TECHNICAL MANUAL

OPERATOR'S AND ORGANIZATIONAL

MAINTENANCE MANUAL

TEST SET GROUP, INDICATOR, RADAR

OQ-63A/APS-94D

(NSN 6625-01-058-7874)

This copy is reprint which includes current pages from Changes 1 and 2.

HEADQUARTERS, DEPARTMENT OF THE ARMY
JANUARY 1979

WARNING

EXTREMELY DANGEROUS VOLTAGES EXIST IN THIS EQUIP-
MENT

Be careful when working on any connector of Test Set Group, Indicator, Radar OQ-63A/APS-94D. Test Set Subassembly MX-8638A/APS-94D and Test Set Subassembly MX-8639A/APS-94D contain connectors with terminals carrying +250 volts dc, 115 volts ac, and +100 volts dc.

Test Set Subassembly MX-8638AIAPS-4D +640 volts dc
(fig. 1-1).
Test Set Subassembly MX-8639AIAPS4-9D +640 volts de
(fig. 1-2).

WARNING

The fumes of TRICHLOROETHANE are toxic. Provide thorough ventilation whenever it is used; avoid prolonged or repeated breathing of vapor. Do not use near an open flame or hot surface; trichloroethane is nonflammable but heat converts the fumes to a highly toxic phosgene gas the inhalation of which could result in serious injury or DEATH. Prolonged or repeated skin contact with trichloroethane can cause skin inflammation. When necessary, use gloves, sleeves, and aprons which the solvent cannot penetrate.

CHANGE }
No. 2 }

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC, 22 July 1981

Operator's and Organizational Maintenance Manual
TEST SET GROUP, INDICATOR, RADAR OQ-63A/APS-94D
(NSN 6625-01-058-7874)

TM 11-66251833-12, 30 January 1979, is changed as follows:

1. New or changed material is indicated by a vertical bar in the margin of the page.
2. Revised illustration areas are indicated by miniature pointing hand.
3. Remove old pages and insert new pages as indicated below:

Remove	Insert
1-1 through 1-4	1-1 thru 1-4
1-9 through 1-12	1-9 thru 1-12
B-5/(B-6 blank)	B-5/(B-6 blank)
D-7 and D-8	7 and 8

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

By Order of the Secretary of the Army:

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

Official:

ROBERT M.
Brigadier General, United States Army
The Adjutant General

JOYCE

DISTRIBUTION:
To be distributed in accordance with DA Form 1236, Direct and General Support Maintenance requirements for AN/APS-94.

WARNING

EXTREMELY DANGEROUS VOLTAGES EXIST IN THIS EQUIPMENT! Be careful when working on any connector of Test Set Group, Indicator, Radar 0O63A/APS-94D. Test Set Subassembly MX-8638A/AS-94D and Test Set Subassembly MX-8639A/APS94D contain connectors with terminals carrying +250 volts dc, 115 volts ac, and + 100 volts dc.

Test Set Subassembly MX-8638A/APS-94D +640 volts dc (fig. 1-1).
Test Set Subassembly MX-8639A/APS-94D +640 volts dc (fig. 1-2).

WARNING

Adequate ventilation should be provided while using TRICHLOROTRIFLUOROETHANE. Prolonged breathing of vapor should be avoided. The solvent should not be used near heat or open flame; the products of decomposition are toxic and irritating. Since TRICHLOROTRIFLUOROETHANE dissolves natural oils, prolonged contact with skin should be avoided. When necessary, use gloves which the solvent cannot penetrate. If the solvent is taken internally, consult a physician immediately.

TECHNICAL MANUAL
No. 11-5895-967-12

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC, 30 January 1979

OPERATOR'S AND ORGANIZATIONAL MAINTENANCE MANUAL

TEST SET GROUP, INDICATOR, RADAR OQ-63A/APS-94D (NSN 6625-01-058-7874)

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 procedure, please let us know. Mail your letter, 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 and Electronics Materiel Readiness Command, ATTN: DRSEL-ME-MQ, Fort Monmouth, NJ 07703. In either case, a reply will furnished direct to you.

***This manual supersedes TM 11-6625-1833-12, 19 November 1970, including all changes.**

LIST OF ILLUSTRATIONS

LIST OF TABLES

CHAPTER 1
INTRODUCTION

Section I. GENERAL

1-1. Scope

a. General. This manual describes Test Set Group, Indicator, Radar OQ-63A/APS-94D and provides instructions for installation, operation, operator's and organizational maintenance, and demolition. Also included are instructions for cleaning and inspection of the equipment and replacement of parts available to the operator and organizational technician.

b. Maintenance Allocation Chart. The maintenance allocation chart (MAC) appears in appendix D.

1-2. Index of Publications

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

b. DA Pam 310-7. Refer to the latest issue of DA Pam 310-7 to determine whether there are Modification Work Orders (MWO's) for the equipment.

1-3. Forms and Records

a. Reports of Maintenance and Unsatisfactory Equipment. Use equipment maintenance forms and records in accordance with instructions in TM 38-750.

b. Report of Packaging and Handling Deficiencies. Fill out and forward DD Form 6 (Packaging Improvement Report) as prescribed in AR 700-58/NAVSUPINST 4030.29/AFR 71-13/MCO P4030.29A, and DLAR 4145.8.

c. Discrepancy in Shipment Report (DISREP) (SF 361). Fill out and forward Discrepancy in Shipment Report (DISREP) (SF 361) as prescribed in AR 55-38/NAVSUPINST 4610.33B/AFR 75-18/MCO P4610.19C and DLAR 4500.15.

1-4. Reporting Equipment Improvement Recommendations (EIR)

If your Test Set Group, Indicator, Radar OQ-63A/APS-94D 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. Tell us why a procedure is hard to perform. Put it on an SF 368 (Quality Deficiency Report). Mail it to Commander, US Army Communications and Electronics Materiel Readiness Command, ATTN: DRSEL-ME-MQ, Fort Monmouth, NJ 07703. We'll send you a reply.

1-5. Preparation for Storage or Shipment

The equipment shall meet the requirements of the operator's preventive maintenance checks and services (para 3-5) prior to storage. Refer to paragraphs 4-1 and 4-2 for packing and packaging the equipment for storage.

1-6. Destruction of Army Electronics Materiel

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

1-6.1. Hand Receipts

Use the hand receipts in TM 11-626-1833-12HR for property accountability of Test Set Group, Indicator, Radar OQ-63A/APS-94D.

Section II. DESCRIPTION AND DATA

1-7. Purpose and Use

a. Test Set Group, Indicator, Radar OQ63A/APS-94D is a portable test set that permits bench testing, aligning, calibrating, and troubleshooting of the units and plug-in modules of the radar cockpit complex of Radar Surveillance Set NA/APS-94E.

b. The OQ-63A/APS-94D consists of two major groups of components: Test Set Subassembly MX-8638A/APS-94D and Test Set Subassembly MX-8639A/APS-94D. The MX-8638A/APS-94D and MX-8639A/APS-94D function together as a single operating unit through interconnecting cables. The MX-8638A/APS-94D simulates the select signals, signal paths, and loads of Recorder-Processor-Viewer, Radar Mapping RO-496/U and Rack, Electrical Equipment MT40156/APS-94D. The MX-8639A/APS-94D simulates the select sig-

nals and loads of the operating Generator, Sweep SG1127/APS-94E and Control, Radar Set C-7645/APS-94D. In addition to the two major groups of components, the OQ-63A/APS-94D includes Test Set Subassembly MX-9984/APS-94D, which contains cables W34 through W40; Alignment Fixture, Electron Tube MX-9985/APS-94D; Extender Card, Electronic Test MX-9986/APS-94D; a card extractor; Mounting Base, Electrical Equipment MT-4978/APS-94D and Case, Test Set CY-7001/APS-94D.

1-8. Equipment Data

Equipment data of the OQ-63A/APS-94D are given in a through i below. The power and signal outputs are provided as a function of the particular test setup configuration. For example, the OQ-63A/APS-94D provides a sweep signal when Recorder-Processor-Viewer, Radar Mapping RO-495/U is interconnected under test; but does not provide the sweep signal output when Generator, Sweep SG-1127/APS-94E is under test. In the latter instance, the sweep signal is generated by the SG-1127/APS-94E and is supplied to the OQ-63A/APS-94D for examination. For this reason, power and signal outputs are grouped by relation to the test setup in which they are supplied as outputs.

a. AU Test Configurations.

Power input requirements to OQ-63AAPS-94D.

Ac Power -- 115 + 5 volts ac line-to-neutral, 400 Hz, 3 phase at 690 volt-amperes maximum.

Dc Power _ _ 27 + 0.5 volts de at 340 watts maximum.

b. Recorder-Processor-Viewer, Radar Mapping RO-4951U Test Configuration.

Power outputs, OQ-63A]APS-94D to unit under test.

Voltage---------- - 28+ 0.028 volts dc
20 + 0.2 volts dc
- 20 + 0.2 volts dc
6.3 + 0.126 volts dc
102 + 2.04 volts dc
640 + 40 volts dc
531+ 5.31 volts dc
15 + 0.75 volts dc
- 15 + 0.75 volts dc

Signal outputs, OQ-63A/APS-94D to unit under test.

FT video signal:
Pulse amplitude ---------- Variable 0 to 5.4 volts
PRF ---------- 750 + 75 pps
Pulse width---------- 102.4 + 5.1 µsec

Test Video signal:
Pulse amplitude---------- Variable 0 to 5.4 volts peak-to-peak.

PRF 5 MHz squarewave

Yoke Clamp gate:
Pulse amplitude---------- 8 ± 0.8 volts peak-to-peak
PRF ---------- 750 ± 20 Hz
Pulse width---------- Selectable: 270 ± 10 µsec, 437 + 15 µsec, or 768+ 20 µsec.

Sweep Gate:
Pulse amplitude ----------4 ± 0.4 volts peak-to-peak
PRF 750 ± 20 Hz
Pulse width----------Selectable: 166.7 ± 10 µsec,
----------334 ± 15 µsec, 667±20 -µsec.

FT enable gate:
Pulse amplitude----------8± 0.8 volts, peak-to-peak
PRF ----------11.8 ± 0.4 Hz
Pulse width----------2.6 ± 0.2 ms

MT enable gate:
Pulse amplitude----------8+ 0.8 volts, peak-to-peak
PRF ----------11.8 ± 0.4 Hz
Pulse width----------26.6 ± 0.2 ms

Range signal ----------20 ± 1.0 volts dc
Video compression ----------15 ± 0.75 volts dc
Vertical offset----------Variable through a minimum range of 3.6 to 7.9 volts de.
FT-MT bias----------0 to - 28± 0.28 volts dc
ECCM video ----------1.5 volts p-p, 620 ms pulse width.
ECCM deflection ----------±2 volts

c. Generator, Sweep SG-1127/APS-94E, Test Configuration.

Power outputs, OQ-63A/APS94D to unit under test.

Ac voltage ----------115±5 volts ac, line-to-neutral 400 Hz, 3-phase.
Dc voltage ----------± 15 volts dc, (-) 15 volts dc

Signal outputs, OQ-3A/APS-94D to unit under test.

Sweep gate ---------- Same as b above
Yoke clamp gate ----------Same as b above
Sine 0 ----------Variable - 3 volts to + 2.8 volts.
Cosine 0 ----------Variable - 2.7 volts to + 11 volts.
Offset gain Variable, - 3.6 to + 3.6 volts dc
Vertical offset override----------20 volts dc

d. Control, Radar Set C-7645/APS-94D, Test Configuration.

Power outputs, OQ-63A/APS-94D to unit under test.

Ac voltage ---------- 26 + 1.3 vac 400 Hz
Dc voltage ----------28 volts dc
- 20 volts dc
+ 20 volts dc
+ 28 volts de

Signal outputs, OQ-3A/APS-94D to unit under test.

Synchro data ----------3-wire positional information
Doppler nav on ----------28 volts dc

Antenna gate:
Pulse amplitude ----------9+ 1 volt peak-to-peak
PRF ----------5.9 + 0.2 Hz
Duty cycle ----------50 + 10 percent

Fault indicator ----------20-+ 1 volts dc
Transmitter ready ----------28 volts dc
Transmitter on ----------28 volts dc
Range/delay error ----------28 + 1 volts dc
Filmspeed reference ----------Variable, 5 to 28 volts dc

e. Rack, Electrical Equipment MT-4015/APS-94D, Test Configuration.

Voltage output, OQ-63A/APS-94D to unit under test.

Ac voltage115 ± 5 volts, 400 Hz

f. Dc Amplifer 5A1, 5A2, 5A3, 5A4, Test Configuration.

Voltage output, O63A/ ± 20 vdc, - 20 vdc
APS-94D to unit under test.
Signal outputs, OQ-63A/APS-94D to unit under test.

Centering voltage ---------- Variable - 1.5 to + 1.5 volts de
Corrected horizontal sweep output is capable of producing the following characteristics at the output of the dc amplifier under test:
Deflection voltage ---------- 10 volts peak at 2-inch beam deflection.
Linearity ±1 percent about centerline.
Load current ---------- 1.76 amp peak at 2-inch beam deflection.

g. Low Voltage Power Supply Module 5A6, Test Configuration.
Regulator Module 5A6A1, Test Configuration.
Voltage output, OQ-63A/APS-94D to unit under test. 115 + 5 volts ac, line-to-neutral, 400 Hz, 3-phase.

h. Sweep Generator Module 5A5, Test Configuration.
Voltage output, OQ-63A/APS-94D to unit under test.
Voltage ---------- - 20 volts dc
- 15 volts dc
+ 15 volts dc

Signal outputs, OQ-3A/APS-94D to unit under test.
Sweep gate ----------Same as b above
Yoke clamp gate ----------Same as b above
Sine 0 ----------Same as c above
Cosine 0 Same as c above
Offset gain ----------Same as c above
Vertical offset override Same as c above

i. Servo Amplifier Module 9Al, Test Configuration.
Power outputs, OQ-63A/APS-94D to unit under test.
Voltage 26----------1.3 volts, 400 Hz
- 20 volts dc
20 volts dc
Signal outputs, OQ-63A/APS-94D to unit under test.
Ground speed on ----------20 volts dc
Drift angle on 20 volts dc
Doppler nav on 28 volts dc
Control transfer data Phase and amplitude variable 400 Hz.

1-9. Components and Dimensions

The components and dimensions of Test Set Group, Indicator, Radar OQ-63A/APS-94D are listed in table 1-1.

Table 1-1. Table of Components and Dimensions

Item	Overall dimensions (inches) (Length) height	(Diam) width	(Length) depth	Weight (lb)	Fig. ref
Test Set Subassembly MX-8638A/APS-94D	19.25	30.38	22.25	125	1-1
Test Set Subassembly MX-8639A/APS-94D including:	19.25	30.38	22.25	140	1-2
Cable Assembly, Power, Electrical CX-12241/U (W10)	72				1-5
Cable Assembly, Special Purpose, Electrical CX-12323/U (W3)	36	0.85			1-5
Cable Assembly, Special Purpose, Electrical CX-12324 (W5)	36	0.5			1-5
Cable Assembly, Special Purpose, Electrical CX-12325 (W1)	96	0.5			1-5
Cable Assembly, Special Purpose, Electrical CX-12326 (W12)	96	0.5			1-5
Cable Assembly, Special Purpose, Electrical CX-12328/U (W15)	96	0.85			1-5
Cable Assembly, Special Purpose, Electrical CX-12296/U (W1)	36	0.55			1-5
Cable Assembly, Special Purpose, Electrical CX-12331/U (W2)	36	0.9			1-5
Cable Assembly, Special Purpose, Electrical CX-12332/U (W4)	36	0.55			1-5
Cable Assembly, Special Purpose, Electrical CX-12240/U (W9)	72	0.5			1-5
Cable Assembly, Radio Frequency CG-3618/U (W19)	48	0.87			1-5
Cable Assembly, Radio Frequency CG-3618/U (W20)	48	0.87			1-5
Cable Assembly, Radio Frequency CG-3618/U (W21)	48	0.87			1-5
Cable Assembly, Radio Frequency CGC3618/U (W22)	48	0.87			1-5
Cable Assembly, Radio Frequency CG-3618/U (W41)	48	0.87			1-5
Cable Assembly, Radio Frequency CG-3618/U (W42)	48	0.87			1-5
Cable Assembly, Special Purpose, Electrical CX-12333/U (W6)	96	1.5			1-5
Cable Assembly, Special Purpose, Electrical CX-12334/U (W7)	60	0.95			1-5
Cable Assembly, Special Purpose, Electrical CX-12335/U (W8)	96	1.5			1-5
Cable Assembly, Special Purpose, Electrical CX-12336/U (W17)	48	0.75			1-5

Table 1-1. Table of Components and Dimensions - Continued

Item	Overall dimensions (inches) (Length) height	(Diam) width	(Length) depth	Weight (lb)	Fig. ref
Cable Assembly, Special Purpose, Electrical CX-12337/U (W18)	48	0.65			1-5
Cable Assembly, Special Purpose, Electrical CX-12338/U (W23)	24	0.5			1-5
Test Set Subassembly MX-9984/APS-94D including:	17.75	31.78	9.76	115	1-3
Case, Test Set CY-7001/APS-94D	17.75	31.78	9.76	10	1-3
Mounting Base, Electrical Equipment MT-4978/APS-94D	26	15	1.5	9.5	1-4
Extender Card, Electronic Test MX-9986/APS-94D14.5	14.5	6	1.25		1-4
Extractor, Electrical Card	5.25	3	0.25		1-4
Cable Assembly, Special Purpose, Electrical (W35)	72	0.75			1-4
Cable Assembly, Special Purpose, Electrical (W36)	72	0.75			1-4
Cable Assembly, Special Purpose, Electrical (W37)	72	0.5			1-4
Cable Assembly, Special Purpose, Electrical (W34)	48	0.5			1-4
Cable Assembly, Special Purpose, Electrical (W39, W40)	48	0.5			1-4
Cable Assembly, Special Purpose, Electrical (W43)	48	0.75			1-4
Cable Assembly, Special Purpose, Electrical (W38)	72	0.75			1-4
Adapter, Test MX-8630/APS-94D	1	12.25	5.5		1-6
Adapter, Test MX-8631/APS-94D	1	10	4.5		1-6
Adapter, Test MX-8632/APS-94D	1	9	5		1-6
Adapter, Test MX-8633/APS-94D	1	13.5	7		1-6
Adapter, Test MX-8634/APS-94D	1	12.5	6		1-6
Adapter, Test MX-8742/APS-94D	1.25	4.5	7.25		1-6
Adapter, Test MX-8794/APS-94D	1.25	4.5	7.25		1-6
Alignment Fixture, Electron Tube MX-9985/APS-94D	11.22	2.38	4.25	5.25	1-7
Microscope, Optical SU-54APS-94D	4	1.5			1-8
Alignment Mask, Crt	11.19	2.75	1.13		1-9
Thermocouple, Reference	3.5	1.3	0.5		1-10

1-10. Common Names

Common names assigned to the components of Test Set Group, Indicator, Radar OQ-63A/APS-94D and to the components of Radar Surveillance Set AN/APS-94E are given in tables 1-2 and 1-3, respectively.

