TM 11-6625-1683-15

TECHNICAL MANUAL

OPERATOR'S, ORGANIZATIONAL, DIRECT SUPPORT, GENERAL SUPPORT
AND DEPOT MAINTENANCE MANUAL
INCLUDING REPAIR PARTS AND SPECIAL TOOLS LISTS

TEST FACILITIES KITS
MK-980/PPS-5 (NSN 6625-00-933-9980)
AND
MK-980A/PPS-5 (NSN 6625-00-453-5667)

This copy is a reprint which includes current pages from Changes 1 through 12.

HEADQUARTERS, DEPARTMENT OF THE ARMY
MAY 1967

WARNING

DANGEROUS VOLTAGES EXIST IN THIS EQUIPMENT

DON'T TAKE CHANCES!

EXTREMELY DANGEROUS VOLTAGES EXIST IN THE FOLLOWING COMPONENT:

CRT TEST press-and-hold switch: 2,000 volts dc.

DEATH may result from contact.

TM 11-6625-1683-15P
C12

CHANGE
No. 12

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, *20 APR/L 1984*

Operator's, Organizational, Direct Support General Support
And
Depot Maintenance Manual

TEST FACILITIES KIT
MK-980/PPS-5 (NSN 6625-00-933-9980
AND
MK-980A/PPS-5 (NSN 6625-00-453-5667)

TM 11-6625-1683-15, 19 May 1967, is changes as follows:
1. New or changed material is indicated by a vertical bar in the margin of the pages.
2. Remove and insert pages as indicated below.

Remove	*Insert*
i and 1-0	i and 1-0
1-1 and 1-2	1-1 and 1-2
8.1-1 and 8.1-2	8.1-1 and 8.1-2
A-1	A-1/(A-2 blank)

3. File this change sheet in front of the publication.

By Order of the Secretary of the Army:

JOHN A. WICKHAM JR.
General, United States Army
Chief of Staff

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

DISTRIBUTION:
To be distributed in accordance with DA Form 12-36B, Direct and General Support Maintenance, requirements for AN/PPS-5.

Change
No. 11

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, *27 December 1979*

Operator's, Organizational, Direct Support, General Support and Depot Maintenance Manual TEST FACILITIES KIT MK-980/PPS-5 (NSN 6625-00-933-9980) AND MK-980A/PPS-5 (NSN 6625-00-453-5667)

TM 11-6625-1683-15, 19 May 1967, is changed as follows:

1. The title of this manual is changed as shown above.

2. Remove and insert pages as indicated in the page list below:

Remove	***Insert***
1-1 and 1-2	1-1 and 1-2
8.1-1 through 8.1-10	8.1-1 through 8.1-10
Figure 9-11[1]	Figure 9-11[1]
Figure 9-12	Figure 9-12
C-l through C-15	C-l through C-7
D-l through D-5	NONE
E-l through E-64	NONE

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

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USAES (2)
USAICS (3)
MAAG (1)
USARMIS (1)
USAERDM (1)
USAERDAW (1)
38th AD Bde (2)
4th USA Msl Comd (2)
Fort Gordon (10)
Fort Carson (5)
Army Dep (1) except
LBAD (14)
SAAD (30)
TOAD (14)
SHAD (3)
Fort Gillem (10)
USA Dep (1)
Sig Sec USA Dep (1)
Fort Richardson (CERCOM Oft) (2)
Units org under fol TOE:
(2 copies each unit)
29-207
29-610
(1 copy each unit)
11-97
11-98
11-117
11-127
11-500(AA-AC)
29-58
29-134
29-136

ARNC: None

USAR: None

For explanation of abbreviations used, see AR 310-50.

TECHNICAL MANUAL
No. 11-6625-1683-15

TM 11-6625-1683-15
HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, *19 May 1967*

OPERATOR'S, ORGANIZATIONAL, DIRECT SUPPORT, GENERAL SUPPORT AND DEPOT MAINTENANCE MANUAL INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST

TEST FACILITIES KITS
MK-980/PPS-5 (NSN 6625-00-453-5667)

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, or DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in back of this manual direct to: Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: DRSEL-ME-MP, Fort Monmouth, New Jersey 07703.

For Navy, mail comments to the Commander, Naval Electronics Systems Command, ATTN: ELEX 8122, Washington, DC 20360.

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

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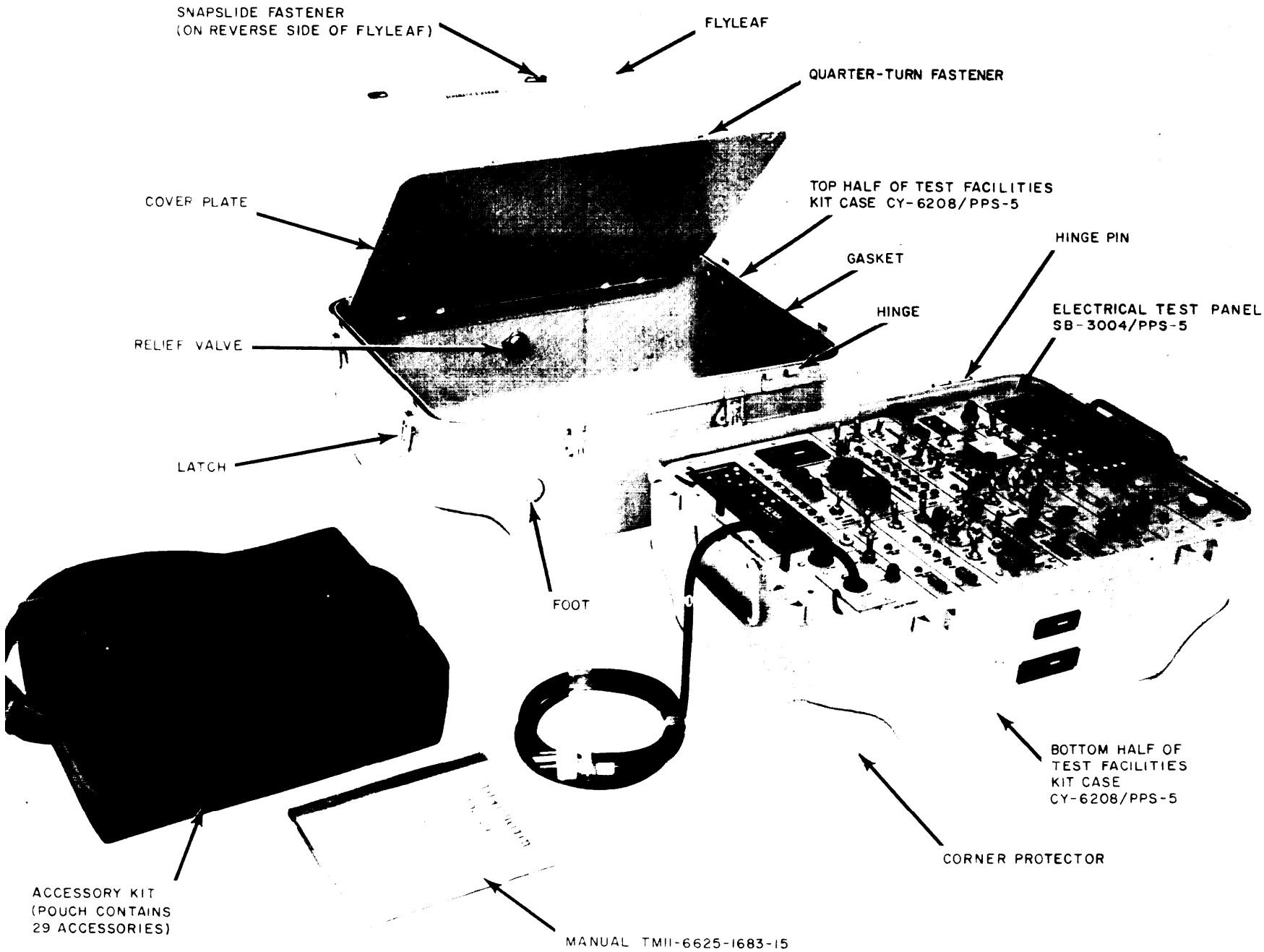

SNAPSLIDE FASTENER
(ON REVERSE SIDE OF FLYLEAF)
FLYLEAF
QUARTER-TURN FASTENER
COVER PLATE
TOP HALF OF TEST FACILITIES
KIT CASE CY-6208/PPS-5
HINGE PIN
GASKET
HINGE
ELECTRICAL TEST PANEL
SB-3004/PPS-5
RELIEF VALVE
LATCH
FOOT
BOTTOM HALF OF
TEST FACILITIES
KIT CASE
CY-6208/PPS-5
CORNER PROTECTOR
ACCESSORY KIT
(POUCH CONTAINS
29 ACCESSORIES)
MANUAL TMII-6625-1683-15

Figure No. 1-1

CHAPTER 1
INTRODUCTION

NOTE

Test Facilities Kit MK-980/PPS-5 is similar to Test Facilities Kit MK-980A/PPS-5. Information in this manual applies to both equipments unless otherwise indicated. Refer to paragraph 1-11 for differences in the equipments.

1-1. Scope

a. This manual describes Test Facilities Kit MK-980/PPS-5 (fig. 1-1) and provides instructions for its operation and maintenance. It includes operation under usual and unusual conditions, cleaning and inspection of the equipment, replacement of parts, and repair. It also includes a maintenance allocation charge (App C), and Repair Parts (App D).

b. Refer to the detailed operating procedures for using Test Facilities Kit MK-980/PPS-5 or similar radar sets (radar set) in the testing procedures for those equipments.

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 DA Pam738-750, as contained in Maintenance Management Update.

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 4355.73A/AFR 400-54/MCO 4430.3F.

c. Discrepancy in Shipment Report (DISREP) (SF 361). Fill out and forward Discrepancy in Shipment Report (DISREP) (SF361) as prescribed in AR55-38/NAVSUPlNST 4610.33C/AFR75-18/MCO P4610.19D/DLAR 4500.15.

1-3.1. Reporting Equipment Improvement Recommendations [EIR]

If your Test Facilities Kit MK-980/PPS-5 or MK-980A/PPS-5 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, New Jersey 07703. We'll send you a reply.

1-3.3. Destruction of Army Electronics Materiel

Destruction of Army electronics materiel to prevent enemy use shall be in accordance with TM 750-244-2.

1-4. Purpose and Use

a. Test facilities Kit MK-980/PPS-5 is a portable test set designed specifically to simplify the troubleshooting of Radar Set AN/PPS-5 and similar radar sets by providing test signals, input voltages, and jacks for connecting the radar set to standard test equipment. By using the MK-980/ PPS-5, many of the plug-in circuits of the radar set can either be tested individually while they are operating as part of the radar, or be removed from the radar set and tested individually on the bench.

b. The cable assembies of the MD-980/PPS-5 can also be used independently: they can be used to make the plug-in circuits more accessible for testing. A plug-in circuit, for example, can be removed from the radar set, one of test cables can be plugged into the connector on the cable. The radar set can then be turned on, and the parts of the circuit can be tested under conditions almost like those under which it operates in the radar set.

c. The MK-980/PPS-5 can be plugged into a 115-volt alternating current (at) line, or it can be powered by either Battery Box CY-3871/PPS-5 or Power Supply PP-4450/PPS-5, which are part of Radar Set AN/PPS-5.

1-5. Technical Characteristics

Input power . . . . . 115 volts ac ± 10 percent, 50 to 1,000 Hz, 0.9 ampere (amp) or 6 volts direct current (dc) ± 10 percent, 9 ampere.

outputs:

Dc voltages . . +2KV (+0 -400), -2KV (+0 +400), -600 (+30 -30), +300V (-0) +20), +110V (+6 -16, +35V (+10-10, +12V (+0-4), -12V (-0 +4), +V (+0.3 -0,9, -6V (-0.3 +0.9), -5V (+0.3 -0), +0.9), -5V (+0.3 -0), +39V (+0 -0.2), and -3.9V (-0 +0.2).

Sync . . . . . .4,000-Hz, 75 volts (+25 -30) amplitude, pulse with 5 to 25 usec.

Trigger . . . . . .4,000-Hz, 10 volts (+1 -1) amplltude, pulse width 2 usec,

Power supply sync. . . . . .4,000-Hz, 8 volts (+1 -1) amplitude, pulse width 2 usec.

Environmental requirements

Operating temperature range . . . . . 0° to 55°, for continuous operation; 0°C to 71°C, for Intermittent operation.

Storage temperature range . . . . . -62°C to +85°C.

Altltude range . . . .0 to 10,000 feet (operting); 0 to 50,000 feet (not operation).

Watertightness . . . . . Leakproof under 3 feet of water when the cover is on and latched.

NOTE

When the cover is unlatched, the control panel is not waterproof or rainproof.

Explosion . . . .Thls equipment is not to be operated in an explosive-type atmosphere, it is not sealed, and its swltches are not sealed.

Weight . . . .55 pounds

1-6. Items Comprising an Operable Equipment

FSN	QTY	Nomenclature, part No., and mfr code	F/g No.	Dimensions (in) Depth	W/dth	He/ght	We/ght (lb)
6625-933-9980		Test Facilities Kit, MK-980/PPS-5 consisting of					
5935-258-7429	2	Adapter, Connector UG-201 A/U	1-25				
5935-149-3534	1	Adapter, connector UG-273/U	1-25				

FSN	QTY	Nomenclature, part No., and mfr code	Fig. No.	Dimensions (in.) Depth	Width	Height	Weight (lb)
6625-926-8452	1	Attenuator,Fixed CN-1175/PPS-5: SM-C-6009; 80058	1-2 ③				
6625-926-7891	4	Cable Assembly, Radio Frequency CG-3353/U (2FT): SM-C-601715; 80058	1-2 ③				24
6625-926-7889	2	Cable Assembly, Radio Frequency CG-3354/U (4FT): SM-C-600895; 80058	1-2 ④				48
6625-926-7909	1	Cable Assembly, Radio Frequency CG-3355/ U (6½ IN): SM-C-601728; 80058	1-2 ③				6½
6625-926-7876	1	Cable Assembly, Special Purpose, Electrical, CX-10429/PPS-5: SM-D-601441; 80058	1-2 ③				24
6625-926-7877	1	Cable Assembly, Special Purpose, Electrical, CX-10430/PPS-5: SM-D-601442; 80058	1-2 ①				24
6625-926-7878	1	Cable Assembly, Special Purpose, Electrical, CX-10431/PPS-5: SM-D-601443; 80058	1-2 ①				24
6625-926-7879	1	Cable Assembly, Special Purpose, Electrical, CX-10432/PPS-5: SM-D-601444; 80058	1-2 ④				24
6625-926-7880	1	Cable Assembly, Special Purpose, Electrical, CX-10433/PPS-5: SM-D-601445; 80058	1–2 ①				24
6625-926-7881	1	Cable Assembly, Special Purpose, Electrical, CX-10434/PPS-5: SM-C-601446; 80058	1-2 ③				24
6625-926-7882	1	Cable Assembly, Special Purpose, Electrical, CX-10435/PPS-5: SM-D-601447; 80058	1-2 ①				24
6625-926-7883	1	Cable Assembly, Special Purpose, Electrical, CX-10436/'PPS-5: SM-D-601448; 80058	1- 2 ①				24
6625-926-7884	1	Cable Assembly, Special Purpose, Electrical, CX-10437/PPS-5: SM-D-601449; 80058	1–2 ①				24
6625-926-7885	7	Cable Assembly, Special Purpose, Electrical, CX-10438/PPS-5: SM-D-601450; 80058	1–2 ②				24
6625-926-7886	1	Cable Assembly, Special Purpose, Electrical, CX-10439/PPS-5: SM-D-601451; 80058	1-2 ①				24
6625-926–7875	1	Cable Assembly, Special Purpose, Electrical, CX-10440/PPS-5: SM-D-601452; 80058	1-2 ①				24
6625-926-7874	1	Cable Assembly, Special Purpose, Electrical, CX-10444/PPS-5: SM-D-601456; 80058	1-2 ①				24
6625-926-7890	1	Cable Assembly, Special Purpose, Electrical, CX-10445/PPS-5: SM-D-601457; 80058	1-2 ②				24
6625–937-0462	1	Cable Assembly, Special Purpose, Electrical, Branched, CX-10441/PPS-5: SM-D-601454; 80058	1-2 ②				24
6625-937–0461	1	Cable Assembly, Special Purpose, Electrical, Branched, CX-10442/PPS-5: SM-D-601455; 80058	1–2 ②				24
6625-937-0460	1	Cable Assembly, Special Purpose, Electrical, Branched, CX-10443/PPS-5: SM-D-601453; 80058	1-2 ④				24
5995-937-6081	1	Cable Assembly, Special Purpose, Electrical, Branched, CX-10485/PPS-5: SM-C-609950; 80058	1-2 ③			4	
6625-990-2863	1	Case, Test Facilities Kit, CY-6208/PPS-5: SM-D-600887; 80058	2-2	15½	21	14½	34
6625–926-7888	1	Lead, Electrical, CX-10446/PPS-5: SM-C-600899-1; 80058	1-2 ③			48	
6625-926-7918	1	Lead, Electrical, CX-10447/PPS-5: SM-C–600899-2; 80058	1-2 ③			48	
6625-926-7917	1	Lead, Electrical, CX-10448/PPS-5: SM-C-601727-1; 80058	1-2 ④			48	
6625-926-7873	1	Lead, Electrical, CX-10449/PPS-5: SM-C-600902; 80058	1-2 ④			9¾	
6625-926-7872	1	Lead, Electrical, CX-10450/PPS-5: SM-C-601726; 80058	1-2 ②			24	

FSN	QTY	Nomenclature, part No., and mfr code	Fig. No.	Dimensions (in.) Depth	Width	Height	Weight (lb)
6625-926-7871	1	Lead, Electrical, CX-10451/PPS-5: SM-C-601714; 80058	1-2 ③			14	
6625-926-7870	1	Lead, Electrical, CX-10452/PPS-5: SM-C-601727-2; 80058	1-2 ④			48	
6625-990-2868	1	Panel, Test, Electrical, SB-3004/PPS-5: SM-D-600888; 80063	1-1	6⅝	19	13¾	21
5120–079-4598	1	Tool, Insertion: M15513-20, SM-B-609917; 11139	1-2 ⑤				
5120-522-8601	1	Tool, Removal: M15515-20, SM-B-69918; 11139	1-2 ⑤				

NOTE

The part number is followed by the applicable 5-digit Federal supply code for manufacturers (FSCM) identified in SB708-42 and used to identify manufacturer, distributor, or Government agency, etc.

1-7. Description of Test Facilities Kit MK-980/PPS-5

Test Facilities Kit MK-980/PPS-5 (fig. l-l) consists of Test Facilities Kit Case CY-6208/PPS–5 containing Electrical Test Panel SB–3004/PPS–5 (test panel), an accessory kit, and a copy of this manual.

1-8. Test Facilities Kit Case CY-6208/PPS-5

a. Test Facilities Kit Case CY-6208/PPS-5 (fig. 1-1) is a two-piece fiberglass case. The case serves both as a storage and transport case and as a means of mounting Electrical Test Panel SB-3004/PPS-5 and storing the accessory kit.

b. The top half of the CY-6208/PPS–5 serves as a waterproof cover when it is secured to the bottom half by locking the eight latches. The gasket around the edge of the top half makes the joint watertight under 3 feet of water. The relief valve permits air to leave the CY-6208/PPS–5 when the pressure inside exceeds that outside (as may happen, for example, during air transport at high altitudes). A release button on the relief valve, when pressed, permits air to enter the CY-6208/PPS–5 if the inside air pressure is lower and makes it easier to open.

c. The hinges on the top half of the CY–6208/PPS-5 are separable from the hinge pins on the lower half, permitting the two halves to be separated for convenience in use. Corner protectors made of metal protect the corners of the CY-6208/PPS-5.

d. Within the top half of the case, a hinged retaining plate provides a compartment for the accessory kit and the technical manual. The retaining plate is secured by two quarter-turn fasteners located along the edge opposite the hinges.

e. A flyleaf is hinged to the top of the retaining plate. The normally exposed side of the fly-leaf contains brief operating instructions, a test jack color code, and a listing of the components of the MK–980/PPS–5. The reverse side of the flyleaf displays a schematic diagram of Electrical Test Panel SB–3004/PPS–5. Two snap fasteners on the free edge of the flyleaf secure it to the retaining plate.

1-9. Electrical Test Panel SB-3004/PPS-5

a. Electrical Test Panel SB–3004/PPS-5 is mounted in the bottom half of the CY–6208/PPS-5. The panel presents an array of test circuits for testing Radar Set AN/PPS-5.

b. The SB–3004/PPS-5 is sectionalized into 23 blocks, each containing all necessary input points, output points, terminations, controls, components, power sources, and switching provisions to enable a technician to conduct a specific test.

c. Each test jack is color-coded, in addition to its adjacent functional marking. The color coding employed is given in chapter 3, section

I, of this manual and on the flyleaf in the top half of the case.

d. Operating power is obtained from any 115-volt, root-mean-square (rms), 50- to 1,000-Hz source. Operational power may also be derived from a 6-volt dc source such as Battery Box CY-3871/PPS-5 or Power Supply PP-4450/PPS-5 (radar power supply).

1-10. Accessory Kit

a. The accessory kit (figs. 1-1 and 1-2) consists of 29 cable assemblies, the adapter connectors, and the pin removal and insertion tools, contained in a canvas pouch.

b. Selection of the appropriate cable assembly and adapter connector enables interconnection to be made between Electrical Test Panel SB–3004/PPS–5 and the element of the radar set under test (refer to chart below). Similarly, connections to any required external instrumentation can be established.

Type No.	*Reference* designation	*Name*	*Qty*	*Use*	*Test panel block No.*
CX-10429/PPS-5	W1	Special Purpose Electrical Cable Assembly.	1	If. amplifier ----------	300
CX-l0430/PPS-5	W2	Special Purpose Electrical Cable Assembly.	1	Afc amplifier ----------	800
CX-l0431/PPS-5	W3	Special Purpose Electrical Cable Assembly.	1	Tr assembly azimuth counter.	100
CX-10432/PPS-5	W4	Special Purpose Electrical Cable Assembly.	1	Modulator motor control --	600
CX-l0433/PPS-5	W5	Special Purpose Electrical Cable Assembly.	1	Relay control ----------	1200
CX-l0434/PPS-5	W6	Special Purpose Electrical Cable Assembly.	1	Azimuth drive assembly --	1000
CX-10436/PPS-5	W7	Special Purpose Electrical Cable Assembly.	1	Antenna drive unit -----	1000
CX-10436/PPS-5	W8	Special Purpose Electrical Cable Assembly.	1	Azimuth servoamplifier .---	2400

Type No.	Reference designation	Name	Qty	Use	Test panel block No.
CX-l0437/PPS-5	W9	Special Purpose Electrical Cable Assembly.	1	Rgf assembly _____	2700
CX-10438/PPS-5	W22	Special Purpose Electrical Cable Assembly.	1	Range amplifier _____	2900
CX-l0439/PPS-5	W10	Special Purpose Electrical Cable Assembly.	1	RCVR-XMTR power converter.	700
CX-l0440/PPS–5	W11	Special Purpose Electrical Cable Assembly.	1	Control indicator power converter.	2300
CX-l0441/PPS-5	W24	Special Purpose Branched Electrical Cable Assembly.	1	A-display assembly ---	2100
CX-10442/PPS-5	W27	Special Purpose Branched Electrical Cable Assembly.	1	B-display assembly ___	2200
CX-10443/PPS–5	W23	Special Purpose Branched Electrical Cable Assembly.	1	Cathode ray tubes ____	CRT TEST
CX-l0444/PPS-5	W25	Special Purpose Electrical Cable Assembly.	1	Boxcar and audio amplifier.	400
CX-l0445/PPS-5	W26	Special Purpose Electrical Cable Assembly.	1	Gate generator -------	500
CG-3353/U (2 ft)	W17, W18, W30, W31	Radio Frequency Cable Assembly.	4	General purpose coaxial.	
CG-3354/U (4 ft)	W12, W13	Radio Frequency Cable Assembly.	2	General purpose coaxial.	
CX-10446/PPS–5	W14	Electrical Lead _____	1	Pin-to-pin, red, general purpose.	
CX-l0447/PPS-5	W28	Electrical Lead ----------	1	Pin-to-pin, black, general purpose.	
CX-10448/PPS-5	W20	Electrical Lead ----------	1	Pin-to-banana plug, red, general purpose,	
CN-1175/PPS-5	AT1	Fixed Attenuator ----------	1	Adapts AN/PPS-5 to Radar Test Set AN/UPM-29.	
CG-3355/U	W21	Radio Frequency Cable Assembly.	1	Preamplifier test signal adapter (dummy crystal).	
CX-l0449/PPS-5	W15	Electrical Lead ----------	1	Modulator-to-modulator dummy load.	600
CX-l0450/PPS-5	W19	Electrical Lead ----------	1	Pin-to-jack, red, general purpose.	
CX-l0451/PPS-5	W16	Electrical Lead _____	1	Provides power to V102*	
CX-10452/PPS-5	W29	Electrical Lead ----------	1	Pin-to-banana plug, red, general purpose.	
CX-10485/PPS-5	W32, W33	Special Purpose Branched Electrical Cable Assembly.	2	Coax-to-pin ----------	
		Connector pin insertion tool ___	1	Connector repair -----	
		Connector pin removal tool ___		Connector repair _____	
UG-20lA/U	CP2, CP3	Adapter Connector _____	2	General purpose coaxial.	
UG-273/U	CP1	Adapter Connector ----------	1	General purpose coaxial.	

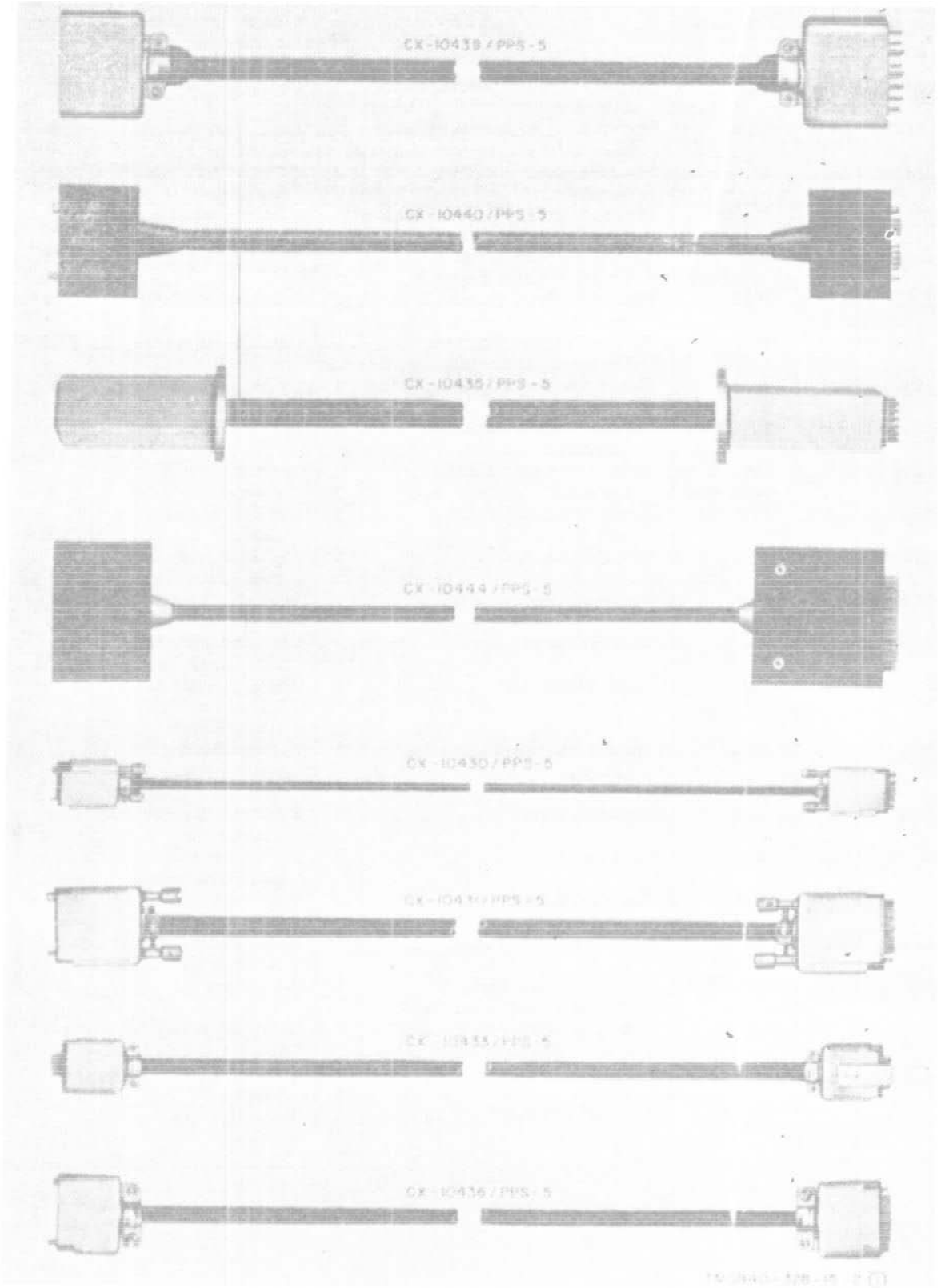


Figure 1-2 ①. Test Facilities Kit MK-980/PPS-5, accessories.

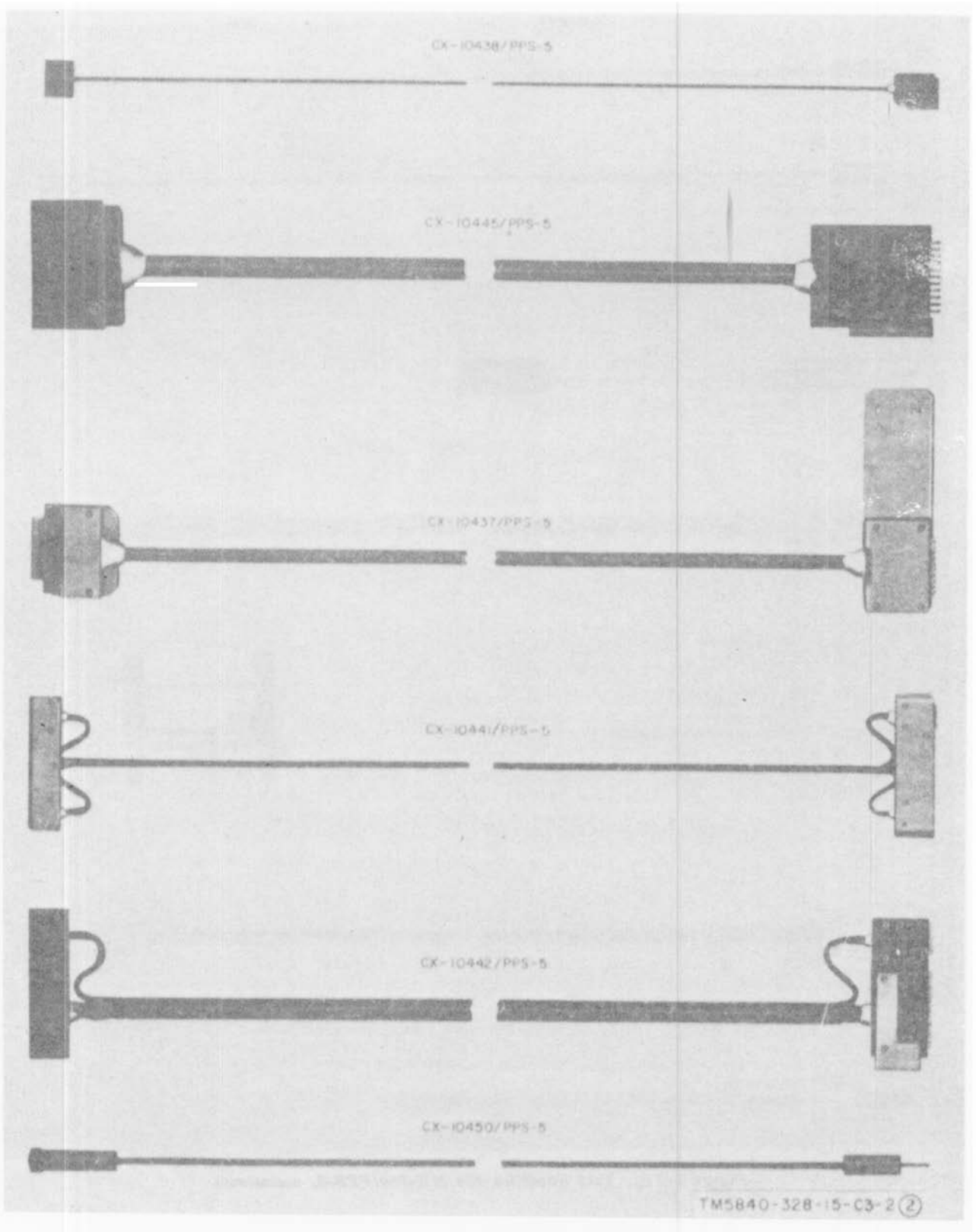


Figure 1-2 ② . Test Facilities Kit MK-980/PPS-5, accessories.

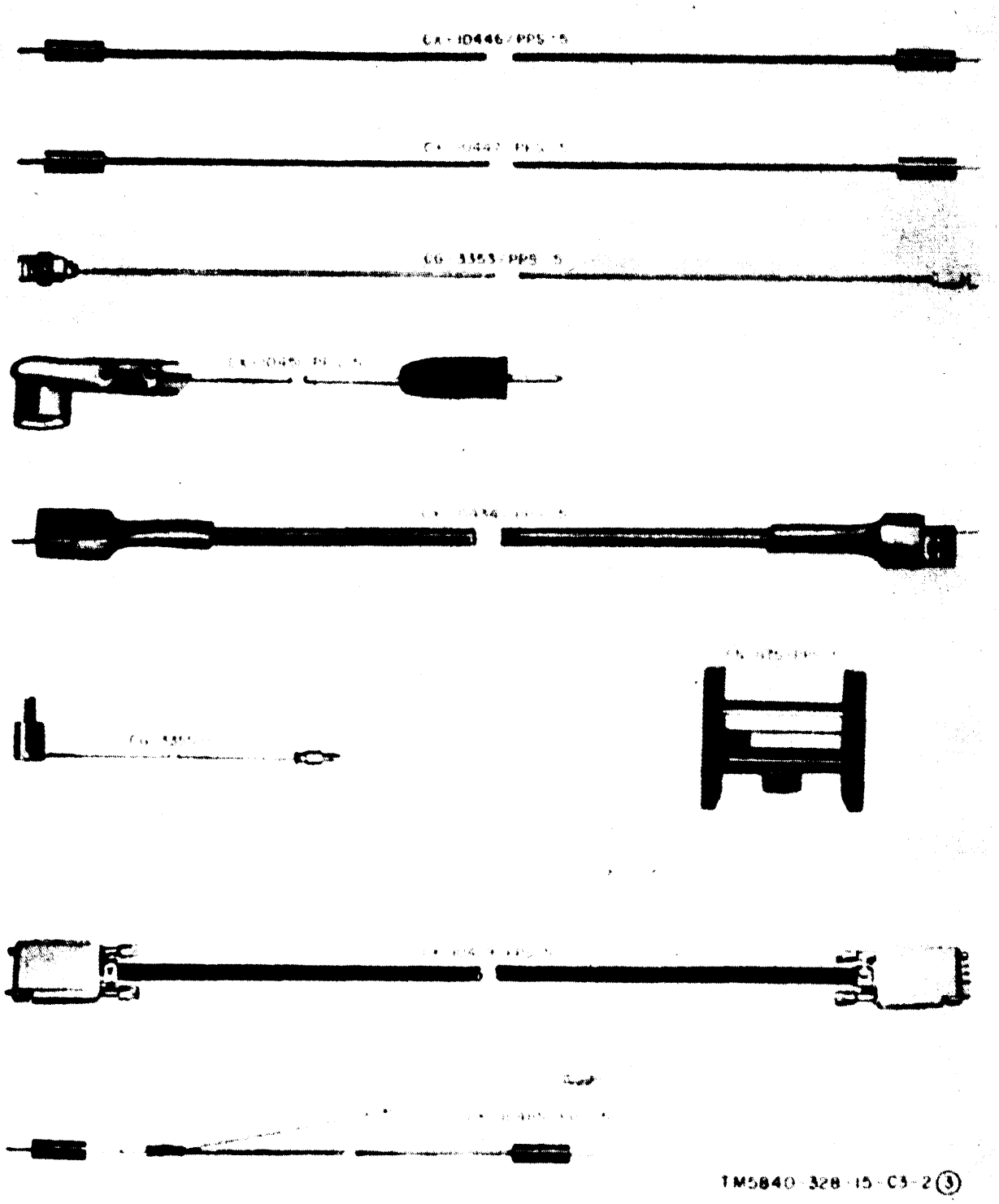


Figure 1-2 ③ . Test Facilities Kit MK-980/PPS-5, accessories.

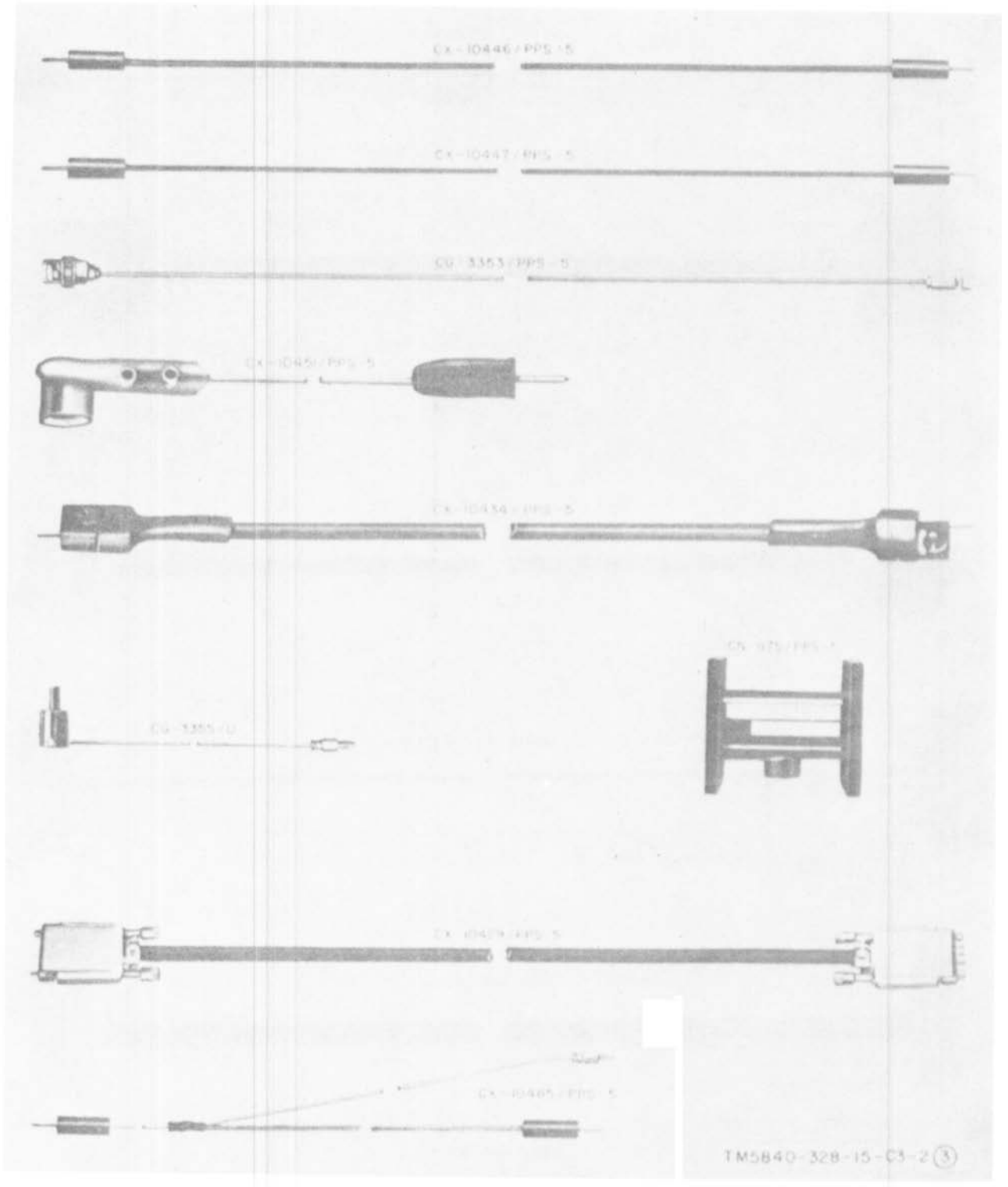


Figure 1-2 ③ . Test Facilities Kit MK-980/S-5, accessories.

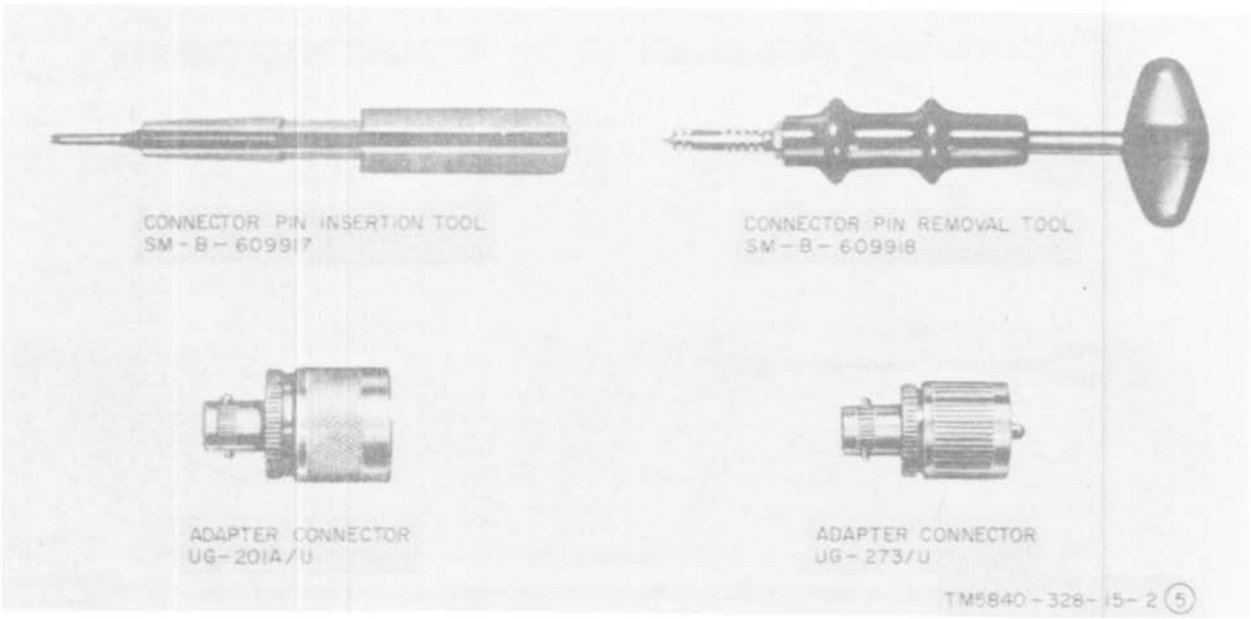


Figure 1-2 ⑤. Test Faclities Kit MK-980/PPS-5, accessories.

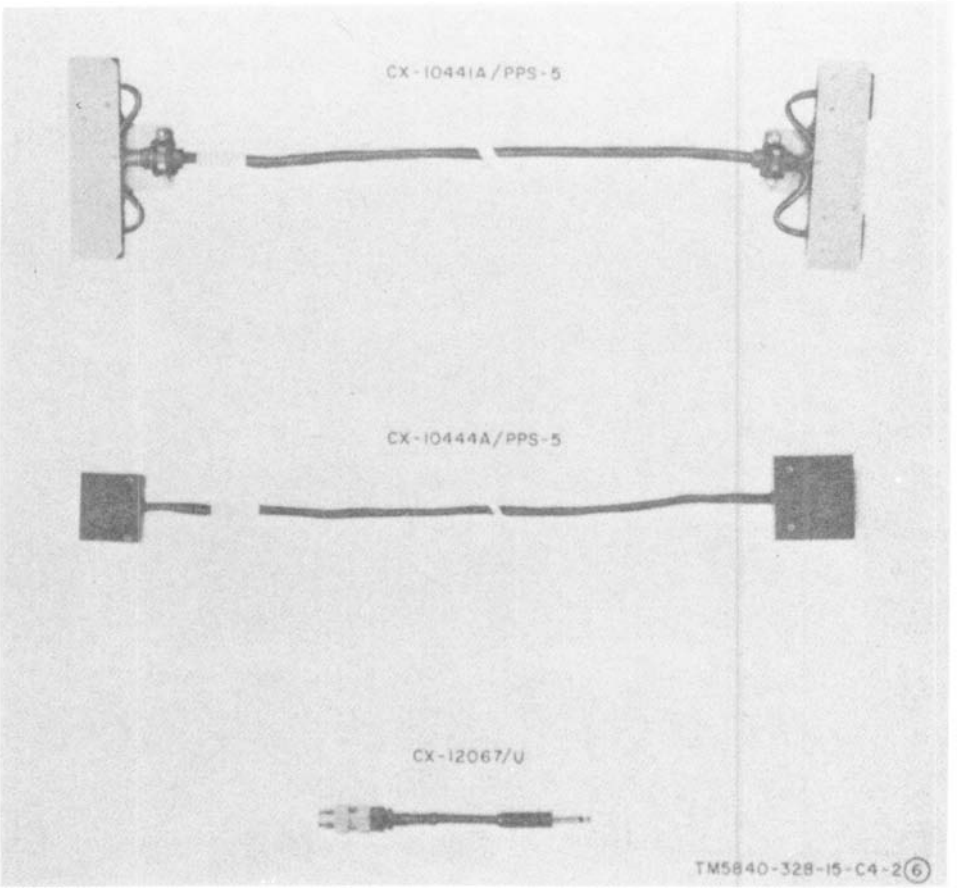


Figure 1-2 ⑥ Kit MK-980A/PPS-5, accessories.

1-11. Differences In Models

Test facilities Kit MK-980A/PPS-5 differs from Test Facilities Kit MK-980/PPS-5 as follows:

a. Special Purpose Electrical Cable Assembly CX-12067/U (fig.1-2 ⑥ . is added to the accessory kit to permit testing Electrical Headset H-2Sl/U (which has a 5-pin connector plug instead of a telephone plug). Cable CX-12067/U has a S-contact receptacle on one end and a telephone plug on the other, and it serves as an adapter cable for connecting headset H-251/U to the telephone jack on the test panel.

b. Special Purpose Branched Electrical Cable Assembly CX-10441A/PPS-5 (fig. l-2 ⑥) replaces cable assembly CX-10441/PPS-5. The two cables are functionally interchangeable, but the construction of cable CX-10441A/PPS-5 is an improvement over that of cable CX-10441/PPS-5.

c. Special Purpose Electrical Cable Assembly CX-10444A/PPS-5 (fig, 1-2 ⑥) replaces cable assembly CX-10444/PPS-5. The female connector of the replacement cable is made smaller to fit the block 400 boxcar and audio amplifier in receiver-transmitter RT-695/PPS-5A.

d. Electrical Test Panel SB-3004A/PPS-5 differs from SB-3004/PPS-5 as follows:

(1) The abbreviated names of AN/PPS-5 plug-in circuits have been added to the test block numbers on the panel (fig. 9-10.1) to facilitate identification.

(2) Four access holes have been added to the cover of component board E2 (fig. 7-7) to permit adjustment of potentiometers R46, R48, R50, and R51 without removing the cover.

(3) A plastic protective cover has been added to cover the back of CRT TEST switch S17 (fig. 7-2) for added safety of maintenance personnel.

(4) Component boards El and E2 (figs. 7-3 and 7-7) are conformal coated to protect the components from moisture and fungus.

(5) Test panel SB-3004A/PPS-5 is secured to case CY-6208/PPS-5 with 14 captive screws instead of 16 machine screws.

(6) The block 700 receiver-transmitter power converter has no 600-volt output (fig. 9-3).

e. Other miscellaneous differences exist between equipment of the same models or between models as a result of modifications or from production updates as follows:

(1) Block 700 receiver-transmitter power converters in some equipment include a 6 volt ac output.

(2) AC test points have been installed on the block 100 section of the front panel (fig. 9-10.2) of some equipment to provide 6-volt ac for testing the operation of the TR unit solid state local oscillator (SSLO) on AN/PPS-S, AN/PPS-5A or AN/PPS-5B so equipped.

CHAPTER 2

INSTALLATION

2-1. Unpacking

a. Packaging Data. When packed for shipment, Test Facilities Kit MK-980/PPS-5 is placed in a wooden box (fig. 2-1) that has been lined with waterproof paper and padded with filler material. The inside of the box is 25¼ inches long by 20½ inches wide by 19½ inches high. The box has a volume of 2.9 cubic feet and weighs 60 pounds.

b. Removing Contents of Packing Box. Open the wooden box, and remove Test Facilities Kit MK–980/PPS-5 as follows:

(1) Cut and fold back the metal straps.

Caution: **Do not attempt to pry open because the equipment may become damaged.**

(2) With a nailpuller, pull the nails out of the wooden cover of the box, and take off the cover.

(3) Open the waterproof paper wrapping.

(4) Remove the top and side filler pads.

(5) Lift out Test Facilities Kit MK-980/PPS-5.

(6) Salvage the box and filler pads for future reuse for shipment or lim d storage.

2-2. Opening Test Facilities Kit MK-980/PPS-5

a. Press and release the button on the relief valve (fig. 2-2).

b. Open the eight latches as follows: pull each spring-loaded latch tab out to its fully extended position, turn it one-half turn clockwise (CW), and then. release the tab. The latch hook will move down and away from the latch groove in the lower half as follos:

c. Remove the top half of the case from the bottom half as follows: raise the top half at the front as high as it will go on the hinges (at the back), then lower the top half until it almost rests on its feet. In this position, the hinges on the top half (fig. l–l) can be disengaged from the hinge pins on the bottom half.

d. Check to see that there is a flyleaf (fig. (1-1) containing printed operating instructions hinged to the retaining plate in the top half.

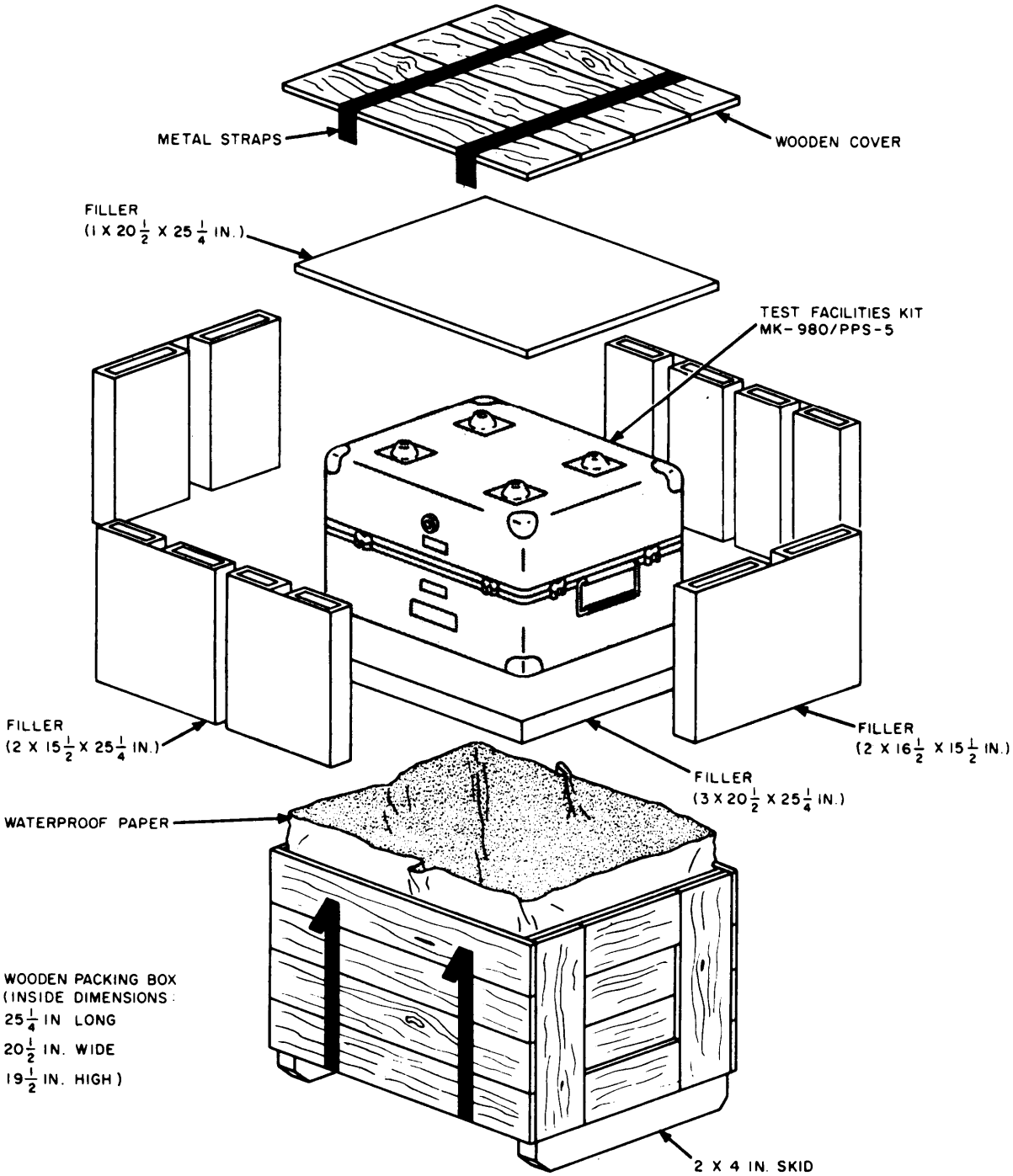
e. Open the accessory kit compartment as follows: release the two quarter-turn fasteners on the retaining plate by turning them one-quarter turn counterclockwise (CCW); then use the fasteners to lift the plate up and swing it back as far as will go.

f. Check to see that the accessory kit compartment contains an accessory kit pouch (fig. l-l) and a copy of TM 11-6625-1683-15.

g. Remove the pouch from the compartment, and close the compartment by lowering the retaining plate into place and securing it with the two quarter-turn fasteners. (To lock a fastener, press it down and turn it clockwise one-quarter turn.)

h. Remove the accessories (fig.1-2) from the accessory kit pouch.

Note. In removing the accessories from the pouch, observe how they are stowed so that they can be put back in the pouch as they were



TM5840-328-15-7

Figure 2-1. Packaging of Test Facilities Kit MK-980/PPS-5 and accessories.

2-3. Checking Unpacked Equipment

a. Inspect the equipment for damage incurred during shipment. Report any damaged on DD Form 6.

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

c. If the equipment has been used or reconditioned, check to 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 (fig. 2-2) near the nomenclature plate. If modified, see that any operational instruction changes resulting from the modification have been entered in the equipment manual.

NOTE

Current MWOs applicable to the equipment are listed in DA Pam 310-4,

d. If the equipment is to be shipped or stored after inspection, repackage it as instructed in chapter 9.

2-4. Connections

After Test Facilities Kit MK-980/PPS-5 has been opened (para 2-2a through c), stand the bottom half of its front side (fig. 2-2) so that Electrical Test Panel SB-3004/PPS-5 (test panel) is upright (fig. 9-l). The test panel can then be connected to 115 volts ac,

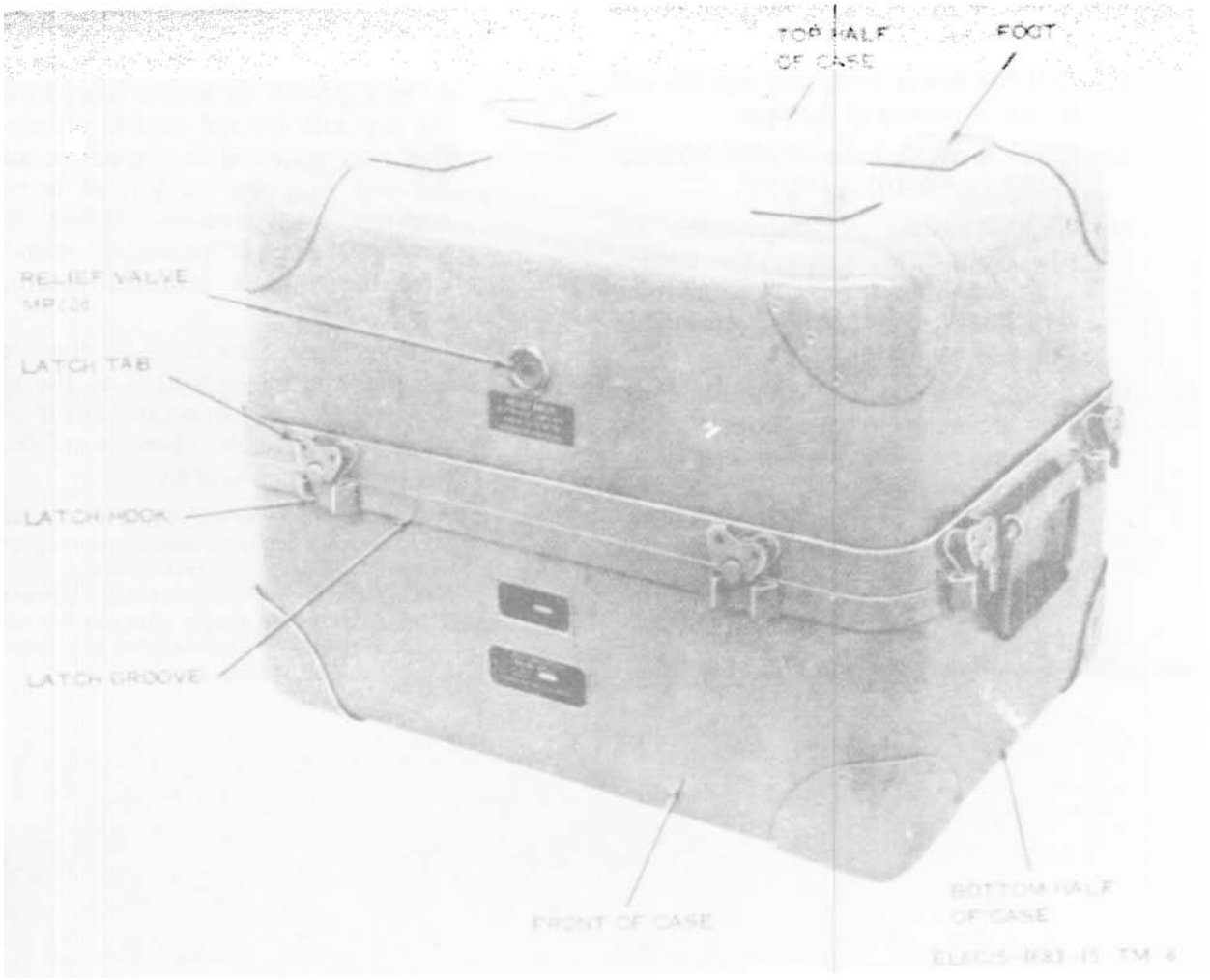


Figure 2-2. Test Facilities Kit MK-980/PPS-5, top half of case in place and latched.

to Battery Box CY–3871/PPS–5, or to Power Supply PP–4450,PPS–5 for operating power.

a. Connecting Electrical Test Panel SB–*3O04/PPS–5 to* 115 *Volts Ac.* Connect the test panel to 115 volts ac as follows:

(1) Take the 115 VAC power cord off its stowage hooks (fig. 9–1).

