DEPARTMENT OF THE ARMY TECHNICAL MANUAL

OPERATOR'S, ORGANIZATIONAL, DS, GS, AND DEPOT MAINTENANCE MANUAL

TEST FACILITIES SET

AN/TPM-24(V)1

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

HEADQUARTERS DEPARTMENT OF THE ARMY

MARCH 1971

WARNING

DANGEROUS VOLTAGE EXISTS IN EQUIPMENT WHICH WILL BE INTERCONNECTED BY THIS TEST FACILITIES SET

DON'T TAKE CHANCES!

EXTREMELY DANGEROUS VOLTAGE

EXISTS IN THE FOLLOWING UNIT:

Receiver-Transmitter. Radio RT-861/UPX 1000 volts

TECHNICAL MANUAL
No. 11-6625-2398-15-1

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON, DC, *15 March 1971*

TEST FACILITIES SET AN/TPM-24(V)1

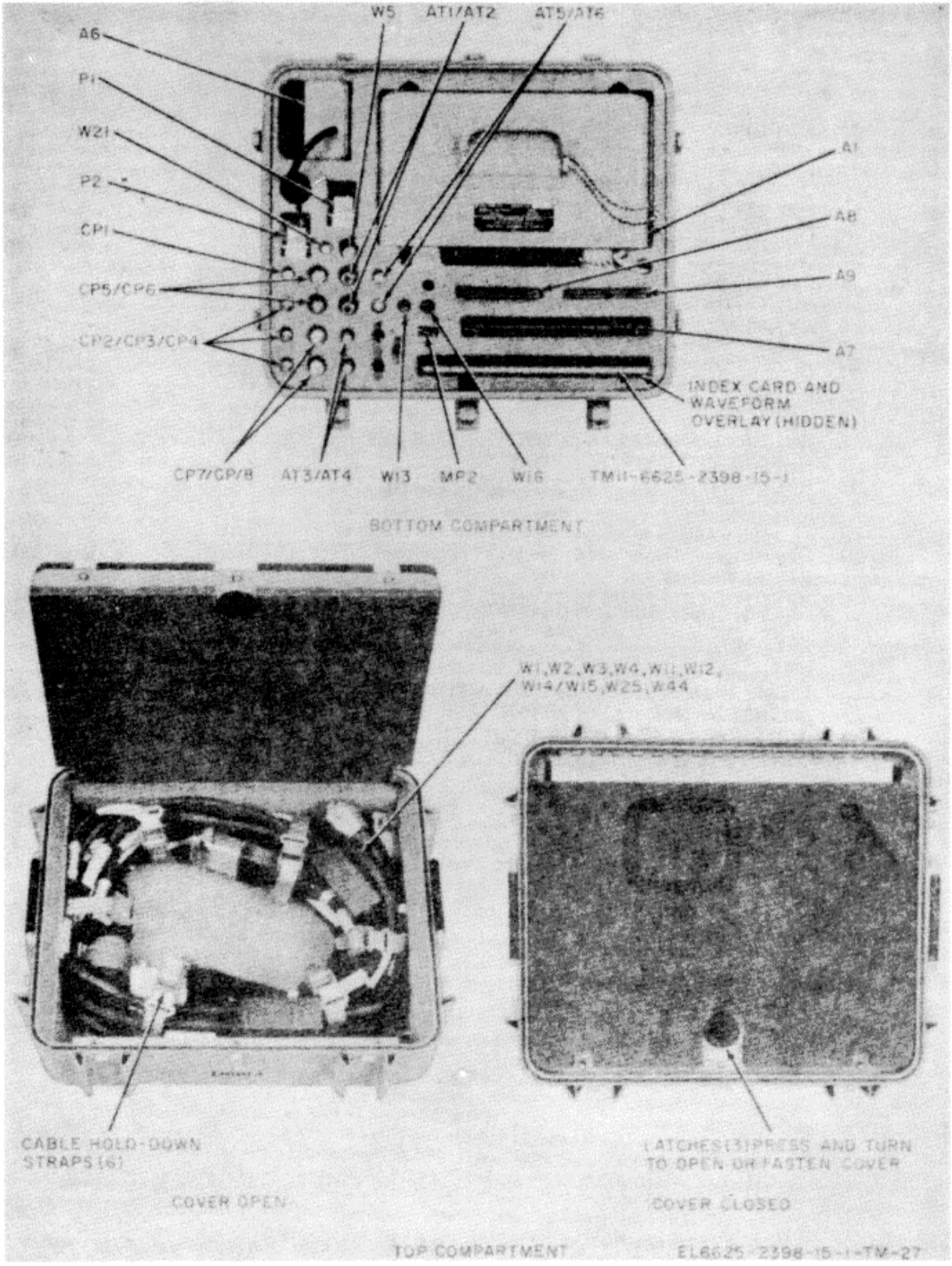


Figure 1-1. Test facilities set AN/TPM-24(V)1

CHAPTER 1

INTRODUCTION

Section I. GENERAL

1-1. Scope

a. This manual describes Test Facilities Set AN/TPM-24(V)1 (fig. 1-1) and provides Instructions for installation, use, and maintenance It includes Instructions for cleaning, Inspection, troubleshooting, testing, calibration, repair and replacement. It also lists tools, materials, and test equipment required for maintenance. A functional analysis of the equipment is also covered.

b. The, repair parts and special tools lists will appear in appendix D.

1-2. Indexes of Publications

a. DA Pam 310-4. Refer to the latest Issue of DA Pam 310-4 to determine whether there are new editions, changes, or additional publications pertaining to the equipment.

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

1-3. Forms and Records

a. Reports of Maintenance and Unsatisfactory Equipment. Maintenance forms, records, and reports which are listed in and prescribed by TM 38-750.

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

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

1-3.1 Reporting of Equipment Publication Improvements

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

Section II. DESCRIPTION AND DATA

1-4. Purpose and Use

a. Test Facilities Set AN/TPM-24(V)1 is a portable set of special test accessories used to support the maintenance of Interrogator Set AN/TPX-45. It contains cable assemblies, a hybrid attenuator, a front panel test adapter, and minor components (including connector adapters, dummy loads, extender boards, and similar items), all housed in a transit case.

b. Four of the AN/TPM-24(V)1 cable assemblies provide interconnections between the major assemblies of Interrogator Set Group OX-6/TPX-45 when Receiver-Transmitter, Radio RT-861/UPX and Electronic Switch SA-1598/TPX-45, are removed from Interrogator Set Group Case CY-6391/TPX-45. Minor components provide terminations for the rf sum and rf difference

channels of Interrogator Set AN/TPX-45. Another cable assembly interconnects the components of the AN/TPX-45 and connects them to external power sources. The Interrogator Set AN/TPX-45 may be energized in a hot mock-up configuration for maintenance purposes by using this last cable assembly and terminations.

CAUTIONS

1. To avoid damage to the equipment under test DO NOT energize Interrogator Set AN/TPX-45 before placing appropriate loads on the rf sum and difference channels (jacks 1J13 and 1J14).
2. Check that the ac power receptacle wiring corresponds to plug P7 of cable W25. The equipment under test could be damaged if the low side of the ac line is not connected to the wide prong of the plug.

c. The hybrid attenuator, two AN/TPM-24(V)1 cable assemblies, and minor components are used in conjunction with other test equipment in performing various rf measurements on the AN/TPX-45. Rf sum channel and rf difference channel parameters may be measured at reply and challenge frequencies.

d. The front panel test adapter connects to 'the TEST jack on the front panel of the RT-861/UPX. It provides a convenient means of selecting and monitoring various signals of the RT-861/UPX using external test equipment.

e. The remaining cable assemblies and minor components of the AN/TPM-24(V)1 are used in performing specific maintenance procedures on the AN/TPX-45. Maintenance procedures for the AN/TPX-45 are covered in the following technical manuals:

TM 11895-595-35	DS, GS, and Depot Maintenance Manual, Interrogator Set AN/TPX-45
TM 11-5895-689-35	DS, GS, and Depot Maintenance Manual, Receiver-Transmitter, Radio RT-861/UPX
TM 11-5895-690-35	DS, GS, and Depot Maintenance Manual, Coder-Decoder, Interrogator Set AN/TPA-8

1-5. Technical Characteristics

The technical characteristics of the components of the Hybrid Attenuator Assembly CN-1322/TPM-24(V) are as follows:

a. Hybrid Junction.

Impedance	50 ohms, nominal
Frequency range	1000-1200 MHz
Nominal coupling	3, + 0.3, -OdB
Max. deviation	±0.25 dB
Max VSWR	1.3 to 1
Min. isolation	20 dB between sum and difference
Power rating	5 kilowatts peak, 50 watt average

b. Attenuator.

Impedance	50 ohms, nominal
Frequency range	1000-1200 MHz
Variable attenuation	0-25 dB, min.
Calibration accuracy at 1090 MHz	0 to 10 dB range +0.35 dB max. 11 to 20 dB range +0.50 dB max 21 to 25 dB range +0.60 dB max.
Accuracy over the band	+2.5 dB max. including insertion loss
Insertion loss	0 5 dB, max
VSWR	1.5 dB, max.
Power rating	6 Kilowatts peak, 10 watts average

1-6. Common Names

a. A list of nomenclature and common names assignments for Test Facilities Set AN/TPM-24(V)1 is given below:

Common Name	*nomenclature*
Adapter CP1	Adapter, Connector UG-1897/ TPM-24(V)
Adapter CP2/CP3/CP4	Adapter, Connector UG-1896/ TPM-24(V)
Adapter CP51CP6	Adapter, Connector UG-1898/ TPM-24(V)
Adapter CP7/CP8	Adapter UG-201A/U
Attenuator AT1/AT2	Attenuator, Fixed CN-1321/ TPM-24(V)
Cable W1	Cable Assembly, Radio Frequency, Branched, CG-36141 TPM-24(V)
Cable W2	Cable Assembly. Special Purpose. Electrical, CX-12219rTPM-24(V)
Cable W3	Cable Assembly, Radio Frequency. Branched. CG-3615/ TPM-24(V)

Common name	*Nomenclature*
Cable W4	Cable Assembly, Special Purpose, Electrical CX-12220/TPM-24(V)
Cable W6	Cable Assembly, Radio Frequency, CG-3607/TPM-24(V)
Cable W11	Cable Assembly, Special Purpose, Electrical, CX-12221/24(V)
Cable W12	Cable Assembly, Radio Frequency, CG3609/TPX-24(V)
Cable W13	Cable Assembly, Radio Frequency, CG-3608/TPM-24(V)
Cable W14/W15	Cable Assembly, Radio Frequency, CG-409F/U (6 ft.)
Cable W16	Cable Assembly, Radio Frequency, CG-3610/TPM-24(V)
Cable W21	Cable Assembly, Radio Frequency, CC3611/TPM-24(V)
Cable W25	Cable Assembly, Special Purpose, Electrical, Branched, CX-12228/TPM-24(V)
Cable W44	Cable Assembly, Special Purpose, Electrical, CX-12226/TPM 24(V)
Dummy Connector P1	Dummy Connector, Plug, MX-8567/TPM-24(V)
Dummy Connector P2	Dummy Connector, Plug, MX-8566/TPM-24(V)
Extender Board A7	Extender, Circuit Board MX-8559/TPM-24(V)
Extender Board A8	Extender, Circuit Board MX-8561/TPM-24(V)
Extender Board A9	Extender, Circuit Board MX-8562/TPM-24(V)

Common Name	*Nomenclature*
Front panel test adapter	Adapter, Test M X-8564/TPM-24(V)
Hybrid attenuator	Hybrid Attenuator Assembly CN-1322/TPM-24(V)
Index card	Card, Index
Printed-circuit board extractor MP2	Extractor, Circuit Board (3.7 in. wide)
Waveform overlay	Overlay, Waveform
Termination AT3/AT4	Dummy Load, Electrical DA-558/ TPM-24(V)
Termination AT5/AT6	Dummy Load, Electrical DA-59/TPM-24(V)
Test facilities set	Test Facilities Set ANITPM-24(V)
Transit case	Case, Test Facilities Set CY-6824/TPM-24(V)1

b. A list of nomenclature and common name assignments for Interrogator Set AN/TPX-45 and cables supplied with Interrogator Set AN/TPX-45 is given below.

Common name	*Nomenclature*
Coder-decoder	Coder-Decoder KY-598/TPX-8
Interrogator unit	Interrogator Set Group OX-6/TPX-45
Receiver-transmitter	Receiver-Transmitter, Radio RT-861/UPX
Remote control switching unit	Control, Remote Switching C-7072/TPA-8
Rf switch	Electronic Switch SA-1598/TPX-45
Transit case	Case, Interrogator Set Group CY-6391/TPX-45

1-7. Items Comprising the Operable Test Facilities Set AN/TPM-24(V)1

FSN	QTY	Nomenclature, part No., and mfr code	Fig. No
		NOTE The part number is followed by the applicable 5-digit Federal supply code for manufacturers (FSCM) identified in SB 708-42 and used to identify manufacturer, distributor, or Government agency, etc	
6625-133-7864		Test Facilities Set AN/TPM-24(V)1, (This item is nonexpendable) which includes:	1-6(1)
5935-837-5280	3	Adapter, Connector UG-1896/TPM-24(V)	1-6(1)
5935-075-7008	1	Adapter, Connector UG1897/TPM-24(V)	1-6(1)
5935-177-2761	2	Adapter, Connector UG-1898/TPM-24(V)	1-6(1)
5935-842-9614	2	Adapter, Connector: UG201AU, 81350	1-6(1)
6625-17S5498	1	Adapter, Test MX-8564/TPM-24(V)	1-4(1)
5985-128-0195	2	Attenuator, Fixed CN-1321/TPM-24(V)	1-6(1)
6625-133-7803	1	Cable Assembly, Radio Frequency, Branched CG3614/TPM-24(V)	1-5(1)
6626-133-7852	1	Cable Assembly, Special Purpose, Electrical CX-12219/TPM- 24(V)	1-5(2)
5935-177-2762		Dummy, Connector, Plug MX-8566/TPM-24(V)	1-6(1)
593-177-2763		Dummy, Connector, Plug MX-8567/TPM-24(V)	1-6(1)

FSN	QTY	Nomenclature, part No., and mfr code	Fig No
5985-861-7856		Dummy Load, Electrical DA-558/TPM-24(V)	1-6(1)
5950-970-1869		Dummy Load, Electrical DA-559/TPM-24(V)	1-6(1)
6625-133-7776		Extender, Circuit Board MX-8559/TPM-24(V)	1-6(2)
6625-133-7775		Extender. Circuit Board MX-8561/TPM-24(V)	1-6(2)
5985-177-2939		Hybrid Attenuator Assembly CN-1322/TPM-24(V)	1-3
5120-450-6766		Puller, Painted Wiring Board SMB687971-2, 80249	1-6(2)
625-465-1706		Scale, Cathode Ray Tube SMC657851, 80249	
662.-133-7804	1	Cable Assembly, Radio -Frequency, Branched CG-3615/TPM-24(V)	1-5(1)
662,5133-7850	1	Cable Assembly, Special Purpose, Electrical CX-12220/TPM-24(V)	1-5(2)
6625-177-488	1	Cable Assembly, Radio Frequency CG-3607/TPM-24(V)	1-5(1)
6625-117-4498	1	Cable Assembly, Special Purpose, Electrical CX-12221/TPM-24(V)	1-5(1)
6625-177-4491	1	Cable Assembly, Radio Frequency CG-3609/TPM-24(V)	1-5(1)
6625-177-4489	1	Cable Assembly, Radio Frequency CG-3608/TPM-24(V)	1-5(1)
5995-905-7194	2	Cable Assembly, Radio Frequency CG-409FIU (6 ft)	1-5(1)
6625-177-4491		Cable Assembly, Radio Frequency CG-3610/TPM-24(V)	1-5(1)
6625-177-4492	1	Cable Assembly, Radio Frequency C-3611/TPM-24(V)	1-5(1)
6625-133-7795	1	Cable Assembly, Special Purpose, Electrical, Branched CX-12228/TPM-24(V)	1-5(2)
6625-177-499	1	Cable Assembly, Special Purpose, Electrical CX-12226TrPM-24(V)	1-5(1)

1-7.1. Components and Dimensions

The index card supplied with the test facilities set provides location of the components in the bottom of the transit case.

NOTE

This listing is based on original shipment of Contract DAAB0569-C-0415. For a current official listing, refer to paragraph 1-7 and appendix B (BIIL). Refer to paragraph 1-6 for nomenclature of items listed below.

a. Major Components.

Quantity	Item	Dimensions (In)			Unit weight (lb)	Figure no
		Height	Depth	Width		
1	Transit case	17	18 1/2	21 3/4	70[b]	1-2
1	Hybrid Attenuator	10 1/2	9 3/8	13 3/8	12.5	1-3
1	[a] Front panel test adapter	4	3 1/2	7 1/4	1 5	1-4
2	TM 11-6625-2398-15-1					

[a]Cable dimensions and weights are not included

[b] Weight of transit case packed for Transportation

b. Cable Assemblies

Quantity	*Item (nom)*	*Length no.*	*Figure*
1	Cable W1	6 ft	1-5
1	Cable W2	6 ft	1-5
1	Cable W3	6 ft	1-5
1	Cable W4	6 ft	1-5
1	Cable W5	6 in	1-5
1	Cable 11	18 In	1-5
1	Cable W12	18 3/8 in	1-5
1	Cable W13	5 In	1-5
2	Cable W14/W15	6 ft	1-5
1	Cable W16	6 In.	1-5
1	Cable W21	6 in	1-6
1	Cable W25	9 ft [a]	1-6
1	Cable W44	1 ft	1-5

[a]Cable W25 is a multi branched cable Nine feet is the length of the longest branch

c. Minor Components.

Quantity	*Item*	*Figure no.*
1	Adapter CP1	1-6
3	Adapter CP2/CP3/CP4	1-6
2	Adapter CP5/CP6	1-6
2	Adapter CP7/CP8	1-6
2	Attenuator AT1/AT2	1-6
1	Dummy Connector P1	1-6
I	Dummy Connector P2	1-6
1	Extender board A7	1-6
1	Extender board AS	1-6
1	Extender board A9	1-6
1	Printed-circuit board extractor MP2	1-6
2	Termination AT3/AT4	1-6
2	Termination AT5/AT6	1-6
1	Waveform overlay	1-6

1-8. Description of Major Components (fig. 1-2, 1-3, and 1-4)

a. Transit Case. The transit case (fig. 1-2) is a reusable protective case which houses the components of the test facilities set during transit or storage. Two handles are provided for lifting and moving the transit case. The transit case consists of a top section and a bottom section (fig. 1-1); the top section comes apart from the bottom section when the spring-loaded latches holding the two sections together are released. The top section contains a compartment into which coiled cables are placed for storage. The bottom section contains a foam filler, with cutouts for storing the other components of the test facilities set. The index card locates the correct storage space for all components. Gasketing around the edge of the top section mates with the bottom section edge to provide a watertight seal for the transit case when the spring-loaded latches are locked, and the pressure-relief valve is closed.

b. Hybrid Attenuator. The hybrid attenuator (fig. 1-3) consists of a hybrid junction and a variable attenuator combined in a single unit with a carrying handle on top of the case. A card, containing calibration data pertaining to the hybrid junction and attenuator insertion losses, is attached to the handle. The card lists the sum channel and difference channel insertion losses at both 1030 and 1090 Mhz when the ATTENUATOR dial is set at 0 dB; also listed are ATTENUATOR insertion losses at 1030 and 1090 MHz for ATTENUATOR dial settings of 0, 3, 6, 9, 12, 15, 20, and 25 dB.

Connectors on the front panel of the unit are used to couple the hybrid junction and/or the attenuator into a test set-up for making use of cables AIW3 (p/o hybrid attenuator) and W14/W15, connected in a configuration determined by the test.

c. Front Panel Test Adapter. The front panel test adapter (fig. 1-4) consists of a selector switch and eight test jacks mounted in a small aluminum enclosure. A cable and plug, integral to the front panel test adapter, permit connecting this item to the front panel of the receiver-transmitter of the rf set for monitoring and checking various signals of the receiver-transmitter. Seven of the test jacks permit direct monitoring of receiver-transmitter signals using external test equipment. The receiver-transmitter signal available at the eighth test jack is determined by the setting of the selector switch.

1-9. Description of Cable Assemblies (fig. 1-5)

a. Cable W1 is a branched type multiconductor cable assembly used in conjunction with cable W2 to extend the rf switch assembly from the interrogator group case. It connects between 1A2P1 of the rf switch and 1XA2P1 of the interrogator group case. The four break-out coaxial cables are connected together by means of adapter couplers and are calibrated for insertion loss (in dB).

b. Cable W2 is a two-ended multiconductor cable assembly used in conjunction with cable W1 to extend the rf switch assembly from the interrogator group case. It connects between 1A2P2 of the rf switch assembly and 1XA2P2 of the interrogator group case.

c. Cable W3 is a branched-type multiconduc-

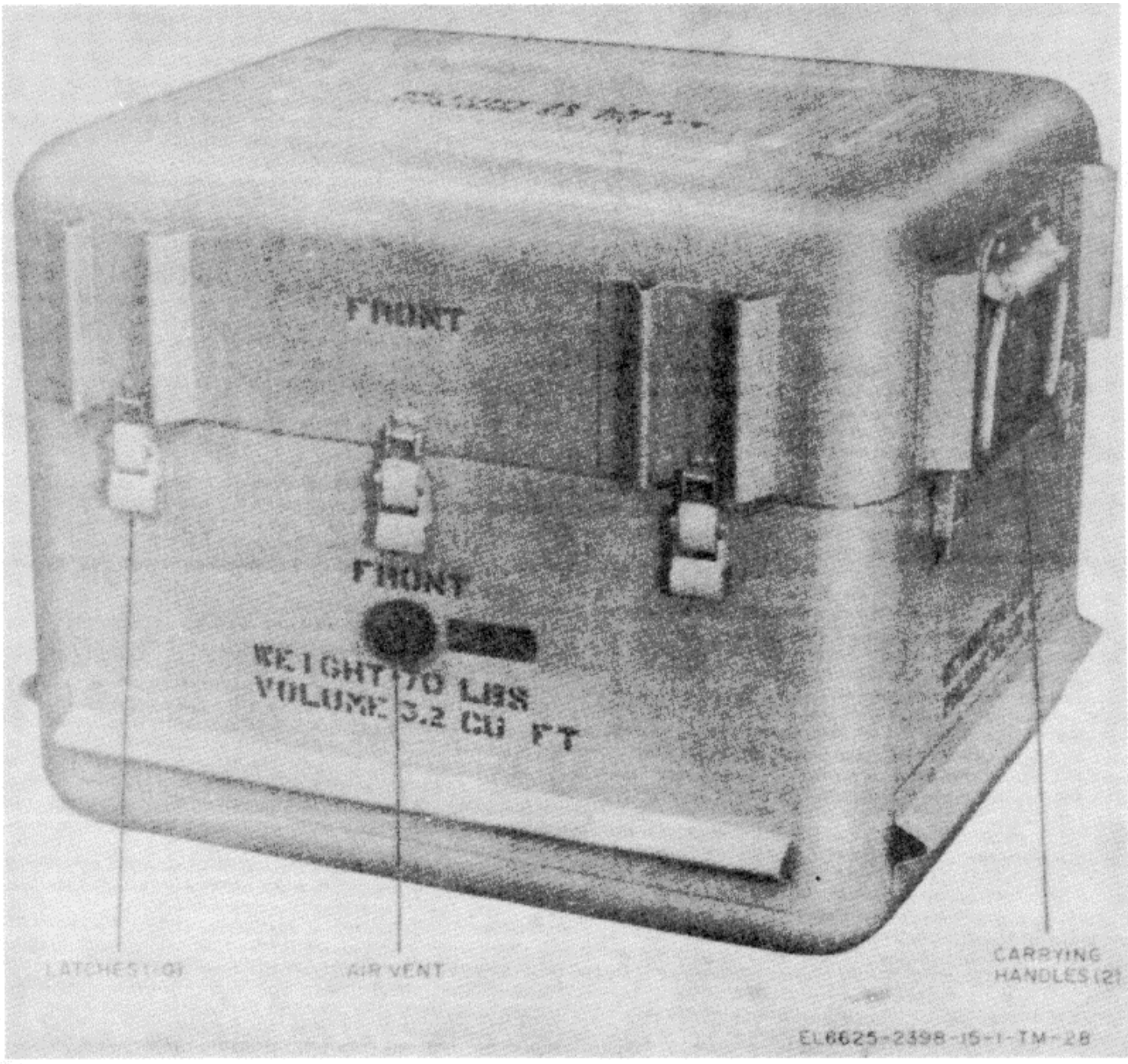


Figure 1-2. Case, Test Facilities Set CY-6824/TPM-24(V)1

tor cable assembly used in conjunction with cable W4 to extend the receiver-transmitter from the interrogator group case. It connects between 1A1P1 of the receiver-transmitter and 1XA1P1 of the interrogator group case. Two break-out coaxial cables in the branched section of the cable assembly are connected together by means of adapter couplers. These two break-out cables are calibrated for insertion loss (in dB).

d. Cable W4 is a two-ended multiconductor cable assembly used in conjunction with cable W3 to extend the receiver-transmitter from the interrogator group case. It connects between 1AlA2P1 of the receiver-transmitter and 1XA1-A2P1 of the interrogator group case.

e. Cable W5 is a two-ended coaxial BNC to Gremar adapter cable assembly. It is used during alignment of the diplexer of the rf switch assembly.

f. Cable W11 is a two-ended multiconductor cable assembly used to extend the receiver mod-

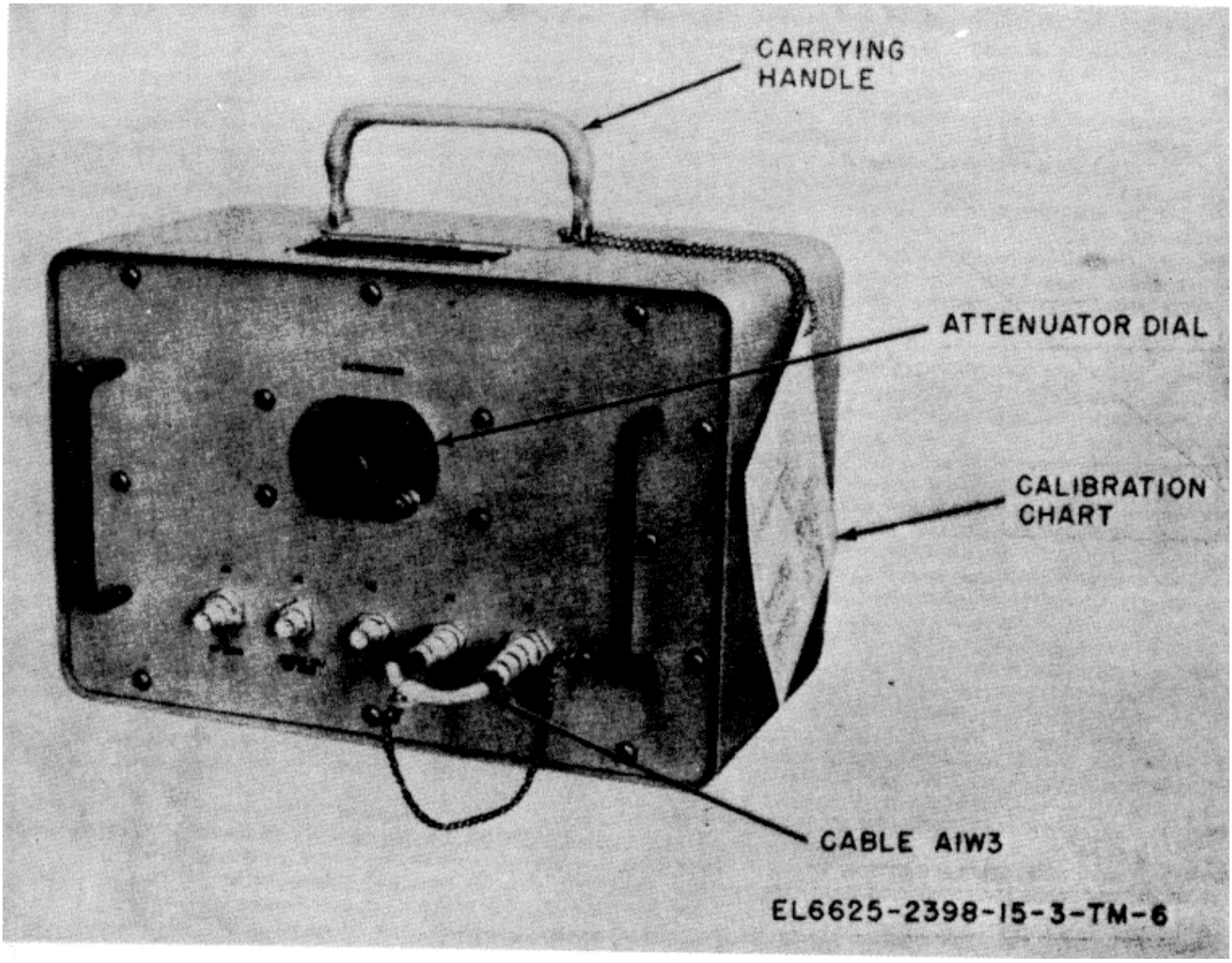


Figure 1-3. Hybrid Attenuator Assembly CN-1322/TPM-24(V).

ule from the receiver-transmitter assembly. It connects between P6 of the receiver-transmitter chassis and J1 of the receiver module.

g. Cable W12 is a two-ended coaxial cable assembly with a detachable junction at the center. This junction is connected by means of an adapter coupler. It permits the connection of the variable attenuator of the hybrid attenuator assembly between the transmitter output and stripline coupler input. The cable is used to interconnect the transmitter output connector CP1 of the transmitter/power supply module to stripline coupler input A1J2 when extending the receiver module from the receiver-transmitter chassis.

h. Cable W13 is a coaxial-type tuned-stub line (open circuit at one end) used as a stripline coupler termination when preselector tuning of the receiver-transmitter is performed.

I. Cables W14/W15 are two-ended coaxial cables used to connect the hybrid attenuator assembly to the interrogator group case. Each cable is calibrated for insertion loss (in dB).

j. Cable W16 is a coaxial cable having alligator-type clips at one end and a BNC connector at the other end. It is used to facilitate self-test signal generator rf power measurements in the receiver-transmitter.

k. Cable W21 is a two-ended coaxial adapter cable assembly used for operating frequency tests and for local oscillator/exciter output measurements. It is connected to J3 or A3J1 of the receiver module.

l. Cable W25 is a branched-type multiconductor cable assembly used to permit bench-operation of the interrogator set components.

m. Cable W44 is a two-ended multiconductor cable used to facilitate troubleshooting and align-

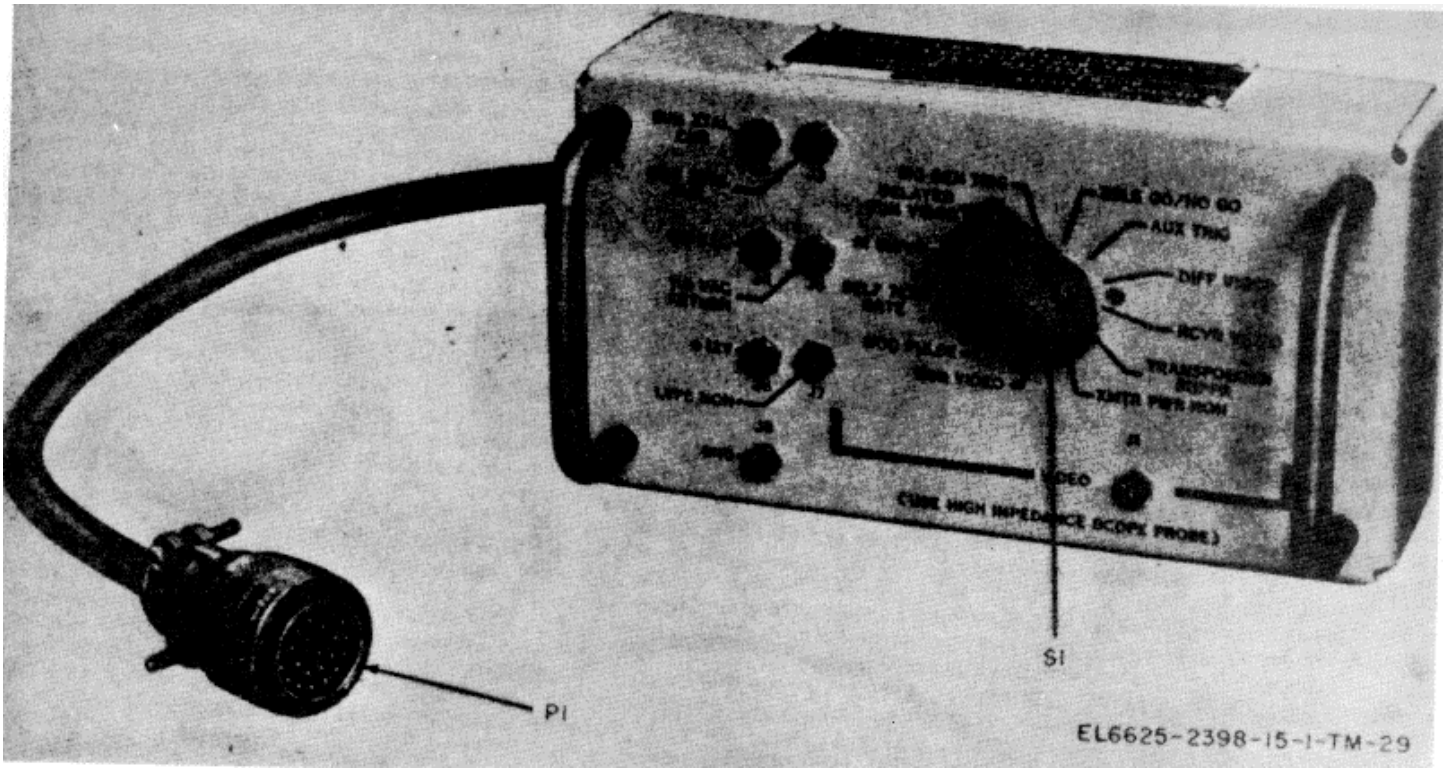


Figure 1-4. Adapter, Test MX-8564/TPM-24(V).

ment of the transmitter power supply module of the receiver-transmitter. It is connected between J1 of the transmitter power supply and P7 of the receiver-transmitter chassis.

1-10. Description of Minor Components (fig. 1-6)

a. Adapter CP1 is a BNC jack to OSM jack adapter used during maintenance of the rf set.

b. Adapters CP2/CP3/CP4 are BNC jack to OSM plug adapters used during maintenance of the rf set.

c. Adapters CP5/CP6 are BNC jack to Selector plug adapters used during maintenance of the rf set.

d. Adapters CP7/CP8 are N-male to BNC-female adapters used during maintenance of the rf set and for testing and/or calibration of components of the test facilities set.

e. Attenuators AT1/AT2 are fixed 6-dB, 50-ohm, coaxial N-type attenuators used to isolate test equipment from the receiver unit during receiver maintenance.

f. Dummy connectors P1 and P2 facilitate the insertion loss measurements of the rf switch assembly.

g. Extender board A7 is used to make accessible f6r maintenance the plug-in printed-circuit boards in the receiver-transmitter.

h. Extender board A8 is used to make accessible for maintenance the plug-in printed-circuit boards of the coder-decoder.

i. Extender board A9 is used to make accessible for maintenance the plug-in printed-circuit boards of the rf switch.

j. Printed-circuit board extractor MP2 provides an efficient means of removing plug-in printed-circuit boards from the rf set components.

k. Terminations AT3/AT4 are 50-ohm, 2 watt, coaxial BNC-type, dummy loads used as low-power rf terminations during maintenance of the rf set and for testing and/or calibration of the hybrid attenuator.

l. Terminations AT5/AT6 are 75-ohm, 1/2 watt, coaxial BNC-type, dummy loads used as video terminations during maintenance of the rf set.

m. The waveform overlay for a test oscilloscope provides the correct GTC response curve.

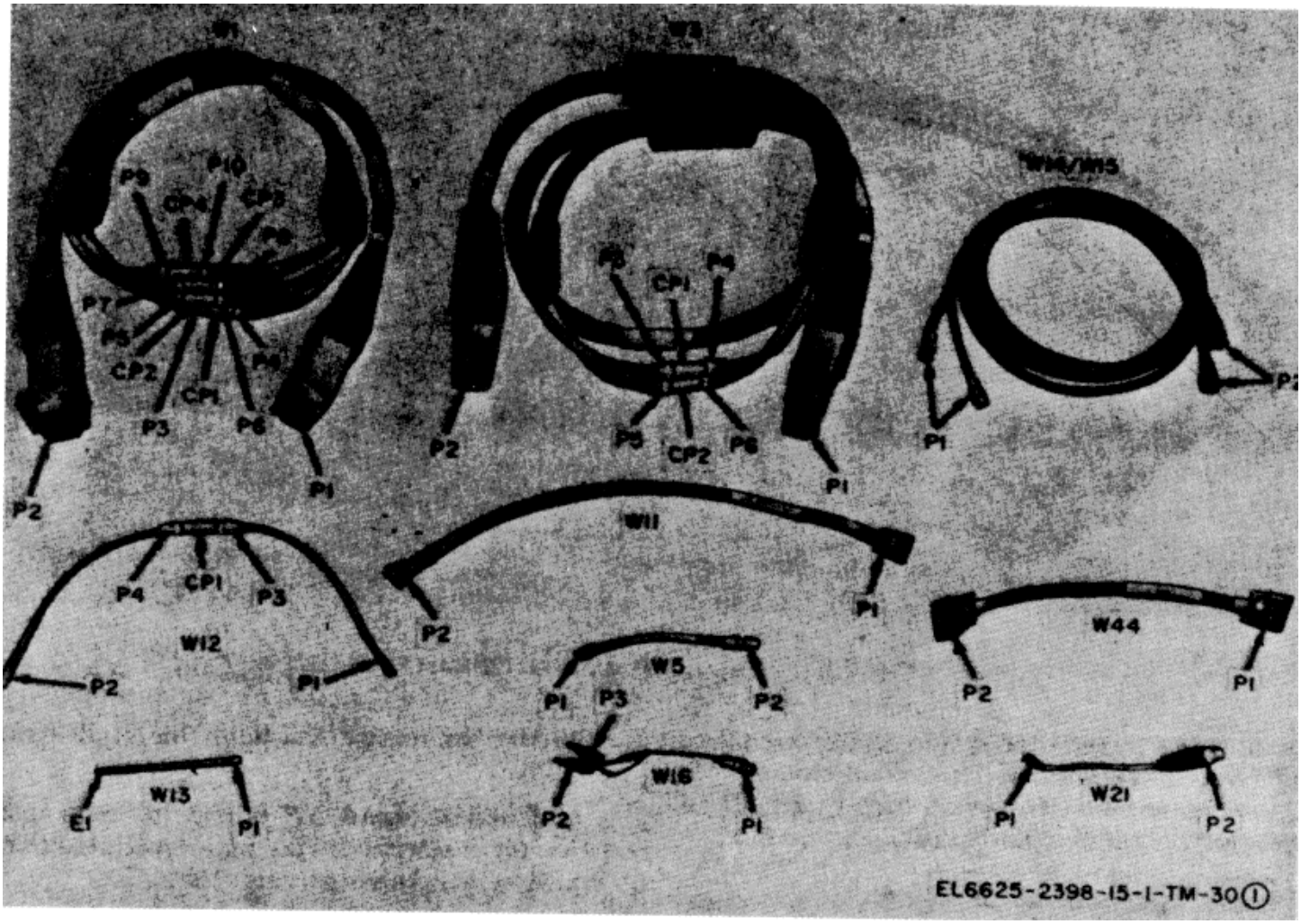


Figure 1-5(1). Test Facilities Set AN/TPX-24(V)1, cable assemblies (part 1 of 2).

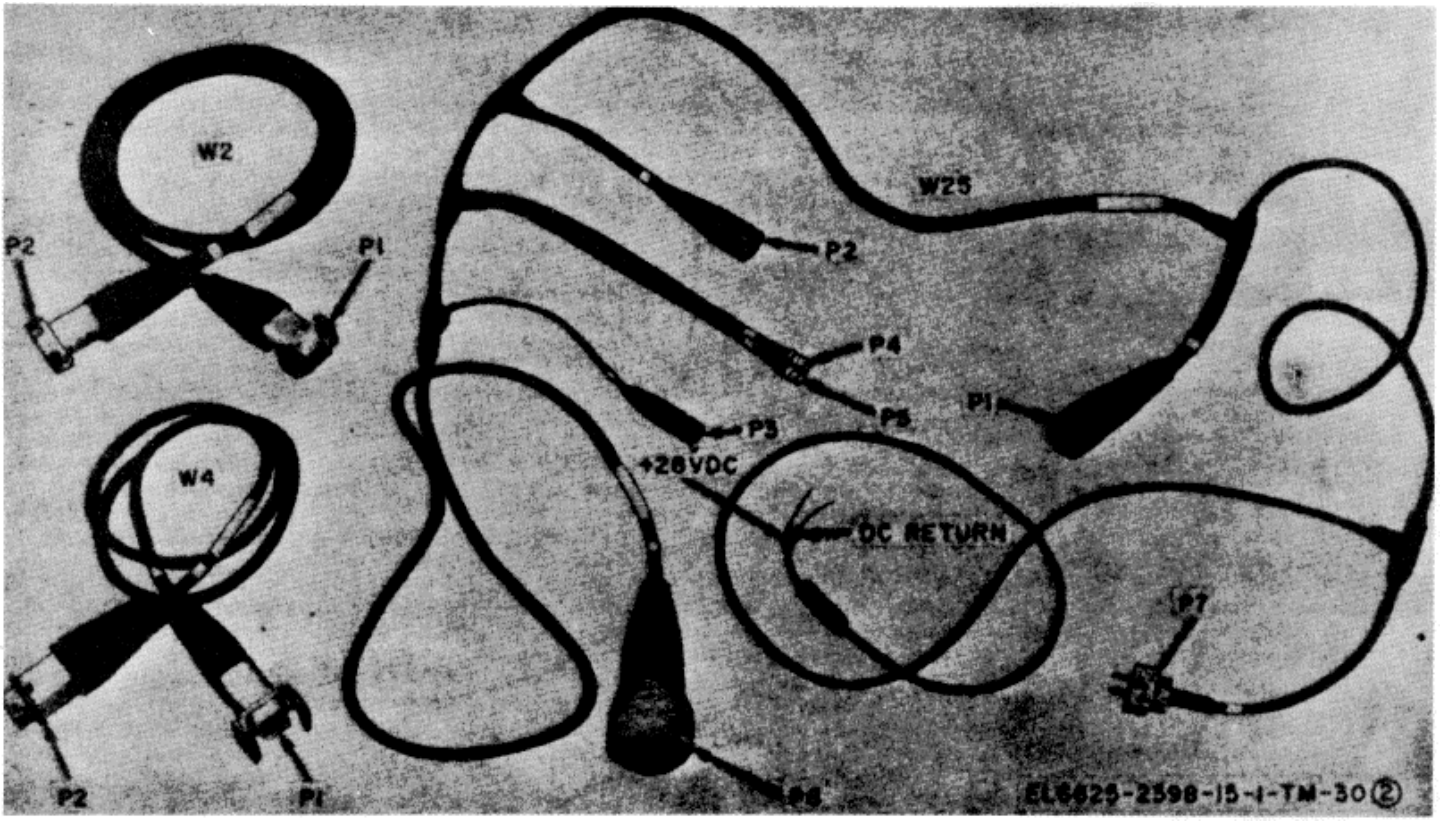


Figure 1-5(2). Test Facilities Set AN/TPM-24(V)1, cable assemblies (part 2 of 2).

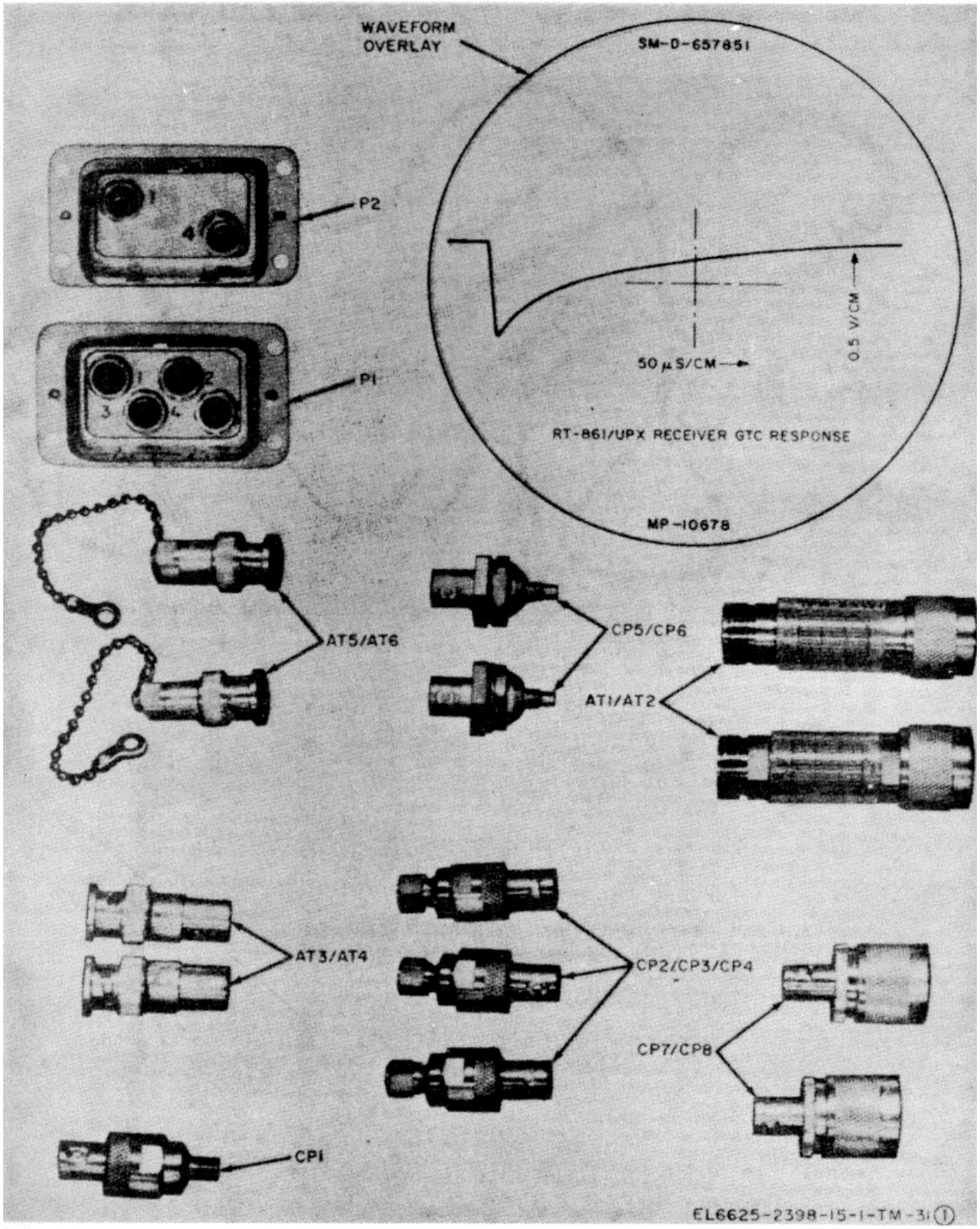


Figure 1-6(1). Test Facilities Set AN/TPM-24(V)1, minor components (part 1 of 2).

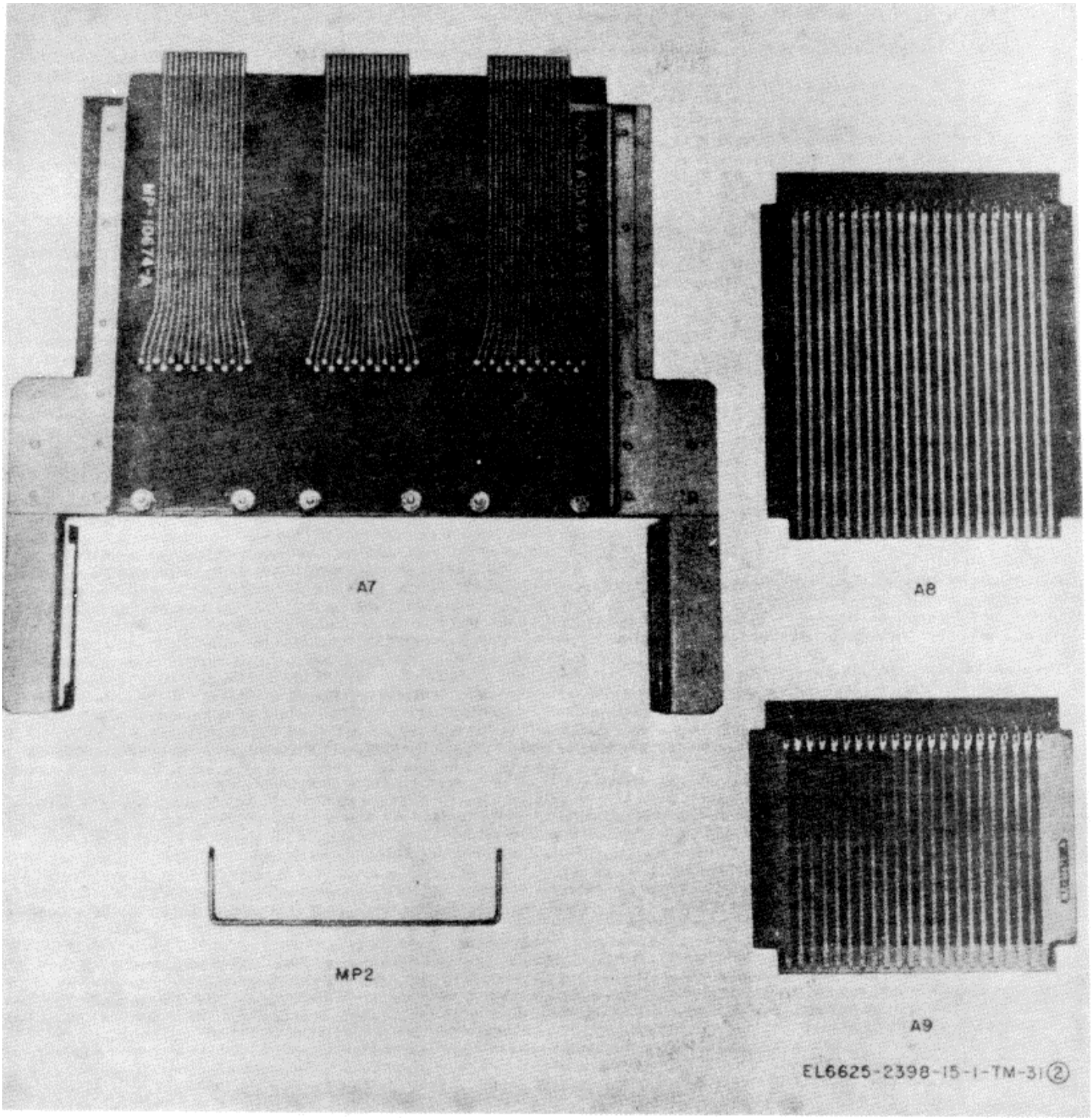


Figure 1-6(2). Test Facilities Set AN/TPM-24(V)1, minor components (part 2 of 2).

CHAPTER 2

INSTALLATION

2-1. Unpacking

a. *Packaging Data*. When packed for shipment, the complete test facilities set is placed in a polyethylene wrap and packed in a single carton which is then sealed. Figure 2-1 illustrates the method employed in packing the test facilities set. The dimensions of the shipping container are 223/ by 21% by 201/ inches, and its volume is 5.72 cubic feet. The test facilities set when packaged weighs approximately 85 pounds.

b. *Removing Contents*.

(1) Cut the seal and fold back the carton cover.

(2) Remove the polyethylene wrapped transit case.

(3) Open the polyethylene wrap and remove the transit case.

(4) Open the transit case and inspect the humidity indicator (should be blue). If the humidity indicator is pink, inspect components for moisture damage.

2-2. Checking Unpacked Equipment

a. Inspect the equipment for damage incurred during shipment. If the equipment has been damaged, report the damage on DD Form 6 (para 1-3).

b. See that the equipment is complete as listed on the packing slip. Report all discrepancies in accordance with TM 38-750. Shortage of a minor assembly or part that does not affect proper functioning of the equipment should not prevent use of the equipment.

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 will appear on the front panel near the nomenclature plate. If modified, see that any operational instruction changes resulting from the modification have been entered in the equipment manual.

NOTE

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

2-3. Installation and Connections

a. *Installation*. The test facilities set is used in conjunction with a fully operational rf set and external test equipment in the test-bench maintenance of rf sets returned from using organizations. Since the test facilities set primarily contains special purpose test accessories, only those components and cables of the test facilities set pertinent to the particular maintenance to be performed need to be installed at any one time. In general, when bench testing of the rf set or its major components is to be performed, sufficient space must be provided on or near the test bench to accommodate the transit case, the external test equipment, the rf set group case, any components of the rf set removed from the group case, and all required interconnecting cabling.

b. *Connections*. As noted in paragraph a, only those cables of the test facilities set required for a particular maintenance operation need to be connected at any one time. If extended and/or extensive use of the test facilities set is anticipated, however, it may be desirable to set up a basic test station. When connections are made as indicated in the following chart, a basic test station for rf set system testing results. This station may be expanded upon, using the information contained in chapter 3 and in the maintenance manuals for the rf set and its major components, to obtain the proper connections for particular maintenance procedures.

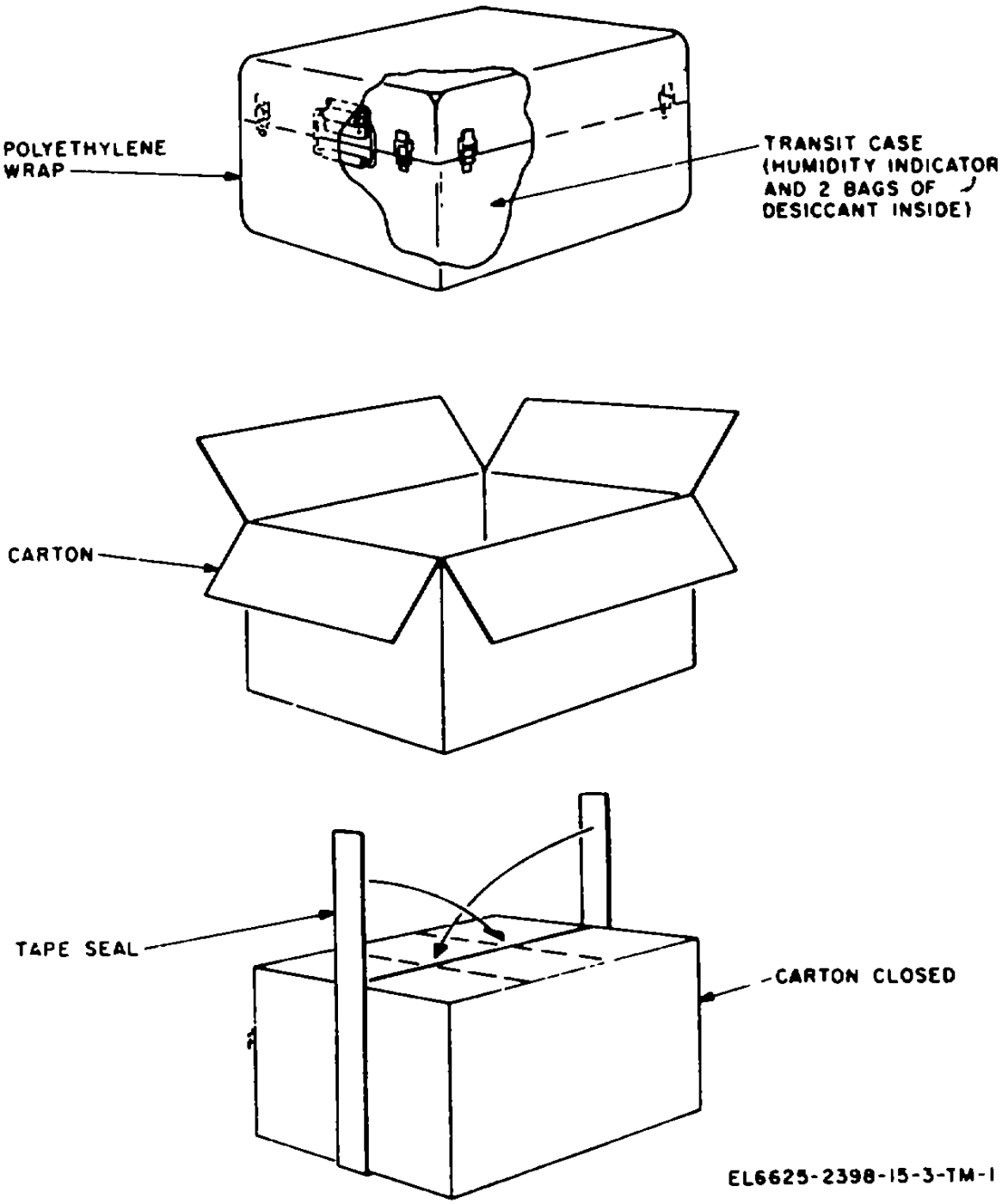


Figure 2-1. Packaging of Test Facilities Set AN/TPM-24(V)1.

Cable no	Required no	Length (ft)	Connects	
			From	To
W1	1	6	1XA2P1 of interrogator group case	1A2P1 of rf switch
W2	1	6	1XA2P2 of interrogator group case	1A2P2 of rf switch
W3	1	6	1XA1P1 of interrogator group case	1A1P1 of receiver-transmitter
W4	1	6	1XA1A2P2 of interrogator group case	1A1A2P1 of receiver-transmitter
W25*	1	9	1J12 of interrogator group case.	2J1, 2J3, 2J5, and 2J6 of coder-decoder, 3J1 of remote control switching unit, and dc and ac power sources.

[a] CAUTION

To avoid damage to the equipment under test, initially check that plug P7 and the AC power receptacle are similarly wired. DO NOT plug in P7 if the "low" side of the line, at the outlet, does not correspond to the wide prong of plug P7.