Table 1-2. Test Set Group, Indicator, Radar OQ-6A/APS-94 Common Names

Nomenclature Test Set Group, Indicator, Radar OQ63A/APS-94D	Common name Test set group
Adapter, Test MX-8630/APS-94D	Standard module extender
Adapter, Test MX--8631/APS-94D	Module extender 1A1A4
Adapter, Test MX-8632/APS-94D	Module extender 1A2A6
Adapter, Test MX-8633/APS-94D	Module extender 2A4
Adapter, Test MX-8634/APS-94D	Module extender 2A5
Adapter, Test MX-8742/APS-94D	Cable W8 adapter
Adapter, Test MX-8794/APS-94D	Cable W6 adapter
Alignment Fixture, Electron Tube MX-9985/APS-94D	Crt alignment fixture
Adapter, Test MX-8633/APS-94D	Module extender 2A4
Alignment Fixture, Electron Tube MX-9985/APS-94D	Crt alignment fixture

Table 1-2. Test Set Group, Indicator, Radar OQ-6A/APS-94 Common Names-Continued

Nomenclature Case, Test Set CY-7001/APS-94D	Common name Test set case
Extender Card, Electronic Test MX-9986/APS-94D	Module extender
Microscope, Optical SU-54APS-94D	Microscope
Mounting Base, Electrical Equipment MT-4978/APS-94D	Mounting base
Splice, high-voltage anode connector	Anode splice
Splice, high-voltage focus connector	Focus splice
Test Set Subassembly MX-8638A/APS-94D	Indicator simulator
Test Set Subassembly MX-8639A/APS-94D	Generator simulator
Test Set Subassembly MX-9984/APS-94D	Accessories set

Table 1-3. Radar Surveillance Set AN/APS-4E Common Names

Nomenclature Radar Surveillance Set AN/APS- 94E	Radar set Common name
Control, Radar Set C-7645/APS-94D	Radar control
Generator, Sweep SG-1127/APS-94E	Sweep generator

Table 1-3. Radar Surveillance Set AN/APS-4E Common Names--Continued

Nomenclature	Common name
Rack, Electrical Equipment MT-4015/APS-94D	Equipment rack
Recorder-Processor-Viewer, Radar Mapping RO-495/U	Recorder

1-11. Description of Major Components

The test set is comprised of three major components, Test Set Subassemblies MX-8638A/APS-94D (fig. 1-1), MX-8639A/APS-94D (fig. 1-2) and MX-9984/APS-94D (fig. 1-3). The MX-8638A/APS-94D and the MX-8639A/APS-94D are housed in aluminum cases and the MX-9984/APS-94D is housed in a fiberglassed case (Case, Test Set CY-7001/APS-94D).

a. Test Set Cases.
(1) The MX-8638A/APS-94D and the MX-8639A/APS-94D cases are equipped with two spring-loaded handles for lifting. A breather valve in the case wall enables equalization of inside-to-outside air pressure. The pressure relief valve operates automatically in either direction when the pressure differential exceeds 2 pounds. The pressure differential can be manually relieved at any time by depressing a red button at the center of the breather valve. This must be accomplished before opening the case cover. Four rubber feet on the bottom of the case body correspond to identation locations in the case cover, and together facilitate stacking for transportation or storage. The case cover is secured to the case body by eight latches, and is made airtight and watertight by a rubber gasket. A bracket around the inside of the case body forms a shelf for attachment of the test set panel and chassis in the case. The panel is secured to the shelf by 12 screws, and is radio frequency interference (rfi) tight. The rfi shield is formed by a silicon rubber and monel wire gasket which lies between the back of the panel and the shelf.

(2) The MX-9984/APS-94D case is similar to the two previous cases with the following exceptions. The breather valve operates at 3 pounds pressure differential and it has only one carrying handle. It has twd latches and no (rfi) shielding.

b. Test Set Subassembly MX-8638A/APS-94D (fig. 1-1). Both the lower and upper halves of the case contain electronic circuitry and a chassis and control panel. The case is opened for operation, and each half becomes an operating cabinet (case). All controls, indicators, and jacks are located on the control panels. All cables used with this component are stored in the upper cover of the generator simulator (fig. 1-2). There is one access cover on the lower case-half panel. Under the LOW VOLTAGE REGULATOR cover is the plug-in low voltage regulator 1AlA4 module. The module may be removed through the cover opening. The interior of the chassis is cooled by taking air in at the left side of the panel through a metallic filter and exhausting the air at the right side of the panel through louvres.

c. Test Set Subassembly MX-8639A/APS-94D (fig. 1-2). The electronic circuitry, chassis, and control panel are located in the lower half of the test set case. The constructional features are the same as described in b above. There are two access covers at the right side of the control panel. One cover permits access and removal of plug-in modules servo amplifier 2A5 and sweep generator 2A4, the other cover is over the horizontal amplifier 2A2. All cables, running spares, and test adapters (extender assemblies) are stored under a hinged lid in the top half of this case. The lid is fastened by three press-to-lock unlock type fasteners.

d. Test Set Subassembly MX-984/APS-94D (fig. 1-3). Test Set Subassembly MX-9984/APS-94D consists of cables and other accessories used in testing the cockpit complex of the AN/APS-94E. The CY-7001/APS-94D (fig. 1-4) consists of an upper and lower half. The lower half contains Mounting Base, Electrical Equipment MT-4978/APS-94D; Extender Card, Electronic Test MX-9986/APS94D; Extractor, Electrical Card; Alignment Fixture, Electron Tube MX-9985/APS-94D, and Cables W34 through W40. The upper half of the case contains a foam rubber pad to protect the contents while the case is in transit.

1-12. Description of Minor Components
All minor components are stored in the cover of Test Set Subassembly MX-8639A/APS-94D and in Test Set Subassembly MX-9984/APS-94D (fig. 1-3). Listings and descriptions of these components are contained in a through f below.

a. Cables. All cables and cable connectors (fig. 1-5) are identified as follows: the cable designator (W1, W2, etc) is stencilled on the cable midpoint between the cable connectors. The cable connectors (P1, P2) are identified by metal bands around the cable ends; and the short form nomenclature, cable reference designation, and manufacturer's part number appear on metal bands encircling the cable at its middle. Table 1-4 lists the cables by reference designation and nomenclature, and also gives mating connector information.

b. Test Adapters. The test adapters (module extenders) are printed circuit boards with a con-

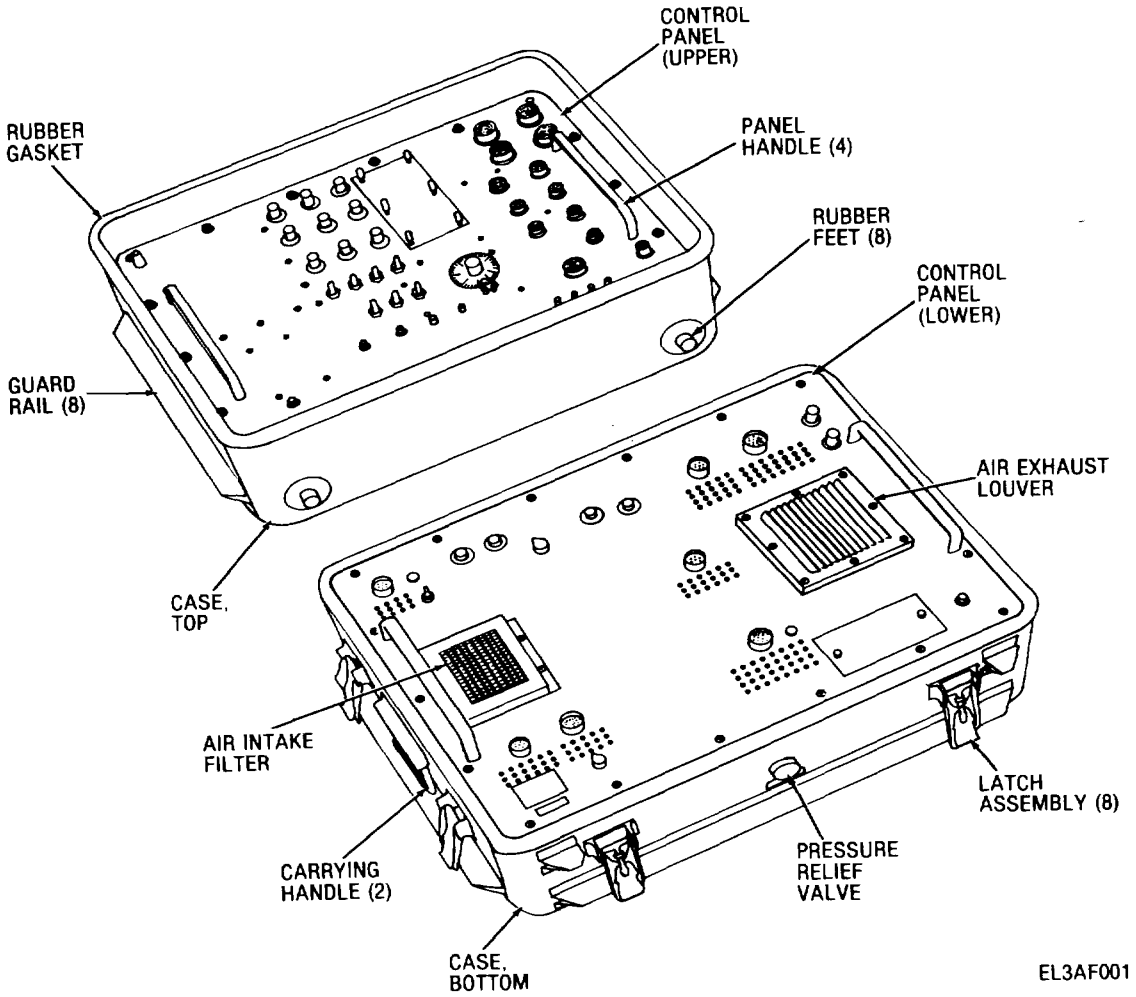


Figure 1-1. Test Set Subassembly MX-8638A/APS-94D.

nector at each end and straight through connector-to-connector wiring. These extenders (fig. 1-6) are used to facilitate maintenance of printed circuit subassemblies. In practice, the subassembly under test is removed from the test set receptacle, the module extender plugged into the test set receptacle, and then the subassembly under test is plugged into the module extender. This positions the subassembly above the test set chassis and permits access for troubleshooting and maintenance. The extenders are listed below and cross-referenced to the test set subassemblies with which they are associated:

Nomenclature	Used with subassembly
Adapter, Test MX-8630/ APS-94D	AP/APS-94E recorder modules
Adapter, Test MX-8631/ APS-94D	Low-voltage regulator 1A1A4
Adapter, Test MX-8632/ APS-94D	Video amplifier 1A2A6
Adapter, Test MX-8633/ APS-94D	Sweep generator 2 4
Adapter, Test MX-8634/ APS-94D	Servo amplifier 2A5

c. Alignment Fixture, Electron Tube MX-9985/ APS-94D. The crt alignment fixture (fig. 1-7) is used to mechanically align the electron tube assemblies in Recorder-Processor-Viewer, Radar Mapping RO-495/U. The crt alignment fixture has a base plate which is used to calibrate the eight precision dial indicators on the crt alignment fixture. When all dials indicate zero, the fixture is placed on the faces of the two crt assemblies and bolted down. The crt assemblies are then adjusted until all eight dials again read zero.

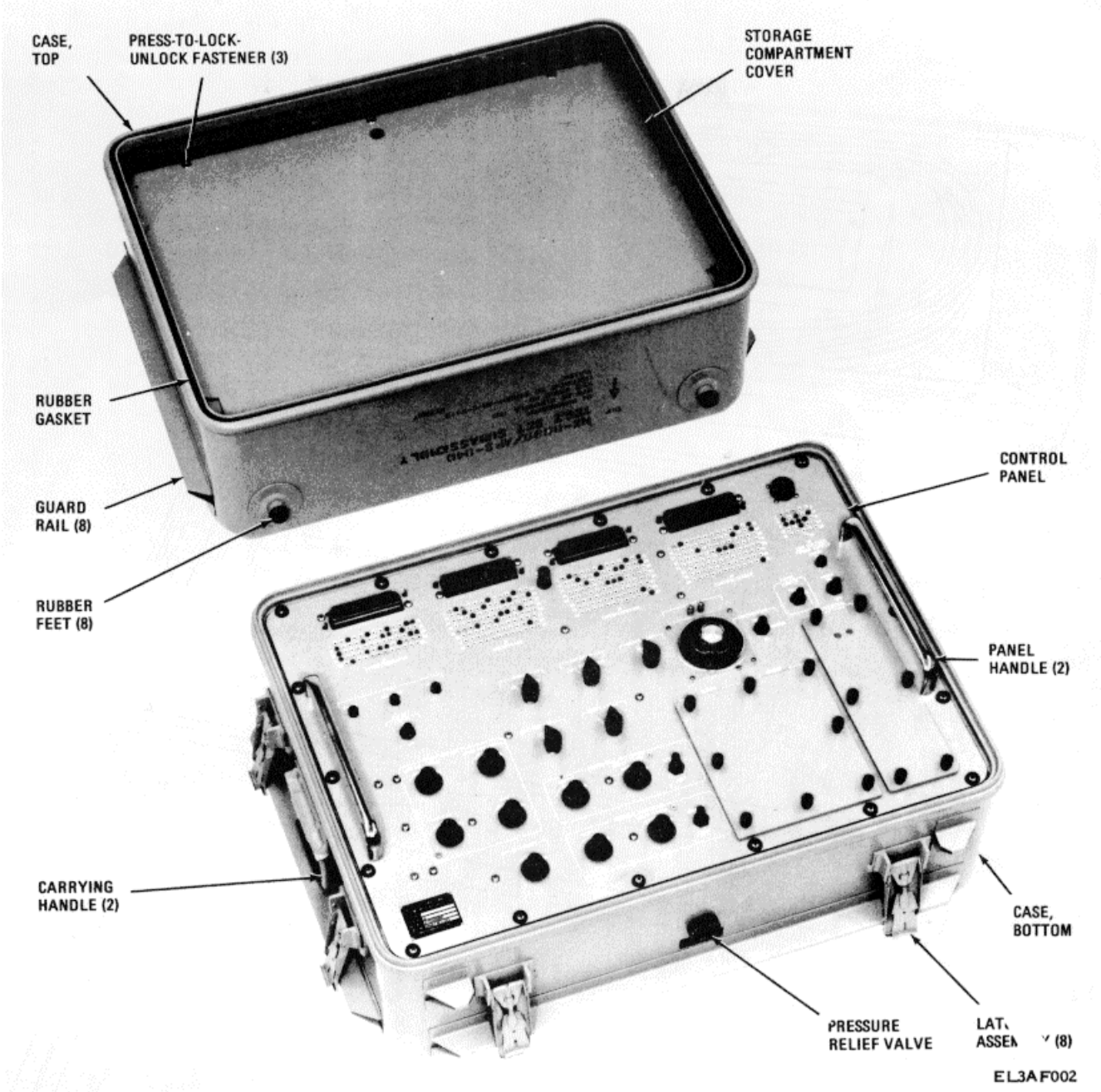


Figure 1-2. Test Set Subassembly MX-8639A/APS-94D.

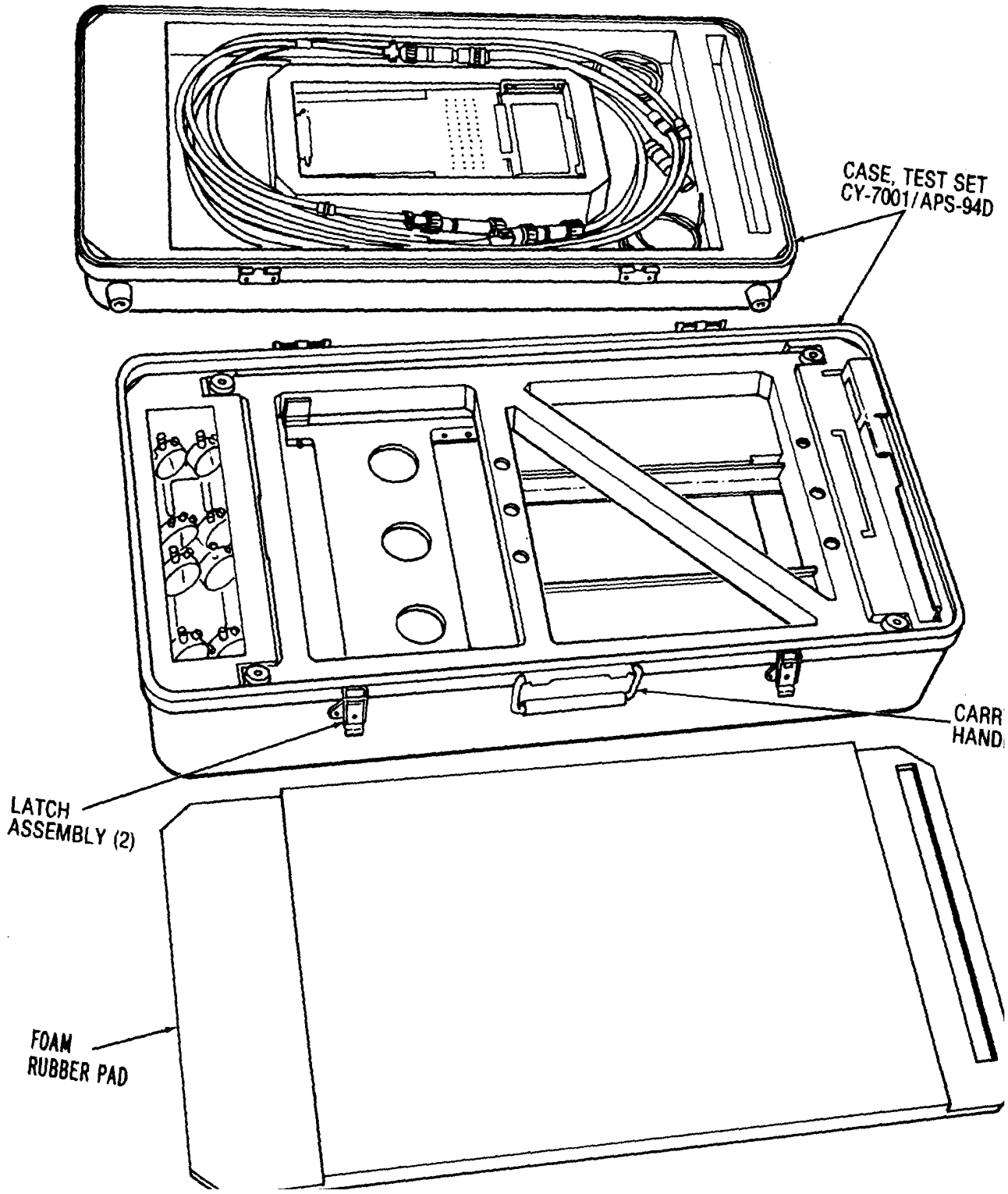
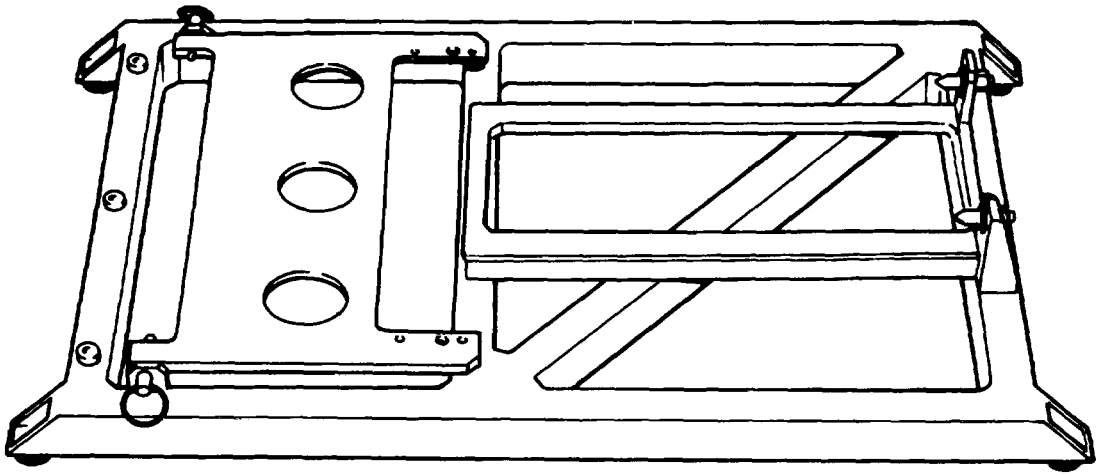
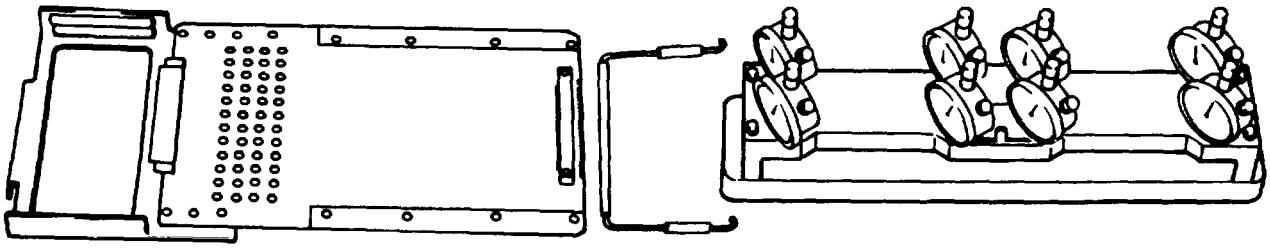


Figure 1-3. Test Set Subassembly MX-9984APS-94D.



