL SELECT switch, located on the back of the antenna control panel, is set to the BEACON position.

b. Check to be sure the antenna is not in an azimuth or an elevation electrical limit. The associated ELECTRIC LIMITS indicator on the antenna control panel should illuminate when the antenna is at one or both electric limits. Move the antenna out of limits as follows:

(1) Set the MOUN'2' SAFE switch on the pedestal power distribution panel to the on (up) position.

(2) Manually release the brakes at the pedestal.

(3) Use the handcrank and rotate the antenna away from the limit.

(4) Engage the brakes at the pedestal and set the MOUNT SAFE switch to the off (down) position.

(5) Check to be sure that the STANDBY indicator switch illuminates when the antenna is out of the limit position.

c. Depress the test translator control INJECTION SIGNAL switch to the OFF position.

d. Set the beacon demod mode selector switch to NORMAL and the TUNING MODE switch to the AFC position; the VCO TUNING meter should start sweeping.

e. On the antenna control panel check to be sure the PENCIL BEAM and NARROW BAND indicators are extinguished. If not extinguished, press the appropri- ate pushbutton indicator switch to extinguish the indi- cator.

f. Depress the antenna control panel MANUAL pushbutton indicator switch. Observe that the MAN- UAL indicator illuminates and the STANDBY indicator extinguishes.

g. Determine the ephemeris data for the selected satellite from the current link terminal acquisition table.

h. Rotate the antenna to the prescribed satellite ephemeris (g above) by using the ELEVATION and AZIMUTH SLEW knob controls for coarse adjustments and the POSITION RATE hand wheels for fine adjustments.

i. If the antenna is positioned to directly face the designated satellite, the following sequence should occur:

(1) The antenna control panel SIGNAL DETECT indicator should illuminate and the beacon demod VCO TUNING meter should stop sweeping.

(2) The SIGNAL STRENGTH meters on the antenna control panel and beacon demod should indicate a signal level greater than zero.

(3) Within 4 seconds the beacon demod BEACON TRACK ACQ indicator and the antenna control panel PHASE LOCK indicators should illuminate and the antenna control panel SIGNAL DETECT indicator should extinguish.

j. Depress the ACQUISITION/AUTOTRACK pushbutton indicator switch; the MANUAL indicator should extinguish and the AUTOTRACK indicator should illuminate to indicate that the antenna is automatically tracking the satellite.

k. If the acquisition sequence outlined in *j* above does not occur proceed as follows:

(1) Set the antenna BAR SCAN CONTROL controls to the following positions for a 2-degree scan:

(a) AZ SECTOR to 2.

(b) EL SELECTOR to 2.

(c) AZ RATE to .4.

(d) EL INCREMENT to .4.

(2) Depress the BAR SCAN and then the ACQITISITION/AUTOTRACK pushbutton indicator switches; the BAR SCAN and ACQUISITION indicators should illuminate. The antenna should scan about the satellite ephemeris set into the system and when the satellite is detected the acquisition sequence outlined in *(a)* through (c) below should occur.

(a) The antenna control panel SIGNAL DETECT and POSITION MEMORY indicators should illuminate, and the beacon demod VCO TUNING meter should stop sweeping.

(b) The SIGNAL STRENGTH meters on the antenna control panel and beacon demod should indicate a signal level greater than zero.

(c) Within 4 seconds the beacon demod BEACON TRACK ACQ indicator and the antenna control panel PHASE LOCK and AUTOTRACK indicators should illuminate and the antenna control panel SIGNAL DETECT, POSITION MEMORY, ACQUISITION, MANUAL, and BAR SCAN indicators should extinguish.

l. The antenna is now automatically tracking the satellite.

m. Depress the MANUAL pushbutton indicator switch and then the ACQUISITION/AUTOTRACK pushbutton indicator switch. This programs the antenna to return to the manual mode rather than the bar scan mode if a momentary loss of signal should occur.

NOTE

The AUTOTRACK and PHASE LOCK indicators should be the only indicators illuminated on the antenna control panel.

3-15. Transmitter Operation

After any extended shutdown period, check out the HPA and LPA transmitter circuits to the AN/TSC-54 before operating this equipment. A comprehensive LPA transmitter checkout can be performed by a higher category of maintenance (field) as described in the direct support test procedures section of TM 11-5895-963-34/NAVELEX 0967-LP-592-7030/TO 31R5-2G-242. Operator level checks of LPA transmitter are limited to the turn-on procedures (para 3-6). The following procedures describe checkout using the HPA transmitter circuits.

a. Acquire a satellite (para 3-14) and be sure that access to the satellite has been authorized.

b. Check out the transmitting circuits as outlined in paragraph 3-10.

c. Observe that various power and STANDBY indicators on the RF PWR. MON/CONTROL panel 1A2A27 are illuminated.

d. Set the METER SELECT selector switch to METER ZERO and adjust the associated rotary control for a zero indication on the RF POWER meter.

e. Set the METER SELECT selector switch to DRIVE and verify that a minimum reading is obtained on the RF POWER meter.

f. Set the BEAM POWER ON-OFF toggle switch to ON.

g. Set the METER SELECT selector switch to FORWARD.

h. Set and hold the transmitter control panel XMIT OUTPUT INCREASE-DECREASE toggle switch to the INCREASE position until the desired indication is obtained on the RF POWER meter.

i. Operate the equipment according to standard communication procedures.

3-16. Link Communication Operation

a. In the normal mode of operation, user teletypewriter operation requires no special patching arrangements. Calibration of the baseband circuits is identical to that performed for the user voice mode of operation (para 3-1) except for the following:

(1) Set the baseband control panel TTY MODE USER lever switch (fig. 3-17) to NORMAL..

(2) Set the 3995 Hz frequency shift keyer S-M-L OFF selector switch (fig. 3-20) to the L position.

(3) Set the baseband amplifier SEND LINE AMPL selector switch to 3995 and adjust the associated rotary control for a 0 vu indication on the SEND LINE AMPL meter.

(4) Set the SEND LINE AMPL selector switch to COMP and adjust the associated rotary control for a 0 vu indication on the SEND LINE AMPL meter.

(5) Connect a patch cord from the baseband patch panel COMM AMPL EQUIP (RECEIVE) jack to the COMM AMPL EQUIP (SEND) jack.

NOTE

The send side of the baseband has now been partially calibrated and is being used to provide a known input signal to the receive side for calibration purposes.

(6) Set the RECEIVE LINE AMPL selector switch to 3995 and adjust the associated rotary control for a 0 vu indication on the RECEIVE LINE AMPL meter.

(7) Set the USER LINE AMPL selector switch to RECEIVE IN and observe that the USER LINE AMPL meter indicates a reading of 0 to - 1.5 vu.

(8) Set the USER LINE AMPL selector switch to RECEIVE OUT and adjust the associated rotary control for a 0 vu indication on the USER LINE AMPL meter.

(9) Remove the patch cord ((5) above) and proceed with modulator-demodulator operation as described in paragraph 3-12.

b. Orderwire teletypewriter operation is identical to user teletypewriter operation (a above) except for the following:

(1) Set the baseband control panel TTY MODE ORDERWIRE lever switch to NORMAL.

(2) Connect a patch cord from the teletypewriter patch panel UGC-77 KEYER PTR jacks to the TTY SEL SW 3395 Jz jacks.

(3) Operate, select, and adjust the 3995 Hz frequency shift keyer inputs and outputs.

c. Orderwire voice operation is identical to user voice operation except that the baseband control panel orderwire handset is used for communication and calibration of the baseband is accomplished as follows:

(1) Set the baseband control panel VOICE USER-ORDERWIRE lever switch to ORDERWIRE.

(2) Talk in a normal tone into the orderwire handset and use the controls on the ORDERWIRE AMPL area (right-hand side) of the baseband amplifier to adjust the proper levels.

d. Normal system operation of the AN/TSC-54 is with comm demod 1A3A3. However, comm demod 1A3A5 may be substituted in the event that comm demod 1A3A3 fails. The patching arrangement to accomplish the substitution is illustrated in figure 3-48.

e. During normal system operation, beacon demod 1A3A4 detects the satellite identification signal and provides the necessary error signal to the antenna control panel. If the beacon demod should fail however, either of the comm demods may be used to provide the error signal if the comm demod matrix board has been properly configured. To substitute either of the comm demods for the beacon demod, proceed as follows:

(1) Pull out the antenna control panel from the rack and set the receiver select switch (fig. 3-6) to the COMM 1 or COMM 2 position depending on which matrix board has been properly configured.

(2) Set the selected comm demod RECEIVE MODE selector switch to the proper position and note that the proper acquisition sequence (para 3-14) occurs.

f. In the event of unconverter failure the remaining units should be used for channels carrying the highest priority communications.

g. If a downconverter failure occurs; use the two remaining units for priority communications and track the satellite using FM communications signal. If this is not feasible, track the satellite as follows:

(1) Disconnect the 50 ohm load from the fourth port of the receive-three way power divider at the top of the 1A19 console.

(2) Connect a spectrum analyzer to the RF test input of the downconverter and tune to the beacon frequency.

(3) Track the satellite, in the manual mode, by maintaining maximum signal strength on the spectrum analyzer.

h. In the event that both the cesium standard (1A2A24) and the xtal standard (1A2A22A1) fails, operations may be resumed as follows:

(1) Move the cable, on the front panel of each synthesizer in the 1A19 console, from EXT STD OUT to INT STD OUT.

(2) Connect a cable to one of the 5 MHz jacks (J1 through J26) on the rear panel of the distribution amplifier in the 1A19 console.

(3) Connect the other end of the cable to the 5 MHz input on the distribution amplifier (1A2A33).

(4) Connect a cable to one of the 1 MHz jacks (J27 through J30) on the rear panel of the distribution amplifier in the 1A19 console.

(5) Connect the other end of the cable to the 1 MHz input on the distribution amplifier (1A2A33).

(6) Resume normal operations.

NOTE

The above outputs in the 1A19 console may be used if the distribution amplifier 1A2A33 fails.

i. The AN/TSC-54 is also equipped to operate with a two-wire user voice connection provided the patching arrangement illustrated in figure 3-49 is made and that the bypass patching arrangement shown in figure 3-46 is removed.

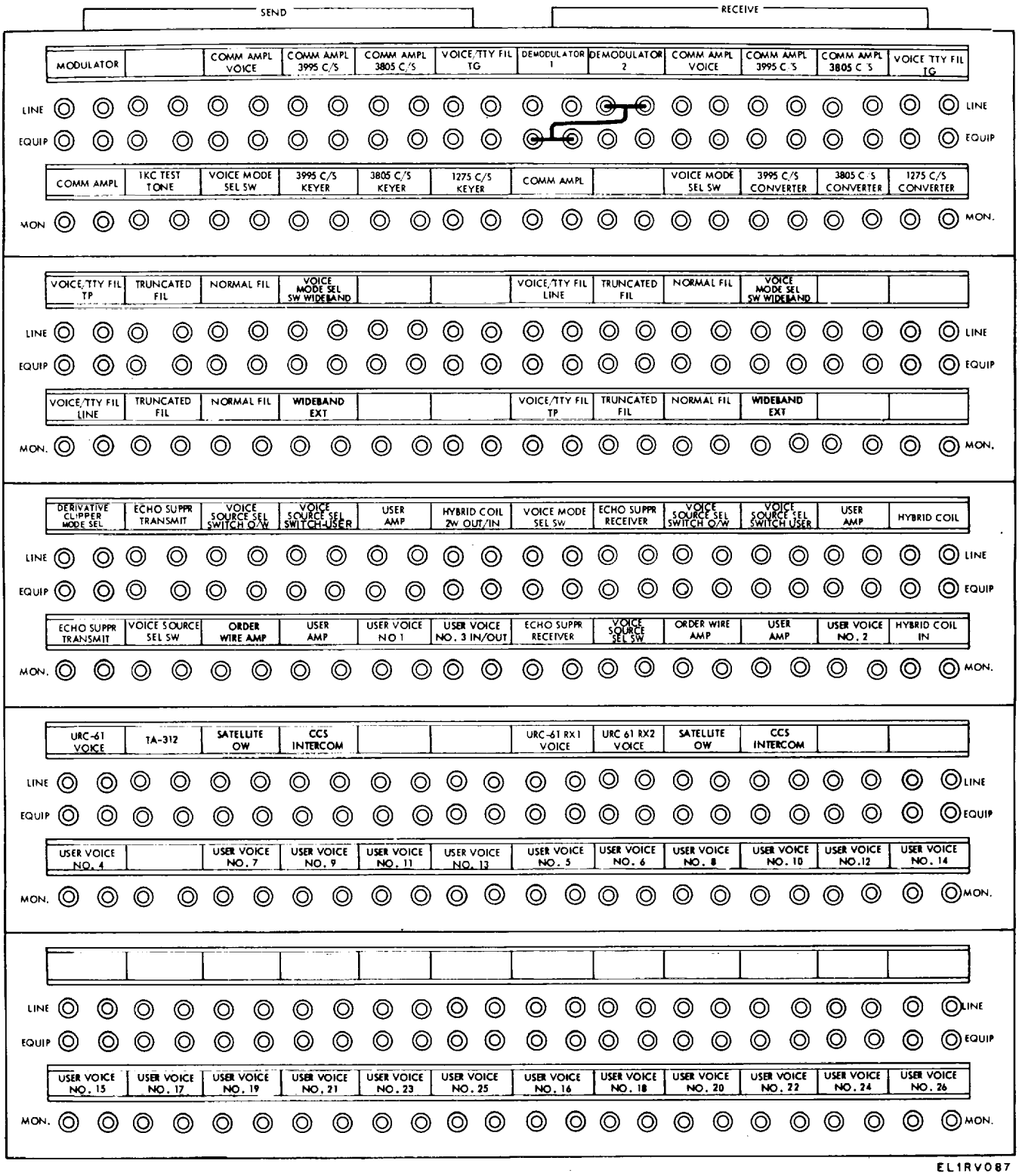


Figure 3-48. Patching arrangement to substitute comm demod 1A3A5 for comm demod 1A3A3.

3-17. Radio Communication Subsystem, AN/URC-61

The AN/URC-61 will operate with either user voice and user teletypewriter input signals or orderwire voice and orderwire teletypewriter input signals as selected with the baseband control panel voice lever switch. Detailed operating procedures for the AN/URC-61 are covered in TM-11-5820-614-12.

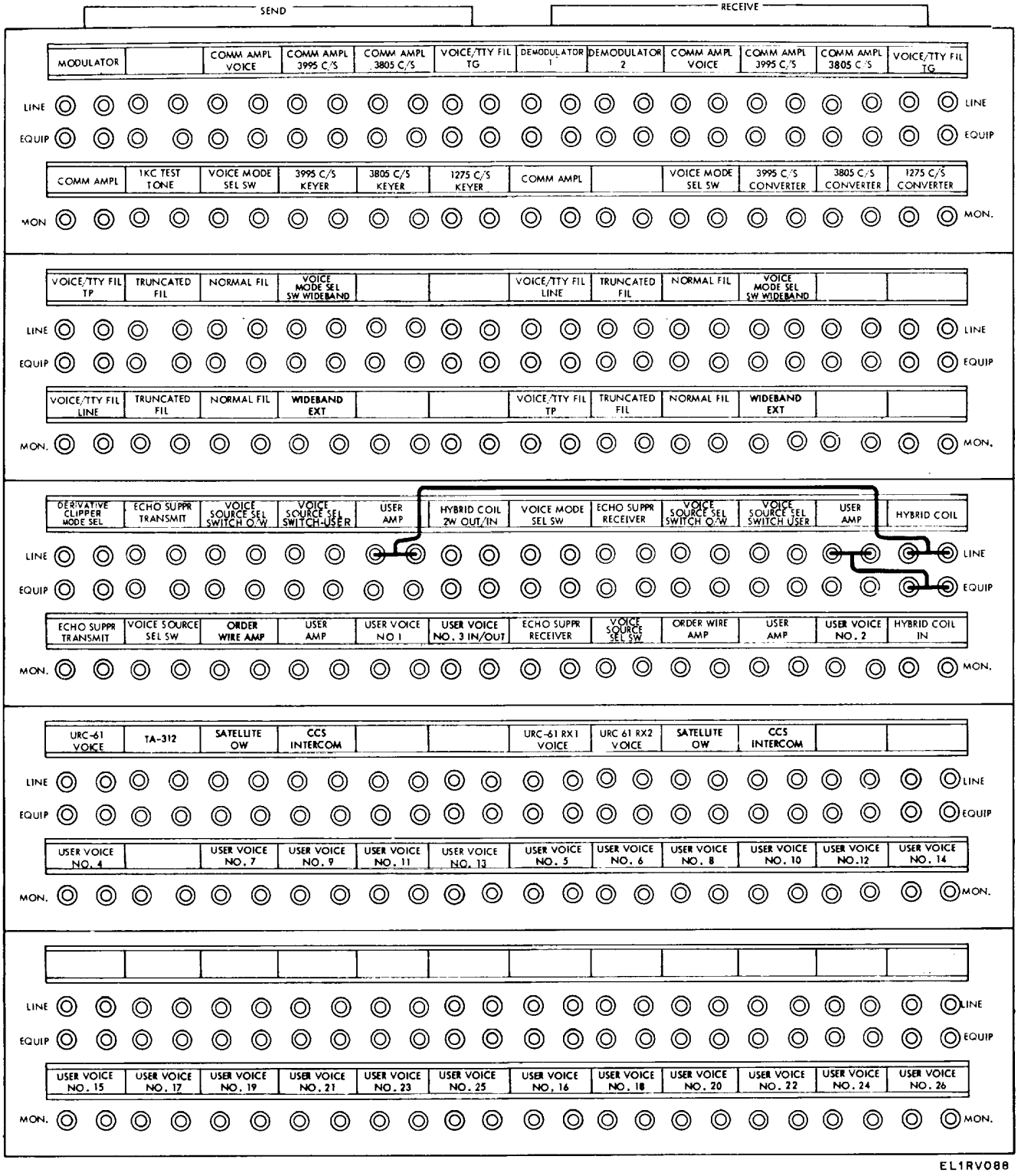


Figure 3-49. Patching arrangement to use a hybrid for two-wire user voice operation.

a. For operation with user voice input signals, the user landlines must be connected to the URC-61 SEND IN/RCV OUT connectors on the AN/TSC-54 external signal distribution box. For operation with orderwire voice, the patching arrangement illustrated in figure 3-50 must be made.

b. For operation with user teletypewriter input signals the user landlines must be connected to the URC-61 DC LINES connectors. For operation with orderwire teletypewriter inputs, the patching signals, arrangement illustrated in figure 3-51 must be made.

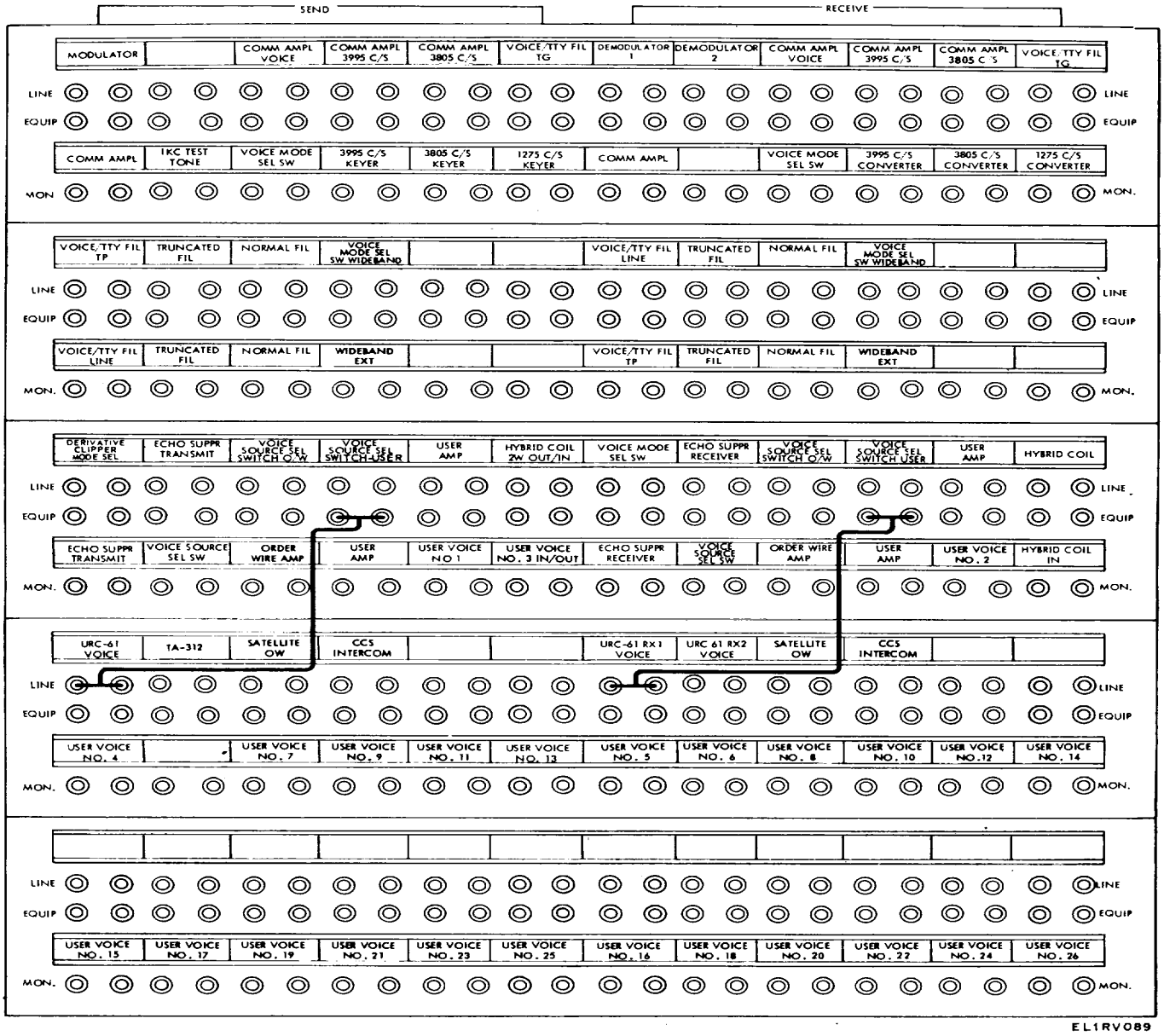


Figure 3-50. Patching arrangement for URC-61 voice operation.

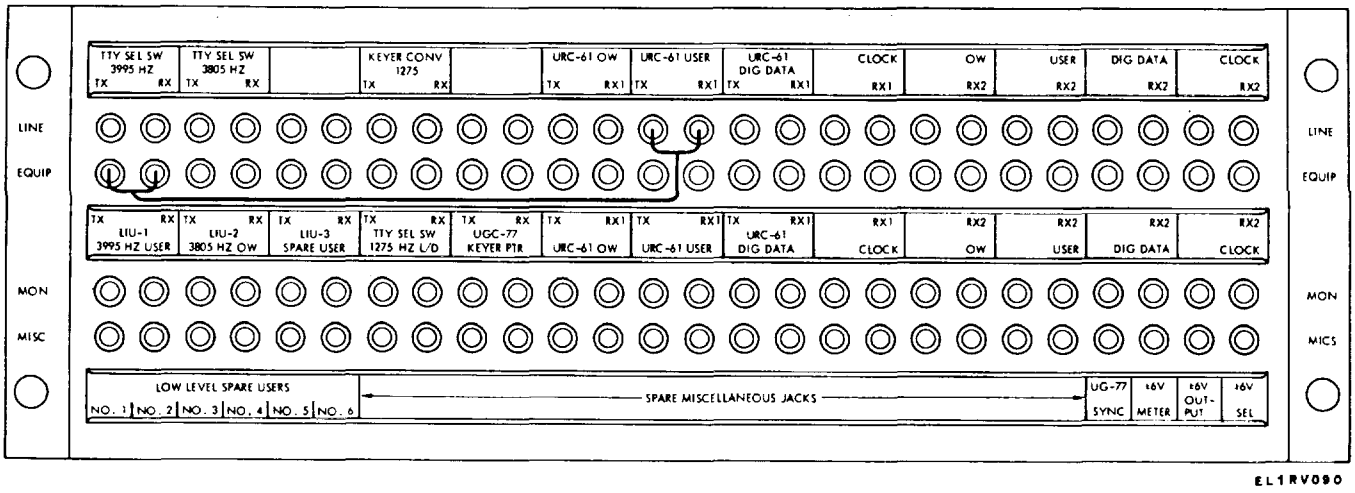


Figure 3-51. Patching arrangement for URC-61 teletypewriter operation.

3-18. Typical Patching Arrangements to Maintain Normal Communications

Figure 3-48 shows the patching arrangement required to substitute comm demod No. 2 for comm demod No. 1 in the event that it fails. The patching arrangement allows rapid restoration of communication.

a. When user voice No. 1 and No. 2 circuits are not available, user voice No. 7 is substituted for user voice No. 1 on the SEND side of the panel and user voice No. 8 is substituted for user voice No. 2 on RECEIVE side of the panel as shown in figure 3-52.

b. Figure 3-53 shows the patching arrangement required to substitute the 3,805 Hz digital keyer for the 3,995 Hz digital keyer; figure 3-54 shows the patching arrangement required to substitute the 3,805 Hz fsk tone converter for the 3,995 Hz fsk tone converter. These illustrations do not represent all the patches that can be made to allow deviation from the normalled path; however, they illustrate what can be accomplished if the tty patch panel is used.

c. Patches can also be made to allow monitoring of user tty communications by the local orderwire teletypewriter. Figure 3-55 shows the patching arrangement required to monitor the user send signal on the local orderwire printer. Note that a reverse polarity patch is used because of patching from the SEND side of the panel to the RECEIVE side. Figure 3-56 illustrates the necessary patching to monitor the user receive signal on the orderwire printer, and figure 3-57 shows the patching arrangement required to monitor the 3,995 digital keyer loop voltage.

3-19. Patching Required for Different Modes of Operation

a. Figure 3-58 shows the patching arrangement required to allow operation with a two-wire user. The HYBRID COIL 2W OUT/IN jacks are jacks located directly below. USER VOICE NO. 3 IN/OUT jacks are connected to the two-wire user on the external signal distribution panel as shown in figure 3-44.

b. URC-61 user landlines are connected to the external signal distribution panel 1A10. The URC-61 SEND IN, RX1 OUT and RX2OUT terminals 4, 5, and 6 are for user voice. These terminals appear in the shelter on the baseband patch panel as USER VOICE No. 4, 5 and 6 and are normalled-through to the URC-61.

c. The user tty dc loops and digital data are labeled URC-61 dc lines and appear in the shelter on the teletype patch panel as URC-61 USER, URC-61 ORDERWIRE and URC-61 DIG DATA and are normalled-through to the URC-61.

d. Patching arrangements for normal operation is shown on figure 3-7. To patch for URC-61 user operation, disconnect the patch cord from the MODULATOR jack and connect to URC-61 MOD jack; also disconnect the patch cord from AUX OUTPUT 50J jack and connect to the URC-61 DEM jack. Figure 3-50 illustrates the patching arrangement required to use the URC-61 for voice operation on the local orderwire facility, the patching shown in figure 3-51 is required for tty operation.

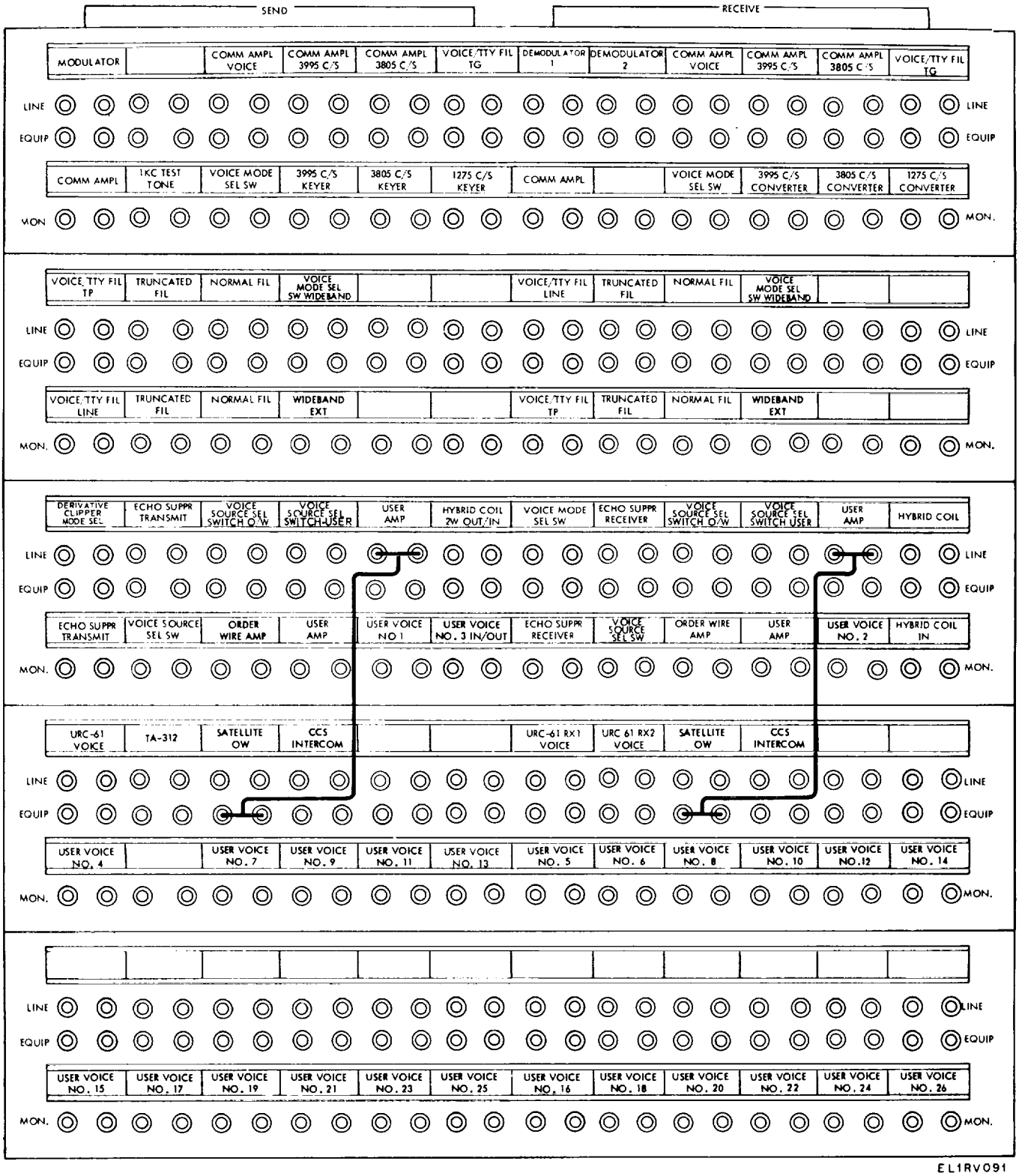


Figure 3-52. Patching arrangement to substitute user voice No. 7 as a send pair, and user voice No. 8 as a receive pair.

3-20. Satellite Handover

Satellite handover may be used when it is desired to rapidly position the antenna from the satellite that is being tracked to a new satellite.

a. Verify that the antenna control panel AUTOTRACK indicator is illuminated.

