TECHNICAL MANUAL.

OPERATOR'S, ORGANIZATIONAL, DIRECT

SUPPORT AND GENERAL SUPPORT

MAINTENANCE MANUAL

TEST FACILITIES SET
AN/TPM-24(V)4
(NSN 6625-01-086-5129)

HEADQUARTERS, DEPARTMENT OF THE ARMY
31 JANUARY 1983

WARNING

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

DON’T TAKE CHANCES!

**DANGEROUS VOLTAGE 168 VOLTS
EXISTS IN SIGNAL PROCESSOR CP-1187/TPX-46(V)7
MODULE A46**

TECHNICAL MANUAL
No. 11-6625-2398-15-4

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC, *31 January 1983*

OPERATOR'S, ORGANIZATIONAL, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL

TEST FACILITIES SET AN/TPM-24(V)4

(NSN 6625-01-086-5129)

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to: Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: DRSEL-ME-MP, Fort Monmouth, NJ 07703. In either case, a reply will be furnished directly to you.

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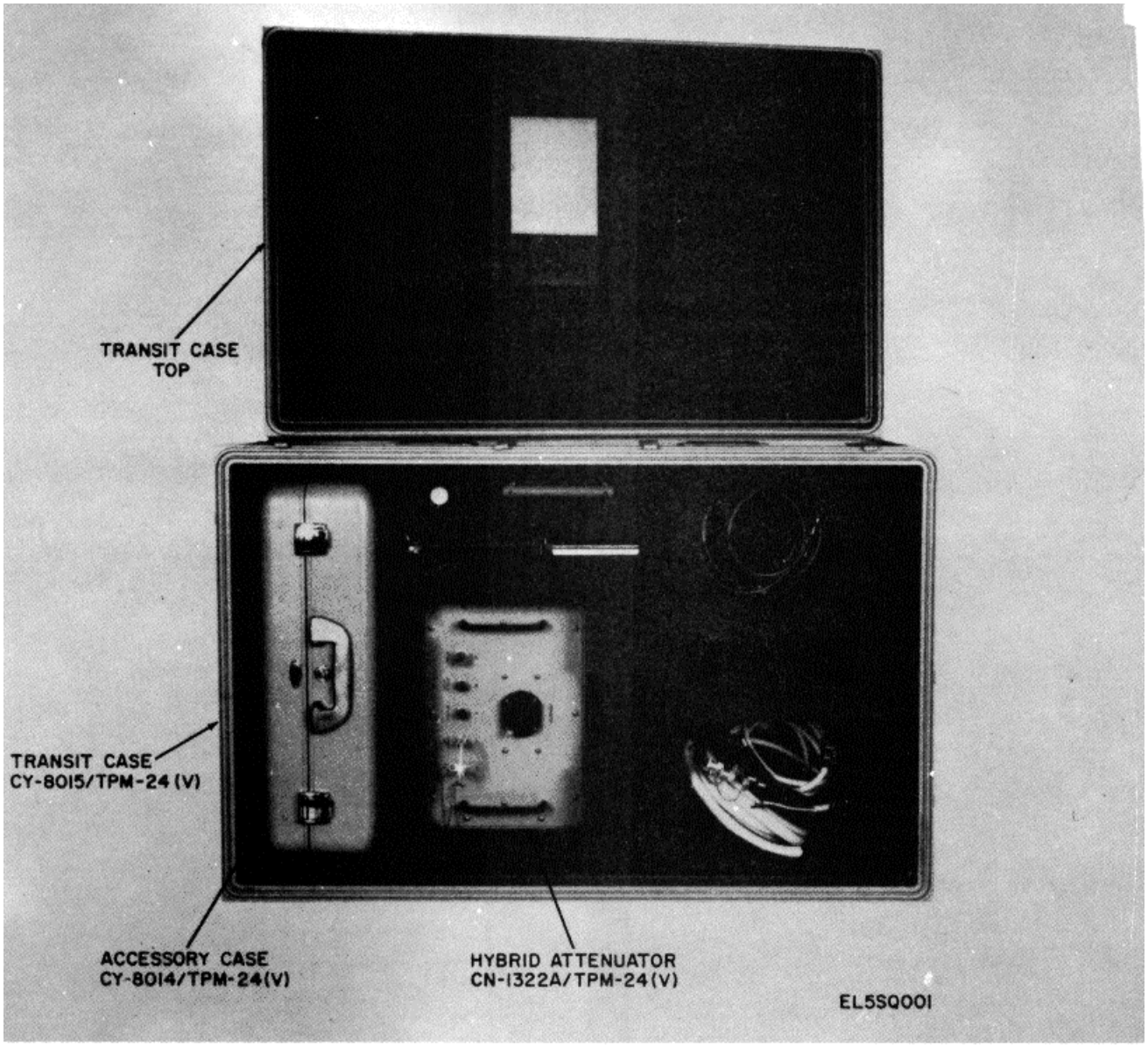


Figure 1-1. Test Facilities Set AN/TPM-24(V)4.

CHAPTER 1

INTRODUCTION'

Section I. GENERAL

1-1. Scope

(Fig. 1-1)

This manual describes Test Facilities Set AN/TPM-24(V)4 and provides instructions for its installation, use, and maintenance. The manual includes instructions for cleaning, inspection, troubleshooting, testing, repair, and removal and replacement of components within the set. It also lists tools, materials, and test equipment required for maintenance. A functional description of the equipment is also provided.

1-2. Consolidated Index of Army Publications and Blank Forms

Refer to the latest issue of DA Pam 310-1 to determine whether there are new editions, changes, or additional publications pertaining to the equipment.

1-3. Maintenance Forms, Records, and Reports

a Reports of Maintenance and Unsatisfactory Equipment.

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by TM 38-750, The Army Maintenance Management System (TAMMS).

b.Report of Packaging and Handling Deficiencies.

Fill out and forward SF 364 (Report of Discrepancy (ROD)) as prescribed in AR 735-11-2/DLAR 4140.55/NAVMATINST 4355.73/AFR 400-54/ MCO 4430.3E.

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/NAVSUPINST 4610.33B/AFR 75-18/MCO P4610.19C/DLAR 4500.15.

1-4. Reporting Equipment Improvement Recommendations (EIR)

If your Test Facilities Set AN/TPM-24(V)4 needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design. Put it on an SF 368 (Quality Deficiency Report). Mail it to Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: DRSEL-ME-MP, Fort Monmouth, NJ 07703. We'll send you a reply.

Section II. DESCRIPTION AND DATA

1-5. Purpose and Use

a Test Facilities Set AN/TPM-24(V)4 provides for interconnection of Interrogator Set AN/TPX-46(V)7 (IFF set) and test equipment which, together, comprise a test bed for the IFF set.

Components of Test Facilities Set ANITPM-24(V)4 consist of Hybrid Attenuator CN-3222A/ TPM-24(V), a set of cables, and minor components.

b.Hybrid Attenuator CN-3222A/TPM-24(V) is provided for use in performing RF measurements in the RF sum and difference channels of the IFF set at challenge and reply frequencies.

c.Cable assemblies are provided for IFF set power connections, for connection of the IFF set to test bed test equipment and for extending the modules of the IFF set processor assembly.

d.Minor components are used in performing specific maintenance procedures on the IFF set. The maintenance procedures are provided in TM 11-5895-824-40, General Support Maintenance Manual, Interrogator Set AN/TPX-46(V)7.

1-6. Tabulated Data for Hybrid Attenuator Assembly

CN-1322A/TPM-24(V)

a. Hybrid Junction. The following is a summary of the characteristics of the hybrid junction:

Impedance .....50 ohms, nominal
Frequency range.....1000-1200 MHz
Nominal coupling.....3.0 +0.3, -0 db
Max. deviation.....+0.25 db

Max. VSWR.....1.65:1
Min. isolation.....20 db between sum and difference
Power rating .....5 kilowatts peak, 50 watts average

b. Attenuator. The following is a summary of the characteristics of the attenuator:

Impedance.....50 ohms, nominal
Frequency range .....1000-1200 MHz
Variable attenuation.....0-25 db, min
Calibration accuracy at 1090 MHz (not including insertion loss).....0-10 db ±0.2 db, 10-20 db ±0.50 db, 20-25 db ±0.60 db
Accuracy over the band .....± 2.5 db max., including insertion loss
Insertion loss.....8.0 db, max.
VSWR 1.5:1
Power rating.....6 kilowatts peak, 10 watts average.

1-7. Common Names

A list of nomenclature and common name assignments for the test facilities set is given below.

Common Name	*Reference{Designation*	*Nomenclature*
Test facilities set	Unit 1	Test Facilities Set AN/TPM-24(V)4
Transit case	1A1	Transit Case CY-8015/TPM-24(V)
Hybrid attenuator	1A1A1	Hybrid Attenuator CN-1322AITPM-24(V)
Accessory case	1AIA2	Case, Accessory CY-8014/TPM-24(V)
Dummy load DA-558	1A1A2AT1, AT2	Dummy Load, Electrical DA-558/TPM-24(V)
Dummy load DA-559	1A1A2AT3	Dummy Load, Electrical DA-5591TPM-24(V)
Dummy load DA-635	1A1A2AT4	Dummy Load, Electrical DA-634/TPM-24(V)
Dummy load DA-635	1A1A2AT5	Dummy Load, Electrical DA-635/TPM-24(V)
Shorting plug 1A 1A2AT6		Interface Unit, Dummy Connector J-3984/ TPM-24(V)
Adapter UG-29B/U	1A1A2CP1, CP2	Adapter, Connector UG-29B/U
Adapter UG-57BIU	1A1A2CP3	Adapter, Connector UG-57B/U
Adapter UG-491BIU	1A1A2CP4, CP5	Adapter, Connector UG-491B/U
Adapter UG-1034/U	1A1A2CP6	Adapter, Connector UG-1034/U
Adapter UG- 1896/U	1A1A2CP-7, CP8, CP9, CP10	Adapter, Connector UG-1896/U
Adapter UG-1897JU	1A1A2CP11, CP12	Adapter, Connector UG-1897/U
Adapter MX-10411	1A1A2CP13	Adapter, Connector MX-1041 1/TPM-24(V)
Adapter MX-10410	1A1A2CP14	Adapter, Connector MX-10410/TPM-24(V)
Adapter MX-10409	1A1A2CP15	Adapter, Connector MX-10409/TPM-24(V)4
Adapter MX-10408	1A1A2CP16	Adapter, Connector MX-10408/TPM-24(V)4
Diode detector	1A1A2CR1	Converter, Radio Frequency CV-3747/TPM-24(V)
Cable CX-12916	1A1A2W1, W2, W3	Cable Assembly. Special Purpose CX-129161 TPM-24(V)
Cable SM-D-986530	1A1A2W4	Cable Assembly, Special Purpose SM-D-986530
Cable SM-D-986531	1A1A2W5	Cable Assembly, Special Purpose SM-D-986531
Grounding Strap	1A1A2W6, W7	Grounding Strap, Special Purpose SM-B-604411
Tuning tool	1A1A2MP1	Tuning Tool, Johanson Part No. JOH8771
5/16" Open end wrench	1A1A2MP2	Open End Wrench, SM-C-986528
15164" Open end wrench	1A1A2MP3	Open End Wrench, SM-C-986529
Card extractor	1A1A3	Extractor, Circuit Board MX-10412/TPM-24(V)
Fault isolation board	1A1A4	Extender Card, Electronic Test MX-9356/ TPM-24(V)
Dummy load DA-636/U	1A1CP1	Dummy Load, Electrical DA-636/U
Dc power cable SM-D-787808	1A1W1	Cable Assembly, Special Purpose, Dc Power SM-D-787808
Ac power cable SM-D-787809	1A1W2	Cable Assembly, Special Purpose, Ac Power SM-D-787809
Cable CG-3750/TPM-24(V)	1A1W3/W4	Cable Assembly, Radio Frequency CG-37501 TPM-24(V)
Mode 4 cable SM-D-986522	1A1W5	Cable Assembly, Special Purpose SM-D-986522
Cable CG-3754/TPM-24(V)	1A1W6, W7, W8	Cable Assembly, Radio Frequency, CG-3754/ TPM-24(V)
Cable SM-D-986535	1A1W9	Cable Assembly, Radio Frequency SM-D-986535
Cable SM-D-986536	1A1W10	Cable Assembly, Radio Frequency SM-D-986536

1-8. Components of Test Facilities Set AN/TPM-24(V)4

a Major Components

(1) *Transit Case 1A1.* Transit case 1A1 weighs 40 lbs, is 25-1/4 inches high, 27-118 inches deep, and 25-5/8 inches wide. The transit case contains all of the components of the test facility set.

(2) *Hybrid Attenuator 1A1A1.* Hybrid attenuator 1A1A1 weighs 12-1/2 lbs, is 10 inches high, 9-1/2 inches deep, and 13-1/4 inches wide.

(3) *Accessory Case 1A1A2.* Accessory case 1A1A2 weighs 12 lbs, is 6-1/2 inches high, 14 inches deep, and 21 inches wide.

b. Cable Assemblies (fig. 1-3)

Quantity	*Item*	*Length*
1	1A1W1 (SM-C-787808)	10 ft.
1	1A1W2 (SM-C-787809)	10 ft.
2	1A1W3JW4 (CG-3750/TPM-24(V))	6 ft.
1	1A1W5 (SM-D-986522)	8 ft.
3	1A1W6 W7W8 (CG-3754/TPM-24(V))	3 ft.
1	1A1W9 (SM-D-986535)	33.66 in.
1	1A1W10 (SM-D-986536)	34.58 in.
3	1A1A2W1/W2/W3 (CX-12916)	2 ft.
1	1A1A2W4 (SM-D-986530)	10 in.
1	1A1A2W5 (SM-D-986530)	10 in.
2	1A1A2W6/W7 (SM-B-604411)	6 in.

c. Minor Components. (fig. 1-5)

Quantity	*Item*
1	Extractor 1A1A3
1	Extender 1A1A4/A5
1	Dummy load 1A1AT1
1	Diode detector 1A1A2CR1
2	Dummy load 1A1A2AT1/AT2 (DA-558)
1	Dummy load 1A1A2AT3 (DA-559)
1	Dummy load 1A1A2AT4 (DA-634)
1	Dummy load 1A1A2AT5 (DA-635)
1	Shorting plug 1A1A2AT6
2	Adapter 1A1A2CPl/CP2 (UG-29B/U)
1	Adapter 1AlA2CP3 (UG-57B/U)
2	Adapter 1A1A2CP4/CP5 (UG-491B/U)
1	Adapter 1A1A2CP6 (UG-1034/U)
4	Adapter 1A1A2CP7/CP8/CP9/CP10 (UG-1896)
2	Adapter 1A1A2CP11/CP12 (UG-1897)
1	Adapter 1A1A2CP13 (MX-10411)
1	Adapter 1A1A2CP14 (MX-10410)
1	Adapter 1A1A2CP15 (MX-10409)
1	Adapter 1A1A2CP16 (MX-10408)
1	Tuning tool 1A1A2NMP1
1	5/16 open end wrench 1A1A2MP2
1	15/64 open end wrench 1A1AMP3

1-9. Description of Transit Case 1A1 (fig. 1-2)

Transit case 1A1 contains all the components of Test Facilities Set AN/TPM-24(V)4. Cutouts in foam rubber form compartments for the individual items. The top of the case, which contains a pressure relief valve, is secured by 16 snap fasteners. Four handles are provided for lifting and carrying the transit case. Items contained in the transit case are listed in paragraph 1-6.

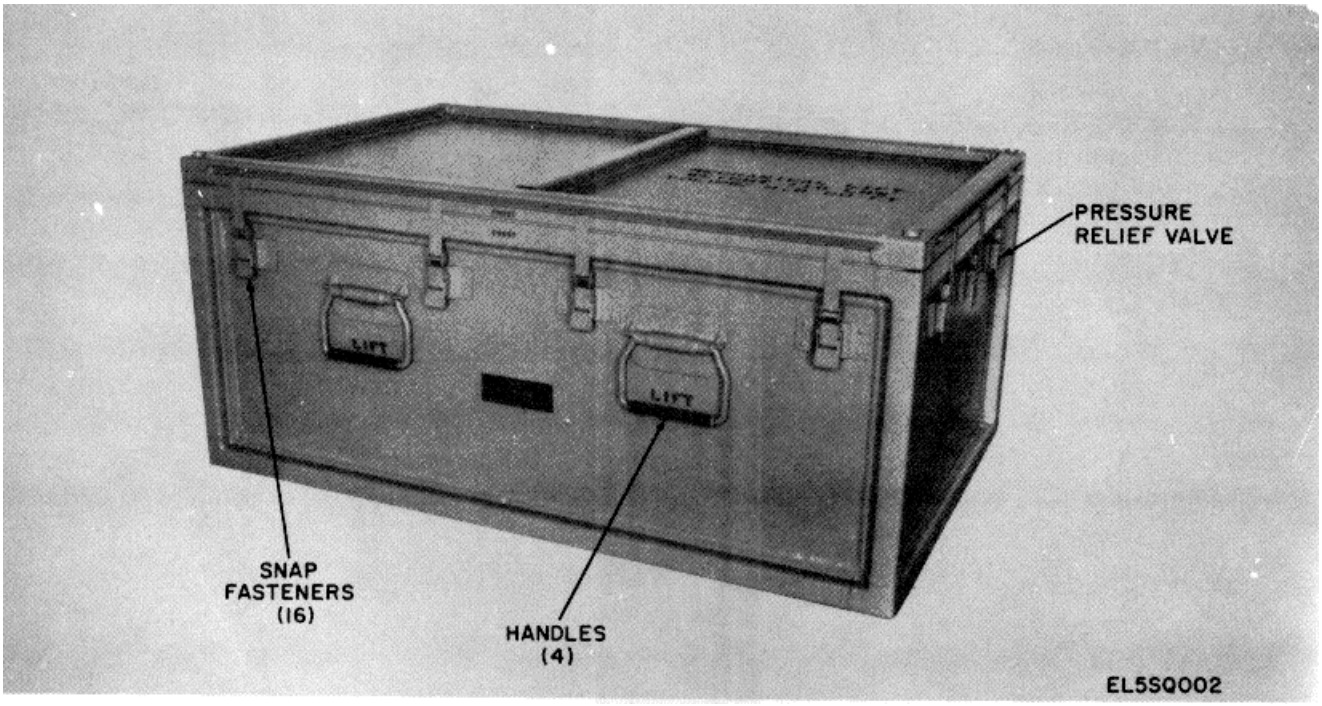


Figure 1-2. Transit Case 1A1

1-10. Description of Hybrid Attenuator 1A1A1 (fig. 1-3)

Hybrid attenuator 1A1A1 consists of a hybrid junction assembly and a variable attenuator assembly. These assemblies are 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 setup using the test facilities set cables.

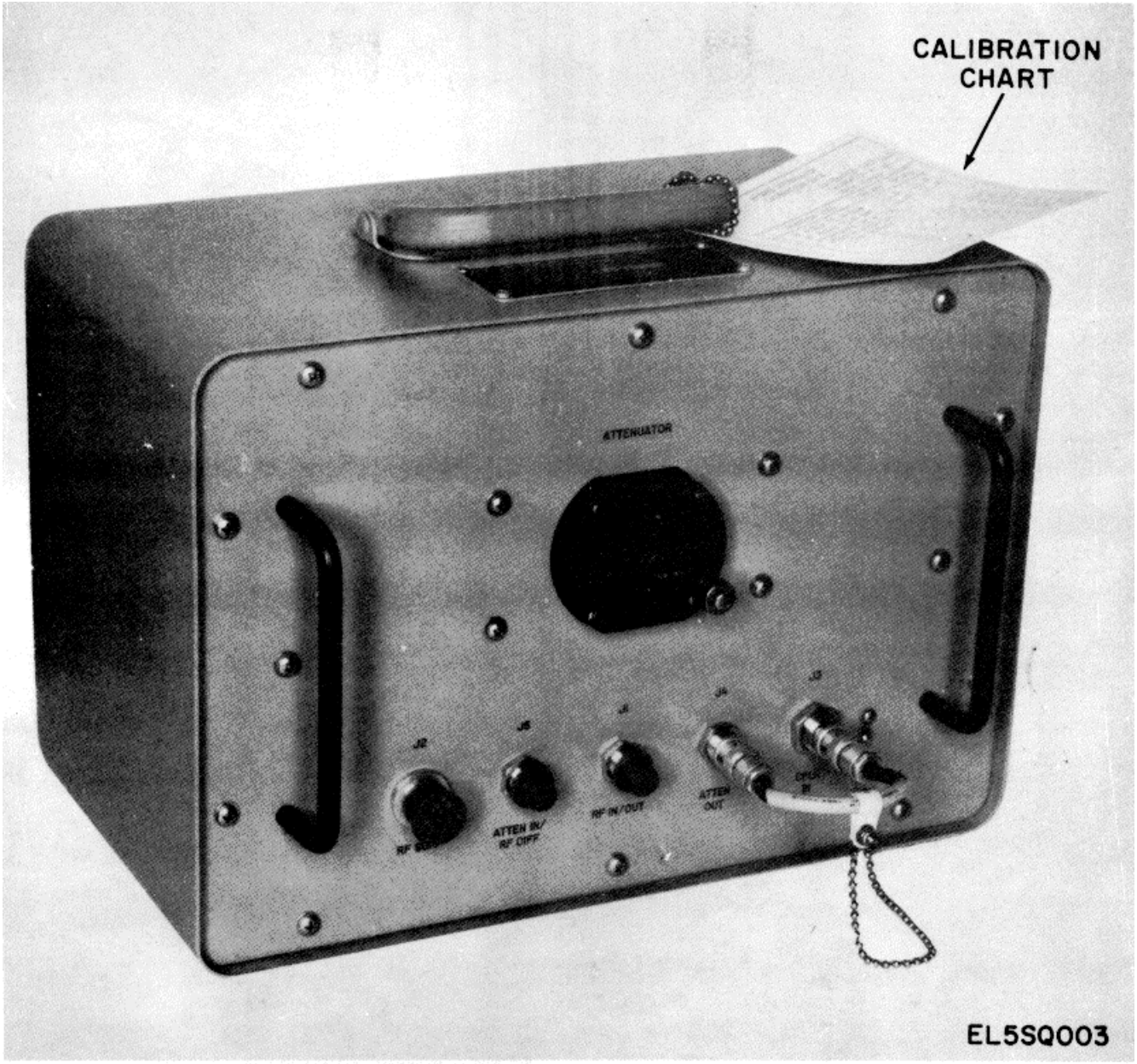


Figure 1-3. Hybrid Attenuator 1A1A1.

1-11. Description of Accessory Case 1A1A2 (fig. 1-4)

Accessory case is a resusable protective case, which houses cables and minor components during transit or storage. The case is equipped with a hinged cover which is held closed by means of two latches. A folding handle is provided for lifting and carrying the accessory case. The cover contains a compartment for storing cables 2 feet or less in length. The bottom section contains compartments for storing various minor components which are held in place by means of spring clips.