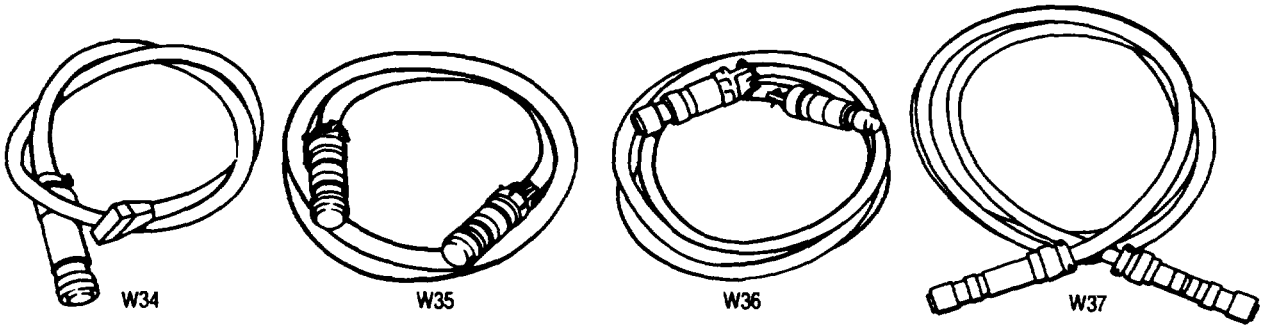
MOUNTING BASE, ELECTRICAL EQUIPMENT MT-4978/APS-94D



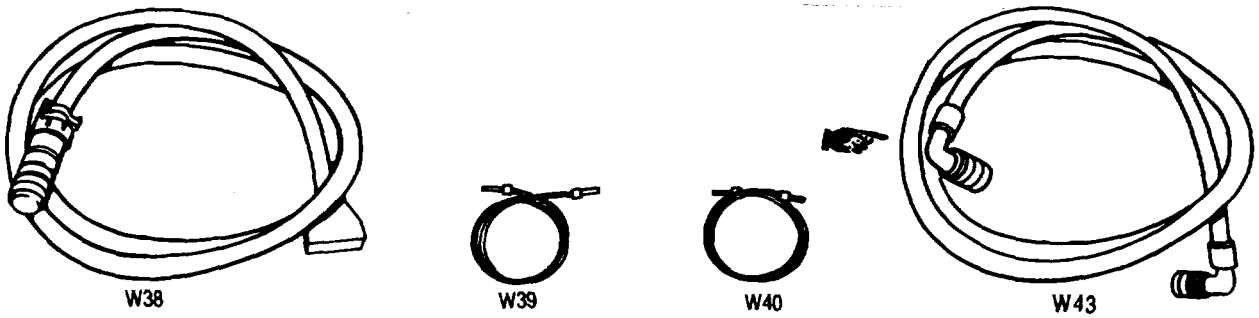
EXTENDER CARD, ELECTRONIC TEST MX-9986/APS-94D

EXTRACTOR, ELECTRICAL CARD

ALIGNMENT FIXTURE, ELECTRON TUBE MX-9985/APS-94D



W34 W35 W36 W37



W38 W39 W40 W43

EL3AF004

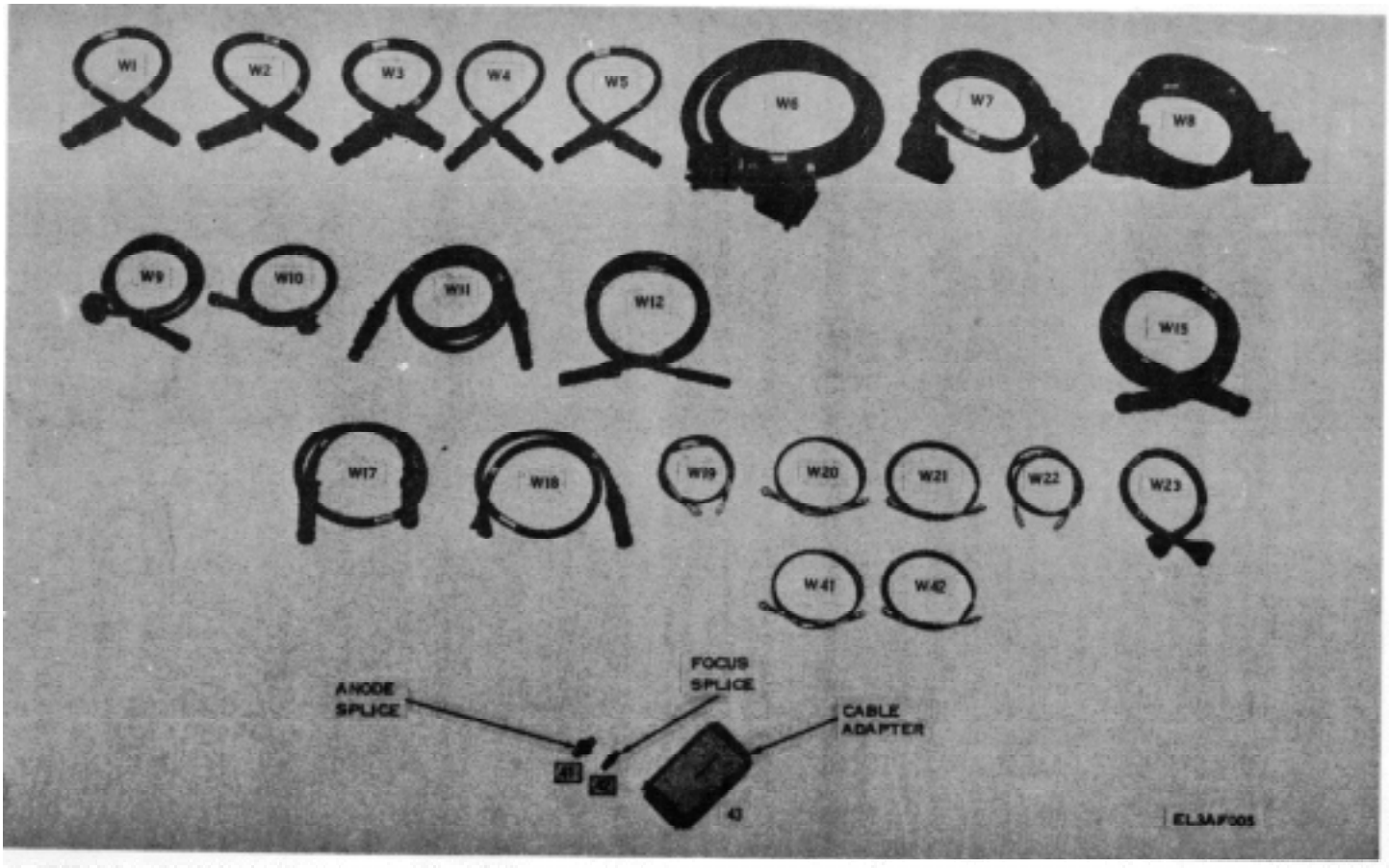


Figure 1-5. Test Set Subassembly MX-8639A/APS-94D cables, cable adapter, and high voltage splices.

Table 1-4 Description of Cable Assemblies

Ref des	Nomenclature and description	P1 destination	P2 destination
W1	Cable Assembly, Special Purpose, Electrical CX-12296/U (3 ft) (25-conductor cable).	I BOX/RACKS J22 on MX-8638A/ APS-94D.	RACK/I BOX J21 on MX-8638A/ APS-94D or 8J1 on AN/APS-94E equipment racks.
W2	Cable Assembly, Special Purpose, Electrical CX-12331;,U (3 ft) (41-conductor cable).	RCDR/RACK J24 MX-8638A/APS-94D	RACK/RCDR J23 on MX-8638A/ APS94D or 8J2 on AN/APS94E equipment rack.
W3	Cable Assembly, Special Purpose, Electrical CX/12323/U (3 ft) (42-conductor cable).	RGP/RACK J26 on MX-8638A/APS-94D	RACK/RGP J25 on MX-838A/APS-94D or 813 on AN/APS-94E equip-ment rack.
W4	Cable Assembly, Special Purpose, Electrical CX-12332/U (3 ft) (18-conductor cable).	RACK NAV SIM J18 on MX-863A/ APS-94D.	RACK/NAV SIM J17 on MX-863A/ APS-94D or to 8J4 on AN/APS-94E equipment rack.
W5	Cable Assembly, Special Purpose, Electrical CX-12324/U (3 ft) (19-conductor cable).	RACK ADAS J20 on MX-8638A/ APS-94D.	RACK/ADAS J19 on MX-9638A/ APS-94D or to 8J5 on AN/APS-94E equipment rack.
W6	Cable Assembly, Special Purpose, Electrical CX-12333/U.	SWEEP/RACK J2 on MX-8639A/ APS-94D.	RACK/SWEEP J10 on MX-8638A/ APS-94D or X5P1 on AN/APS-94E equipment rack.
W7	Cable Assembly, Special Purpose, Electrical CX-12334/U (5 ft) (66-conductor cable).	a. SWEEP/INDICATOR J1 on MX-84639A/APS-94D. APS-94E recorder. b. INDICATOR/SWEEP J11 on MX-8638A/APS-94D.	a. INDICATOR/SWEEP J11 on MX-8638A/APS-94D or P1 on AN/ b. P1 on AN/APS-94E sweep generator.
W8	Cable Assembly, Special Purpose, Electrical CX-123351U (8 ft) (100-conductor cable).	a CONTROL/SWEEP J4 on MX-8639A/APS-94D. b. SWEEP/CONTROL J3 on MX-8639A/APS94D.	a. SWEEP CONTROL J3 on MX-8639A/APS-94D or X9P1 on AN/APS-94E sweep generator. b. P1 on AN/APS94E radar control.
W9	Cable Assembly, Special Purpose, Electrical CX-12440/U (6 ft) (4-conductor cable).	115-vac power source.	AC POWER IN J13 MX-8638A/APS-94D.
W10	Cable Assembly, Special Purpose, Electrical CX-12241/U (6 ft) (2-conductor cable).	28-vdc power source.	DC POWER IN J12 on MX-8638A/ APS-94D.
W11	Cable Assembly, Special Purpose, Electrical CX-12325/U (8 ft) (10-conductor cable).	YOKE LOAD J14 on MX-8638A/ APS-94D.	YOKE DRIVE JI on MX-8638A/ APS-94D.
W12	Cable Assembly, Special Purpose, Electrical CX-12326/U (8 ft) (10-conductor cable).	AN/AP-94E cathode ray tube.	YOKE DRIVE J1 on MX-8638A/ APS-94D.
W15	Cable Assembly, Special Purpose, Electrical CX-12328/U (8 ft) (41-conductor cable).	HIGH VOLTAGE REGULATOR J2 on MX-8638A/APS-94D.	HIGH VOLTAGE REGULATOR J15 on MX-8638A/APS-4D.
W17	Cable Assembly, Special Purpose, Electrical CX-12336/U (4 ft) (26-conductor cable).	LOW VOLTAGE POWER SUPPLY J1 on MX-8638A/APS-94D.	LOW VOLTAGE POWER SUPPLY J5 on MX-8638A/APS-94D.
W18	Cable Assembly, Special Purpose, Electrical CX-12337/U (4 ft) (27-conductor cable).	Module 5A6 of AN/APS-94E sweep generator.	LOW VOLTAGE POWER SUPPLY J5 on MX-8639A/APS-94D.
W19	Cable Assembly, Radio Frequency, CG-3618WU (4 ft) (Coaxial).	FT VIDEO J2 on MX438A/APS-94D.	J3 on MX-8638A/APS-94D or J4 on AN/APS-94E recorder.

Table 1-4. Description of Cable Assemblies-Continued

Ref des	Nomenclature and description	PI destination	P2 destination
W20	Cable Assembly, Radio Frequency, CG-361/U (4 ft) (Coaxial).	MT VIDEO J4 on MX-8638A/APS-94D.	J56 on MX-8638A/APS-94D or J3 on AN/APS-94E recorder.
W21	Cable Assembly, Radio Frequency, CG-3618U (4 ft) (Coaxial).	SWEEP GATE J8 on MX-8638A/ APS-94D.	J9 on MX-8638A/APS-94D or J2 on AN/APS-94E recorder.
W22	Cable Assembly, Radio Frequency, CG3618/U (4 ft) (Coaxial).	TEST VIDEO J6 on MX-8638A/ APS-94D.	J7 on MX-838A/APAS-94D or J56 on AN/APS-94E recorder.
W23	Cable Assembly, Special Purpose, Electrical CX-12338/U (2 ft) (21-conductor cable). sweep generator.	J1 of module 2A2 of MX-8639A/APS-94D or to J1 of modules 5A1 through 5A4 of AN/APS-94E	XA2 on MX-8639A/APS-94D.
W34	Cable Assembly, Special Purpose, Electrical (4 ft) (19-conductor cable).	1A1J3 on MX-8638A/APS-94D.	P1 on AN/APS-94E film processing assy 10A1A1A1.
W35	Cable Assembly, Special Purpose, Electrical (6 ft) (41-conductor cable).	J1 of ANIAPS-94E Recorder Controller Assembly 10A2.	8J2 on AN/APS94E equipment rack or 1A1J4 on MX-8638A/APS-94D.
W36	Cable Assembly, Special Purpose, Electrical (6 ft) (16-conductor cable).	J10 of AN/APS-94E Recorder Controller Assembly 10A2.	1A1J7 on MX-8638A/APS-94D.
W37	Cable Assembly, Special Purpose, Electrical (6 ft) (19-conductor cable).	8J5 on AN/APS-94E Equipment Rack.	1A1J9 on MX-8638A/APS-94D.
W38	Cable Assembly, Special Purpose, Electrical (6 ft) (26-conductor cable).	J6 of AN/APS-94E Recorder Assembly 10A1A4.	1A1J5 on MX-8638A/APS-94D.
W39	Cable Assembly, Special Purpose, Electrical (48-inch, 1-conductor h-v cable).	1A1J8 on MX-863A/APS-94D. 10A1A5.	J1, J2, or J3 of power supply module
W40	Cable Assembly, Special Purpose, Electrical (48inch, 1-conductor h-v cable).	1A1J6 on MX-8638A/APS-94D.	J4 or J5 of power supply module 10A1A5.
W43	Cable Assembly, Special Purpose, Electrical (4 ft)- (128 -conductor cable).	J1 on AN/APS-94F film processing J8 assy 10A1Al	J6 of AN/APS-94F Recorder Controller Assembly 10A2.
W41	Cable Assembly, Radio Frequency, CG-3618U (4 ft) (Coaxial).	ECCM VIDEO J10 on MX-8638A/ APS-94D.	J11 on AN/APS94E recorder.
W42	Cable Assembly, Radio Frequency, CG-3618/U (4 ft) (Coaxial).	ECCM DEFLECTION J11 on MX-8638A/APS94D.	J12 on AN/APS-94E recorder.

d. *Microscope, Optical SU-5/APS94~D*. The microscope (fig. 1-8) provides 50-power magnification to view and check the crt trace for proper focusing along its entire length. It also provides the necessary resolving power to enable viewing of individual high frequency pulses on the crt.

e. Crt Alignmet Mask. The crt alignment mask (fig. 1-9) is used to position the deflection yokes on the two crt's. The crt alignment mask is bolted down on the faces of the crt's and a trace is generated. The yokes are adjusted until the trace is in line with the hairline etched on the crt alignment mask. The crt alignment mask is stored in the MX-8639/APS-94D.

f. Reference Thermocouple Assembly. The reference thermocouple assembly (fig. 1-10) is used to measure the temperature of the RO-495/U heater bar. The reference thermocouple assembly is placed in a location where it can sense ambient temperature which is measured with a thermometer. Wires from the reference thermocouple assembly are connected to the heater bar and the difference in temperature between the reference thermocouple and the heater bar is calculated using a voltmeter connected between the reference thermocouple and heater bar. The voltage is converted to the actual heater bar temperature by use of a conversion chart. The reference ther-

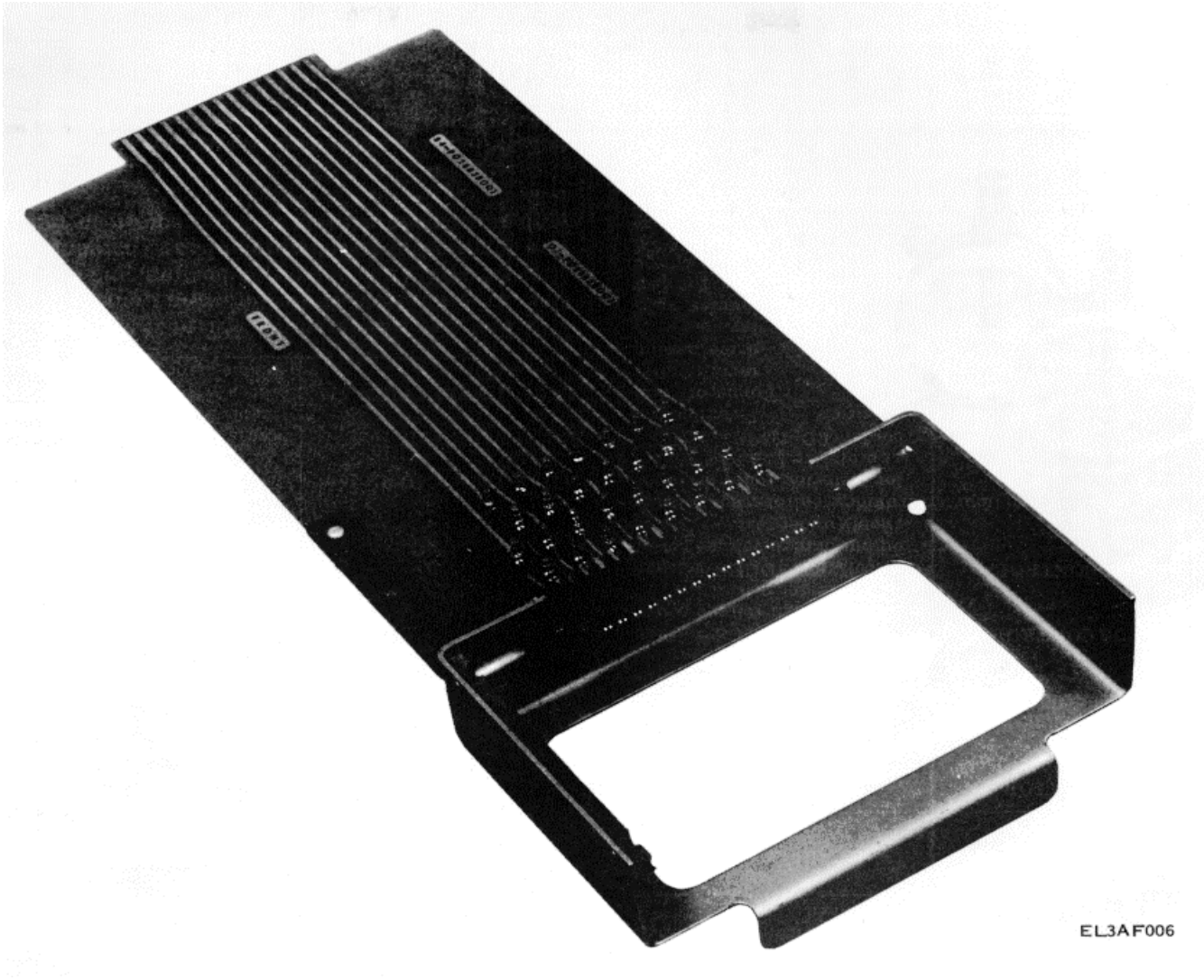


Figure 1-6. Typical test adapter.

mocouple is stored in the MX-8639/APS-94D.

g. Cable Adapters. Cable W8 adapter (MX-8742/ APS-94D) (fig. 15) provides the physical clearance required to permit electrical connection of cable W8 to receptacle X9P1 of Generator, Sweep SG-1127/APS-94E and to plug P1 of Control, Radar C-7645/APS-94D. Cable W6 adapter (MX-8794/ APS-94D) (fig. 1-5) provides the physical clearance required to permit electrical connection of cable W6 to plug P1 of Generator, Sweep SG1127/APS-94E.

h. Anode Splice. The anode splice (fig. 1-5) permits connection of cable W39 to anode connector J1, J2, or J3 of power supply module 10A1A5 in Recorder-Processor-Viewer, Radar Mapping RO-495/U.

i. Focus Splice. The focus splice (fig. 1-5) permits connection of cable W40 to focus connector J4 or J5 of power supply module lOAlA5 in Recorder-Processor-Viewer, Radar Mapping RO-495/U.