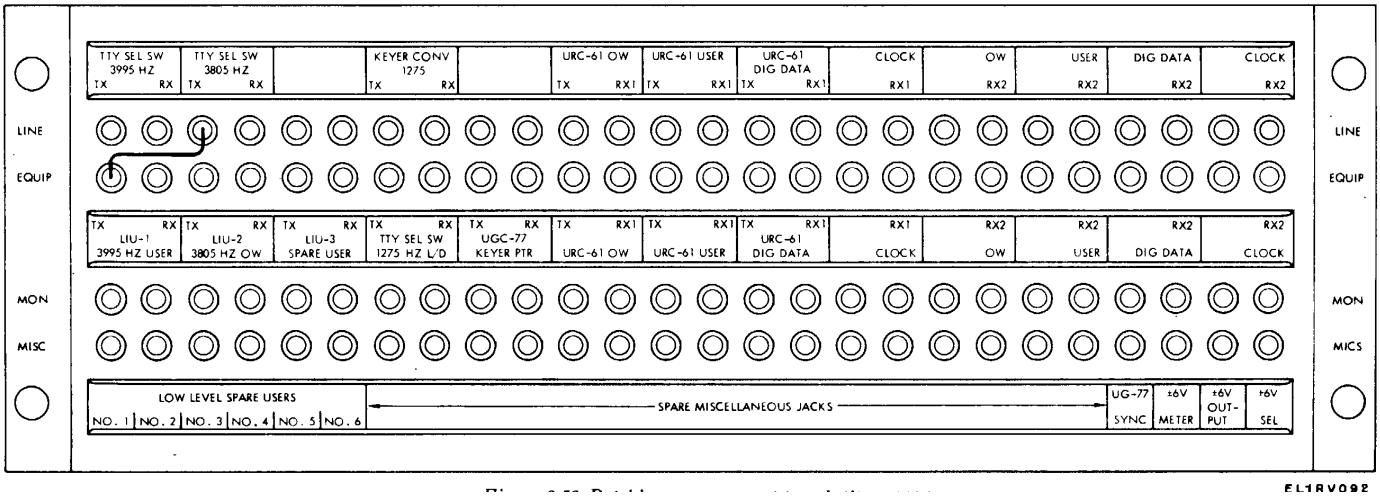


Figure 3-53. Patching arrangement to substitute 3805-Hz keyer for 3995-Hz keyer.

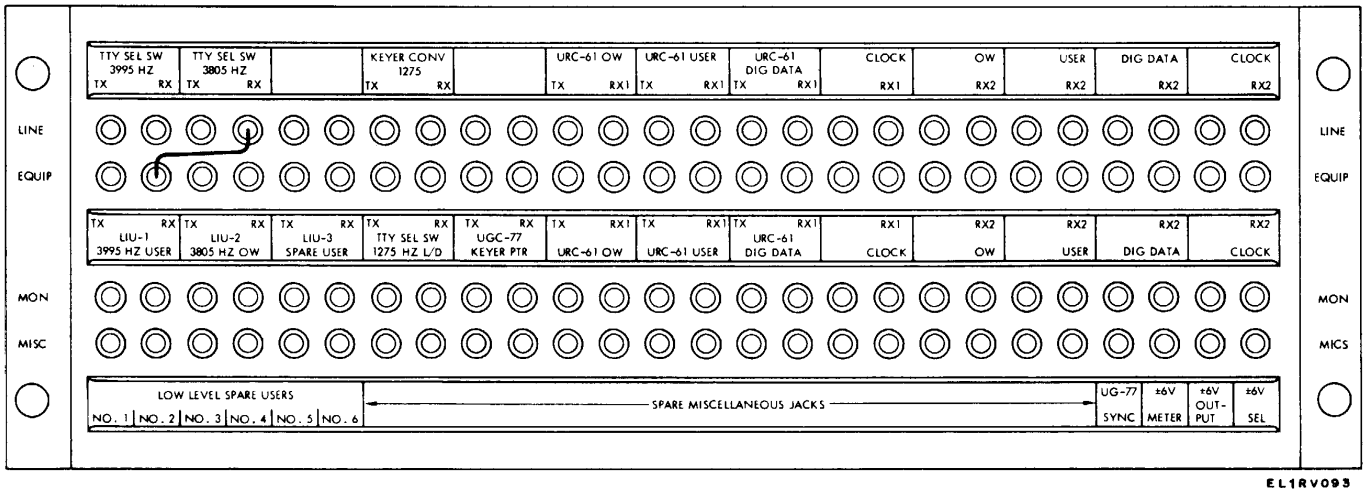


Figure 3-54. Patching arrangement to substitute 3805-Hz tone converter for 3995-Hz tone converter.

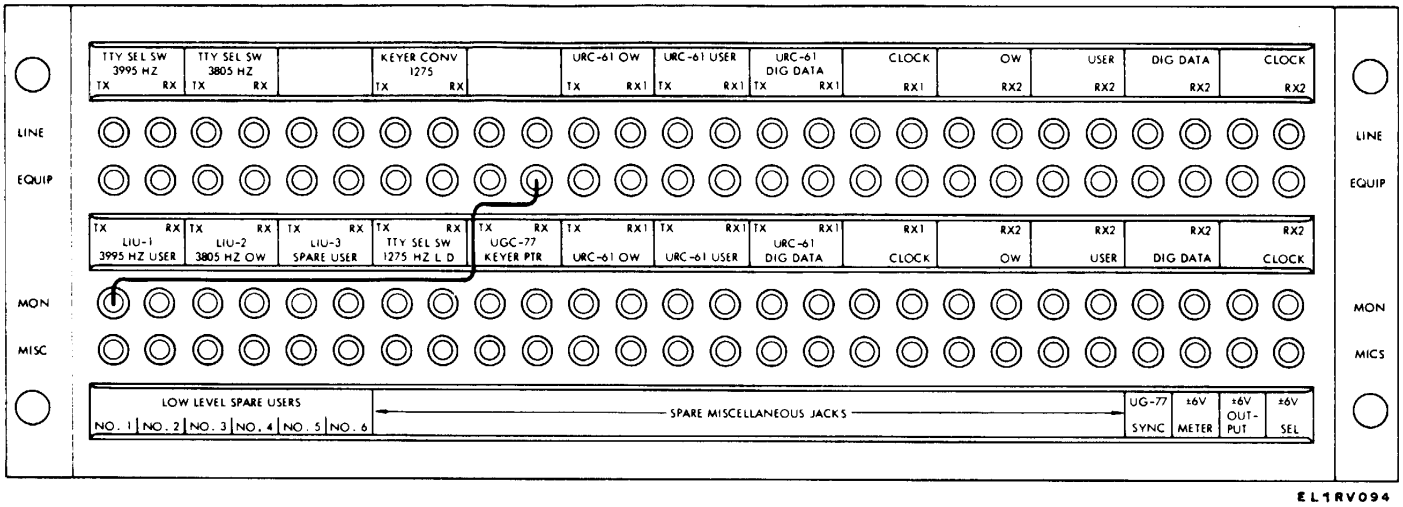


Figure 3-55. Patching arrangement to monitor user send on orderwire teletypewriter.

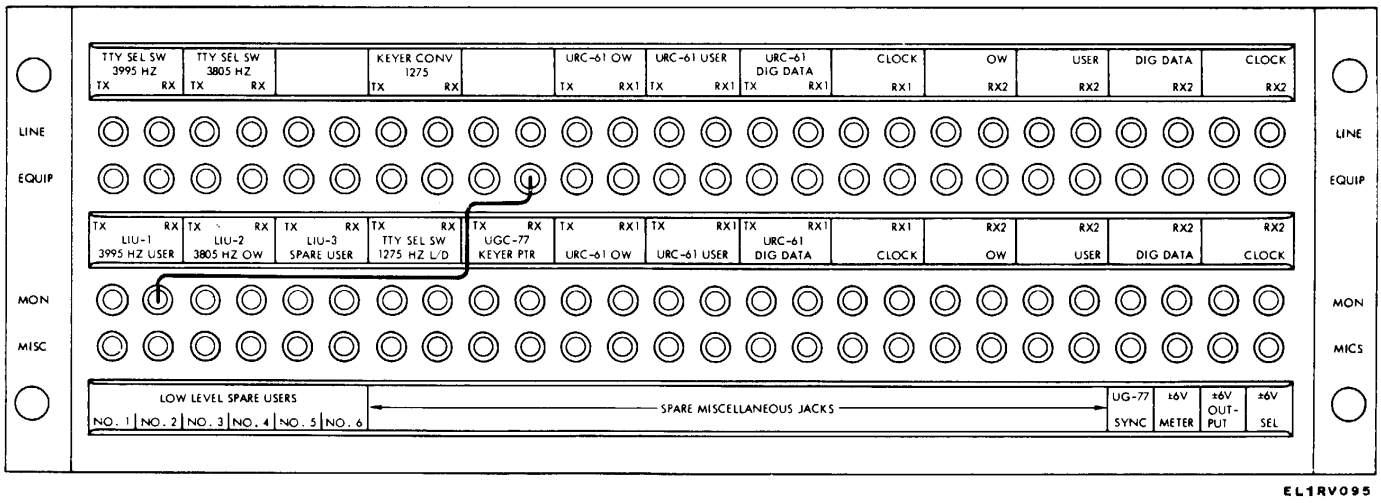


Figure 3-56. Patching arrangement to monitor user receive on orderwire teletypewriter.

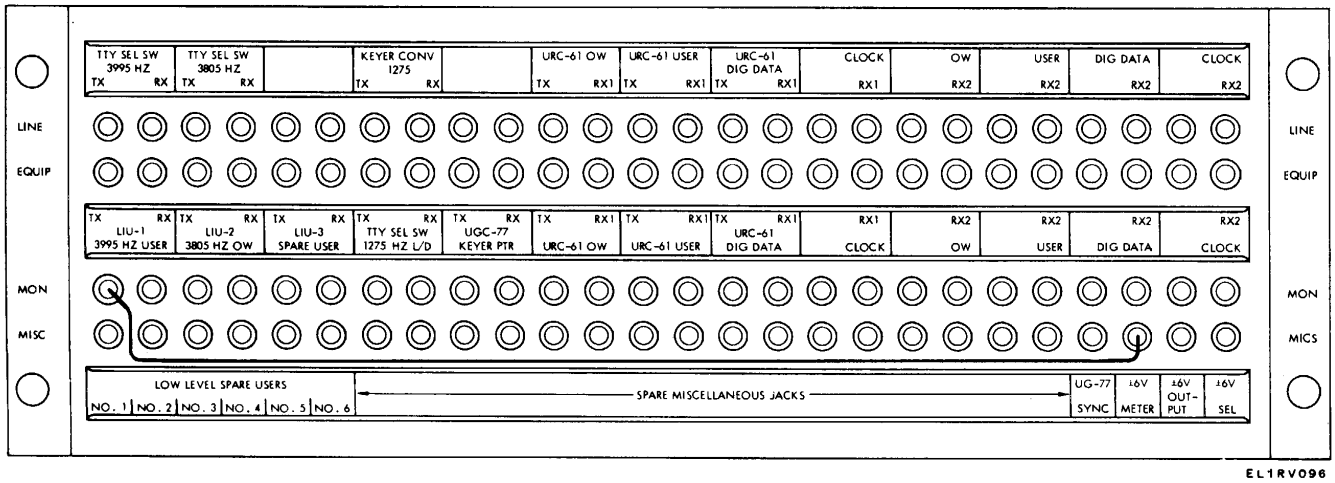


Figure 3-57. Patching arrangement to monitor 3995-Hz keyer loop voltage.

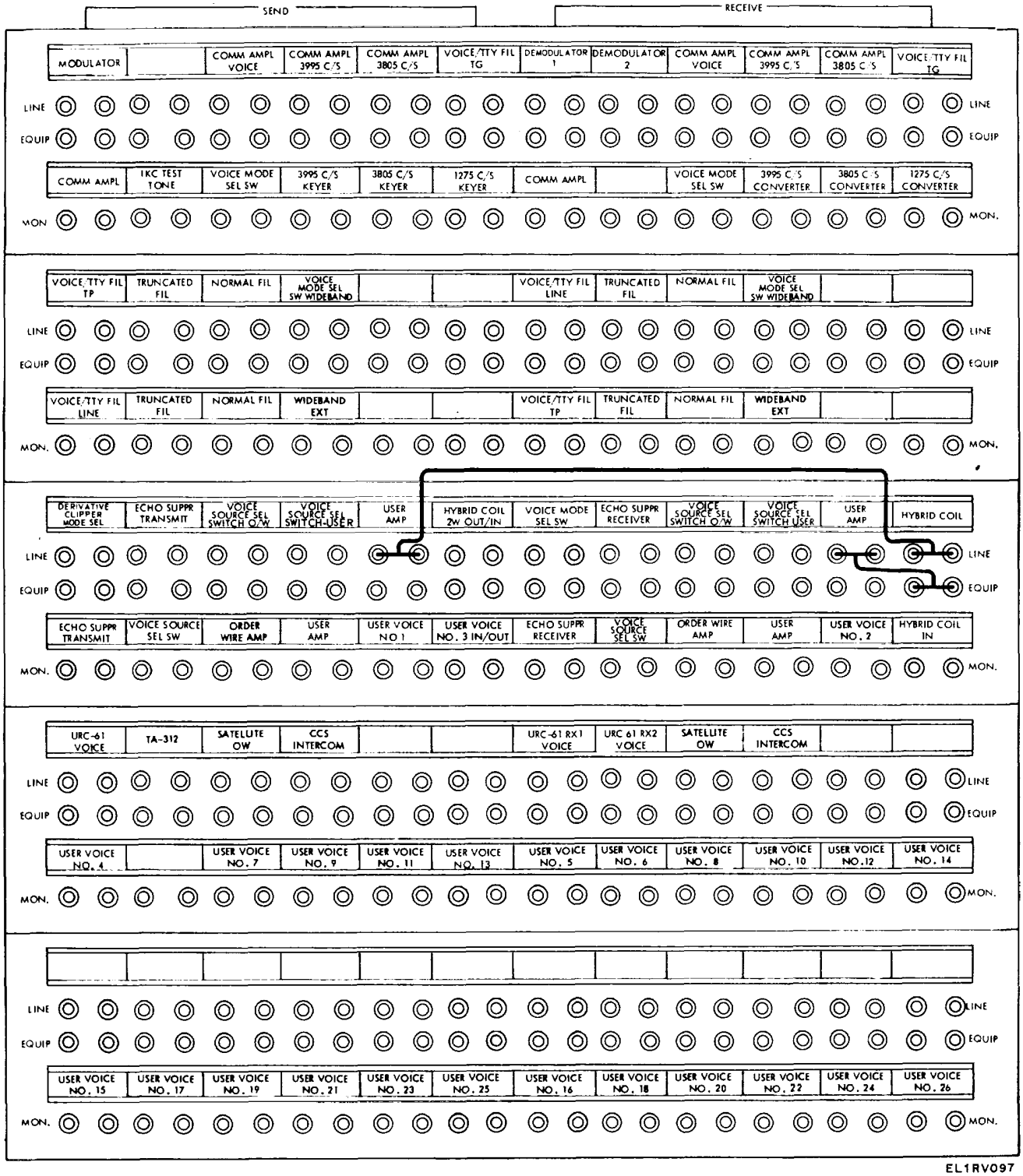


Figure 3-58. Patching arrangement for two-wire user send/receive voice operation.

b. Depress the FOLLOWUP DISABLE pushbutton indicator switch; the indicator should illuminate.

c. Use the AZIMUTH and ELEVATION POSTION RATE handwheels to position the digital readouts the ephemeris for the new satellite.

d. When it is desired to position to the new satellite, depress the MANUAL pushbutton indicator switch. The antenna should now slew to the coordinates as in c above and the acquisition sequence

outlined in paragraph 3-14 should occur.

3-21.System Operational Checkout Procedure

After Satellite Communication Terminal AN/ TSC-54 has been installed at the operating site and preliminary alignments (para 2-24) have been made, a system check of the equipment should be performed to verify and validate proper operation. The test procedure outlined in a through *aw* below is provided to check out the operational status of the AN/TSC-54 without establishing a communications link through a satellite. Refer to TM 11-5895-963-12/NAVELEX 0967-LP-592-7010/TO 31RS-2G-241 for LPA operating procedures.

a. Apply power to the terminal (para 3-6).

b. Perform the transmitter checkout procedure (para 3-10).

b.1. Perform the antenna control operational checkout procedure (para 3-10.1).

c. Calibrate the baseband circuits (para 3-11).

NOTE

Check to be sure that the 1 kHz test tone and echo suppressors are bypassed by the proper patching arrangement (fig. 3-46).

d. Set the baseband amplifier and baseband control panel controls for orderwise voice operation.

e. Use the key and turn the RF pwr monitor/control CONTROL PEDESTAL-LOCAL key-switch to the LOCAL position.

f. Set the METER SELECT switch to METER ZERO and adjust the associated rotary control for a zero indication on the RF POWER meter.

g. Connect the equipment as follows:

(1) RF TEST OUTPUT of the Upconverter under test to Test Translator RF INPUT.

(2) Test Translator RF OUTPUT to RF TEST INPUT of the Downconverter under test.

(3) 70-MHz If. Test Signal to the Upconverter under test. (If. Patch Panel)

NOTE

The 70-MHz signal may be obtained from J5, on the Test Translator of the 70-MHz output at the If. Patch Panel.

(4) 70-MHz SAMPLE output of Downconverter under test to RF POWER METER INPUT.

(5) RF POWER MONITOR output to RF POWER METER INPUT (Upconverter).

h. Set Set Translator controls as follows:

(1) POWER ON-OFF	ON
(2) LO SEL	725 MHz lamp illuminates
(3) LEVEL SET ATTEN-ATTEN 1	50 maximum
(4) LEVEL SET ATTEN-ATTEN 2	10 maximum
(5) 70 MHz ON	ON
(6) 5 MHz ON	ON

i. Set Upconverter controls as follows:

(1) POWER ON-OFF	ON
(2) RF OUTPUT	OFF-LINE
(3) TRANSMIT FREQUENCY SELECTOR MHz	8250.000
(4) POWER METER RANGE	0 dBm
(5) RF OUTPUT LEVEL ADJ	30

j. Set Downconverter controls as follows:

(1) POWER ON-OFF	ON
(2) RECEIVER FREQUENCY SELECTOR MHz	7525.000
(3) POWER METER RANGE	-10 dBm

CAUTION

Make certain that the power input signal to the equipment RF power meters does not exceed 0 dBm for the downconverter or -14 dBm for the upconverter.

k. Set upconverter status selector switch to 70 MHz IF.

l. Set IF. LEVEL ATTENUATOR for center scale reading on STATUS meter.

m. Adjust RF OUTPUT LEVEL ADJ for -1.5 dBm indication on RF POWER meter.

n. Adjust RF POWER meter upper and lower limits to -2.5 and -0.5 dBm, respectively.

o. Observe downconverter RF POWER meter while adjusting Test Translator LEVEL SET ATTEN - ATTEN 1 and ATTEN 2 controls to obtain a reading of -10 dBm +3 dBm. Do not change the settings of ATTEN 1 and ATTEN 2 throughout the remainder of this procedure.

p. Rotate upconverter status selector switch to each position and observe the following indications on the STATUS METER.

(1) 70 MHz If.	Blue Sale
(2) 700 MHz If.	Blue Scale
(3) +24 V	Green Scale
(4) RF LO TUNE	Red Scale
(5) STD LEVEL	Blue Scale
(6) RF LO	Blue Scale
(7) If. LO	Blue Scale

q. Rotate downconverter status selector to each position and observe the following indications on the STATUS METER.

(1) +24 V	Green Scale
(2) STD LEVEL	Blue Scale
(3) RF LO	Blue Scale
(4) If. LO	Blue Scale
(5) 700 MHz If.	0 to 3
(6) 70 MHz If.	Blue Scale
(7) RF LO TUNE	Red Scale

r. Disconnect the cable from 70-MHz TEST

OUTPUT at the Test Translator. Observe that the up converter RF LEVEL lamp illuminates and the audible alarm activates.

s. Reconnect the cable; the alarms should deactivate.

t. Disconnect the frequency synthesizer (associated with upconverter under test) cable from REFERENCE FREQUENCY SYNTH IN connector J2. Observe that the upconverter RF LEVEL, RF LO and If. LO lamp illuminates and the audible alarm activates.

u. Reconnect the cable; the alarms should deactivate.

NOTE

RF LO FAULT INDICATOR light will flash for a short period before extinguishing.

v. Disconnect the frequency synthesizer (associated with the downconverter under test) cable from REFERENCE FREQUENCY SYNTH IN connector J2. Observe that the RF LO and If. LO lamps illuminate and the audible alarm activates.

w. Reconnect the cable; the alarms should deactivate.

x. Repeat steps g through w above for the remaining units.

y. Set the upconverter units to the desired frequencies (para 3-15).

z. Set the downconverter units to the desired frequencies (para 3-15).

aa. Set the RF pwr monitor/control METER SELECT switch to FORWARD.

NOTE

The transmitter must be radiating into the antenna during this procedure. Be sure that the antenna is pointing away from any active satellite before proceeding with the checkout procedures. The antenna should preferably be at the zenith 900 position.

ab. Set the BEAM POWER toggle switch to ON and observe that the STANDBY indicator extinguishes and that the XMIT indicator illuminates.

ac. Set and hold the TRANSMITTER OUTPUT toggle switch to INCREASE until maximum reading is attained on the RF POWER meter.

NOTE

It must be assumed that the test translator is calibrated for a saturated output level of -110 dBm.

ad. Set all the test translator control ATTENUATION toggle switches to the down position.

ae. Set the modulator DEVIATION CONTROL selector switch to MANUAL ADJUST.

af. Set the deviation range selector switch to 60 kHz and patch the 1 Khz test tone according to figure 3-46.

ag. Set the MANUAL ADJUST selector switches for an indication of lo kHz deviation on the DEVIATION meter.

ah. Set the comm demod RECEIVE MODE selector switch to the proper position for 10-kHz frequency modulation operation.

ai. Set the TUNING mode toggle switch to AFC.

aj. Adjust the VCO MANUAL TUNING rotary control to the 5 o'clock position and observe that the VCC TUNING meter indicates a sweep of + 150 kHz from the center position.

ak. Set the beacon demod mode selector switch to NORMAL.

al. Set the TUNING MODE toggle switch to AFC.

am. Adjust the VCO MANUAL TUNING rotary controls to the 5 o'clock position and observe that the VCO TUNING meter indicates a sweep of + 150 kHz from the center position.

an. Set the test translator INJECTION SIGNAL switch to ON and INJECTION POINT switch to 3; the following indication should be observed:

(1) On the beacon demod and the comm demod that is being used, the VCO TUNING meters should stop sweeping.

(2) The comm demod SIGNAL STRENGTH meter should indicate 16+ 2 dB.

(3) The beacon demod BEACON TRACK ACQ indicator should be illuminated.

(4) The antenna control panel SIGNAL DETECT and POSITION MEMORY indicators should illuminate momentarily; the PHASE LOCK indicator should illuminate and remain illuminated.

ao. On comm demod 1A3A3 or 1A3A5, set the BASEBAND ATTENUATION toggle switches for a zero indication on the BASEBAND LEVEL meter.

ap. Verify that a constant 1 kHz tone is heard in the baseband control panel handset.

aq. Disconnect the 1 kHz test tone patch cord (fig. 3-46), and speak into the headset in a normal voice. Verify that the voice signal is heard in the headset without distortion.

ar. Substitute the remaining comm demod (fig. 3-48) and perform steps *af* through *aq* above.

as. Set the baseband amplifier baseband control panel and tty patch panel for orderwire tty operation (para. 3-16). Type a sample message using the 3,995 Hz, 3,805 Hz, and 1.275 Hz frequency shift keyers and converters, and verify that the message is accurately reproduced in each condition.

at. Set the test translator control ATTENUATION toggle switches in increasing amounts until the SIGNAL STRENGTH meter in the comm demod indicates 3 dB.

au. Verify that neither of the demodulators begins sweeping and that the antenna control panel PHASE LOCK indicator remains illuminated.

av. Set all the test translator control ATTENUATION toggle switches to the down position.

aw. Set the INJECTOR POINT switch to POSITION 1. Verify that neither comm demodulator VCO TUNING meter indicates sweeping, and the antenna control panel PHASE LOCK indicator remains illuminated.

3-22. Air Conditioner Operating Instructions

Operating information for air conditioner is provided below:

Type of air conditioning required	Thermostat setting	Intake air grille dampers	Fresh air damper door	Rotary switch position
Cooling - 100%o recirculated air	Desired temperature	Open	Closed	COOL
Cooling - with fresh makeup air	Desired temperature	Partially closed*	Open	COOL
Cooling- with fresh makeup air drawn through CB filter (outdoor air contaminated)	Desired temperature	Open	Closed	COOL
Heating - 100% recirculated air	Desired temperature	Open	Closed	LO-HEAT or HI-HEAT
Heating - with fresh makeup air	Desired temperature	Partially closed*	Open	LO-HEAT or HI-HEAT
Heating - with fresh makeup air drawn through CB filter (outdoor contaminated)	Desired air temperature	Open	Closed	LOHEAT or HI-HEAT
Ventilation - maximum outdoor air	Any	Closed	Open	VENTILATE

*Partial closing of the intake air grille dampers causes a greater portion of the total air flow to be drawn from the outside.

Section IV. OPERATION UNDER UNUSUAL CLIMATIC CONDITIONS

3-23. General

Satellite Communication Terminal AN/TSC-54 has been designed to operate under conditions of extreme cold and hot climates. The shelter and the pedestal structure offer complete protection from the elements, for personnel and equipment. However, additional precautionary measures are necessary to preclude inadvertent equipment damage or degraded operation. The precautionary measures are detailed in paragraphs 3-24, 3-25, 3-26 and 3-27.

3-24. Operation in Desert Climate

In hot, dry climates, the exposed electrical connectors, receptacles, and terminals are subject to damage from blown dirt and dust. Also, lubricants used on moving parts may be contaminated with sand and grit and accelerate parts wear by resulting abrasive action. Minimize the effects of dirt, dust, and sand by observing the following precautions:

a. Ensure that unused electrical connectors and receptacles have protective covers installed when not in use.

b. Maintain air filter screens in good condition by cleaning them frequently and immediately after duststorms.

c. Keep the shelter door closed except when entering or leaving the shelter. Close air filter doors when the equipment is not in operation.

d. Keep the antenna pedestal panels and doors doors or panels must be opened for equipment maintenance during windy conditions, erect a temporary wind baffle or position a vehicle to block the wind.

e. Do not lay any tools or parts directly on the ground; use a container or a tarpaulin. Keep all unused tools, equipment, and spare parts in their assigned storage cases and covered with a tarpaulin.

f. Be sure that equipment dust covers are serviceable and secured in place with all fasteners.

3-25. Operation In Tropical Climate

In warm, damp climates or swampy regions, the equipment is subject to damage from moisture and fungus. Observe the following precautions:

a. Frequently check the equipment for condensed moisture and fungus growths. Thoroughly wipe moisture from the exterior of the equipment within the shelter with a lint-free cloth; clean off fungus immediately.

b. Frequently check the level of the antenna pedestal to assure that uneven settling of outrigger ground pads has not occurred; be sure that ground anchor cables have not loosened excessively in rain-softened ground.

c. Avoid frequent opening and closing of the shelter door to minimize moisture condensation and water dripping at the air conditioner outlets. Wipe up moisture as a normal part of housekeeping tasks.

d. If moisture is suspected within the waveguides, operate the transmitter at reduced power (100 watts) for 1 hour, and then increase the output power in small increments over the next 3 hours to achieve the desired output power level without danger of moisture-induced waveguide arcing.

3-26. Operation in Arctic Climate

Subzero temperatures and climate conditions associated with cold weather affect the operating efficiency of equipment. Extreme cold causes cables and wires to become hard, brittle, and difficult to handle. Ice formations and snow deposits may impede normal operation of moving parts. The following precautionary measures apply:

a. Be careful when handling the power and signal cables so that kinks and unnecessary loops will not form and result in permanent damage.

b. Assure that external connectors and receptacles are kept free of frost, snow, and ice. Keep pretective covers installed on unused electrical receptacles. Never drag or place an unprotected cable connector in the snow.

c. Use the correct grade lubricant in the diesel engine of the generator set.

d. Ensure that coolant solutions in the diesel engine and transmitter heat exchanger are suitable for use in the prevailing ambient temperatures.

e. Keep wet batteries fully charged.

f. During the nonoperating periods, keep the transmitter in the standby mode.

g. Do not attempt to rotate the antenna when ice loading on it exceeds 2 inches.

3-27. Operation Under Excessive Wind Velocity Conditions.

For wind conditions exceeding 45 mph, the following precautionary or configuration changes to the AN/TSC-54 become necessary.

a. With wind velocities between 45 and 60 mph, degraded equipment performance may occur due to the difficulty in antenna tracking because of wind resistance.

(1) Rotate the antenna to the zenith 90° position and apply the elevation brake.

(2) Rotate the antenna in azimuth to the stow position and place the stow pin in the locking hold.

NOTE

The shelter may remain in an operational configuration.

b. When the winds are expected to exceed 60 mph, the terminal must be removed from service.

CAUTION

The antenna should be placed in the position shown in figure 3-59 prior to the winds reaching a velocity of 60 mph.

(1) Rotate the antenna in azimuth to face the downwind direction as shown in B, figure 3-58.

(2) Apply the azimuth brakes.

(3) Fold the antenna leaves.

(4) Check the earth anchors and properly retention them after the antenna is positioned as outlined above.

NOTE

The shelter should be left on the ground surface, but all equipment that was removed during installation must be placed inside the shelter.

c. When wind velocities are expected to exceed 80 mph, the terminal must be placed in the transport configuration. Preparation of the equipment for road transport is given in paragraph 5-3.

NOTE

If the terminal has to remain on the communication site, it should be placed in an area where falling trees are not likely to strike and damage the shelter. The wheels should be removed and the shelter lowered to the ground.

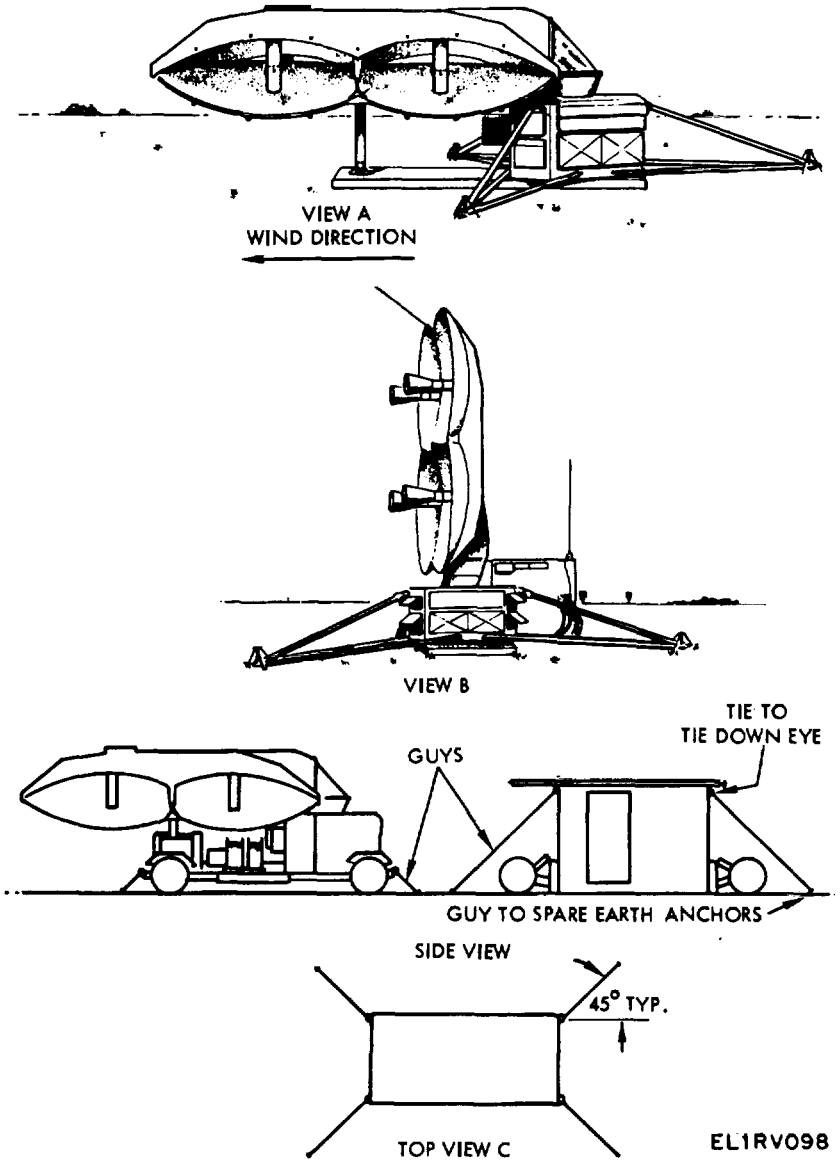


Figure 3-59. System configuration for high wind velocities.