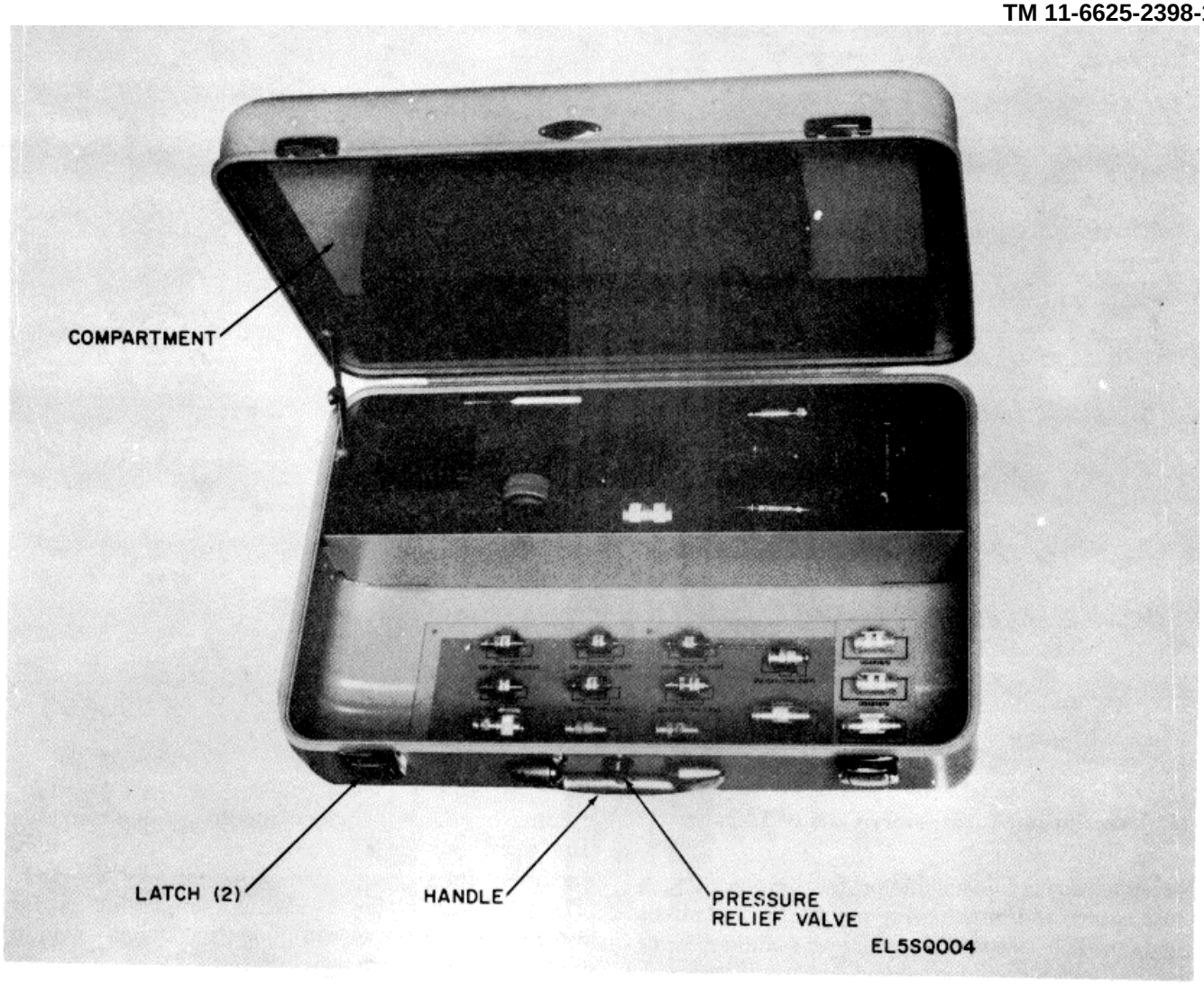


Figure 1-4. Accessory Case 1A1A2.

1-12. Description of Cables
(fig. 1-5)

a. Cable 1A1W1 (SM-C-787808) is a 10-foot cable with one connector and 11 color coded wires, and is used for connecting the IFF set to the dc power source.

b. Cable 1A1W2 (SM-C-787809) is a 10-foot cable with one connector and three color coded

wires, and is used for connecting the IFF set to the ac power source.

c. Cable 1A1W3 (SM-D-986522) is an 8-foot cable used for connecting the IFF set to the radar test set.

d. Cables 1A1W4 and W5 (CG-3750/TPM-24(V)) are six 6-foot cables used for connection of the sum and difference connectors of the IFF set to the hybrid attenuator ’or to the radar test set.

e. Cables 1A1W6, W7, and W8, (CG-3754/TPM-24(V)) are 3-foot cables used when modules are extended from the processor chassis to connect the connectors of the extended chassis to the semirigid coaxial cables in the processor chassis.

f Cable 1A1W9 is a 33. inch critical length cable used to connect rf switch module connector A32A3J3 to receiver module connector A35A1J2 when the receiver module is extended from the processor chassis.

g. Cable 1A1W10 is a 34.58 inch critical length cable used to connect rf switch module connector A32A3J2 to receiver module connector A35A1J3 when the receiver module is extended from the processor chassis.

h. Cables 1A1A2W1, W2, and W3 (CX-12916/TPM-24(V)) are 2-foot cables used for connection between rf switch module connectors 1A32P1 and 1A32XP1, between self-test of switch module connectors 1A33P1 and 1A33XP1, between transmitter module connectors 1A34P1 and 1A34XP1, between receiver module connectors 1A35P1 and 1A35XP1, and between low voltage power supply modules 1A46P1 and 1A46XP1, when these modules are extended.

i. Cable 1AlA2W4 is a 10-inch cable used to connect transmitter module driver assembly cable A34A1A8P1 to transmitter module connector A34J2 when transmitter assembly A34A1 is extended from the transmitter module.

j. Cable 1A1A2W5 is a 10-inch cable used to connect transmitter module power distribution board connector A34A1A7P1 to transmitter module connector A34J1 when transmitter assembly A34A1 is extended from the transmitter module.

k. Grounding straps 1A1A2W6 and W7 provide ground connections for self-test rf switch card A33A1 when it is extended from the module.

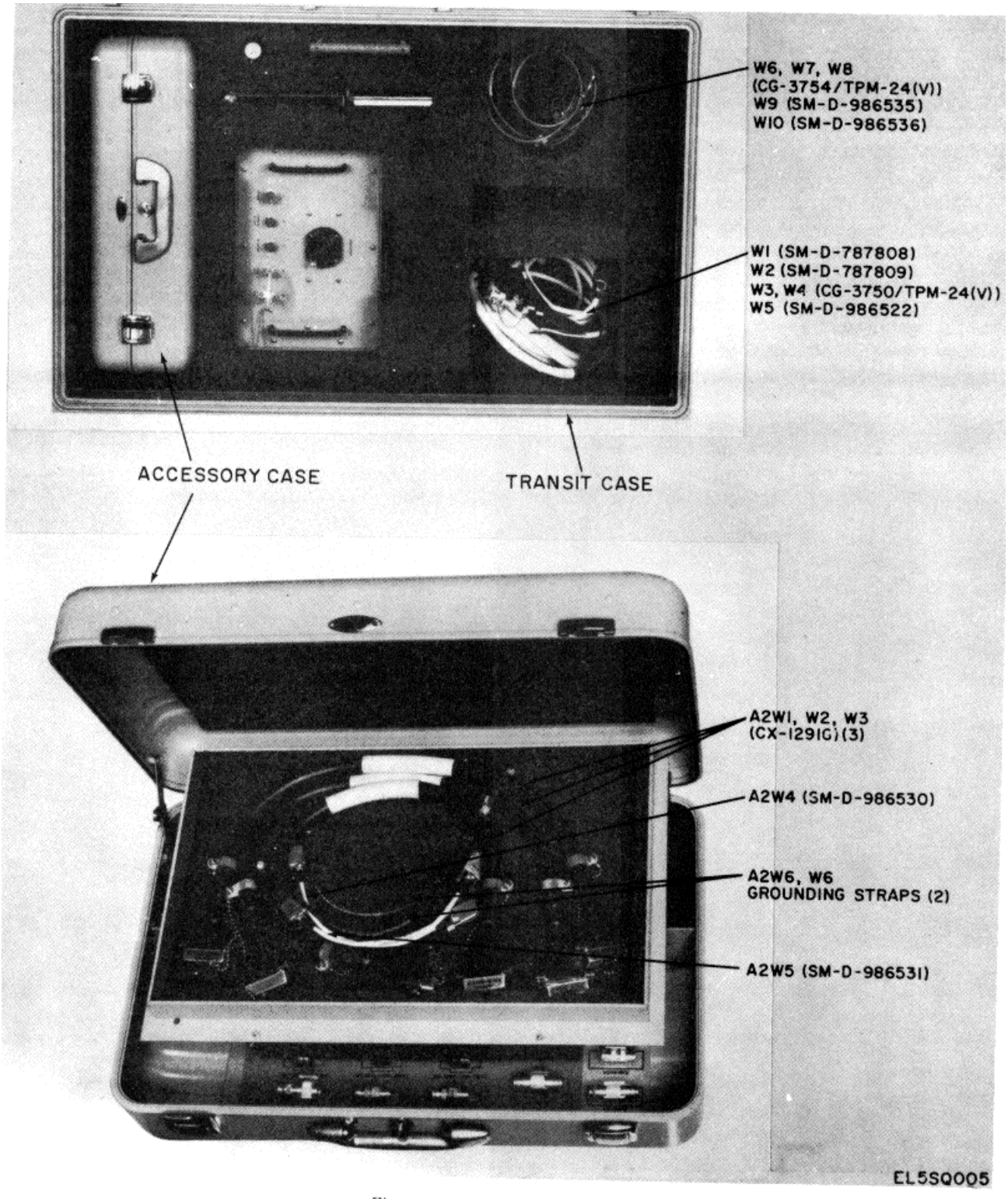


Figure 1-5. Test Facilities Set Cables.

1-13. Description of Minor Components
(fig. 1-6 and 1-7)

a. Extractor 1A1A3 (MX-10412) is used to remove printed wiring cards from processor or module chassis.

b. Fault isolation card 1AlA4 (MX-9356) provides for operation of printed wiring cards when they are extended from the module of chassis and provides the means to interrupt or to ground signal paths to and from the extended card.

c. Dummy load lAlAT1 (DA-636) is a 50 ohm, 50 watt termination used during maintenance of the IFF set.

d Dummy loads 1A1A2AT1 and 1A1A2AT2 (DA-558) are 50 ohm terminations used during maintenance of the IFF set.

e. Dummy load 1AIA2AT3 (DA-559) is a 75 ohm termination used during maintenance of the IFF set.

f. Dummy load 1A1A2AT4 (DA-634) is a 5 db mismatch used during maintenance of the IFF set.

g. Dummy load 1A1A2AT5 (DA-635) is an 11 db mismatch used during maintenance of the IFF set.

h. Shorting plug 1A1A2AT6 (J-3984) (fig. 1-7) connects to processor connector receptacle SIG INTFC J1 when the processor is installed in a test bed.

i. Adapters 1A1A2CP1 through 1A1A2CP13 are used to connect test facility cables to the IFF set, or test equipment cable connectors to cables in the IFF set. These adapters consist of the following:

(1) BNC-male to BNC-male
(2) BNC-female to SMA-male
(3) N-male to BNC-male
(4) SMA-male to BNC-female
(5) N-female to N-female
(6) SMA-male to SMC-female
(7) SMC-male to SMC-female
(8) SMC-male to SMC-male

j. Adapter 1AlA2CP15 (MX-10408) is used with diode detector 1A1A2CR1 (CV-3747) for checking transmitter driver test points.

k. Tuning tool 1A1A2MP1 is used for tuning rf circuits.

l. Two wrenches 1AlA2MP2 and MP3 are provided for semirigid cable connectors.

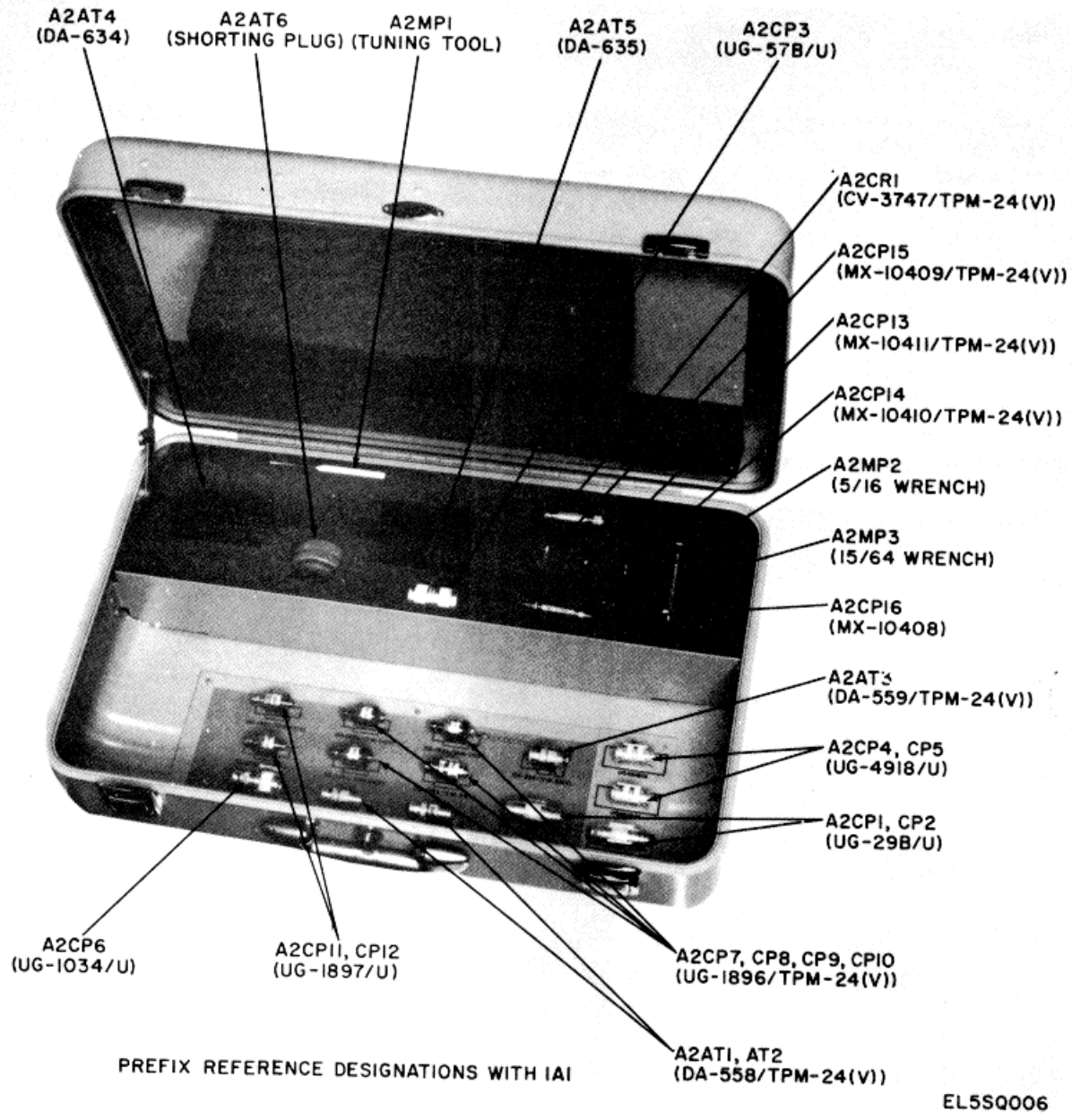


Figure 1-6 (1) Test Facilities Set Minor Components. (Sheet 1 of 2)

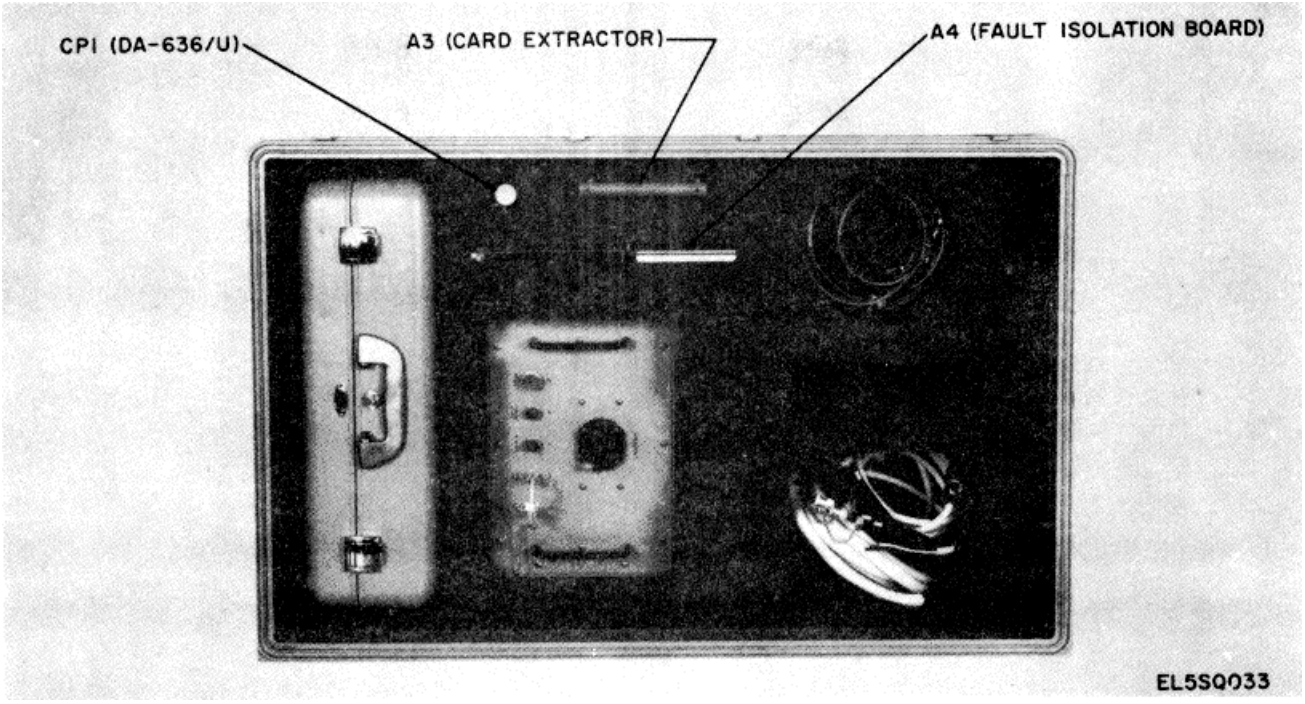


Figure 1-6 (2) . Test Facilities Set Minor Components. (Sheet 2 of 2)

Figure 1-7. Shorting Connector 1A1A2AT6.

CHAPTER 2
INSTALLATION

2-1. Unpacking

(fig. 2-1)

a. Packaging Data. Components of Test Facilities Set AN/TPM-24(V)4 are contained in the transit case which is packed in a wooden packing case.

b. Unpacking.

(1) Cut the metal straps and bend them away from the packing case.

(2) Use a nail puller or equivalent tool to remove the wooden cover.

(3) Remove the transit case in its polyethylene wrap.

(4) Remove the polyethylene wrap.

(5) Open the transit case by releasing the 16 spring locks and inspect the humidity indicator; it should be blue. If the humidity indicator is pink, inspect the contents 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 SF 364 (para 1-3b).

b. See that the equipment is complete as listed on the packing slip. If a packing slip is not available, check the equipment against the basic issue items list and repair parts and special tools list (appendix C). Report all discrepancies in accordance with TM 38-750. Shortage of a minor assembly or parts that does not affect proper functioning of the equipment should not prevent use of the equipment.

c. If the equipment has been 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.

NOTE

Current MWO's applicable to the equipment are listed in DA Pam 310-1.

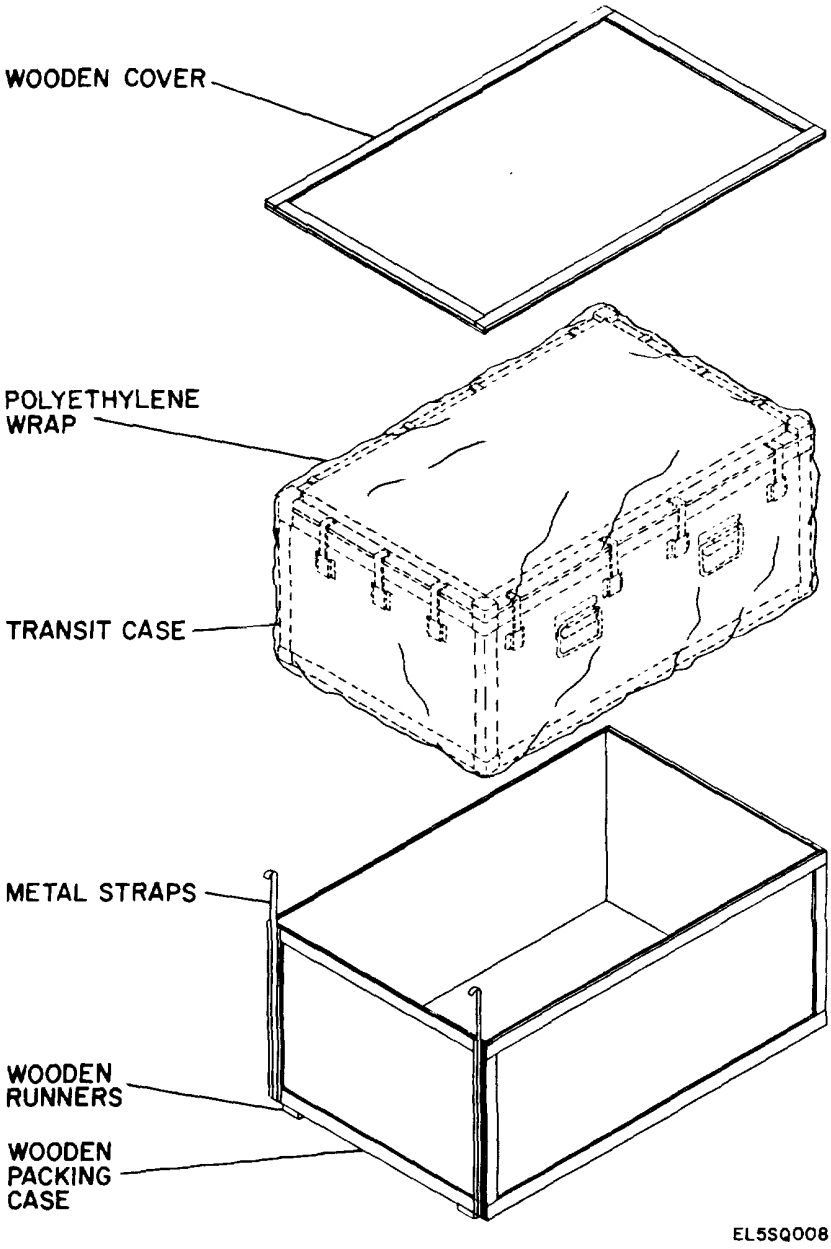


Figure 2-1. Test Facilities Set AN/TPM-24(V)4, Packaging.