CHAPTER 3

OPERATING INSTRUCTIONS

Section I. OPERATOR'S CONTROLS AND CONNECTORS

3-1. Hybrid Attenuator A1, Operating Control, Connectors and Cable (fig. 3-1)

Control or cable connector	*Function*
ATTENUATOR control AT1 (variable attenuator)	Provides continuously variable control of the attenuation between ATTEN OUT jack J4 and ATTEN IN/RF DIFF jack J5 from 0 to 25 dB.
ATTEN IN/RF DIFF jack J5	Permits connection of external equipment to ATTENUATOR AT1
ATTEN OUT jack J4	Permits connection of external equipment or the hybrid junction of the hybrid attenuator to ATTENUATOR AT1
Cable A1W3	Permits series connection of ATTENUATOR AT1 and the hybrid junction by interconnecting ATTEN OUT jack J4 and CPLR IN jack J3
RF IN/OUT jack J1	Permits connection of external equipment to the hybrid junction When used as an input connection, rf signals applied at this jack are equally spilt and appear in attenuated form (approximately 6 dB down) at both RF SUM jack J2 and CPLR IN jack J3 When used as an output connection, rf signals applied at either RF SUM jack J2, or CPLR IN jack J3 appear in attenuated form (approximately 6 dB down) at this jack.
RF SUM jack J2	Permits connection of external equipment to the hybrid junction. When used as an input connection, rf signals applied at this jack appear (less insertion loss of the cables and hybrid junction) at RF IN/OUT jack J1. May also be used as an output connection when rf signals are applied at RF IN/OUT jack J1 (see above).
CPLR IN jack J3	Permits connection of external equipment or ATTENUATOR AT1 (via A1W3) to the hybrid junction. When used as an input connection, rf signals applied at this jack appear (less insertion losses) at RF IN/'OUT jack J1. May also be used as an output connection when rf signals are applied at RF IN/OUT jack J1 (see above).

3-2. Front Panel Test Adapter A6, Operating Control and Connectors (fig. 3-2)

Control or connector	*Function*
Plug P1	Connects front panel test adapter to TEST connector 1A1J3 on the front panel of the receiver-transmitter.
VIDEO switch S1	Selects various signals of the receiver-transmitter for monitoring at VIDEO jack J1 as follows
	Position Signal
SUM VIDEO	If sum video output
MOD PULSE	Modulation pulse output
SELF TEST GATE	Self-test gate output
IR SUPPR	Interrogator suppression input
DELAYED SUM VIDEO	Delay if sum video output
SIG GEN TRIG	Self-test signal generator trigger
RSLS GO/NO GO AUX TRIG	RSLS go/no-go level auxiliary trigger
DIFF VIDEO	If difference video output
RCVR VIDEO	Receiver Video output
TRANSPONDER SUPPR	Transponder suppression output
XMTR PWR MON	Transmitter power monitor output
VIDEO jack J1	Permits monitoring of various receiver-transmitter signals as selected by VIDEO switch S1.
SUM XTAL CURRENT jack J2	Permits monitoring of the sum channel crystal current signal of the receiver-transmitter
DIFF XTAL CURRENT jacK,	Permits monitoring of the difference channel crystal current signal of the receiver-transmitter.
115 VAC jack J4	Permits monitoring of 115 vac to power supply system of receiver-transmitter.

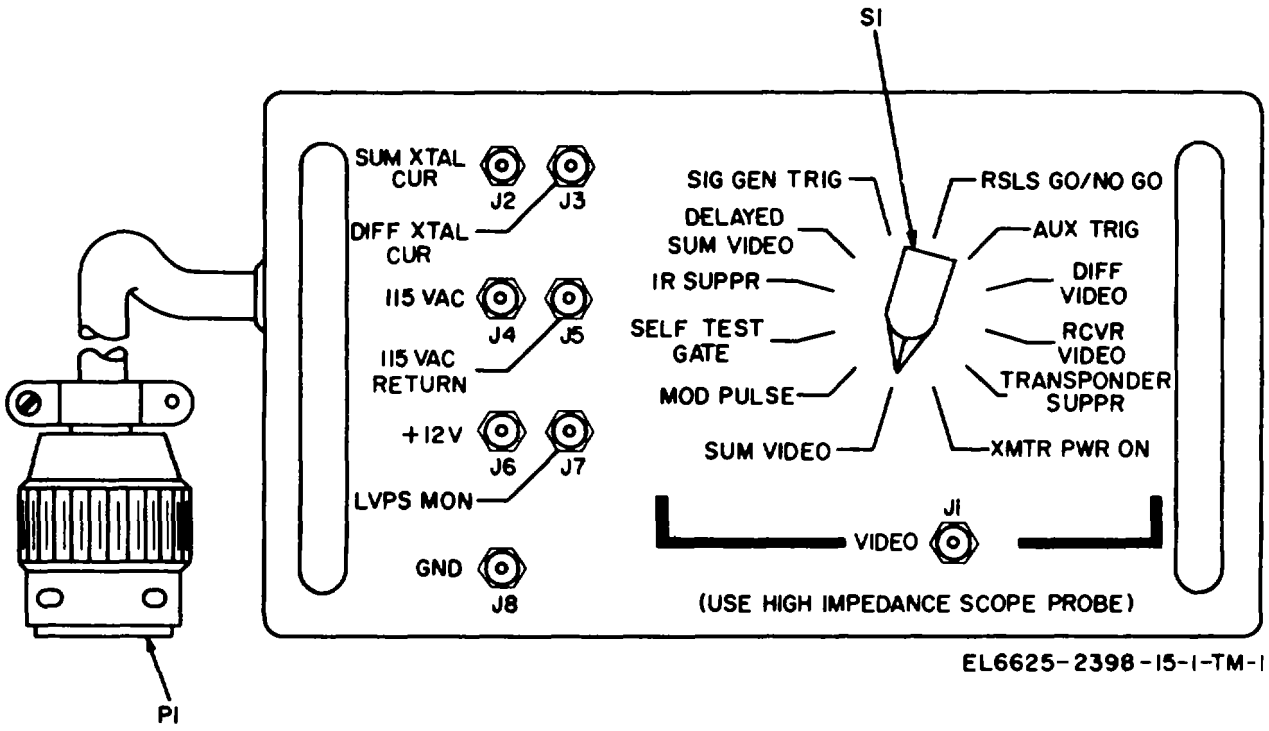


Figure 3-1. Hybrid attenuator A1, operating control, connectors, and cable.

Control or connector	*Function*
115 VAC RE-TURN Jack J5	Provides return for monitoring of 115 vac
+12 V jack J6	Permits monitoring of 12 vdc from power supply system of receiver-transmitter
LVPS MON jack J7	Permits monitoring of the low voltage power supply monitor level
GND jack J8	Provides a ground return for the receiver-transmitter signal or voltage being monitored at jacks J1, J2, J3, J6 or J7.

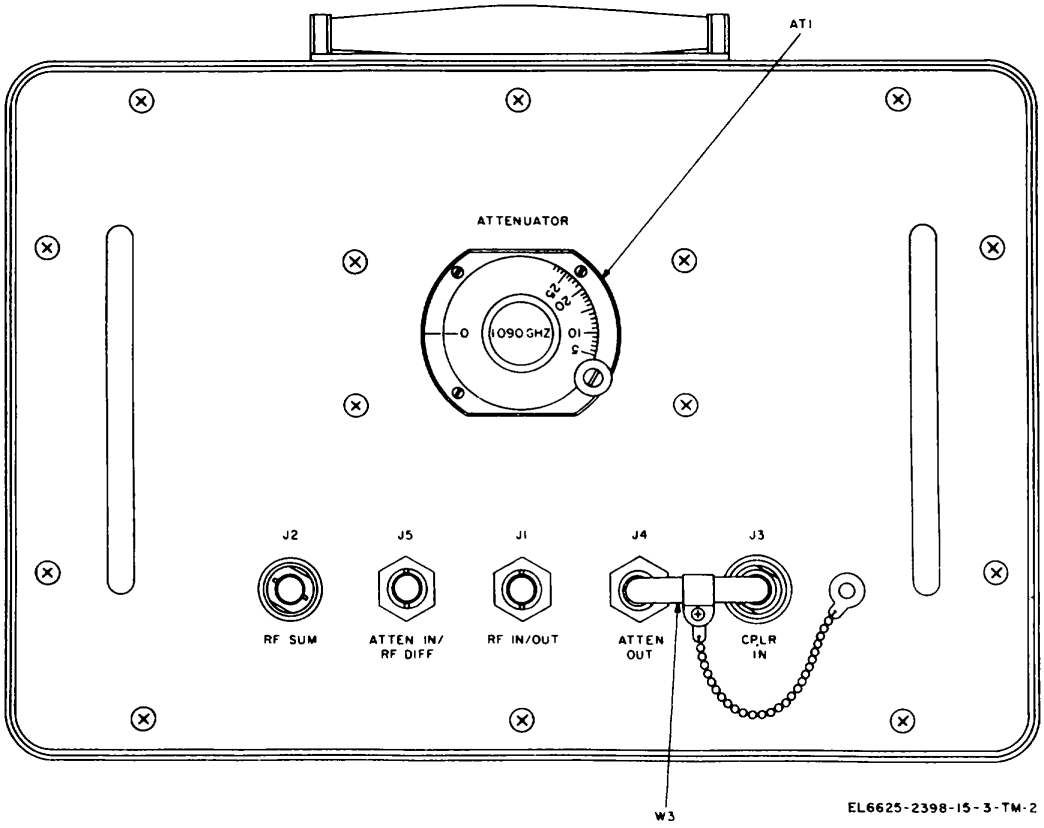


Figure 3-2. Front panel test adapter A6, operating control and connectors.

Section II. OPERATION

3-3. Types of Operation

a. The test facilities set is used to interconnect components of the rf set and to facilitate monitoring of signals and voltages when the rf set and/or its components are undergoing test-bench maintenance. Depending on the availability of bench space and the expected maintenance work-load at a particular maintenance activity, the test facilities set and associated required equipment may be installed and connected as a semi-permanent test station (para 2-3), or only those applicable components required for the particular maintenance task may be set up.

b. Specific instructions for connecting the rf set and required test equipment and accessories, and for performing maintenance on the various rf set components are contained in the technical manuals listed below. General instructions for operation of the test facilities set are contained in paragraphs 3-4 through 3-15.

Rf set component	*Technical manual*
Coder-decoder	TM-11-5895-690-35
Interrogator group case	TM-11-5895-595-35
Receiver-transmitter	TM-11-5895-689-35
Remote control switching unit	TM-11-5895-690-356
Rf switch	TM-11-5895-595-35

3-4. Extension of Major Components from Interrogator Group Case

In order to set up a basic test station, it will be necessary to remove the receiver-transmitter and rf switch from the interrogator group case. Cables W1 and W2 are provided to extend the rf switch and cables W3 and W4 are provided to extend the receiver-transmitter. To connect these extender cables, first remove the component(s) from the interrogator group case as described in a, below; and then make the appropriate connections using the information in *b*, below.

a. Component Removal.

(1) Receiver-transmitter.

(a) Set the POWER switches on the remote control switching unit and the receiver-transmitter to OFF.

(b) Loosen the six knurled screws that clamp the receiver-transmitter to the transit case and rotate their associated pawls until they clear the receiver-transmitter front panel.

(c) Extend the folding handle until it is perpendicular to the front panel.

(d) Using a steady force, pull straight out on the handle until the two connectors at the rear of the receiver-transmitter disengage from their mates on the transit case.

(c) Remove the receiver-transmitter from the transit case.

(2) Rf switch.

(a) Set the POWER switch on the remote control switching unit to OFF and turn off the power switch on the rf switch.

(b) Unfasten the front panel from the transit case by loosening the six knurled captive screws that hold the panel to the case.

(c) Using a steady force, pull straight out on the handle of the rf switch until the two V connectors at the rear of the rf switch disengage from their mates on the transit case.

(d) Remove the rf switch from the transit case.

b. Cable Connections.

(fig. 3-3)

From					To	
Component	Connector	Connector	Cable	Connector	Connector	Component
Receiver-transmitter	1A1P1	P1	W3	P2	IXA1P1	Interrogator group case
Receiver-transmitter	1A1A2P1	P1	W4	P2	1XA1A2P1	Interrogator group case
Rf switch	1A2P1	P1	W1	P2	1XA2P1	Interrogator group case
Rf switch	1A2P2	P1	W2	P2	1XA2P2	Interrogator group case

3-5. Extension of Components from the Receiver-Transmitter

Test procedures may require the extension of the transmitter power supply and/or the receiver module from the receiver-transmitter. Cables W11 and W44 of the AN/TPM-24(V)1 Test Facilities Set are used for this purpose. See TM 11-5895-689-35 for the specific test procedures, test set-ups, and procedures used to remove the receiver module and the transmitter power supply.

3-6. Use of Cable W5

Cable W5 is used to facilitate the alinement of diplexer filter FL3 of the rf switch. See TM 11-5895-595-35 for detailed connections and uses of cable W5.

3-7. Use of Cable W12

Cable W12 is used to interconnect the transmitter output connector CP1 of the transmitter power supply module to the strip line coupler A1J2 input when the receiver module is extended from the receiver-transmitter. See TM 11-5895-689-35 for detailed connections and uses of cable W12.

3-8. Use of Cable W13

(Cable W13 is provided for use during preselector alinement of the receiver circuits of the receiver-transmitter. As part of this alinement, which is performed with the receiver-transmitter deenergized, a 1090 MHz signal from external test equipment is applied to stripline coupler connector A1J1 or connector J2 of receiver 1A1A1, and various coupling probes and resonator tuning caps of the receiver assembly are adjusted for the proper response characteristics. (See TM 11-5895-689-35.)

Stripline coupler connector A1J1, however, is directly coupled to stripline coupler connector A1J2, which must be terminated with cable W13 to simulate the characteristics of the cavity amplifiers of the transmitting circuits of the receiver-transmitter connected to this point during normal operation. Before performing preselector alinement, connect P1 of the cable W13 to connector 1A1A1A1J2 of the receiver-transmitter.

3-9. Use of Cables W14/W15

Cables W14/W15 are used during calibration of the hybrid attenuator. See paragraphs 6-8 through 6-11 for the detailed calibration procedures. During maintenance of the rf set, cables W14/W15 connect the hybrid attenuator assembly to the interrogator group case. See TM 11-5895-689-35 for the detailed test procedures and connections using these cables.

3-10. Use of Cable W16

Cable W16 is provided for use during alinement of the self-test signal generator of the self-test circuits of the receiver-transmitter. As part of this alinement, the output power at terminal 4 of self-test signal generator board 1A1A1A2 is monitored using an external power meter, and

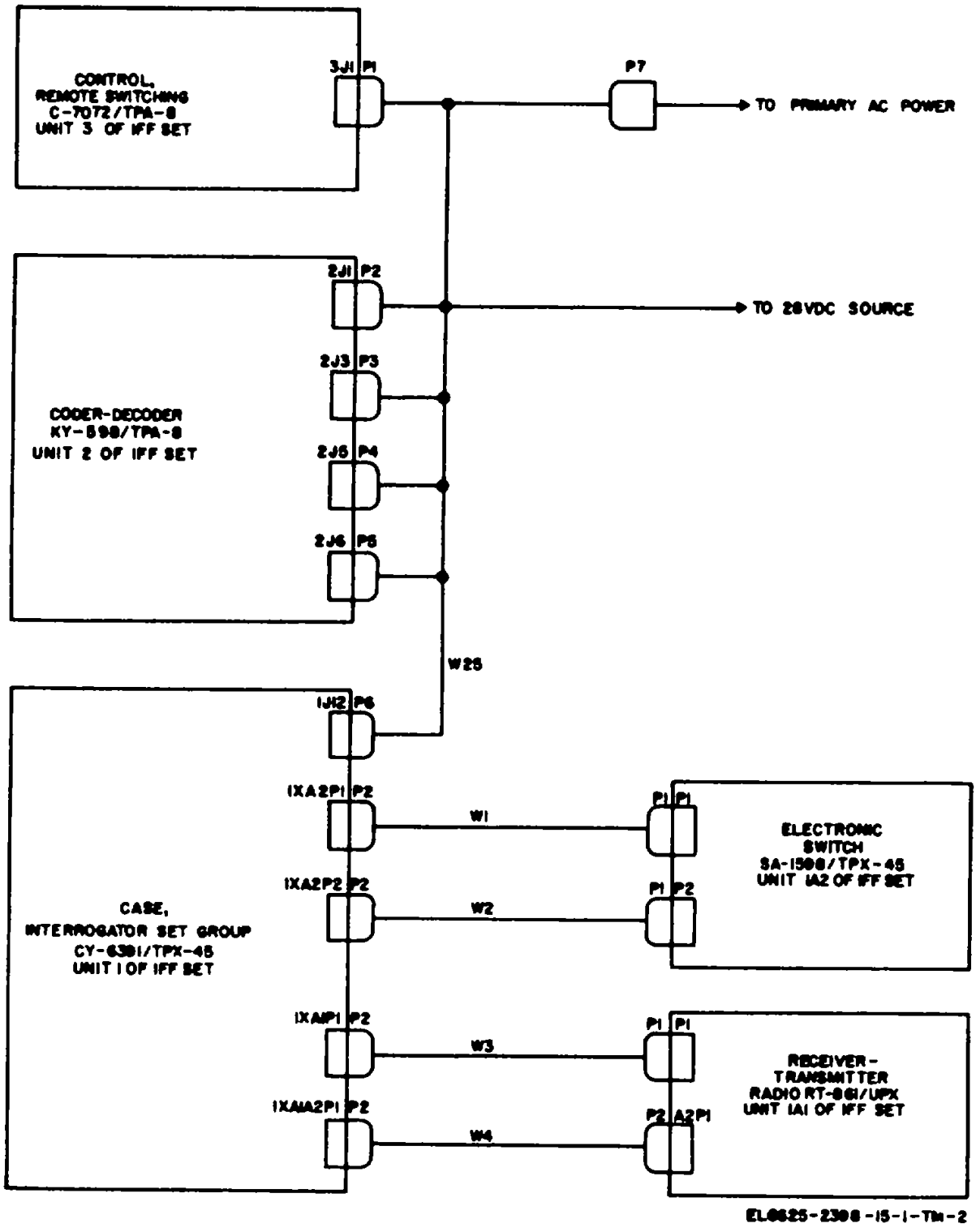


Figure 3-3. Connections of test cables to the rf set.

various tuning coils and capacitors are adjusted for maximum power output. See TM 11-5895-689-35 for the detailed procedure of this alinement.

3-11. Use of Cable W21

Cable W21 is used to adapt a selector-type jack to a BNC-type plug during local oscillator/exciter measurements and transmitting system operating frequency tests Se TM 11-5895-689-35 for detailed connections and uses of cable W21.

3-12. Use of Cable W25

Cable W25 is provided to interconnect Interrogator set components for receiver-transmitter testing In setting up a basic test station the following W25 connections are made. Connect P1 to remote control switching unit connector 3J1, P2, P3, P4, and P5 to coder-decoder connectors 2J1, 2J3, 2J5, and 2J6 respectively; P6 to transit case connector 1J12; P7 to ac primary power source; the leads marked +28 VDC and DC RET to +28 volts dc and ground. See TM 11-5895-689-35 for the detailed connections and uses of cable W25.

CAUTION

To avoid damage to the equipment under test DO NOT connect P7 of cable W25 to the ac power receptacle until verifying that the "low" side of the ac line is connected to the large pin receptacle on the connector.

3-13. Operation of Front Panel Test Adapter

The front panel test adapter is provided to facilitate monitoring of various signals of the receiver-transmitter Signals available at multipin TEST connector 1AIJ3 of the receiver-transmitter are either routed directly to individually labeled test jacks on the front panel test adapter, or are routed through the VIDEO selector switch to the VIDEO jack To operate the front panel test adapter, proceed as follows

a. Connect P1 of the front panel test adapter cable to TEST connector 1A1J3 on the front panel of the receiver-transmitter.

b. To monitor signals at the individually labeled test jacks (except J4 and J5) connect the appropriate external test equipment (e g multimeter, differential voltmeter etc) to the test jack of interest and to GND test jack J8 on the front panel test adapter, and observe the reading on the external test equipment.

c. To monitor signals at the VIDEO jack (J1), connect an oscilloscope to the VIDEO jack using a high impedance probe (ground the probe to GND jack J8), select the signal of interest on the VIDEO switch, and observe the signal on the oscilloscope

d. To monitor the 115 vac input connect the test equipment across the 115 vac and 115 vac return jacks, J4 and J5.

3-14. Operation of Hybrid Attenuator

The hybrid attenuator is provided to facilitate testing, troubleshooting and alignment/adjustment of the receiver-transmitter in the rf set. All of the specific uses of the hybrid attenuator with the receiver-transmitter are described in TM 11-5895-689-35. Operation of the hybrid attenuator as a variable attenuator (*a* below) and in typical receiver and transmitter test configurations (b below) are as follows:

a. Typical Procedure for Using Hybrid Attenuator Assembly as a Variable Attenuator.

(1) Disconnect coaxial cable A1W3 from the ATTEN OUT Jack

(2) Connect a coaxial cable (and adapter, if required) between the ATTEN OUT jack and the equipment under test.

(3) Connect a coaxial cable between the ATTEN IN/RF DIFF jack and the signal source.

(4) Set the attenuator control dial to the desired attenuation.

(5) Determine the attenuation of the connecting rf cables at the signal frequency.

b. Typical Hybrid Attenuator Receiver and Transmitter Test Configurations.

(1) The test connections between the rf set and the hybrid attenuator, shown in figure 3-4, are typical for some of the receiver and transmitter tests on the rf set. Consult the individual test procedure in the TM 11-5895-689-35 for possible deviations in the test connections and for prescribed settings of the ATTENUATOR control.

CAUTION

To avoid damage to the equipment under test DO NOT energize Interrogator Set AN/TPX-45 before terminating

jacks 1J13 and 1J14 with appropriate rf loads.

(2) The insertion losses marked on the tags attached to the hybrid attenuator and connecting coaxial cables (i.e., W14/W15) have to be taken into consideration when figuring the attenuation in dB for setting the ATTENUATOR control.

3-15. Typical Connection and Use of Minor Components

Certain of the minor components of the test facilities set are standard general-purpose adapters and terminations which are used in a large number of the test set-ups required in maintaining the complete rf set. Included in this category are adapter CP7/CP8 (N-male to BNC-female adapter, type UG-201A/U), termination A.T3/AT4 (50-ohm dummy load, type DA-558), and termination AT5/AT6 (75-ohm dummy load, type DA-559). General instructions for connecting the remaining minor components of the test facilities set are provided below.

a. Extender Boards and Printed Circuit Board Extractor.

(1) Printed circuit (pc) board extractor MP2 is used to remove plug-in printed circuit boards from the receiver-transmitter, rf switch, and coder-decoder. See TM 11-5895-689-35, TM 11-5805-59535, and TM 11-5895-690-35 for procedures to gain access to the plug-in boards. After gaining access to the boards, insert the tines of MP2 into the holes at the top of the pc board and pull out the board.

(2) Extender board A7 is used to make plug-in boards 1A1A3A3, 1A1ABA4, and 1A1AA3A6 of the receiver-transmitter accessible for maintenance. Remove the pc board with board extractor MP2 and insert extender board A7 into the connectors for the removed board. Orient the component side of the removed pc board with the top of the receiver-transmitter assembly. Insert the sides of the pc board in the slots of A7 and plug the pc board connectors into the extender board connectors.

(3) Extender board A8 is used to make plug-in boards 2A1, 2A2, and 2A8 of the coder-decoder accessible for maintenance. Remove the pc board with board extractor MP2 and insert extender board A8 into the connector for the removed board. Plug the pc board into the extender board with the component side of the pc board oriented with the component sides, of the

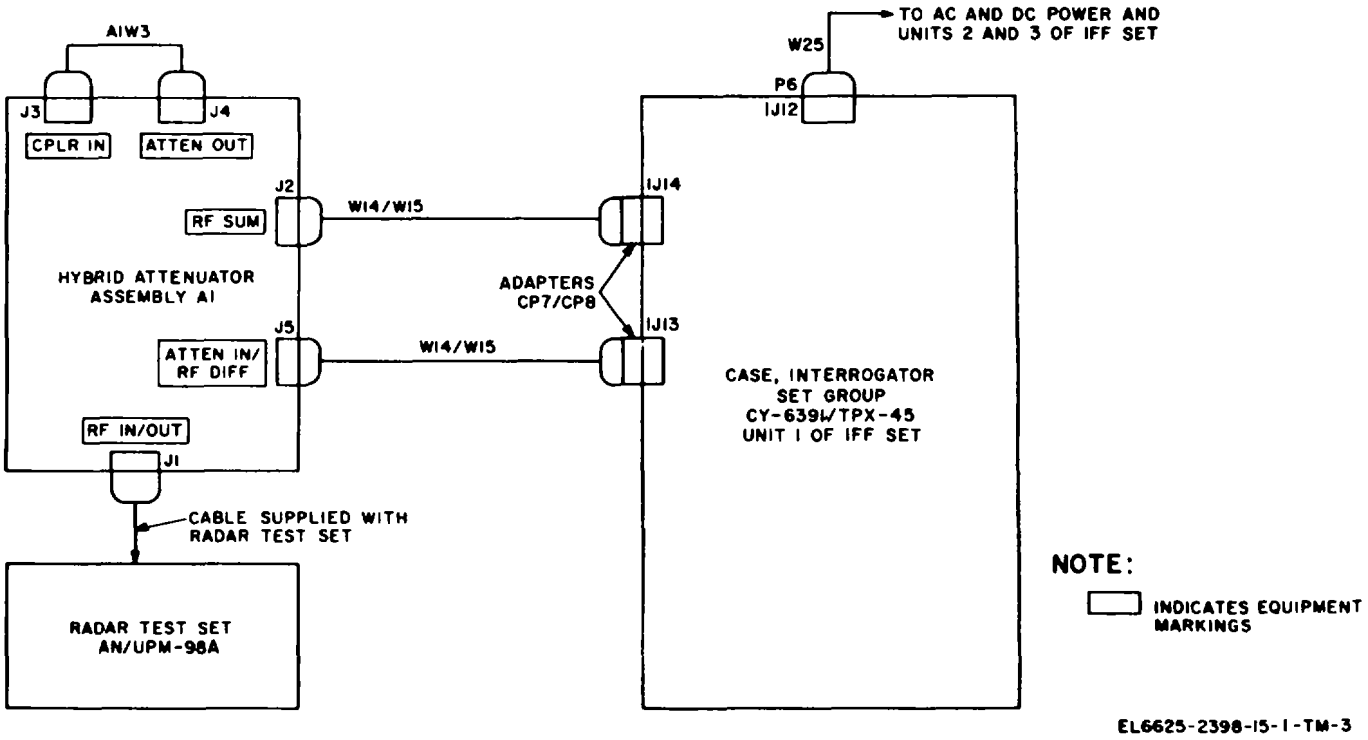


Figure 3-4. Typical hybrid attenuator receiver and transmitter test connections.

other two coder-decoder pc boards in the assembly.

(4) Extender board A9 is used to make plug-in boards 1A2A1, 1A2A2, and 1A2A4 of the rf switch accessible for maintenance. Remove the pc board with board extractor MP2 and insert extender board A9 into the connector for the removed board. Plug the pc board into the extender board, with the component side of the pc board facing the top of the rf switch assembly.

b. Adapters CP1 and CP2/CP3/CP4. Adapter CP1 permits connection of an OSM type plug to a BNC type plug. Adapters CP2/CP3/CP4 permit connection of OSM type jacks to BNC type plugs. Typical connection of these adapters is given in the self-test fault detection adjustment provided in TM 11-5895-68935.

c. Attenuators AT1/AT2. Attenuators AT1/AT2 are general purpose 50-ohm 6dB attenuators. Together with other uses they provide isolation during rf switch diplexer adjustment. Typical connection of these attenuators is provided in TM 11-5895-595-35.

d. Dummy Connectors P1 and P2. Dummy connectors P1 and P2 are used to facilitate insertion loss measurements of the rf switch assembly. See TM 11-5895-595-35 for detailed connections and uses.

e. Waveform Overlay. The waveform overlay for a test oscilloscope, enables accurate GTC alignment of the rf set on the sum and difference channels.

CHAPTER 4

OPERATOR'S AND ORGANIZATIONAL MAINTENANCE

4-1. Scope of Maintenance

The maintenance duties assigned to the operator and/or organizational maintenance mechanic of the -test facilities set are listed below, together with the references to the paragraphs covering the 'specific maintenance function. These duties do not require special tools or test equipment.

a. Weekly preventive checks and services (para 4-5).

b. Quarterly preventive checks and services (para 4-6).

c. Cleaning (para 4-7).

d. Troubleshooting (para 4-9).

e. Repairs and adjustments (para 4-10).

4-2. Tools, Materials, and Test Equipment Required

A list of parts authorized for operator's and organizational maintenance appears in appendix D. The tools, materials, and test equipment required for operator's and organizational maintenance are listed below:

a. Tools.

Common name	*equipment*	*Technical manual*
Tool kit	Electronic Equipment Tool	

b. Materials.

Cleaning compound (FSN 7930-395-9542)
Inhibisol cleaning solvent
Cleaning cloth
Isopropyl alcohol
Camel-hair brush
Fine sandpaper
Light gray enamel paint (gloss)
Light gray enamel paint (semi-gloss)
Rubber tape
Friction tape

c. Test Equipment.

Common name	*Equipment*	*Technical manual*
Multimeter	Multimeter AN/PSM-6B	TM 11-6625-475-10

4-3. Preventive Maintenance

Preventive maintenance is the systematic care, servicing, and Inspection of equipment to prevent the occurrence of trouble, to reduce down-time, and to assure that the equipment is serviceable.

a. Systematic Care. The procedures given in paragraphs 4-5 through 4-8 cover routine systematic care and cleaning essential to proper upkeep and operation of the equipment.

b. Preventive Maintenance Checks and Services. The preventive maintenance checks and services charts (para 45 and 46) outline the functions to be performed at specific intervals. These checks and services are to maintain the equipment in a serviceable condition. To assist in maintaining serviceability, the charts indicate what to check, how to check, and what the normal conditions are; the References column-lists the illustration, paragraph, or TM that contain repair or replacement procedures. If the defect cannot be remedied by performing the corrective actions indicated, higher category maintenance or repair is required. Records and reports of these checks and services must be made in accordance with the requirements set forth in TM 38750.

4-4. Preventive Maintenance Checks and Services Periods

Preventive maintenance checks and services for the test facilities set are required weekly and quarterly.

a. Paragraph 45 specifies checks and services that must be accomplished weekly and under the conditions listed below:

(1) When the equipment is initially installed.

(2) At least once each month if the equipment is not used periodically.

b. Paragraph 4-6 specifies checks and services that must be performed on a quarterly basis.

4-5. Weekly Preventive Maintenance Checks and Services Chart

Sequence no.	*Item*	*Procedure*	*References*
1	Completeness	Check all components of the test facilities set against the list of components supplied; give particular attention to small components.	para 1-7.
2	Exterior surfaces	Clean the transit case exterior with a clean, lint-free cloth containing cleaning compound, Fed. Stock No. 7930-395-9542 (or equivalent), to remove accumulated oil film or dust. Then, dry all surfaces thoroughly with a clean lint-free cloth. Inspect all painted surfaces for spots, chips, cracks, and corrosion. Touch up or refinish the surface as required	para 4-7. para 4-8.
3	Connectors and adapters	*a.* Check for broken pins, and replace connectors where necessary. *b.* Clean dirt from all contacts	*a.* Higher category maintenance required. *b.* para 4-7.
4	Extender boards	*a.* Check for broken pins and for cracks in the board. *b.* Replace all damaged extender boards, clean dirt from electrical contacts.	*a.* Higher category maintenance required. *b.* para 4-7.
5	Cables	Check for cuts, kinks and breaks. Replace all defective cables.	para 4-10.
6	Controls	Check controls on hybrid attenuator and front panel test adapter. Replace defective controls and knobs.	para 4-10.
7	Handles and latches	Inspect handles and latches on the transit case and handles of the hybrid attenuator.	Higher category maintenance required.
8	Operation	During operation, be alert to any unusual performance or condition.	

4-6. Quarterly Preventive Maintenance Checks and Services Chart

Sequence no.	*Item*	*Procedure*	*References*
1	Publications	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.	TM 38-750 and DA PAM 310-4.
3	Cleanliness	See that equipment is clean.	para 4-7.
4	Preservation	Check all surfaces for evidence of rust and corrosion. Remove rust and corrosion and paint bare spots.	para 4-8.
5	Components	Check components: 1. Cables for proper mating. 2. Smooth operation of ATTENUATOR dial on hybrid attenuator. 3. Extender boards for proper seating in rf set printed circuit (pc) board connectors. 4. Pc board extractors for proper mating in holes of pc board.	
6	Calibration	1. Check hybrid attenuator insertion losses. 2. Check hybrid attenuator VSWR. 3. Check insertion losses of cables W1, W3, and W14/W15.	para 6-8 through 6-10. para 6-11. para 6-12.

4-7. Cleaning

a. Transit Case. Inspect the exterior surfaces of the transit case. The exterior surfaces should be clean, free of dust, dirt and grease.

(1) Remove dust and loose dirt with a clean, lint-free cloth.

WARNING

Cleaning compound is flammable and its fumes are toxic. Provide adequate ventilation. DO NOT use near a flame.

(2) Remove grease, and ground-in dirt from the components. Use a cloth dampened (not wet) with cleaning compound.

(3) Use a brush to remove dust or dirt from plugs, jacks, and knobs.

b. Extender Boards. Periodically clean the extender board assemblies with inhibisol cleaning solvent or with a solution of 70 percent isopropyl alcohol and 30 percent distilled water. Using a brush, clean the printed-circuit contacts with Miller-Stephenson Freon TF Degreaser.

4-8. Touchup Painting Instructions

Remove rust and corrosion from metal surfaces (which have been painted) by lightly sanding them with fine sandpaper. Brush two thin coats of paint (see below) on the bare metal to protect it from further corrosion. Refer to applicable cleaning and refinishing practices specified in TM 9-213, Painting Instructions for Field Use. For touchup painting of the Transit Case, use Light Gray Enamel, Formula No. 11 per MIL-E-15090, Type II, Class I (Gloss); for touchup painting of the, Hybrid Attenuator Assembly and Front Panel Test Adapter use Light Gray Enamel, Formula No. 11 per MIL-E-15090, Type II, Class 2 (Semi-gloss).

4-9. General Troubleshooting Information

Troubleshooting this equipment is based upon the operation of the test facilities set in a hot mock-up configuration to operate the rf set. If, in troubleshooting the rf set, certain components of the test facilities set are defective or suspected of being defective (other than cables, extender boards or the front panel test adapter) higher category maintenance is required. Troubleshooting the cables, extender boards and the front panel test adapter of the test facilities set consists of continuity checks with a multimeter (para 4-11). The schematics, in chapter 6 are to be used as a guide in determining the connections to check for continuity. Any cable found to be defective should be sent to higher category maintenance for repair.

4-10. Operator's Repairs and Adjustments

a. Minor Repair of Cables. Repair minor cuts in cable insulation by covering it first with rubber tape and then with friction tape. If cable is broken, refer defective cable to higher category maintenance for repair.

b. Replacement or Adjustment of Knobs.

(1) Replacement. To replace a defective knob, proceed as follows:

(a) Set the knob to its extreme counter-clockwise position.

(b) Loosen setscrews on the defective knob and remove the knob from the shaft.

(c) Place a new knob on the hybrid attenuator shaft, and line up the zero position on the new knob with the zero index of the. stationary portion. Place a new knob on the front panel test adapter, aline marker of the knob with the first (counterclockwise) switch position.

(d) Tighten setscrews.

(2) Adjustment. To adjust a knob on its shaft proceed as follows:

(a) Tighten the setscrews on the loose knob and turn it to its extreme counterclock-wise stop.

(b) Loosen setscrews and line up the zero position of the knob with the zero index of the stationary portion.

(c) Tighten setscrews.

4-11. Continuity Check of Cables, Extender Boards, and Front Panel Test Adapter (fig. 4-1)

Use Multimeter AN/PSM-B to perform the continuity checks. All tests are made with the following control settings on the multimeter:

FUNCTION-HMS
RANGE-R X 1

Refer to the referenced schematic diagrams for component wiring.

a. Cables W1 and W3 (fig. 6-7 and 6-9). Couplers W3CP1 and W3CP2 must be connected on cable W3. Couplers W1CP1 through W1CP4 must be connected on W1.

(1) Check individual wire shielding by progressively connecting the multimeter test leads

to the outer conductor of each coaxial pin/socket on the plugs at each end of the cable. The meter must indicate zero ohms (continuity) for each shield.

(2) Check for shorting of wires to shields by progressively connecting the multimeter test leads to the pin connectors for each wire and to its shield on a plug at one end of the cable. The meter must indicate open circuit.

(3) Check continuity of cable wires by progressively connecting the multimeter test leads to the active pins on the plugs at each end of the cable. The meter must indicate zero ohms (continuity) for each wire.

b. Cable W2.
(fig 6-8)

(1) Check that the cable shielding is bonded to the shell of the plugs, by connecting one multimeter test lead to the shell of one plug, and the other test lead to the shell of the other plug. The meter must indicate zero ohms (continuity).

(2) Check individual wire shielding by progressively connecting the multimeter test leads to each wire shield pin connection on the plugs at each end of the cable. The meter must indicate zero ohms (continuity) for each shield.

(3) Check for shorting of wires to shields by progressively connecting the multimeter test leads to the pin connectors for each wire and to its shield on a plug at one end of the cable. The meter must indicate open circuit.

(4) Check continuity of cable wires by progressively connecting the multimeter test leads to the active pins on the plugs at each end of the cable. The meter must indicate zero ohms (continuity) for each wire.

c. Cable W4.
(fig. 6-10)

(1) Check that the cable shielding is bonded to the shell of the plugs, by connecting one multimeter test lead to the shell of one plug, and the other test lead to the shell of the other plug. The meter must indicate zero ohms (continuity).

(2) Check continuity of the cable wires by progressively connecting the multimeter test leads to the active pins on the plugs at each end of the cable. The multimeter must indicate zero ohms (continuity) for each wire.

d. Cables W5, W12, W14/W15, W16, and W21.
(fig. 6-11, 6-13, 6-15, 6-16, and 6-17)

(1) Connect one multimeter test lead to the center conductor of either plug, and the other test lead to the shell of the same plug. The meter must indicate open circuit.

(2) Connect one multimeter test lead to the center conductor of one plug, and the other test lead to the center conductor of the plug on the other end of the cable. The meter must indicate zero ohms (continuity).

(3) Connect one multimeter test lead to the outer shell of one plug on the cable, and the other test lead to the outer shell on the other end of the cable. The meter must indicate zero ohms (continuity).

NOTES

1. One end of cable W16 has alligator Clips. P2 is the center conductor connector, and P3 is the shell connector.
2. Coupler W12CP1 must be connected on cable W12.

e. Cables W11 and W44 (fig. 6-12 and 6-19). Check continuity of the cable wires by progressively connecting the multimeter test leads to the active pins on the plugs at each end of the cable. The meter must indicate zero ohms (continuity) for each wire.

f. Cable W13 (fig. 6-14). Connect one multimeter test lead to the center conductor of the plug on the cable, and the other test lead to the shell of the plug. The meter must indicate open circuit.

g. Cable W25. (fig. 6-18)

(1) Check individual wire shielding by progressively connecting the multimeter test leads to each of the shells of the coaxial connectors (P4 and P5) and the appropriate contacts on multipin connector P6. The meter must indicate zero ohms (continuity) for each test.

(2) Check for shorting of wires to shields on plugs P4 and P5 by connecting one multimeter test lead to the center conductor and the other test lead to the shell of the same plug. The meter must indicate open circuit.

(3) Check continuity of the center conductors by progressively connecting the multimeter test leads to the center conductor terminals of P4 and P5, and the corresponding center conductor terminals of multipin connector P6. The meter must indicate approximately zero ohms (continuity) for each test.

(4) Check continuity of the balance of the cable wires as follows:

(a) Progressively connect the multimeter test leads to the active pins on plug P1 and the wire terminating pins on connectors P2, P3, P6 or P7. The meter must indicate zero ohms (continuity) for each test.

(b) Connect the multimeter test leads to P6-K and P7 ground, P6-P and P3-A, P6q and the +28 volt dc wire, P6-w and the dc return wire, P6--M and P6-q, and P6-q and P6-v. The meter must indicate zero ohms (continuity) for each test.

h. Extender Board A7. (fig. 6-23)

(1) Check for short circuits by connecting the multimeter test leads to the first two etched terminals of the 15 pin section on the left side of the board. Move the two multimeter test leads successively, by advancing each test lead one terminal at a time, across the section. Repeat for the other two 15 pin sections. The meter must indicate open circuit for each test.

(2) Check board continuity by progressively connecting one multimeter test lead to the etched terminals at one end of the board, and the other test lead to the corresponding connector contact at the other end of the board. The meter must read zero ohms (continuity) for each etched terminal.

I. Extender Boards A8 and A9. (fig. 6-24)

(1) Check for short circuits by connecting the multimeter test leads to the first two etched terminals on one side of the board. Move the two multimeter test leads successively, by advancing each test lead one terminal at a time, across the board. Repeat for the etched terminals on the opposite side of the board. The meter must indicate open circuit for each test.

(2) Check for short circuits by successively connecting the multimeter test leads to the etched terminals back-to-back on opposite sides of the boards. The meter must indicate open circuit for each test.

(3) Check board continuity be progressively connecting one multimeter test lead to the etched terminals at one end of the board, and the other test lead to the corresponding connector contact at the opposite end of the board. The meter must read zero ohms (continuity) for each etched terminal.

j. Dummy connectors P1 and P2. (fig. 6-20)

(1) Connector P1.

(a) Check wire shielding by connecting multimeter test leads to the outer terminal of pins 1 and 4. The meter must indicate zero ohms (continuity).

(b) Check continuity of the inner conductor by connecting the multimeter test leads to the inner terminal of pins 1 and 4. The meter must indicate zero ohms (continuity).

(c) Check for shorting of inner conductor to shield by connecting the multimeter test leads to the inner terminal of pin 4 and the outer terminal of pin 1. The meter must indicate open circuit.

(2) Connector P2.

(a) Repeat (a) and (b) above for pins 1 to 3 and 2 to 4. The meter must indicate zero ohms (continuity) for each test.

(b) Repeat (c) above for pins 1 and 8, and 2 and 4. The meter must indicate open circuit for both tests.

k. Front Panel Test Adapter. (fig. 6-22)

(1) Connect one multimeter test lead to VIDEO connector J1 on the front panel. Successively connect the other test lead to plug P1 contacts listed below. Rotate the VIDEO switch to the position corresponding to the plug contact below for each test. The meter must indicate zero ohms (continuity) for each switch position.

Plug P1 contacts	*VIDEO switch position*
A	SUM VIDEO
B	MOD PULSE
C	SELF TEST GATE
D	IR SUPPR
F	DELAYED SUM VIDEO
G	SIG GEN TRIG
H	RSLS GO/NO GO
J	AUX TRIG
M	DIFF VIDEO
N	RCVR VIDEO
X	TRANSPONDER SUPPR
Y	XMTR PWR MON

(2) Successively connect the multimeter test leads to the connectors and plug P1 contacts listed below. The meter must read zero ohms (continuity) for each test.

Connector	*Plug P1 contacts*
SUM XTAL CURRENT J2	E
DIFF XTAL CURRENT J3	W
115 VAC J4	S
1156 VAC RETURN J5	R
+12V J6	P
LVPS MON J7	a
GND J8	c

(3) Connect the multimeter test leads to VIDEO J1 and GND J8 front panel connectors. Rotate the VIDEO switch successively to the positions listed below. The meter must indicate open circuit for each test position.

SUM VIDEO	RSLS GO/NO GO	MOD PULSE	AUX TRIG
		SELF TEST GATE	DIFF VIDEO
		IR SUPPR	RCVR VIDEO
		DELAYED SUM VIDEO	TRANSPONDER SUPPR
		SIG GEN TRIG	XMTR PWR MON

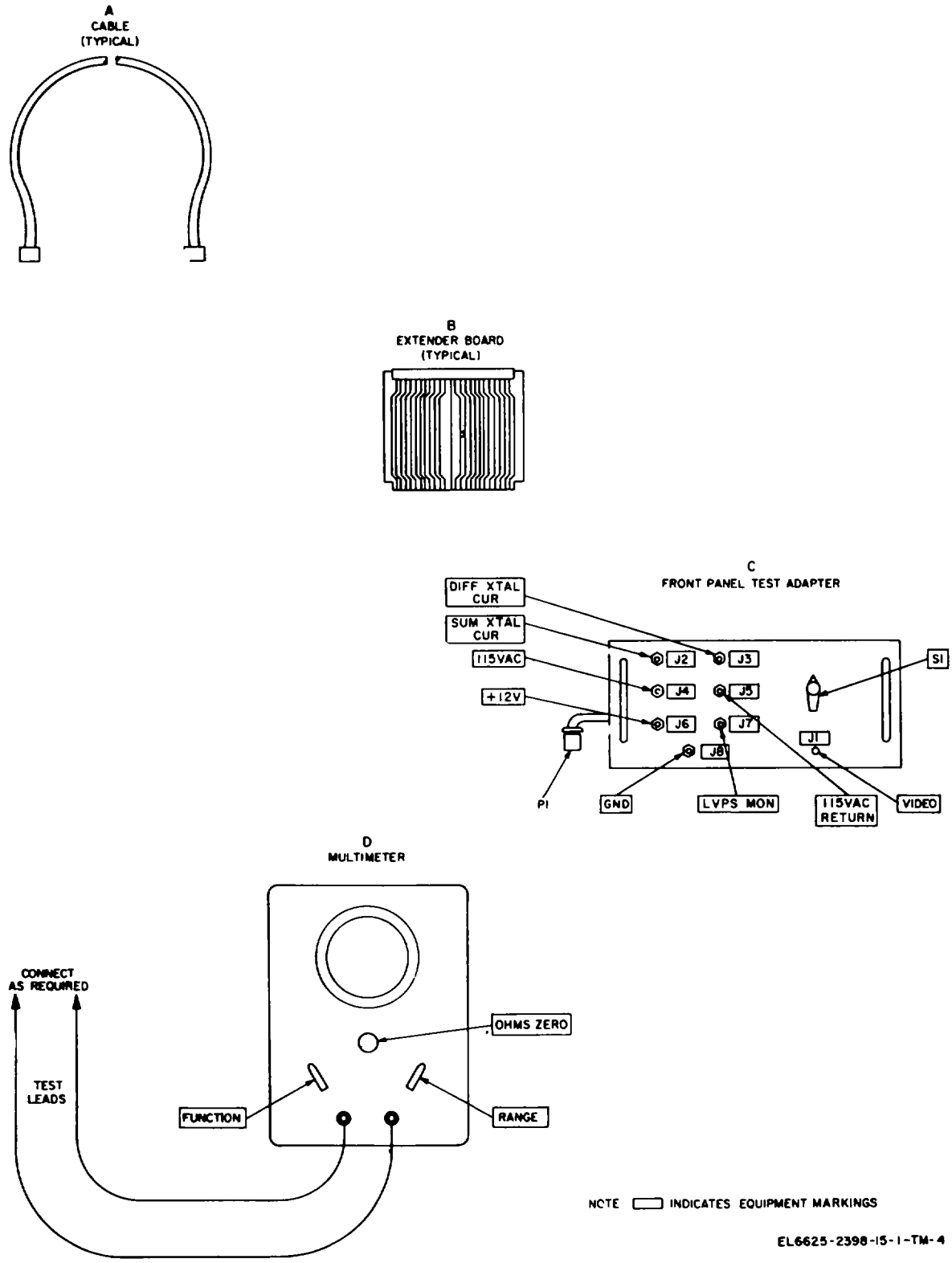


Figure 4-1. Multimeter test connections.

CHAPTER 5

FUNCTIONING

5-1. General

The functioning of the hybrid attenuator (A1) and cable W13 is described in this chapter. The functioning of the balance of the components of the test facilities set is self evident.

5-2. Hybrid Attenuator (fig. 6-21)

a. The hybrid attenuator basically consists of two subassemblies, hybrid coupler (HY1) and variable attenuator (AT1). The hybrid attenuator can be used as an entity to couple rf to or from the iff set and external test equipment, or AT1 can be used alone as a variable attenuator.

b. When the hybrid attenuator is used to couple rf, external cable A1W3 connects attenuator AT1 to hybrid coupler HY1. This permits up to 25 dB attenuation of difference channel rf, below the sum channel rf, when performing receiver testing of the iff set.

5-3. Attenuator AT1

Attenuator AT1 is a two-port, non-repairable, wide-band variable attenuator with a direct reading dial. The dial is calibrated from 0 to 25 dB in 1-dB steps. The ATTEN IN/RF DIFF jack (J5) and the ATTEN OUT jack (J4), together with the associated coaxial cabling and connectors P3 and P2, respectively, make AT1 accessible at the front panels.

5-4. Hybrid Coupler HY1

a. Hybrid coupler HY1 is a four-port, 3-dB coupler which evenly divides an input signal from external test equipment into isolated quadrature-phased outputs, for receiver testing of the iff set. Front panel RF IN/OUT jack (J1) provides the input to HY1 and the RF SUM (J2) and CPLR IN (J3) jacks provide the outputs for receiver testing.

b. The hybrid coupler input signals for iff set transmitter testing are applied via the RF SUM (J2) and CPLR IN (J3) jacks. The hybrid coupler then combines the sum and difference rf signals into one resultant rf output to external test equipment at the front panel RF IN/OUT jack (J1).

c. The coupler is symmetrical; signals applied to any input port (e.g., HYlJ1) will divide equally between the opposite pair of ports (HY1J2 and HY1J3) and the adjacent port (HY1J4) will be isolated. By the same principle, if equal amplitude quadrature-phased signals are applied to adjacent ports (e.g., HY1J2 and HY1J3) they will combine at one output port (HY1J1) and cancel at the other (HY1J4). Termination AT2 (to HY1J4) is a 50 ohm matched load and is provided to minimize reflected signals from port HY1J2.

d. The sum channel overall insertion loss of the hybrid coupler from the RF SUM jack (J2) to the RF IN/OUT jack (J1) is the sum of the losses of W1 (approximately 3.75 dB), HY1 (3 dB) and miscellaneous losses in J2, CP2, and the coaxial cable terminated by P1 and J1.

e. The difference channel overall insertion loss of the hybrid coupler from the CPLR IN jack (J3) to the RF IN/OUT jack (J1) is the sum of the losses of W2 (approximately 3.25 dB), HY1 (3 dB) and miscellaneous losses in J3, CP1, and the coaxial cable terminated by P1 and J1. These losses when added to the losses of A1W3 and the AT1 circuit (para 5-3, with the ATTENUATOR control set at 0) are equal to or slightly less than the overall insertion loss of the sum channel.

5-5. Cable W13 (fig. 6-14)

Cable W13 is a non-repairable, coaxial-type, tuned-stub line (open circuit at one end). It is used as a strip line coupler termination for connector A1J2 during preselector alignment of the receiver circuits of the receiver-transmitter It

simulates the characteristics of the cavity amplifiers of the transmitting circuits of the receiver-transmitter connected to A1J2 during normal operation.

CHAPTER 6

GENERAL SUPPORT MAINTENANCE

Section I. GENERAL TROUBLESHOOTING INFORMATION

WARNING

When using this equipment in conjunction with the iff set, be extremely careful because of high voltages associated with some assemblies of the iff set. Consult the applicable iff set TM for further information on circuits that are extremely dangerous.

6-1. General Instructions

Troubleshooting at general support (GS) maintenance level includes all the techniques outlined for operator's and organizational maintenance, and any special or additional techniques required to isolate a defective part. Section II provides troubleshooting procedures to be used at the GS level. Section III provides component testing and calibration techniques.

6-2. Organization of Troubleshooting Procedures

a. General. The three steps in servicing the test facilities set are:

(1) Sectionalization of the fault
(2) Localization of the fault
(3) Isolation of the fault

b. Sectionalization. The test facilities set consists of the components listed in paragraph 1-6. The first step in tracing the trouble is to locate the component or components at fault by the following methods:

(1) Visual inspection. The purpose of visual inspection is to locate faults without testing or measuring.

(2) Operational. Except for the hybrid attenuator assembly, troubleshooting is based on the operational use of this equipment with an iff set.

c. Localization. In the course of using this equipment to maintain the iff set, the operational or maintenance tests called for in the iff set manual may be used in determining the location of the fault in the test facilities set (para 65).

d. Procedures for isolating troubles in the hybrid attenuator assembly are given in paragraph 6-6.

e. Techniques. In performing the sectionalization, localization, and isolation procedures, the following techniques may be applied:

(1) Insulation resistance measurements.
(2) Continuity checks.

6-3. Test Equipment Required

The following chart lists test equipment required for troubleshooting the test facilities set. The associated technical manuals are also listed.

CAUTION

Be certain that the components of test facilities set are disconnected from the iff set before performing troubleshooting. The iff set contains transistors which could be damaged.

Common name	*test equipment*	*Technical manual*
Multimeter	AN/PSM-6B	TM 11-6625-475-10
Megger	Ohmmeter ZM-21A/U	TM 11-2050
Signal Generator	Signal Generator SG-340/G	
SWR Indicator,	Indicator, Standing Wave Ratio AN/UPM-108A	TM 11-6625-335-12
Variable attenuator,	Variable attenuator Alfred Electronics Model E101	
Slotted Line	Coaxial Slotted Line IM-92/U	TM 11-5109
Crystal Detector	Crystal Detector Hewlett-Packard Co. Model 423A	
Filter	Low-Pass Filter Hewlett-Packard Co. Model 350C	
Printed Wiring Kit	Repair Kit, Printed Wiring Board, MK-772/U	
Tool Kit	Tool Kit, Electronic Equipment Tool Kit TK-1OOG	

Common name	*Test equipment*	*Technical manual*
50-ohm termination	Termination, 50-ohms, Microlab/FXR-TA-6MN	
Adapter	Adapter (type N male to type BNC femkle), UG-201A/U	
Adapter	Adapter (type N female to type BNC female), UG-606/U	
Adapter	Adapter (type BNC female to type BNC female), UG914/U	

Section II. COMPONENT TROUBLESHOOTING

CAUTION

Do not attempt removal or replacement of parts before reading the instructions in chapter 7.

6-4. Visual Checks

Visually inspect the components of the test facilities set for evidence of physical damage to extender boards, insulation or sleeving of cables, mating parts of connectors and couplings, operating controls of the hybrid attenuator assembly and front panel test adapter, and broken, corroded, and bent connector pins.

6-5. Localization of Trouble

a. In troubleshooting the iff set in accordance with the technical manuals for that equipment the procedures therein make use of the components of the test facilities set. If the same fault(s) appear for similar assemblies of the iff set, using the same test setup in consecutive tests, a component of the test facilities set is probably at fault. When trouble is indicated in a component of the test facilities set, replace that component with a spare (if available) before making further tests. If the trouble is cured by the replacement spare, then the component re-

Symptom	*Probable trouble*
1. Excessive rf sum channel insertion loss (para 6-8)	Improper connections
	Defective cable A1W1 or hybrid coupler A1HY1
2. Excessive rf difference channel insertion loss (para 6-9)	Improper connections
	Defective cables, attenuator, or hybrid coupler A1HY1

moved is malfunctioning and it should be checked further to isolate the malfunction.

b. Once the trouble has been isolated to the test facilities set component or if a spare is not available, continuity checks (para P11) and/or insulation resistance measurements (para 6-7) on that component may be performed.

CAUTION

Always disconnect the test facilities set component from the iff set test set-up. Transistors and integrated circuits are used in the iff set, and continuity measurements by a multimeter may damage or destroy these circuits.

6-6. Isolation of Trouble in Hybrid Attenuator

a. Calibration of the hybrid attenuator assembly every ninety days will hold faulty operation to a minimum since the periodic check will establish its operational capability.

b. In the event the hybrid attenuator assembly fails to perform properly, the cause of the malfunction must be determined and remedied. The troubleshooting chart below provides a step-by-step procedure for troubleshooting. This procedure is based on the VSWR and insertion loss measurements.

	Correction
Check that connections to A1HY1J1, A1HY1J2 and the connections of ALW1 are secure.	Tighten loose connections and replace defective connectors.
Check difference channel insertion loss (para 6-9).	If the sum channel and difference channel insertion losses are both excessive, check cable from A1J1 to A1HY1J1. If cable is not at fault, replace hybrid coupler A1HY1 and recalibrate insertion losses (para 6-8 and 6-9). If only the sum channel has an excessive loss, replace cable A1W1 and recalibrate insertion loss (para 6-8).
Check that all connections to A1J5 and A1J1 are made, and are secure.	Tighten loose connections and replace defective connectors.
Check sum channel insertion loss (para 6-8).	If sum channel and difference channel insertion losses are both excessive, check cable from A1J1 to A1HY1J1. If cable is not at fault, replace hybrid coupler ALHY1 and recalibrate insertion losses (para 6-8 and 6-9). If only the difference channel has an excessive loss, check cable A1W3, cable A1W2, attenuator A1AT1 and the cables

Symptom	*Probable trouble*	*Correction*
3. Excessive VSWR (para para 6-11)	Improper connections	from A1J4 and A1J5 to attenuator A1AT1. Replace defective parts and recalibrate (para 6-9 and 6-10).
	Defective parts	Check all connections between the input showing excessive VSWR and the termination(s); tighten loose connections, replace defective connectors and recalibrate (para 6-8, 6-9 and 6-10).
		Check cables A1W1, A1W2, attenuator A1AT1, hybrid coupler A1HY1, cable A1W3 and the cables from A1J1, A1J4 and A1J5. Replace defective parts and recalibrate (para 68, 6-9 and 610).

Section III. COMPONENT TESTING AND CALIBRATION

6-7. Insulation Resistance Tests on Cables (fig. 6-1)

Use the megger to perform the insulation resistance tests' Refer to the referenced schematic diagrams for wiring of the cables.

WARNING

Test leads of Ohmmeter ZM-21A/U are at potentials up to 500 volts when the hand crank is being rotated. To avoid injury make all connections when the hand crank is not being rotated. DO NOT handle the test leads while the crank is rotating.

NOTE

To accomplish connection of the test leads from the LINE and GROUND megger terminals to the pin contacts of the cable connectors, proceed as follows, whenever applicable.