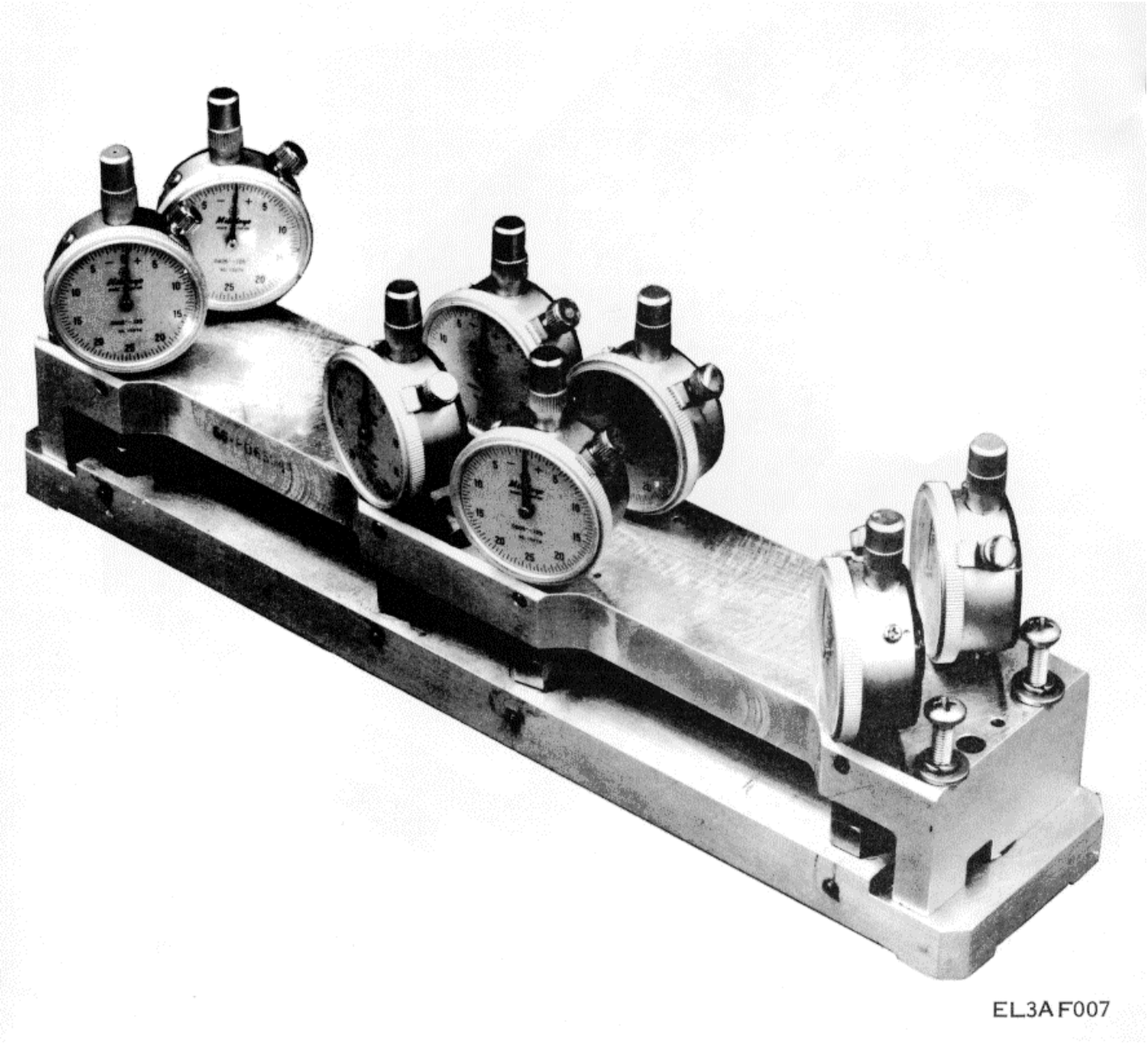


Figure 1-7. Alignment Fixture, Electron Tube MX-9985/APS-94D.

Figure 1-8. Microscope, Optical SU-54/APS-94D.

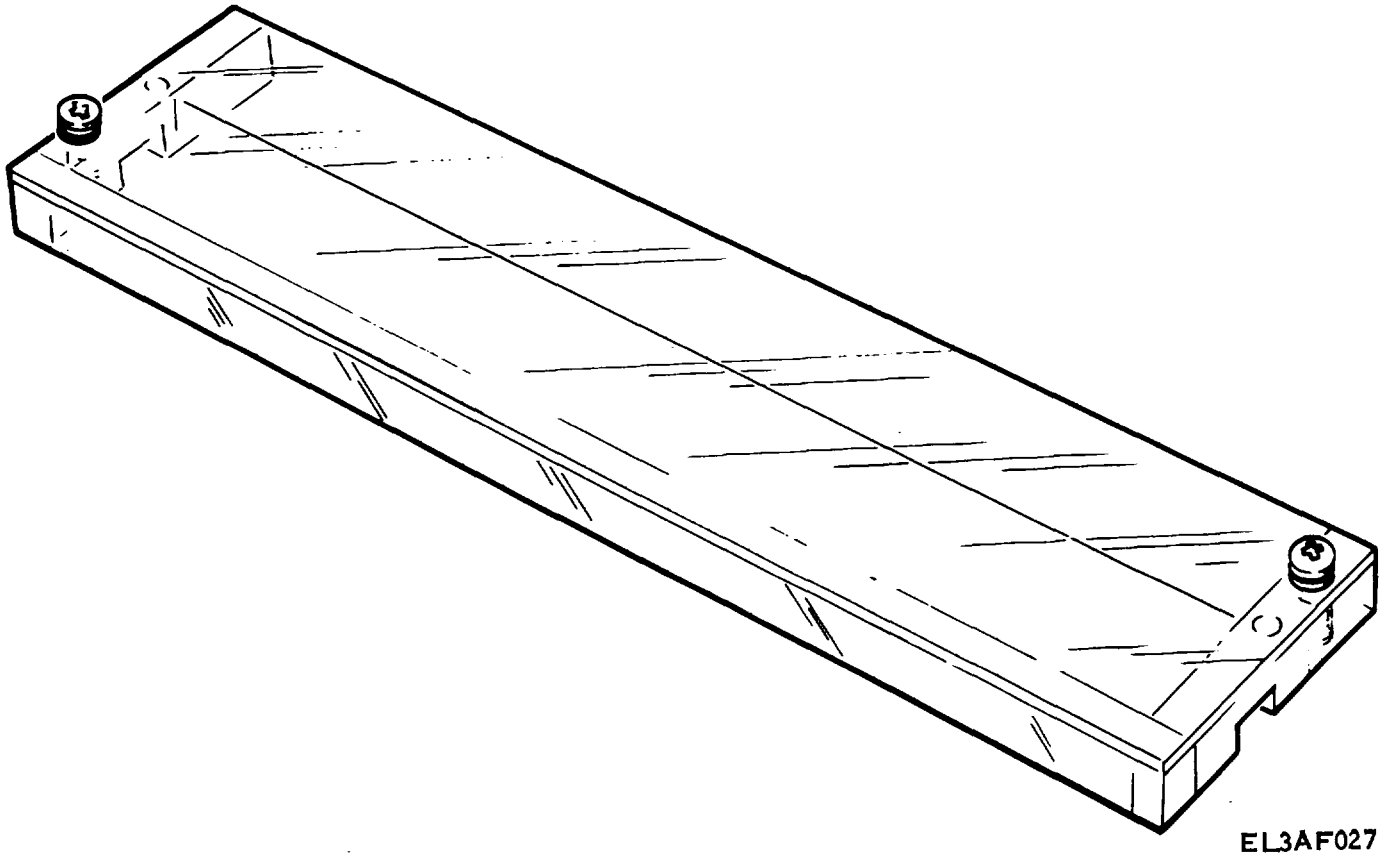


Figure 1-9. CRT alignment mask.

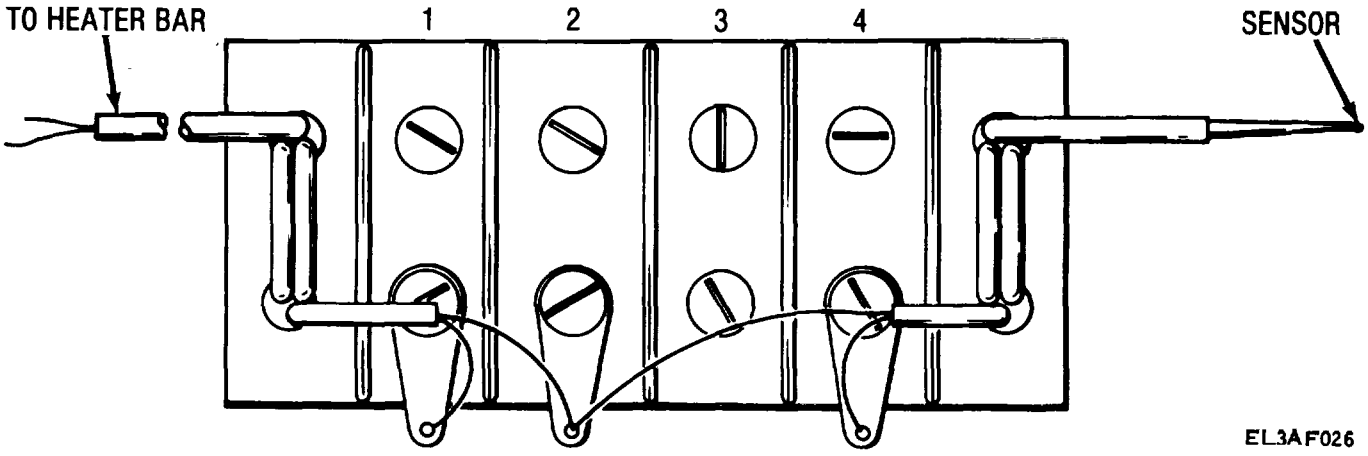


Figure 1-10. Reference thermocouple assembly.

CHAPTER 2

INSTALLATION AND OPERATING INSTRUCTIONS

Section I. SERVICE UPON RECEIPT OF EQUIPMENT

2-1. Unpacking

a. Packaging data. Each unit of the test set is individually packaged for shipment or limited storage in a cleated plywood box (fig. 2-1) reinforced with metal strapping. The plywood box for the indicator simulator and the generator simulator are each 23 inches high by 35 inches wide by 27.5 inches in depth, and have a volume of 16.4 cubic feet. The loaded plywood box containing the indicator simulator weighs 140 pounds and the generator simulator and its plywood box weighs 155 pounds. The plywood box containing the accessories set which houses necessary cables and auxiliary equipment is 16.8 inches high by 23.5 inches wide by 38.8 inches in depth, has a volume of 9.54 cubic feet, and weighs 140 pounds.

b. Removing Contents. Do not attempt to pry off the top and sides of the cleated plywood box. Prying may damage the equipment.

(1) Cut the metal straps from around the plywood box.

(2) Remove the nails from the top and sides of the plywood box.

(3) Spread the side covers of the plywood box to provide working space.

(4) Remove the foam corner blocks and corrugated fiberboard liners from around the case.

NOTE

The number of corrugated fiberboard liners (minimum of one at top, bottom, and sides of units) will vary, due to the thickness of the foam corner blocks.

(5) Obtain assistance and remove the case from the plywood box.

(6) Save the plywood box and other packing materials for repackaging.

2-2. Checking Unpacked Equipment

a. Checking Equipment for Completeness. See that the equipment is complete as listed on the packing slip. If a packing slip is not available, check the equipment against the components list (table 1-1). Report all discrepancies (para 1-3c)

NOTE

Shortage of a minor assembly or part that does not affect proper functioning of the equipment should not prevent use of the equipment.

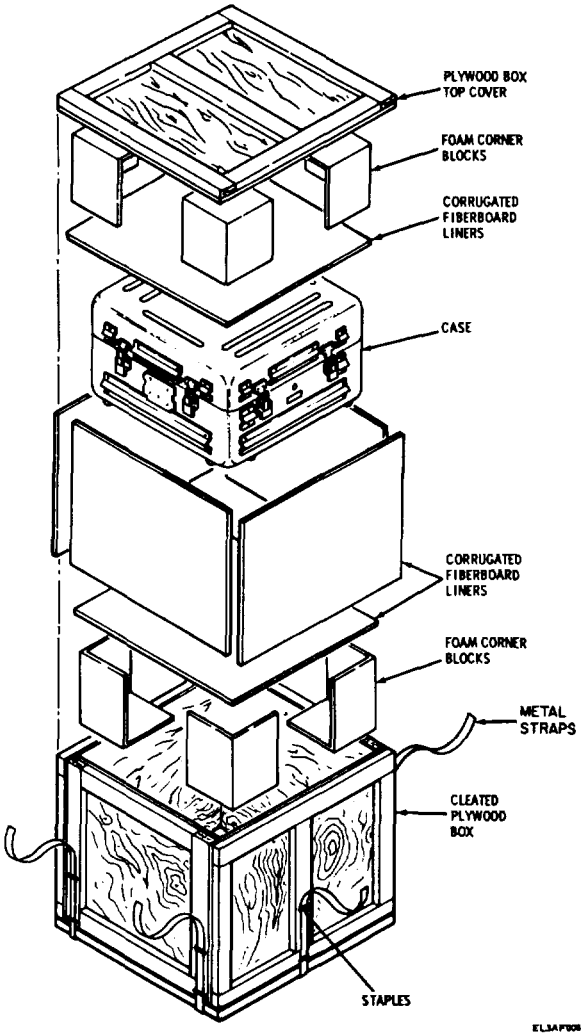


Figure 2-1. Typical packaging of test set.

b. Checking Equipment for Damage. Inspect the equipment for damage incurred during shipment. If the equipment was improperly packaged, or damaged, report the difficulty on DD Form 6 or (DISREP (SF 361)), as pertinent.

c Equipment for Modifications. If the equipment has been used or reconditioned, see whether it has been changed by a Modification Work Order (MWO). If the equipment has been modified, the MWO number(s) will appear on the front panel near the nomenclature plate. Check to see whether the modified equipments are covered in the manual.

NOTE

This manual does not include Modification Work Orders (MWO) for the equipment.

d. Preoperating Check. In order to establish that the test set has not been damaged during packing, shipment, or unpacking, conduct the preoperating check given in paragraph 2-4. Do not perform preoperating checks unless familiar with operating controls (para 2-3).

Section II. OPERATING INSTRUCTIONS

2-3. Operator's Controls and Indicators

This section contains descriptions of those controls and indicators used by the operator. Controls (adjustments) used by maintenance personnel are covered in the manual for the appropriate maintenance category.

a. Test Set Subassembly MX-8638A/APS-4D-Operating Controls, Indicators, and Connectors on Lower Panel. The controls, indicators, and connectors for the lower control panel are listed, along with functions, in table 2-1 and shown in figure

Table 2-1. Test Set Subassembly MX-638A/APS-94D (Lower Control Panel) Controls, Indicators, and Connectors

Control, indicator, or connectors	Function
HIGH VOLTAGE ON lamp.	With HIGH VOLTAGE switch positioned to ON, lamp lights.
LOW VOLTAGE POWER SUPPLY J1 connector.	Mates with connector P1 of cable assembly W17.
HIGH VOLTAGE REGULATOR J2 connector.	Mates with connector P1 of cable assembly W15.
METERING ROLLER DRIVE J3 connector.	Mates with P1 of cable assembly W34.
RACK RO-495 J4 connector.	Mates with P2 of cable assembly W35.
HIGH VOLTAGE SUPPLY J5 connector.	Mates with P2 of cable assembly W38.
FOCUS LOAD J6 connector.	Connects focus load module 1A1A5 to connector J4 or J5 of high voltage power supply module 10A1A5 of recorder (RO-495/U) via cable W40.
ADAS SIMULATOR J7 connector.	Mates with P2 of cable assembly W36.
ANODE LOAD J8 connector.	Connects anode load module 1A1A6 to connector J1, J2,
or J3 of high voltage power supply module 10A1A5 of	

Table 2-1. Test Set Subassembly MX-868A/APS-4D (Lower Control Panel) Controls, Indicators, and Connectors-Continued

Control, indicator, or connectors	Function
	recorder (RO-495/U) via cabl W39.
ANODE RIPPLE El test jack.	Provides measuring point for measuring ripple amplitude across anode load.
FOCUS RIPPLE E2 test.	Provides measuring point for measuring ripple amplitude across focus load.
ANODE VOLTAGE 1V/ 10KVE3 test jack.	Provides measuring point for measuring divided down voltage of high voltage power supply.
FOCUS VOLTAGE 2.75V/ 2.75KV E4testjack.	Provides measuring point for measuring divided down voltage of high voltage power supply.
FILM SPEEED DETECTOR E5 test jack.	Provides measuring point for measuring pulse rate of encoder wheel in RO-495/U to determine film speed.
LOW VOLTAGE POWER SUPPLY J1-1 through 26 test jacks.	Test jacks in these jack fields are wired on a one-to-one basis to corresponding pins of connector located adjacent to jack field. These test jacks provide measurement points for selected signals and voltages present at inaccessible connector pins.
HIGH VOLTAGE REGULATOR J2-1 through 41 test jacks.	Same as for J1-1 through 26 above.
METERING ROLLER DRIVE J3-1 through 19 test jacks.	Same as for J1-1 through 26 above.
RACK/RO-495 J4-1 through 41 test jacks.	Same as for J1-1 through 26 above.
HIGH VOLTAGE SUPPLY J5-1 through 26 test jacks.	Same as for J1-1 through 26 above.

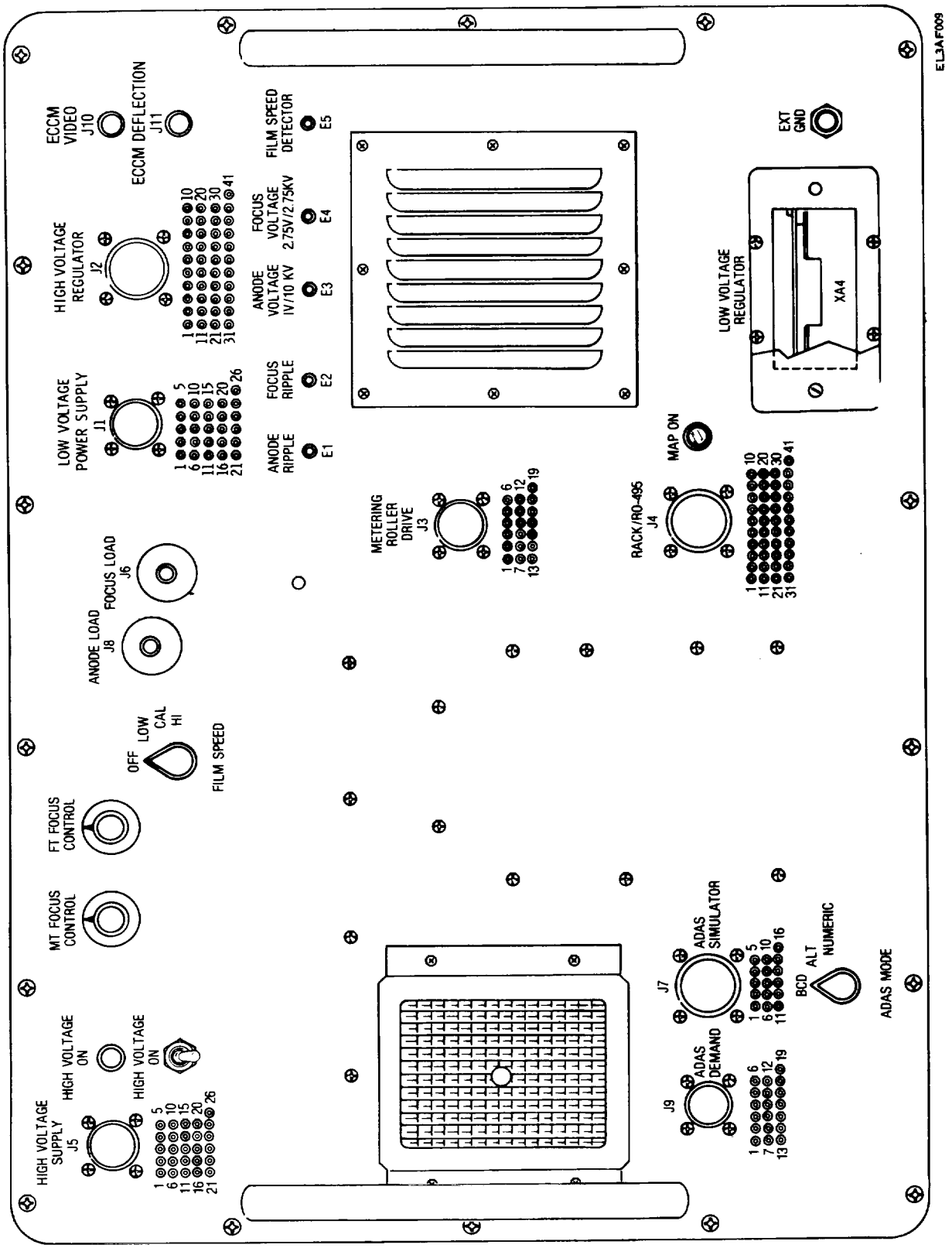


Figure 2-2. Test Set Subassembly MX-8638A/APS-94D (lower control panel), controls, indicators, and connectors.