2-3. Installation and Connections

a. Installation. The test facilities set is used in conjunction with a fully operational IFF set and external test equipment in the test-bench maintenance of IFF set components returned from using organizations. Since the test facilities set primarily contains special purpose test accessories, only those components and cables of 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 IFF set or its major components is to be performed, sufficient space must be provided on or near the test bench to accommodate components of the test facilities set, the external test equipment, the IFF set processor, any components removed from the processor, and all required interconnecting cables.

b. Connections. As noted in a above, only those cables of the test facilities set required for a particular maintenance operation need be connected at

any one time. If extended and/or extensive use of the test facilities set is anticipated, it may be desirable to set up a basic test station. (When connections are made as shown in figure 2-2, a basic test station for IFF set system testing results.) This station may be expanded upon, using the information contained in chapter 3 and in the maintenance manual for the IFF set to obtain the proper connections for particular maintenance procedures. Paragraph 2-4 provides test bed power connections. Other connections, as shown in figure 2-2, are covered in the maintenance procedures contained in the IFF set maintenance manual.

2-4. Ac and Dc Power Connections

a. Ac Power Connections. Cable 1A1W2 (SM-C-787809) is 10 feet long, has one connector and three wires, and is connected as follows:

(1) The connector end is connected to processor connector receptacle AC POWER J6.

(2) The black wire connects to the 120 vac 400 Hz supply.

(3) The white wire connects to the 120 vac return.

(4) The green wire connects to the power ground.

b. Dc Power Connections. Cable lA1W1 (SM-C-787808) is 10 feet long, has one connector and 11 wires, and is connected as follows:

(1) The connector end is connected to processor connector receptacle DC POWER J5.

(2) Two red (+) and one black (-) wire are connected to a 5 vdc power supply.

(3) The orange (+) and one black (-) wire are connected to a 12 vdc power supply.

(4) The violet (-) and one black (+) wire are connected to a 12 vdc power supply.

(5) The remaining three black wires are connected to the test bed ground.

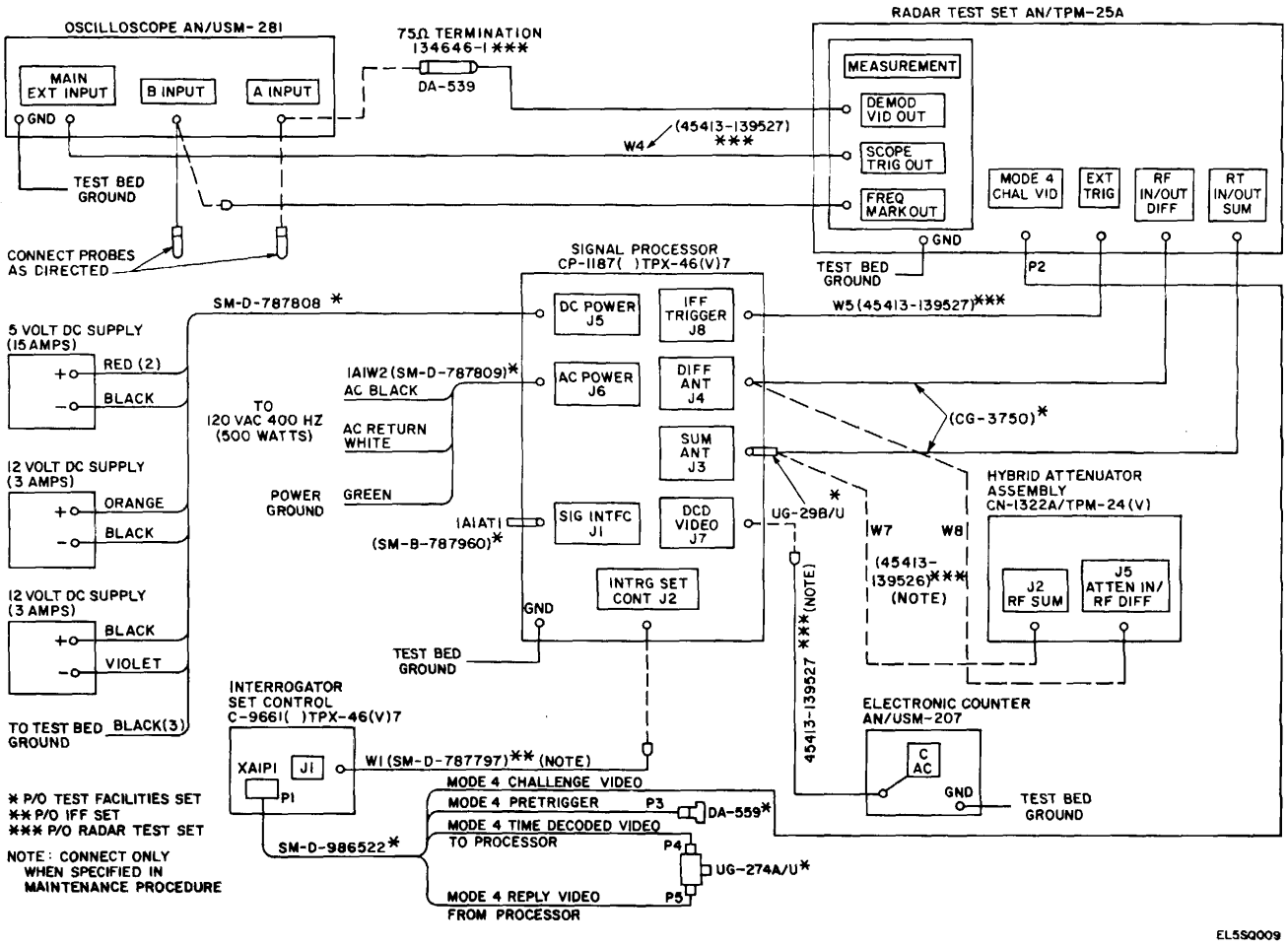


Figure 2-2. Test Bed Setup.

CHAPTER 3

OPERATING INSTRUCTIONS

Section I. OPERATOR'S CONTROLS AND CONNECTORS

3-1. Hybrid Attenuator 1A1A1, Operating Control, Cable and Connectors (fig. 3-1)

The following table provides a description of the control, cable and connectors located on the front panel of hybrid attenuator 1A1A1.

Table 3-1. Operating Control Cable and Connectors

Control, cable or connector	*Function*
ATTENUATOR control AT1 variable attenuator)	Continuously variable control of the attenuation between ATTEN OUT jack J4 and ATTEN INIRF DIFF jack J5 (from O to 25 db)
ATTEN IN/RF DIFF jack 5	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 connecting ATTEN OUT jack J4 to CPLR IN jack J3
RF IN/OUT JACK J1	Permits connection of external equipment

Table 3-1. Operating Control Cable and Connectors-Continued

Control cable or connector	*Function*
	to the hybrid junction. When used as an input connection, rf signals applied at down) at both RF SUM jack J2 and CPLR IN jack J3. When used as an output connection, rf signals applied at either the RF SUM jack 32 or CPLR IN jack J3 appear in attenuated form (approximately 3db down) at this jack.
RF SUM jack J2	Permits connections of external equipment to the hybrid junction. When used as an input connection, rf signals applied at this jack appear (less insertion loss of cables and hybrid junction) at CPLR IN jack RF in/OUT jack J1. May also be used as an output connection when RF signals are applied at RF INIOUT jack J1.
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 loss) at RF IN/OUT jack J1. May also be used as an output connection when rf signals are applied to RF IN/OUT jack J1.

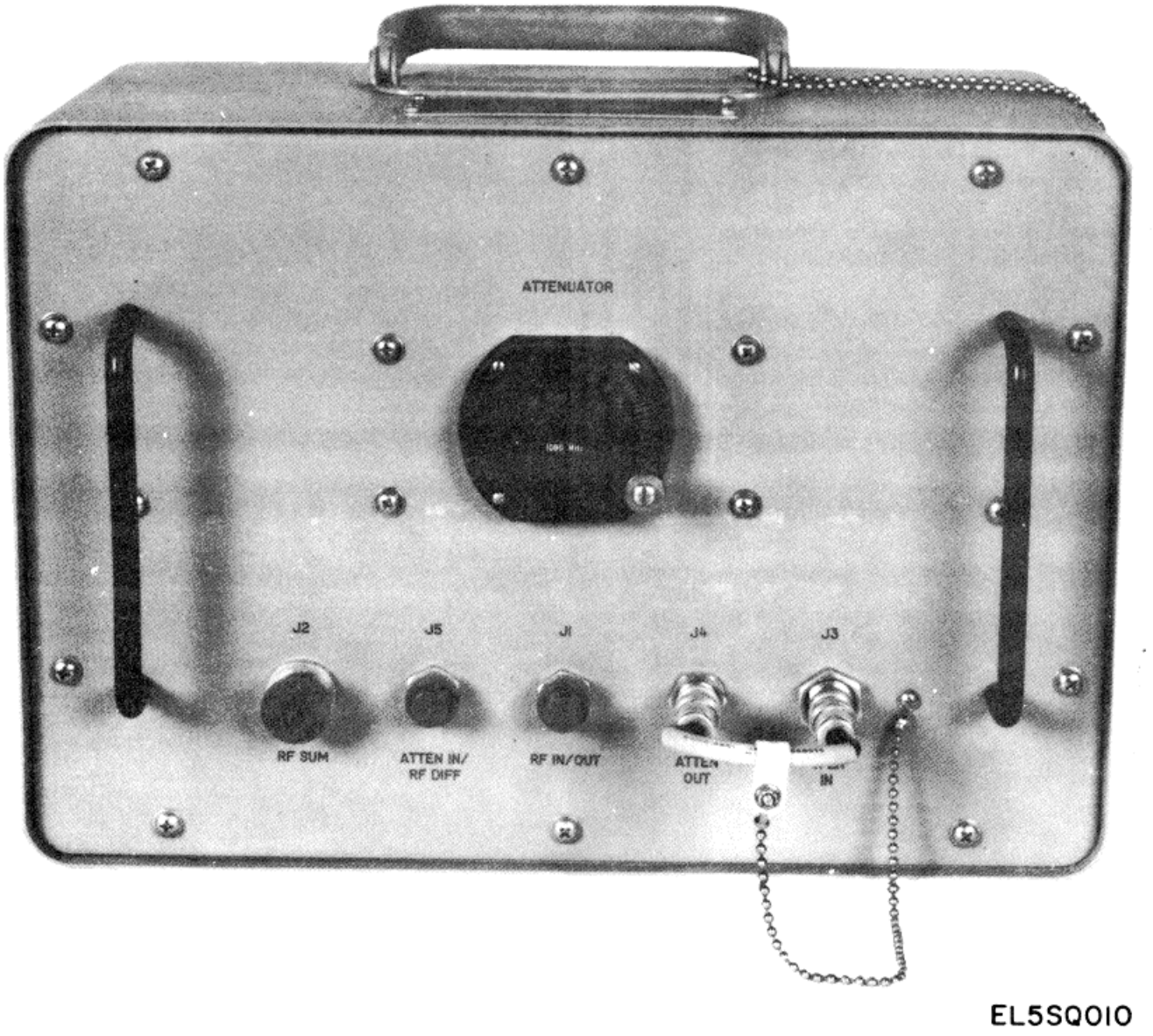


Figure 3-1. Hybrid Attenuator 1A1A1, Operating Control and Connectors.

Section II. OPERATION

3-2. Types of Operation

a. The test facilities set is used to connect the IFF set to ac and dc power sources (fig. 2-2), to connect the IFF set to the associated test equipment, and to extend the printed wiring cards and modules from the processor chassis during maintenance procedures.

b. The initial test bed setup is shown in figure 22. Specific maintenance connections and alternatives to the initial test bed setup are contained in TM 11-5895-824-40.

3-3. Extension of Modules for Maintenance

a. General. The components of the test facilities set provide for extension of rf switch module 1A32, self-test, rf switch module 1A33, transmitter module 1A34, receiver module 1A35, and low voltage power supply 1A46.

b. Cabling Connections. Cables 1AlW6, 1A1W7, and 1A1W8, (CG-3754/TPM-24(V)) and cables 1A1W9 (SM-D-986535) and lAlW10 (SM-D-986536) are used, with appropriate adapters, for connections between the rigid coaxial

cables in the processor chassis and the extended module under test. Cables 1AlA2W1, 1A1A2W2, and 1A1A2W3 (CX-12916) are used for connection between connectors 1A32P1, 1A33P1, and 1A35P1 and 1A32XP1, 1A33XP1, 1A34P1 and 1A34XP1, 1A35XP1, and 1A46XP1 respectively.

3-4. Connection of Test Facilities Cables

a. Cable 1A1W1 (SM-C-787808) is provided to connect +5 vdc, +12 vdc, -12 vdc power to the IFF set (para 2-4).

b. Cable W2 (SM-C-787809) is provided to connect 120 vac, 400 Hz power to the IFF set (para 2-4).

c. Cables 1A1W3 and 1A1W4 (CG-3750) are provided for connection of IFF set SUM ANT J3 and DIFF ANT J4 connectors to hybrid attenuator RF SUM J2 and ATTEN IN/RF DIFF J5 connectors, respectively.

d Cable W5 (CG-3751) is provided to connect Radar Test Set AN/TPM-25 to the mode 4 panel of the IFF set. Detailed connection procedures are contained in TM 11-5895-824-40.

e. Cables 1A1W6, 1A1W7, and 1A1W8 (CG-3754/TPM-24(V)) are used when modules are extended (para 3-3), for connections between the rigid coaxial cables and module connectors.

f. Cables 1A1W9 (SM-D-986535) and lAlW10 (SM-D-986536) are used for connection between rf switch module 1A32 and receiver module 1A35 when the receiver module is extended.

g. Cables 1A1A2W4 (SM-D-986530) and 1A1A2W5 (SM-D-986531) are used for connection of transmitter assembly A34A1 to transmitter module A34 when the transmitter assembly is extended from the transmitter module.

h. Cables 1AlA2W1, 1A1A2W2 and 1A1A2W3 (CX-12916) are used when modules are extended (para 3-3) for connection between chassis and module connectors.

3-5. Operation of Hybrid Attenuator 1A1A1

a. The hybrid attenuator is provided to facilitate testing, troubleshooting, and alignment/adjustment of the receiver/transmitter of the IFF set. All of the specific uses of the hybrid attenuator with the receiver/transmitter are described in TM 11-5895-824-40. Operation of the hybrid attenuator in typical receiver/transmitter test configurations is described below.

b. The test connections between the processor and the hybrid attenuator are typical for most of the receiver/transmitter test sets (fig. 2-2). Consult the individual test procedure in TM 11-5895-824-40 for possible deviations in the test connections and for prescribed settings of the ATTENUATOR control.

c. Cables 1A1W3 and 1AlW4 (CG-3750/TPM-24(V)) connect the RF sum (J2), and RF difference (J3), channels to the hybrid attenuator or to the radar test set. Adapter 1A1A2CP6 (UG-1034/U) enables connection of cable 1A1W3 or 1AiW4 to J5 on the hybrid attenuator.

CAUTION

To avoid damage to the equipment under test, DO NOT energize the receiver/transmitter before terminating SUM ANT and DIFF ANT jacks J2 and J3.

d. The insertion losses marked on the tag attached to the hybrid attenuator, and marked on the connecting coaxial cables should be considered when calculating the attenuation in dB required for setting the ATTENUATOR control.

3-6. Typical Connection and Use of Minor Components

Connections and use of minor components of the IFF set are briefly described in a through o below. Exact connections and usage procedures are contained in TM 11-5895-824-12 and TM 11-5895-824-40.

a. Extractor 1A1A3 (MX-10412) is provided for removal of printed wiring cards from the processor chassis or from processor modules.

b. Extender 1A1A4 (MX-9356) is provided to connect the printed wiring card to its connector in the processor when the card is extended. The extender card is provided with test points for each input or output pin on the extended card. Also provided are pin connected jumper wires to allow for fault isolation or injection.

c. Grounding Straps 1A1A2W6 and W7 are provided for grounding self-test RF switch driver card 1A33A1 when it is installed on an extender board.

d. Shorting plug 1A1A2AT6 (J-3984) is provided as a termination for SIG INTFC connector J1 on the processor when the IFF set is installed in a test bed.

e. Dummy loads 1A1A2AT1 and AT2 (DA-558), AT3 (DA-559), and 1A1AT6 (DA-636) are provided for termination of rf signal connectors when they are not being used.

f. Dummy loads 1A1A2AT4 (DA-634) and AT5 (DA-635) are fixed 5 db and 11 db, respectively, mismatches provided for use during VSWR tests.

g. Adapters 1AlA2CP1 and CP2 (UG-29B/U) provide for connection of N-male to N-male.

h. Adapter 1A1A2CP3 (UG-57B/U) provides for

connection of an N-female to N-female.

i. Adapters 1A1A2CP4 and CP5 (UG-491B/U) provide for connection of BNC-female to BNC female.

j. Adapter 1A1A2CP6 (UG-1034/U) provides for connection of N-female to BNC-female.

k. Adapters 1A1A2CP7 through CP10 (UG-1896) provide for connection of SMA-female to BNC-male.

l. Adapters 1AlA2CPll11 and CP12 (UG-1897) provide for connection of SMA-male to BNC-male.

m. Adapter, right angle 1AlA2CP13 (MS-10411) provides for connection of SMC-male to SMC female.

n. Adapter 1A1A2CP14 (MX-10410) provides for connection of SMC-female to SMA-male.

o. Adapter 1AlA2CP15 (MX-10409) provides for connection of SMC-male to SMC-male.

CHAPTER 4
OPERATOR'S AND ORGANIZATIONAL MAINTENANCE

Section I. GENERAL

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. These duties do not require special tools or test equipment.

a. Cleaning.
b. Troubleshooting.
c. Repairs and adjustments.

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

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

a. Tools and Test Equipment.

Common name	*Equipment*	*Technical manual*
Tool Kit	Tool Kit, Electronic Equipment TK-100/G	SC 5180-91-CL-521.
Multimeter	Multimeter TS-352B/U	TM 11-6625-366-15 and TB 11-6625-366-3511.

b. Material Required for Maintenance

Cleaning compound (NSN 7930-00-395-9542)	Light gray enamel paint (gloss)	Isopropyl alcohol	Rubber tape
Inhibisol cleaning solvent	Light gray enamel paint (semigloss)	Camel's-hair brush	Friction tape
Cleaning cloth		Fine sandpaper	Miller-Stephenson fre-on TF degreaser

Section II. LUBRICATION

4-3. Lubrication Requirements

Lubrication is not required for any component of the test facilities set.

Section III. MAINTENANCE

4-4. General

There are no maintenance procedures that will prevent a part from failing or indicate that a part of the equipment is about to fail. However, if the equipment is kept clean and is properly stored when it is not being used, chances of causing a failure or loss of a piece part will be greatly reduced. Unnecessary periodic checking of equipment can result in damage to the equipment.

4-5. Maintenance Procedures

Maintenance procedures for the test facilities set are performed partially during normal operation (para 4-6) and partially during downtime when the equipment is not being used (para 4-7).

4-6. Operational Maintenance

During normal operation, inspect the equipment as outlined in a, b and c below.

a. When connecting adapters, cables, and the fault isolation board, check for bent pins, broken connectors, damaged insulation, or dirt.
(1) Carefully straighten bent pins.
(2) Send cables with damaged connectors or

insulation to higher category maintenance for repair.
(3) Repair minor damage to cable insulation (para 4-1 la).

(4) Damaged adapters are not repairable; they must be replaced with new ones.

(5) Clean dirty connectors (para 4-8).

b. Check operation of ATTENUATOR knob on the hybrid attenuator for looseness (para 4-1 lb).

c. Perform troubleshooting procedures for suspected cables or fault isolation board (para 4-12).

4-7. Downtime Maintenance

During downtime, inspect the equipment as described in a through d below.

a. Check that test facilities set equipment is complete and that quantities are the same as listed in paragraph 1-7.

b. Clean the transit case, hybrid attenuator case, and the accessory case surfaces, if required (para 4-8).

c. Touchup or refinish transit case, hybrid attenuator, and accessory case surfaces if required (para 4-9).

d. Calibrate hybrid attenuator as described in TB 11-6625-2398-35 (to be done by higher category maintenance).

4-8. Cleaning

a. Hybrid Attenuator 1A1A1. Inspect the exterior surfaces of the hybrid attenuator. The exterior surfaces should be clean, free of dust, dirt and grease.

(1) Remove dust and loose dirt with a clean, lint-free cloth, item 2, appendix E.

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, item 1, appendix E.

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

b. Fault Isolation Card 1A1A4. Clean the extender board assembly as required, 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 board contacts with Miller-Stephenson freon TF degreaser.

4-9. 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 on the bare metal to protect it from further corrosion. Refer to applicable cleaning and refinishing practices specified in TB734-0118. For touchup painting, use light gray enamel, formula No. 11 (per MIL-E-15090), type II, class 2 (semigloss).

4-10. General Troubleshooting Information

Troubleshooting this equipment is based upon the operation of the test facilities set in a test configuration with the IFF set. If, in troubleshooting the IFF set, certain components of the test facilities set are defective, or suspected of being defective (other than cables or extender boards), higher category maintenance is required. Troubleshooting the cables and fault isolation board of the test facilities set consists of continuity checks with a multimeter (para 4-12). The schematic diagrams 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 a higher category of maintenance for repair.

4-11. 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 a cable is broken, ship defective cable to higher category of maintenance for repair.

b. Replacement and Calibration of Hybrid Attenuator Knob. If ATTENUATION control AT1 knob on the hybrid attenuator either becomes loose or must be replaced, it must be calibrated by higher category maintenance.

4-12. Continuity Check of Cables and Extender Boards

Use multimeter TS-352B/U to perform the continuity checks. All tests are made with the controls of the multimeter set as follows:

FUNCTION ..... OHMS
RANGE RX1

a. Fault Isolation Board 1AlA4 (fig. 6-10).

(1) Check for short circuits by connecting the multimeter test leads between 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 board continuity by progressively connecting one multimeter test lead to the etched terminals at one end of the board, while the other

test lead is connected to the corresponding contact at the opposite end of the board. The meter must read zero ohm (continuity) for each etched terminal.

(3) Check continuity to board test points by connecting the multimeter test leads between the first connector contact and the test point (1 or 2) immediately below. Advance test leads successively across the board to the last connector contact and the last test point (40 or 41). Repeat the above procedures for the opposite side of the board. The meter must indicate zero ohm (continuity) for each measurement.

b. Cables Shorts Check. To check a multiconductor cable for shorts between conductors, proceed as follows:

(1) Connect one ohmmeter lead to each cable conductor, while performing (2) below.

(2) Connect the second ohmmeter lead to every other conductor in the cable (one conductor at a time).

(3) If the meter indicates zero, a short exists between the two conductors.

(4) If the meter indicates less than infinite, but more than zero, the two conductors contain a dc leakage path.

(5) If the meter indicates infinite, the two conductors are not shorted.

c. Cable Continuity Check. Check continuity of the cable wires by progressively connecting the multimeter test leads to the corresponding pins on the plugs at each end of the cable. The multimeter must indicate zero ohm (continuity).

CHAPTER 5

FUNCTIONING

5-1. General

The functioning of hybrid attenuator 1A1A1 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. 6-1)

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 AlW3 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-terminal, nonrepairable, 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 through 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., HY1J1) 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 out the other (HY1J4). Termination AT2 (to HY1J4) is a 50-ohm matched load and is provided to minimize reflected signal 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 (approx 3.
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 (approx 3.25 db), HY1 (3 db) miscellaneous losses in J3, CP1, and the coaxial cable terminated by P1 and J. These losses when added to the losses of W3 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.