1. When possible, connect the two test leads to opposite ends of the cable to avoid shorting.
2. To connect a test lead to a male pin of a cable connector, adapt the alligator clip by connecting it to a female pin of the correct size.
3. To connect a test lead to a female pin of a cable connector, adapt the alligator clip by connecting it to a male pin (or solid wire) of the correct size.

a. Cable W1 (fig. 6-7). Couplers W1CP1 through W1CP4 must be connected on the cable.

(1) Connect the GROUND terminal of the megger to the outer shell of one of the coaxial connectors on a plug.

(2) Connect the LINE terminal of the megger to a corresponding contact connected to the inner conductor.

(3) Wrap an uninsulated wire around the outer covering of the cable, and connect the wire to the GUARD terminal of the megger.

(4) Rotate the hand crank of the megger at a speed of at least 160 revolutions per minute (rpm), and read the insulation resistance on the meter. IA meter reading of 100 megohms or higher must be obtained.

(5) Repeat steps (1), (2), and (4) for the balance of the coaxial wires (3).

b. Cable W2 (fig. 6-8)

(1) Connect the GROUND terminal of the megger to plug contact pin 10.

(2) Connect the LINE terminal to plug contact pin 12.

(3) Repeat step *a*(3).

(4) Repeat step *a*(4).

(5) Connect the GROUND terminal of the megger to plug contact pin 19.

(6) Connect the LINE terminal to plug contact pin 21.

(7) Repeat step a(4).

(8) Connect the GROUND terminal of the megger to plug contact pin 20.

(9) Connect the LINE terminal to plug contact pin 22.

(10) Repeat step a(4).

(11) Connect the GROUND terminal of the megger to the outer shell of either plug on the cable.

(12) Successively (stop cranking between connections) connect the LINE terminal of the megger to plug contact pins 1, 3, 7, 11, and 23.

(13) Repeat step a(4) for the 5 tests.

(14) Connect the LINE terminal of the megger successively between tests to each plug contact pin carrying a wire. In turn, connect the

GROUND lead to each of the other plug contact pins carrying wires. Repeat step a(4) for each wire. Perform 10 separate tests until all wires have been tested with respect to each other.

c. Cable W3 (fig. 6-9). Couplers W3CP1 and W3CP2 must be connected on the cable.

(1) Connect the GROUND terminal of the megger to the outer shell of one of the coaxial connectors on a plug.

(2) Connect the LINE terminal of the megger to a corresponding contact connected to the inner conductor.

(3) Repeat step a(3).

(4) Repeat step a(4).

(5) Repeat steps (1), (2), and (4) for the balance of the coaxial wires (4).

d. Cable W4. (fig. 6-10)

(1) Connect the GROUND terminal of the megger to the outer shell of either plug on the cable.

(2) Repeat step a(3).

(3) Successively (stop cranking between connections) connect the LINE terminal of the megger to each plug contact pin carrying a wire.

(4) Repeat step a(4) for the five tests.

(5) Connect the LINE test lead of the megger successively between tests to each plug contact pin carrying a wire. In turn, connect the GROUND lead to each of the other plug contact pins carrying wires. Repeat step a(4) for each wire Perform 10 separate tests until all wires have been tested with respect to each other.

e. Cables W5, W12, W13, W14/W15, W16, and W21 (fig. 6-11, 6-13, 6-14, 6-15, 6-16, and 6-17). Coupler W12CP1 must be connected on cable W12.

(1) Connect the LINE terminal of the megger to the center contact of a plug.

(2) Connect the GROUND terminal of the megger to the shell of a plug.

(3) Repeat step a(3).

(4) Repeat step a(4).

f. Cable W11.
(fig. 6-12)

(1) Repeat step a(3).

(2) Connect the LINE test lead of the megger successively between tests to each plug contact pin. In turn, connect the GROUND lead to each of the other plug contact pins. Repeat step a(4) for each wire. Perform 153 separate tests until all wires have been tested with respect to each other.

g. Cable W25 (fig. 6-18). Check that the wires marked +28 VDC and DC RET are not touching before testing cable W25.

(1) Connect the GROUND terminal of the megger to the outer shell of one of the coaxial connectors (P4 or P5).

(2) Repeat step a(3), wrapping wire around cable between P1 and P2.

(3) Connect the LINE terminal of the megger successively to P6 pins L, K, N, P, W, k, m, q, w and the inner contact of coaxial pin r.

(4) Repeat step a(4) for each test.

(5) Repeat steps (1), (3), and (4) for the other coaxial connector.

(6) Connect the LINE test lead of the megger successively between tests to each plug contact pin carrying a wire. In turn, connect the GROUND lead to each of the other plug contact pins carrying wires or directly to the two wires. Repeat step a(4) for each wire. Perform 6 tests on P6 for pins K, P, q and w. Perform 435 tests on P1 for all pins (30) carrying wires and check pins K, q and w of P6 against the 30 wire carrying pins of P1 (90 tests).

h. Cable W44 (fig. 6-19)

(1) Repeat step a(3).

(2) Connect the LINE test lead of the megger successively between tests to each plug contact pin. In turn, connect the GROUND lead to each of the other plug contact pins. Repeat step a(4) for each wire. Perform 325 separate tests until all wires have been tested with respect to each other.

6-8. Hybrid Attenuator Sum Channel (RF IN/OUT to RF SUM Jacks) Insertion Loss Calibration (fig. 6-2)

a. Test Equipment and Materials. The following test equipment and materials are required:

Signal Generator SG-340/G

Variable Attenuator, Alfred Electronics Model E101

SWR Indicator AN/UPM-108A

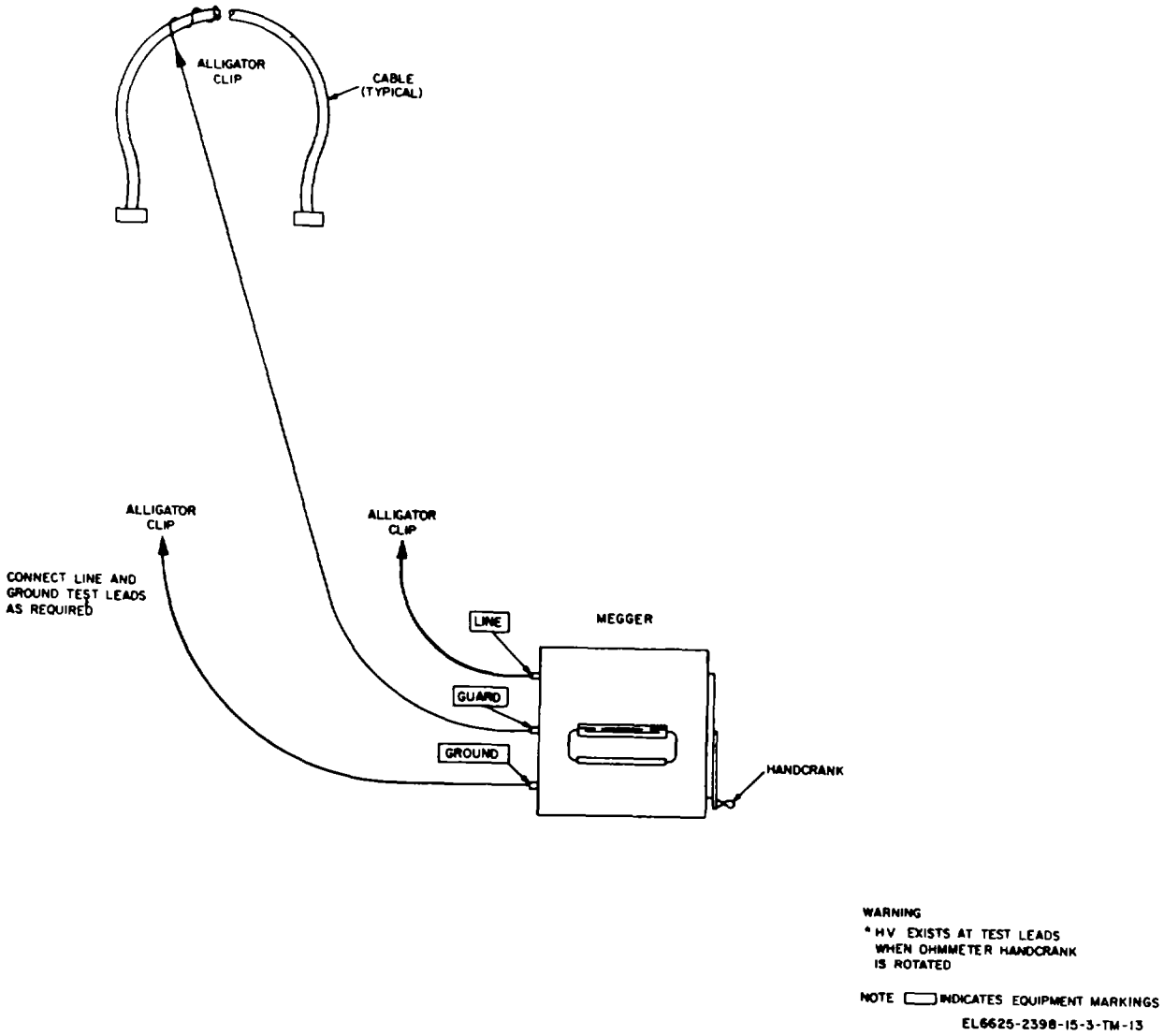


Figure 6-1. Cable megger test connections.

Crystal Detector HP-423A
Adapter UG-201A/U
Adapter UG-606/U
Adapters CP7/CP8(2)
Fixed Attenuators AT1/AT2(2)
Termination AT3/AT4
50-ohm Terminations (2), Microlab/FXR TA-6MN
Cables W14/W15(2)

b. Procedure. Connect the equipment as shown in solid lines (fig. 6-2) and proceed as follows:

(1) On the signal generator, set the MEGACYCLES dial to 1090 with the frequency control knob. Set the function switch to CW and turn on the signal generator. Allow a minimum of 20 minutes warm-up period before proceeding.

(2) With the METER SCALE set to NORMAL, and INPUT SELECTOR set to XTAL 200K a, turn on the SWR indicator and allow a minimum of 10 minutes warm-up period before proceeding.

(3) Turn off the signal generator and zero set the OUTPUT VOLTS meter.

(4) Turn on the signal generator, and ad-

just the OUTPUT LEVEL control knob for an OUTPUT VOLTS meter indication at the SET LEVEL (+4DBM) mark, with the attenuator set to OdB

NOTE

Check that OUTPUT VOLTS meter indication is exactly on the SET LEVEL mark with the attenuator set to OdB (outer scale). Readjust the OUTPUT LEVEL control knob if required.

(5) On the signal generator, set the function switch to 1000 - the MOD. UP-NORMAL-DOWN to NORMAL and adjust the MOD. LEVEL control for a reading of 50 on the PERCENT MODULATION meter. With the SWR indicator METER SCALE set to EXPAND, adjust the SWR indicator VERNIER GAIN control and RANGE switch for an exact meter reading (e g, 5 on the EXPANDED DB meter scale.) Record the meter reading.

(6) Disconnect the hybrid attenuator under test and connect the variable attenuator, as shown by the broken lines in figure 6-2.

(7) adjust the variable attenuator ATTENUATOR DB control for the same SWR indicator meter reading recorded in step b(5). Insertion loss on the ATTENUATOR DB control of the variable attenuator must indicate 6.5 $\pm$ 1.5 dB.

(8) Correct the hybrid attenuator calibration tag marking for 1090 MHz, if incorrect.

NOTE

This insertion loss must be slightly more (at least 0.2 dB) than the insertion loss measured between the RF IN/OUT and ATTEN IN/RF DIFF jacks (para 6-9).

(9) Reconnect the hybrid attenuator, solid lines figure 6-2.

(10) Reset the signal generator MEGACYCLES dial to 1030 and repeat steps (3) through (7) above.

(11) Correct the hybrid attenuator calibration tag marking for 1030 MHz, if incorrect.

6-9. Hybrid Attenuator Difference Channel (RF IN/OUT to ATTEN IN/RF DIFF Jacks) Insertion Loss Calibration (fig. 6-3)

a. Test Equipment and Materials. The following test equipment and materials are required:

Signal Generator SG-340/G
Variable Attenuator, Alfred Electronics Model E101
SWR Indicator AN/UPM-108A
Crystal Detector HP423A
Adapter UG-201A/U
Adapter UG 60/U
Adapter CP7/CP8(2)
Fixed Attenuators AT1/AT2(2)
Termination AT3/AT4
50-ohm Terminations (2), Microlab/FXR TA-6MN
Cables W14/W15(2)

b. Procedure. Connect the equipment as shown in solid lines, (fig. 6-3) and proceed as follows:

(1) On the signal generator, set the MEGACYCLES dial to 1030 with the frequency control knob. Set the function switch to CW, and turn on the signal generator. Allow a minimum of 20 minutes warm-up period before proceeding.

(2) With the METER SCALE set to NORMAL and INPUT SELECTOR set to XTAL-200K n, turn on the SWR indicator, and allow a minimum of 10 minutes warm-up period before proceeding.

(3) Turn off the signal generator and zero set the OUTPUT VOLTS meter.

(4) Turn on the signal generator, and adjust the OUTPUT LEVEL control knob for an OUTPUT 'VOLTS meter indication at the SET LEVEL (+4 DBM) mark, with the attenuator set to OdB.

NOTE

Check that OUTPUT VOLTS meter indication is exactly on the SET LEVEL mark with the attenuator set to OdB (outer scale). Readjust the OUTPUT LEVEL control knob if required.

(5) On the signal generator, set the function switch to 1000-, the MOD. UP-NORMAL-DOWN switch to NORMAL and adjust the MOD. LEVEL control for a reading of 50 on the PERCENT MODULATION meter. Set the hybrid attenuator ATTENUATOR control to 0 (zero). Adjust the SWR indicator VERNIER GAIN control and the RANGE switch for an exact meter reading (e.g., .6 on the DB meter scale). Record the meter reading.

(6) Disconnect the hybrid attenuator under test and connect the variable attenuator, as shown by broken lines, figure 6-3.

(7) Adjust the variable attenuator AT-

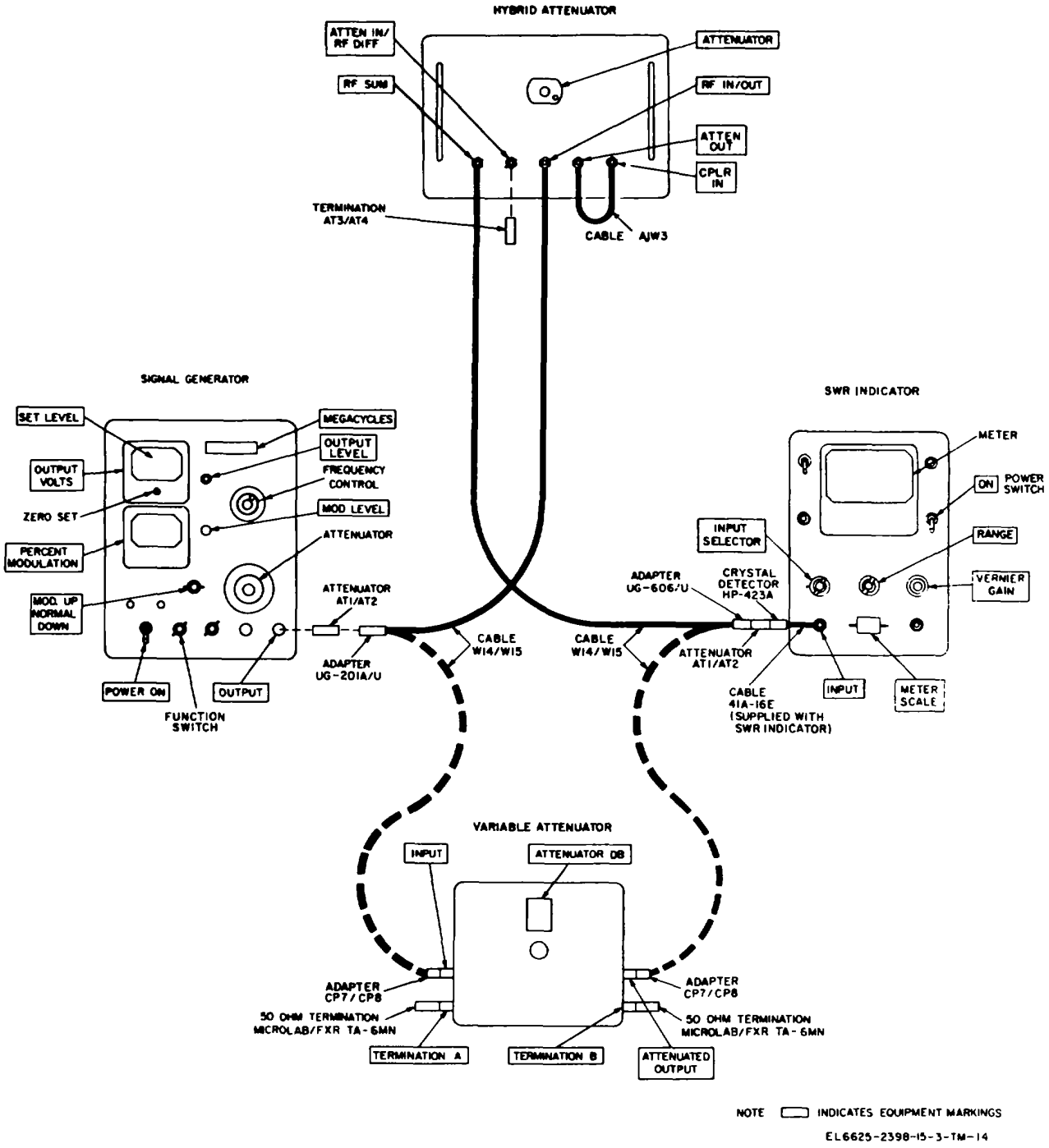


Figure 6-2. Hybrid attenuator sum channel (RF IN/OUT to RF SUM)jacks) insertion loss, calibration connections.

TENUATOR DB control for the same SWR indicator meter reading recorded in step b(5). Insertion loss on ATTENUATOR DB control of the variable attenuator must indicate 6.5 ± 1.5 dB.

NOTE

This insertion loss must be slightly less (at least 0.2dB) than the insertion loss measured between the RF IN/OUT and RF SUM jacks (para 6-8).

(8) Correct the hybrid attenuator calibration tag marking, if incorrect.

(9) Successively increase the ATTENUATOR DB control, from the reading obtained in step (7), by 6, 9, and 12. Record the readings on the meter of the SWR indicator for the variable attenuator ATTENUATOR DB control settings of plus 6dB, plus 9dB, and plus 12dB.

(10) Reconnect the hybrid attenuator, solid lines figure 6-3.

(11) Adjust the hybrid attenuator ATTENUATOR control for the same SWR indicator meter readings recorded in step (12). Insertion losses must be within the following limits:

Variable attenuator setting	Hybrid attenuator setting
Increased 6dB	13 +2 0, -1.3dB
Increased 9dB	16 +2.5, -1.3dB
Increased 12dB	19 +3.0, -1.5dB

(12) Reset the signal generator MEGACYCLES dial to 1090 and repeat steps (3) through (7).

(13) Correct the hybrid attenuator calibration tag marking for 1090 MHz, if incorrect.

(14) Repeat step (9) using the reading obtained In step (13) for the variable attenuator.

(15) Reconnect the hybrid, attenuator, solid lines figure 63.'

(16) Adjust the hybrid attenuator ATTENUATOR control for the same SWR indicator meter readings recorded in step (14). Insertions losses must be within the following limits:

Variable attenuator setting	Hybrid attenuator setting
Increased 6dB	13 +20, -1.3dB
Increased 9dB	16 +25, -1.3dB
Increased 12dB	19 +2.5, -14dB

6-10. Hybrid Attenuator ATTENUATOR Dial Calibration (fig. 6-4)

a. Test Equipment and Material. The following test equipment and materials are required:

Signal Generator SG-340/G
Variable Attenuator, Alfred Electronics Model E101
SWR Indicator AN/UPM-108A
Crystal Detector HP-423A
Adapter UG-201A/U
Adapter UG-606/U
Adapters CP7/CP8(2)
Fixed Attenuator AT1/AT2(2)
50-ohm Terminations (2), Microlab/FXR TA-6MN
Cables W14/W15(2)

b. Procedure. Connect the equipment as shown in solid lines 'fig. 6-4), and proceed as follows:

(1) On the signal generator, set the MEGACYCLES dial to 1090 with the frequency control knob. Set the function switch to CW, and turn on the signal generator. Allow a minimum of 20 minutes warm-up period before proceeding.

(2) With the METER SCALE set to NORMAL and INPUT SELECTOR set to XTAL-200K n, turn on the SWR indicator and allow a minimum of 10 minutes warm-up period before proceeding.

(3) Turn off the signal generator and zero set the OUTPUT VOLTS meter.

(4) Turn on the signal generator, and adjust the OUTPUT LEVEL control knob for an OUTPUT VOLTS meter indication at the SET LEVEL (+4 DBM) mark, with the attenuator set to 0dB.

NOTE

Check that OUTPUT VOLTS meter indication is exactly on the SET LEVEL mark with the attenuator set to 0dB (outer scale). Readjust the OUTPUT LEVEL control knob if required.

(5) On the signal generator, set the function switch to 1000-, the MOD. UP-NORMAL-DOWN switch to NORMAL and adjust the MOD. LEVEL control for a reading of 50 on the PERCENT MODULATION meter. Set the hybrid attenuator ATTENUATOR control to 0 (zero). Adjust the SWR indicator VERNIER GAIN control and the RANGE switch for an exact meter reading (e.g., .5 on the DB meter scale). Record the meter reading.

(6) Disconnect the hybrid attenuator under test and connect the variable attenuator, as shown by broken lines;, figure 6-4.

(7) Adjust the variable attenuator ATTENUATOR DB control for the same SWR indicator meter reading recorded in step b(5) The ATTENUATOR DB control of the variable attenuator must indicate 0 + 1.0, - 0.0dB.

(8) Correct the hybrid attenuator calibration tag marking, if incorrect.

(9) Disconnect the variable attenuator and reconnect the hybrid attenuator, as shown by solid lines, figure 6-4.

(10) Record the readings on the meter of the standing wave ratio indicator for the hybrid

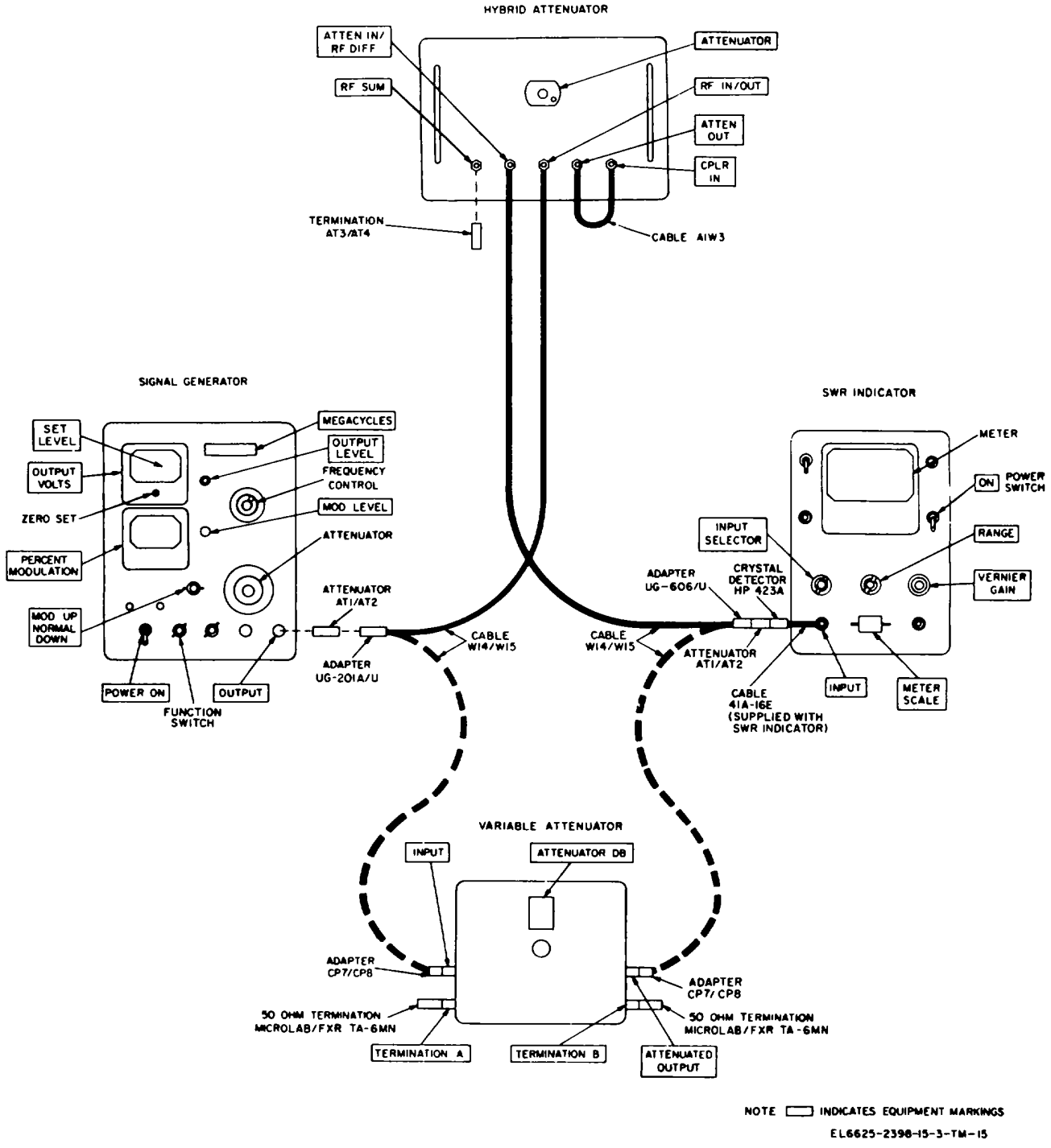


Figure 6-3. Hybrid attenuator difference channel (RF IN/OUT to ATTEN IN/RF DIFF jacks) insertion loss, calibration connections.

attenuator ATTENUATOR control settings of 3.0, 6.0, 9.0, 12.0, 15.0, 20.0, and 25.0.

(11) Disconnect the hybrid attenuator and reconnect the variable attenuator, as shown by broken lines, figure 6-4.

(12) Adjust the variable attenuator AT-

TENUATOR DB control for the same SWR indicator meter readings recorded in step (10). Calibration of the hybrid attenuator must be within the following limits:

Hybrid attenuator settings	Variable attenuator setting
3.0	3 ± 1.0dB
6.0	6 ± 1.0dB
9 0	9 ± l.0dB
12 0	12 ± 1.1dB
15.0	15 ±1.1dB
20.0	20 ± 1.1dB
25.0	25 ± 1.2dB

(13)Correct the hybrid attenuator calibration tag markings for 1090 MHz, if incorrect.

(14)Reset the signal generator MEGACYCLES dial to 1030 and repeat steps (3) through (11) above The ATTENUATOR DB control of the variable a attenuator must indicate 0 + 3 0, - 0.0dB.

(15)Repeat step (12) for the readings recorded in step (14), with the following limits:

Hybrid attenuator settings	Variable attenuator settings
3.0	3 ±3.0, -2.0dB
6.0	6 ±3.0, -2.0dB
9.0	9 ±3.0, -2.0dB
120	12 ±3 0, -2.0dB
15.0	15 ±3.0, -2.0dB
20.0	20±3.0, -2.0dB
25.0	25 ±3.0, -2.0dB

(16)Correct the hybrid attenuator calibration tag markings for 1030 MHz, if incorrect.

6-11. Hybrid Attenuator VSWR Measurements. (fig 6-5)

a. Test Equipment and Materials. The following test equipment and materials are required:

Signal Generator SG-340/G
Slotted Line IM-92/U
SWR Indicator AN/UPM-108A
Low Pass Filter HP-360C
Adapter UG-606/U
Fixed Attenuator AT1/AT2
Terminations AT3/AT4(2)
Adapter CP7/CP8(2)
Cables W14/W15(2)

b. Procedure.

(1) On the signal generator, set the MEGACYCLES dial to 1030 with the frequency control knob. Set the function switch to 1000-the MOD. UP-NORMAL-DOWN to NORMAL, adjust the MOD. LEVEL control for a reading of 50 on the PERCENT MODULATION meter, and set the attenuator to OdB (outer scale). Turn on the signal generator and allow a minimum of 20 minutes warm-up period before proceeding.

(2) With the METER SCALE set to NORMAL, and INPUT SELECTOR set to XTAL-200K n, turn on the SWR indicator and allow a minimum of 10 minutes warm-up period before proceeding.

(3) Terminate and connect the hybrid attenuator as directed in A of figure 6-5 (RF IN/OUT jack VSWR).

(4) Insert the crystal in the rf detector of the slotted line and turn the probe depth control fully clockwise. Adjust the slotted line tuning knob for a maximum indication on the meter of the SWR indicator.

(5) Adjust the signal generator OUTPUT LEVEL control for a centered reading on the meter of the SWR indicator.

(6) Move the carriage of the slotted line, with the drive control, to obtain a peak (maximum) meter reading on the SWR indicator.

(7) Decrease the slotted line probe depth (turn control counterclockwise), while adjusting the VERNIER GAIN control and RANGE switch of the SWR indicator, to the minimum probe depth required to provide full scale deflection on the meter of the SWR indicator (consistent with a usable meter reading, free of noise and jitter).

(8) Readjust the drive control knob of the slotted line for the peak (maximum) reading on the standing wave ratio indicator meter Adjust the VERNIER GAIN control and RANGE switch of the SWR indicator for a meter reading of exactly 1 on the SWR scale.

(9) Move the carriage of the slotted line, with the drive knob, to obtain a null (minimum) reading on the meter of the SWR indicator. Read the voltage standing wave ratio on the SWR scale (top) of the SWR indicator meter. The meter must indicate less than 1 65 on the SWR scale.

(10)Terminate and connect the hybrid attenuator as directed In B of figure 6-5 (RF SUM jack VSWR)

(11)Repeat steps (4) through (9) SWR indicator meter must indicate less than 1.2 on the SWR scale

(12)Terminate and connect the hybrid attenuator as directed in C of figure 6-5 (CPLR IN jack VSWR).

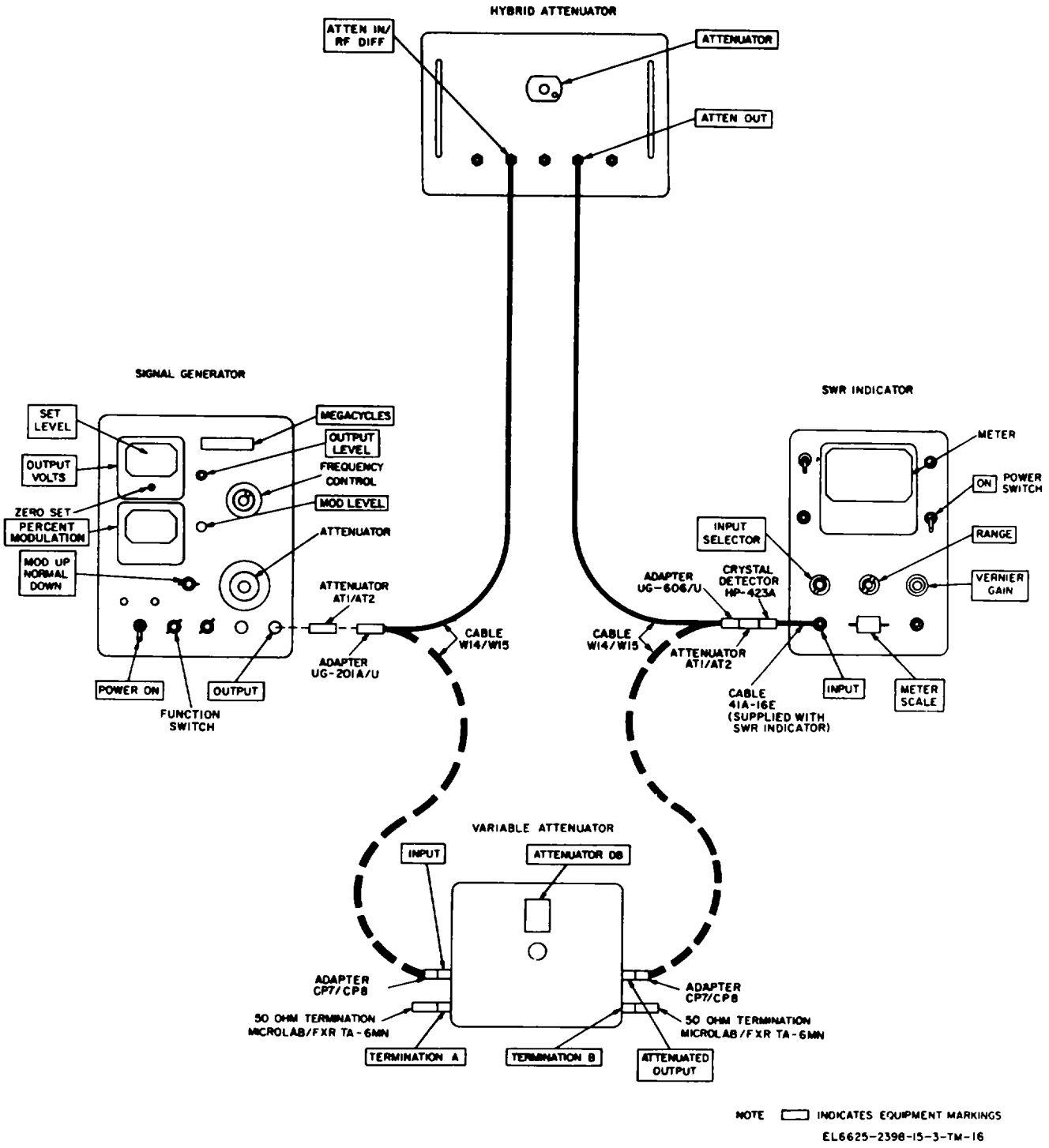


Figure 6-4. Hybrid attenuator ATTENUATOR dial, calibration connections.

(13) Repeat steps (4) through (9). SWR indicator meter must indicate less than 1.5 on the SWR scale.

(14) Terminate and connect the hybrid attenuator as directed in D of figure 6-5 (ATTEN OUT jack VSWR). Set ATTENUATOR control to 0 (zero).

(15) Repeat steps (4) through (9). SWR

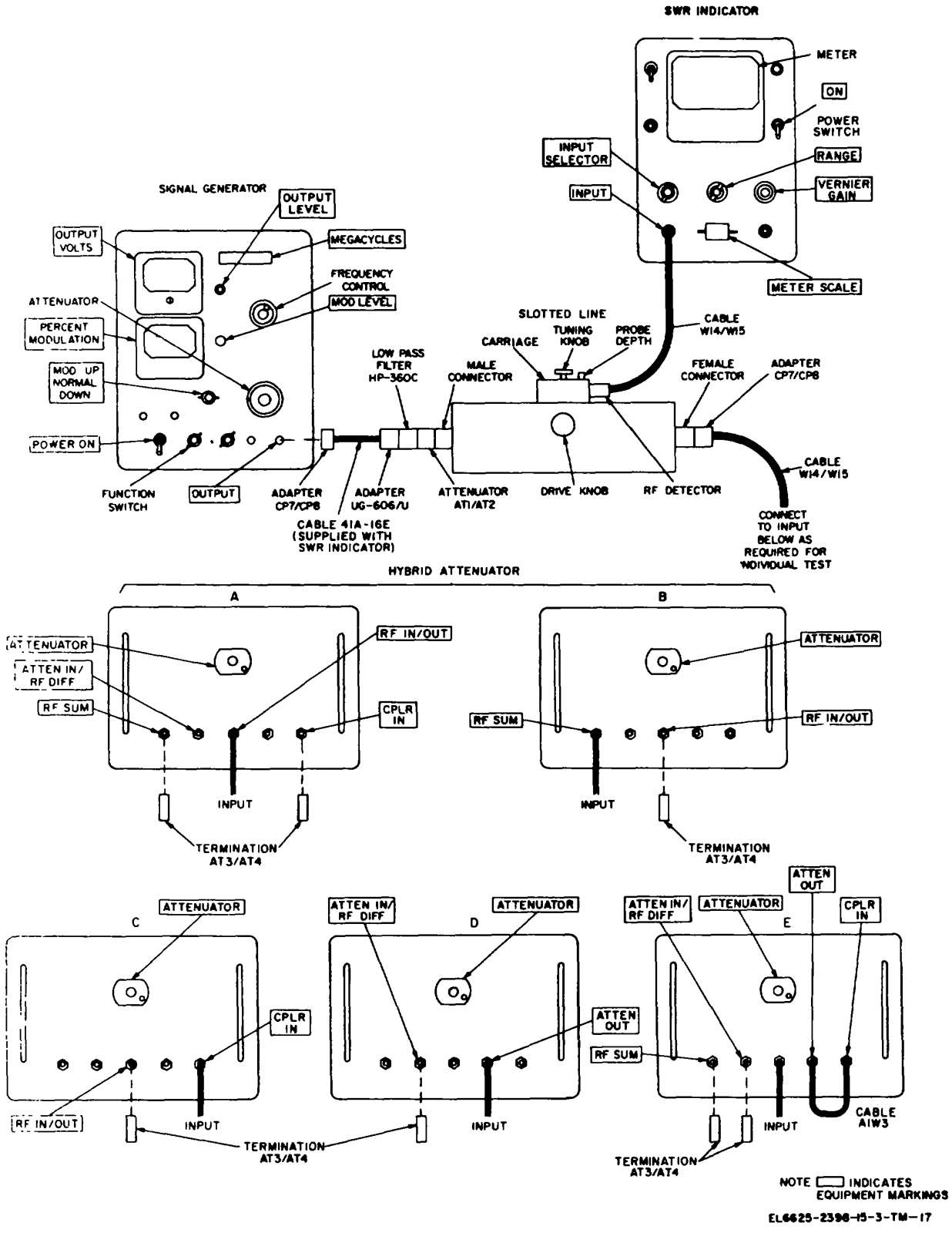


Figure 6-5. Hybrid attenuator VSWR, test connections.

indicator meter must indicate less than 1.5 on the SWR scale.

(16) Terminate and connect the hybrid attenuator as directed in E of figure 6-5 (hybrid attenuator VSWR). Set ATTENUATOR control to 0 (zero).

(17) Repeat steps (4) through (9). Standing wave ratio indicator must indicate less than 1.6 on the SWR scale.

6-12. Calibration of Insertion Loss for Cables W1, W3 and W14/W15 (fig. 6-6)

a. Test Equipment and Materials. The following test equipment and materials are required:

Signal Generator SG-340/G
SWR Indicator AN/UPM-108A
Adapter UG-606/U
Adapter UG-914/U
Adapter CP7/CP8 (2)
Cable W14/W15 (1)

NOTE

Connect the test equipment as shown in solid lines of figure 6-6.

b. Procedure for Cables W14/W15.

(1) On the signal generator, set the MEGACYCLES dial to 1030 with the frequency control knob. Set the function switch to 1000-the MOD. UP-NORMAL-DOWN to NORMAL, and the attenuator to OdB (outer scale). Turn on the signal generator and allow a minimum of 20 minutes warm-up period before proceeding. Adjust the MOD LEVEL control for a reading of 50 on the PERCENT MODULATION meter.

(2) With the METER SCALE set to EXPAND, and the INPUT SELECTOR set to XTAL-200K Ω, turn on the SWR indicator and allow a minimum of 10 minutes warm-up period before proceeding.

(3) Adjust the VERNIER GAIN control and the RANGE switch for a reading of 0 (zero) on the EXPANDED DB scale of the SWR indicator meter.

(4) Connect the unused W14/W15 cable as shown with broken lines in figure 6-6.

(5) Read insertion loss on the EXPANDED DB scale of the SWR indicator meter, reading must not exceed 2.5. Replace or repair (para 7-7) the cable if the insertion loss exceeds 2.5 dB.

(6) Compare insertion loss with 1030 Mhz insertion loss marking on cable sleeve Change the marking, (by scraping off ink and remarking with India ink) if measured insertion loss exceeds +0.2dB of marked insertion loss.

(7) Reconnect the test equipment as shown with solid lines in figure 6-6 and set the MEGACYCLES dial of the signal generator to 1090 MHz.

(8) Repeat steps (3) through (6) except compare insertion loss with sleeve marking for 1090 MHz.

(9) Substitute the calibrated W14,/W15 cable for the uncalibrated cable and connect the test equipment as shown with solid lines in figure 6-6.

(10) Repeat steps (7) and (8) for the uncalibrated W14/W15 cable.

(11) Reconnect the test equipment as shown with solid lines in figure 6-6 and set the MEGACYCLES dial of the signal generator to 1030 MHz.

(12) Repeat steps (3) through (6) above.

c. Procedure for Cable W1. (fig. 6-7)

(1) Remove and retain couplers CP1 through CP4. Remove the retaining clips on one end of the cable by loosening the six screws on the shell. (Four cornered on the mating side and two centered on the back of the shell). Slip out the clips. Insert connector P1 into connector P2.

(2) Repeat steps (1) through (8) of *b* above, substituting plugs P3 and P4 of W1 (sleeve markings P1/1-P2/1) as the cable to be tested in step b(4). Insertion loss of cable at both frequencies must not exceed 2.0dB.

(3) Repeat steps (3) through (8) of *b*, above, substituting plugs P5 and P6 of W1 (sleeve markings P 1/2-P2/2) as the cable to be tested in step b(4). Insertion loss of cable at both frequencies must not exceed 2 0 dR.

(4) Repeat steps (3) through (8) of *b* above, substituting plugs P7 and P8 of W1 (sleeve markings P1/3-P2/3) as the cable to be tested in step b(4). Insertion loss of cable at both frequencies must not exceed 2.0dB.

(5) Repeat steps (3) through (8) of *b* above, substituting plugs P9 and P10 of W1 (sleeve markings P1/4-P2/4) as the cable to be tested in step b(4). Insertion loss of cable at both frequencies must not exceed 2.0dB.

(6) Remove cable WI from the test set-up, disengage plugs P2 and P1, replace the two retaining clips and tighten the six loosened screws. Replace couplers CP1, CP2, CP3, and CP4 between plugs P3/P4, P5/P6, P7/PS, and P9/P10, respectively.

d. Procedure for Cable W3. (fig. 6-9)

(1) Remove and retain couplers CP1 and CP2. Remove the retaining clips on one end of the cable by loosening six screws on the shell, (four cornered on the mating side and two centered on the back of the shell). Slip out the clips. Bend cable W3 into a circle and insert connector P1 into connector P2.

(2) Repeat steps (1) through (8) of *b* above, substituting plugs P3 and P4 of W3 (sleeve markings P1/A-P2/A) as the cable to be tested in step b(4). Insertion loss of cable at both frequencies must not exceed 2.0 dB.

(3) Repeat steps (3) through (8) of *b* above, substituting plugs P5 and P6 of WS3 (sleeve markings P1/B-P2/B) as the cable to be tested in step b(4). Insertion loss of cable at both frequencies must not exceed 2.0dB.

(4) Remove cable W3 from the test set-up, disengage plugs P2 and P1, replace the two retaining clips and tighten the six loosened screws Replace couplers CP1 and CP2 between plugs P3/P4 and P5/P6, respectively.

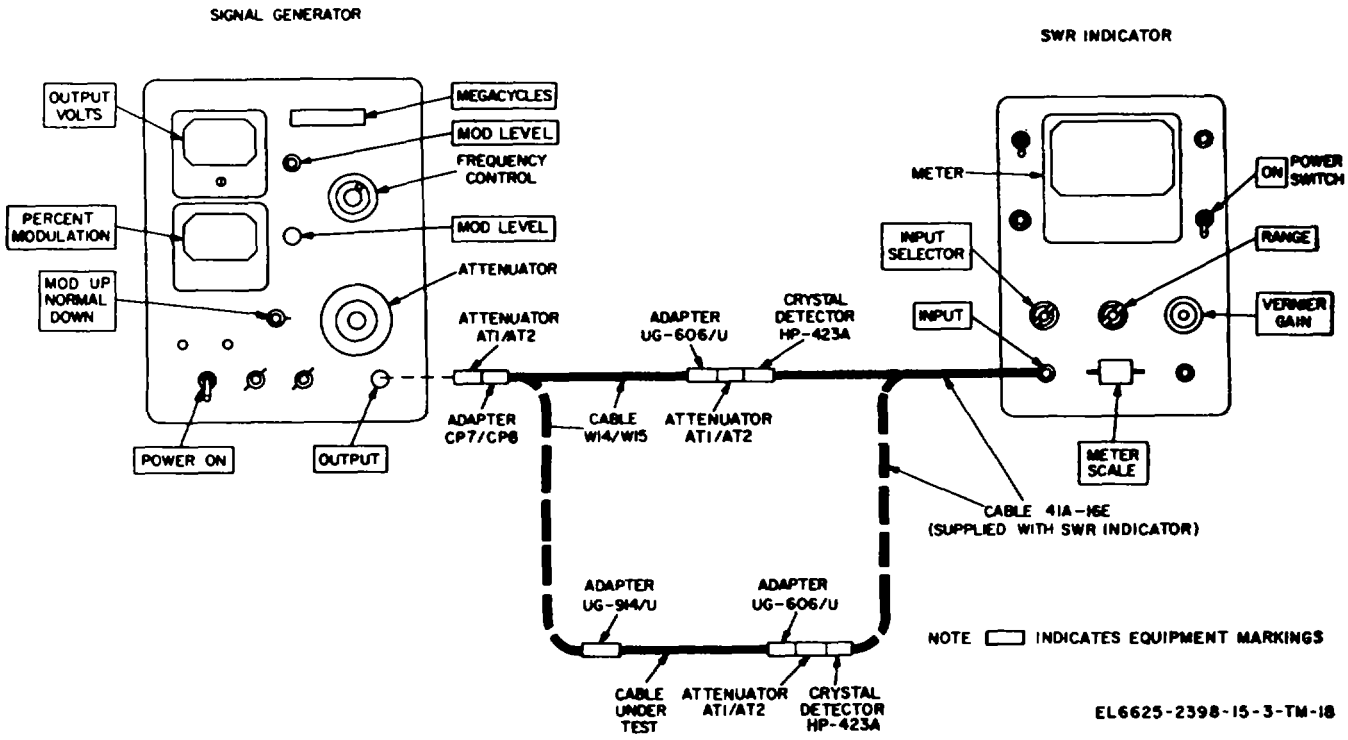


Figure 6-6. Rf cable insertion losses, calibration connections.

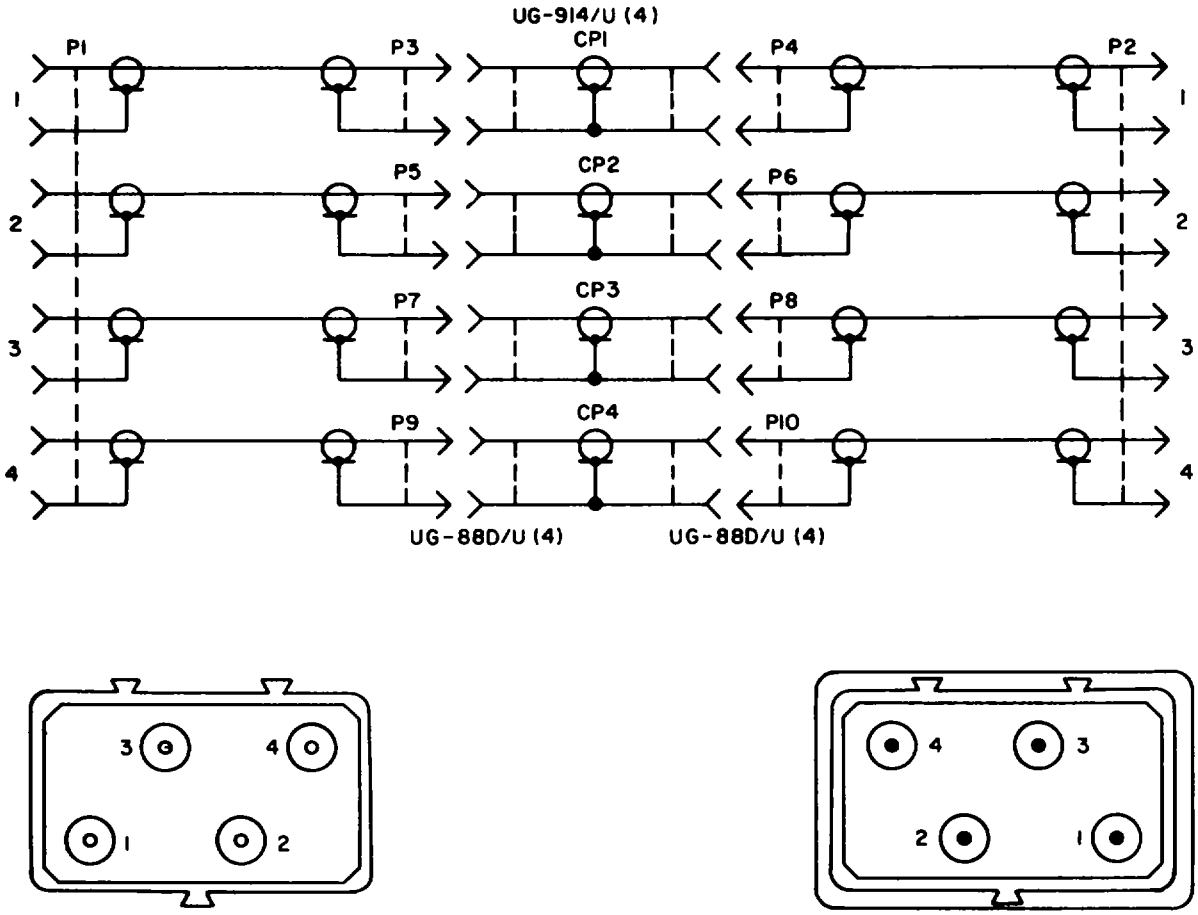


Figure 6-7. Cable W1, schematic diagram

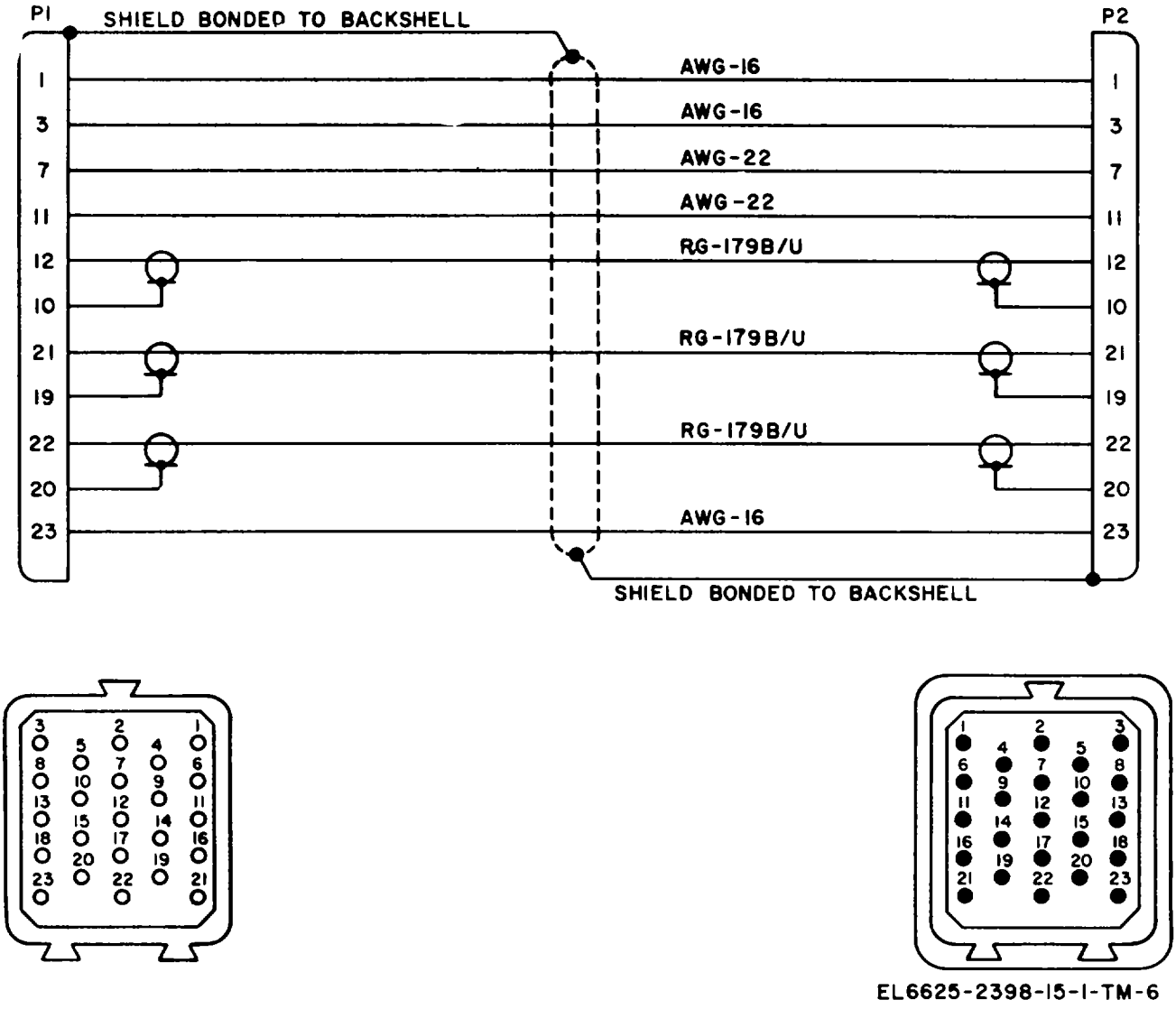


Figure 6-8. Cable W2, schematic diagram

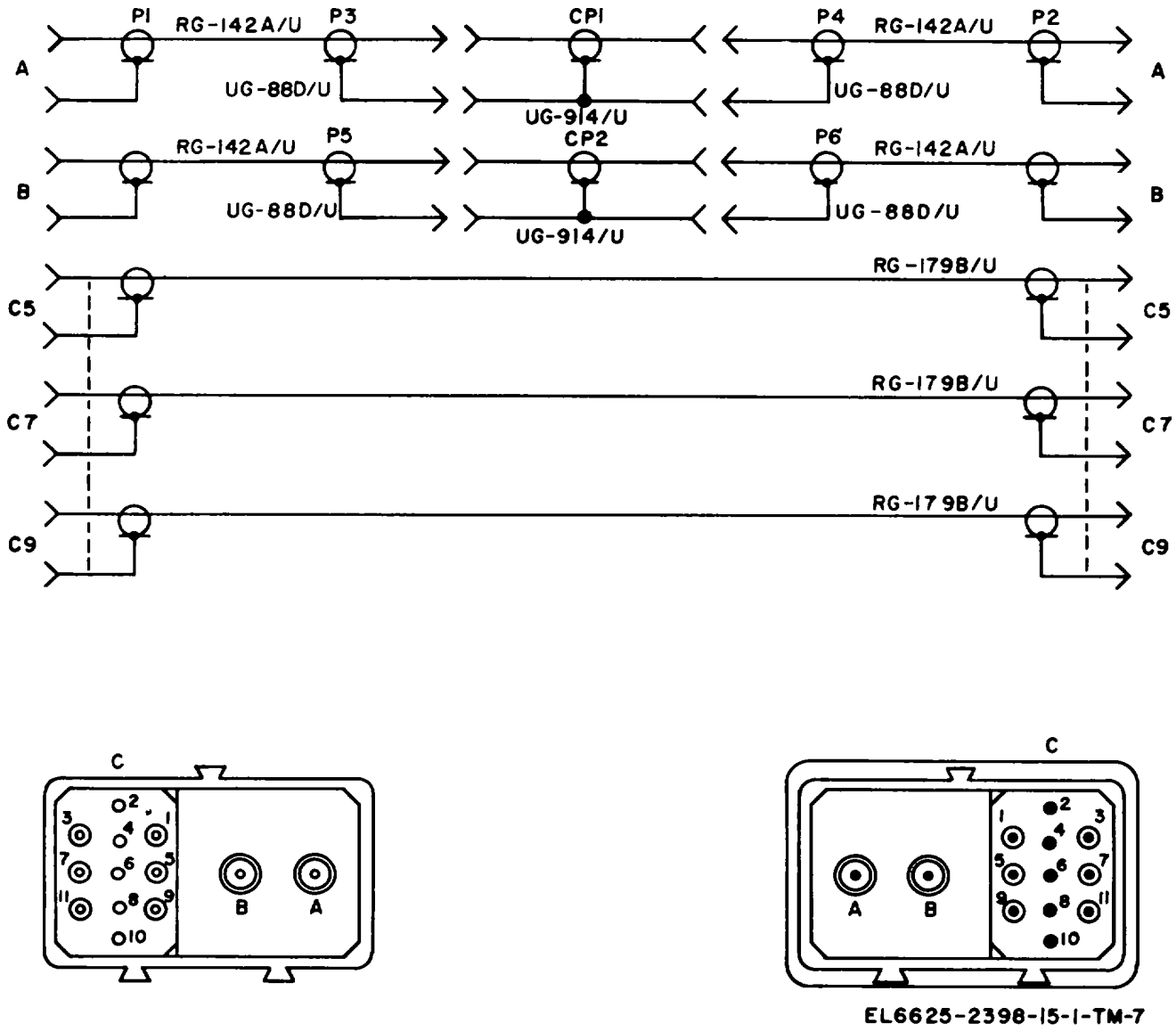


Figure 6-9. Cable W3, schematic diagram

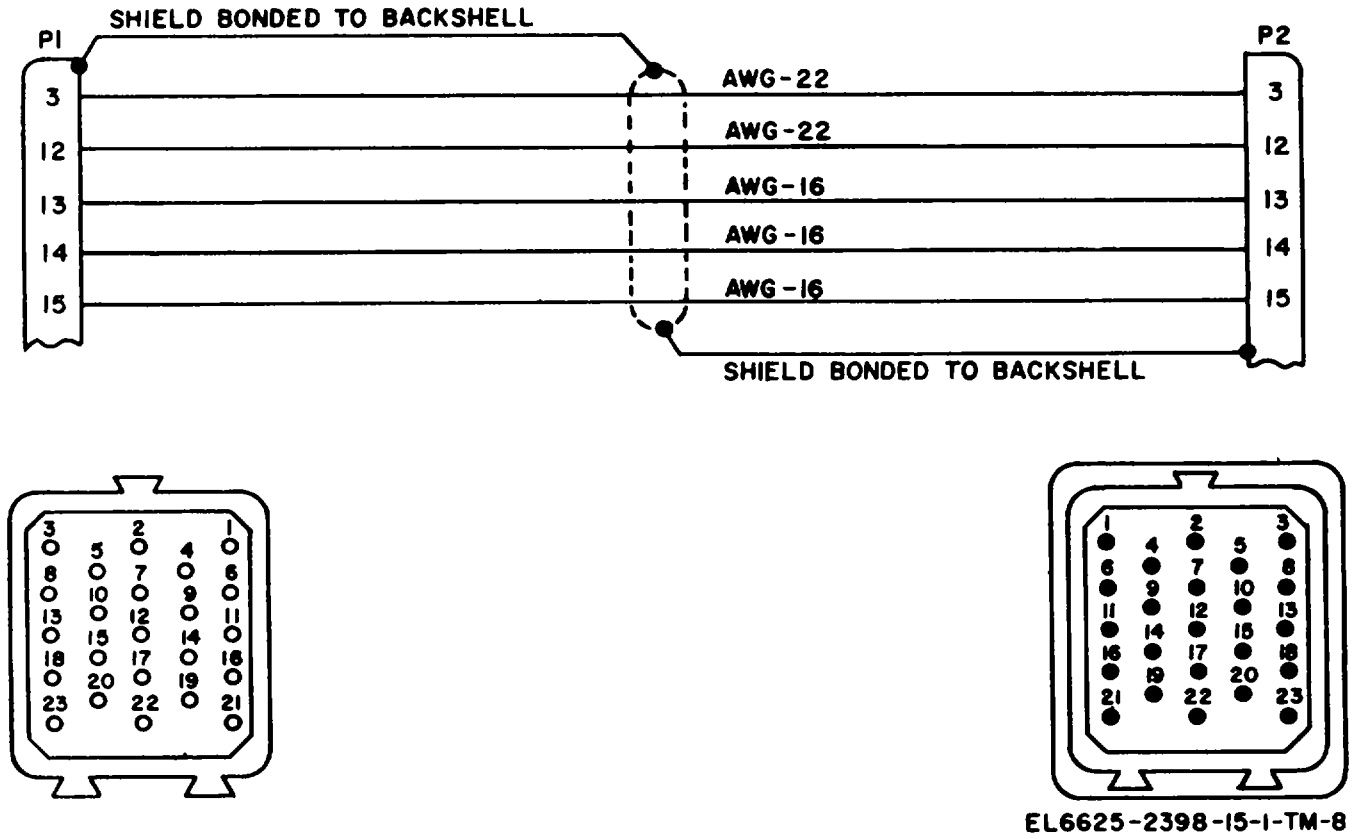


Figure 6-10. Cable W5, schematic diagram.