(2) Check to see that the INPUT POWER switch (fig, 9–10) is at OFF.

(3) Connect the power cord to a source of 115 volts ac.

*b. Connecting Electrical Test Panel SB-*3004/PPS-5 to *Battery Box CY–3871/ PPS–5.* Connect the test panel to Battery Box CY-3871/PPS-5 as follows:

(1) Take the 115 VAC power cord off its stowage hooks (fig. 9–1).

(2) Coil the power cord, and put the coil beside or in back of the case.

(3) Check to see that the INPUT POWER switch (fig. 9-10) is at OFF.

(4) At the bottom of Battery Box C--3871/PPS-5, disconnect the battery cable connector from the dummy plug by pulling on the lanyard attached to the cable connector.

(5) Unwrap the battery cable from the stowage hook on the bottom of the battery box, align the keyslot in the battery cable plug with the key on the 6 VDC jack on the SB-3004/ PPS-5, and then push the plug into the jack until they snap-lock together.

c. *Connecting Electrical Test Panel SB–3004/PPS-5 to Power Supply PP-4450/PPS-5.* Connect the test panel to Power Supply PP–4450/PPS–5 as follows:

(1) Take the 115 VAC power cord off its stowage hooks (fig. 9–1).

(2) Coil the power cord, and put the coil beside or in back of the case.

(3) Check to see that the INPUT POWER switch (fig. 9-10) is at OFF.

(4) Remove the protective cap from the plug on the radar power supply output cable by pulling on the lanyard attached to it.

(5) Align the keyslot in the output cable plug with the key on the 6 VDC jack on the SB–3004/PPS-4 test panel; then push the plug into the jack until they snap-lock together.

(6) Connect the external power cable of the radar power supply to either a 6- or a 24-volt dc source, connecting the clip with the red hood to the positive (+) terminal of the source and the clip with the black hood to the negative (–) terminal. (Clean the terminals first, if necessary, with a wire brush or a terminal cleaning tool.)

(7) If the source is 24 volts dc, check to see that the toggle switch on the radar power supply is set to 24V; if the source is 6 volts dc, check to see that the toggle switch is at 6V.

Note. The radar power supply and the test panel are both protected against overvoltage, undervoltage, and incorrect polarity; therefore, no damage will be done to the equipment if the radar power supply clips are not connected correctly or are connected to a source other than 6 or 24 volts dc.

CHAPTER 3

OPERATING INSTRUCTIONS

Section I. OPERATOR'S CONTROLS AND INDICATORS

3-1. General Information

The functions of some of the controls and indicators on the test panel are described by telling what they accomplish in the radar circuits being tested. The circuits being tested in the radar set are referred to by their block numbers.

3-2. INPUT POWER Block Controls and Indicators (fig. 9-10)

Control or indicator	Function
INPUT POWER switch	*Position* / *Action* OFF — Deenergized test panel. AC ON — Connects test panel to 115-vac input power. DC ON — Connects test panel to dc input power.
AC ON indicator light (red).	*Position* / *Action* ON — Indicates test panel is being energized by 11-vac power.
DC ON indicator light (clear)	ON — Indicates test panel is being energized by dc power.
115 VAC line cord	Connects test panel to 115-vac power.
6 VDC jack	Provides for connection of cable to Battery Box CY–3871/PPS–5 or to Power Supply PP-4450/PPS-5.

3-3. Block 300 (If. Amplifier Test) Controls and Indicators (fig. 9-10)

Control or indicator	Function
ON/OFF switch	*Position* / *Action* ON — Connects pin C of connector 300 to – 5 volts, pin H to +12 volts, and pin B to + 6 volts to energize block 300 if. amplifier circuits. OFF — Disconnects dc supply voltages from connector 300, and connects them to ground through resistive load equal to that of block 300 if. amplifier.
RCVR-XMTR VIDEO test jack (blue).	Provides connection for observation of target video output from block 300 if. amplifier to headphone and test meter target indication circuits in receiver-transmitter.
CONT-IND VIDEO test jack (blue)	Provides connection for 'observation of target video output from block 300 if, amplifier to video precessing circuits in control-indicator.
Connector 300 (seven-pin)	Provides connection for CX-10429/PPS-5.

3-4. Block 800 (Aft Amplifier Test) Controls and Indicators

(fig. 9-10)

Control or indicator	
	Position — *Action*
ON/OFF switch	ON — Connects pin F of connector 800 to –5 volts, pin H to +12 volts, pin E to +6 volts, and pin L to +110 v to energize block 800 automatic frequency control (aft) amplifier.
	OFF — Disconnect dc supply voltages from connector 300, and connects them to ground through resistive load equal to that of block 800 afc amplifier.
AFC test jack (blue)	Provides connection for observation of unfiltered output from block 800 afc amplifier to local oscillator (lo) in afc mixer circuits.
CONT-IND test jack (blue)	Provides connection to pin B to observe filtered output of block 800 afc amplifier to test meter on control-indicator.
RCVR-XMTR test jack (blue)	Provides connection to pin D to observe unfiltered output of block 800 afc amplifier to test meter on receiver-transmitter.
GAIN test jack (purple)	Provides connection for measurement of dc voltage output from AFC GAIN CONTROL potentiometer in block 800 afc amplifier to afc pre-amplifier (block 200).
Connector 800 (11-pin)	Provides connection for CX-11430/PPS-5.

3-5. Block 1200 (Relay Control Circuit Board Test) Controls and Indicators

(fig. 9-10)

Control or indicator	Function
	Position — *Action*
ON/OFF switch	ON — Connects – 5 v to pin H of connector 1200 to energize 60-second thermal time delay relay on block 1200 relay control board.
	Position — *Action*
DLY indicator light (clear)	ON — Indicates time delay lockout relay on block 1200 board has been energized by 60-second thermal time delay relay.
LV indicator light (clear)	ON — Indicates that low voltage cutout relay on block 1200 relay control board has been energized by low-voltage cutout (which indicates– 6-volt supply voltage is not too low and permits it to pass to radar circuits).
DRIVE indicator light (clear)	ON — Indicates drive control relay has been energized and its contacts have transferred.
FWD/REV indicator light (clear)	ON — Indicates presence of – 6 volts at pin J of connector 1200, which indicates that gate position relay on block 1200 relay board has been energized and has transferred its contacts to the position required during right-to-left sweep of radar antenna.
	Position — *Action*
FWD/REV switch	FWD — Connects pin L of connector 1200 to – 6 volts to energize gate position relay (a latching relay) on block 1200 relay board and transfer its contacts to position required during left-to-right sweep of radar antenna.
	REV — Connects pin K of connector 1200 to – 6 volts to energize gate position relay and transfer its contacts to position required during right-to left sweep of antenna.
DRIVE switch	ON (up) Connects pin E of connector 1200 to – 6 volts to energize drive control relay on block 1200 relay board.
LV control	When turned in direction of INCR arrow (from fully ccw position), provides increasing voltage up to – 6 volts to pin A of connector 1200 to test operation of low-voltage cutout circuit and relay on block 1200 relay board.

Control or indicator	Function
LV test jack (purple)	Provides connection to measure dc voltage applied to pin A of connector 1200 by LV control.
Connector 1200 (14-pin)	Provides connection for CX-10433/PPS-5.

3-6. Block 400 (Boxcar and Audio Amplifier Test) Controls and Indicators

(fig. 9-10)

Control or indicator	Function
	Position — *Action*
ON/OFF switch	ON — Connects pin 6 of connector 400 to –5 volts, pin 4 to +12 volts, and pin 8 to + 6 volts to energise block 400 boxcar and audio amplifier.
	OFF — Disconnects dc supply voltages from connector 400 and connects them to ground through resistive load equal to that of block 400 amplifier.
NAR/W switch	NAR — Connects pin 14 of connector 400 to – 6 volts to energize gate width selector relay in block 400 amplifier to transfer its contacts to position required for narrow (40-meter) range gate.
	W — Disconnects pin 14 of connector 400 from dc voltage, leaving contacts of gate width selector relay in block 400 in position required for wide (300-meter) range gate.
GAIN control	When turned in direction of INCR arrow (from fully ccw position), applies up to – 5 volts to pin 3 of connector 400 to increase gain of audio amplifier circuits in block 400, which increases strength of signal at phone jack in AUDIO test block on test panel.
SIG test jack (blue)	Provides connection to measure strength of target signal output from block 400 amplifier to test meter on receiver-transmitter.
VID test jack (green)	Provides connection for injecting teat video signal into block 400 amplifier at pin 11 of connector 400.
GATE test jack (green)	Provides connection for injecting test gate pulse at pin 10 of connector 400 to gate the outputs of block 400 amplifier (audio output to phone jack in AUDIO block on test panel and signal strength output at SIG jack on test panel).
AUDIO phone jack (in lower right corner of test panel).	Provides headphone connection for audio output of block 400 amplifier.
Connector 400 (17-pin)	Provides connection for CX-1044/PPS-5.

3-7. Block 600 (Modulator Test) Controls and Indicators

(fig. 9-10)

Control or indicator	Function
	Position — *Action*
ON/OFF switch	ON — Connects pin 8 of connector 600 to +300 volts, pin 14 to -5 volts, and pin 6 to +12 volts to energize block 600 modulator circuits.
	OFF — Disconnects dc supply voltages from connector 400, and connects them to ground through a resistive load equal to that of block 600 modulator.
MAG I test jacks (yellow)	Left jack: Provides connection to pin 10 *of* connector 600 for measuring current of signal sent to test meter on receiver-transmittal, which indicates magnetron firing-pulse current.

Control or indicator	Function
	Position *Action*
	Right jack Provides connection to pin 2 of connector 600 for measuring current of signal sent to test meter on control-indicator, which indicates magnetron firing-pulse current.
TRIG test jack (blue)	Provides connection to pin 9 of connector 600 to observe system trigger output from block 600 modulator.
LOAD jack	Provides connection for Electrical Lead CX-10449/PPS5 to connect magnetron trigger pulse output of block 600 modulator to ground (in test panel) through a resistive load equal to that of magnetron.
LOAD test jack (blue)	Provides connection to measure loaded, magnetron trigger pulse output of block 600 modulator.
Connecter 600 (15-pin)	Provides connection for CX-10432/PPS-5.

3-8. Block 100 (Tr Assembly Test) Controls and Indicators

(fig. 9-10)

Control or indicator	Function
	Position *Action*
ON/OFF switch	ON Connects pin J of connector 100 to + 100 volts, pin B to +6 colts, and pin C to -5 volts to energize block 100 tr assembly circuits.
	OFF Disconnects dc supply voltages from connector 100, and connects them to ground through a resistive load equal to that of block 100 tr assembly circuits.
RCVR GAIN control ..	When turned in direction of INCR arrow (from fully ccw position), applies up to +6 volts to pin E of connector 100, increasing gain of if. preamplifier (block 200-1); performs same function as RCVR GAIN control on receiver-transmitter or on control-indicator.
AFC GAIN control	When turned in direction of INCR arrow (from fully ccw position), applies up to –5 volts to pin D of connector 100, increasing gain of afc preamplifier (block 2002).
OSC CUR test jack (yellow)	Provides connection of pin K of connector 100 for either of the following:
	1. On equipment w/o AC test jacks installed, the signal output from 10 test meter on receiver-transmitter may be measured.
AC test jacks	2. On equipment with AC test jacks installed the 7 volt dc output of SSLO voltage regulato: may be measured. Where provided, connects to 6 volt ac output of block 700 receiver-transmitter power converter.
Connector 100 (14-pin)	Provides connection for CX-10431/PPS-5.

3-9. Block 2900 (Range Amplifier Test) Controls and indicators

(fig. 9-10)

Control or indicator	Function
	Position *Action*
ON/OFF switch	*ON* Connects pin 6 of connector 2900 to +35 volts, pin 4 to +12 volts, and pin 11 to – 12 v to energize block 2900 range amplifier.
	OFF Disconnects connector 2900 from dc supply voltages and connects the voltages to ground through a resistive load equal to that of block 2900 amplifier.
T'EST jack (blue)	Provides connection to pin 8 of connector 2900 for observation of trigger generated by delayed system trigger (delayed in accordance with the target range of interest).
Connector 2900 (11-pin)	Provides connection for CX-10438/PPS-5.

3-10. Block 2700 (Range Gated Filter Assembly Test) Controls and Indicators

(fig. 9-10)

Control or indicator	Function	
	Position	*Action*
ON/OFF switch	ON	Connects pin J of connector 2700 to –12 volts and pin K to +12 volts to energize block 2700 rgf circuits.
	OFF	Disconnects dc supply voltages from connector 2700 and connects voltages to ground through a resistive load equal to that of block 2700 rgf assembly.
VIDEO test jacks	Blue:	Provides connection to pin L of connector 2700 for observation of video output of block 2700 rgf assembly.
	Green:	Provides connection to pin E of connector 2700 to inject video test signal into block 2700 rgf assembly.
TRIG test jack (blue)	Provides connection to pin C of connector 2700 for observation of trigger output from rgf assembly (delayed 6.667 usec by delay line in rgf assembly).	
TRIG test jacks (blue, two on lower right side of test panel).	Provide connection to pin H of connector 2700 to observe trigger pulse injected by trigger amplifier Z3 to gate on rgf subassemblies in block 2700 rgf assembly.	
Connector 2700 (l0-pin)	Provides connection for CX-10437/PPS-5.	

3-11. Block 500 (Gate Generator Test) Controls and Indicators

(fig. 9-10)

Control or indicator	Function	
	Position	Action
ON/OFF switch	ON	Connects pin 8 of connector 600 to +12 volts and pin 9 to -6 volts to energize block 500 gate generator.
	OFF	Disconnects dc supply voltages from connector 600 and connects voltages to ground through a resistive load equal to that of block 500 gate generator.
GATE POSITION switch	On (up)	Connects – 6 volts to pin 7 of connector 500 to energize gate position relay, transferring its contacts to position required during right-to-left sweep of antenna and for narrow (40-meter) range gate operation.
	Off (down)	Disconnects – 6 volts from pin 7 of connector 600, permitting gate position relay contacts to stay in position required during left-to-right sweep of antenna.
BLANK switch	On (up)	Connects pin 1 of connector 600 to +6v, preventing block 600 gate generator from producing gate output (at pin 10 of connector 600) in response to trigger input at pin 8.
	Off (down	Removes + 6v from pin 1 of connector 500, llowing block 600 gate generator to produce gate output.
GATE test jack (blue)	Provides connection to pin 10 of connector 500 for observation of gate input of block 600 gate generation.	
Connector 600 (n-pin)	Provides connection for CX-10445/PPS-6.	

3-12. Block 700 (Receiver-Transmitter Power Converter Test) Indicators

(fig, 9-10)

Control or indicator	Function
-600 test.jack (purple)	Provides connection to pin 9 of connector 700 for measurement of -600-volt output of block 700 power converter. **See para 1-11d(4) (h))**
+880 test jack (red)	Provides connection to pin 8 of connector 700 for measurement of + 800-volt output of block 700 converter (+330 volt if transformer lead is connected to 14A).
+110 test jack (red)	Provides connection to pin 7 of connector 700 for measurement of +110-volt output of block 700 converter.
+12 test jack (red)	Provides connection to pine 6 and 12 of connector 700 for measurement of +12-volt output of block 700 converter.
+6 test jack (red)	Provides connection to pin 6 of connector 700 for measurement of +6-volt output of block 700 converter.
-5 test jack (purple)	Provides connection to pins 9 and 15 of connector 700 for measurement of regulated - 5-vo1t output of block 700 power converter.
-6 test jack (purple)	Provides connection to pins 10 and 19 of connector 700 for measurement of -6-volt input from INPUT POWER block circuits to block 700 power converter via RCVR-XMTR switch breaker.
GND test jack (black)	Provides connection pins 1, 13, and 14 of connector 700 for connection to ground of block 700 converter in measuring dc voltage outputs of the converter.
SYNC test jack (blue)	Provides connection to pin 16 of connector 700 for observation of timing pulse output from block 700 power converter to modulator (block 600) of radar set and for use as sync pulse for test equipment when testing radar set.
Connector 700 (20-pin beneath block 700 in well).	Provides connection for block 700 power converter (marked PWR, CONV.

3-13 CIRCUIT BREAKERS Block Controls

(Fig. 9-10)

Control or Indicator	Function	
	Position	
RCVR-XNTR switch breaker	ON	Connects-6-volt power to all teat circuits on test panel and to CONT-IND push breaker and to CONTROL push breaker; connects pin 20 (-6 volt return) of connector 700 to ground on test panel; protects block 700 power converter and all radar set components connected to test panel (except block 2800 azimuth counter assembly and block 900 motor control) from short circuits and from input voltage in excess of -6 volts.
	OFF (down)	Disconnects all test circuits on test panel from -6-volt power and disconnects block 700 power converter from test panel ground; indicates possible short circuit in radar set component being tested or in test panel circuits, or indicates input voltage exceeds -6 volts.
CONT-IND push breaker	Closed (pushbutton pressed down).	Connects block 2300 control-indicator power converter to -6-volt power (by RCVR-XMTR switch breaker) and protects block 2300 converter from short circuits and input voltage in excess of -6 volts.

Control or indicator	Function	
	Position	*Action*
CONTROL push breaker ----------	Open (pushbutton up).	Indicates possible short circuit in block 2300 converter or in radar set component being tested and deriving power from block 2800 converter.
	Closed (pushbutton pressed down).	Connects block 2800 connector and block 900 connector to – 6 volts (by RCVR-XMTR switch breaker) and protects block 2800 azimuth counter assembly and block 900 motor control circuits from short circuits and from input power voltages in excess of – 6 volts during test.
MAIN PWR push breaker ---------	Open (pushbutton up).	Indicates possible short circuit in block 2800 azimuth counter assembly or block 900 motor control circuits being tested or in test panel circuits, or indicates input voltage in excess of – 6 volts.
	Closed (pushbutton pressed down),	Connects one side of 115-volt power input to ac-to-dc converter in test panel INPUT POWER circuits and protects INPUT POWER circuits from input ac power in excess of 115 volts.
	Open (pushbutton Up).	Indicates possible short circuit in INPUT POWER 'circuits or input ac power in excess of 115 volts.

3-14. REMOTE CABLE Block (Remote Cable Test) Connectors

(fig. 9-l0)

Control or indicator	Function
Female connector ----------	Provides connection for male connector of remote cable and connects conductors of cable in series.
Male connector ----------	Provides connection for female connector of remote cable and connects conductors of cable in series.
TEST jack (white) ----------	Provides connection to pin r of male connector to check for voltage out of series-connected conductors of cable.

3-15. Block 2200 (B-Scope Display Circuits Test) Controls and Indicators

(fig. 9-10)

Control or indicator	Function	
	Position	*Action*
ON/OFF switch ----------	ON	Connects pin 11 of larger of block 2200 connectors to +12 volts, pin 10 to – 12 volts, and pin 6 to +35 volts to energize block 2200 B-display circuits.
	OFF	Disconnects dc supply voltages from larger of block 2200 connectors and connects them to a resistive load equal to that of block 2200 circuits.
NORM/MTI switch ----------	NORM	Connects – 6 volts to pin 11 of smaller of block 2200 connectors to energize mti/normal selector relay, transferring its contacts to position required for display of normal video.
	MTI	Disconnects – 6 volts from mti/normal selector relay in block 2200 circuits, allowing contacts to remain in position required for display of mti video.
MARK test jack (green) _____	Provides connection to pin – 3 of smaller of block 2200 connectors to inject range gate marker pulse into block 2200 circuits.	

Control or indicator	Function
	Position — *Action*
VID B test jack (green)	Provides connection to pin 10 of smaller of block 2200 connectors to inject video input into block 2200 circuits.
VID RGF test jack (blue)	Provides connection to pin 21 of larger of block 2200 connectors forobservation of video output from block 220 circuits to rgf circuits (block 2700) .
VID SEL test jack (blue)	Provides connection to pin 4 of larger of block 2200 connectors for observation of selected (mti or normal) video output of block 2200 circuits.
VID IN test jack (green)	Provides connection to pin 20 of larger of block 2200 connectors to inject test video into block 2200 circuits.
SWP test jacks (blue)	Left side: Provides connection to pin 7 of smaller of block 2200 connectors for observation of sweep voltage output from block 2200 circuits. Right side: Provides connection to pin 6 of smaller of block 2200 connectors for observation of sweep voltage output from block 2200 circuits.
BLANK test jack (blue)	Provides connection to pin 3 of larger of block 2200 connectors for observation of unblinking gate output from block 2200 circuits to cathode of B-scope.
ASTIG test jack (red)	Provide connection to pin 2 of smaller of block 2200 connectors for measurement of output voltage from astigmatism control in block 2200 circuits to B-scope.
B VID test jack (blue)	Provides connection of pin 8 of larger of block 2200 connectors for observation of video output from block 2200 circuits to B-scope.
MT1 teat jacks (green	Provide connections to pins 13, 14, 16, 17, and 18 of larger of block 2200 connectors to inject test mti video into block 2200 circuits.
2200 connectors (11-pin and 22-pin)	Provide connection for CX-10442/PPS-5.

3-16. Block 2100 (A-Scope Display Circuits Test) Controls and Indicators

(fig. 9-10)

Control or indicator	Function	
	Position	*Action*
ON/OFF switch	ON	Connects pins 4 and 6 of lower block 2100 connector to +12 volts, pin 2 to – 12 volts, and pin 9 of upper block 2100 connector to +35 volts to energize block 2100 A-scope display circuits.
	OFF	Disconnects dc supply voltages from block 2100 connectors and connects them to a resistive load equal to that of block 2100 circuits.
MARKER switch	On (up)	Connects pin 7 of lower block 2100 connector to – 6 volts to energize marker width selector relay, transferring its concontacts to position required for wide range gate operation.
GATE DELAY switch	On (up)	Connects pin 9 of lower block 2100 connector to --6 volta to energize delay relay (for range gate marker pulse delay), transferring its contacts to position required during right-to-left sweep of antenna.
	Off (down)	Disconnects pin 9 of lower block 2100 connector from – 6 volts, letting delay relay contacts remain in position required during left-to-right antenna sweep.
SAP LENGTH switch	On (up)	Connects pin 5 of upper block 2100 connector to --6 volts to energize three relays, the sweep selector, sweep length selector, and gate width selector, and to transfer their contacts to the position required during short sweep operation.

Control or indicator	Function
	Position — *Action* Off (down) — Disconnects pin 5 of upper block 2100 connector from –6 volts to deenergize sweep selector relay, sweep length selector relay, and gate width selector relay, allowing their contacts to remain in position required during long sweep operation.
VID test jack (green)	Provides connection to pin 1 of upper block 2100 connector for injection of video test signal into block 2100 A-scope display circuits.
VID test jack (blue)	Provides connection to pin 11 of lower block 2100 connector for observation of video output from block 2100 circuits to A-scope upper deflection plate.
TRIG test jack	Provides connection to pin 5 of lower block 2100 connector for observation of range trigger output from block 2100 circuit to range gate generator (block 500 in receiver-transmitter).
V CTR test jack (red)	Provides connection to pin 10 of upper block 2100 connector to measure voltage output from vertical centering control of block 2100 circuits.
SWP test jacks (blue)	Provide connections to pins 6 and 7 of upper block 2100 connector for observation of sweep voltage outputs from block 2100 circuits to A-scope horizontal deflection plates.
BLANK test jack (blue)	Provides connection to pin 3 of upper block 2100 connector for observation of unblinking gate output from block 2100 circuits to A-scope.
MARK test jack (blue)	Provides connection to pin 8 of lower block 2100 connector for observation of range gate marker pulse output from block 2100 circuits to B-scope.
2100 connectors (n-pin)	Provide connection for CX-10441/PPS-5.

3-17. Block 900 (Motor Control Circuit Test) Controls and Indicators

(fig. 9-10)

Control or indicator	Function	
	Position	*Action*
ON/OFF switch	ON	Connects pin 6 of block 900 connector to +6 volts, pin 7 to +12 volts, and pin 5 to –-- 5 volts to energize block 900 motor control circuits.
	OFF	Disconnects dc supply voltage from pins of block 900 connector, and connects them to a resistive load equal to that of block 900 circuits.
FWD/REV switch	FWD	Connects pin 1 of block 900 connector to ground, pin A of the 2-pin drive motor jack (under hinged cover marked 1000) to – 6 volts, and pin B of drive motor jack to ground.
	REV	Connects pin 1 of block 900 connector to – 6 volts, pin A of drive motor jack to ground, and pin B of drive motor jack to – 6 volts.
	OFF	Disconnects pin 1 of block 900 connector and both pin A and pin B of drive motor jack from dc voltage and from ground.
REV A/REV B switch	REV A	Connects pin 2 of block 900 connector to – 6 volts to energize automatic-scan direction relay (latching relay), transferring its contacts to position required for left-to-right sweep of antenna.
	REV B	Connects pin 3 of block 900 connector to – 6 volts to energize automatic-scan direction relay, transferring its contacts to position required for right-to-left sweep of antenna.
Connector 900 (15-pin)	Provides connection for CX–10432/PPS-5.	

Control or indicator	Function	
	Position	*Action*
TEST ON/OFF switch _____	ON	Connects output of TEST control potentiometer to pin Y of connector 1000 (beneath hinged cover on test panel marked AZ DRIVE) to apply up to – 6 volts to energize drive motor.
	OFF	Disconnects output of TEST control potentiometer from pin Y of connector 1000.
TEST control potentiometer --------	When turned cw from fully ccw position, applies up to – 6 volts to TEST switch.	

3-18. Block 1000 (Antenna Drive Unit Test) Connectors and Indicators

(fig. 9-10)

Control or Indicator	Function
SWP test jacks _____	Provide connections to pins K and H of block 1000 connector for measurement of dc output voltages from block 1000 scan drive unit to B-scope display circuits (to control azimuth position of B-scope trace).
Connector 1000 (32-pin, beneath hinged cover marked AZ DRIVE).	Provides connection for testing block 1000 scan drive unit circuits.
Connector (two-pin, beneath hinged cover marked AZ DRIVE).	Provides connection for testing drive motor B1OO1.

3–19. Block 2400 (Azimuth Servoamplifier Test) Controls and Indicators

(fig. 9-10)

Control or indicator	Function	
ON/OFF switch ----------	ON	Connects pin B of block 2400 connector to +12 volts and pin C to ---– 12 volts to energize block 2400 amplifier.
400 CPS test jacks (white and black, on lower right of test panel).	Provide connections to pins D, P, R, and S of block 2400 connector for observation of 400-Hz outputs from block 2400 amplifier to servomotor in block 2800 azimuth counter assembly.	
Connector 2400 (20-pin) _____	Provides connection for CX-10436/PPS-5.	

3-20. Block 2800 (Azimuth Counter Assembly Test) Connection

(fig. 9-10)

The only connection of block 2800 is 14-pin connector 2800 which provides connection for the CX-10436/PPS-5.

3-21. CRT TEST Block Controls and Indicators

(fig. 9-10)

Control or indicator	Function
CRT TEST switch ----------	When pressed down and held: connects pin 13 of larger CRT connector to +2 kv and pin 12, 14, 9, 7, 11, and 10 to –2 kv for testing A- or B-scope.
DEFL control potentiometer _____	Applies up to + 300 volts to pins E and F of smaller CRT connector for adjusting position of spot on A- or B-scope under test.
CRT test connectors ----------	Larger (15-pin) : provides connection for 15-pin plug on CX-10443/PPS-5. Smaller (seven-pin) : provides connection for seven-pin plug on CX-10443/PPS-5.

3-22. Block 2300 (Control-Indicator Power Converter Test) Indicators
(fig. 9-10)

Control or indicator	Function
+35 test jack (red)	Provides connection to pin E of block 2300 connector for measurement of + 35-volt output of block 2300 converter.
+12 test jack	Provides conection to pins H and D of block 2300 connector for measurement of + 12-volt output of block 2300 converter.
–12 test jack (purple)	Provides connection to pins F and C of block 2300 connector for measurement of — 12-volt output of block 2300 converter.
GND test jack (black)	Provides connection to pins A and K and to ground to provide ground reference for measuring output voltages of block 2300 converter.

Section II. OPERATION UNDER USUAL CONDITIONS

3–23. Starting procedure

a. Check to see that all 14 ON/OFF test switches are at OFF and that the RCVR-XMTR switch breaker is off (down).

b. If the test panel is connected to a 115-volt ac power source, press and release the MAIN PWR, CONTRO, and CONT-IND push breakers, set the RCVR-XMTR switch breaker to ON, and then set the INPUT POWER switch to AC ON; the red AC ON indicator light will light.

c. If the test panel is connected to a dc power source (Battery Box CY–3871/PPS–5 or Power Supply PP–4450/PPS–5), press and release the CONTROL and CONT-IND push breakers, set the RCVR-XMTR switch breaker to ON, and then set the INPUT POWER switch to DC ON; the clear DC ON indicator light will light.

3–24. Operating Procedures

Use the test panel and accessories of Test Facilities Kit MK–980/PPS–5 in accordance with the instructions in the technical manual covering the radar set.

3–25. Stopping Procedure

a. Set the INPUT POWER switch to OFF.

b. Set the RCVR-XMTR switch breaker to its off (down) position.

c. Check to see that all 14 ON/OFF switches are at OFF.

Section III. OPERATION UNDER UNUSUAL CONDITIONS

3-26. Operation Under Arctic Conditions

Test Facilities Kit MK–980/PPS–5 is not affected by exposure to arctic temperature conditions. However, the test panel must be protected against the formation of frost deposits which might prevent the use of switches and controls or obstruct contact openings in the connectors, thereby interfering with their proper mating to the interconnecting cables.

3-27. Operation Under Tropical Conditions

Protect the equipment from excessive condensation on the surface or interior components. Wipe away any moisture that could cause electrical leakage to develop between points where voltage differences exist.

3-28. Operation in Desert Climates

Protect the equipment against sand and dust. As often as necessary, use a vacuum cleaner and soft brush to remove all traces of sand or grit, especially in the connectors and test jacks.

CHAPTER 4

ORGANIZATIONAL MAINTENANCE

4-1. Scope of Maintenance

The duties assigned to organizational maintenance for Test Facilities Kit MK-980/PPS-5 are indicated in a through *h* below. Also noted are references to the paragraphs covering the specific maintenance function.

a. Daily preventive maintenance checks and services (para 4–5).

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

c. Monthly preventive maintenance checks and services (para 4–7).

d. Quarterly preventive maintenance checks and services (para 4–8).

e. Cleaning (para 4–9).

f. Touchup painting (para 4-10).

g. Troubleshooting (para (4-13).

h. Repair and adjustments (para 4–14).

4-2. Test Equipment Required

Multimeter ME-26B/U is required for organizational maintenance.

4-3. Preventive Maintenance

Preventive maintenance is the systematic care, servicing, and inspection of equipment to prevent the occurrence of trouble, to reduce downtime, and to assure that the equipment is serviceable.

a. Systematic Care. The procedures given in paragraphs 4-5 through 4-10 cover routine systematic care and cleaning essential to proper upkeep and operation of the equipment.

b. Preventive Maintenance Checks and Services. The preventive maintenance checks and services charts (paras 4–5 through 4–8) outline functions to be performed at specific intervals. These checks and services are to maintain Army electronic equipment in a combat serviceable condition; that is in good general (physical) and in good operating condition. To assist in maintaining combat serviceability, the charts indicate what to check, how to check, and what the normal conditions are. The *References* column lists the illustrations, paragraphs, or manuals that contain detailed repair or replacement procedures. If the defect cannot be remedied by performing the corrective actions indicated, higher category maintenance or repair is required. Records and reports of these checks and services must be made in accordance with the requirements set forth in TM 38–750.

4-4 Preventive Maintenance Checks and Services Periods

Preventive maintenance checks and services of the MK–980/PPS–5 are required daily, weekly, monthly, and quarterly.

a. Paragraph 4–5 specifies checks and services that must be accomplished daily and under the special conditions listed below:

(1) When the equipment is initially installed.

(2) When the equipment is reinstalled after removal for any reason.

(3) At least once each week if the equipment is maintained in standby condition.

b. Paragraphs 4–6, 4–7, and 4–8 specify additional checks and services that must be performed on a weekly, monthly, and quarterly basis, respectively.

4-5. Daily Preventive Maintenance Checks and Services Chart

sequence No.	Item to be inspected	Procedure	Reference
1	General inspection _____	Inspect external surfaces for dust, dirt, rust, and corrosion. Clean as required.	Para 4-9.
2	Damage inspection _____	Inspect exposed components for damage -------	Fig. 1-1.
3	Controls _____	During operation, check action of switches and potentiometers for smooth response without binding, backlash, or looseness. All knobs must be secure.	Fig. 9-10.
4	Preliminary operational ___	Set all ON/OFF switches to OFF. Press and release CIRCUIT BREAKERS. Set RCVR-XMTR switch breaker to ON. Plug INPUT POWER cable into a 115-volt ac power receptacle (if available). Connect Battery Box CY-3871/PPS-5 or Power Supply PP-4450/ PPS-5 to the 6 VDC connector on the INPUT POWER section.	Fig. 9-10.
5	INPUT POWER switch ---	Set to DC ON. Check to see that clear DC ON indicator light lights.	Fig. 9-10; paras 4-13 and 4-14.
6	INPUT POWER switch ---	Set to AC ON. Check to see that red AC ON indicator light lights.	Paras 4-13 and 4-14.

4-6.. Weekly Preventive Maintenance Check and Services Chart

Sequence No.	Item to be inspected	Procedure	Reference
1	Completeness _____	Check for completeness of equipment ----------	App B.
2	Accessories _____	Inspect cords and cables for cuts, kinks, breaks, crushing, fraying, and improper positioning. Replace, if necessary.	
3	External items ----------	Inspect external items such as mounting screws, latches, handles, and hinges for looseness, loss, or breakage. Tighten or replace as required.	
4	Metal surfaces _____	Inspect exposed metal surfaces for rust and corrosion. Clean and touchup paint as required.	Para 4-10.

4-7. Monthly Preventive Maintenance Checks and Services Chart

Sequence No.	Item to be inspected	Procedure	Reference
1	Cane and back of test panel----	Remove test panel, clean inside of CY-6208/ PPS-5 and back of test panel, and reinstall test panel.	Para 4-9 *e;* fig. 9-1.
2	Test panel ----------	*a.* Remove block 700 power converter from test panel, clean out the well, and reinstall power converter.	a. Para 4-14 *b;* fig. 4-1.
		b. Remove block 2300 power converter, clean out the well, and reinstall power converter.	b. Para 4-14 *c;* fig. 4-1.
3	Top half of case -----	Clean out accessory kit compartments with brush or vacuum cleaner.	Para 4-9; fig. 1-1.

Sequence No.	Item to be inspected	Procedure	Reference
4	Accessory kit pouch _____	Clean out accessory kit pouch with brush or vacuum cleaner.	Para 4-9; fig. 1-1.
5	Test cable _____	Clean connector contacts with brush or vacuum cleaner.	Para 4–9.

4-8. Quarterly Preventive Maintenance Checks and Services Chart

Sequence No.	Item to be inspected	Procedure	Reference
1	Components ----------	Tighten switches, terminal blocks, connectors, indicator lights, and test jacks.	Fig. 9-10.
2	Pluckout items ----------	Inspect seating of pluckout items _____	Fig. 4-1.
3	Electrical and mechanical items.	Check electrical items for evidence of overheating and mechanical items for wear and proper adjustment. Replace parts or adjust as required.	Figs. 7-1 and 9-1; para 4-9 and 4-14.
4	Case ----------	Inspect interior of case for dirt, moisture, corrosion, and rust. Clean and touchup paint as required.	Fig. 1-1; para 4-9 and 4-10.
5	Gasket ----------	Inspect cover gasket for damage. Check to see that it has resilience and proper fit. Replace, if necessary.	Fig. 1-1.
6	Interlock ----------	Check interlock switch for proper operation. Replace, if necessary.	Fig. 7–1.
7	Publications ----------	Check to see that all publications are complete, serviceable, and current.	DA Pam 310-4.
8	Modification work orders -----	Check DA Pam 310-4 to determine if new applicable MWO'S have been published. ALL URGENT MWO'S must be applied immediate y. All NORMAL MWO'S must be scheduled.	TM 38-750 and DA Pam 310-4.
9	Spare para ----------	Check all spare parts (operator and organizational) for general condition and method of storage. No overstock should be evident, and all shortages must be on valid requisitions	App B.

4-9. Cleaning

Examine both the exterior and interior surfaces of the MK-980/PPS-5, especially Electrical Test Panel S-3004/PPS-5. Surfaces should be clean and free from dust and other dirt, grease, and fungus.

a. Remove loose dirt with a clean, soft cloth or, where access is restricted, a shop vacuum cleaner with a soft, brush-type nozzle.

b. Remove dirt from plugs and jacks, using either a brush or vacuum cleaner.

Warning: **Prolonged breathing of cleaning compound is dangerous; make certain that adequate ventilation is provided. Cleaning compound is flammable; do not use near a flame. Avoid contact with the skin; wash off any that spills on your hands.**

c. Remove grease, fungus, or ground-in dirt with a cloth dampened (not wet) with cleaning compound (FSN 7930-395-9542).

d. Effective cleaning can be accomplished by using a soft, clean cloth dampened, not saturated, with a solution of mild soap and water.

Care must be taken to prevent the entry of moisture into connector contact openings or any other openings in the test panel.

e. To gain access for cleaning the interior of of the case, remove the 16 machine screws and washers (fig. 9–1) located along the edges of the test panel; then carefully lift the panel out of the case.

f. Remove the block 700 power converter from its well (fig. 4–1) in the test panel by loosening the two diagonally positioned corner screws on the face of the power converter unit. These are captive screws and are a part of the block 700 power converter. When the screws are disengaged from their mating nuts in the test panel, the power converter can be lifted out of its well. This separates the two sections of a multi-pin connector which interconnects the power converter and the test panel circuits. With the power converter extracted, its well can be cleaned. Vacuum cleaning is the preferred method.

g. To remove the block 2300 power converter from its well in the test panel (fig. 4–1), the four retaining screws located in the corners of the face plate of the power converter must be unscrewed. Gently lift out the power converter to the extent permitted by the short connecting cable. Manually separate the two sections of the cable connector to allow complete detachment of the power converter. The well must then be cleaned, preferably by a vacuum cleaner.

h. The indicator lamps (fig. 9–10) and their associated lenses are integral. To remove these lamp elements for inspection or replacement, grasp the knurled edge with the fingers and rotate them counterclockwise to unscrew the assembly.

4-10. Touchup Painting

a. Remove rust and corrosion from metal surfaces by lightly sanding them with fine sandpaper. Brush two thin coats of enamel on the bare metal to protect it from further corrosion. Refer to applicable cleaning and refinishing practices specified in TB SIG 364 and TM 9-213.

b. The fiberglass body of the case is color impregnated and requires no touchup for maintenance.

4-11. Lubrication

No lubrication is required.

4-12. General Troubleshooting Information

Troubleshooting this equipment is based upon the operational check contained in the daily preventive maintenance checks and services chart. To troubleshoot the equipment, perform all functions starting with item number 4 in the daily preventive maintenance checks and services chart (para 4–5). When an abnormal condition or result is observed, perform the checks and corrective measures indicated in the troubleshooting chart (para 4–13). If the corrective measures indicated do not result in correction of the trouble, higher category of maintenance is required.

4-13. Troubleshooting Chart

Item No.	Trouble symptom	Probable trouble	Checks and corrective measures
1	Clear DC ON indicator light does not light when operating from battery or power supply source.	*a.* Power supply or battery not delivering current to equipment. *b.* Indicator light defective ------- *c.* Interlock switch not activated --- *d.* Block 700 power converter de-- fective.	*a.*. Check battery condition or connections. *b.* Replace indicator light DS5002. c. Make certain test panel is firmly seated in case. d. Replace block 700 power converter.
2	Red AC ON indicator light does not light when operating from power line.	*a.* Power line not energized ----- *b.* Indicator light defective --------- *c.* Interlock switch not activated ---	*a.* Check power line fuses. b. Replace indicator light DS5001. c. Make certain test panel is firmly seated in case.

Item No.	Trouble symptom	Probable trouble	Checks and corrective measures
		d. Block 700 power converter defective.	*d*. Replace block 700 power converter.
3	No voltage output at any one or all block 700 test jacks.	Defective connector or defective block 700 power converter.	Replace block 700 power converter. If not effective, requires higher category maintenance.
4	No voltage output at any or all block 2300 test jacks.	Defective connector or defective component block 2300 power converter.	Replace block 2300 power converter. If not effective, requires higher category maintenance.
5	Indicator lamp in block 1200 does not light during relay control circuit board test.	Defective lamp ----------	Replace defective lamp: DLY (DS 5003), LV (DS5006), DRIVE (DS5004), FWD REV (DS5005).

4-14. Repairs and Adjustments

a. Replacement of Indicator Lights.

(1) Grasp the knurled ring around the base of the lens (fig. 4–1) with the fingers, and remove the combined lamp and lens by rotating it counterclockwise. Remove the combined lamp and lens.

(2) Replace the lamp and lens combination, screwing the unit in a clockwise direction until finger tight.

b. Replacement of Block 700 Power Converter.

(1) By turning them counterclockwise, unscrew the two captive retaining screws located, respectively, in the upper right and lower left corners of the power converter face panel (fig. 4–1). This will also disengage the internal connector assembly.

(2) Gently lift out the power converter.

(3) Carefully set the replacement power converter into the test panel, positioning it to permit engagement of the retaining screws.

(4) Rotate the screws in a clockwise direction, alternately taking up a few turns on one and then the other. Tighten until snug, but do not force.

c. Replacement of Block 2300 Power Converter.

(1) Unscrew the four retaining screws by turning them counterclockwise. Each one is located in a corner of the power converter face panel (fig. 4–1). Remove the screws.

(2) Gently lift out the power converter.

(3) Manually separate the two sections of the connector in back of the power converter. This completes detachment.

(4) Manually interconnect the replacement power converter connector with the mating plug.

(5) Set the power converter into the test panel with all mounting holes in proper alignment.

(6) Reinsert the retaining screws, and tighten in a clockwise direction. Do not force.

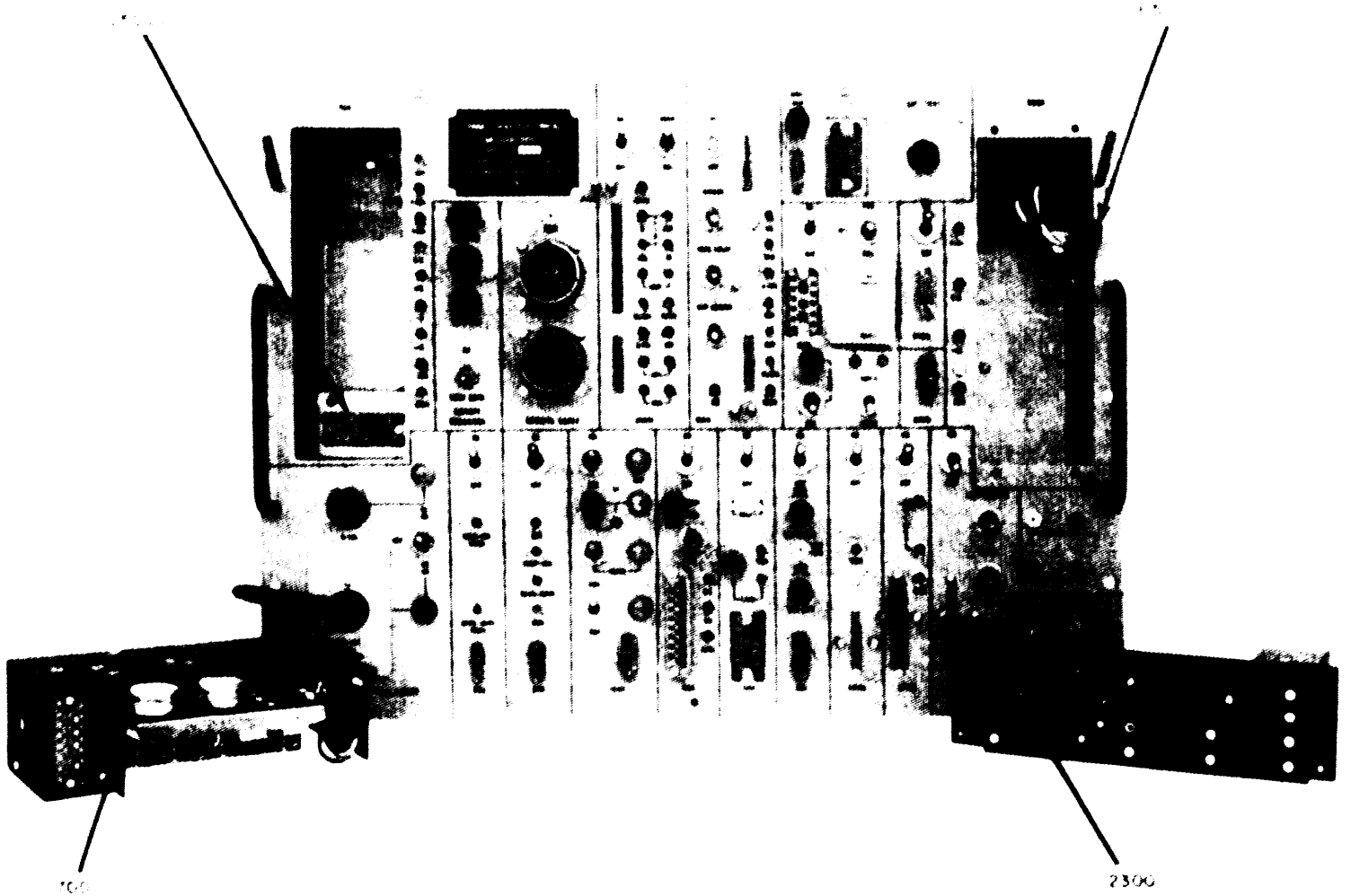


Figure 4-1. Electrical Test Panel SB-3004/PPS-5, power converters removed.

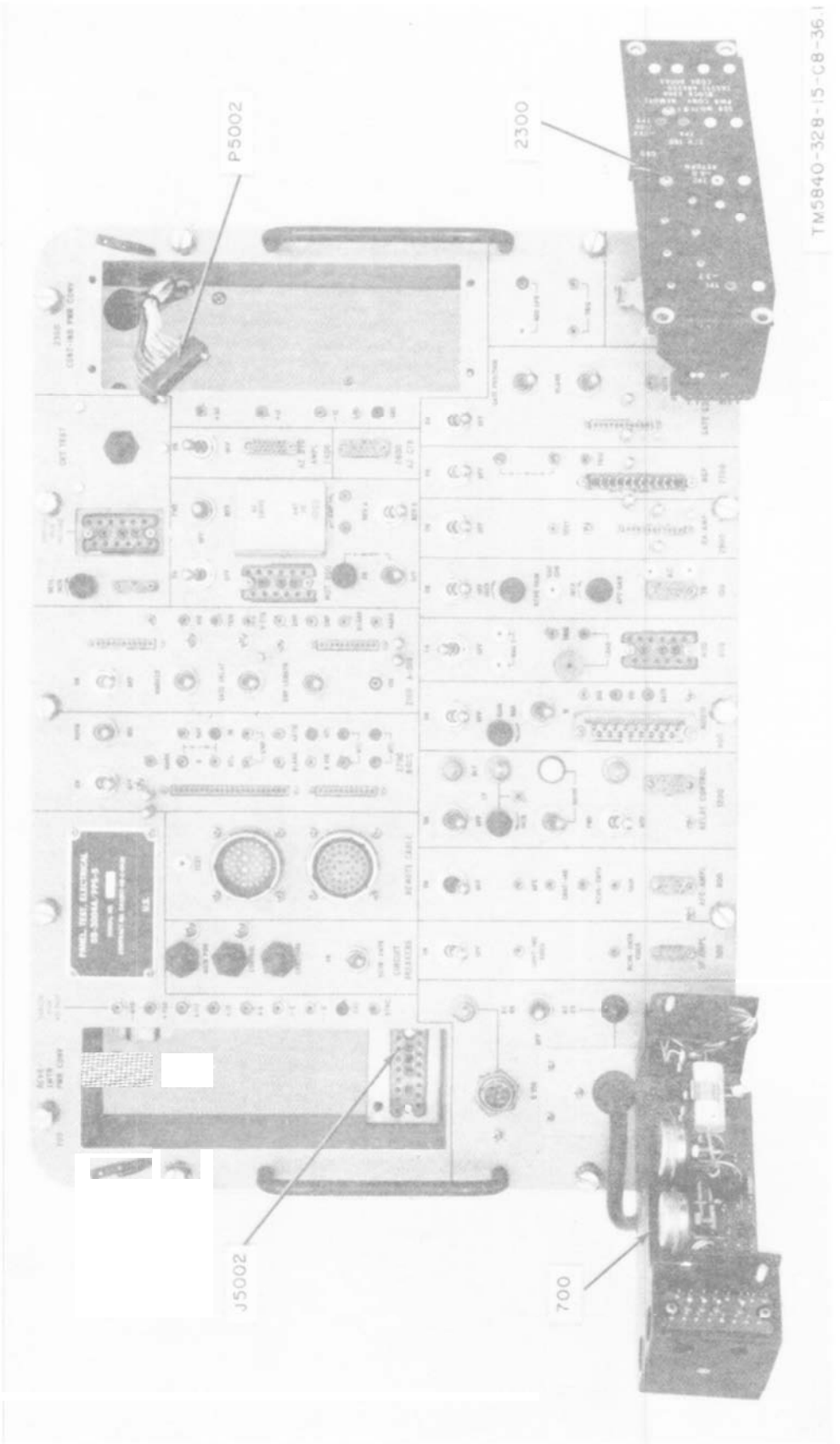


Figure .4-1.1. Electrical Test Panel SB-3004A/PPS-5, power converters removed

CHAPTER 5

FUNCTIONING

5-1. General

Test Panel SB-3004/PPS–5 consists of 23 individual and independent circuits (fig. 9-11 ①) a compact and integrated assembly for testing the radar set or its components. It contains power converter units, identical with those in the radar set, thereby providing convenient sources of the voltages required for energizing removed components of the radar set. Test jacks provide access to circuit test points; connectors and test cables provide coupling to the radar set components undergoing test.

5-2. INPUT POWER Circuit

The input power required to energize the equipment may be either 6 volts dc at 9 amperes (obtainable from Battery Box CY-3871/PPS-5 or Power Supply PP-4450/PPS-5) or 115 volts ac, 50 to 1,000 Hz, at 0.9 ampere.

5-3. 6 VDC INPUT POWER

(fig. 9-11 ①)

Power enters through connector J1, pins 2 and 7 carrying –6 volts; pins 3, 4, and 5 connect the positive side to ground. The negative side (–6 volts) feeds through interlock switch S28–A to INPUT POWER switch S1-C. The INPUT POWER switch controls power mode selection and, in the DC ON position, supplies operation voltage to the various circuits requiring this potential. Overload protection in this circuit is provided by RCVR-XMTR switch breaker CB4. Pins 1 and 6 supply synchronizing signals (4,000 Hz, 8 volts) from block 700 to Power Supply PP-4450/PPS-5.

5-4. 115 VAC INPUT POWER

(fig. 9-11 ①)

a. One side of the power line entering through the power cable and pin 1 of terminal board TB1 is fed through interlock switch S28-B into INPUT POWER switch S1-A. With the INPUT POWER switch at AC ON, connection is established to MAIN POWER push breaker CB1. This push breaker provides overload protection. In the closed circuit condition, push breaker CB1 completes the circuit of one leg of the 115 VAC input power line leading to an internal power converter.

b. The other leg of the 115 VAC power input cable connects to the internal power converter through pin 2 of terminal board TB1 and INPUT POWER switch S1–B. Each leg of the 115-volt ac power circuit enters the power converter through radio frequency (rf) filters, designated FL1 and FL2, respectively. These filters contained within the power converter shield, serve to prevent emission of rf interference signals that might be generated by the converter circuit. Each filter consists of a pi-network offering a high order of attenuation to frequencies above 1 kHz.

c. After passing through the rf filters, the ac input is applied to a bridge rectifier consisting of four 1N3190 diodes (CRI, CR2, CR3, and CR4). The negative side of the dc output from the rectifier is floating. The positive side of the dc output passes into a choke input filter circuit containing inductor L1 and six capacitors, Cl through C6, connected in parallel. This represents a total capacitance of 216 microfarads (uf). The voltage at the output of the

filter circuit approximates 100 volts dc and activates the inverter section of the power converter.

d. The function of the inverter is to translate the 100-volt dc supply into a square-wave]ow-voltage ac. The components of the inverter circuit are: resistors R77, R78, and R79; saturable transformer T1; and transistors Q1 and Q2, both of which are type DTS-431.

e. The + 100 volts applied to transformer T1 is connected to the center tap of the primary (terminal 2). The collector of transistor Q1 is connected to primary terminal 3, while the collector of transistor Q2 is connected to primary terminal 1.

f. Two feedback windings are incorporated as part of transformer T1. Terminal 6 of one winding is connected to the base of Q1 through resistor R78, while terminal 7 at the other end of this feedback winding is connected to the emitter of Ql, which is held at the negative potential of the inverter circuit. Terminal 5 of the other feedback winding is connected to the base of Q2 through resistor R79. Terminal 4 of this winding is brought to the emitter of Q2 which, in the same manner as the emitter of Ql, is maintained at the negative potential.

g. Resistors R78 and R79 limit the current flow in the base circuits of Q1 and Q2. Without these current-limiting resistors, excessive current flow could develop with a consequent destructive effect on the transistors

h. The feedback windings are phased with relation to the primary winding so that positive, or in-phase, feedback will occur. This implies that a positive impulse appearing at the Q1 collector will be reflected by a positive impulse at the base of this transistor. Similarly, the same relative polarization will occur in transistor Q2. This phase relationship is governed by the direction of the windings.

i. In a quiescent state, the collectors of Q1 and Q2 could be equipotential in terms of applied dc. This would inhibit essential oscillatory action. To avoid this state and to insure a flip-flop switching effect, resistor R77 is connected from the +100-volt supply to the base of Q1. This places a slight positive bias on the base of Q1 in contrast to the zero bias on the base of Q2. Under these conditions, Q1 is in a conductive state while Q2 is nonconductive.

j. With the application of voltage to the circuit, current flow through Q1 takes place. The impedance of the associated half of the primary winding under current carrying conditions develops a voltage drop, making the collector end of the winding negative with respect to the center tap. This induces a negative signal into the base end of the feedback winding, reducing the biasing potential on the base to the cutoff point.

k. Simultaneously, the opposite end of the primary winding feeding the collector of Q2 assumes a positive character, inducing a positive signal into the base of Q2. This cause Q2 to become conductive. As the voltage drop through its half of the primary winding becomes effective, cutoff takes place and the switching cycle repeats. This cyclic change occurs at a rate of approximately 1 kHz and is basically governed by the parameters of transformer T1.

l. A secondary winding coupled to the primary is proportioned to provide an unloaded voltage output of approximately 8 volts ac on each side of the center tap. To assist in maintaining frequency, the secondary is tuned with capacitor C9. This capacitor aids in removing transient spikes that tend to appear in the output waveshape (fig. 5–1).

m. The square-wave ac secondary output is rectified by a pair of 1N1199 diodes, CR5 and CR6 (fig. 9–1l ①) in a full-wave configuration. The dc resultant is fed to a capacitive input filter consisting of input capacitor C10, series inductor L2, and output capacitors C11 and C12. The –6 volt dc filtered output is passed through rf filter FL3 within the converter shield. This serves as a safeguard against external radiation of rf signal components generated within the converter.

n. The positive side of the dc output is grounded. The -6-volt dc output is brought to INPUT POWER switch S1-C for distribution to the various circuits requiring this potential.

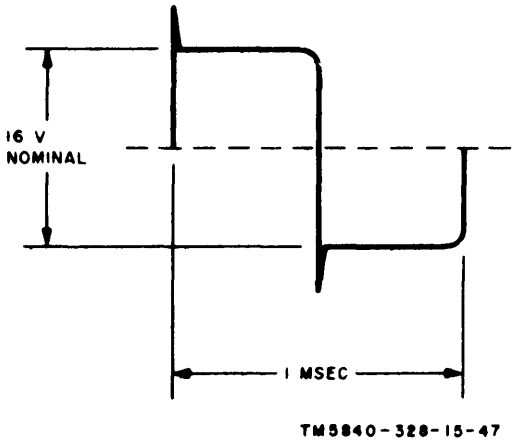


Figure 5-1. Waveshape of ouput at secondary terminals 8 and 10 of transformer T1.

5-5. CIRCUIT BREAKERS
(fig. 9-11①)

Four magnetically actuated circuit breakers are employed to guard against overload damage to the equipment.

a. MAIN PWR push breaker CB1, rated at 1.5 amperes, is in one side of the 115 VAC power input circuit. Any current demand exceeding this rating will cause the magnetic actuator to trip the switch, opening the power line circuit. The circuit breaker is closed by pressing and releasing the panel button.

b. CONTROL push breaker CB2, rated at 3 amperes, is in the –6-volt supply to block 2800, block 900, block 1000, and the drive motor test circuits. Current in excess of the circuit breaker rating will cause the breaker to trip, thereby opening the -6-volt dc supply circuit. The circuit breaker is closed by pressing and releasing the panel button.

c. CONT-IND push breaker CB3, rated at 3 amperes, is in the -6-volt supply to the control-indicator power converter (block 2300). A rise in current beyond its 3-ampere rating will cause the circuit breaker to trip and open the circuit. The circuit breaker is closed by pressing and releasing the panel button.

d. RCVR-XMTR switch breaker CB4, rated at 12 amperes, is a two-pole device. One pole, bridging terminals 3 and 4, is in the main -6-volt supply line, when the equipment is in the 6 VDC operating mode. Any current demand in excess of 12 amperes will activate the circuit breaker, thereby opening the entire -6-volt circuit. The second pole, bridging terminals 1 and 2, is in the ground return circuit of the receiver-transmitter power converter (block 700). Any excessive current demand by the converter unit will cause the 6-volt supply circuit to open. Both poles of the circuit breaker are closed simultaneously by setting it to ON.