CHAPTER 6

GENERAL SUPPORT MAINTENANCE

Section I. GENERAL TROUBLESHOOTING INFORMATION

CAUTION

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

6-1. General Instructions

Troubleshooting at the 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 data. When performing troubleshooting procedures for hybrid attenuator, refer to figure 6-1.

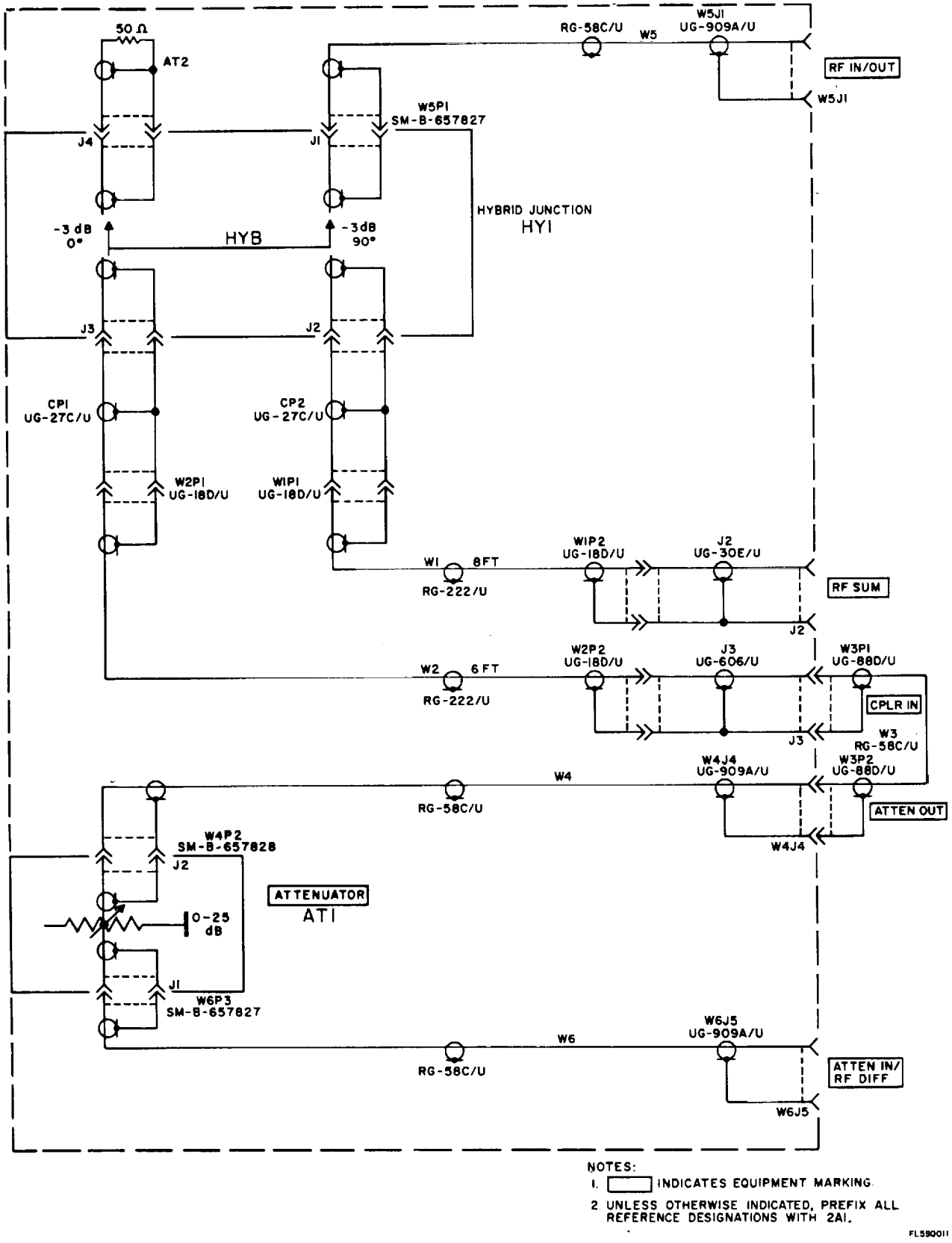


Figure 6-1. Hybrid Attenuator 1A1A1, Schematic Diagram.

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 consist of the components listed in paragraph 1-7. 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.

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. Procedures for isolating troubles in the test facilities set are given in paragraphs 6-4 through 6-7.

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

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

e. Connector Pin Extension. When measurements are to be made at connector pins, it is necessary to extend the connector pins beyond the connector shell. To accomplish connector pin extension, obtain corresponding pins from spare parts and wrap the pins with electrical tape. Insert the plug ends of the insulated pins over the appropriate connector pins and connect required test equipment.

6-3. Test Equipment Required

The following is a listing of test equipment required for troubleshooting the test facilities set. The associated 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 and integrated circuits which could be damaged.

Common Name	*Nomenclature*	*Reference*
Multimeter	Multimeter TA-352B/U	TM 11-6625-1559-12
Megger	Ohmmeter ZM-21A/U	
Oscilloscope	Oscilloscope AN/USM-281A	TM 11-6625-1703-15

Section II. COMPOMENT 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 of sleeving of cables, mating parts of connectors and couplings, operating control of hybrid attenuator Al, and broken, corroded, or 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 faults 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 corrected by the replacement, then the component removed should be checked further to isolate the malfunction.

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

CAUTION

Always disconnect the test facilities set component from the IFF set test setup before making continuity measurements. 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

a Calibration of the hybrid attenuator assembly every 90 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 table for the hybrid attenuator provides a step-by-step procedure for troubleshooting. This procedure is based on the VSWR and insertion loss measurements.

c. General support troubleshooting procedure, Hybrid Attenuator lAlAl.

Table 6-1. Troubleshooting the Test Facilities Set AN/TPM-24(V)4

Symptoms	Probable Cause	Correction
1. Excessive RF sum channel insertion loss.	a. Improper connections.	a. Check that connections to A1HY1J1, A1HY1J2 and the connections of A1W1 are secure. Tighten loose connections or replace defective connectors.
	b. Defective cable A1W1 or hybrid coupler A1HY1.	b. Check difference channel insertion loss. If the sum channel and difference channel insertion losses are both excessive, check cable from A1W5J1 to A1HY1J1 (para 4-12). If cable is not at fault, replace hybrid coupler A1HY1 and recalibrate (refer to TB 11-6625-2398-35). If only the sum channel has an excessive loss, replace cable A1W1 and recalibrate (refer to TB 11-6625-2398-35).
2. Excessive RF difference channel insertion loss.	a. Improper connections	a. Check that all connections to A1W6J5 and A1J1 are made, and are secure. Tighten loose connections and replace defective connectors.
	b. Defective cables, attenuator, or hybrid coupler A1HY1.	b. Check sum channel insertion loss. If sum channel and difference channel insertion losses are both excessive, check cable from A1W5J1 to A1HY1J1 (para 4-12). If cable is not at fault, replace hybrid coupler A1HY1 and recalibrate (refer to TB 11-6625-2398-35). If only the difference channel has an excessive loss, check cable A1W3, cable A1W2 (para 4-12), attenuator A1AT1, and the cables from A1W4J4 and A1W6J5 to attenuator A1AT1. Replace defective parts and recalibrate (refer to TB 11-6625-2398-35).
3. Excessive VSWR....	a. Improper connections.	a. Check all connections between the input showing excessive VSWR and the termination(s). Tighten loose connections, replace defective connectors and recalibrate (refer to TB 11-6625-2398-35).
	b. Defective parts.	b. Check cables A1W1, A1W2, (para 4-12), attenuator A1AT1, hybrid coupler A1HY1, cable A1W3 and the cables from A1W5J1, A1W4J4 and A1W6J5 (para 4-12). Replace defective parts and recalibrate (refer to TB 11-6625-2398-35).

d. Testing of cables of the test facilities set consists of continuity checks for cables and connectors, and insulation resistance checks for cables. When a cable or connector of the test facilities set is suspected as being faulty, perform standard continuity checks for cables using the applicable cable schematic diagram (fig. 6-2 through 6-10). The schematic diagram for extender card lA1A4 is shown in figure 6-11. The schematic diagram for shorting plug 1A1A2AT6 is shown in figure 6-12.

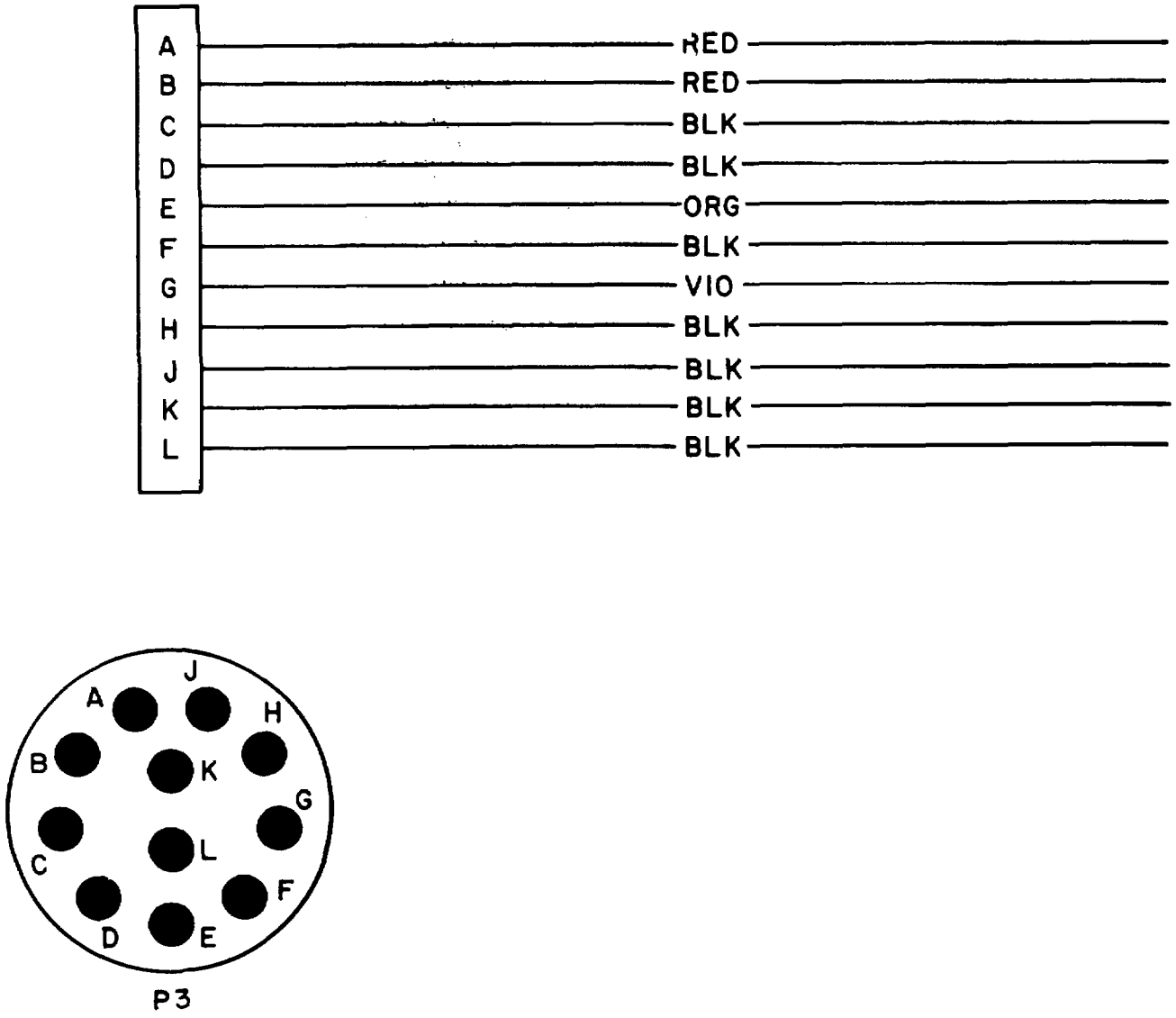


Figure 6-2. Cable AI W1 (SM-D-787808), Schematic Diagram.

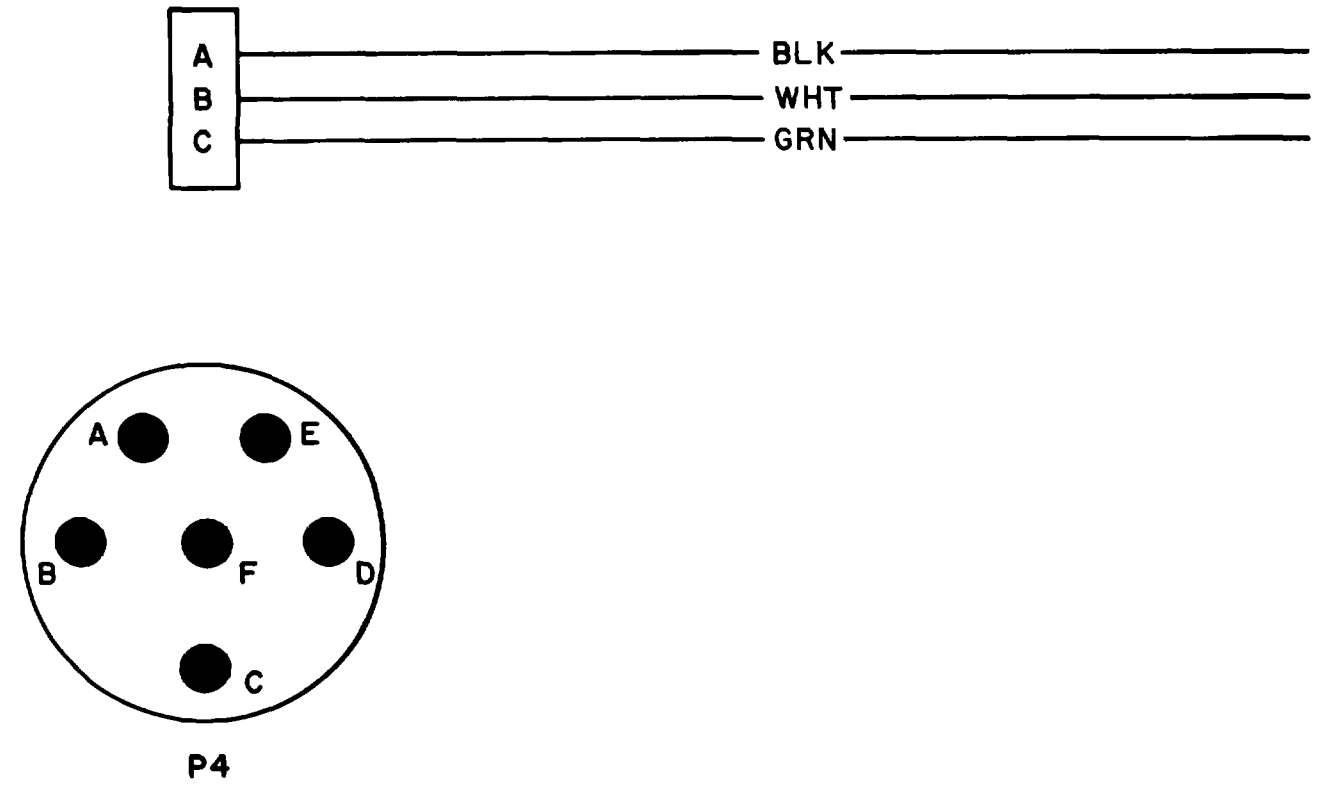


Figure 6-3. Cable 1A1W2 (SM-D-787809), Schematic Diagram.

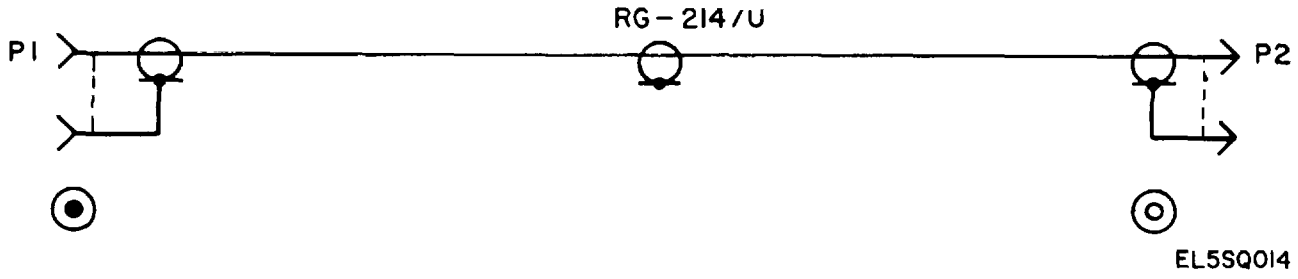


Figure 6-4. Cables 1A1 W3 and W4 (CG -3750/TPM-24(V), Schematic Diagram.

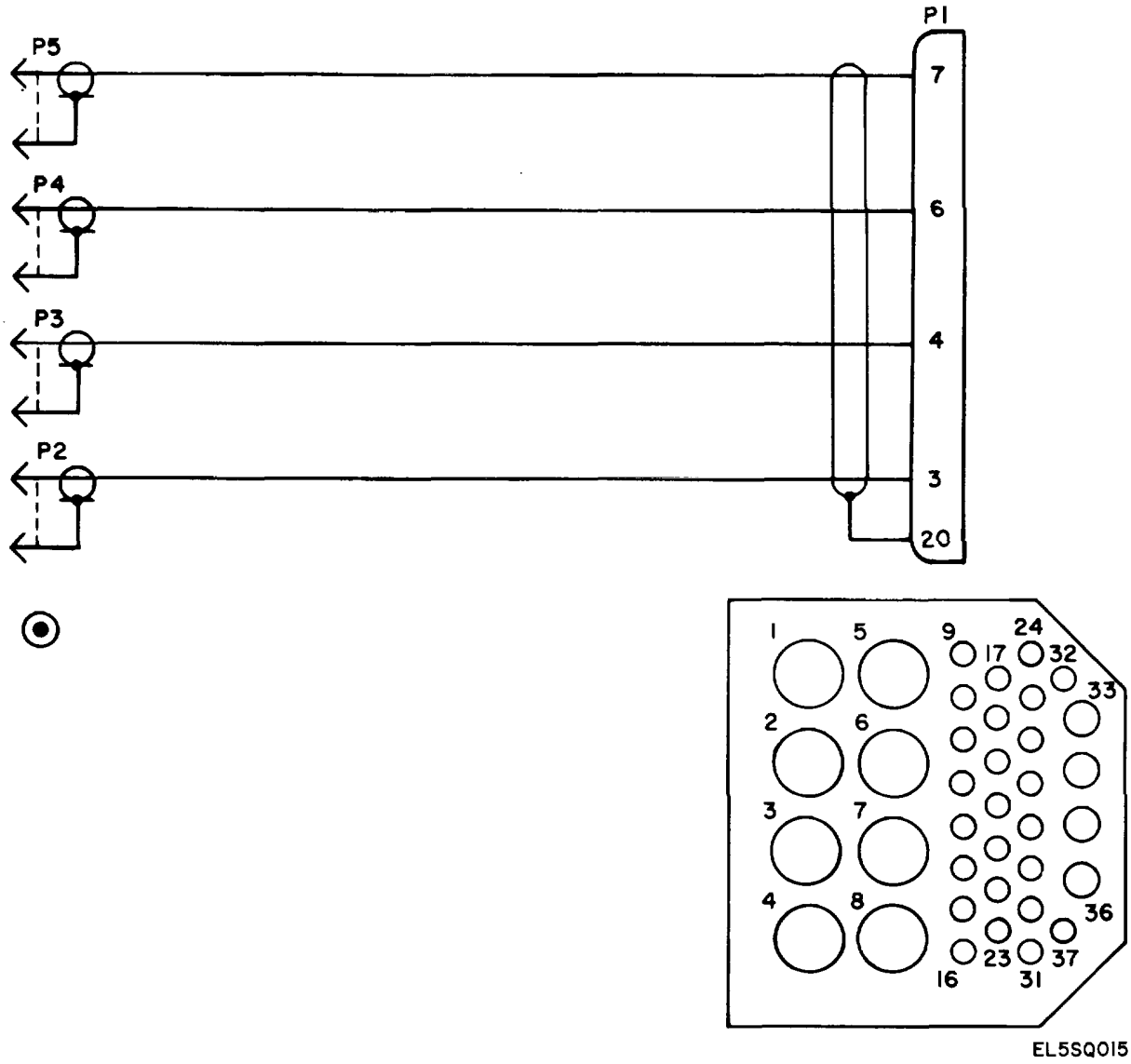


Figure 6-5. Cable 1A1W5 (SM-D-986522), Schematic Diagram.

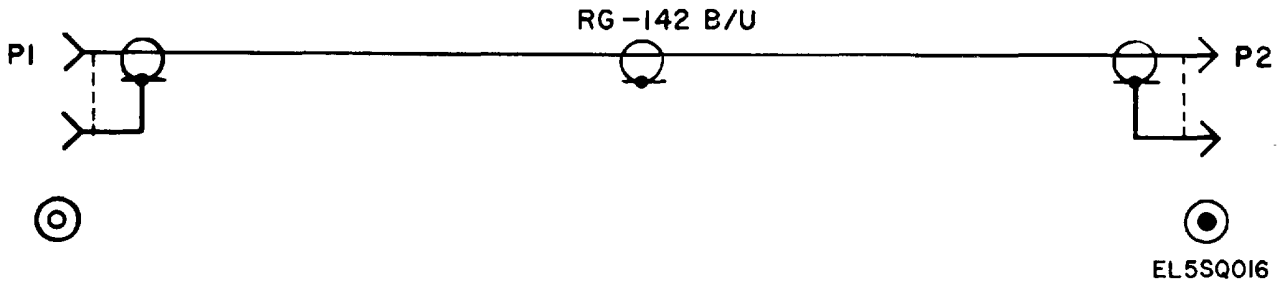


Figure 6-6. Cables 1A1 W6, W7, and W8 (CG-3754/TPM-24 (V)), Schematic Diagram.

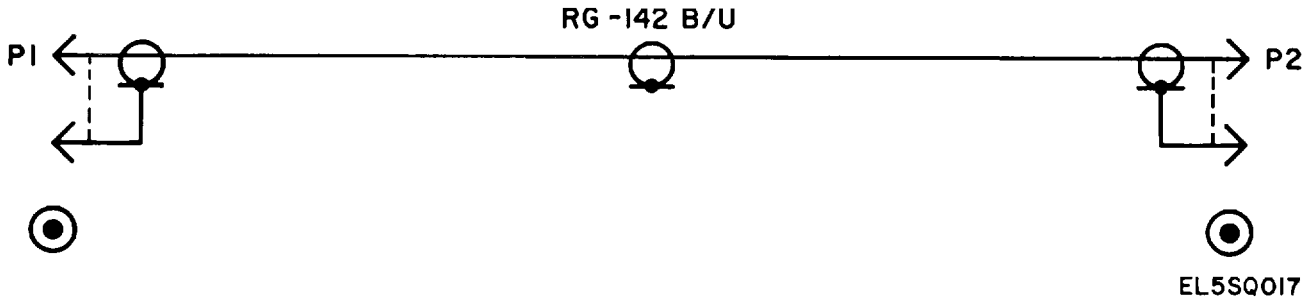


Figure 6-7. . Cables 1A1 W9 (SM-D-986535) and 1A1 W10 (SM-D-986536), Schematic Diagram.