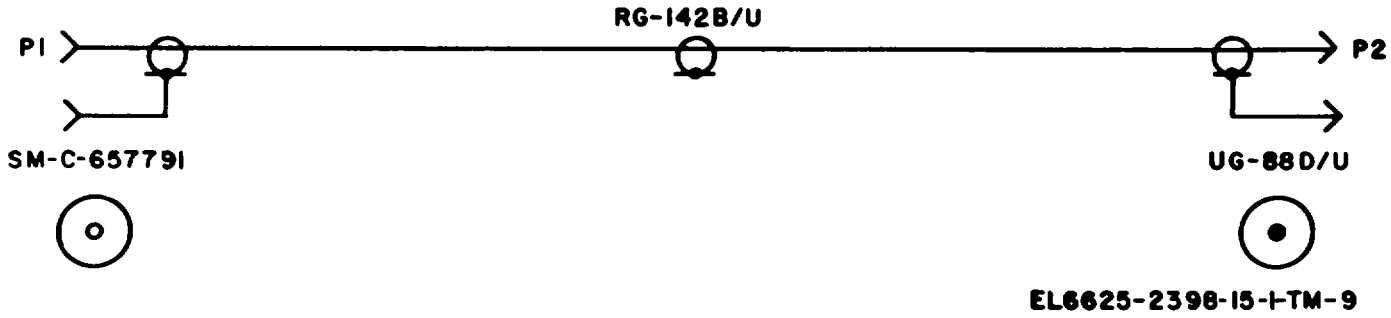


Figure 6-11. Cable W5, schematic diagram.

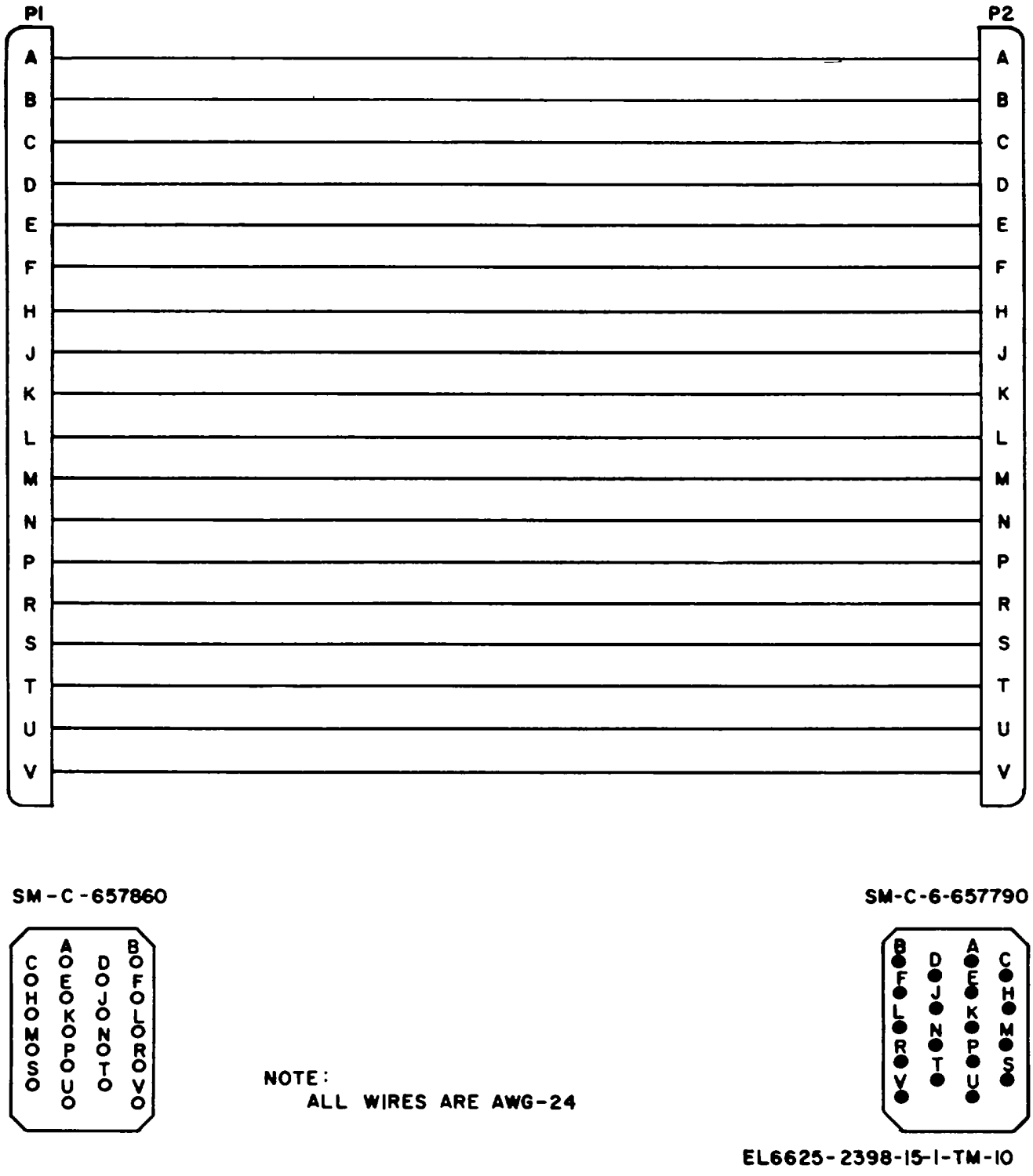


Figure 6-12. Cable W11, schematic diagram

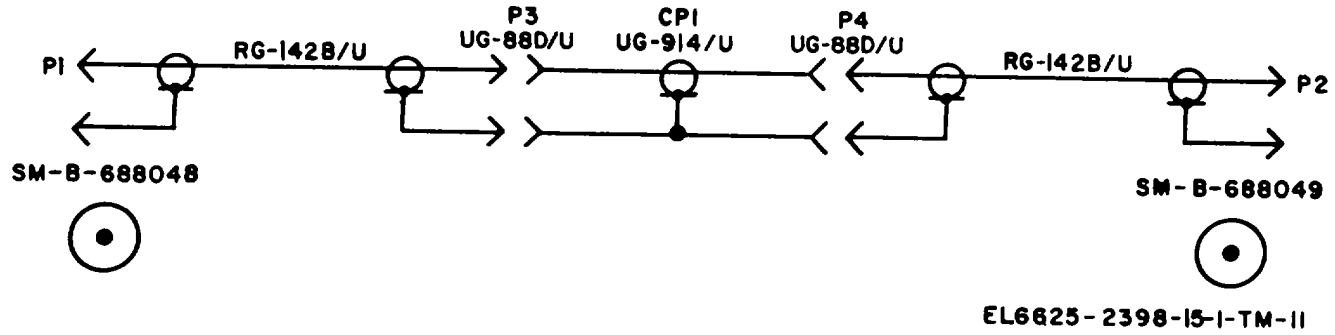


Figure 6-13. Cable W12, schematic diagram.

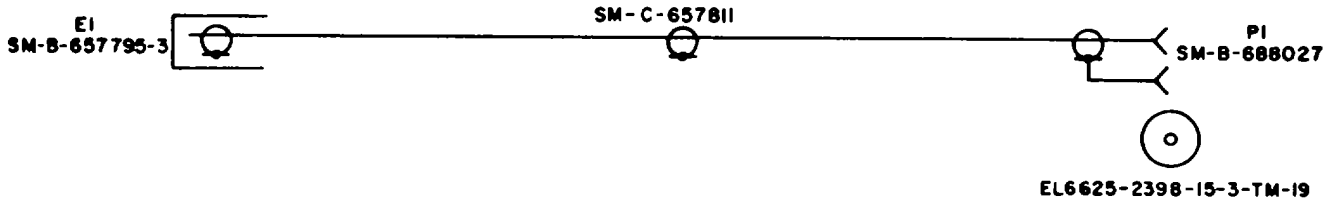


Figure 6-14. Cable W13, schematic diagram.

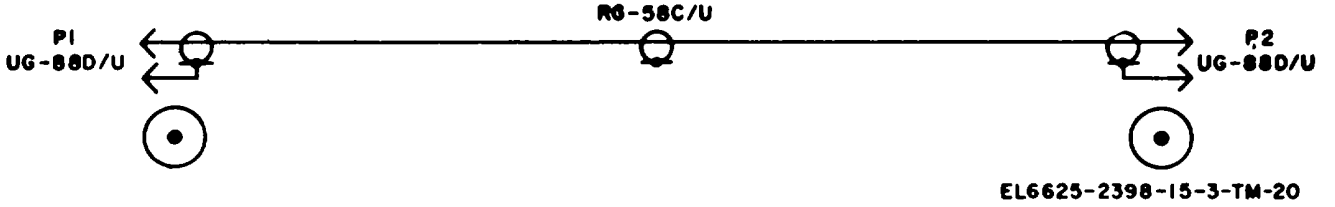


Figure 6-15. Cable W14/W15, schematic diagram.

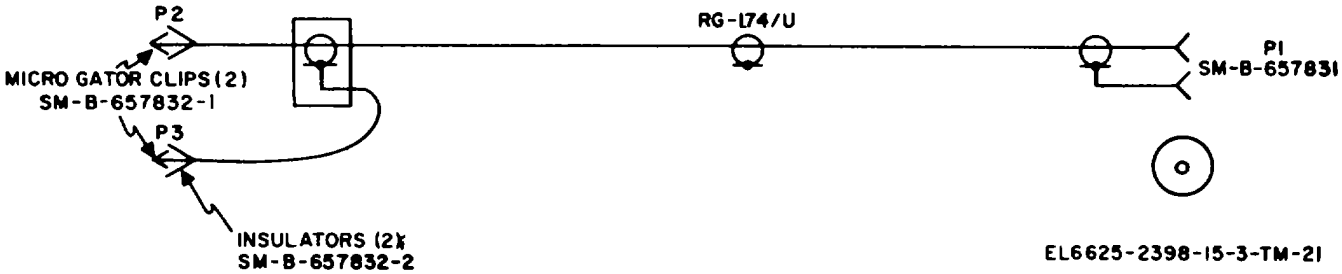


Figure 6-16. Cable W16, schematic diagram.

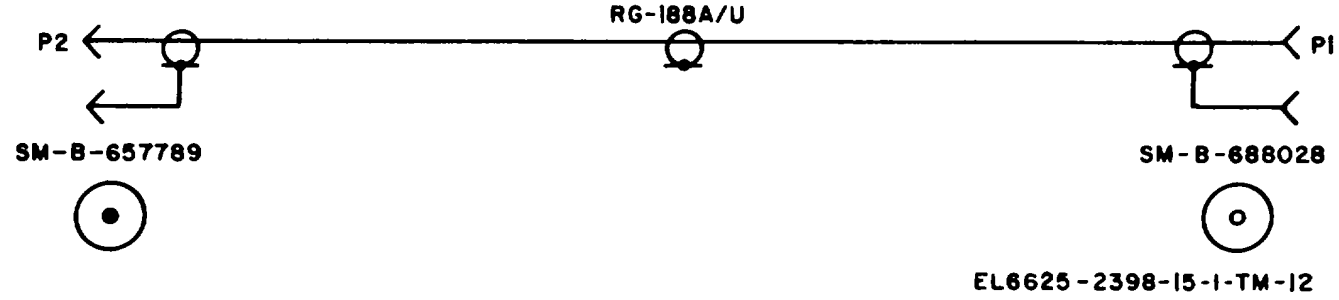


Figure 6-17. Cable W21, schematic diagram.

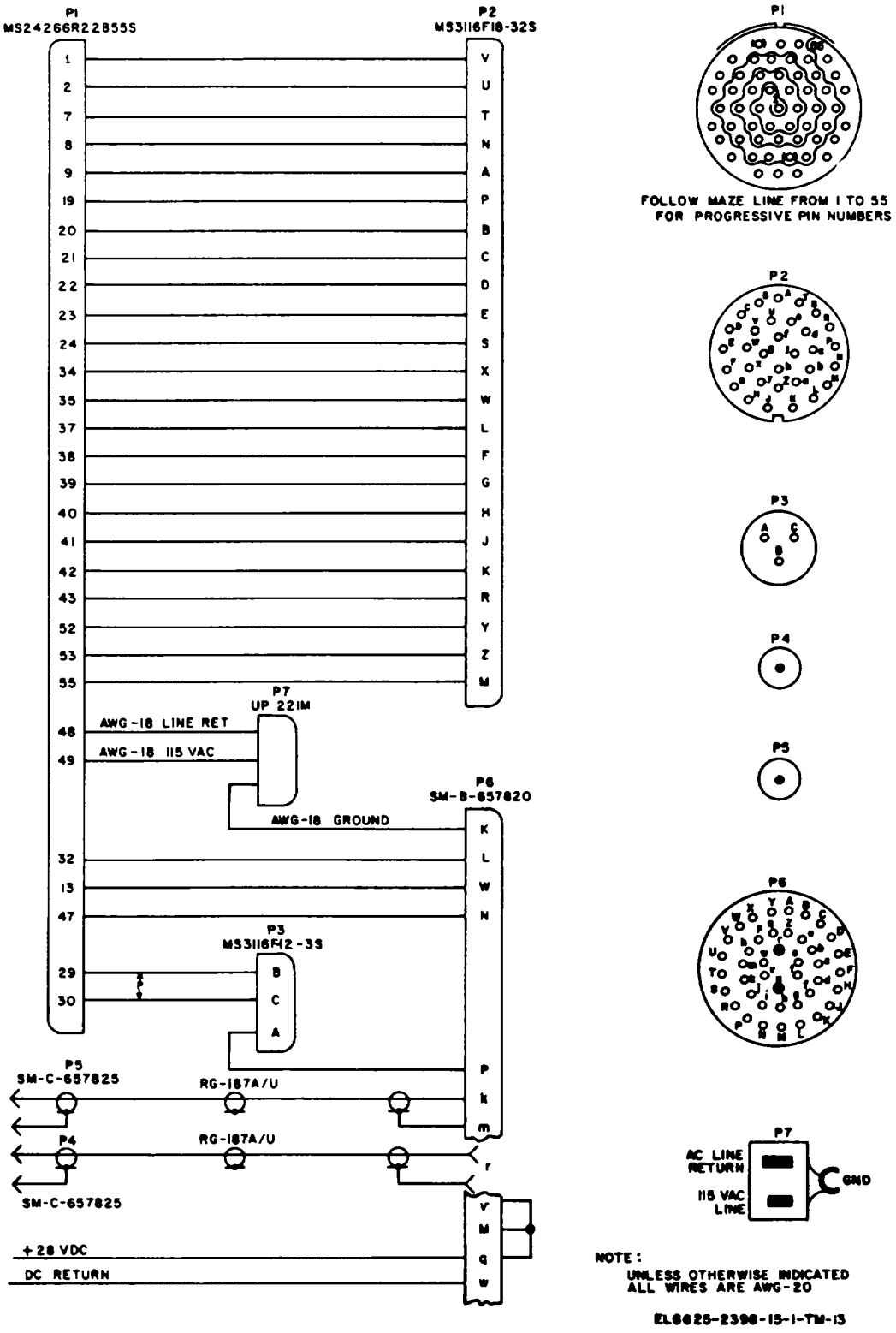


Figure 6-18. Cable 25, schematic diagram.

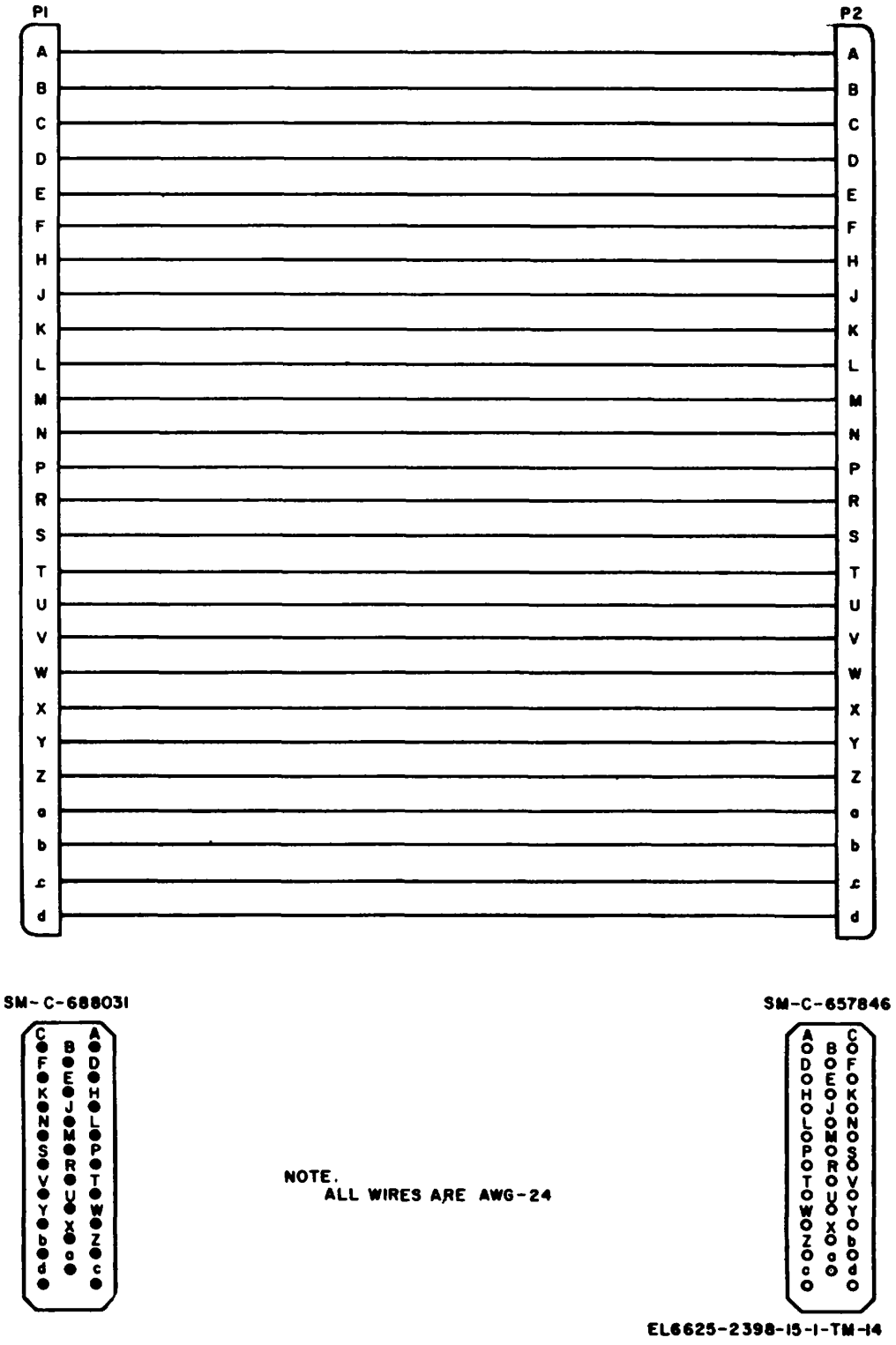


Figure 6-19. Cable 44, schematic diagram.

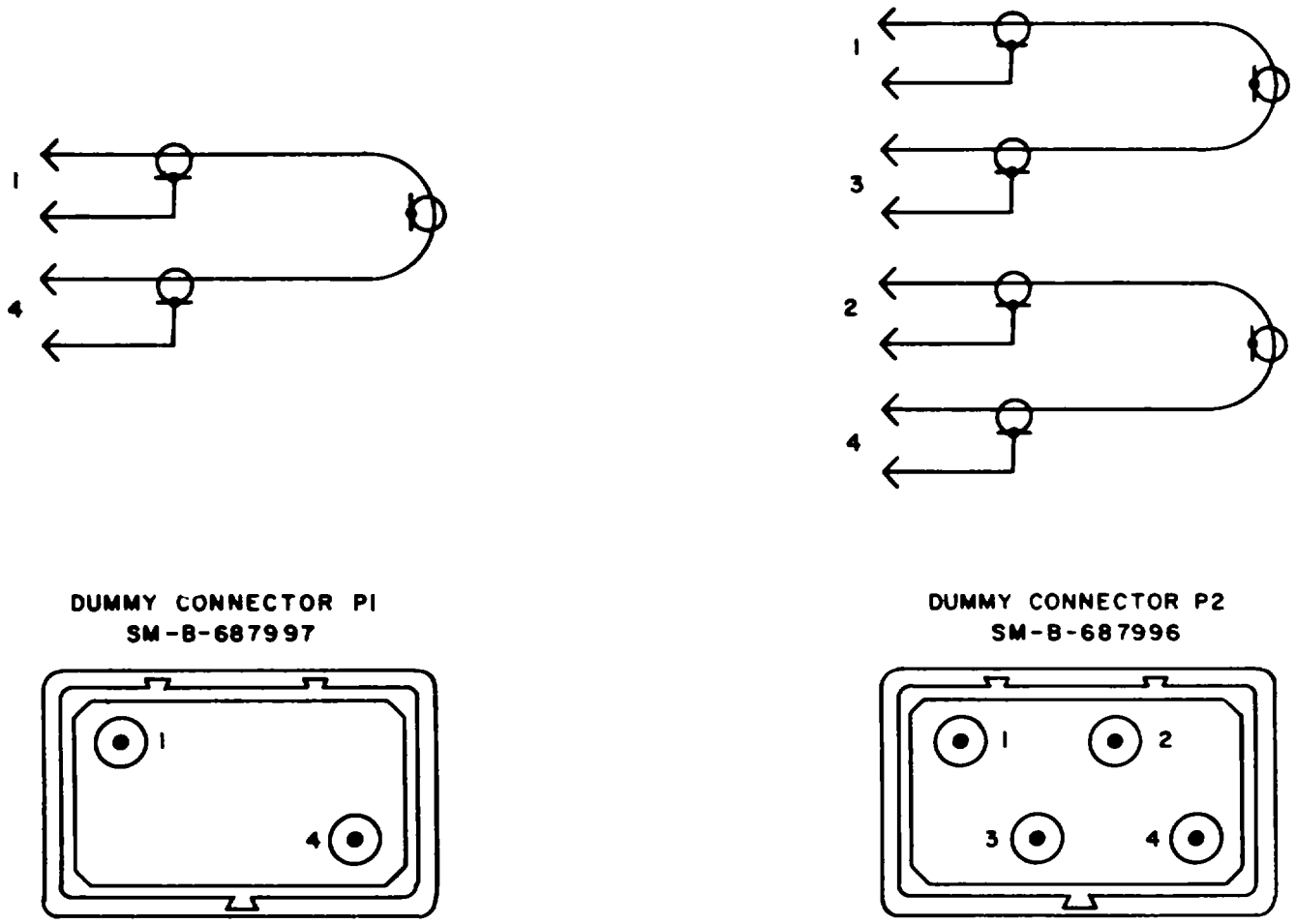


Figure 6-20. Dummy connectors P1 and P2, schematic diagram.

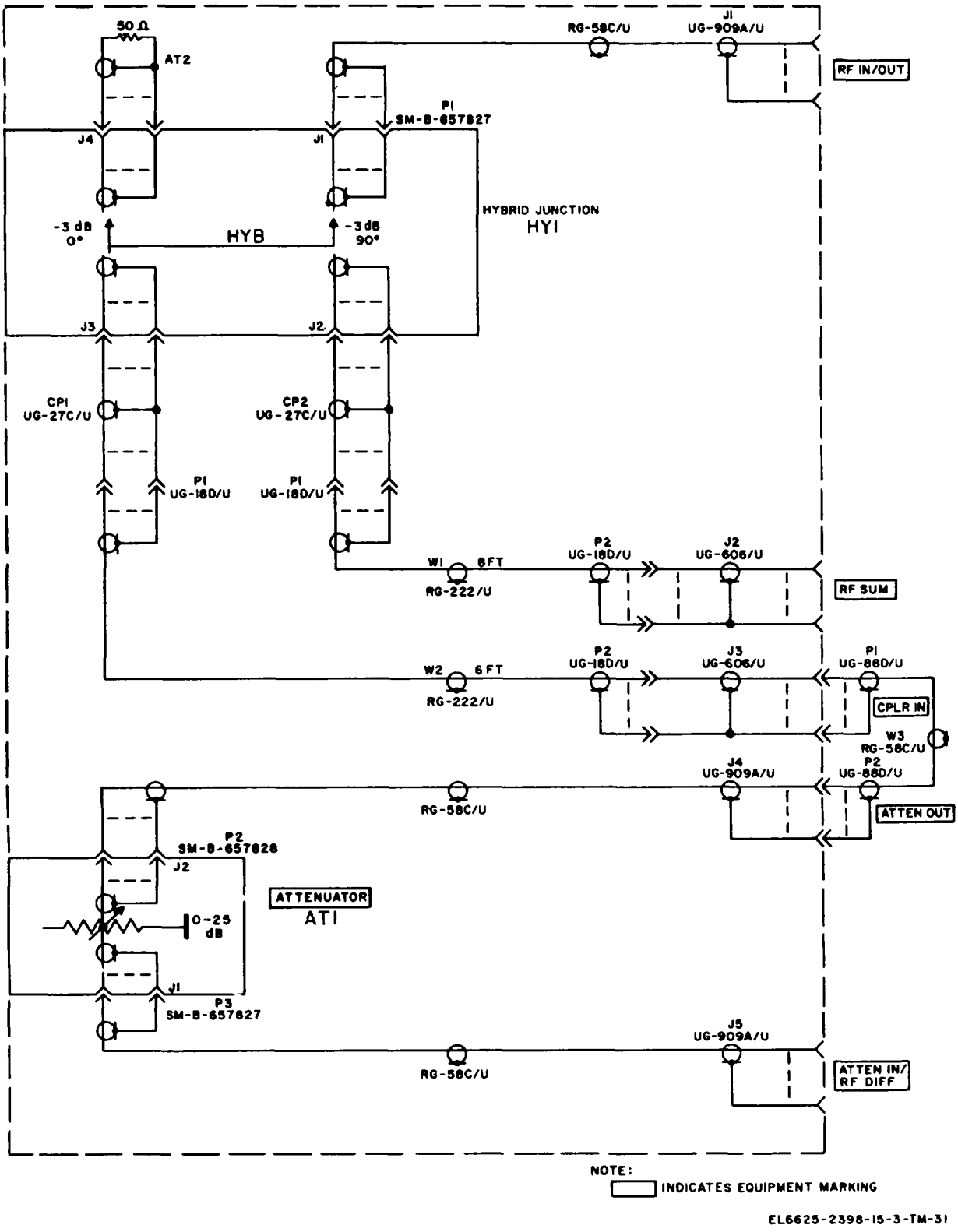


Figure 6-21. Hybrid Attenuator Assembly CN-1322/TPM-24(V), schematic diagram.

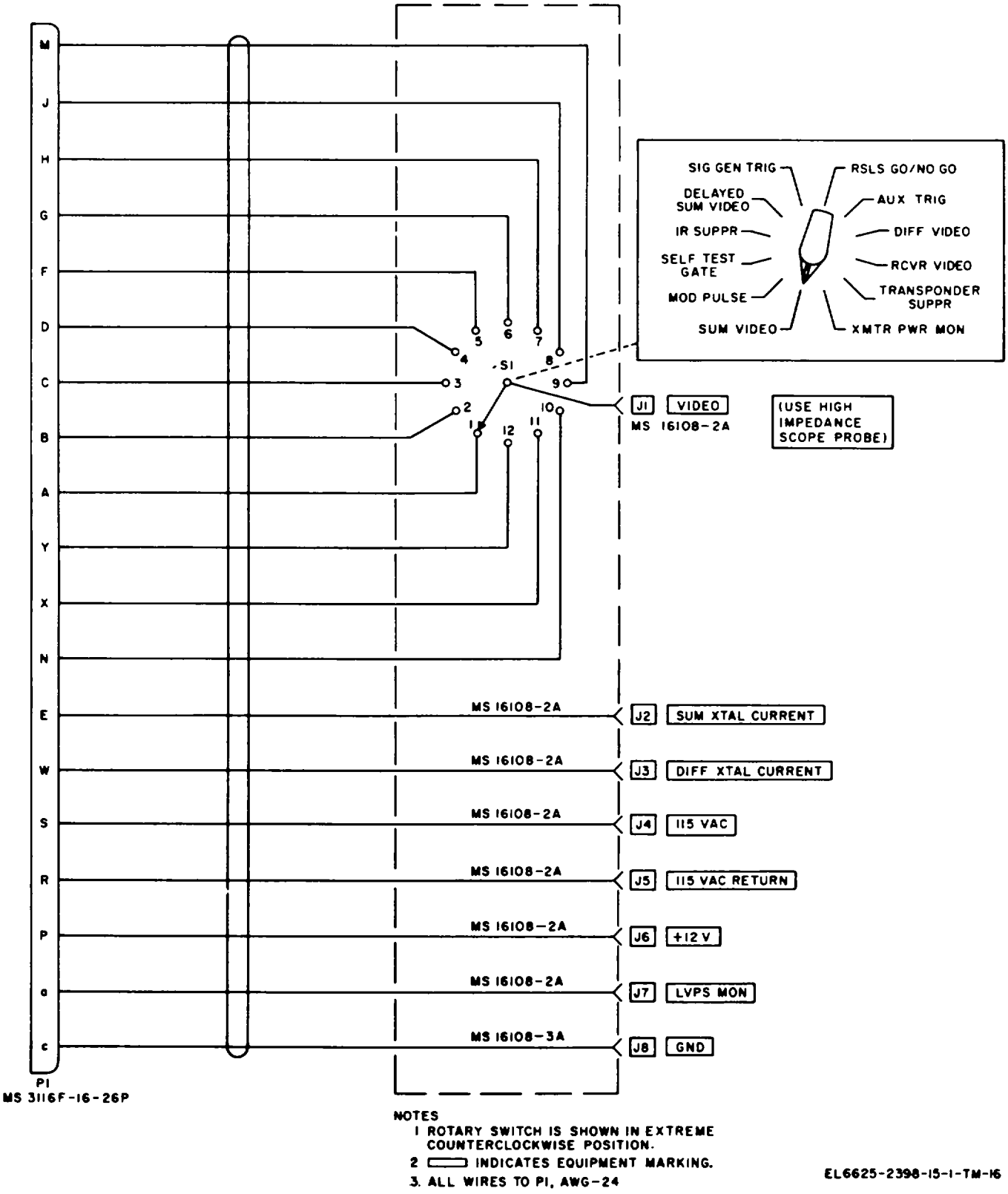


Figure 6-22. Adapter, Test MX-8564/TPM-24(V) schematic diagram.

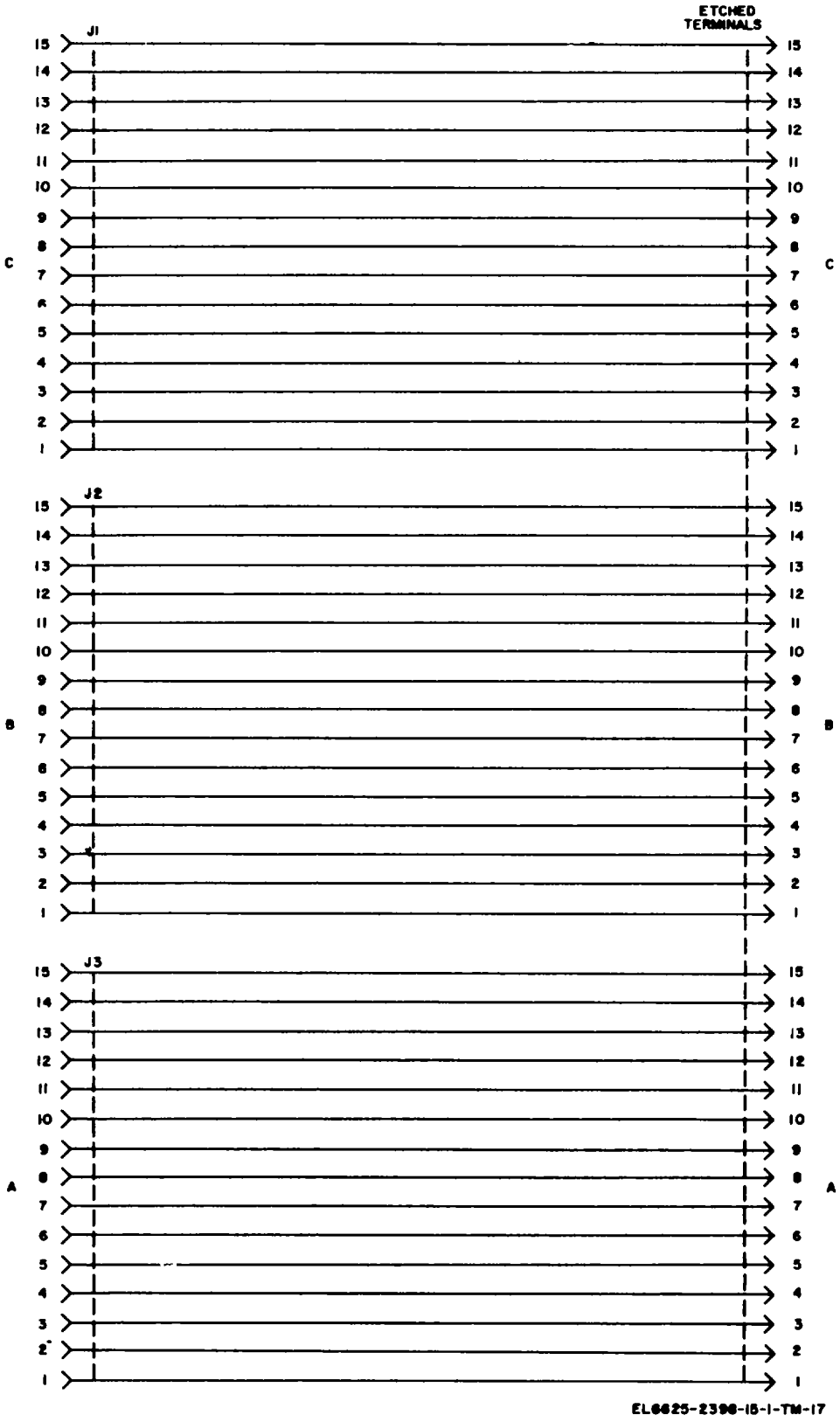


Figure 6-23. Extender board A7, schematic diagram.

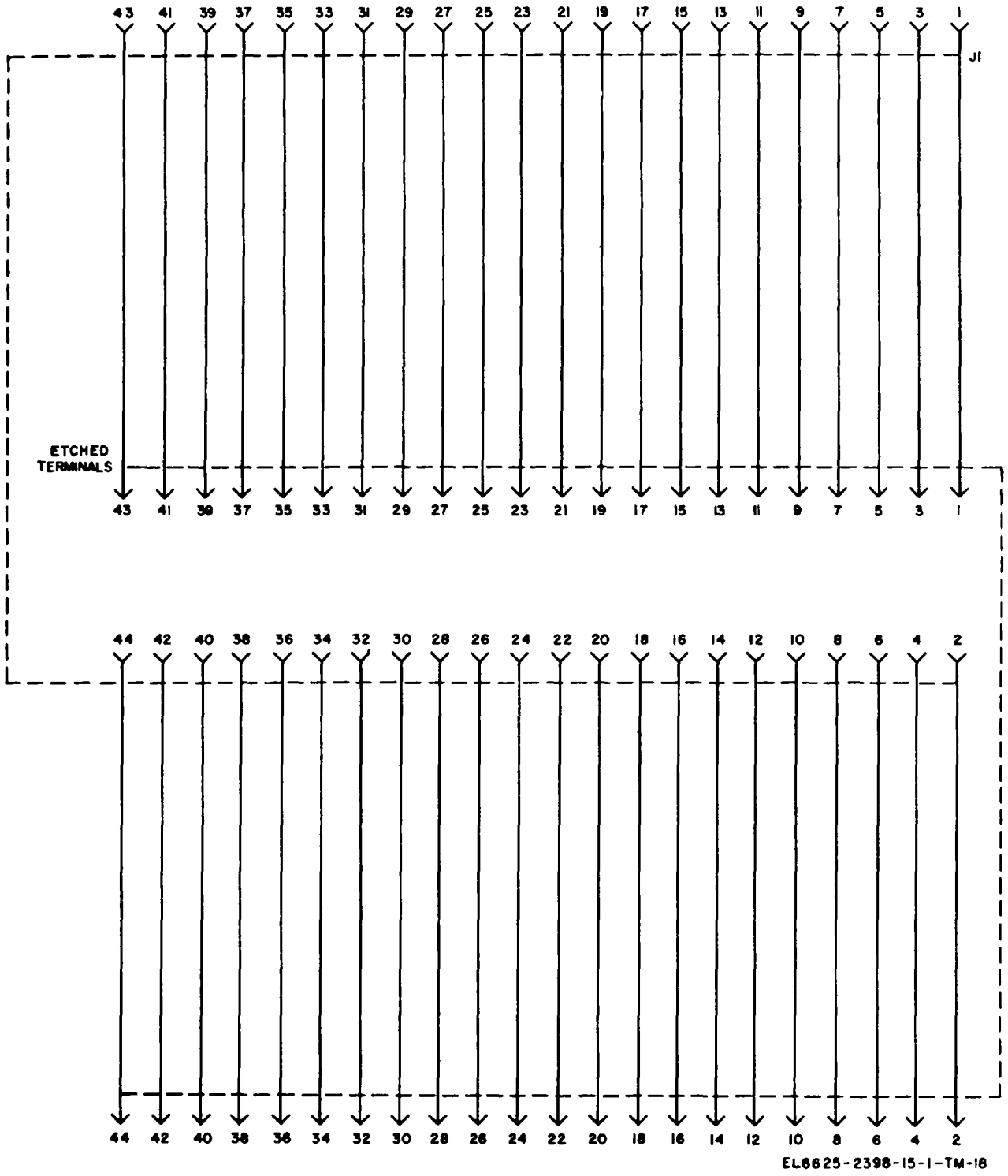


Figure 6-24. Extender boards A8 and A9, schematic diagrams

CHAPTER 7

REPAIRS

7-1. General Parts Replacement Techniques

All components of the test facilities set that are repairable. can be easily replaced without special procedures. Parts located in the hybrid attenuator assembly (fig. 7-1) are accessible when the chassis of the hybrid attenuator assembly is removed from its case. Parts of the R/T front panel test adapter are accessible when the bottom cover is removed.

7-2. Non-repairable Components

The following components of the test facilities set are nonrepairable.

a. *Cables.* Cables W1 (except plugs P3 through

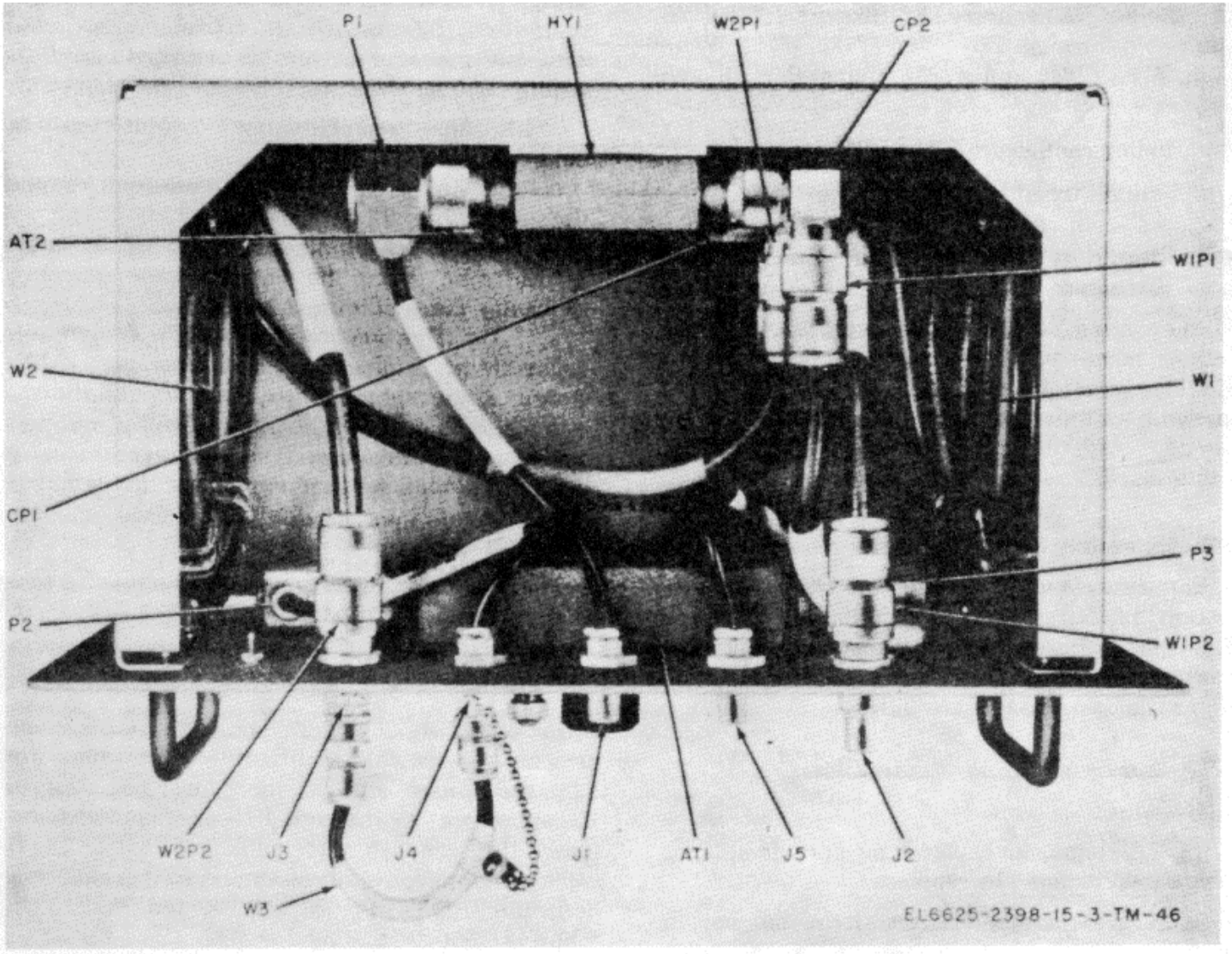


Figure 7-1. Part locations, hybrid attenuator A1.

P10) W2, W3 (except plugs P3 through P6) W4, W13, and W25 (except plugs P4, P5 and P7).

b. Adapters, Terminations, and Attenuators.

(1) Adapters: CP1 through CP8.

(2) Terminations: AT3 through AT6.

(3) Attenuators: AT1/AT2.

c. Couplers. W1CP1 through W1CP4, W3CP1, W3CP2 and W12CP1.

d. Overlay. Waveform overlay.

7-3. Tools and Kits Required

Common name	*Tools or kit*	*Technical manual*
Tool Kit	Tool kit, Electronic Equipment TK-100/G.	TM 11-5180
Printed Wiring repair kit	Repair kit, Printed Wiring Board MK-772/U	TM-11-599

7-4. Repairable Components

The following components are repairable:

a. Hybrid Attenuator Assembly Al.

b. Front Panel Test Adapter A6.

c. Extender Boards A7, A8, and A9.

d. Cables W1 (plugs P3 through P10), W3 (plugs P3 through P6) W5, W11, W12, W14/W15, W16, W21, and W25 (plugs P4, P5 and P7).

e. Dummy connectors P1 and P2.

f. Printed Circuit Board Extractor MP1.

7-5. Repair of Printed Circuit Board Extractor

If the printed circuit board extractor becomes bent or misalined, bend back into proper shape with a pair of pliers. After bending, check that the width of the extractor is correct for proper insertion into the puller holes of the printed-circuit board.

7-6. Extender Board Repair

If the printed-circuit wiring on the board extenders breaks, solder a short length of copper wire across the break. Use just enough heat to assure a well soldered bond, being careful not to burn the board base material.

7-7. Repair of Cable Assemblies

a. General.

(1) A damaged cable connector should not be repaired, it should be replaced.

(2) Cable assemblies less than one foot in length:

(a) If a connector is damaged, replace the cable assembly with a spare. If no spare is available, rebuild the cable assembly using a new length of cable and new and/or salvaged connectors. If a new length of cable is not available, replace the damaged connector.

(b) If the cable conductors are damaged, replace the cable assembly with a spare. If no spare is available, rebuild the cable assembly using a new length of cable and new or salvaged connectors. If a new length of cable is not available, salvage as much of the damaged cable assembly as possible, and replace one connector.

(3) Cable assemblies one foot in length or longer:

(a) If a connector is damaged, replace the connector.

(b) If less than one tenth of the cable is destroyed, repair the damaged cable assembly, replacing damaged connector(s).

(c) If more than one tenth of the cable is destroyed, replace the cable assembly with a spare. If no spare is available, rebuild the assembly, using a new length of cable and new or salvaged connectors. If a new length of cable is not available, salvage as much of the damaged cable assembly as possible, and replace one connector.

(4) To salvage a connector, reverse the procedure that is used to attach it.

(5) To remove a damaged connector, cut the cable as closely as possible to the connector.

b. Cable W1. Plugs P1 and P2 on this cable are non-repairable. If either of these plugs are damaged, a new cable assembly must be obtained. If connectors P3 through P10 are damaged, replace the connector if sufficient RG-142A/U cable remains on the assembly to permit connection of P3/P4, P5/P6, P7/P8, and P9/P10 by couplers CP1, CP2, CP3 and CP4.

Replace connectors P3 through P10 as follows:

(1) Remove any damaged connector by cut-

ting the cable as closely as possible to the damaged connector.

(2) Slip the clamp nut, washer, and gasket over the cable (A fig. 7-5). Trim the jacket (dimension (D), A fig. 7-2).

(3) Comb out the braid smoothly and taper over the dielectric. Slide the braid clamp over the braid and push it against the cable jacket (B fig. 7-5).

(4) Bend the braid back over the braid clamp and trim the excess braid. Make sure that the braid does not extend beyond the braid clamp shoulder (C fig. 7-5).

(5) Cut the cable dielectric (dimension (A), A fig. 7-2), being careful not to nick the inner conductor. Tin the inner conductor (D fig. 7-5). Avoid melting or swelling the dielectric.

(6) Solder the contact to the inner conductor, making sure that the outer surfaces of the contact are free of solder. Avoid using excessive heat. The contact should be flush against the cable dielectric (E fig. 7-5).

(7) Insert the cable and parts into the connector body. Care should be taken to insure that the knife edge of the braid clamp is properly seated in the V-groove gasket (F fig. 7-5). Tighten the clamp nut securely.

(8) Calibrate the repaired cable (para 6-12).

c. Cable W3. Plugs P1 and P2 on this cable are non-repairable. If either of these plugs is damaged, a new cable assembly must be obtained. If connectors P3 through P6 are damaged, replace the connector if sufficient RG-142A/U cable remains on the assembly to permit connection of P3/P4 and P5/P6 by couplers CP1 and CP2. Replace connectors PS through P6 by repeating steps b(1) through b(8).

d. Cable W5. If any part of the cable assembly is damaged, the entire assembly must be rebuilt. Use a new six inch length of RG-142B/U, and new or salvaged connectors

(1) Attach connector P2 to the new cable by repeating steps b(2) through b(7).

(2) To attach connector P1 to the new cable proceed as follows:

NOTE

The truarc ring and spring washer usually supplied with connector SM-C-657791 are not required on connector P1 of cable W5.

(a) Trim the jacket 33/64 inch from end of cable (dimension (D), A fig. 7-2).

(b) Cut and remove 1/4 inch of the two braided outer conductors from end of cable (dimensions (A) plus (B), A fig. 7-2).

(c) Remove 3/22 inch of cable dielectric (dimension (A), A fig. 7-2), being careful not to nick the inner conductor.

(d) Slide the ferrule over the cable jacket (A fig. 7-6). Tin the inner conductor. Avoid melting or swelling the dielectric.

(e) Solder the contact to the inner conductor (B fig. 7-6) through the hole of the contact. Avoid use of excess heat and remove all excess solder from the outside of the contact.

(f) Insert contact into hole in dielectric of cable body and force the knurled collar of the connector body under both braided outer conductors as far as it will go (C fig. 7-6).

(g) Slide the ferrule over the outer braided conductor until it contacts the connector body. Crimp the ferrule to the outer braided conductor.

e. Cable W11. If the cable is damaged beyond repair, rebuild the cable assembly with SM-657812-24-9 wire. See figure 6-12 for proper connections. Salvage all undamaged connectors and the outer tubing. The procedure for replacing a damaged connector is as follows:

(1) Cut the cable as closely as possible to the damaged connector. Loosen the two screws on the cable bracket attached to the damaged connector and remove the cable.

(2) Only remove as much outer tubing as necessary to allow for stripping of wires and soldering.

(3) Strip 3/32 inch of insulation from each wire (dimension (A), D of fig. 7-2) and tin each conductor end.

(4) Loosen the two screws on the bracket clamp of the new connector and push the cable through the bracket clamp opening.

(5) Slide approximately 1/2 inch of electrical insulation tubing (SM-C-657794-16) on each wire.

(6) Solder each wire to the proper connector contact. See figure 6-12 for proper connections.

(7) Slide insulation tubing, assembled in step (5), over each soldered contact.

(8) Tighten the two screws on the bracket clamp.

f. Cable W12. If either half of the cable is damaged, rebuild the damaged portion using a length of RG-142B/U cable, which will provide an overall cable length (including the coupler and four connectors) of 18 3/8 inches Salvage connector s whenever possible.

(1) Connections P3 or P4 will be assembled by repeating steps b(1) through b(7).

(2) Connector P1 will be assembled as follows':

(a) Salvage the connector if undamaged.

(b). Trim the outer jacket (dimension (D), B fig 7-2).

(c). Cut the braid and dielectric (dimension (A), B fig 7-2) being careful not to nick the inner conductor.

(d) Place sheath and outer sleeve over cable (A fig 7-7).

(e) Flare braid (B fig 7-7) and tin center conductor.

(f) Solder contact to center conductor. Remove excess solder.

(g) Place housing between dielectric and braid and slide the outer sleeve over the braid (C fig 7-7).

(h) Apply solder through the holes in the outer sleeve.

(I) Position the sheath over the soldered area of the outer sleeve, and heat shrink the sheath (D fig 7-7).

(3) Connector P2 will be assembled as follows:

(a) Salvage the connector if undamaged.

(b) Place clamp nut and gasket over cable (A fig. 7-8).

(c) Trim the outer jacket (dimension (D), B fig. 7-2).

(d) Cut the braid and dielectric (dimension (A), B fig. 7-2), being careful not to nick the Inner conductor.

(e) Comb out braid. Install clamp and fold braid back over clamp (B fig 7-8). Trim excess braid.

(f) Solder contact (C fig. 7-8) to center conductor and remove all excess solder.

(g) Insert the cable and parts into the connector body. Tighten the clamp nut securely.

g. Cables W14/W15. If the cable is damaged beyond repair, use a new six foot length of RG-58C/U to rebuild the cable assembly. If the repaired cable will be more than 5 feet long, it may be repaired Salvage connectors whenever possible. Replace a connector by repeating steps *b*(1) through *b*(8).

NOTE

A W14/W15 cabl2 assembly that has been shortened must not be connected to the hybrid attenuator RF SUM jack J2 during any of the tests. Write this on a tag, and attach the tag to the shortened W14/W15 cable.

h. Cable W16. If connector P1 or the conductors of the cable are damaged the entire assembly must be rebuilt Use a new 6-inch length of RG-174/U Salvage connector P1 and the alligator clips, if they are undamaged A damaged alligator clip can be replaced without rebuilding the entire cable assembly.

(1) To attach connector P1 to the cable proceed as follows'

(a) Slide clamp nut and braid clamp over cable (A fig. 7-3) Trim the jacket (dimension (D), A fig. 7-2).

(b) Cut the braid without damaging the dielectric (dimension (C), A fig 7-2): Cut the dielectric, being careful not to nick the inner conductor (dimension (A), A fig 7-2). Tin the inner conductor (B fig. 7-3)

(c) Flare braid without combing. Insert wedge between braid and dielectric. Push the braid clamp over wedge to hold it in place (C fig. 7-3)

(d) Solder contact to center conductor (E fig. 7-3), making sure outside surfaces are free of solder Avoid use of excessive heat.

(e) Insert cable and parts into connector body. Rotate cable slightly to make sure braid clamp is seated properly (F fig 7-3) Tighten clamp nut securely to complete assembly.

(2) To fabricate the alligator clip assembly proceed as follows:

(a) On the other end of the cable, strip 23/8 inches of outer jacket (dimension (D), A fig. 7-2)

(b) From the end of the cable, remove 2 inches of braided outer conductor.

(c) From the end of the cable, remove 3/8 inch of dielectric (dimension (A), A fig. 7-2).

(d) From a 3-inch length of wire, remove 1/4 inch of insulation from one end and 3/8 inch from the other end (A fig. 7-4).

(e) Place the 1/4-inch side against the braid (B fig. 7-4).

(f) Slip the ferrule over the braid and the 1/4-inch side of the wire, so that the ferrule bottoms against the cable jacket and the wire insulation (C fig. 7-4).

(g) Using a crimping tool, crimp the ferrule to the conductors.

(h) Solder alligator clips to the end of the 3inch wire, and the end of the cable (D fig. 7-4).

(I) Push an insulator over each alligator clip (D fig. 7-4).

I. Cable W21. If any part of the cable assembly is damaged, the entire assembly must be rebuilt. Use a new 6-inch length of RG-188A/U, and new or salvaged connectors.

(1) To attach connector P2, proceed as follows:

(a) Slide boot and outer ferrule over cable (A fig. 7-9).

(b) Trim the cable jacket (dimension (D), A fig. 7-2).

(c) Cut the braid without damaging the dielectric (dimension (C), A fig. 7-2). Cut the dielectric, being careful not to nick the inner conductor (dimension (A), A fig. 7-2). Tin the center conductor. Avoid excessive heat while tinning to prevent swelling of cable dielectric.

(d) Install ferrule clamp nut assembly over cable so that the ferrule portion slides under braid and the insulator butts flush against cable dielectric. Slide outer ferrule over braid and up against nut. Crimp outer ferrule using crimping tool. Keep the cable dielectric bottomed against insulator (B fig. 7-9).

(e) Solder cable center conductor to contact.

(f) Screw connector body onto ferrule clamp nut assembly and tighten (C fig. 7-9).

(g) Push boot forward to complete assembly (D fig. 7-9).

(2) To attach connector P1, proceed as follows:

(a) Slide clamp nut over jacket of cable (A fig. 7-10) and cut off jacket and braid from the end of the cable (dimension (A), C fig. 7-2).

(b) Cut the dielectric, being careful not to nick the center conductor (dimension (B), C fig. 7-2).

(c) Tin the center conductor (B fig. 7-10).

(d) Slit the jacket at two places, 180 degrees apart and 1/8 inch long.

(e) Insert the contact and insulator-ferrule assembly between the braid and cable insulation (C fig. 7-10), making sure the center conductor enters the hole in the contact.

(f) Solder contact to center conductor.

(g) Insert the cable assembly into the body assembly, and lock the cable assembly by screwing the clamp nut to the body assembly (D fig. 7-10).

j. Cable W25. This cable is not repairable on branches terminated by P1, P2, P3, or P6. Cable repair to branches terminated by P4, P5 or P7 can be accomplished if the branch lengths(s) will be long enough, after repair, to connect the cable. Salvage connectors P4, P5, or P7 whenever possible.

(1) A damaged connector P4 or P5 will be replaced as follows:

(a) Remove the damaged connector by cutting the cable as closely as possible to the damaged connector.