Section V. EMERGENCY OPERATION PROCEDURES

3-28. General

Satellite Communication Terminal AN/TSC-54 may be operated under emergency conditions after certain equipment failures by using special procedures. The transmitter section of the terminal contains both a high power amplifier (HPA) and a low power amplifier (LPA) that provides a redundancy capability. If either transmitter is taken off line because of operational failure, the other transmitter may be placed on line if the mission operational requirements can be met. However, if the HPA fails at a time when mission requirements cannot be met by the LPA, perform the procedures described in paragraphs 3-29, 3-30, and 3-31. Operation under emergency conditions depends on the extent of equipment failure, the tactical situation, and the urgency of maintaining communications. The emergency operation procedures will be accomplished only upon order of the terminal Commander.

3-29. Operation After Failure of Transmitter Heat Exchanger Thermostat

When the transmitter heat exchanger thermostat fails, transmitting operations can be continued by manually engaging a thermostat override device

and then manually maintaining a coolant temperature setting. Proceed as follows:

CAUTION

Perform this procedure only when it is positively known that the thermostat has failed. Once the override device has been engaged, the heat exchanger cannot be returned to thermostat-controlled operation until the temperature control valve is disassembled and the override device reset.

a. Cut the safety wire that secures the temperature control valve manual override handle (fig. 3460). Turn the handle fully clockwise or until an audible click is heard inside the temperature control valve.

NOTE

Once the manual override is engaged, a retaining ring will drop into a handle shaft groove and the handle cannot be disengaged without disassembling the temperature control valve.

b. Turn the temperature control valve handle fully counterclockwise to a minimum coolant temperature setting; observe that the coolant temperature gage indication decreases.

c. Decrease the klystron drive power to a minimum level by holding the transmitter control panel XMIT OUTPUT toggle switch in the DECREASE position.

d. While observing the coolant temperature gage on the side of the heat exchanger, set the transmitter control panel BEAM POWER toggle switch to ON.

e. Observe that the temperature first rises and then stabilizes approximately 3 minutes after beam power has been applied. If the indicated temperature exceeds 150°F, immediately set the BEAM POWER ON-OFF toggle switch to the OFF position; if the temperature stabilizes normally below 145°F, proceed with f below.

f. Turn the temperature control value handle clockwise in small increments until the coolant temperature stabilizes at 145" F. Allow 5 minutes.

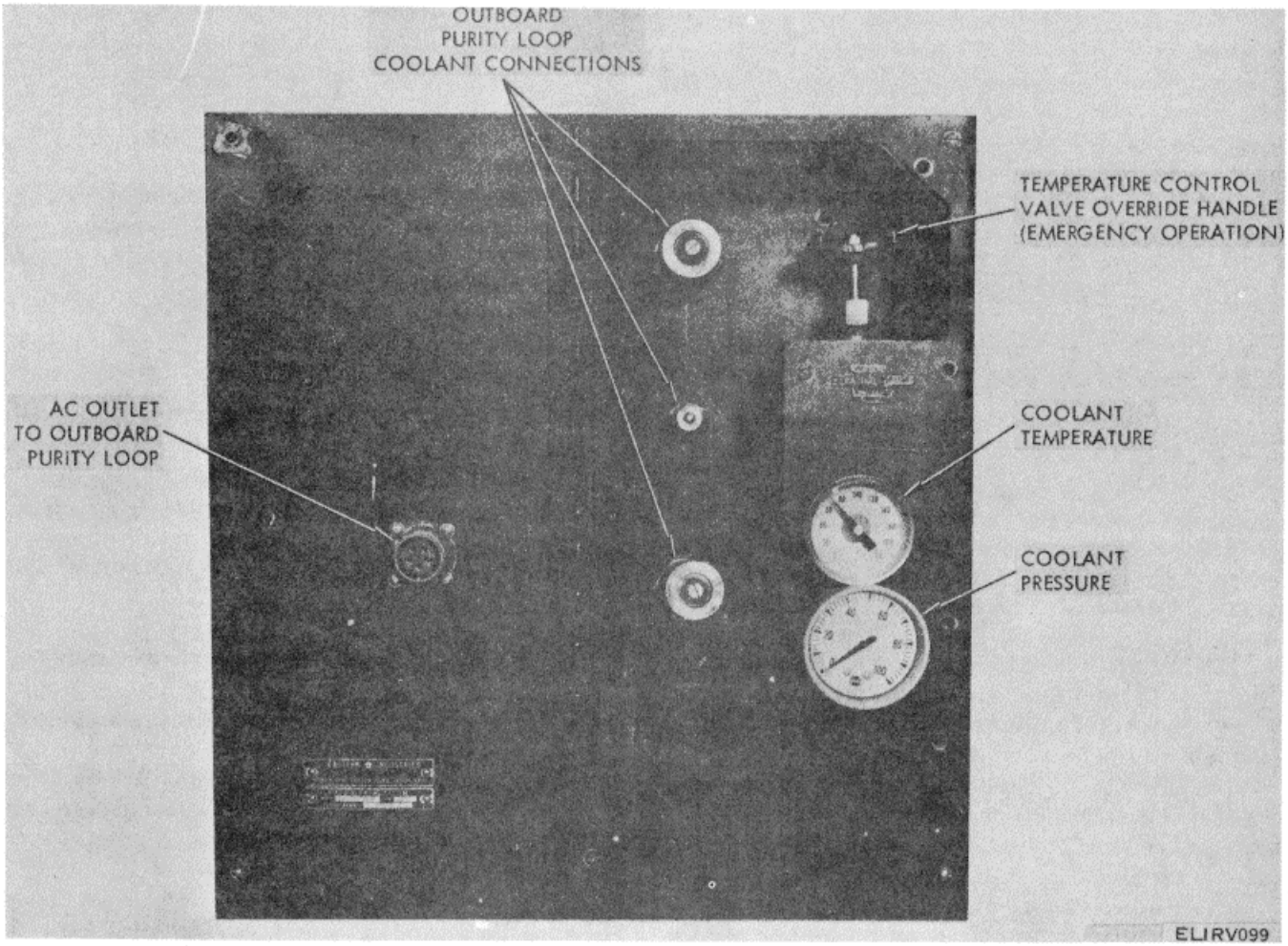


Figure 3-60. Heat exchanger temperature control valve override handle location.

for coolant temperature rise stabilization after each clockwise advance of the temperature control valve handle.

g. Increase the transmitter output power to the desired operating level. If a slight drip in coolant temperature is noted after transmitter power has been increased, do not readjust the control valve; readjust the coolant temperature setting only when transmitter power is at its minimum level.

NOTE

The automatic thermostat is now bypassed; therefore, changes in ambiant temperature will affect the heat exchanger coolant temperature. If the coolant temperature changes $^{5°}$ F. or -10° F. or more, reduce the transmitter output power to its minimum level and repeat the procedure outlined in f above to restore the coolant temperature at a 145° F. setting.

3-30. Operation After Failure of Dehydrator Unit

After failure of the dehydrator unit, in-progress transmit operations may be continued because heat from RF power dissipation with the waveguides will keep them dry. When transmit operations are to be resumed after equipment shutdown and auxiliary dry nitrogen is not available for waveguide purging, the transmitter power must be brought up slowly from its minimum level. The slowly increasing power dissipation will gradually heat-dry the air within the waveguides, thus minimizing the possibility of waveguide arcing.

a. Apply prime power and initiate normal transmitter turn on.

b. While the transmitter circuits are sequencing through normal interlock delays after the XMIT POWER toggle switch is set to ON, decrease the klystron drive power to minimum by holding the XMIT OUTPUT toggle switch in the DECREASE position.

c. After the transmitter control panel STANDBY indicator illuminates, set the BEAM POWER ON-OFF toggle switch to ON. Observe that STANDBY indicator extinguishes and the TRANSMIT indicator illuminates.

d. Use the XMIT OUTPUT toggle switch, and adjust the transmitter output power level to 100 watts. Operate the transmitter at the 100 watt level for 1 hour before proceeding with the procedure outlined in e below.

e. Periodically increase the RF power in small increments during the next 3 hours to achieve a desired output power level.

f. Resume normal transmit operations.

3-31. Operation After Failure of Motor Compressor Assembly

After failure of the waveguide pressurization motor compressor assembly, or in the event the assembly is not available; waveguide pressure can be restored or maintained as indicated below.

a. Slightly open the bleed valves located in the waveguide adapter flanges.

b. Attach the 1/4-in. diameter tube supplied between the nitrogen bottle pressure regulator and the NITROGEN INPUT on the antenna pedestal.

c. Set the DEHYDRATOR-NITROGEN valve (fig. 3-61) to NITROGEN.

d. Adjust the nitrogen regulator for 2 to 3 PS1 and purge for 1 minute.

e. Shut off the nitrogen supply and close the bleed valves.

f. Turn on the nitrogen supply and adjust the nitrogen pressure for 3/4 psig output pressure.

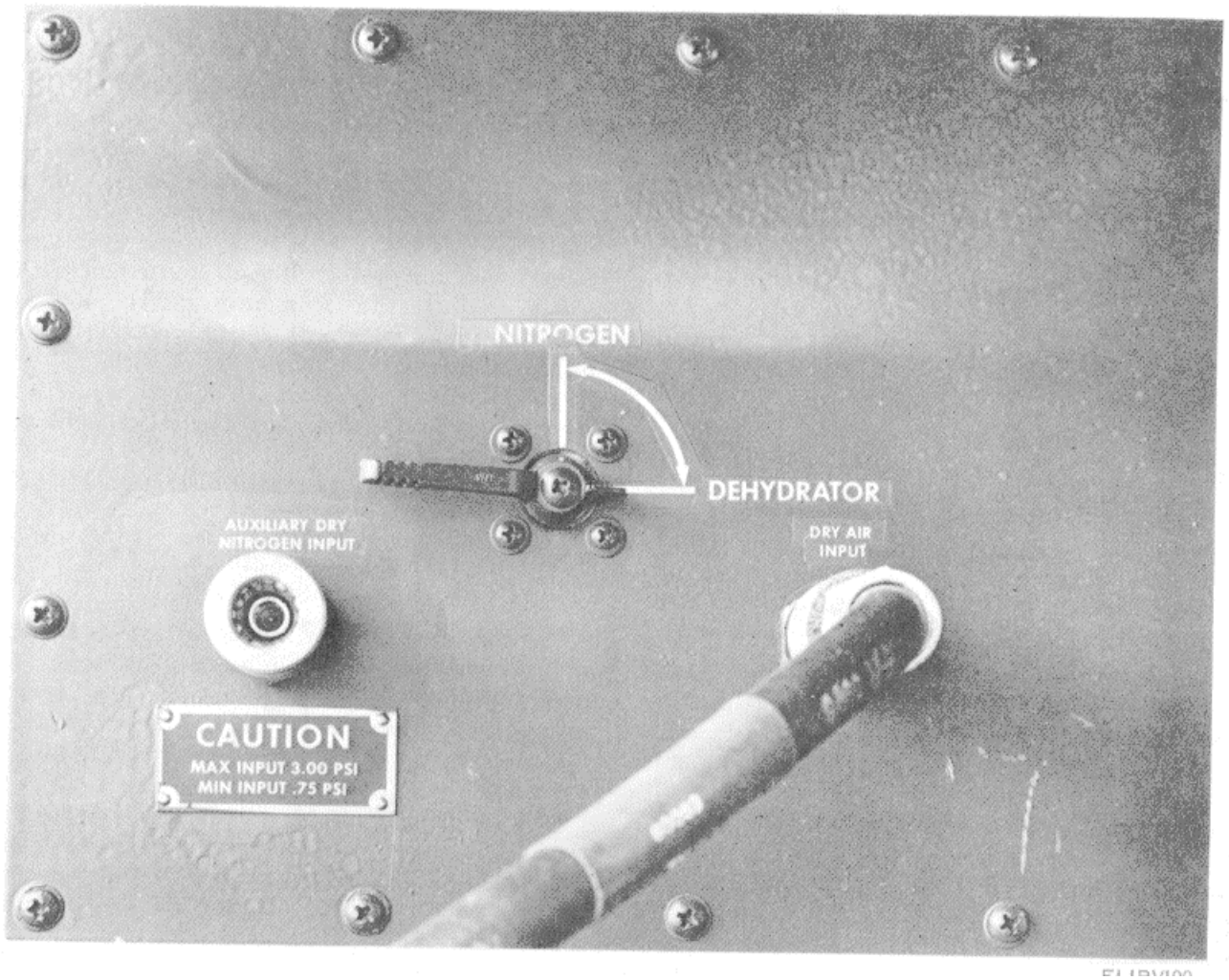


Figure 3-61. Auxiliary dry nitrogen input and control valve locations.

CHAPTER 4
OPERATOR AND ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

Section I. OPERATOR'S MAINTENANCE

4-1. Scope of Operator's Maintenance

The maintenance duties assigned to the operator of Satellite Communications Terminal AN/TSC-54 are listed below together with references to the paragraphs covering the specific maintenance functions. The duties assigned do not require tools or test equipment other than those issued with the equipment.

a. Daily preventative maintenance checks and services (para 4-5).
b. Cleaning (para 4-6).
c. Troubleshooting (para 4-11).
d. Replacement of fuses (para 4-8).
e. Replacement of indicator lamps (para 4-9).

4-2. Tools, Material, and Test Equipment Required for Operator's Maintenance.

The only tools and test equipment required for operator's maintenance are those furnished as part of the shelter. The required materials are as follows:

a. Trichloroethane (FSN 6810-664-0273).
b. Cloth, textile; cheesecloth, lint-free (FSN 8305-267-3015).
c. Grease, Graphite, (FED VV-67).
d. Lubricating Oil, General Purpose, Preservative (FED VV-L-800) (FSN 9150-273-2389).
e. Grease, Aircraft and Instrument (GL) (FSN 9150-261-8298).
f. Grease, Automotive and Artillery (MIL-G-10924).
g. Hydraulic Oil (MIL-H-5606).
h. Machine Oil, Mo. 10.
i. Brake Fluid (MIL-VV-TT-910).
j. Silicone Grease.
k. Locktite refrigerant sealant.
l. Lubricating Oil, (MIL-L-2104) (FSN 9150-265-9425).
m. Abrasive Sheet (FSN 5350-271-7939).
n. Lubricating Oil, Gear (MIL-0-6068) (FSN 9150-265-9417).
o. Grease, Aircraft and Instrument (MIL-G-23827) (FSN 9150-985-7243).

4-3. Operator's Proventive Maintenance

Preventive maintenance is the systematic care, servicing, and inspection of equipment to prevent the occurrence of trouble, to reduce downtime, and to assure that the equipment is serviceable.

a. Systematic Care. The procedures given in paragraphs 4-6 through 4-10 cover routine systematic care and cleaning essential to proper upkeep and operation of the equipment.

b. Preventive Maintenance Checks and Services (PMCS). The preventive maintenance checks and services are performed at specific intervals. These checks and services are required to maintain military electronic equipment in a combat serviceable condition; that is, in good general (physical) condition and in good operating condition. To assist operators in maintaining combat serviceability, the PMCS listings (para 4-5) indicate what to check, how to check, and the normal conditions; the references column lists the illustrations, paragraphs, or manuals that contain detailed repair or replacement procedures. If the defect cannot be remedied by the operator performing the corrective actions listed, higher category of maintenance or repair is required. Records and reports of these checks and services must be made in accordance with the requirements in TM 38-750.

4-4. Preventive Maintenance Checks and Services Periods

Preventive maintenance and services of Satellite Communications Terminal AN/'SC-54 are required daily. Paragraph 4-5 specifies checks and services that must be accomplished daily by the operator or under the special conditions listed in a and *b* below. Refer to TM 11-5895-963-12/NAVELEX 0967-LP-592-7010/TO 31R5-2G-241 for LPA preventive maintenance.

a. Mobile Installations.
(1) When the equipment is initially installed.
(2) When the equipment is reinstalled after removal for any reason.
(3) Before the start of a mission.
(4) At least once each week if the equipment is maintained in a standby condition.

b. Fixed Site Installations.
(1) When the equipment is initially installed.
(2) When the equipment is reinstalled after removal for any reason.
(3) At least once each week if the equipment is maintained in a standby condition.

4-5. Operator's Daily Preventive Maintenance Checks and Services

Sequence number	ITEM TO BE INSPECTED PROCEDURE	Reference
1	COMPLETENESS See that the equipment is complete.	
2	EXTERIOR SURFACES Clean the exterior surfaces of the equipment cases.	Para 46.
3	CONNECTORS AND BINDING POSTS Check the tightness of all power connectors and binding posts.	Fig. 2-13, 2-14, 2-15, 3-7, 3-15, 3-16 3-17, 3-23, 3-25, 3-26 and 3-35 through 3-54.
4	INSTALLATION Check that the equipment is properly installed.	Para 24 through 2-23.
5	SHELTER SKIN Check for skin punctures, tears, or open seams that would permit moisture to enter the shelter walls.	Fig. 1-6.
6	GROUNDING SYSTEM Check to see that the grounding system is properly installed. Tighten any loose ground connections.	Para 212.
7	GENERATOR SET Clean the generator set and perform the required daily maintenance checks and services.	TM 5-611636515
8	SIGNAL CABLES, WIRES, AND PATCHING CORDS Inspect the cables for fraying or damaged insulation. Inspect for defective connections with strained wires. Tighten any loose plugs and connections.	Fig. 2-12, 2-13, 2-14 2-15, 7, 3-15, 3,-24, 3-25, 3-26, and 3-35 through 3-58.
9	SHELTER LIGHTING SYSTEM Be sure the shelter lighting system is functioning properly.	
10	WASTE RECEPTACLES AND STORAGE CABINETS Empty all waste receptacles. Remove all unauthorized articles from the storage cabinets.	
11	ANCHOR CABLE TENSION INDICATORS *a.* Observe that red groove just shows. Readjust cable tension if required. *b.* Relevel pedestal if necessary	*a.* Fig. 2-22 and para 2-20 *b.* Para 2-19.
12	TERMINAL CLOCK Regulate the clock	Para 4-7.
13	FREQUENCY STANDARD Monitor operation of frequency standard and if improper refer to higher level of maintenance.	Table 3-1.
14	DIESEL FUEL See that enough fuel is available to accomplish mission.	
15	JACKS Inspect the mechanical action of each jack by inserting a plug.	
16	CANISTERS, MOUNTS, AND PEDESTAL Inspect the canisters, mounts, pedestal, and exposed metal surfaces for rust and corrosion.	
17	HARDWARE Check the condition of all supporting protuberances. Make certain that all threaded hardware is not nicked, burred, or otherwise marred.	
18	CONTROLS AND INDICATORS While makingthe operatingchecks (sequence No. 19), observe that the mechanical action of each knob, dial, and switch is smooth and free of external or internal binding and that no excessive looseness exists.	
19	OPERATION Operate the equipment according to appropriate instructions. Report any operational failure. Replace defective items for which running spares are authorized.	App. A and TM 38-750

4-6. Cleaning

Inspect the exterior of the shelter. The exterior surfaces should be free of dust, dirt, grease, and fungus. Clean the interior equipment as follows:

a. Remove dust and loose dirt with a clean, soft cloth.

WARNING

Trichloroethane is flameless and its fumes are toxic. Provide adequate ventilation. Do not use near a flame.

b. Remove grease, fungus, and ground-in dirt from the equipment cases; use a cloth dampened (not wet) with trichloroethane.

c. Remove dust or dirt from plugs and jacks with a dry brush.

d. Clean the equipment front panels, meters, and control knobs; use a soft, clean cloth. If dirt is difficult to remove, dampen the cloth with water; mild soap may be used for more effective cleaning.

e. Remove dust and dirt from the air exhaust screens with a soft brush. If dust is difficult to remove, wash the air exhaust screens with soap and water.

f. Remove dust from around terminal boards and form under other small components by using a properly shaped brush to loosen the accumulation. If available, dry compressed air may be used at a line pressure not to exceed 60 pounds-per-square-inch (PSI) to remove dust from inaccessible places; be careful however, or mechanical damage from the airblast may result.

4-7. Terminal Clock Adjustment

If daily monitoring indicates a gain or loss of time, regulate the clock as follows:

a. Remove the clock from the wall.

b. Rotate the notched wheel on the rear of the clock on notch for each 4 seconds of time lost or gained per 24 hours. Move the notched wheel toward the F if the clock is losing time and toward the S if it is gaining time.

4-8. Replacement of Fuses

Both indicating and nonindicating extractor type fuses are used in the AN/TSC-54. Fuses in extractor-type holders are released by pushing in and turning the holder caps. In each case, the fuse and cap are then removed together, a new fuse is placed in the cap, and the combination is inserted in the holder. The removal and insertion procedure is similar to that used with bayonet-type automobile lamps.

CAUTION

Never replace a fuse with one of a higher current rating. Fuse ratings are normally marked on or adjacent to each fuseholder and each rating has been carefully chosen to protect the equipment. A fuse or higher current rating will remove this protection and endanger the equipment.

4-9. Replacement of Indicator Lamps

The AN/TSC-54 equipment used in plug-in cartridge, split indicator and mechanical dimming indicator lampholders:

a. Change a lamp in a plug-in cartridge type, holder (used on the demodulators, frequency multiplier, signal data translator, etc) as follows:

(1) Unscrew the lens cap.

(2) Pull the plug-in cartridge out of the socket and discard it.

(3) Make certain the offset pins on the rear of the new cartridge are properly aligned with the socket, and then press them into place.

(4) Install the lens cap.

b. Change a lamp in a switch-indicator (used on the antenna control panel) or split-indicator (used in on line transmitter output power assembly 1A2A27A4), as follows:

(1) Grip the switch pushbutton by its recessed edges, and pull the switch-indicator out of the panel approximately ½ inch.

(2) Rotate the switch-indicator 90° counterclockwise.

(3) Depress the switch-indicator slightly to release it so that it can be pulled out to allow access to the lamp.

(4) Push the lamp out and install the replacement lamp.

(5) Place the pushbutton back into position. With the pushbutton still oriented 90° vertically as in (2) above, push in as far as possible.

(6) While maintaining slight pressure on the pushbutton, rotate it 90° clockwise and push it into the locked position.

c. Change a lamp in the mechanical dimming type holder (used on the transmitter control panel), as follows:

(1) Unscrew the lens cap which contains the lamp.

(2) Grasp the flange of the lamp and pull it out of the lens cap.

(3) Insert the replacement lamp.

(4) Install the lens cap and lamp combination into the panel.

(5) Rotate the lens cap to provide the desired light intensity.

4-10. Operator's Toubleshooting

Whenever an equipment trouble occurs, make a visual inspection of all equipment panels, controls, and cable connections before performing any

detailed troubleshooting procedures. The following visual checks should be made by the operator to determine the possible cause of malfunction:

a. Check all equipment controls for proper positioning.

b. If necessary, check to see that all patching arrangements are correctly located and secure.

c. Check for tripped circuit breakers at the shelter power distribution panels.

d. Check for blown fuses in the equipment components.

e. Perform other visual checks as indicated in the appropriate instruction manuals (app A).

f. If the trouble is not apparent or the above checks do not reveal the cause of malfunctioning, higher category of maintenance is required.

Section II. ORGANIZATIONAL MAINTENANCE

4-11. Organizational Preventive Maintenance

a. Preventive maintenance is the systematic care, inspection, and servicing of equipment to maintain it in serviceable condition, prevent breakdowns, and assure maximum operation efficiency. Preventive maintenance is the responsibility of all categories of maintenance concerned with the equipment. It includes inspection, testing, and repair or replacement of parts, subassemblies, or units that inspection and tests indicate would probably fail before the next scheduled periodic service. Preventive maintenance checks and services of Satellite Communications Terminal AN/TSC-54 at the organizational maintenance category are made monthly unless otherwise directed by the commanding officer.

b. Maintenance forms and records to be used and maintained on the equipment are specified in TM 38-750.

4-12. Organizational Monthly Maintenance

Perform the maintenance functions indicated under monthly preventive maintenance checks and services, paragraphs 4-13, once each month. A month is defined as approximately 30 calendar days of 8 hour-per-day operation. If the equipment is operated 16 hours a day, the monthly preventive maintenance checks and services should be performed at 15-day intervals. Adjustment of the maintenance interval must be made to compensate for any unusual operating conditions. Equipment maintained in a standby (ready for immediate operation) condition must have monthly preventive checks and services. Equipment in limited storage (requires service before operation) does not require monthly preventative maintenance.

4-13. Organizational Monthly Preventive Maintenance Checks and Services

Sequence number	ITEM TO BE INSPECTED PROCEDURE	Reference
1	PUBLICATIO1NS See that all publications are complete, serviceable, and current.	DA Pam 310-4
2	MODIFICATIONS Check DA Pam 310-7 to determine if new applicable MWO's have been published. All URGENT MWO's must be applied immediately. All NORMAL MWO's must be scheduled.	DA Pam 31-7 and TM 38750.
3	SPARE PARTS Check all spare parts (operator and organizational) for general condition and method of storage. No overstock should be evident and all shortages must be on valid requisitions.	
4	LUBRICATION Lubricate the equipment Para 4-15.	
5	EQUIPMENT MOUNTINGS Check to see that equipment mountings such as racks, frames, shelves, braces, and clamps are not bent, broken, or out of shape. Tighten loose bolts, nuts, and screws that hold the equipment. Replace missing bolts, screws, nuts, and washers. Replace all badly burred screws, bolts, and nuts which cannot be engaged or turned with a screwdriver or wrench.	
6	FIRST AID KIT Replace if case is broken or damaged. Replace any item that is missing.	
7	GENERATOR SET Perform the required preventative maintenance procedures.	TM 56115-365-15
8	LOCATION OF PARTS Check to see that all component parts are mounted or stowed in assigned places, except those items being used.	

Sequence number	ITEM TO BE INSPECTED PROCEDURE	Reference
9	SIGNAL AND POWER CABLES AND CORDS Dress all cables and cords neatly.	
10	DOLLY SETS *a.* Check the oil level in each hydraulic pump reservoir. Refill with hydraulic oil NIL-H-5606, or equivalent, if needed. *b.* Check the oil level in each brake master cylinder. Refill with brake fluid, MIL W-TT-910, or equivalent, if needed.	Fig. 1-5 and 1-8.
11	MISCELLANEOUS ITEMS SUCH AS DIELGUIDE CANNISTERS AND INSTALLATION TOOLS Check to see that all items not required for immediate use are properly stored.	
12	ELEVATION GEARBOX VENT VALVE Check the valve for correct position; closed when antenna is folded, opened when operating.	Fig. 220.
13	PEDESTAL AIR FILTER DOOR, CONTROL PANEL DOORS, AND ACCESS PANELS. See that the ventilating doors are closed if the transmitter is shut down, and open if the transmitter is operating. See that pedestal base access panels are in place.	
14	GASKETS Inspect waterproof gaskets for leaks and worn or loose edges.	
15	RF BOX Brush dirt from screens at each end of the RF box.	
16	SHELTER AIR FILTERS Clean air conditioner filter and rfi filters.	Para 4-18.
17	OUTRIGGERS Lubricate at grease fittingl Check leveling mechanism lubricant level and add fluid if required.	Para 4-16.
18	MAST STRUCTURE Lubricate the mast structure.	Para 4-17.
19	PEDESTAL AIR FILTERS Clean filters.	Para 4-18.
20	CABLE LAYOUT Inspect the cable layout and relocate cables as necessary so that they are not endangered by, and are not dangerous to, personnel and vehicles.	

4-14. Organizational Troubleshooting

The troubleshooting and repair work that can be performed at the organizational maintenance category is necessarily limited in scope by the tools, test equipment, replaceable parts issue, and by the existing tactical situation. Accordingly, troubleshooting is based on the performance of the equipment and the use of the senses in determining such troubles as burned out indicator lamps, fuses, and loose connections. Refer to TM 11-5896-963-12/NAVELEX 0967-LP-692-7010/TO31R5-2G-241 for LPA organizational troubleshooting.

4-15. General Lubricating Instructions

a. Lubricate the door locks and latches with grease, FED W-G-67; lubricate hinges with lubricating oil, FED VVL-800, or lubricating oil, MIL-L-2104.

CAUTION

After lubrication, always wipe away excess lubricant to prevent damage to wire insulation and other nonmetalic parts.

b. Lubricate earth anchor turnbuckle threads with a light film coating of grease, aircraft and instrument (MIL-G-23827).

c. Lubricate the engine generator as instructed in TM 5-6115-365-15.

d. Except for the wheels, and the grease fittings periodic lubrication of the dolly sets is not necessary. The lubrication schedule for the dolly sets should coincide with the maintenance schedules established for other vehicles used at the AN/TSC54 site.

4-16. Antenna Outrigger Lubrication (fig. 4-1)

Lubricate the outriggers as follows:

a. Apply grease MIL-G-10924 to the lower ends of outriggers.

b. Lubricate the balljoint at the upper end of the outriggers with No. 10 machine oil. Do not remove the quick-release pins for lubrication during preventive maintenance; these pins are not to be lubricated during system installation.

c. Remove the side plugs from the leveling mechanisms on the antenna outriggers. The lubricant levels should be at the lower edge of the hole.

d. If the lubricant level is low, remove the fill plug on top of the leveling mechanism housing and add lubricating oil MIL-L-6086 as required.

e. Replace the fill plugs.

f. Remove the protective boot from the upper end of each antenna outrigger, and wipe the jackscrews with lubricant MIL-G-23827.

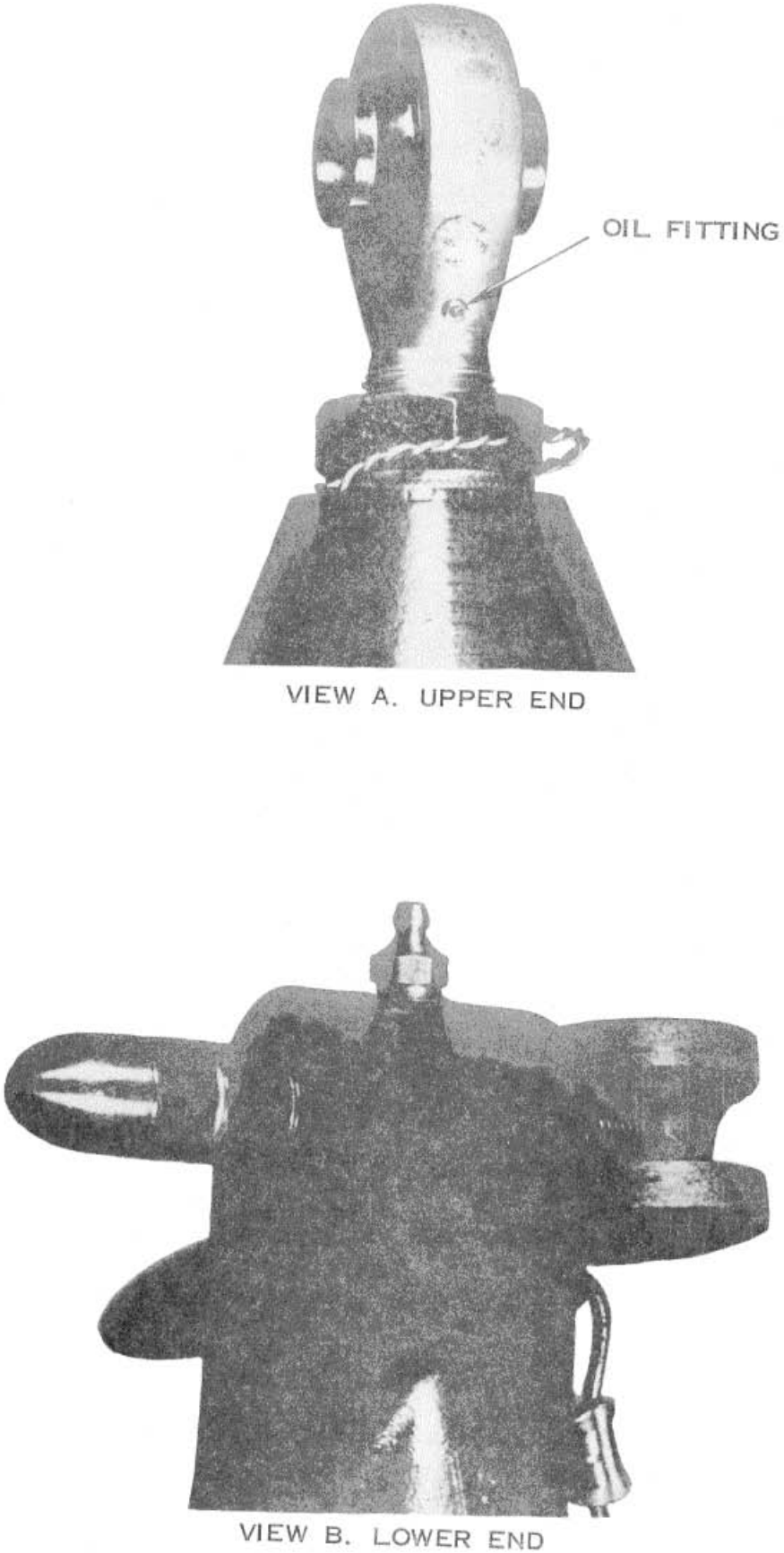


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Figure 4-1. Antenna outrigger lubrication points.