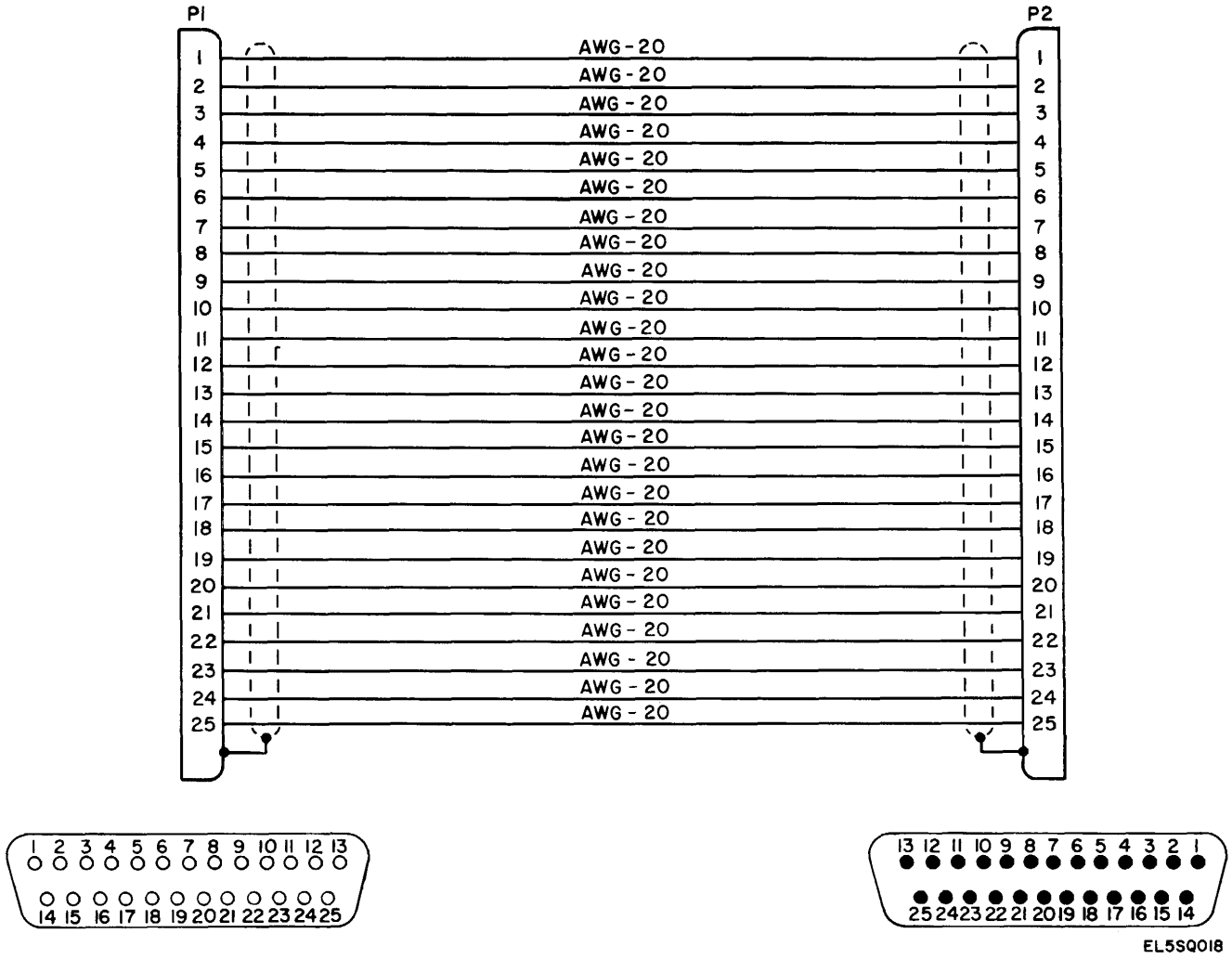


Figure 6-8. Cables 1AIA2Wl, W2, and W3 (CG-12916TPM-24 (V)), Schematic Diagram.

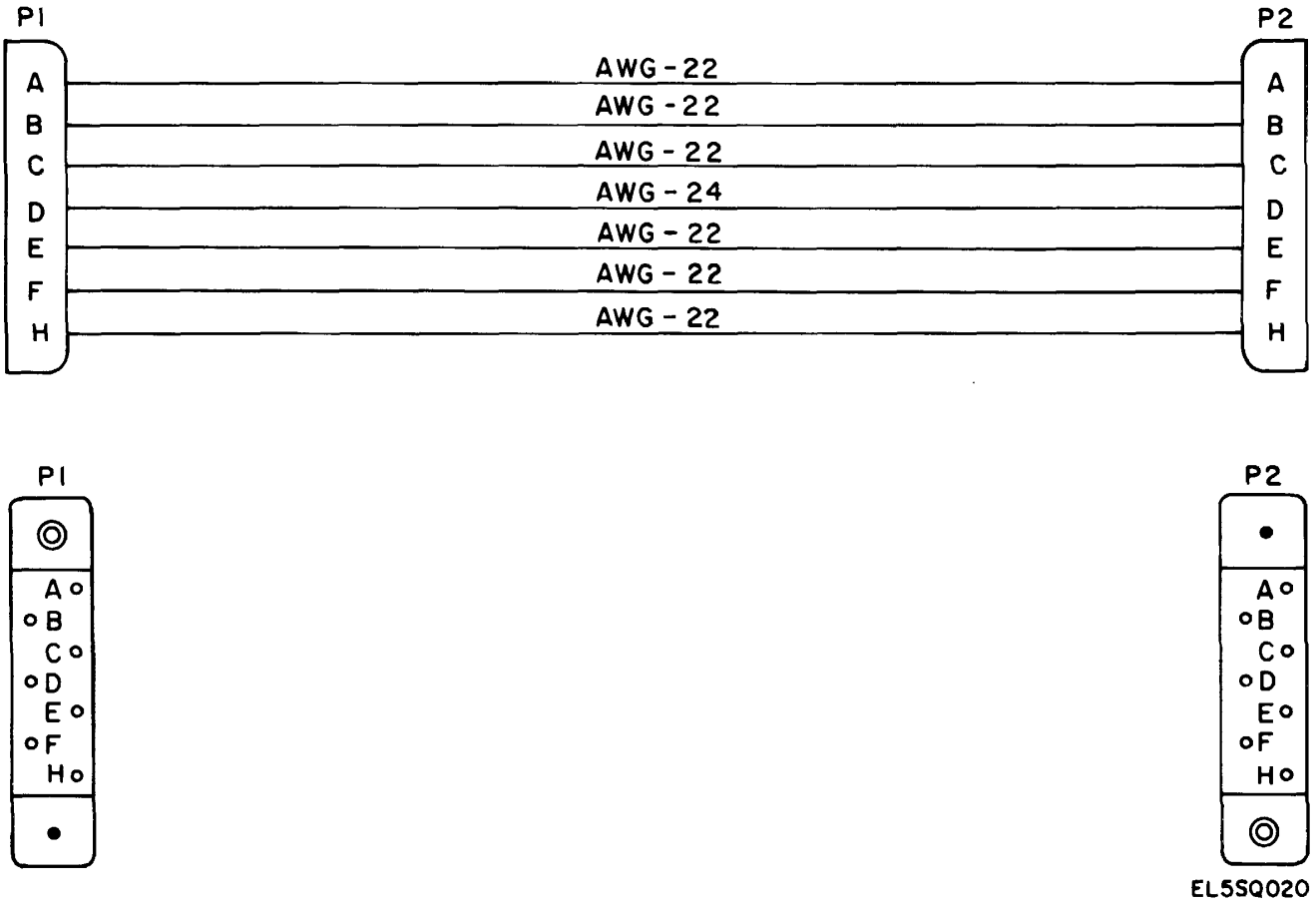


Figure 6-9. Cable 1AIA2W4 (SM-D-986530), Schematic Diagram.

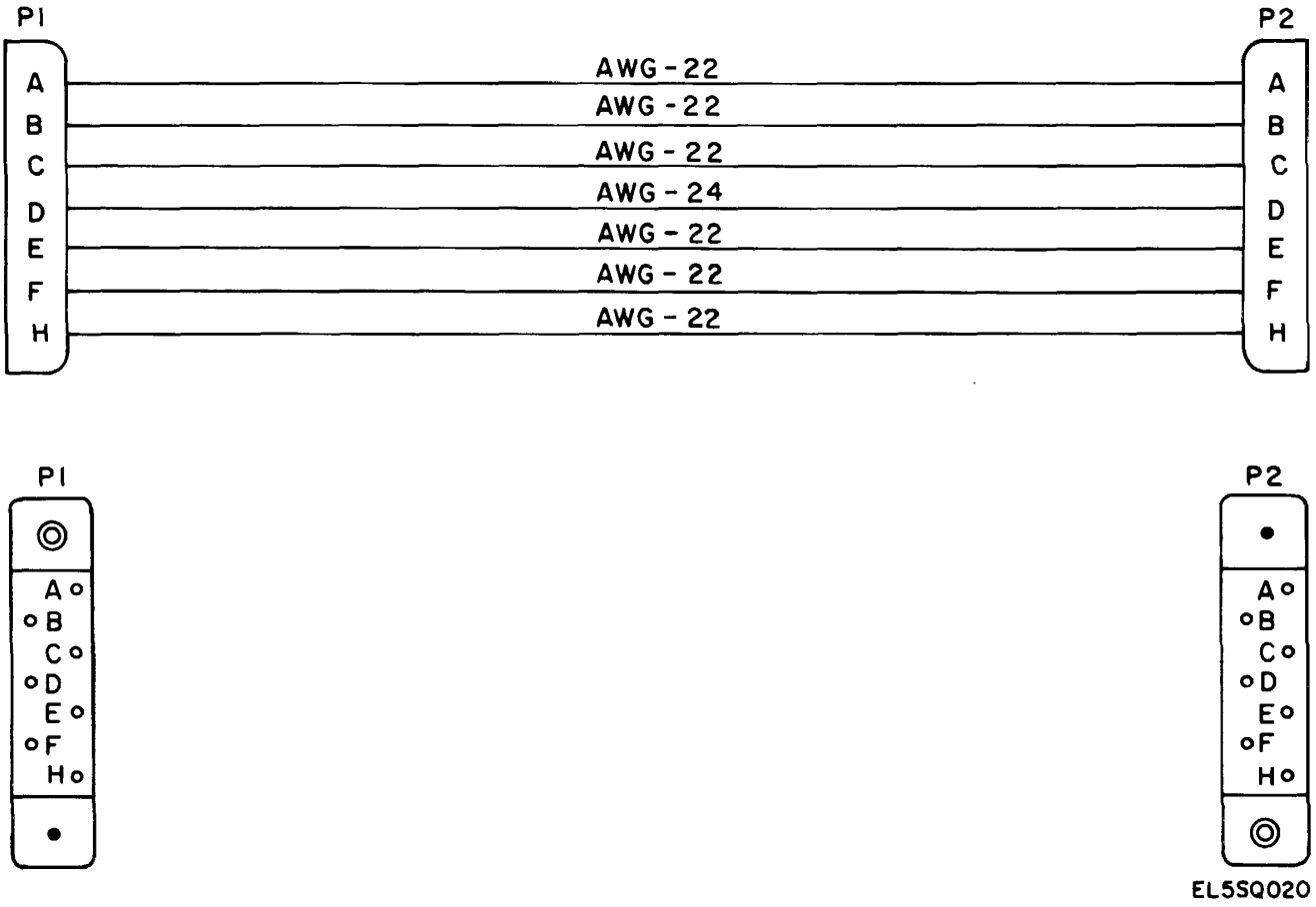


Figure 6-10. Cable 1AIA2W5 (SM-D-986531), Schematic Diagram.

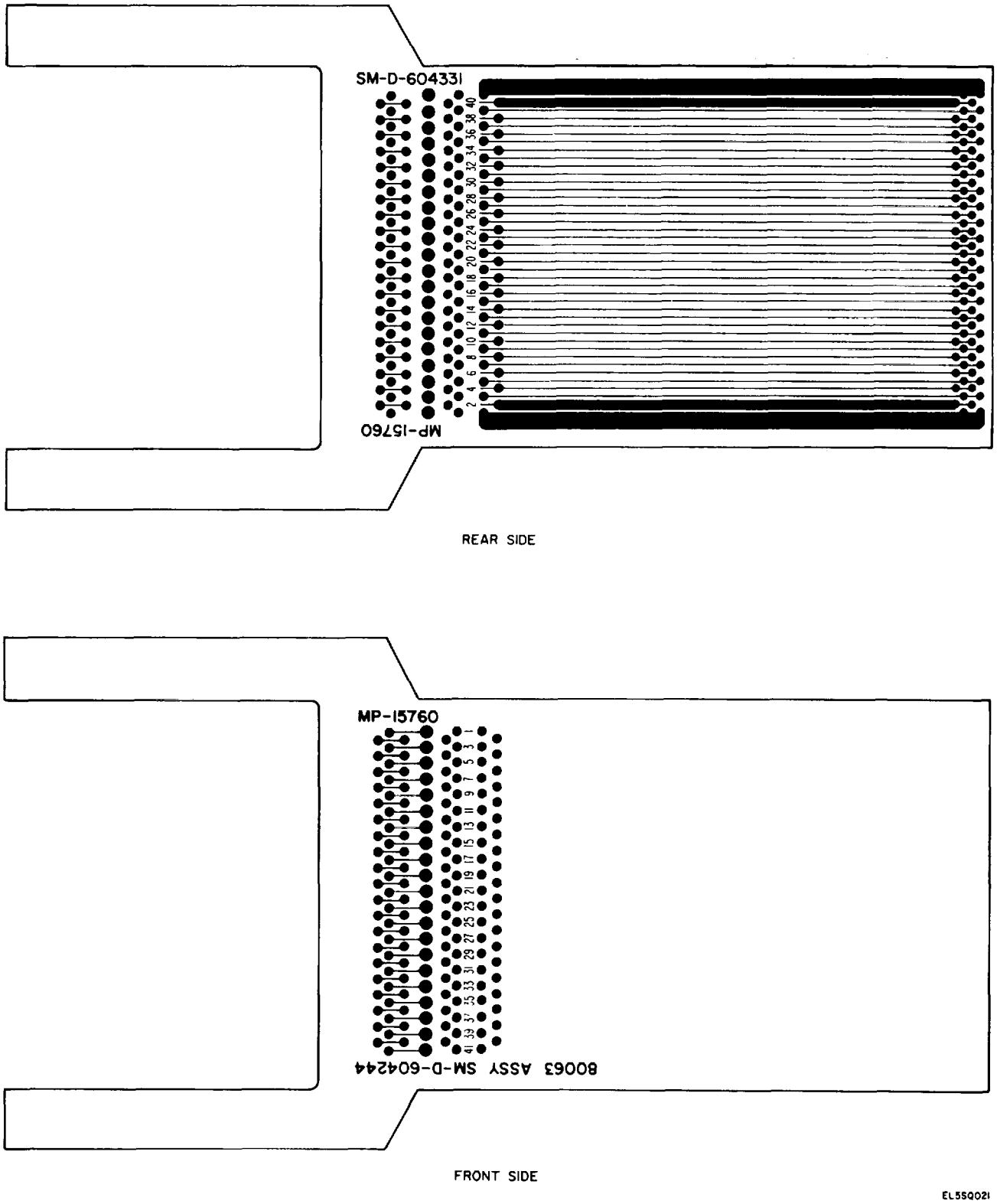


Figure 6-11. Fault Isolation Card IA1A4, Schematic Diagram.

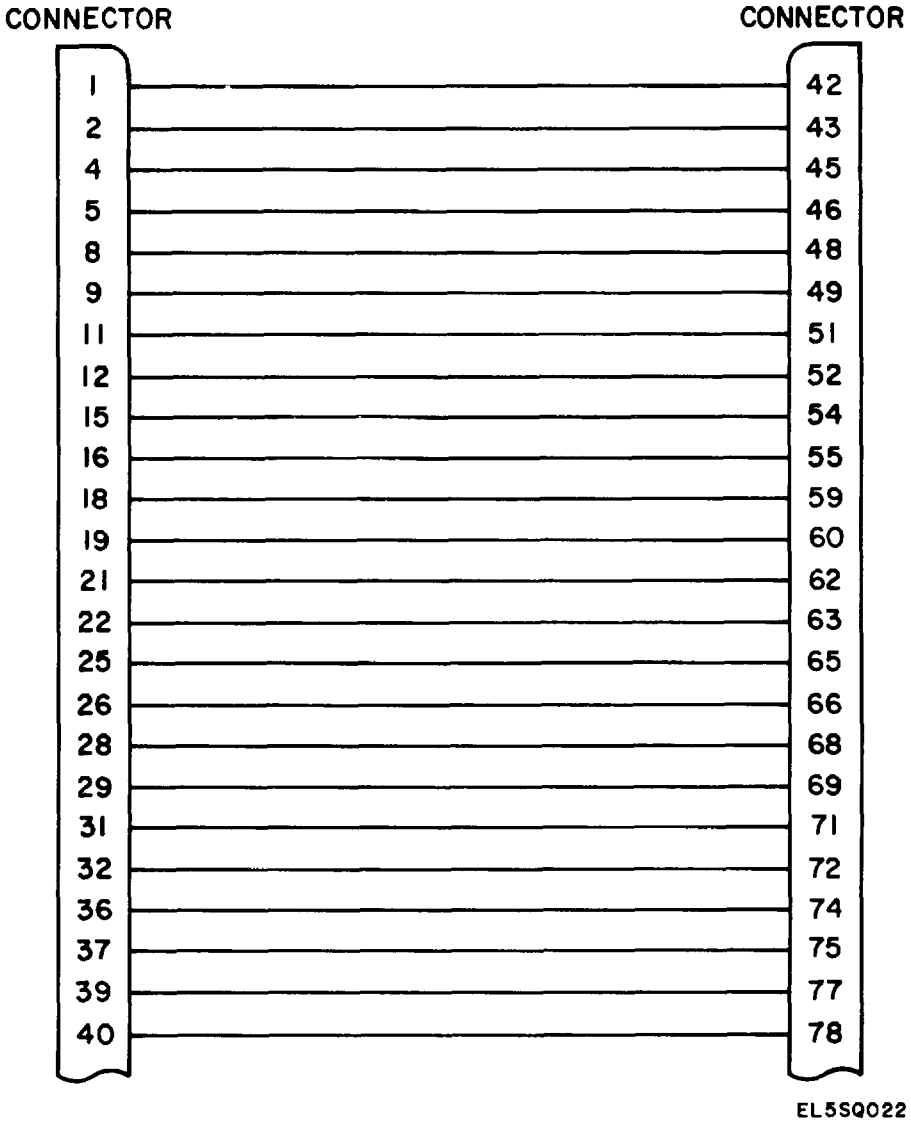


Figure 6-12. Shorting Plug 1A IA2A T6 (SM-C- 787960), Schematic Diagram.

CHAPTER 7
REPAIR

7-1. General Parts Replacement Techniques

All components of the test facilities set that are repairable can be easily replace*d.* Parts located in hybrid attenuator assembly lAlAl (fig. 7-1), are accessible when the chassis is removed from its case. Repair parts, special tools, test, and support equipment are listed in appendix *C.* Refer to appendix C for all illustrations required for disassembly and reassembly procedures.

7-2. Nonrepairable

Components The following components of the test facilities set are nonrepairable:

a. Adapters 1A1A2CP1 through CP16

b. Shorting plug, terminations, and attenuators 1A1AT1 and 1A1A2AT1 through AT6, and cables 1A1A2W1 through W7.

7-3. Tools and Kits Required

Tools and kits required to repair components and assemblies of the test facilities set are listed below:

Tool or kit	*Technical manual*
Tool Kit, Electronic Equipment TK-100/G	SC 5180-91-CL-S21
Repair Kit, Printed Wiring Board MK-772/U	SC 5999-91-CL-F01

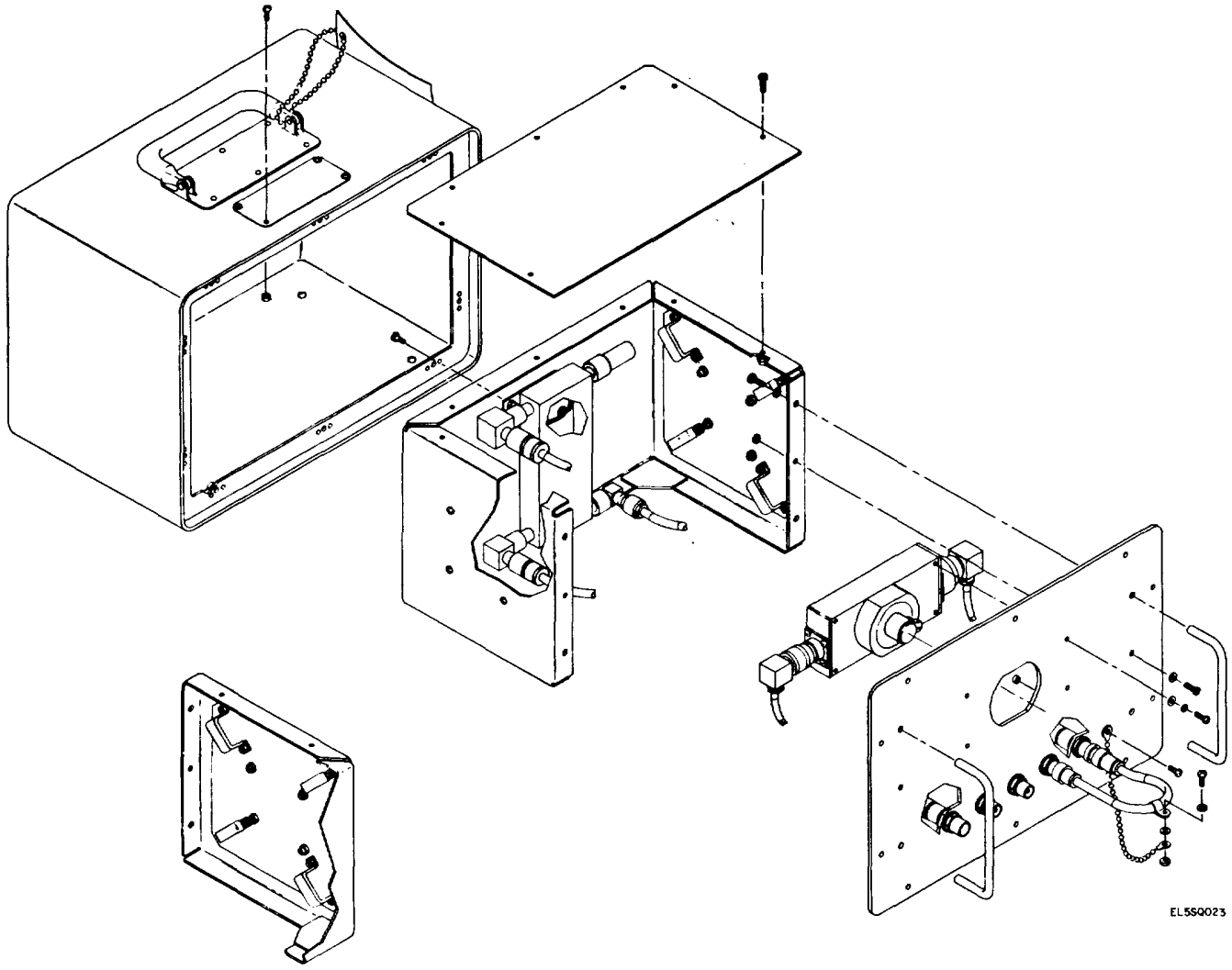


Figure 7-1. Hybrid Attenuator Assembly JAIA1, Internal View.