(b) Repeat steps h(1)(*a*) through h(1) (*e*).

(c) Heat shrink sleeving over the cable and connector.

(2) A damaged connector P7 will be replaced as follows:

(a) Loosen the two screws on the strain relief.

(b) Slide the insulating plate over the connector prongs.

(c) Loosen the binding screws holding the ac line return and the 115 vac line. Loosen the screw holding the ground lead.

(d) Identify the three wires, unwrap the wires from the screws and remove the damaged connector.

(e) If any of the leads are damaged, cut off the damaged part and remove 1/2 inch of insulation (dimension (A), D fig. 7-2).

(f) Loosen the two screws on the strain relief of the new connector. Slide the insulating plate over the connector prongs. Loosen the two binding screws and the screw which will hold the ground lead.

(g) Push the cable through the strain relief. Wrap the ac line return (to wide prong of plug) and 115 vac lead around the corresponding binding screw. Pull the ground lead through the opening in the connector and wrap it around the ground lead binding screw. Tighten the binding screws. Check with figure 6-18 to insure that connections are properly made.

(h) Push back the insulating plate and tighten the two screws on the strain relief.

k. Cable W44. If the conductors of the cable are damaged beyond repair, rebuild the cable assembly with SM-657812-24-9 wire. See figure 6-19 for proper connections. Salvage connectors

whenever possible. The procedure for replacing a connector are as follows:

(1) Remove the knob from each screwlock by loosening the set screw on the knob, and sliding off the knob. Slide off the hood and cut the cable as closely as possible to the damaged connector.

(2) Only remove as much tubing as necessary to allow for stripping of wires and soldering.

(3) Remove 3/32 inch of insulation from each wire (dimension (A), D fig. 7-2), and tin each conductor end.

(4) Loosen the screws on the clamp of the hood, and slide the hood over the cable.

(5) Slide approximately 1/2 inch of electrical insulation tubing (SM-C-657794-16) on each wire.

(6) Solder each wire to the proper connector contact (A fig. 7-11). See figure 6-19 for proper connections.

(7) Slide insulation ,tubing, assembled in step 5, over each soldered contact.

(8) Remove the knob from each screwlock by loosening the setscrew on the knob, and sliding off the knob.

(9) Push the screwlocks through the holes in the connector (B fig. 7-11).

(10) Push the hood forward over the screw-locks until it makes contact with the connector (C fig. 7-11).

(11) Place a knob over each screwlock and tighten the setscrew (D fig. 7-11).

(12) Tighten the screws on the clamp of the hood.

l. Cable A1W1. (fig. 7-1) If the cable is damaged beyond repair, use a new eight foot (+1 inch, -0) length of RG-222/U and new or salvaged connectors, to rebuild the cable assembly. If the damaged cable can still; be used, repair the longer end of the cable.

NOTE

It is necessary that the insertion losses of the difference channel be at least 0.2 dB less than the insertion losses of the sum channel, with a 0 dB setting of the variable attenuator. After repairing a damaged cable or replacing a connector, check to see that the 0.2 dB difference still exists. If it does not, fabricate a new cable.

(1) A damaged connector will be replaced as follows:

(a) Repeat steps *b*(1) through *b*(4).

(b) Cut the cable dielectric (dimension (A), A fig. 7-2), being careful not to nick the inner conductor.

(c) Clean the center conductor of the - able with muriatic acid.

(d) Tin the center conductor. Use type SN60WS solder.

(e) Wash the center conductor in ammonia.

(f) Rinse the center conductor in isopropyl alcohol.

(g) Solder the contact to the inner conductor, making sure that the outer surfaces of the contact are free of solder. Use type SN60WS solder. Avoid using excessive heat. The contact should be flush against the cable dielectric (E fig. 7-5).

(h) Insert the cable and parts into the connector body. Care should be taken to insure that the knife edge of the braid clamp is properly seated in the V-groove gasket (F fig. 7-1). Tighten the clamp nut securely.

(2) After the cable assembly is completed, calibrate the hybrid attenuator (para 6-10) and measure the hybrid attenuator VSWR (para 6-11).

m. Cable A1W2. (fig. 7-1) If the cable assembly is damaged beyond repair, use a new six foot (+1 inch, -0) length of RG-222/U and new or salvaged connectors to rebuild the cable assembly. If the damaged cable can still be used, repair the longer end of the cable.

(1) Replace a damaged connector as follows:

(a) Repeat steps b(1) through b(4).

(b) Repeat steps *l*(1)(b) through *l*(1) (*h*).

(2) After the cable assembly is completed, calibrate the hybrid attenuator (para 6-10) and measure the hybrid attenuator VSWR (para 6-11).

n. Cable A1W3. If any part of the cable assembly is damaged, the entire assembly must be rebuilt. Use a new six inch (+1/8 inch, -0) length of RG-58C/U, and new or salvaged connectors.

(1) Attach connectors P1 and P2 to the new cable by repeating steps *b*(2) through *b*(7).

(2) Calibrate the hybrid attenuator (para

6-10) and measure the hybrid attenuator VSWR (para 6-11).

o. Cable to A1J1. (fig. 7-1) If any part of the cable assembly is damaged, the entire assembly must be rebuilt. Use a new eight inch (+1/8 inch, -0) length of RG-58C/U, and new or salvaged connectors.

(1) To attach connector A1J1, repeat steps *b* (2) through *b* 7).

(2) To attach connector AlP1, proceed as follows:

(a) Slip nut assembly over cable (A fig. 7-12).

(b) Cut off 1/2 inch of jacket and braid from the end of the cable (dimension (A), C fig. 7-2). Do not damage the cable dielectric.

(c) Cut off dielectric (dimension (B), C fig. 7-2) from jacket and braid. Do not nick the inner conductor.

(d) Tin the inner conductor (B fig. 7-12).

(e) Cut 3 slits 1/8 inch long and 120 degrees apart in outer jacket only (C fig. 7-12) without damaging braid. Raise outer jacket and braid away from dielectric In order to facilitate the entry of contact-wedge assembly. Straighten inner conductor if necessary.

(/) Slide contact-wedge assembly under braid and jacket (D fig. 7-12). Push back as far as possible, making sure that inner conductor is visible through side hole of contact Solder contact to inner conductor through side hole and make sure outside surfaces are free of solder. Avoid use of excessive heat.

(g) Insert cable and contact-wedge assembly into body assembly. Tighten nut securely to complete assembly.

(3) Calibrate hybrid attenuator (para 6-10) and measure the hybrid attenuator VSWR (para 6-11).

p. Cable to A1J4. (fig. 7-1) If any part of the cable assembly is damaged, the entire assembly must be rebuilt. Use a new eight inch (+1/8 inch, -0) length of RG-58C/U and new or salvaged connectors.

(1) To attach connectors A1J4, repeat steps *b*(2) through *b*(7).

(2) The procedure for attaching A1P2 is as follows:

(a) Repeat steps *b*(2) through *b*(5).

(b) Insert cable into angle body. Make sure that inner conductor is nested into slot of contact, and knife edge of braid clamp is properly seated in V-groove gasket. Tighten clamp nut securely.

(c) Solder inner conductor to contact through opening in body.

(d) Place cover in position and screw into place to complete assembly.

(3) Calibrate the hybrid attenuator (para 6-10) and measure the hybrid attenuator VSWR (para 6-11).

q. Cable to A1J5. (fig. 7-1) If any part of the cable assembly is damaged, the entire assembly must be rebuilt. Use a new eight inch (+1/8 inch, -0) length of RG-58C/U and new or salvaged connectors.

(1) To attach connector AIJ5, repeat steps *b*(2) through *b*(7).

(2) To attach connector AlP3 to the cable, repeat steps *o*(2) (*a*) through *o*(2) (*g*).

(3) Calibrate the hybrid attenuator (para 6-10) and measure the hybrid attenuator VSWR (para 6-11).

r. Cable to A6P1. If the conductors of the cable are damaged beyond repair, rebuild the cable assembly with SM-657812-24-9 wire. See figure 6-22 for proper connections. Salvage connector A6P1 whenever possible The procedure for replacing a damaged connector A6P1 is as follows:

(1) Remove the damaged connector by cutting the cable as closely as possible to the damaged connector.

(2) Remove approximately one inch of the outer tubing.

(3) Remove 0.38 inch of insulation from each wire.

(4) Tin each conductor end.

(5) Unscrew strain relief from a new connector and slide it back over the cable.

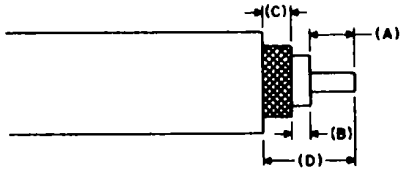
(6) Insert boot into tubing.

(7) Push grommet over wires.

(8) Solder each wire to the proper connector contact. See figure 6-22 for proper connections.

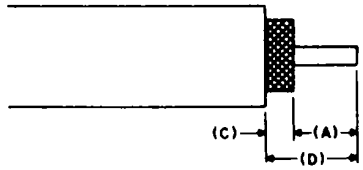
(9) Push grommet forward into body of connector.

(10) Push the strain relief forward and tighten.



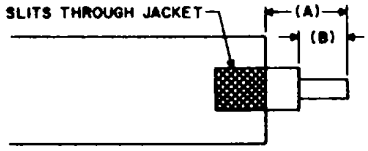
A

CABLE	CONNECTOR	TYPE	(A)	(B)	(C)	(D)
W1	P3 THRU P10	UG-88D/U	7/64	7/64	1/16	9/32
W3	P3 THRU P6	UG-88D/U	7/64	7/64	1/16	9/32
W5	P1	SM-C-657791	3/32	5/32	17/64	33/64
W5	P2	UG-89C/U	7/64	7/64	1/16	9/32
W12	P3 & P4	UG-88D/U	7/64	7/64	1/16	9/32
W14/W15	P1 & P2	UG-88D/U	7/64	7/64	1/16	9/32
W16	P1	SM-B-657831	3/32	9/32	11/64	35/64
W16	ALLIGATOR CLIPS	SM-B-657832	3/8	1-5/8	3/8	2-3/8
W21	P2	SM-B-657789	1/4	17/64	9/32	51/64
W25	P4 & P5	SM-C-657825	3/32	9/32	11/64	35/64
A1W1	P1 & P2	UG-18D/U	5/32	3/64	5/64	9/32
A1W2	P1 & P2	UG-18D/U	5/32	3/64	5/64	9/32
A1W3	P1 & P2	UG-88D/U	7/64	7/64	1/16	9/32
CABLES TO A1J1 AND A1J5	A1J1, A1J5	UG-909A/U	7/64	7/64	1/16	9/32
CABLE TO A1J4	A1J4	UG-909A/U	7/64	7/64	1/16	9/32
CABLE TO A1J4	P2	SM-B-657828	1/4	1/4	1/16	9/16



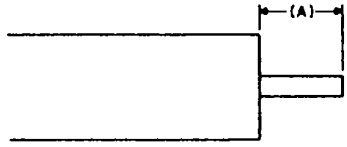
B

CABLE	CONNECTOR	TYPE	(A)	(C)	(D)
W12	P1	SM-B-688048	5/32	7/32	3/8
W12	P2	SM-B-688049	1/8	7/16	9/16



C

CABLE	CONNECTOR	TYPE	(A)	(B)
W21	P1	SM-B-688028	1/4	3/32
CABLE TO A1J1 AND A1J5	P1 & P3	SM-B-657827	1/2	5/32



D

CABLE	CONNECTOR	TYPE	(A)
W25	P7	UP-221M	1/2
W11	P1	SM-C-657860	3/32
W11	P2	SM-C-657790	3/32
W44	P1	SM-C-688031	3/32
W44	P2	SM-C-657846	3/32

EL6625-2398-15-1-TM-20

Figure 7-2. Cable stripping details.

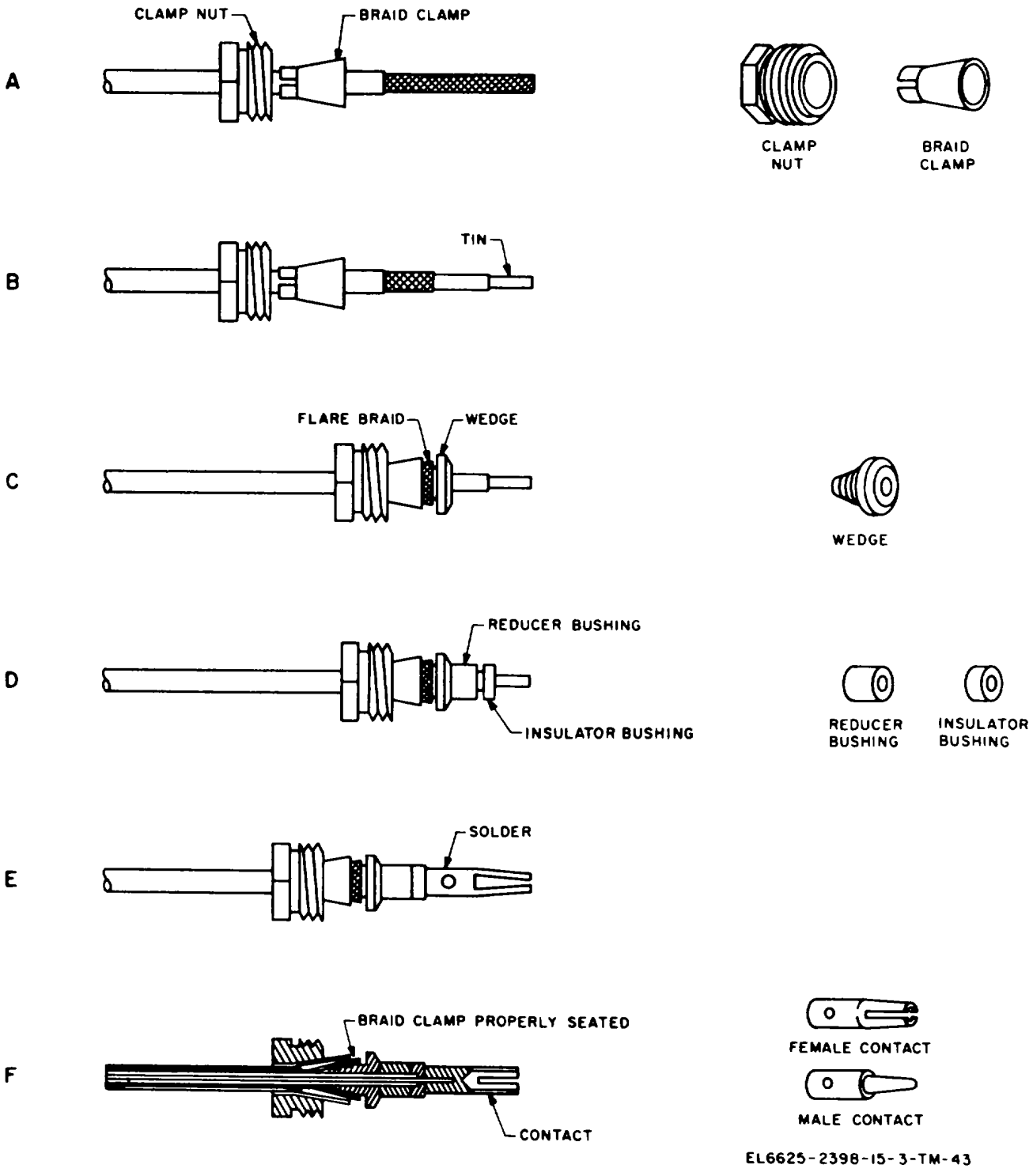


Figure 7-3. Assembly of connectors on cables W16 and W25, and hybrid attenuator cables.

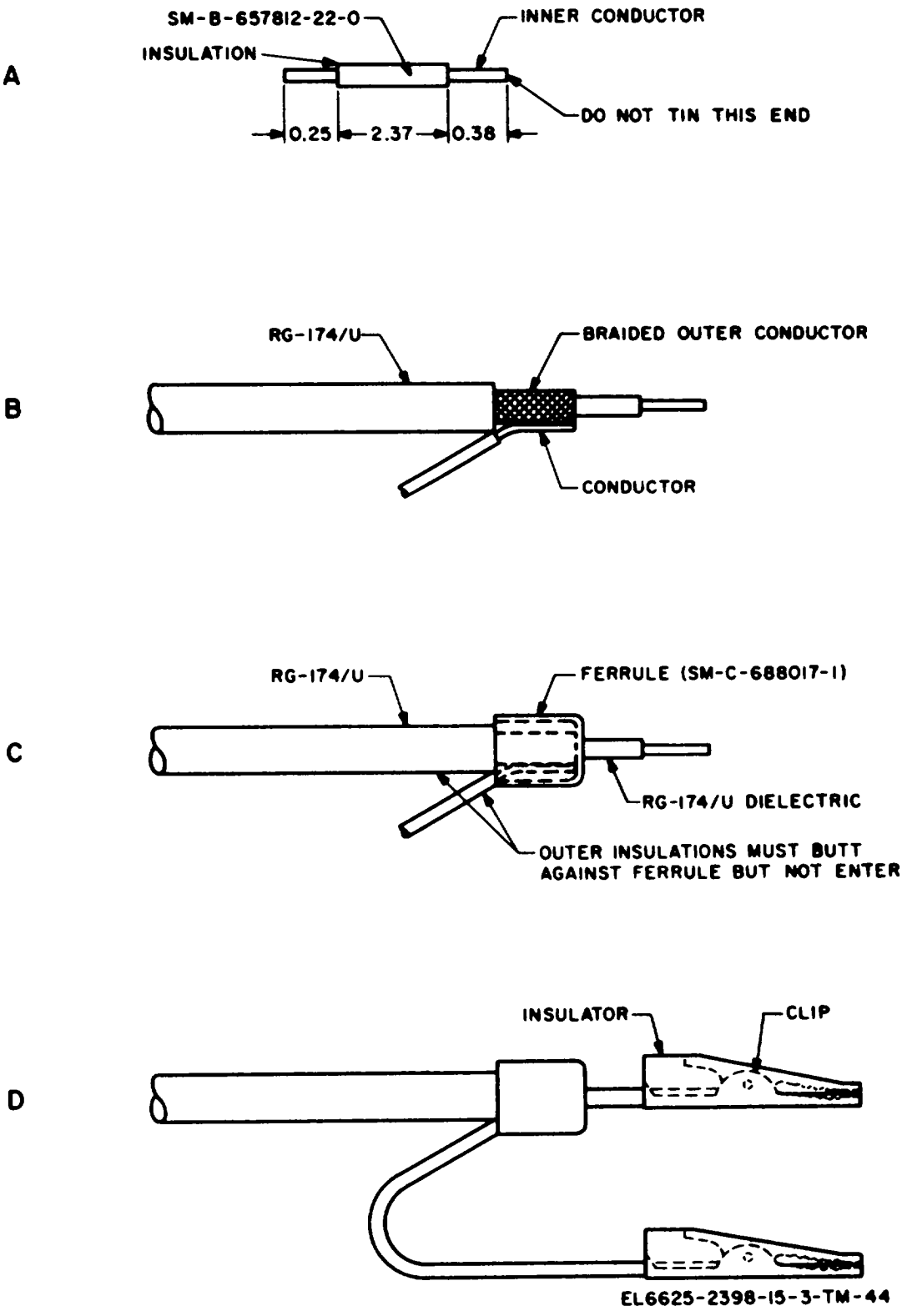


Figure 7-4. Assembly of alligator clips on cable W16.

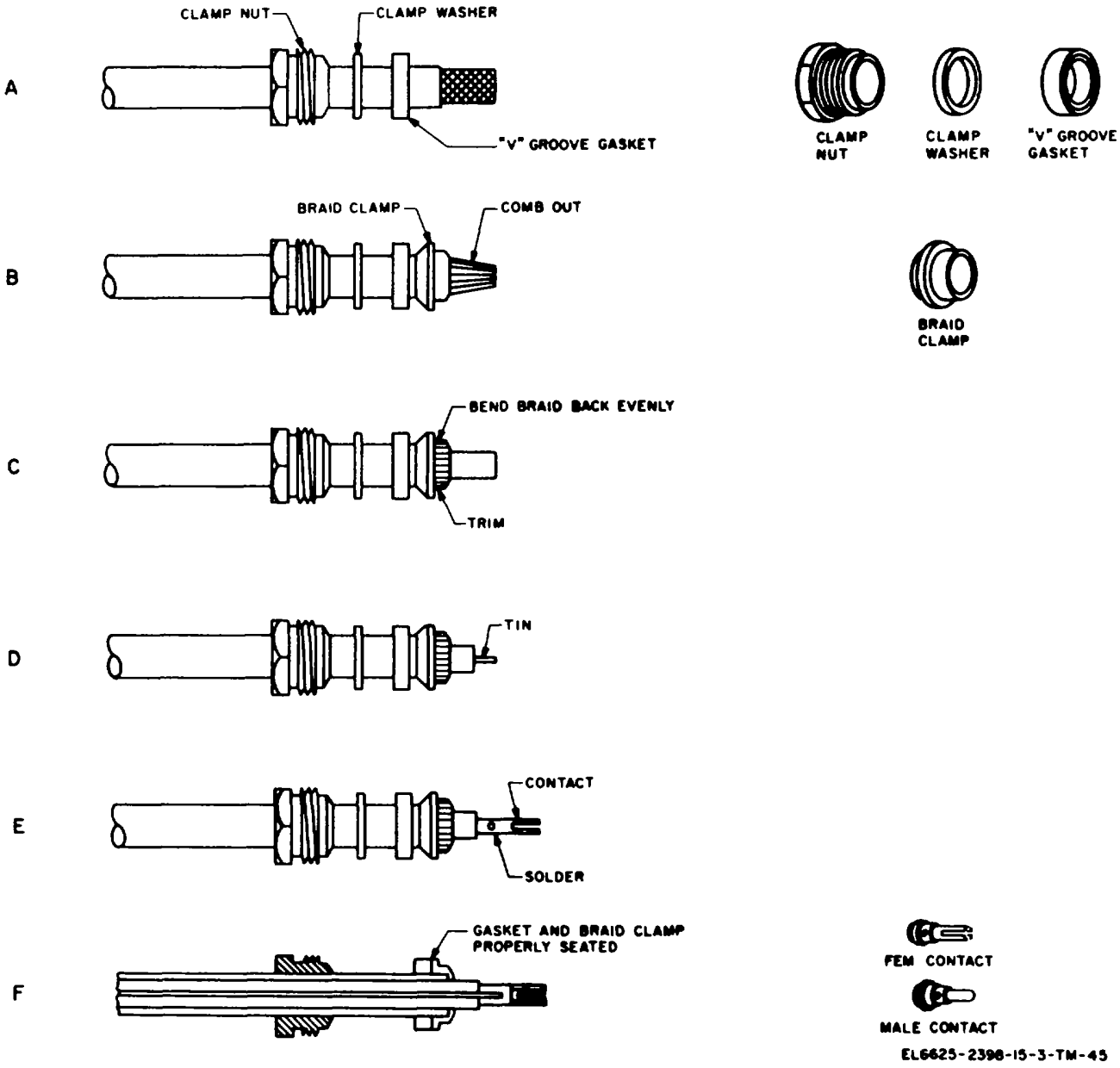


Figure 7-5. Assembly of connectors on cable W1, W3, W5, and W25, W14/W15, and hybrid attenuator cables.

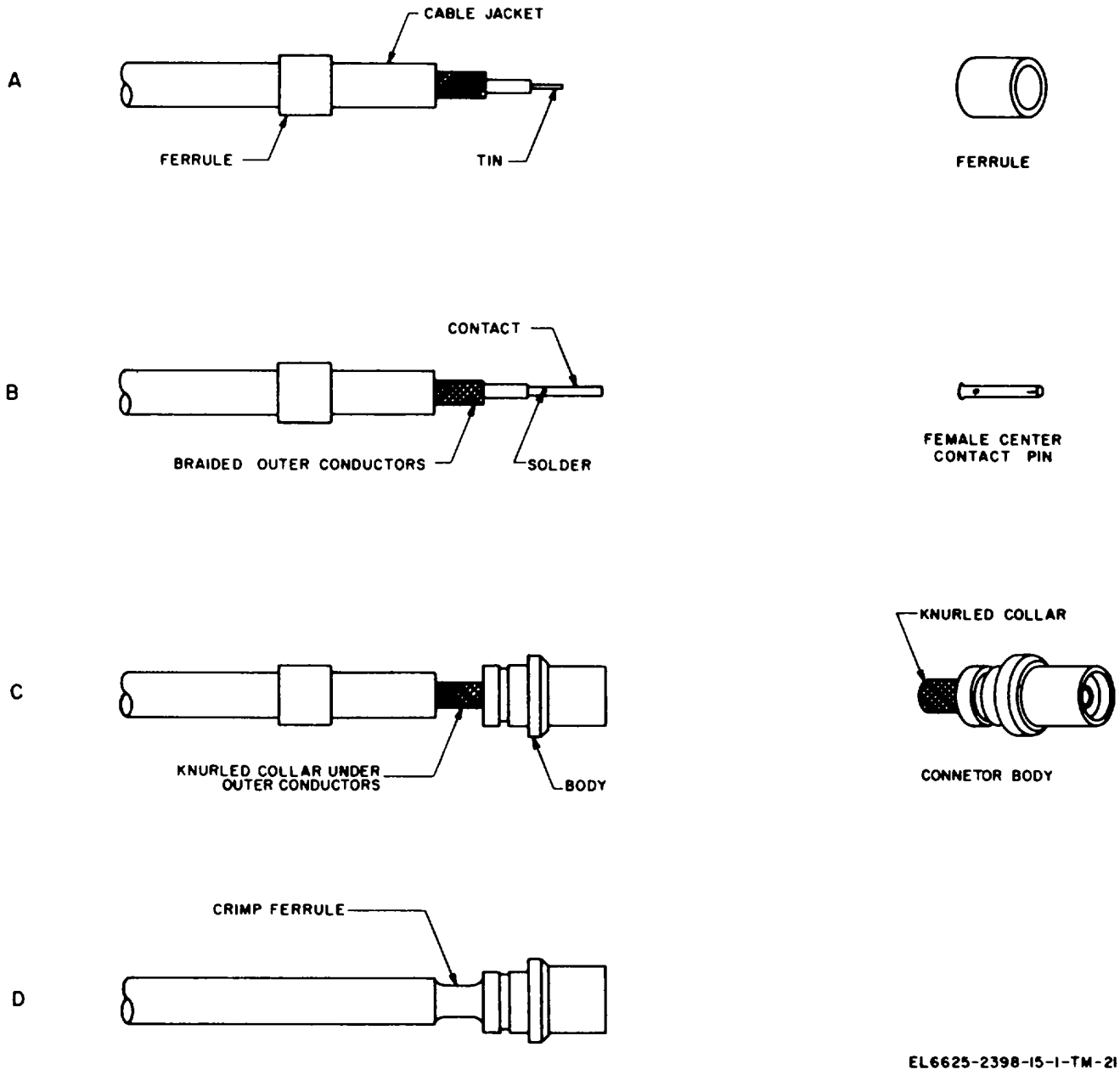


Figure 7-6. Assembly of connector W5P1.

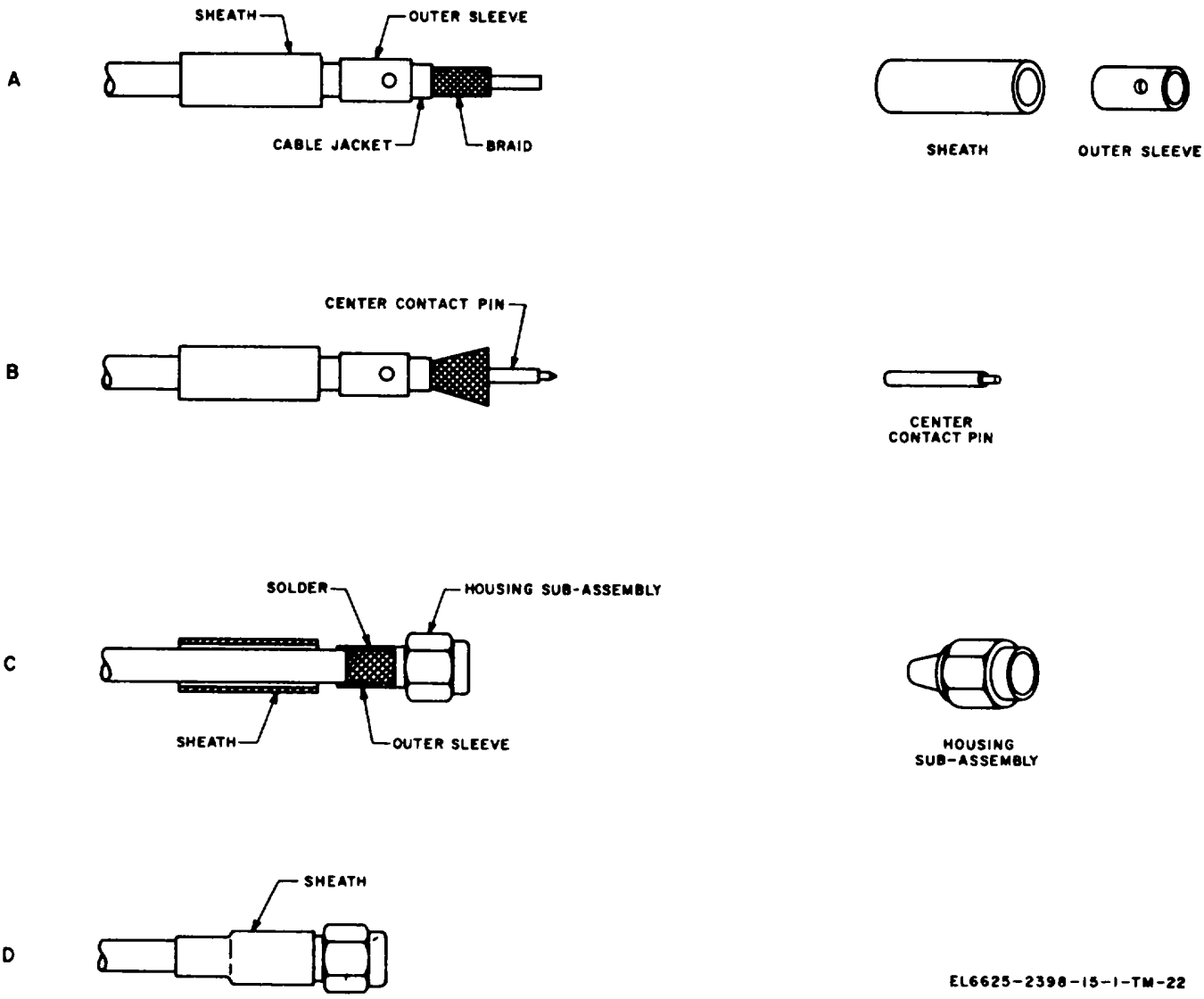


Figure 7-7. Assembly of Connector W12P1.

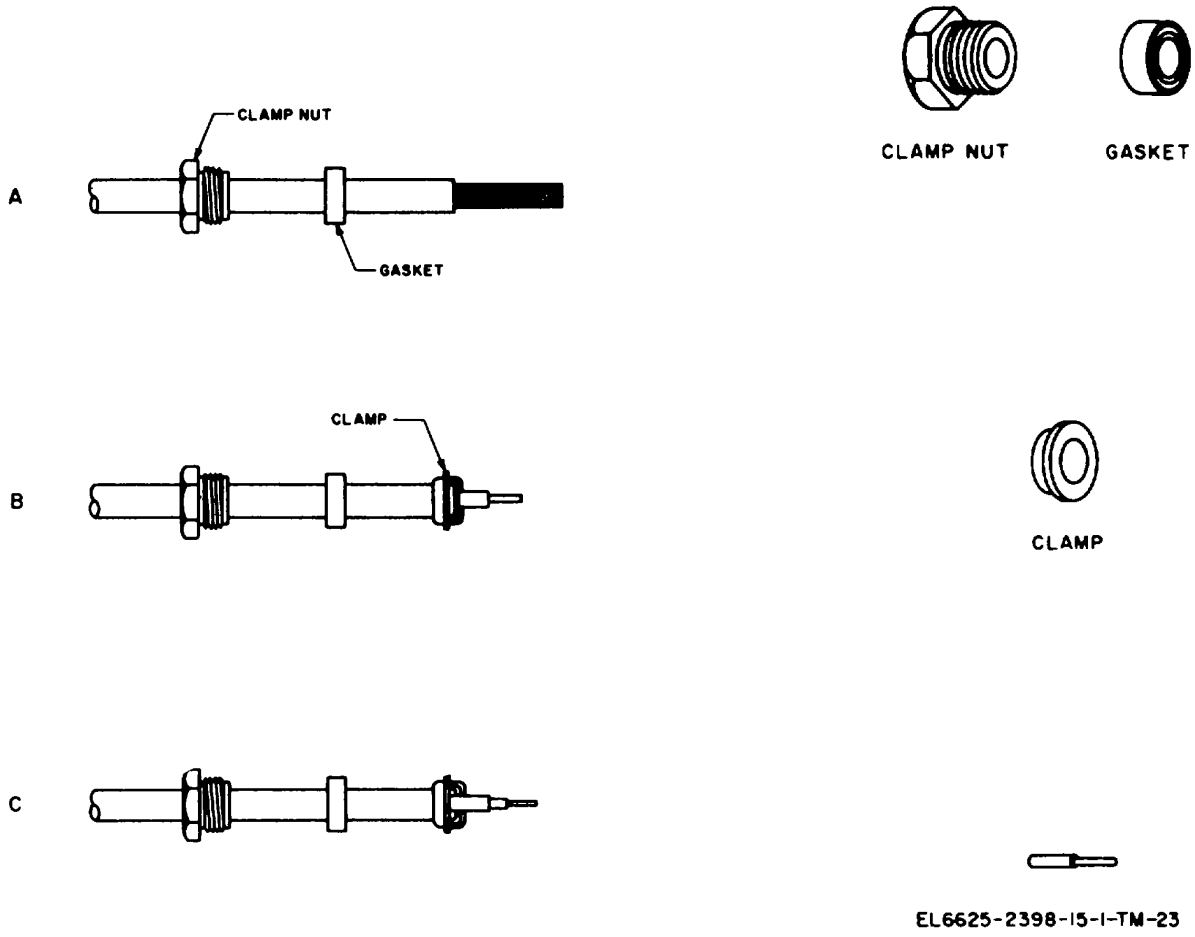


Figure 7-8. Assembly of Connector W12P2.

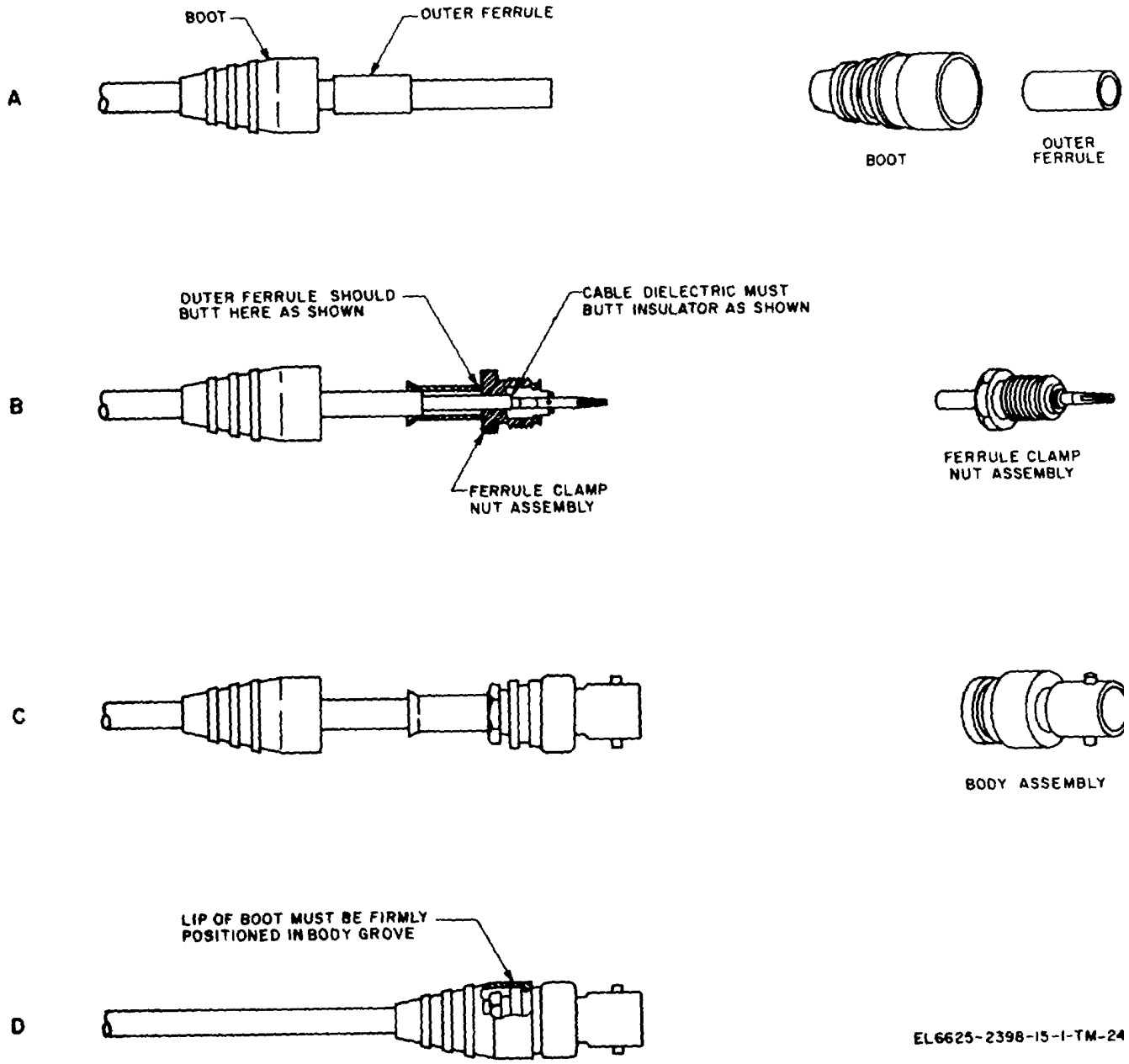


Figure 7-9. Assembly of Connector W21P2.

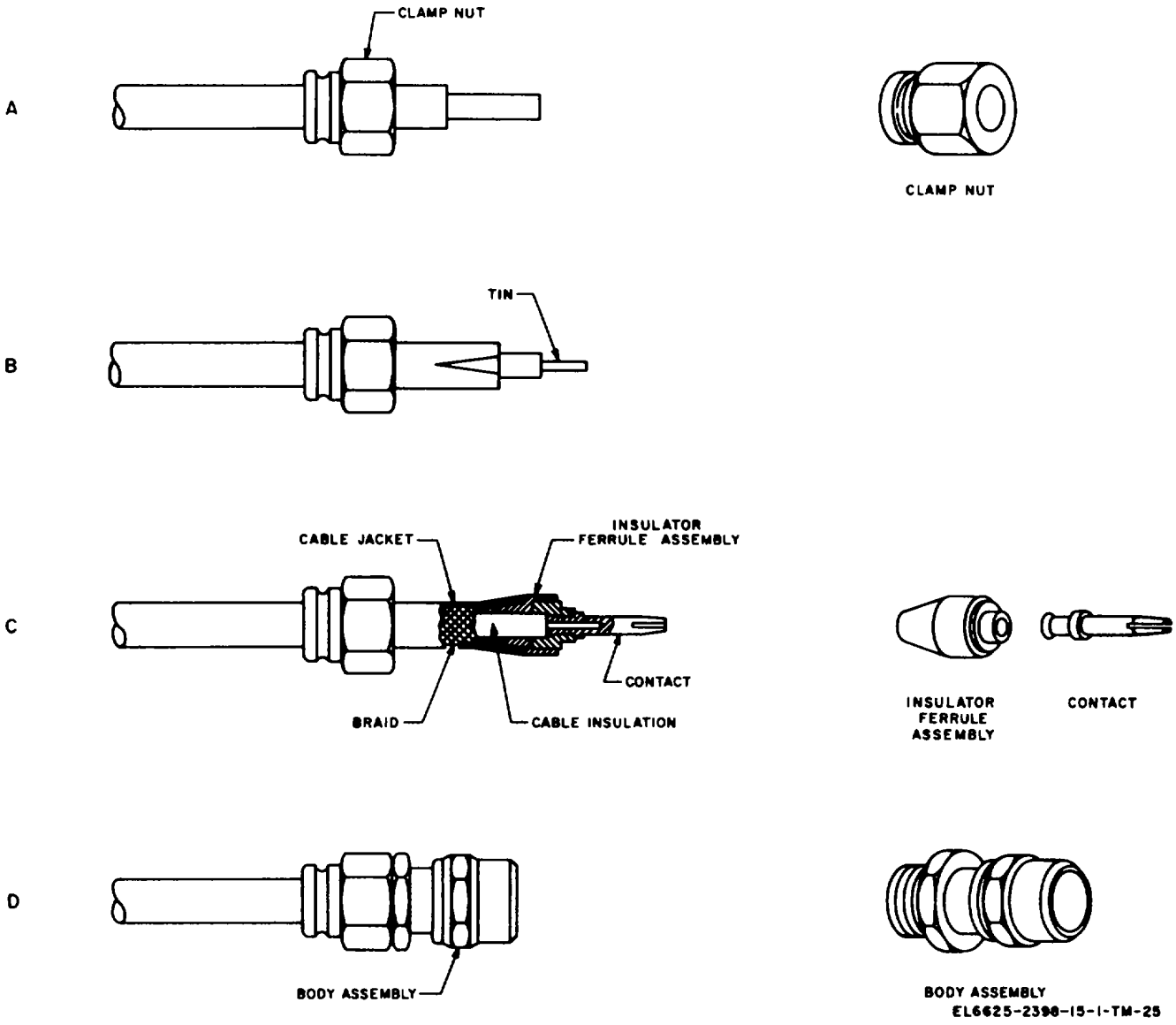


Figure 7-10. Assembly of Connector W21P1.

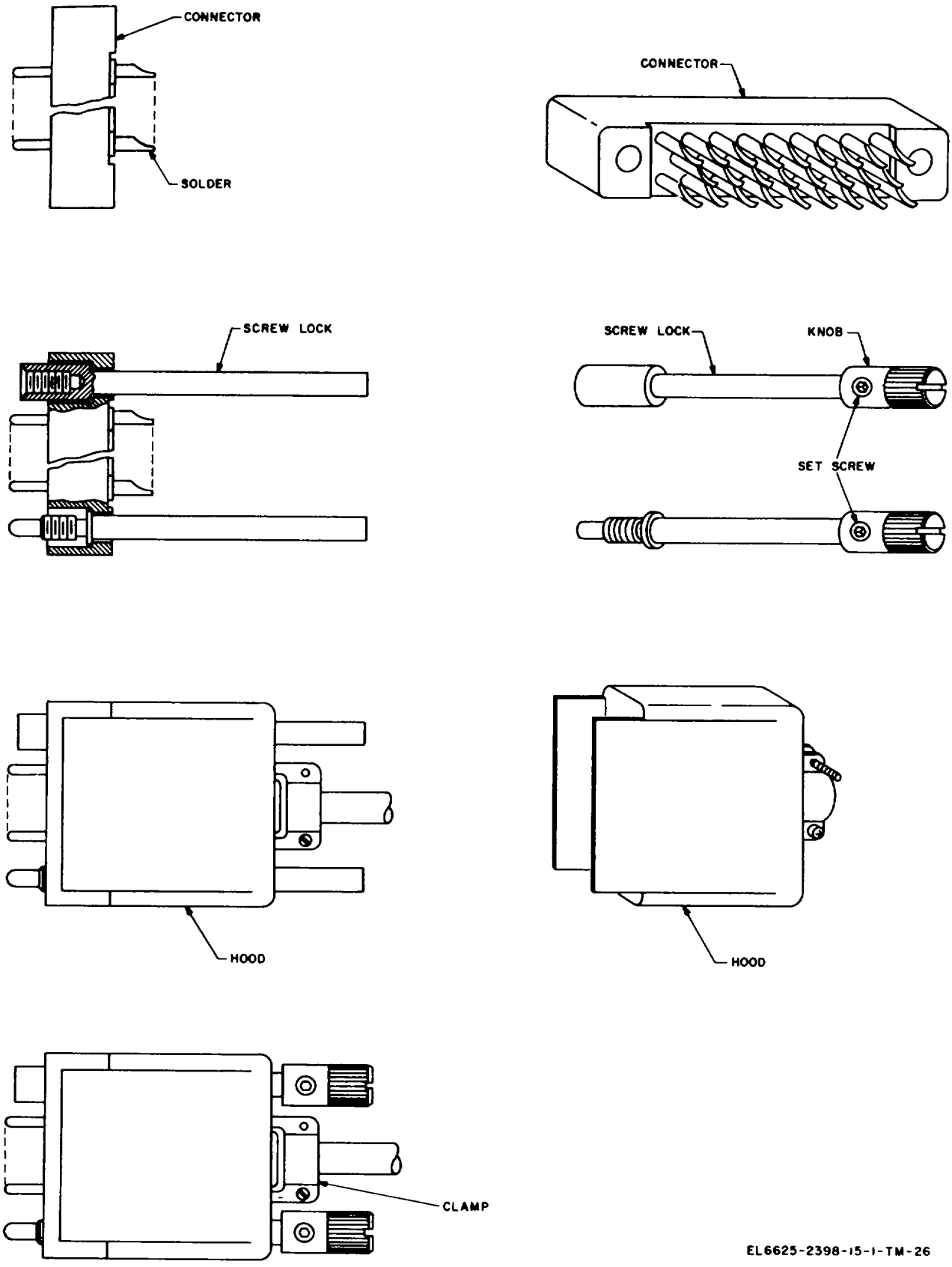


Figure 7-11. Assembly of connectors on cable W44.

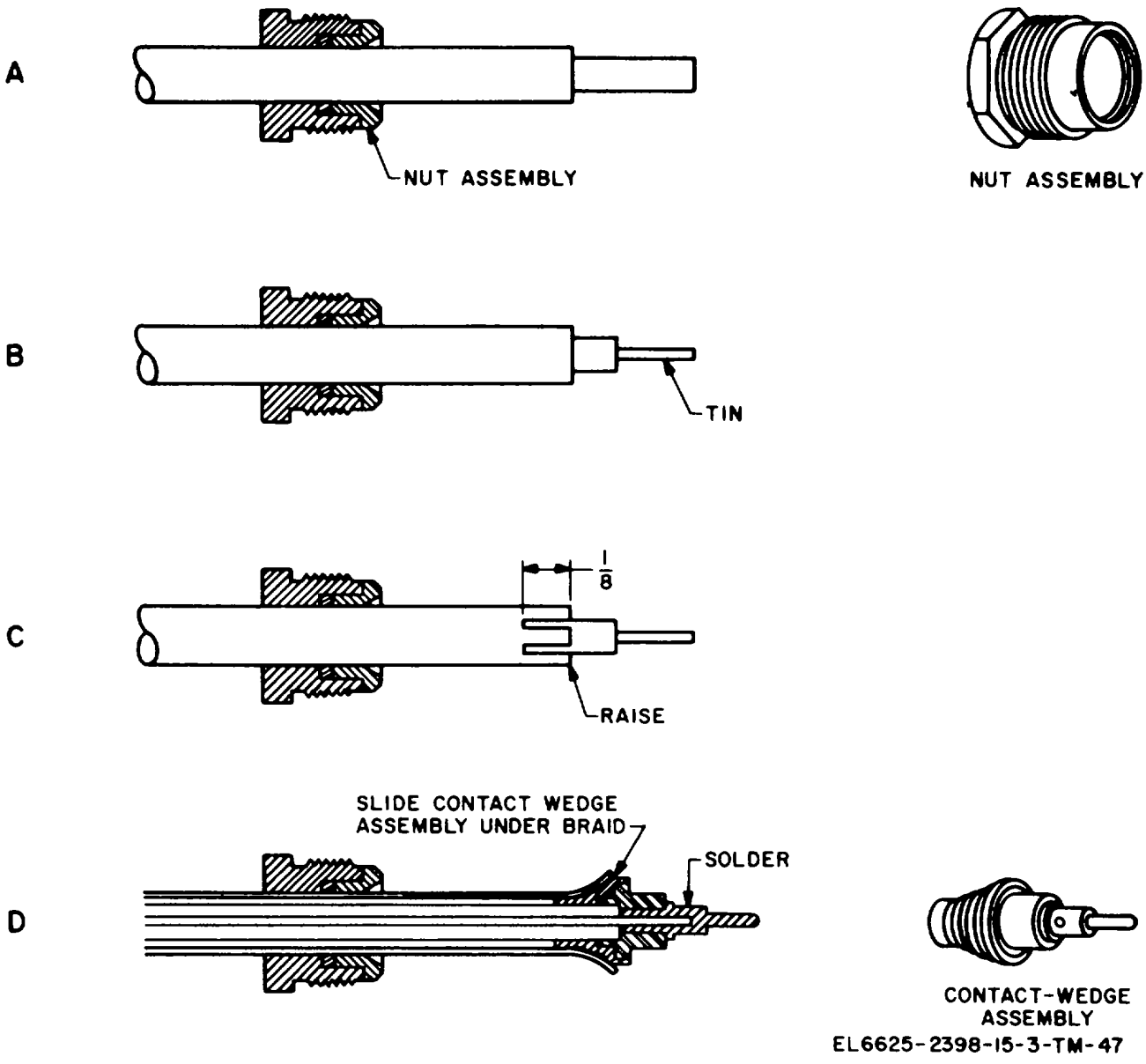


Figure 7-12. Assembly of connectors on hybrid attenuator cables.

CHAPTER 8

GENERAL SUPPORT TESTING PROCEDURES

8-1. General

a. Testing procedures are prepared for use by Signal Field Maintenance Shops and Signal Service Organizations responsible for general support maintenance of signal equipment to determine the acceptability of repaired equipment. These procedures set forth specific requirements that repaired equipment *must* meet before it is returned to the using organization. These procedures may also be used as a guide for testing equipment that has been repaired if the proper tools and test equipments are available. A summary of the performance standards is given in paragraph 8-11.

b. Comply with the instructions preceding each chart before proceeding to the chart. Perform each step in sequence. Do not vary the sequence. For each step, perform all the actions required in the *Test equipment control settings* and *Equipment under test control settings* columns; then perform each specific test procedure and verify it against its performance standard.

8-2. Test Equipment and Materials

All test equipment required to perform the testing procedures given in this chapter are listed in the following charts and Is authorized under TA-11-17, Signal Field Maintenance Shops, and TA-11-100(11-17), Allowances of Signal Corps Expendable Supplies for Signal Maintenance Shop, Continental United States.

a. Test Equipment.

Nomenclature	*Technical manual*
Signal Generator SG-340/G	
Multimeter AN/PSM-6B	TM 11-6625-475-10
Ohmmeter ZM-21A/U	TM 11-2050
Standing Wave Ratio Indicator AN/UPM-108A.	TM 11-6625-335-12
Coaxial Slotted Line IM-92/U	TM 11-5109
Low Pass Filter Hewlett-Packard Co Model 350C.	.....
Crystal Detector Hewlett-Packard Co. Model 423A.	.....
Variable Attenuator, Alfred Electronics Model E101.	.....
Adapter (type N male to type BNC female) UG-201A/U.	.....
Adapter (type N female to type BNC female) UG-606/U.	.....
50 ohm Termination, Microlab/FXR TA-6MN.	.....
Adapter (type BNC female to BNC female) UG-914U.	.....

b. Materials. The materials below required for the general support testing procedures are supplied with the test facilities set.

Materials	*Reference designation*
Fixed Attenuators	AT1/AT2
Terminations	AT3/AT4
Cables	W14/W15
Cable	A1W3
Adapters	CP7/CP8

8-3. Modification Work Orders

The performance' standards listed in the tests (para 8-4 through 8-10) are based on having no modification work orders performed on the test facilities set.

8-4. Continuity Tests on Cables, Extender Boards and Front Panel Test Adapter

a. Test Equipment and Materials. Multimeter AN/PSM-6B

b. Test Connections and Conditions. Connect the equipment shown in figure 8-1 accordance with the directions in the steps of the procedure below.

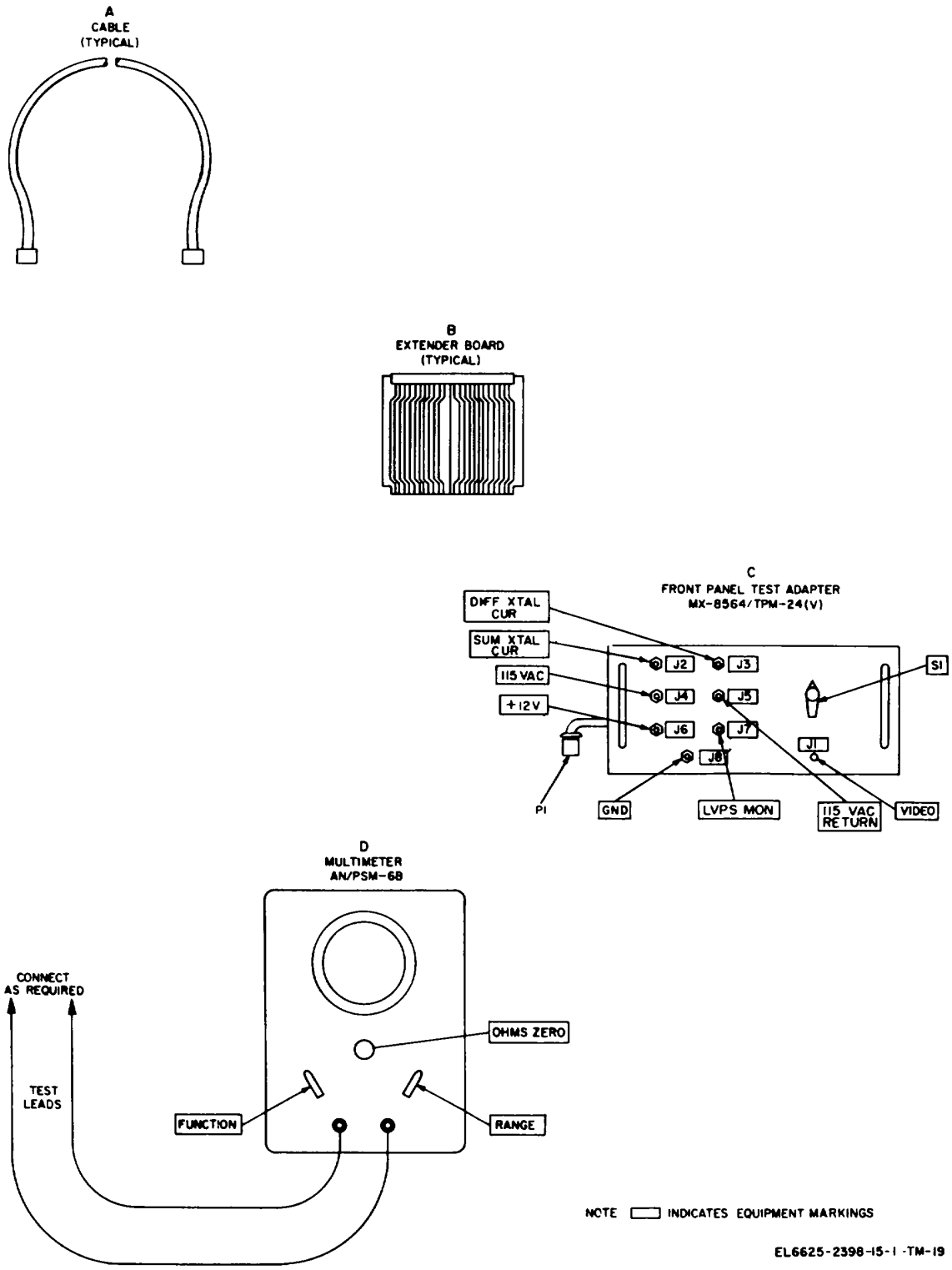


Figure 8-1. Cable, front panel test adapter and extender boards, continuity test connections.

c. Procedure.

Step no.	Test equipment control settings	Equipment under test control settings	Test procedure	Performance standard
1	AN/PSM-6B Function. OHMS Range: R X 1	None	Plug test leads into multimeter and short circuit free ends of test leads. Adjust OHMS ZERO until meter pointer reads zero on the OHMS scale.	None
			NOTES 1. Consult the schematic diagrams for cables W1 through W4, W11; and W44 (fig. 6-7 through 6-10, 6-12, and 6-19 respectively) to perform step 2. The schematic diagrams identify the lead terminations and shields (if any) in each cable. Perform test procedures *a, b*, and *c*, below (as required) for continuity checks of cables W1 through W4, W11, and W44. 2. Cables W11 and W44 are unshielded and do not have shielded leads. Therefore, test procedures *a* and *b* below are not to be performed for these cables. 3. Couplers W1CP1 through WICP4, and W3CP1 and W3CP2 must be connected on cables W1 and W3, respectively, when performing test procedures *b* and *c*	
2	Remove the short circuit on test leads of AN/PSM-6B and leave controls in positions given in step 1.		*a.* Check shielding, bonded to the shell of the plugs, by connecting one multimeter test lead to the shell of one plug and the other test lead to the shell of the other plug. *b.* Check individual wire shielding by progressively connecting the multimeter test lead to each wire shield pin connection of the plugs at each end of the cable. *c.* Check continuity of cable wires by progressively connecting the multimeter test leads to the wire connecting pins on the plugs at each end of the cable.	*a.* Meter must indicate zero ohms (continuity). See notes 2 and 4 above for cables W1, W3, W11, and W44. *b.* Meter must indicate zero ohms (continuity) for each shield. See notes 2 and 8 above for cables W1,W3,W11, and W44. *c.* Multimeter must indicate zero ohms (continuity) for each wire. See note above for cables W1 and W3.
3	Leave controls and test leads in positions indicated in step 2		*a.* Connect one multimeter test lead to the center conductor of one plug on cable W5. Connect the other test lead to the center conductor of the plug on the other end of the cable. *b.* Connect one multimeter test lead to the outer shell of one plug on cable W5. Connect the other test lead to the shell of the plug on the other end of the cable. *c.* Perform steps a and b for the two W14/W15 cables and cables W12, W16, and W21.	*a.* Meter must indicate zero ohms (continuity). *b.* Meter must indicate zero ohms (continuity). *c.* Meter must indicate zero ohms (continuity) for each test on each cable.
			NOTES 1. One end of cable W16 has alligator clips, P2 is the center conductor termination and P3 is the shell (shield) termination. 2. Coupler W12CP1 must be connected on cable W12.	