5-6. REMOTE CABLE Test Circuit
(fig. 9-11①)

a. The REMOTE CABLE test circuit tests the remote cable (Special Purpose Electrical Cable Assembly CX-20004/PPS-5 in the AN/PPS-5) of the rader set by connecting the conductors of the cable in series and measuring the voltage output at one end of the series-connected conductors while applying -6 volts at the other end. A conductor that is broken (open) will cause a 0-volt reading; conductors shorted to each other will cause a voltage reading higher than -2.0 ±0.5 volts; and a high resistance in a conductor will cause a voltage reading lower than –2.0 ±0.5 volts.

b. At pin W of connector J18, -6 volts is applied, and, at pin r of connector J19, TEST jack TP26 provides a means of measuring the voltage output. Resistor R63 provides a shunt resistance load from TEST jack TP26 to ground.

5-7. TRIG Output Circuit
(fig. 9-11①)

a. TRIG output test jack TP50 and TP51 derive a test trigger pulse from networks Zl, 22, and 23. The modulator trigger pulse (fig. 5-2) produced by the block 700 receiver-transmitter power converter is shaped by network Z1 into a waveform with a steep leading

edge. This pulse is used to control Z2, which is a one-shot multivibrator that provides a **2**-microsecond (usec) pulse.

b. The 2-usec pulse is fed to driver amplifier 23 (fig. 9-11①), which permits effective coupling of the pulse into a low-impedance circuit such as the block 500 gate generator. The triggering pulse also appears at connector pins J8–3, J20-3, J22–2, and J24-H.

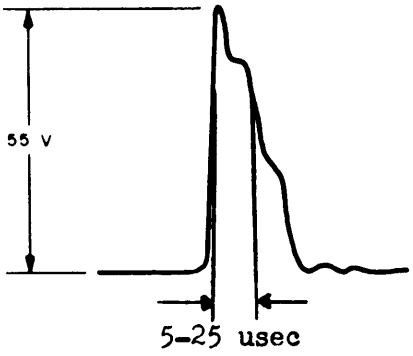


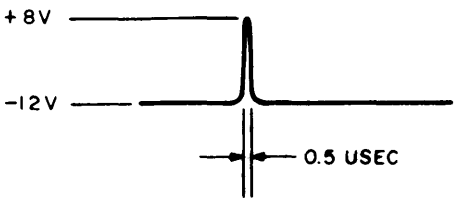
Figure 5–2. SYNC pulse waveshape.

5-8. Triggering Circuit

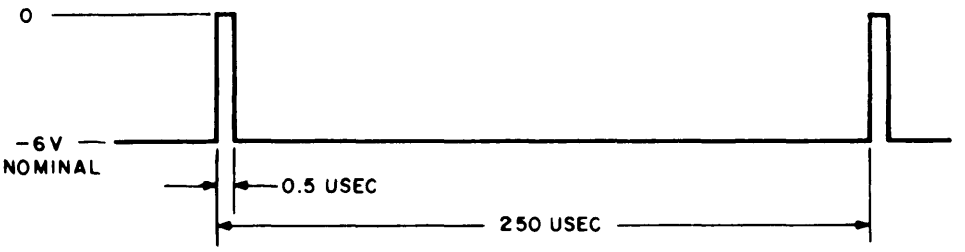
a. Squaring Amplifier Z1. The function of squaring amplifier Z1 (fig. 5–4) is to translate the asymmetric synchronized (sync) pulses developed by the receiver-transmitter power converter (block 700) into well defined, sharply rising pulses with uniform amplitude and a rectangular-shaped waveform. To accomplish this, a modified Schmitt trigger circuit is employed. In operation, no output signal occurs until a positive-going pulse is applied to the input. When the input signal exceeds a predetermined threshold level (–2.5 volts dc), input transistor Q1 switches abruptly from the conductive to the nonconductive state. With the voltage at the collector of Q1 at the nonconductive level, the bias on the base of output transistor Q2 is shifted in the negative direction, causing Q2 to become conductive. As a result, the normally negative polarization of the collector shifts to a zero potential. This condition prevails until the actuating pulse from the power converter reverses its direction and reaches the threshold value of –2.5 volts dc, when the circuit is restored to its original state. This cycle of operation occurs repetitively every 250 usec (B, fig. 5-3) ,

b. One-Shot Multivibrator Z2. The function of one-shot multivibrator Z2 (fig, 5–5) is to maintain the rectangular waveform created by squaring amplifier Z1 for a specific duration. Since the waveform width developed in the squaring amplifier is governed by the time (approximately 0.5 usec) required by the sync pulse to rise through and then fall back through the threshold level of **–2.5** volts dc, the one-shot multivibrator serves to extend the wave duration to approximately **2** usec. Operationally, the positive-going leading edge of the output signal produced by squaring amplifier Z1 is coupled to the base of input transistor Ql, which is normally biased into a conductive state, The impressed signal alters this state, and Q1 is driven into nonconduction. This permits the base of transistor Q2 to become more negative, and, consequently, Q2 swings into conduction. However, during the period of nonconduction, capacitor **C2** acquires a charge that holds the circuits in its activated cycle, even after the decay of the actuating signal. This condition is sustained until capacitor C2 is discharged, at which time the circuits are restored to their quiescent state. The component values are selected to provide a time constant of approximately 2 usec (C, fig. 5-3) .

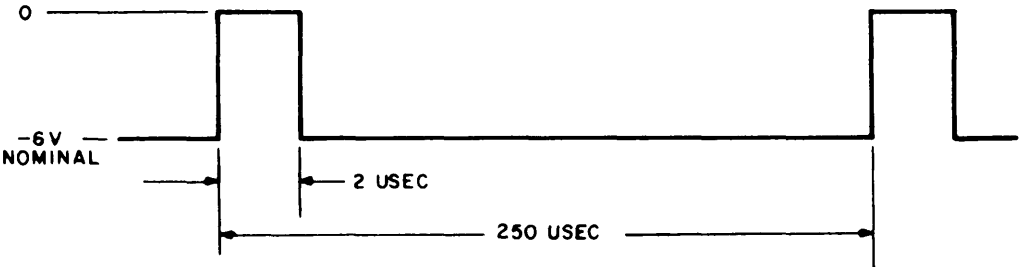
c. Driver Amplifier Z3. To provide a triggering signal to external circuits without introducing variable loading conditions on the one-shot multivibrator, with consequent deviations in operating characteristics, it is essential that a decoupling system be employed. Driver amplifier 23 (fig. 5–6) serves this purpose. It consists of a twin, two-stage amplifier with inputs and outputs, each connected together to provide paralleled circuits. The frequency response characteristic permits operation from 0 to 50 kHz, which enables the



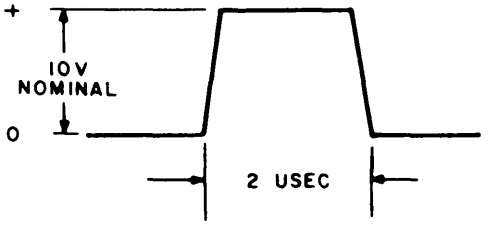
A. INPUT PULSE AT PIN 4 0F SQUARING AMPLIFIER 21



B. OUTPUT AT PIN 8 OF SQUARING AMPLIFIER 22
INPUT AT PIN 4 OF ONE-SHOT MULTIVIBRATOR 22



C. OUTPUT AT PIN 7 OF ONE -SHOT MULTIVIBRATOR 22
INPUT AT PIN 2 OF DRIVER AMPLIFIER 23



D. TRIG OUTPUT PULSE AT TRIG TEST JACKS TP50 AND TP51

TM5840-328-15-49

Figure 5-3. Waveforms in trigger shaping circuits.

system to adequately pass the rectangular wave coupled into it from the one-shot multivibrator. Direct coupling is employed between Q1 and Q3 in the one amplifier series and, likewise, between Q2 and Q4 in the other amplifier series to insure the necessary low frequency response. The appearance of the output waveshape is indicated in D, figure 5-3.

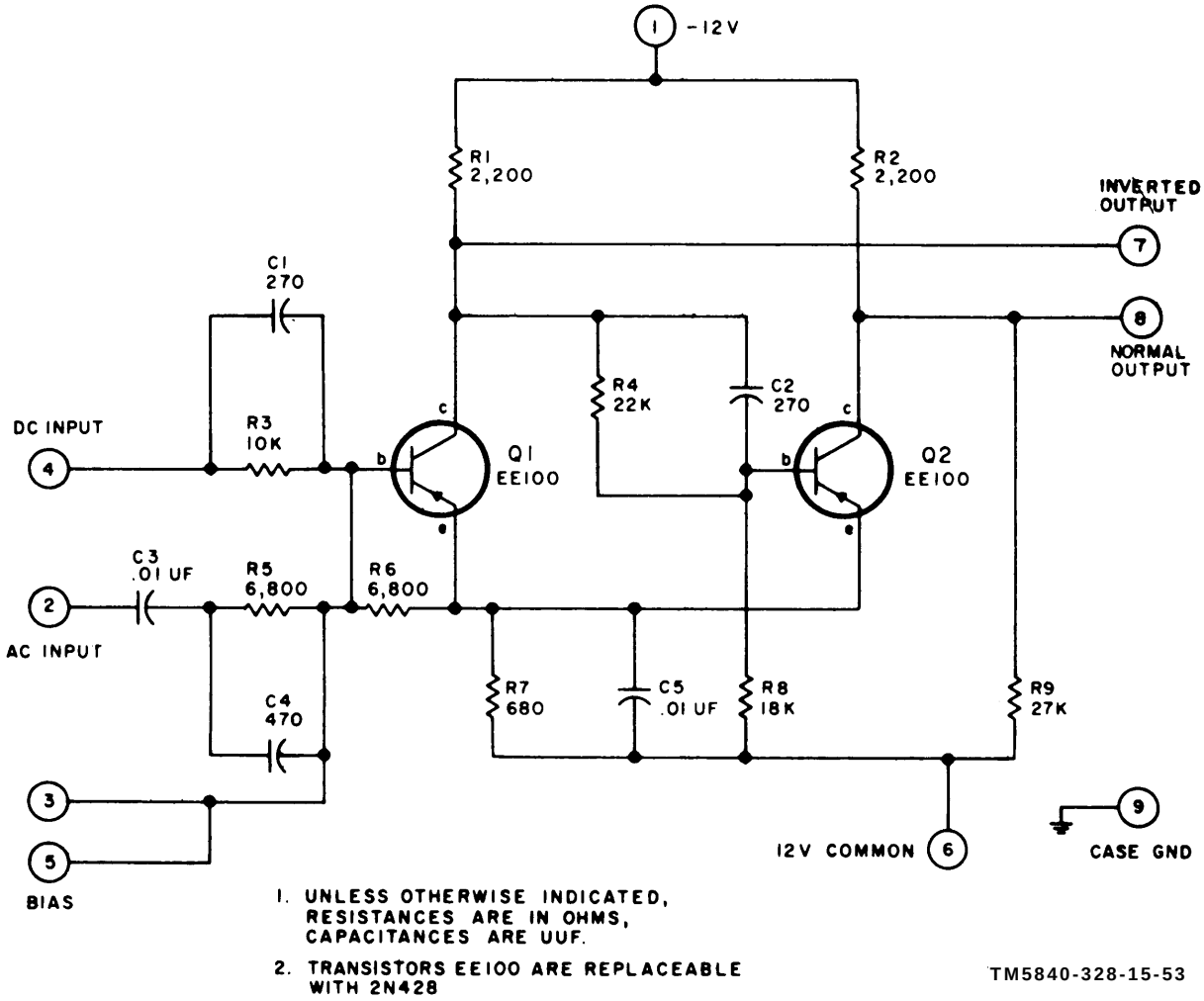


Figure 5–4. Squaring amplifier 21, schematic diagram.

5-9. 400 CPS Output Circuit
(fig. 9-11①)

Test jack TP60 (white) and test jack TP61 (black) permit observation of the 400–Hz signal that appears at connector J11 in block 2400, connector J12 in block 2800, and connector J14 in block 1000. Waveforms developed in the triggering circuit are shown in figure 5-3.

5-10. Block 100 Tr Assembly Test Circuit
(fig. 9-11①)

Connector J7 provides a means of interconnection with the block 100 tr assembly of the radar set. Through this connector, power and circuit connections are established. RCVR GAIN potentiometer R7 controls the gain of the intermediate frequency (if.) preamplifier located on the tr assembly. AFC GAIN potentiometer R8 provides control of the gain of the afc preamplifier located on the tr assembly. ON/OFF switch S6 is a three-pole, two position toggle switch that controls the power delivery to connector J7. In the ON position, one pole supplies –5 volts to pin J7-C, the second pole supplies + 6 volts to pin J7-B, and the third pole furnishes + 110 volts to pin J7-J. In the OFF position, these power circuits operate, respectively, into dummy load

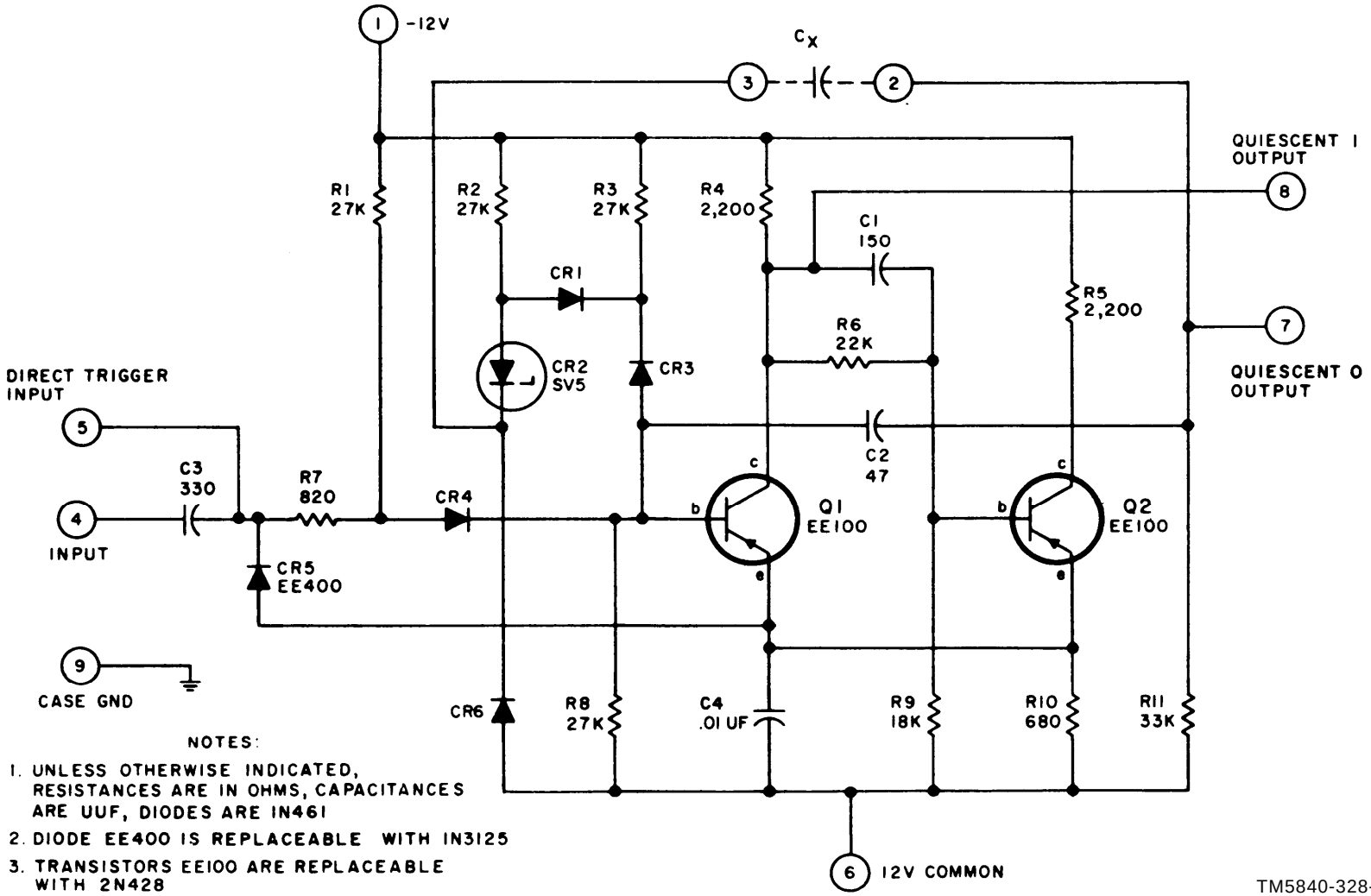


Figure 5-5. *One-shot multivibrator Z2 schematic diagram.*

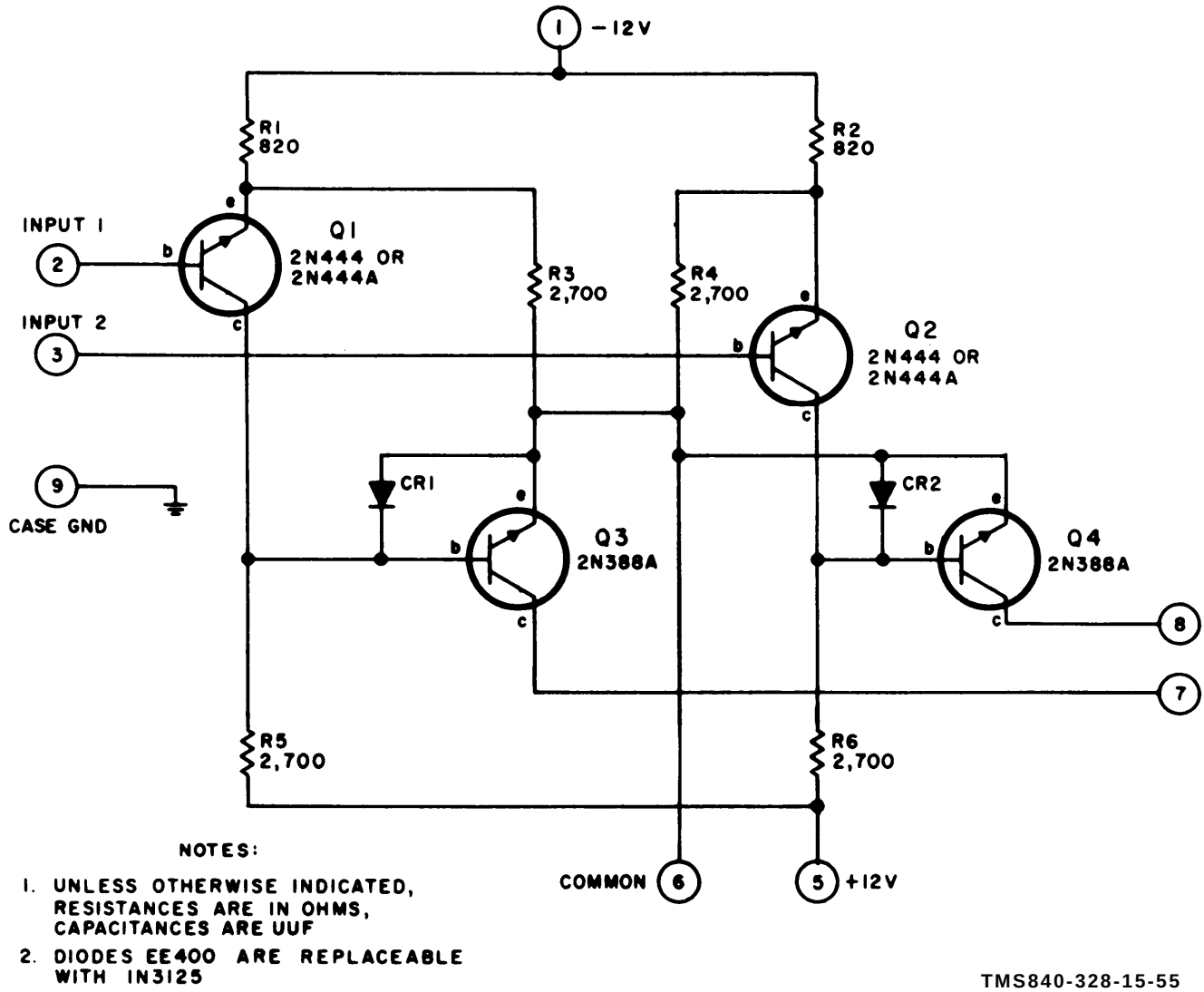


Figure 5-6. Driver amplifier Z3, schematic diagram.

Resistors R2, R1, and R3. OSC CUR test jack TP1l enables monitoring of the local oscillator current in the tr assembly or the 7-volt dc output of the SSLO voltage regulator. On some test panels, AC test jacks provide connection to measure 6-volt ac output of block 700 power converter.

5-11. Block 300 If. Amplifier Test Circuit

a. Connector J4 provides a means of interconnection with the block 300 if. amplifier of the radar set. Through this connector, power and circuit connections are established. ON/OFF switch S2 is a three-pole, two-position toggle switch that controls the power delivery to connector J4. In the ON position, one pole supplies –5 volts to pin J4-C, the second pole supplies +12 volts to pin J4-H, and the third pole furnishes +6 volts to pin J4-B.

b. In the OFF position, these power circuits feed, respectively, into dummy load resistors R5, R6, and R4. RCVR-XMTR VIDEO test jack TP2 permits monitoring the video output from the if. amplifier to the receiver-transmitter headphone circuits, and CONT — IND VIDEO test jack TP3 provides a monitoring point for the video output to the control-indicator.

5-12. Block 400 Boxcar and Audio Amplifier Test Circuit

(fig. 9-11①)

a. Connector J6 provides a means of interconnection with the radar set block 400 boxcar and audio amplifier. Through this connector, power and circuit connections are estab-

lished. ON/OFF switch S5 is a three-pole, two-position toggle switch that controls the power delivery to connector J6. In the ON position, one pole supplies – 5 volts to pins J6-6 and J6-7. The second pole supplies +12 volts to pin J6-4. The third pole furnishes + 6 volts to pin J6-8. In the OFF position, these power circuits feed, respectively, into dummy load resistors R16, R17, and R15. SIG test jack TP8 provides a test point for monitoring the signal potential. This is resolved as a dc electromotive force (emf) proportional to the video signal strength. Connection to the block 400 amplifier of the radar set is established through pin J6-11.

b. VID test jack TP9 provides a test point for monitoring the video signal from the block 400 amplifier. Entry for this signal is through. pin J6-16. GATE test jack TP10 serves as a point of observation for the gating signal developed in the block 400 amplifier, This signal is admitted through pin J6-10.

c. NAR/W switch S4 is a single-pole, single-throw switch, At W (the open circuit condition), the video delay line in the block 400 amplifier is in a summed state and provides a wide range gate, At NAR (the closed circuit condition), the switch applies – 6 volts to a relay in the block 400 amplifier pin J6-14. This produces a narrow range gate. GAIN potentiometer R18 varies the potential at pin J6-3 between ground level and – 5 volts This provides control of gain in the audio amplifier in the block 400 amplifier.

5-13. Block 500 Gate Generator Test Circuit (fig. 9-11①)

a. Connector J8 provides a means of interconnection with the block 500 gate generator of the radar set. Through this connector, power and circuit connections are established. ON/OFF switch S7 is a two-pole, two-position toggle switch that controls power delivery to connector J8. In the ON position, one pole supplies + 12 volts to pin J8-8. The other pole furnishes – 5 volts to pin J8-9. In the OFF position, these power circuits feed, respectively, into dummy load resistors R14 and R13.

b. The gate signal carried through pin J8-10 is seen at GATE test jack TP18. GATE POSITION switch S9 is a single-pole, single-throw toggle switch. In the closed condition, this switch applies – 6 volts to pin J8-7. With this circuit closed, the gate position relay in the block 500 generator is actuated.

c. BLANK switch S8 is a single-pole, single-throw toggle switch, When closed, this switch connects +6 volts to the circuit through J8-l, providing a test of the false-trigger blanking capability of the gate generator.

5-14. Block 600 Modulator Test Circuit (fig. 9-11①)

a. Connector J10 provides a means of interconnection with the block 600 modulator of the radar set. Through this connector, power and circuit connections are established. ON/OFF switch S13 is a three-pole, two-position toggle switch that controls the power delivery to connector J10. In the ON position, one pole supplies +300 volts to pin J10-8. The second pole supplies – 5 volts to pin J10-14, while the third pole furnishes +12 volts to pin J 10-6. In the OFF position, these power circuits feed, respectively, into dummy load resistors R36, R34, and R35.

***b.* The system trigger output signal from the block 600 modulator of the radar set is admitted through pin J10–9 and is seen at TRIG test jack TP20. The magnetron current signal for the test meter on the control-indicator, entering through pin J10–2, is monitored at MAG I test jack TP22. The magnetron current signal for the test meter** on the receiver-transmitter, brought through pin J10-10, is monitored at MAG I test jack TP 21.

c. LOAD connector J27 is connected to ground through a series of six resistors (R76, R27, R28, R29, R30, and R31), totaling 2,020 ohms. This provides a resistive load for the magnetron trigger output of the block 600 modulator of the radar set. LOAD test jack

TP 19 permits examination of the magnetron trigger pulse from the block 600 modulator at the junction of load resistors R30 and R31.

5-15. Block 700 Receiver-Transmitter Power Converter

(fig. 9-3)

a. The receiver-transmitter power converter (marked PWR. CONV. RADAR) is a removable from the test panel and is similar to the receiver-transmitter power converter in the radar set. Refer to the technical manual for the radar set for a detailed description and presentation of the functioning of the converter.

b. All dc outputs from the converter are brought to test jacks located on the test panel adjacent to the power converter. The voltage levels at these monitoring points and the corresponding test jacks are as given in the chart below,

NOTE

The normal voltage at jack marked +330 (TP62) is approximately +300 volts.

Volta	*Test jack*
[a] *-600*	TP23
+300	TP 62
+110	TP16
+12	TP16
-5	TP14
–6	TP17
GND	TP12

[a] on some equipments there is no -600 volt output

c. A synchronizing signal appears at SYNC test jack TP1 and maybe employed to snychronize test instruments.

d. On test panels equipped with AC test jacks, 8 volts ac (nominal) should appear between AC test points TP64 and TP65 on the block 100 test circuit.

5-16. Block 800 Afc Amplifier Test Circuit

(fig. 9-11.①)

a. Connector J5 provides a means of interconnection with the block 800 afc amplifier, Through this connector, power and circuit connections are established. ON/OFF switch S3 is a four-pole, two-position toggle switch that controls power delivery to connector J5. In the ON position, the first pole supplies -5 volts to pin J5-F. The second pole feeds to +12 volts to pin J5-H. The third pole furnishes +6 volts to pin J5-E. The fourth pole delivers +110 volts to pin J5-L. In the OFF position, these power circuits feed, respectively, into dummy load resistors R10, R11, R9, and R12.

b. The afc output of block 800 amplifier is brought in through pin J5-B and is monitored at AFC test jack TP4. CONT-IND test jack TP6 permits testing the unfiltered afc output, which is admitted through pin J5-M and intended for the test meter on the control-indicator. RCVR-XMTR test jack TP5 connects to pin J5-D and monitors the unfiltered afc output intended for the test meter on the receiver-transmitter. GAIN test jack TP7 permits monitoring the dc voltage output from the AFC GAIN CONTROL of the block 800 amplifier to the block 200 afc amplifier. This signal enters through pin J5J.

5-17. Block 900 Motor Control Test Circuit

(fig. 9-11①).

a. Connector J13 provides a means of interconnection with the radar set motor control circuits. Through this connector, power and circuit connections are established. ON/OFF switch S26 is a three-pole, two-position toggle switch that controls power delivery to connector J13. In the ON position, the first pole connects the –5-volt supply to pin J13-5. The second pole supplies +12 volts to pin J13-7. The third pole feeds +6 volts to pin J13-6. In the OFF position, these power circuits feed, respectively, into dummy load resistors R67, R65, and R66.

b. A voltage divider, consisting of 24-kilohm resistor R39 and 1,800-ohm resistor R40, is shunted across the +12-volt supply. The junction of this divider is brought to pin J13-8 and provides a fixed speed-control voltage. Capacitor C8 (2,800-µf) connects to pin J13-10 and filters the dc power applied to a motor drive emitter follower in the motor control circuits.

c. REV A/REV B switch S16 is a single-pole, double-throw toggle switch that transfers the -6 volt supply selectively to either pin J13-2 or pin J13-3. This simulates the commutating action normally provided by the

commutator switch in the antenna drive assembly. FWD/REV switch S15 is a double-pole, double-throw, three-position toggle switch. In the FWD position, it connects pin J13-1 to ground, pin J16-A to – 6 volts, and pin JI5-B to ground; in the REV position, it connects pin J13-1 to – 6 volts, pin J15–A to ground, and J16-B to – 6 volts; in the OFF position, it disconnects pins J13-1, JI5-A, and J16-B from ground and from dc voltage.

d. TEST potentiometer R64 provides a variable voltage ranging between 0 and -6 volts. TEST ON/OFF switch S12 is a single-pole, single-throw toggle switch. In the ON position, it closes the circuit between the voltage take-off point on potentiometer R64 and pin J13-14 and is employed as a motor control test,

5-18. Block 1000 Antenna Drive Unit Test Circuit
(fig. 9-11①)

a. Connector J14 provides a means of interconnection with the radar set antenna drive assembly. Through this connector, power and circuit connections are established, The connector is mounted behind a protective flap marked AZ DRIVE, This prevents accidental contact with the +300 volts carried by pin J14-M.

b. SWP test jacks TP24 and TP25 connect to pins J14-K and J14-H, respectively, and enable tests to be made on the output of the antenna drive sweep pontentiometers in the radar set,

5-19. Block 1200 Relay Control Test Circuit
(fig. 9-11①)

a. Connector J9 provides a means of interconnection between the test circuits and the radar set relay control assembly. ON/OFF switch S24 is a single-pole, single-throw toggle switch. In the ON position, it closes the circuit between the – 5-volt source and pin J9-H.

b. DRIVE switch S10 is a single-pole, single-throw toggle switch. In the closed circuit condition, it delivers – 6 volts to pin J9–E. Functioning of this circuit is indicated by DRIVE pilot lamp DS4, which connects to pin J9-F.

c. FWD/REV switch S11 is a single-pole, double-throw toggle switch. In the FWD position, it delivers – 6 volts to pin J9-L. In the REV position, the – 6 volts is applied to pin J9-K. Operation of this switch provides range gate position control, and functioning is indicated by pilot lamp DS5, which connects to pin J9-J.

d. LV potentiometer R26 provides a means of varying the – 6 volts supplied to the low-voltage cutout circuit of the radar set relay control assembly. Connection is made through pin J9–A. The applied voltage is monitored at LV test jack TP63. Functional indication is provided by LV pilot lamp DS6, which is connected to pin J9-B. DLY pilot lamp DS3 indicates operation of the time delay circuit and connects to pin J9–M.

5-20. Block 2100 A-Scope Display Assembly Test Circuit
(fig. 9-11①)

a. Connectors J20 and J21 provide a means of circuit and power connection to the radar set A-scope display assembly. ON/OFF switch S20 is a three-pole, two-position toggle switch. In the ON position, the first pole applies +12 volts to pins J20-4 and J20-6. The second pole feeds – 12 volts to pin J20–2. The third pole supplies +35 volts to pin J21-9. In the OFF position, the + 12-volt circuit is connected to dummy load resistor R42, while the +35-volt circuit is connected to dummy load resistor R43.

b. The +300-volt supply connects to the A-scope display centering circuits in the radar set through pin J21-8. MARKER switch S18 is a single-pole, single-throw toggle switch. In the closed condition, it applies – 6 volts to pin J20-7, which serves to control marker width. GATE DELAY switch S19 is a single-pole, single-throw toggle switch, In the closed con-

dition, it applies – 6 volts to pin J20–9, which serves to control the gating time.

c. The trigger output of driver-amplifier Z3 is connected to pin J20-3. SWP LENGTH switch S21 is a single-pole, single-throw toggle switch. In the closed condition, it applies – 6 volts to pin J21–5, which serves to control the sweep length.

d. The monitoring points for the various functions and the corresponding terminations at the connectors are as follows:

(1) VID test jack TP30, video output, connects to pin J20-11.

(2) TRIG test jack TP28, range trigger output, connects to pin J20-5.

(3) V CTR test jack TP85, vertical centering, connects to pin J21-10.

(4) SWP test jack TP33, sweep output, connects to pin J21-6.

(5) SWP test jack TP34, sweep output, connects to pin J21-7.

(6) BLANK test jack TP 32, unblinking output, connects to pin J21-3.

(7) MARK test jack TP29, marker output, connects to pin J20-8.

(8) VID test jack TP31, test video input, connections to pin J21–1.

5-21. Block 2200 B-Scope Display Assembly Test Circuit

(fig. 9-11.①)

a. Connectors J22 and J23 provide a means of circuit and power connection to the radar set B-scope display assembly. ON/OFF switch S22 is a three-pole, two-position toggle switch. In the ON position, one pole connects +12 volts to J22-1 10. The second pole applies – 12 volts to pin J22-10. The third pole furnishes +35 volts to pin J22-6. In the OFF position, the three poles are, respectively, connected to dummy load resistors R54, R55, and R56.

b. NORM/MTI switch S23 is a single-pole, single-throw toggle switch. Normal operation occurs in the closed circuit condition, when – 6 volts is applied to pin J23-11. The +300-volt supply connects to the B-scope astigmatism and vertical centering circuits through pin J23-4.

c. The monitoring points for the various functions and the related terminations at the connectors are as follows:

(1) MARK test jack TP46, marker teat input, connects to pin J23-8.

(2) VID B test jack TP49, test video input, connects to pin J23-10.

(3) VID RGF test jack TP46, video output to range gated filter (rgf) circuits, connecti to pin J22-21.

(4) VID SEL test jack TP37, selected video output, connects to pin J224.

(5) VID IN test jack TP44, test video input to B-scope display, connects to pin J22-20.

(6) SWP test jack TP47, sweep output, connects to pin J23-6.

(7) SWP test jack TP48, sweep output, connects to pin J23-7.

(8) BLANK tist jack TP36, unblinking output, connects to pin J22-3.

(9) ASTIG test jack TP27, astigmatism control voltage, connects to pin J23-2.

(10) B VID test jack TP88, video output to B-scope, connects to pin J22-8.

(11) MTI test jack TP89, test MTI input as from rgf A, connects to pin J22-13.

(12) MTI test jack TP40, test MTI input as from rgf B, connects to pin J22-14.

(13) MTI test jack TP41, test MTI input as from rgf C, connects to pin J22-16.

(14) MTI test jack TP42, test MTI input as from rgf D, connects to pin J22-17.

(15) MTI test jack TP48, test MTI input as from rgf E, connects to pin J22-18.

5-22. Block 2300 Control-Indicator Power Converter Test Circuit
(fig. 9-2)

a. The power converter (marked PWR. CONV. REMOTE) is removable from the test panel and is identical with the corresponding unit in the radar set control-indicator. Refer to the technical manual for the radar set for a detailed description and presentation of the functioning of this unit.

b. All dc outputs except the – 2,000 volts and the + 2,000 volts are brought to test jacks located on the test panel adjacent to the power converter. The voltage levels at these monitoring points and the corresponding test jacks are as follows:

Volts	Test jack	Volts	Tent point
+35 +12	TP58 TP56	–12 GND	TP57 TP59

c. The – 2,000 volts and the +2,000 volts are connected directly to the CRT TEST push-and-hold switch S17 located at the upper right corner of the test panel adjacent to the power converter. Dc power from switch breaker CB4 is connected to the converter through push breaker CB3 and resistor R82. This resistor simulates the normal voltage drop encountered in the radar set, in the remote 50-foot cable, and in the control-indicator circuits.

5-23. Block 2400 Azimuth Servoamplifier Test Circuit
(fig. 9-11 ①)

a. Connector J11 provides a means of circuit and power connection to the radar set servoamplifier assembly. ON/OFF switch S14 is a two-pole, two-position toggle switch. In the ON position, – 12 volts is connected to pin J1l–C and +12 volts is fed to pin J1l–B. In the OFF position, the poles are connected to dummy load resistors R37 and R38.

b. The 400-Hz power generated in the servoamplifier circuit is brought to the test circuit through paralleled pins J11-D and J1l-P. This termination is monitored at 400 CPS test jack TP60 (white). The **400-Hz** power is also brought into the test circuit through paralleled pins J1l–R and J1l-S. This input is monitored at 400 CPS test jack TP61 (black).

5–24. Block 2700 Range Gated Filter Assembly Test Circuit
(fig. 9-11 ①)

a. Connector J24 provides a means of circuit and power connection to the radar set range gated filter assemblies. ON/OFF switch S27 is a two-pole, two-position toggle switch. In the ON position, +12 volts is connected to pin J24–K, and – 12 volts is connected to pin J24–J. In the OFF position, the poles are connected to dummy load resistors R45 and R44.

b. A voltage regulating circuit (consisting of Zener diodes CR9 and CR10, resistors R80 and R81, and capacitors C13 and C14) is connected to the 12-volt dc source. The + 3.9-volt regulated output is fed to pin J24–B, while the – 3.9-volt regulated output connects to pin J24-A.

c. The triggering signal generated by shaping circuits Zl, Z2, and Z3 is brought to pin J24–H and, simultaneously, appears at TRIG test jacks TP50 and TP51. VIDEO test jack TP53 (green) permits injecting a test input video signal and connects to pin J24–E. VIDEO test jack TP54 (blue) permits monitoring the output video signal and connects to pin J24-L. TRIG test jack TP52 permits monitoring the trigger output signal and connects to pin J24–C.

5-25. Block 2800 Azimuth Counter Test Circuit
(fig. 9-11 ①)

Connector J12 provides interconnection between the block 2800 azimuth counter assembly, the block 1000 antenna drive unit, and the block 2400 servoamplifier. Interconnection of these three units is essential for tests of the azimuth counter assembly.

5-26. Block 2900 Range Amplifier Test Circuit

(fig. 9-11 ①)

Connector J25 provides a means of circuit and power connection to the radar set range amplifier assembly. ON/OFF switch S25 is a three-pole, two-position toggle switch. One pole applies – 12 volts to pin J25–11. The second pole furnishes + 12 volts to pin J25-4. The third pole feeds +35 volts to pin J25-6. In the OFF position, these poles are, respectively, connected to dummy load resistors R58, R59, and R57. TEST jack TP55 permits monitoring the range-delayed trigger output and connects to pin J25–8.

5-27. CRT TEST Circuit

(fig. 9-11 ①)

a. Connector J16 provides a means of connecting gun voltages to the A–scope and B–scope. Deflection voltages for these tubes are applied through connector J17. Gun voltages are derived from the block 2300 power converter. The 2,000-volt dc output is controlled by two-pole press-and-hold switch S17. One pole carries the + 2,000 volts to pin J16-13. The other pole applies – 2,000 volts dc to a parallel voltage divider network.

b. One branch of the voltage divider network supplies the A–scope and the other branch supplies the B-scope. The A-scope voltage divider consists of internally mounted A-bright potentiometer R49, which establishes the image brightness; series resistor R50; internally mounted A-focus potentiometer R51, which controls image spot size; and series resistors R53, R72, R73, and R74, which terminate at ground. The brightness controlling voltage set by R49 is brought to pin J 16-7. The junction point of R49 and R50 connects to pin J16-9. The focusing voltage set by R51 is brought to pin J16-11.

c. The B-scope voltage divider consists of internally mounted B-bright potentiometer R46, which establishes image brightness; series resistor R47; internally mounted B-focus potentiometer R48, which controls image spot size; and series resistors R52, R69, R70, and R71, which terminate at ground. The brightness controlling voltage set by R46 is brought to pin J16-12. The junction point of R46 and R47 connects to pin J16-10. The focusing voltage set by R48 is brought to pin J16–14, and + 110 volts is applied to pin J16-1.

d. In the deflection control circuit, + 300 volts is impressed across series resistors R60 and R62. The + 150-volt junction of R60 and R62 is joined to pins J17-A and J17-D. The low side of R62 is brought to pin J17-H, which is also grounded. DEFL potentiometer R61 bridges R60 and R61 and enables the operator to vary the spot position on the scope being tested. The variable voltage output of this potentiometer is connected to pins J17–E and J17–F.

5-28. AUDIO Output Circuit

(fig, 9-11 ①)

AUDIO jack J26 is connected between pin J6-2 and ground. It permits the audio output signal from block 400 audio amplifier to be aurally monitored.

CHAPTER 6

TROUBLESHOOTING

Section 1. GENERAL TROUBLESHOOTING INFORMATION

Warning: **High voltages are present in the MK-980/PPS-5, and safety precautions should be observed. Potentials of 2,000 volts appear at the CRT TEST push switch and at contact 13 of CRT TEST connector J16 when the push switch is depressed.**

6-1. General Instructions

Troubleshooting at general support includes all the techniques outlined for organizational maintenance, and any special or additional techniques required to isolate a defective part and effect restoration of the equipment to service. Paragraphs 6-4 through 6-10 present the individual circuit units that comprise the MK–980/PPS–5 and the troubleshooting procedures applicable to each circuit unit. Where circuit or functional interrelationships are involved, the techniques for localizing and isolating faults are described.

6-2. Organization of Troubleshooting Procedures

a. General. The initial requirement for a logical service procedure is localization of the faulty area of operation. This may be determined by the nature and area of the deficiency or abnormality. Once this is established, the next step is to isolate or locate the specific cause of the abnormality. This may be a defective component or the result of some mechanical failure. Primarily, isolation of a fault will require voltage or resistance readout. The normal operational use of the MK-980/PPS-5 will, in a large measure, indicate the location and probable nature of the defect.

b. Localization. Test Facilities Kit MK-980/PPS–5 consists of an array of test circuits in addition to power sources for energizing the circuits with the various voltage levels required. It also provides an accessory kit containing cables and couplings for interconnecting the individual MK-980/PPS-5 test circuits with the corresponding circuits of the AN/PPS-5 radar set. Except for the power requirement dependency involving the power converters, each test circuit is an independent unit; therefore, localization of faults will be self-evident during operational use of the equipment or in the course of sequential maintenance checkout procedures.

c. Isolation. Reference to paragraphs 6-4 through 6-10 and the associated troubleshooting charts will indicate the specific waveforms, voltage, *or* resistance readings that should be obtainable at significant points in each test block. Deviations from the normal will define the component or other circuit element causing any malfunction. Frequently, visual inspection will disclose a source of trouble either because of thermal discoloration or mechanical abnormality.

d. Resistance Measurements. Although transistorized circuits are utilized for power supply purposes, these circuits are de-isolated from all other circuits wherein ohmmeter measurements would be applicable. Therefore, no special precautions are required in the use of the ohmmeter with respect to polarity or *range* unless expressly stated.

e. Voltage Measurements. Unless otherwise indicated by directions for a specific measure-

ment, voltage readings may be taken by use of a multimeter, using any appropriate range.

f. Waveforms. Waveform comparison between patterns obtained at indicated test points. and reference patterns will materially aid in the analysis of malfunction in those circuits where waveform is of major significance.

g. Test Points. Panel-mounted test jacks connect to significant circuit points in each block area of the equipment. Connection of testing instrumentation to these test points will facilitate troubleshooting without needless disassembly of the equipment. The schematic diagram (fig. 9–11) shows the circuit location of each test point, and figure 9–10 depicts their physical distribution and location.

h. Intermittent Troubles. Trouble of an intermittent nature is occasionally encountered, In endeavoring to isolate the cause, it is generally necessary to induce the condition by tapping, jarring, or probing the equipment. A cold-soldered or rosined connection may be the cause. Likewise, a fractured wire or printed circuit board may be responsible. Visual examination with the aid of magnification may be of assistance in locating the defect.

i. Resistor, Capacitor, and Diode Color Code Diagrams. Color code diagrams for resistors, capacitors, and diodes provide pertinent resistance, voltage, rating, and tolerance information (fig. 9-4 and 9–5).

6-3. Test Equipment Required

The following chart lists test equipment required for troubleshooting Test Facilities Kit MK-980/PPS-5. The associated technical manuals are also listed.

Test equipment	Technical manual
Multimeter ME-26 B/U ------	TM 11-6625-200-12
Oscilloscope AN/USM-140B --	TM 11-6625 -535-15-1
Test Set, Insulation Breakdown AN/GSM-6.	TM 11-6625-273-12
Tool Kit, Electronic Equipment TK–100/G.	SB 11-604

Section II. TROUBLESHOOTING ELECTRICAL TEST PANEL SB-3004/PPS-5

Notes:

1. Short-circuit protection is afforded by circuit breakers in the various power circuits. Failure of a circuit breaker to remain in a closed condition is evidence of either a short circuit or an excessive current demand in the associated circuit. If such a condition develops, immediate investigation is required. Circuit breaker protective response initiated by a malfunction in the test facilities kit must be divorced from the reaction induced by a shorted radar unit in the course of service operations. To segregate externally caused circuit breaker reaction from an internally caused kickout, disconnect the interconnecting cable from the test facilities kit. If the trouble persists, corrective measures are called for in the test facilities kit. The following chart indicates the block areas controlled by each circuit breaker:

Circuit breaker	Block area
MAIN PWR CB1 ____	Ac operation only. Internal power converter.
CONTROL CB2 -----	Ac or dc operation. Blocks 2,800, 900, antenna drive motor.
CONT-IND CB3 -----	At or dc operation. Block 2,300.
RCVR-XMTR CB4 ---	Ac or dc operation. Blocks 700, 1,200, 500, 400, 2,100, 2,200.

2. To a great extent, service analysis can be effected through the use of the panel-mounted test jacks and connectors without removing the panel from its case. However, some internal measurements may be required or repairs necessitated, To gain access to the interior of the instrument, remove the 16 machine screws from around the edge of the panel. Grasp the panel handles, and gently lift the panel from the case. With the panel removed from the case, interlock switch S28, which is secured to one of the rear side support bars, will automatically open the input power circuits. Voltage tests made at interior points will require that this interlock switch be closed by manually pressing the actuating button.

Caution: **Several high-voltage points are easily accessible with the rear of the panel**

exposed. Use every precaution to avoid the hazard of a severe shock.

6-4. Checking INPUT POWER Circuits

Faulty functioning of the INPUT POWER section may become apparent while operating from the ac powerline only, from a 6-volt dc source only, or from either type of power supply.

Symptoms, causes, and corrective measures are given in the chart below.

Symptom	Probable trouble	Correction
Operating from ac powerline, INPUT POWER switch S1 at AC ON:		
Red AC ON indicator DS1 light does not go on.	*a.* Indicator light DS1 defective .	a. Replace indicator light DS1.
	b. Interlock switch S28 not closed .	*b.* Apply sufficient pressure to close switch.
	c. No power on ac supply line . . .	*c.* Check line fuses or control switch.
	d. Interlock switch S28 defective .	*d.* With INPUT POWER switch at OFF and interlock switch S28 closed, using low ohms range of multimetir, check continuity across contact of interlock switch section S28B. Should indicate closed circuit; otherwise replace interlock switch S28.
	e. INPUT POWER switch S1 defective.	e. With the power cable disconnected from the powerline and INPUT POWER switch S1 at AC ON, check continuity across switch contacts. Closed circuit should be indicated; otherwise, replace switch S 1.
Operating from 6-volt dc power source, INPUT POWER switch at DC ON:		
Clear DC ON indicator DS2 light does not go on.	*a.* Indicator light DS2 defective ._	*a.* Replace indicator light DS2.
	b. Battery charge low ----------	*b.* Replace with charged battery.
	c. Interlock switch S28 not closed_	*c.* Apply sufficient pressure to close switch S28.
	d. Interlock switch S28 defective -	*d.* With INPUT POWER switch at OFF and interlock switch S28 closed, using low ohms range of multimeter, check continuity across contacts of interlock switch section S28A. Should indicate closed circuit; other wise, replace switch S28.
	e. INPUT POWER switch S1 defective.	*e.* With 6-volt power source disconnected and INPUT POWER switch S1 at DC ON, check continuity across switch contacts S1C8 to S1C9 and SID11 to S1D12. Closed circuit should be indicated; otherwise, replace switch S1.

Symptom	Probable tremble	Correction
	f. RCVR-XMTR circuit breaker CB4 defective.	*f.* With INPUT POWER switch S1 at OFF and circuit breaker CB4 at (ON, check continuity across contacts 1 to 2 and 3 to 4. Closed circuit should be indicated; otherwise, replace circuit breaker CB4.
	g. Defective power converter block 700.	*g.* Check for +300-volt output at TP62. If not indicated, replace converter unit 700.

6-5. Checking Circuit Breakers

Circuit breaker defects fall into two categories: mechanical failure and electrical failure.

a. Mechanical Failure, This is evidenced by a failure to maintain latching, when the circuit breaker is set to ON with no power in the circuit. Replace if necessary.

b. Electrical Failure. This is observed as an open circuit condition with the circuit breaker set to ON. A continuity test, with a multimeter in low ohms setting, taken across the terminals of the circuit breaker will indicate if closure is being effected. An open circuit requires replacement of the component.

6-6. Checking internal Power Converter

a. The internal converter functions only when power is derived from a 115-volt ac source and INPUT POWER switch S1 is at AC ON. The primary evidence of possible failure in this circuit is an absence of operating voltages.

b. To localize this condition to the converter, with INPUT POWER switch S1 at ON, check for the presence of 115 volts ac at the input terminals of filters FL1 and FL2 (fig. 7–5). With power at these terminals, a reading taken by the multimeter at the terminal of filter FL3 referenced to ground should show approximately – 6 volts.

c. If this voltage is not available, failure of the converter is indicated and a detailed analysis is required. To do this, remove the cover of the shield. This provides access to the interior.

d. A listing of possible faults and corrective measures follows:

Symptom	Probable trouble	Correction
1. With 115 volts ac at input terminals of filters FL1 and FL2, the multimeter set to provide a reading of 100 volts dc connected across capacitor C6, either no voltage is indicated or it is less than approximately 100 volts.	*a.* One or more diodes of bridge rectifier CR1, CR2, CR3, and CR4 are defective.	*a.* Replace rectifiers.
	b. One or more of bank of filter capacitors C1, C2, C3, C4, C5, and C6 are shorted or have electrical leakage.	*b.* Disconnect individual capacitors from terminal studs and, with multimeter, check across each for leakage resistance or shorts. Observe correct polarity. Reversal will give erroneous reading. Replace defective capacitors.
2. With 115 volts oc at input terminals of filters FL1 and FL2, connect cathode-ray oscilloscope across terminals 8 and 104 toroidal power	*a.* Transistor Q1 or Q2 is defective.	*a.* Replace defective transistor (fig. 7-6) .
	b. Short or leakage condition in capacitor C10, C11, or C12.	*b.* Isolate and test each capacitor (fig. 7-5) for leakage, resist-

Symptom	Probable trouble	Correction
transformer T1: a square wave with a frequency of approximately 1 kHz and an amplitude of approximately 16 volts should be obtained. If this is not observed:		ante, or short; use the multimeter. Observe correct polarity. Replace any defective capacitors.
9. With correct square-wave output observable at terminals 8 and 10 of power transformer T1, no de voltage is obtained at output terminal of filter FL3.	*c.* Rectifier diodes CRS or CR6 open.	c. Replace diodes (fig. 7-6).

6-7. Checking Receiver-Transmitter Power Converter 700

The function of this power converter is to supply voltages for testing. In addition, a synchronizing pulse, derived from the 4-kHz oscillation frequency, is made available. Troubleshooting will be aided by referring to the following chart.

Symptom	Probable trouble	Correction
With equipment operating from 115-volt line, INPUT POWER switch S1 at AC ON, and CIRCUIT BREAKERS closed (on):		
1. No dc voltage readings between ground and any block 700 voltage test jack.	1. Block 700 power converter not functioning.	1. Take input voltage reading between GRD and TP6 on converter panel. If –6-volt reading is obtained, indicating satisfactory input, replace converter. For repairs on converter, refer to TM 11-5840-298-35.
2. Voltage readings obtainable at some, but not all, block 700 test jacks.	2. Block 700 power converter faulty.	2. Replace block 700 power converter. For repair information, refer to TM 11-5840-298-35.
3. No voltage readings at any block 700 test jack and no –6-volt input indicated at TP6 on converter panel. AC ON indicator light not on.	3. No ac power being furnished to circuits.	*a.* Check powerline fuses and switches. *b.* Make certain that all CIRCUIT BREAKERS are on (closed).
4. No voltage readings at any test jack in block 700 test area and no –6-volt input indicated at TP6 on converter panel. AC ON indicator light is on.	4. Internal power converter not functioning.	4. Repair internal power converter. For repair information, refer to paragraph 6-6.

6-8. Checking Control Indicator Power Converter 2300

The function of this power converter is to supply a range of the following specific dc voltages: +2,000, –2,000, +35, +12, and – 12. Troubleshooting will be aided by referring to the following chart:

8ymptom	Probable trouble	Correction
With power on, no dc voltage reading between ground and any block 2300 test jack.	*a.* No current supply to block *2300* power converter. *b.* Block 2300 power converter faulty.	*a.* Make certain that CONT-IND circuit breaker CB3 is closed. *b.* Replace block *2300* power converter. For repair information refer to TM 11-5840-298-35.

6-9. Checking REMOTE CABLE Test Circuit

a. With input power on, using the appropriate voltage range on the multimeter, a reading of -6 volts should be obtained at pin W of connector J18 (lower). If not indicated, check for open circuit between pin W and -6 test jack TP17 in block 700 area.

b. Using the appropriate ohms scale of the multimeter, check resistance from pin r of connector J19 (upper) and ground. Reading should be 56 ohms. If not indicated, replace resistor R63.

6-10. Checking TRIG Output Circuits

With input power on, connect oscilloscope AN/USM-140B between either TRIG test jack (TP50 or TP51) and ground. A 2-usec pulse at a repetition frequency of 4 kHz and 10 volts should be observed (D, fig. 6-3). If this indication is not obtained, proceed as follows:

a. With the oscilloscope connected between pin 7 of multivibrator 22 and ground, note whether a pulse is observable. If a pulse (B, fig. 5-3) is present, replace driver amplifier *Z3* and review the test at the TRIG test jack.

b. If no pulse is apparent, connect the oscilloscope to pin 8 of squaring amplifier 21. If a pulse is viewed, replace 22 and recheck the response at the TRIG test jack. If a pulse is not noted, replace 21. If the pulse is still not obtainable, check for a synchronizing pulse (A, figure 5-3) at pin 4 of 21. Failure to perceive a pulse at this point indicates a defect in power converter block 700.

6-11. Conformal Coded Components

Component boards El and E2 (fig. 7-3 and 7-7) in test panel SB-3004A/PPS-5 have been conformal coated to protect the components from fungus and moisture. When taking readings with a meter, therefore, use probe tips that are sharp enough to pierce through the coating to the bare wire, or scrape the coating away with a blade. At completion of troubleshooting and repair, seal up any holes that have been made in the coating. Use the procedures given in Solder and Soldering Change 1, TB SIG 222.

CHAPTER 7

REPAIRS AND ADJUSTMENT

Section I. REPAIRS

7-1. General Parts Replacement Techniques

a. No unusual procedures are involved in the replacement of parts in the MK–980/PPS-5. The customary care must be observed in replacing transistors or diodes. Avoid excessive heat when soldering; use a 25-watt, pencil-type solder iron. If possible, use a heat sink or clamp a pair of long-nose pliers between a solder joint and the diode or transistor. Do not use soldering guns because of the danger of inductive voltages being generated in components. Make certain that the test panel, when undergoing repair, is disconnected from the powerline.

b. When replacing components, be careful to avoid creating mechanical stresses or strains that may cause ultimate, if not immediate, breakdown. In general, the components and structures in the MK-980/PPS-5 are easily accessible. Thus, replacement of such items is no problem, and standard techniques of demounting, remounting, and soldering are used.

7-2. Replacement of Parts

a. Receiver-Transmitter Power Converter (PWR. CONV. RADAR) in Block 700. Test procedures for this unit appear in Chapter 6. If tests disclose a fault, remove and replace the unit in accordance with the procedures given in paragraph 4–9f. Repair procedures are contained in TM 11-5840-298-35.

b. Control-Indicator Power Converter (PWR. CONV. REMOTE) in Block 2300. Test procedures for this unit appear in Chapter 6. If test disclose a fault, remove and replace the unit in accordance with the procedures given in paragraph 4-9g. Repair procedures are contained in TM 11-5840-298-35.

c. *Internal Power Converter.* Test procedures for this unit appear in Chapter 6. The unit is in a shield (fig. 7–5) on a pair of brackets between the bottom of the test panel and a partition. The interior of the shield may be reached by removing the four screws at the top corners and lifting off the cover plate (fig. 7-4). With the cover removed, limited routine service tests are possible. If service requirements demand complete interior availability, remove the inverter circuit subassembly (fig. 7-6). This subassembly consists of: transistors Q1 and Q2, diodes CR6 and CR6, filter choke L2, resistors R77, R78, and R79, and capacitor C9. Remove the subassembly as follows:

(1) Remove the four machine screws that secure it to the rear surface of the shield (fig. 7-4).

(2) Unsolder the nine leads connecting terminals on the subassembly to terminals of components mounted on the shield (fig. 7-5).

(3) Lift out the subassembly. All components comprising the internal power converter assembly will now be exposed for test or replacement. If it is necessary to remove the complete internal power converter, procede as follows:

(a) Unsolder the three leads at the terminals of FL1, FL2, and FL3 (fig. 7-5) o

(b) Remove four screws securing the converter side bracketa to the test

panel. The screws are accessible from the top of the panel.

(c) Remove four screws securing the side brackets to the partition.

(d) Remove the power converter assembly.

Note. Removal of the internal power converter assembly will also provide access to parts on the upper central area of the test panel that normally are hidden by the converter. For examination or replacement of such components, it is not necessary to disconnect the three leads to the interior power converter. Enough slack is allowed in the leads to permit the converter to be mechanically detached and displaced sufficiently to avoid obstructing service operations.

d. Shaping Network. The shaping network consists of three nonrepairable component: squaring amplifier Z1, one-shot multivibrator Z2, and drive amplifier Z3 (fig. 7-1). These three components are mounted on a socket assembly at the left side of the test panel. To remove any one of these components, detach the covering shield of each, held in place by a bayonet-type latch. Extract the component from its socket by a direct outward pull. Do not rock or apply strong force, or distortion of the contact pins may result, When installing the components, be sure that the proper type is returned to the designated socket.