Table 2-1. Test Set Subassembly MX-8638A/APS-94D (Lower Control Panel) Controls, Indicators, and Connectors-Continued

Control, indicator, or connectors	Function
ADAS SIMULATOR J7-1 through J7-16 test jacks.	Same as for J1-1 through 26 above.
ADAS DEMAND J9-1 through 19 test jacks.	Same as for J1-1 through 26 above.
HIGH VOLTAGE switch.	When set on ON supplies + 26V to high voltage power supply under test.
MT FOCUS CONTROL.	Controls MT FOCUS voltage output of high voltage power supply under test.
FT FOCUS CONTROL.	Controls FT FOCUS voltage output of high voltage power supply under test.
FILM SPEED switch (four-position rotary).	Provides calibrated voltage for metering roller drive assembly 10A1A1A1 of recorder (RO-495/U). Position — Action OFF — Turns off metering roller drive assembly. LOW — Provides voltage for low film speed check of assembly (0.82 to 1.01 inches/10 minutes). CAL — Provides voltage for calibrating assembly (3.30 to 3.92 inches/10 minutes). HIGH — Provides voltage for high speed check of assembly (13.2 to 16.1 inches/10 minutes).
MAP ON lamp.	Lights when recorder (RO-495/U) mode control is in OPR position.
ADAS MODE switch (three position rotary)	Selects type of simulated ASAS data for output to recorder (RO-495/U). Position — Action BCD — Generates simulated ADAS data for the recorder (RO-495/U) in BCD format. ALT — Generates simulated ADAS data for recorder in alternating BCD and numerical format. NUMERIC — Generates simulated ADAS data for recorder in numeric format.
ADAS DEMAND J9 connector.	Connects with connector P2 of Cable assembly W37.
ECCM VIDEO J10 connector.	Mates with connec- connector P1 of cable assembly W41.
ECCM DEFLECTION J11 connector.	Mates with connector P1 of cable assembly W42.

Table 2-1. Test Set Subassembly MX8638A/APS-94D (Lower Control Panel) Controls, Indicators, and Connectors-Continued

b. Test Set Subassembly MX-8638A/APS-94D, Operating Controls, Indicators, and Connectors on Upper Panel. The controls, indicators, and connectors for the upper control panel are listed, along with functions, in table 2-2 and shown in figure 2-3.

Table 2-2. Test Set Subassembly MX-868AIAPS-4D (Upper Control Panel) Controls, Indicators, and Connectors

Control, indicator, or connectors	Function
DC RESET circuit breaker.	Pushbutton (push-to-reset) circuit breaker, in 28 volts dc input line. Interrupts current in excess of 5 amperes.
AC RESET circuit breaker.	Pushbutton (push-to-reset) 3-phase circuit breaker in 115 volts ac 400 Hz 3-phase input line. Interrupts current in excess of 2 amperes.
PANEL LIGHTS TEST switch (two-position momentary toggle).	In up (direction of arrow) position during testing of radar control C-7645/APS-94D supplies 20 volts de to cause . following shutter type indicators on that unit to show black: ERROR, ANT, R/T, RGP, REC, XMTR ON, and POWER RDY. In this manner, operation of these indicators can be checked.
POWER ON pilot lamp.	Lights when POWER ON-OFF switch, on control panel of MX-8639A/APS-94D, is po-

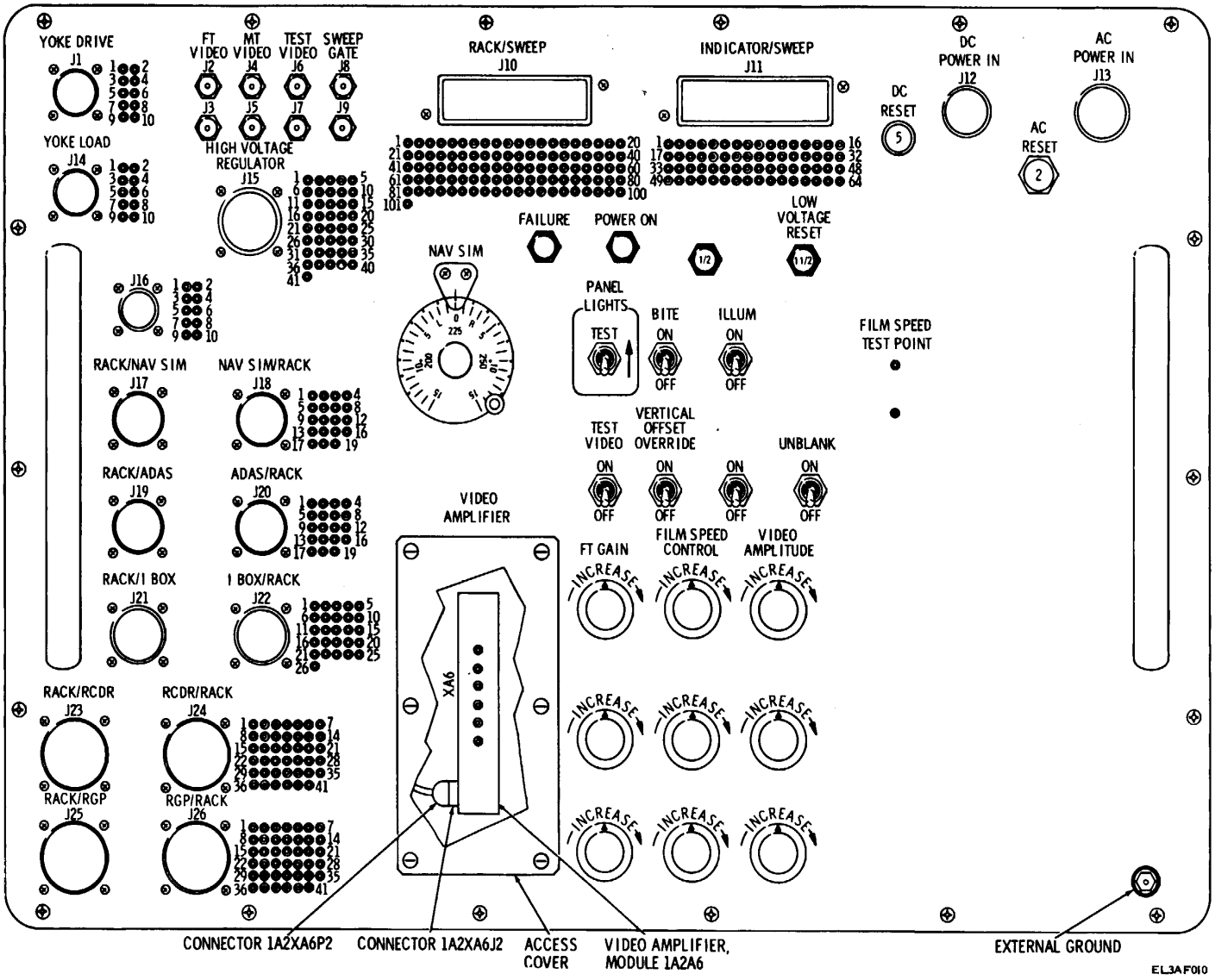


Figure 2-3. Test Set Subassembly MX-8638A/APS-94D (upper control panel) controls, indicators, and connectors.

Table 2-2. Test Set Subassembly MX-8638A/APS-94D (Upper Control Panel) Controls, indicators, and Connectors-Continued

Control, indicator, or connectors	Function
	sitioned to ON to indicate power is being received.
BITE switch (two-position toggle).	Enables test set BITE circuitry.
ILLUM switch (two-position toggle).	Supplies power to panel lamps on Radar Set control panel under test.
LOW VOLTAGE RESET circuit breaker.	Pushbutton (push-to-reset) 3-phase circuit breaker in 115 volts ac 400 Hz line to low voltage power supply module 1A1A3. Interrupts current in excess of 1½amperes.
TEST VIDEO switch (two-position toggle).	Permits selection of test set generated video signals for test and calibration of video amplifier. In ON position, selects test video signal. In OFF position, selects ft video signal.
VERTICAL OFFSET OVERRIDE (two-position toggle).	Eliminates the effect of test set vertical offset controls.
UNBLANK (two-position toggle)	In OFF position, prevents generation of unblank signal thereby permitting manual removal of display from cathode ray tube under test.
FAILURE indicator lamp.	Illuminates when BITE circuit detects an error in test set or in equipment under test.
FT GAIN control.	Controls amplitude of video signal displayed on cathode ray tube under test.
FILM SPEED control.	Controls amplitude of film speed signal.
VIDEO AMPLITUDE control.	Permits control of amplitude of ft video generated by video simulator and synchronizing circuit.
NAV-SIM control.	Permits control or drift angle-ground speed input magnitude and sense.
YOKE DRIVE J1 connector.	Mates with connector P1 of cable assembly W11, or with connector P1 of cable assembly W12.
YOKE LOAD J14 connector.	Mates with connector P1 of cable assembly W11.
HIGH VOLTAGE REGULATOR J15 connector.	Mates with connector P2 of cable assembly W15, or with connector P1 of cable assembly W16.
RACK/NAV SIM J17 connector.	Mates with connector P2 of cable assembly W4.
RACK/NAV SIM J18 connector.	Mates with connector P1 of cable assembly W4.

Table 2-2. Test Set Subassembly MX-8638A/APS-4D (Upper Control Panel) Controls, indicators, and Connectors-Continued

Control, indicator, or connectors	Function
RACK/ADAS J19 connector.	Mates with connector P2 of cable assembly WS.
ADAS/RACK J20 connector.	Mates with connector P1 of cable assembly W5.
RACK/I BOX J21 connector.	Mates with connector P2 of cable assembly WI.
I BOX/RACK J22 connector.	Mates with connector P1 of cable assembly W1.
RACK/RCDR J23 connector.	Mates with connector P2 of cable assembly W2.
RCDRIRACK J24 connector.	Mates with connector P1 of cable assembly W2.
Rack/RGP J25 connector.	Mates with connector P2 of cable assembly W3.
RGP/RACK J26 connector.	Mates with connector P1 of cable assembly W3.
POWER IN J12 connector.	Mates with connector P2 of cable assembly W10.
AC POWER IN J13 connector.	Mates with connector P2 of cable assembly W9.
RACK/SWEEP J10 connector.	Mates with connector P2 of cable assembly W6.
INDICATOR/SWEEP J11 connector.	Mates with connector P2 of cable assembly W7.
FT VIDEO J2 connector.	Mates with connector P1 of cable assembly W19.
J3 connector.	Mates with connector P2 of cable assembly W22.
MT VIDEO J4 connector.	Mates with connector P1 of cable assembly W20.
J5 connector.	Mates with connector P2 of cable assembly W21.
TEST VIDEO J6 connector.	Mates with connector P1 of cable assembly W21.
J7 connector.	Mates with connector P2 of cable assembly W20.
SWEEP GATE J8 connector.	Mates with connector P1 of cable assembly W21.
J9 connector.	Mates with connector P2 of cable assembly W21.
FILM SPEED TEST POINT test jack.	Provides measuring point for measuring amplitude of film speed signal.
YOKE DRIVE J1-1 through 10 test jacks.	Test jacks in these jack fields are wired on a one-to-one basis to corresponding pins of connector located adjacent to jack field. These test jacks provide measurement points for selected signals and voltages present at inaccessible connector pins.
YOKE LOAD J14-1 through 10 test jacks.	Same as for J1-1 through 10 test jacks above.
HIGH VOLTAGE REGULATOR J15-1 through 41 test jacks.	Same as for J1-1 through 10 test jacks above.
RACK/NAV SIM J18-1 through 19 test jacks.	Same as for J1-1 through 10 test jacks above.
ADAS/RACK J20-1 through	Same as for J1-1 through 10

Table 2-2. Test Set Subassembly MX-8638A/APS-94D (Upper Control Panel) Controls, Indicators, and Connectors-Continued

Control, indicator, or connectors	Function
19 test jacks.	test jacks above.
I BOX/RACK J22-1 through 26 test jacks.	Same as for J1-1 through 10 test jacks above.
RCDR/RACK J24-1 through 41 test jacks.	Same as for J1-1 through 10 test jacks above.
RGP/RACK J261 through 41 test jacks.	Same as for J1-1 through 10 test jacks above.
RACK/SWEEP J10-1 through 101 test jacks.	Same as for J1-1 through 10 test jacks above.
INDICATOR/SWEEP J11-1 through 64 test jacks.	Same as for J1-1 through 10 test jacks above.

c. Test Set Subassembly MX-8659A/APS-94D Operating Controls, Indicators, and Connectors (fig. 2-4). The controls, indicators, and connectors for the MX-8639A/APS-94D are listed, along with functions, in table 2-3 and shown in figure 2-4.

Table 2-3. Test Set Subassembly MX-8639A/APS-94D Controls, Indicators, and Connectors

Control, indicator, or connectors	Function
POWER switch (two-position toggle).	Controls application of power to test set.
POWER ON lamp.	Lights when POWER switch is positioned to ON to indicate that power is being received.
PANEL LIGHTS switch (two-position toggle).	In up (direction of arrow) position, checks operation of FAULT (SWEEP, INDICATOR, and SERVO) lamps by supplying power to those lamps. In down (direction opposite arrow) position, removes power to these lamps to enable BITE operation.
NAVIGATION switch (three-position toggle).	Permits selection of mode of operation of ground speed or drift angle servo amplifiers. Position — Action AUTO — Permits either servo amplifier channel to be selected for operation. MANUAL — Disables both servo amplifier channels. GS — Disables drift angle servo amplifier.
GS/DFT DRIVE switch (two-position toggle).	In ON position, enables stepper motor that drives GS/DFT indicator. In OFF position, disables stepper motor for purpose of calibration.
GS/DFT indicator.	Displays output of ground speed or drift angle servo loop.
SERVO LOOP switch (two-position rotary).	Permits selection of ground speed (GS) or drift angle (DFT) servo channel for testing.
ANTENNA switch (three-position rotary).	Permits selection of antenna mode of operation of the test set. Position — Action LEFT — Operates test set in left antenna mode. BOTH — Operates test set in both antenna modes. RIGHT — Operates test set in right antenna mode.
RANGE switch (three-position rotary).	Permits selection of radar range information of 25km, 50km, or 100km.
FAULT indicator lamps.	These lamps flash on and off to indicate existence of fault in test set or in equipment under test. Lamp — Function SWEEP — Flashes when horizontal sweep fault is detected in video amplifier. INDICATOR — Flashes when fault is detected in high voltage regulator or ft or mt focus circuits. SERVO — Flashes when a fault is detected in either ground speed or drift angle servo channels.
DISPLAY switch (two-position rotary).	Permits selection of FT or MT cathode ray tube to which sweep information is to be supplied.

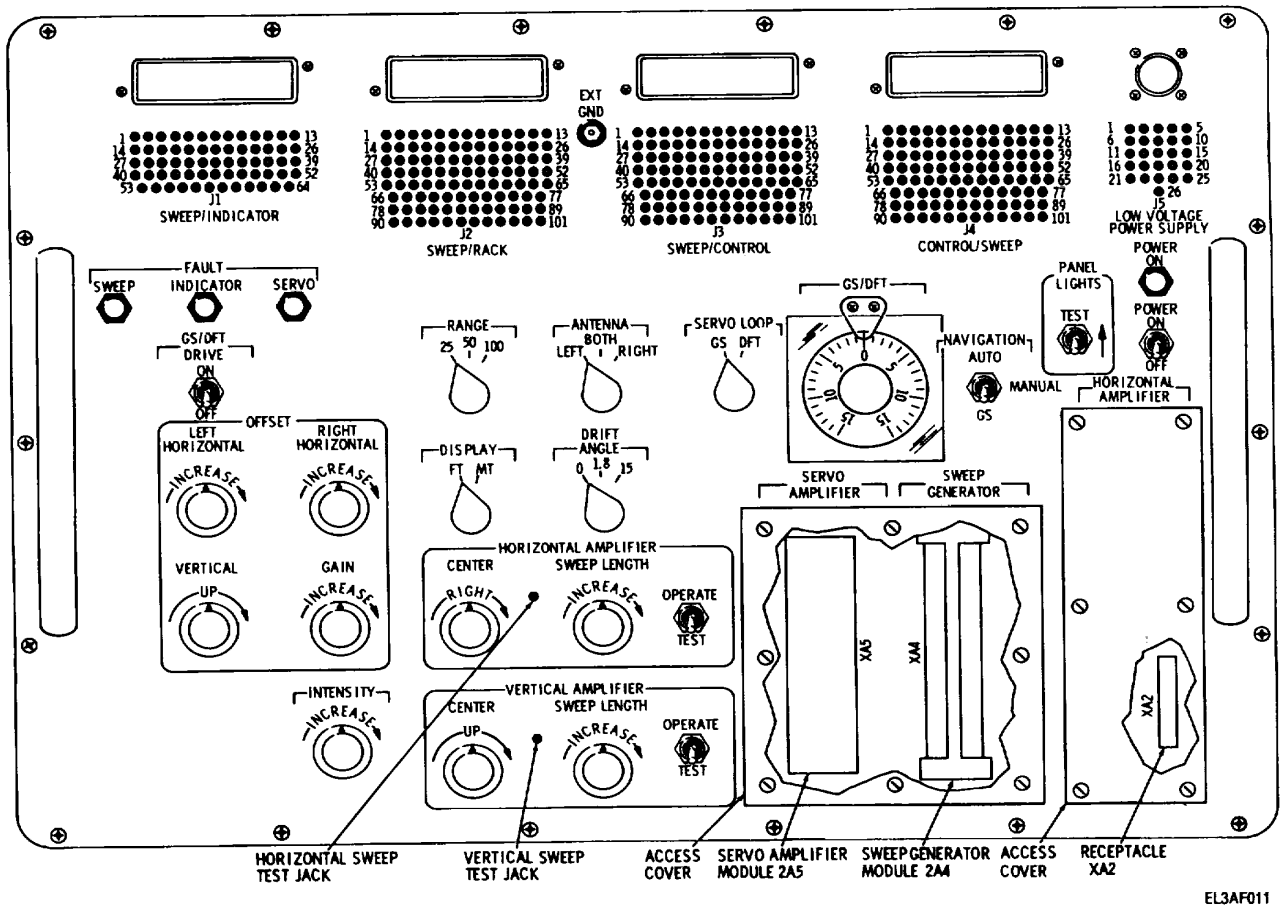


Figure 2-4. Test Set Subassembly MX-8639A/APS-94D controls, indicators, and connectors.