Step no.	Test equipment control settings	Equipment under test control settings	Test procedure	Performance standard
4	Leave controls and test leads in position indicated in step 2.		*a.* Check individual wire shielding of cable W25 (fig. 6-18) by progressively connecting the multimeter test leads to each of the shells of the coaxial connectors (P4 and P5) and the appropriate contact pins on multipin connector P6.	*a.* Meter must indicate zero ohms (continuity) for each test.
			b. Check continuity of the center coaxial conductors of cable W25 by progressively connecting the multimeter test leads to the center conductor terminals of P4 and P5 and the corresponding center conductor contacts of multipin connector P6.	*b.* Meter must indicate Set ohms (continuity) for each test
			c. Progressively connect the multimeter test leads to the active pins on plug P1 and the wire terminating pins on connectors P2, P3, P6, and P7T.	*c.* Meter must indicate zero ohms (continuity) for each test.
			d. Connect the multimeter test leads to P6-K and P7 ground, P6-P and PS-A, P6-q and the +28 volt dc wire, P6-w and the dc return wire, P6-M and P6-q and P6-q and P6-v.	*d.* Meter must indicate zero ohms (continuity) for each test
			NOTE Consult schematic diagram for printed circuit extender board A7 (fig. 6-23).	
6	Leave controls and test leads in positions indicated in step 2.		*a.* Check for short circuits by connecting the multimeter test leads to the first two etched terminals of the 15 pin section on the left side of the board. Move the two multimeter test leads decisively, by advancing each test lead one terminal at a time, across the section. Repeat for the other two 15 pin sections.	*a.* Meter must indicate open circuit for each test
			b. Check board continuity by progressively connecting one multimeter test lead to the etched terminals at one end of the board, and the other test lead to the corresponding connector contact at the other end of the board.	*b.* Meter must indicate zero ohms (con tinuity) for each test
			NOTE Consult schematic diagram for printed circuit extender boards A8 and A9 (fig. 6-24).	
6	Leave controls and test lead in positions indicated in step 2.		*a.* Check for short circuits by connecting the multimeter test leads to the first two etched terminals on one side of the board. Move the two multimeter test leads successively, by advancing each test lead one terminal at a time, across the board. Repeat for the etched terminals on the opposite side of the board.	*a.* Meter must indicate open circuit for each test.
			b. Check for short circuits by successively connecting the multimeter test leads to the etched terminals back-to-back on opposite ides of the board	*b.* Meter must indicate open circuit for each test-

Step no.	Test equipment control settings	Equipment under test control settings	Test procedure	Performance standard
			c. Check board continuity by progressively connecting one multimeter test lead to the etched terminals at one end of the board, and the other test lead to the corresponding connector contact at the opposite end of the board.	*c.* Meter must indicate zero ohms (continuity) for each test.
7	Leave controls and test leads in positions indicated in step 2,		*a.* Check wire shielding of dummy connector P1 by connecting multimeter test leads to the outer terminals of pins 1 and 4.	*a.* Meter must indicate zero ohms (continuity).
			b. Check continuity of the inner conductor by connecting the multimeter test leads to the inner terminal of pins 1 and 4.	*b.* Meter must indicate zero ohms (continuity).
			c. Repeat a and b above for pins 1 to 3 and 2 to 4 of dummy connector P2.	*c.* Meter must indicate zero ohms (continuity).
8	Leave controls and test leads in positions indicated in step 2.	Adapter Test MX-864/TPM-24 (V). VIDEO switch to positions indicated in test procedure.	*a.* Connect one multimeter test lead to VIDEO jack J1 on front panel. Successively connect the other test lead to plug P1 contacts listed below. Rotate the VIDEO switch to the position corresponding to the plug contact below for each test. Test lead to — VIDEO switch position P1-A — SUM VIDEO P1-B — MOD PLUSE P1-C — SELF TEST GATE P1-D — IR SUPPR P1-F — DELAY SUM VIDEO P1-G — SIG GEN TRIG P1-H — RSLS GO/NO GO P14 — AUX TRIG P1-M — DIFF VIDEO P1-N — RCVR VIDEO P1-X — TRANSPONDER SUPPR P1-Y — XMTR PWR MON	*a.* Meter must indicate zero ohms (continuity) for each switch position.
		b. VIDEO switch in any position.	*b.* Successively connect the multimeter test leads to the jacks and plug P1 contacts as follows: Test lead to. — Test lead to: SUM XTAL CURRENT J2 — P1-E DIFF XTAL CURRENT J3 — P1-W 116 VAC J4 — P1-S 115 VAC RETURN J5 — P1-R + 12V J6 — P1-P LVPS MON J7 — P1-a GND J8 — P1-c	*b.* Meter must indicate zero ohms (continuity) for each test
		c. Video switch to positions indicated in test procedure.	*c.* Successively connect one multimeter lead to the active pins on plug P1 (fig. 6-22). Successively connect the other multimeter lead to J1 (rotating VIDEO switch S1 through all 12 positions) and J2 through J8 for each active pin,	*c.* Meter must indicate an open circuit for each test, except for the switch positions and jacks requiring continuity to plug P1 in *a* and *b* above.

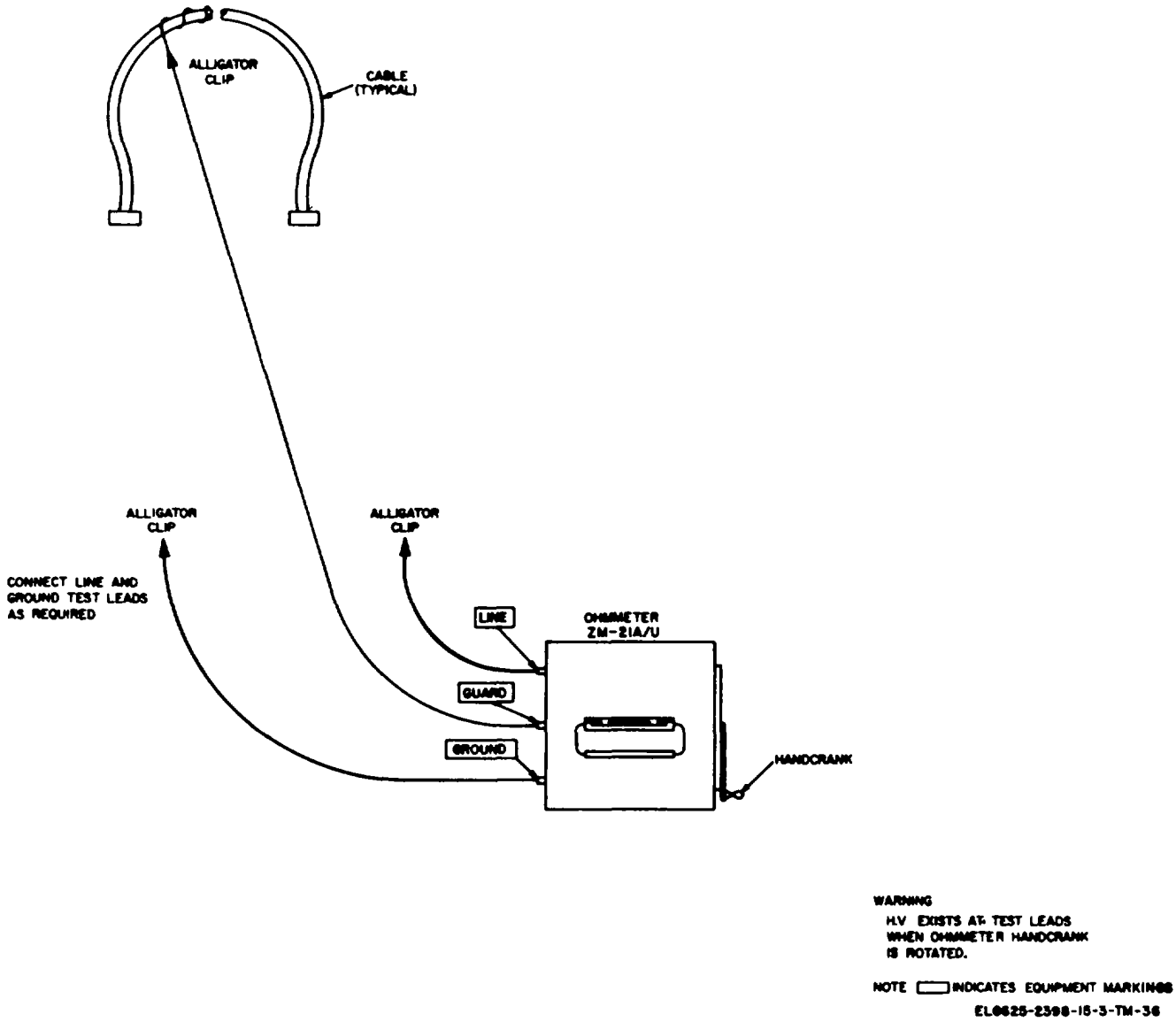


Figure 8-2. Connections for insulation resistance tests on cables.

8-5. Insulation Resistance Tests on Cables

a. Test Equipment and Material. Ohmmeter ZM-21A/U.

b. Test Connections Conditions. Connect the equipment as shown in figure 8-2 in accordance with the directions in the steps of the procedure below. To accomplish connection of the test leads from the LINE and GROUND terminals of Ohmmeter ZM-21A/U to the pin contacts of the cable connectors, proceed as follows whenever applicable:

(1) When possible, connect the two test leads to opposite ends of the cables to avoid shorting.

(2) To connect a test lead to a male pin of a cable connector, adapt the alligator clip by connecting it to a female pin of the correct size.

(3) To connect a test lead to a female pin of a cable connector, adapt the alligator clip by connecting it to a male pin of the correct size, or to a solid wire of the correct size.

c. Procedure.

Step no.	Test equipment control settings	Equipment under test control settings	Test procedure	Performance standard
1	ZM-21A/U None		**WARNING** Test leads of Ohmmeter ZM-21A/U are at potentials up to 500 volts when ohmmeter hand crank is being rotated. To avoid injury make all connections when the hand crank is not being rotated. DO NOT handle the test leads while the crank is rotating. Check insulation resistance of cable W1 (fig. 6-7) as follows: **NOTE** Couplers W1CP1 through W1CP4 must be connected on W1. *a.* Connect the GROUND terminal of the ohmmeter to the outer shell of one of the coaxial connectors on a plug. *b.* Wrap an uninsulated wire around the outer covering of the cable and connect the wire to the GUARD terminal of the ohmmeter. *c.* Connect the LINE terminal of the ohmmeter to the corresponding contact connected to the inner conductor. *d.* Rotate the hand crank of the ohmmeter at 160 (minimum) revolutions per minute (rpm) and read the insulation resistance on the meter. *e.* Repeat, a, c, and d, (stopping hand cranking while connecting test leads between each test) for the balance (3) of the coaxial wires	*d.* Meter reading of 100 megohms or higher must be obtained *e.* Meter reading of 100 megohms or higher must be obtained for each t
2	Observe WARNING in step 1 above.		Check insulation resistance of cable W2 (fig. 6-8) as follows: *a.* Connect the GROUND terminal of the ohmmeter to plug contact pin 10. *b.* Connect the LINE terminal to plug contact pin 12 *c.* Repeat *b* of step 1. *d.* Repeat *d* of step 1. *e.* Connect the GROUND terminal of the megger to plug contact pin 19. *f.* Connect the LINE terminal to plug contact pin 21. *g.* Repeat d of step 1. *h.* Connect the GROUND terminal of the megger to plug contact pin 20. *I.* Connect the LINE terminal to plug contact pin 22	*d.* Meter reading of 100 megohm or higher must be obtained *g.* Meter reading of 100 megohms or higher must be obtained.

Step no.	Test equipment control settings	Equipment under test control settings	Test procedure	Performance standard
			j. Repeat d of step 1.	*j.* Meter reading of 100 megohms or higher must be obtained.
			k. Connect the GROUND terminal of the megger to the outer shell of either plug on the cable	
			L. Successively (stopping hand cranking between connections) connect the LINE terminal of the megger to plug contact pins 1, 3, 7, 11, and 23.	
			m. Repeat d of step 1 for the five tests.	*m.* Meter reading of 100 megohms or higher must be obtained for each test.
			n. Connect the LINE terminal of the megger successively between tests to each plug contact pin carrying a wire In turn, connect the GROUND lead to each of the other plug contact pins carrying wires. Repeat *d* of step 1 for each wire Perform 10 separate tests until all wires have been tested with respect to each other.	*n.* Meter reading of 100 megohms or higher must be obtained for each test'
3	Observe WARNING in step 1 above.		Check insulation resistance of cable W3 (fig. 6-9) as follows:	
			NOTE Couplers W3CP1 and W3CP2 must be connected in cable W3.	
			a. Connect the GROUND terminal of the ohmmeter to the outer shell of one of the coaxial connector on a plug.	
			b. Repeat *b* of step 1.	
			c. Connect the LINE terminal of the ohmmeter to the corresponding contact connected to the inner conductor.	
			d. Repeat *d* of step 1.	*d.* Meter reading of 100 megohms or higher must be obtained
			e. Repeat *a, c* and *d* (stopping hand cranking while connecting test leads between each test for the balance (4) of the coaxial wires	Meter reading of 100 megohms or higher must be obtained for each test
4	Observe WARNING in step 1 above.		Check insulation resistance of cable W4 (fig. 6-10) as follows:	
			a. Connect the GROUND terminal of the ohmmeter to the outer shell of either plug on the cable-	
			b. Repeat *b* of step 1.	
			c. Successively (stopping hand cranking while connecting test lead between each test) connect the LINE terminal to each plug contact (total 5) connected to wires	
			d. Repeat *d* of step 1 for the five tests	Meter reading of 100 megohms or higher must be obtained for each to

Step no.	Test equipment control settings	Equipment under test control settings	Test procedure	Performance standard
			e. Connect the LINE terminal of the ohmmeter successively (stopping hand cranking while connecting test lead between each test) to each plug contact pin carrying a wire.	
			f. Concurrently with step e connect the GROUND terminal to each of the other plug contact pins connected to wires, repeating *d* of step 1 for each wire.	*f.* Meter reading of 100 megohms or higher must be obtained for each test.
			Perform 10 separate tests until all wires have been tested with respect to each other.	
6	Observe WARNING in step 1 above		Check insulation resistance of coaxial cables W5, W12, W14/W15(2), W16, and W21 as follows:	
			a. Connect the LINE terminal of the ohmmeter to the center contact of one plug.	
			b. Connect the GROUND terminal of the ohmmeter to the shell of a plug.	
			c. Repeat *b* of step 1.	
			d. Rotate the hand crank of the ohmmeter at 160 (minimum) revolutions per minute (rpm) and read the insulation resistance on the meter.	*d.* Meter reading of 100 megohms or higher must be obtained.
6	Observe WARNING in step 1 above.		Check insulation resistance of cable W11 (fig. 612) as follows:	
			a. Repeat *b* of step 1.	
			b. Connect the LINE terminal of the ohmmeter successively (stopping hand cranking while connecting test lead between each test) to each plug contact pin.	
			c. Concurrently with step *b* connect the GROUND terminal to each of the other plug contact pins, repeating d of step 1 for each wire.	*c.* Meter reading of 100 megohms or higher must be obtained for each test.
			Perform 168 separate tests until all wires have been tested with respect to each other.	
7	Observe WARNING in step 1 above.		Check insulation resistance of cable W25 (fig. 6-18) as follows:	
			a. Connect the GROUND terminal of the ohmmeter to the outer shell of one of the coaxial connectors (P4 or P5).	
			b. Repeat *b* of step 1, wrapping wire around cable between P1 and P2.	
			c. Connect the LINE terminal of the ohmmeter to P6 pins L, K, N, P, W, k, q, w, and the inner contact of coaxial pin 4.	
			d. Repeat *d* of step 1 for each test.	*d.* Meter reading of 100 megohms or higher must be obtained.
			e. Repeat *a, c*, and *d* for the other coaxial connector.	*e.* Meter reading of 100 megohms or higher must be obtained.

Step no.	Test equipment control settings	Equipment under test control settings	Test procedure	Performance standard
			f. Connect the LINE test lead of the ohmmeter successively between tests to each plug contact pin carrying a wire. In turn connect the GROUND lead to each of the other plug contact pins carrying wires or directly to the wire. Repeat *d* of step 1 for each wire. Perform 6 tests on P6 for pins K, P, q, and w. Perform 436 tests on P1 for all pins (30) carrying wires, and check pins K, q, and w of P6 against the 30 wire carrying pins of P1 (90 tests).	*f.* Meter reading of 100 megohms or higher must be obtained for each test.
8	Observe WARNING in step 1 above.		Check insulation resistance of cable W44 (fig. 6-19) as follows: *a.* Repeat *b* of step 1. *b.* Connect the LINE terminal of the ohmmeter successively (stopping hand cranking while connecting test lead between each test) to each plug contact pin. *c.* Concurrently with *b* connect the GROUND terminal to each of the other plug contact pins, repeating *d* of step 1 for each wire. Perform 325 separate tests until all wires have been tested with respect to each other.	*c.* Meter reading of 100 megohms or higher must be obtained for each test.

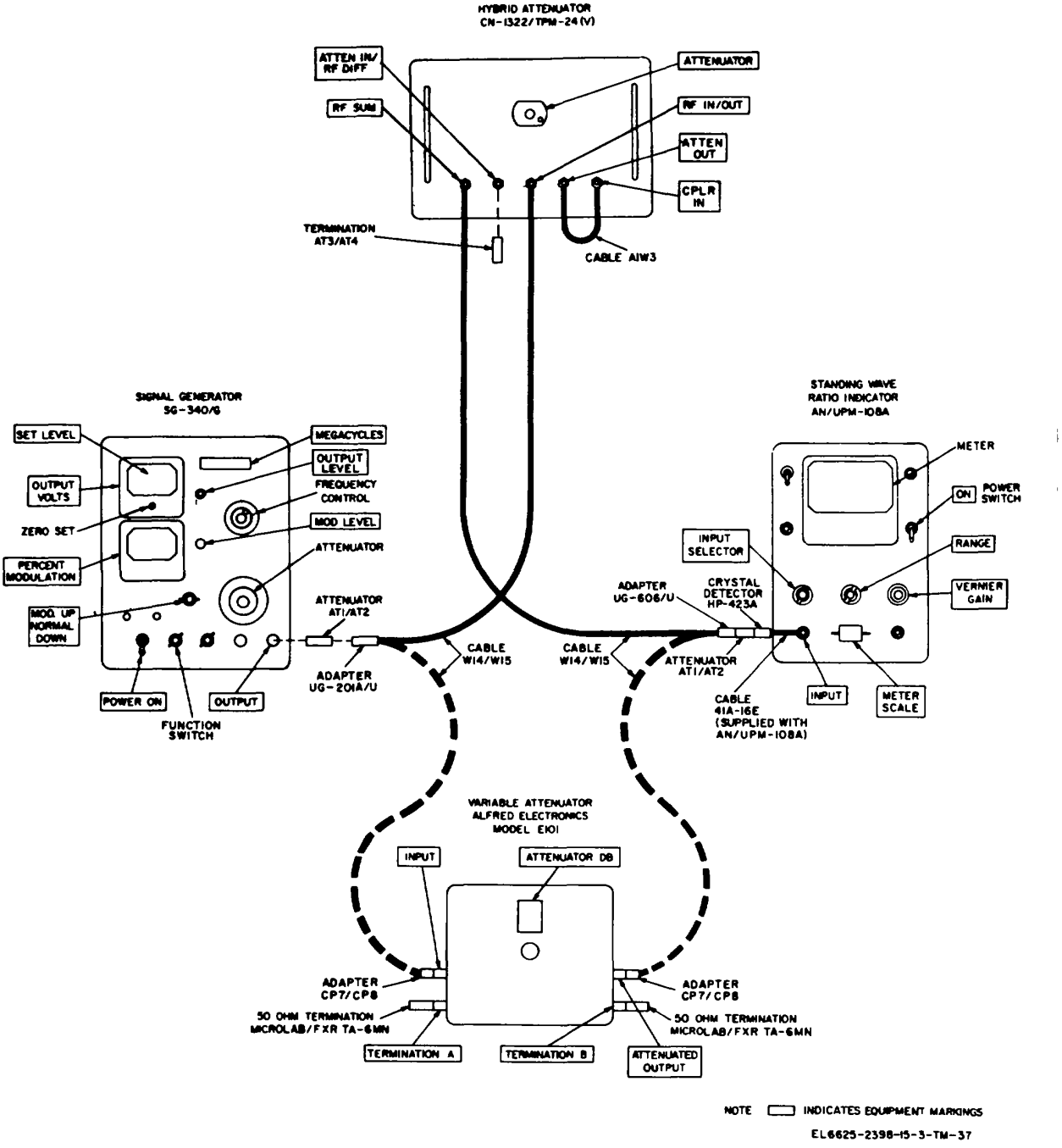


Figure 8-3. Hybrid attenuator insertion loss measurement between RF IN/OUT and RF SUM connectors, test connections.

8-6. Hybrid Attenuator Insertion Loss Measurement between RF IN/OUT and RF SUM Connectors

a. Test Equipment and Material.

(1) Signal Generator SG-40/G.
(2) Variable Attenuator, Alfred Electronics Model E101.
(3) Standing Wave Ratio Indicator AN/UPM-108A.
(4) Crystal Detector HP-428A.
(5) Adapter UG-201A/U.
(6) Adapters CP7/CP8(2).
(7) Fixed Attenuator AT1/AT2(2).
(8) Termination ATS/AT4(1).
(9) 50-ohm Terminations (2), Microlab/FXR TA-6MN.
(10) Cables W14/W15(2).
(11) Adapter UG-606/U.

b. Test Connections and Conditions. Initially connect the equipment as shown in solid lines, figure 8-3. Disconnect the hybrid attenuator and connect the variable attenuator (connections shown in broken lines) as directed in the procedure below.

c. Procedure.

Step no.	Test equipment control settings	Equipment under test control settings	Test procedure	Performance standard
1	*a.* SG-340/G POWER: ON Function switch: CW MEGACYCLES: 1090	None	*a.* Set the MEGACYCLES dial to 1090 with the frequency control knob. Turn on the signal generator and allow a minimum of 20 minutes warm-up period before proceeding.	
	b. AN/UPM-108A Power: ON METER SCALE: NORMAL INPUT SELECTOR: XTAL-200KΩ	’	*b.* Turn on the standing wave ratio indicator and allow a minimum of 10 minutes warm-up period before proceeding.	
	c. SG-40/G POWER: OFF (down) OUTPUTS VOLTS: zero set		*c.* Turn off the signal generator and zero set the OUTPUT VOLTS meter.	
	d. SG-340/G POWER: ON Attenuator: 0dB OUTPUT VOLTS: SET LEVEL		*d.* Turn on the signal generator and adjust the OUTPUT LEVEL control knob for an OUTPUT VOLTS meter indication at the SET LEVEL (+4DBM) mark. **NOTE** Check that OUTPUT VOLTS meter indication is exactly on the SET LEVEL mark with the attenuator set to 0dB (outer scale). Readjust the OUTPUT LEVEL control knob if required.	
2	SG-340/G Function Switch: 1000-PERCENT MODULATION: 50 MOD. UP-NORMAL-DOWN: NORMAL AN/UPM-108A METER SCALE: EXPAND RANGE: As required for meter reading.	None	Adjust the MOD. LEVEL control for a reading of 50 on the PERCENT MODULATION meter. Adjust the standing wave ratio indicator VERNIER GAIN control and RANGE switch for an exact meter reading (eg 5 on the EXPANDED DB meter scale). Record the meter reading.	
	Control remains as at end of step 2.		*a.* Disconnect the hybrid attenuator under text and connect the variable attenuator, us shown by broken lines, figure 8-3	

Step no.	Test equipment control settings	Equipment under test control settings	Test procedure	Performance standard
			b. Adjust the variable attenuator ATTENUATOR DB control for the same standing wave indicator meter reading recorded in step 2 above	Insertion loss on the ATTENUATOR DB control of the variable attenuator must indicate 6.6 ±1.5. **NOTE** Correct the hybrid attenuator calibration tag marking for 1090 MHz, if incorrect.
4	SG-340/G MEGACYCLES: 1030 Balance of controls remains as end of step 2.	None	*a.* Reconnect the hybrid attenuator, solid lines figure 8-3. *b.* Bent the signal generator MEGACYCLES dial to 1030 with the frequency control knob and repeat steps 2 and 3.	Insertion loss on the ATTENUATOR DB control of the variable attenuator must indicate 6.5 ±1.5. NOTE Correct the hybrid attenuator calibration tag marking for 1030 MHz, if incorrect.

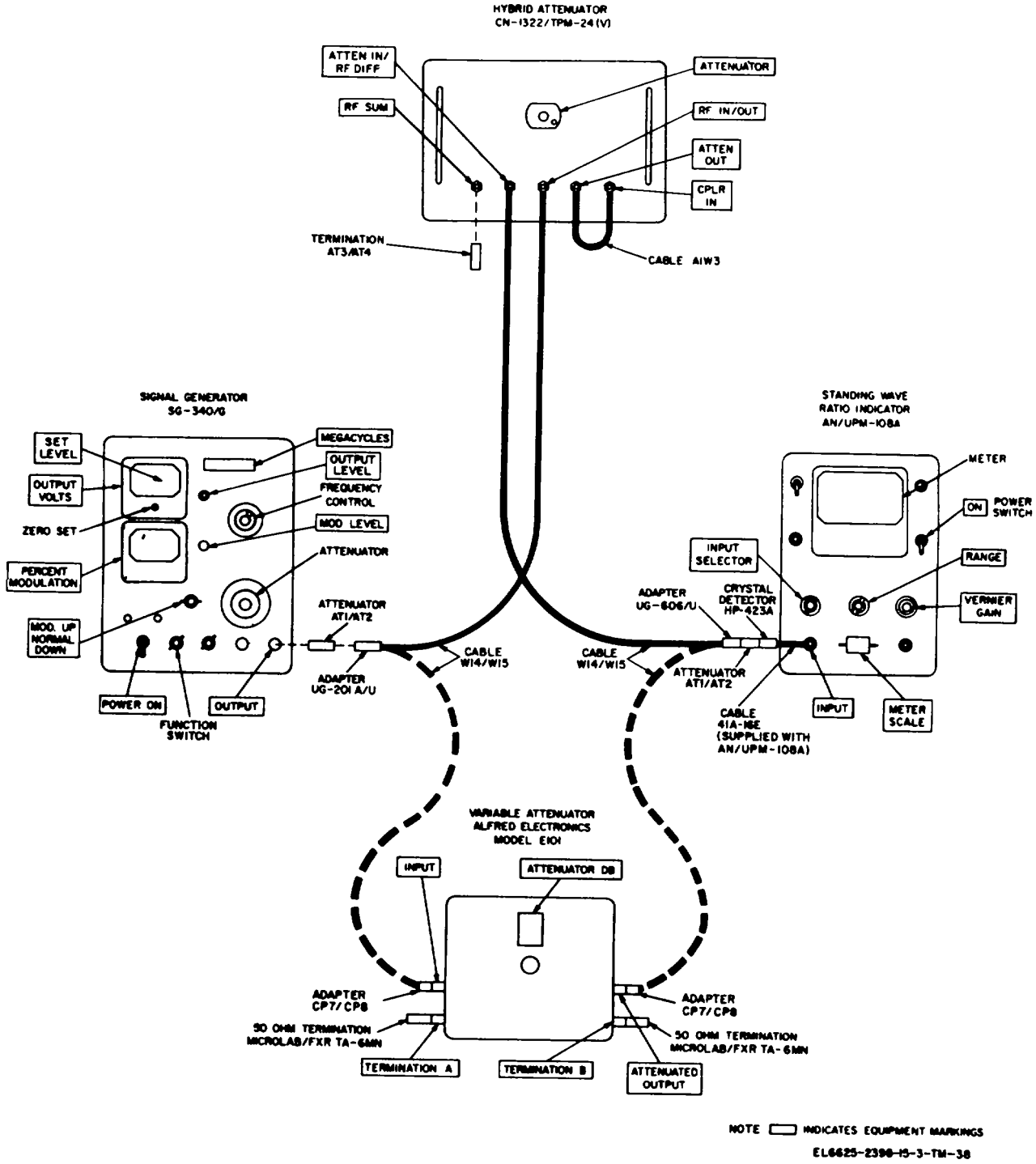


Figure 8-4. Hybrid Attenuator insertion loss measurement between RF IN/OUT and ATTEN IN/RF DIFF connectors, test connections.

8-7. Hybrid Attenuator Insertion Loss Measurement between RF IN/OUT and ATTEN IN/RF DUFF Connectors

a. Test Equipment and Materials.

(1) Signal Generator SG-340/G.
(2) Variable Attenuator, Alfred Electronics Model E101.
(3) Standing Wave Ratio Indicator AN/UMP-108A.
(4) Crystal Detector HP-423A.
(5) Adapter UG-201A/U.
(6) Adapters CP7/CPS(2).
(7) Fixed Attenuators AT1/AT2(2).
(8) Termination AT3/AT4(1).
(9) 50ohm Terminations (2), Microlab/FXR TA-6MN.
(10) Cables W14/W15(2).
(11) Cable A1W3.
(12) Adapter UG-606/U.

b. Test Connections and Conditions. Initially connect the equipment as shown in solid lines, figure 8-4. Disconnect the hybrid attenuator and connect the variable attenuator (connections shown in broken lines) as directed in the procedure below.

c. Procedure.

Step no.	Test equipment control settings	Equipment under test control settings	Test procedure	Performance standard
1	*a.* SG-340/G POWER: ON Function Switch: CW MEGACYCLE: 1030 *b.* AN/UPM-108A Power: ON METER SCALE: NORMAL INPUT SELECTOR: XTAL-200KO *c.* SG-340/G POWER: OFF (down) OUTPUT VOLTS: zero set *d.* SG-340/G POWER: ON Attenuator: 0dB OUTPUT VOLTS: SET LEVEL	None	*a.* Set the MEGACYCLES dial to 1030 with the frequency control knob. Turn on the signal generator and allow a minimum of 20 minutes warm-up period before proceeding. *b.* Turn on the standing wave ratio indicator and allow a minimum of 10 minutes warm-up period before proceeding. *c.* Turn off the signal generator and zero set the OUTPUT VOLTS meter. *d.* Turn on the signal generator and adjust the OUTPUT LEVEL control knob for an OUTPUT VOLTS meter indication at the SET LEVEL (+4DBM) mark. **NOTE** Check that OUTPUT VOLTS meter indication is exactly on the SET LEVEL mark, with the attenuator set to 0dB (outer scale). Readjust the OUTPUT LEVEL control knob if required.	
2	SG-340/G Function Switch: 1000- PERCENT MODULATION: 50 ATTENUATOR: 0 (zero) MOD UP-NORMAL-DOWN: NORMAL AN/UPM-108A RANGE: as required for meter reading.	ATTENUATOR: 0 (zero)	Adjust the MOD LEVEL control for a reading of 50 on the PERCENT MODULATION meter. Adjust the standing wave ratio indicator VERNIER GAIN control and RANGE switch for an exact meter reading (e.g 5 on the DB meter scale). Record the meter reading.	

Step no.	Test equipment control settings	Equipment under test control settings	Test procedure	Performance standard
3.	Controls remain as at end of step 2		*a.* Disconnect the hybrid attenuator under test and connect the variable attenuator, a shown by broken lines, figure 8-4. *b.* Adjust the variable ATTENUATOR DB control for the same standing wave ratio indicator meter reading recorded in step 2 above.	Insertion loss on ATTENUATOR DB controls of the variable attenuator must indicate 6.5 ± 1.5 and be slightly less (approximately 0.2dB) than the loss measured at 1080 Mhz between the RF IN/OUT and RF SUM connectors (para 8-6). NOTE Correct the hybrid attenuator calibration tag marking for 1030 MHz, if incorrect.
4	Alfred Electronics Model E101 Successively increase the ATTENUATOR DB control (from the reading obtained in b of step 8) solid lines, by 6, 9 and 12.	ATTENUATOR: As directed in test procedure	*a.* Record the reading on the meter of the standing wave ratio indicator for the variable attenuator ATTENUATOR DB increased control setting of 6dB, 9dB and 12dB. *b.* Disconnect the variable attenuator as shown by figure 8-4. *c.* Adjust the hybrid attenuator ATTENUATOR control for the same standing wave ratio indicator meter readings recorded in a above.	Insertion loss must be within the following limits: Variable attenuator control setting — Hybrid attenuator control setting Increased 6dB — 18 +2.0, - 1.3dB Increased 9dB — 16 +2.5, - 1.3dB Increased 12dB — 19 +3.0, - 1.5dB
5	SG-340/G MEGACYCLES: 1090 Balance of controls remain at end of step 2.	ATTENUATOR: 0 (zero)	a. Reconnect the hybrid attenuator, solid line figure 8-4 *b.* Reset the signal generator MEGACYCLES dial to 1090 with the frequency control knob and repeat	Insertion loss on the ATTENUATOR DB control of the variable attenuator must indicate 6.5 ±1.5 and be slightly less (approximately 0.2dB) than the loss measured at 1090 Mhz between the RF IN/OUT and RF SUM connectors (para 8-6). **NOTE** Correct the hybrid attenuator calibration tag marking for 1090 MHz, if incorrect.

Step no.	Test equipment control settings	Equipment under test control settings	Test procedure	Performance standard
6	Alfred Electronics Model E101 *b* of step 5)	ATTENUATOR: As directed in test	Repeat step 5. Successively increase by 6, 9 and 12	Insertion losses must be within the following limit.: Increased 6dB procedure 13 +2.0, - 1.S3B

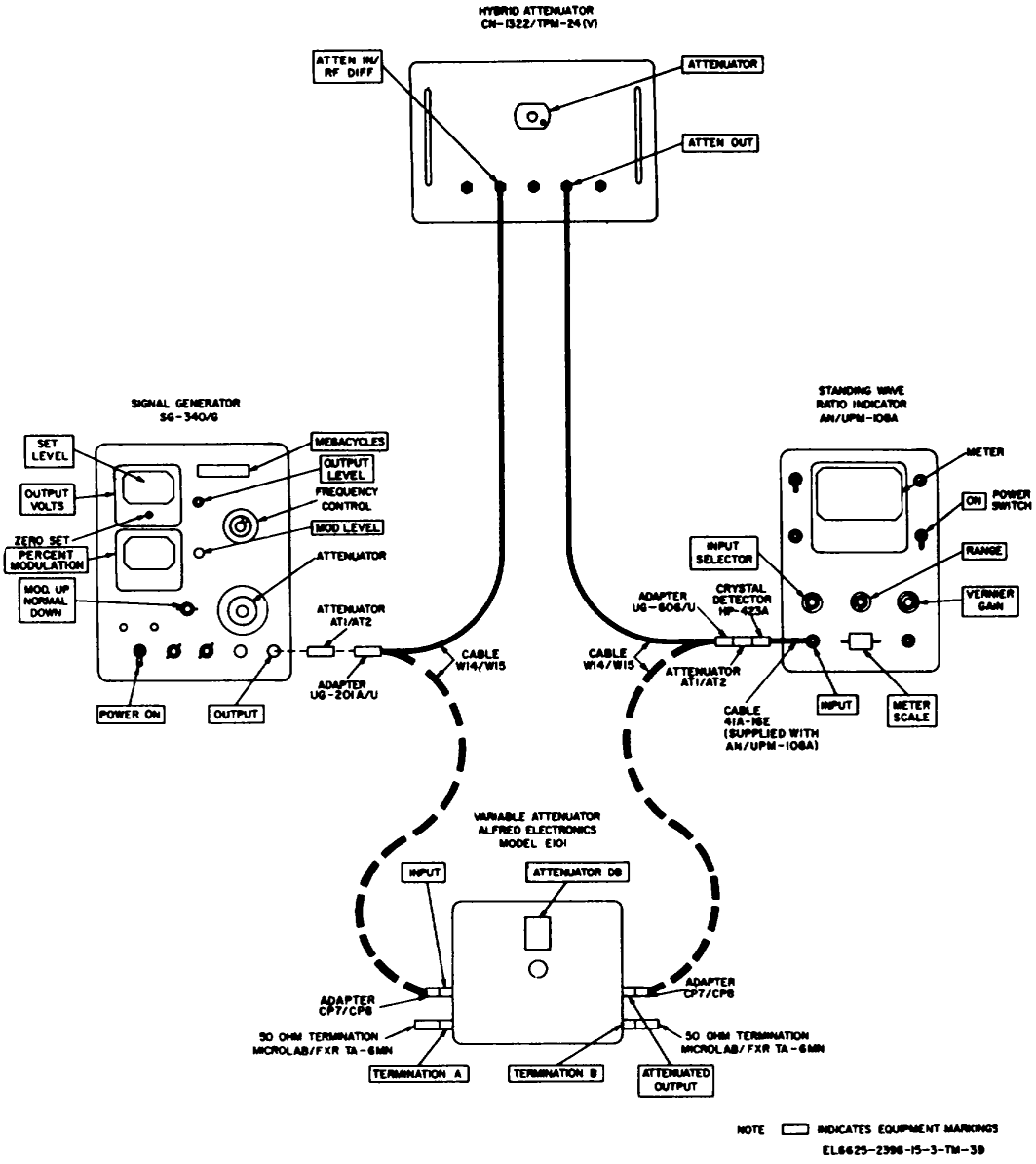


Figure 8-5. Hybrid attenuator calibration, test connections.

8-8. Hybrid Attenuator Calibration Tests

a. Test Equipment and Materials.

(1) Signal Generator SG-340/G.
(2) Variable Attenuator, Alfred Electronics Model E101.
(3) Standing Wave Ratio Indicator AN/UPM-108A.
(4) Crystal Detector HP-423A.
(5) Adapter UG--201A/U.
(6) Adapters CP7/CP8(2).
(7) Fixed Attenuators AT1/AT2(2)
(8) 50-ohm Terminations (2), Microlab/FXR TA-6MN.
(9) Cables W14/W15(2).
(10) Cable A1W3.
(11) Adapter UG-606/U.

b. Test Connections and Conditions. Initially connect the equipment as shown in solid lines, figure 8-5. Disconnect the hybrid attenuator and connect the variable attenuator (connections shown in broken lines) as directed in the procedure below.

c. Procedure.

Step no.	Test equipment control settings	Equipment under test control settings	Test procedure	Performance standard
1	*a.* SG-340/G POWER: ON Function Switch: CW MEGACYCLES: 1090 *b.* AN/UPM-108A POWER: ON METER SCALE: NORMAL INPUT SELECTOR: XTAL-200KΩ *c.* SG-340/G POWER: OFF (down) OUTPUT VOLTS: zero set *d.* SG-340/G POWER: ON Attenuator: 0dB OUTPUT VOLTS: SET LEVEL	None	*a.* Set the MEGACYCLES dial to 1090 with the frequency control knob. Turn on the signal generator and allow a minimum of 20 minutes warm-up period before proceeding. *b.* Turn on the standing wave ratio indicator and allow a minimum of 10 minutes warm-up period before proceeding. *c.* Turn off the signal generator and zero set the OUTPUT VOLTS meter. *d.* Turn on the signal generator and adjust the OUTPUT LEVEL control knob for an OUTPUT VOLTS meter indication at the SET LEVEL (+4DBM) mark. **NOTE** Check that OUTPUT VOLTS meter indication is exactly on the SET LEVEL mark with the attenuator set to 0dB (outer scale). Readjust the OUTPUT LEVEL control knob if required.	
2	SG-340/G Function Switch 1000-MOD. UP-NORMAL-DOWN: NORMAL PERCENT MODULATION: 50 AN/UPM-108A RANGE: As required for meter reading.	ATTENUATOR: 0 (zero)	Adjust the MOD LEVEL control for a reading of 50 on the PERCENT MODULATION meter. Adjust the standing wave indicator VERNIER GAIN control and RANGE switch for an exact meter reading (e.g., .5 on the DB meter scale). Record the meter reading.	
3	Controls remain as at end of step 2		*a.* Disconnect the hybrid attenuator under test and connect the variable attenuator, as shown by broken lines, figure 8-5. *b.* Adjust the variable attenuator ATTENUATOR DB control for the same standing wave ratio indicator meter reading recorded in step 2 above.	ATTENUATOR DB control of the variable attenuator must indicate 0 +1.0, -0.0dB.

Step no.	Test equipment control settings	Equipment under test control settings	Test procedure	Performance standard
4	Alfred Electronics Model E101 As directed in the test procedure	ATTENUATOR: Successively to 3, 6, 9, 12 15, 20 and 25.	*a.* Disconnect the variable attenuator and reconnect the hybrid attenuator, as shown by solid lines, figure 8-5. *b.* Record the readings on the meter of the standing wave ratio indicator for the hybrid attenuator ATTENUATOR control settings of 3, 6, 9, 12, 15, 20 and 25. *c.* Disconnect the hybrid attenuator and reconnect the variable attenuator, as shown by broken lines, figure 8-5. *d.* Adjust the variable attenuator, ATTENUATOR DB control for the same standing wave ratio indicator meter readings recorded in *b* above.	Calibration of the hybrid attenuator must be within the following limits: Hybrid attenuator control setting — Variable attenuator control setting 3dB — 3 ± 1.0dB 6dB — 6 ±1.0dB 9dB — 9 ± 1.0dB 12dB — 12 ±1.0dB 15dB — 15 ± 1.1dB 20dB — 20 ±1.1dB 25dB — 25 ±1.2dB **NOTE** Correct the hybrid attenuator calibration tag marking for 1090 MHz, if incorrect.
5	SG-340/G MEGACYCLB8: 1030 Balance of controls as at end of step 2	*a.* ATTENUATOR: 0 (zero)	*a.* Repeat steps 2 and 3.	*a.* ATTENUATOR dB control of the variable attenuator must indicate 0 +3.0, -0.0dB.
		b. ATTENUATOR: Successively to 3, 6, 9, 12, 15, 20 and 25.	*b.* Repeat step 4.	*b.* Calibration of the hybrid attenuator must be within the following limits: Hybrid attenuator control settings — Variable attenuator control settings 8dB — 3 +3.0, -2.0dB 6dB — 6 + 3.0, -2.0dB 9dB — 9 +3.0, -2.0dB 12dB — 12 +3.0, -2.0dB 15dB — 15 + 3.0, -2.0dB 20dB — 20 +3.0, -2.0dB 26dB — 25 +3.0, -2.0dB **NOTE** Correct the hybrid attenuator calibration tag marking for 1030 MHz, if incorrect.

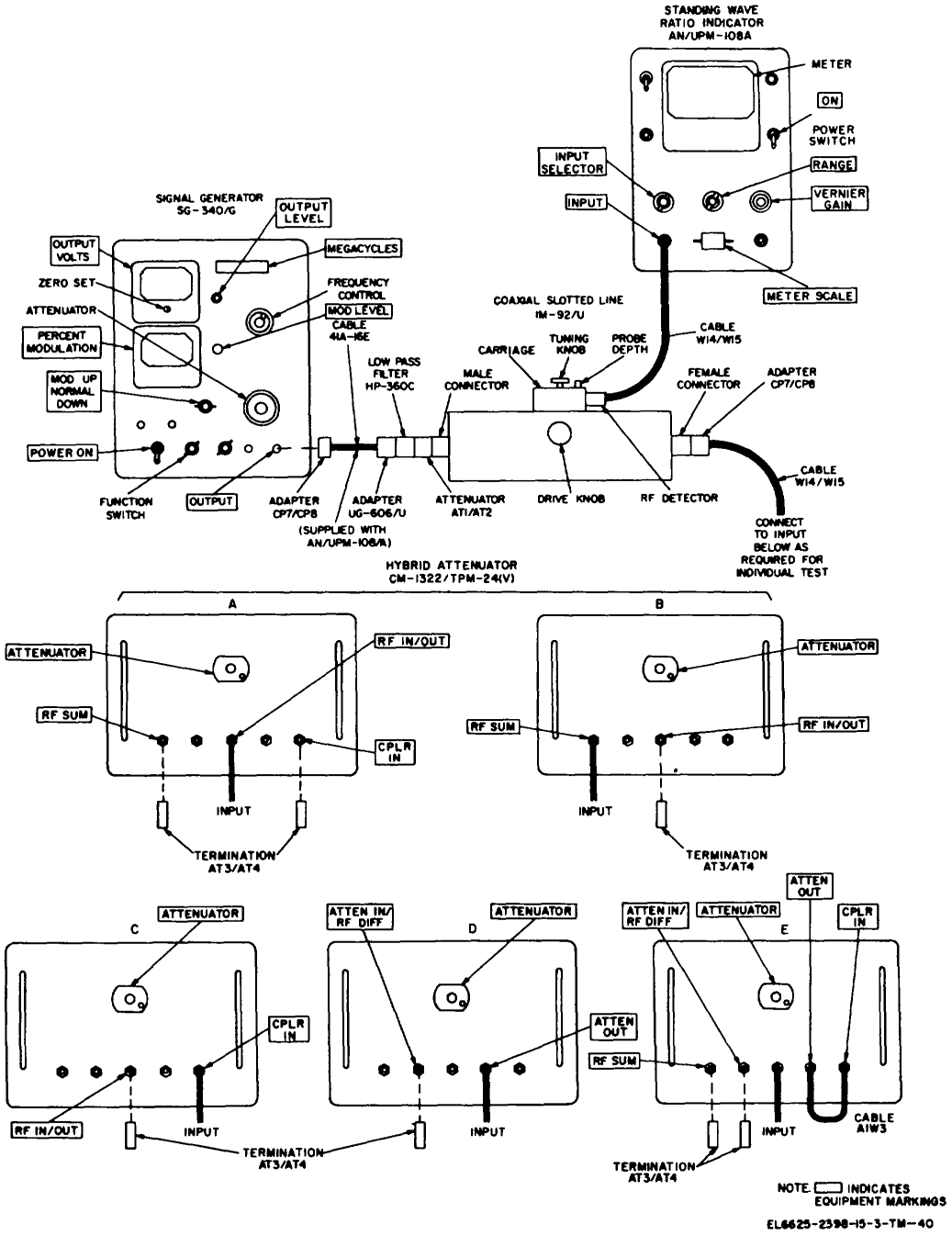


Figure 8-6. Hybrid Attenuator VSWR, test connections.

8-9. Hybrid Attenuator VSWR Measurements

a. Test Equipment and Materials.

(1) Signal Generator SGS40/G.
(2) Coaxial Slotted Line IM-92/U.
(3) Standing Wave Ratio Indicator AN/UPM-108A.
(4) Low Pass Filter HP-360C.
(5) Fixed Attenuator AT1/AT2 (1).
(6) Terminations AT3/AT4 (2).
(7) Adapter CP7/CP8 (2).
(8) Cables W14/W15 (2)
(9) Cable A1W3.
(10) Adapter UG-606/U.

b. Test Connections and Conditions. The five hybrid attenuator test configurations in figure 8-6 to the test equipment in accordance with the directions supplied in the procedure below.

c. Procedure.

Step no.	Test equipment control settings	Equipment under test control settings	Test procedure	Performance standard
1	*a.* SG-340/G POWER: ON Function Switch: 1000-MEGACYCLES: 1030 MOD. UP-NORMAL-DOWN: NORMAL Attenuator: 0dB (outer scale) PERCENT MODULATION: 50	None	*a.* Set the MEGACYCLES dial to 1030 with the frequency control knob. Turn on the signal generator and allow a minimum of 20 minutes warm-up period before proceeding. Adjust the MOD LEVEL control for a reading of 50 on the PERCENT MODULATION meter.	
	b. AN/UPM-108A POWER: ON RANGE: 0 (zero) METER SCALE: NORMAL INPUT SELECTOR: XTAL-200 KΩ		*b.* Turn on the standing wave ratio indicator and allow a minimum of 10 minutes warm-up before proceeding.	period
2	IM-92/U as directed in procedure AN/UPM-108A VERNIER GAIN: as directed in procedure SG-340/G OUTPUT LEVEL: as directed in procedure	None	*a.* Terminate and connect the hybrid attenuator as directed in A of figure 8-6. *b.* Insert the crystal in the rf detector of the coaxial slotted line and turn the probe depth control fully clockwise Adjust the coaxial slotted line tuning knob for a maximum indication on the meter of the standing wave ratio indicator. *c.* Adjust the signal generator OUTPUT LEVEL control fox a centered reading on the meter of the standing wave ratio indicator. *d.* Move the carriage of the coaxial slotted line, with the drive control to obtain a peak (maximum) meter reading on the standing wave ratio indicator.	
	e. AN/UPM-108A RANGE: As required for meter reading.		*a.* Decrease the probe depth (turn control counter-clockwise), while adjusting the VERNIER GAIN control and RANGE switch of the standing wave ratio indicator, to the minimum probe depth required to provide full scale deflection on the meter of the standing wave ratio indicator (consistent with a usable meter reading, free of noise and jitter). *f.* Readjust the drive control knob of the coaxial slotted line for the peak (maximum) reading on the standing wave ratio indicator meter. Adjust the VERNIER GAIN control of the standing wave ratio indicator for a meter reading of exactly 1 on the SWR scale.	

Step no.	Test equipment control settings	Equipment under test control settings	Test procedure	Performance standard
			g. Move the carriage of the coaxial slotted line, with the drive knob, to obtain a null (minimum) reading on the meter of the standing wave ratio indicator. Read the voltage standing wave ratio on the SWR scale (top) of the standing wave ratio indicator.	Standing wave ratio indicator must indicate less than 1.65 on the SWR scale.
3	Controls as at end of step 1. IM-92/U As directed in step 2 AN/UPM-108A VERNIER GAIN and RANGE: As directed in step 2 SG-340/G OUTPUT LEVEL: As directed in step 2	None	*a.* Terminate and connect the hybrid attenuator as directed in B of figure 8-6. *b.* Repeat *b* through *g* of step 2	Standing wave ratio indicator must indicate less than 1.2 on the SWR scale.
4	Controls as at end of step 1. IM-O2/U As directed in stop 2 AN/UPM-108A VERNIER GAIN and RANGE: As directed in step 2 SG-340/G OUTPUT LEVEL: As directed in step 2	None	*a.* Terminate and connect the hybrid attenuator an directed in C of figure 8-6. *b.* Repeat *b* through *g* of step 2	Standing wave ratio indicator must indicate less than 1.5 on the SWR scale.
5	Controls as at end of step 2. IM-92/U As directed in step 2 AN/UPM-108A VERNIER GAIN and RANGE: As directed in step 2 ST-340/G OUTPUT LEVEL: As directed in step 2-	ATTENUATOR: 0 (zero)	*a.* Terminate and connect the hybrid attenuator as directed in C of figure 8-6. *b.* Repeat *b* through *g* of step 2-	Standing wave ratio indicator must indicate lees than 1.5 on the SWR scale
6	Controls as at end of step 1. IM-92/U As directed in step 2. AN/UPM-108A VERNIER GAIN and RANGE: As directed in step 2. SG-340/G OUTPUT LEVEL: As directed in step 2.	ATTENUATOR: 0 (zero)	*a.* Terminate and connect the hybrid connector as directed in E of figure 8-6. *b.* Repeat *b* through *g* of step 2.	Standing wave ratio indicator must indicate less than 1.6 on the SWR scale.

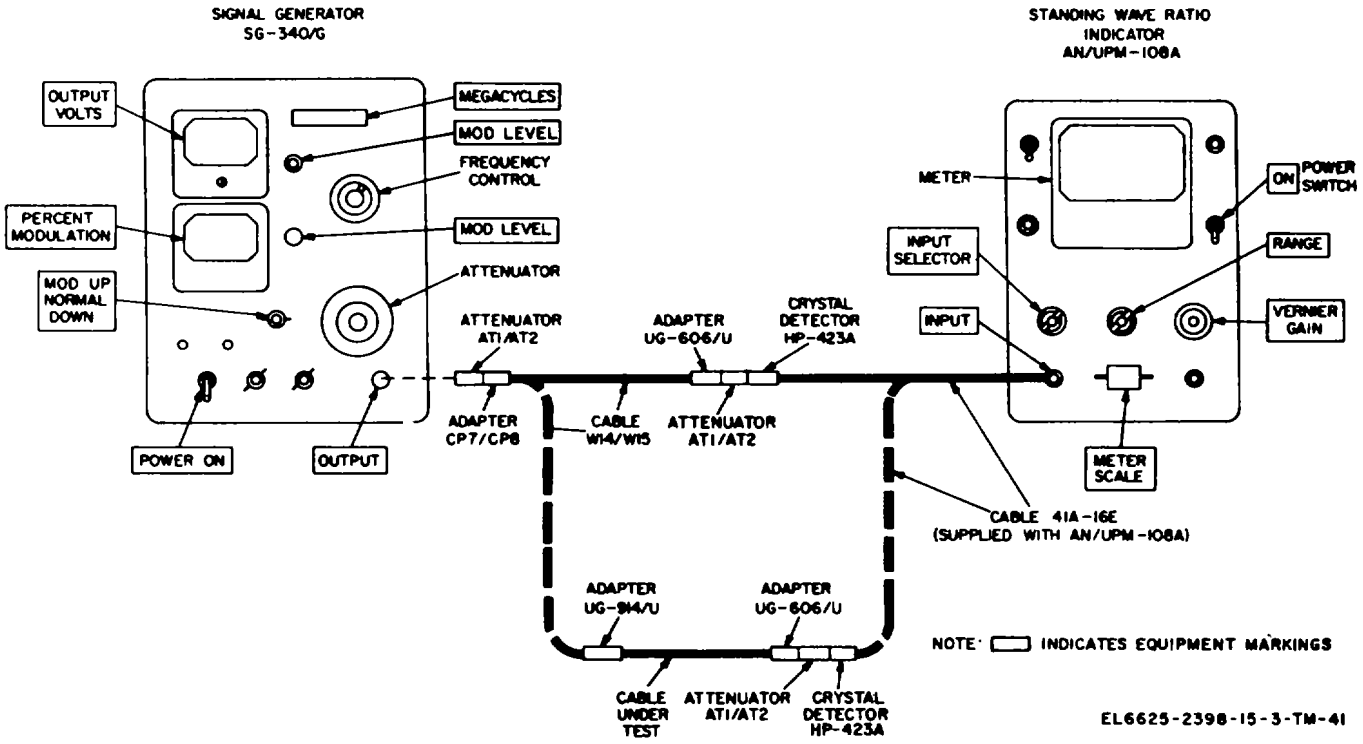


Figure 8-7. Cable insertion losses, test connections.

8-10. Insertion loss measurements for cables W1, W3, and W14/W15.

a. Test Equipment and Material.

(1) Signal Generator SG-340/G.
(2) Crystal Detector HP-423A.
(3) Standing Wave Ratio Indicator AN/UPM-108A.
(4) Adapter UG 606/U.
(5) Adapter UG-915/U.
(6) Adapter CP7/CP8(2).
(7) Attenuators AT1/AT2(2).
(8) Cable W14/W15(1).

b. Test Connection and Condition.

Connect the test equipment as shown with solid lines in figure 8-7. Additional instructions for connecting the cable under test and preparation of cables W1 and WS are provided in the procedure below.

c. Procedure.

Step no.	Test equipment control settings	Equipment under test control settings	Test procedure	Performance standard
1	*a.* SG-340/G POWER: ON Function switch 1000 MEGACYCLES: 1080 MOD UP-NORMAL DOWN: NORMAL Attenuator: 0dB (outer scale) PERCENT MODULATION: 50	None	*a.* Set the MEGACYCLES dial to 1030 with the frequency control knob. Turn on the signal generator and allow a minimum of 20 minutes warm-up period before proceeding. Adjust the MOD LEVEL control for a reading of 50 on the PERCENT MODULATION meter.	
	b. AN/UPM-108A POWER: ON METER SCALE: EXPAND INPUT SELECTOR: XTAL-200 KΩ		*b.* Turn on the standing wave ratio indicator and allow a minimum of 10 minutes warm-up period before proceeding.	
2	AN/UP-108A VERNIER GAIN and RANGE: As directed in the procedure.		*a.* Adjust the VERNIER GAIN control and RANGE switch for a 0 indication on the EXPANDED DB scale of the meter on the standing wave ratio indicator. *b.* Connect the unused W14/W15 cable shown with broken lines in figure 8-7. *c.* Read insertion loss of cable on EXPANDED DB scale of standing wave ratio indicator meter. Compare with insertion line marked for 100 MHz on cable sleeve. If incorrect by more than ±2.0dB change the marking on the sleeve,	Cable insertion loss must not exceed 2.5 dB.
3	SG-840/G MEGACYCLES: 1090		*a.* Connect the test equipment s shown with solid lines in figure 8-7. *b.* Repeat step 2 for the same W14/W15 cable, except compare loss with sleeve marking for 1090 Mhz.	Cable insertion loss must not exceed 2.5 dB.
4	Controls remain as at end of step 3.		Repeat step 3 for the second W14/W15 cable	Cable insertion loss must not exceed 2.5 dB.
5	SG-340/G MEGACYCLES: 1080		Repeat step 2 for the second W14/W15 cable	Cable insertion loss must not exceed 2.5 dB.
6	Controls as at end of step 1. SG-340/G MEGACYCLES: As directed by procedure		*a.* Refer to schematic diagram of cable W3 (figure 6-9). Remove and retain couplers CP1 and CPL Remove the retaining clips on one end of the cable by loosening six screws on the shell (four centered on the mating side and two centered on the back of the shell), slip out the two clips. Bend the cable	

c. Procedure.