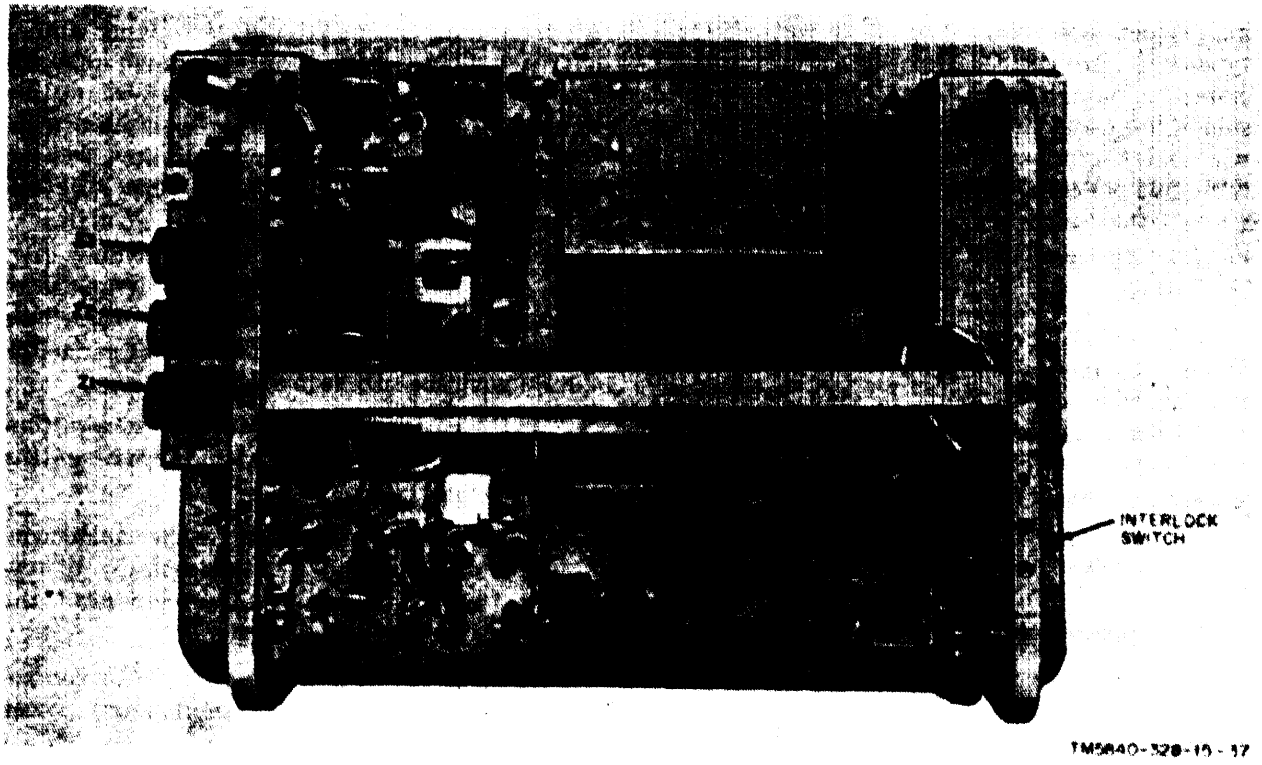


Figure 7-1, Test Panel SB-3004/PPS-5, bottom view.

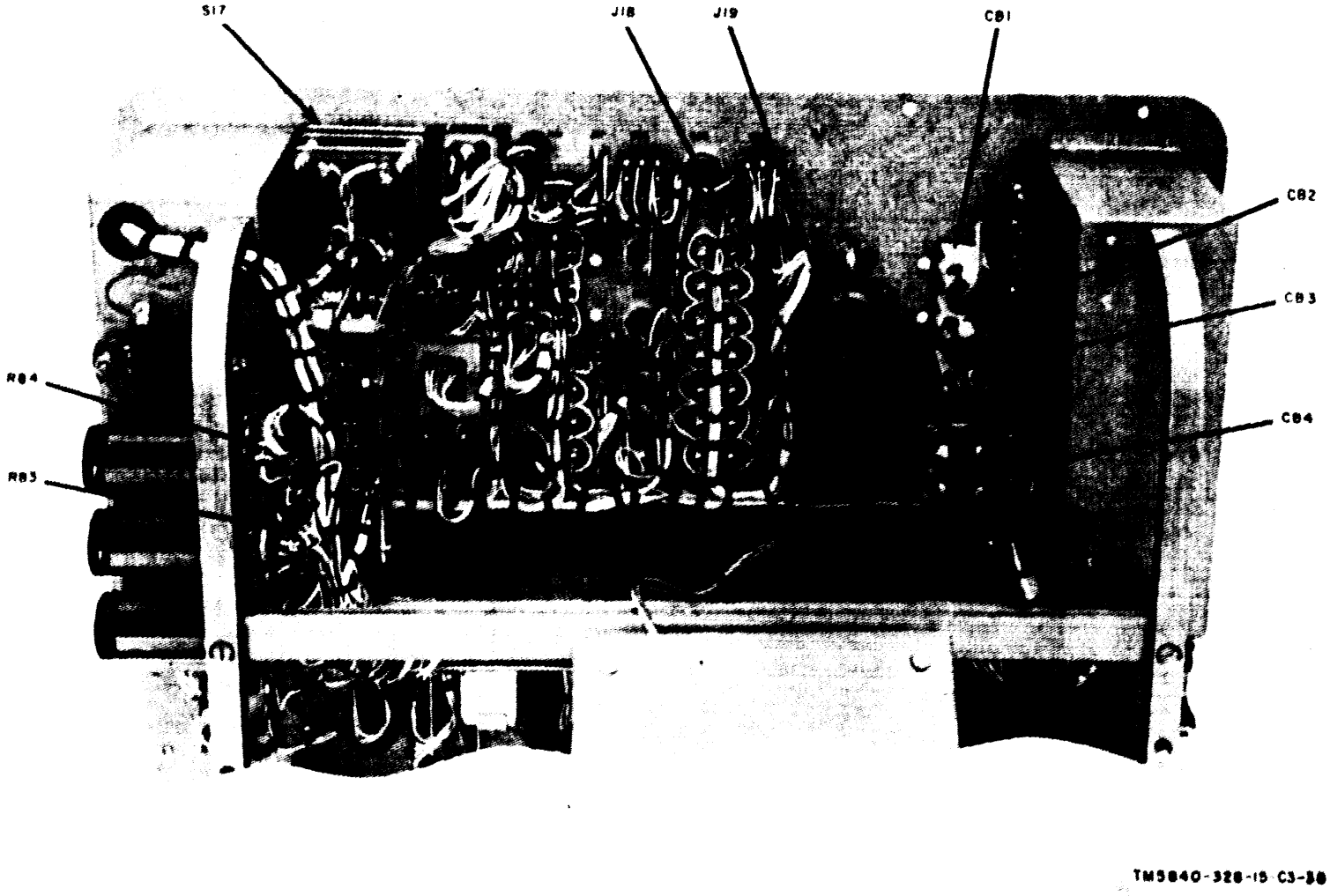
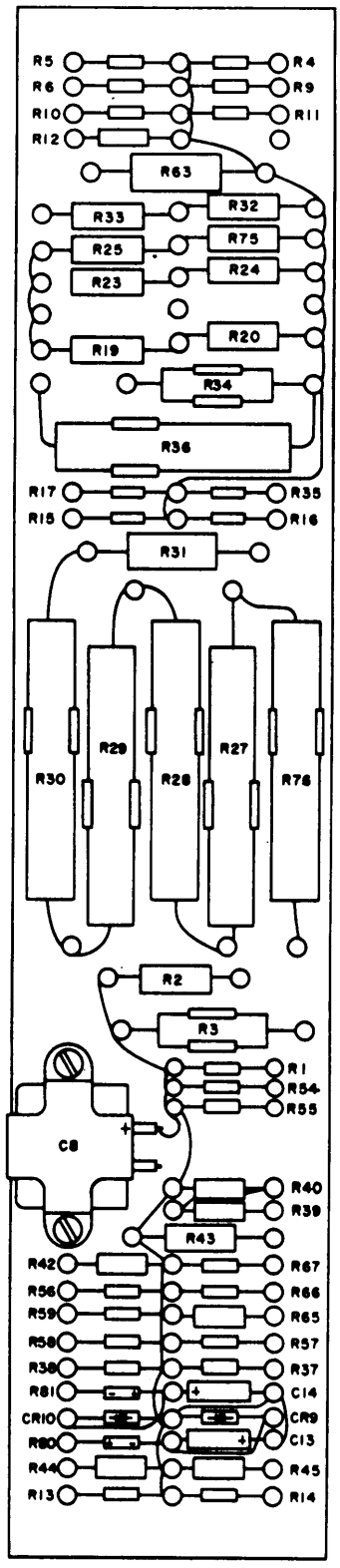


Figure 7–2. Electrical Test Panel SB-3004/PPS-5, rear view, internal power converter removed



TM5840-328-15-C7-52

Figure 7-3. Load resistor board assembly E1, component location.

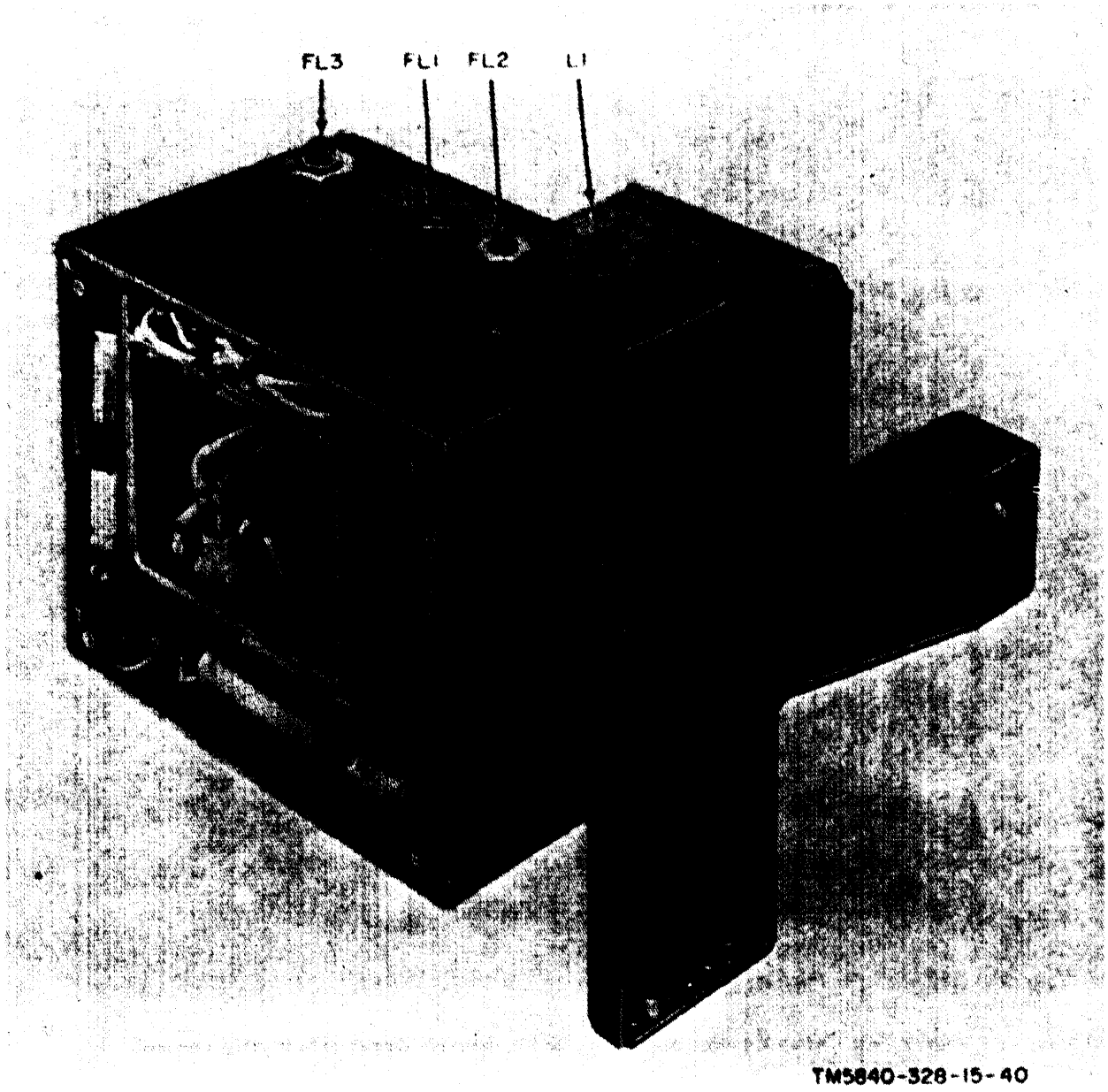


Figure 7-4. Internal power converter, PS5001, cover removed from shield.

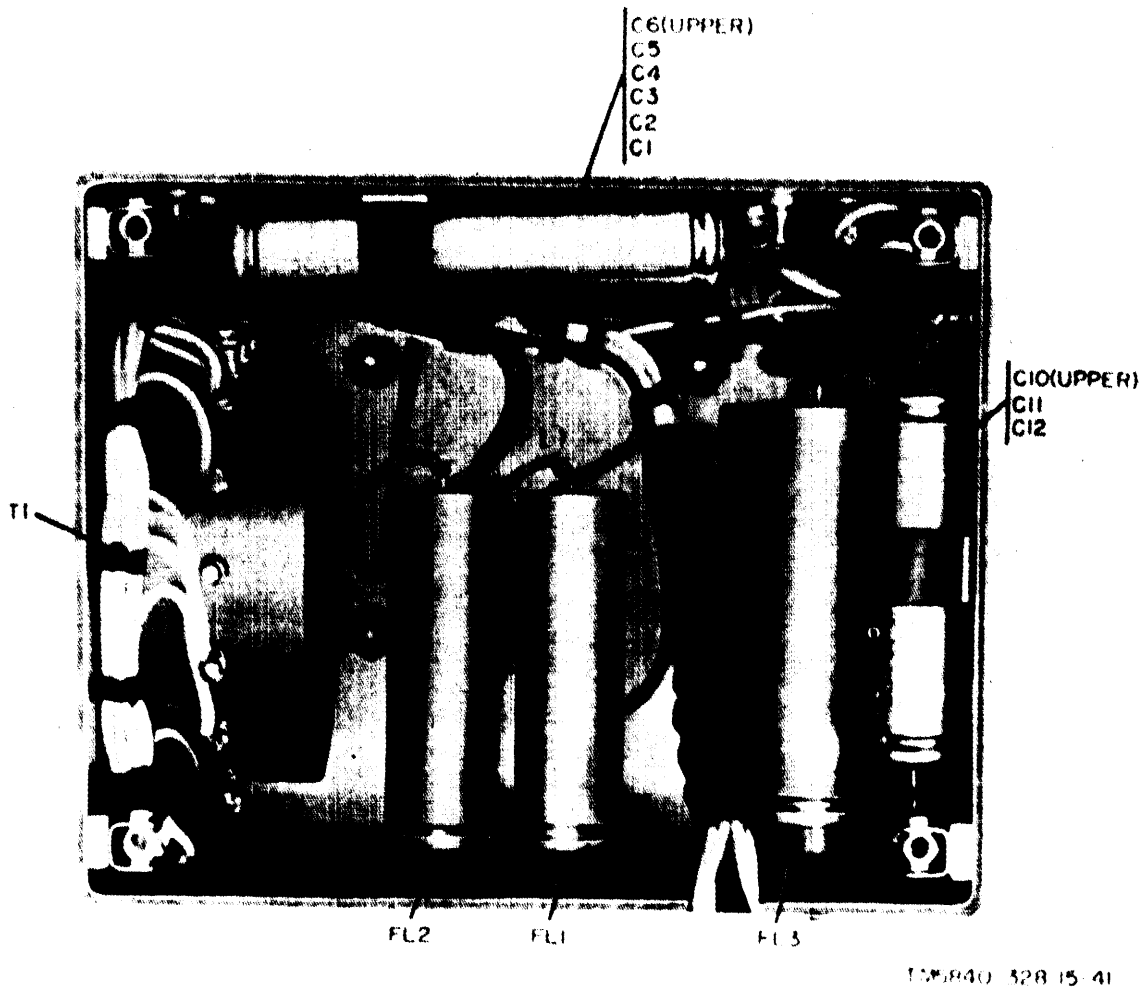


Figure 7-5. Internal power converter, PS5001, inverter circuit subassembly removed.

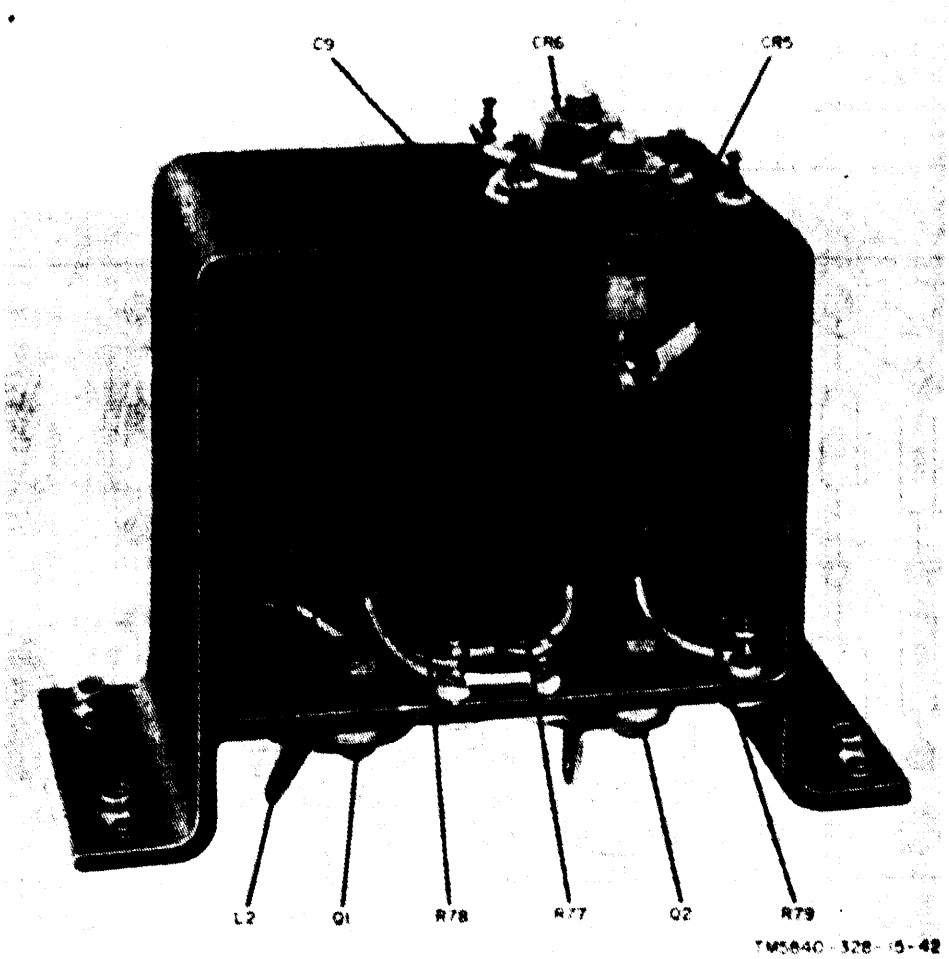


Figure 7-6. Inverter circuit subassembly.

Section II. ADJUSTMENT

7-3. Test Equipment Required

The only test equipment required for adjustment purposes is Multimeter TS-352B/U. No special tools are needed.

7-4 Adjustment Instructions

The CRT TEST circuit is the only area of the MK-980/PPS-5 requiring preset adjustment. The adjustments consist of voltage settings for controlling the brightness and focus of the two cathode-ray tubes (crt) of Radar Set AN/PPS-5 when they are being tested by the MK-980/PPS-5. Adjustment is affected by means of potentiometers R46, R48, R49, and R51, located on a component board (fig. 7-7) mounted on the upper left side of the test panel. The potentiometer functions, the voltages to be established, and the test points for measurement are given in the chart below.

Warning: The voltages at these readout points are extremely high. Refer to paragraph 8-12 for procedure and test equipment needed to check these voltages.

Reference designation	Function	Voltage setting	Readout point
R46	B brightness	–1.68 kv	J16-12
R48	B focus	–1.2 kv	J16-14
R49	*A* brightness	–1.8 kv	J16-7
R5l	A focus	–1.2 kv	J16-11

Notes:

1. All readings referred to ground.
2. CRT TEST push switch S17 must be pressed and held to obtain readings.

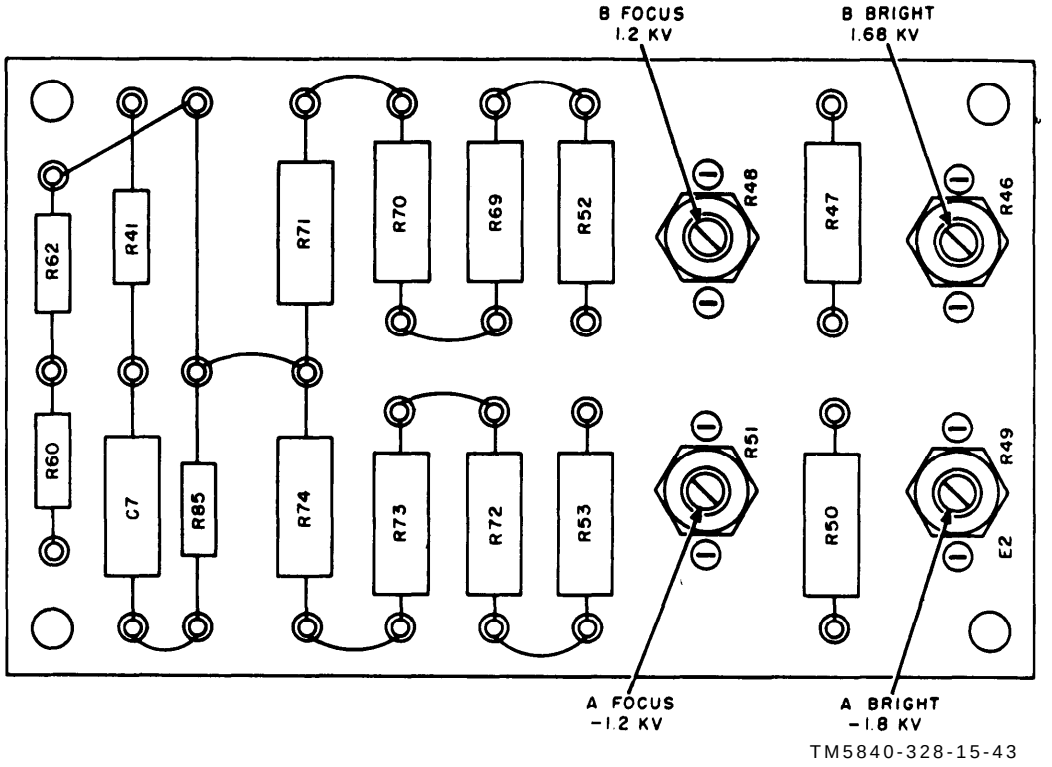


Figure 7-7. Compont board assembly.

Section III. CABLE REPAIR

If cable repair is necessary, be careful not to damage any re-usable portion of the assembly. Do not use excessive heat when unsoldering leads, and avoid spattering solder over connector surfaces. Be sure that connector pins are not bent or distorted.

7-5. Cable Assembly CX-10431/PPS-5
(fig. 7-8)

a. Detach either connector from the cable as follows:

(1) Loosen two strain clamp screws.

(2) Note the locations of the male and female locking screws relative to the contact designations on the connector face. This is important in order to maintain correct orientation of the connector with respect to its mate.

(3) With a spline-type wrench, loosen the setscrews in the knurled knobs at the rear of the connector.

(4) Remove the knobs and the small spacing washers.

(5) Withdraw the molded connector body from the shell, carefully feeding the cable along through the shell. Avoid strains.

(6) With the connector body and attached cable clear of the shell, slip the plastic end sleeves that cover each terminal back along its wire. This will expose the terminals.

(7) Carefully unsolder each lead from its terminal.

(8) Withdraw the cable from the shell.

b. If the connector is to be replaced, proceed as follows:

(1) Separate the sections of the replacement connector as indicated in a(l) through (4) above.

(2) Make sure that ends of cable are free of surplus solder and prepared for insertion into solder pockets of connector terminals.

(3) Feed cable end through loosened strain clamp and cable opening in shell.

(4) With plastic sleeves retracted on wire leads, insert lead ends into designated solder pockets of connector terminals, one at a time, and solder each securely when inserted.

(5) Slip plastic sleeves along wire and over terminal ends.

(6) Reassemble connector, making certain that strain clamp is tightened and that knurled knobs are properly set up and secure.

(7) With an ohmmeter, check circuitry for correctness, continuity, and shorts before returning cable to service.

c. If repairs require cable replacement, proceed as follows:

(1) Skin end of each wire lead one-eighth inch, and tin.

(2) Insert cable end through connector shell with clamp end inward.

(3) Slip 3/8-inch long plastic sleeve over each wire.

(4) Insert each wire in solder pocket of designated connector terminal, and securely solder in place.

(5) Assemble each connector.

(6) With an ohmmeter, check for circuit correctness, continuity, and shorts before placing cable assembly in service.

7-6. Cable Assembly CX-10429/PPS-5 (fig. 7-9)

The repair procedure is the same as that given in paragraph 7-5.

7-7. Cable Assembly CX-10430/PPS-5 (fig. 7-10).

The repair procedure is the same as that given in paragraph 7–5.

7-8. Cable Assembly CX-10433/PPS-5 (fig. 7-11)

The repair procedure is the same as that given in paragraph 7–5, except that connectors do not use locking screws. The molded plastic connector body is held in place by two machine screws accessible at the face.

7-9. Cable Assembly CX-10436/PPS-5 (fig. 7-12)

The repair procedure is the same as that given in paragraph 7–5, except that connectors do not use locking screws. The molded plastic connector body is held in place by the male and female guides at each end of the connector face. Unscrew to remove. Note relative location to retain proper orientation of connectors.

7-10. Cable Assembly CX-10432/PPS-5 (fig. 7-13)

a. Detach either connector from the cable as follows:

(1) Loosen two strain clamp screws.

(2) Remove the two holding screws at the ends of the molded connector body.

(3) Withdraw the molded connector body from the shell, carefully feeding the attached cable along through the shell.

(4) With the connector body and

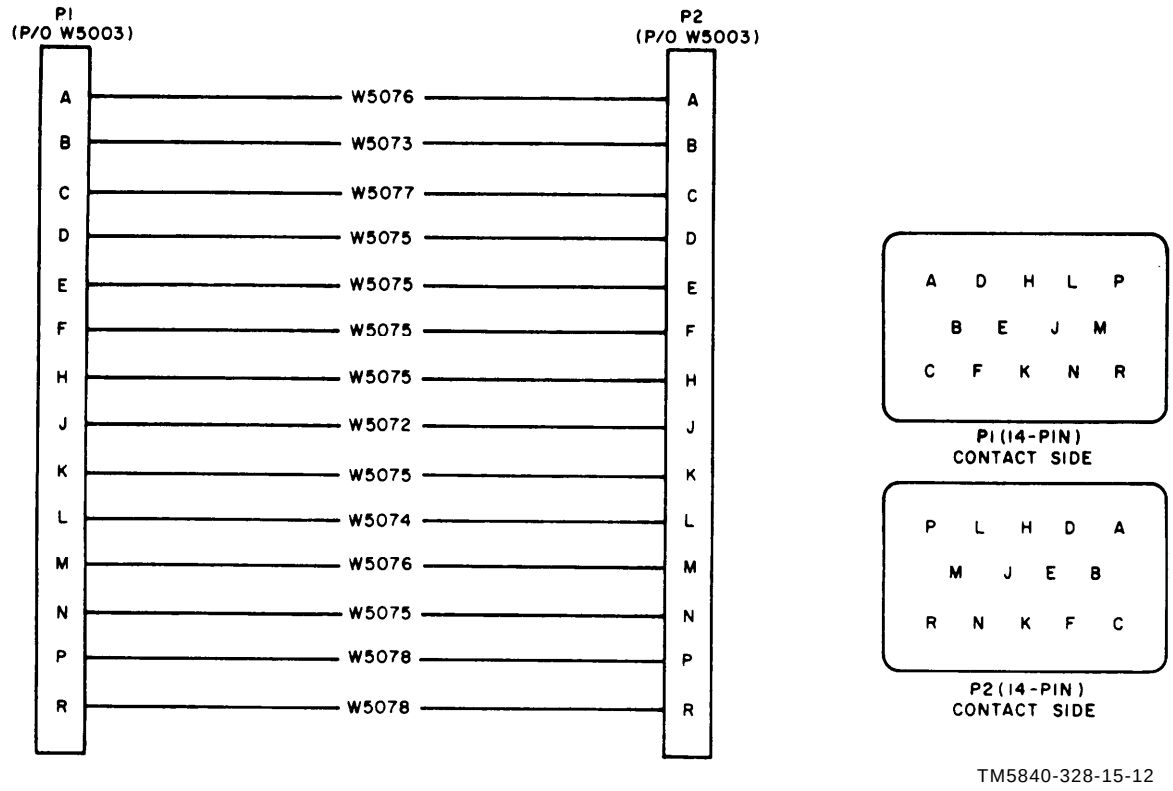


Figure 7-8. Special Purpose Cable Assembly CX-10429/PPS–5, schematic diagram.

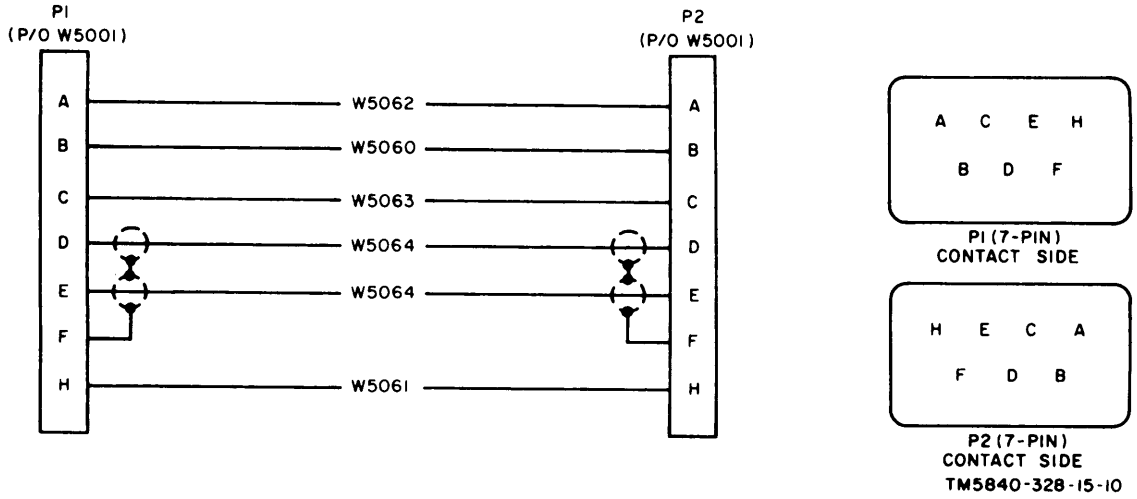


Figure 7–9. Special Purpose Cable Assembly CX–10429/PPS-5, schematic diugram.

attached cable clear of the shell, slip the plastic end sleeves that cover each terminal back along its wire. This will fully expose the terminals.

(5) Carefully unsolder each lead from its terminal.

(6) Withdraw the cable from the shell.

b. If the connector is to be replaced, proceed as follows:

(1) Separate the sections of the replacement connector as indicated in a(1) and (2) above.

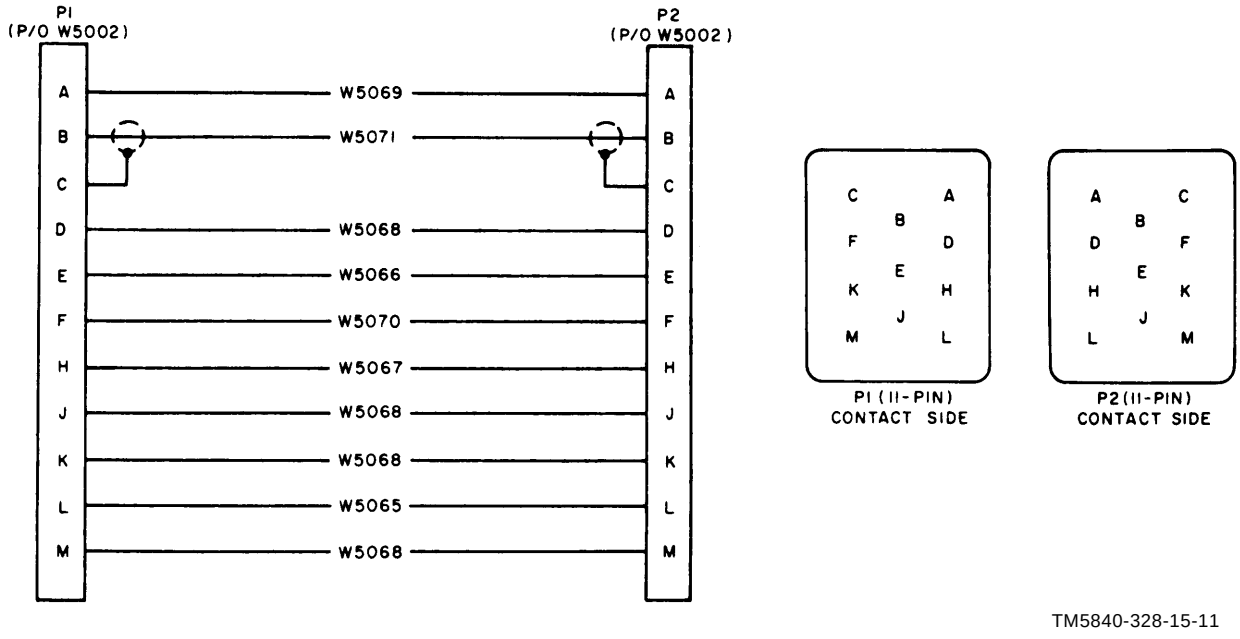


Figure 7-10. Special Purpose Cable Assembly CX-10490/PPS–5, schematic diagram.

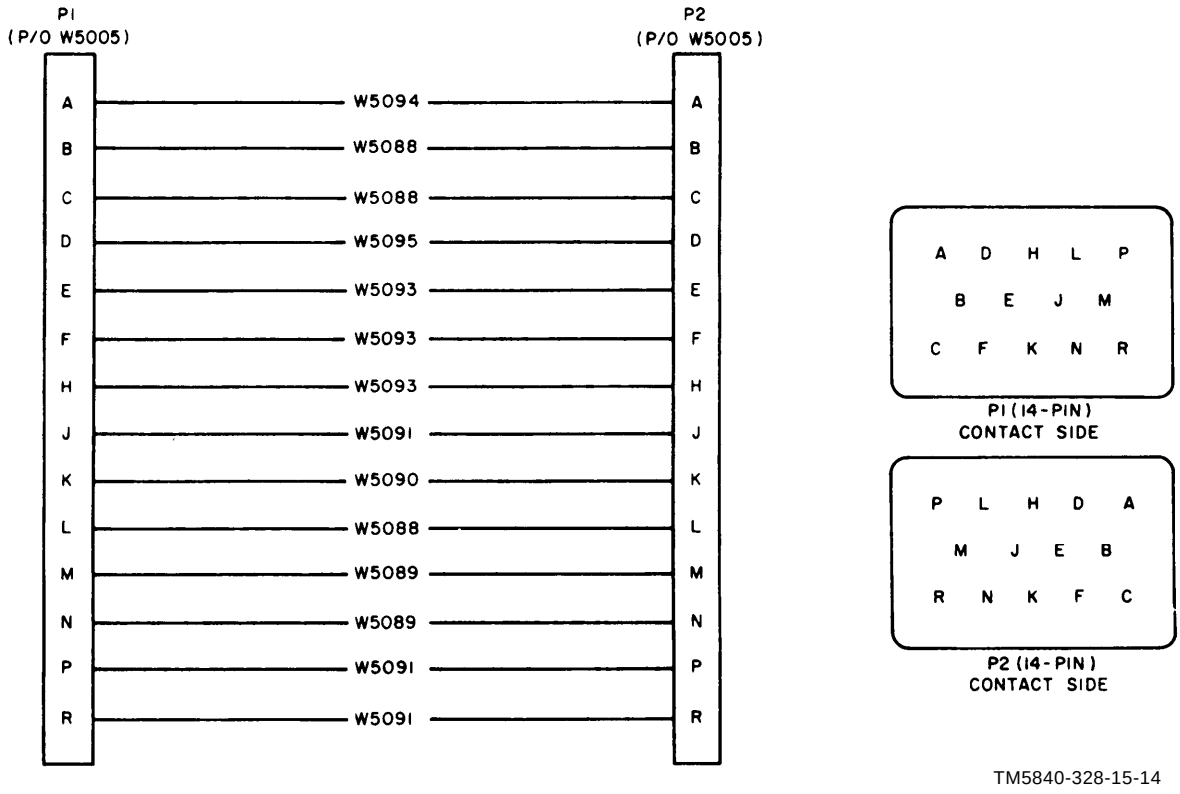


Figure 7-11. Special Purpose Cable Assembly CX–10430/PPS–5, schematic diugram.

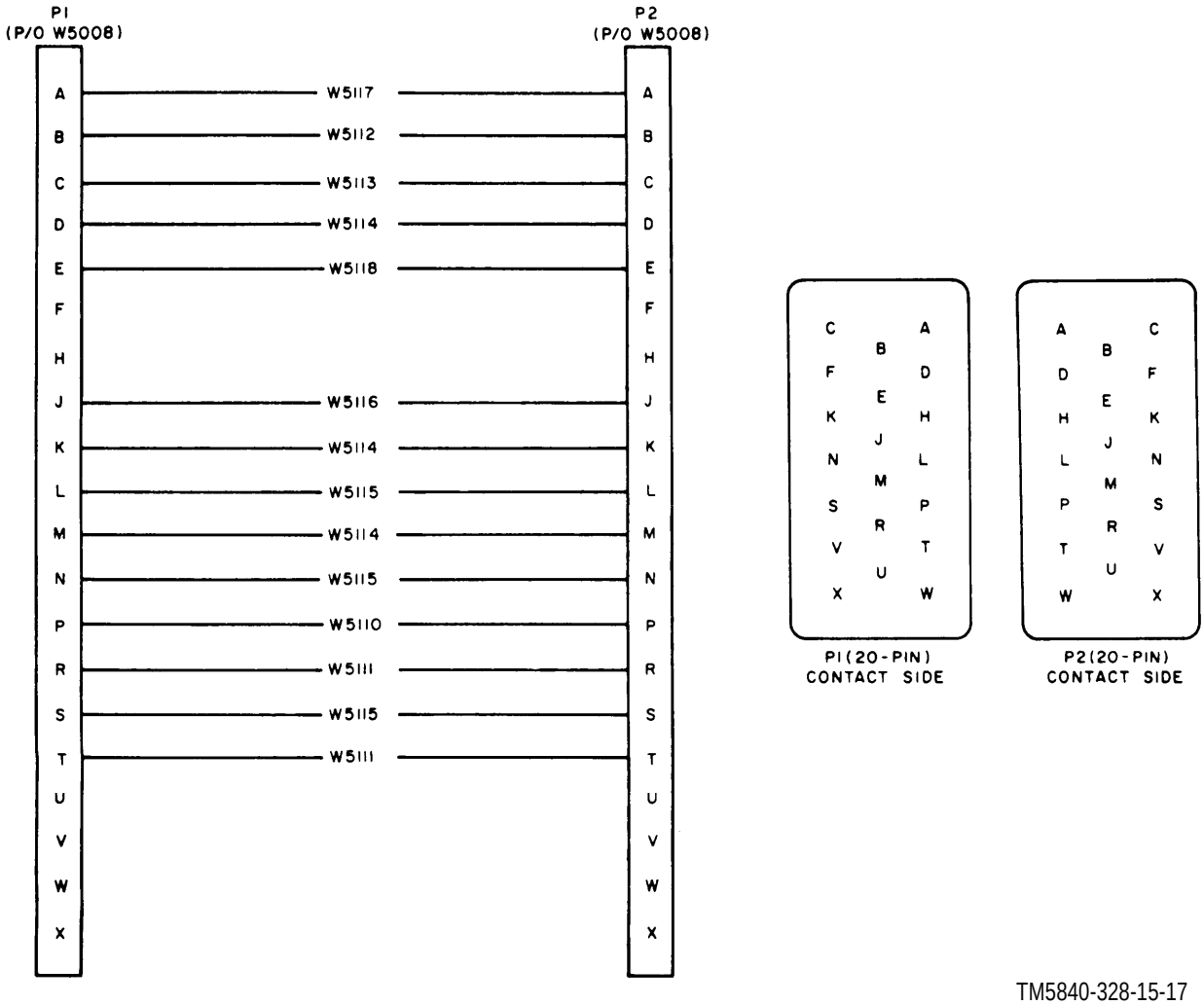


Figure 7–12. Special Purpose Cable Assembly CX–10436/PPPS-5, schematic diagram.

(2) Make sure that ends of wires are clear of surplus solder and are neat and trim.

(3) Feed cable end through loosened strain clamp and cable opening in shell.

(4) With plastic sleeves retracted on wire leads, insert lead ends through eyes of designated terminals on connector body, clinching and soldering each lead as inserted.

(5) Slip plastic sleeves along wire and over terminals.

(6) Reassemble connector, making certain that strain clamp is tightened.

(7) Check cable for correctness, continuity, and shorts before returning cable to service.

c. If repairs require cable replacement, refer to figure 7–13 for wire and circuit details.

(1) Strip end of each wire one-eighth inch.

(2) Insert cable end through shell from clamp end.

(3) Slip 3/8-inch long plastic sleeve over each wire. Retract to keep stripped end of wire clear.

(4) Thread each wire lead through the eye of the designated terminal on the

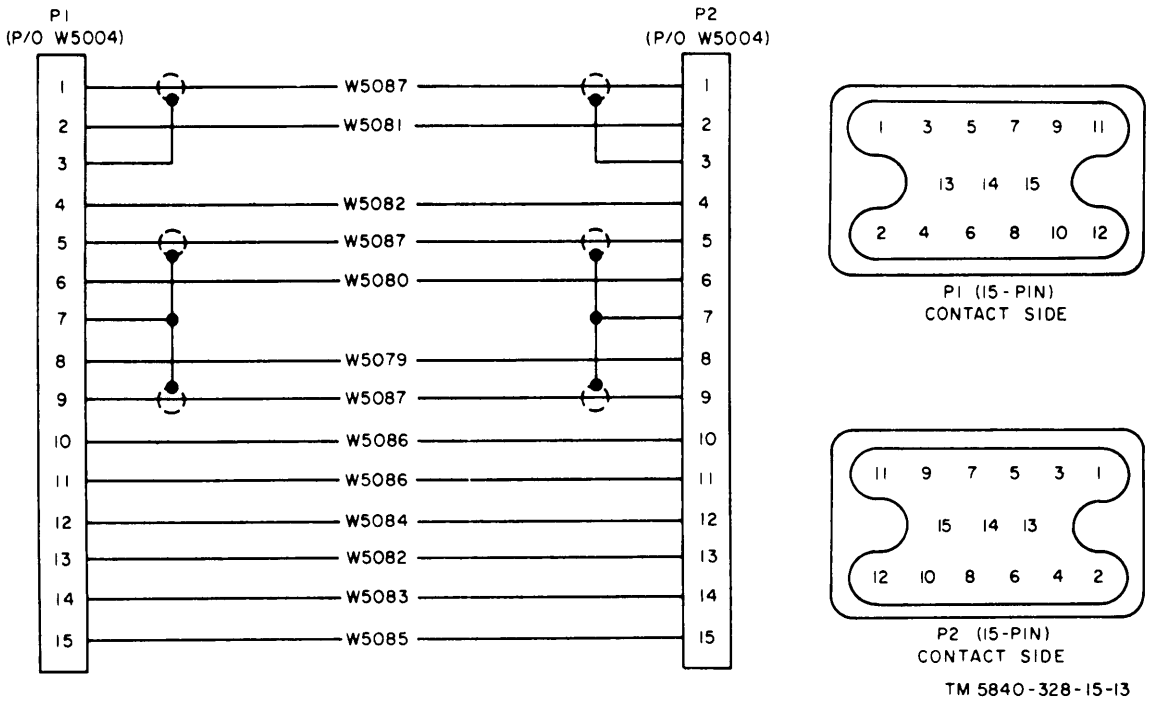


Figure 7-13. Special Purpose Cable Assembly CX-10432/PPS-5, schematic diagram.

connector body, clinching and soldering each lead as inserted.

(5) Slip plastic sleeves along wire and over terminals.

(6) Reassemble each connector, making certain that cable clamp is secure.

(7) Check for correctness, continuity, and shorts before returning the cable to service.

7-11. Cable Assembly CX-10439/PPS-5
(fig. 7-14)

The repair procedure is the same as that given in paragraph 7–10.

7-12. Cable Assembly CX-10443/PPS-5
(fig. 7-15)

a. To detach small connector from cable, refer to paragraph *7-5a(1)* through (8).

b. To replace small connector on cable, refer to paragraph *7-5b(1)* through (7).

c. To detach large connector from cable, refer to paragraph 7-10a(1) through (6).

d. To replace large connector on cable, refer to paragraph 7-10b(1) through (7).

e. To replace small crt socket (not salvageable), proceed as follows:

(1) Clip the wire leads as close to the socket as possible.

(2) Strip each lead end one-eighth inch.

(3) Slip 3/8-inch lengths of plastic sleeving over each lead and place it in a retracted position so that stripped ends of wires are clear.

(4) The connector has two plastic sections with metal contact inserted in the molded section. Solder each wire to the appropriate contact.

(5) Adjust the plastic sleeve on each wire to cover the tab end of the contact.

(6) Cement the plastic backplate to the reverse side of the molded section,

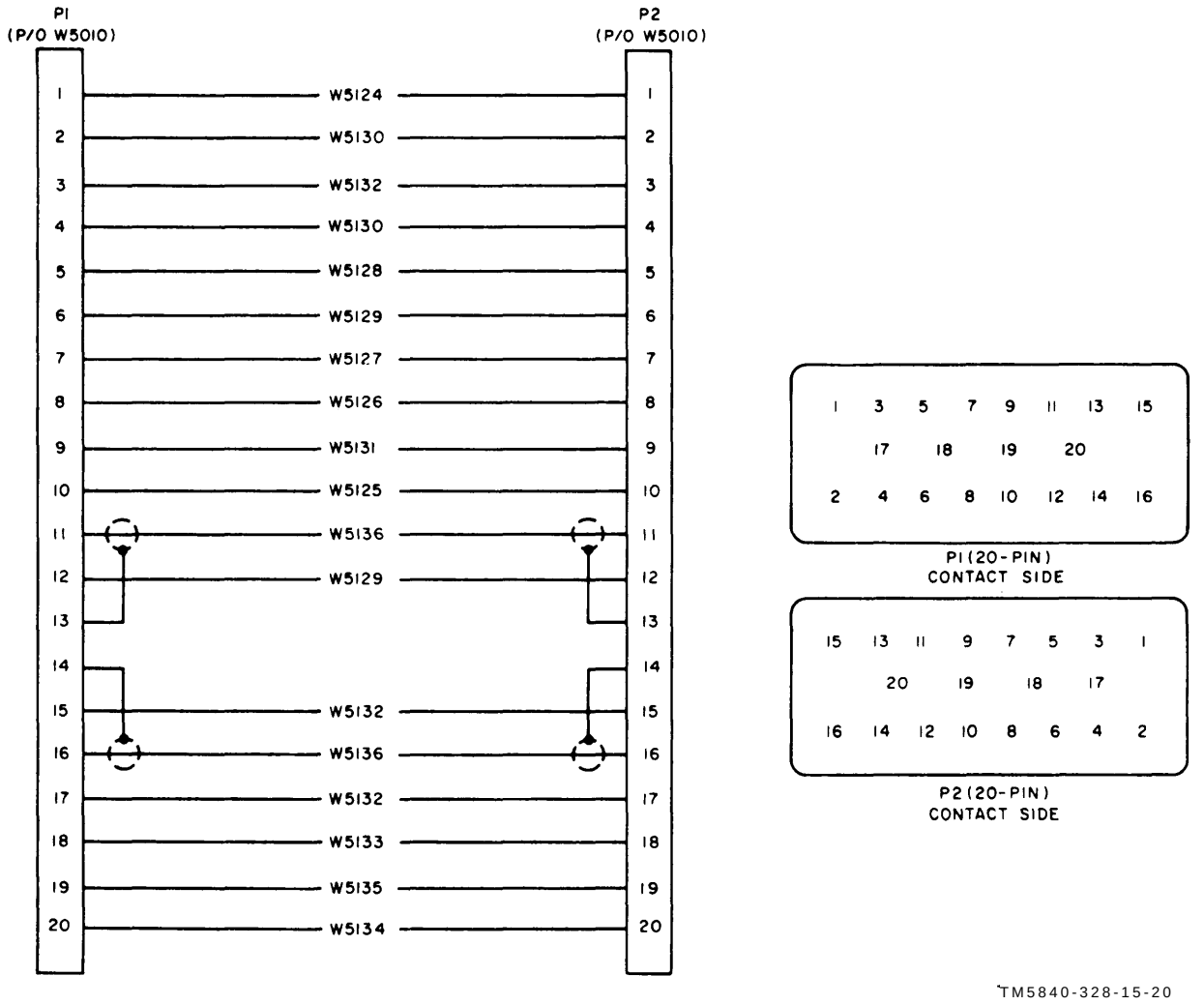


Figure 7-14. Special Purpose Cable Assembly CX-104S9/PPS-5, schematic diagram.

making certain that the keyways in each are in alignment.

f. Replace the large crt socket as follows:

(1) Follow the procedures given in e(l) through (5) above.

(2) Affix plastic backplate to molded section with two machine screws, nuts, and washers.

g. Replace the cable as follows:

(1) Refer to circuit and material details in figure 7–15.

(2) Check circuits for conformity (fig. 7-15) and absence of shorts.

7-13. Rf Cable Assembly CG-3353/U

(fig. 7-16)

a. *BNC Connector Plug.* Replace the connector as follows:

(1) Cut cable as close to connector as possible.

(2) Cut cable off square.

(3) Strip outer Teflon jacket to braid for distance of one-half inch.

(4) Slip clamp nut, washer, gasket, and a second washer back on cable.

(5) Smooth braid out over washers, and bend braid back.

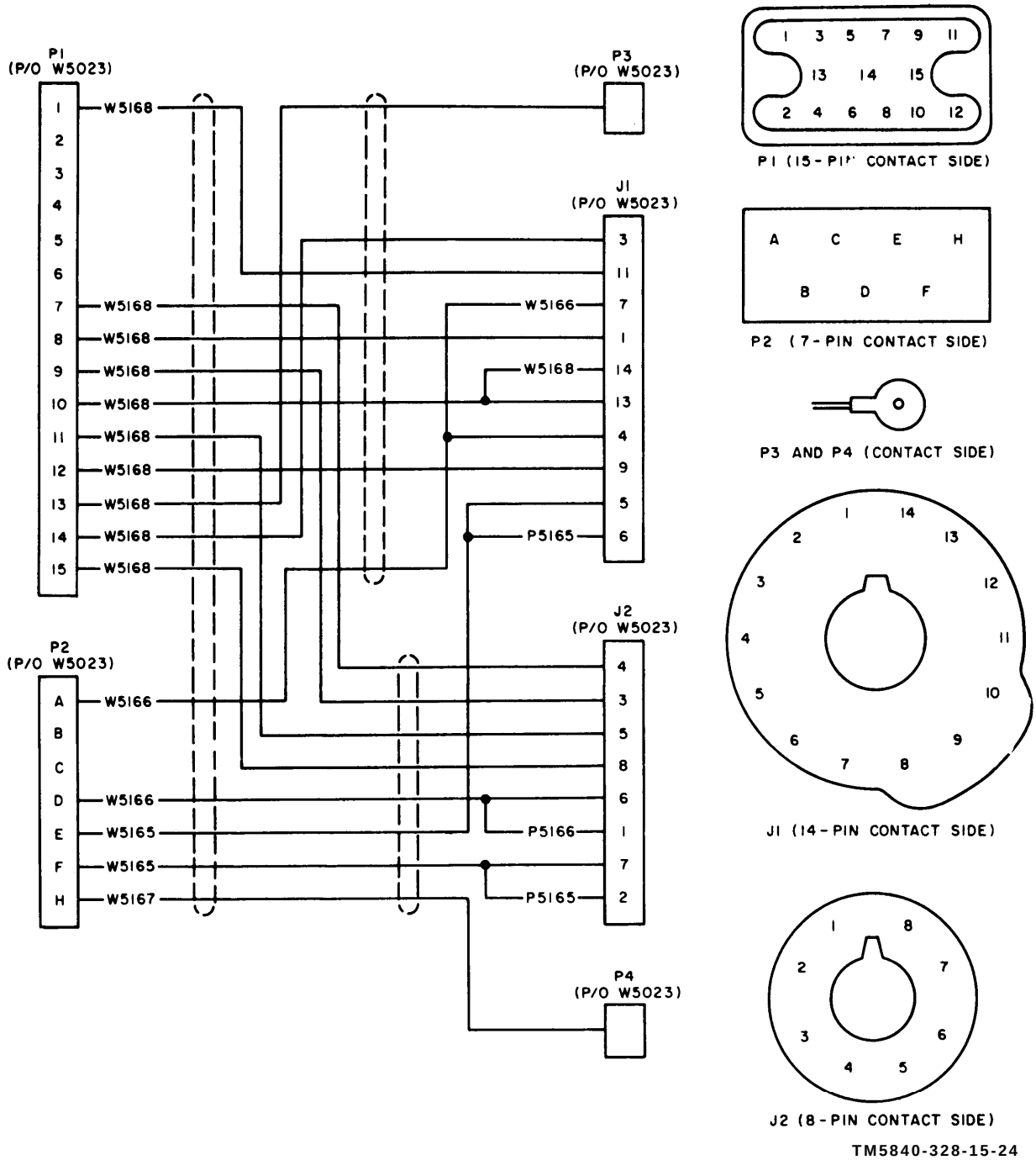


Figure 7-15. Special Purpose Cable Assembly CX-10443/PPS-5, schematic diagram.

With knife, chamfer end of Teflon dielectric.

(7) Hold cable jacket with emery cloth (to keep jacket from slipping), and insert flange sleeve between braid and cable dielectric until flange rests firmly against braid.

(8) Trim braid to diameter slightly smaller than flange.

(9) Trim cable dielectric and center conductor to length of 0.135 inch from flange.

(lo) Trim dielectric to 0.040 inch from flange,

(11) Slip insulator over dielectric until it rests against flange.

(12) Slip contact over wire, and solder with minimum heat.

(13) Slip body over pin, and press washers, gasket, and clamp into body; tighten clamp nut.

b. Miniature Connector Plug. To replace miniature connector plug, use the procedure given in *a* above.

c. *Cable.* Replace cable as follows:

(1) Remove damaged cable from connector by disassembling connectors and unsoldering cable from contacts.

(2) Install new cable on connectors *(a* above).

7-140 Rf Cable Assembly CG-3354/U
(fig. 7-16)

The repair procedure is the same as that given in paragraph 7–13.

7-15. Rf Cable Assembly CG-3355/U
(fig. 7-17)

a. Miniature Connector Plug. To replace miniature connector plug, follow the procedure given in paragraph 7–13a.

b. Cable. The cable can be repaired by cutting it shorter and reconnecting it to the miniature connector plug, but its length cannot be less than 3. inches from adapter end.

c. *Adapter.* To repair adapter, remove epoxy potting, replace resistors as necessary, replace coaxial contact, if necessary, strip back coaxial cable three-eights inch, solder braid of cable to inside wall of adapter, and solder cable conductor to standoff inside adapter. Refill adapter with epoxy resin.

7-16. Special Purpose Cable Assembly CX-104341PPS-5
(fig. 7-18)

Replace connectors as follows:

a. Remove boot from connector.

b. Remove retaining screws.

c. Disassemble connector.

d. Unsolder conductors from contacts.

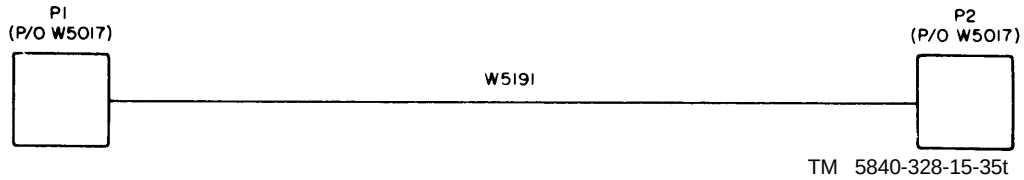


Figure 7-16. Special Purpose Cable Assembly CX-3353/PPS-5, schematic diagram.

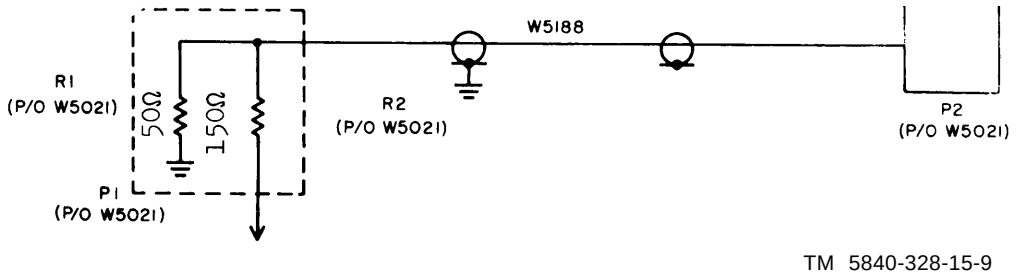


Figure 7-17. Rf Cable Assembly CG-3355/U, schematic diagram.

e. Solder contacts of new connector to conductors.

f. Assemble parts of connector (two halves and a hood) and screw them together.

g. Install new boot by slipping 1 1/2-inch length of No. 2 shrink sleeving over connector, and shrink in place by applying heat.

7-17. Electrical Lead CX-10449/PPS-5
(fig. 7-19)

a. Replace six-contact connector as follows:
(1) Unscrew cap section from terminal body section.
(2) Unsolder red rubber lead from terminal B.
(3) On replacement connector, interconnect terminals A to D and E to F.
(4) Solder red rubber lead to terminal B.
(5) Slip cap section over lead and screw it to terminal body section.

b. Replace single connecting tip as follows:
(1) Unscrew plastic insulting grip from tip.
(2) Unsolder red rubber lead.
(3) Remove discarded fittings.
(4) Slip replacement plastic insulating grip over red rubber lead.
(5) Solder stripped end of red rubber lead to replacement pin section.
(6) Screw fitting together.

c. Replace lead as follows:
(1) Strip insulation one-eighth inch from each end of wire.
(2) Solder and assemble as instructed in *b(1)* through (6) above.