Table 2-4. Test Set Subassembly MX-869A/APS-94D Controls, Indicators, and Connectors-Continued

Control, indicator, or connectors	Function
DRIFT ANGLE switch (three-position rotary).	Permits selection of 0 degree, 1.8 degree, or 15 degrees drift angle input to sweep circuits.
HORIZONTAL AMPLIFIER switch (two-position toggle).	In OPERATE position, enables horizontal sweep circuit. In TEST position, permits horizontal sweep length adjustment calibration.
HORIZONTAL AMPLIFIER SWEEP LENGTH control.	Permits calibrated horizontal sweep length adjustment with HORIZONTAL AMPLIFIER OPERATE-TEST switch in TEST POSITION.

Table 2-4. Test Set Subassembly MX-469A/APS-94D Controls, Indicators, and Connectors-Continued

Control, indicator, or connectors	Function
HORIZONTAL AMPLIFIER CENTER control.	Permits left-right centering of trace on cathode ray tube under test.
VERTICAL AMPLIFIER switch (two-position toggle).	In OPERATE position, enables vertical sweep circuit. In TEST position, permits vertical sweep length adjustment calibration.
VERTICAL AMPLIFIER SWEEP LENGTH control.	Permits calibrated vertical sweep length adjustment with VERTICAL AMPLIFIER OPERATE-TEST switch in TEST POSITION.

Table 2-3. Test Set Subassembly MX-8639AIAPS-94D Controls, Indicators, and Connectors-Continued

Control, indicator, or connectors	Function
VERTICAL AMPLIFIER CENTER control.	Permits up-down centering of trace on cathode ray tube under test.
INTENSITY control.	Permits control of trace brightness of cathode ray tube under test.
OFFSET LEFT HORI-ZONTAL control.	Permits trace on cathode ray tube under test to be shifted left.
OFFSET RIGHT HORI-ZONTAL control.	Permits trace on cathode ray tube under test to be shifted right.
OFFSET VERTICAL con-trol.	Permits trace on cathode ray tube under test to be shifted up.
OFFSET GAIN control.	Permits adjustment of offset voltages.
SWEEP/INDICATOR J1 connector.	Mates with connector P1 of cable assembly W7.
SWEEP/RACK J2 connec-tor.	Mates with connector P1 of cable assembly W6.
SWEEP/CONTROL J3 con-nector.	Mates with connector P2 of cable assembly W8.
CONTROL/SWEEP J4 con-nector.	Mates with connector P1 of cable assembly W8.
LOW VOLTAGE POWER SUPPLY J5 connector.	Mates with connector P2 of cable assembly W17 or with connector P2 of cable as-sembly W18.
SWEEP/INDICATOR Jl-1 through 64 test jacks.	Test jacks in these jack fields are connected, as required, on one-to-one basis, to pins of the connector located ad-jacent to jack field. Test jacks provide measurement points for selected signals and voltages present at in-accessible connector pins.
SWEEP/RACK J2-1 through 101 test jacks.	Same as for jacks J1-1 through 64 above.
SWEEP/CONTROL J3-1 through 101 test jacks.	Same as for jacks J1-1 through 64 above.
CONTROL/SWEEP J4-1 through 101 test jacks.	Same as for jacks J1-1 through 64 above.
LOW VOLTAGE POWER SUPPLY J5-1 through 26.	Same as for jacks Jl-1 through 64 above.
Vertical sweep test jack.	Provides test point for check-ing input to vertical dc am-plifier.
Horizontal sweep test jack.	Provides test point for check-ing input to horizontal dc amplifier.

2-4. Preoperating Checks

(fig. 2-5)

Perform the following steps, in the sequence indicated, to establish that the test set is operating properly.

a. Arrange the units of the test set on the test bench in the following sequence, left to right: MX-8638A/APS-94D (upper), MX-8639A/APS-94D, MX-8638A/APS-94D (lower).

WARNING

When power is applied to the test set, potentials of +640 vdc, +100 vdc, and 115 vac exist in the MX-8638A/APS-94D (lower) and potentials of +640 vdc exist throughout the test set. Exercise extreme caution when power is applied to avoid contact with any exposed connector terminals. Contact with these voltages may result in injury or death.

b. Set all switches, circuit breakers, and controls to off, down, or fully counterclockwise.

c. Make test set cable connections shown in figure 2-5.

d. Reset all circuit breakers and set the MX-8639A/APS-94D POWER switch (fig. 2-4) to ON. Observe the POWER ON pilot lamp on the upper control panel of the MX-8638A/APS-94D (fig. 2-3) lights. *e.* Momentarily set PANEL LIGHTS switches on two of the three control panels (figs. 2-3 and 2-4) to TEST and observe that all lamps on each panel light.

f. Set the MX-8638A/APS-94D HIGH VOLTAGE switch on the lower control panel (fig. 2-2) to ON. Observe that the HIGH VOLTAGE ON lamp lights.

g. Set the MX-638A/APS-94D BITE switch on the upper control panel (fig. 2-3) to ON. Observe that the FAILURE lamp lights.

h. Set MX-8639A/APS-94D DRIFT ANGLE switch to 15. Set the MX-8638A/APS-94D UNBLANK switch on upper control panel (fig. 2-3) to ON. Set FT GAIN control and VIDEO AMPLITUDE control fully clockwise. Observe that FAILURE lamp goes off.

i. Set MX-8639A/APS-94D NAVIGATION switch (fig. 2-4) to AUTO. Set GS/DFT DRIVE switch to ON.

j. Set the MX-8638A/APS-94D NAV SIM control on the upper control panel (fig. 2-3) to zero (0) degree. Allow indication of GS/DFT indicator on control panel (fig. 2-4) of MX-8639A/APS-94D to stabilize at 0 degree. Set NAV SIM control (fig. 2-3) clockwise to 7 degrees. Observe that SERVO FAULT indicator lamp, on control panel (fig. 2-4) of MX-8639A/APS-94D flashes. Observe that indication on GS/DFT indicator increases clockwise and stabilizes at 7 degrees. Observe that SERVO

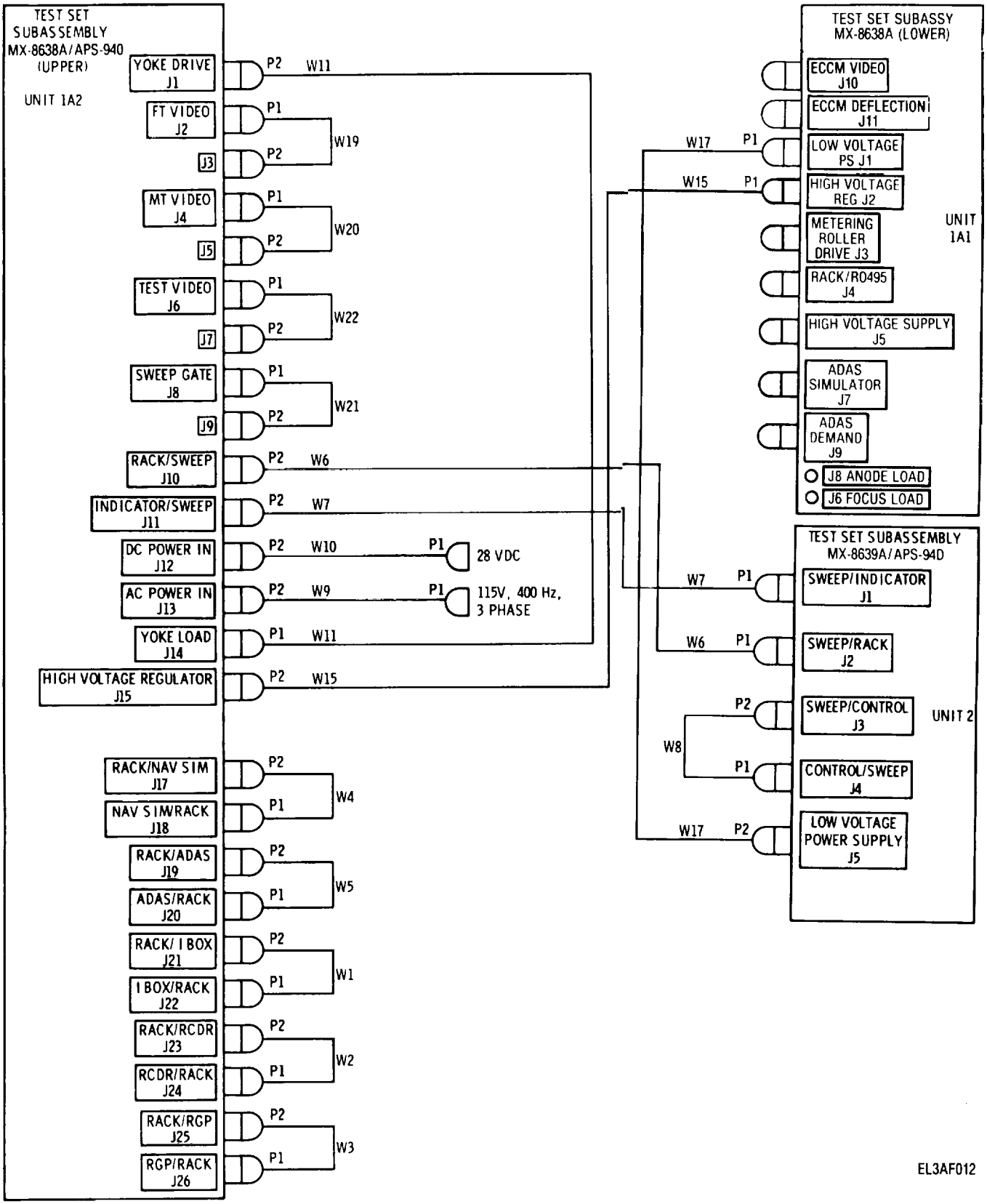


Figure 2- 5. Preoperating checks, bench setup .

FAULT indicator lamp turns off when the indication reaches 7 degrees.

k. Set the NAV SIM control (fig. 2-3) counterclockwise to 7 degrees. Observe that SERVO FAULT indicator rotates counterclockwise and stabilizes at 7 degrees. Observe that SERVO FAULT indicator lamp turns off.

l. Set the MX-8639A/APS-94D SERVO LOOP switch (fig. 2-4) to DFT and repeat steps h and i above.

m. Loosen captive screws securing the MX-8639A/APS-94D SERVO AMPLIFIER-SWEEP GENERATOR access panel (fig. 2-4). Remove access panel and remove sweep generator module 2A4. Note the SWEEP FAULT indicator lamp flashes. Install sweep generator module 2A4 and note that the light SWEEP FAULT indicator lamp turns off. Install access panel and secure with screws.

n. Set the MX-8639A/APS-94D POWER switch (fig. 2-4) to OFF. Disconnect primary power input cable assemblies W9 and W10 from power sources.

2-5. Test Setups

There are 12 basis test setups used to interconnect the test set and the radar set components for maintenance. Before connecting the equipment in any one of the 12 configurations, always set all test set switches circuit breakers and controls to off, down, or fully counterclockwise. Eight of the test setups, requiring just cable interconnections, are listed in a below. Five test setups require cabling interconnections and installations as described in b through e below.

a. Cable Connections (Only). The following listed setups require cable connections only. The listing indicates the radar set component to be tested and the figure number for the test setup.

Component under test	Figure No. test setup
Recorder-Processor Viewer, Radar Mapping RO-495/U	2-6
Generator, Sweep SG1127/APS-94E	2-7
Control, Radar Set C-7645/APS94D	2-8
Rack, Electrical Equipment MT-4015/APS-94D	2-9
Low voltage power supply module 5A6	2-10
Cockpit complex test setup	2-11
High voltage power supply module 10A1A5	2-12
Metering roller drive assembly 10AlA1A1	2-13

b. Servo Amplifier Module 9A1 Test Setup. Make the test connections of figure 2-14.

(1) At the MX-8639A/APS-94D, loosen the captive screws securing the SERVO AMPLIFIER-SWEEP GENERATOR access cover (fig. 2-4). Remove the access cover.

(2) Lift out the servo amplifier module 2A5.

(3) Install the module extender-2A5 in the module 2A5 receptacle (MX-8634/APS94D).

(4) Plug the servo amplifier module, 9A1 into the module extender-2A5.

c. Low Voltage Regulator Module 5A6A1 Test Setup. Make the test connections of figure 2-15.

(1) At the lower control panel of the MX-8638A/APS-94D, loosen the captive screws securing the LOW VOLTAGE REGULATOR access cover (fig. 2-2). Remove the access cover.

(2) Remove the low voltage regulator module 1A1A4 from its receptacle.

(3) Install the module extender-lA1A4 (MX-8631/APS94D) in the module 1A1A4 receptacle.

(4) Plug the low voltage regulator module 5A6A1 in the module extender-lA1A4.

d. Sweep Generator Module 5A5 Test Setup. Make the test connections of figure 2-16.

(1) At the MX-8639A/APS-94D, loosen the captive screws securing the SERVO AMPLIFIER-SWEEP GENERATOR access cover (fig. 2-4). Remove the access cover panel.

(2) Remove the sweep generator module 2A4 from its receptacle.

(3) Install the module extender-2A4 in the module 2A4 receptacle (MX-633/APS-94).

(4) Plug the sweep generator module 5A5 in the module extender-2A4.

e. DC Amplifier Modules 5A1, 5A2, 5A3, or 5A4 Test Setup. Make the test connections of figure 2-17. Connect cable W23 after performing the following steps:

(1) At the MX-8639A/APS-94D, loosen the captive screws securing the HORIZONTAL AMPLIFIER access cover (fig. 2-4).

(2) Lift the horizontal amplifier module 2A2 which is attached to the access cover from its receptacle.

(3) Connect cable W23 into the module 2A2 receptacle.

(4) Plug the dc amplifier module 5A1, 5A2, 5A3, or 5A4, as required, into the P2 connector of cable W23.

2-6. Operating procedures

The detailed operating procedures involving the MX-8638A/APS-94D and the MX-8639A/APS94D and the components of Radar Surveillance Set AN/APS-94E are functions of higher level maintenance. Use of the test set group in testing, aligning, and troubleshooting the radar set is restricted to the direct support and depot maintenance levels.

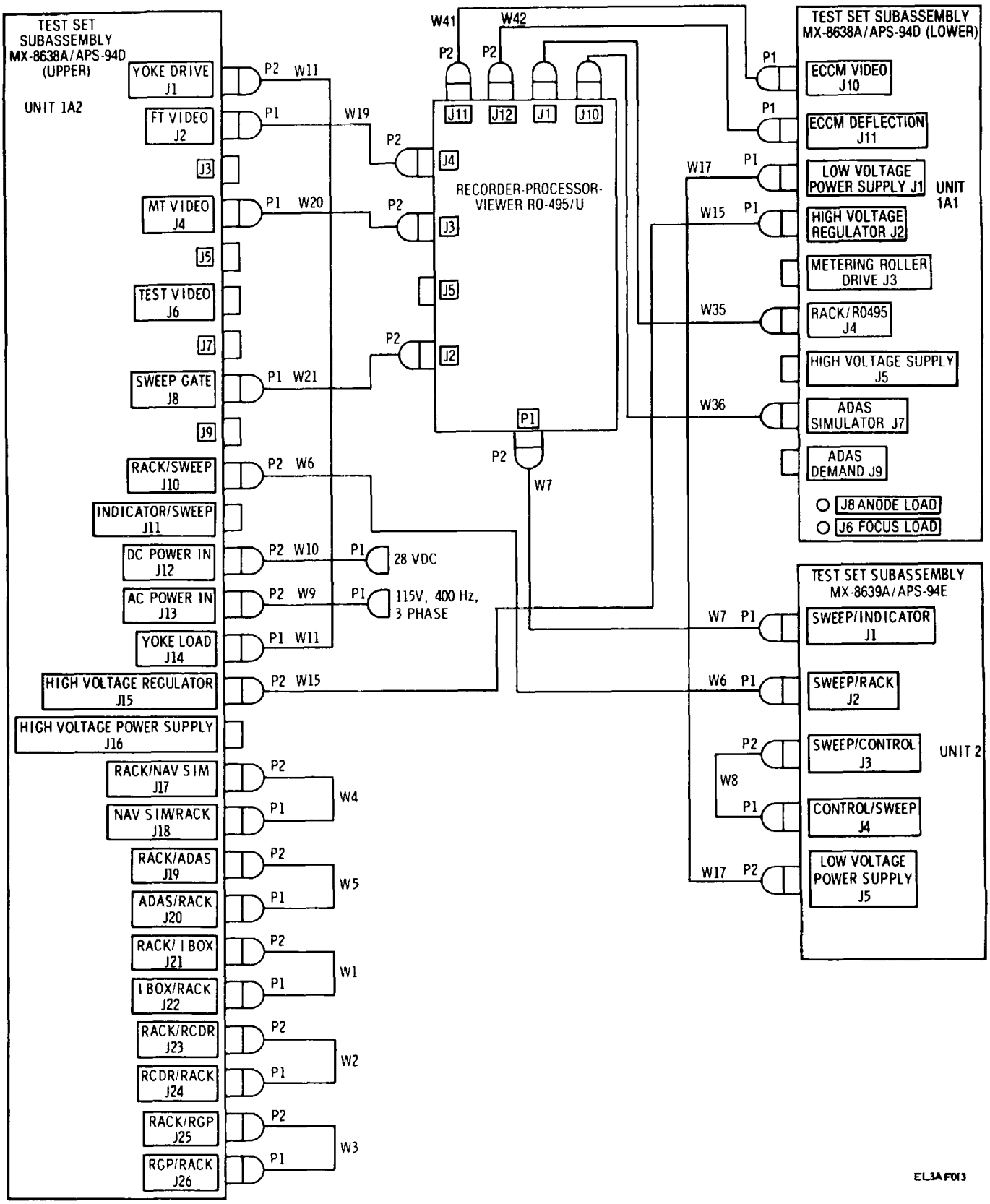


Figure 2-6. Test setup for Recorder-Processor-Viewer, Radar Mapping RO-495/U

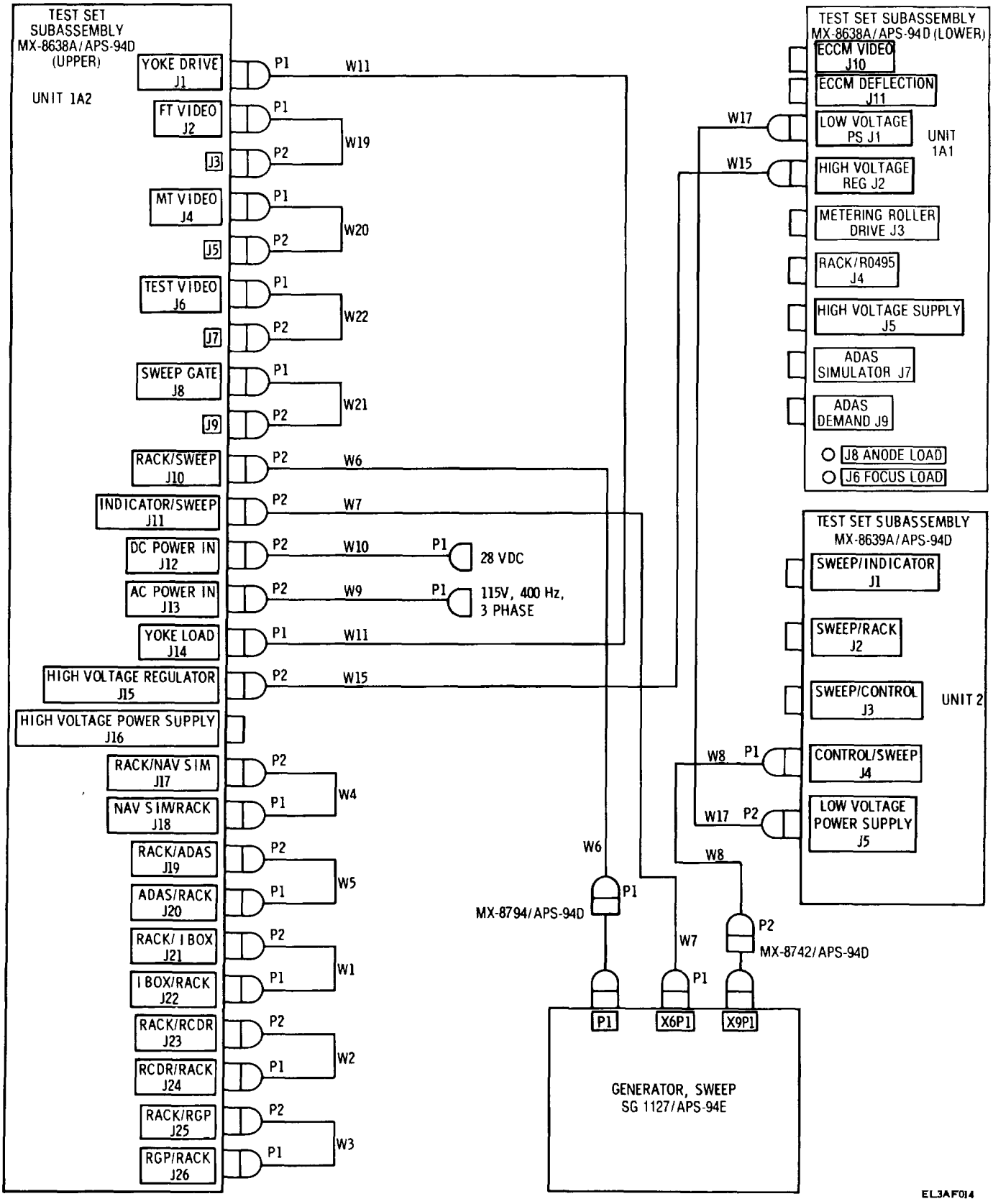


Figure 2-7. Test setup for Generator, Sweep SG-1127/APS-94E.