4-17. Mast Lubrication (fig 4-2)

The grease fittings, gears, and gear shafts inside the antenna mast are to be lubricated during system installation or when the mast is folded down for some other reason.

NOTE

Do not remove the quick-release pins on the mast for lubrication; these pins are to be lubricated during installation. Apply grease MIL-G-10924 to grease fittings on the outside of the mast.

4-18. Elevation Drive Gearbox Lubrication (fig. 4-3)

a. The elevation drive assembly gearbox assembly must be drained whenever the mast is lowered. In order to drain the assembly, perform the following:

(1) On the mast assembly remove access ports A2 and B1.

(2) Place an oil absorbant cloth within the mast housing directly beneath the elevation drive gearbox drain plug.

(3) Place the funnel-tube assembly through access port A2 and under the gearbox drain plug with the tube extending outside the antenna mast.

(4) While holding the funnel beneath the drain plug, remove the plug and catch the oil in the funnel.

(5) Replace plug, remove the funnel and cloth.

(6) Replace and secure access ports A2 and B1.

b. In order to refill the elevation gearbox assembly, perform the following:

(1) On the mast assembly remove access ports A2 and B1.

(2) Remove filler pipe plug.

(3) Place the tube of the funnel-type assembly through access port B1 and insert the end of the tube into oil fill tube.

(4) While holding the funnel carefully, refill the gearbox with new lubricating oil (MIL-L-6068 FSN 9150-265-9417). The elevation drive assembly will

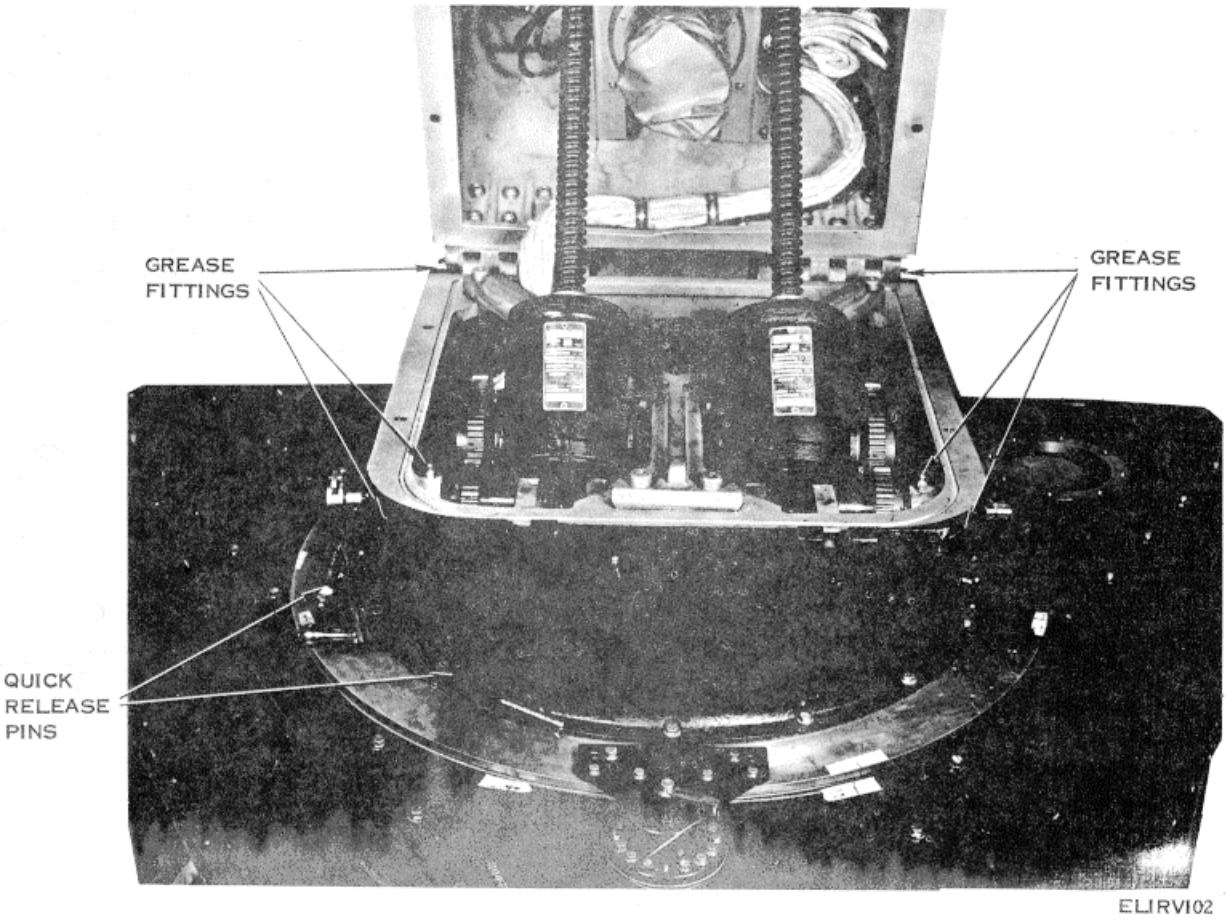

Figure 4-2. Mast lubrication points.

hold approximately one and one-half quarts of oil.

NOTE

The elevation drive gearbox is full when the oil level is at the top of the filler pipe.

(5) Remove the funnel-tube assembly from the mast and replace the filler pipe plug.

(6) Clean up any oil spillage from within or outside the mast assembly.

(7) Replace and secure access ports A2 and B1.

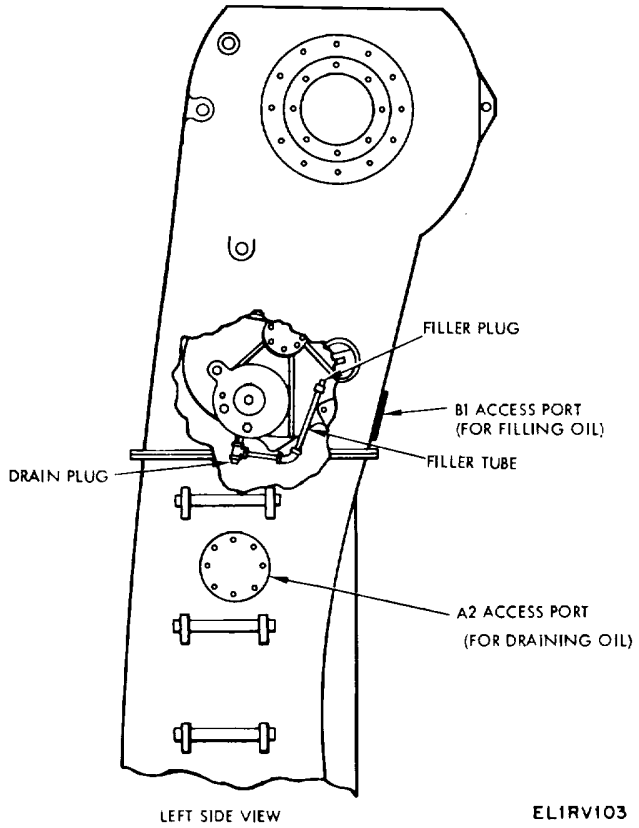

Figure 4-3. Elevation drive gearbox, location diagram.

4-19. Cleaning Air Filters

a. Loosen the wing screws which secure the cover to the compartment.

b. Remove the cover.

c. Remove the fillister-head screws which attach the louver plate to the compartment.

d. Remove the louver plate and gasket.

e. Mark the face (outside) of the filter and then remove the filter.

f. Tap the edge of the filter against the ground to remove as much dirt as possible.

WARNING

Trichloroethane is flammable and its fumes are toxic. Provide adequate ventilation. Do not use near a flame.

g. Wash the filter in trichloroethane (FSN 6810-664-0273) or soap and water; use a brush to remove the dirt from the wire mesh.

h. Place the filter face down on two supports. Let it drain and dry thoroughly before reoiling it.

CAUTION

Do not lubricate open honeycomb type filters.

i. Apply a light coat of No. 10 machine oil to the filters. Allow them to drip dry.

j. When reinserting the filter, be sure that the face (marked side) is toward the outside of the shelter.

4-20. Touchup Painting Instructions

a. Remove rust and corrosion from metal surfaces by lightly sanding them with sandpaper.

b. Brush two coats of paint on the bare metal to protect it from further corrosion. Refer to the applicable cleaning and refinishing practices specified in TB 746-10.

4-21. Maintenance of Canvas

Mildew thrives on a combination of heat, dirt, and water and although most canvas material has been treated for water and fungusproofing, it may become necessary in warm, damp climates to afford additional protection against mildew.

a. Brush all dirt and foreign matter from the canvas sun shield (if used).

b. Apply a coating of compound, textile preservative, mildew resistant, solvent type, paste form, pigments (FSN 8030-264-3840).

NOTE

One gallon of the diluted compound (with petroleum solvent) should cover 10 square yards of canvas.

CHAPTER 5
SHIPMENT, TRANSPORTATION, AND LIMITED STORAGE

Section I. SHIPPING AND TRANSPORTING DATA

5-1. General

Tactical urgency, availability of transport aircraft or tow vehicles, and other circumstances involved in relocation of the AN/TSC-54 govern the mode of transportation used. The circumstances involved in shipment vary, and therefore no definite procedures for repacking can be given. The following instructions are recommended however, as a guide for preparing the AN/TSC-54 for transportation and storage. Perform the procedures outlined in paragraphs 5-3 through 5-12 when the AN/TSC-54 is to be moved or placed in limited storage.

5-2. Transportation Data

Dimension, volume, and weight data for the various shipping configurations of the AN/TSC-54 units are given in a, b, and c below; the center-of-gravity points of the shelter and the antenna are shown in figure 5-1. Specific procedures for handling the equipment under the various shipping methods that can be used are detailed in paragraphs 5-3 through 5-11. Limited storage of the AN/TSC-54 is included in paragraph 5-12.

a. Shipping Data for Road Transport

Unit	Dimensions Height	Length	Width	Volume (cu ft)	Weight (lb)
Shelter (wheels on)	8’10"	17’6"	8’	1,252.34	7,540
Antenna carrier (wheels on)	8’10"	23’6"	8’	1,141.73	7,360
Fuel tanks				385 gallons plus contents of fuel tank in diesel engine.	3,000

b. Shipping Data for C-130E Transport.

Unit	Dimensions Height	Length	Width	Volume (cu ft)	Weight (lb)
Shelter (wheels on)	7’8"	17’6"	8’	1,041.68	7,540
Antenna carrier (wheels on)	8’10"	23’6"	8’	1,141.73	7,360
Fuel tanks				385 gallons plus contents of full tank in diesel engine.	3,000

c. Shipping Data for Helicopter Airlift.

Unit	Dimensions Height	Length	Width	Volume (cu ft)	Weight (lb)
Shelter (wheels off)	7’8"	15'5"	7'4"		
Antenna carrier (wheels off)	8’10"	23’6"	7' 11½”	1,033.44	6,168
Fuel tanks				385 gallons plus contents of full tank in diesel engine.	3,000

5-3. Equipment Preparation for Road Transport

Preparation of Satellite Communication Terminal AN/TSC-54 for road transport are given in a through m below. Since the AN/TSC-54 may require road transport from a site following a helicopter delivery, procedures are also included for installation of the equipment dolly sets. Shelter handling details are illustrated in figure 5-2.

a. Disassembly of Antenna Carrier.

(1) Rotate the antenna to within a few degrees of the azimuth stowing position.

(2) Install the stowlock plate with the two quick-release pins.

(3) Use the handcrank and position the antenna so that the stowlock quick-release pin can be inserted into the locking hold (fig. 2-9).

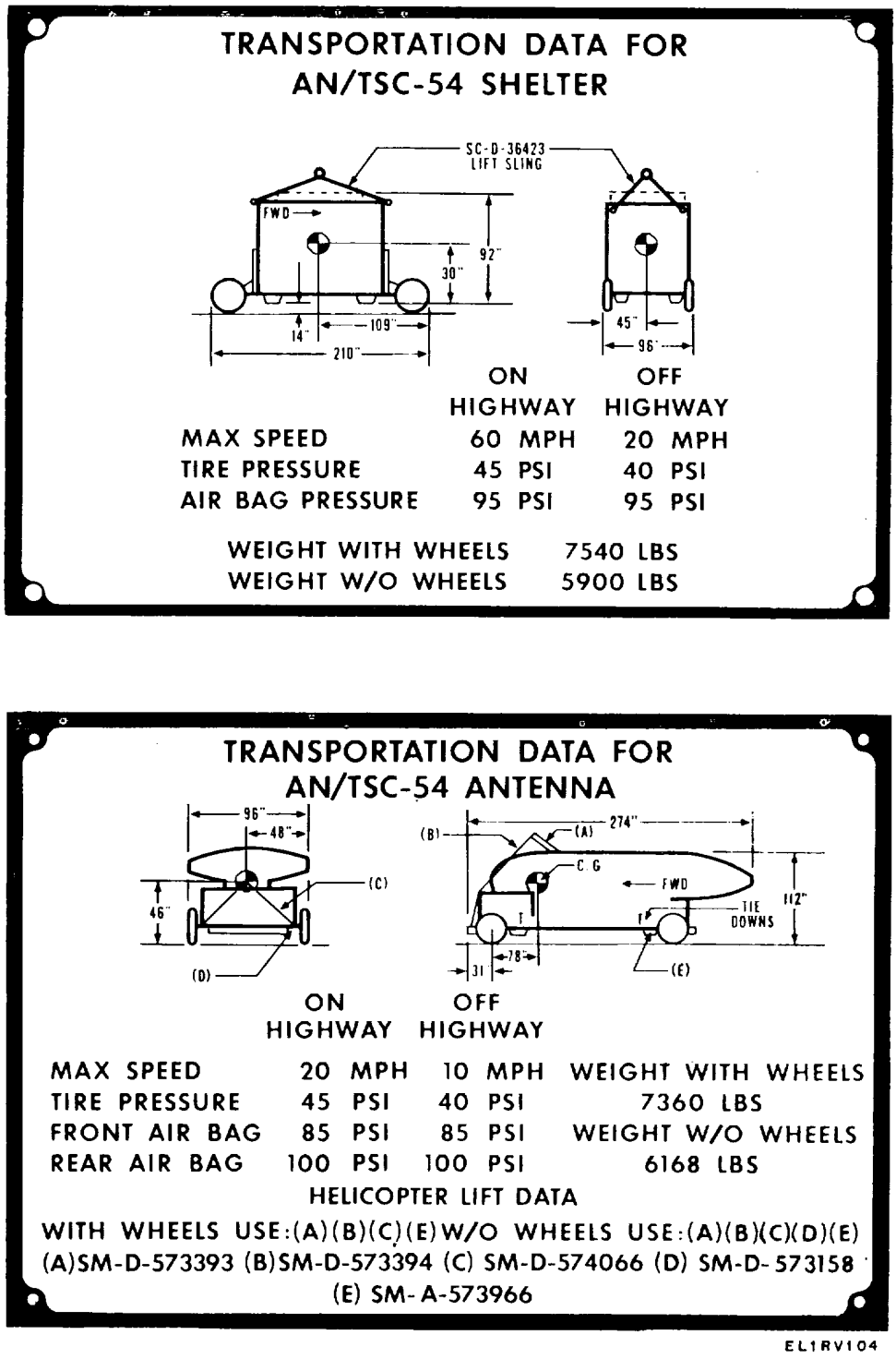

Figure 5-1. AN/TSC-54 transportation data.

(4) Lower the antenna to its electrical lowelevation limit.

(5) Turn off the system power except pedestal prime power and utility power, as follows:

(a) Set all power supply panel switches to OFF.

(b) Place all power distribution assembly (fig. 3-29, sheet 2) circuit breakers to OFF.

(c) Deactivate the power distribution panel assembly (fig. 3-29) SENSITIVE POWER and CONSOLE POWER circuit breakers.

(d) Deactivate the AN/URC-61 circuit breaker.

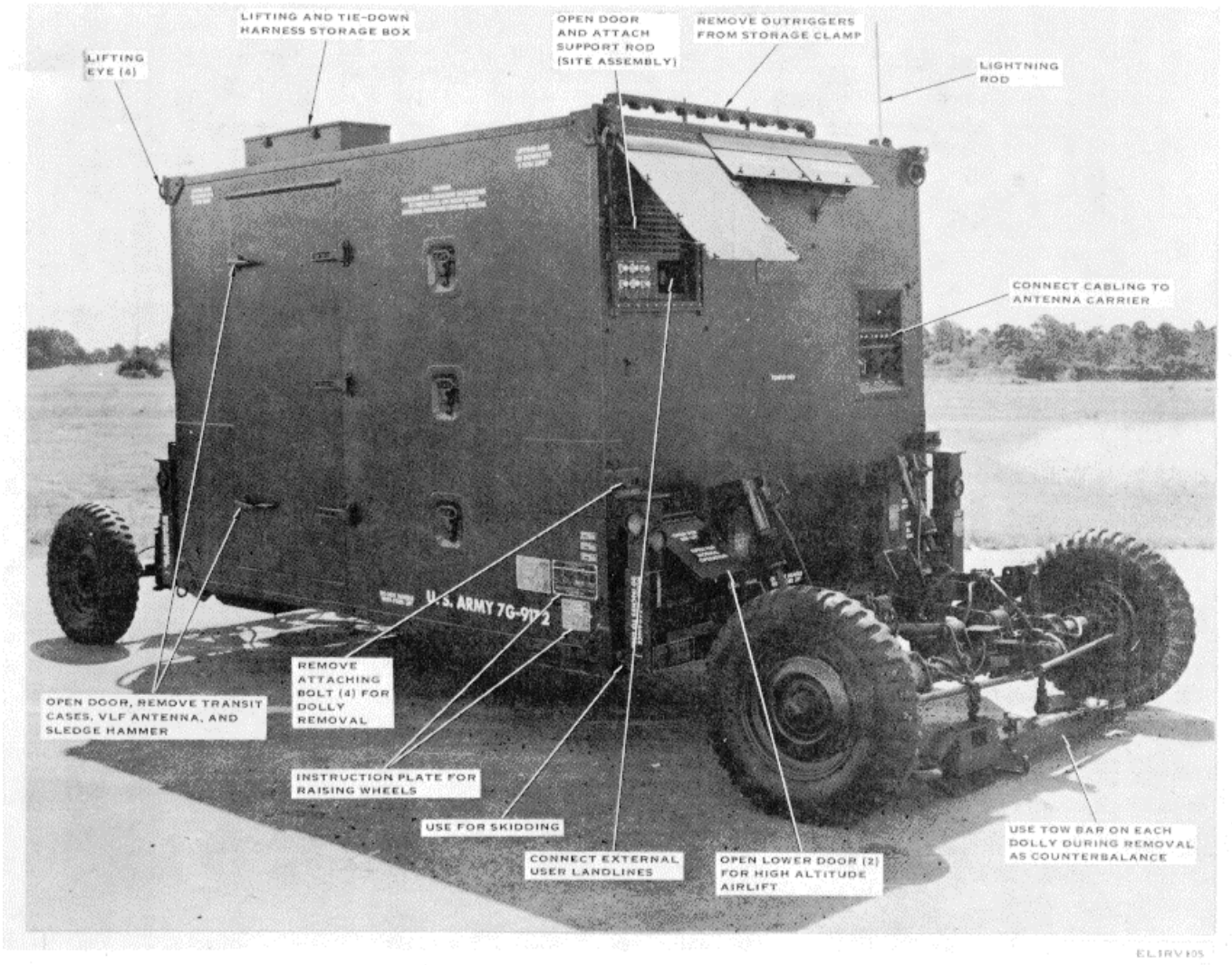

Figure 5-2. Equipment shelter handling details.

(e) Deactivate the AIR COND, SHELTER LIGHTS, and both OUTLETS circuit breakers.

(*f*) Use the key and turn the CRITICAL POWER ON-OFF keyswitch on the power distribution panel (fig. 3-5) to OFF.

(g) Set the antenna control panel (fig. 3-6) 400 CPS REF toggle switch to OFF.

(h) Place all primary power distribution panel (fig. 3-32) circuit breakers to OFF except the two UTILITY OUTLET circuit breakers.

(6) Disconnect all power and signal cables from the antenna pedestal except prime power cable W13 and the grounding strap and move them clear of the antenna carrier platform.

(7) Obtain the handcrank from its assigned storage space and climb the mast. Turn the elevation gearbox vent valve (fig. 2-20) to the CLOSED position.

(8) Release the elevation brake as illustrated in figure 5-3, and crank the antenna down to the mechanical stop.

(9) Engage and lock the elevation brake.

b. Folding the Antenna.

(1) Remove the quick-release pins (fig. 2-9) that fasten the mast structure to the pedestal.

(2) Use the electric drill with the socket and adapter and lower the mast down antenna to the lowest horizontal position.

(3) Obtain the protective canisters from storage in the DIELGUIDE storage containers.

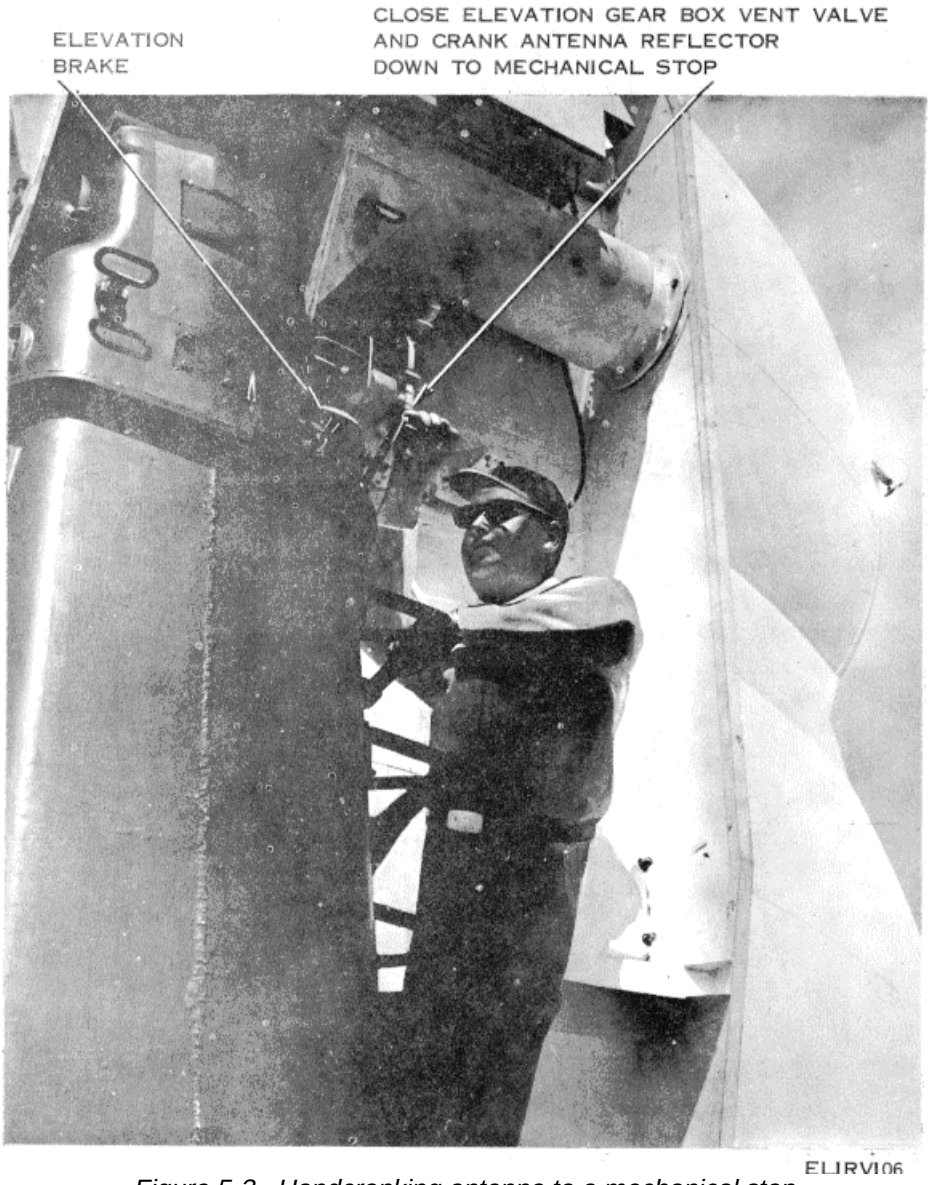

Figure 5-3. Handcranking antenna to a mechanical stop.

CAUTION

Be sure that cable brackets in the DIELGUIDE storage containers do not contact the DIELGUIDE: the DIELGUIDE may be damaged.

(4) Remove the DIELGUIDE and use the DIELGUIDE carrying handles for carrying the DIELGUIDES. Store two DIELGUIDES in each storage container.

(5) Install the protective canisters on the feedhorns.

(6) Unscrew the lightning rod from its holder (B, fig. 2-19) and place it in the assigned storage location on the platform (fig. 2-3).

(7) With two men holding each antenna leaf, unlatch the latching mechanisms on the reflector (reverse procedure of that shown in B, fig. 2-18).

(8) Raise the mast to the same position (about 60°) used in the installation procedure (fig. 2-17).

(9) Fold in the right and left reflector sections.

(10)Insert the bottom fold-lock quick-release pin.

(11)Crank down the mast until the top fold-lock pin can be inserted. Leave clearance beneath the folded antenna to facilitate latching the platform *(c* below).

c. Pedesal-to-Platform Latching and Installation

of Antenna Support Post.

(1) Remove enough pedestal base access panels to permit a thorough visual inspection for loose hardware and tools.

(2) Loosen the waveguide clamps securing the flexible waveguide between LPA and pedestal. This will permit a slight movement of the waveguide during transit and reduce the possibility of damage. (The pedestal is loose mounted to the platform and movement must be permitted. Refer to LPA enclosure 2All removal illustration in TM 11-5895-389-34-3/NAVELEX 0967-LP-377-7021/TO 31R5-2TSC54-22-2.)

(3) Replace the access panels ((1) above) and close all ventilating doors and the transmitter control panel door.

(4) Turn the red valve under the heat exchanger to the CLOSED position

.

(5) Check the platform alignment with the pedestal for the pedestal latching position (fig. 5-4).

CAUTION

Disconnect all the remaining cables and the grounding straps from the pedestal, generator set, and shelter. DO NOT remove the ground rods.

(6) Loosen the tension on the earth anchor cables (fig. 2-21) until the shacklebolt can be detached from each earth anchor cable.

NOTE

Do not try to recover the earth anchors, they are expendable.

(7) Station one man at each main outrigger. jack screw handle and slowly lower the pedestal (always keeping the pedestal level) to within ¼s inch of the antenna carrier.

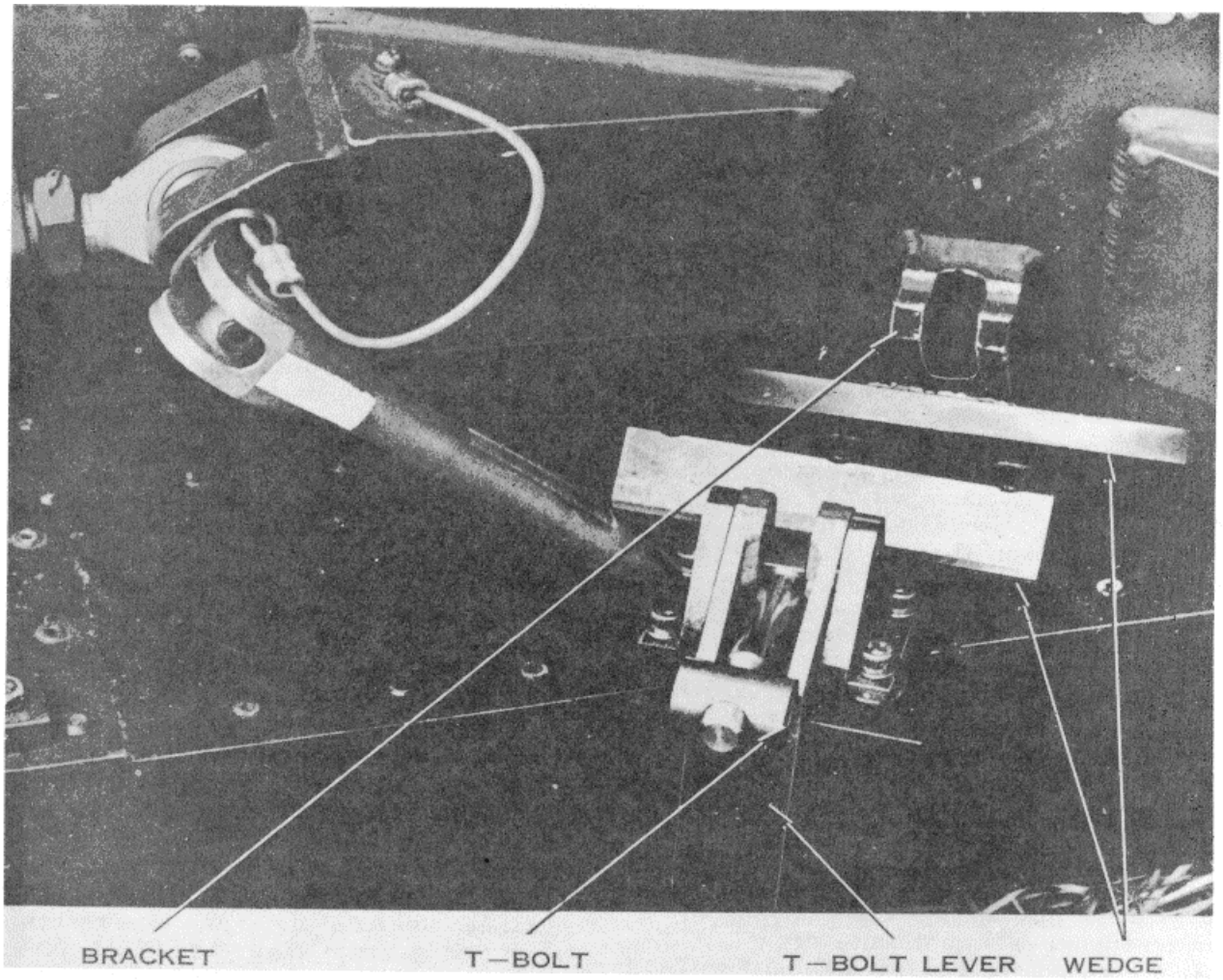

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Figure 5-4. Antenna pedestal-to-platforrn latching details. 5-5

CAUTION

The weight of the pedestal must be properly supported by the outriggers. Failure to do so can cause serious damage to the equipment.

(8) Latch the carrier to the pedestal as illustrated on figure 5-4 in the following manner:

(a) Use the row rings attached to the tie down rings and move the platform until the wedge surfaces are alined

(b) Raise the T-bolt lever and engage the T-bolt into the bracket slots.