7-18. Special Purpose Electrical Cable Assembly CX-10435/PPS-5
(fig. 7-20)

a. Male Connector. Replace male connector as follows:
(1) Remove epoxy bead that secures plug to shell.
(2) Remove rubber sealing compound from flange end of shell.
(3) Tap connector to loosen it from shell; slide shell back over cable.
(4) Unsolder conductors from connector contacts.
(5) On replacement connector, remove

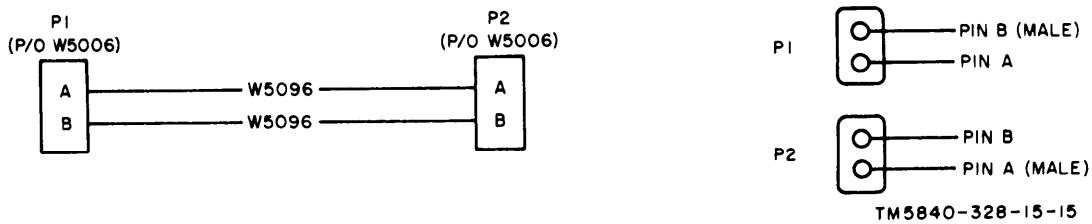


Figure 7-18. Specal purpose *Cable Assembly CX-10434/PPS-5, schematic diagram.*

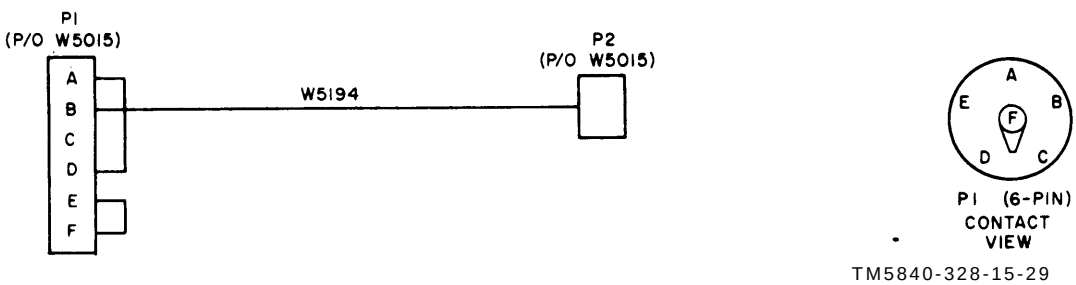


Figure 7-19. Electrical Lead CX-10449/PPS-5, schematic diagram.

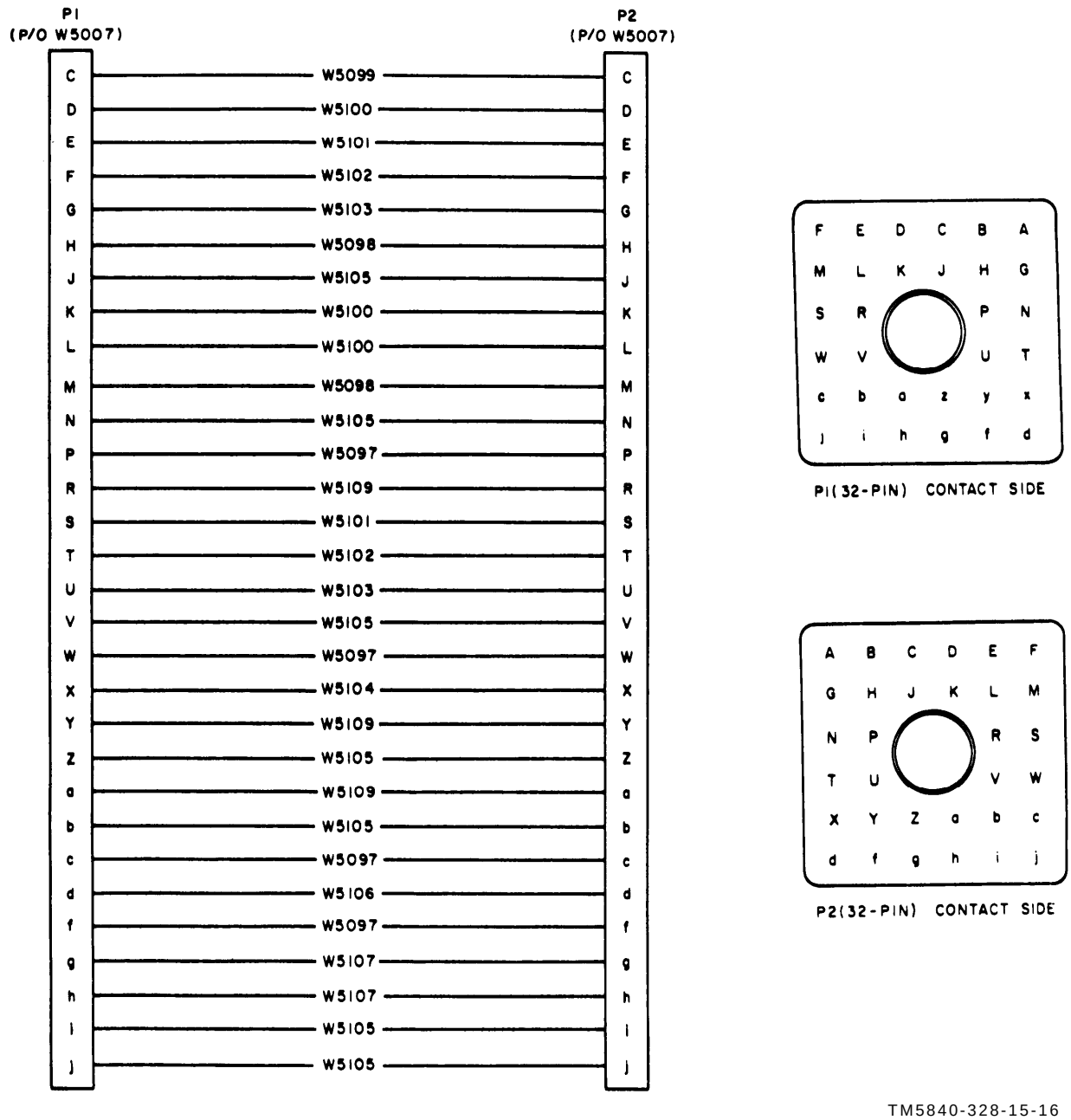


Figure 7-20. Special Purpose Electrical Cable Assembly CX-10435/PPS-5, schematic diagram.

and discard jackscrew and retaining ting.

(6) Solder conductors to replacement connector.

(7) Slide shell over connector; make sure indexing pins align with indexing hole in flange of shell,

(8) Replace epoxy bead to secure connector to shell,

(9) Replace rubber sealing bead at flange end of shell.

b. Female Connector. Replace female connector by using the procedure given in a above, except that there is no jackscrew, and

the locating holes are aligned with the indexing hole in the flange of the shell.

c. Cable, TReplace cable as follows:

(1) Remove connectors from cable as instructed in a(1) through (4) above.

(2) Connect conductors of cable to contacts of connectors, and reassemble connectors as instructed in (5) through (9) above,

7-19. Special Purpose Electrical Cable Assembly CX-10437/PPS-5
(fig, 7-21)

a. Male Connector, Replace connector as follows:

(1) Remove epoxy potting material from connector plate assembly, and disassemble plate assembly, (Note location of connector pin A with respect to plate,)

(2) Unsolder conductors from connector contacts.

(3) Solder cable conductors to contacts of replacement connector,

(4) Reassemble connector to plate assembly, orienting pin A of connector properly to plate,

b. Female Connector. Replace connector by use of the procedure in *a* above.

c. Cable. Replace cable as follows:

(1) Remove connectors from cable as in strutted in a(1) and (2) above.

(2) Install new cable as instructed in *a(3), (4),* and *(5)* above.

7-20. Special Purpose Electrical Cable Assembly CX-10438/PPS-5
(fig, 7-22)

a. Male Connector. Replace male connector as follows:

(1) Note dimensions of epoxy material.

(2) Remove epoxy material,

(3) Remove indexing tab by removing rivets that hold it to printed-circuit board.

(4) Unsolder cable conductors from board.

(5) (Solder replacement connector into replacement printed-circuit board.

(6) Rivet indexing tab to printed-circuit board on same side of board as connector.

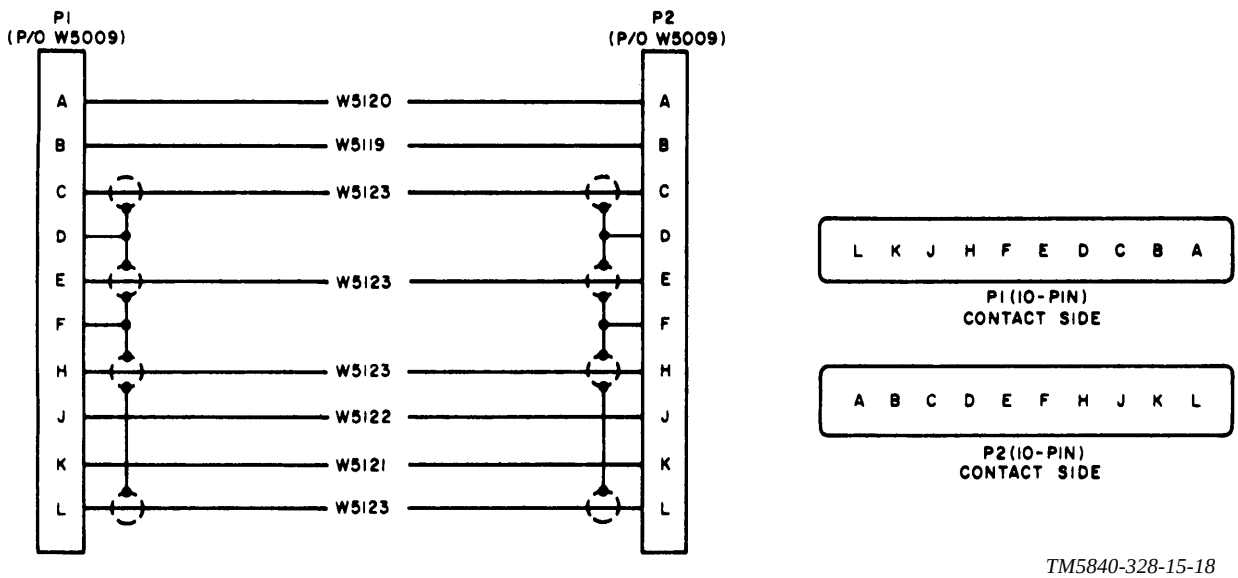


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Figure 7-21, Special Purpose Electrical Cable Assembly CX-10437/PPS-5, schematic diagram.

(7) Solder cable conductors to printed-circuit board terminals.

(8) Replace epoxy material,

b. Female Connector. Replace connector as follows:

(1) Note dimensions of epoxy material and dimensions and location of step.

(2) Remove epoxy material, and remove rubber cushioning from around contact terminals.

(3) Unsolder cable conductors from connector terminals.

(4) Solder cable conductors to replacement connector.

(5) Install new rubber cushioning around connector terminals.

(6) Replace epoxy material, and machine step on epoxy material at front of connector in location noted in (1) above.

c. Cable. Replace cable as follows:

(1) Remove connectors from cable as instrutted in a(l) through (4) and b(l), (2), and (3) above.

(2) Connect replacement cable to connectors as instructed in a(5) through (8) and b(4), (5), and (6) above.

7-21. Electrical Lead CX-10452/PP5-S

(fig. 7-23)

a. To replace either end fitting, proceed as follows:

(1) Unscrew plastic insulating grip form tip.

(2) Unsolder rubber covered wire from tip,

(3) Remove discarded fitting.

(4) Slip replacement plastic insulating grip on wire,

(5) Solder end of wire to replacement tip.

(6) Screw sections of fitting together.

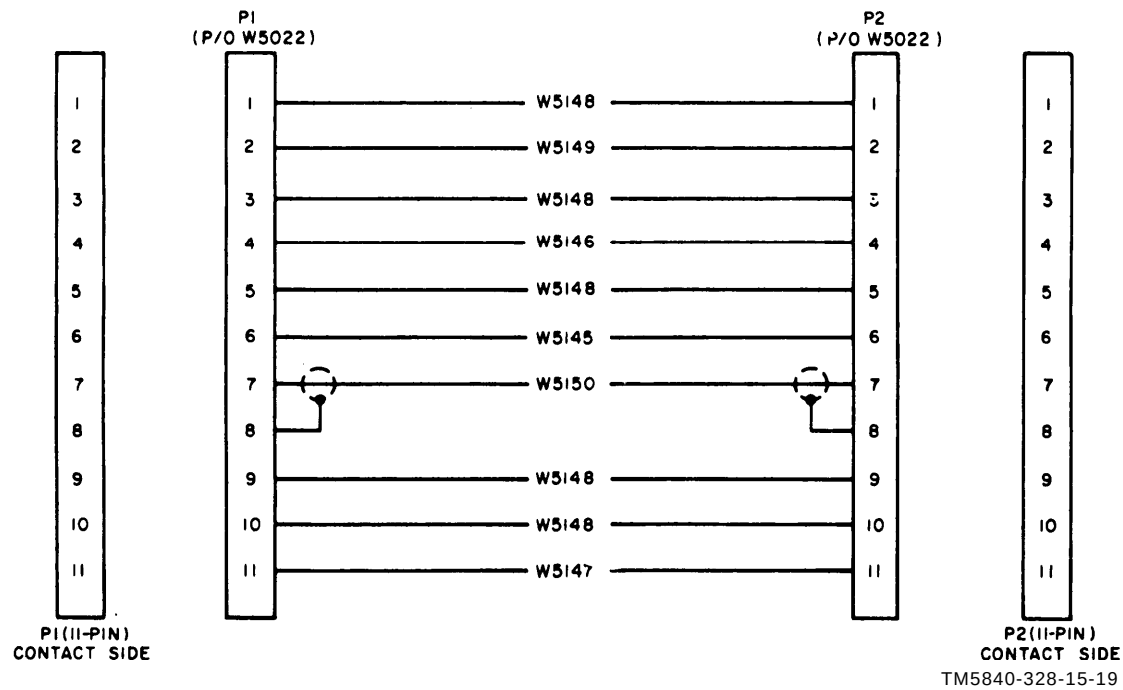


Figure 7-22. Special Purpose Cable Assembly CX-10438/PPS-5, schematic diagram.

b. To replace rubber covered wire, proceed as follows:

(1) Strip each end one-eighth inch and tin.

(2) Assemble to fittings as outlined in a(l) through (6) above.

7-22. Electrical Lead CX-10448/PPS–5
(fig, 7-24)

The repair procedure is given in paragraph 7-21.

7-23. Special Purpose Electrical Cable Assembly CX-10440/PPS-5
(fig. 7-25)

a. Male Connector. Replace connector as follows:

(1) Note dimensions of epoxy material.

(2) Remove epoxy material and rubber cushioning around terminals of connector contacts.

(3) Unsolder cable conductors from contacts of connector.

(4) On replacement connector, remove and discard contacts J, L, M, N, R, and V.

(5) Solder cable conductors to replacement connector.

(6) Install new rubber cushioning material around connector terminals.

(7) Replace epoxy material; maintain dimensions noted in (1) above.

b. Female Connector. Replace connector by using the procedure given in a(1) through (7) above.

c. Cable. Replace cable as follows:

(1) Remove connectors from cable as outlined in a(l), *(2),* and (3) above.

(2) Connect conductors of replacement cable to connectors as outlined in *a(4)* through (7) above.

7-24. Special Purpose Branched Electrical Cable Assembly CX-10441/PPS-5
(fig. 7-26)

a. Male Connector. Replace connector as follows:

(1) Note relationship of connectors to plate; disassemble index plate assembly.

(2) Note dimensions of epoxy material; remove epoxy material from connectors. (Salvage threaded inserts in epoxy.)

(3) Unsolder cable conductors from printed-circuit boards.

(4) Solder replacement connectors to replacement printed-circuit boards.

(5) Solder cable conductors to boards.

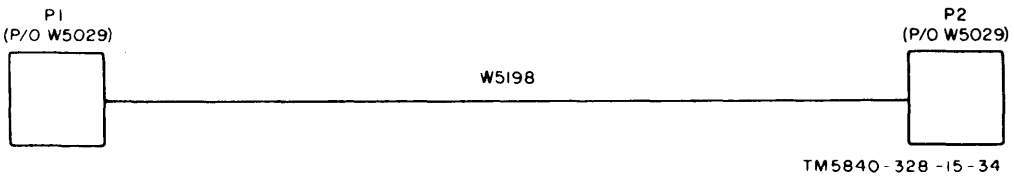


Figure 7-23. Electrical Lead CX-10452/PPS-5, schematic diagram.

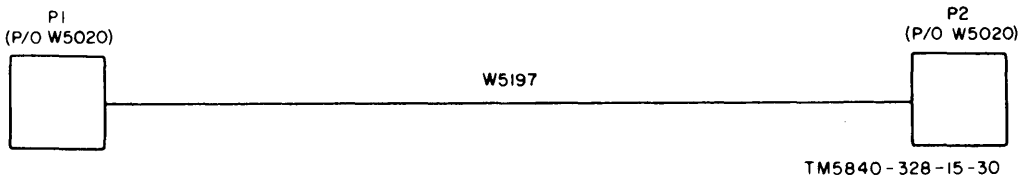


Figure 7-24. Electrical Lead CX-10448/PPS-5, schematic diagram.t

(6) Embed connectors in epoxy of sizes noted in (2) above, with threaded inserts correctly located.

(7) Install connectors in plate assembly with connectors correctly located with respect to index notch.

b. Female Connector. Replace connector as follows:

(1) Note relationship of connectors and their contacts with respect to the plate assembly; disassemble the plate assembly.

(2) Note dimensions of epoxy blocks; remove epoxy from connectors. (Salvage threaded inserts.)

(3) Unsolder cable conductors from printed-circuit boards.

(4) Unsolder printed-circuit board terminals from connector terminals,

(5) Solder replacement connectors to printed-circuit boards.

(6) Solder cable conductors to terminals of printed-circuit boards.

(7) Embed connectors in epoxy of sizes noted in (2) above, with threaded inserts correctly located.

(8) Install connectors in plate assembly, with connectors located as noted in (1) above.

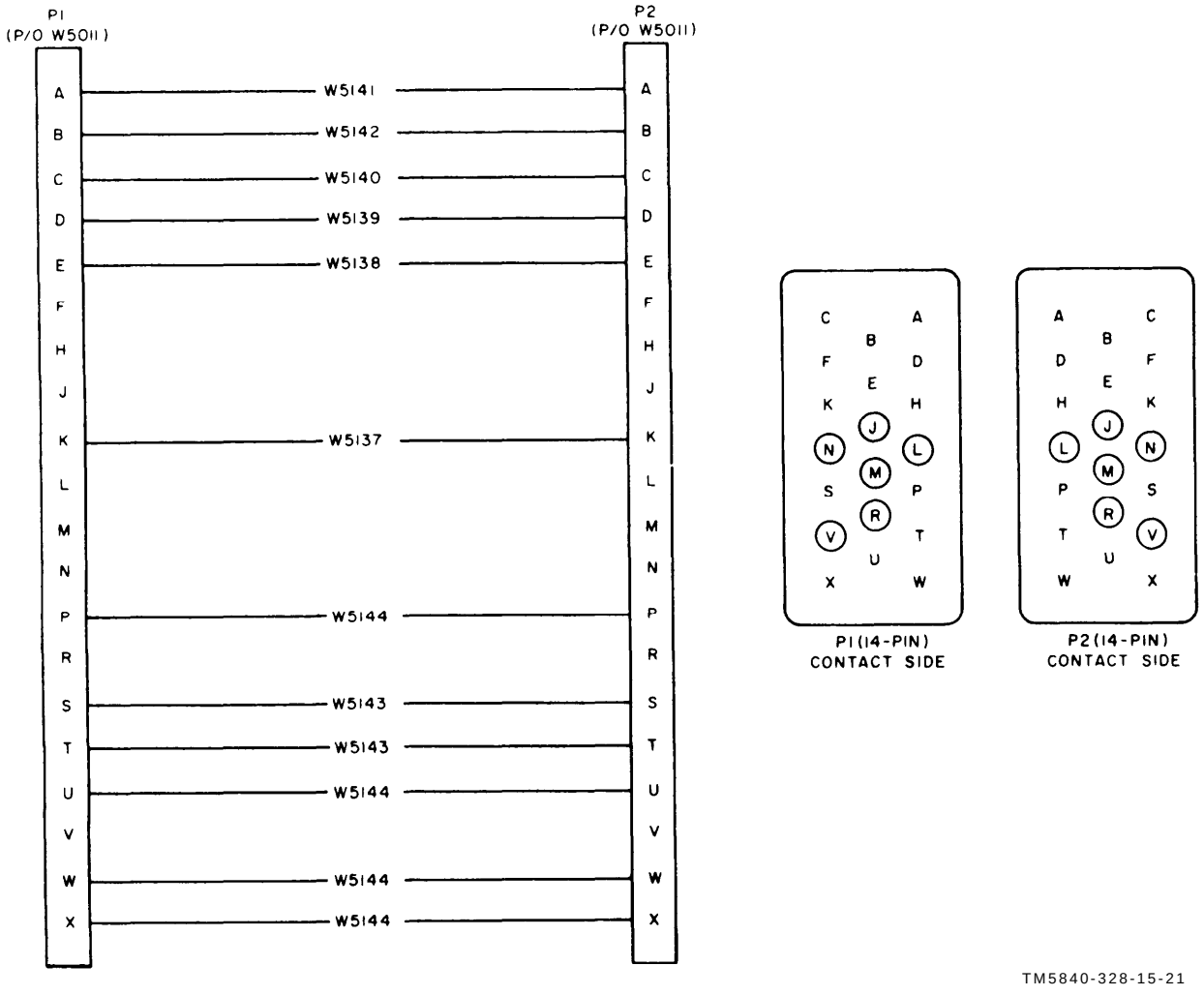


Figure 7-25. Special Purpose Cable Assembly CX-10440/PPS–5, schematic diagram.

c. Cable. Replace cable as follows:

(1) Disconnect connectors from cable as directed in a(l), (2), and (3) and b(l) through (4) above.

(2) Connect replacement cable to connectors as directed in a(4) through (7) and b(5) through (8) above.

7-25. Electrical Lead CX-10446/PPS–5

(fig. 7-27)

The repair procedure is same as that given in paragraph 7–21.

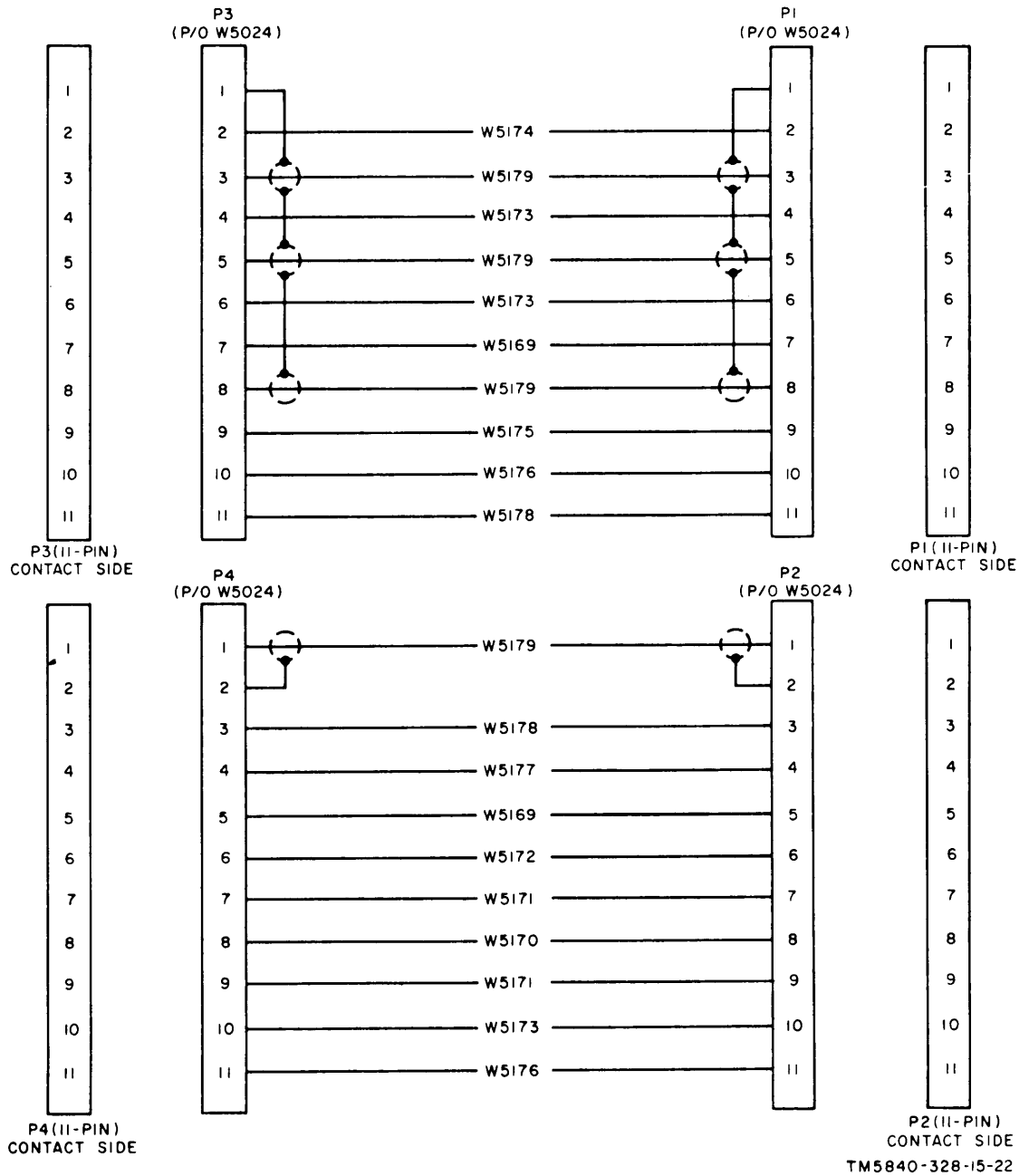


Figure 7–26. Special Purpose Branched Cable Assembly CX-10441/PPS–5 schematic diagram.

7-26. Electrical Lead CX-I0450/PPS-5
(fig. 7-28)

The repair procedure is the same as that given in paragraph 7-21.

7–27. Electrical Lead CX–10447/PPS-5
(fig. 7-29)

The repair procedure is the same as that given in paragraph 7–21.

7-28. Electrical Lead CX-10451/PPS-5
(fig. 7-30)

The repair procedure is the same as that given in paragraph 7–21.

7-29. Special Purpose Branched Electrical Cable Assembly CX-10442/PPS-5
(fig. 7-31)

a. Male Connector. Replace connector as follows:

(1) Note the distance (within 0.010 inch) from pin 22 of one male connector to pin 11 of the other, the dimensions of the epoxy blocks in which the connectors are embedded, and the location of the indexing plate.

(2) Remove the indexing plates; use a 50 watt soldering iron to remove the epoxy from the connectors. Brush away residue.

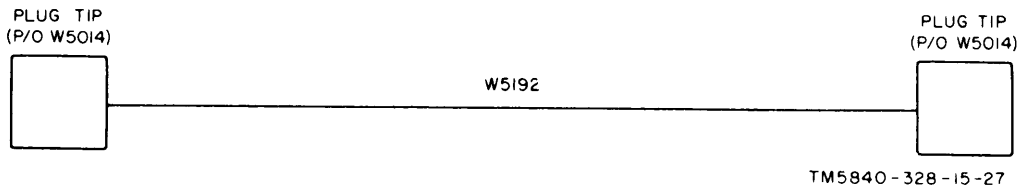


Figure 7-27. Electrical Lead CX-10446/PPS-5, schematic diagram

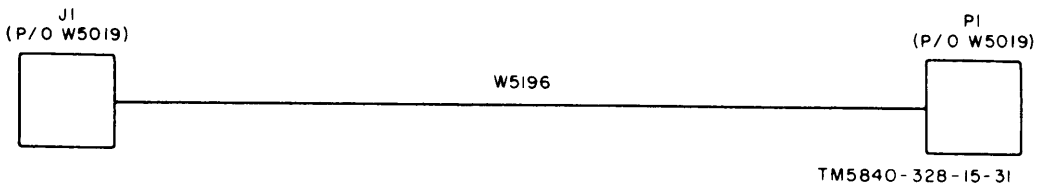


Figure 7-28. Electrical Lead CX-10450/PPS-5, schematic diagram.

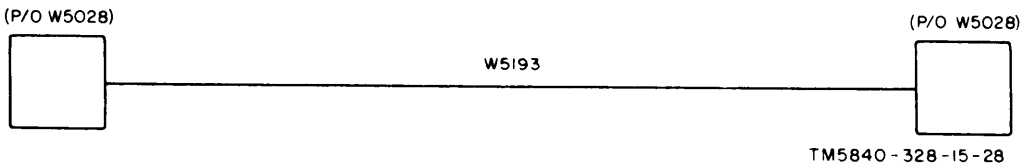


Figure 7-29. Electrical Lead CX-10447/PPS-5, schematic diagram.

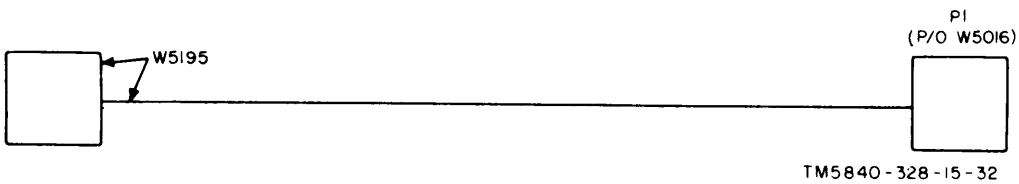


Figure 7-30. Electrical Lead CX-10451/PPS-5, schematic diagram.

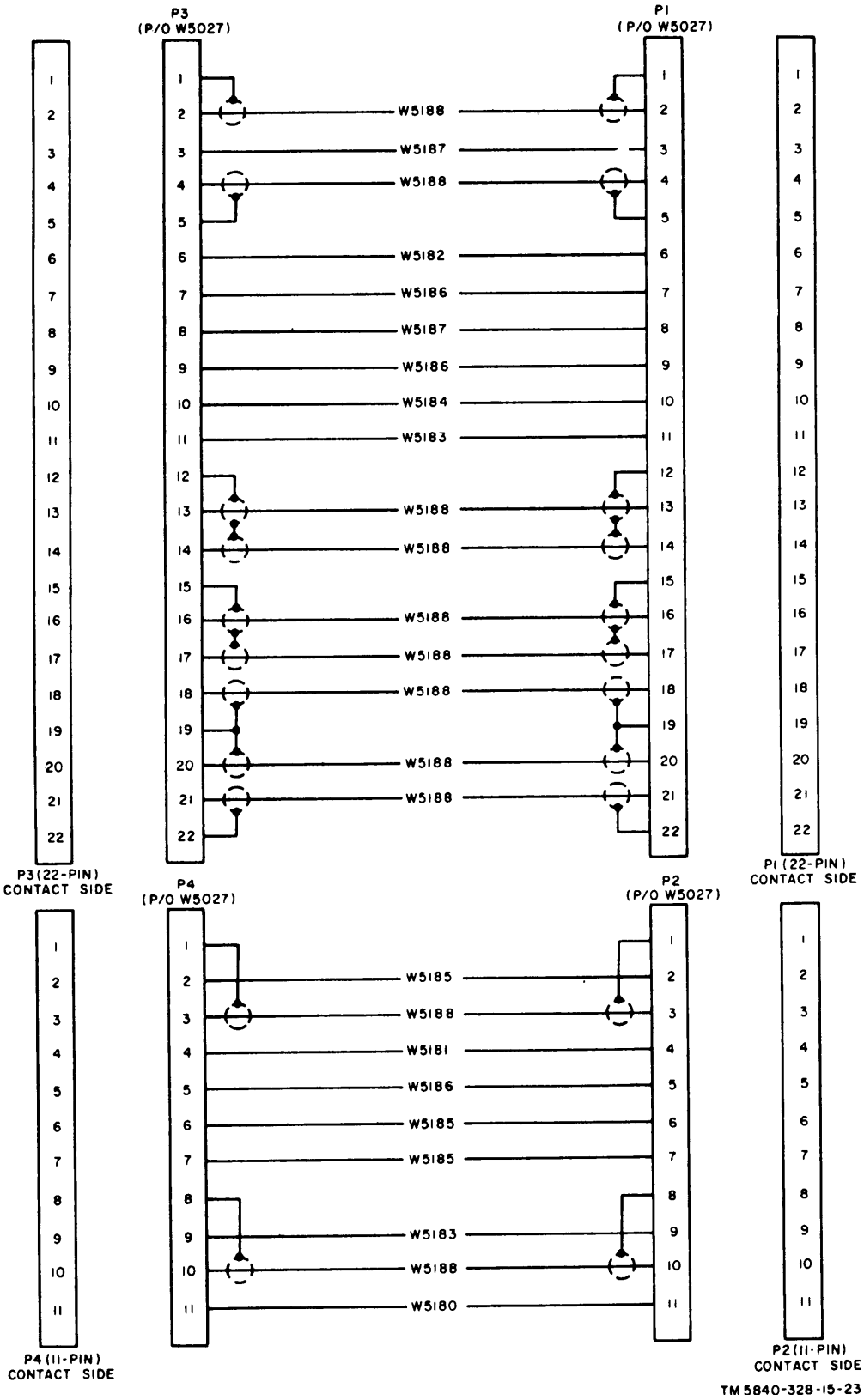


Figure 7-31. Special Purpose Branched Electrical Cable Assembly CX-10442/PPS-5, schematic diagram.

(3) Unsolder the cable conductors from the terminals of the connectors.

(4) Solder the cable conductors to the terminals of the replacement connectors.

(5) Embed the connectors in epoxy having dimensions noted in (1) above. Pin 22 of one male connector should be the same distance from pin 11 as noted in (1) above.

(6) Install the indexing plate as noted in (1) above.

b. Female Connector. Replace the connector as follows:

(1) Note the distance from contact 22 of one connector to pin 11 of the other, note the dimensions of the epoxy block in which connectors are embedded.

(2) Remove the epoxy from the connectors, and remove the rubber cushioning from around the connector terminals.

(3) Unsolder the cable conductors from the connector terminals.

(4) Solder the cable conductors to the terminals of the replacement connectors.

(5) Install rubber cushioning around the terminal of the connectors.

(6) Embed the connectors in epoxy having same dimensions noted in (1) above. Pin 22 of one connector should be the same distance from pin 11 of the other as noted in (1) above.

c. Cable. Replace the cable as follows:

(1) Disconnect the connectors from the cable as directed in b(l), (2), and (3) above.

(2) Connect replacement cable to connectors as directed in a(4), (5), and (6) and b(4), (5), and (6) above.

7-30. Special Purpose Electrical Cable Assembly CX-10444/PPS-5

(fig. 7-32)

a. Male Connector. Replace male connector as follows:

(1) Note dimensions of epoxy material.

(2) Remove epoxy material from connector.

(3) Unsolder cable conductors from printed-circuit board.

(4) Solder replacement connector into replacement printed-circuit board.

(5) Solder cable conductors to printed-circuit board terminals.

(6) Embed connector in epoxy material with dimensions noted in (1) above.

b. Female Connector. Replace connector as follows:

(1) Note dimensions of epoxy material.

(2) Remove epoxy material from connector, and remove rubber cushioning from around contact terminals.

(3) Unsolder cable conductors from connector terminals.

(4) Solder cable conductors to replacement connector.

(5) Install new rubber cushioning around connector terminals.

(6) Embed connector in epoxy material with dimensions noted in (1) above.

c. Cable. Replace cable as follows:

(1) Remove connectors from cable as outlined in *a* and b(l), (2), and (3) above.

(2) Connect replacement cable to connectors as outlined in a and b(4), (5), and (6) above,

7-31. Special Purpose Electrical Cable Assembly CX–10445/PPS-5

(fig. 7-33)

a. Male Connector. Replace male connector as follows:

(1) Note location of index tab with respect to connector, and note dimensions of epoxy material.

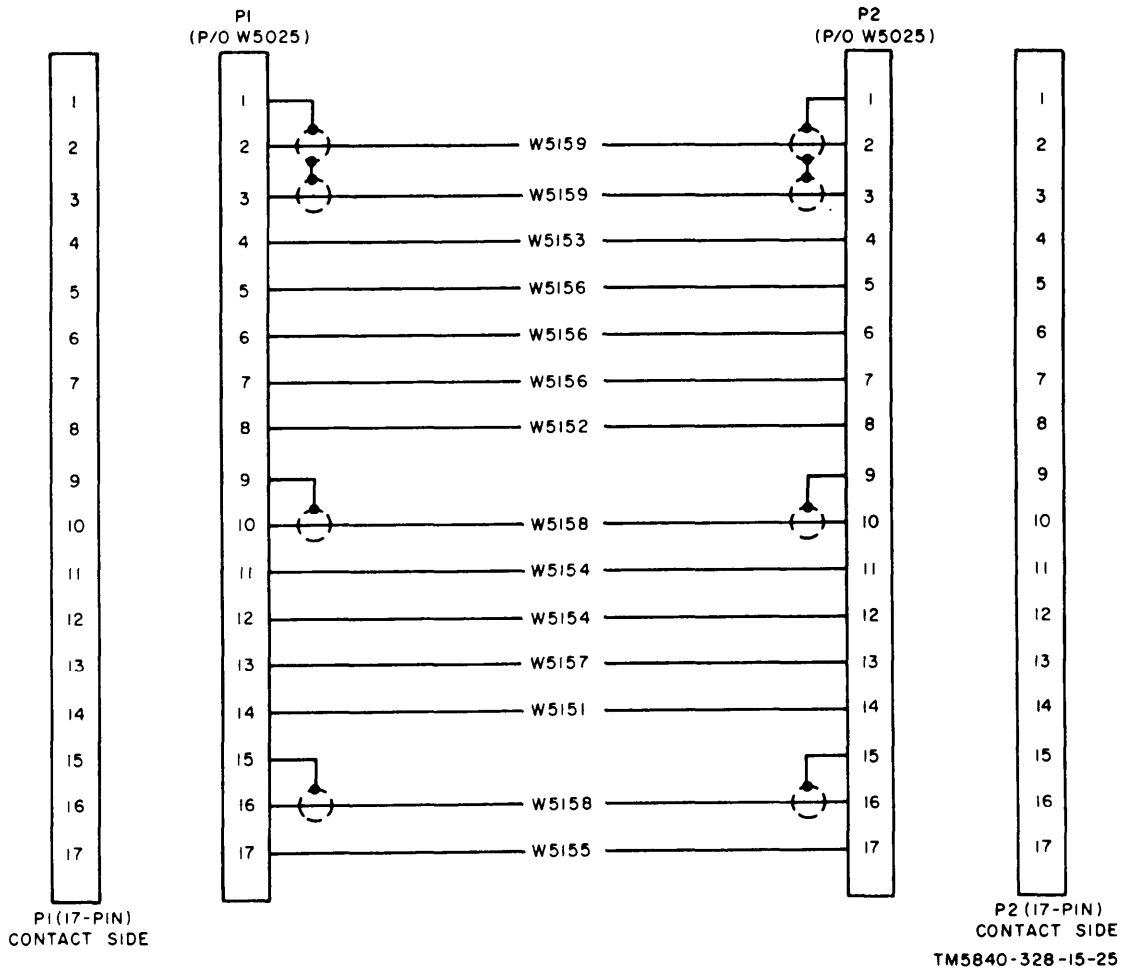


Figure 7-32. Special Purpose Branched Cable Assembly CX-1044/PPS-5, schematic diagram.

(2) Remove epoxy material.

(3) Remove indexing tab by removing rivets that hold it to printed-circuit board.

(4) Unsolder cable connectors from board.

(5) Solder replacement connector into replacement printed-circuit board.

(6) Rivet indexing tab to printed-circuit board on opposite side of board from connector.

(7) Solder cable conductors to printed-circuit board terminals.

(8) Embed connector in epoxy material with dimensions noted in (1) above.

b. Female Connector. Replace connector as follows:

(1) Note dimensions of epoxy material and location of inserts.

(2) Remove epoxy material and rubber cushioning from around contact terminals; salvage the inserts.

(3) Unsolder cable conductors from connector terminals.

(4) Solder cable conductors to replacement connector.

(5) Install new rubber cushioning around connector terminals.

(6) Embed connector in epoxy material with dimensions noted in (1) above.

c. *Cable.* Replace cable as follows:

(1) Remove connectors from cable as outlined in a(l) through (4) and b(l), (2), and (3) above.

(2) Connect replacement cable to connectors as outlined in *a(5)* through (8) and *b(4),* (5), and (6) above.

7-32. Special Purpose Branched Electrical Cable Assembly CX-10485/PPS-5

(fig. 7-34)

a. Miniature Coaxial Connector. Replace the connector as described in paragraph 7–13a.

b. Pin Plug (on Rubber-Covered Wire). Replace the pin plug as follows:

(1) Unscrew plastic insulating grip from plug.

(2) Unsolder rubber-covered wire from tip of plug.

(3) Remove plug.

(4) Slip plastic insulating grip of replacement plug on wire.

(5) Solder end of wire to tip of replacement plug.

(6) Screw sections of plug together.

c. *Pin Plug (on Coaxial Cable).* Replace the pin plug as follows:

(1) Unscrew plastic insulating grip from plug.

(2) Unsolder center conductor of coaxial cable from tip of plug.

(3) Remove plug.

(4) Slip plastic insulating grip of replacement plug on coaxial cable.

(5) Solder end of center conductor of coaxial cable to tip of replacement plug.

(6) Screw sections of plug together.

d. Coaxial Cable. Replace the coaxial cable as follows:

(1) Note length of cable.

(2) Remove pin plug from cable as described in c(l), (2), and (3) above.

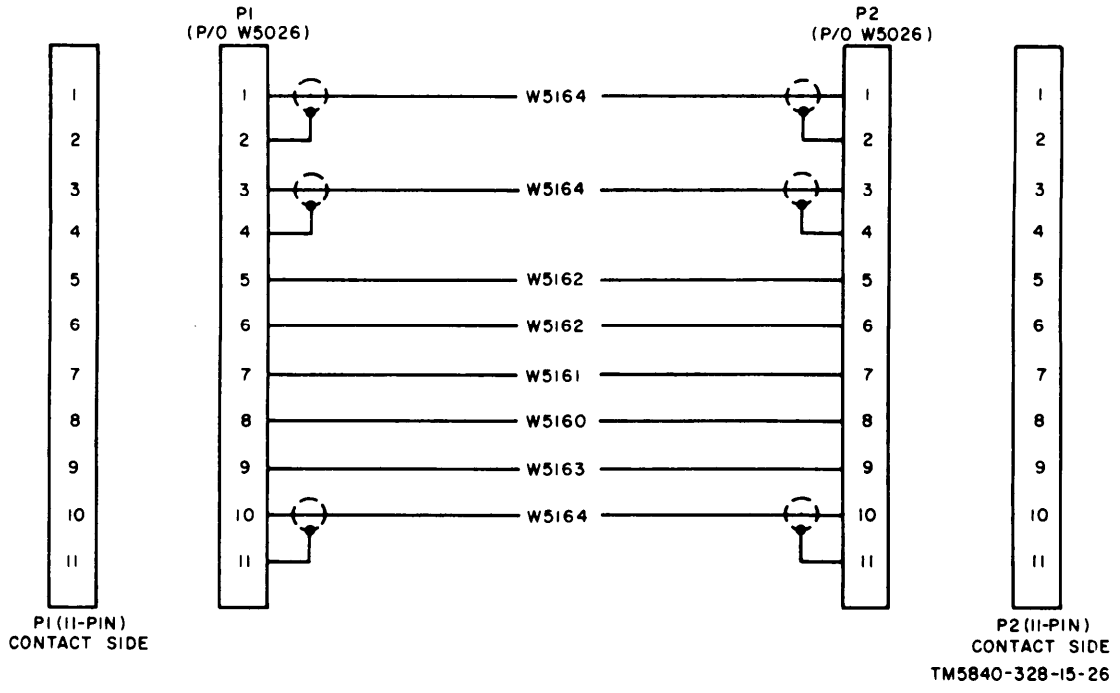


Figure 7-33. Special Purpose Branched Cable Assembly CX-10445/PPS-5, schematic diagram.

(3) Remove coaxial connector from cable by disassembling the connector body and unsoldering the center conductor of the cable from the connector contact.

(4) Remove the shrink sleeving from the joint of the coaxial cable and the rubber-covered wire.

(5) Unsolder shield of coaxial cable from wire.

(6) Cut replacement coaxial cable to length noted in (1) above.

(7) Install coaxial connector on replacement coaxial cable as described in paragraph 7–13c.

(8) At the midpoint of the coaxial cable, strip away one-quarter inch of the outer jacket.

(9) Wrap end of rubber-covered wire around the exposed one-quarter inch of coaxial cable shield, and solder the wire to the shield.

(10) Slip new shrink sleeving (about 1-inch length) over joint.

(11) Cut off outer jacket and braid one-half inch from other end of cable.

(12) Strip center insulation back one-quarter inch from end of cable.

(13) Slip plastic insulating grip of pin plug over cable.

(14) Solder center conductor of coaxial cable to contact pin.

(15) Screw pin and plug sections together.

e. Rubber-Covered Wire. Replace the rubber-covered wire as follows:

(1) Note length of wire.

(2) Remove pin plug from wire by unscrewing plastic insulating grip from pin plug and unsoldering the contact pin from the wire.

(3) Remove shrink sleeving from joint of wire and coaxial cable.

(4) Unsolder the wire from the shield of the coaxial cable.

(5) Cut new wire to length noted in (1) above.

(6) Strip back insulation from one-half inch from end of wire.

(7) Wrap end of wire around exposed 1/4-inch length of shield on coaxial cable.

(8) Solder wire to coaxial cable shield.

(9) Remove the pin plug from the coaxial cable as described in c(1), *(2),* and (3) above.

(l0) Slide new shrink sleeving (about 1-inch length) over the joint.

(11) Install pin plug on coaxial cable as described in c(4), (5), and (6) above.

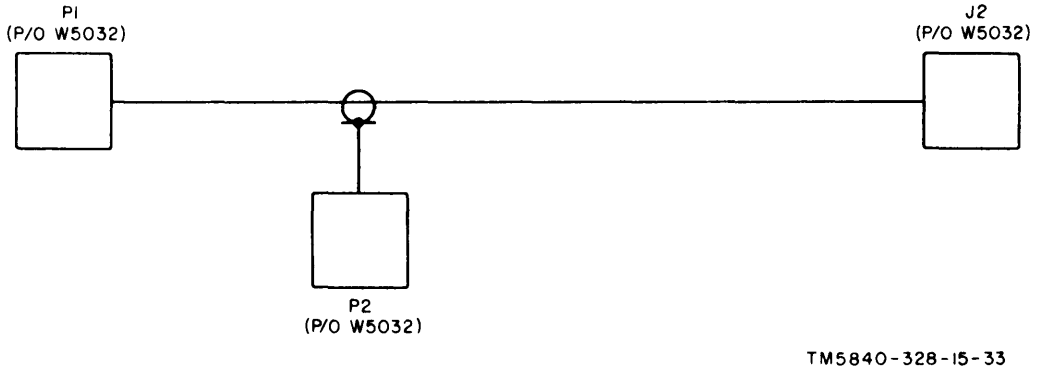


Figure 7-34. Special Purpose Branched Cable Assembly CX-104485/PPS -5, schematic diagram..

7-33. Special Purpose Electrical Cable Assembly CX-12067/U

(fig. 7-35)

a. *Telephone Plug*. Replace the telephone plug as follows:

(1) Unscrew housing from stem, and slide housing back along wires to obtain access to terminals.

(2) Remove terminal screws, and discard screws, plug, and housing.

(3) Unscrew housing from replacement plug, and slide housing onto wires.

(4) Remove terminal screws of replacement plug, and discard lugs.

NOTE

If lugs on wires have been damaged, replace them with new lugs supplied with replacement plug.

(5) Using screws, connect black wire to terminal of plug tip, and connect white wire to terminal of plug stem.

(6) Screw housing on plug.

b. Connector. Replace the connector (fig. 7-36) as follows:

(1) Unscrew gland nut from adapter nut, then slide gland nut, cable spring, clamp washer, and bushing washer back along wires.

(2) Unscrew adapter nut from receptacle shell, then slide adapter nut, sealing gasket, and load ring back along wires.

(3) Push insert out of shell.

(4) Unsolder wires from solder cups.

(5) Slide load ring, sealing gasket, clamp washer, cable spring, and gland nut off wires.

(6) Slide replacement connector gland nut, cable spring, clamp washer, bushing gasket, adapter nut, sealing gasket, and load ring onto wires.

(7) Solder black wire to cup A and white wire to cup B.

(8) Check that the wires are soldered securely and deeply enough in the cups so that no bare wire is exposed between the insert and the thermofit tubing.

NOTE

The following step will require firm manipulation, but not forcing, because of the tight fit between the rubber ring on the insert and the inside of the shell.

(9) Align key on inside of shell with keyway in insert, then push insert fully into shell.

NOTE

The tips o f the electrical contacts should project almost to the level of the end of the shell when the insert is pushed fully in.

(10) Assembly load ring and sealing gasket into threaded end of shell.

(11) Screw adapter nut fully into threaded end of shell, until none of nut thread is visible.

NOTE

If the adapter nut cannot be screwed into the shell fully, as described, it may be because the insert was not properly aligned and seated inside the shell. Disassemble the parts, and repeat step (9).

(12) Assembly bushing gasket and clamp washer into internally threaded end of adapter nut, then screw gland nut into adapter nut.

c. Cable. Replace the cable as follows:

(1) Remove telephone plug from cable. Save terminal screws, and unsolder and save lugs.

(2) Remove connector from cable as in b(1) through (5) above.

(3) Solder two lugs to wires at one end of replacement cable, then connect them to telephone plug: black wire to tip terminal, white wire to stem terminal.

(4) Connect other end of replacement cable to 5-contact connector as described in b(6) through (12) above.

7-34. Special Purpose Branched Electrical Cable Assembly CX-10441A/PPS-5

Follow the repair procedure in paragraph 7-24, and refer to the schematic diagram in figure 7-26.

7-35. Special Purpose Electrical Cable Assembly CX-10444A/PPS-5

Follow the repair procedure in paragraph 7-30, and refer to the schematic diagram in figure 7–32.

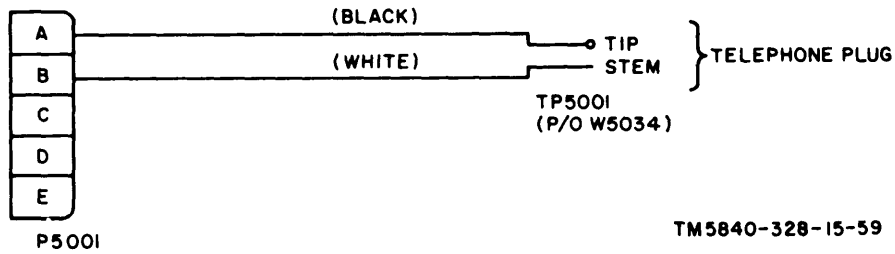


Figure 7–35. Special Purpose Electrical Cable Assembly CX-12067/U, schematic diagram.

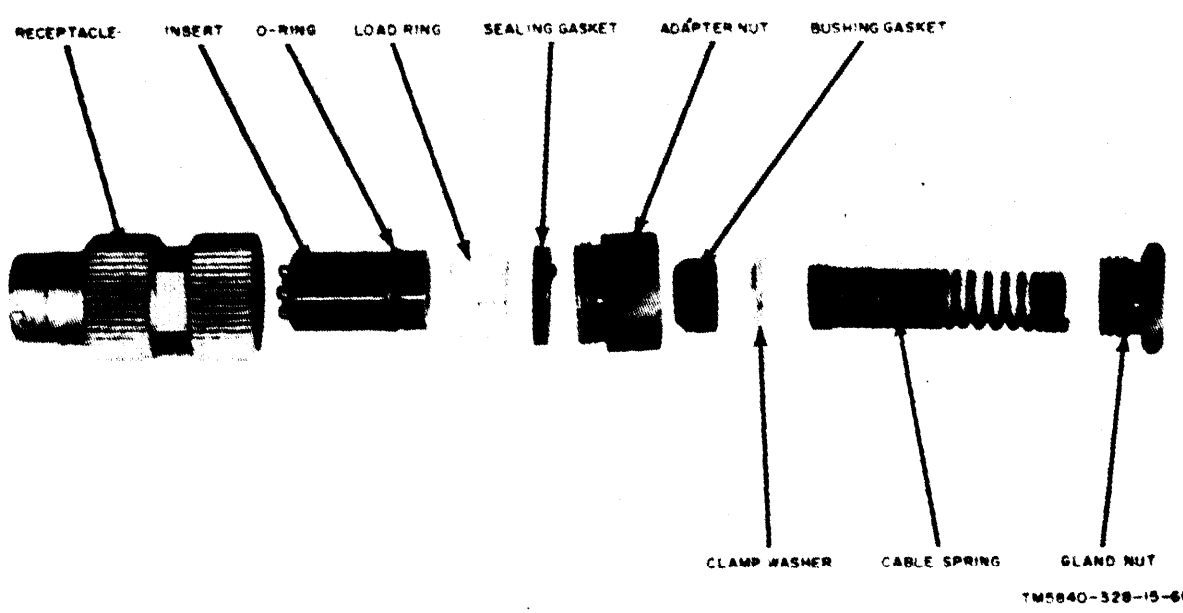


Figure 7-36. Miniature Audio Connector Assembly U-228/U, exploded view.

CHAPTER 8

GENERAL SUPPORT TESTING PROCEDURES

8-1. General Instructions

a. Testing procedures are prepared for use by Signal Field Maintenance Shops and Signal Service Organizations responsible for general support maintenance of electronics equipment to determine the acceptability of repaired equipment. These procedures set forth specific requirements that repaired equipment must meet before it is returned to the using organization. These procedures may also be used as a guide for testing equipment that has been repaired at direct support, if the proper tools and test equipments are available.

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

8-2. Test Equipment, Tools, and Materials

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

a. Test Equipment.

Nomenclature	Federal stock No.	Technical manual
Multimeter ME-26B/U.		TM 11-6625-200-12
Oscilloscope AN/USM-140B.		TM 11-6625-535 -15-1
Multimeter TS-352B/U.		TM 11-6625-366-15

b. Took and Materials. No tools or materials are required for general support testing procedures.

8-3. Modification Work Orders

The performance standards listed in the tests (para 8-4 through 8-14) are based on the assumption that all modification work orders have been performed. A listing of current modification work orders will be found in DA Pam 310–4.

8–4. Physical Tests and Inspections

a. Test Equipment and Materials. None.

b. Test Connections and Conditions.

(1) No connections.

(2) Test Facilities Kit MK–980/PPS–5 in its case; case closed and latched.

c. Procedure.

Step No.	Control settings		Test procedure	Performance standard
	Test equipment	Test panel		
1	None		Check exterior of case for damage, missing parts, and condition of painted parts.	Exterior will be clean; painted surfaces will not be scraped or scratched to bare metal; the following will not be damaged or missing: 8 protective corners, 12 feet, 2 carrying handles, 8 latches, 3 identification plates, and 1 relief valve; identification plates will be legible.
2	None		Open latches by pulling latch tabs out and turning them counterclockwise one-half turn.	As each latch tab is turned ccw, latch hook will move down from latch groove and pop away from case; each latch tab, when released, will snap down against case.
3	None		Press and release relief valve, and then take top half of case off bottom half, and put it down on its feet. (To remove top half, raise side opposite hinges as high as it will go, lower it toward hinge side until its feet are about 3 inches above bench, and separate top half from bottom half by lifting hinge pins.)	Inside painted surface of case will not be scraped or scratched to bare metal; the following will not be damaged or missing: 2 hinges and hinge pins, instruction flyleaf (hinged to inside of top half), line cord and plug, 4 line cord stowage hooks, AUDIO jack cover, 2 power converters (one marked PWR. CONV. RADAR, other PWR. CONV. REMOTE), 6 control knobs (on blocks 1200, 400, 100, and 900), 4 rubber switch boots, and 2 test panel lift handles.
4	None		Unsnap 2 instruction sheet fasteners and lift sheet up on hinges.	Snap fasteners will not be damaged or missing; schematic diagram on sheet back will be clean and legible.
5	None		Snap fasten instruction sheet to retaining plate, release 2 quarter-turn fasteners on plate, and lift plate up on hinges as far as it will go.	Quarter-turn fasteners will not be damaged or missing; retaining plate hinge will not be damaged; painted surfaces will not be scraped or scratched to bare metal.
6	None		Remove accessory kit pouch from top half of case, and inspect inside of top half of case.	Inside of case will be clean and free of damage, relief valve will not be damaged, and painted surfaces will not be scraped or scratched to bare metal.
7	None		Open accessory kit pouch, remove test cables and accessories, and inspect for loss or damage.	All test cables and accessories listed on instruction sheet (on flyleaf in top half) will be present or accounted for and not damaged; cables will not be cut or broken; connector pins will not be bent or broken; female contacts in connectors will be clean; pouch will be clean inside and out and free of holes, rips, and tears; snap fasteners on cover and on pockets that hold accessories will not be damaged or missing.
8	None	Any	On test panel, actuate all toggle switch handles, turn all control knobs through limit of their travel, inspect test jacks, connectors, and indicator lights; press and release circuit breakers.	Toggle switches will not be loose and will snap firmly into marked positions; controls will turn freely without binding or excessive looseness; test jacks and connectors will not be loose and will be clean; indicator lights will not be loose, missing, or broken; circuit breakers will stay down when pressed.
9	None		Inspect 16 screws that hold test panel to bottom half of case, screws that hold power converters in place, other screws that hold electrical components in place, and identification plate.	Screws will not be loose or missing; identification plate will not be damaged or missing and will be legible.

8–5. Checking -6-Volt Outputs

a. Test Equipment and Materials. Multimeter ME–26B/U, Power Supply PP–4450/PPS–5, and dc source (6 or 24 volts).

b. Test Connections and Conditions.

(1) *Test Panel SB–3004/PPS–5.* Connect test panel (fig. 9–6) as follows:
- (*a*) Be sure all test panel switches are at OFF.
- (*b*) Connect power supply to dc source (red-hood clip to positive, black-hood clip to negative).
- (*c*) **Be sure power supply switch is on (at 24V position on some power supplies).**
- (*d*) Connect power supply cable plug to test panel 6 VDC jack.
- (*e*) Connect test panel 115 VAC line cord to 115-volt ac source.

(2) *Electrical Lead CX–10452/PPS–5.* Connect electrical lead (or equivalent) to GND test jack in 2300 block of test panel by inserting pin-tip plug of lead fully into GND jack.

(3) *Multimeter ME–26B/U.* Connect ME–26B/U as follows:
- (*a*) Be sure FUNCTION switch is at OFF.
- (*b*) Connect line cord to 115-volt ac source.
- (*c*) Connect COMMON lead to Electrical Lead CX–10452/PPS–5 by fastening the COMMON lead clip to the banana-tip plug of the lead.
- (*d*) Touch the dc probe to each test jack and each connector contact listed in *c* below.

Caution: **Do not insert dc probe fully into connector contacts of SB–3004/PPS–5 when taking voltage readings; insert probe just far enough to make electrical contact. Contacts of connectors can be damaged by inserting dc probe too far.**

c. Procedure.