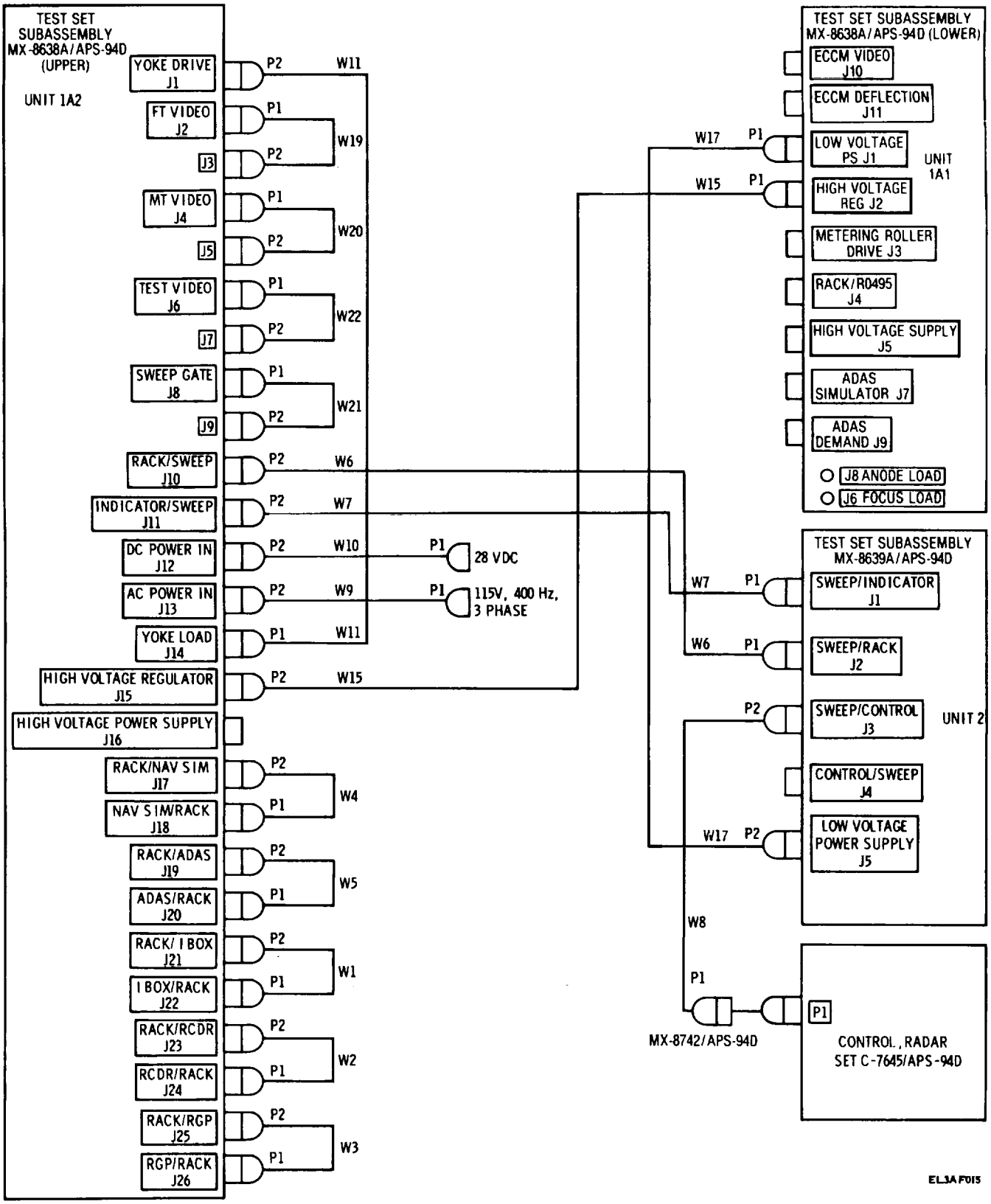


Figure 2-8. Test setup for Control, Radar Set C-7645/APS-94D.

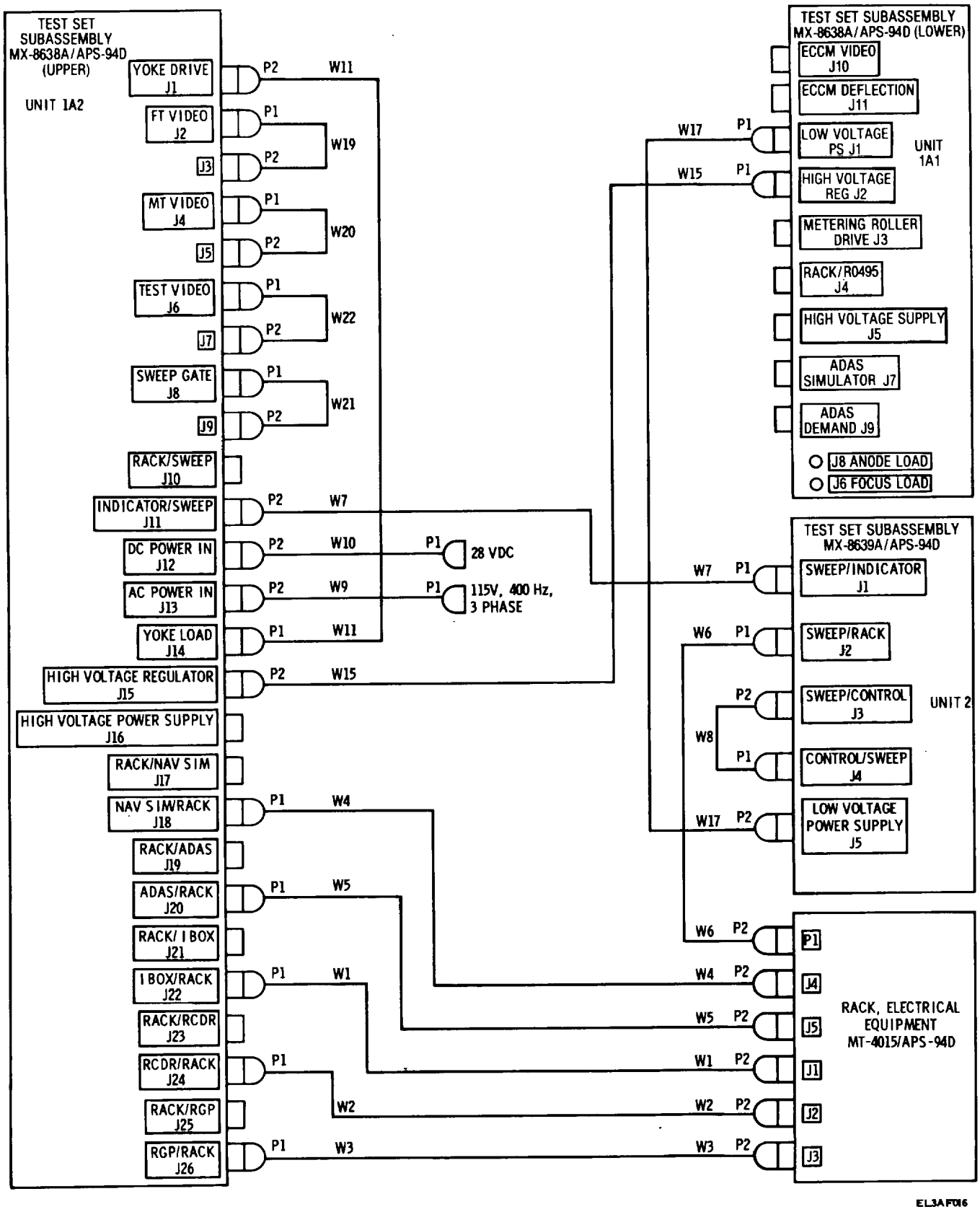


Figure 2-9. Test setup for Rack, Electrical Equipment MT-4015/APS-94D.

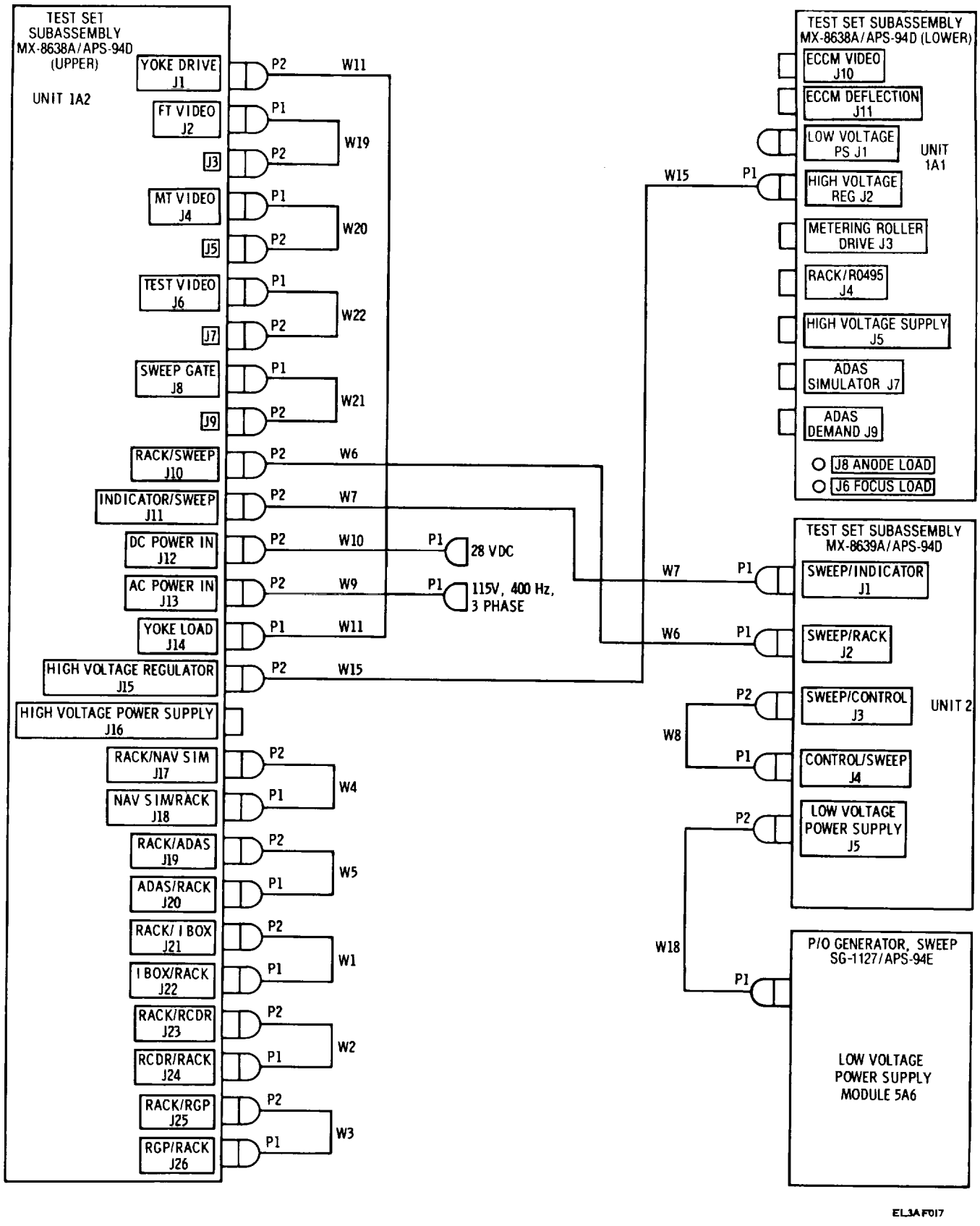


Figure 2-10. Test setup for low voltage power supply module 5A6.

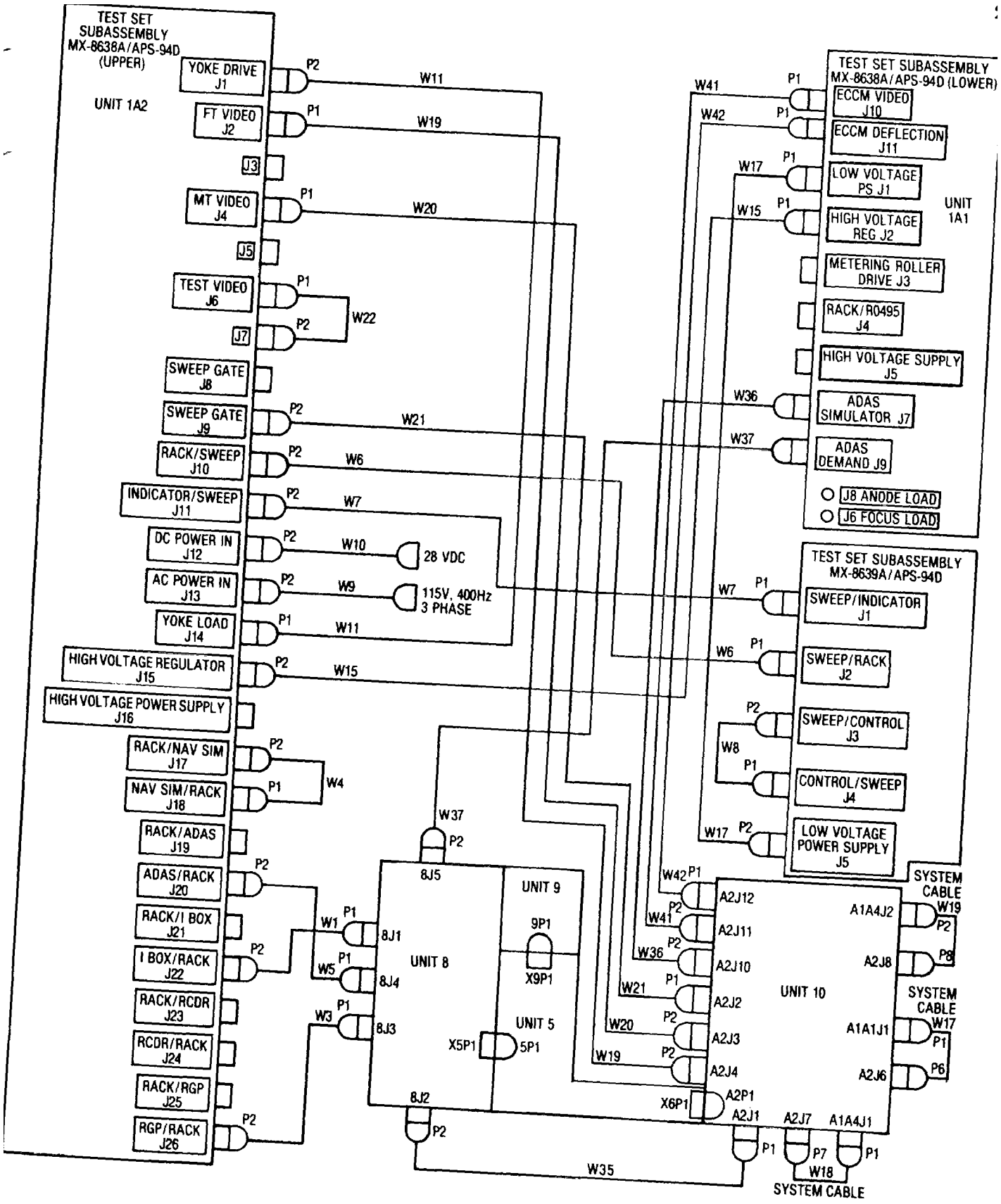


Figure 2-11 . Test setup for cockpit complex.

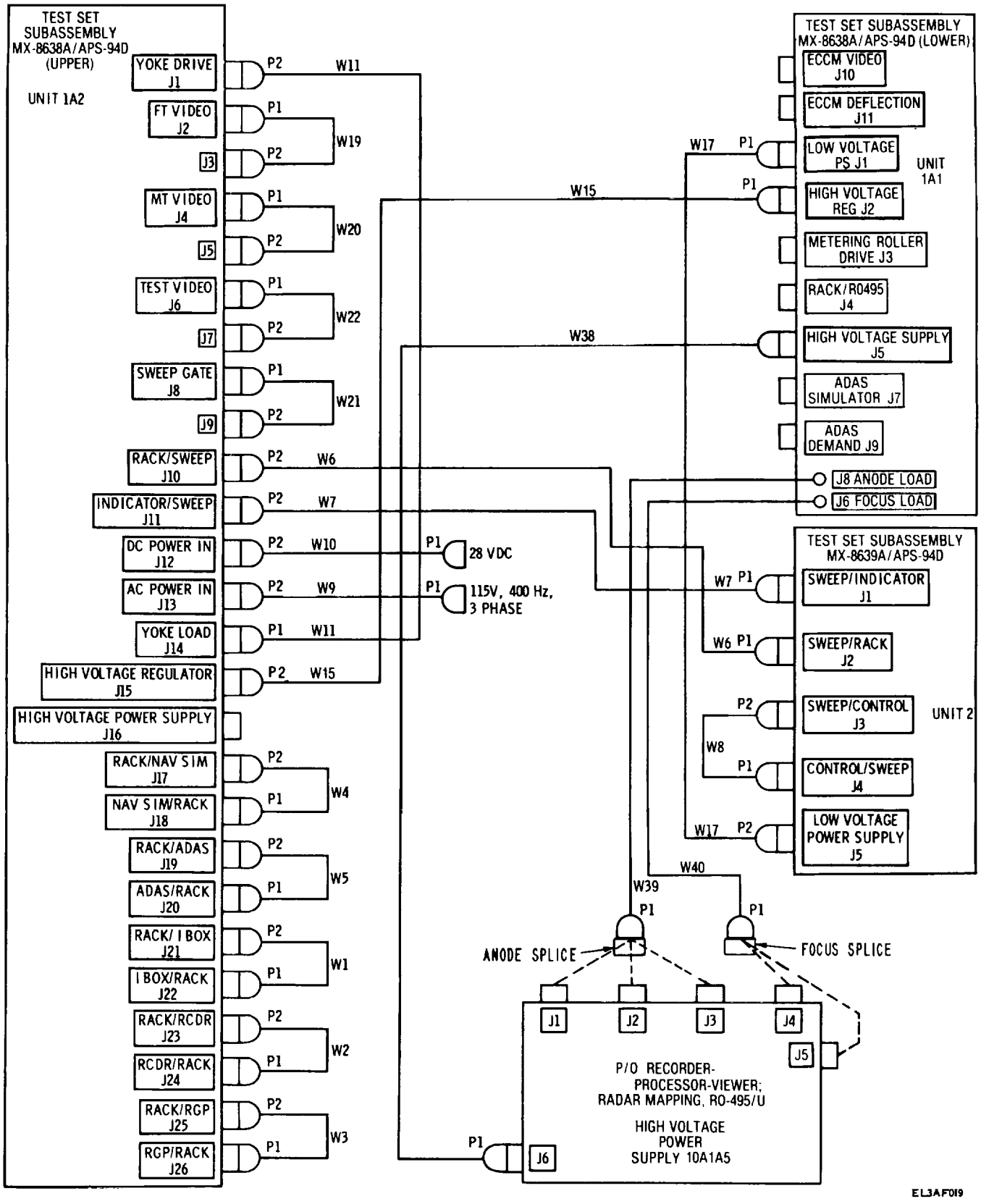


Figure 2-12. Test setup for high voltage power supply module 10A1A5.