(c) Depress the lever to lock the pedestal base to the platform.

(9) Attach the antenna mast support post to the carrier.

(10) Raise the antenna mast support post into position for attachment to the antenna. It may be necessary to raise the mast for the clearance required if the mast was previously lowered too far.

(11) Position the antenna support post and carefully lower the mast until the support post latch can be engaged (fig. 2-16).

(12) Check the antenna carrier surface at the latch under the heat exchanger to insure that the surface is level. Raise or lower the mast to make the carrier surface level.

(13) Install the protective cover over the antenna fold joint.

CAUTION

The EMERGENCY OFF pushbutton switch is normally used when the heat exchanger is not operating. It should be used with discretion or possible damage to the transmitter may result.

(14) Depress the EMERGENCY OFF pushbutton switch on the side of the pedestal power distribution panel.

(15) Shut down the diesel generator. Refer to the appropriate instruction manual (app A) for the detailed shutdown procedure.

d. Removal of Antenna Pedestal Outrigger Assembly.

(1) Retract all three center outrigger sections so that the base plates are off the ground.

(2) Remove each side outrigger section and then the center outrigger section.

CAUTION

Be careful with the quick-release pins to assure they are kept clean. After removal insert them back into the sleeves.

(3) On each outrigger base plate, fold down the earth anchor tiedown post and secure it to the base plate with the attached pin.

(4) Fold the baseplate against the outrigger and secure it to the outrigger with the attached pin.

(5) Store the outriggers on the shelter roof.

e. Installation of Antenna Dolly Set on Carrier Platform.

(1) Obtain the hydraulic jacks from their storage location. Place one jack under each rear jack pad of the antenna carrier platform.

NOTE

Always keep the carrier level when raising or lowering with the hydraulic jacks.

(2) Raise the rear of the antenna carrier platform enough to allow the rear wheels to be rolled in place and secured to the rear of the carrier with the securing pins (B and C, fig. 2-7).

(3) Obtain the two rear shock absorbers and slide them into place on the shock pad plate at each wheel. Secure each shock absorber to the plate with the attached pin.

(4) By adjusting the level of the carrier with the hydraulic jacks, locate and tighten the shock absorber alignment bolts to the carrier (one on each side).

(5) Secure each shock absorber to the carrier with the attached bolts (A, fig. 2-7).

(6) When both rear shock absorbers are secured, slowly lower the carrier onto the rear wheels and apply the rear brakes.

(7) Remove the shock pad from under the rear of the carrier and attach it to one side of the carrier (fig. 2-6).

(8) Remove the hydraulic jacks from under the rearjack pads and place them under the front jack pads.

(9) Install the front wheels; follow the procedure outlined in (2) through (5) above.

(10) Uncoil the stoplight and brake cables from the right front wheel fender (fig. 5-6) and attach them to the rear wheels.

(11) Check the antenna carrier surface at the latch under the heat exchanger to be sure the surface is level. Raise or lower the jacks, as necessary, to make the carrier surface level.

f. Equipment Storage and Carrier Checkout.

(1) Secure the lightning and driving rods, with the fastening straps, to the antenna carrier platform (fig. 2-3).

(2) Account for all items, except those discarded as expendable, and store them in the transit case shown in figure 1-13.

(3) Close and latch the transit case.

(4) Account for all items and store them in the transit case shown in figure 1-12.

(5) Close and latch the transit case.

(6) Account for all DIELGUIDEs and store them in the storage containers.

(7) Close and latch the DIELGUIDE storage container (fig. 1-11).

(8) Store and secure the transit cases and DIELGUIDE storage containers (fig. 2-3).

(9) Coil all cables onto the cable reels; secure the cable reels on the antenna carrier platform.

(10) Be sure the air pressure in the shock absorbers and the tires of the dolly set are correct.

(11) Check the dolly set stoplight and brakes after the antenna carrier has been connected to the towing vehicle.

(12) Install the shipping tie down (SCD-D-36962) as follows:

(a) Attach the eye block of the shipping tie down assembly to the rear center outrigger attachment point near the top rear of the pedestal using the outrigger quick-release pin (fig. 5-5).

(b) Attach each turn buckle hook of the shipping tie down assembly to the respective safety chain ring on the front axle of the dolly set.

(c) Tighten each turn buckle until the assemble is snug.

g. Removal and Storage of Air Conditioner.

(1) Disconnect the air conditioner primary power plug from the bottom-left side of the air conditioner.

NOTE

Before removing-any mounting screws from the flange securing the air conditioner to the shelter, ensure that adequate personnel or equipment handling device(s) are available to lift and maneuver the air' conditioner (approximate weight, with mounting flange, 270 pounds). Failure to observe this warning may result in serious injury or death to personnel.

(2) Position personnel on the outside of the shelter such that they can support the total weight of the air conditioner.

(3) Loosen, but do not remove, all screws securing the mounting flange to the shelter except the bottom three (see fig. 3-1).

(4) Loosen the bottom three screws slightly and remove the top five screws so that the support bracket (angle iron beneath flange) begins to support the load.

(5) Alternately loosen the two remaining screws above the bottom flange and the three bottom-flange screws until the air conditioner can be tilted away from the shelter far enough to pass the ends of a safety strap through the opening between the flange and the picture-frame opening near the top of the air conditioner.

(6) Position two men inside the shelter; one on each-end of the safety strap.

(7) With personnel outside of the shelter remaining in position to support the weight of the air conditioner, remove all remaining screws from the mounting flange.

(8) With the bottom flange firmly held against the support bracket and the side of the shelter, remove all remaining screws from the mounting flange and slowly tilt the air conditioner back away from the shelter while personnel inside the shelter playout the safety strap such that it supports part of the load.

(9) Continue to playout the safety strap until the air conditioner is tilted back far enough for personnel positioned outside to reach the top of the air conditioner.

(10) With the aid of personnel holding the bottom of the air conditioner, lower it to the ground.

(11) Rotate the air conditioner 180° so that the back is facing the picture-frame opening in the side of the shelter (the mounting flange away from the shelter).

(12) With two men grasping the top, the air conditioner as though it would come to rest flange down on the ground until two additional men can grasp the bottom near the end.

(13) Raise the air conditioner in the tilted position, and move the bottom portion through the picture window opening and let the bottom come to rest on the bottom of the window.

CAUTION

Before bringing the air conditioner to the full vertical position, personnel should be positioned inside the shelter to maneuver it in order to avoid damaging equipment mounted in the 1A2 rack.

(14) Tilt the air conditioner upward until it comes to the full vertical position and carefully push it forward until the mounting flange is flush against the side of the shelter and hold firmly in that position.

(15) Place weather cover over the front of the air conditioner and align the mounting holes to match the mounting-flange holes.

(16) Insert the mounting bolts and tighten securely.

h. Equipment Stowage in OCV Interior.

(1) Store and secure the folding chairs and tables.

(2) Remove all patching cables from the tty and baseband patch panels. Store the patching cables, instructions manuals, and charts in storage drawer 1A3A18.

(3) Insure that the sledge hammer, broom, dustpan, axe, and first aid kit are secured properly in the shelter door.

(4) Store the local orderwire telephone handsets in the baseband control panel storage compartment.

(5) Secure the orderwlre handset to the front panel with the strap.

(6) Check each console to insure that all drawers are securely fastened. If shelter heating by equipment power dissipation was used, make sure that the blank panel that was removed for this type of heating is replaced.

(7) Check the contents of each transit case that is stored in the OCV.

(8) Store and secure the equipment to the floor with the straps that were removed from the storage drawer.

(9) Thoroughly check the OCV for loose items.

i. Preparation of OCV Exterior.

(1) Disconnect the external user landlines from the external signal distribution box. Move the landlines clear of the OCV.

(2) Check to see that primary power and signal cables are disconnected.

(3) Close all ventilating doors.

NOTE

If the OCV was delivered to the site by helicopter airlift, attach the shelter dolly set.

(4) Raise the level to road clearance (k below).

(5) Connect the intervehicular lines to the towing vehicle.

(6) Check the brakes, lights, and tire pressure. If tire pressure has been reduced to 20 psi, inflate to 45 psi for over-the-road transport.

(7) Close and lock the OCV door.

j. Shelter Dolly Set Installation.

(1) Tow the transportable shelter dolly set from its storage area to the shelter position.

(2) Apply the parking brakes at the rear dolly assembly.

(3) Disconnect the safety chains, towing bar, electrical cable connector, and airhose connector from the towing vehicle.

(4) Disconnect the airhose on the towing bar.

(5) Coil the electrical cable and the air hoses on the front dolly assembly chassis.

(6) Use the lifting handles to raise the towing bar and secure it in the upright position.

(7) Open the four hydraulic line shutoff valves and two main valves and allow the lifting jacks to retract until the torque tube assemblies rest on the ground.

(8) Remove the mounting bolts that secure the upper torque tube arms to the spacing blocks, and remove the spacing blocks. Place the spacing blocks in the storage compartment.

(9) Remove the coupling clamps from the torque tube mounting tongues and place them in the stowage compartment.

(10) Lower the towing bar by the lifting handles. after releasing the spring-loaded catch.

(11) Have two men use the towing bar to roll the front dolly assembly to the front of the shelter.

(12) Place the dolly assembly so the outer torque tube arms rest against the corners of the shelter and the mounting tongues on the inner arms are in the recesses in the two adapter brackets on the bottom of the shelter.

(13) Using the towing bar as a lever, lift the torque tube assembly until the mounting tongues are completely engaged in the shelter mounting bracket grooves.

(14) Open both hydraulic line valves and close the main pump valve.

(15) Actuate the pump and raise both lifting jacks until the torque arms rest firmly against the shelter pads at the corner of the shelter and install the mounting bolts.

(16) Remove the quick-release pin that is securing the tow bar to the front dolly.

(17) Remove the two bar and install the bar on the rear dolly.

(18) Release the parking brakes on the rear dolly assembly.

(19) Repeat the instructions specified in (12), (13), and (14) above, except substitute the rear dolly assembly for the front dolly assembly and the rear of the shelter for the front of the shelter.

(20) Reapply the parking brakes.

(21) Remove the two bar from the rear dolly assembly and install it on the front dolly assembly.

CAUTION

Do not elevate the tow bar to the raised position until the shelter is in the raised position.

(22) Connect the airhose to the tow bar, and attach the airhose connector temporarily to the storage clamp on the tow bar.

k. Raising and Leveling Shelter.

(1) Be sure the wheel-equipped shelter is setting on a level ground surface or pavement, and visually check the shelter level.

(2) Set the parking brakes on the rear wheels.

CAUTION

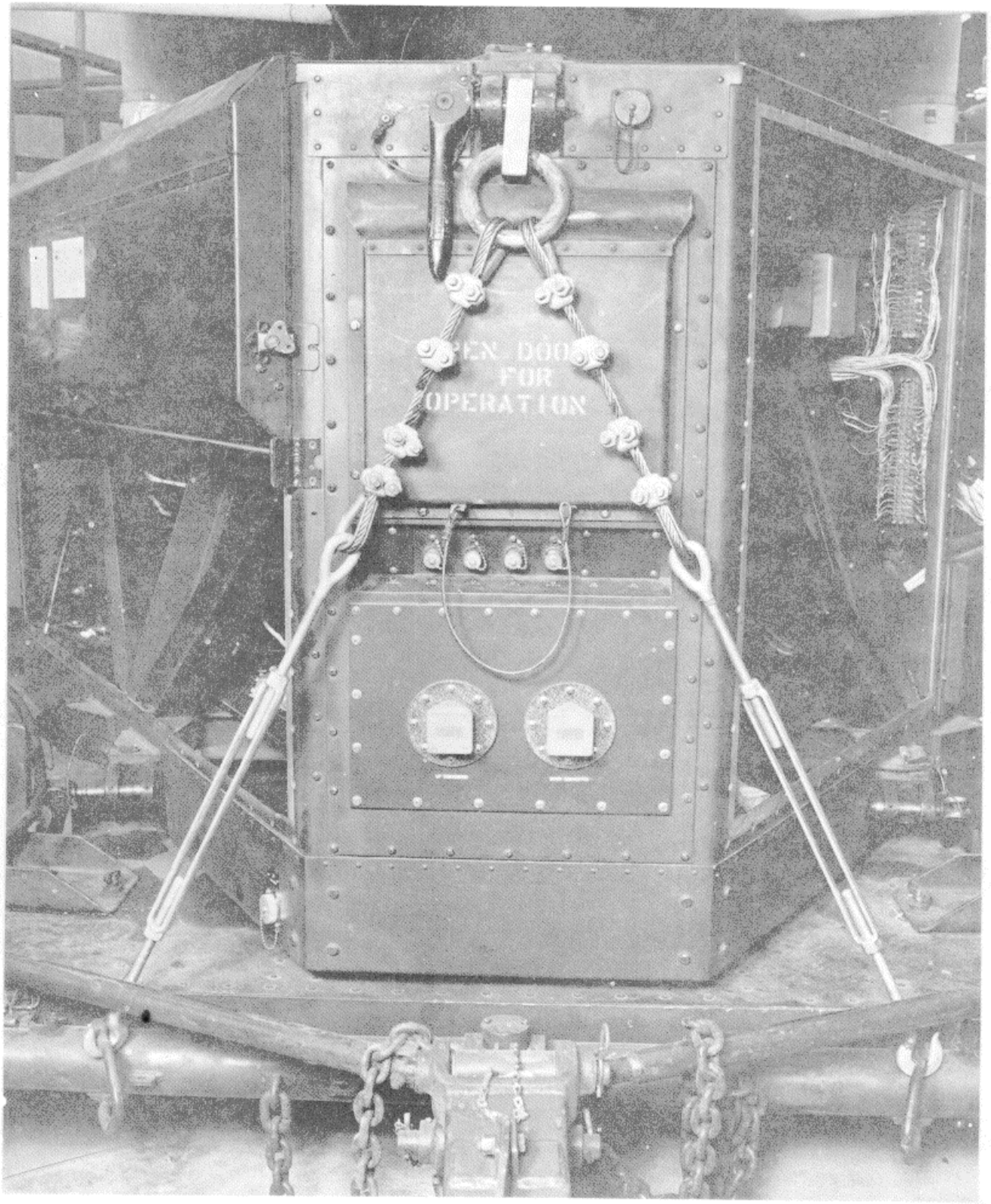
Do not start raising the shelter unless both dolly assemblies are installed and secured.

(3) Close the two main hydraulic valves and open the four line valves (fig. 5-6).

(4) Actuate both hydraulic pumps simultaneously until the shelter is raised slightly higher than the desired clearance height.

NOTE

The shelter can be leveled best by lowering the high points rather than raising the low points. Normal ground clearance



ELIRV108

Figure 5-5. Shipping tiedown installation.

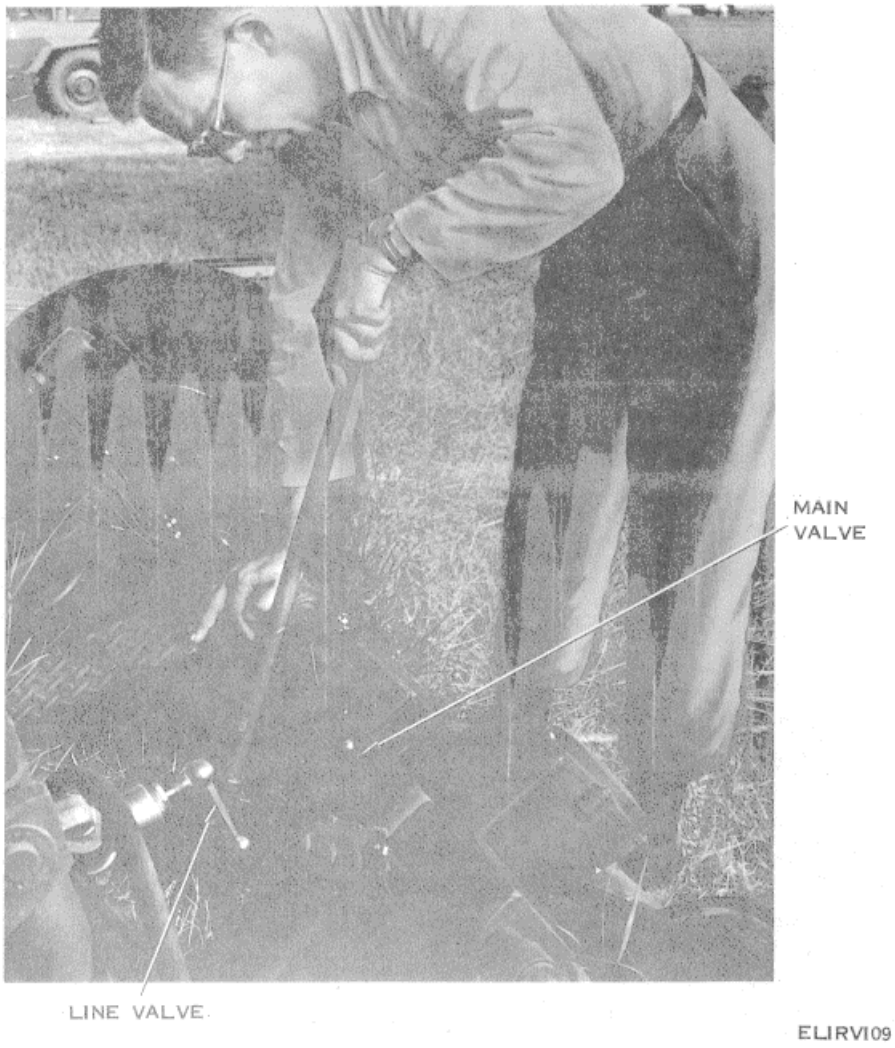


Figure 5-6. Shelter raising procedures

for road transport is 14 inches from the bottom of the shelter skids. A clearance of 17 inches is required only when 20° ramp angles are involved.

(5) Level the shelter lengthwise by first opening the two hydraulic line valves at the higher end of the shelter, and then opening the main valve, at the front of the hydraulic handpump housing, to lower the shelter. Be careful when opening the main valve so that the shelter is lowered slowly.

(6) Close all valves when the shelter is leveled lengthwise.

(7) Turn the yellow locknuts, on the low side of the shelter, up against the jack housing.

(8) Level the shelter transversely by first opening the hydraulic line valves leading to the jacks on the high side of the shelter.

(9) Open the main valve slowly until the shelter is level.

CAUTION

Be careful not to open the main valve too far because the hydraulic jack may collapse suddenly.

(10) Close all valves and raise the remaining yellow locknuts to the hydraulic jack casings.

l. Generator Set Preparation. Prepare the generator set for over-the-road transport in accordance with the instructions given in the appropriate instruction manual.

m. Preparation of Fuel Tank and Fuel Line.

(1) Remove and store the fuel lines.

(2) Prepare the diesel fuel tanks for transport in accordance with standard military procedure for over-the-road transport.

(3) Load the fuel tanks into the appropriate cargo trucks.

5-4. Equipment Preparation for Long-Haul Transport

Normally, the AN/TSC-54 units are in the over-the-road transport configuration with dolly sets installed when loaded into the aircraft. All the units are loaded (towed-end forward) against the right-hand wall of the aircraft to provide maximum space forward and aft, and to leave a afoot aisle on the left side of the cargo compartment. Figure 5-7 shows the AN/TSC-54 layout in the cargo compartment of the C130E aircraft. Equipment preparation, loading, and unloading procedures are given in a through i below.

a. Disassemble and prepare the antenna-receiver-transmitter group and electronic equipment shelter for shipment as described in paragraph 5-3.

b. Prepare the generator set for air shipment according to instructions in the appropriate instruction manual.

c. Move the AN/TSC-54 units to the aircraft loading area. Position the units for loading in the following order:

(1) Shelter.
(2) Generator set.
(3) Antenna carrier.
(4) Fuel tanks.

d. Use the aircraft winch to pull the shelter (fig. 5-8) to the designated location in the cargo compartment.

e. Remove the dolly set tongue, and slowly roll the shelter forward until its front wheels touch the forward bulkhead.

f. Lower the shelter to the floor as follows:

(1) Retract the yellow locknuts at the four hydraulic lifting jacks on the dolly set.

(2) Slowly open the line valve (fig. 5-6) on each hydraulic lifting jack to. allow the pressure to equalize.

(3) With a man at each axle, carefully open the two main hydraulic valves, and slowly lower the shelter until its skids rest on the floor.

(4) Tie down the shelter (para 5-5).

NOTE

In the wheels-up position or when close-coupled without the shelter installed, the dolly set tire pressure can be reduced to 20 psi. For loaded conditions, the tire pressure should be maintained at 45 psi.

(5) After the shelter is properly located, lowered, and tied down, load one diesel fuel tank immediately behind the right rear wheel of the shelter.

(6) Secure the fuel tank with tiedown straps.

g. The generator set is loaded directly behind the shelter as follows:

(1) Roll the generator set up the aircraft loading ramp (fig. 5-9).

(2) Carefully pull the generator set forward in the cargo compartment until the third wheel support touches the shelter dolly set rear axle.

(3) Place a wooden bearing plate beneath the third wheel to distribute the wheel weight over a larger area of cargo floor.

(4) Tie down the generator set (para 5-5).

h. Carefully roll the antenna carrier up the aircraft loading ramp (A, fig. 5-10) and locate the front end of the carrier within 1 inch of the generator set (g above).

NOTE

The center of the rear dolly assembly wheels should be approximately 12 inches forward of the loading ramp hinge line.

i. Tie down the antenna carrier (para 5-5).

j. Raise the loading ramp to its horizontal position.

k. Load the diesel fuel tanks onto the ramp and arrange them in three rows of two drums each centered between the rear wheels of the antenna dolly set (B, fig. 5-10).

5-5. Equipment Tiedown

WARNING

During aircraft landing, the AN/TSC-54 may be subjected to gravity-load forces up to 8 G. Make sure all units are securely tied to withstand this strain and to prevent equipment damage or possible personnel injury.

CAUTION

Never attempt to tiedown the antenna carrier with tiedown straps passed over the reflector and secured to the floor; this will distort and damage the reflector.

a. The dolly set axles are provided with tiedown rings for minimizing load shifting due to transverse strains. Block the antenna dolly set springs, if possible, to prevent loosening of the tiedown straps because of sag. The spring blockout procedure does not apply to the shelter dolly because the shelter is lowered onto the floor for shipment.

b. Secure the shelter with tiedown straps fastened to the skid rings, and also the lifting and tiedown rings on the shelter roof.

c. Check the generator set wheels and secure the unit with tiedown and cargo straps.

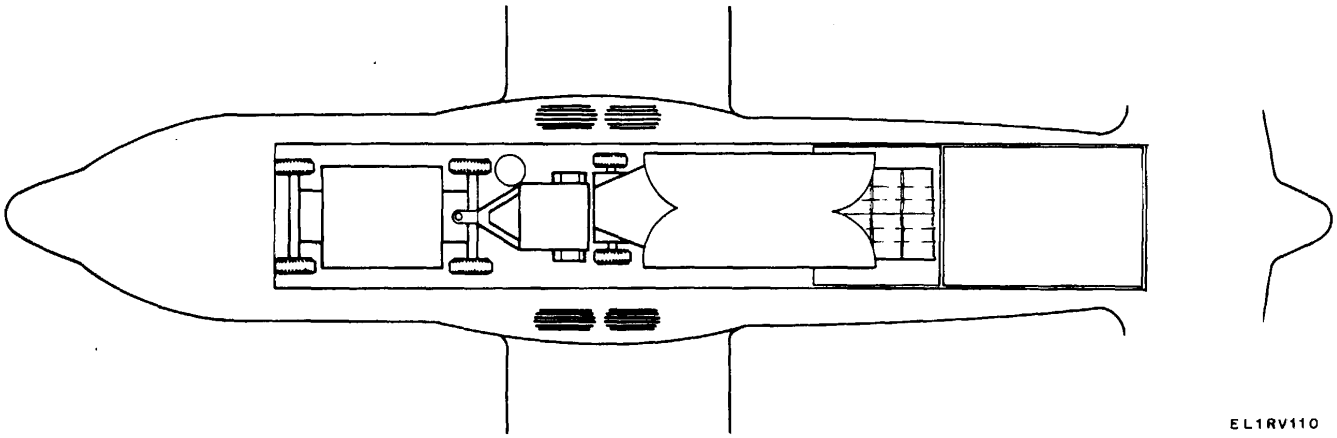


Figure 5-7. ANITSC-54, layout in C-130E aircraft 5-12

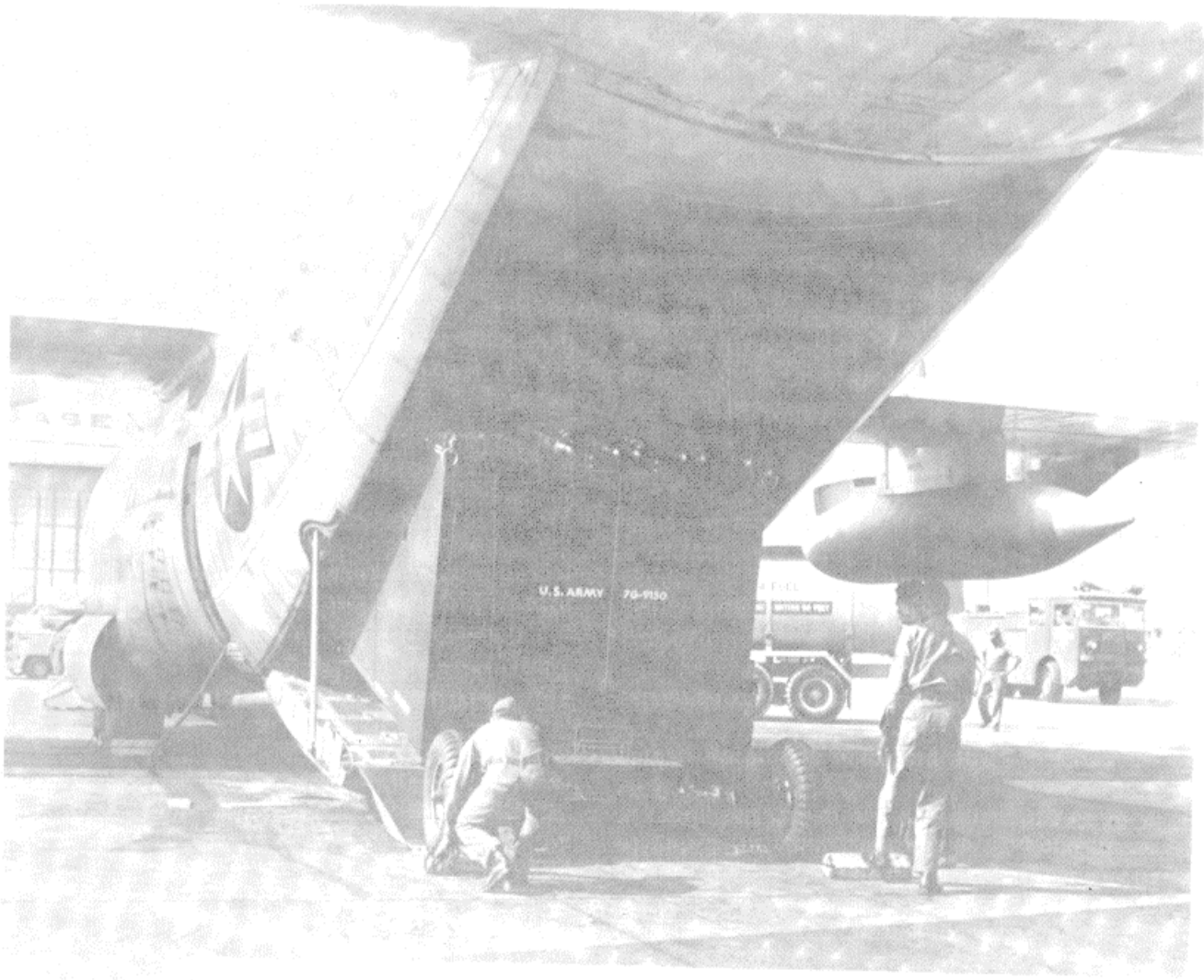


Figure 5-8. OVC loading into aircraft

d. Check the fuel drums to prevent rolling, and securely fasten them to the loading ramp with tiedown and cargo straps.

e. Double check all the units and equipment to be sure that tiedown is complete, especially the single fuel tank behind the right rear wheel of the shelter.

NOTE

During high altitude aircraft transport, it is essential that pressurized cabin air be permitted to circulate within the shelter. Open the two lower ventilating doors on the towed end of the shelter to provide the necessary ventilation.

5-6. Equipment Unloading

Except for shelter unloading, equipment unloading procedures are essentially the reverse of the loading procedures specified in paragraph 5-4. After the shelter tiedown straps are detached, close the shelter ventilating doors and raise the shelter to the correct ground clearance. Raise and level the shelter as described in paragraph 5-3k before unloading the shelter.

5-7. Equipment Preparation for Transport to Installation Site

When unloaded from the aircraft, the AN/TSC-54 must be prepared for transport to the installation site. If helicopter airlift without wheels is to be used, refer to paragraph 5-8. If over-the-road transport is to be used, proceed as follows:

a. Electronic Equipment Shelter.

Figure 5-9. Generator set loading into aircraft

(1) Make sure the shelter is raised to the required 14-inch ground clearance (para 5-3k).

(2) Connect the electric cable and brake connecting hose from the front dolly assembly to the rear dolly assembly with quick-disconnect type connectors.

(3) Secure the electric cable and brake connecting hose along the top of the shelter in the bow shocks.

(4) Attach the lunette eye of the tow bar to the pintle on the towing vehicle.

(5) Attach the two safety chains.

(6) Attach the intervheicular cable of the dolly set to the towing vehicle with the quick disconnect couplings.

(7) Check the stoplights and brakes to insure proper operation before traveling.

(8) See that all valves are closed and the lower yellow locknut on each hydraulic lifting jacks is against the jack housing.

(9) Release the parking brakes on the rear wheels.

(10) Stow the pump handles in the storage clamps on the torque tubes.

b. Antenna Carrier.

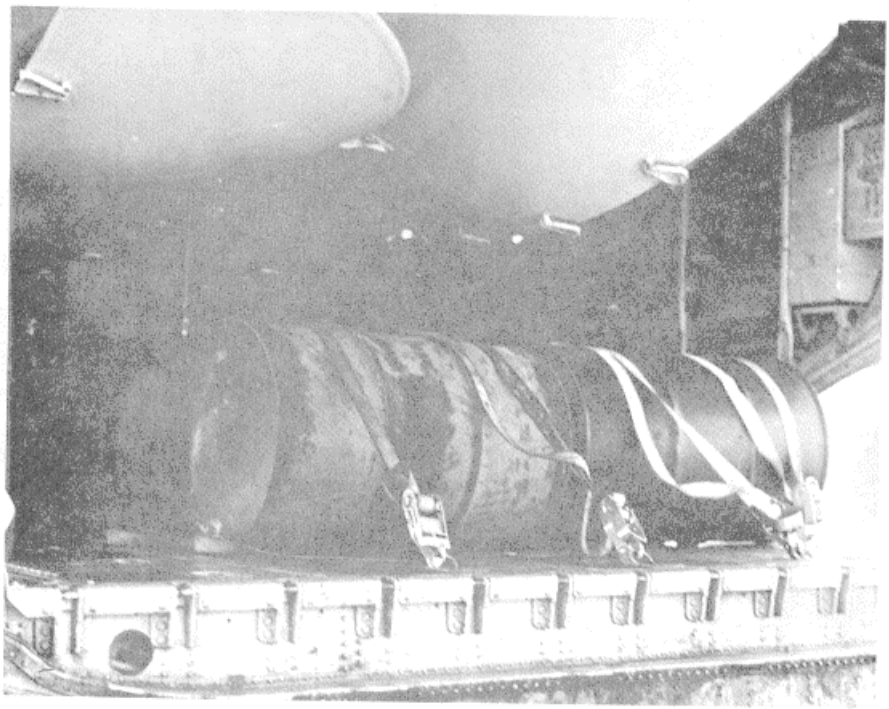
(1) Attach the lunette eye of the tow bar to the pintle on the towing vehicle.