Step No.	Control settings: Test equipment	Control settings: Test panel	Test procedure	Performance standard
1	*a.* FUNCTION: + ----------	*a.* INPUT POWER: OFF	Allow ME–26B/U to warm up 5 minutes.	
	b. RANGE: 10V ----------	*b.* All ON-OFF switches at OFF		
2	Same as step 1 ----------	*a.* INUT POWER: DC ON	*a.* Press and release three CIRCUIT BREAKERS (MAIN PWR, CONTROL, and CONT-IND).	DC ON indicator light (clear) will glow; ME–26B/U will indicate −5.6 to −6.8 volts.
		b. RCVR-XMTR: ON	*b.* Touch dc probe to –6 test jack in block 700 and to pin W of male connector in REMOTE CABLE block.	
3	Same as step 1 ----------	*a.* INPUT POWER: AC ON	Touch dc probe to –6 test jack in block 700 and to pin W of female connector in REMOTE CABLE block.	Same as step 2, except AC ON indicator light (red) will go on.
		b. RCVR-XMTR: ON		
4	Same as step 1 ----------	Same as step 2 and, in block 400: *a.* ON-OFF: ON *b.* W-NAR: NAR	Touch dc probe to block 400 connector pin 14.	Same as step 2.
5	Same as step 1 ----------	Same as step 2 and, in block 500: *a.* ON-OFF: ON *b.* GATE POSITION: on (up)	Touch dc probe to block 500 connector pin 7.	Same as step 2.
6	Same as step 1 ----------	Same as step 2 and, in block 900: *a.* ON-OFF: ON *b.* REV A-REV B: REV A *c.* FWD-OFF-REV: REV	Touch dc probe to block 900 connector pins 2, 11, 12, and 1, in turn.	Same as step 2.
7	Same as step 1 ----------	Same as step 2 and, in block 900: *a.* ON-OFF: ON *b.* REV A-REV B: REV B *c.* TEST: ON *d.* TEST control: fully cw	Touch dc probe to block 900 connector pins 3 and 14.	Same as step 2.
8	Same as step 1 ----------	Same as step 2 and, in block 1000: *a.* TEST: ON *b.* TEST control: fully cw	Touch dc probe to block 1000 connector pin Y. Note reading and then turn TEST control fully ccw.	Same as step 2. As TEST control is turned, voltage smoothly drops to zero.
9	Same as step 1 ----------	Same as step 2 and, in block 1200: *a.* ON–OFF: ON *b.* DRIVE: on (up) *c.* LV control: fully cw *d.* FWD–REV: REV	Touch dc probe to block 1200 connector pins E, L, and A, and to test jack LV. When measuring at LV jack, turn LV control fully ccw.	Same as step 2. As LV control is turned, voltage smoothly drops to 0 volt.
10	Same as step 1 ----------	Same as step 2 and, in block 1200: *a.* ON–OFF: ON *b.* FWD–REV: FWD	Touch dc probe to block 1200 connector pin K.	Same as step 2.
11	Same as step 1 ----------	Same as step 2 and, in block 2100: *a.* ON-OFF: ON *b.* MARKER: on (up) *c.* GATE DELAY: on (up) *d.* SWP LENGTH: on (up)	Touch dc proble to block 2100 lower connector pins 7 and 9, and upper connector pin 5.	Same as step 2.
12	Same as step 1 ----------	Same as step 2 and, in block 2200: *a.* ON-OFF: ON *b.* MTI-NORM: NORM	Touch dc probe to block 2200 lower connector pin 11, and to block 2800 connector pin R.	Same as step 2.

8–6. Checking +6-Volt Outputs

a. Test Equipment. Multimeter ME–26B/U.

b. Test Connections and Conditions.

(1) *Test Panel SB–3004/PPS–5.* Connect test panel (fig. 9–6) as follows:
  (*a*) Be sure all test panel switches are at OFF.
  (*b*) Connect power supply cable plug to test panel 6 VDC jack.
  (*c*) Connect test panel 115 VAC line cord to 115-volt ac source.

(2) *Electrical Lead CX–10452/PPS–5.* Connect electrical lead (or equivalent) to GND test jack in test panel 2300 block by inserting pin-tip plug of lead fully into GND jack.

(3) *Multimeter ME–26B/U.* Connect ME–26B/U as follows:
  (*a*) Be sure FUNCTION switch is at OFF.
  (*b*) Connect line cord to 115-volt ac source.
  (*c*) Connect COMMON lead to Electrical Lead CX–10452/PPS–5 by fastening the COMMON lead clip to the banana-tip plug of the lead.
  (*d*) Touch the dc probe to each test jack and each connector contact listed in *c* below.

Caution: Do not insert dc probe fully into connector contacts when taking voltage readings; insert probe just far enough to make electrical contact. Contacts of connectors can be damaged by inserting dc probe too far.

c. Procedure.

Step No.	Control settings		Test procedure	Performance standard
	Test equipment	Test panel		
1	*a.* FUNCTION: — ----------	*a.* INPUT POWER: OFF	Allow ME–26B/U to warm up 5 minutes.	
	b. RANGE: 10V ----------	*b.* All ON-OFF switches at OFF		
2	Same as step 1 ----------	*a.* INPUT POWER: AC ON	Touch dc probe to +6 test jack in block 700.	ME–26B/U will indicate +5.1 to +6 volts.
		b. RCVR-XMTR: ON		
3	Same as step 1 ----------	Same as step 2 and, in block 100:	Touch dc probe to block 100 connector pins B and E. Note E reading and then turn RCVR GAIN fully ccw.	Same as step 2. As RCVR GAIN control is turned, voltage at pin E smoothly drops to 0 volt.
		a. ON-OFF: ON		
		b. RCVR GAIN control: fully cw		
4	Same as step 1 ----------	Same as step 2 and, in block 300:	Touch dc probe to block 300 connector pin B.	Same as step 2.
		ON-OFF: ON		
5	Same as step 1 ----------	Same as step 2 and, in block 400:	Touch dc probe to pin 8 of block 400-connector.	Same as step 2.
		ON-OFF: ON		
6	Same as step 1 ----------	Same as step 2 and, in block 800:	Touch dc probe to pin E of block 800 connector.	Same as step 2.
		ON-OFF: ON		
7	Same as step 1 ----------	Same as step 2 and, in block 900:	Touch dc probe to pin 6 of block 900 connector.	Same as step 2.
		ON-OFF: ON		

8-7. Checking -5 Volt Outputs

a. Test Equipment. Multimeter ME-26B/U.

b. Test Connections and Conditions.

(1) *Test Panel SB-3004/PPS-5.* Connect test panel (fig. 9-6) as follows:
- (*a*) See that all test panel switches are at OFF.
- (*b*) Connect power supply cable plug to test panel 6 VDC jack.
- (*c*) Connect test panel 115 VAC line cord to 115-volt ac source.

(2) *Electrical Lead CX-10452/PPS-5.* Connect electrical lead (or equivalent) to GND test jack in test panel 2300 block by inserting pin-tip plug of lead fully into GND jack.

(3) *Multimeter ME-26B/U.* Connect ME-26B/U as follows:
- (*a*) See that FUNCTION switch is at OFF.
- (*b*) Connect line cord to 115-volt ac source.
- (*c*) Connect COMMON lead to Electrical Lead CX-10452/PPS-5 by fastening the COMMON lead clip to the banana-tip plug of the lead.
- (*d*) Touch the dc probe to each test jack and each connector contact listed in *c* below.

Caution: **Do not insert dc probe fully into connector contacts when taking voltage readings; insert probe just far enough to make electrical contact. Contacts of connectors can be damaged by inserting dc probe too far.**

c. Procedure.

Step No.	Control settings: Test equipment	Control settings: Test panel	Test procedure	Performance standard
1	*a.* FUNCTION: — ----------	*a.* INPUT POWER: OFF	Allow ME-26B/U to warm up 5 minutes.	
	b. RANGE: 10V ----------	*b.* All ON-OFF switches at OFF		
2	Same as step 1 ----------	*a.* INPUT POWER: AC ON *b.* RCVR-XMTR: ON	Touch dc probe to −5 test jack in block 700.	ME-26B/U will indicate −4.7 to −5.0 volts.
3	Same as step 1 ----------	*a.* INPUT POWER: AC ON *b.* RCVR-XMTR: ON *c.* AFC GAIN control: fully cw *d.* ON-OFF switch to ON	Touch dc probe to pins C and D of block 100 connector. When measuring at pin D, turn AFC GAIN fully ccw.	Same as step 2. When AFC GAIN is turned, voltage drops smoothly to 0 volt.
4	Same as step 1 ----------	Same as step 2 and, in block 300: ON-OFF: ON	Touch dc probe to pin C of block 300 connector.	Same as step 2.
5	Same as step 1 ----------	Same as step 2 and, in block 400: *a.* ON-OFF: ON *b.* GAIN control: fully cw	Touch dc probe to pins 7, 3, and 6 of block 400 connector. When measuring at pin 3, turn GAIN control fully ccw.	Same as step 2. As GAIN control is turned, voltage smoothly drops to 0 volt.
6	Same as step 1 ----------	Same as step 2 and, in block 500: ON-OFF: ON	Touch dc probe to pin 9 of block 500 connector.	Same as step 2.
7	Same as step 1 ----------	Same as step 2 and, in block 600: ON-OFF: ON	Touch dc probe to pin 14 of block 600 connector.	Same as step 2.
8	Same as step 1 ----------	Same as step 2 and, in block 800: ON-OFF: ON	Touch dc probe to pin F of block 800 connector.	Same as step 2.
9	Same as step 1 ----------	Same as step 2 and, in block 900: ON-OFF: ON	Touch dc probe to pin 5 of block 900 connector.	Same as step 2.
10	Same as step 1 ----------	Same as step 2 and, in block 1200: ON-OFF: ON	Touch dc probe to pin H of block 1200 connector.	Same as step 2.

8–8. Checking +12-Volt Outputs

a. Test Equipment. Multimeter ME–26B/U.

b. Test Connections and Conditions.

(1) *Test Panel SB–3004/PPS–5.* Connect test panel (fig. 9–6) as follows:
- (*a*) Be sure all test panel switches are at OFF.
- (*b*) Connect power supply cable plug to test panel 6 VDC jack.
- (*c*) Connect test panel 115 VAC line cord to 115-volt ac source.

(2) *Electrical Lead CX–10452/PPS–5.* Connect electrical lead (or equivalent) to GND test jack in 2300 block of test panel by inserting pin-tip plug of lead fully into GND jack.

(3) *Multimeter ME–26B/U.* Connect ME–26B/U as follows:
- (*a*) Be sure FUNCTION switch is at OFF.
- (*b*) Connect line cord to 115-volt ac source.
- (*c*) Connect COMMON lead to Electrical Lead CX–10452/PPS–5 by fastening the COMMON lead clip to the banana-tip plug of the lead.
- (*d*) Touch the dc probe to each test jack and each connector contact listed in *c* below.

***Caution:* Do not insert dc probe fully into connector contacts when taking voltage readings; insert probe just far enough to make electrical contact. Contacts of connectors can be damaged by inserting dc probe too far.**

c. Procedure.

Step No.	Control settings: Test equipment	Control settings: Test panel	Test procedure	Performance standard
1	*a.* FUNCTION: + ----------	*a.* INPUT POWER: OFF	Allow ME–26B/U to warm up 5 minutes.	
	b. RANGE: 30V ----------	*b.* All ON-OFF switches at OFF		
2	Same as step 1 ----------	*a.* INPUT POWER: AC ON	Touch dc probe to +12 test jack in block 700.	ME–26B/U will indicate +12 +0 -4 volts.
		b. RCVR-XMTR: ON		
3	Same as step 1 ----------	Same as step 2 and, in block 100: ON-OFF: ON	Touch dc probe to pins F and L of block 100 connector.	Same as step 2.
4	Same as step 1 ----------	Same as step 2 and, in block 300: ON-OFF: ON	Touch dc probe to pin H of block 300 connector.	Same as step 2.
5	Same as step 1 ----------	Same as step 2 and, in block 400: ON-OFF: ON	Touch dc probe to pin 4 of block 400 connector.	Same as step 2.
6	Same as step 1 ----------	Same as step 2 and, in block 500: ON-OFF: ON	Touch dc probe to pin 8 of block 500 connector.	Same as step 2.
7	Same as step 1 ----------	Same as step 2 and, in block 600: ON-OFF: ON	Touch dc probe to pin 6 of block 600 connector.	Same as step 2.
8	Same as step 1 ----------	Same as step 2 and, in block 800: ON-OFF: ON	Touch dc probe to pin H of block 800 connector.	Same as step 2.
9	Same as step 1 ----------	Same as step 2 and, in block 900: ON-OFF: ON	Touch dc probe to pin 7 of block 900 connector.	Same as step 2.
10	Same as step 1 ----------	Same as step 2 and, in block 2100: ON-OFF: ON	Touch dc probe to pins 4 and 6 in the lower connector of block 2100.	ME–26B/U will indicate +12 +0 -4 volts.
11	Same as step 1 ----------	Same as step 2 and, in block 2200: ON-OFF: ON	Touch dc probe to pin 11 of upper block 2200 connector.	Same as step 10.
12	Same as step 1 ----------	Same as step 2 and, in block 2400: ON-OFF: ON	Touch dc probe to pin B of block 2400 connector.	Same as step 10.
13	Same as step 1 ----------	Same as step 2 and, in block 2700: ON-OFF: ON	Touch dc probe to pin K of block 2700 connector.	Same as step 10.
14	Same as step 1 ----------	Same as step 2 and, in block 2900: ON-OFF: ON	Touch dc probe to pin 4 of block 2900 connector.	Same as step 10.
15	Same as step 1 ----------	Same as step 2 ----------	Touch dc probe to +12 test jack in block 2300.	Same as step 10.

8–9. Check -12 Volt Outputs

a. Test Equipment. Multimeter ME–26B/U.

b. Test Connections and Conditions.

(1) *Test Panel SB–3004/PPS–5.* Connect test panel (fig. 9–6) as follows:
- (*a*) Be sure all test panel switches are at OFF.
- (*b*) Connect power supply cable plug to test panel 6 VDC jack.
- (*c*) Connect test panel 115 VAC line cord to 115-volt ac source.

(2) *Electrical Lead CX–10452/PPS–5.* Connect electrical lead (or equivalent) to GND test jack in 2300 block of test panel by inserting pin-tip plug of lead fully into GND jack.

(3) *Multimeter ME–26B/U.* Connect ME–26B/U as follows:
- (*a*) Be sure FUNCTION switch is at OFF.
- (*b*) Connect line cord to 115-volt ac source.
- (*c*) Connect COMMON lead to Electrical Lead CX–10452/PPS–5 by fastening the COMMON lead clip to the banana-tip plug of the lead.
- (*d*) Touch the dc probe to each test jack and each connector contact listed in *c* below.

Caution: **Do not insert dc probe fully into connector contacts when taking voltage readings; insert probe just far enough to make electrical contact. Contacts of connectors can be damaged by inserting dc probe too far.**

c. Procedure.

Step No.	Control settings		Test procedure	Performance standard
	Test equipment	Test panel		
1	*a.* FUNCTION: — _____ *b.* RANGE: 30V _____	*a.* INPUT POWER: OFF *b.* All ON-OFF switches at OFF	Allow ME–26B/U to warm up 5 minutes.	
2	Same as step 1 _____	*a.* INPUT POWER: AC ON *b.* RCVR-XMTR: ON	Touch dc probe to −12 test jack in block 2300.	ME–26B/U will indicate −8 to −12 volts.
3	Same as step 1 _____	Same as step 2 and, in block 2100: ON-OFF: ON	Touch dc probe to pin 2 of block 2100 lower connector.	Same as step 2.
4	Same as step 1 _____	Same as step 2 and, in block 2200: ON-OFF: ON	Touch dc probe to pin 10 of block 2200 upper connector.	Same as step 2.
5	Same as step 1 _____	Same as step 2 and, in block 2400: ON-OFF: ON	Touch dc probe to pin C of block 2400 connector.	Same as step 2.
6	Same as step 1 _____	Same as step 2 and, block 2700: ON-OFF: ON	Touch dc probe to pin J of block 2700 connector.	Same as step 2.
7	Same as step 1 _____	Same as step 2 and, in block 2900: ON-OFF: ON	Touch dc probe to pin 11 of block 2900 connector.	Same as step 2.

8–10. Checking 3.9-, 35-, and 110-Volt Outputs and Block 1200 Indicator Lights

a. Test Equipment. Multimeter ME–26B/U.

b. Test Connections and Conditions.

(1) *Test Panel SB–3004/PPS–5.* Connect test panel (fig. 9–6) as follows:
- (*a*) Be sure all test panel switches are at OFF.
- (*b*) Connect power supply cable plug to test panel 6 VDC jack.
- (*c*) Connect test panel 115 VAC line cord to 115-volt ac source.

(2) *Electrical Lead CX–10452/PPS–5.* Connect electrical lead (or equivalent) to GND test jack in 2300 block of test panel by inserting pin-tip plug of lead fully into GND jack.

(3) *Multimeter ME–26B/U.* Connect ME–26B/U as follows:
- (*a*) Be sure FUNCTION switch is at OFF.
- (*b*) Connect line cord to 115-volt ac source.
- (*c*) Connect COMMON lead to Electrical Lead CX–10452/PPS–5 by fastening the COMMON lead clip to the banana-tip plug of the lead.
- (*d*) Touch the dc probe to each test jack and each connector contact listed in *c* below.

Caution: Do not insert dc probe fully into connector contacts when taking voltage readings; insert probe just far enough to make electrical contact. Contacts of connectors can be damaged by inserting dc probe too far.

c. Procedure.

Step No.	Control settings: Test equipment	Control settings: Test panel	Test procedure	Performance standard
1	*a.* FUNCTION: — --------- *b.* RANGE: 10V ----------	*a.* INPUT POWER: OFF *b.* All ON-OFF switches at OFF	Allow ME–26B/U to warm up 5 minutes.	
2	Same as step 1 ----------	*a.* INPUT POWER: AC ON *b.* RCVR-XMTR: ON *c.* Block 2700: ON/OFF: ON	Touch dc probe to pin A of block 2700 connector.	ME–26B/U will indicate —3.3 volts ±0.3.
3	*a.* FUNCTION: + --------- b. RANGE: 10V	Same as step 2 ----------	Touch dc probe to pin B of block 2700 connector.	ME–26B/U will indicate +3.3 volts ±0.3.
4	*a.* FUNCTION: + --------- *b.* RANGE: 100V ----------	*a.* INPUT POWER: AC ON *b.* RCVR-XMTR: ON	Touch dc probe to +35 test jack block 2300.	ME–26B/U will indicate +35 (+0 −10) volts.
5	Same as step 4 ----------	Same as step 4 and, in block 2100: ON-OFF: ON	Touch dc probe to pin 9 of block 2100 upper connector.	Same as step 4.
6	Same as step 4 ----------	Same as step 4 and, in block 2200: ON-OFF: ON	Touch dc probe to pin 6 of block 2200 larger connector.	Same as step 4.
7	Same as step 4 ----------	Same as step 4 and, in block 2900: ON-OFF: ON	Touch dc probe to pin 6 of block 2900 connector.	Same as step 4.
8	*a.* FUNCTION: + --------- *b.* RANGE: 300V	Same as step 4 ----------	Touch dc probe to +110 test jack in 700 block.	ME–26B/U will indicate +110 (+6,–16) volts.
9	Same as step 8 ----------	Same as step 4 and, in block 100: ON-OFF: ON	Touch dc probe to pin J of block 100 connector.	Same as step 8.
10		Same as step 4 and, in block 800: ON-OFF: ON	Touch dc probe to pin L of block 800 connector.	Same as step 8.
11		Same as step 4 and, in block 1200: ON-OFF: ON	Ground each of the following pins of block 1200 connectors: *a.* Pin M. *b.* Pin J. *c.* Pin B	Following indicator lights will go on: *a.* DLY *b.* FWD-REV *c.* LV
12		Same as step 4, in block 1200: FWD-REV at REV.	Short pin F to pin L on 1200 block Connector	DRIVE light lights.

8–11. Checking +300- and −600-Volt Outputs

a. Test Equnipment. Multimeter ME–26B/U.

b. Test Connections and Conditions.

(1) *Test Panel SB–3004/PPS–5.* Connect test panel (fig. 9–6) as follows:
- (*a*) Be sure all test panel switches are at OFF.
- (*b*) Connect power supply cable plug to test panel 6 VDC jack.
- (*c*) Connect test panel 115 VAC line cord to 115-volt ac source.

(2) *Electrical Lead CX–10452/PPS–5.* Connect electrical lead (or equivalent) to GND test jack in 2300 block of test panel by inserting pin-tip plug of lead fully into GND jack.

(3) *Multimeter ME–26B/U.* Connect ME–26B/U as follows:
- (*a*) Be sure FUNCTION switch is at OFF.
- (*b*) Connect line cord to 115-volt ac source.
- (*c*) Connect COMMON lead to Electrical Lead CX–10452/PPS–5 by fastening the COMMON lead clip tothe banana-tip plug of the lead.
- (*d*) Touch the dc probe to each test jack and each connector contact listed in *c* below.

Caution: **Do not insert dc probe fully into connector contacts when taking voltage readings; insert probe just far enough to make electrical contact. Contacts of connectors can be damaged by inserting dc probe too far.**

c. Procedure.

Step No.	Control settings: Test equipment	Control settings: Test panel	Test procedure	Performance standard
1	*a.* FUNCTION: + ----------	*a.* INPUT POWER: OFF	Allow ME–26B/U to warm up 5 minutes.	
	b. RANGE: 1000V ----------	*b.* All ON-OFF switches at OFF		
2	Same as step 1 ----------	*a.* INPUT POWER: AC ON *b.* RCVR-XMTR: ON	Touch dc probe to +330 test jack in block 700.	ME–26B/U will indicate +300 (−0 +20) volts.
3	Same as step 1 ----------	Same as step 2 and, in block 1000: ON-OFF: ON	Touch dc probe to pin M of block 1000 connector.	Same as step 2.
4	Same as step 1 ----------	Same as step 2 and, in block 2100: ON-OFF: ON	Touch dc probe to pin 8 of block 2100 upper connector.	Same as step 2.
5	Same as step 1 ----------	Same as step 2 and, in block 2200: ON-OFF: ON	Touch dc probe to pin 4 of smaller block 2200 connector.	Same as step 2.
6	Same as step 1 ----------	Same as step 2 and, in CRT TEST block: DEFL control: fully cw.	Touch DC probe to pins E and F of smaller connector of CRT TEST block. Note reading as DEFL INCR is turned fully ccw.	As in step 2. A DEFL INCR control is turned, voltage smoothly drops to 0 volt.
7	FUNCTION: − ---------- RANGE: 1000V	Same as step 2 ----------	Touch dc probe to −600 test jack in block 700.	ME–26B/U will indicate −600 ±30 volts. (See para 1-11d(4)(h))
8	FUNCTION: + ---------- RANGE: 300	Same as step 2 ----------	Touch dc probe to J17 (CRT test block) pins A and D.	+150 volts ±10.

8-12. Checking 2,000-Volt Outputs

a. Test Equipment. Multimeter TS-352B/U.

b. Test Connections and Conditions.

(1) *Test Panel SB-3004/PPS-5.* Connect test panel (fig. 9-7) as follows:
- (*a*) Be sure all test panel switches are at OFF.
- (*b*) Connect power supply cable plug to test panel 6 VDC jack.
- (*c*) Connect test panel 115 VAC line cord to 115-volt ac source.

(2) *Multimeter TS-352B/U.* Connect TS-352B/U as follows:
- (*a*) Insert Cord CX-927/U (part of TS-352B/U) in the 5000 VOLTS DC 2,000 OHMS/VOLT jack of the multiplier.
- (*b*) Connect Cord CX-939/U (part of TS-352B/U) between the multiplier CONNECT to 2.5 VOLT JACK and to the 2,000 OHMS PER VOLT DC 2.5V jack.
- (*c*) Turn FUNCTION switch to DIRECT.
- (*d*) Connect the black test lead between the OHMS-DC±AC jack on the multimeter and the GND jack on test Panel SB-3004/PPS-5 (fig. 9-7).
- (*e*) Connect clamp of Cord CX-927/U to one end of Electrical Lead CX-10452/PPS-5. Connect the other end of Electrical Lead CX-10452/PPS-5 to pin 13 of larger connector in CRT TEST block (fig. 9-11②).

Warning: **Make sure that the connection between the clamp of Cord CX-927/U and Electrical Lead CX-10452/PPS-5 is not touching a common ground. High voltage (2000 volts) is present, exercise extreme caution.**

Caution: **Do not insert dc probe fully into connector contacts when taking voltage readings; insert probe just far enough to make electrical contact. Contacts of connector can be damaged by inserting DC probe too far.**

c. Procedure.

Step No.	Control settings: Test equipment	Control settings: Test panel	Test procedure	Performance standard
1	*a.* FUNCTION switch to DIRECT. *b.* RANGE: 5000V	*a.* INPUT POWER: OFF *b.* All ON-OFF switches at OFF	Allow to warm up 5 minutes. ***Caution:*** **Under no conditions should the CRT TEST switch be pressed when measuring the filament voltages. Damage to the multimeter will result.**	
2	Same as step 1	*a.* INPUT POWER: AC ON *b.* RCVR-XMTR: ON	Press and hold CRT TEST switch, observe reading on TS-352B/U; release CRT TEST switch.	TS-352B/U will indicate +2,000 volts ±100. *Note.* Read O— to 5-dc scale.
3	*a.* FUNCTION switch: 20,000 Ω/VDC REV. *b.* RANGE: 5000V	*a.* Same as step 1 *b.* Same as step 2	*a.* Connect Electrical Lead CX-10452/PPS-5 to pin 12 of larger connector in CRT TEST block (fig. 9-11③). *b.* Same as step 2	TS-352/U will indicate −1,680 volts ±100. Read 0-5-dc scale.
4	Same as step 3	*a.* Same as step 1 *b.* Same as step 2	*a.* Connect Electrical Lead CX-10452/PPS-5 to pin 14 of larger connector in CRT TEST block (fig. 9-11②). *b.* Same as step 2.	TS-352B/U will indicate −1,200 volts ±100. Read 0-5 dc scale.
5	Same as step 3	*a.* Same as step 1 *b.* Same as step 2	*a.* Connect Electrical Lead CX-10452/PPS-5 to pin 7 of larger connector in CRT TEST block (fig. 9-11②). *b.* Same as step 2.	TS-352B/U will indicate −1,800 volts ±100. Read 0-5 dc scale.
6	Same as step 3	*a.* Same as step 1 *b.* Same as step 2	*a.* Connect Electrical Lead CX-10452/PPS-5 to pin 11 of larger connector in CRT TEST block (fig. 9-11②). *b.* Same as step 2.	TS-352B/U will indicate −1,200 volts ±100. Read 0-5 dc scale.

Caution: **Under no conditions should CRT TEST switch be pressed when measuring the filament voltages. Damage to the multimeter will result.**

7	FUNCTION switch: AC VOLTS. RANGE: 10	*a.* Same as step 1 *b.* Same as step 2	*a.* Connect TS-352B/U black lead to −DC ±AC OHMS jack, and red lead to 10V jack on the 1,000 OHMS PER VOLT AC DC side of the meter. *b.* Connect the other end of the black and red leads between pins 15 and 9 of larger connector in CRT TEST block (fig. 9-11②).	TS-352B/U will indicate 1.5 ±0.2 vac.
8	Same as step 7	*a.* Same as step 1 *b.* Same as step 2	Same as step 1*a* above *b.* Connect the other ends of the black and red leads between pins 8 and 10 of larger connector in CRT TEST block (fig. 9-11②).	TS-352B/U will indicate 1.5 ±0.2 vac.
9	FUNCTION switch: OHMS RANGE switch: RX100	Same as step 1	*a.* Connect TS-352B/U black lead to −DC ±AC OHMS jack. Connect red lead to OHMS jack. *b.* Connect other end of black lead to GND (fig. 9-7). Connect other end of red lead to J27 LOAD test jack (600 block).	TS-352B/U will indicate 2,000 ohms ±100.
10	Same as step 9 except RANGE switch to RX 1.	Same as step 1	Connect the black and red leads as in *a* and *b* above except the other end of the red lead to TP 19 LOAD test point (600 block).	TS-352B/U will indicate 10 ohms ±1.

8–13. Checking SYNC and TRIG Outputs

a. Test Equipment. Oscilloscope AN/USM–140B.

b. Test Connections and Conditions.

(1) *Test Panel SB–3004/PPS–5.* Connect test panel (fig. 9–8) as follows:
- (*a*) Be sure all test panel switches are at OFF.
- (*b*) Connect power supply cable plug to panel 6 VDC jack.
- (*c*) Connect test panel 115 VAC line cord to 115 volts ac.

(2) *Electrical Lead CX–10452/PPS–5.* Connect electrical lead (or equivalent) to GND test jack in 2300 block of test panel by inserting pin-tip plug of lead fully into GND jack.

(3) *Oscilloscope AN/USM–140B.* Connect AN/USM–140B as follows:
- (*a*) Be sure POWER switch is off (down).
- (*b*) Connect line cord to 115-volt ac source.
- (*c*) Connect probe lead to CHANNEL A INPUT connector.
- (*d*) Connect ground lead from probe to Electrical Lead CX–10452/PPS–5 by fastening the ground lead clip to the banana-tip of the lead.
- (e) Touch the probe to the test packs and connector contacts listed in *c* below.

Caution: **Do not insert dc probe fully into connector contacts when taking voltage readings; insert probe just far enough to make electrical contact. Contacts of connectors can be damaged by inserting dc probe too far.**

c. Procedure.

Step No.	Control settings: Test equipment	Control settings: Test panel	Test procedure	Performance standard
1	Turn on AN/USM–140B, and prepare it for use.	*a.* INPUT POWER: OFF *b.* All ON-OFF switches at OFF	Allow AN/USM–140B to warm up.	
2	*a.* Vertical presentation selector switch: CHANNEL A. *b.* SWEEP TIME switch (black): 50 MICROSECONDS/CM. *c.* SWEEP TIME VERNIER (red): CALIBRATED. *d.* SENSITIVITY switch (black): 10 VOLTS/CM. *e.* SENSITIVITY VERNIER control (red): CALIBRATED.	*a.* INPUT POWER: AC ON *b.* RCVR-XMTR: ON	*a.* Touch probe to SYNC test jack in block 700 and to pin 5 of block 600 connector. *b.* Touch probe to each of two TRIG test jacks (lower right of test panel) in turn, and to following connector contacts: *block* 500 *pin* 3 2100 (lower connector) 3 2200 (larger connector) 2 2700 H	*a.* AN/USM–140B will display pulses that are 250 μsec apart and minimum 45 volts in amplitude. *b.* AN/USM–140B will display 2-usec triggers that are 250 usec apart and 10 volts in amplitude.
3	Same as step 2	Same as step 2 but with the power supply cable disconnected from the 6VDC jack.	*a.* Touch probe to pin 1 of the 6 VDC jack. *b.* Touch probe to pin 6 of the 6 VDC jack.	*a.* AN/USM–140B will display pulses that are 250 μsec with an amplitude of approximately 8 volts. *b.* Same as *a* above except pulses will be 180° out of phase.

Step No.	Test equipment control settings	Cable assembly	Test procedure	Performance standard
31	Same as step 1-------	CX-12067/U: clip COMMON lead of ME-26B/U to stem of telephone plug.	Touch OHM probe to contact A of connector.	Same as step 2
		Clip COMMON lead of ME-26B/U to tip of telephone plug.	Touch OHM probe to contact B of connector.	Same as step 2.
32	Same as step 1------	CX-10441A/PPS-5: same as step 14-----	Same as step 2 ----------	Same as step 2.
33	Same as step 1 ----------	CX-10444A/PPS--5: same as step 17 -------	Same as step 2 ----------	Same as step 2.

CHAPTER 8.1
DEPOT OVERHAUL STANDARDS

8.1-1. Applicability of Depot Overhaul Standards

The tests outlined in this chapter are designed to measure the performance capability of repaired equipment. Equipment that is to be returned to stock should meet the standards given in these tests.

8.1-2. Applicable References

a. *Repair Standards.* Applicable procedures of the depot performing this test, and its general standards for repaired electronic equipment given in TB SIG 355-1, TB SIG 355-2, and TB SIG 355-3, form a part of the requirements for testing this equipment.

b. Technical Publications. The following technical publications are applicable to this equipment.

Equipment and subject	Publication
Organizational Radar Set Manual Radar Set AN/PPS-5	TM 11-5840-298-12
DS, GS, and Depot Maintenance Manual, Radar Set AN/PPS-5	TM 11-5840-298-35

c. Modification Work Orders. Perform all applicable modification work orders pertaining to this equipment before making the tests specified. DA Pam 310-1 lists all available MWO's.

8.1-3. Test Facilities Required

The following equipments, or suitable equivalents, will be used in determining compliance with this specific standard:

Equipment	National Stock No.	Qty Reqd	Applicable Literature
Voltmeter, Electronic AN/USM-98	6625-00-753-2115	1	TM 11-6625-438-10
Variable Power Transformer TF-171A/USM	5950-00-503-0632	1	TM 11 -5905-203-15F
Insulation Breakdown Test Set AN/GSM-6	6625-00-542-1331	1	TM 11-6625-273-12
Multimeter ME-26 (*)/U*	6625-00-360-2493	1	TM 11-6625-200-12
Multimeter TS-352B/U	6625-00-553-0142	1	TM 11-6625-366-15
Oscilloscope AN/USM-140D	6625-00-788-8598	1	TM 11-6625 -535-15-1
Power Supply PP-2309A/U	6130-00-752-2215	1	TM 11-6130-245-15

'Indicates Multimeters ME-26A/U, ME-26C/U, and ME-26 D/U

b. Additional Equipment

(1) Power Supply PP-450/PPS-5, NSN 5840-01-012-8792; used with the AN/PPS-5

(2) Plug, seven-contact, push-pull DS-type Quick-disconnect, NSN 5935-00-076-1479. Used to prefabricate cable (fig. 8.1-3.

8.1-3.1

a. Unpacking, Cleaning, and Inspection.

(1) If the MK-980A/PPS-5 is received in the shipping container, unpack the equipment as described in chapter 2.

(2) Physically check all tags and forms attached to the MK-980-A/PPS-5 to determine the reason for removal from service and other discrepancies.

(3) Remove the MK-980A/PPS-5 from its transit cases as described in chapter2. Inspect all metal and painted surfaces for cracks, dents, and other defects caused by corrosion, abrasion, or mechanical injury.

(4) Clean exterior surfaces of MK-980A/PPS-5 as described in chapter 4.

(5) Remove the MK-980A/PPS-5 component chassis from the case as described in chapter 7. Inspect the chassis for damage, missing parts, and the condition of the finish.

(6) Remove each testblock from test panel chassis as described in chapter 7. Inspect each test block for defective electronic circuitry parts and broken, loose or corroded foil.

(7) Replace the test block into chassis and then into case. Perform the operational tests given in chapter 8 to determine the nature of the problem.

b. Disassembly of End Item. Disassembly of the MK-980A/PPS-5 components is confined to the removal of the chassis from the case and the removal of the test block from the test panel chassis.

c. Temporary Preservation. For temporary preservtion pending maintenance, the chassis, all test block and test panel components shall be enclosed in waterproof, greaseproof wrapper.

8.1-3.2. Maintenance Overhaul and Repair

a. Disassembly. In general, disassembly of the MK-980A/PPS-5 shall be based on the result of the preshop analysis, including a thorough visual inspection, the performance of operational test, and shall be limited to the removal and separation of the chassis and test block. Normally disassembly should not include the separation of bonded, soldered, welded or riveted parts nor the removal of electronic circuitry parts (internal wiring, resistors, capacitors, transistors, etc.) unless to clean, inspect or test a part.

b. Cleaning. Cleaning procedures, methods and materiel for the MK-980A/PPS-5 shall be in accordance with cleaning requirements of TB SIG 355-1. Moisture/fungus proofing instructions, materiel and inspection requirements shall be specified in TB SIG 355-3.

c. *Repair.* Repair procedures for the MK-980A/PPS-5

(including voltage, resistance and waveform data) as well as schematics and component location diagrams are provided in chapter 9. Wiring lists are provided in chapter 9.

8.1-4. General Test Requirements

a. Alternating Current Operation. For alternating current (at) operation, connect the equipment as shown in figure 8.1-1. Set Variable Power Transformer TF-171/USM to provide ±5 volts ac. All circuit brakers should be on, and all switches except the lNPUT POWER switch should be in the down position.

b. Direct Current Operation. For direct current (de) operation, connect the equipment as shown in figure 8.1-2. Monitor the output of Power Supply PP-2309A/U to provide 6± .06 volts dc at test point TP7. All circuit breakers should be on, and all switches except the INPUT POWER switch should be in the down position.

c. Voltage Tests. All voltage tests should be made first in ac operation and then in dc operation. All dc voltages should be made between a test jack, a front panel connector pin, and/or appropriate extender test cable and ground. All ac voltages should be measured as indicated in the test. The high voltage test should be made with Multi meter TS-352/P connected as shown in figure 9-7. The low voltage test should be made with the Multi meter ME-26 (*)/U connected as shown in figure 9-6.

d. Continuity Tests. All continuity and resistance tests should be made with the input voltage disconnected.

e. *Co/or Coded Test Jacks.* Test jacks on the front panel are color coded as follows:

Color	*Indication*
Red	Positive voltage
Purple (PR)	Negative voltage
Green (GRN)	Input signal
Blue (BLU)	Output signal
Yellow (YEL)	Interstage signal
Black (BLK)	Ground
Whlte(WHT)	REMOTE CABLE TEST
White and adjacent black	400 cps

t. *Preliminary Adjustment.* Prior to starting depot overhaul standards tests, adjust internal variable resistor R713 of block 700 receiver-transmitter power converter for -4.85 to 4.90 voltd dc measured at TP705 using the AN/USM-98. A direct current supply voltage of ± .06 monitored at TP17 is required for the tests.

8.1-5. Front Panel Voltage Test Points (figs. 9-10.9-11[1])

a. Connect the equipment as required in paragraph 8.1-4a ans set the INPUT POWER switch to AC ON. Measure the voltages given in c below.

b. Connect the equipment as required in paragraph 8.1-4b and set the INPUT POWER switch to DC ON. Measure the voltages given in c below.

c. Make test point measurements as indicated in the chart below.

NOTE

Use Multimeter ME-26 (*)/U to measure voltage at TP3 and TP4 (2300) block). Use the AN/USM-98 voltmeter to make all other voltage measurements.

NOTE

The block 700 receiver-transmitter power converter in some equipment may not have a -600 volt output.

Panel marking and test point	Block No	DC voltage Mln	Max
-600 PR(TP23)	700	-580	-640
+330 RED(TP62)	700	+300	+320
+110 RED(TP16)	700	+96	+118
+12 RED(TP15)	700	+112	+122
+6 RED(TP13)	700	+5 6	+6 5
-5 PR(TP14)	700	-47	-5.0
-6 PURP(TP17)	700	-58	-70
+35 RED(TP58)	2300	+27	+31
+12 RED(TP56)	2300	+8 5	+10
-12 PURP(TP57)	2300	-85	-10.3
TP3	2300	-185	-270
TP4	2300	+185	+27 O
VAC (TP64 and TP65)	700		6VAC

[1] *Not in all equ/pment*

8.1-6. Front Panel Waveforms (figs. 9-8,9-10.9-11[1])

a. Connect the equipment as required (para 8.1-4).

b. Connect oscilloscope AN/ USM-140B as shown in figure 9-8. Measure the waveforms given in c below.

e. Make test point measurements as indicated in the chart below.

Panel marking and test point	Block No.	Amplitude volts	Waveform width in u sec	Period in u sec
SYNC (TP1)	700	40-160	5-5	225-275
J10 pin 5	600	40-160	.5-5	225-275
TRIG (TP50)	.....	6-12	2*0.5	225-275
TRIG (TP51)	.....	.6-12	2*0/5	227-275
J8 pin 3	500	6-12	2*0.5	225-275
J20 pin 3	2100	6-12	2*0.5	225-275
J22 pin 2	2200	6-12	2*0.5	225-275
J24 pin H	2700	6-12	2*0.5	225-275

8.1-7. Block 100 Voltage and Continuity Tests

a. Connect the equipment as required (para 8.1-4).

b. Set the block 100 power switch to ON. Check the 100 connector J7 and OSC CUR test jack TP11 *()c* below). Use the CX-10431/PPS-5 cable.

c. Make voltage and/or continuity measurements as indicated in the chart below.

Terminal	Voltage	Continuity	Conditions
A	0	0 ohms to ground	
B	+6.0 to +6.9		
C	-4.7 to -5.0		
D	0 to -4.85 ±.15		Varies with setting of

Terminal	Voltage	Continuity	Conditions
E	0 to +6.35 ±0.35	.....	AFC GAIN control. Varies with setting of RCVR GAIN control.
F	+11.4 to +12.6		
H	0	0 ohms to ground	
J	+96 to +118		
K	0	0 ohms to OSC	
[1]L	+11.4 to +12.6		
M	NC	NC	
N	NC	NC	
[1]P	8 vac to R		
[1]R	8 vac to P		

[1]Not connected in some equipment.

d. Set the 100 block power switch to OFF.

8.1-8. Block 300 Voltage and Continuity Test

a. Connect the equipment as required (para 8.1-4).

b. Set the 300 block power switch to ON. Check the 300 connector J4, RCVR-XMTR VIDEO test jack TP2, and CONT-IND VIDEO test jack TP3 as indicated in c below; use the CX-10429/PPS-5 cable (or CX-10444A/PPS-5).

c. Make voltage and/or continuity measurements as indicated in the chart below.

Terminal	Voltage	Continuity
A	0	0 ohms to ground
B	+6.0 to +6.7	
c	–4.7 to –5.0	
D	o	0 ohms to RCVR-XMTR VIDEO TP3
E	0	0 ohms to CONT-IND VIDEO TP3.
F	0	0 ohms to ground
H	+ 11.4 to +12.6	

d. Set the 300 block power ON-OFF switch to OFF.

8.1-9. Block 400 Voltage and Continuity

a. Connect the equipment as required (para 8.1-4).

b. Set the 400 block power ON-OFF switch to ON. Check 400 connector J6, and AUDIO jack J26 as indicated in c below; use the CX-10444/PPS-5 cable.

c. Make voltage and/or continuity measurements as indicated in the chart below.

Terminal	*Voltage*	*Continuity*	*Conditions*
2	0	0 Ω to ground	
2	0	0 Ω to AUDIO J26	
3	0 to 4.85 ±.15	.....	Varies with setting of GAIN control.
4	+11.4 to +12.6		
5	NC	NC	NC
6	–4.7 to –5		
7	–4.7 to –5		
8	+6.0 to +6.7		
9	0	0 Ω to ground	
10	0	0 Ω to GATE TP10	
11	0	0 Ω to SIG TP8	
12	NC	NC	NC
13	0	0 Ω to ground	
14	–5.8 to –7.0	.....	W-NAR switch at NAR.
14	0		W-NAR switch at W.
15	0	0 Ω to ground	
16	0	0 Ω to VID TP9	
17	0	0 Ω to ground	

d. Set the 400 block power ON-OFF switch to OFF.

8.1-10. Block 500 Voltage and Continuity Tests

a. Connect the equipment as required (para *8.1-4).*

b. Set the 500 block power ON-OFF switch to ON. Check the 500 connector J8 and GATE test jack TP18 as indicated in c below; use the CX-1044W PPS-5 cable.

c. Make voltage and/or continuity measurements as indicated in the chart below.

Terminal	*Voltage*	*Continuity*	*Conditions*
1	+6.0 to +6.7	.....	BLANK switch up.
1	0	.....	BLANK switch down.
2	0	0 Ω to ground	
4	0	0 Ω to ground	
5	0	0 Ω to ground	
6	0	0 Ω to ground	
7	–5.8 to –7.0	.....	GATE position switch up.
7	0	.....	GATE position switch down.
8	+11.4 to +12.6		
9	–4.7 to –5		
10	0	0 Ω to GATE TP18.	
11	0	0 Ω to ground	

d. Set 500 block power ON-OFF switch to OFF.

8.1-11. Block 600 Voltage and Continuity Test

a. Connect the equipment as required (para 8.1-4).

b. Set the 600 block power ON-OFF switch to ON. Check the 600 connector J10, LOAD jack J27, and LOAD test jack TP19 as indicated in c below; use the CX-10432/PPS-5 cable.

c. Make voltage and/or continuity measurements as indicated in the chart below.

Terminal	*Voltage*	*Continuing*
1	NC	NC
2	0	0Ω to MAG1 TP22
3	0	0Ω to ground
4	NC	NC
6	+ 11.4 to +14	
7	0	0Ω to ground
8	+320 to +360	
9	0	0Ω to TRIG TP20
10	0	0Ω to MAG I TP21
11	0	0Ω to ground
12	NC	NC
13	0	0Ω to ground
	−4.8 to −5.2	
15	0	0Ω to ground

[a] Connected to ground on some models.

d. Set the 600 block power ON-OFF switch to OFF.

8.1-12. Block 800 Voltage and Continuity Test

a. Connect the equipment as required (para 8.1-4).

b. Set the 800 block power ON-OFF switch to ON. Check 800 connector J5, AFC test jack TP4, CONT-IND test jack TP6 and RCVR-XMTR test jack TP7 as indicated in c below; use the CX 10430/PPS-5 cable.

c. Make voltage and/or continuity measurements as indicated in the chart below.

Terminal	*Voltage*	*Continuity*
A	0	0Ω to ground
B	0	0Ω to TP4
C	0	0Ω to ground
D	0	0Ω to RCVR-XMTR TP5
E	+6.0 to +6.7	
F	−4.7 to −5	
H	+11.4 to +12.6	
J	0	0Ω to GAIN TP7
K	NC	NC
L	+94 to 116	
M	0	0Ω to CONT-IND TP6

d. Set the 800 block power ON-OFF switch to OFF.

8.1-13. Block 900 Voltage and Continuity

a. Connect the equipment as required (para 8.1-4).

b. Set the 900 block power ON-OFF switch to ON Check 900 connector J13 as indicated in *c* below use the CX-10432/PPS-5 cable.

c. Make voltage and/or continuity measurements as indicated in the chart below.

Terminal	Voltage	Continuity	Conditions
1	–5.8 to –7.0	----------	FWD–REV switch set to REV.
1	0	----------	FWD–REV switch set to FWD.
2	–5.8 to –7.0	----------	REV A–REV B switch to REV A.
2	0	----------	REV A–REV B switch to REV B.
3	–5.8 to –7.0	----------	REV A–REV B switch to REV B.
3	0	----------	REV A–REV B switch set to REV A.
4	0	0Ω to ground	
5	–4.7 to –5		
6	+6.0 to +6.7		
7	+11.4 to +13		
8	+0.64 to +0.96		
9	0	0Ω to ground	
10	0	----------	Affected by discharge of C8.
11	–5.8 to –7.0		
12	0		
13	----------	0Ω to 1000 block pin a of J14	
14	0	----------	TEST switch OFF.
14	0 to –6.4 ±.6	----------	TEST switch ON, varies with setting of TEST control.
15	0	0Ω to ground	

d. Set the 900 power ON-OFF switch to OFF.

8.1-14. Block 1000 Voltage and Continuity Tests

a. connect the equipment as required (para 8.1-4).

b. Check 1000 connector J14 and SW P test jacks TP24 and TP25 as indicated in c below; use the CX-10435/PPS-5 cable.

c. Make voltage and for continuity measurements as indicated in the chart below.

Terminal	Voltage	Continuity	Conditions
A	NC	NC	NC
B	NC	NC	NC
C	0	0Ω to 2400 block J11 pins D, P, and TP60; 2800 block J12 pin F.	
D	0	0Ω to 2400 block J11 pins R, S, and TP61; 2800 block J12 pin H.	
E	0	0Ω to 2800 block J12 pin A.	
F	0	0Ω to 2800 block J12 pin B.	
G	0	0Ω to 2800 block J12 pin C.	
H	0	0Ω to SWP TP25	
J	NC	NC	NC
K	0	0Ω to SWP TP24	
L	NC	NC	NC
M	300 to +320		
N–X	NC	NC	NC
Y	0 to –6.4 to ±.6	----------	TEST ON–OFF switch S12 to ON.
Z	NC	NC	NC
a	0	0Ω to 900 block J13 pin 13.	
b and j	NC	NC	NC
d	0	0Ω to ground	

8.1-15. Block 1200 Voltage and Continuity Tests

a. Connect the equipment as required (para 8.14).

b. Set the 1200 block power ON-OFF switch to ON. Check 1200 connector J9, DLY indicator light DS3, FWD-REV indicator light DS5, DRIVE indicator light DS4, and LV indicator light DS6 as indicated in c below; use the CX-10433/PPS-5 cable.

c. Make voltage and/or continuity measurements as indicated in the chart below.

Terminal	Voltage	Continuity	
A	0 to –6.4 ±.6	0Ω to LV TP63	Varies with setting of LV control.
B	----------	----------	Short to ground, LV indicator lights.
C	0	0Ω to ground	
D	0	0Ω to ground	
E	–5.6 to –6.8	----------	DRIVE switch up.
E	0	----------	DRIVE switch down.
F	----------	---	Short to L with FWD–REV switch at REV. DRIVE indicator lights.
H	–4.7 to 5		
J	----------	----------	Short to ground, FWD–REV indicator lights.
K	–5.8 to –7.0	----------	FWD–REV switch set to FWD.
K	0	----------	FWD–REV switch set to REV.
L	–5.8 to –7.0	----------	FWD–REV switch set to REV.
L	0	----------	FWD–REV switch set to FWD.
M	----------	----------	Short to ground, DLY indicator lights.
N	0	0Ω to ground	
PR	NC	NC	NC

d. Set the 1200 block power ON-OFF switch to OFF.

8-1-16. Block 2100 Voltage and Continuity Tests

a. Connect the equipment as required (para 8.1-4).

b. Set the 2100 block power ON-OFF switch to ON. Check both 2100 connectors (J20 and J21) and the test jacks (VID TP30, TRIG TP28, VCTR TP35, SWP TP38, SWP TP34, BLANK TP32, MARK TP29, and VID TP31) as indicated in *c* and *d* below; use the CX-10441/PPs-5 cable. (or CX-10441A).

c. Make voltage and/or continuity measurements for connector J20 as indicated in the chart below.

Terminal	Voltage	Continuity	Conditions
1	0	0Ω to ground	
2	–8.5 to –10		
4	+8.5 to +10		
5	0	0Ω to TRIG TP28	
6	+8.5 to +10		
7	–5.8 to –7.0	----------	MARKER switch up.
7	0	----------	MARKER switch down.
8	0	0Ω to MARK TP 29	
9	–5.8 to –7.0	----------	GATE DELAY switch up.
9	0	----------	GATE DELAY switch down.
10	0	0Ω to ground	
11	0	0Ω to VID TP30.	

d. Make voltage and/or continuity measurements for connector J21 as indicated in the chart below.

Terminal	Voltage	Continuity	Conditions
1	0	0Ω to VID TP31.	
2	0	0Ω to ground	
3	0	0Ω to BLANK TP32	
4	0	0Ω to ground	
5	–5.8 to –7.0	----------	SWP LENGTH switch up.
5	0	----------	SWP LENGTH switch down.
6	0	0Ω to SWP TP33	
7	0	0Ω to SWP TS34	
8	+300 to +320		
9	+27 to +31		
10	0	0Ω to VCTR TP35.	
11	0	0Ω to ground	

e. Set the 2100 block power ON-OFF switch to OFF.

8.1-17. Block 2200 Voltage and Continuity Tests

a. Connect the equipment as required (para 8.1-4).

b. Set the 220 block power ON-OFF' switch to ON. Check both 2200 connectors (J22 and J23) and the test jacks. (MARK TP46, VID B TP49, VID RGF TP45, VID SEL TP37, VID IN TP44, SWP TP47, SWP TP48, BLANK TP36, ASTIG TP27, B VID TP39, MTI TP38, MTI TP40, MTI TP41, MTI TP43, MTI TP42) (c and *d* below), use the CX-10442/PPS-5 cable.

c. Make voltage and/or continuity measurements for connector J22 as indicated in the chart below.

Terminal	*Voltage*	*Continuity*
1	0	0Ω to ground
3	0	0Ω to BLANK TP36
4	0	0Ω to VID SEL TP37
5	0	0Ω to ground
6	+27 to +31	
7	0	0Ω to ground
8	0	0Ω to B VID TP38
9	0	0Ω to ground
10	-8.5 to -10.3	
11	+8.5 to +10	
12	0	0Ω to ground
13	0	0Ω to MTI TP39
14	0	0Ω to MTI TP40
16	0	0Ω to ground
16	0	0Ω to MTI TP41
17	0	0Ω to MTI TP42
18	0	0Ω to MTI TP43
19	0	0Ω to ground
20	0	0Ω to VID IN TP44.
21	0	0Ω to VID RGF TP45.
22	0	0Ω to ground

d. Make voltage and/or continuity measurements for connector J23 as indicated in the chart below.

Terminal	*Voltage*	*Continuity*	*Conditions*
3	0	0Ω to MARK TP46	
4	+300 to +320		
5	0	0Ω to ground	
6	0	0Ω to SWP TP47	
7	0	0Ω to SWP TP48	
8	0	0Ω to ground	
9	0	0Ω to ground	
10	0	0Ω to VID B TP49.	
11	-5.8 to -7.0		NORM-MTI switch set to NORM.
11	0		NORM-MTI switch set to MTI.

e. Set the 2100 block power ON-OFF switch to OFF.

8.1-18. Block 2400 Voltage and Continuity Tests

a. Connect the equipment as required (para 8.1-4).

b. Set the 2400 block power ON-OFF switch to ON, Check 2400 connectors Jll as indicated in *c* below; use the CX-10436/PPS-5 cable.

c. Make voltage and/or continuity measurements as indicated in the chart below.

Terminal	*Voltage*	*Continuity*	*Conditions*
A	0	0Ω to ground	
B	+8.5 to +10		
C	-8.5 to -10		
D	0	0Ω to 400 CPS TP60 (white)	
E	-5.8 to -7.0		
K	0	0Ω to ground	
L		0Ω to 2800 block J12 pin E.	
M	0	0Ω to 2800 block J12 pin J.	
N		0Ω to 2800 block J12 pin K.	
P	0	0Ω to 400 CPS TP60 (white).	
R	0	0Ω to 400 CPS TP61 (black).	

Terminal	Voltage	Continuity	Conditions
S	0	0Ω to 400 CPS TP61 (black).	
T	0	0Ω to 2800 block J12 pin L.	
U,V W,X	NC	NC	NC

d. Set the 2400 block power ON-OFF switch to OFF,

8.1-19. Block 2700 Voltage and Continuity Test

a. Connect the equipment as required (para 8,1-4).

b. Set the 2700 block power ON-OFF switch to ON. Check the 2700 connector J24 and the test jacks (VIDEO TP53 and TP54, and TRIG TP52) as indicated in *c* below; use the CX-10437/PPS-5 cable.

c. Make voltage and/or continuity measurements as indicated in the chart below,

Terminal	Voltage	Continuity
A	-2.5 to -3.3	
B	+2.5 to +3.3	
C	0	0Ω to TRIG TP52
D	0	0Ω to ground
E	0	0Ω to VIDEO TP53 (green)
F	0	0Ω to ground
J	-8.5 to -10.3	
K	+8.5 to +10	
L	0	0Ω to VIDEO TP54 (blue).

d. Set the 2700 block power ON-OFF switch to OFF.

8.1-20. Block 2800 Voltage and Continuity Tests

a. Connect the equipment as required (para 8.1–4).

b. Check 2800 block J12 as indicated in c below; use the CX-10431/PPS–5 cable.

c. Make voltage and/or continuity measurements as indicated in the chart below.

Terminal	Voltage	Conditions
A	0	0Ω to 1000 block J14 pin E.
B	0	0Ω to 1000 block J14 pin F.
C	0	0Ω to 1000 block J14 pin G.
D	0	0Ω to ground.
E	0	0Ω to 2400 block J11, pin L.
F	0	0Ω to 400 cps TP60 (white)
H	0	0Ω to 400CPS TP61 (black).
J	0	0Ω to 2400 block J11, pin M.
K	0	0Ω to 2400 block J11, pin N.
L	NC	0Ω to 2400 block J11, pin T.
N	0	NC
P	-5.6 to -6.8	
R	-5.6 to -6.8	

8.1-21. Block 2900 Voltage and Continuity Tests

a. Connect the equipment as required (para 8.1-4).

b. Set the 2900 block power ON-OFF switch to ON. Check 2900 connector J25 and test jack TP55 as indicated in c below; use the CX-10438/PPS-5 cable.

c. Make voltage and or continuity measurements as indicated in the chart below.

Terminal	Voltage	Continuity
1	NC	NC
2	0	0Ω to ground
3	NC	NC
4	+8.5 to +10	
5	NC	NC
6	+27 to +31	
7	0	0Ω to ground
8	0	0Ω to TEST TP55
9-10	NC	NC
11	-8.5 to -10	

d. Set the 2900 power ON-OFF switch to *OFF.*

8.1-22. CRT TEST Voltage Test

a. Connect the equipment as required (para 8.1-4).

b. Check CRT TEST connectors J16 *(c* below) and J17 *(d* below) ; use the CX-10443/ PPS-5 cable.

Warning

Voltage up to 2,000 volts is present at connector J16 and the test cable assembly when the CRT TEST pushbutton is depressed.

Caution

Under no conditions should the CRT TEST pushbutton be depressed when measuring the filament voltage. Damage to the multimeter will result.

c. Make continuity and/or voltage measurements as indicated in the chart below.

Terminal	*Voltage*	*Continuity*	*Conditions*
1	+94 to +116	0Ω to 700 block +100 TP16	
2–6	NC	NC	
7	-1750 ±100	----------	CRT TEST pushbutton depressed and B BRIGHT R49 adjusted.
8 and 10	1.35 to 1.65	----------	Ac voltage obtained between pins 8 and 10.
8	-1,450 to -1,900	----------	Dc voltage obtained between pin 8 and ground. with CRT TEST push-button de. pressed.
9 and 15	1.35 to 1.65	----------	Ac voltage obtained between pins 9 and 16.
9	-1,500 to -1,900	----------	Dc voltage obtained between pin 9 and ground, with CRT TEST push-button depressed.
10	-1,450 to -1,900	----------	De voltage obtained between pin 10 and ground, with CRT TEST push-button depressed.
11	-1,200 ±100	----------	CRT TEST pushbutton depressed and A FOCUS R51 adjusted.
12	–1,680 ±100	----------	CRT TEST pushbutton depressed and B BRIGHT R46 adjusted,
13	+ 1,800 to +2,300	----------	CRT TEST pushbutton depressed.
14	-1,200 ±100	----------	CRT TEST pushbutton depressed and B FOCUS R48 adjusted.

d. Make voltage and/or continuity measurements for connector J17 as indicated in the chart below.

Terminal	*Voltage*	*Continuity*	*Conditions*
A	+140 to +160		
B–C	NC	NC	
D	+140 to +160		
E–F	0 to 310 ±10	----------	Variable by DEFL R61 control.
H	0	0Ω to ground	

8.1-23. Block 600 LOAD Tests

The resistance between LOAD test jack J27 to ground should be 2,020 ohms ±5 percent. The resistance between LOAD (BLU) test point TP19 and ground should be 10 ohms ±5 percent.

8.1-24. Drive Motor B1 001

a. Connect the equipment as required (para 8.1-4).

b. Check motor power connector J15 (c below) ; use the CX-10434/PPS-5 cable.

c. Make voltage and continuity measurements as indicated in the chart below.