Step no.	Test equipment control settings	Equipment under test control settings	Test procedure	Performance standard
			into a circle and insert the male connector P1 into the female connector P2. Connect plugs P3 and P4 (sleeve markings P1/A-P2/A) as the cable to be tested (fig. 8-7).	
			b. Repeat steps 2 and 3.	b. Insertion loss of cable at both frequencies must not exceed 2.0 dB.
			c. Repeat steps 2 and 3 using plugs P5 and P6 of cable W3 as the cable to be tested.	*c.* Insertion loss of cable at both frequencies must not exceed 2.0 dB.
			d. Remove cable W3 from the test set-up disconnect P1 and P2, replace the retaining clips and tighten the six loosened screws. Replace couplers CP1 and CP2 between plugs P3/P4 and P5/P6 respectively.	
7	Controls at end of step 1		*a.* Refer to schematic diagram of cable W1 (fig.6-7). Remove and retain couplers CP1 through CP4. Remove the retaining clips on one end of the cable by loosening six screws on the shell (four centered on the mating aide and two centered on the back of the shell), slip out the clips. Insert male connector P1 into female connector P2. Connect plugs P3 and P4 as the cable to be tested (fig. 8-7).	
			b. Repeat steps 2 and 3.	*b.* Insertion loss of cable at both frequencies must not exceed 1.5dB.
			c. Repeat steps 2 and 3 using plugs P6 of cable W1 as the cable to be tested.	*c.* Insertion loss of cable at both frequencies must not exceed 1.5dB.
			d. Repeat steps 2 and 3 using plugs P7 and P8 of cable W1 as the cable to be tested	*d.* Insertion loss of cable at both frequencies must not exceed 1.5dB.
			e. Repeat steps 2 and 3 using plugs P9 and P10. of cable W1 as the cable to be tested	*e.* Insertion loss of cable at both frequincies must not exceed 1.5dB.
			f. Remove cable W1 from the test set-up, disconnect P1 from P2, replace the retaining clips and tighten the six loosening screws. Replace couplers CP1, CP2, CP3, and CP4 between plugs P3/P4, P5/P6, P7/P8, and P9/P10, respectively.	

8-11. Test Data Summary

a. Continuity Checks. Continuity checks on cables, extender boards and the front panel test adapter must be as indicated in paragraph 8-4.

b. Insulation Resistance. Insulation resistance tests on cables must indicate a minimum of 100 megohms.

c. Insertion Losses.

Hybrid Attenuator RF IN/OUT to RF SUM
-6.5 ± 1.5dB

Hybrid Attenuator ATTEN IN/RF DIFF to RF IN/OUT-6.5 ± 1.5dB with the hybrid attenuator set for minimum attenuation.

Four RF leads of cable W1-1.5dB maximum.
Two RF leads of cable W31.5dB maximum.
Cables W14/W15-2.0dB maximum.

d. Hybrid Attenuator Calibrations.

	Attenuation

Control	**1030MHz**	**1090MHz**
3.0	3 +3.0, -2.0dB	3 -± 1.0dB
6.0	6 +3.0, -2.0dB	6±1.0dB
9.0	9 +3.0, -2.0dB	9±.1.0dB
12	12 +3.0, -2.0dB	12 ±1.1dB
15	15 +3.0, -2.0dB	15 ± 1.1dB
20	20 +3.0, -2.0dB	20 ±1.1dB
25	26 +3.0, -2.0dB	25 ±1.2dB

e. VSWR of Hybrid Attenuator Connectors.

---- RF IN/OUT ---------- less than 1.65:1
---- RF SUM ---------- less than 1.2:1
---- CPLR IN---------- less than 1.5:1
---- ATTEN OUT ---------- less than 1.5:1

f. VSWR of Hybrid Attenuator. Overall VS-WR of the hybrid attenuator must be less than 1.6:1.

CHAPTER 9

DEPOT OVERHAUL STANDARDS

9-1. Applicability of Depot Overhaul Standards

Test Facilities Set AN/TPM-24 (V) 1 must be tested thoroughly after rebuild or repair to ensure that it meets adequate performance standards for return to stock and reissue. Use the test described in this chapter and in the applicable technical manuals referenced in paragraph 9-2. It is mandatory that equipment to be reissued, or returned to stock for reissue, meet all of these performance standards.

9-2. Applicable References

a. Repair Standards. Applicable procedures of the depot performing this and its general standards for repaired equipment form a part of the requirements for testing this equipment.

b. Technical Publications. The following Technical Manuals are applicable to this equipment.

Test equipment

Ohmmeter ZM-21/U
Coaxial Slotted Line IM-92/U
Indicator, Standing Wave Ratio AN/UPM-108
Multimeters AN/PSM-6, AN/PSM-6A, and AN/PSM-6B
Signal Generator SG-340 (A)/G (Model 612A UHF Signal Generator).
Variable Attenuator Alfred Electronics Model E101
Crystal Detector HP-423A
Low Pass Filter HP-360C
Adapter (type N male to type BNC female) UG 06/U
Adapter (type N male to type BNC female) UG-201A/U
Adapter (type BNC female to BNC female) UG-914/U
50-ohm termination, Microlab/FXR TA-6MN

9-4. General Test Requirements

Always allow at least 30 minutes for the equipment under test and the test equipment to reach stabilized temperatures. The test equipment and the materials required to perform the following test are listed in paragraph 9-3.

equipment and Subject	*Publications*
DS, GS, and Depot Maintenance Manual, Receiver-Transmitter Radio RT 861/UPX.	TM 11-5895-689-35
DS, GS, and Depot Maintenance Manual, Coder-Decoder, Interrogator Set AN/TPA-8.	TM 11-5895-690-35
DS, GS and Depot Maintenance Manual, Interrogator Set AN/TPX-45.	TM 11-5895-595-35

c. Modification Work Orders. Perform all applicable Modification Work Orders (MWO's) pertaining to this equipment before making test specified. DA Pam 310-7 lists all available MWO's.

9-3. Test Facilities Required

The following equipments, or suitable equivalents of known accuracy, will be employed in determining compliance with the requirements of this specific (standard and will be capable of conforming to their respective repair standard or depot overhaul standard.

Quantity *required*	*Applicable literature*
1	TM-11-2050
1	TM 11-5109
1	TM 11-6625-335-12
1	TM 11-6625-475-10
1	
1	
1	
1	
2	
2	
2	
2	

9-5. Continuity Checks

Check the continuity of all cables, extender boards, and front panel adapter.

9-6. Insulation Resistance

Connect the test equipment as shown in figure 8-2. Measure the insulation resistance of all

cables (the resistance between the conductor and the insulation material). A minimum reading of 100 megohms is required.

9-7. Insertion Losses

a. On the hybrid attenuator measure the insertion loss between RF IN/OUT and RF SUM connectors and the loss between the RF IN/OUT and ATTEN IN/RF DIFF connectors. The insertion losses should be 6.5 ± 1.5 dB.

NOTE

The hybrid attenuator control should be set for minimum attenuation. Refer to figures 8-3 and 8-4 for test connections.

b. The four RF leads of cable W1 should have a loss of 1.5 dB maximum. Refer to figure 6-7.

c. The two RF leads of cable W3 should have a loss of 1.5 dB maximum. Refer to figure 6-9.

d. The loss of cables W14 and W15 should have a loss of 2.0 dB maximum. Refer to figure 6-15.

9-8. Hybrid Attenuator

a. Connect the hybrid attenuator as shown in figure 8-5. The chart below gives the hybrid attenuator ATTENUATOR dial setting (fig. 1-3) and the minimum and maximum insertion loss in dB's at 1030 MHz and 1090 MHz.

Dial setting	Attenuation in dB's	
	1030 Mhz	1090 MHz
3.0	1-4	2-4
6.0	4-9	5-7
9.0	7-12	8-10
12	10-15	10.9-13.1
15	13-18	13.9-16.1
20	18-23	18.9-21.1
25	23-28	23.8-26.2

b. Check the actual dB value obtained in test a above against the value listed on the calibration chart chained to the handle of the hybrid attenuator (fig. 1-6). Make corrections on the chart as necessary.

9-9. VSWR of Hybrid Attenuator Connectors

a. Connect the equipment as shown in figure 8-6.

b. The chart below lists the hybrid connectors and gives the VSWR that is acceptable.

Connector	*VSWR*
RF IN/OUT	less than 1.65 to 1
RF SUM	less than 1.2 to 1
CPLR IN	less than 1.5 to 1
ATTEN OUT	less than 1.5 to 1

c. The overall VSWR of the hybrid attenuator must be less than 1.6 to 1.

CHAPTER 10

SHIPMENT AND LIMITED STORAGE, AND DEMOLITION TO PREVENT ENEMY USE

Section I. SHIPMENT AND LIMITED STORAGE

10-1. Disassembly of Test Set-up

Prepare the test facilities set for shipment or limited storage as follows:

a. Remove all power from the associated iff set.

b. Remove all cables and items connected to the iff set.

c. Gather all other items (not in use at time of disassembly). Check all items against the list of components for the test facilities set (para 1-7), to insure completeness.

d. Store the components in the transit case. Cables stored in the cover should be coiled neatly and placed such that the connectors will not bind the cable wire when the cable compartment holddown cover is closed. After the cables are placed in position, tighten the tie-down straps, making certain that all of the connectors are held firmly. Close the cable hold-down cover, depress and turn the three fasteners to hold the cover in place. Complete stowage by placing the rest of components in the slots allocated for them.

10-2. Repackaging for Shipment and Limited Storage

The exact procedure for repacking depends on the material available and the conditions under which the equipment is to be shipped or stored. Adapt the outline below as required. The information concerning the original packaging (fig. 2-1) will also be helpful.

a. Material Requirements. The following materials are required for packaging the test facilities set. For stock numbers of the materials, consult SB 8-100, Preservation, Packaging and Packing Materials, Supplies, and Equipment Used in the Army. Material dimensions are in inches.

NOTE

For short-haul travel or domestic shipment the transit case may be shipped without repacking. For overseas shipment or long-haul travel, the transit case should be repackaged.

Material	*Size (in.)*	*Quantity*
Polyethylene wrap	36 by 84	1
Humidity indicator	per MS-20003	1
Desiccant	per MIL-D 3464	2
Carton (350# DW)	22 3/4 BY 21 1/2 BY 20 1/2	1
sealing tape	3 BY 43	2

b. Packaging. After the components of the test facilities set have been placed in its transit case, perform the following:

(1) Place two desiccant bags and one spot humidity indicator inside the case. Close the transit case.

(2) Secure the warning label to the top of the transit case.

(3) Open the vent valve on the front of case.

(4) Wrap the transit case in polyethylene wrap.

(5) Place the transit case, wrapped in polyethylene, in the carton (fig. 2-1). Seal the carton.

(6) Mark the carton in accordance with MIL-STD-129.

c. Shipment. There are no special requirements for shipment of the test facilities set once it has been packaged. The test facilities set when package weighs approximately 85 pounds.

Section II. DEMOLITION OF MATERIAL TO PREVENT ENEMY USE

10-3. Authority for Demolition

The demolition procedures given in paragraph 9-4 will be used to prevent the enemy from using or salvaging this equipment. Demolition of the equipment will be accomplished only upon the order of the commander.

10-4. Methods of Destruction

The tactical situation and time available will determine the method to be used when destruction of equipment is ordered. In most cases, it is preferable to completely demolish some portions of the equipment rather than partially destroy all the equipment components.

a. smash. Use sledges, axes, hammers, and any other heavy tool available to smash the interior of the transit case, connectors, hybrid attenuator assembly, and printed-circuit boards.

b. Cut. Use axes, handaxes, machetes, and similar tools to cut the cables. Cut all cables in a number of places.

WARNING

Be extremely careful with explosives and incendiary devices. Use these items only when the need is urgent.

c. Burn. Burn the technical manuals first. Pour gasoline on the cut cables and smashed printed-circuit boards and burn them.

d. Explode. Use explosives to complete demolition or to cause maximum damage, before burning, when time does not permit complete demolition by other means. Powder charges, fragmentation grenades, or incendiary grenades may be used. Incendiary grenades usually are more effective if destruction of small parts and wiring is desired.

For quick destruction, place as much equipment as possible in the transit case, place an incendiary grenade in the unit, quickly close the cover, and get away from the transit case after the grenade is placed.

e. Dispose. Bury or scatter destroyed components or throw them into nearby waterways. This is particularly important if a number of components have not been completely destroyed.

APPENDIX A

REFERENCES

Following is a list of applicable references available to the operator, organizational and GS maintenance of Test Facilities Set AN/TPM-24 (V) 1.

DA Pam 310-4	Index of Technical Manuals, Technical Bulletins, Supply Bulletins, and Lubrication Orders.
DA Pam 310-7	U.S. Army Equipment Index of Modification Work Orders.
TM 11-5895-595-35	DS, GS and Depot Maintenance Manual, Interrogator Set AN/TPX-45.
TM 11-5895-689-35	DS, GS and Depot Maintenance Manual, Receiver-Transmitter, Radio RT-861/UPX.
TM 11-5895-690-35	DS, GS and Depot Maintenance Manual, Coder-Decoder, Interrogator Set AN/TPA-8.
TM 11-6625-335-12	Operator's and Organizational Maintenance Manual Indicator, Standing Wave Ratio AN/UPM-108.
TM	11-6625-475-10Operator's Manual Multimeters AN/PSM-6, AN/PSM-6A and AN/PSM-6B.
TM 11-2050	Test Set I-48-B and Ohmmeter, ZM-21A/U.
TM 11-5109	Coaxial Slotted Line IM-92/U.
	Technical Manual Signal Generator SG-340/U.

APPENDIX B

BASIC ISSUE ITEMS LIST (BILL) AND ITEMS TROOP

INSTALLED OR AUTHORIZED UST (ITIAL)

Section I. INTRODUCTION

B-1. Scope

This appendix lists basic issue items required by the crew/operator for installation, operation, and maintenance of Test Facilities Set AN/TPM-24(V)1.

B-2. General

This Basic Issue Items and Items Troop Installed or Authorized List is divided into the following sections:

a. Basic Issue Items List-Section II. A list, in alphabetical sequence, of items which are furnished with, and which must be turned in with the end item.

b. Items Troop Installed or Authorized List-Section III. Not applicable.

B-3. Explanation of Columns

The following provides an explanation of columns found in the tabular listings:

a. Illustration. This column is divided as follows:

(1) Figure number. Indicates the figure number of the illustration in which the item is shown.

(2) Item number. Not applicable.

b. Federal Stock Number. Indicates the Federal stock number assigned to the item and will be used for requisitioning purposes.

c. Part number. Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications standards, and inspection requirements, to identify an item or range of items.

d. Federal Supply Code for Manufacturer (FSCM). The FSCM is a 5-digit numeric code used to identify the manufacturer, distributor, or Government agency, etc., and is identified in SB 708-42.

e. Description. Indicates the Federal item name and a minimum description required to identify the item.

f. Unit of Measure (U/M). Indicates the standard of basic quantity of the listed item as used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation, (e.g., ea, in., pr, etc.). When the unit of measure differs from the unit of issue, the lowest unit of issue that will satisfy the required units of measure will be requisitioned.

g. Quantity Furnished with Equipment (Basic Issue Items Only). Indicates the quantity of the basic issue item furnished with the equipment.

Section II. BASIC ISSUE ITEMS LIST

(1) ILLUSTRATION		(2)	(3)	(4)	(5)	(6)	(7)
(A) FIG NO.	(B) ITEM NO.	FEDERAL STOCK NUMBER	PART NUMBER	FSCM	DESCRIPTION ON CODE	UNIT OF USABLE MEAS	QTY FURN WITH EQUIP
1-2		6625-133-7799			CASE, TEST FACILITIES Set CY-6824/TPM-24(V)1	EA	1

APPENDIX C

MAINTENANCE ALLOCATION

Section I. INTRODUCTION

C-1. General

This appendix provides a summary of the maintenance operations covered in the equipment literature for the AN/TPM-24(V)1. 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. Aline. 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 it the depot maintenance category. Rebuild reduces to zero the hours or miles the equipment, or component thereof, has been in use.

l. Symbols. The uppercase letter placed in the appropriate column indicates the lowest level at

which that particular maintenance function is to be performed.

C-3. Explanation of Format

a. Column 1, Group Number. Not applicable.

b. Column 2, Functional Group. Column 2 lists the noun names of components, assemblies, subassemblies and modules on which maintenance is authorized.

c. Column 5, Maintenance Functions. Column 3 list 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
0	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 b, Remarks. Self-explanatory.

C-4. Explanation of Format of Table 1, Tool and Test Equipment Requirements

The column in table 1, Tool and Test Equipment Requirements are as follows:

a. Tools and Equipment. The numbers in this column coincide with the numbers used in the tools and equipment column of the Maintenance Allocation Chart. The numbers indicate the applicable tool for the maintenance function.

b. Maintenance Category. The codes in this column indicate the maintenance category normally allocated the facility.

c. Nomenclature. This column lists tools, test, and maintenance equipment required to perform the maintenance functions.

d. Federal Stock Number. This column lists the Federal stock number of the specific tool or test equipment.

e. Tool Number. Not used.

Section II. MAINTENANCE ALLOCATION CHART

MAINTENANCE ALLOCATION CHART

GROUP NUMBER	FUNCTIONAL GROUP COMPONENT ASSEMBLY	MAINTENANCE FUNCTIONS											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
	AN/TPM-24(V1) & (V3)	C												VISUAL
			C											OPERATIONAL
			H										2 THRU 9, 11, 12	
				C									1	PREVENTIVE MAINT.
							H						4 THRU 9, 11, 12	
									C					
										H			1, 10,	SHOP FACILITIES
											D	D	1 THRU 12	DEPOT FACILITIES
	HYBRID ATTENUATOR ASSEMBLIES	C												VISUAL
			H										2 THRU 9, 11, 12	
				C									1	PREVENTIVE MAINT.
							H						4 THRU 9, 11, 12	
									C					
										H			1	SHOP FACILITIES
W25	EXTENDER CABLE ASSEMBLY	C												
			C										2	
									C					
										H			1	SHOP FACILITIES
			H				H						2, 3, 4 7, 9, 12	

MAINTENANCE ALLOCATION CHART

GROUP NUMBER	FUNCTIONAL GROUP COMPONENT ASSEMBLY	MAINTENANCE FUNCTIONS											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
	AN/TPM-24(V1) & (V3)													
W1	EXTENDER CALBE	C												VISUAL
W2	ASSEMBLIES		C										2	
W3			H				H						2, 3, 4	
W4									C					NON REPAIRABLE EXCEPT
W13														FOR REPLACEMENT OF
W39														STANDARD CONNECTORS.
W40														
W41														
W42														
W43														
W48														
	EXTENDER CABLE	C												VISUAL
W5	ASSEMBLIES		C										2	
W11			H				H						2, 3, 4,	
W12													7, 9, 12	
									C					
W14/W15										H			1	SHOP FACILITIES
W16														
W21														
W32														
W44														
W45														
W47														
	EXTENDER CARDS	C												VISUAL
			C										2	
									C					
										H			1, 10	SHOP FACILITIES
	SHORTING PLUG	C												VISUAL
	ASSEMBLIES		C										2	
									C					
	ATTENUATOR, FIXED	C												
			C										2	
			H										2, 4, 7, 9	SHOP FACILITIES

(1) GROUP NUMBER	(2) FUNCTIONAL GROUP	(3) MAINTENANCE FUNCTIONS											(4) TOOLS AND EQUIPMENT	(5) REMARKS
		A INSPECT	B TEST	C SERVICE	D ADJUST	E ALIGN	F CALIBRATE	G INSTALL	H REPLACE	I REPAIR	J OVERHAUL	K REBUILD		
	AN/TPM-24(V1) & (V3) ADAPTER, TEST M-8565/TPM-24(V)	C	C						C	H			2 1	VISUAL SHOP FACILITIES

Table 1. TOOL AND TEST EQUIPMENT REQUIREMENTS

TOOLS AND TEST EQUIPMENT REQUIREMENTS				
TOOLS AND EQUIPMENT	**MAINTENANCE CATEGORY**	**NOMENCLATURE**	**FEDERAL STOCK NUMBER**	**TOOL NUMBER**
		AN/TPM-24(V1) & (V3)		
1	F,H,D	TOOL KIT, ELECTRONIC EQUIPMENT TK-100/G	5180-605-0079	
2	F,H,D	MULTIMETER, AN/PSM-6B	6625-957-4374	
3	H,D	OHMETER, ZM-21A/U	6625-581-2466	
4	H,D	SIGNAL GENERATOR, SG-340/G	6625-542-1292	
5	H,D	LOW-PASS, BAND PASS FILTER HP 360C	5915-503-0533	
6	H,D	O-50dB ALFRED MODEL E101 (Will be in Repair Parts and special Tools List)		
7	H,D	INDICATOR, STANDING WAVE RATIO AN/UPM-108A	6625-682-4494	
8	H,D	CRYSTAL DETECTOR, HP 423A	4940-871-8508	
9	H,D	SLOTTED LINE 1M-92/U	6625-356-0314	
10	H,D	REFAIR KIT, PRINTED WIRING BOARD, MK-772/U	5999-757-7042	
11	H,D	TERMINATION, 50 OHM, MICRO LAB/FXR TA-6MN (2 required; will be in Repair Parts and Special Tools List)		
12	H,D	ADAPTER, N MALE/BNC FEMALE UG-201A/U	5935-201-3090	

APPENDIX D

ORGAN1ZAT1ONAL D1RECT SUPPORT, GENERAL SUPPORT, AND DEPOT MA1NTENANCE

REFAR PARTS AND SPECAL TOOL LISTS

Section I. INTRODUCTION

D-1. Scope

This appendix lists Repair parts and special tools required for the performance of organizational, direct support, general support, and depot maintenance of the AN/TPM-24(V)1.

D-2. General

This Repair Parts and Special Tools List is divided into the following sections:

a. Prescribed Load Allowance (PLA)-Section II. A composite listing of Repair parts, special tools, test and support equipment having quantitative allowances for initial stockage at the organizational level.

b. Repair Parts for Organ1zat1onal Ma1ntenance-Section III list of Repair parts authorized for the performance of maintenance at the organizational level.

c. Special Tools, Test, and Support Equipment for Organizational Maintenance-Section IV. Not applicable.

d. Repair Parts for Direct Support, General Support, and Depot Maintenance-Section V. A list of Repair parts authorized for the performance of maintenance at the direct support, general support, and depot level.

e. Special Tools, Test, and Support Equipment for Direct Support, General Support, and Depot Maintenance-Section VI Not applicable.

f. Index-Federal Stock Number Cross Reference to Figure and item Number of Designat1on-Section VII. A list of Federal stock numbers in ascend1ng numerical sequence, followed by a list of reference numbers appearing in ascending alphanumeric sequence, cross-referenced to the illustration figure number and reference designation.

g. Index---Reference Designation Cross Reference to Page Number-Sect1on VIII. A list of reference designations cross-referenced to page numbers.

D-3. Explanation of Columns

The following provides an explanation of columns in the tabular lists:

a. Source, Maintenance, and Recoverability Codes (SMR).

(1) Source code indicates the selection status and source for the listed item. Source codes are:

Code	*Explanation*
P	Repair parts which are stocked in or supplied from the GSA/DSA, or Army supply system and authorized for use at indicated maintenance categories.
P2	Repair parts which are procured and stocked for insurance purposes because the combat or military essentiality of the end-item dictates that a minimum quantity be available in the supply system.
P9	Assigned to items which are NSA design controlled: unique Repair parts, special tools, test, measuring and diagnostic equipment, which are stocked and supplied by the Army COMSEC logistic system, and which are not subject to the provisions of AR 38041.
P10	Assigned to items which are NSA design controlled: special tools, test, measuring and diagnostic equipment for COMSEC support, which are accountable under the provisions of AR 380-41, and which are stocked and supplied by the Army COMSEC logistic system.

Code	*Explanation*
M	Repair parts which are not procured or stocked, but are to be manufactured in indicated maintenance levels.
A	Assemblies which are not procured or stocked as such, but are made up of two or more units. Such component units carry individual stock numbers and descriptions, are procured and stocked separately and can be assembled to form the required assembly at indicated maintenance categories.
X	Parts and assemblies which are not procured or stocked and the mortality of which normally is below that of the applicable end item or component. The failure of such part or assembly should result in retirement of the end-item from the supply system.
X1	Repair parts which are not procured or stocked. The requirement for such items will be filled by use of the next higher assembly or component.
X2	Repair parts which are not stocked. The indicated maintenance category requiring such Repair parts will attempt to obtain same through cannibalization. Where such Repair parts are not obtainable through cannibalization, requirements will be requisitioned, with accompanying justification, through normal supply channels.
G	Major assemblies that are procured with PEMA funds for initial issue only as exchange assemblies at DSU and GSU level. These assemblies will not be stocked above DS and GS level or returned to depot supply level.

(2) Maintenance code indicates the lowest category of maintenance authorized to install the listed item. The maintenance level codes are:

Code	*Explanation*
C	Operator/Crew
0	Organizational Maintenance
F	Direct Support Maintenance
H	General Support Maintenance
D	Depot Maintenance

(3) Recoverability code indicates whether unserviceable items should be returned for recovery or salvage. Items not coded are expendable. Recoverability codes are:

Code	*Explanation*
R	Repair parts and assemblies that are economically Repairable at DSU and GSU activities and are normally furnished by supply on an exchange basis.
S	Repair parts and assemblies which are economically Repairable at DSU and GSU activities and which normally are furnished by supply on an exchange basis. When items are determined by GSU to be uneconomically Repairable, they will be evacuated to a depot for evaluation and analysis before final disposition.
T	High dollar value recoverable Repair parts which are subject to special handling and are issued on an exchange basis. Such Repair parts normally are repaired or overhauled at depot maintenance activities.
U	repair parts specifically selected for salvage by reclamation units because of precious metal content, critical materials, or high dollar value reusable casings or castings.

b. Federal Stock Number. Indicates the Federal stock number assigned to the item and will be used for requisitioning purposes.

c. Description. Indicates the Federal item name and any additional description of the item required. The index number has been included as part of the description to aid in the location of "same as" items. A part number or other reference number is followed by the applicable five-digit Federal supply code for manufacturers in parentheses.

d. Unit of Measure (U/M). A two-character alphabetic abbreviation indicating the amount or quantity of the item upon which the allowances are based, e.g., ft, ea, pr, etc.

e. Quantity Incorporated in Unit. Indicates the quantity of the item used in the AN/TPM-24(V)1. Subsequent appearances of the same item in the same assembly are indicated by the letters "REF".

f. 15-Day Organizational Maintenance Allowances.

(1) The allowance columns are divided into four subcolumns. Indicated in each subcolumn opposite the first appearance of each item is the total quantity of items authorized for the number of equipments supported. Subsequent appearances of the same item will have the letters "REF" in the allowance columns. Items authorized for use as required, but not for initial

stockage, are identified with an asterisk in the allowance column.

(2) The quantitative allowances for organizational level of maintenance represents one initial prescribed load for a 15-day period for the number of equipments supported. Units and organizations authorized additional prescribed loads will multiply the number of prescribed loads authorized by the quantity of repair parts reflected in the appropriate density column to obtain the total quantity of repair parts authorized.

(3) Organizational units providing maintenance for more than 100 of these equipments shall determine the total quantity of parts required by converting the equipment quantity to a decimal factor by placing a decimal point before the next to last digit of the number to indicate hundredths, and multiplying the decimal factor by the parts quantity authorized allowance for the 51-100 allowance column. Example, authorized allowance for 51-100 equipments is 12, for 140 equipments multiply 12 by 1.40 or 16.80 rounded off to 17 parts required.

(4) Subsequent changes to allowances will be limited as follows: No change in the range of items is authorized. If additional items -are considered necessary, recommendation should be forwarded to Commanding General, U.S. Army Electronics Command, ATTN: AMSEL-ME-NMP-EM, Fort Monmouth, New Jersey 07703, for exception or revision to the allowance list. Revisions to the range of items authorized will be made by the USAECOM National Maintenance Point based upon engineering experience, demand data, or TAERS information.

g. 3O-Day DS/GS Maintenance Allowances.

NOTE

Allowances in GS column are for GS maintenance only.

(1) The allowance columns are divided into three subcolumns. Indicated in each subcolumn, opposite the first appearance of each item, is the total quantity of items authorized for the number of equipments supported. Subsequent appearances of the same item will have the letters "REF" in the applicable allowance columns Items authorized for use as-required, but not for initial stockage, are identified with an asterisk in the allowance column.

(2) The quantitative allowances for DS/GS levels of maintenance will Represent initial stockage for a 30-day period for the number of equipments supported.

(3) Determination of the total quantity of parts required for maintenance of more than 100 of these equipments can be accomplished by converting the equipment quantity to a decimal factor by placing a decimal point before the next to last digit of the number to indicate hundredths, and multiplying the decimal factor by the parts quantity authorized in the 51-100 allowance column. Example, authorized allowance for 51-100 equipments is 40; for 150 equipments multiply 40 by 1.50 or 60 parts required.

h. 1-Year Allowances Per 100 Equipments/Contingency Planning Purposes. Indicates opposite the first appearance of each item the total quantity required for distribution and contingency planning purposes. The range of items indicates total quantities of all authorized items required to provide for adequate support of 100 equipments for one year.

I. Depot Maintenance Allowance Per 100 Equipments. Indicates opposite the first appearance of each item the total quantity authorized for depot maintenance of 100 equipments. Subsequent appearances of the same item will have the letters "REF" in the allowance column. Items authorized for use as required, but not for initial stockage, are identified with an asterisk in the allowance column.

j. Illustrations.

(1) *Figure number*. Indicates the figure number of the illustration in which the item is shown.

(2) Item number or reference designation. Indicates the reference designation used to identify the item in the illustration.

D-4. Special Information

repair parts mortality is computed from failure rates derived from experience factors with the individual parts in a variety of equipments. Variations in the specific application and periods of use of electronics equipment, the fragility of electronic piece parts, plus intangible material and quality factors intrinsic to the manufacture of electronic parts, do not permit mortality to be based on hours of end-item use. However, long periods of continuous use under adverse conditions are likely to increase repair parts mortality.

D-5. Location of repair Parts

a. This appendix contains two cross-reference indexes (sec VII and sec VIII) to be used to locate a repair part when either the Federal stock number, reference number (manufacturer's part number), or reference designation is known. The first column in each index is prepared in numerical and/or alphanumeric sequence in ascending order Where a Federal stock number is not listed, refer to the reference number (manufacturer's part numbers) immediately following the Federal stock number.

b. When the Federal stock number is known, follow the procedures given in (1) and (2) below.

(1) Refer to the index of Federal stock numbers (sec VII) and locate the Federal stock number. The FSN is cross-referenced to the applicable figure and reference designation.

(2) When the reference designation is determined, refer to the reference designation index (sec. VIII). The reference designations are listed in alphanumeric ascending order and are cross-referenced to the page number on which they appear in the repair parts list (sec III and sec V). Refer to the page number noted in the index and locate the reference designation in the repair parts list (col. 7b, repair Parts for Organizational Maintenance or col. 10b, repair Parts for Direct Support, General Support and Depot Maintenance). If the word "REF" appears in the allowance column for the repair part, note the Federal stock number (col. 2) or manufacturer's part number (col. 3). Refer to the FSN index and note the reference designation for that FSN or part number. Refer to the reference designation index and note the page number given for the reference designation. Refer to the page noted in the RPSTL (sec III or sec V) and locate the reference designation in column 7b, repair Parts for Organizational Maintenance or column 10b, repair Parts for Direct Support, General Support, and Depot Maintenance of the repair parts list.

c. When the reference designation is known, follow the procedures given in b(2) above.

d. When neither the FSN nor reference designation is known, identify the part in the illustration and follow directions given in *c* above or scrutinize column 3 of the repair parts lists (sec III and sec V).

D-6. Federal Supply Code for Manufacturers

Code	*Manufacturer*
00779	AMP Inc.
00929	Microlab/FXR
01480	Whirlpool Corp.
01881	Anaconda American Brass Co.
02660	Bunker & Ramo Corp., The Amphenal Connector Div.
08795	Rayclad Tubes Inc.
09922	Burndy Corp.
12457	Merrimac Research and Development Inc.
14925	Brown Engineering A Teledyne Co.
16179	Omni Spectra Inc.
16733	Phelps Dodge Communications Co., A Division of Phelps Dodge Copper Products Corp.
17549	ITT Gremar Connectors Canada L+
19178	Zero Mfg. Co. East Division
22238	MI & KRO Connector Corp.
28480	Hewlett-Packard Company
46384	Penn Engineering and Mfg. Corp.
76545	Mueller Electric Company
77820	The Bendix Corp., Electrical Components Division
80058	Joint Electronic Type Designation System
80205	National Aerospace Standards Committee, Aerospace Industries Association of America Inc.
80249	Hazeltine Corp.
81349	Military Specifications
84971	TA Mfg. Corp.
88044	Aeronautical Standards Group, Dept. of Navy and Air Force
91737	ITT Gremar Inc.
93306	Uniform Tubes
94375	Automatic Metal Products Corp.
95077	General RF Fittings Inc.
95238	Continental Connector Corp.
96906	Military Standards
98313	Davis Aircraft Products Co. Inc.
98376	Zero Mfg. Co. West Division
99899	The Narda Microwave Corp.

Section II. PRESCRIBED LOAD ALLOWANCE

(1) FEDERAL STOCK NUMBER	(2) DESCRIPTION USABLE ON CODE	(3) 15-DAY ORG. MAINT. ALLOWANCE (a) 1-5	(b) 6-20	(c) 21-50	(d) 51-100
5935-837-5280	ADAPTER, CONNECTOR UG-1896/TPM-24(V): 21190 (16179				1
5995-905-7194	CABLE ASSEMBLY, RADIO FREQUENCY CG-409F/Y(6FT): SMD657879 (80249)				1
6625-133-7795	CABLE ASSEMBLY,SP, ELEC, BR CX-12228/TPM-24(V) (80249)				1

Section III. REFAIR PARTS FOR ORGANIZATIONAL MAINTENANCE

(1) SMR CODE	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION REF NUMBER & MFR CODE — USABLE ON CODE	(4) UNIT OF MEAS	(5) QTY INC IN UNIT	(6) 15-DAY ORGANIZATIONAL MAINTENANCE ALW (A) 1-5	(B) 6-20	(C) 21-50	(D) 51-100	(7) ILLUS-TRATION (A) FIG. NO.	(B) ITEM NO.
	6625-133-7868	A001TEST FACILITIES SET AN/TPM-24(V)1: (This item is nonexpendable)							1-1	
P-C	5935-842-9614	A002ADAPTER, CONNECTOR: UG201AU (81349)	EA	2	*	*	*	*	1-6(1)	CP7
P-C	5935-842-9614	A003ADAPTER, CONNECTOR. SAME AS A002	EA	REF	REF	REF	REF	REF	1-6(1)	CP8
P-C	5935-177-2761	A004ADAPTER, CONNECTOR UG-1898/TPM-24(V): 701067 (18733)	EA	2	*	*	*	*	1-6(1)	CP5
P-C	5935-177-2786	A005ADAPTER, CONNECTOR UG-1898/TPM-24(V): SAME AS A004	EA	REF	REF	REF	REF	REF	1-6(1)	CP6
P-C	5935-837-5280	A006ADAPTER, CONNECTOR UG-1896/TPM-24(V): 21190 (18179)	EA	3	*	*	*	*	1-6(1)	CP2
P-C	5935-837-5280	A007ADAPTER, CONNECTOR UG-1896/TPM-24(V): SAME AS A006	EA	REF	REF	REF	REF	REF	1-6(1)	CP3
P-C	5935-837-5280	A008ADAPTER, CONNECTOR UG-1896/TPM-24(V): SAME AS A006	EA	REF	REF	REF	REF	REF	1-6(1)	CP4
P-C	5935-075-7008	A009ADAPTER, CONNECTOR UG-1897/TPM-24(V): 21170 (16179)	EA	1	*	*	*	*	1-6(1)	CP1
P-CR	6625-176-5498	A010ADAPTER, TEST MX-8564/TPM-24(V): SMC687994 (80249)	EA	1					1-4	A6
P-C	5935-177-2762	A041DUMMY, CONNECTOR, PLUG MX-8566/ TPM-24(V): SMB687996 (80249)	EA	1	*	*	*	*	1-6(1)	P2
P-C	5935-17'7-2783	A042DUMMY, CONNECTOR, PLUG MX-8567/ TPM-24(V); SMB687997 (80249)	EA	1	*	*	*	*	1-6(1)	P1
P-C	5985-128-0195	A043ATTENUATOR, FIXED CN-1321/TPM-24(V): 8491A (28480)	EA	2	*	*	*	*	1-6(1)	AT1
P-C	5985-128-0195	A044ATTENUATOR, FIXED CN-1321/TPM-24(V): SAME AS A043	EA	REF	REF	REF	REF	REF	1-6(1)	AT2
P-C	6625-133-7803	A045CABLE ASSEMBLY, RADIO FREQ, BR CG-3614/TPM-24(V): SMD688000 (80249)	EA	1	*	*	*	*	1-5(1)	W1
P-C	6625-133-7852	A073CABLE ASSEMBLY, SP, ELECTRICAL CX-12219/TPM-24(V)' SMD688001 (80249)	EA	1	*	*	*	*	1-5(1)	W2
P-C	6825-133-7804	A093CABLE ASSEMBLY, RADIO FREQ, BR CG-3615/TPM-24(V)* SMD688002 (80249)	EA	1	*	*	*	*	1-5(1)	W3
P-C	8625-133-7850	A118CABLE ASSEMBLY, SP, ELECTRICAL CX- 12220/TPM-24(V): SMD688003 (80249)	EA	1	*	*	*	*	1-5(1)	W4
P-C	6625-177-4488	A134CABLE ASSEMBLY, RADIO FREQUENCY CG-3607/TPM-24(V): SMD687998 (80249)	EA	1	*	*	*	*	1-5(1)	W5
P-C	6625-177-4498	A139CABLE ASSEMBLY, SP, ELECTRICAL CX-12221/TPM-24(V) SMD688004 (80249)	EA	1	*	*	*	*	1-5(1)	W11
P-C	6625-177-4491	A146CABLE ASSEMBLY, RADIO FREQUENCY CG-3609/TPM-24(V) SMC688005 (80249)	EA	1	*	*	*	*	1-5(1)	W12
P-C	6625-177-4489	A154CABLE ASSEMBLY, RADJO FREQUENCY CG-3608/TPM-24(V). SMC687978 (80249)	EA	1	*	*	*	*	1-5(1)	W13

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Section III. REFAIR PARTS FOR ORGANIZATIONAL MAINTENANCE

(1) SMR CODE	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION REF NUMBER & MFR CODE	USABLE ON CODE	(4) UNIT OF MEAS	(5) QTY INC IN UNIT	(6) 15-DAY ORGANIZATIONAL MAINTENANCE ALW (A) 1-5	(B) 6-20	(C) 21-50	(D) 51-100	(7) ILLUS-TRATION (A) FIG. NO.	(B) ITEM NO.
P-CR	5995-905-7194	A159CABLE ASSEMBLY, RADIO FREQUENCY CG-409F/U(6 FT): SMD657879 (80249)		EA	2	*	*	*	*	1-5(1)	W14
P-CR	5995-905-7194	A160CABLE ASSEMELY, RADIO FREQUENCY CG-409F/U(6 FT): SAME AS A159		EA	REF	REF	REF	REF	REF	1-5(1)	W15
P-C-R	6625-177-4490	A169CABLE ASSEMBLY, RADIO FREQUENCY CG-3610/TPM-24(V): SMC687979 (80249)		EA	1	*	*	*	*	1-5(1)	W14
P-CR	5625-177-4492	A178CABLE ASSEMBLY, RADIO FRECJENCY CG-3611 /TPM-24(V): SMC687999 (80249)		EA	1	*	*	*	*	1-5(1)	W16
P-CR	6625-133-7795	A183CABLE ASSEMBLY, SP, ELEC. BR CX- 12228/TPM-24(V): SMCS880M0 (80249)		EA	1	*	*	*	*	1-5(1)	W25
P-C-R	6625-177-4499	A196CABLE ASSEMBLY, SP, ELECTRICAL CX-12226/TPM-24(V): SMD688007 (80249'		EA	1	*	*	*	*	1-5(1)	W44
X2-CR	6625-133-7799	A203CASE, TEST FACILITIES SET CY-6824/ TPM-24(V) 1: SMD687993-2 (80249)		EA	1					1-2	MP4
P-C	5985-861-7856	A204DUMMY LOAD, ELECTRICAL DA-558/ M-24(V): TA5MB (00929)		EA	2	*	*	*	*	1-6(1)	AT3
P-C	5985-861-7856	A205DUMMY LOAD. ELECTRICAL DA-558/ TPM-24(V): SAME AS A204		EA	REF	REF	REF	REF	REF	1-6(1)	AT4
P-C	5950-970-1869	A206DUMMY LOAD, ELECTRICAL DA-559/ TPM-24(V): BNCRT1M75 (91737)		EA	2	*	*	*	*	1-6(1)	AT5
P-C	5950-970-1869	A207DUMMY LOAD, ELECTRICAL DA-559/ TPM-24(V): SAME AS A206		EA	REF	REF	REF	REF	REF	1-6(1)	AT6
P-CR	5625-133-7776	A208EXTENDER, CIRCUIT BOARD MX-8559/ TPM-24(V): SMD687959 (80249)		EA	1	*	*	*	*	1-6(2)	A7
P-CR	5625-133-7775	A226EXTENDER, CIRCUIT BOARD MX-8561/ TPM-24(V): SMC687960 (80249)		EA	1	*	*	*	*	1-6(2)	A8
P-CR	5625-133-7773	A229EXTENDER, CIRCUIT BOARD MX-8562/ TPM-24(V): SMC687961 (80249)		EA	1	*	*	*	*	1-6(2)	A9
G-C-S	5985-177-2939	A232HYBRID ATTENUATOR ASSEMBLY CN-1322/TPM-24(V): SMD687967 (80249)		EA	1	*	*	*	*	1-3	A1
P-C	5120-450-6766	A319PULLER, PRINTED WIRING BOARD SMB687971-2 (80249)		EA	1	*	*	*	*	1-6(2)	MP1
P-C	6625-465-1706	A320SCALE, CATHODE RAY TUBE: SMC657851 (80249)		EA	1	*	*	*	*		MP2

Section V. REFAIR PARTS FOR DIRECT SUPPORT, GENERAL SUPPORT, AND DEPOT MAINTENANCE

(1) SMR CODE	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION REF. NUMBER & MFR CODE	USABLE ON CODE	(4) UNIT OF MEAS	(5) QTY INC IN UNIT	(6) 30 DAY DS MAINT ALLOWANCE (A) 1-20	(B) 21-50	(C) 51-100	(7) 30 DAY DS MAINT ALLOWANCE (A) 1-20	(B) 21-50	(C) 51-100	(8) 1-YR ALW PER 100 EQUIP CNTGY	(9) DEPOT MAINT ALW PER 100 EQUIP	(10) ILLUSTRATION (A) FIG. NO.	(B) ITEM NO. OR REFERENCE DESIGNATION
	5825-133-7864	A001 TEST FACILITIES SET1-1 AN/TPM-24(V) 1: (This item is nonexpendable)													
P-C	5935-842-9614	A002 ADAPTER, CONNECTOR UG201AU (81349)		EA	2	*	*	1	*		*	10	6	1-6(1)	CP7
P-C	5935-842-9614	A003 ADAPTER, CONNECTOR: SAME AS AO02		EA	REF	REF	REF	REF	REF	REF	REF	REF	REF	1-6(1)	CP8
P-C	5935-177-2761	A004 ADAPTER, CONNECTOR UG-1898/TPM-24(V): 701067 (16733)		EA	2	*	*	1	*		*	10	6	1-6(1)	CP5
P-C	5935-177-2761	A005 ADAPTER, CONNECTOR UG-1898/TPM-24(V): SAME AS A004		EA	REF	REF	REF	REF	REF	REF	REF	REF	REF	1-6(1)	CP6
P-C	5935-837-5280	A006 ADAPTER, CONNECTOR UG-1896/TPM-24(V): 21190 (16179)		EA	3	*	*	1	1	*	1	13	9	1-6(1)	CP2
P-C	5935-837-5280	A007 ADAPTER, CONNECTOR UG-1896/TPM-24(V): SAME AS A006		EA	REF	REF	REF	REF	REF	REF	REF	REF	REF	1-6(1)	CP3
P-C	5935-837-5280	A008 ADAPTER, CONNECTOR UG-1896/TPM-24(V): SAME AS A006		EA	REF	REF	REF	REF	REF	REF	REF	REF	REF	1-6(1)	CP4
P-C	5935-075-7008	A009 ADAPTER, CONNECTOR UG-1897/TPM-24(V): 21170 .(16179)		EA	1	*	*	*	*	*	*	5	3	1-6(1)	CP1
X2-CR	6625-176-5498	A010 ADAPTER, TEST MX-8564/TPM-24(V): SMC687994 (80249)		EA	1									1-4	A6
P-H	5340-664-6881	A010OA BUMPER, RUBBER: 711 (70485)		EA	4				*	*	1		10		A6MP10
X1-H		A011 CHASSIS, ELECTRICAL EQUIPMENT: SMB687995 (80249)		EA	1										ASMP1
X1- H		A012 CHASSIS, ELECTRICAL EQUIPMENT: sMD687965 (80249)		EA	1										A6MP2
X1-H		A013 CHASSIS, ELECTRICAL EQUIPMENT: SMD687965-1 (80249)		EA	1										A6MP3
X2-H	5325-817-1126	A014 EYELET, METALLIC: 493 (01881)		EA	1										A6H1
X2-H	5310-864-5798	A015 NUT, SELF-LOCKING, CLINCH: LK9032-2 (46384)		EA	1										A6H2
X2-H	5310-819-9188	A016 NUT, SELF-LOCKING, CLINCH: LK9832-2 (46384)		EA	6										A6H3
P-H	5340-997-2964	A017 CLAMP, LOOP: M821322-36 (96906)		EA	1				*	*	*	5	3		A6MP4
X2-H	5305-050-9227	A018 SCREW, MACHINE: MS51957-61 (96906)		EA	1										A6H4
P-H	5935-772-9261	A019 CONNECTOR, PLUG, ELECTRICAL: MS3116FI6-26P (96906)		EA	1				*	*	*	5	3	1-4	A6P1

SECTION V. REFAIR PARTS FOR DIRECT SUPPORT, GENERAL SUPPORT, AND DEPOT MAINTENANCE

(1) SMR CODE	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION / REF. NUMBER & MFR CODE / USABLE ON CODE	(4) UNIT OF MEAS	(5) QTY INC IN UNIT	(6) 30 DAY DS MAINT ALLOWANCE (A) 1-20	(B) 21-50	(C) 51-100	(7) 30 DAY DS MAINT ALLOWANCE (A) 1-20	(B) 21-50	(C) 51-100	(8) 1-YR ALW PER 100 EQUIP CNTGY	(9) DEPOT MAINT ALW PER 100 EQUIP	(10) ILLUSTRATION (A) FIG. NO.	(B) ITEM NO. OR REFERENCE DESIGNATION
X1-H		A020 COVER, REAR: SMB687966 (80249)	EA	1										A6MP5
X2-H	5305-054-6652	A021 SCREW, MACHINE: MS51957-28 (96906)	EA	6										A6H5
P-H	5340-761-1258	A022 HANDLE, BOW: MS39087-6 (96906)	EA	2				*	*	*		3		A6MP6
X2-H	5305-050-9229	A023 SCREW, MACHINE: MS51957-63 (96906)	EA	4										ASH6
X2-H	5310-933-8120	A024 WASHER, LOCK: MS35338-138 (96906)	EA	4										A6H7
X2-H		A025 INSULATION, SLEEVING: RT510-1-4 (08795)	FT	1										A6MP7
P-H	5935-578-3489	A026 JACK, TIP: MS16108-2A (96906)	EA	7				*	1	2	25	28	3-2	A6J1
P-H	5935-578-3489	A027 JACK, TIP: SAME AS A026	EA	REF				REF	REF	REF	REF	REF	3-2	A6J2
P-H	5935-578-3489	A028 JACK, TIP: SAME AS A026	EA	REF				REF	REF	REF	REF	REF	3-2	ASJ3
P-H	5935-578-3489	A029 JACK, TIP: SAME AS A026	EA	REF				REF	REF	REF	REF	REF	3-2	A6J4
P-H	5935-578-3489	A030 JACK, TIP: SAME AS A026	EA	REF				REF	REF	REF	REF	REF	3-2	A6J5
P-H	5935-578-3489	A031 JACK, TIP: SAME AS A026	EA	REF				REF	REF	REF	REF	REF	3-2	A6J6
P-H	5935-578-3489	A032 JACK, TIP: SAME AS A026	EA	REF				REF	REF	REF	REF	REF	3-2	A6J7
P-H	5935-577-2336	A033 JACK, TIP: MS16108-3A (96906)	EA	1				*	*	*	5	3	3-2	A6J8
P-F	5355-842-3111	A034 KNOB: MS91528-A2B (96906)	EA	1	*	*	*		*	*	*	3		AGMP8
M-D		A035 PLATE, IDENTIFICATION: SMD657839-4 (80249)	EA	1										A6MP9
X2-H	5310-934-9748	A036 NUT, PLAIN, HEXAGON: MS35649-244 (96906)	EA	4										A6H8
X2-H	5305-054-5648	A037 SCREW, MACHINE: MS51957-14 (96906)	EA	4										ASH9
X2-H	5310-933-8118	A038 WASHER, LOCK: MS35338-135 (96906)	EA	4										A6H10
P-H	5930-177-2777	A039 SWITCH, ROTARY: SMC657829 (80249)	EA	1				*	*	1	8	5	1-4	A6S1
X2-H		A040 WIRE, ELECTRICAL: SMB657812-20-9 (80249)	FT	1										A6W1
P-C	5935-177-2762	A041 DUMMY, CONNECTOR, PLUG MX-8566/TPM-24(V): SMB687996 (80249)	EA	1	*	*	*	*	*	*	5	3	1-6(1)	P2
X1-H		A041A CABLE ASSEMBLY, SP, ELECTRICAL: SMB657866 (80249)	EA	1										P2W1

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SECTION V. REFAIR PARTS LIST

(1) SMR CODE	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION / REF. NUMBER & MFR CODE / USABLE ON CODE	(4) UNIT OF MEAS	(5) QTY INC IN UNIT	(6) 30 DAY DS MAINT ALLOWANCE (A) 1-20	(B) 21-50	(C) 51-100	(7) 30 DAY DS MAINT ALLOWANCE (A) 1-20	(B) 21-50	(C) 51-100	(8) 1-YR ALW PER 100 EQUIP CNTGY	(9) DEPOT MAINT ALW PER 100 EQUIP	(10) ILLUSTRATION (A) FIG. NO.	(B) ITEM NO. OR REFERENCE DESIGNATION
X2-H	6145-935-2646	A041B CABLE, RADIO FREQUENCY: UTI41C (93306)	FT	1										P2W2
X2-H		A041C CONNECTOR, PLUG, ELECTRICAL: 23008 (91737)	EA	2										P2W1P1
X2-H		A041E CONNECTOR, PLUG, ELECTRICAL: SAME AS A041C	EA	REF										P2W1P2
X1-H		A041F INSERT, 4ELECTRICAL CONNECTOR: 8MBf57798 (80249)	EA	1										P2MP1
X1-H		A041G HELL, ELECTRICAL CONNECTOR: 202681-2 (00779)	EA	1										P2MP2
P-C	5935-177-2763	A042 DUMMY, CONNECTOR, PLUG MX-8567/TPM-24(V): SMB687997 (80249)	EA	1	*	*	*	*	*	*	5	3	1-6(1)	P1
X1-H		A042A CABLE ASSEMBLY, SP, ELECTRICAL: SMB657867 (80249)	EA	1										P1W1
X2-H	6145-935-2646	A042B CABLE, SPECIAL PURPOSE, ELEC: SAME AS A041B	EA	1										P1W2
X2-H		A042C CONNECTOR, PLUG, ELECTRICAL: SAME AS A041C	EA	2										P1W1P1
X2-H		A0421; CONNECTOR, PLUG, ELECTRICAL: SAME AS A041C	EA	REF										P1WIP2
X1-H		A042F INSERT, ELECTRICAL CONNECTOR: SMB657845 (80249)	EA	1										P1MP1
X1-H		A042G SHELL, ELECTRICAL CONNECTOR: SAME AS A041G	EA	1										P1MP2
P-C	5985-128-0195	A043 ATTENUATOR, FIXED CN-1321/TPM-24(V): 8491A (28480)	EA	2	*	*	1	*	*	1	10	5	1-6(1)	AT1
P-C	5985-128-0195	A044 ATTENUATOR, FIXED CN-1321/TPM-24(V): SAME AS A043	EA	REF	REF	REF	REF	REF	REF	REF	REF	REF	1-4	AT2
P-C	3625-133-7803	A045 CABLE ASSEMBLY, RADIO FREQ, BR CG-3614/TPM-24(V): SMD688000 (80249)	EA	1	*	*	1	*	*	1	8	5	1-6(1)	W1
P-H	5935-280-1454	A046 ADAPTER, CONNECTOR: UG914U (81349)	EA	4				*	1	2	25	21	1-5(1)	W1CP1
P-H	5935-280-1454	A047 ADAPTER, CONNECTOR: SAME AS A046	EA	REF				REF	REF	REF	REF	REF	1-6(1)	W1CP2
P-H	5935-280-1454	A048 ADAPTER, CONNECTOR: SAME AS A046	EA	REF				REF	REF	REF	REF	REF	1-6(1)	W1CP3
P-H	5935-280-1454	A049 ADAPTER, CONNECTOR: SAME AS A046	EA	REF				REF	REF	REF	REF	REF	1-6(1)	W1CP4

SECTION V. REFAIR PARTS FOR DIRECT SUPPORT, GENERAL SUPPORT, AND DEPOT MAINTENANCE

(1) SMR CODE	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION / REF. NUMBER & MFR CODE / USABLE ON CODE	(4) UNIT OF MEAS	(5) QTY INC IN UNIT	(6) 30 DAY DS MAINT ALLOWANCE (A) 1-20	(B) 21-50	(C) 51-100	(7) 30 DAY DS MAINT ALLOWANCE (A) 1-20	(B) 21-50	(C) 51-100	(8) 1-YR ALW PER 100 EQUIP CNTGY	(9) DEPOT MAINT ALW PER 100 EQUIP	(10) ILLUSTRATION (A) FIG. NO.	(B) ITEM NO. OR REFERENCE DESIGNATION
X1-H	6145-835-1085	A050 CABLE, RADIO FREQUENCY: RG14IAU (81349)	FT	30										.W1W1
P-H		A051 CLIP, SPRING TENSION: SMBS57809 (80249)	EA	2				*	*	1		8		W1MP1
P-H		AO52 CLIP, SPRING TENSION: MB657873-2 (80t49)	EA	2				*	*	*		4		W1MP2
P-H	5935-81-5681	A053 CONNECTOR, PLUG, ELECTRICAL: UG88DU (81149)	EA	8				1	3	5	50	38	1-5(1)	W1P3
P-H	5935-681-5685	A054 CONNECTOR, PLUG, ELECTRICAL: SAME AS A053	EA	REF				REF	REF	REF	REF	REF	1-5(1)	W1P4
P-H	5935-681-5685	A055 CONNECTOR, PLUG, ELECT'RICAL: SAME AS A053	EA	REF				REF	REF	REF	REF	REF	1-5(1)	W1P5
P-H	5035-681-5685	A056 CONNECTOR, PLUG, ELECTRICAL: SAME AS AO53	EA	REF				REF	REF	REF	REF	REF	1-5(1)	W1P6
P-H	5935-681-5685	A057 CONNECTOR, PLUG, ELECTRICAL: SAME AS AO53	EA	REF				REF	REF	REF	REF	REF	1-5(1)	W1P7
P-H	5935-681-5685	A058 CONNECTOR, PLUG, ELECTRICAL: SAME AS A053	EA	REF				REF	REF	REF	REF	REF	1-5(1)	W1P8
P-H	5935-681-5685	A059 CONNECTOR, PLUG, ELECTRICAL: SAME A A053	EA	REF				REF	REF	REF	REF	REF	1-5(1)	W1P9
P-H	5935-681-5685	A060 CONNECTOR, PLUG, ELECTRICAL: SAME AS A053	EA	REF				REF	REF	REF	REF	REF	1-5(1)	W1P10
X1-H		A061 CONTACT, ELECTRICAL 23103-1 (17549)	EA	4										W1E1
X1-H		A062 INSERT, ELECTRICAL CONNECTOR: SAME AS A041F	EA	1										W1MP2
X1-H		A063 INSERT, ELECTRICAL CONNECTOR: SMB657799 (80249)	EA	1										W1MP3
P-H		A064 CONNECTOR, PLUG, ELECTRICAL: 23007-1 (91737)	EA	4				*	*	*	5	3		W1MP4
X1-H		A065 SHELL, ELECTRICAL CONNECTOR: SAME AS A041G	EA	1										W1MP5
X1-H		A066 SHELL, ELECTRICAL CONNECTOR: 202789-1 (00779)	EA	1										W1MP6
X1-H		A067 SHIELD, ELECTRICAL CONNECTOR: 202617-1 (00779)	EA	2										W1MP7
X2-H	5305-054-5649	A068 SCREW, MACHINE: MS51957-15 (96906)	EA	8										W1H1
X2-H	5310-933-8118	A069 WASHER, LOCK: SAME AS A038	EA	8										W1H2