(2) Attach the safety chains.

(3) Remove the airbrake hose and electric cable from storage on the right front fender of dolly set (fig. 5-5) and connect them to the towing vehicle.

(4) Check the stoplights and brakes to insure proper operation before traveling.

VIEW A



VIEW B

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Figure 5-10. Antenna carrier and fule tanks loading into aircraft.

(5) Release the parking brakes on the rear wheels.

c. Generator Set. Prepare the generator set according to instructions in the appropriate manual (app A).

d. Fuel Tanks. Load the diesel fuel tanks into a cargo truck for transport to the installation site.

5-8. Equipment Preparation for Short-Haul Air Transport

Short-haul air transport of the AN/TSC-54 requires removal of the wheels (dolly sets) from units, except the generator set, and lifting the units with the special lifting slings and cables. Short-haul air transport is normally ac complished by helicopters; however, lifting cranes can be used for on-site relocation of the units. Helicopter airlift of the AN/TSC-54 is accomplished in tow load deliveries. The first load consists of the three basic operating units and sufficient diesel fuel for 72 hours operation. The second load consists of the redundant generator set, primary power cables W12 and W13, a servicing platform for the antenna RF box, additional test equipment, and spare units.

5-9. Antenna Carrier Helicopter Airlift Procedure

a. If the antenna carrier is to be airlifted from an operational site, disassemble and prepare the antenna-receiver-transmitter group as described in paragraph 5-3. Do not install the dolly set on the antenna carrier platform.

NOTE

Before lowering the pedestal onto the antenna carrier platform, raise each end of the platform, in turn, with hydraulic jacks, and inspect the two shock pads. Replace damaged shock pads.

b. If the antenna dolly set is installed (following air or road transport), remove both dolly assemblies as described in paragraph 2-10.

c. Obtain the antenna carrier lifting cable assembly and the two special bolts from the applicable transit case. Assembly the lifting cable illustrated in figures 5-11 and 5-12 as follows:

(1) Assemble the lift ring cable assembly to the pedestal attaching plate using the shackle bolt.

(2) Assemble the platform attaching cables to the shackle.

(3) Attach the shackle bolt through the pedestal attaching plate.

d. Obtain the antenna carrier lifting yoke from storage on the rear exterior wall of the shelter (fig. 5-13) and attach the lifting yoke to the elevation head with the two special bolts as shown in figure 5-14.

e. Attach the lifting cable assembly to the wedge brackets of the front end of the platform (wheels off lift points), the pedestal outrigger bracket, and the lifting yoke. The antenna carrier is now ready to be airlifted.

5-10. Electronic Equipment Shelter Helicopter Airlift Procedure

a. Lower the shelter as follows:

(1) Retract the yellow locknuts at the four hydraulic lifting jacks on the dolly set.

(2) Slowly open the line valve (fig. 5-6) on each hydraulic lifting jack to allow the pressures to equalize.

(3) With a man stationed at each axle, carefully open the two main hydraulic valves, and slowly lower the shelter until its skids rest on the ground.

b. Disconnect the electrical cable and brake connecting hose couplings between the front and rear dolly assemblies.

CAUTION

While each dolly assembly is being detached (c and d below), balance it with the tow bar to relieve its weight from the attaching bolts, or the bolts may be damaged.

c. Remove the two attaching bolts from the front dolly assembly; pull the front dolly assembly clear of the shelter.

d. Transfer the tow bar from the front dolly assembly to the rear dolly assembly.

e. Remove the two attaching bolts from the rear dolly assembly; pull the rear dolly assembly clear of the shelter.

f. Use the dolly couplers stored in the shelter platform storage box, and couple the front and rear dolly sets together.

g. Install the tow bar on the front end of the dolly set, and tow the dolly set from the airlift area.

h. Obtain the shelter lifting cable and hooks from the storage box on top of the shelter. En gage the lifting cable hooks in the shelter lift eyes.

i. Engage the helicopter lift hook with the shelter lifting cable ring. The shelter is now ready to be airlifted.

5-11. Lifting-Crane Airlift of Units with Wheels Installed

a. The shelter, with its wheels attached, can be lifted by crane. The wheels should not be subjected to any more stress than is encountered in

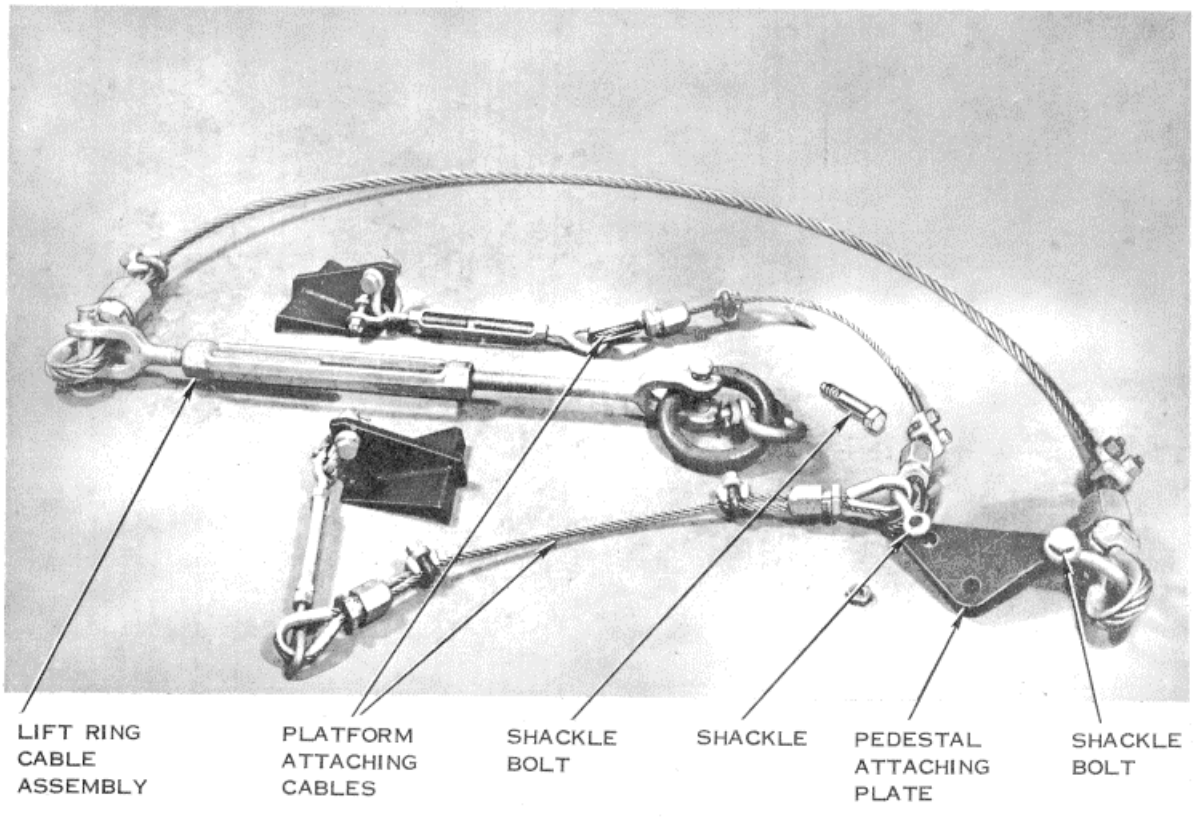

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Figure 5-11. Antenna carrier lifting cable assembly

normal road transport. A 3-inch freedrop should be established as the limit. Proceed as follows:

(1) Secure all intervehicular cables and make certain their stowage does not interfere with any moving parts during airlift.

(2) Adjust the yellow locknuts on the hydraulic lifting jacks for road travel.

(3) Raise the tongue to the vertical position and secure it to the shelter roof lift rings.

(4) Attach the lifting cables in the same way as for helicopter airlifting.

(5) Raise and move the shelter.

b. The antenna carrier is not designed for helicopter drop with the wheels attached. However, the antenna carrier can be lifted by crane using the same procedure as for helicopter airlift wheels, except for the following:

(1) Only part of the cable assembly required for airlifting without wheels is used. Remove the two cables that attach to the platform wedge brackets and substitute with cables that are designed for attachment to the platform skid rings.

(2) Attach the cable assembly as shown in figure 5-13.

(3) Fasten the platform attaching cables to the corner skid rings (wheels on lift points).

(4) Raise and move the antenna carrier.

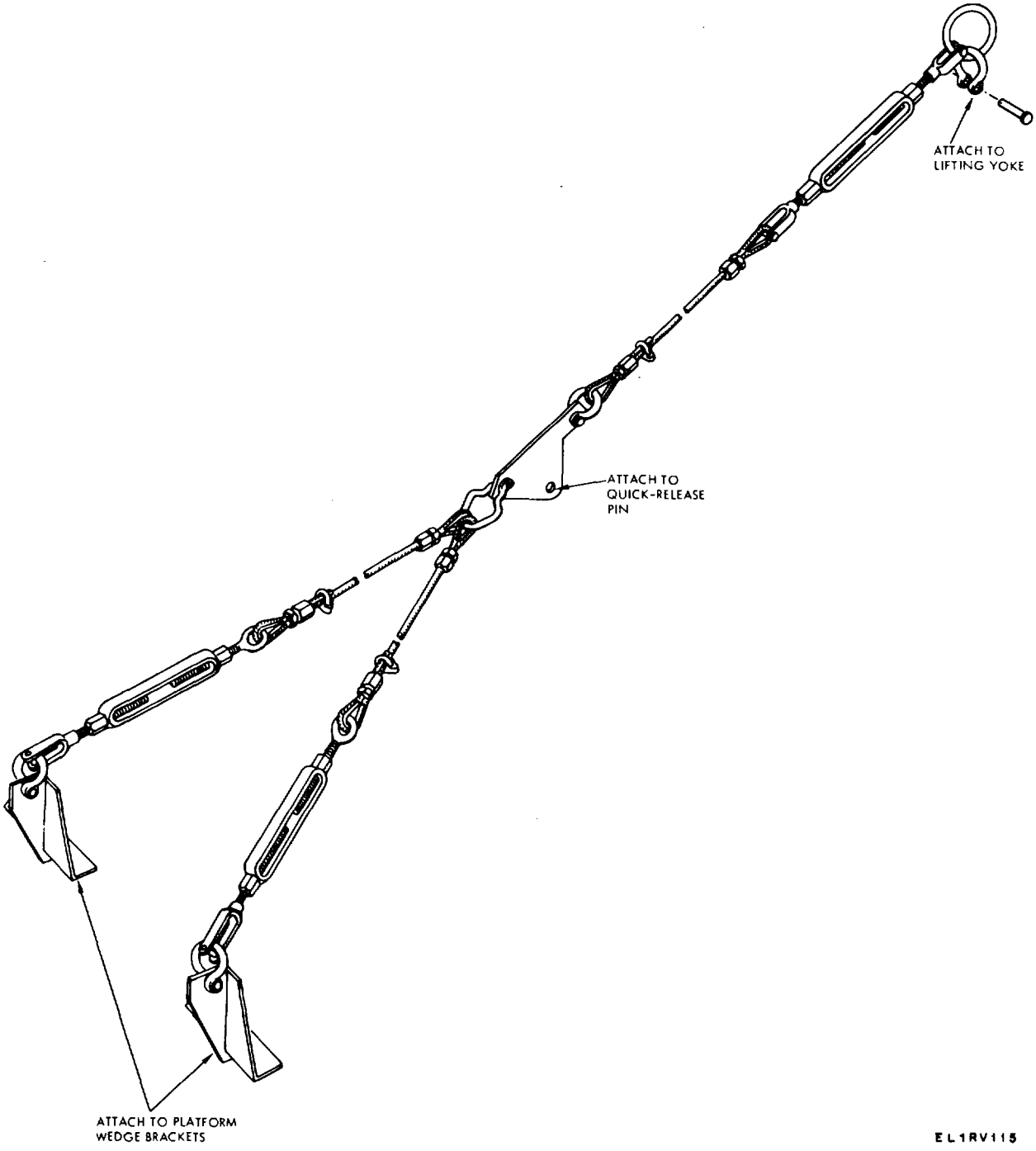

Figure 5-12. Antenna carrier lifting cable assembled for helicopter airlift.

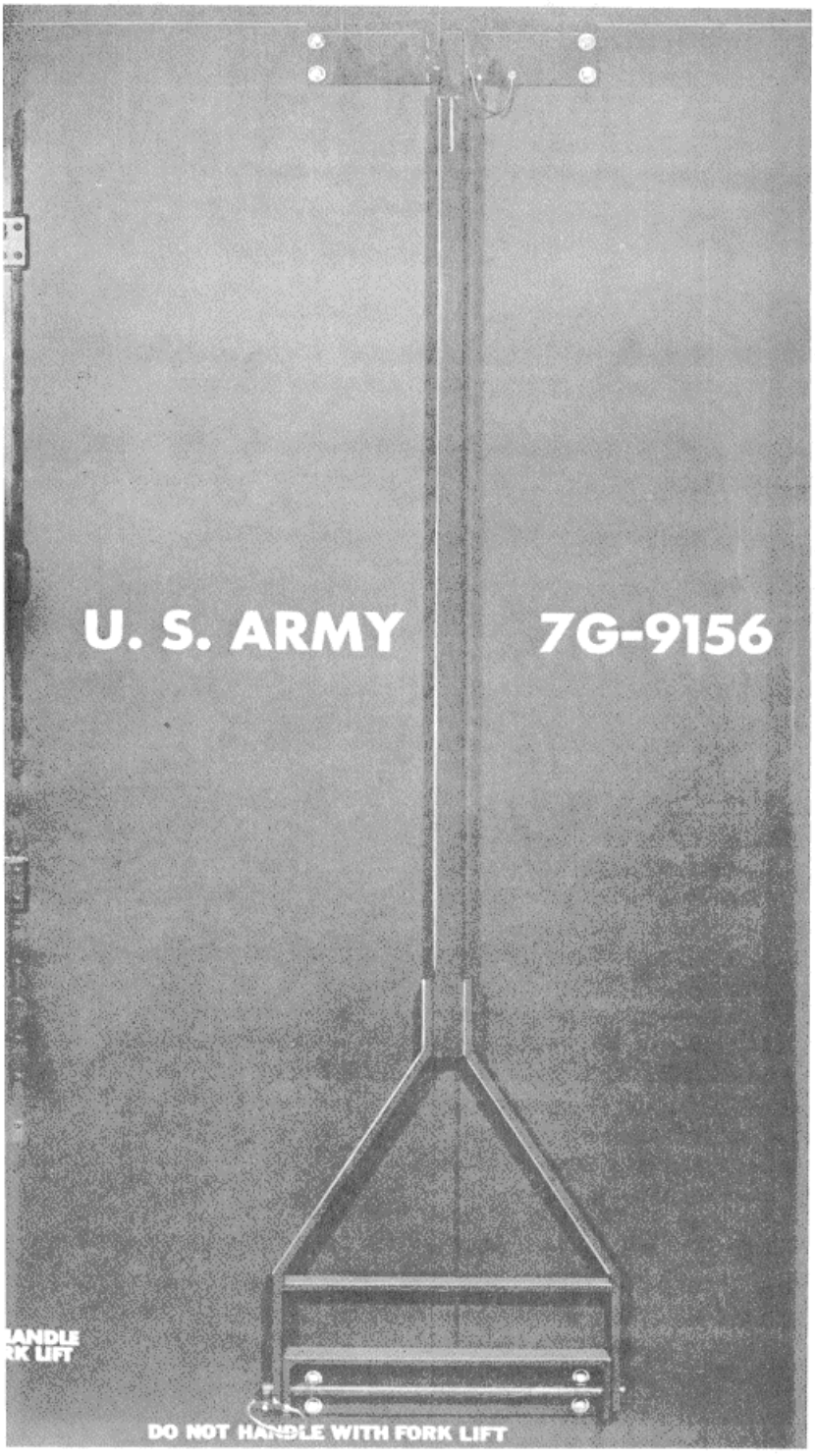

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Figure 5-13. Antenna carrier lifting yoke storage.

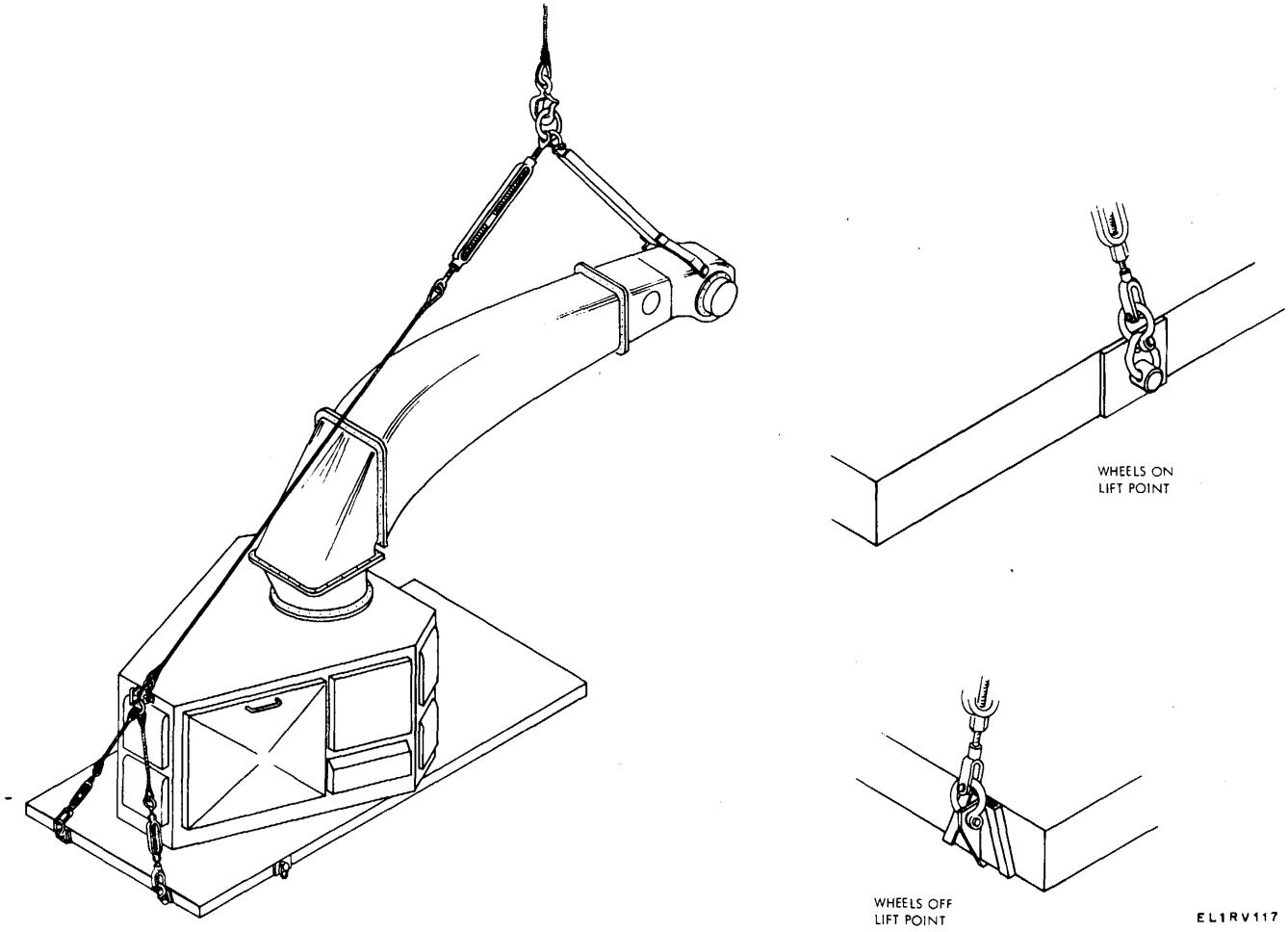

Figure 5-14. Antenna carrier lifting cable and yoke installation points

Section II. LIMITED STORAGE

5-12. Limited Storage Instructions

Repackaging of the AN/TSC-54 equipment for limited storage normally will be performed at a packaging facility or by a packaging team. The extent of equipment preparation or repackaging is determined by the length of time during which the AN/TSC-54 will remain inactive. Extensive repackaging is required for extended storage, and minimum packaging and protective measures are required for short-time storage. If emergency packaging is required, select materials from those listed in SM 11-100. Repackage the equipment in accordance with the original packaging methods as far as possible with the available materials.

5-13. Method of Storage

a. Storage normally refers to the placement of material in a building or covered structure and is classified as follows:

(1) Class A storage is a building or closed structure that is heated and designed to afford protection from the elements.

(2) Class B storage is a closed structure or building which is designed to afford protection from the elements but is not heated.

(3) Class C storage is a structure in which the atmosphere is maintained at a specified relative humidity by mechanical or electrical controlled humidity devices.

NOTE

A surveillance inspection (visual examination) is required of packing, packaging, and reservation for evidence of damage or deterioration of the equipment on a daily basis.

b. Keep the AN/TSC-54 intact and ready for immediate deployment as practical. Normally, the ventilation doors on the shelter and antenna pedestal should be kept opened.

(1) If dusty conditions prevail in the storage area, clean all rfi filters before deployment of the equipment.

(2) Lower the shelter onto its skids to relieve the weight on the dolly set wheels; decrease tire pressures to 20 psi.

(3) Electrical power is not normally required. However, if storage time is uncertain, set the toggle switch on the cesuim environmental closure (fig. 3-12) to ARCRFT and apply 115 VAC, 400 Hz power to 1 J22 on the servo, and signal entrance panel to insure calibration stability of the frequency standard.

CAUTION

Do not place tarpaulins or tiedown straps over the antenna reflector; it may become distorted and damaged.

c. For outdoor storage use the procedure for under-roof storage (b above). Also, tarpaulins or plastic sheets can be used to protect the units from the elements. Use the tie rings on the equipment for securing the tarpaulins over the shelter and the equipment on the antenna carrier platform. Fit the tarpaulins so that air circulation about the equipment is not completely impeded.

APPENDIX A
REFERENCES

Listed below are applicable publications available to operator and organizational maintenance personnel J of Satellite Communication Terminal AN/TSC-54.

AR 380-5	Department of the Army Supplement to DOD 5200.1-R (DODISPR).
DA Pam 310-4	Index of Technical Publications: Technical Bulletins, Supply Manuals (Types 7, 8, and 9), Supply Bulletins, and Lubrication Orders.
DA Pam 310-7	US Army Equipment Index of Modification Work Orders.
NAVSHIPS 0967-059-9010	Organizational Maintenance Manual Including Repair Parts and Special Tool Lists: Teletypewriter Sets AN/UGC-20, AN/UGC-20X, AN/UGC-25 and AN/UGC-25X.
SB 38-100	Preservation, Packaging, and Packing Materials, Supplies, and Equipment used by the Army.
TB 43-0118	Field Instructions for Painting and Preserving Electronics Command Equipment Including Camouflage Pattern Painting of Electrical Equipment Shelters.
TM 5-4120308-15	Operator, Organizational, Direct Support, General Support and Depot Maintenance Manual-Air Conditioner, Compact, Vertical 208 Volt, 3 Phase, 50/60 Hertz, 18,000 BTU Cooling, 12,000 BTU Heating, American Air Filter Model CH620-2, NSN 4120-00-168-1781.
TM 5-6115-235-10	Operator's Manual, Generator Set, Diesel Engine: 45 KW, AC, 108/208, 240/416 V, 3 Phase, 400 Hz; Skid Mounted (Consolidated Diesel Model 4060) FSN 6115-624-0385 (Diesel Engine Generator Set PU-401/M).
TM 5-6115-235-20	Organizational Maintenance Manual, Generator Set, Diesel Engine: 45 KW, AC, 108/208, 240/416 V, 3 Phase, 400 Hz; Skid Mounted (Consolidated Diesel Model 4060) FSN 6115-624-0385 (Diesel Engine Generator Set PU-401/M).
TM 54115-235-25P	Organizational, Direct and General Support, and Depot Maintenance Repair Parts and Special Tools List, Generator Set Diesel Engine; 45 KW, AC, 120/208, 240/416 V, 3 Phase, 400 Hz; Skid Mounted (Consolidated Diesel Model 4060) FSN 6115-624-0385 (Diesel Engine Generator Set PU-401/M).
TM 5-6115-293-12/	Operator and Organizational Maintenance Manual, Generator Set, Diesel Engine: Precise Power; 100 KW, AC 120/208 V, 2401416 V, 3 Piase, 50 Hz at 1500 RFP; Skid Mounted (Detroit Diesel, General Motors Model 6910A) FSN 6116-798-3444 (Diesel Engine Generator Set PU-495/G).
TM 54115-293-20P	Organizational Maintenance Repair Parts and Special Tool Lists, Generator Set, Diesel Engine: Precise Power: 100 KW, AC 120/208 V, 240/416 V, 3 Phase, 60 HZ at 1,800 RPM, 83.3 KW, 120/208 V, 240/416 V, 3 Phase, 50 HZ at 1,500 RPM; Skid Mounted (Detroit Diesel Div., General Motors Corp, Model 6910A) FSN 6115-798-3444 (Diesel Engine Generator Set PU-495/G).
TM 5-6115-365-15/	Organizational, Direct Support, General Support and Depot Maintenance Manual, Including Repair Parts Generator Sets, Gasoline and Diesel Engine Driven, Trailer Mounted (Includes PU-401/M FSN 6115-823-2217; PU-495/G FSN 6115-823-2218).
TM 11-5805-201-12/ TO 31W1-2PT-281	Operator and Organizational Maintenance Manual, Including Repair Parts and Special Tool Lists: Telephone Set TA-312/PT.
TM 11-5805-243-12/ TO 31W1-2PT-421	Operation and Organizational Maintenance: Telephone Set TA-I/PT.
TM 11-5805-243-20P	Organizational Maintenance Repair Parts and Special Tools Lists: Telephone Set TA-1/PT.
TM 11-5820-819-12&P/ NAVELEX 0967-LP-544-6010/ TO 31R5-2TSC54-81	Operator's and Organizational Maintenance Manual Including Repair Parts and Special Tools List, Amplifier, Parametric AM-6676/TSC-54(V).
TM 11-5831-201-20	Organizational Maintenance Manual Control, Intercommunication Set C-1611D/AIC and Discriminator, Discrete Signal MD-736/A.
TM 11-5831-201-20P	Organizational Maintenance Repair Parts and Special Tool Lists: Control,

	Intercommunication Set C-1611D/AIC and Discriminator, Discrete Circuits MD-736/A.
TM 11-5895-783-12/ NAVELEX 0967-LP-457-9010/ TO 31R5-2TSC54-51	Operator's and Organizational Maintenance Manual for Power Distribution-Switching Unit SA-1901/TSC-54.
TM 11-5895-825-14/ NAVELEX 0967-LP-465-3010/ TO 31Z3-640-31	System Overview Manual, Satellite Communications Terminal AN/TSC-54 as used in the Earth Terminal Complex.
TM 11-5895-833-12/ NAVELEX 0967-LP-550-1010/ TO 31R5-2TSC54-91	Operator's and Organizational Maintenance Manual, Frequency Conversion Subsystem for Satellite Communication Terminal AN/TSC-54.
TM 11-5895-833-20P/ NAVELEX 0967-LP-550-1020/ TO 31R5-2TSC54-94	Operator's and Organizational Maintenance Repair Parts and Special Tools List Manual, Frequency Conversion Subsystem for Satellite Communications Terminal AN/TSC-54.
TM 11-5895-963-12/ NAVELEX 0967/LP-592-7010/ TO 31R5-2G-241	Operator and Organizational Maintenance Manual for Radio Frequency Amplifier Group OG-163/G.
TM 11-5895-963-20P/ NAVELEX 0967-LP-592-7020/ TO 31R5-2G-244	Organizational Maintenance Repair Parts and Special Tools for Radio Frequency Amplifier Group OG-163/G.
TM 11-5965-224-14P	Operator's and Organizational, Direct Support and General Support Maintenance Repair Parts and Special Tool Lists (Including Depot Maintenance Repair Parts and Special Tools) Handsets H-60/PT (FSN 5965-669-9145) and H-165/U (FSN 5965-543-1837).
TM 11-6625-475-10	Operator's Manual: Multimeters AN/PSM-6, AN/PSM-6A, AN/PSM-6B.
TM 11-6625-475-24P-1	Organizational, Direct Support, and General Support Maintenance Repair Parts and Special Tools Lists (Including Depot Maintenance Repair Parts and Special Tools): Multimeter AN/PSM-6B FSN 6625-957-4374.
TM 11-6625-475-25	Organizational, Direct Support General Support, and Depot Maintenance Manual: Multimeter AN/PSM-6, AN/PSM-6A, and AN/PSM-6B.
TM 11-6625-1548-15	Organizational, Direct Support, General Support and Depot Maintenance Manual: Counter, Electronic, Digital CP-772/U Hewlett-Packard Model 5245L.
TM 11-6625-1549-15	Organizational, Direct Support, General Support and Depot Maintenance Manual: Power Meter AN/USM-260 Hewlett-Packard Model 431C.
TM 38750	The Army Maintenance Management System (TAMMS).
TM 55-5410-200-12-1	Air Transport of Supplies and Equipment: Shelter Electrical Equipment, S141/G Transported by US Air Force C-119, C-123 and C-130 Aircraft.
TM 750-244-2	Procedures for Destruction of Electronics Material to Prevent Enemy Use (Electronics Command).
TO 31W4-2T-102	Service, Circuit Diagrams and Illustrated Parts Breakdown; Isolator, Telegraph Line CU-1819/T.

APPENDIX C
MAINTENANCE ALLOCATION

Section I. INTRODUCTION

C-1. General

This appendix provides a summary of the maintenance operations covered in the equipment literature for the AN/TSC-54. It authorizes categories of maintenance for specific maintenance functions on repairable items and components and the tools and equipment required to perform each function. This appendix may be used as an aid in planning maintenance operations.

C-2. Maintenance Functions

Maintenance functions will be limited to and defined as follows:

a. INSPECT. To determine serviceability of an item by comparing its physical, mechanical, and electrical characteristics with established standards.

b. TEST. To verify serviceability and to detect incipient electrical or mechanical failure by use of special equipment such as gages, meters, etc. This is accomplished with external test equipment and does not include operation of the equipment and operator type tests using internal meters or indicating devices.

c. SERVICE. To clean, to preserve, to charge, and to add fuel, lubricants, cooling agents, and air. If it is desired that elements, such as painting and lubricating, be defined separately, they may be so listed.

d. ADJUST. To rectify to the extent necessary to bring into proper operating range.

e. ALIGN. To adjust two or more components or assemblies of an electrical or mechanical system so that their functions are properly synchronized. This does not include setting the frequency control knob of radio receivers or transmitters to the desired frequency.

f. CALIBRATE. To determine the corrections to be made in the readings of instruments or test equipment used in precise measurement. Consists of the comparison of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared with the certified standard.

g. INSTALL. To set up for use in an operational environment such as an encampment, site, or vehicle.

h. REPLACE. To replace unserviceable items with serviceable like 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 materiel maintenance. It consists of restoring equipment as nearly as possible to new condition in accordance with original manufacturing standards. Rebuild is performed only when required by operational considerations or other paramount factors and then only at the depot maintenance category. Rebuil4 reduces to zero the hours or miles the equipment, or component thereof, has been in use.

l. SYMBOLS. The uppercase letter placed in the appropriate column indicates the lowest level at which that particular maintenance function is to be performed.

C-3. Explanation of Format

a. Column 1, Group Number. Column 1 lists group numbers, the purpose of which is to identify components, assemblies, subassemblies and modules with the next higher assembly.

b. Column 2, Component Assembly. Column 2 lists the noun names of components, assemblies, subassemblies and modules on which maintenance is authorized.

c. Column 3, Maintenance Functions. Column 3 lists the maintenance category at which performance of the specific maintenance function is authorized. Authorization to perform a function at any category also includes authorization to perform that function at higher categories. The codes used represent the various maintenance

categories as follows:

Code	Maintenance/Category
C	Operator/Crew
O	Organizational Maintenance
F	Direct Support Maintenance
H	General Support Maintenance
D	Depot Maintenance

d. Column 4, Tools and Test Equipment. Column 4 Specifies, by code, those tools and test equipment required to perform the designated function. The numbers appearing in this column refer to specific tools and test equipment which are identified in Table I.

e. Column 5, Remarks. Self-explanatory.