Terminal	*Voltage*	*Continuity*	*Conditions*
A	–5.8 to –7.0	----------	FWD–REV switch set to FWD.
A	0	0Ω to ground	FWD–REV switch set to REV.
B	–5.8 to –7.0	----------	FWD–REV switch set to REV.
B	0	0Ω to ground	FWD–REV switch set to FWD.

8.1-25. REMOTE CABLE Test (fig. 9-11 ①)

a. Connect the equipment as required (para 8.1-4).

b. Measure the voltage at connector J18 pin W, the voltage should be -6 ±.06 volts.

c. For connector J18, there should be zero ohms between pins V and U, T and S, R and P, N and M, L and K, J and H, G and F, E and D, A and X, j and g, h and f, e and d, c and b, a and Z, Y and i, q and p, n and m, k and r.

d. For connector J-19, there should be zero ohms between pins W-V, U-T, S-R, P-N, M-L, K–J, H-G, F–E, D–A, X–j, g-h, f-e, d-c, b-a, Z-Y, i-q, p-n, m-k, and r-TEST (WHT) TP26.

e. There should be 56 ohms ±5 percent between TEST (WHT) TP26 and ground.

8.1-26. Special Purpose Cable Assemblies Tests

a. *General.* The following test procedures should be performed in the order listed. Applicable standards are indicated for each item.

b. Test Equipment Required, Multimeter ME-26 (*), U and Test Set, Insulation Breakdown AN/GSM–6 are the equipment required for this test (para 8.1-3).

c. General Procedures and Requirements.

(1) CX-10429 PPS-5 cable assembly (block 300).

(a) Perform a continuity test between each pin of P1 and the corresponding pin; use the RX1 range on Multimeter ME-26(*)/U, The resistance should be less than 0.1 ohm,

(b) Perform a leakage and high-pot test from each pin of P1 to all other pins of P1 and to each connector hood. Leakage should be greater than 10 megohms. High-pot at 500 volts ac for 1 minute.

(2) CX-10480 PPS-5 cable assembly (block 800).

(a) Perform a continuity test between each pin of P1 and the corresponding pin of P2; use the RX1 range on Multimeter ME-26(*)/U. The resistance should be less than 0.1 ohm.

(b) Perform a leakage and high-pot test from each pin of P1 to all other pins of P1 and to each connector hood. Leakage should be greater than 10 megohms. High-pot at 500 volts ac for 1 minute.

(3) *CX-10441* PPS-5 *cable assembly (block 2100).*

(a) Perform a continuity test between each pin of P1 and corresponding pin of P3 and between each pin of P2 to the corresponding pin of P4. Use the RX1 range on Multimeter ME-26(*)/U.

(b) Perform a leakage and high-pot test from each pin of P1 and P2 to all other pins of both P1 and P2 and to each connector assembly frame. Leakage should be greater than 10 megohms. High-pot at 500 volts ac for 1 minute.

(4) *CX-10442 PPS-5 cable assembly (block 2200).*

(a) Perform a continuity test between each pin of P1 and the corresponding pin of P3, and between each pin of P2 and the corresponding pin of P4. Use the RX1 range on Multimeter ME–26(*)/U. The re-

sistance should be less than 0.1 ohm.

(b) Perform a leakage and high-pot test from each pin of P1 and P2 to all other pins of both P1 and P2 to each connector assembly frame. Leakage should be greater than 10 megohms. High-pot at 500 volts ac for 1 minute.

(5) *CX-10431 PPS-5 cable assembly (blocks 100 and* 2800).

(a) Perform a continuity test between each pin of PI and the corresponding pin of P2, Use the RX1 range on Multimeter ME-26(*)/U. Resistance should be less than 0.1 ohm.

(b) Perform a leakage and high-pot test from each pin of P1 to all other pins of P1 and to each connector hood. Leakage should be greater than 10 megohms. High-pot at 500 volts ac for 1 minute,

(6) *CX-10432 PPS-5 cable assembly (blocks 600 and 900).*

(a) Perform a continuity test between each pin of PI and the corresponding pin of P2. Use the RX1 range on Multimeter ME–26(*)/U. The resistance should be less than 0.1 ohm.

(b) Perform a leakage and high-pot test from each pin of P1 to all other pins of P1 and to each connector hood. Leakage should be greater than 10 megohms. High-pot at 500 volts ac for 1 minute except pin 8, which should be high-potted at 700 volts ac for 1 minute.

(7) *CX-10433 PPS-5 cable assembly (block 1200).*

(a) Perform a continuity test between each pin of P1 and the corresponding pin of P2. Use the RX 1 range on Multimeter ME-26(*)/U. the resistance should be less than 0.1 ohm.

(b) Perform a leakage and high-pot test from each pin of P1 to all other pins of PI and to each connector hood. Leakage should be greater than 10 megohoms. High-pot at 500 volts ac for 1 minute.

(8) *CX-10434/PPS-5 cable assembly (block 1000).*

(a) Perform a continuity test between each pin of P1 and the corresponding pin of P2. Use the RX1 range on Multimeter ME–26 (*)/U. The resistance should be less than 0.1 ohms.

(b) Perform a leakage and higkpot test between pins A and B of P1 Leakage should be greater than 10 ac for 1 minute.

(9) *CX-10435/PPS-5 cable assembly (block 1000).*

(a) Perform a continuity test between each pin of P1 and the corresponding pin of P2. Use the RX1 range on Multimeter ME–26 (*) /U. The resistance should be less than 0.1 ohm.

(b) Perform a leakage and high-pot test from each pin of P1 to all other pins of P1 and to each connector hood. Leakage should be greater than 10 megohms. High-pot at 500 volts ac for 1 minute.

(10) *CX-10436/PPS-5 cable asembly (block 2400).*

(a) Perform a continuity test between each pin of P1 and the corresponding pin of P2. Use the RXI range on Multimeter ME–26 (*) /U. Resistance should be less than 0.1 ohm.

(b) Perform a leakage and high-pot test from each pin of P1 to all other pins of P1 and to each connector hood. Leakage should be greater than 10 megohms. High-pot at 500 volts ac for 1 minute.

(11) *CX-10443 PPS-5 cable assembly (CRT TEST) .*

(a) Perform a continuity test between the pins as tabulated below. Use the RX1 range of Multimeter ME–26 (*)/U. The resistence should be less than 0.1 ohm.

From—	P1-7	P1-8	P1-9	P1-10	P1-11	P1-12	P1-13	P1-14	P1-15	P1-1	P2-A	P2-D	P2-E	P2-F	P2-H
To—	J2-4	J1-1	J2-3	J1-14	J2-5	J1-9	P3	J1-3	J2-8	J1-11	J1-4 J1-7	J2-1 J2-6	J1-5 J1-6	J2-2 J2-7	P4

(b) Perform a leakage test from each pin of P1 and P2 to all other pins of PI and P2 and to the hoods of P1 and P2. The leakage should be greater than 10 megohms.

(c) Perform a high-pot test between each pin of Pl, except pin 13, and all other pins of P1. A potential of 3 kilovolts ac should be applied for 1 minute. Apply 6 kilovolts ac between pin 13 and each of the other pins of PI for 1 minute. A potential of 500 volts ac should be applied between each pin of P2 and all other pins of P2 for 1 minute.

(12) *CX-I04W PPS-5 cable assembly (block 2700).*

(a) Perform a continuity test between each pin of PI and the corresponding pin of P2. Use the RX1 range on Multimeter ME–26 (*) /U. The resistance should be less than 0.1 ohm.

(b) Perform a leakage and high-pot test from each pin of P1 to all other pins of P1. Leakage should be greater than 10 megohms. High-pot at 500 volts ac for 1 minute.

(13) *CX-10438 PPS-5 cable assembly (block 2900).*

(a) Perform a continuity test between each pin of P1 and the corresponding pin of P2. Use the RX1 range on Multimeter ME–26 (*) /U. The resistance should be less than 0.1 ohm.

(b) Perform a leakage and high-pot test from each pin of P1 to all other pins of P1. Leakage should be greater than 10-megohms. High-pot at 500 volts ac for 1 minute.

(14) *CX-10439 PPS-5 cable assembly (block 700)* .

(a) Perform a continuity test between each pin of P1 and the corresponding pin of P2. Use the RX1 range on Multimeter ME–26 (*) /U. The resistance should be less than 0.1 ohm.

(b) Perform a leakage and high-pot test from each pin of P1 to all other pins of P1 and to the connector hoods. Leakage should be greater than 10 megohms. High-pot at *500* volts ac for 1 minute except P1–9, which should be high-potted to other pins and hood at 1,000 volts ac for 1 minute.

(15) *CX-10440 PPS-5 cable assembly (block 2300).*

(a) Perform a continuity test between each pin of P1 and the corresponding pin of P2. Use the RX1 range on Multimeter ME-26(*)/U. The resistance should be less than 0.1 ohm.

(b) Perform a leakage and high-pot test from each pin of P1 to all other pins of P1. Leakage should be greater than 10 megohms. Tests between pin S and other pins should be made with 6 kilovolts ac applied for 1 minute.

(16) *CX-10445 PPS-5 cable assembly (block 400).*

(a) Perform a continuity test between each pin of PI and the corresponding contact of J1. Use the RX1 range on Multimeter ME–26 (*)/ U. The resistance should be less than 0.1 ohm.

(b) Perform a leakage and high-pot test from each pin of P1 to all other pins of P1. Leakage should be greater than 10 megohms. High-pot at 500 volt ac for 1 minute.

(17) *CX-10445 PPS-5 cable assembly (block 500).*

(a) Perform a continuity test between each pin of P1 and the corresponding contact of J1. Use the RX1 range on Multimeter ME–26 (*)/ U. The resistance should be less than 0.1 ohm.

(b) Perform a leakage and high-pot test from each pin of P1 to all other pins of P1. Leakage should be greater than 10 megohms. High-pot at 500 volt 9 ac for 1 minute.

(18) *Modulator load, Preamplifier adapter, coaxial and test lead assemblies.*

(a) Perform a continuity check from end to end. Use the RX1 range on Multimeter ME–26 (*)/U. The resistance should be less than 0.1 ohm except on Radio Frequency Cable Assembly CG3355/U, where the resistance should be 150 ohms ±5 percent. Resistance from P2 to ground should be 51 ohms ±5 percent.

(b) Perform a leakage test on Electrical Lead CX–10449/PPS-5. Leakage should be greater than 10 megohms to ground.

(C) Perform high-pot tests on the following assemblies. The indicated voltages should be applied for 1 minute.

Cable assembly	Voltage to ground
CX–10449/PPS–5	3 kilovolts dc
CG–3354/U	500 volts dc
CX–10446/PPS–5	8 kilovolts dc
CX–10447/PPS–5	8 kilovolts dc
CX–10451/PPS–5	8 kilovolts dc

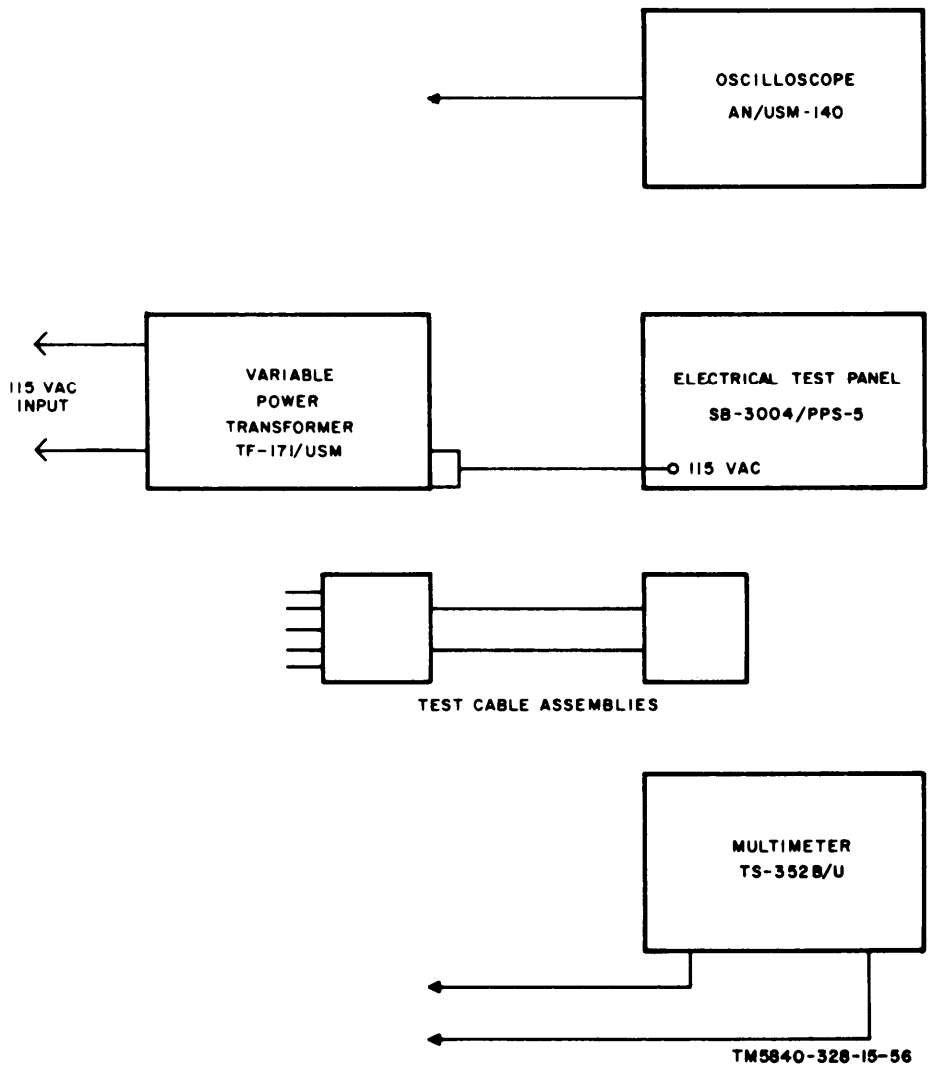


Figure 8.1-1. Test setup with ac input power to Electrical Test Panel SB-3004/PPS-5.

(19) CX-12067/U *cable assembly (AUDIO).*

(a) Perform a continuity test between connector contact A and the tip of the telephone plug, and between contact B and the stem pf the telephone plug. Use the RX1 range on Multimeter ME-26B/U. The resistance should be less than 0.1 ohm.

(b) Perform a leakage and high-pot test between connector contacts A and B, and between the tip and the stem of the telephone plug. Perform the same test between each connector contact and the connector assembly frame, and between the tip of the telephone plug and the housing of the plug. Leakage should be greater than 10 megohms. High-pot at 500 volts ac for 1 minute.

(20) CX-10441A/PPS-5 cable assembly (block 2100). Follow the test procedures in (3) (a) and *(b)* above.

(21) CX-10444A/PPS-5 cable assembly (block 400). Follow the test procedures in (16) (a) and *(b)* above.

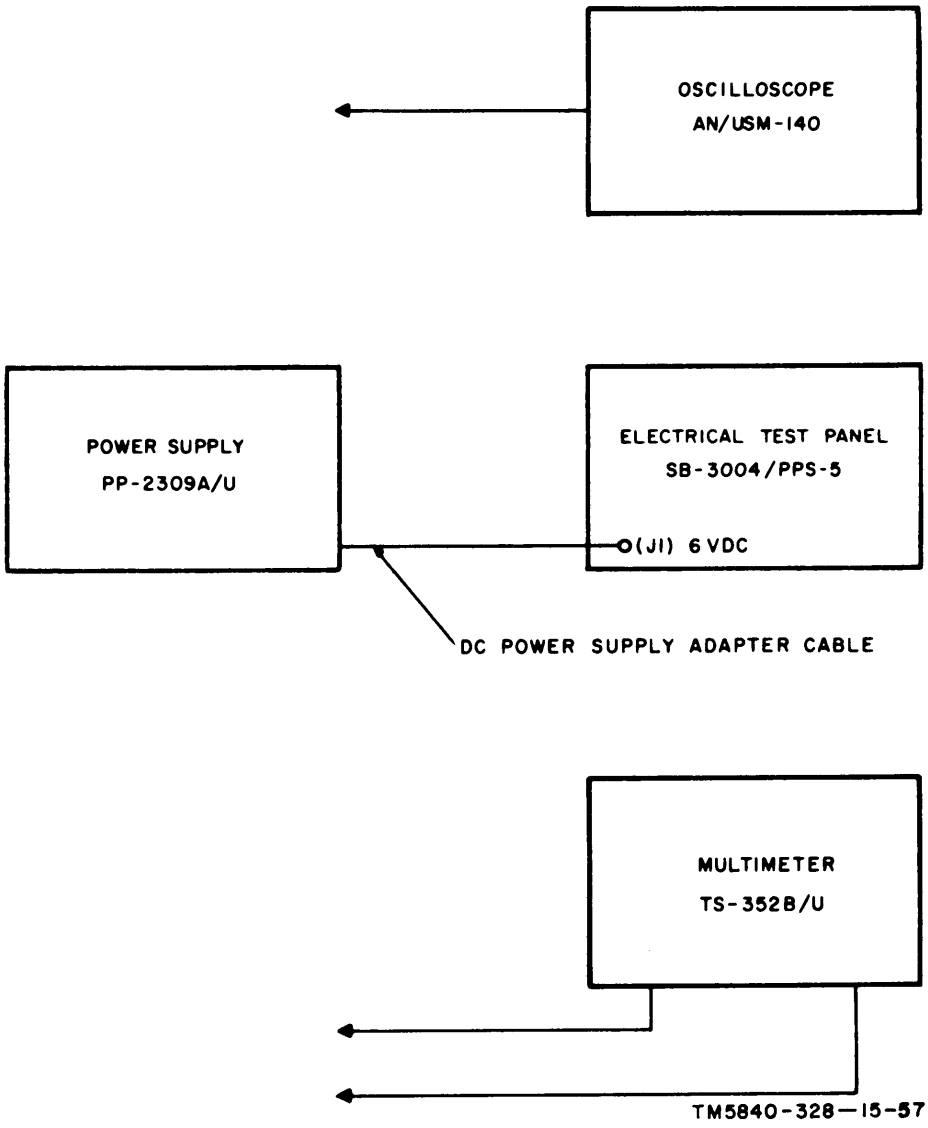


Figure 8.1-2. Test Setup with dc input to Electrical Test Panel SB-3004/PPS-5.

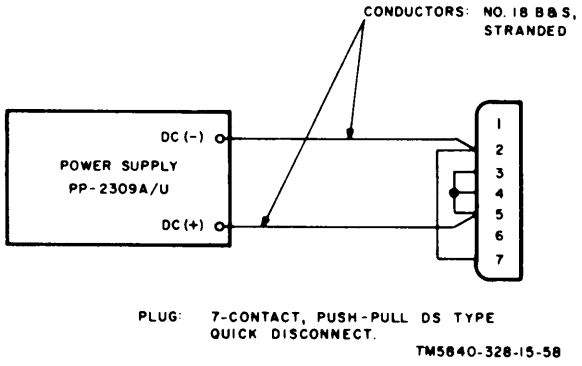


Figure 8-1.-3. Dc power supply adapter cable.

CHAPTER 9

SHIPMENT AND LIMITED STORAGE AND DEMOLITION TO PREVENT ENEMY USE

Section I. SHIPMENT AND LIMITED STORAGE

9-1. General Information

For shipment or limited storage of the MK-980/PPS–5 check its physical and operating condition (para 4–5), stow all the accessories inside the case and close it (para 9–2), and put the MK–980/PPS–5 in a wooden packing box (para 9-3).

9-2. Stowing Test Facilities Kit MK–980/PPS-5 In Case

After the MK-980/PPS-5 has been checked (para 4–5) and all components are at hand or accounted for, (app B), proceed as follows:

a. Stow the accessories (fig. 1–2) in the accessory kit pouch (fig. 1–1).

b. Stow the accessory kit pouch and a copy of this technical manual in the accessory kit compartment.

c. Close the accessory kit compartment by lowering the retaining plate into place and securing it with the two quarter-turn fasteners. (To lock a fastener, press it down and turn it clockwise one-quarter turn.)

d. If the SB–3004/PPS–5 test panel is connected to 1115 volts ac, disconnect the power cord from the ac outlet.

e. If the test panel is connected to Battery Box CY-3871/PPS-5 or to Power Supply PP-4450/PPS–5, disconnect the battery cable or the power supply cable from the test panel 6 VDC jack by pulling the lanyard attached to the plug. Place the protective cap on the plug.

f. Stow the power cord by wrapping it on the stowage hooks on the test panel (fig. 9-1) in an X pattern, and secure the loose end by pressing the clip (on the plug) onto the adjacent portion of the cord. Make sure the cord is dressed to pass inside the test panel handle, so that it will not prevent the top half of the case from seating properly on the bottom half.

g. Place the top half of the case (fig. 1-1) next to the bottom half so that the hinges are adjacent to the hinge pins, lift and tilt the top half toward the bottom half so that the hinges engage the hinge pins, and close the case by swinging the top half over and down on to the bottom half.

h. Secure the eight latches as follows: press and hold each latch hook against the side of the case, pull the latch tab out and up, and turn the tab clockwise one-half turn. Make sure each latch hook engages the latch groove as it rises when the tab is turned.

9-3. Repackaging Test Facilities Kit MK-980/PPS-5 For Shipment or Limited Storage

The exact procedure for repackaging depends on the materials available and the conditions under which the equipment is to be shipped or stored. Whenever possible, adapt the following materials and procedures.

a. Materials. The materials listed in the chart below are required for repackaging test Facilities Kit MK–980/PPS–5. For stock numbers of materials, refer to SB 38-100.

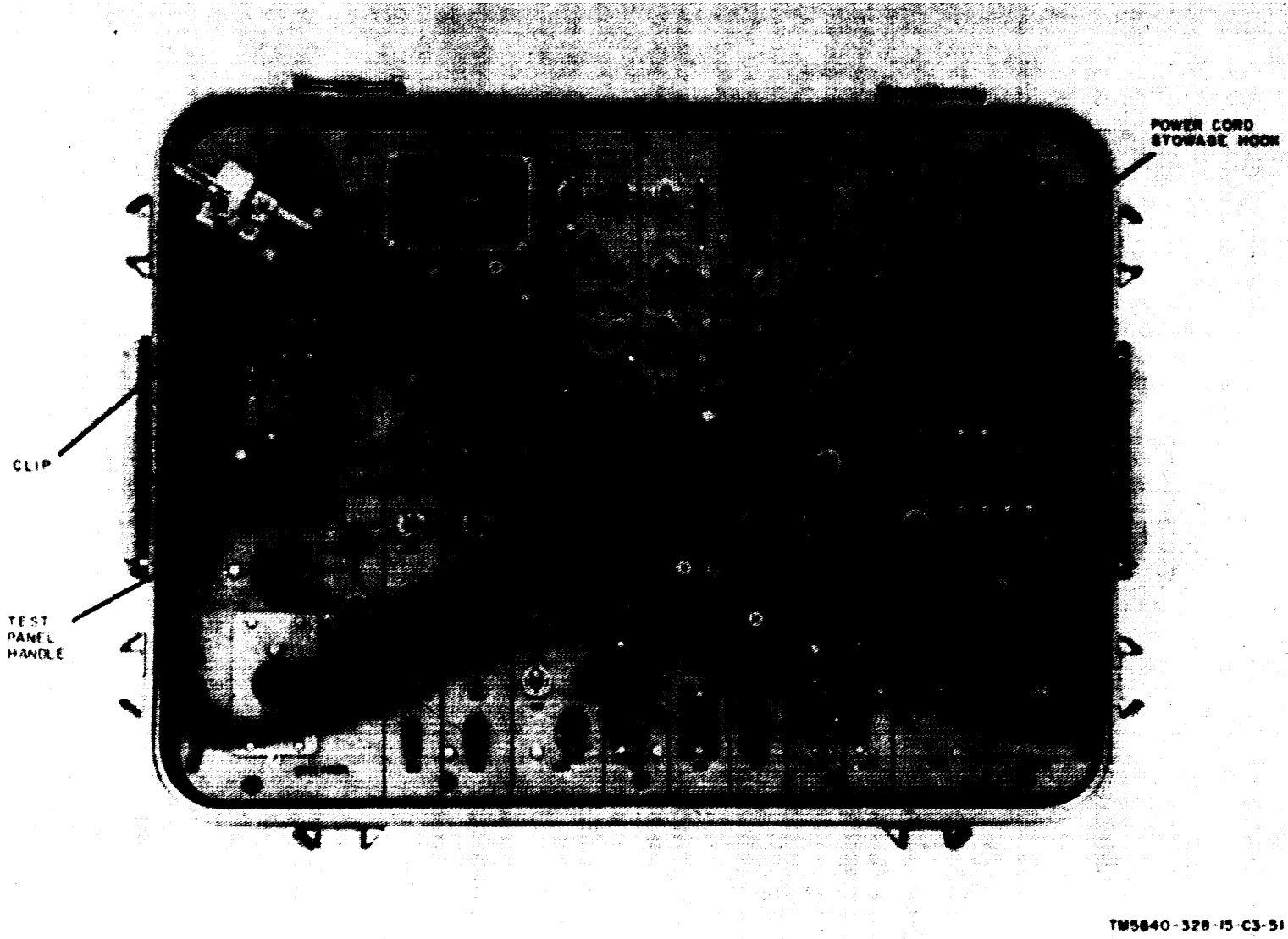


Figure 9–1. Test Facilities Kit Case CY-6208/PPS-5, stowage of power cord.

Materials	Quantity (ft)
Wood, ¾ in. by 6 in. (pine)	44
Wood, 1 in. by 2 in. (pine)	7
Wood, 2 in. by 4 in. (fir)	4
Nails (eightpenny)	1 lb
Metal strap (½ in.)	14
Filler (2 in. thick by 30 in. wide)	5
Filler (1 in. thick by 30 in. wide)	2
Filler (3 in. thick by 30 in. wide)	2
Waterproof paper (30 in. wide)	8
Waterproof adhesive tape (2-in. wide)	3

b. Repackaging Procedure.

(1) Obtain or make a wooden packing box (fig. 2–1) that is 25 1/4 inches long, 20 1/2 inches wide and 18 1/2 inches high. The inside of the box should be lined with waterproof paper secured to the inside by liquid tar.

(2) Place a 3-inch-thick pad of filler material in the bottom of the box, and put the MK–980/PPS–5 in the box.

(3) Fit 2-inch-thick filler pads around the sides of the MK-980/PPS-5, and put a l-inch-thick filler pad on top of the equipment.

(4) Fold the waterproof paper over the top filler pad, and secure the folds with waterproof tape.

(5) Nail (or screw) the wooden cover in place.

(6) Double-band the box with metal straps.

(7) Mark box (contents, destination) as required.

Section II. DEMOLITION OF MATERIEL TO PREVENT ENEMY USE

9-4. Authority for Demolition

The demolition procedures (para 9–5) will be used to prevent the enemy from using or salvaging the equipment. Demolition of the equipment will be accomplished only upon the order of the commander.

9-5. Destruction Plan

Field manuals direct that a destruction plan for equipment will be prepared. It is desirable that, in this plan, personnel be assigned specific tasks so that minimum time will be required should destruction become necessary, It is desirable also that all personnel concerned be familiar with all aspects of the complete destruction plan, The plan must be complete and adequate and easily carried out in the field and must provide for destruction as complete as the available time, equipment, and personnel will permit. Because the time required for complete destruction may not always be available, field manuals also direct that destruction priorities be established to insure that essential parts of the equipment will be destroyed first. Priority in the following order is suggested for Test Facilities Kit MK-980/PPS-5.

a. Receiver-transmitter power converter marked PWR. CONV. RADAR).

b. Control-indicator power converter (marked PWR. CONV. REMOTE).

c. Electrical Test Panel SB–3004/PPS–5.

d. Accessories (test cables, attenuators, adapters, tools).

e. Case,

f. Technical manual.

9–6. Methods of Destruction

Use any or all of the methods of destruction given in a through e below. Available time and the tactical situation will determine the methods to be used, but it is better to completely destroy one or two parts of the equipment than to only partially destroy all parts.

a. Smash. Use sledge, ax, hammer, crowbar, or any heavy object.

(1) Take the receiver-transmitter power converter out of the test panel (pry it out), and smash it.

(2) Take the control-indicator power con-

verter out of the test panel (pry it out), and smash it.

(3) Smash the test panel switches and jacks.

(4) Pry the test panel out of the case, and smash the circuit components at the back of the panel.

(5) Take the accessories out of the pouch, and smash the test cable connectors and the attenuator, tools, and adapters.

(6) Smash the case.

b. Cut Use ax, machete, or knife.

(1) Cut the power cord.

(2) Take the test panel out of the case (pry it out), and cut the circuit wiring at the back of the panel.

(3) Take the accessories out of the pouch, cut the test cables, and cut the pouch.

(4) Cut the flyleaf (marked OPERATING INSTRUCTIONS),

(5) Cut the technical manual.

Warning: **Be extremely careful. Use incendiary devices only in very urgent situations.**

c. Bum. Use gasoline, oil, flamethrower, or incendiary grenade.

(1) Burn technical manual.

(2) Take test panel out of the case (pry it out), and burn out the components and wiring at the back of the panel.

(3) Burn the pouch and the accessories in it.

(4) Burn the case.

d. Explosives. Use explosives when time does not permit destruction by any other means, Incendiary grenades are very effective. Explode an incendiary grenade next to the test panel.

e. Disposal. Bury or scatter parts, or throw them into waterways.

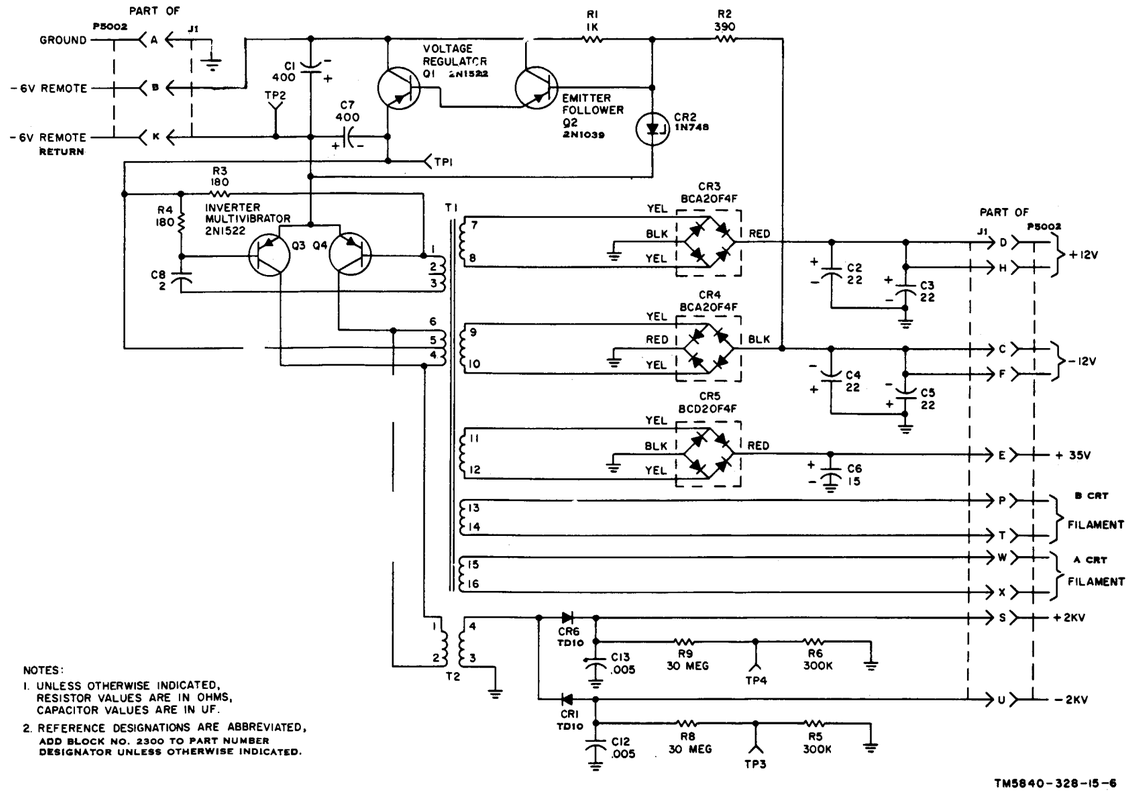
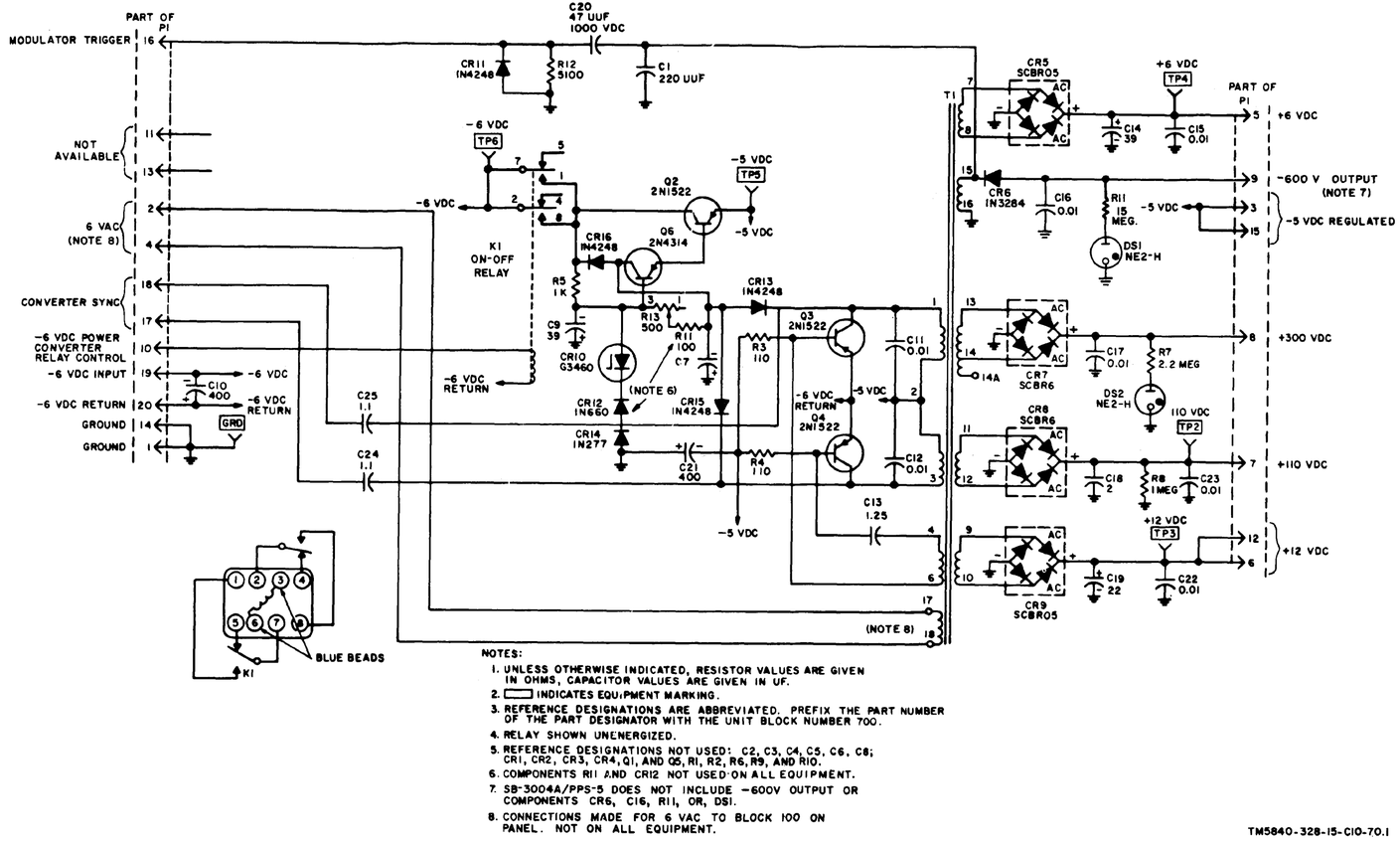


Figure 9-2. Control indicator power converter, schematic diagram.



NOTES:

1. UNLESS OTHERWISE INDICATED, RESISTOR VALUES ARE GIVEN IN OHMS, CAPACITOR VALUES ARE GIVEN IN UF.
2. ▭ INDICATES EQUIPMENT MARKING.
3. REFERENCE DESIGNATIONS ARE ABBREVIATED. PREFIX THE PART NUMBER OF THE PART DESIGNATOR WITH THE UNIT BLOCK NUMBER 700.
4. RELAY SHOWN UNENERGIZED.
5. REFERENCE DESIGNATIONS NOT USED: C2, C3, C4, C5, C6, C8; CR1, CR2, CR3, CR4, Q1, AND Q5, R1, R2, R6, R9, AND R10.
6. COMPONENTS R11 AND CR12 NOT USED ON ALL EQUIPMENT.
7. SB-3004A/PPS-5 DOES NOT INCLUDE -600V OUTPUT OR COMPONENTS CR6, C16, R11, OR, DS1.
8. CONNECTIONS MADE FOR 6 VAC TO BLOCK 100 ON PANEL. NOT ON ALL EQUIPMENT.

TM5840-328-15-C10-70.1

Figure 9-3. Block 700 receiver transmitter Power converter, schematic diagram.

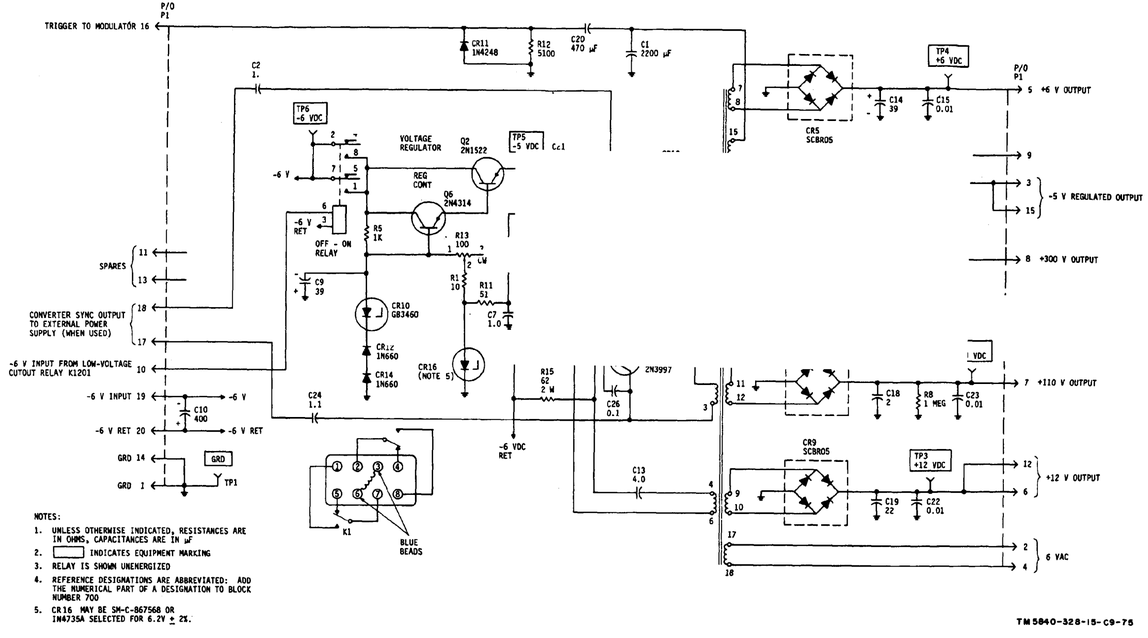


Figure 9-3.1. Block 700 receiver-transmitter power converter in SB-3004/UPPS-5 with serial number 086 and up on contract DAAB07-78-C-1624, schematic diagram.

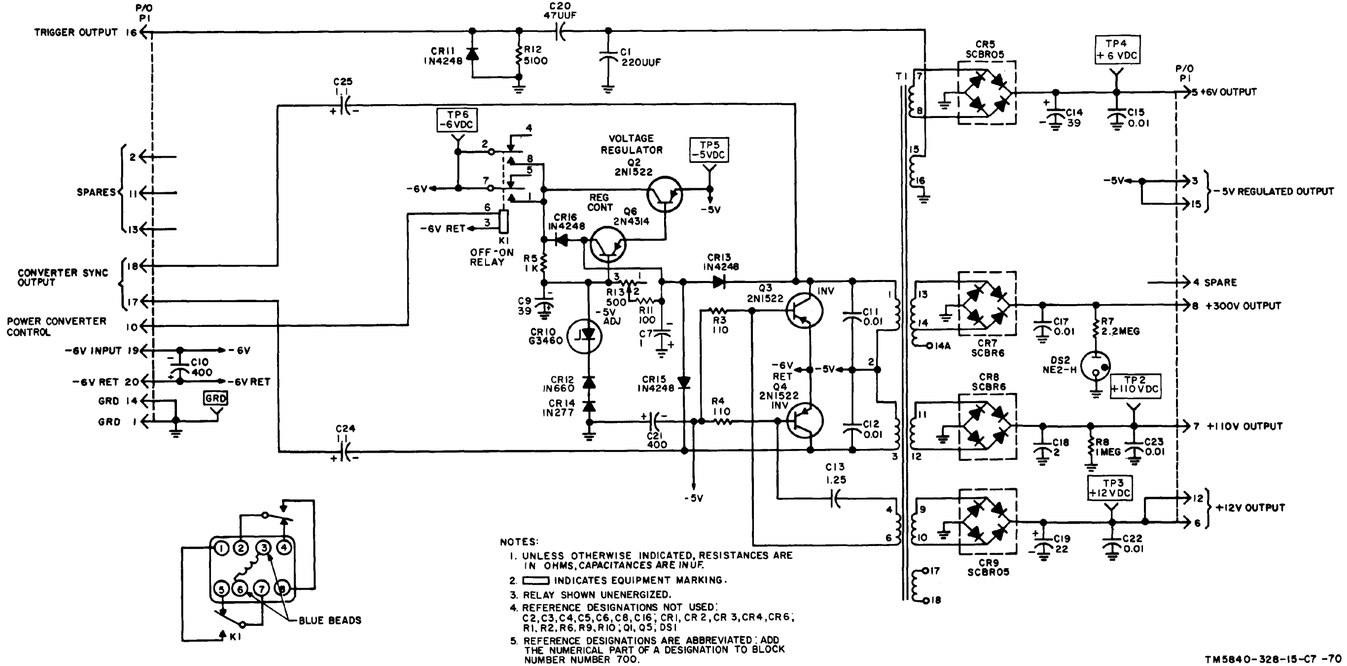


Figure 9-3.2. Block 700 receiver-transmitter power converter 686221 in SB-3001A/PPS-5 test panels, schematic diagram.

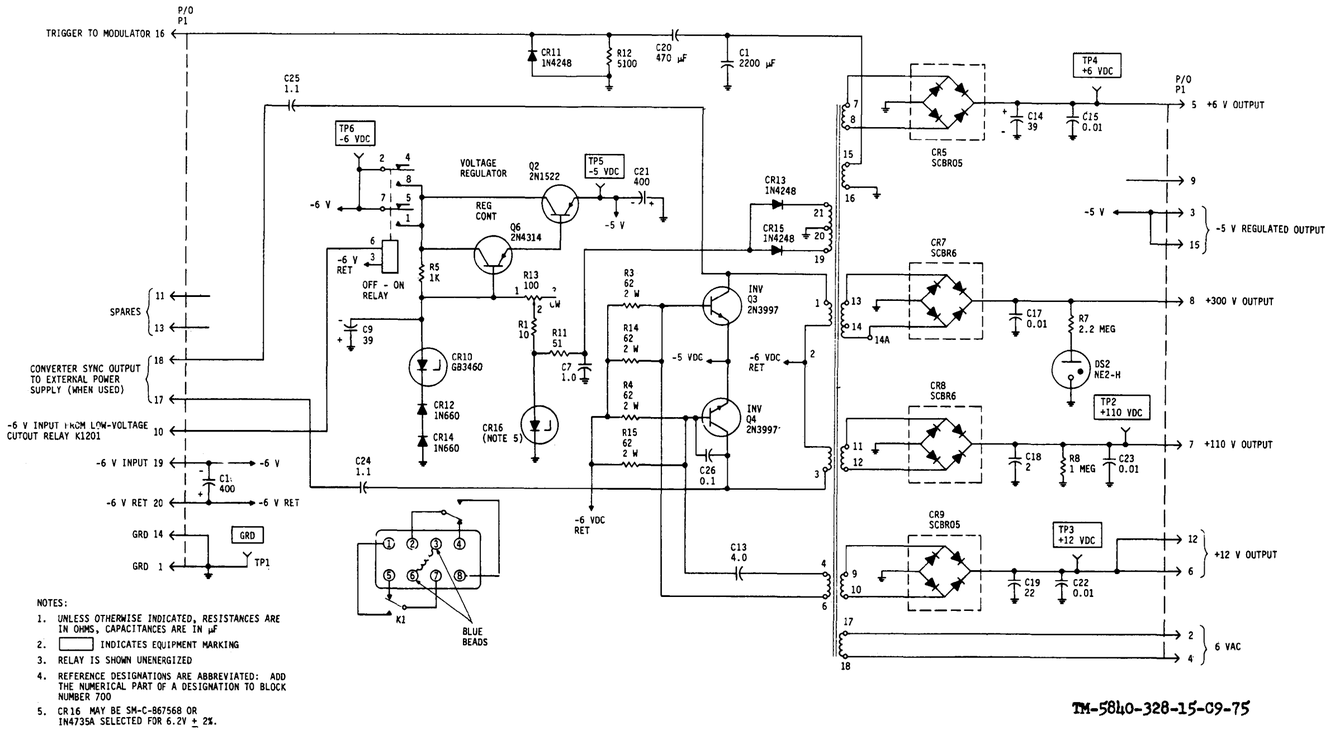
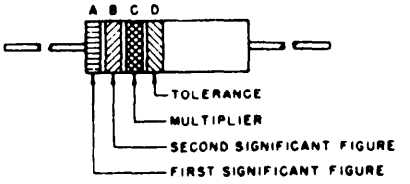


Figure 9-3.3. Block 700 receiver-transmitter power converter in SB-3004A/PPS-5 test panels with serial numbers 026 and up on Contract DAAB07-73-C-1624, schematic diagram.

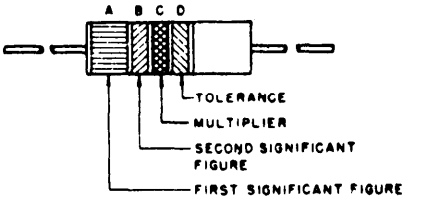
COLOR CODE MARKING FOR MILITARY STANDARD RESISTORS

COMPOSITION-TYPE RESISTORS



BAND A— Equal Width Band Signifies Composition-Type

WIREWOUND-TYPE RESISTORS

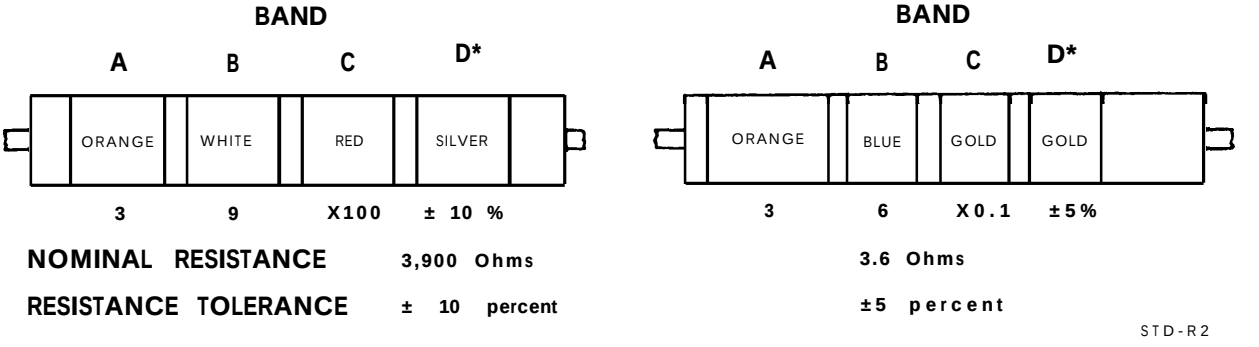


BAND A— Double Width Signifies Wire-wound Resistor

COLOR CODE TABLE

BAND A		BAND B		BAND C		BAND D	
COLOR	FIRST SIGNIFICANT FIGURE	COLOR	SECOND SIGNIFICANT FIGURE	COLOR	MULTIPLIER	COLOR	RESISTANCE TOLERANCE (PERCENT)
BLACK	0	BLACK	0	BLACK	1		
BROWN	1	BROWN	1	BROWN	10		
RED	2	RED	2	RED	100		
ORANGE	3	ORANGE	3	ORANGE	1,000		
YELLOW	4	YELLOW	4	YELLOW	10,000	SILVER	± 10
GREEN	5	GREEN	5	GREEN	100,000	GOLD	± 5
BLUE	6	BLUE	6	BLUE	1,000,000		
PURPLE (VIOLET)	7	PURPLE (VIOLET)	7				
GRAY	8	GRAY	8	SILVER	0.01		
WHITE	9	WHITE	9	GOLD	0.1		

EXAMPLES OF COLOR CODING

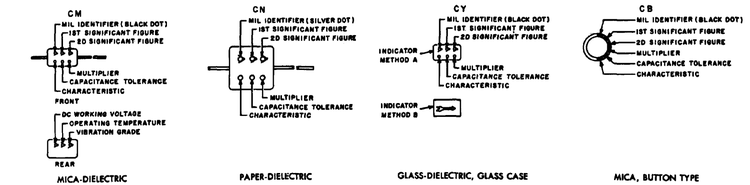


***If Band D is omitted, the resistor tolerance is ± 20%, and the resistor is not Mil-Std.**

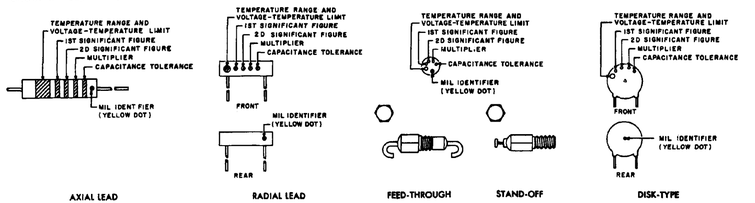
Figure 9–4. MIL-STD resistor color code markings.

COLOR CODE MARKING FOR MILITARY STANDARD CAPACITORS

GROUP I *Capacitors, Fixed, Various-Dielectrics, Styles CM, CN, CY, and CB*



GROUP II *Capacitors, Fixed Ceramic-Dielectric (General Purpose) Style CK*



GROUP III *Capacitors, Fixed, Ceramic-Dieletric (Temperature Compensating) Style CC*

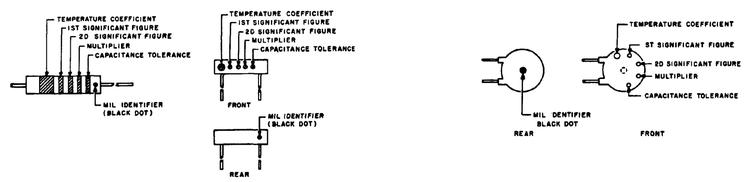


Figure 9-5. MIL-STD capacitor color code markings.

AGO 7918A

COLOR CODE TABLES

TABLE I – For use with Group I, Styles CM, CN, CY and CB

COLOR	MIL ID	1st SIG FIG	2nd SIG FIG	MULTIPLIER[1]	CAPACITANCE TOLERANCE				CHARACTERISTIC[2]				DC WORKING VOLTAGE	OPERATING TEMP. RANGE	VIBRATION GRADE
					CM	CN	CY	CB	CM	CN	CY	CB	CM	CM	CM
BLACK	CM, CY CB	0	0	1			± 20%	± 20%		A				−55° to +70°C	10–55 cps
BROWN		1	1	10					B	E		B			
RED		2	2	100	± 2%		± 2%	± 2%	C		C			−55° to +85°C	
ORANGE		3	3	1,000		± 30%			D			D	300		
YELLOW		4	4	10,000					E					−55° to +125°C	10–2,000 cps
GREEN		5	5		± 5%				F				500		
BLUE		6	6											−55° to +150°C	
PURPLE (VIOLET)		7	7												
GREY		8	8												
WHITE		9	9												
GOLD				0.1			± 5%	± 5%							
SILVER	CM				± 10%	± 10%	± 10%	± 10%							

TABLE II – For use with Group II, General Purpose, Style CK

COLOR	TEMP. RANGE AND VOLTAGE – TEMP. LIMITS[3]	1st SIG FIG	2nd SIG FIG	MULTIPLIER[1]	CAPACITANCE TOLERANCE	MIL ID
BLACK		0	0	1	± 20%	
BROWN	AW	1	1	10	± 10%	
RED	AX	2	2	100		
ORANGE	BX	3	3	1,000		
YELLOW	AV	4	4	10,000		CK
GREEN	CZ	5	5			
BLUE	BV	6	6			
PURPLE (VIOLET)		7	7			
GREY		8	8			
WHITE		9	9			
GOLD						
SILVER						

TABLE III – For use with Group III, Temperature Compensating, Style CC

COLOR	TEMPERATURE COEFFICIENT[4]	1st SIG FIG	2nd SIG FIG	MULTIPLIER[1]	CAPACITANCE TOLERANCE		MIL ID
					Capacitances over 10uuf	Capacitances 10uuf or less	
BLACK	0	0	0	1		± 2.0uuf	CC
BROWN	−30	1	1	10	± 1%		
RED	−80	2	2	100	± 2%	± 0.25uuf	
ORANGE	−150	3	3	1,000			
YELLOW	−220	4	4				
GREEN	−330	5	5		± 5%	± 0.5uuf	
BLUE	−470	6	6				
PURPLE (VIOLET)	−750	7	7				
GREY		8	8	0.01			
WHITE		9	9	0.1	± 10%		
GOLD	+100					± 1.0uuf	
SILVER							

1. The multiplier is the number by which the two significant (SIG) figures are multiplied to obtain the capacitance in uuf.
2. Letters indicate the Characteristics designated in applicable specifications: MIL-C-5, MIL-C-91, MIL-C-11272 and MIL-C-10950 respectively.
3. Letters indicate the temperature range and voltage-temperature limits designated in MIL-C-11015.
4. Temperature coefficient in parts per million per degree centigrade.

STO-62

Army-Ft Monmouth,NJ-MON 524-61

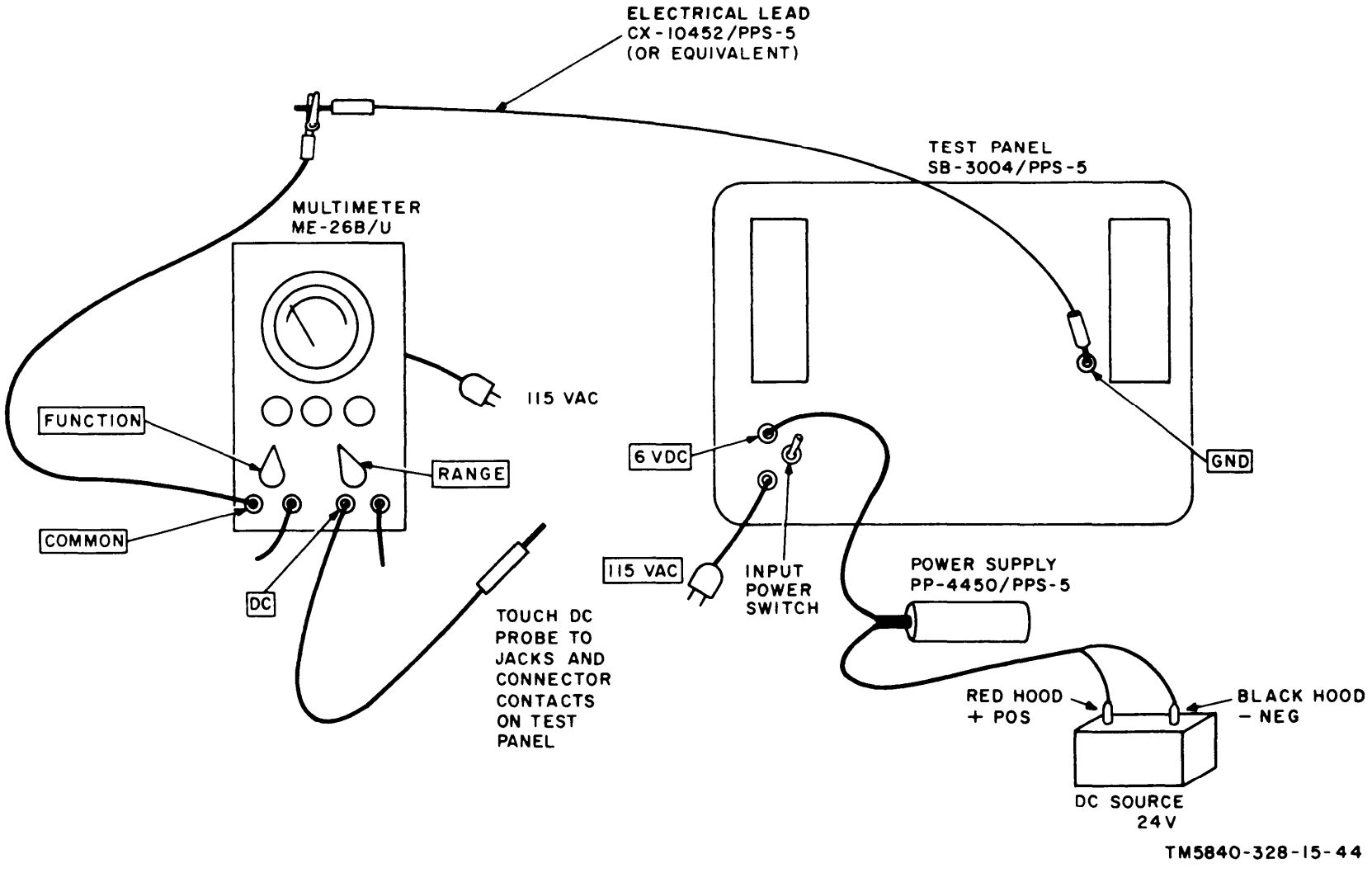


Figure 9–6. Test setup for checking –6-, +6-, –5-, +12-, –12-, +3.9-, +35-, 110-, +300-, and – 600-volt outputs.