SECTION V. REFAIR PARTS FOR DIRECT SUPPORT, GENERAL SUPPORT, AND DEPOT MAINTENANCE

(1) SMR CODE	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION / REF. NUMBER & MFR CODE / USABLE ON CODE	(4) UNIT OF MEAS	(5) QTY INC IN UNIT	(6) 30 DAY DS MAINT ALLOWANCE (A) 1-20	(B) 21-50	(C) 51-100	(7) 30 DAY DS MAINT ALLOWANCE (A) 1-20	(B) 21-50	(C) 51-100	(8) 1-YR ALW PER 100 EQUIP	(9) DEPOT MAINT ALW PER 100	(10) ILLUSTRATION (A) FIG.	(B) ITEM NO. OR REFERENCE DESIGNATION
X2-H		A070 SLEEVE, MARKER, CABLE: SMC678559-62 (80249)	EA	1										W1MP8
X1-H		A071 SLEEVE, MARKER, CABLE: SMC657859-17 (80249)	EA	1										W1MP9
XK-H		A071A SLEEVE, MARKER, CABLE: SMC657859-28 (80249)	EA	1										W1MPI1
X2-H		A071B SLEEISVE, MARKER, CABLE: SMC657859-30 (80249)	EA	1										W1MP12
X1-H		A071C SLEEVZ, MARKER, CABLE: SMC657859-53 (80o49)	EA	1										W1MP13
X2-H		A071E SLIEVE, MARKER, CABLE: SMC657859-54 (80249)	EA	1										W1MP14
X2-H		A071P SLEEVE, MARDSR, CABLE: SMC657859-55 (80249)	EA	1										W1MP15
X2-H		A071G SLEEVE, MARKER, CABLE: SMC657859-56 (80249)	EA	1										W1MP18
X2-H		A071H SLEEVS, MARKER, CABLE: SMC657850-57 (80249)	EA	1										W1MP17
X2-H		A071l SLEEVE, MARKER, CABLE: SMC657859-51 (80249)	EA	1										W1MP18
X2-H		A071J SLEEVE, MARKER, CABLE: 8157859-59 (80249)	EA	1										W1MP19
X2-H		A071K 8SLEVE, MARKER, CABLE: SMC6578594-0 (80249)	EA	1										W1MP20
X2-H		A071L SEEVE, MARKER, CABLE: SMC657859-65 (80249)	EA	1										W1MYP21
X2-H		A072 INSULAT1DN, SLEEVING, ELECTRICAL: RNF100-1-2 (08795)	EA	1										W1MP10
P-C		2-133-t8.52l A073 CABLE ASEMBLY, SP, ELECTRICAL CX-12219/TPM-24(V): SMC688001 (80249)	EA	1	*	*	1	*	*	1	8	5	1-5(2)	W2
X2-H	8145-781-5502	A074 CABLE, RADIO FRE-QUEC: RG179BU (81349)	FT	6										W2W1
P-H		A075 CLIP, 8PRING TENSION: SAME AS A051	EA	2				REF	REF	REF		REF		W2MP1
P-H		A076 CLIP, SPRING TENSION: SMB657873-1 (80249)	EA	6				*	1	1		8		W2MP2
X2-H	5935-103-7371	A077 CONTACT, ELECTRICAL 1-331952-0 (00779)	EA	3										W2E1

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X2-H	5935-789-627	A078 CONTACT, ELECTRICAL 1-331950-0 (00779)	EA	3										W2E2
X2-H	5935-918-4046	A079 CONTACT, ELECTRICAL 66100-1 (00779)	EA	8										W2E3
X2-H	5935-909-8565	A080 CONTACT, ELECTRICAL 66104-1 (00779)	EA	3										W2E4
X2-H	5935-909-8516	A081 CONTACT, ELECTRICAL 66102-1 (00779)	EA	8										W2E5
X2-H	5935-910-9177	A082 CONTACT, ELECTRICAL 66098-1 (00779)	EA	3										W2E6
X2-H	5940-929-8558	A083 FERRULE, RF CABLE, GROUNDING: D133 (08795)	EA	6										W2E7
X2-H	5935-106-3803	A084 INSERT, ELECTRICAL CONNECTOR: 202650-2 (00779)	EA	1										W2MP3
X2-H	5935-103-1756	A085 INSERT, ELECTRICAL CONNECTOR: 202651-2 (00779)	EA	1										W2MP4
X2-H		A086 SHELL, ELECTRICAL 202279-3 (00779)	EA	1										W2MPS
X2-H		A087 SHELL, ELECTRICAL CONNECTOR: 202786-1 (00779)	EA	1										W2MP6
X2-H		A088 SHIELD, ELECTRICAL CONNECTOR: 202305-4 (00779)	EA	2										W2MP7
X2-H	5305-054-5649	A089 SCREW, MACHINE: SAME AS A068	EA	8										W2H1
X2-H	5310-933-8118	A090 WASHER, LOCK: SAME AS A038	EA	8										W2H2
X2-H		A090A SLEEVE, MARKER, CABLE: SMC657859-18 (80249)	EA	1										W2MP8
X2-H		A090B SLEEVE, MARKER, CABLE: SAME AS A071A	EA	1										W2MP9
X2-H		A09O0C SLEEVE, MARKER, CABLE: SAME AS A071B	EA	1										W2MP10
X2-H		A091 WIRE, ELECTRICAL: SMB657812-16-9 (80249)	FT	12										W2W3
X2-H		A092 WIRE, ELECTRICAL: SMB657812-22-9 (80249)	FT	12										W2W2
P-C	6625-133-7804	A093 CABLE ASSEMBLY, RADIO FREQ, BR CG-3615/ TPM-24(V): SMD688002 (80249)	EA	1	*	*	1	*	*	1	8	5	1-5(1)	W3
P-H	5935-280-1454	A094 ADAPTER, CONNECTOR: SAME AS A046	EA	2				REF	REF	REF	REF	REF	1-5(1)	W3CP1
P-H	5935-280-1454	A095 ADAPTER, CONNECTOR: SAME AS A046	EA	REF				REF	REF	REF	REF	REF	1-5(1)	W3CP2

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X2-H	6145-835-1085	A096 CABLE, RADIO FREQUENCY: SAME AS A050	FT	12									6-9	W3W1
X2-H	6145-781-5502	A097 CABLE, RADIO FREQUENCY: SAME AS A074	FT	18									6-9	W3W2
P-H		A098 CLIP, SPRING EA SAME AS A051	EA	2			REF	REF	REF	REF		REF	1-5(1)	W3MP1
P-H		A099 CLIP, SPRING TENSION: SMB657810-2 (80249)	EA	2				*	*	*		4		W3MP2
P-H	5935-681-5685	A100 CONNECTOR, PLUG, ELECTRICAL: SAME AS A053	EA	4				REF	REF	REF	REF	REF	1-5(1)	W3P3
P-H	5935-681-5685	A101 CONNECTOR, PLUG, ELECTRICAL: SAME AS A053	EA	REF				REF	REF	REF	REF	REF	1-5(1)	W3P4
P-H	5935-681-5685	A102 CONNECTOR, PLUG, ELECTRICAL: SAME AS A053	EA	REF				REF	REF	REF	REF	REF	1-5(1)	W3P5
P-H	5935-681-5685	A103 CONNECTOR, PLUG, ELECTRICAL: SAME AS A053	EA	REF				REF	REF	REF	REF	REF	1-5(1)	W3P6
X1-H		A104 CONNECTOR, PLUG, ELECTRICAL: SAME AS A064	EA	2										W3E4
X2-H	5935-989-6819	A105 CONTACT, ELECTRICAL: 201144-1 (00779)	EA	3										W3E1
X2-H	5935-789-7765	A106 CONTACT, ELECTRICAL: 201143-1 (00779)	EA	3										W3E2
X1-H		A106A CONTACT, ELECTRICAL: SAME AS A061	EA	2										W3E5
X2-H	5940-989-8407	A107 FERRULE, RF CABLE, GROUNDING: 328666 (00779)	EA	6										W3E3
X1-H		A108 INSERT, ELECTRICAL: SMB657801 (80249)	EA	1										W3MP3
X1-H		A109 INSERT, ELECTRICAL CONNECTOR: SMB657797 (80249)	EA	1										W3MP4
X1-H		A110 INSERT, ELECTRICAL: 202648-2 (00779)	EA	1										W3MP5
X2-H	5935-104-348C	A111 INSERT, ELECTRICAL CONNECTOR: 202649-2 (00779)	EA	1										W3MP6
X2-H	5935-103-1755	A112 SHELL, ELECTRICAL CONNECTOR: 202287-1 (00779)	EA	1										W3MP7
X2-H		A113 SHELL, ELECTRICAL CONNECTOR: 202795-1 (00779)	EA	1										W3MP8
X2-H	5935-103-7370	A114 SHIELD, ELECTRICAL CONNECTOR 1-202301-0 (00779)	EA	2										W3MP9

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X2-H		A114A SLEEVE, MARKER CABLE: SMC657859-64 (80249)	EA	1										A31MP11
X2-H		A114B SLEEVE, MARKER, CABLE: SMC657859-19 (80249)	EA	1										W3MP12
X2-H		A114C SLEEVE, MARKER, CABLE: SAME AS A071A	EA	1										W3MP13
X2-H		A114E SLEEVE, MARKER, CABLE: SAME AS A071B	EA	1										W3MP14
X2-H		A114F SLEEVE, MARKER, CABLE: SAME AS A071C	EA	1										W3MP15
X2-H		A114G SLEEVE, MARKER, CABLE: SAME AS AO71E	EA	1										W3MP16
X2-H		A114H SLEEVE, MARKER, CABLE: SAME AS A071IF	EA	1										W3MP17
X2-H		A114I SLEEVE, MARKER, CABLE: SAME AS A071G	EA	1										W3MP18
X2-H	5305-054-5649	A115 SCREW, MACHINE: SAME AS A068	EA	8										W3H1
X2-H	5310-933-8118	A116 WASHER, LOCK: SAME AS A038	EA	8										W3H2
X2-H	5820-986-7389	A117 SPRING, RETAINING: 201142-2 (00779)	EA	6										W3MP10
P-C	6625-133-7850	A118 CABLE ASSEMBLY, SP, ELECTRICAL CX-12220/TPM-24(V): SMDB88003 (80249)	EA	1	*	*	1	*		1	8	5	1-5(1)	W4
P-H		A119 CLIP, SPRING TENSION: SAME AS A051	EA	1				REF	REF	REF		REF		W4MP1
P-H		A120 CLIP, SPRING TENSION: SAME AS A099	EA	1				REF	REF	REF		REF		W4MP2
X2-H	5935-909-8565	A121 CONTACT, ELECTRICAL: SAME AS A080	EA	2										W4E1
X2-H	5935-918-4046	A122 CONTACT, ELECTRICAL: SAME AS A079	EA	3										W4E2
X2-H	5935-909-8516	A123 CONTACT, ELECTRICAL: SAME AS A081	EA	2										W4E*3*
X2-H	5935-910-9177	A124 CONTACT, ELECTRICAL: SAME AS A082	EA	3										W4E4
X2-H	5935-106-3803	A125 INSERT, ELECTRICAL: SAME AS A084	EA	1										W4MP3
X2-H	5935-103-1756	A12O INSERT, ELECTRICAL CONNECTOR: SAME AS A085.	EA	1										W4MP4
X2-H		A127 SHELL, ELECTRICAL CONNECTOR: SAME AS A086	EA	1										W4MP5

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X2-H		A128 SHELL, ELECTRICAL CONNECTOR: SAME AS A087	EA	1										W4MP6
X2-H		A129 SHIELD, ELECTRICAL CONNECTOR: SAME AS A088	EA	2										W4MP7
X2-H		A129A SLEEVE, MARKER, CABLE: SMD657859-20 (80249)	EA	1										W4MP7
X2-H		A129B SLEEVE, MARKER, CABLE: SAME AS A071A	EA	1										W4MP8
X2-H		A129C SLEEVE, MARKER, CABLE: SAME AS A071B	EA	1										W4MP9
X2-H		5305-054-5649A130 SCREW, MACHINE: SAME AS A068	EA	8										W4H1
X2-H	5310-933-8118	A131 WASHER, LOCK: SAME AS A038	EA	8										W4H2
X2-H		A132 WIRE, ELECTRICAL: SAME AS A091	FT	18										W4W1
X2-H		A133 WIRE, ELECTRICAL: SAME AS A092	FT	12										W4W2
P-C-R	6625-1T7-4488	A134 CABLE ASSEMBLY, RADIO FREQUENCY CG-3607/TPM-24(V): SMD887998 (80249)	EA	1	*	*	1	*	*	1	8	5	1-5(1)	W5
P-H	6145-823-2544	A135 CABLE, RADIO FREQUENCY: RG142BU (81349)	FT	1				*	*	*		15		W5W1
P-H	5935-577-2281	A136 CONNECTOR, PLUG, ELECTRICAL: UG89CU (80058)	EA	1				*	*	*	5	3	1-5(1)	W5P1
P-H		A137 CONNECTOR, PLUG, ELECTRICAL: SAME AS A064	EA	1				REF	REF	REF	REF	REF	1-5(1)	W5P2
X2-H		A138 SLEEVE, MARKER, CABLE: SMC657859-14 (80249)	EA	1										W5MP1
P-C-R	6625-177-4498	A139 CABLE ASSEMBLY, SP, ELECTRICAL CX-1222l/TPMY-4(V): SMD688004(80249)	EA	1	*	*	1	*	*	1	8	5	1-5(1)	W11
P-H	5935-177-2791	A140 CONNECTOR, PLUG, ELECTRICAL: MM18-22SGDSLB68 (95238)	EA	1				*	*	*	5	3	1-5(1)	W11P1
P-H	5935-177-2791	A141 CONNECTOR, PLUG, ELECTRICAL: MM18-22PGDSLB8 (95238)	EA	1				*	*	*	5	3	1-5(1)	W11P2
X2-H		A142 INSULATIDN, SLEEVING, ELECTRICAL: SMC657794-16 (80249)	EA	1										W11MP1
X2-H		A143 INSULATION, SLEEVING, ELECTRICAL: RTS10 (08795)	EA	1										W11MP2

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X2-H		A144 SLEEVE, MARKER, CABLE: SMC657859-16 (80249)	EA	1										W11MP3
X2-H		A144A SLEEVE, MARKER, CABLE: SAME AS A071A	EA	1										W11MP4
X2-H		A144B SLEEVE, MARKER, CABLE: SAME AS A0711	EA	1										W11MP5
X2-H		A145 WIRE, ELECTRICAL: SMB657812-24-9 (80249)	FT	2										W11W1
P-C-R	1625-177-4491	A146 CABLE ASSEMBLY, RADIO FREQUENCY CG-3609/TPM-24(V): SMCO88005 (80249)	EA	1	*	*	1	*	*	1	8	5	1-5(1)	W12
P-H	5935-280-1454	A147 ADAPTER, CONNECTOR: SAME AS A048	EA	1				REF	REF	REF	REF	REF	1-5(1)	W12CP1
P-H	5145-823-2544	A148 CABLE, RADIO FREQUENCY: SAME AS A135	FT	2				REF	REF	REF		REF		W12W1
P-H	5935-681-5685	A149 CONNECTOR, PLUG, ELECTRICAL: SAME AS A053	EA		2			REF	REF	REF	REF	REF	1-5(1)	W12PS
P-H	5935-681-5685	A150 CONNECTOR, PLUG, ELECTRICAL: SAME AS A053	EA	REF				REF	REF	REF	REF	REF	1-5(1)	W12P4
P-H	5935-931-0412	A151 CONNECTOR, PLUG, ELECTRICAL: OSM501-1 (16179)	EA	1				*	*	*	5	3	1-5(1)	W12P1
P-H	5035-056-0393	A152 CONNECTOR, PLUG, ELECTRICAL: 3003-0001 (95077)	EA	1				*	*	*	5	1	1-5(1)	W12P2
X2-H		A153 SLEEVE, MARKER, CABLE: SMC657859-2 (80249)	EA	2										W12MP1
P-C	5825-177-	A154 CABLE ASSEMBLY, RADIO FREQUENCY CG-3608/TPMY-4(V): SMC687978 (80249)	EA	1	*	*	1	*	*	1	8	5	1-5(1)	W13
X3-H	5145-935-1646	A155 CABLE, RADIO FREQUENCY: SAME AS A041B		FT	1									W13W1
X2-H	5935-945-7352	A156 CONNECTOR, PLUG, ELECTRICAL: OSM101-1 (16179)	EA	1									1-5(1)	W13P1
X2-H	4506	A157 IN8ULATOR, CAP: TC4005CRN (08795)	EA	1									1-5(1)	W13E1
X2-H		A158 SLEEVE, MARKER, CABLE: SMC857859-6 (80349)	EA	1										W13MP1
P-C-R	5995-905-7194	A159 CABLE A8SEMBLY, RADIO FRBQUENCY CG-409F/U(S FT): SMD657879 (80249)	EA	2	*	*	1	*	*	1	3	10	1-5(1)	W14

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P-C-R	5995-905-719,	A160 CABLE ASSEMBLY, RADIO FREQUENCY CG-409F/U(6 FT): SAME AS A159	EA	REF	REF	REF	REF	REF	REF	REF	REF	REF	1-5(1)	W1S
P-H	6145-54U2-092	A161 CABLE, RADD FREQUENCY: RG6MCU (81349)	FT	6				*		12	24	60		W14W1
P-H	6145-542-6092	A162 CABLE, .RADIO FREQUENCY: SAME AS A11	FT	REF				REF	REF	REF		REF		W15W1
P-H	5935-681-5685	A163 CONNECTOR, PLUG, ELECTRICAL: SAME AS A053	EA	4				REF	REF	REF	REF	REF	1-5(1)	W14P1
P-H	5935-681-5685	A164 CONNECTOR, PLUG, ELECTRICAL: SAME AS A053	EA	REF				REF	REF	REF	REF	REF	1-5(1)	W14P2
P-H	5935-681-5685	A165 CONNECTOR, PLUG, ELECTRICAL: SAME AS A053	EA	REF				REF	REF	REF	REF	REF	1-5(1)	W15P1
P-H	5935-681-5685	A166 CONNECTOR, PLUG, ELECTRICAL: SAME AS A053	EA	REF				REF	REF	REF	REF	REF	1-5(1)	W15P2
X2-H		A167 SLEEVE, MARKER, CABLE: SMC657859-12 (80249)	EA	2										W14MP1
X2-H		A168A SLEEVE, MARKER, CABLE: SMC657859-52 (80249)	EA	2										W14MP2
X2-H		A168B SLEEVE, MARKER, CABLE: SAME AS A18SA	EA	REF										W15MP2
X2-H		A168C SLEEVE, MARKER, CABLE: SMC657859-61 (80249)	EA	2										W14MP3
X2-H		A168E SLEEVE, MARKER, CABLE: SAME AS A168C	EA	REF										W15MP3
X2-H		A168 SLEEVE, MARKER, CABLE: SAME AS A167	EA	REF										W15MP1
P-C-R	6625-177-449C	A169 CABLE ASSEMBLY, RADIO FREQUENCY CG-3610/TPM-24(V): SMC687979 (80249)	EA	1	*	*	1	*	*	1	8	5	1-5(1)	W16
P-H	6145-606-8237	A170 CABLE, RADIO FREQUENCY: RG174U (81349)	FT		1	*	*	1	*	*		5		W16W1
P-H	5940-857-4914	A171 CLIP, ELECTRICAL: 34 (76545)	EA	2				*	*	1	10	6	1-5(1)	W16EI
P-H	5940-857-4914	A172 CLIP, ELECTRICAL: SAME AS A171	EA	REF				REF	REF	REF	REF	REF	1-5(1)	W1SE2
P-H	5935-086-4683	A173 CONNECTOR, PLUG, ELECTRICAL: 025B3600 (94375)	EA	1				*	*	*	5	3	1-5(1)	W16PI
P-H	5940-993-5216	A174 FERRULE, RF CABLE, GROUNDING: 2-323930-2 (00779)	EA	1				*	*	*	5	3		W16E3

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X2-F		A174A DISULATION, SLEEVING, ELECTRICAL: RNF1001-4 (08795)	EA	1										W16MP3
P-H	5975-763-4442	A175 INSULTOR, CLIP: 36 (76545)	EA	2				*	*	1	10	6		W16MPl
X2-H		A176 SLEEVES, MARKER, CABLE: SMC657859-5 (80249)	EA	1										W18MP2
X2-H		A177 WIRE, ELEC'RICAL: SMB657812-23-0 (80:49)	EA	1										W116W
P-CR	6625-177-4492	A178 CABLE ASSEMBLY, RADIO FREQUENCY CG-3611/TPM-24(V): SMC687999 (80249)	EA	1	*	*	1	*	*	1	8	5	1-5(1)	W21
P-H	6145-080-4383	A179 CABLE, RADIO FRE-QUENCY: RG188AU (81349)	FT	1				*	*	*		10		W21W1
P-H	5935-833-0991	A180 CONNECTOR, PLUG, ELECTRICAL: 31-371 (0s660)	EA	1				*	*	*	5	3	1-5(1)	W21P2
P-H	5935-916-3780	A181 CONNECTOR, PLUG, ELECTRICAL: T5002-188 (32238)	EA	1				*	*	*	5	3	1-5(1)	W21P1
X2-H		A182 SLEEVE, MARER, CABLE: SMC657859-1 (80249)	EA	1										W21MP1
P-CR	6625-133-7795	A183 CABLE ASSEMBLY, SP, ELEC, BR CX-12228/ TPM-24(V): SMC688006 (80249)	EA	1	*	1	1	*	1	1	12	5	1-5(2)	W35
P-H	6145-080-6515	A184 CABLE, RADIO FRE-QUENCY: RG187AU (81349)	FT	15				*	*	*		150		W25W1
P-H		A185 ADAPTER, CONNECTOR: 10-350695-32 (77820)	EA	1				*		*	*	3		W25CP1
P-H	5935-081-4340	A186 CONNECTOR, PLUG, ELECTRICAL: MS24661R22B55S (96906)	EA	1					*	*	*	3	1-5(1)	W25P1
P-H	6035-901-8871	A187 CONNECTOR, PLUG, ELECTRICAL: MS3116F12-3S (96906)	EA	1					*	*	*	3	1-5(1)	W25P3
P-H	5935-717-3591	A188 CONNECTOR, PLUG, ELECTRICAL: MS3116F18-328 (96908)	EA	1					*	*	*	3	1-5(2)	W25P2
P-H	5035-931-7490	A189 CONNECTOR, PLUG, ELECTRICAL: UP:Y1M (81349)	EA	1					*	*	*	3	1-5(2)	W25P7
P-H	5935-976-0862	A190 CONNECTOR, PLUG, ELECTRICAL: 025B1600 (94375)	EA	2					*	*	1	6	1-5(2)	W25P4
P-H	5935-976-0862	A191 CONNECTOR, PLUG, ELECTRICAL: SAME AS A190	EA	REF				REF	REF	REF	REF	REF	1-5(2)	W25P5
P-H	5935-827-5670	A192 CONNECTOR, PLUG, ELECTRICAL: 10-194632-59S (77820)	EA	1				*	*	*	5	3	1-5(2)	W25P1

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P-H	5940-993-5216	A192A FERRULE, RF CAB;E GROUNDING SAME AS A174	EA	1				REF	REF	REF	REF	REF		W25E1
X2-H		A193A INSULATION, SLEEVING, ELECTRICAL: SAME AS A072	EA	1										W25MP2
X2-H		A193B SLEEVE, MARKER, CABLE: SMC657859-21 (80249)	EA	1										W25MP3
X2-H		A193C SLEEVE, MARKER CABLER, CABLE: SAME AS A071A	EA	1										W25MP4
X2-H		A193A SLEEVE, MARKER, CABLE; SAME AS A071B	EA	1										W25MP5
X2-H		A193F SLEEVE, MARKER, CABLE: SMC657859-34 (80249)	EA	1										W25MP6
X2-H		A193G SLEEVE, MARKER, CABLE: SMC657859-37 (80249)	EA	1										W25MP7
X2-H		A193H SLEEVE, MARKER, CABLE: SMC057859-40 (80249)	EA	1										W25MP8
X2-H		A193I SLEEVE, MARKER, CABLE: 81C657859-44 (80249)	EA	1										W25MP9
X2-H		A193J SLEEVE, MARKER, CABLE: SMC657859-46 (80249)	EA	1										W25MP10
X2-H		A193 SLEEVE, MARKER, CABLE: SMC657859-50 (80249)	EA	1										W25MP11
X2-H		A193L SLEEVE, MARKER, CABLE: SMC657859-51 (80249)	EA	1										W25MP12
X2-H		A193M INSULATIN, SLEEVING, ELECTRICAL: SMB657793-09 (80249)	EA	1										W25MP1
X2-H		A194 WIRE, ELECTRICAL: SMBB57812-18-9 (80249)	EA	1										W25W2
X2-H		A195 LEEE, ELECTRICAL: SAME AS A040	EA	1										W25W3
P-C-R	6625-177-4499	A196 CABLE ASSEMBLY, SP, ELECTRICAL CX-12226/ TPM-24(V): SMD688007 (80249)	EA	1	*	*	1	*	*	1	8	5	1-5(1)	W44
P-H	5935-018-1123	A197 CONNECTOR, PLUG, ELECTRICAL: MM26-22SGDSKH (95238)	EA	1				*	*	*	5	3	1-5(1)	W44P2
P-H	5935-851-3554	A198 CONABLCTOR, PLUG, ELECTRICAL: MM26-22SGDSKH (95238)	EA	1				*	*	*	5	8	1-5(1)	W44P1
P-H		A199 INSULATION, SLEEVING, ELECTRICAL: SAME AS A142	EA	1										W44MP1

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X2-H		A200 INSULATION, SLEEVING, ELECTRICAL: RT510-1-2 (08795)	EA	1										W44MP2
X2-H		A201 SLEEVE, MARKER, CABLE: SMC657859-15 (80249)	EA	1										W44MP3
X2-H		A201A SLEEVE, MARKER, CABLE: SAME AS A071A	EA	1										W44MP4
X2-H		A201B SLEEVE, MARKER, CABLE: SAME AS A071B	EA	1										W44MP5
X2-H		A202 WIRE, ELECTRICAL: SAME AS A145	FT	1										W44W1
X2-C-R		625-133-7799A203 CASE, TEST FACILITIES SET CY-6824/TPM-24(V)1: SMD687993-2 (80249)	EA	1									1-2	MP4
X1-H		A203A CASE, TEST FACILITIES SET: D8762/ALTERED (98376)	EA	1										MP4MP8
P-H	5340-997-9007	A203B CATCH, CLAMPING: ZSP2-204 (98378)	EA	10				*	1	2		10		MP4MP3
X2-H		A203C GUARD RAIL: ZSP1-158 (98376)	EA	4										MP4MP4
X2-H		A203E HANDLE, BOW: ZSP3-377 (98376)	EA	2									1-2	MP4MP2
X2-H		A203F HINGE, CONTINUOUS: ZSP6-806 (98376)	EA	1										MP4MP6
P-H	6825-993-0879	A203G LATCH, PUSH BUTTON: ZSP2-2004 (98376)	EA	3				*	*	1		15		MP4MP7
X2-H		A203H STRAP ASSEMBLY: FDK1152 (98313)	EA	6										MP4MP5
P-H	4820-898-300.1	A2031 VALVE, SAFETY RELIEF: ZSP6-037-4 (98376)	EA	1				*	*	*		4		MP4MP1
P-C	5985-861-7856	A204 DUMMY LOAD, ELEC-TRICAL DA-558/ TPM-24(V): TA5MB (00929)	EA	2	*	*	1	*	*	1	10	6	1-6(1)	AT3
P-C	5985-861-785	A205 DUMMY LOAD, ELEC-TRICAL DA-558/ TPM-24(V): SAME AS A204	EA	REF	REF	REF	REF	REF	REF	REF	REF	REF	1-6(1)	AT4
P-C	5950-970-186G	A206 DUMMY LOAD, ELEC-TRICAL DA-559/ TPM-24(V): BNCRTIM75 (91737)	EA	2	*	*	1	*	*	1	10	6	1-6(1)	AT5
P-C	5950-970-1869	A207 DUMMY LOAD, ELEC-TRICAL DA-559/ TPM-24(V): SAME AS A206	EA	REF	REF	REF	REF	REF	REF	REF	REF	REF	1-6(1)	AT6
P-C-R	6625-133-7776	A208 EXTENDER, CIRCUIT BOARD MX-8559/ TPM-24(V): SMD687959 (80249)	EA	1	*	*	1	*	*	1	8	5	1-6(2)	A7
X1-H		A209 BRACKET, ANGLE: SMD687959-1 (80249)	EA	1	A7MP1									

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X1-H		A210 BRACKET, ANGLE: SMD687959-2 (80249)	EA	1										A7MP2
X1-H		A211 BRACKET, ANGLE: SMD687959-3 (80249)	EA	1										A7MP3
X1-H		A212 BRACKET, ANGLE: SMD687959-4 (80249)	EA	1										A7MP4
X2-H	5320-721-5243	A213 RIVET, TUBULAR:EA 6A7H1 MS168535-78 (96906)												
P-H	5935-177-2793	A214 CONNECTOR, RECEP-TACLE, ELEC: 2832-013 (14925)	EA	3				*	1	1		9		A7J1
P-H	5935-177-2793	A215 CONNECTOR, RECEP-TACLE, ELEC: SAME AS A214	EA	REF				REF	REF	REF		REF		A7J2
P-H	5935-1'77-2793	A216 CONNECTOR, RECEP-TACLE, ELEC: SAME AS A214	EA	REF				REF	REF	REF		REF		A7J3
X2-H		A217 PLATE, ADAPTER: 2704-3-7 (14925)	EA	3										A7MP5
X2-H	5320-821-4995	A218 RIVET, TUBULAR: MS16535-22 (96908)	EA	4										A7H2
X2-H	5310-938-201,	A219 NUT, PLAIN, HEXAGON: MS35649-224 (96906)	EA	6										A7H1
X2-H	5305-054-5642	A220 SCREW, MACHINE: MS51957-8 (96906)	EA	6										A7H4
X2-H		A221 WASHER, FLAT: AN96OC3 (88044)	EA	6										A7H5
X2-H		A222 WASHER, LOCK: MS35338-134 (96906)	EA	6										A7H6
X1-H		A223 PRINTED WIRING BOARD: BMD687955 (80249)	EA	1										A7TB1
X2-H	5320-721-5243	A224 RIVET, TUBULAR: SAME AS A213	EA	12										A7H7
X2-H		A225 RETAINER, PRINTED WIRING BOARD: 35-182-5-3 (01480)	EA	2										A7MP8
P-C-R	6625-133-7775	A226 EXTENDER, CIRCUIT BOARD MX-8561/ TPM-24(V): SMC687960 (80249)	EA	1	*	*	1	*	*	1	8	5	1-6(1)	A8
P-H	5935-878-641C	A227 CONNECTOR, RECEP-TACLE, ELEC: 600-13PCGD22 (95238)	EA	1				*	*	1	10	6		A8J1
X1-H		A228 PRINTED WIRING BOARD: SMD687956 (80249)	EA	1										A8TB1
P-C-R	6825-133-7771	A229 EXTENDER, CIRCUIT BOARD MX-8562/ TPM-24(V): SMC687961 (80249)	EA	1	*	*	1	*	*	1	8	5	1-6(1)	A9
P-H	5935-878-641C	A230 CONNECTOR, RECEP-TACLE, ELEC: SAME AS A227	EA	1				REF	REF	REF	REF	REF		A9J1

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X1-H		A231 PRINTED WIRING BOARD: SMD687957 (80249)	EA	1										A9TB1
G-C-$	5985-177-2939	A232 HYBRID ATTENUATOR ASSEMBLY CN-1322/ TPY-34(V): SMD687967 (80249)	EA	1									1-3	A1
X2-H	5305-054-6670	A233 SCREW, MACHRE: MS51957-45 (96900)	EA	10										A1H1
X2-H	5310-685-3744	A234 WASHER, FLAT: AN960CS (88044)	EA	10										A1H2
P-H	S935-904-4050	A235 ADAPTER, CONNECTOR: MS90156-370 (96906)	EA	2				*	*	1	10	6	7-1	A1CP1
P-H	5935-904-405	A236 ADAPTER, CONNECTOR: SAME AS A235	EA	REF				REF	RFF	RFF	REF	REF	7-1	A1CP2
P-H	5935-329695	A237 ADAPTER, CONNECOR: UG606U (81349)	EA	2				*	*	1	10	6		A1CP3
P-H	5935-2954295	A238 ADAPTER, CONNECTOR: SAME AS A23S7	EA	REF				RFF	RFF	REF	RFF	REF		A1CP4
P-H	625-042-8084	A239 ATTFNAUTOR, VARIABLE: AU46A1NC1 (12457)	EA	1				*	*	*	5	3	3-1	A1AT1
X2-H	5305-054-6652	A240 SCREW, MACHINE: SAME AS A021	EA	4										A1H3
X2-H	5310-531-9514	A241 WASHER, FLAT: AN96OC6 (88044)	EA	4										A1H4
X2-H	5310-9294-395	A242 WASHER, UC: MS35338-136 (96906)	EA	4										A1H5
X1-H		A243 BRACKET, HYBRID JUNCTION: SMC688016 (80249)	EA	1										A1MP1
X1-H		A244 BRACKET, HYBRID JUNCTION: SMC688016-1 (80249)	EA	1										A1MP2
X2-H	5310-819-9180	A245 NUT, SELF-LOCKING, CLINCH: SAME AS A016	EA	4										A1H6
X2-H	5305-054-465	A246 SCREW, MACHINE: SAME AS A021	EA	4										A1H7
P-H	5340-58-0383	A247 CLAMP, LOOP: HP4N (09922)	EA	1				*	*	*		2		A1MP3
X2-H	5310-934-9748	A248 NUT, PLAIN, P, HAGON: SAME AS A036	EA	1										A1H8
X2-H	5305-054-5651	A249 SCREW, MACHINE: MS51957-17 (96906)	EA	1										A1H9
X2-H	53104-324721	A250 WASHER, FLAT: AN960C4 (88044)	EA	1										A1H10
X2-H	5310-933-8110	A251 WASHER, LOCK: SAME AS A038	EA	1										A1H11
A-H-R		A252 CABLE ASSEMBLY, RADIO FREQUENCY: SMC688010 (80249)	EA	2										A1W4

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A-H-R		A253 CABLE ASSEMBLY, RADIO FREQUENCY. SAME AS A252	EA	REF										A1W5
P-H	6145-542-6092	A254 CABLE, RADIO FREQUENCY: SAME AS A181	FT	1				REF	REF	REF		REF		A1W4W1
P-H	5935-804-7447	A255 CONNECTOR, PLUG, ELECTRICAL: UG909AU (81349)	EA	1				*	*	*	5	4		A1W4P1
P-H	5935-760-1787	A256 CONNECTOR, PLUG, ELECTRICAL: 101N2800 (94375)	EA	1				*	*	*	5	4		A1W4P2
X2-H		A257 SLEEVE, MARKER, CABLE: SMC657859-8 (80249)	EA	1										A1W4MP1
A-H-R		A258 CABLE ASSEMBLY, RADIO FREQUENCY: SMC688011-1 (80249)	EA	1									7-1	A1W1
P-H	6145-660-8716	A259 CABLE, RADIO FREQUENCY: RG222U (81349)	FT	8				*	16	16	96	48		A1W1W1
P-H	5935-752-279:	A260 CONNECTOR, PLUG, ELECTRICAL: UG18DU (81349)	EA	2				*	*	1	10	8	7-1	A1W1P1
P-H	5935-752-279:	A261 CONNECTOR, PLUG, ELECTRICAL: SAME AS A260	EA	REF				REF	REF	REF	REF	REF	7-1	A1W1P2
X2-H		A262 SLEEVE, MARKER, CABLE: SMC657859-9 (80249)	EA	1										A1W1MP1
A-H-R		A263 CABLE ASSEMBLY, RADIO FRIQUENCY: SMC6858011-2 (80249)	EA	1									7-1	A1W2
P-H	6145-660-8716	A264 CABLE, RADIO FREQUENCY: SAME AS A159	FT	6				REF	REF	REF	REF	REF		A1W2W1
P-H	5935-752-2792	A265 CONNECTOR, PLUG, ELECTRICAL: SAME AS A260	EA	2				REF	REF	REF	REF	REF	7-1	A1W2P1
P-H	5935-752-2792	A266 CONNECTOR, PLUG, ELECTRICAL: SAME AS A260	EA	REF				REF	REF	REF	REF	REF	7-1	A1W2P2
X-H		A267 SLEEVIE, MARKER, CABLE: SMC657859-10 (80349)	EA	1										A1W2MP1
A-H-F		A268 CABLE ASSEMBLY, RADIO FREQUENCY: MC688013 (80249)	EA	1										A1W6
P-H	6145-542-6092	A269 CABLE, RADIO FREQUENCY: SAME AS A161	FT	1					REF	REF	REF	REF		A1W6W1
P-H	5935-804-7447	A270 CONNECTOR, PLUG, ELECTRICAL: SAME AS A255	EA	1					REF	REF	REF	REF		A1W6P1
P-H		A271 CONNZCTOR, PLUG, ELECTRICAL: 101N4800A (94375)	EA	1				*	*	*	5	3		A1W6P2

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X2-H		A272 SLEEVE, MARKER, CABLE: SMC657859-11 (80249)	EA	1										A1WMP1
A-H-R		A273 CABLE ASSEMBLY, RADID FREQUENCY: SMC688015 (80249)	EA	1									7-1	A1W3
P-H	6145-542-6092	A274 CABLE, RADIO FRE QUENCY: SAME AS A161	FT	1				REF	REF	REF		REF		A1W3W1
P-H	5935-681-5685	A275 CONNECTOR, PLUG, ELECTRICAL: SAME AS A053	EA	2				REF	REF	REF	REF	REF		A1W3P1
P-H	5935-681-5685	A276 CONNECTOR, PLUG, ELECTRICAL: SAME AS A053	EA	REF				REF	REF	REF	REF	REF		A1W3P2
X2-H		A277 SLEEVE, MARKER, CABLE: SMC657859-7 (80249)	EA	1										A1W3MP1
X2-H		A278 CASE, ELECTRICAL EQUIPMENT: Z147-212BM8472 (19178)	EA	1										A1MP5
P-H		A279 BUMPER, RUBBER: Z8P7-703 (19178)	EA	4				*	*	1		8		A1MP6
P-H	5340-775-597E	A280 HANDLE, BAIL: ZSPM-304 (19178)	EA	1				*	*	*		3	1-3	A1MP7
P-H	4010-849-7341	A281 CHAIN, BEAD: NAS1201C6A168 (80205)	EA	1				*	*	*		4		A1MP8
X2-H	5310-934-9748	A282 NUT, PLAIN, HEXAGON: SAME AS A036	EA	1										A1H12
X2-H	5305-054-5651	A283 SCREW, MACHINE: SAME AS A249	EA	1										A1H13
X2-H	5310-933-8111	A284 WASHBR, LOCK SAME AS A038	EA	1										A1H14
X1-H		A285 CHAMSSIS, ELECTRICAL EQUIPMENT: SM687991 (80149)	EA	1										A1MP9
X2-H	5310-819-9188	A286 NUT, SELF-LOCING,	EA	7										A1H15
														CLINCH: SAME AS A016
										X1-H				A287 COVER, HYBRID ATTENU-ATOR ASSY: SMC6857989 (8024119)
										X2-H	5305-054-6652			A288 SCREW, MACHINE: SAME AS A021
										P-H	5935-893-1773			A289 DUMMY LOAD, ELEC-TRICAL: 370NM (9899)
										P-H	5340-840-095,			A290 HANDLE, BOW: MS39087-4 (98906)
										X2-H	5305-059-3860			A291 SCREW, MACHINE: MS1958-64 (96908)
										X2-H	5310-933-8120			A292 WASHER, LOCK: SAME AS A024

SECTION V. REFAIR PARTS FOR DIRECT SUPPORT, GENERAL SUPPORT, AND DEPOT MAINTENANCE

(1) SMR CODE	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION / REF. NUMBER & MFR CODE / USABLE ON CODE	(4) UNIT OF MEAS	(5) QTY INC IN UNIT	(6) 30 DAY DS MAINT ALLOWANCE (A) 1-20	(B) 21-50	(C) 51-100	(7) 30 DAY DS MAINT ALLOWANCE (A) 1-20	(B) 21-50	(C) 51-100	(8) 1-YR ALW PER 100 EQUIP	(9) DEPOT MAINT ALW PER 100	(10) ILLUSTRATION (A) FIG.	(B) ITEM NO. OR REFERENCE DESIGNATION
P-H	1430-856-3283	A293 HYBRID JUNCTION, RF: 3032 (99899)	EA	1				*	*	*	5	3	7-1	A1HY1
X2-H	5305-054-1670	A294 SCREW, MACHINE: SAME AS A233	EA	4										A1H19
X2-H	5310-933-8119	A295 WASHER, LOCK: MS85338-137 (90906)	EA	4										A1H20
X2-H		A296 PANEL, FRONT: SM687968 (80249)	EA	1										A1MP12
X2-H	5310-934-9759	A297 NUT, PLAIN, HEXAGON: MS35649-284 (96906)	EA	2										A1H21
X2-H	5305-054-6670	A298 SCREW, MACHINE: SAME AS A233	EA	2										A1H22
X2-H	5310-685-3744	A299 WASHER, FLAT: SAME AS A234	EA	2										A1H23
X2-H	5310-933-8119	A300 WASHER, LOCK: SAME AS A295	EA	2										A1H24
X2-H		A301 PLATE, CABLE REEL: SMC687970 (80249)	EA	2										A1MP13
X2-H	5310-819-9188	A302 NUT, SELF-LOCK[NG, CLINCH: SAME AS A016	EA	4										A1H25
X1-H		A303 PLATE, CABLE REEL: SMC687970-1 (80249)	EA	1										A1MP14
X2-H	5305-054-6652	A304 SCREW, MACHINE: SAME AS A021	EA	8										A1H26
X2-H		A305 PLATE, IDENTIFICATION: SMD657839-2 (80249)	EA	1										A1MP15
X2-H	5310-934-9748	A306 NUT, PLAIN, HEXAGON: SAME AS A036	EA	4										A1R27
X2-H	5305-054-5649	A307 SCREW, MACHINE: SAME AS A068	EA	4										A1H28
X2-H	5310-933-8118	A308 WASHER, LOCK: SAME AS A038	EA	4										A1H29
M-D		A309 PLATE, INSTRUCTION: SMC657856 (80249)	EA	1										A1MP4
X2-H		A310 STRAP, RETAINING: TA514D12-12 (84971)	EA	4										A1MP16
X2-H	5310-934-9761	A311 NUT, PLAIN, HEXAGON: MS35649-264 (96906)	EA	8										A1H30
X2-H	5305-958-2918	A312 SCREW, MACHINE: MS24693C26 (96906)	EA	8										A1H31
X2-H	5310-929-6395	A313 WASHER, LOCK: SAME AS A242	EA	8										A1H32
X2-H		A314 STRAP, RETAING: TA514D11-12 (84971)	EA	4										A1MP17
X2-H	5310-934-9761	A315 NUT, PLAIN, HEXAGON: SAME AS A311	EA	8										A1H33
X2-H	5305-958-2918	A316 SCREW, MACHINE: SAME AS A312	EA	8										A1H34
X2-H	5310-929-6395	A317 WASHER, LOCK: SAME AS A242	EA	8										A1H35

SECTION V. REFAIR PARTS FOR DIRECT SUPPORT, GENERAL SUPPORT, AND DEPOT MAINTENANCE

(1) SMR CODE	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION / REF. NUMBER & MFR CODE / USABLE ON CODE	(4) UNIT OF MEAS	(5) QTY INC IN UNIT	(6) 30 DAY DS MAINT ALLOWANCE (A) 1-20	(B) 21-50	(C) 51-100	(7) 30 DAY DS MAINT ALLOWANCE (A) 1-20	(B) 21-50	(C) 51-100	(8) 1-YR ALW PER 100 EQUIP	(9) DEPOT MAINT ALW PER 100	(10) ILLUSTRATION (A) FIG.	(B) ITEM NO. OR REFERENCE DESIGNATION
M-D		A318 PLATE, IDENTIFICATION: SMD657839-1 (80349)	EA	1										MP3
P-C	5120-450-6766	A319 PULLER, PR ED WIRING BOARD: SMB687971-2 (80349)	EA	1	*	*	*	*	*	*		2	1-6(2)	MP1
P-C	5625-465-1706	A30 SCALE, CATBODE RAY TUBE: SMC657851 (80249)	EA	1	*	*	1	*	*	1	8	5		MP2

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SECTION VII. INDEX-FEDERAL STOCK NUMBER CROSS REFERENCE TO FIGURE AND ITEM NUMBER OR REFERENCE DESIGNATION

SECTION IV. INDEX FEDERAL STOCK NUMBER CROSS REFERENCE

CROSS-REFERENCE TO FIGURE AND ITEM NUMBER

FEDERAL STOCK NO.	FIG. NO.	ITEM NUMBER OR REF. DESIGNATION
1430-856-3283	7-1	A1HY1
4010-849-7347		A1MP8
4820-898-3003		MP4MP1
5120-450-6766	1-6	MP1
5305-050-9227		A6H4
5305-050-9229		A6H6
5305-054-5642		A7H4
5305-054-5648		A6H9
5305-054-5649		W1H1
5305-054-5649		W2H1
5305-054-5649		W3H1
5305-054-5649		W4H1
5305-054-5649		A1H28
5305-054-5651		A1H9
5305-054-5651		A1H13
5305-054-6652		A1H3
5305-054-6652		A1H7
5305-054-4652		A1H16
5305-054-6652		A1H26
5305-054-6652		A6H5
5305-054-6670		A1H1
5305-054-6670		A1H19
5305-054-6670		A1H22
5305-059-3660		A1H17
5305-958-2918		A1H31
5305-958-2918		A1H34
5310-531-9514		A1H4
5310-632-6721		A1H10
5310-685-3744		A1H2
5310-685-3744		A1H23
5310-819-9188		A1H6
5310-819-9188		A1H15
5310-819-9188		A1H25
5310-819-9188		A6H3
5310-864-5798		A6H2
5310-929-6395		A1H5
5310-929-6395		A1H32
5310-929-6395		A1H35
5310-933-8118		W1H2
5310-933-8118		W2H2
5310-933-8118		W3H2
5310-933-8118		W4H2
5310-933-8118		A1H11
5310-933-8118		A1H14
5310-933-8118		A1H29
5310-933-8118		A6H10
5340-933-8119		A1H20
5310-933-8119		A1H24
5310-933-8120		A1H18
5310-933-8120		A6H7
5310-934-9748		A1H8
5310-934-9748		A1H27
5310-934-9748		A6H8
5310-934-9759		A1H21
5310-934-9761		A1H30
5310-934-9711		A1H33
5310-938-2013		A7H4
5320-721-5243		A7H1
5320-721-5243		A7H7
5310-821-4995		A7H2
5325-817-1126		A6H1
5340-598-0383		A1MP3
5340-664-6881		A6MP10
5340-761-1258		A6MP6
5340-775-5978	1-3	A1MP7
5340-840-0954		A1MP11
5340-997-2964		A6MP4
5340-997-9007		MP4MP3
5355-842-3111		A6MP8
5820-986-7389		W3MP10
5930-177-2777	1-4	A6S1
5935-018-1121	1-5	W44P2
5935-056-0393	1-5	W12P2
5935-075-7008	1-6	CP1
5935-081-4340	1-5	W25P1
5935-086-4683	1-5	W16P1
5935-103-1755		W3MP7
5935-103-1756		W2MP4
5935-103-1756		W4MP4
5935-103-7370		W3MP9
5935-103-7371		W3E1
5935-104-3480		W3MP6
5935-106-3803		W2MP3
5935-106-3803		W4MP3
5935-177-2761	1-6	CP5
5935-177-2761	1-6	CP6
5935-177-2762	1-6	P2
5935-177-2763	1-6	P1
5935-177-2790	1-5	W11P2
5935-177-2791	1-5	W11P1
5935-177-2793		A7J1
5935-177-2793		A7J2
5935-177-2793		A7J3
5935-280-1454	1-5	W1CP1
5935-280-1454	1-5	W1CP2
5935-280-1454	1-5	W1CP3
5935-280-1454	1-5	W1CP4
5935-280-1454	1-5	W3CP1
5935-280-1454	1-5	W3CP2
5935-280-1454	1-5	W12CP1
5935-295-6295		A1CP3
5935-295-6295		A1CP4
5935-577-2281	1-5	W5P1
5935-577-2336	3-2	A6J8
5935-578-3489	3-2	A6J1
5935-578-3489	3-2	A6J2
5935-578-3489	3-2	A6J3
5935-578-3489	3-2	A6J4
5935-578-3489	3-2	A6J5
5935-578-3489	3-2	A6J6
5935-578-3489	3-2	A6J7
5935-681-5685	1-5	W1P3
5935-681-5685	1-5	W1P4
5935-681-5685	1-5	W1P5
5935-681-5685	1-5	W1P6
5935-681-5685	1-5	W1P7
5935-681-5685	1-5	W1P8
5935-681-5685	1-5	W1P9
5935-681-5685	1-5	W1P10
5935-681-5685	1-5	W3P3
5935-681-5685	1-5	W3P4
5935-681-5685	1-5	W3P5
5935-681-5685	1-5	W3P3
5935-681-5685	1-5	W12P4
5935-681-5685	1-5	W14P1
5935-481-5685	1-5	W14P2
5935-681-5685	1-5	W15P1
5935-681-5685	1-5	W15P2
5935-681-5685		A1W3P1
5935-681-5685		A1W3P2
5935-681-5685		A1W3P2
5935-717-2591	1-5	W25P2
5935-752-2792	7-1	A1W1P1
5935-752-2792	7-1	A1W1P2
5935-752-2792	7-1	A1W2P2
5935-752-2792	7-1	A1W2P2
5935-760-1767		A1W4P2
5935-772-9261	1-4	A6P1
5935-789-6272		W2E2

SECTION VII, INDEX-FEDERAL STOCK NUMBER CROSS REFERENCE TO FIGURE AND ITEM NUMBER OR REFERENCE DESIGNATION (continued)

FEDERAL STOCK NUMBER	FIGURE NUMBER	ITEM NUMBER OR REF. DESIGNATION
5935-789-7765		W3E2
5935-804-7447		A1W4P1
5935-804-7447		A1W6P1
5935-827-5670	1-5	W25P6
5935-833-0991	1-5	W21P2
5935-837-5280	1-6	CP2
5935-837-5280	1-6	CP3
5935-837-5280	1-6	CP4
5935-842-9614	1-6	CP7
5935-842-9614	1-6	CP8
5935-851-3554	1-5	W44P1
5935-878-6410		A8J1
5935-878-6410		A9J1
5935-893-1773	7-1	A1J4
5935-901-8871	1-5	W25P3
5935-904-4050	7-1	A1CP1
5935-904-4050	7-1	A1CP2
5935-909-8516		W2E5
5935-909-8516		W4E3
5935-909-8565		W2E4
5935-909-8565		W4E1
5935-910-9177		W2E6
5935-910-9177		W4E4
5935-916-3780	1-5	W21P1
5935-918-4046		W2E3
5935-918-4046		W4E2
5935-931-0412	1-5	W12P1
5935-931-7490	1-5	W25P7
5935-945-7352	1-5	W13P1
5935-976-0862	1-5	W25P4
5935-976-0862	1-5	W25P5
5935-989-6819		W3E1
5940-857-4914	1-5	W16E1
5940-857-4914	1-5	W16E2
5940-929-8558		W2E7
5940-989-8407		W3E3
5940-993-5216		W16E3
5940-993-5216		W25E1
5950-970-1869	1-6	AT5
5950-970-1869	1-6	AT6
5970-823-4506	1-5	W13E1
5975-763-4442		W16MP1
5985-128-0195	1-6	AT1
5985-128-0195	1-6	AT2
5985-177-2939	1-3	A1
5985-861-7856	1-6	AT3
5985-861-7856	1-6	AT4
5995-905-7194	1-5	W14
5995-905-7194	1-5	W15
6145-080-4383		W21W1
6145-080-6515		W25W1
6145-542-6092		W14W1
6145-542-6092		W15W1
6145-542-6092		A1W3W1
6145-542-6092		A1W4W1
6145-542-6092		A1W6W1
6145-606-8237		W16W1
6145-660-8716		A1W1W1
6145-660-8716		A1W2W1
6145-781-5502		W2W1
6145-781-5502	6-9	W5W1
6145-823-2544		W12W1
6145-823-2544		W1W1
6145-835-1085		W3W1
6145-835-1085	6-9	W3W2
6145-935-2646		P1W2
6145-935-2646		P1W2
6145-935-2646		P2W2
6625-042-8084	3-1	A1AT1
6625-133-7773	1-6	A9
6625-133-7775	1-6	A8
6625-133-7776	1-6	A7
6625-133-7795	1-5	W25
6625-133-7799	1-2	MP4
6625-133-7803	1-5	W1
6625-133-7804	1-5	W3
6626-133-7850	1-5	W4
6625-133-7852	1-5	W2
6625-176-5498	1-4	A6
6625-177-4488	1-5	W5
6625-177-4489	1-5	W13
6625-177-4490	1-5	W16
6625-177-4491	1-5	W12
6625-177-4492	1-5	W21
6625-177-4498	1-5	W11
6625-177-4499	1-5	W44
6625-465-1706		MP2
6625-993-0879		MP4MP7

Reference No.	Mfg. Code	Fig. No.	Ref. Desig.
AN960C3	88044		A7H5
D8762/ALTERED/	98376		MP4MP8
FDK1152	98313		MP4MP5
MS35338-134	96906		A7H6
RNF100-1-2	08795		W1MP10
RNF100-1-2	08795		W25MP2
RNF1001-4	08795		W16MP3
RT510	08795		W11MP2
RT510-1-2	08795		W44MP2
RT510-1-4	08795		A6MP7
SMB657793-09	80249		W251MP1
SMB657797	80249		W3MP4
SMB657798	80249		P2MP1
SMB657798	80249		W1MP2
SMB657799	80249		W1MP3
SMB657801	80249		W3MP3
SMB657809	80249		W1MP1
SMB657809	80249		W2MP1
SMB657809	80249		W3MP1
SMB657809	80249		W4MP1
SMB657810-2	80249		W3MP2
SMB657810-2	80249		W4MP2
SMB657812-16-9	80249		W2W3
SMB657812-16-9	80249		W4W1
SMB657812-18-9	80249		W25W2
SMB657812-20-9	80249		W25W3
SMB657812-20-9	80249		A6W1
SMB657812-22-0	80249		W16W2
SMB657812-22-9	80249		W2W2
SMB657812-22-9	80249		W4W2
SMB657812-24-9	80249		W11W1
SMB657812-24-9	80249		W44W1
SMB657845	80249		P1MP1
SMB657866	80249		P2W1
SMB657867	80249		P1W1
SMB657873-1	80249		W2MP2
SMB657873-2	80249		W1MP2
SMB6587966	80249		A6MP5
SMB687995	80249		A6MP1
SMC657794-16	80249		W11WMP1
SMC657794-16	80249		W44MP1
SMC657856	80249		A1MP4
SMC657859-1	80249		W21MP1
SMC657859-2	80249		W12MP1
SMC657859-5	80249		W16MP2
SMC657859-6	80249		W13MP1
SMC657859-7	80249		A1W3MP1
SMC657859-8	80249		A1W4MP1

SECTION INDEX-FEDERAL STOCK NUMBER CROSS REFERENCE TO FIGURE AND ITEM NUMBER OR REFERENCE DESIGNATION (Continued)

REFERENCE NO.	MFR CODE	FIG. NO.	REF. DESIG.
SMC65785-9-9	80249		A1W1MP1
SMC657859-10	80249		A1W2MP1
SMC657859-11	80249		A1W6MP1
SMC657859-12	80249		W14MP1
SMC657859-12	80249		W15MP1
SMC657859-14	80249		W5MP1
SMC657859-15	80249		W44MP3
SMC657859-16	80249		W11MP3
SMC657859-17	80249		W1MP9
SMC657859-18	80249		W2MP8
SMC657859-19	80249		W3MP12
SMC657859-20	80249		W4MP7
SMC657859-21	80249		W25MP3
SMC657859-28	80249		W1MP11
SMC657859-28	80249		W2MP9
SMC657859-28	80249		W3MP3
SMC657859-28	80249		W4MP8
SMC657859-28	80249		W11MP4
SMC657859-28	80249		W25MP4
SMC657859-28	80249		W44MP4
SMC657859-30	80249		W1MP12
SMC657859-30	80249		W2MP10
SMC657859-30	80249		W3MP14
SMC657859-30	80249		W4MP9
SMC657859-30	80249		1W11MP5
SMC657859-30	80249		W25MP5
SMC657859-30	80249		W44MP5
SMC657859-34	80249		W25MP6
SMC657859-37	80249		W25MP7
SMC657859-40	80249		W25MP8
SMC657859-44	80249		W25MP9
SMC657859-46	80249		W25MP10
SMC657859-50	80249		W25MP11
SMC657859-51	80249		W25MP12
SMC657859-52	80249		W14MP2
SMC657859-52	80249		W15MP2
SMC657859-523	80249		1W1MP13
SMC657859-53	80249		W3MP15
SMC657859-54	80249		W1MP14
SMC657859-54	80249		W3MP16
SMC657859-55	80249		VW1MP15
SMC657859-55	80249		W3MP17
SMC657859-56	80249		W1MP16
SMC65 7859-56	80249		W3MP18
SMC657859-57	80249		W1MP17
SMC657859-56	$0249		W1MP18
SMC657859-58	80249		W1MP19
SMC657859-60	80249		W1MP20
SMC657859-61	80249		W14MP3
SMC657859-61	80249		W15MP3
SMC657859-62	80249		W1MP8
SMC657859-64	80249		W3MP11
SMC657859-65	80249		W1MP21
SMC687969	80249		A1MP10
SMC687970	80249		A1MP13
SMC687970-1	80249		A1MP14
SMC688010	80249		A1W4
SMC688010	80249		A1W5
SMC688011-1	80249		7-1 A1W1
SMC688011-2	80249		7-1 A1W2
SMC688013			A1W6
SMC688015	80249		7-1 A1W3
SMC688016	80249		A1MP1
SMC688016-1	80249		A1MP2
SMD657839-1	80249		MP3
SMD657839-2	80249		UA1MP15
SMD657839-4	80249		A6MP9
SMD687955	80249		A7TB1
SMD687956	80249		A8TB1
SMD687957	80249		A9TB1
SMD687959-1	80249		A7MP1
SMD687959-2	80249		A7MP2
SMD687959-3	80249		A7MP3
SMD687959-4	80269		A7MP4
SMD687965	80249		A6MP2
SMD687965-1	80249		A6MP3
SMD687968	80249		A1MP12
SMD687991	80249		A1MP9
TA514D12-12	84971		A1MP16
TA514D16-12	84971		A1MP17
ZSP1-158	98376		MP4MP4
ZSP3-377	98376	1-2	MP4MP2
ZSP7-703	19178		A1MP6
ZSP8-806	98376		MP4MP6
Z147-212BM8472	19178		A1MP5
101N4800A	94375		A1W6P2
10-350695-32	77820		W25CP1
202279-3	00779		W2MP5
202279-3	00779		W4MP5
202305-4	00779		W2MP7
202305-4	00779		W4MP7
202617-1	00779		W1MP7
202648-2	00779		W3MP5
202681-2	00775		P1MP2
202681-2	00775		P2MP2
202681-2	00779		W1MP5
202786-1	00779		W2MP6
202786-1	00779		W4MP6
202789-1	00779		W1MP6
202795-1	00779		W3MP8
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NG: None.
USAR: None.
For explanation of abbreviation used, see AR 310-50.

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