C-4. Explanation of Format of Table 1, Tool and Test Equipment Requirements

The columns in Table I, Tool and Test Equipment . Requirements, are as follows:

a. Tools and Equipment. The numbers in this column coincide with the numbers used in the tools and equipment column of the 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.

(Next printed page C-4)

SECTION II. MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT SATELLITE COMMUNICATION TERMINAL AN/TSC-54															
GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
	Terminal, Satellite Communications AN/TSC-54 (SM-E-570956)	O											46	Daily visual inspection for cleanness, tightness of all power connectors, anchor cable tension indicators, mechanical jacks & related controls for looseness or binding
								O					46,50,51	Initial site installation
			O										46	General system checkout after initial site installation
				O									46	Post-installation and pre-shipping lubrication and coolant service
										O			46	Replace front panel fuses & indicator lamps
							O						46,49	Baseband circuits using built-in panel indicators

SECTION II. MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT SATELLITE COMMUNICATION TERMINAL AN/TSC-54															
GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION												TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD			
			F											8,12,14,15,35, 45,46,47,59	Transmitter, receiver, base-band and antenna control circuits as result of item replacement
										F				46,49	Replace major assemblies
			F											47,49,53,97, 104,105,106	AZ/EL servo mechanism to determine status
					F									49	Complete AZ/EL servo for proper performance
										F				3,46,49	Replace components of inter-unit cabling and inter-unit waveguide
1	Communications Terminal Group OW-11/TSC-54	C													Daily; visual inspection of shelter interfacing signal cables, patch cords & terminal clock
				O										46	Monthly; clean air-flow RFI filters

SECTION II. MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT

SATELLITE COMMUNICATION TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
					C								46	Terminal clock
								O					46	All interfacing cable connections
										F			3,46,49	Replacement of cables or cable components and major assemblies
1A1	Air conditioner CH-620-2			O									46	Monthly: clean filter. See TM 5-4120-308-15
					O									Front panel adjustments to control temperature & air-flow within shelter
									F				46,49	Unit assembly
										D				Depot disposition. See TM 5-4120-312-14

SECTION II. MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT

SATELLITE COMMUNICATIONS TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
1A2	Console, satellite communications OJ-17/TSC-54 including	O											49	Visual inspection for mechanical condition only
										F			3,46,49	By replacing major assemblies
	Cabinet, electrical equipment CY-6092/TSC-54									F			3,47,49	Mechanical and cabling repair
1A2A1	Control, Zero set C-7242/TSC-54					O							46,50	Alignment for known magnetic variation made during installation
			F										3, 4	System checkout and troubleshooting
										F			46,49	Replace magnetic clutch A1, switch S1 and gear assembly

SECTION II. MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT SATELLITE COMMUNICATIONS TERMINAL AN/TSC-54														
GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
1A2A1B1	Synchro								F				46,49	
						F							3,46,49	Synchro zeroing procedure
										D			3,46,49	Depot disposition
1A2A1B2	Resolver								F				46, 49	
						F							3,46,49	Resolver zeroing procedure
										D			3,46,49	Depot disposition
1A2A4	Panel, power distribution SB-2892/TSC-54									F			46,49	Replace modular power supplies PS1-5, and axial fan. Depot disposition of failed modules PS-1 through PS-5
			F										3,49	I/O voltage checks

SECTION II. MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT SATELLITE COMMUNICATIONS TERMINAL AN/TSC-54														
GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
1A2A5	Control, antenna C-7243/TSC-54	C												Cables, controls, and indicators
			O											During system checkout
										O				Replace indicator lamps, knobs
			F										4,30,37,45, 46,49	During operational checkout, equipment repair, parts replacement or maladjustment
						F							4,30,37,45, 46,49	After equipment repair, parts replacement or maladjustment
										F			46,49	Module and piece part replacement

SECTION II. MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT

SATELLITE COMMUNICATIONS TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
1A2A5A16 or A17	Analog indicator					F							46,49	Initial N-S alignement, after equipment repair, parts replacement or maladjustment
			F										3,46,49	System checkout and troubleshooting
									F				46,49	AZ or EL assembly
			D											To determine status
										D			46,49	Depot disposition

SECTION II. MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT

SATELLITE COMMUNICATIONS TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
1A2A5A18 or A19	Slew potentiometers assembly		F										3,46,49	System checkout and troubleshooting
									F				46,49	
1A2A5A20	Scan generator assembly		F										3,4,46,49	System checkout and troubleshooting
									F				46,49	Board assembly
										D			46,49	Depot disposition
1A2A4A21 or A22	Position servo mechanism 6-00 194S		F										3,4,46,49	System checkout and troubleshooting
									F				46,49	Replace AZ or EL assembly
										F			46,49	Replace AZ or EL follow-up resolver
										D			46, 49	Replace modules and piece parts
			D										4,30,37,45,46 47,49,170	

SECTION II. MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT SATELLITE COMMUNICATION TERMINAL AN/TSC-54														
GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
1A2A5A21B3 or A22B3	AZ and EL follow-up resolver					F							46,49,50	Initial site installation, after equipt repair, parts replacement or maladjustment
										D			46,49	Depot disposition
1A2A5A23 & 1A2A5A24	Module board assemblies SM-E-572020 & SM-E-572022				F	F							4,30,37,46,49	Align or adjust variable & compensating modules after equipt repair, parts replacement or maladjustment
									F				46,49	Replace contact board
										F			4,30,45,46,49	Repair by module and piece part replacement
1A2A5A23A1, A10,A18,A32,	Relay driver module assembly		D										46,49	Depot disposition
A33,A43,A56,										D			46,49	Depot disposition
A57,A71,A72, A84,A85,A97, A98,A110, A111,A112, A123,A137, A138														NOTE Encapsulated module

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT

SATELLITE COMMUNICATION TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
1A2A5A23A2, A9, A11, A17, A19, A26, A33, A38, A154, A155 and 1A2A5A24A46	Capacitor module SM-A-569444-1		D										46,49	Depot disposition
										D			46,49	Depot disposition NOTE Potted module
1A2A5A23A3, A8, A16, A20, A25, A45, A46, A51, A52, A99, A106 and 1A2A5A24A2, A7, A8, A13, A14, A19, A20, A25, A28, A33, A36, A52	Operational amplifier module assy SM-D-573303		D										46,49	Depot disposition
										D			46,49	Depot disposition NOTE Encapsulated module
1A2A5A23A4, A7, A47, A50, A128, A130, A143, A145 &	Dc gain set module assy SM-D-569778		D										46,49	Depot disposition
										D			46,49	Depot disposition

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT SATELLITE COMMUNICATION TERMINAL AN/TSC-54															
GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
1A2A5A24A21, A29, A38, A41, A56														NOTE Encapsulated module
1A2A5A23A5, A6, A101, A104, A129, A131, A144, A146 and 1A2A5A24A15, A18, A23, A31, A55, A64, A65	Variable divider module assy SM-D-569774		D										46,49	Depot disposition
										D			46,49	Depot disposition NOTE Encapsulated module
1A2A5A23A12, A15	Resistor module assy SM-D-570211		D										46,49	Depot disposition
										D			46,49	Depot disposition NOTE Encapsulated module

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT

SATELLITE COMMUNICATION TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
1A2A5A23A13, A14, A22, A23, A35, A36, A37, A44, A48, A49, A62, A64, A75, A77, A78, A89, A90, A150, A151, A152, A153 and 1A2A5A24A4, A61, A62, A63, A66-A68, A74	Relay armature module assy SM-D-571417-1		D										46,49	Depot disposition
										D			46,49	Depot disposition NOTE Encapsulated module
1A2A5A23A21, A24	Position amplifier module assy SM-D-570210		D										46,49	Depot disposition
										D			46,49	Depot disposition NOTE Encapsulated module
1A2A5A23A27, A58	Gate expander module assy SM-D-569786		D										46,49	Depot disposition
										D			46,49	Depot disposition

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT

SATELLITE COMMUNICATION TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
														NOTE Encapsulated module
1A2A5A23A28, A53, A68, A81, A94, A96, A108, A109, A121, A134, A135, A136 & 1A2A5A24A40	Dual NAND module assy SM-D-569787		D										46,49	Depot disposition
										D			46,49	Depot disposition
														NOTE Encapsulated module
1A2A5A23A29, A30, A39, A40, A46, A54, A55, A69, A74, A82, A83, A95, A118, A120, A149 and 1A2A5A24A39	NAND module assy SM-D-569777		D										46,49	Depot disposition
										D			46,49	Depot disposition
														NOTE Encapsulated module

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT

SATELLITE COMMUNICATION TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
1A2A5A23A31, A41, A107, A122	NAND driver module assy SM-D-569788		D										46,49	Depot disposition
										D			46,49	Depot disposition NOTE Encapsulated module
1A2A5A23A59, A63	Parameter set, tack amplifier module assy SM-D-570212		D										46,49	Depot disposition
										D			46,49	Depot disposition NOTE Encapsulated module
1A2A5A23A60, A67	Compensation module assy SM-D-569758		D										46,49	Depot disposition
										D			46,49	Depot disposition NOTE Encapsulated module

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT

SATELLITE COMMUNICATION TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
1A2A5A23A61, A66, A100, A105, A127, A132, A142, A147	Operational amplifier module assy SM-D-569773		D										46,49	Depot disposition
										D			46,49	Depot disposition NOTE Encapsulated module
1A2A5A23A63, A115, A116 & 1A2A5A24A26, A27, A34, A35, A48	Level shifter module assy SM-D-569811		D										46,49	Depot disposition
										D			46,49	Depot disposition NOTE Encapsulated module
1A2A5A23A73, A80	Capacitor module assy no. 1 SM-D-569768		D										46,49	Depot disposition
										D			46,49	Depot disposition NOTE Encapsulated module

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT

SATELLITE COMMUNICATION TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
1A2A5A23A76, A102, A103 & 1A2A5A24A10, A11, A22, A30, A49	Dual low-level switch module assy SM-D-569780		D										46,49	Depot disposition
										D			46,49	Depot disposition NOTE Encapsulated module
1A2A5A23A86, A93	Parameter set, position memory module assy SM-D-570215		D										46,49	Depot disposition
										D			46,49	Depot disposition NOTE Encapsulated module
1A2A5A23A87, A92	Limit level set module assy SM-D-569775		D										46,49	Depot disposition
										D			46,49	Depot disposition NOTE Encapsulated module

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT

SATELLITE COMMUNICATION TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
1A2A5A23A88, A91	Diode QUAD module assy SM-D-570213		D										46,49	Depot disposition
										D			46,49	Depot disposition NOTE Encapsulated module
1A2A5A23-A113,A118 & 1A2A5A24A73	Capacitor module assy no. 2 SM-D-569763		D										46,49	Depot disposition
										D			46,49	Depot disposition NOTE Encapsulated module
1A2A5A24A1	Shaping circuit module assy SM-D-574089		D										46,49	Depot disposition
										D			46,49	Depot disposition NOTE Encapsulated module

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT

SATELLITE COMMUNICATION TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
1A2A5A24A3, A6, A9, A12, A16, A17, A24, A32	Dc gain set module assy SM-D-569779		D										46,49	Depot disposition
										D			46,49	Depot disposition
														NOTE
														Encapsulated module
1A2A5A24A37, A42, A57	Operational amplifier module assy SM-D-569773		D										46,49	Depot disposition
										D			46,49	Depot disposition
														NOTE
														Encapsulated module
1A2A5A24A44, A53, A69, A71	Line driver module assy SM-D-569809		D										46,49	Depot disposition
										D			46,49	Depot disposition
														NOTE
														Encapsulated module

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT

SATELLITE COMMUNICATION TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
1A2A5A24A45, A54, A70, A72	Impedance amplifier module assy SM-D-573566		D										46,49	Depot disposition
										D			46,49	Depot disposition NOTE Encapsulated module
1A2A5A24A47	Variable time delay module assy SM-D-569810		D										46,49	Depot disposition
										D			46,49	Depot disposition NOTE Encapsulated module
1A2A5A24A59	Relay armature module assy SM-A-571417-2		D										46,49	Depot disposition
1A2A5A24A60	SM-A-571417-3									D			46,49	Depot disposition
1A2A5A24A58	SM-A-571417-4													NOTE Encapsulated module

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT

SATELLITE COMMUNICATION TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
1A2A5R3 and R4	AZ and EL rate potentiometer								F				46,49	Replace module assy
1A2A9	Panel, indicator, ID-1444/URC-61													See DTM 11-5820-614-12
1A2A10	Link terminal timing central TD-851/URC-61													See DTM 11-5820-614-12
1A2A21	Fan assembly SM-D-573654								F				46,49	Replace fan assembly
										F			46,49	Replace fan
1A2A22	Frequency distribution unit SM-D-778523					F							1,8,12,30,44, 45,46,49	After equipt repair, parts replacement or maladjustment, allow 15-minute warmup
			F										1,8,12,30,44, 45,46,49	To determine status
										F			45,46,49	Replacement of filter and switches

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT SATELLITE COMMUNICATION TERMINAL AN/TSC-54														
GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
1A2A22A1	FE-12 frequency standard								F				45,46,49	
						F							4	
			D										1,12,30,46,49,56	To determine status
										D			45,46,49	Depot disposition
1A2A22AR1 or AR2	1-MHz or 5-MHz limiter amplifier								F				46,49	
			D										1,4,12,30,47,49,54,97	To determine status
										D			46,49	Depot disposition
1A2A22CP3	Two-way power divider								F				46,49	
			D										46,49	Depot disposition
1A2A22PS1	Power supply								F				46,49	
			D										46,49	Depot disposition

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT

SATELLITE COMMUNICATION TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
										D			46,49	Depot disposition
1A2A24	Cesium beam frequency standard H.P. 5061A													Refer to H.P. Operation & Maintenance Manual for Cesium Beam Frequency Standard 5061A
1A2A25	Power supply (cesium beam) H.P. 5085A													Refer to H.P. Operator & Maintenance Manual for H.P. 5085A
1A2A26	Control test translator SM-D-778525									F			46,49	Replacing switches, resistors, and meters
			F											Functional test with RF system
							F						1,2,23,45,46, 49	Allow 30-minute warmup
1A2A27	Panel, power monitor and control SM-D-778538									F			46,49	Replace resistors, relays, diodes, and meter

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT

SATELLITE COMMUNICATION TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
			F											Test in conjunction with Xmit RF
							F						9,13,18,45, 46,49	After equipment repair, parts replacement, or maladjustment
1A2A27A4	On-line transmitter output power assy		F										9,13	Comparison check only
									F				46,49	
										D			46,49	
1A2A29	Time transfer unit CM-427(XB-1) URC													Reference Log Bulletin 1-73
1A2A30 or A31	Group delay equalizer CN-1425/MSC-46(V)													Reference TM 5895-833-12
1A2A33	Amplifier, rf H.P. 5087A		F			F							1,8,12,44,45, 46,49	After equip repair, parts replacement, or maladjustment
									D				46,49	Depot disposition

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT
SATELLITE COMMUNICATION TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
										F			46,49	By module replacement
										D			46,49	Depot disposition
1A2A33A1	Power module								F				46,49	Module assembly
			F											Test as part of 1A2A33
										D			46,49	Depot disposition
1A2A33A2	Power supply assembly								F				46,49	
			F											Test as part of 1A2A33
										D			46,49	Depot disposition
1A2A33A3	Motherboard								F				46,49	
			D										46,49	Depot disposition
										D			46,49	Depot disposition

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT

SATELLITE COMMUNICATION TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
1A2A33A4	Circuit checkboard		F											Test as part of 1A2A33
										D			46,49	Depot disposition
1A2A33A5	1-MHz/5-MHz preamplifiers								F				46,49	
			F											Test as part of 1A2A33
									F				46,49	
										D			46,49	Depot disposition
1A2A33A8/A9	Output amplifiers								F				46,49	
			F											Test as part of 1A2A33
										D			46,49	Depot disposition
1A2A35	Converter, frequency, static CV-3192/TSC-54									F			30,46,49	Replace circuit breakers, transformers, capacitors and modules
									F				46,49	

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT SATELLITE COMMUNICATION TERMINAL AN/TSC-54															
GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
										D			46,49	Depot disposition
			F										4,47,49,62	To determine status
	Consists of:													
	Power block assemblies								F				46,49	
			D										3,46,49,65,69	To determine status
										D			46,49	Depot disposition
	Logic assembly								F				46,49	
			D										3,46,49,65,69	To determine status
										D			46,49	Depot disposition
	Driver amplifier assy								F				46,49	
			D										3,46,49,65,69	To determine status
										D			46,49	Depot disposition

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT SATELLITE COMMUNICATIONS TERMINAL AN/TSC-54															
GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
	Inrush current limiter assembly								F				46,49	
			D										3,36,49,65, 69	To determine status
										D			46,49	Depot disposition
1A2A36	Control-Indicator C-10252/G SM-D-883248													Refer to TM 11-5895-963-12/ NAVELEX 0967-LP-952-7010/TO 31R5-2G-241

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT

SATELLITE COMMUNICATIONS TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
1A3	Console, satellite communications OJ-18/TSC-54	O												Visual inspection for mechanical condition only
			F											Tests made at individual equipment level
										F			46,49	By replacing major assemblies
	Cabinet, communication console CY-6093/TSC-54									F			3,47,49	Mechanical and cabling repair
1A3A3 or 1A3A5	Demodulator, communication MD-706/TSC-54		F										1,2,12,14, 15,30,35,37, 41,45,46,49	Loop test, deviation test, and troubleshoot to determine fault
										F			46,49	By module replacement
			H										8,12,14,15, 35,45,47,49	Baseband circuits

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT SATELLITE COMMUNICATION TERMINAL AN/TSC-54														
GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
										H			46,49	By module replacement
			D										8,12,14,15,29,35,38,39,45,47,49,54,69	To determine status of I.F., wide, and narrow bandwidth
										D			46,49	Depot disposition
1A3A3A1 or 1A3A5A1	70-MHz bandpass filter								F				46,49	
			D										1,2,4,47,49,55,74,77,79,86,88,95,100,121,122,123	To determine status
										D			46,49	Depot disposition
1A3A3A2 or 1A3A5A2	70-MHz/21.4-MHz balanced mixer								F				46,49	
			D										1,9,14,47,49,56,67,74,97	To determine status
										D			46,49	Depot disposition

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT

SATELLITE COMMUNICATION TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
1A3A3A3 or 1A3A5A3	Demod 48.6 MHz VCO					F							1,22,46,49	When maladjusted, allow 0.5-hour warmup
									F				46,49	
			D										1,2,9,47,49, 67,70,97,165	To determine status
										D			46,49	Depot disposition
1A3A3A4 or 1A3A5A4	21.4-MHz IF preamplifier								F				46,49	
			D										1,2,9,13,14, 15,47,49,74, 94,97	To determine status
										D			46,49	Depot disposition
1A3A3A5 or 1A3A3A11 or 1A3A5A5 or 1A3A5A11	Signal bandwidth select switch								F				46,49	
			D										1,43,47,49,56, 65,97,168	To determine status
										D			47,49	Depot disposition

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT SATELLITE COMMUNICATION TERMINAL AN/TSC-54															
GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
1A3A3A6 or 1A3A5A6	75-kHz bandpass filter								F				46,49	
			D										4,47,49,65,74, 90,121,122, 124	To determine status
										D			46,49	Depot disposition
1A3A3A7 or 1A3A5A7	150-kHz bandpass filter								F				46,49	
			D										4,47,49,65,74, 90,121,122, 124	To determine status
										D			46,49	Depot disposition
1A3A3A8 or 1A3A5A8	300-kHz bandpass filter								F				46,49	
			D										1,2,47,49,56, 87,88	To determine status
										D			46,49	Depot disposition

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT

SATELLITE COMMUNICATION TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
1A3A3A9 or 1A3A5A9	560-kHz bandpass filter								F				46,49	
			D										4,47,49,65,74, 90,121,122,124	To determine status
										D			46,49	Depot disposition
1A3A3A10 or 1A3A5A10	1,000-kHz bandpass filter								F				46,49	
			D										4,47,49,65,74, 90,121,122,124	To determine status
										D			46,49	Depot disposition
1A3A3A12 or 1A3A5A12	21.4-MHz post amplifier								F				46,49	
			D										4,47,49,61,65, 74,97,121,122, 124	To determine status
										D			46,49	Depot disposition

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT

SATELLITE COMMUNICATION TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
1A3A3A13 or A16 or 1A3A5A13 or A16	21.4-MHz am phase detector								F				46,49	
			D										4,47,49,74,97	To determine status
										D			46,49	Depot disposition
1A3A3A15	3-way power divider								F				46,49	
			D										47,49,56,88, 116	To determine status
										D			47,49	Depot disposition
1A3A3A17	Demod 21.4 MHz VCO					F							1,8,12,14,15, 35,45,46,49	When maladjusted
									F				46,49	
			D										1,9,47,49,53, 67,97	To determine status
										D			46,49	Depot disposition

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT
SATELLITE COMMUNICATION TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
1A3A3A18 or A5A18	30-kHz loop filter								F				46,49	
			D										46,49	Depot disposition
										D			46,49	Depot disposition
1A3A3A19 or A5A19	50-kHz loop filter								F				46,49	
			D										46,49	Depot disposition
										D			46,49	Depot disposition
1A3A3A20 or A5A20	1,500-kHz loop filter								F				46,49	
			D										46,49	Depot disposition
										D			46,49	Depot disposition
1A3A3A21 or A40 or 1A3A5A21 or A40	21.4-MHz/1.4-MHz loop amplifier								F				46,49	
			D										12,47,49,69, 97,126,149	To determine status
										D			46,49	Depot disposition

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT
SATELLITE COMMUNICATION TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
1A3A3A22 or 1A3A5A22	Agc amplifier					F							9,13,14,15,45, 46,49	When maladjusted
									F				46,49	
			D										9,47,49,52,67, 74,97,127,129	To determine status
										D			46,49	Depot disposition
1A3A3A23 or 1A5A5A23	Demod signal detector					F							14,15,30,45, 46,49	When maladjusted
									F				46,49	
			D										30,37,47,49, 97,147	To determine status
										D			46,49	Depot disposition

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT
SATELLITE COMMUNICATION TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
1A3A3A24 or 1A3A5A24	21.4-MHz wideband discriminator					F							4,14,15,45,46,49	When maladjusted, allow 1.0-hour warmup before alignment
									F				46,49	
			D										1,4,56,94,97,121,122	To determine status
										D			46,49	Depot disposition
1A3A3A25 or 1A3A5A25	21.4-MHz narrowband discriminator					F							4,14,15,45,46,49	When maladjusted, allow 1.0-hour warmup before alignment
									F				46,49	
			D										1,4,47,49,56,94,97,121,122	To determine status
										D			46,49	Depot disposition

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT

SATELLITE COMMUNICATION TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
1A3A3A26 or 1A3A5A26	1.4-MHz narrowband discriminator					F							4,14,15,45,46,49	When maladjusted, allow 1.0-hour warmup before alignment
									F				46,49	
			D										46,49	Depot disposition
										D			46,49	Depot disposition
1A3A3A27 or 1A3A5A27	Phaselock detect and sweep stop lock					F							4,14,15,45,46,49	When maladjusted
									F				46,49	
			D										30,47,49,73,97,151	To determine status
										D			46,49	Depot disposition
1A3A3A28 or 1A3A5A28	X4 frequency multiplier								F				46,49	

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT

SATELLITE COMMUNICATION TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
			D										1,12,47,49, 56,91,97	To determine status
										D			46,49	Depot disposition
1A3A3A29 or 1A3A5A29	Afc and sweep circuit								F				46,49	
			D										47,49,54,94, 97,120,158	To determine status
										D			46,49	Depot disposition
1A3A3A34 or 1A3A5A34	1.4-MHz post amplifier								F				46,49	
			D										4,47,49,53,56, 65,97,121,122, 124	To determine status
										D			46,49	Depot disposition

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT

SATELLITE COMMUNICATION TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
1A3A3A35 or 1A3A5A35	1.4-MHz 90° phase shifter								F				46,49	
			D			D							1,47,49,56,98	To determine status & align for phase shift 90 ±3°
										D			46,49	Depot disposition
1A3A3A36 or A37 or 1A3A5A36 or A37	1.4-MHz loop phase detector								F				46,49	
			D			D							1,4,47,49,53, 56,97,102	To determine status and align
										D			46,49	Depot disposition
1A3A3A38 or 1A3A5A38	1.4-MHz VCXO					F							1,45,46,49	When maladjusted, allow 1.0-hour warmup
			D										46,49	Depot disposition
										D			46,49	Depot disposition

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT SATELLITE COMMUNICATION TERMINAL AN/TSC-54														
GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
1A3A3A39 or 1A3A5A39	Two-way power divider								F				46,49	
			D										47,49,56,87, 88,116	To determine status
										D			47,49	Depot disposition
1A3A3A41 or 1A3A5A41	275-Hz loop filter								F				46,49	
			D										46,49	Depot disposition
										D			46,49	Depot disposition
1A3A3A42 or 1A3A5A42	550-Hz loop filter								F				46,49	
			D										46,49	Depot disposition
										D			46,49	Depot disposition
1A3A3A43 or 1A3A5A43	0-30-db attenuator and audio amplifier								F				46,49	
			D										47,49,61,69, 97,155	To determine status

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT

SATELLITE COMMUNICATION TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
										D			47,49	By replacement of T-1 and printed circuit board assemblies
	Baseband amplifier card assy SM-D-572123		D										46,49	Depot disposition
										D			46,49	Depot disposition
	0-30-dB attenuator card assy SM-D-572124		D										46,49	Depot disposition
										D			46,49	Depot disposition
1A3A3A44 or 1A3A5A44	Am amplifier								F				46,49	
			D										4,47,49,97, 114,145	To determine status
										D			46,49	Depot disposition
1A3A3A45 or 1A3A5A45	Matrix board assembly								F				47,49	
			D										46,49	Depot disposition

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT SATELLITE COMMUNICATION TERMINAL AN/TSC-54														
GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
1A3A3A47 or 1A3A5A47	Power supply monitoring circuit								F				46,49	
			D										47,49,97,146	To determine status
										D			46,49	By replacement of circuit board assemblies
	Circuit board assembly SM-D-570718		D										46,49	Depot disposition
										D			46,49	Depot disposition
	Circuit board assembly SM-D-570723		D										46,49	Depot disposition
										D			46,49	Depot disposition
1A3A3A48 or 1A3A5A48	Module assembly								F				46,49	
			D										47,49,97,167	To determine status
										D			46,49	Depot disposition
1A3A3A49 or 1A3A5A49	300-kHz loop filter								F				46,49	
										D			46,49	Depot disposition

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT
SATELLITE COMMUNICATIONS TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
1A3A24	Out-Of-Band Noise Monitoring Panel Code Ident 05869 P/N 1574742-100	O											46	
										O			46	By lamp replacement
			F										30, 186	To isolate defective module and panel/chassis components and confirm operability
					F								30, 97	
							F						30, 97, 186	
										F			46	By replacement of module and panel/chassis components
1A3A24A1	Circuit Card Assembly Out-of-Band Noise Code Ident 05869 P/N 1574744		F										30, 186	To confirm operability
					F								30, 97	In conjunction with NHA
									F				46	
			D										30	To isolate defective components and confirm operability
										D			30,46,97,186	By component replacement

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT

SATELLITE COMMUNICATION TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
1A14	Distribution box assy, D.C. power SM-C-571291			F					F				46,49	Replace batteries, lamp and switch, and alarm unit
			F										30,46,49	
1A15	Panel, distribution primary power SM-D-778541									F			46,49	Replace circuit breakers and switches
			F										30,46,49	
1A16	Monitor, prime power SM-D-571085									F			46,49	Replace meters & switch
			F										30,46,49	
1A17	Heater assy, personnel SM-D-778532									F			46,49	Replacement of piece parts
										D			46,49	Depot disposition

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT
SATELLITE COMMUNICATION TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
1A19	Frequency conversion subsystem SM-F-758199													See TM 11-5895-833-12
	Dolly set, transportable shelter V-394/TSC-54 (Craig Model 404B(H))	O											46,51	Monthly; hydraulic pump and master brake cylinder fluid levels
				O									46	Lubricate in accordance with maintenance schedule for other vehicles at site
										O			46	Minor repairs; all higher categories of maintenance will be performed by MOCOM NOTE See commercial manual included in AN/TSC-54 Log Support Plan

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT
SATELLITE COMMUNICATIONS TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
1W14	Cable Assembly SM-C-883459	0												Visual inspection
			F											In conjunction with system checkout
										F			3, 46, 49	
1W15	Cable Assembly SM-C-883460	0												Visual inspection
			F											In conjunction with system checkout
										F			3, 46, 49	
1W (W601)	Cable Assembly Code Ident 05869 P/N 1574739	0												Visual inspection
			F											In conjunction with system checkout
										F			3, 46, 49	

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT

SATELLITE COMMUNICATIONS TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
1W (W602)	Cable Assembly Code Ident 05869 P/N 1574740	O												Visual inspection
			F											In conjunction with system checkout
										F			3, 46, 49	
1W (W603)	Cable Assembly Code Ident 05869 P/N 1574856	O												Visual inspection
			F											In conjunction with system checkout
										F			3, 46, 49	
1W (W604)	Cable Assembly Code Ident 05869 P/N 1574857-1	O												Visual inspection
			F											In conjunction with system checkout
										F			3, 46, 49	

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT
SATELLITE COMMUNICATION TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
2	Antenna-receiver/transmitter group OA-8244/TSC-54	O											46	Visual observation of interconnecting cables, ground rods; daily & monthly inspections
			F											NOTE Test as part of system
								O					46,50,51	Initial site installation
									D				47,49,50,51, 133 through 140	Replacement of major assys
											D		46,49,50,51	Depot disposition
	Dolly set, transportable V-395/TSC-54	O											46,51	Monthly hydraulic pump & master brake cylinder fluid level

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT

SATELLITE COMMUNICATION TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
				O									46	Lubricate in accordance with the maintenance schedule of other vehicles at site
										O			46	Minor repairs: all higher categories of maintenance will be performed by MOCOM
2A1	Platform assy SM-E-572392	F											46,49	Inspect for corrosion
				F										Perform corrosion control procedure
2A2	Power supply, beam power SM-E-571389		F										3,46,49	Resistance checks
									F				46,49	Unit assembly
										F			46,49	By replacement of interlock and vacuum switches
			D										47,49,62	To determine status

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT

SATELLITE COMMUNICATION TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
										D			47,49	Depot disposition
2A3	Pedestal, antenna AB-978/ TSC-54			O									46	Monthly lubricate outrigger grease fittings & clean pedestal air filt, corrosion control, and touch up painting
2A3A3	Transmitter liquid cooler		F										30,46,49	
				F									46,49	Flush, rinse, and refill
										F			46,47,49	Replace unit assy, RFI filter, flo switches, water pump and fan assembly, pressure and thermostat switches
2A3A7	Panel, transmitter control assembly SM-D-572614		O											Daily transmitter operational check out using built-in panel indicators

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT

SATELLITE COMMUNICATION TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
			F										9,30,45,46,49	Troubleshooting for: low magnet current, high body current, collector flow, and antenna sector limit
					F								3,46,49	Power trip point
							F						9,13,45,46,49	Forward and reflected power circuit after equipment repair, parts replacement or maladjustment
										F			46,49	Replacement of meters, indicator lights, resistors, switches and tip jacks
2A3A7A1	Module contact board assy SM-D-573589									F			46,49	Replace modules A1 through A9
			D										46,49	Depot disposition