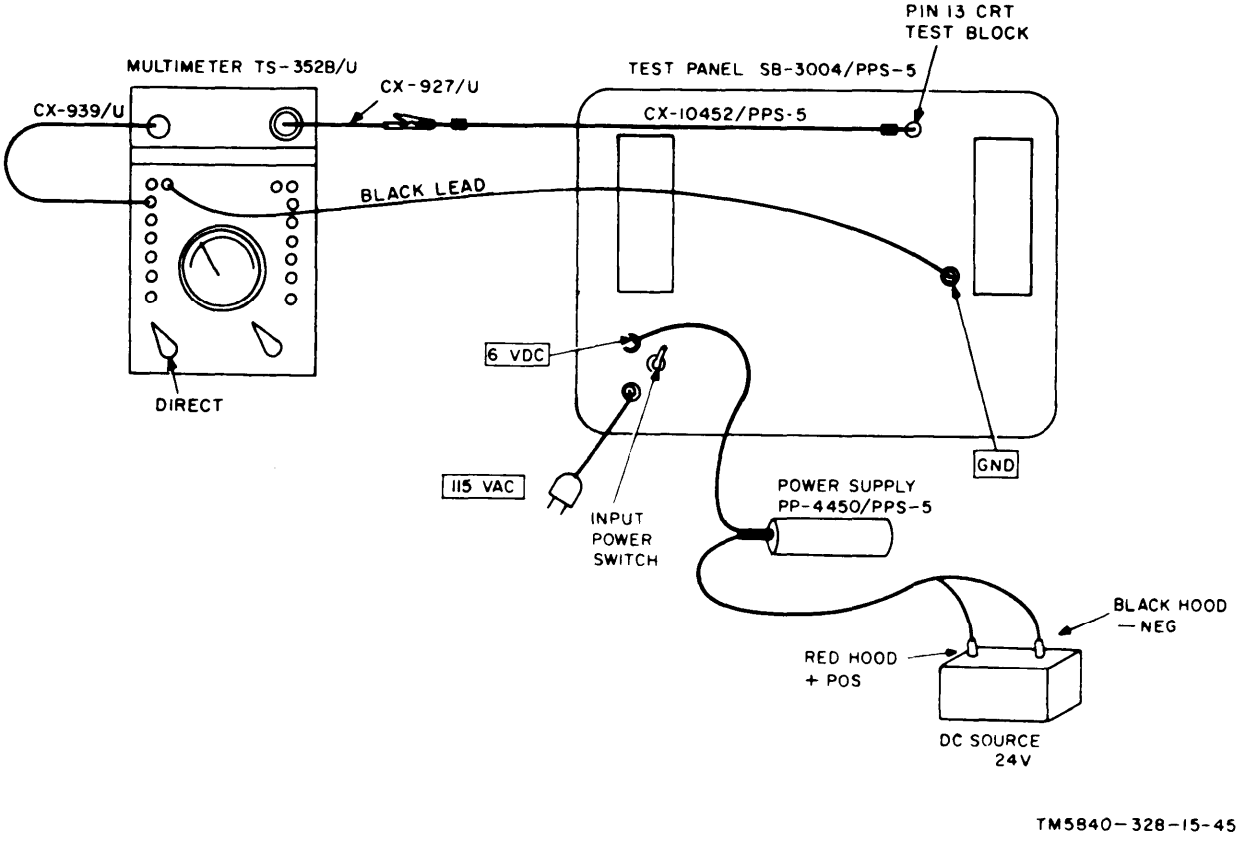


Figure 9–7. Test setup for checking 2,000-volt outputs.

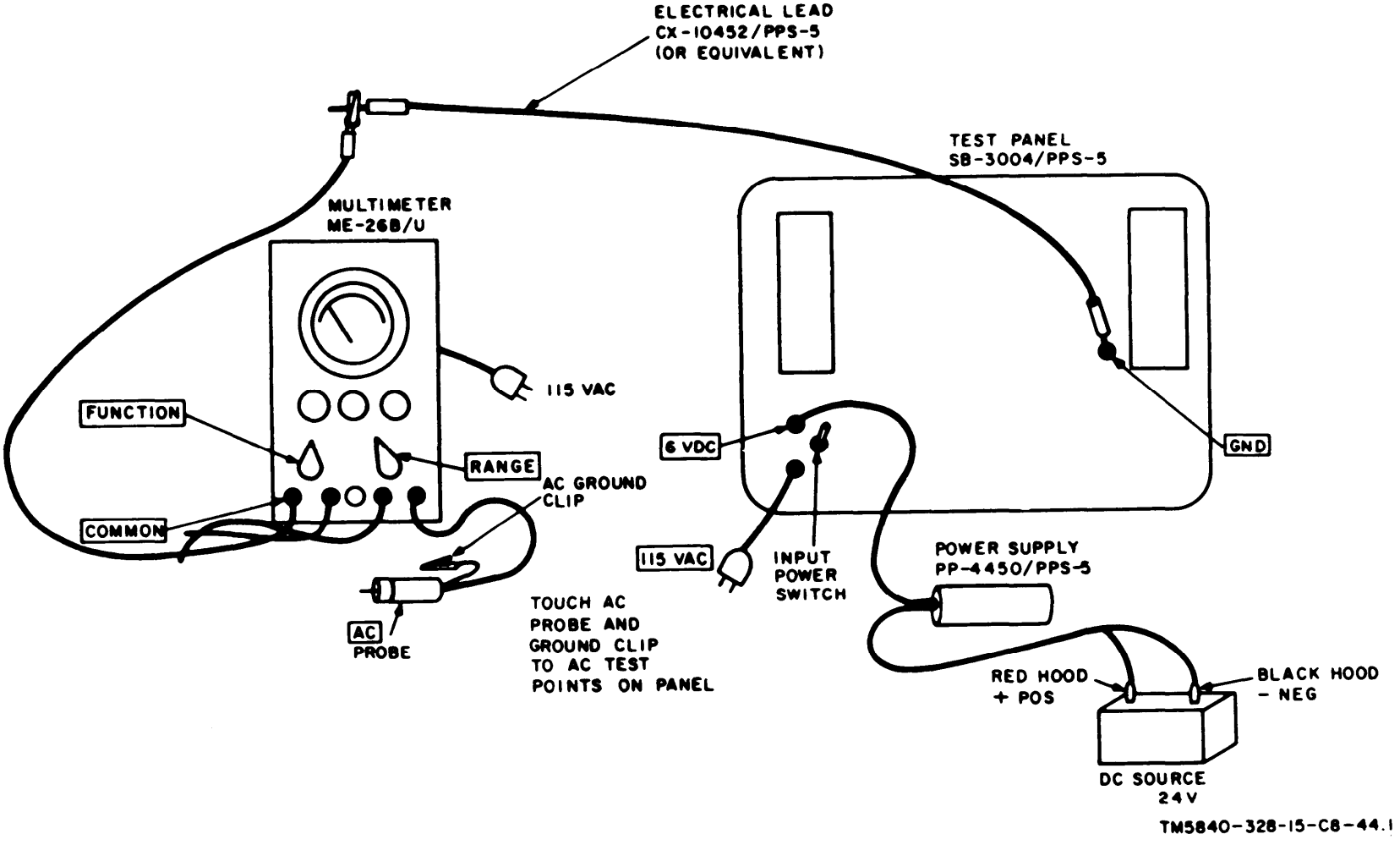


Figure 9-7.1. Test setup for cheching 6 volt AC output.

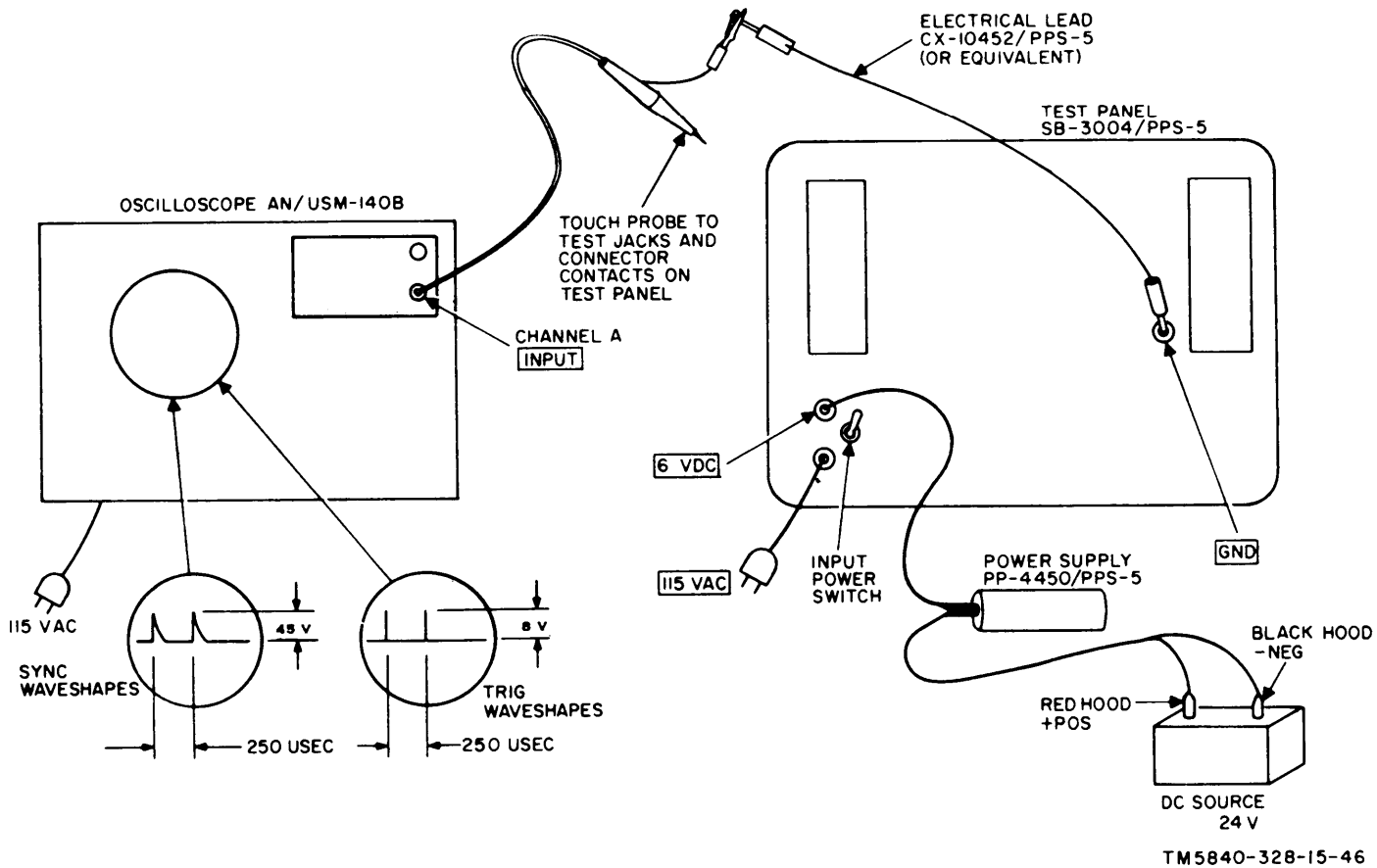


Figure 9-8. Test setup for checking SYNC and TRIG outputs.

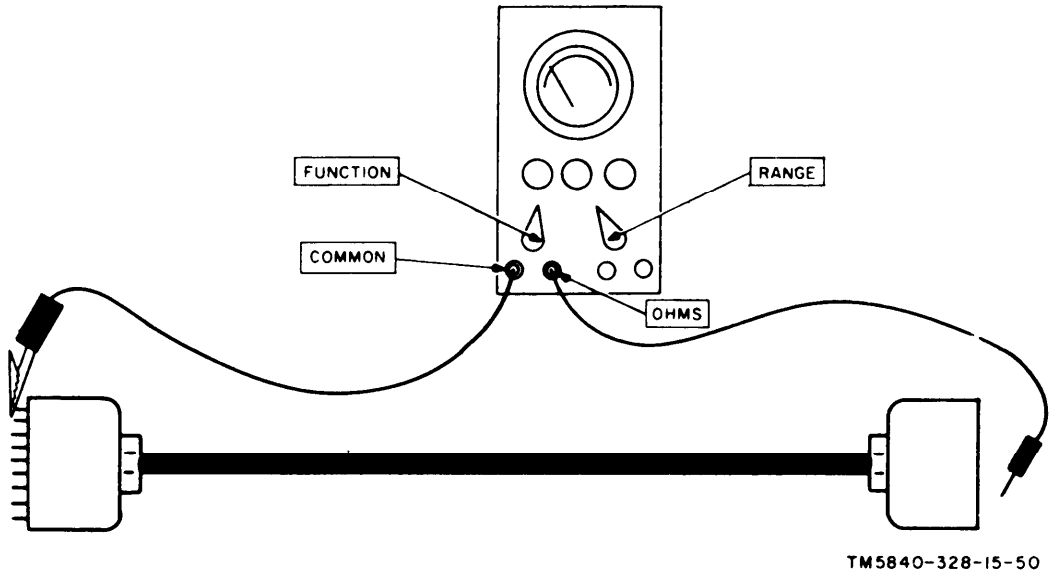
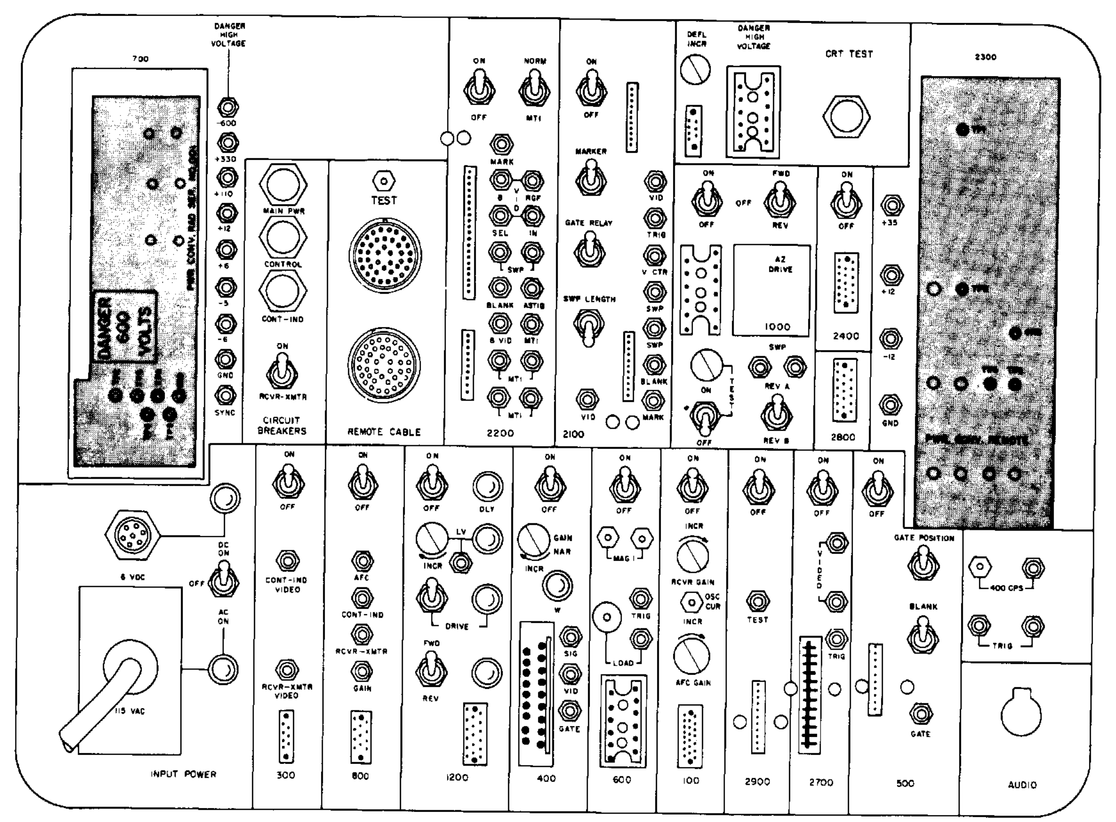


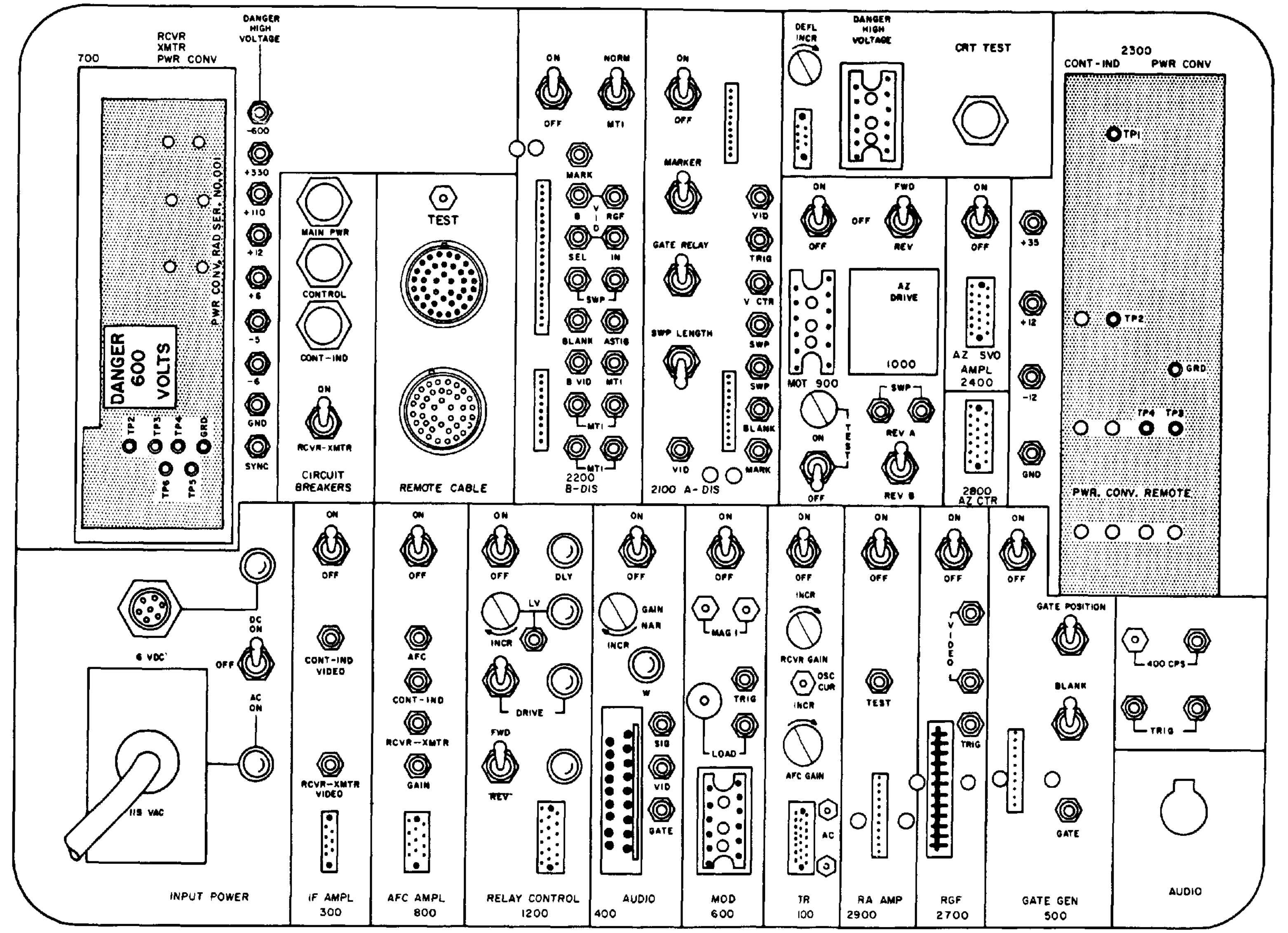
Figure 9-9. Test setup for checking test cables.



BLOCK	ITEM	REF DESIG
100	CONNECTOR (14-PIN)	J5007
	OSC CUR TEST JACK	J5011
	RCVR GAIN CONTROL	R5007
	RCVR GAIN CONTROL KNOB	MP5011
	AFC GAIN CONTROL	R5008
	AFC GAIN CONTROL KNOB	MP5011
	ON/OFF SWITCH	S5006
300	CONNECTOR (7-PIN)	J5004
	RCVR-XMTR VIDEO TEST JACK	TP5002
	CONT-IND VIDEO TEST JACK	TP5003
	ON/OFF SWITCH	S5002
400	CONNECTOR (17-PIN)	J5006
	GATE TEST JACK	TP5010
	VID TEST JACK	TP5009
	SIG TEST JACK	TP5008
	NAR/W SWITCH	S5004
	GAIN CONTROL	R5018
	GAIN CONTROL KNOB	MP5011
	ON/OFF SWITCH	S5005
500	CONNECTOR (11-PIN)	J5008
	GATE TEST JACK	TP5008
	BLANK SWITCH	S5008
	GATE POSITION SWITCH	S5009
	ON/OFF SWITCH	S5007
600	CONNECTOR (15-PIN)	J5010
	LOAD JACK	J5027
	LOAD TEST JACK	TP 5019
	TRIG TEST JACK	TP5020
	MAG I TEST JACK (LEFT)	TP5022
	MAG I TEST JACK (RIGHT)	TP5021
	ON/OFF SWITCH	S5013
700	SYNC TEST JACK	TP5001
	GND TEST JACK	TP5012
	-6 TEST JACK	TP5017
	-5 TEST JACK	TP5014
	+6 TEST JACK	TP5013
	+12 TEST JACK	TP5015
	+110 TEST JACK	TP5016
	+330 TEST JACK	TP5062
	-600 TEST JACK	TP5023
800	CONNECTOR (11-PIN)	J5005
	GAIN TEST JACK	TP5007
	RCVR-XMTR TEST JACK	TP5005
	CONT-IND TEST JACK	TP5006
	AFC TEST JACK	TP5004
	ON/OFF SWITCH	S5003
900	CONNECTOR (15-PIN)	J5013
	ON/OFF SWITCH	S5026
	FWD/REV SWITCH	S5015
	REV A/REV B SWITCH	S5016
1000	CONNECTOR (32-PIN)	J5015
	CONNECTOR (2-PIN)	J5014
	TEST CONTROL	R5064
	TEST CONTROL KNOB	MP5011
	TEST SWITCH	S5012
	SWP TEST JACK (LEFT)	TP5024
	SWP TEST JACK (RIGHT)	TP5024
1200	CONNECTOR (14-PIN)	J5009
	FWD/REV INDICATOR LIGHT	XDS5005
	FWD/REV SWITCH	S5011
1200	DRIVE INDICATOR LIGHT	XDS5004
	DRIVE SWITCH	S5010
	LV CONTROL	R5026
	LV CONTROL KNOB	MP5011
	LV TEST JACK	TP55063
	LV INDICATOR LIGHT	XDS5006
	DLY INDICATOR LIGHT	XDS5024
	ON/OFF SWITCH	S5024
2100	CONNECTOR (11-PIN, UPPER)	J5020
	CONNECTOR (11-PIN, LOWER)	
	VIDEO TEST JACK (BLUE)	TP5031
	MARK TEST JACK	TP5029
	BLANK TEST JACK	TP5032
	SWP TEST JACK (UPPER)	TP5033
	SWP TEST JACK (LOWER)	TP5034
	V CTR TEST JACK	TP5035
	TRIG TEST JACK	TP5028
	VID TEST JACK (GREEN)	TP5030
	SWP LENGTH SWITCH	S5021
	GATE DELAY SWITCH	S5019
	MARKER SWITCH	S5018
	ON/OFF SWITCH	S5020
2200	CONNECTOR (11-PIN)	J5023
	CONNECTOR (22-PIN)	J5022
	MTI TEST JACK (LOWER LEFT)	TP5043
	MTI TEST JACK (LOWER RIGHT)	TP5042
	MTI TEST JACK (UPPER LEFT)	TP5041
	MTI TEST JACK (MIDDLE RIGHT)	TP5040
	MTI TEST JACK (UPPER)	TP5034
	B VID TEST JACK	TP5038
	BLANK TEST JACK	TP5036
	ASTIG TEST JACK	TP5027
	SWP TEST JACK (LEFT)	TP5048
	SWP TEST JACK (RIGHT)	TP5047
	VID SEL TEST JACK	TP5037
	VID IN TEST JACK	TP5044
	VID B TEST JACK	TP5044
	VID ROF TEST JACK	TP5045
	MARK TEST JACK	TP5046
	NORM/MTI SWITCH	S5023
	ON/OFF SWITCH	S5022
2300	GND TEST JACK	TP5059
	-12 TEST JACK	TP5057
	+12 TEST JACK	TP5056
	+35 TEST JACK	TP5058
2400	CONNECTOR (20-PIN)	J55011
	ON/OFF SWITCH	S5014
2700	CONNECTOR (10-PIN)	J5024
	TRIG TEST JACK	TP5052
	VIDEO TEST JACK (BLUE)	TP5054
	VIDEO TEST JACK (GREEN)	TP5053
	ON/OFF SWITCH	S5027
2800	CONNECTOR (14-PIN)	J5012
2900	CONNECTOR (LL-PIN)	J5025
	TEST JACK	TP5055
	ON/OFF SWITCH	S5025
CRT TEST	CONNECTOR (7-PIN)	J5017
	CONNECTOR (15-PIN)	J5016
	DFL CONTROL	R5061
	DFL CONTROL KNOB	MP5011
	CRT TEST SWITCH	S5017
	CRT TEST SWITCH BOOT	MP5003
REMOTE CABLE	CONNECTOR (39-PIN, MALE)	J5019
	CONNECTOR (39-PIN, FEMALE)	J5018
	TEST JACK	TP5026
CIRCUIT BREAKERS	RCVR-XMTR SWITCH BREAKER	CB5004
	CONT-IND PUSH BREAKER	CB5003
	CONT-IND PUSH BREAKER BOOT	MP5012
	CONTROL PUSH BREAKER	CB5002
	CONTROL PUSH BREAKER BOOT	MP5012
	MAIN POWER PUSH BREAKER	CB5001
	MAIN POWER PUSH BREAKER BOOT	MP5012
INPUT POWER	CONNECTOR (7-PIN)	J5001
	INPUT POWER SWITCH	S5001
	DC ON INDICATOR LIGHT	XDS5002
	AC ON INDICATOR LIGHT	XDS5001
AUDIO	AUDIO JACK	J5026
	AUDIO JACK COVER	MP5009
400 CPS	JACK (WHITE)	TP5060
	JACK (BLACK)	TP5061
TRIG	JACK (LEFT)	TP5051
	JACK (RIGHT)	TP5050

Figure 9-10. Test Facilities Kit MK-980/PPS-5, controls and indicators.

TM 5840-328-15-C3-3



BLOCK	ITEM	REF DESIG
100	CONNECTOR (14-PIN)	J5007
	OSC CUR TEST JACK	J5011
	RCVR GAIN CONTROL	R5007
	RCVR GAIN CONTROL KNOB	MP5011
	AFC GAIN CONTROL	R5008
	AFC GAIN CONTROL KNOB	MP5011
	ON/OFF SWITCH	S5006
	AC TEST POINTS (SEE NOTE)	TP64, TP65
300	CONNECTOR (7-PIN)	J5004
	RCVR-XMTR VIDEO TEST JACK	TP5002
	CONT-IND VIDEO TEST JACK	TP5003
	ON/OFF SWITCH	S5002
400	CONNECTOR (17-PIN)	J5006
	GATE TEST JACK	TP5010
	VID TEST JACK	TP5009
	SIG TEST JACK	TP5008
	NAR/W SWITCH	S5004
	GAIN CONTROL	R5018
	GAIN CONTROL KNOB	MP5011
	ON/OFF SWITCH	S5005
500	CONNECTOR (11-PIN)	J5008
	GATE TEST JACK	TP5008
	BLANK SWITCH	S5008
	GATE POSITION SWITCH	S5009
	ON/OFF SWITCH	S5007
600	CONNECTOR (15-PIN)	J5010
	LOAD JACK	J5027
	LOAD TEST JACK	TP 5019
	TRIG TEST JACK	TP5020
	MAG I TEST JACK (LEFT)	TP5022
	MAG I TEST JACK (RIGHT)	TP5021
	ON/OFF SWITCH	S5013
700	SYNC TEST JACK	TP5001
	GND TEST JACK	TP5012
	-6 TEST JACK	TP5017
	-5 TEST JACK	TP5014
	+6 TEST JACK	TP5013
	+12 TEST JACK	TP5015
	+110 TEST JACK	TP5016
	+330 TEST JACK	TP5062
	-600 TEST JACK	TP5023
800	CONNECTOR (11-PIN)	J5005
	GAIN TEST JACK	TP5007
	RCVR-XMTR TEST JACK	TP5005
	CONT-IND TEST JACK	TP5006
	AFC TEST JACK	TP5004
	ON/OFF SWITCH	S5003
900	CONNECTOR (15-PIN)	J5013
	ON/OFF SWITCH	S5026
	FWD/REV SWITCH	S5015
	REV A/REV B SWITCH	S5016
1000	CONNECTOR (32-PIN)	J5015
	CONNECTOR (2-PIN)	J5014
	TEST CONTROL	R5064
	TEST CONTROL KNOB	MP5011
	TEST SWITCH	S5012
	SWP TEST JACK (LEFT)	TP5024
	SWP TEST JACK (RIGHT)	TP5024
1200	CONNECTOR (14-PIN)	J5009
	FWD/REV INDICATOR LIGHT	XDS5005
	FWD/REV SWITCH	S5011
1200	DRIVE INDICATOR LIGHT	XDS5004
	DRIVE SWITCH	S5010
	LV CONTROL	R5026
	LV CONTROL KNOB	MP5011
	LV TEST JACK	TP55063
	LV INDICATOR LIGHT	XDS5006
	DLY INDICATOR LIGHT	XDS5024
	ON/OFF SWITCH	S5003
2100	CONNECTOR (11-PIN, UPPER)	J5020
	CONNECTOR (11-PIN, LOWER)	
	VIDEO TEST JACK (BLUE)	TP5031
	MARK TEST JACK	TP5029
	BLANK TEST JACK	TP5032
	SWP TEST JACK (UPPER)	TP5034
	SWP TEST JACK (LOWER)	TP5033
	V CTR TEST JACK	TP5035
	TRIG TEST JACK	TP5028
	VID TEST JACK (GREEN)	TP5030
	SWP LENGTH SWITCH	S5021
	GATE DELAY SWITCH	S5019
	MARKER SWITCH	S5018
	ON/OFF SWITCH	S5020
2200	CONNECTOR (11-PIN)	J5023
	CONNECTOR (22-PIN)	J5022
	MTI TEST JACK (LOWER LEFT)	TP5043
	MTI TEST JACK (LOWER RIGHT)	TP5042
	MTI TEST JACK (UPPER LEFT)	TP5041
	MTI TEST JACK (MIDDLE RIGHT)	TP5040
	MTI TEST JACK (UPPER)	TP5034
	B VID TEST JACK	TP5038
	BLANK TEST JACK	TP5036
	ASTIG TEST JACK	TP5027
	SWP TEST JACK (LEFT)	TP5048
	SWP TEST JACK (RIGHT)	TP5047
	VID SEL TEST JACK	TP5037
	VID IN TEST JACK	TP5044
	VID B TEST JACK	TP5044
	VID RGF TEST JACK	TP5045
	MARK TEST JACK	TP5046
	NORM/MTI SWITCH	S5023
	ON/OFF SWITCH	S5022
2300	GND TEST JACK	TP5059
	-12 TEST JACK	TP5057
	+12 TEST JACK	TP5056
	+35 TEST JACK	TP5058
2400	CONNECTOR (20-PIN)	J55011
	ON/OFF SWITCH	S5014
2700	CONNECTOR (10-PIN)	J5024
	TRIG TEST JACK	TP5052
	VIDEO TEST JACK (BLUE)	TP5054
	VIDEO TEST JACK (GREEN)	TP5053
	ON/OFF SWITCH	S5027
2800	CONNECTOR (14-PIN)	J5012
2900	CONNECTOR (LL-PIN)	J5025
	TEST JACK	TP5055
	ON/OFF SWITCH	S5025
CRT TEST	CONNECTOR (7-PIN)	J5017
	CONNECTOR (15-PIN)	J5016
	DFL CONTROL	R5061
	DFL CONTROL KNOB	MP5011
	CRT TEST SWITCH	S5017
	CRT TEST SWITCH BOOT	MP5003
REMOTE CABLE	CONNECTOR (39-PIN, MALE)	J5019
	CONNECTOR (39-PIN, FEMALE)	J5018
	TEST JACK	TP5026
CIRCUIT BREAKERS	RCVR-XMTR SWITCH BREAKER	CB5004
	CONT-IND PUSH BREAKER	CB5003
	CONT-IND PUSH BREAKER BOOT	MP5012
	CONTROL PUSH BREAKER	CB5002
	CONTROL PUSH BREAKER BOOT	MP5012
	MAIN POWER PUSH BREAKER	CB5001
	MAIN POWER PUSH BREAKER BOOT	MP5012
INPUT POWER	CONNECTOR (7-PIN)	J5001
	INPUT POWER SWITCH	S5001
	DC ON INDICATOR LIGHT	XDS5002
	AC ON INDICATOR LIGHT	XDS5001
AUDIO	AUDIO JACK	J5026
	AUDIO JACK COVER	MP5009
400 CPS	JACK (WHITE)	TP5060
	JACK (BLACK)	TP5061
TRIG	JACK (LEFT)	TP5051
	JACK (RIGHT)	TP5050

NOTE:
AC TEST POINTS NOT ON ALL EQUIPMENT.

TM5840-328-15-C10-3.1

Figure 9-10.1 Electrical Test Panel SB-3004A/PPS-5 controls and indicators.

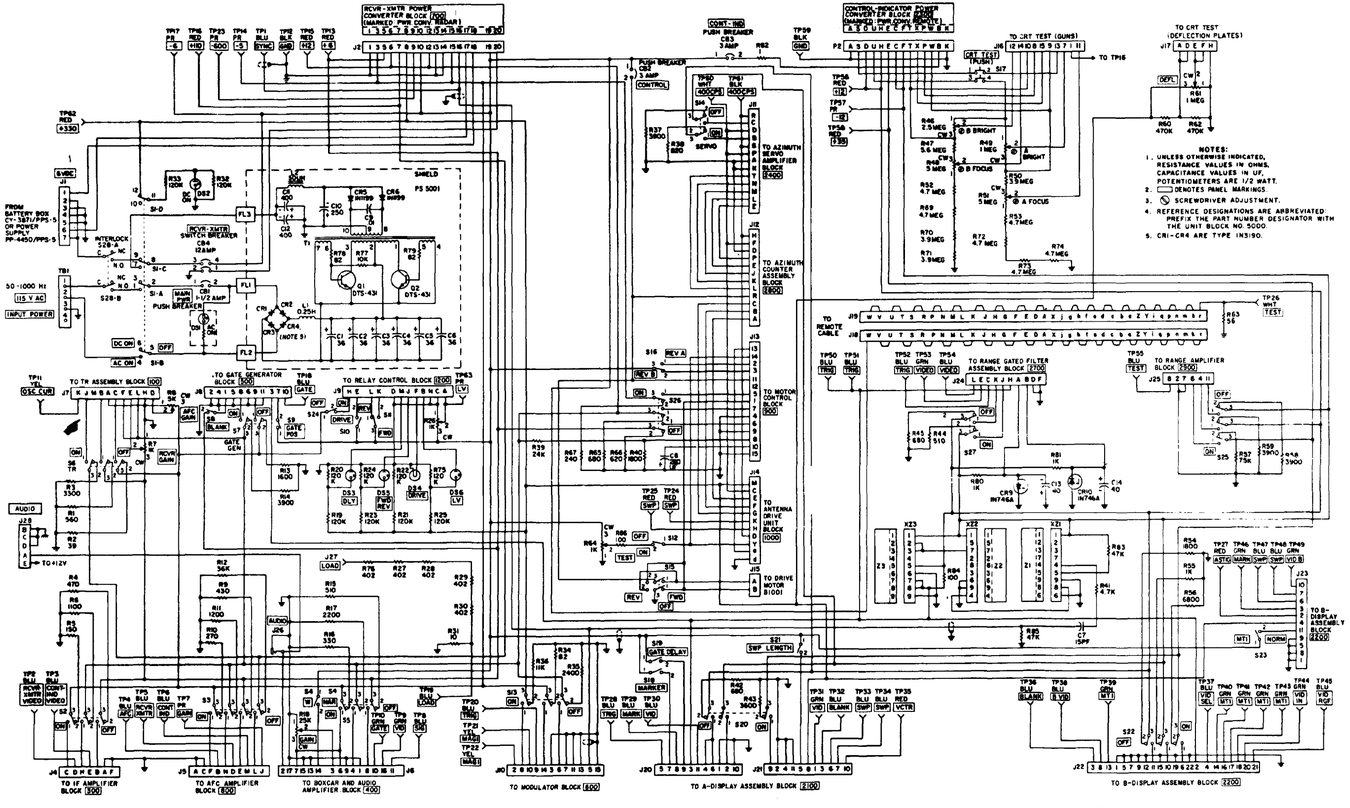


Figure 9-11① Panel, Test Electrical SB-3004/PPS-5

TM 5840-328-15-TM-4①

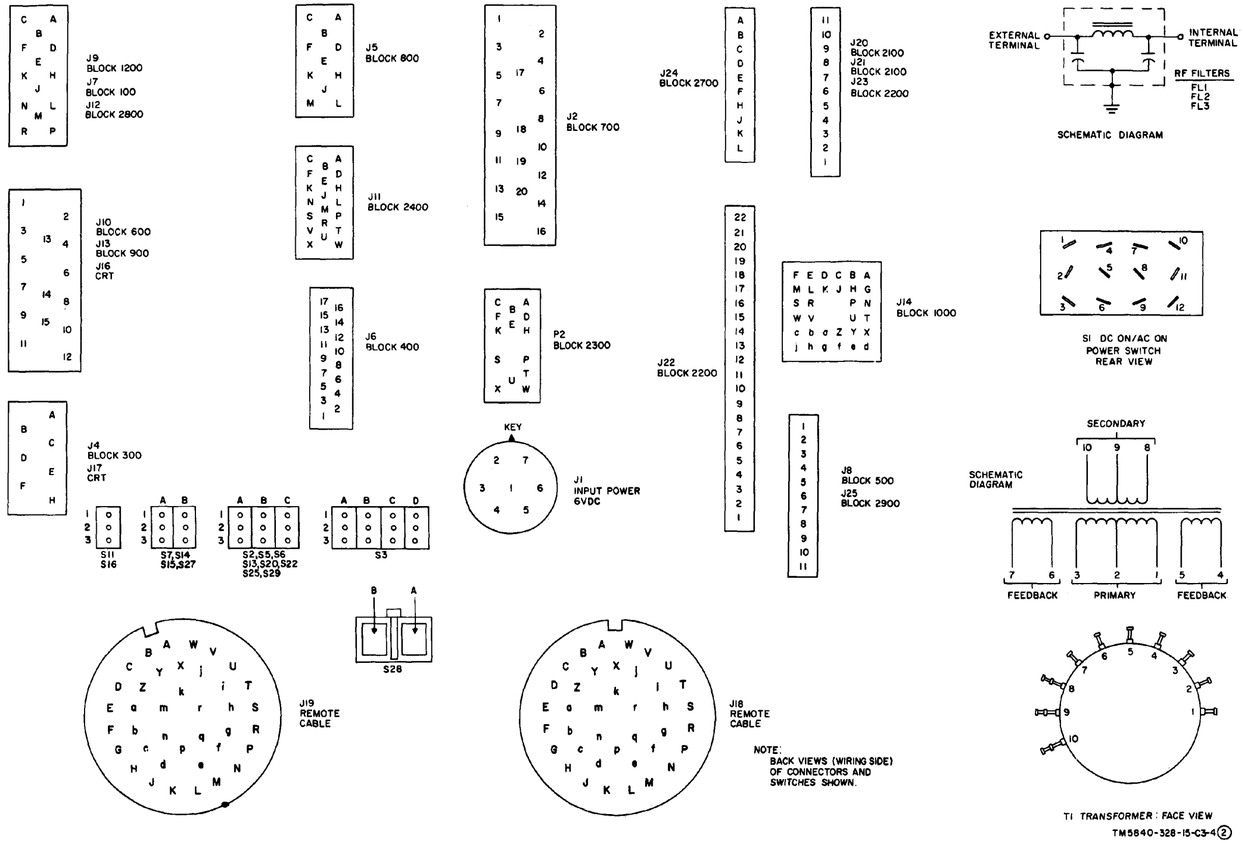


Figure 9-11 (3). Test Facilities Kit MK-980/PPS-5 schematic diagram.

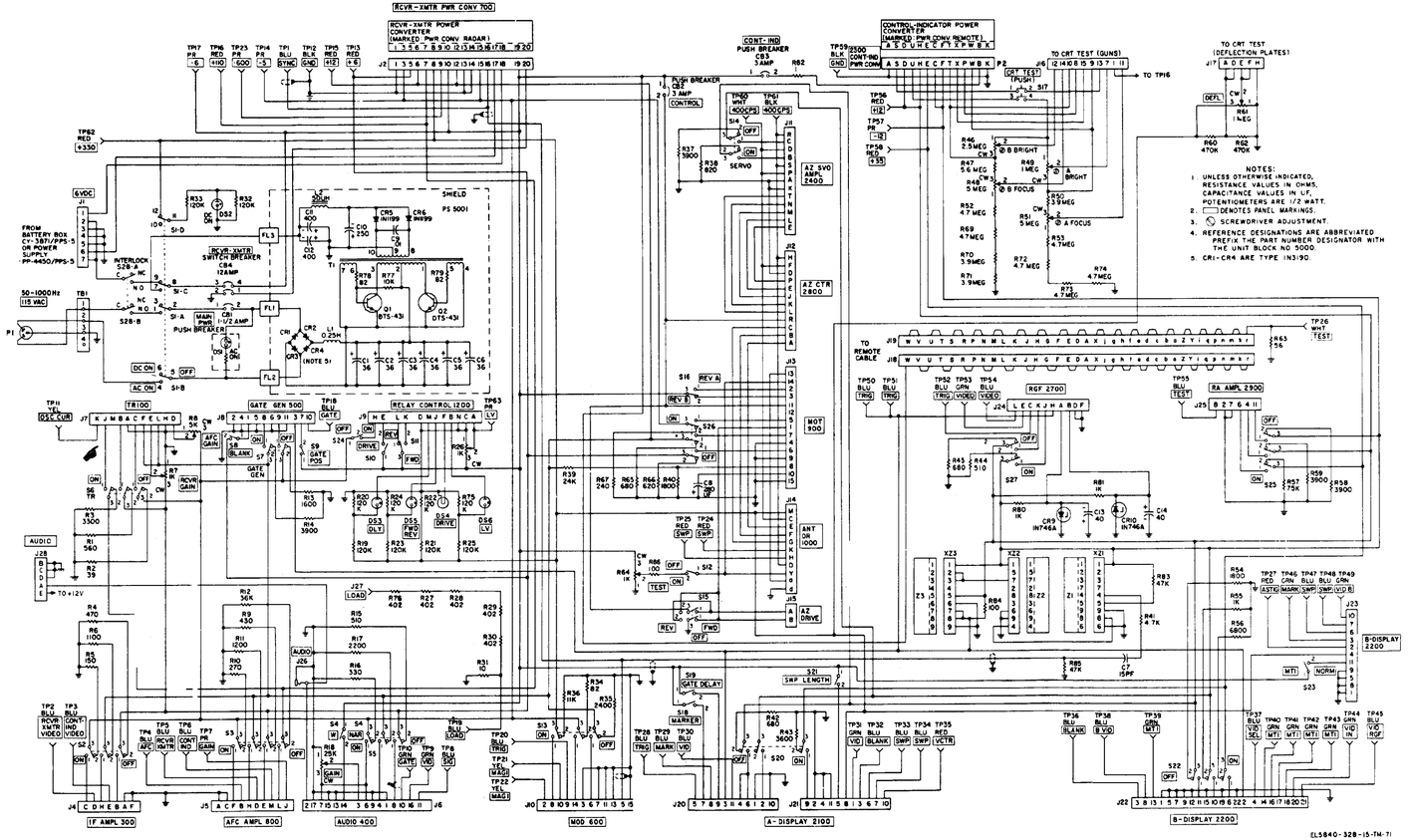


Figure 9-12 Electrical Test Panel SB-3004A/PPS-5

APPENDIX A
REFERENCES

The following references are available for the organizational, general support and depot maintenance of Test Facilities Kit MK-980/PPS-5 and MK-980A/PPS-5

DA Pam 310-1	Consolidated Index of Army Publications and Blank Forms
DA Pam 738-750	The Army Maintenance Management System (TAMMS).
SB 11-604	Replacement of Tool Kits, Radar and Radio Repairman TK-87/U and TK-88/U and Tool Kits, Electronic Equipment TK-105/G and TK-100/G.
SB 38-100	Preservation, Packaging, and Packing Materiels, Supplies, and Equipment Used by the Army.
TM 11-5840-298-12	Operator's and Organizational Maintenance Manual Radar Sets AN/PPS-5 (NSN 5840-00-168-1567), AN/ PPS-5A (NSN 5840-00-238-9366) and AN/ PPS-5B (NSN 5840-01-009-4939).
TM 11-5840-298-35	Direct Support, General Support, and Depot Maintenance Manual Radar Sets AN/PPS-5 (NSN 5840-00-168-1567, AN/PPS-5A (NSN 5840-00-238-9366) and AN/PPS-5B (NSN 5840-01-009-4939).
TM 11-5950-203-15P	Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart for Variable Power Transformer TF-171A/USM.
TM 11-6130-245-15	Operator, Organizational, Direct Support, General Support, and Depot Maintenance Manual (Including Repair Parts and Special Tools List for Power Supply PP-2309A/U (NSN6130-00-986-6305).
TM 11-6625-200-15	Operator's, Organizational, Direct Support, General Support, and Depot Maintenance Manual for Multi meters ME-26A/U (NSN 6625-00-360-2493), ME-26B/ U, ME-26C/ U (NSN 6625-00-646-9409), and ME-26D/ U (NSN 6625-00-913-9761).
TM 11-6625-273-12	Operation and Organizational Maintenance: Insulation Breakdown Test Sets AN/GSM-6 and AN/GSM-6A.
TM 11-6625-366-15	Organizational, DS, GS, and Depot Maintenance Manual: Multimeter TS-352B/U (NSN 6625-00-953-0142).
TM 11-6625-535-15-1	Organizational, DS, GS, and Depot Maintenance Manual: Oscilloscopes AN/ USM-140B, AN/USM-140C, AN/USM-141A, and AN/USM-141B.

APPENDIX B
BASIC ISSUE ITEMS LIST (BIIL) AND ITEMS TROOP INSTALLED OR AUTHORIZED LIST (ITIAL)

Section I. INTRODUCTION

B1. Scope

This appendix lists only basic issue items required by the crew/operator for installation, operation, and maintenance of Test Facilities Kit 980/PPS-5.

B-2. General

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

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

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

B-3. Explanation of Columns

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

a. Ilustration. This column is divided as follows:

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

(2) *Item Number.* Not applicable.

b. Federal Stock Number. Not applicable.

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

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

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

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

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

Section IL BASIC ISSUE ITEMS LIST

(1) Illustration		(2) Federal stock number	(3) Part number	(4) FSCM	(5) Description Usable on code	(6) Unit of meas	(7) Qty furn with equip
(A) Fig. no.	(B) Item no.						
1-1			SM-D-609913	80063	POUCH ACCESSORY KIT	EA	1

APPENDIX C
MAINTENANCE ALLOCATION

Section I. INTRODUCTION

C-1. General

This appendix provides a summary of the maintenance operations for Test Facilities Kit MK-980/PPS-5 and MK-980A/PPS-5. It authorizes categories of maintenance for specific maintenance functions on repairable items and components and the tools and equipment required to perform each function. This appendix may be used as an aid in planning maintenance operations.

C-2. Maintenance 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, remachining, 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 equipments/components.

C-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 "worktime" figure in the appropriate subcolumn(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 "worktime" figures will be shown for each category. The number of task-hours specified by the "worktime" 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. Subcolumns 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.

C-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.

C-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.

(Next printed page is C-3)

SECTION II MAINTENANCE ALLOCATION CHART
FOR
TEST FACILITIES KIT MK-980/PPS-5 and MK-980A/PPS-5

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY C	O	F	H	D	(5) TOOLS AND EQPT.	(6) REMARKS
00	TEST FACILITIES KIT MK-980/PPS-5 and MK-980A/PPS-5	INSPECT		0.1					
		TEST		0.4				2,6	
		SERVICE		0.1					
		ADJUST		0.2				2,6	
		INSTALL		0.1				6	
		REPLACE		0.1				6	
		TEST				0.5		1 thru 5	
		REPAIR				0.5		1 thru 5	
		OVERHAUL				1.0		1 thru 5	
01	ELECTRICAL TEST PANEL SB-3004/PPS-5, SB-3004A/PPS-5	INSPECT		0.1					
		TEST		0.4				2,6	
		SERVICE		0.1				6	
		ADJUST		0.2				2,6	
		INSTALL		0.1				6	
		REPLACE		0.1				6	
		TEST				0.5		1 thru 5	
		REPAIR				0.5		1 thru 5	
0101	CONVERTER ASSEMBLY UNIT 2300	INSPECT		0.1					A
		SERVICE		0.1				6	
		INSTALL		0.1				6	
		REPLACE		0.1				6	
		TEST				0.5		1 thru 5	
		REPAIR				0.5		1 thru 5	
0102	CONVERTER ASSEMBLY UNIT 700	INSPECT		0.1					A
		SERVICE		0.1				6	
		INSTALL		0.1				6	
		REPLACE		0.1				6	
		TEST				0.5		1 thru 5	
		REPAIR				0.5		1 thru 5	
02	TEST FACILITIES KIT CASE CY-6208/PPS-5	INSPECT		0.1					
		SERVICE		0.1				6	
		INSTALL		0.1				6	
		REPLACE		0.1				6	
		REPAIR				0.3		5	
03	KIT, ACCESSORY	REPAIR		0.1					B
0301	SPECIAL PURPOSE ELECTRICAL CABLE ASSEMBLY CX-10429/PPS-5	INSPECT		0.1					
		TEST		0.2				2,6	
		SERVICE		0.1				6	
		REPLACE		0.1				6	
		REPAIR				0.5		1,2,4,5	
0302	SPECIAL PURPOSE ELECTRICAL CABLE ASSEMBLY CX-10430/PPS-5	INSPECT		0.1					
		TEST		0.2				2,6	
		SERVICE		0.1				6	
		REPLACE		0.1					
		REPAIR				0.5		1,2,4,5	
0303	SPECIAL PURPOSE ELECTRICAL CABLE ASSEMBLY CX-10431/PPS-5	INSPECT		0.1					
		TEST		0.2				2,6	
		SERVICE		0.1				6	
		REPLACE		0.1					
		REPAIR				0.5		1,2,4,5	
0304	SPECIAL PURPOSE ELECTRICAL CABLE ASSEMBLY CX-10432/PPS-5	INSPECT		0.1					
		TEST		0.2				2,6	
		SERVICE		0.1				6	
		REPLACE		0.1					
		REPAIR				0.5		1,2,4,5	
0305	SPECIAL PURPOSE ELECTRICAL CABLE ASSEMBLY CX-10433/PPS-5	INSPECT		0.1					
		TEST		0.2				2,6	
		SERVICE		0.1				6	
		REPLACE		0.1					
		REPAIR				0.5		1,2,4,5	

SECTION II MAINTENANCE ALLOCATION CHART
FOR

TEST FACILITIES KIT MK-980/PPS-5 and MK-980A/PPS-5

(1) GROUP NUMBER	(2) COMPONENT ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY					(5) TOOLS AND EQPT.	(6) REMARKS
			c	o	F	H	D		
0306	SPECIAL PURPOSE ELECTRICAL CABLE ASSEMBLY CX-10434/PPS-5	INSPECT		0.1					
		TEST		0.2				2,6	
		SERVICE		0.1				6	
		REPLACE		0.1				6	
		REPAIR				0,5		1,2,4,5	
0307	SPECIAL PURPOSE ELECTRICAL CABLE ASSEMBLY CX-10435/PPS-5	INSPECT		0.1					
		TEST		0.2				2,6	
		SERVICE		0.1				6	
		REPLACE		0.1				6	
		REPAIR				0.5		1,2,4,5	
0308	SPECIAL PURPOSE ELECTRICAL CABLE ASSEMBLY CX-10436/PPS-5	INSPECT		0.1					
		TEST		0.2				2,6	
		SERVICE		0.1				6	
		REPLACE		0.1				6	
		REPAIR				0.5		1,2,4,5	
0309	SPECIAL PURPOSE ELECTRICAL CABLE ASSEMBLY CX-10437/PPS-5	INSPECT		0.1					
		TEST		0.2				2,6	
		SERVICE		0.1				6	
		REPLACE		0.1				6	
		REPAIR				0.5		1,2,4,5	
0310	SPECIAL PURPOSE ELECTRICAL CABLE ASSEMBLY CX-10438/PPS-5	INSPECT		0.1					
		TEST		0.2				2,6	
		SERVICE		0.1				6	
		REPLACE		0.1				6	
		REPAIR				0.5		1,2,4,5	
0311	SPECIAL PURPOSE ELECTRICAL CABLE ASSEMBLY CX-10439/PPS-5	INSPECT		0.1					
		TEST		0.2				2,6	
		SERVICE		0.1				6	
		REPLACE		0.1					
		REPAIR				0.5		1,2,4,5	
0312	SPECIAL PURPOSE ELECTRICAL CABLE ASSEMBLY CX-10440/PPS-5	INSPECT		0.1					
		TEST		0.2				2,6	
		SERVICE		0.1				6	
		REPLACE		0.1				6	
		REPAIR				0.5		1,2,4,5	
0313	SPECIAL PURPOSE ELECTRICAL CABLE ASSEMBLY CX-10441/PPS-5, CX-10441A/PPS-5	INSPECT							
		TEST		0.2				2,6	
		SERVICE		0.1				6	
		REPLACE		0.1					
		REPAIR				0.5		1,2,4,5	
0314	SPECIAL PURPOSE ELECTRICAL CABLE ASSEMBLY CX-10442/PPS-5	INSPECT		0.1					
		TEST		0.2				2,6	
		SERVICE		0.1				6	
		REPLACE		0.1				6	
		REPAIR				0.5		1,2,4,5	
0315	SPECIAL PURPOSE BRANCHEd ELECTRICAL CABLE ASSEMBLY CX-10443/PPS-5	INSPECT		0.1					
		TEST		0.2				2,6	
		SERVICE		0.1					
		REPLACE		0.1				6	
		REPAIR				0.5		1,2,4,5	
0316	SPECIAL PURPOSE ELECTRICAL CABLE ASSEMBLY CX-10444/PPS-5, CX-1044A/PPS-5	INSPECT		0.1					
		TEST		0.2				2,6	
		SERVICE		0.1				6	
		REPLACE		0.1					
		REPAIR				0.5		1,2,4,5	
0317	SPECIAL PURPOSE ELECTRICAL CABLE ASSEMBLY CX-10445/PPS-5	INSPECT		0.1					
		TEST		0.2				2,6	
		SERVICE		0.1				6	
		REPLACE		0.1				6	
		REPAIR				0.5		1,2,4,5	

SECTION II MAINTENANCE ALLOCATION CHART
FOR

TEST FACILITIES KIT MK-980/PPS-5 and MK-980A/PPS-5

(1) GROUP NUMBER	(2) COMPONENT ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY C	O	F	H	D	(5) TOOLS AND EQPT.	(6) REMARKS
0318	SPECIAL PURPOSE BRANCHED ELECTRICAL CABLE ASSEMBLY CX-10485/PPS-5	INSPECT TEST SERVICE REPLACE REPAIR		0.1 0.2 0.1 0.1		0.5		2,6 6 6 1,2,4,5	
0319	RADIO FREQUENCY CABLE ASSEMBLY CG03353/U (2 ft)	INSPECT TEST SERVICE REPLACE REPAIR		0.1 0.2 0.1 0.1		0.5		2,6 6 6 1,2,4,5	
0320	RADIO FREQUENCY CABLE ASSEMBLY CG-3354/U (4 ft)	INSPECT TEST SERVICE REPLACE REPAIR		0.1 0.2 0.1 0.1		0.5		2,6 6 1,2,4,5	
0321	ELECTRICAL LEAD CX-10446/PPS-5	INSPECT TEST SERVICE REPLACE REPAIR		0.1 0.2 0.1 0.1		0.5		2,6 6 1,2,4,5	
0322	ELECTRICAL LEAD CK-10447/PPS-5	INSPECT TEST SERVICE REPLACE REPAIR		0.1 0.2 0.1 0.1		0.5		2,6 6 6 1,2,4,5	
0323	ELECTRICAL LEAD CX-10448/PPS-5	INSPECT TEST SERVICE REPLACE REPAIR		0.1 0.2 0.1 0.1		0.5		2,6 6 6 1,2,4,5	
0324	RADIO FREQUENCY CABLE ASSEMBLY CG-3355/U	INSPECT TEST SERVICE REPLACE REPAIR		0.1 0.2 0.1 0.1		0.5		2,6 6 1,2,4,5	
0325	ELECTRICAL LEAD CX-10449/PPS-5	INSPECT TEST SERVICE REPLACE REPAIR		0.1 0.2 0.1 0.1		0.5		2,6 6 6 1,2,4,5	
0326	ELECTRICAL LEAD CX-10450/PPS-5	INSPECT TEST SERVICE REPLACE REPAIR		0.1 0.2 0.1 0.1		0.5		2,6 6 6 1,2,4,5	
0327	ELECTRICAL LEAD CX-10451/PPS-5	INSPECT TEST SERVICE REPLACE REPAIR		0.1 0.2 0.1 0.1		0.5		2,6 6 6 1,2,4,5	
0328	ELECTRICAL LEAD CX-10452/PPS-5	INSPECT TEST SERVICE REPLACE REPAIR		0.1 0.2 0.1 0.1		0.5		2,6 6 6 1,2,4,5	

SECTION III TOOL AND TEST EQUIPMENT REQUIREMENTS
FOR
TEST FACILITIES KIT MK-980/PPS-5 and MK-980A/PPS-5

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE CATEGORY	NOMENCLATURE	NATIONAL/NATO STOCK NUMBER	TOOL NUMBER
1	H,D	MULTIMETER ME-260/U	6625-00-913-9781	
2	O,H,D	MULTIMETER TS-352B/U	6625-00-553-0142	
3	H,D	OSCILLOSCOPE AN/USM-117	6625-00-787-0304	
4	H,D	TEST SET, INSULATION BREAKDOWN AN/GSM-6	6625-00-542-1331	
5	H,D	TOOL KIT, ELECTRONIC EQUIPMENT TK-100/G	5180-00-605-0079	
6	0	TOOL KIT, ELECTRONIC EQUIPMENT TK-101/GSQ	5180-00-064-5172	

SECTION IV. REMARKS

REFERENCE CODE	REMARKS
A	DIFFERENT MODELS ARE USED. SEE TM 11-5840-298-35 FOR REPAIR INSTRUCTIONS,
B	REPAIR BY ONLY BY REPLACEMENT OF ITEMS: 0301 thru 0328 OR CANVAS POUCH.

INDEX

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Gen Dep (1) except
PAC (5)
Sig See, Gen Dep (4) except
PAC (8)
Sig Dep (6) except
PAC (12)
Army Dep (1) except
LBAD (14)
SAAD (30)
TOAD (14)
LEAD (7)
NAAD (3)
SVAD (3)
ATAD (10)
Sig FLDMS (1) except
PAC (3)
USACRREL (2)
Units org under fol TOE (1 ea) :
11-155
11-157
11-158
11-587
11-592
11-597
29-134

NG: State AG (3).
USAR: None.
For explanation of abbreviations used see AR 320-S0.

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