7-4. Repairable Components

The following components are repairable:

a. Hybrid attenuator assembly lA1Al.

b. PC board extractor 1A1A3.

c. Fault isolation card 1A1A4.

d Cables lAiW1 through W9 and 1A1A2W2 through W5.

7-5. Repair of Printed Circuit Board Extractor

If printed circuit board extractor 1A1A3 is bent or misaligned, bent 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 a printed circuit boar*d.*

7-2 7-6. Extender Card 1A1A4, Repair (fig. 6-10)

If the printed wiring on the extender card 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. Cable Repair Instructions

Cable repair consists of replacement of damaged pins and damaged connectors. If a connector is to be replaced, all pins must be remove*d.* If a pin is to be replaced and no spare pins are available, remove an unused pin from the connector to replace the damaged one. If an individual wire is broken, a spare

wire in the cable may be substitute*d.* If a cable is broken it must be spliced by placing a male connector on one side of the break and a female connector on the other.

7-8. Repair of Cable lA1Wl (SM-D-787808)

a. Description of Cable. Cable lAlW1 (SM-D-787808) is a 10 foot multiconductor cable having 11 conductors and one connector. The connector (MS2746E21BllS) contains 11 No. 12 sockets, of which all are use*d.* All wires are No. 12 gauge. For color of wires connected to each socket, see schematic diagram of cable (fig. 6-2).

b. Cable Repair Procedures.

(1) Loosen two screws on cable clamp and unscrew (counterclockwise rotation) cable clamp from connector.

(2) Slide cable clamp and rubber buffer away from connector so that inner conductors in the cable are expose*d.*

(3) Use Bendix 11-8675-12 extraction tool inserted into rear of connector to remove socket from conductor.

(4) Cut wire as close to the socket as possible.

(5) Trim insulation 3/16 inch (fig. 7-2).

(6) Insert wire into new socket and crimp with MS3191-4 crimping tool and MS3191-9T positioner.

(7) Insert new socket into connector using 11-8674-12 insertion tool.

(8) Slide cable clamp with rubber buffer into position on connector.

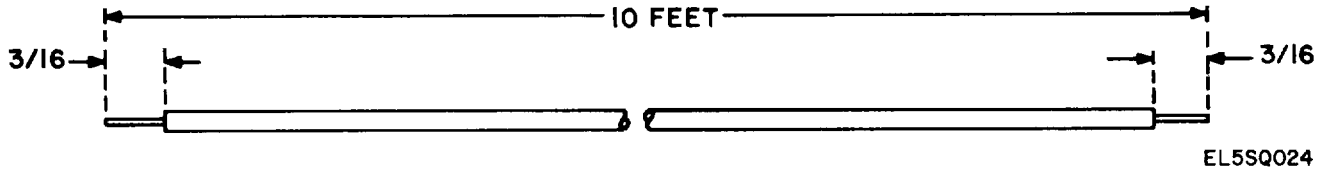


Figure 7-2. Stripping Details, Cables IAI WI and W2.

(9) Screw (clockwise rotation) cable clamp onto connector.

(10) Tighten two screws on cable.

7-9. Repair of Cable 1A1W2 (SM-D-787809)

a. Description of Cable. Cable 1A1W2 (SM-D-787809) is a 10-foot multiconductor cable having three conductors and one connector. The connector (MS27467E17B6S) contains six No. 12 sockets of which three (A, B, and C) are use*d.* Sockets D, E, and F are spares. The three conductors are No. 12 gauge wire, colored Black, White, and Green and are connected to sockets A, B, and C, respectively (fig. 6-3).

b. Repair of Cable. Repair of cable SM-D-787809 is the same as that for cable SM-D-787808, as described in paragraph 7-8*b.*

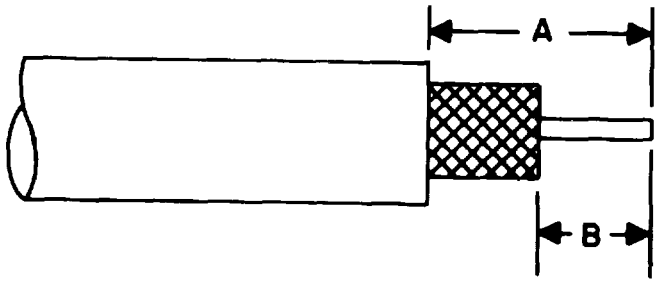
7-10. Repair of Cables 1A1W3 and W4 (CG-3750)

a. Description of Cable. Cables 1AlW3/W4 (CG-3750) are 6-foot RG-214/U cables with connectors on each end (fig. 6-4). Connector P1 is M39012/01-0002 and P2 is M39012/02-0002. Dust caps for each connector are attached to the cable.

b. Repair of Cable. The following procedures apply for either end of the cable.

(1) Cut a 72-inch length of RG-214/U cable.

(2) Strip 11/32-inch of outside jacket from both ends of cable (fig. 7-3, dimension A).



CABLES	DIMENSION (INCHES)	
	A	B
W6-W10	17/64	1/8

EL5SQ025

Figure 7-3. Stripping Details, Cables 1A1 W3 and W4 and W6 through WIO.

(3) Place tag marker over outside of cable jacket.

(4) Strip 7/32 inch of insulation from both ends of the cable (fig. 7-3, dimension B).

(5) Obtain new connector or salvage connector from defective cable assembly. Disassemble the connector (fig. 7-4, view A).

(6) Slip clamp nut, washer, and gasket over cable (fig. 7-4, view B).

(7) Comb out braid smoothly and taper over dielectric. Slide braid clamp over braid and push back against cable jacket (fig. 7-4, view C).

(8) Bend braid back over clamp and trim excess braid. Make sure braid does not extend past shoulder of braid clamp (fig. 7-4, view D).

(9) Tin cable end, inner conductor (fig. 7-4, view E).

(10) Solder contact to center conductor making sure outside surfaces are free of solder. Avoid use of excessive heat. Contact should be flush against cable dielectric (fig. 7-4, view F).

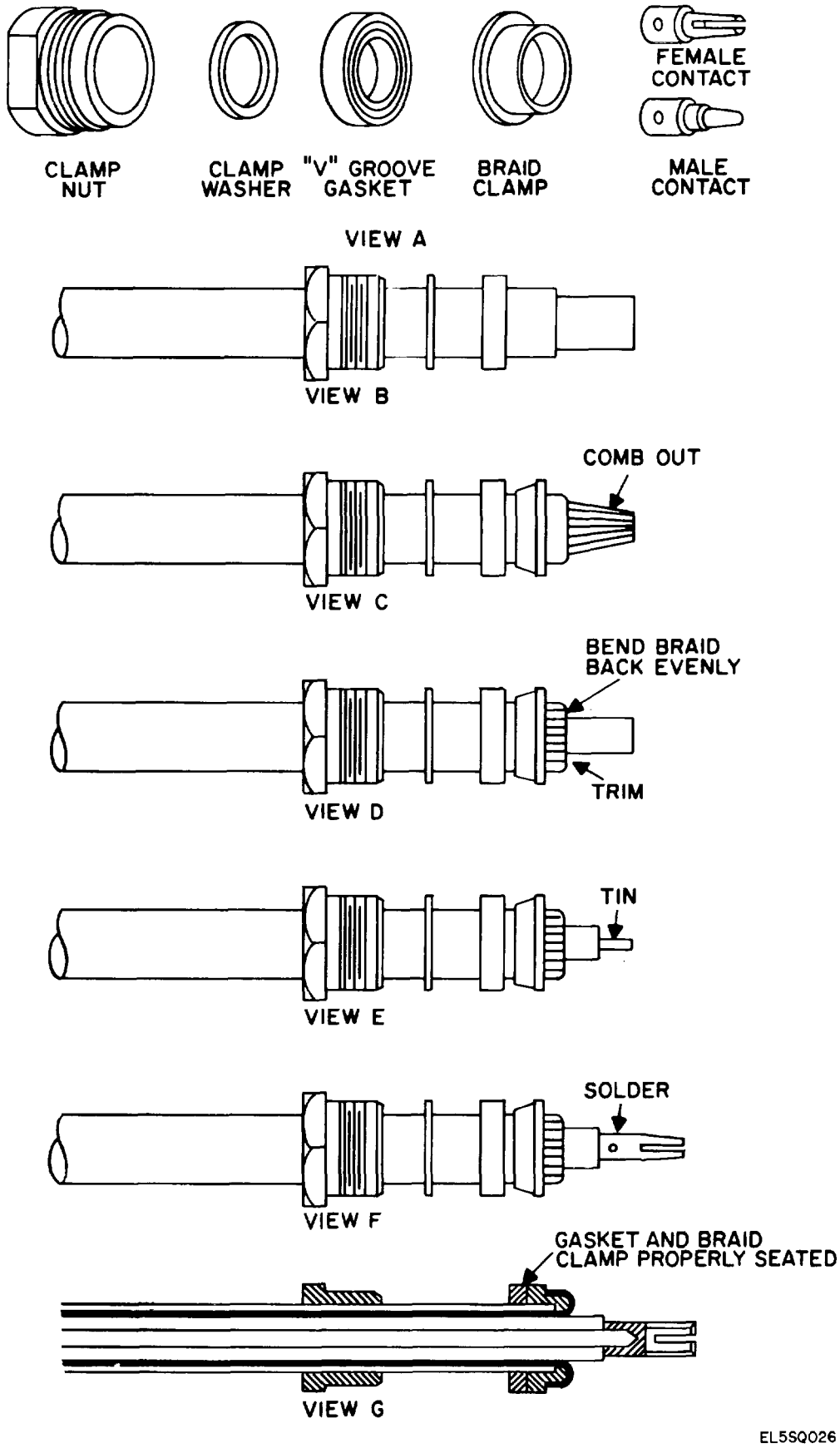


Figure 7-4. Typical Connector Assembly for Cables IAI W3and W4.

(11) Insert cable and parts into connector body. Care should be taken to insure that knife edge of braid clamp is properly seated in "V" groove gasket. Tighten clamp nut securely to complete assembly (fig. 7-4, view G).

(12) Using heat gun, shrink tag marker.

(13) Attach dust cover to cable with cable clamp.

(14) Calibrate cable in accordance with procedures contained in TB 11-6625-2398-35.

7-11. Repair of Cable 1A1W5 (SM-D-986522)

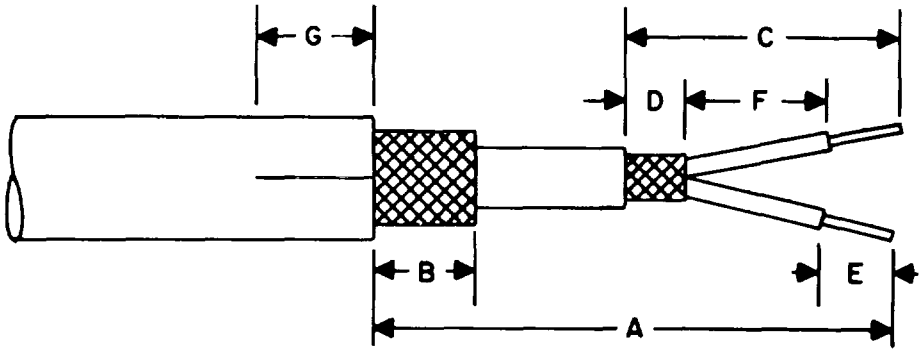
a. Description of Cable. Cable lAIW5 is a multiconductor (SM-D-604261) cable having four conductors and five connectors. Connector P1 (SM-A-604383-1) is a NSA connector, part No. ON089559-1, containing eight coaxial pins of which four are used for RF-180B/U cable, four No. 16 coaxial pins of which one is used, and 25 No. 20 pins of which one is use*d.* Connectors P2 through P5 (SM-B-604273-1) are Amphenol, BNC male connectors part No. 31-232.

b. Repair of Cable. The following procedure is to be performed when a new cable assembly is to be fabricate*d.* To replace plug P1 perform (1) through (23) below. To replace plugs P2 through P5, perform (24 through 46) below.

(1) Cut a section of cable (SM-D-604261) 96 inches in length.

(2) Place tag marker, boot, one 6-inch piece of heat shrink sleeving and two 5-1/4-inch long pieces of heat shrink sleeving over outside of cable jacket.

(3) Strip 3 inches of outside cable jacket from end of cable which will connect to P1 (fig. 7-5, dimension A).



CABLE	DIMENSION (INCHES)				
	A	B	C	D	E
W5-P1	3	7/8	15/32	7/32	13/64

EL5SQ027

Figure 7-5.Stripping Details, Cable 1A1W5P1.

(4) Trim 2-1/8 inches of braid from end of cable leaving 7/8-inch of braid exposed (fig. 7-5, dimension B).

(5) Strip 15/32-inch from jacket of coaxial cable (fig. 7-5, dimension C).

(6) Trim 1/4-inch of braid from coaxial cable leaving 7/32-inch of braid exposed (fig. 7-5, dimension D).

(7) Cut a 3-1/2-inch length of 22AWG black wire and strip 1/2-inch and 3/8-inch of insulation from the wire ends. Hairpin the end of the black wire which has 11/2-inch of insulation remove*d.*

(8) Slide inner ground ring over cable wires and under cable brai*d.*

(9) Slide outer ground ring over cable wires and braid so that outer ground ring is centered over inner ground ring.

(10) Insert hair pinned end of wire (refer to (7) above) between outside ground ring and cable brai*d.*

(11) Using crimping tool, crimp outer ground ring, black wire, and inner ground ring.

(12) Strip 13/64-inch of insulation from each wire which will be connected to P1 (fig. 7-5, dimension E).

(13) Using crimping tool MS3191-4 with MS319T positioner, crimp pins supplied with connector P1 onto exposed wire ends.

(14) Insert pinned wires into connector (fig.

6-5) and fill open pin apertures with spare pins except for coaxial cable receptacles.

(15) Attach plate to rear of connector using hardware supplied, then attach dust cover bracket to rear plate.

(16) Slide 5-1/4-inch-piece of heat shrink sleeving to the end of the cable, then shrink the sleeving.

(17) Slide the second 5-1/4-inch-piece of sleeving to the end of the cable, then shrink the sleeving.

(18) Apply adhesive (R.T.V. 728 or equivalent), under end of sleeving. Slide the 6-1/4-inch-piece of sleeving to the end of the cable, then shrink the sleeving.

(19) Clean end of cable covered by heat shrink sleeving.

(20) Apply thermo fit to area to be covered by boot.

(21) Slide boot up to the bracket and shrink the boot.

(22) Remove excess adhesive from boot.

(23) Attach the dust cover to the connector.

(24) Strip 48 inches of outside jacket and cable braid from end of cable which will connect to P2 through P5 (fig. 7-6, dimension A).

(25) Strip 19/32 inch of jacket from coaxial cable (fig. 7-6, dimension B).

(26) Trim 11/32 inch of braid from coaxial cable leaving 1/4 inch of braid exposed (fig. 7-6, dimension C).

(27) Strip 1/8 inch of insulation from the end of each wire in the assembly (fig. 7-5, dimension E).

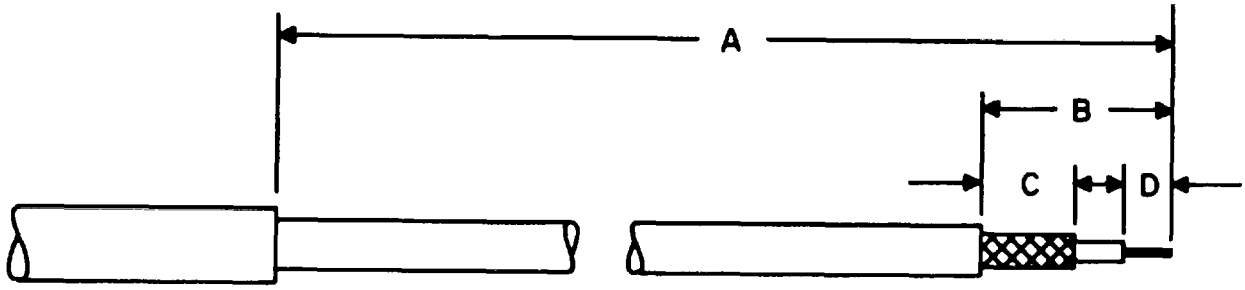
(28) Slide four-fingered boot over cable so that one coaxial cable fits in each finger of the boot.

(29) Cut a piece of heat shrink sleeving 47-1/4 inches in length.

(30) Slide the sleeving over the appropriate coaxial cable and under the applicable finger of the boot.

(31) Position the appropriate tag marker on the sleeving approximately 7 inches from the end of the coaxial cable.

(32) Disassemble new or salvaged connector (fig. 7-7).



CABLE	DIMENSION (INCHES)			
	A	B	C	D
W5-P2-P5	48	19/32	11/32	1/8

EL5SQ028

Figure 7-6.Stripping Details, Cable !A1W5P2 through P5.

(33) Slide outer ferrule over end of cable (fig. 7-8, view A).

(34) Flare the cable braid slightly, do not comb out braid (fig. 7-8, view B).

(35) Place contact on end of cable so that it butts against cable insulation, and crimp contact.

(36) Install cable assembly ino body so that inner ferrule portion slides under brai*d.* Push cable assembly forward until contact snaps into place in insulator. Slide outer ferrule over braid and up against connector body (fig. 7-8, view C).

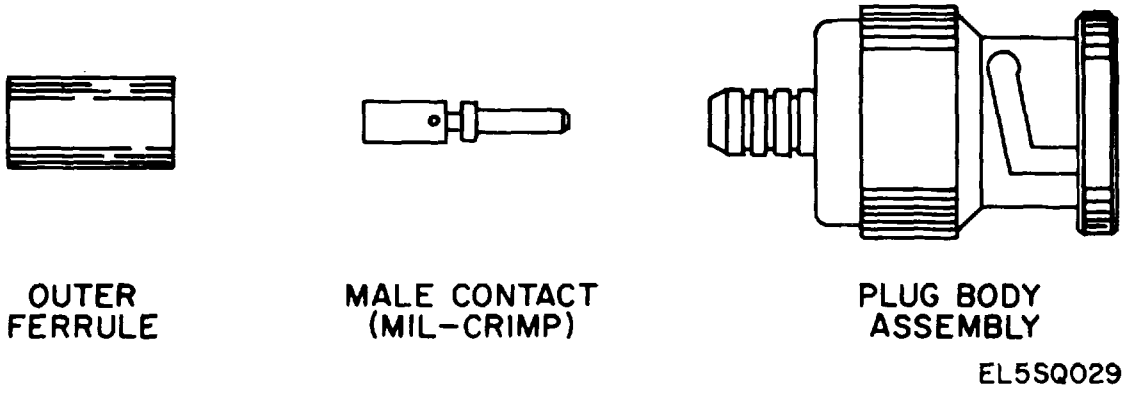


Figure 7-7. Connector Exploded View, Cable 1AIW5P2 through P5.

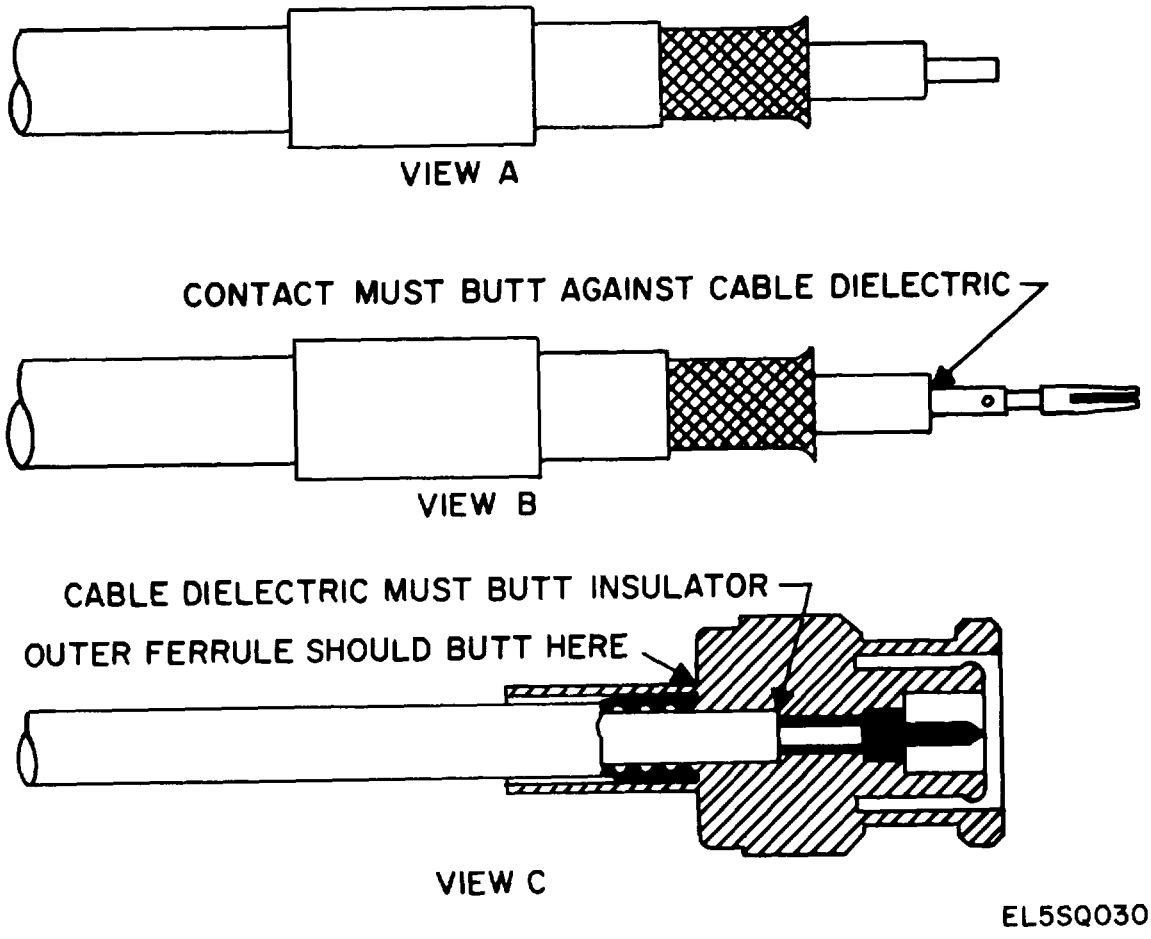


Figure 7-8. Connector Assembly, Cable 1AIW5P2 through P5.