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT

SATELLITE COMMUNICATION TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
2A3A7A1A1	Module assy		D										46,49	Depot disposition
	SM-D-572551									D			46,49	Depot disposition
2A3A7A1A2, A4	Module assy		D										46,49	Depot disposition
	SM-D-572665									D			46,49	Depot disposition
2A3A7A1A3, A5	Module assy		D										46,49	Depot disposition
	SM-D-572662									D			46,49	Depot disposition
2A3A7A1A6	Module assy		D										46,49	Depot disposition
	SM-D-572666									D			46,49	Depot disposition
2A3A7A1A7	Module assy		D										46,49	Depot disposition
	SM-D-572663									D			46,49	Depot disposition
2A3A7A1A8	Module assy		D										46,49	Depot disposition
	SM-D-572667									D			46,49	Depot disposition
2A3A7A2	Component board assembly									F			46,49	Replace solid state devices
			D										46,49	Depot disposition
									D				46,49	Depot disposition

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT
SATELLITE COMMUNICATION TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
2A3A9	Relay box assy SM-D-572408									F			46,49	Replace relays determined to be defective by 2A3A7 troubleshooting
2A3A10	Transmitter/exciter plate SM-E-573000		F										30,46,49	Interlock circuits, waveguide, arcing, high coolant temperatures, low liquid fault, high beam current, high body currents, collector flow, waveguide sector limit, waveguide dummy load, body & magnetic flow
						F							9,13,46,49	For TWT saturation after equipment repair, parts replacement or adjustment
										F			46,49	By replacement of attenuators, filter isolators, waveguide adapters, switch & module assemblies

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT

SATELLITE COMMUNICATION TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
2A3A10A5, A6, A7, or A8	Rf detector amplifier								F				46,49	
			D										46,49	Depot disposition
										D			46,49	Depot disposition
2A3A10A9 A10, A11, or A12	Detector amplifier, vswr								F				46,49	
			D										46,49	Depot disposition
										D			46,49	Depot disposition
2A3A10A13	ARC detection amplifier								F				46,49	
			D										46,49	Depot disposition
										D			46,49	Depot disposition
2A3A10A14	Rf amplifier, TWT								F				46,49	
			F											Test with built-in test equipment

NOMENCLATURE OF END ITEM OR COMPONENT

SATELLITE COMMUNICATION TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
			D										47,49,53,66, 97,130	To determine status
										D			46,49	Depot disposition
2A3A10A15	Amplifier test head assy								F				46,49	
			D										12,47,49,69, 97,126,149	To determine status
										D			46,49	Depot disposition
2A3A10A16	RF head assembly								F				46,49	
			D										47,49,53,63, 69,85	To determine status
										D			46,49	Depot disposition
2A3A10A19	Klystron and electromagnetic assembly				F								46,49	After tube replacement or gross maladjustment using built-in test equipment

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT

SATELLITE COMMUNICATIONS TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
2A3A10A18	Amplifier SM-A-883162-1		F										46,49	Transmitter checkout
									F				46,49	
			D										1,30,49,54, 94,97,171, 172,174,175, 176,185	To determine status
										D			46,49	By replacement of piece parts
2A3A10A19	Klystron and electromagnetic assembly		F											Transmitter checkout
					F								46,49	After tube replacement or gross maladjustment using built-in test equipment
									F				46,49	
			D											Depot disposition
										D			46,49	Depot disposition

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT

SATELLITE COMMUNICATIONS TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
2A3A10A22	RF head SM-A-883162-2		F											Transmitter checkout
									F				46,49	
			D										49,94,97, 174,175,176, 177,178,179	To determine status
										D			46,49	Depot disposition
2A3A10S2	RF coax switch SM-A-883146		F											Transmitter checkout
									F				46,49	
			D										1,9,13,33,43 49,97,173,184	To determine status
										D			46,49	Depot disposition

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT

SATELLITE COMMUNICATIONS TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
2A3A10S3	Waveguide switch SM-A-883073-1		F											Transmitter checkout
									F				46,49	
			D										1,9,13,30,33, 43,49,181, 182	To determine status
										D			46,49	Depot disposition

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT

SATELLITE COMMUNICATIONS TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
2A3A11	High voltage cage assy SM-D-574067		F										30,46,49	High beam current
										F			46,49	Replace relays, transformers, voltmeter
			D										47,49,94,97	To determine status
										D			46,49	Depot disposition
2A3A11A1	Component board assembly SM-D-573052								F				46,49	
										F			46,49	Replacement of piece parts
			F										30,46,49	High beam current
										D			46, 49	Depot disposition

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT

SATELLITE COMMUNICATION TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
2A3A14	Panel, primary power distribution SM-D-573130									F			46,49	Replace circuit breakers, fuses, meters, relays & connectors
			D										46,49	Depot disposition
									D				46,49	Depot disposition
2A3A17	AZ servo amplifier (unit 1) assy SM-E-572362		F										4,30,45,46,49	Troubleshooting
										F			46,49	Replacement of relays
									F				46,49	
			D										4,47,49,75,97, 170	To determine status
										D			46,49	Depot disposition

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT
SATELLITE COMMUNICATION TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
2A3A18	AZ servo amplifier (unit 2) assy SM-D-570343		F										4,30,45,46,49	Troubleshooting
										F			46,49	Replacement of relays
									F				46,49	
			D										4,47,49,97, 170	To determine status
										D			46,49	Depot disposition
2A3A18A1	Power amplifier SM-D-569871		D										4,47,49,97, 170	To determine status
										D			47,49	Depot disposition
2A3A21	Magnet power supply		F										30,46,49	Troubleshooting
									F				46,49	
			D										30,47,49	To determine status
										D			47,49	Depot disposition

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT

SATELLITE COMMUNICATION TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
2A3A22	AZ drive assy SM-E-572395		F										4,45,46,49	Troubleshooting
										F			46,49	By replacement of subassemblies
									D				47,49,137, 138,139	
										D			47,49,137, 138,139	Replacement of bearing shafts, etc.
2A3A22A2	AZ synchro and limit switch assy SM-D-571901					F							3,46,49	Initial-prior to installation & after equipment repair, parts replacement or maladjustment
										F			46,49	By replacement of synchro and switch
									F				46,49	
										D			47,49	Depot disposition

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT

SATELLITE COMMUNICATIONS TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
2A3A22A5	AZ resolver assembly		F										4,30,45,46,49	Troubleshooting NOTE Determine operation after repair
									F				46,49	
						F							46,49	True N-S & after equipment repair, parts replacement & maladjustment
										D			47,49	Depot disposition

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT

SATELLITE COMMUNICATIONS TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
2A3A22A5B1	AZ resolver transmitter		F										4,30,45,46,49	Troubleshooting
									F				46,49	
										D			47,49	Depot disposition
2A3A22A6	AZ synchro assy SM-D-571331		F											Troubleshooting
									F				46,49	
										D			47, 49	Depot disposition

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT

SATELLITE COMMUNICATIONS TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
2A3A22A6B1	AZ sync transmitter assy		F											Troubleshooting
						F							46,49	Initial N-S installation & after equipment repair, parts replacement or maladjustment
									F				46,49	
2A3A22A15	Rotary joint assembly		F											Operational mode test with internal test equipment
									F				46,49	
										D			46,49	Depot dispostion
2A3A22A20	AZ brake assy SM-D-573503		F											Troubleshooting
									F				46,49	
										D			46,49	Depot disposition

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT

SATELLITE COMMUNICATIONS TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
2A3A22B1	AZ drive motor assy SM-A-571434		F										3,46	Troubleshooting
									F				46,49	
										D			46,49	Depot disposition
2A3A24	Intercom/airmonitor panel SM-D-778666	F											46,49	Inspect for air leaks
										F			46,49	Replace indicators, regulators, switches, etc.
			D										46,49	Depot disposition
										D			46,49	Depot disposition
2A3A24A1	Control, Intercommunication Set C-1611D/AIC				F									Reference TM 11-5831-201-20

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT SATELLITE COMMUNICATIONS TERMINAL AN/TSC-54														
GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
2A3K1-K3	Solid-state contactors									F			46,49	By circuit card replacement
			F											Functional test with built-in indicators and meters
2A3K1A1-2A3K3A1	Contactor Controller SM-D-778891									D			46,49	Depot disposition
			D										30,97,180	To determine status

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT

SATELLITE COMMUNICATIONS TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
2A3PS1,2 3,4 or 5	Power supply								F				30,46,47	
			F											Functional test with built-in indicators and meters
										D			30,47,49	Depot disposition
2A3S2	RF coax switch SM-A-883145-1		F										9,13	Transmitter checkout
									F				46,49	
			D										1,9,13,33,43, 46,97,184	To determine status
										D			46,49	Depot disposition

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT

SATELLITE COMMUNICATIONS TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
2A3AT100	Variable attenuator SM-A-571571-1		F											Transmitter checkout
									F				46,49	
			D										1,33,43,49, 178,179,183	To determine status
										D			46,49	
2A4	Mast assembly AB-1006/TSC-54	O												Inspect for corrosion and chipped paint
				O									46,49	Corrosion control and touch up painting
									D				47,49,135, 139,140	

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT

SATELLITE COMMUNICATIONS TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
	EL drive gearbox SM-E-571100	O											46	Monthly: gearbox vent valve
										D			47,49,135, 139,140	Depot disposition
				O									46	Monthly: lubricate mast grease fittings
2A4A3	EL servo amplifier (unit 1) assy SM-D-572362		F										4,30,45,46,49	Troubleshooting
										F			46,49	Replace relays K2-K5
									F				46,49	Replace assembly
			D										47,49,75,97	To determine status
										D			47,49	Depot disposition

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT SATELLITE COMMUNICATIONS TERMINAL AN/TSC-54															
GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
2A4A4	EL servo amplifier (unit 2) assy SM-D-570343		F										3	Troubleshooting
									F				46,49	
			D										4,47,49,97, 170	To determine status
										D			46,49	Depot disposition

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT SATELLITE COMMUNICATIONS TERMINAL AN/TSC-54														
GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
2A4A4A1	Power amplifier SM-D-569871		D										4,46,49,97, 170	To determine status
										D			47,49	Depot disposition
2A4A6	EL synchro and limit switch assy SM-D-571198		F											Troubleshooting
						F							3,46,49	Initial: prior to installation and after equipment repair part replacement or maladjustment
										F			46,49	Replacement of synchro and switch
									F				46,49	
										D			47,49	Depot disposition

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT SATELLITE COMMUNICATION TERMINAL AN/TSC-54														
GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
2A4A6S1	EL limit switch assy					F							3,46,49	Initial: prior to installation and after equipment repair part replacement or maladjustment
										D			3,46,49	Depot disposition
			F										3	Troubleshooting
									F				46,49	
2A4A7	EL resolver assembly SM-D-571196		F										3	Troubleshooting
									F				46,49	
										F			46,49	By replacement of resolver
						F							46,49	After replacement of resolver or other equipment repair
										D			47,49	Depot disposition

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT

SATELLITE COMMUNICATION TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
2A4A7B1	EL resolver transmitter					F							46,49	After equipment repair, parts replacement, or maladjustment
			F										30,54,55	During troubleshooting procedure
									F				46,49	
										D			46,49	Depot disposition

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT SATELLITE COMMUNICATION TERMINAL AN/TSC-54															
GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
2A4A8	Launcher divider SM-D-569745		F											Functional test with entire RF system
									F				46,49	
										D			46,49	Depot disposition
2A4A11	EL brake assembly SM-D-573503		F										3	Troubleshooting
									F				46,49	
										D			46,49	Depot disposition
2A4B1	EL drive motor SM-A-571434		F										3	Troubleshooting
									F				46,49	
									D				46,49	Depot disposition

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT

SATELLITE COMMUNICATION TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
						D							25,28,33,47, 49,50,51,64, 68,80,82,107, 108,109,111, 112,113,115, 117,118,125, 131,132,134, 141,142,143	Boresight & after repair or replacement of assemblies affecting antenna beam pattern
										D			47,49,134	Replace reflector and component assemblies
										D			47,49	By minor repairs to reflector surfaces
2A9A1	Rf box assy SM-E-572569		F										4,9,12,13,26, 28,32,45,46, 49	Troubleshooting
										F			46,49	Replace waveguide and coaxial switch

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT

SATELLITE COMMUNICATION TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
	Air filter			O									46	Monthly: brush dirt from screens at each end of rf box
2A9A1A1	Scanner assy SM-D-572654		D										9,47,49,57,58, 59,60,67,76, 78,92,96,97, 99,101,104	To determine status
									D				47,49	Depot disposition
										D			47,49	Depot disposition
2A9A1A2, 2A9A1A3	Amplifier, parametric AM-6676/TSC-54													See TM 11-5820-819-12
2A9A1A4	Oscillator								F				47,49	
			D										46,49	Depot disposition
										D			47,49	Depot disposition
2A9A1A5 or A6	Traveling wave tube		F										9,13,24,30, 45,46,49	Troubleshooting

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT

SATELLITE COMMUNICATION TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
					F								9,13,24,30, 45,46,49	Saturation adjustment
									F				46,49	
										D			46,49	Depot disposition
2A9A1A7	Detector/amplifier								F				46,49	
			D										46,49	Depot disposition
										D			46,49	Depot disposition
2A9A1A12	Harmonic generator								F				46,49	
			D										46,49	Depot disposition
										D			46,49	Depot disposition
2A9A1AT1 thru AT14	Attenuator								F				46,49	
			D										46,49	Depot disposition
										D			46,49	Depot disposition

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT

SATELLITE COMMUNICATION TERMINAL AN/TSC-54

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
2A9A1B1	Axial fan motor								F				46,49	
			D										46,49	Depot disposition
										D			46,49	Depot disposition
2A9A1PS1 or PS2	Power supply								F				46,49	
			D										46,49	Depot disposition
										D			46,49	Depot disposition
2A9A25, A26, A27, A28	Dielguide assy SM-D-574144									D				Depot disposition
2A10	Purity loop filter assy LBAD-D-33102									F			46,49	By piece part replacement
			D										46,49	Depot disposition
										D			46,49	Depot disposition

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT SATELLITE COMMUNICATIONS TERMINAL AN/TSC-54														
GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
2A11	Amplifier, RF AM-6929/G SM-E-883248													Refer to TM 11-5895-963-12/NAVELEX 0967-LP-952-7010/TO 31R5-2G-241
2W21	Cable assembly SM-C-883302-001	O												Visual inspection
			F											In conjunction with system checkout
										F			3,46,49	
2W22	Cable assembly SM-C-883448	O												Visual inspection
			F											In conjunction with system checkout
										F			3,46,49	

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT SATELLITE COMMUNICATIONS TERMINAL AN/TSC-54														
GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTION											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
W16	Cable Assembly SM-C-883302-002 Interconnects AN/TSC-54 Pedestal and OCV	0												Visual inspection
			F											In conjunction with system checkout
										F			3, 46, 49	
W19A	Cable Assembly SM-C-883301 Interconnects AN/TSC-54 LPA Transmitter with OCV													Refer to TM 11-5895-963-12/ NAVELEX 0967-LP-592-7010/TO 31R5-2G-241
W33	Cable Assembly Interface AN/TCC-79 for OBN	0												In conjunction with terminal OBN monitor checkout
			F											
	(Interconnects AN/TSC-54 OCV and AN/TCC-79 for OBN Operation)									F			3, 46, 49	

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT SATELLITE COMMUNICATION TERMINAL AN/TSC-54				
TOOL OR TEST EQUIPMENT REFERENCE CODE	MAINTENANCE CATEGORY	NOMENCLATURE	FEDERAL STOCK NUMBER	TOOL NUMBER
1	O,F,D	Counter, Elec, Digital, CP-772/U	6625-973-4837	
2	O,F,D	Converter, Freq. Elec, CV-2002/U	6625-226-3483	
3	O,F,D	Multimeter, AN/PSM-6B	6625-957-4374	
4	O,F,D	Oscilloscope, AN/USM-273	6625-930-6637	
5	O	Divider, Current, MX-8899/U	5895-242-4031	
6	O,D	Voltmeter, ME-303/U	6625-902-7140	
7	O	Wavemeter, ME-409/U	6625-877-3268	
8	O,F,H	Sig. Gen, SG-632/U	6625-986-4625	
9	O,F,D	Power Meter, AN/USM-260	6625-917-3099	
10	O	Probe, A.C., MX-8881/U	6625-910-5973	
11	O	Probe, A.C., MX-8891/U	6625-076-0806	
12	O,F,H,D	Voltmeter, Elec (RMS) AN/USM-224(U) A	6625-727-4706	
13	O,F	Thermistor Mount, MX-7772/U	6625-886-1955	
14	O,F,H,D	Attenuator, Var., CN-970/U	5985-993-1377	
15	O,F,H,D	Attenuator, Var, CN-1128/U	5985-957-1860	
16	F,H,D	Adapter, UG-1054 (2 each)	5985-295-9824	
17	F,H,D	Adapter, UG-27B/U	5935-295-6287	
18	F,D	Adapter, R.F. UG-29B/U	5935-643-9875	
19	F,H,D	Adapter Connector, UG-914/U	5935-280-1454	
20	F,H,D	Adapter Connector, UG-1917/U	5935-709-5709	
21	D	Waveguide Assembly, CG-3673/U	5985-061-5536	
22	F	Analyzer, Spectrum AN/USM-366 (V)-1	6625-494-2937	
23	F	Analyzer, Spectrum TS-3066(V) 1/U	6625-160-0535	
24	F	Attenuator, Fxd, CN-1364/U	5985-835-3934	
25	D	Attenuator, Var, CN-1367/U	6625-679-0625	
26	D	Detector, R.F., RF-253/U	5820-877-7148	
27	F,H,D	Coupler, Direct, CU-1984/U	5985-729-6971	

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT SATELLITE COMMUNICATION TERMINAL AN/TSC-54				
TOOL OR TEST EQUIPMENT REFERENCE CODE	MAINTENANCE CATEGORY	NOMENCLATURE	FEDERAL STOCK NUMBER	TOOL NUMBER
28	F,D	Frequency Meter, FR-194/U	6625-730-8570	
29	D	Mixer, Crystal, Coax, CV-2343/U	5985-087-4714	
30	F,D	Multimeter, AN/USM-210	6625-019-0815	
31	D	Telephone Test Set AN/USM-181A	6625-740-0344	
32	F,D	R.F. Unit, RF-254/U	6625-159-2224	
33	D	Generator, Signal, SG-944/U	6625-107-8173	
34	D	Gen Subassembly, MX-8364(P)/USM-308(V)	6625-928-0364	
35	F,H	Transformer, R.F. TF-547/U	5950-678-0343	
36	D	Video Amplifier AM-1881/U	6625-092-7924	
37	F,D	Voltmeter, Elec, ME-408/U	6625-456-7459	
38	D	Freq Synthesizer AN/USM-194 (HP5100)	6625-053-3077	
39	D	FM Gen HP202J (Formerly Boonton 202J)	6625-056-6962	
40	F,H,D	Probe, Adapter, MX-8885/U	6625-964-9267	
41	F	Dummy Load, Electric, DA-463/U	5985-087-4954	
42	F,H,D	Adapter, Conn., UG-1918/U	5935-984-5563	
43	D	Converter, Freq. HP-5255A	6625-058-3042	
44	F	Gen. Signal, AN/USM-272	6625-957-0421	
45	O,F,H	Test Leads Adapter Kit, SM-D-573554		
46	O,F	Tool Kit, Elec. Equip., TK-100/G	5180-605-0079	
47	H,D,	Tool Equip., TE-123	5180-408-1881	
48	F,D	Tool Equip., TE-50B	5180-356-4602	
49	F,H,D	Tool Kit, Elec. Equip., TK-105/G	5180-610-8177	
50	O,F,D	Storage Container, SM-C-574241		
		Consisting of: (ea)		
		Bracket: SM-D-573380 1		
		Case Equipment; SM-A-573953-1 1		
		Compass Magnetic; SM-A-571441-1 1		

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT SATELLITE COMMUNICATION TERMINAL AN/TSC-54				
TOOL OR TEST EQUIPMENT REFERENCE CODE	MAINTENANCE CATEGORY	NOMENCLATURE	FEDERAL STOCK NUMBER	TOOL NUMBER
51	O,F,D	(ea) Level Precision; SM-A-571412-1 1 Telescope Straight; DSK273 (SM-B-573680) 1 Storage Container, SM-C-574242 Consisting of: Anchor Gnd: Used to anchor bearing plate; SM-C-573526 9 Bolt Special: For storing Dielguide; SM-B-572310 2 Bracket, Lifting: SM-D-573158 2 Cable Lifting: SM-D-573394 1 Cable Lifting: SM-D-574066 2 Case Equipment: SM-A-573953-2 1 Clamp: P/O Ground Rod Assy; SM-A-571733-1031 3 Clip Assy Ground: SM-C-573562 1 Converter, 400 Cycle: SM-D-573048 1 Coupling: P/O Ground Rod Assy; SM-A-571733-101 6 Dip Stick: SM-C-574081 1 Drill, Elec, Portable SM-A-573969-1 1 Driving Head: SM-C-574140 1 Driving Stud: P/O Ground Rod Assy; SM-A-571733-102 3 Grounding Cable: P/O Ground Rod Assy; SM-C-571991 1		

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT SATELLITE COMMUNICATION TERMINAL AN/TSC-54				
TOOL OR TEST EQUIPMENT REFERENCE CODE	MAINTENANCE CATEGORY	NOMENCLATURE	FEDERAL STOCK NUMBER	TOOL NUMBER
		(ea)		
		Grounding Cable: SM-C-573532 2		
		Handle, Crank: SM-D-572619 3		
		Jack, Hydr FSN 5120-540-2343 2		
		Tension Indicator Assy: SM-C-573541 (Used w/anchor; SM-C-573526) 9		
		Tool, Coupling: SM-C-569839 1		
		Wrench Assy: SM-C-574008 1		
		Wrench, Hex: SM-A-574160-1 1		
52	D	Voltmeter, Vacuum, AN/PRM-15		
53	D	Voltmeter, DC Vacuum, AN/USM-183		
54	D	Oscilloscope, AN/USM-196 (Tek 545)		
55	D	Oscilloscope, Plug-In, AM-3148/USM (Tek Type D)	6625-875-1058	
56	D	Signal, Generator, AN/URM-53 (HP-606A)		
57	D	Meter, Freq FR-155( )/USM-129		
58	D	Attenuator, Var. CN-1048/G		
59	D	Attenuator, Coaxial CN-1285/U	5985-128-0195	
60	D	Coupler, Directional CU-1515/U		
61	D	Voltmeter, Vacuum ME-30A/U	6625-643-1670	
62	D	Voltmeter, ME-303/U	6625-969-4105	
63	D	Voltmeter, RMS ME-318/U	6625-727-4706	
64	D	Meter, SWR, ME-339/U		
65	D	Millivoltmeter, RF ME-88/U (HP-411A)		
66	D	Generator, Signal TS-621 A/U or AN/URM-170	6625-556-8107	
67	D	Mount, Thermistor, MX-2144 A/U	6625-519-2414	

NOMENCLATURE OF END ITEM OR COMPONENT

SATELLITE COMMUNICATION TERMINAL AN/TSC-54

TOOL OR TEST EQUIPMENT REFERENCE CODE	MAINTENANCE CATEGORY	NOMENCLATURE	FEDERAL STOCK NUMBER	TOOL NUMBER
68	D	Waveguide Termination, MS-8426X	5985-888-5511	
69	D	Oscillator, Wide Range 0-1025/U	6625-578-4659	
70	D	Power Supply, Variable PP-3514/U	6130-445-6933	
71	D	Generator, Signal SG-479/G	6625-892-4703	
72	D	Generator, Function SG-747/U		
73	D	VTVM, TS-505/U	6625-243-0562	
74	D	Generator, Signal, TS-510A/U	6625-698-4757	
75	D	Multitester, TS-618/U	6625-519-0113	
76	D	Adapter, Coax-to-Waveguide UG-1053/U		
77	D	Receiver, Precision AIL 13610		
78	D	Generator, Sweep AL 650		
79	D	Amplifier, Power Boonton 203A		
80	D	Joint, Waveguide, DICO 20-645-0		
81	D	Voltmeter, Digital, Electro Inst. 1050		
82	D	Tower, Boresight, E-Z Way C-240		
83	D	Comparator, Phase, Fed Elec FE40A		
84	D	Probe, Millivac G-H		
85	D	Bridge, Impedance, Gen Radio 1650B		
86	D	Power Head, Thermistor, G.Microwave N346		
87	D	Power Head, Thermistor, G.Microwave N421		
88	D	Meter, Power, G.Microwave 454-A		
89	D	Transmitter, Data HESD 7450		
90	D	Probe, HP 11025A		
91	D	Probe, HP 11074A		
92	D	Recorder, X-Y, HP 135C		

NOMENCLATURE OF END ITEM OR COMPONENT SATELLITE COMMUNICATION TERMINAL AN/TSC-54				
TOOL OR TEST EQUIPMENT REFERENCE CODE	MAINTENANCE CATEGORY	NOMENCLATURE	FEDERAL STOCK NUMBER	TOOL NUMBER
93	D	Amplifier, Power, HP 230A		
94	D	Voltmeter, Digital, HP 3430A		
95	D	Detector, Crystal, HP J423A		
96	D	Detector, Crystal, HP J424A		
97	D	Power Supply, HP 6265A		
98	D	Voltmeter, Vector HP 8405A		
99	D	Filter, HP 8433A		
100	D	Voltmeter, Differential, John Fluke 801B		
101	D	Termination, Microlab DA-2/UP		
102	D	Splitter, Power, Microlab DA-3FB		
103	D	Meter, Power, MV-28B		
104	D	Power Supply, NJE Model TFC-115-200		
105	D	Voltmeter, Phase Angle, N.Atlantic 202BR		
106	D	Ratio Boxes, N.Atlantic, RB-503		
107	D	Mixer, Crystal, Scient-Atla 13-7.0		
108	D	Recorder, Scien-Atlan 1525		
109	D	Receiver, Scien-Atlan 1640AZ		
110	D	Unit, Control & Indicator S.A.411/4404P		
111	D	Control, Positioner, S.A. 4122		
112	D	Control, Indicator, S.A. 4403A/4403E		
113	D	Antenna Positioner, S.A. 5330B-20BR		
114	D	Oscilloscope Probe, Tek P6008		
115	D	Positioner, Polarization, S.A. 5613		
116	D	Load 50 ohm, Sealectro 60-001-0501		
117	D	Reflector, TACO PS-0617		
118	D	Feed, TACO PF-0617081		
119	D	Plug-in, Tek Type CA		

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT SATELLITE COMMUNICATION TERMINAL AN/TSC-54				
TOOL OR TEST EQUIPMENT REFERENCE CODE	MAINTENANCE CATEGORY	NOMENCLATURE	FEDERAL STOCK NUMBER	TOOL NUMBER
120	D	Oscilloscope, Probe, Tek P-6047		
121	D	Generator, Sweep, Head Telonic LH-2M		
122	D	Generator, Sweep, Telonic SM-2000		
123	D	VSWR Kit, Telonic TRK-1		
124	D	Detector, RF, Telonic XD-3A		
125	D	Transition Waveguide, Waveline 594B		
126	D	1,500 KHz Loop Filter, SM-D-570010		
127	D	Preamplifier Module, SM-D-570304		
128	D	480 KHz Voltage Control Oscillator SM-D-570327		
129	D	Post Amplifier Module, SM-D-570341		
130	D	RF Head Assembly, SM-D-571069		
131	D	Reflector Aligning Tool, T-7057-1165		
132	D	Reflector Holding Tool, T-7051-1165		
133	D	Optical Alignment Tool (other) T-7069-1165		
134	D	Reflector Lifting Plate, T-7076-1165		
135	D	Mast Assembly Tool, T-7077-1165		
136	D	Pedestal Lifting Plate, T-7078-1165		
137	D	Top Plate Assembly Tool, T-7082-1165		
138	D	Lifting Sling, Top Plate-Pedestal T-7086-1165		
139	D	Mast Lifting Sling, T-7093-1165		
140	D	Mode Launcher & Waveguide Tool Pedestal/ Mast, T-8085-1165		
141	D	Waveguide Adapter, T-9596-1165		
142	D	Waveguide Folded Hybrid, T-9597-1165		
143	D	Scanner/Waveguide Switch Control T9598-1165		

NOMENCLATURE OF END ITEM OR COMPONENT SATELLITE COMMUNICATION TERMINAL AN/TSC-54				
TOOL OR TEST EQUIPMENT REFERENCE CODE	MAINTENANCE CATEGORY	NOMENCLATURE	FEDERAL STOCK NUMBER	TOOL NUMBER
144	D	Test Fixture, Audio Amplifier, TJ525		
145	D	Test Fixture, AM Amplifier, TJ526		
146	D	Test Fixture, Power Supply Monitoring Circuit, TJ 527		
147	D	Test Fixture, Signal Detect Comm Demod, TJ 535		
148	D	Test Fixture, Level Det & Fault Loop Driver, TJ 536		
149	D	Test Fixture, 21.4 MHz/1.4 MHz Loop Amplifier TJ 537		
150	D	Test Fixture, 120-KHz Loop Phase Detector, TJ 540		
151	D	Test Fixture, Phaselock Detect & Sweep Stop Circuits, TJ 541		
152	D	Test Fixture, Deviation Monitor, TJ 542		
153	D	1.4 MC BW Select Switch, TJ 544		
154	D	Test Fixture, 1.4 MHz IF BW Select Circuit TJ 545		
155	D	Test Fixture, 0-30-dB Attenuator & Audio Amplifier, TJ 546		
156	D	Test Fixture, ÷100 Frequency & Phase Detector, TJ 547		
157	D	Test Fixture, AFC & Sweep Amplifier, TJ 548		
158	D	Test Fixture, AFC & Sweep Circuits TJ 549		
159	D	Test Fixture, Phaselock Loop Amplifier TJ 550		

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT SATELLITE COMMUNICATIONS TERMINAL AN/TSC-54				
TOOL OR TEST EQUIPMENT REFERENCE CODE	MAINTENANCE CATEGORY	NOMENCLATURE	FEDERAL STOCK NUMBER	TOOL NUMBER
160	D	Test Fixture, 480 KHz Voltage Control Oscillator, TJ 554		
161	D	Test Fixture, ID 411 Countdown & Quadrature, TJ 553		
162	D	Test Fixture, ID Sweep Loop & Acquisition TJ 555		
163	D	Test Fixture, Echo Suppressor TF 559, 559A		
164	D	Test Fixture, Power Supply, TJ 563		
165	D	Test Fixture, Demod 4816 MHz VCO, TJ 564		
166	D	Test Fixture 1.4 MHz (and 2.8 MHz) Loop Amplifier, TJ 566		
167	D	Test Fixture, Relay, TJ 568		
168	D	Test Fixture, Signal Bandwidth Select Switch, TJ 567		
169	D	Test Fixture, Echo Suppressor, TJ 599		
170	D	Test Fixture, AZ/EL Servo Amplifier TJ 1564		
171	D	RF Head, G. Microwave, 420C-(3)		
172	D	Calibrator, G Microwave, 305B		
173	D	Connector, MS316F-8-4S		
174	D	Potentiometer, RJ26CP503		
175	D	Generator Subassembly, MX-8364A/ USM-308 (HP, 8690B)	6625-442-3470	
176	D	BWO Plug-In (HP, 8694A)		
177	D	Amplifier SM-A-883162-1		
178	D	Power Meter, Boonton, 42B	6625-395-9430	
179	D	Thermistor Mount, Boonton 41-4B	6625-224-2431	

MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEM OR COMPONENT

SATELLITE COMMUNICATIONS TERMINAL AN/TSC-54

TOOL OR TEST EQUIPMENT REFERENCE CODE	MAINTENANCE CATEGORY	NOMENCLATURE	FEDERAL STOCK NUMBER	TOOL NUMBER
180	D	Test Fixture, Contactor Controller T-14132		
181	D	Waveguide to Coax Adapter UG 1357/U Flange to Type N Female Coax, Microwave Research, Type No. J40-NH-1.1 to 1 VSWR, 7.9 to 8.4 GHz with UG1357 Flange		
182	D	Connector, MS3106A-24-5S		
183	D	Adapter, Coax to Waveguide, HP, H281A		
184	D	Adapter, Female to Female Connector, M5539/7-00029		
185	D	Connector, MS3116F-14-19S		
186	F, D	Precision Power Supply, 0 to 1 Volt in 1 millivolt steps (HP 6113A or equivalent)		

INDEX

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