(37) Using crimping tool (M22520/1-01), crimp outer ferrule.

(38) Clean end of cable and apply adhesive (R.T.V. 728 or equivalent) under heat shrink sleeving.

(39) Using heat gun, shrink sleeving until sleeving is approximately 5 inches from connector.

(40) Position tag marker over section of sleeving which was shrunk.

(41) Using heat gun, shrink remainder of sleeving down to the level of the boot.

(42) Shrink tag marker.

(43) Apply thermo fit adhesive under boot.

(44) Using heat gun, shrink the boot.

(45) Remove excess adhesive from boot and sleeving.

(46) Attach link chain attachment and dust cover to cable using cable clamp.

7-12. Repair of Cables 1A1W6, W7, and W8 (CG-3754/TPM-24(V))

a. Description of Cable. Cables 1A1W6, W7, and W8 (CG-3754/TPM-24(V)) are 3-foot RG-142B/U cables with a connector on each end (fig. 6-6). Connector P1 is an M39012/57-4004 connector and P2 is an M39012/55-4004 connector.

b. Repair of Cable. The following procedure applies for replacement of connectors P1 and P2.

(1) Cut a section of cable (RG-142B/U), 35-3/4 inches in length.

(2) Place tag marker over outside of cable jacket.

(3) Obtain new connector or salvage connector from defective cable assembly. Disassemble the connector (fig. 7-9, view A).

(4) Place nut and gasket over cable (fig. 7-9, view B).

(5) Strip 17/64 inch of outside jacket from end of cable (fig. 7-3, dimension A).

(6) Trim 1/8 inch of braid from end of cable; and strip 1/8 inch of insulation from end of wire (fig. 7-3, dimension B).

(7) Comb out braid and fold out (fig. 7-10, view C).

(8) Pull braid wires forward and taper toward center conductor. Place braid clamp over braid and push back against cable jacket. Fold back braid wires, trim as necessary so that wires do not touch shoulder of clamp (fig. 7-10, view D).

(9) Solder center contact to cable. Center contact must sit squarely against dielectri*c.* Avoid excessive heat which may distort dielectric (fig. 7-10, view E)

(10) Thread connector assembly onto prepared cable assembly (fig. 7-10, view F).

(11) Using heat gun, shrink tag marker.

(12) Attach dust covers to cable using cable clamps.

(13) Calibrate cable in accordance with procedures contained in TB 11-6625-2398-35.

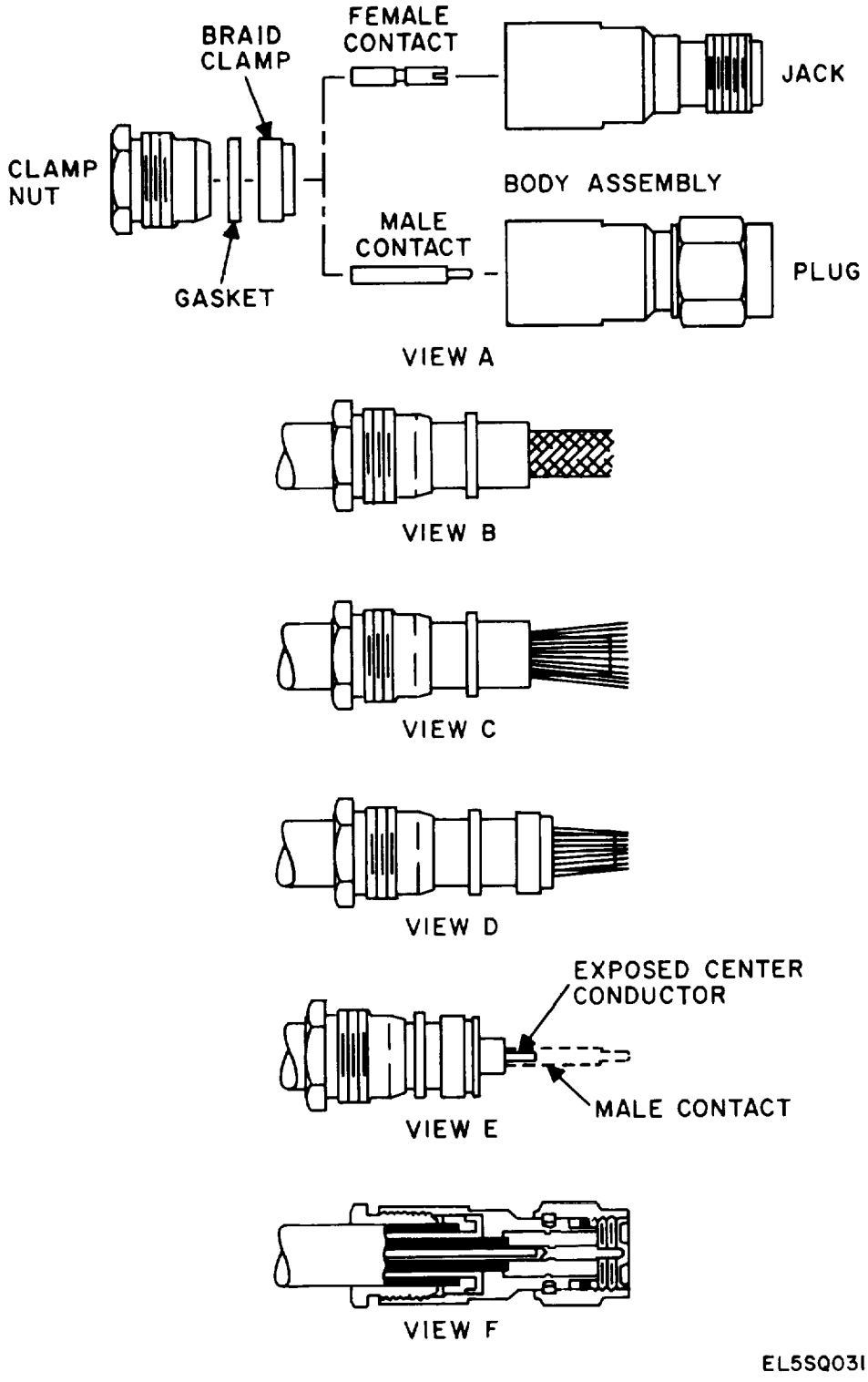


Figure 7-9. Typical Connector Assembly.

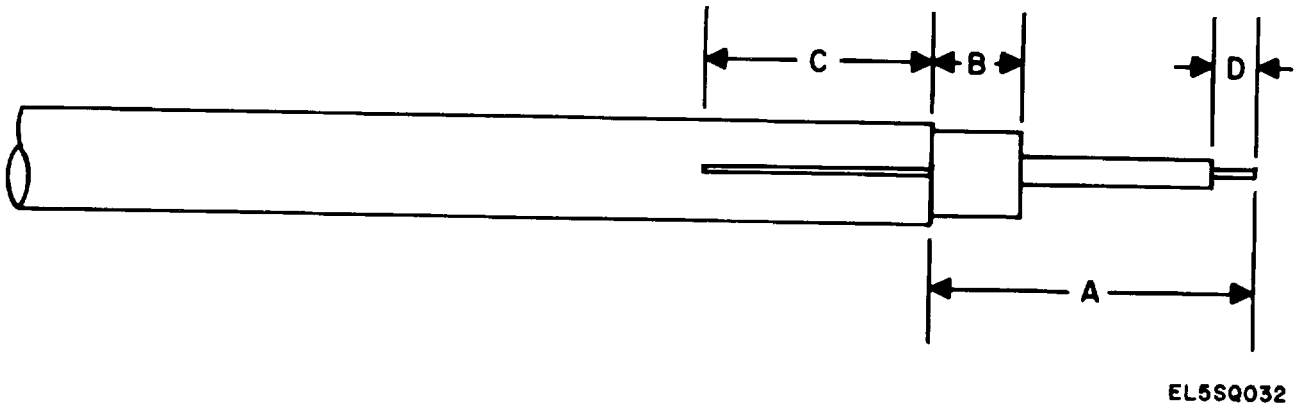


Figure 7-10. Typical Connector Stripping Details.

7-13. Repair of Cables 1AlW9 (SM-D-986535) and W10 (SM-D-986536)

a. Description of Cables. Cables 1A1W9 (SM-D-986535) and lAlW10 (SM-D-986536) (fig. 6-7) are critical length RG-142B/U cables and are 33.66 +-0.05 inches and 34.58 ±0.05 inches, respectively. Each cable has two M39012/55-4009 connectors.

b. Repair of Cable. The following procedure applies for replacement of connectors P1 and P2 of both cables.

(1) Cut a section of cable (RG-142B/U) 33.41 inches for 1A1W9 or 34.33 inches for lAW10.

(2) Perform the procedures of paragraph 7-12b(2) through (13).

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 repaire*d.*

b. Comply with the instructions preceding each chart before procedures contained in 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 standar*d.*

8-2. Test Equipment and Materials

Multimeter TS-352B/U and those equipment's listed in TB 11-6625-2398-35 are required to perform the testing procedures in this chapter.

8-3. Modification Work Order

The performance standards listed in the tests (para 8-4, 8-5 and 8-6) are based on having no modification work orders performed on the test facilities set.

8-4. Cable Short Circuit

Check To check a multiconductor cable for shorts between conductors, proceed as follows:

a. Connect one ohmmeter lead to each cable conductor, one at a time, while performing the following steps for each connection.

b. Connect the second ohmmeter lead to every other conductor in the cable (one conductor at a time).

c. If the meter indicates zero short exists between the two conductors being measure*d.*

d. If the meter indicates less than infinite but more than zero, the two conductors have a dc leakage path between them.

e. If the meter indicates infinite, the two conductors are not shorte*d.*

8-5. Cable Continuity Check

When checking for continuity, the ohmmeter leads may not be long enough to be connected to both ends of the cable. The following procedures are given as a convenient method of determining the condition of a cable.

a. Connect a resistor of known value, 50,000 ohms or more, between one end of the suspected cable conductor and groun*d.*

b. Connect the ohmmeter leads between the conductor and ground at the other end of the cable.

c. If the meter indicates approximately 50,000 ohms, the conductor has continuity.

d. If the meter indicates infinite resistance, the conductor is open.

e. If the meter indicates zero resistance, the conductor is shorted to groun*d.*

f. If the meter indicates much less than 50,000 ohms, but not necessarily zero, the conductor has a dc leakage path to groun*d.*

8-6. Hybrid Attenuator lAlAl, Performance Standards

Performance standards for the hybrid attenuator are achieved when the hybrid attenuator can comply with its calibration standards. Hybrid attenuator calibration standards are contained in TB 11-6625-2398-35.

CHAPTER 9
SHIPMENT, LIMITED STORAGE, AND DEMOLITION TO PREVENT ENEMY USE

Section I. SHIPMENT AND LIMITED STORAGE

9-1. Disassembly of Test Setup

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. Check all items against the list of components for the test facilitities set (para 1-7) to insure completeness.

d. Store the components in their respective places in the transit case and in the accessory case (fig. 1-2 and 1-4). Cables should be coiled neatly and placed such that the connectors will not bind the cable wire when the container is close*d.*

9-2. 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 store*d.* Adapt the outline below as require*d.* 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 SB38-100.

Material	*Size (inL*
Polyethylene wrap.....	As required
Humidity indicator.....	.....Per MS 20003
Desiccant	..... Per MIL-D-3464
Suitable wood packing case	
Sealing tape	

b. Packaging. After the components of the test facilities set have been placed into their allocated containers, perform the following:

(1) Place two desiccant bags and one spot humidity indicator inside of transit case. Close case by securing 16 spacing fasteners.

(2) Wrap the transit case in a polyethylene wrap and seal the wrap with sealing tape.

(3) Place the transit case into the wooden packing case and secure the wooden cover.

(4) Bind the packing case with two metal straps.

(5) Secure the warning label to the top of 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 package*d.* The test facilities set when packaged weighs approximately 110 pounds.

Section II. DEMOLITION OF MATERIAL TO PREVENT ENEMY USE

9-3. 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.

9-4. Methods of Destruction

The tactical situation and time available will determine the method to be used when destruction of equipment is ordere*d.* 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 connectors, hybrid attenuator assembly and printed circuit boards.

b. Cut. Use axes, handaxes, matchetes, 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 use*d.* Incendiary grenades usually are more effective if destruction of small parts and wiring is desire*d.* For quick destruction, place as much equipment as possible in any covered case, place an incendiary grenade in the unit, quickly close the cover, and evacuate the are*a.*

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 destroye*d.*

APPENDIX A
REFERENCES

DA Pam 310-1	Consolidated Index of Army Publications and Blank Forms.
SB 11-604	Replacement of Tool Kits, Radar and Radio Repairment, TK-87/U andTK-88/U with Tool Kits, Electronic Equipment, TK-105/G and TK-100/G.
SB 38-100	Preservation, Packaging, Packing and Marking Materials, Supplies and Equipment used by the Army.
TB 11-6625-2398-35	Calibration Procedure for Test Facilities Sets AN/TPM- 24(V)1, AN/TPM-24(V)2 and AN/TPM-24 (V) 3.
TB 43-0118	Field Instructions for Painting and Preserving Electronics Command Equipment Including Camouflage Pattern Painting of Electrical Equipment Shelters.
TM 11-5895-824-12	Operator and Organizational Maintenance Manual: Interrogator Set AN/TPX-46(V)7.
TM 11-5895-824-40	General Support Maintenance Manual: Interrogator Set AN/TPX-46(V)7.
TM 11-6625-299-15	Operator's Organizational, General Support or Depot Maintenance Manual: Signal Generators AN/URM-64 (NSN 6625-00-283-9621) and AN/URM-64A (NSN 6625-00-553-0433).
TM 11-6625-366-15	Operator's, Organizational, DS, GS, and Depot Maintenance Manual: Multimeter TS-352B/U (NSN 6625-00-553-0142).
TM 11-6625-545-15	Operator's, Organizational, DS, GS, and Depot Maintenance Manual: Indicators, Standing Wave Ratio IM-1751U (NSN 6625-00-892-5670) and IM-175B/U (NSN 6625-00-862-3480).
TM 11-6625-1559-12	Operator and Organizational Maintenance Manual: Generator, Signal Sweep, AN/USM-203 (NSN 6625-935-0145).
TM 11-6625-1703-15	Operator's, Organizational, Direct Support, General Support and Depot Maintenance Manual:Oscilloscope AN/USM-281A (NSN 6625-00-228-2201).
TM 38-750	The Army Maintenance Management System (TAMMS).

APPENDIX B
COMPONENTS OF END ITEM LIST

Section I. INTRODUCTION

B-1. Scope

This appendix lists integral components of and basic issue items for the AN/TPM-24(V)4 to help you inventory items required for safe and efficient operation.

B-2. General

This Components of End Item List is divided into the following sections:

a. Section II. Integral Components of the End Item. Not applicable.

b. Section III. Basic Issue Items. These are the minimum essential items required to place the AN/TPM-24(V)4 in operation, to operate it, and to perform emergency repairs. Although shipped separately packed they must accompany the AN/TPM-24(V)4 during operation and whenever it is transferred between accountable officers. The illustrations will assist you with hard-to-identify items. This manual is your authority to requisition replacement BII., based on TOEIMTOE authorization of the end item.

B-3. Explanation of Columns

a. Illustration. This column is divided as follows:

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

(2) Item number. The number used to identify item called out in the illustration.

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

c. Part Number. Indicates the primary number used by the manufacturer, 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. Following the part number, the Federal Supply Code for Manufacturers (FSCM) is shown in parentheses.

d. Description. Indicates the Federal item name and, if required, a minimum description to identify the item.

e. Location. The physical location of each item listed is given in this column. The lists are designed to inventory all items in one area of the major item before moving on to an adjacent are*a.*

f. Usable on Code. Not applicable. "USABLE ON" codes are included to help you identify which component items are used on the different models. Identification of the codes used in these lists are:

Code *Used on*

g. Quantity Required (Qty Reqd). This column lists the quantity of each item required for a complete major item.

h. Quantity. This column is left blank for use during an inventory. Under the Rcvd column, list the quantity you actually receive on your major item. The Date columns are for your use when you inventory the major item at a later date; such as for shipment to another site.

(Next printed page is B-2)

(1) ILLUSTRATION (A) FIG.	(B) ITEM	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION PART NUMBER CAGE	(4) LOCATION	(5) USUABLE ON CODE	(6) QTY REQD	(7) QUANTITY RCVD	DATE
1-6			ADAPTER, CONNECTOR (8005EOOE) UG-29B/U			2		
1-6			ADAPTER, CONNECTOR (80058) UG-57B/U			1		
1-6			ADAPTER, CONNECTOR (80058) UG-491B/U			2		
1-6			ADAPTER, CONNECTOR (80058) UG-1034/U			1		
1-6			ADAPTER, CONNECTOR UG-1896/TPM-24 (V) (80063) SM-B-687974			4		
1-6			ADAPTER, CONNECTOR UG-1897/TPM-24 (V) (80063) SH-C-687975			2		
1-6			ADAPTER, CONNECTOR NX-10408/TPM-24 (V) (80063) SH-C-986526			1		
1-6			ADAPTER, CONNECTOR MX-10409/TPM-24(V) (16179) 5080-0000-09			1		
1-6			ADAPTER, CONNECTOR MX-10410/TPM-24(V) (98291) 50-074-6201-31			1		
1-6			ADAPTER, CONNECTOR MX-10411/TP-24 (V) (98291) 50-078-0000			1		
1-5			CABLE ASSEMBLY, POWER, ELECTRICAL (10 FT) (80063) SN-D-787B08			1		
1-5			CABLE ASSEMBLY, POWER, ELECTRICAL (10 FT) (80063) SM-D-78780"			1		
1-5			CABLE ASSEABLY, RADIO FREQUENCY CG-3750/TPM-24 (V) (6 FT) (80063) SH-D-604256-2			2		
1-5			CABLE ASSEMBLY, RADIO FREQUENCY CG-3754/TPM-24 (V) (3 FT) (80063) SM-D-604230-1			3		
1-5			CABLE ASSEMBLY, RADIO FREQUENCY (80063) SM-D-986535			1		
1-5			CABLE ASSEMBLY, RADIO FREQUENCY (80063) SM-D-986536			1		
1-5			CABLE ASSEMBLY, RADIO FREQUENCY, BRANCHED (80063) SM-D-986522			1		
1-5			CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL CX-12916/TPM-24 (V) (80063) SM-D-604236			3		
1-5			CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL (10 IN.) (80063) SM-D-986530			1		
1-5			CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL (10 IN.) (80063) SM-D-986531			1		
1-4			CASE, ACCESSORIES CV-8014/TPM-24 (V) (80063) SM-D-986534			1		
1-2			CASE, TEST FACILITIES SET CY-8015/TPM-24 (V) (80063) SM-D-986520			1		
1-6			CONVERTER, RADIO FREQUENCY CV-3747/TPM-24 (V) (28480) HP-8473B			1		
1-6			DUMMY LOAD, ELECTRICAL DA-558/TPH- 24 (V) (80063) SM-C-687972			1		
1-6			DUMMY LOAD, ELECTRICAL DA-559/TPM-24 (V) (80063) SM-C-687977			1		

(1) ILLUSTRATION (A) FIG.	(B) ITEM	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION PART NUMBER CAGE	(4) LOCATION	(5) USUABLE ON CODE	(6) QTY REQD	(7) QUANTITY RCVD	DATE
1-6			Dumsy Load, Electrical DA-634/U (80063) SN-C-604317-1			1		
1-6			Durmy Load, Electrical DA-635/U (80063) SH-C-604317-2			1		
1-6			Dummy Load, Electrical DA-636/U (80063) SM-C-604306			1		
1-6			Extender Card, Electronic Test MX-9356/TPM-24 (V) (80063) SY?-D-604244			1		
1-6			Extractor, Circuit Board XX-10412/TPl-24 (V) (80063) SN-C-787928			1		
1-5			Grounding Strap Assembly (80063) SM-B-604411			2		
1-3			Hybrid Attenuator Assembly CN-1322A/TPM-24 (V) (80063) SM-D-604227			1		
1-7			Interface Unit, Dumny Connector J-3984/TPn-24 (V) (80063) SM-C-787960			1		
1-2			Technical Manual TM 11-6625-238-15-4			2		
1-6			Tool, Tuning (91293) JOHB771			1		
1-6			Wrench, Open End 5/16 (80063) S.-C-986528			1		
1-6			Trench, Open End 15/64 (80063) SM-C-986529			1		

APPENDIX D

MAINTENANCE ALLOCATION

Section I. INTRODUCTION

D-1. General

This appendix provides a summary of the maintenance operations for AN/TPM-24(V)4. 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.

D-2. Maintenance Function

Maintenance functions will be limited to and defined as follows:

a. Inspect. To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination.

b. Test. To verify serviceability and to detect incipient failure by measuring the mechanical or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. Service. Operations required periodically to keep an item in proper operating condition, i.e., to clean (decontaminate), to preserve, to drain, to paint, or to replenish fuel, lubricants, hydraulic fluids, or compressed air supplies.

d. Adjust. To maintain, within prescribed limits, by bringing into proper or exact position, or by setting the operating characteristics to the specified parameters.

e. Align. To adjust specified variable elements of an item to bring about optimum or desired performance.

f. Calibrate. To determine and cause corrections to be made or to be adjusted on instruments or test measuring and diagnostic equipments used in precision measurement. Consists of comparisons 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.

g. Install. The act of emplacing, seating, or fixing into position an item, part, module (component or assembly) in a manner to allow the proper functioning of the equipment or system.

h. Replace. The act of substituting a serviceable like type part, subassembly, or module (component or assembly) for an unserviceable counterpart.

i. Repair. The application of maintenance services (inspect, test, service, adjust, align, calibrate, replace) or other maintenance actions (welding, grinding, riveting, straightening, facing, re-machining, or resurfacing) to restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

j. Overhaul. That maintenance effort (service/action) necessary to restore an item to a completely serviceable/operational condition as prescribed by maintenance standards (i.e., DMWR) in appropriate technical publications. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

k. Rebuild. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of materiel maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours, miles, etc.) considered in classifying Army equipment/components.

D-3. Column Entries

a. Column 1, Group Number. Column 1 lists group numbers, the purpose of which is to identify components, assemblies, subassemblies and modules with the next higher assembly.

b. Column 2, Component/Assembly. Column 2 contains the noun names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

c. Column 3, Maintenance Functions. Column 3 lists the functions to be performed on the item listed in column 2. When items are listed without maintenance functions, it is solely for purpose of having the group numbers in the MAC and RPSTL coincide.

d. Column 4, Maintenance Category. Column 4

specifies, by the listing of a "work time" figure in the appropriate sub-column(s), the lowest level of maintenance authorized to perform the function listed in column 3. This figure represents the active time required to perform that maintenance function at the indicated category of maintenance. If the number or complexity of the tasks within the listed maintenance function vary at different maintenance categories, appropriate "work time" figures will be shown for each category. The number of task-hours specified by the "work time" figure represents the average time required to restore an item (assembly, subassembly, component, module, end item or system) to a serviceable condition under typical field operating conditions. This time includes preparation time, troubleshooting time, and quality assurance/quality control time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the maintenance allocation chart. Sub-columns of column 4 are as follows:

C - Operator/Crew
O - Organizational
F - Direct Support
H - General Support
D - Depot

e. Column 5, Tools and Equipment. Column 5 specifies by code, those common tool sets (not individual tools) and special tools, test, and support equipment required to perform the designated function.

f. Column 6, Remarks. Column 6 contains an alphabetic code which leads to the remark in section IV, Remarks, which is pertinent to the item opposite the particular code.

D-4. Tool and Test Equipment Requirements (Sect. III)

a. Tool or Test Equipment Reference Code. The numbers in this column coincide with the numbers used in the tools and equipment column of the MAC. The numbers indicate the applicable tool or test equipment for the maintenance functions.

b. Maintenance Category. The codes in this column indicate the maintenance category allocated the tool or test equipment.

c. Nomenclature. This column lists the noun name and nomenclature of the tools and test equipment required to perform the maintenance functions.

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

e. Tool Number. This column lists the manufacturer's part number of the tool followed by the Federal Supply Code for manufacturers (5-digit) in parentheses.

D-5. Remarks (Sect. IV)

a. Reference Code. This code refers to the appropriate item in section II, column 6.

b. Remarks. This column provides the required explanatory information necessary to clarify items appearing in section II.

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SECTION II. MAINTENANCE ALLOCATION CHART

FOR

AN/TPM-24(V)4

(1) GROUP NUMBER	(2) COMPONENT ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY C	O	F	H	D	(5) TOOLS AND EQUIPMENT	(6) REMARKS
00	TEST FACILITIES SET AN/TPM-24(V)4 UNIT 1	INSPECT	0.3					NONE	A
		TEST	0.2					11,20	B
		TEST	0.5					11,20	B
		TEST				1.5		1,2,3,4,5,6 7,8,9,10, 11,12,13, 14,15,16, 17,18,19	B,M,N,O P,Q,R
		CALIBRATE				1.5		1,2,3,4,5, 6,7,8,9,10 11,13,14, 15,16,17, 18,19	C,D,E
		INSTALL	0.1					NONE	
		SERVICE		0.3				20	F,G,S
		REPAIR				1.5		1,2,3,4,5, 6,7,8,9,10 11,12,13, 14,15,16, 17,18,19, 20,21,22	H,I,J, K,L
		REPLACE		0.1				NONE	
01	CASE, TEST FACILITIES SET (TRANSIT CASE) CY-8015/TPM-24(V) (1A1)	INSPECT	0.1					NONE	A
		SERVICE				0.3		19	F,L,S
		REPAIR							U
		REPLACE		0.1				NONE	
02	HYBRID ATTENUATOR ASSEMBLY CN-1322A/TPM-24(V) (1A1A1)	INSPECT	0.1					NONE	A
		TEST				0.5		1,2,4,5,6, 7,8,9,10, 11,13,14, 15,16,17,19	B,M,N
		CALIBRATE				0.4		1,2,4,5,6, 7,8,9,10, 11,13,14, 15,16,17,19	E
		SERVICE				0.3		19	F,S
		REPAIR				0.6		1,2,4,5,6, 7,8,9,10, 11,13,14, 15,16,17, 19,21	J
		REPLACE		0.1				NONE	
0201	HYBRID JUNCTION, RADIO FREQUENCY 3032 (99899) (1A1HY1)	INSPECT				0.1		NONE	A
		TEST				0.1		11,19	B
		SERVICE				0.1		19	F
		REPAIR				0.2		11,19	K
		REPLACE				0.1		19	
	EXTRACTOR, CIRCUIT BOARD MX-10412/TPM-24(V) (1A1A3)	INSPECT	0.2					NONE	A
		REPLACE		0.1				NONE	T
03	EXTENDER CARD, ELECTRONIC TEST MX-9356/TPM-24(V) (1A1A4)	INSPECT	0.1					NONE	A
		TEST		0.2				11,20	B
		SERVICE				0.1		19	F
		REPAIR				0.5		11,19,21,22	I
		REPLACE		0.1				NONE	
	DUMMY LOAD, ELECTRICAL (50 OHM, 50 WATT TERMINATION) DA-636/U (1A1AT1)	INSPECT	0.1					NONE	A
		TEST		0.1				11	B
		CALIBRATE				0.2		1,2,5,7,10 11,19	B,C
		SERVICE				0.1		19	F
		REPLACE		0.1				NONE	T
04	CABLE ASSEMBLY, POWER, ELECTRICAL (10 ft., SPECIAL PURPOSE, DC POWER) SM-D-787808 (1A1W1)	INSPECT	0.1					NONE	A
		TEST		0.2				11	B
		SERVICE		0.2				19,20	F,G
		REPAIR				0.2		11,19,21	H
		REPLACE		0.1				NONE	

SECTION II. MAINTENANCE ALLOCATION CHART

FOR

AN/TPM-24(V)4

(1) GROUP NUMBER	(2) COMPONENT ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY C	O	F	H	D	(5) TOOLS AND EQUIPMENT	(6) REMARKS
05	CABLE ASSEMBLY, POWER ELECTRICAL, (100FT.,	INSPECT	0.1					NONE	A
	SPECIAL PURPOSE AC POWER)	TEST		0.1				11	B
	SM-D-787809	TEST				0.2		11,12	B,0
	(1A1W2)	SERVICE		0.2				19,20	F,G
	REPAIR					0.2		11,12,19,21	H
		REPLACE		0.1				NONE	
06	CABLE ASSEMBLY, RADIO FREQUENCY (6FT.)	INSPECT	0.1					NONE	A
	CG-3750/TPM-24(V)	TEST		0.1				11	B
	(1A1W3,W4)	TEST				0.2		11,12	B,O
	(TOTAL QTY: 2)	CALIBRATE				0.2		2,7,9,10,11 19	D
		SERVICE		0.2				19,20	F,G
		REPAIR				0.2		2,7,9,10,11 12,19,21	H
		REPLACE		0.1				NONE	
07	CABLE ASSEMBLY, RADIO FREQUENCY (8FT.,	INSPECT	0.1					NONE	A
	SPECIAL PURPOSE, BRANCHED)	TEST		0.2				11	B
	SM-D-986522	TEST				0.2		11,12	B,O
	(1A1WS)	CALIBRATE				0.2		2,7,9,10,11 19	D
		SERVICE		0.2				19,20	F,G
		REPAIR				0.3		2,7,9,10,11 12,19,21	H
		REPLACE		0.1				NONE	
08	CABLE ASSEMBLY, RADIO FREQUENCY (3FT.)	INSPECT	0.1					NONE	A
	CG-3754/TPM-24(V)	TEST		0.1				11	B
	(1A1W6,W7,W8)	TEST				0.2		11,12	B,O
	(TOTAL QTY: 3)	CALIBRATE				0.2		2,7,9,10,11 19	D
		SERVICE		0.2				19,20	F,G
		REPAIR				0.1		2,7,9,10,11 12,19,21	H
		REPLACE		0.1				NONE	
09	CABLE ASSEMBLY, RADIO FREQUENCY (33.6 inch)	INSPECT	0.1					NONE	A
	SM-D-986535	TEST		0.1				11	B
	(1A1W9)	TEST				0.2		11,12	B,O
		CALIBRATE				0.2		2,7,9,10,11 19	D
		SERVICE		0.2				19,20	F,G
		REPAIR				0.2		2,7,9,10,11 12,19,21	H
		REPLACE		0.1				NONE	
10	CABLE ASSEMBLY, RADIO FREQUENCY (34.58 inch)	INSPECT	0.1					NONE	A
	SM-D-986536	TEST		0.1				11	B
	(1A1W10)	TEST				0.2		11,12	B,O
		CALIBRATE				0.2		2,7,9,10,11 12,19	D
		SERVICE		0.2				19,20	F,G
		REPAIR				0.2		2,7,9,10,11 12,19,21	H
		REPLACE		0.1				NONE	
11	CASE ACCESSORIES	INSPECT	0.1					NONE	A
	CY-8014/TPM-24(V)	SERVICE		0.1				20	F
	(1A1A2)	SERVICE				0.2		19	F,L,S
		REPAIR				0.1			V
		REPAIR							U
		REPLACE		0.1				NONE	
	DUMMY LOAD, ELECTRICAL (50 OHM TERMINATION)	INSPECT	0.1					NONE	A
	DA-558/TPM-24(V)	TEST				0.1		11	B
	(1A1A2AT1,AT2)	CALIBRATE				0.2		1,2,5,7,10 11,19	C
	(TOTAL OTY: 2)	SERVICE		0.1				20	F
		REPLACE		0.1				NONE	T

SECTION II. MAINTENANCE ALLOCATION CHART

FOR

AN/TPM-24(V)4

(1) GROUP NUMBER	(2) COMPONENT ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY C	O	F	H	D	(5) TOOLS AND EQUIPMENT	(6) REMARKS
	DUMMY LOAD, ELECTRICAL (75 OHM TERMINATION)	INSPECT	0.1					NONE	A
	DA-559/U	TEST				0.1		11	B
	(1A1A2AT3)	CALIBRATE				0.2		1,2,5,7,10 11,19	C
		SERVICE		0.1				20	F
		REPLACE		0.1				NONE	T
	DUMMY LOAD, ELECTRICAL (ATTENUATOR, 5dB)	INSPECT	0.1					NONE	A
	DA-634/U	TEST				0.1		11	B
	(1A1A2AT4)	CALIBRATE				0.2		1,2,5,7,10 11,19	C
		SERVICE		0.1				20	F
		REPLACE		0.1				NONE	T
	DUMMY LOAD, ELECTRICAL (ATTENUATOR, 11dB)	INSPECT	0.1					NONE	A
	DA-635/U	TEST				0.1		11	B
	(1A1A2AT5)	CALIBRATE				0.2		1,2,5,7,10 11,19	C
		SERVICE		0.1				20	F
		REPLACE		0.1				NONE	T
	INTERFACE UNIT, DUMMY CONNECTOR (SHORTING PLUG)	INSPECT	0.1					NONE	A
		TEST				0.3		11	B
	J-3984/TPM-24(V)	SERVICE		0.1				20	F
	(1A1A2AT6)	REPLACE		0.1				NONE	T
	ADAPTER, CONNECTOR (N-FEMALE TO N-FEMALE)	INSPECT	0.1					NONE	A
	UG-29B/U	TEST				0.1		11	B
	(1A1A2CP1,CP2)	SERVICE			0.1			20	F
	(TOTAL OTY: 2)	REPLACE			0.1			NONE	T
	ADAPTER, CONNECTOR (N-MALE TO N-MALE)	INSPECT	0.1					NONE	A
	UG-57B/U	TEST				0.1		11	B
	(1A1A2CP3)	SERVICE			0.1			20	F
		REPLACE			0.1			NONE	T
	ADAPTER, CONNECTOR (BNC-MALE TO BNC-MALE)	INSPECT	0.1					NONE	A
	UG-491B/U	TEST				0.1		11	B
	(1A1A2CP4,CP5)	SERVICE			0.1			20	F
	(TOTAL QTY: 2)	REPLACE			0.1			NONE	T
	ADAPTER, CONNECTOR (N-MALE TO BNC-MALE)	INSPECT	0.1					NONE	A
	UG-1034/U	TEST				0.1		11	B
	(1A1A2CP6)	SERVICE			0.1			20	F
		REPLACE			0.1			NONE	T
	ADAPTER, CONNECTOR (BNC-FEMALE TO SMA-MALE)	INSPECT	0.1					NONE	A
	UG-1896/TPM-24(V)	TEST				0.1		11	B
	(1A1A2CP7,CPS,CP9,CP10)	SERVICE			0.1			20	F
	(TOTAL QTY: 4)	REPLACE			0.1			NONE	T
	ADAPTER, CONNECTOR (SMA-FEMALE TO BNC-FEMALE)	INSPECT	0.1					NONE	A
	UG-1897/TPM-24(V)	TEST				0.1		11	B
	(1A1A2CP11,CP12)	SERVICE			0.1			20	F
	(TOTAL QTY: 2)	REPLACE			0.1			NONE	T
	ADAPTER, CONNECTOR (SMC-PEMALE TO SMC-MALE)	INSPECT	0.1					NONE	A
	MX-10411/TPM-24(V)4	TEST				0.1		11	B
	(1A1A2CP13)	SERVICE			0.1			20	F
		REPLACE			0.1			NONE	T
	ADAPTER, CONNECTOR (SMC-MALE TO SMC-MALE)	INSPECT	0.1					NONE	A
	MX-10410/TPM-24(V)4	TEST				0.1		11	B
	(1A1A2CP14)	SERVICE			0.1			20	F
		REPLACE			0.1			NONE	T
	ADAPTER, CONNECTOR (SMA-FEMALE TO SMC-FEMALE)	INSPECT	0.1					NONE	A
	MX-10409/TPM-24(V)4	TEST				0.1		11	B
	(1A1A2CP15)	SERVICE			0.1			20	F
		REPLACE			0.1			NONE	T

SECTION II. MAINTENANCE ALLOCATION CHART

FOR

AN/TPM-24(V)4

(1) GROUP NUMBER	(2) COMPONENT ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY C	O	F	H	D	(5) TOOLS AND EQUIPMENT	(6) REMARKS
	ADAPTER, CONNECTOR (SMA-FEALEP TO MACHINE	INSPECT	0.1					NONE	A
	SCREW THREAD) MX-10408/TPM-24 (V)	TEST				0.1		11	B
	(1A1A2CP16)	SERVICE			0.1			20	F
		REPLACE			0.1			NONE	T
	CONVERTER, RADIO FREQUENCY (DIODE	INSPECT	0.2					NONE	A
	DETECTOR)								
	CV-3747/TPM-24(V)	TEST				0.5		1,3,5,7,8,	P,Q,R
	(1A1A2CR1)							9,10,11,15,	
								18,19	
		SERVICE		0.1				20	F
		REPLACE		0.1				NONE	T
1101	CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL	INSPECT	0.1					NONE	A
	(2FT.) CX-12916/TPM-24 (V)	TEST		0.2				11	B
	(1A1A2W1,N2,W3)	TEST			0.2			11,12	B,O
	(TOTAL OTY: 3)	CALIBRATE				0.2		2,7,9,10,11	D
								19	
		SERVICE		0.1				20	F,G
		REPAIR				0.2		2,7,9,10,11	H
								12,19,21	
		REPLACE		0.1				NONE	
1102	CABLE ASSEMBLY, SPECIAL PURPOSE ELECTRICAL	INSPECT	0.1					NONE	A
	(10-inch)	TEST		0.1				11	B
	SM-D-986530	TEST				0.1		11,12	B,O
	(1A1A2W4)	CALIBRATE				0.2		2,7,9,10,11	D
								19	
		SERVICE		0.1				20	F,G
		REPAIR				0.2		2,7,9,10,11	H
								12,19,21	
		REPLACE		0.1				NONE	
1103	CABLE ASSEMBLY, SPECIAL PURPOSE,ELECTRICAL	INSPECT	0.1					NONE	A
	(10-inch	TEST		0.1				11	B
	SM-D-986531	TEST				0.1		11,12	B,O
	(1A1A2W5)	CALIBRATE				0.2		2,7,9,10,11	D
								19	
		SERVICE		0.1				20	F,G
		REPAIR				0.2		2,7,9,10,11	H
								12,19,21	
		REPLACE		0.1				NONE	
	GROUNDING STRAP ASSEMBLY (SPECIAL PURPOSE)	INSPECT	0.1					NONE	A
	-B-604411	TEST		0.1				11	B
	(1A1A2W6,W7)	REPLACE		0.1				NONE	T
	(TOTAL QTYs 2)								
	TOOL TUNING (JOHANSON)	INSPECT	0.1					NONE	A
	PART NO. 8771	REPLACE		0.1				NONE	T
	(1A1A2MP1)								
	WRENCH, OPEN END	INSPECT	0.1					NONE	A
	SN-C-986529	REPLACE		0.1				NONE	T
	(1A1A2MP2)								
	WRENCH, OPEN END	INSPECT	0.1					NONE	A
	SM-C-986529	REPLACE		0.1				NONE	T
	(1AA2ZHP3)								

SECTION III. TOOL AND TEST EQUIPMENT REQUIREMENTS FOR AN/TPM-24(V)4

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE CATEGORY	NOMENCLATURE	NATIONAL/NATO STOCK NUMBER	TOOL NUMBER
1	B,D	50 OHM TERMINATION (DUMMY LOAD), WEINSCHEL MODEL 535MB	5985-00-821.7367	
2	H,D	ATTNUATOR, FIXED, 6dB MICROLAB AA06B	5985-00-882-8440	
3	H,D	ATTENUATOR, FIXED, 10dB MICROLAB AA10N	5985-00-082-0603	
4	H,D	CRYSTAL DETECTOR (R.F. CONVERTER) HEWLETT PACKARD J-3984/TPM-24	6625-01-080-2791	
5	H,D	SLOTTED LINE (SLOTTED LINE WAVEGUIDE) HEWLETT PACKARD HP-8052C	6625-00-225-6543	
6	H,D	ATTENUATOR, PRECISION STEP (VARIABLE) ALFRED E101	6625-00-061-0230	
7	H,D	INDICATOR, STANDING WAVE RATIO, IM-175/U	6625-00-892-5670	
8	H,D	OSCILLOSCPE, AN/USM-281C	6625-00-106-9622	
9	H,D	TEST SET, RADIO FREQUENCY POWER, AN/USM-161	6625-00-892-5541	
10	H,D	SIGNAL GENERATOR, AN/URM-64A-2	6625-00-087-4795	
11	C,O,H,D	MULTIMETER, AN/URM-105C	6625-00-999-6282	
12	H,D	TEST SET, INSULATION BREAKDOWN AN/GSM-6	6625-00-542-1331	
13	H,D	ADAPTER, N PLUG TO BNC JACK, ONNI SPECTRA P/N 3082-2320-00	5935-00-759-0847	
14	H,D	ADAPTER, N PLUG TO SNA JACK, OMNI SPECTRA P/N 3082-2240-00	5935-00-470-0051	
15	H,D	ADAPTER, BNC PLUG TO SMA JACK, MIL-A-55339/44-30001	NOT ASSIGNED	
16	H,D	ADAPTER, BNC PLUG TO N PLUG, MIL-A-55339/18-01034	NOT ASSIGNED	
17	H,D	ADAPTER, N JACK TO SMA JACK, OMNI SPECTRA P/N 3080-2240-00	5935-00-824-7588	
18	H,D	ADAPTER, BNC PLUG TO BNC PLUG, ML-A-55339/15-0491	NOT ASSICNED	
19	O,H,D	TOOL KIT, ELECTRONIC EQUIPMENT, TK-100/G	5180-00-605-0079	
20	C,O,H,D	TOOL KIT, ELECTRONIC EQUIPMENT, TK-105/G	5180-00-610-8177	
21	H,D	HEAT GUN ASSEMBLY WITH ADAPTER AND BAFFLE, HG-501	4949-00-561-1002	
22	H,D	REPAIR KIT, MK-772/G	5999-00-757-7042	

MISA-FM 2132-77

(Edition of 1 Oct 74 may be used until exhausted)

SECTION IV. REMARKS

REFERENCE CODE	REMARKS
A	BY VISUAL INSPECTION
B	BY ELECTRICAL CONTINUITY CHECKS
C	BY CHECKING VSWR AND ATTENUATION OF ELECTRICAL DUMMY LOADS
D	BY CALIBRATION OF INSERTION LOSS FOR RF CABLES IN ACCORDANCE WITH TB 11-6625-2398-35
E	BY CALIBRATION OF INSERTION LOSS FOR HYBRID ATTENUATOR SUM/DIFFERENCE CHANNELS AND CALIBRATION OF HYBRID ATTENUATOR DIAL IN ACCORDANCE WITH TB 11-6625-2398-35
F	BY CLEANING, SUCH THAT ELECTRICAL CONTACTS AND METAL SURFACES ARE FREE OF DUST, DIRT, AND GREASE
G	BY TAPING MINOR CUTS OF CABLES
H	BY REPAIRING BROKEN AC/DC POWER AND RF CABLE CONNECTORS IN ACCORDANCE WITH TM 11-6625-2398-14-4
I	BY REPAIRING EXTENDER CARD CONNECTOR CONTACTS IN ACCORDANCE WITH TM 11-6625-2398-14-4
J	BY REPAIRING HYBRID JUNCTION (SEE REF. CODE XK), AND REPLACEMENT OF VARIABLE ATTENUATOR, RF CABLES AND PIECE PARTS, IN ACCORDANCE WITH TM 11-6625-2398-14-4
K	REPAIR HYBRID JUNCTION BY PIECE PART REPLACEMENT
L	BY SERVICING THE DAMAGED SURFACE OF TRANSIT CASE AND ACCESSORY CASE IN ACCORDANCE WITH TM 11-6625-2398-14-4
M	BY PERFORMING VSWR TEST ON HYBRID ATTENUATOR IN ACCORDANCE WITH TB 11-6625-2398-35
N	BY PERFORMING INSERTION LOSS TEST ON HYBRID ATTENUATOR IN ACCORDANCE WITH TB 11-6625-2398-35
O	BY PERFORMING INSULATION BREAKDOWN TEST ON RF CABLES IN ACCORDANCE WITH TM 11-6625-2398-14-4
P	BY PERFORMING VSWR TEST ON RF CONVERTER
Q	BY PERFORMING FREQUENCY RESPONSE TEST ON RF CONVERTER
R	BY PERFORMING HIGH LEVEL AND LOW LEVEL SENSITIVITY TEST ON RF CONVERTER
S	TOUCH UP PAINTING
T	NON-REPAIRABLE ITEM, REPLACE IF DEFECTIVE
U	FACTORY REPAIRABLE; REPLACEMENT OF HINGES, FASTENER AND HANDLES REQUIRES WELDING AND REPAINTING
V	BY TIGHTENING LOOSE HANDLE

APPENDIX E

EXPENDABLE SUPPLIES AND MATERIALS LIST

Section I. INTRODUCTION

E-1. Scope

This appendix lists expendable supplies and materials you will need to operate and maintain the AN/TPM-24(V)4. These items are authorized to you by CTA 50-970, Expendable Items (Except Medical, Class V, Repair Parts, and Heraldic Items).

E-2. Explanation of Columns

a. Column 1-Item Number. This number is assigned to the entry in the listing and is referred in the narrative instructions to identify the material (e.g., "Use cleaning compound, item 5, App. D").

b. Column 2-Level. This column identifies the lowest level of maintenance that requires the listed item.

C - Operator/Crew
O - Organizational Maintenance
F - Direct Support Maintenance
H - General Support Maintenance

c. Column 3-National Stock Number. This is the National stock number assigned to the item; use it to request or requisition the item.

d. Column 4-Description. Indicates the Federal item name and, if required, a description to identify the item. The last line for each item indicates the part number followed by the Federal Supply Code for Manufacturer (FSCM) in parentheses, if applicable.

e. Column 5-Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pr). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

(Next printed page is E-2)

SECTION II. EXPENDABLE SUPPLIES AND MATERIALS LIST

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION PART NO. AND FSCM	(5) UNIT OF MEAS.
1	0	6850-00-597-9765	Cleaning compound	Gal
2	0		Lint-free cloth	yd
3	0		Paint, light gray enamel, formula No. 11 (per NIL-E-1590), type II, class 2, semi-gloss	gal

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