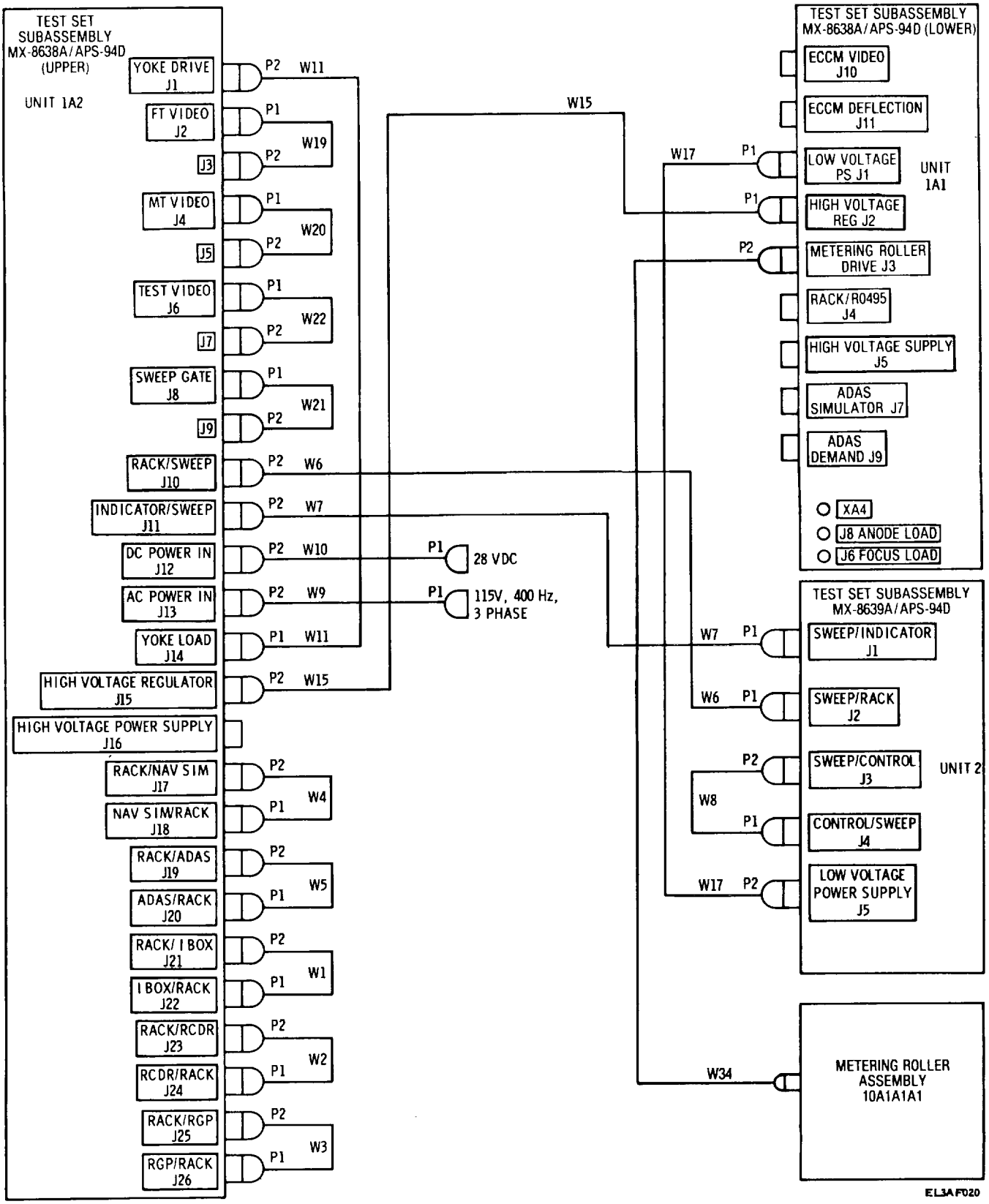


Figure 2-13. Test setup for metering roller drive assembly 10A1A1A1.

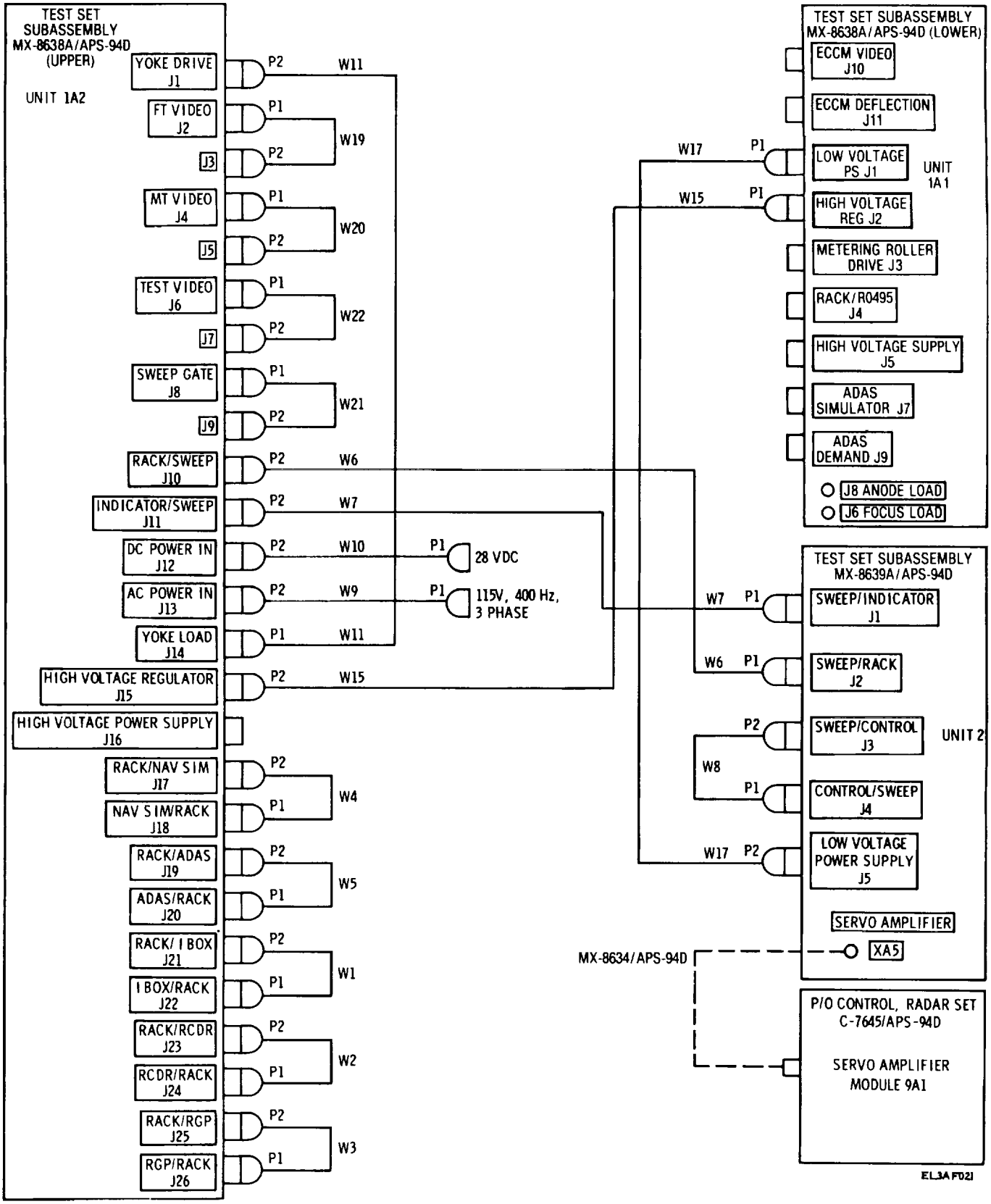


Figure 2-14. Test setup for servo amplifier module 9A1.

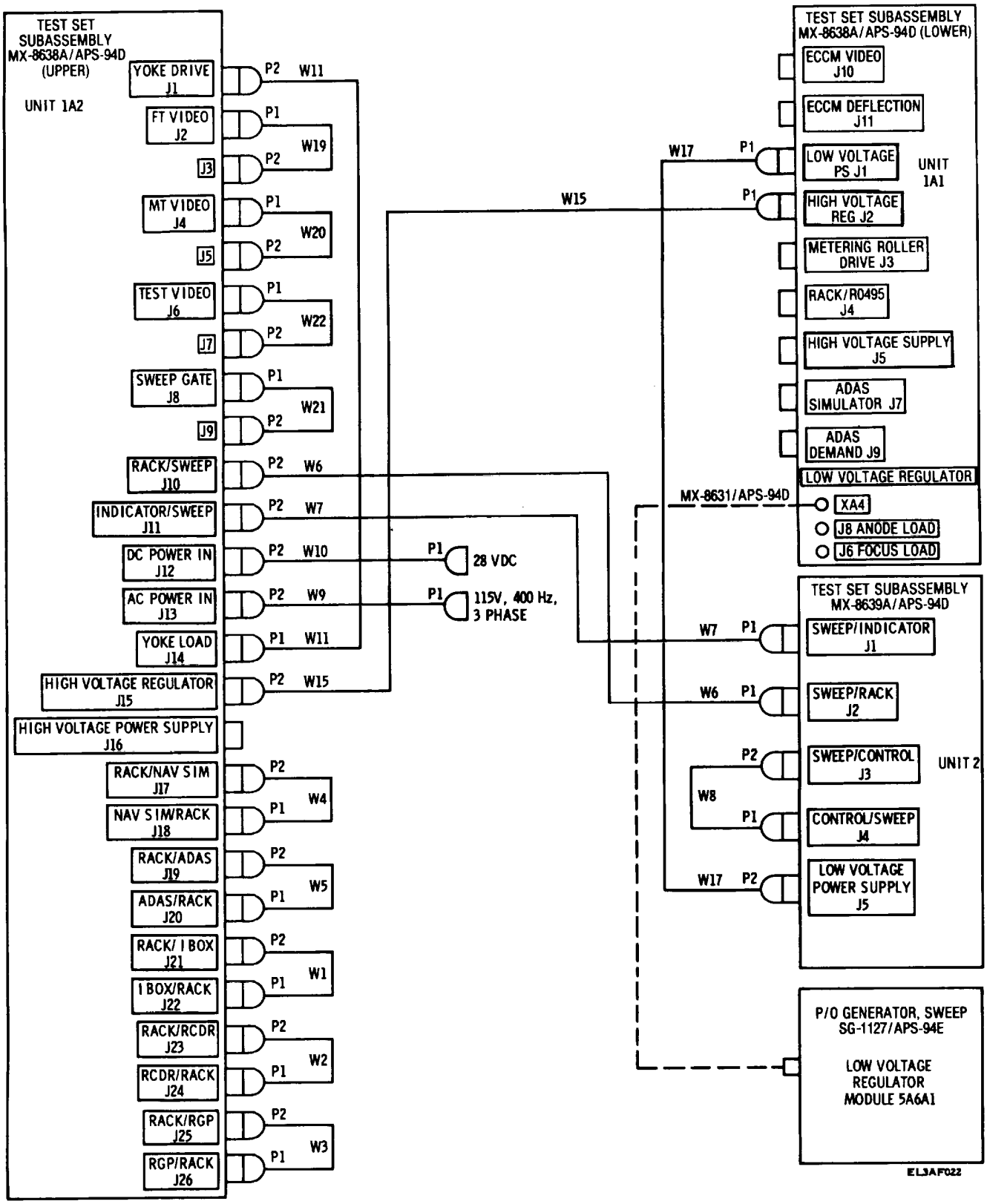


Figure 2-15. Test setup for low voltage regulator 5A6A1.

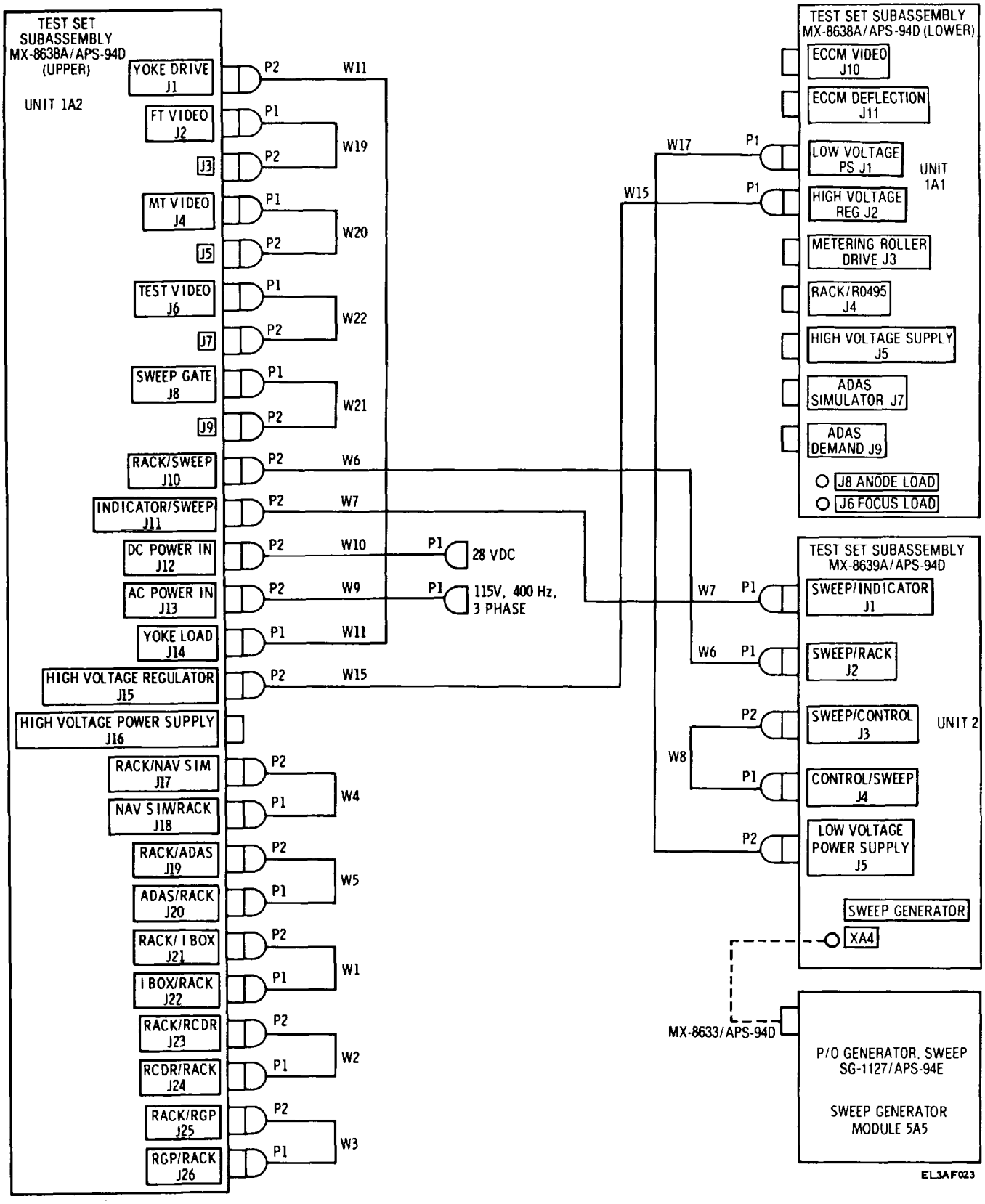


Figure 2-16. Test setup for sweep generator module 5A5.

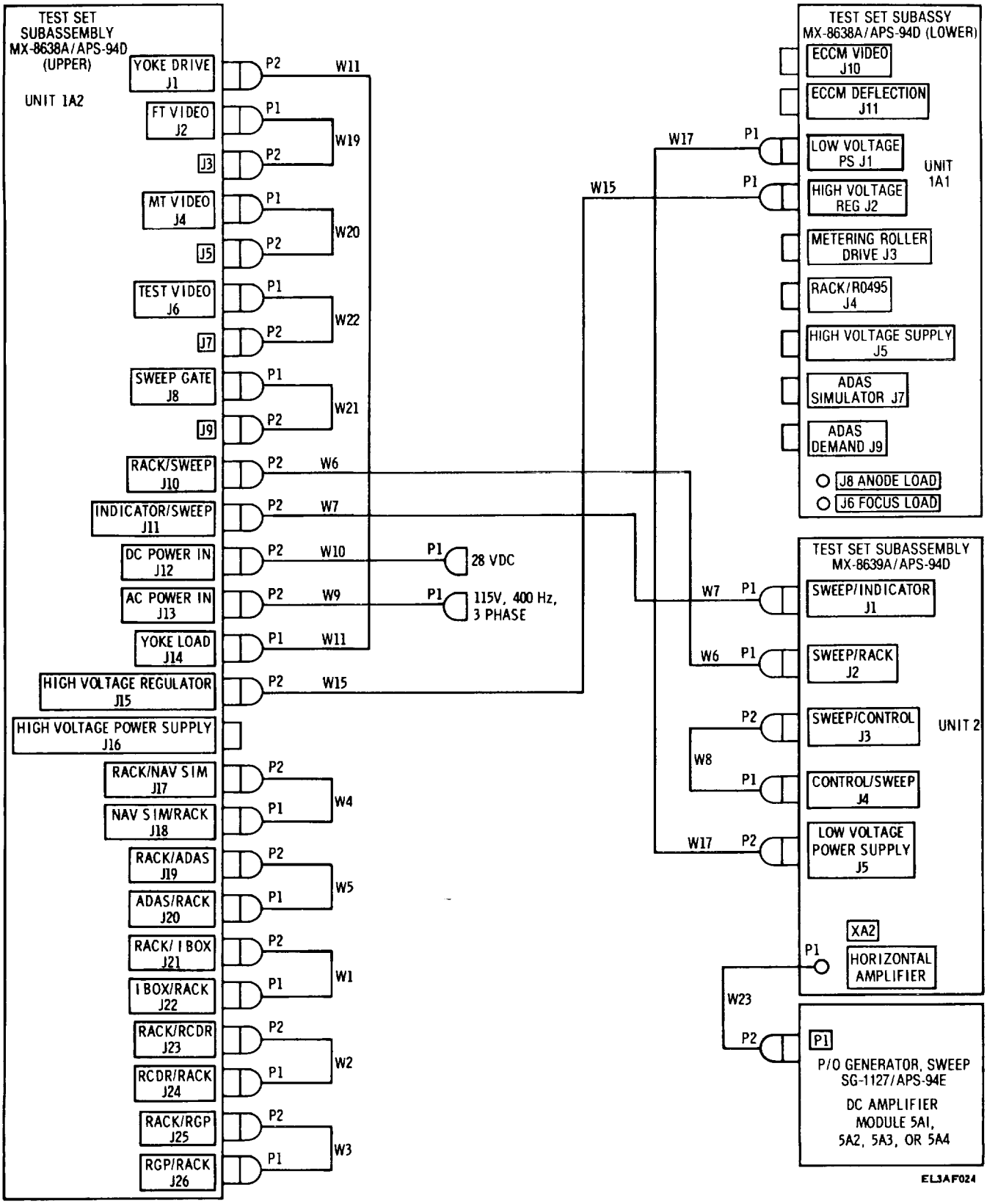


Figure 2-17. Test setup for dc amplifier module 5A1, 5A2, 5A3, or 5A4.

CHAPTER 3

MAINTENANCE INSTRUCTIONS

Section I. OPERATORS MAINTENANCE

3-1. Scope of Operator's Maintenance

The maintenance duties of the operator are to perform a prescribed sequence of preventive maintenance checks and services. The preventive maintenance procedures are the systematic care, servicing, and inspection of equipment to prevent the occurrence of trouble and to reduce downtime by detecting and correcting the onset of trouble. These checks and services are to maintain Army electronic equipment in a combat serviceable and mission ready condition.

a. Routine services (para 3-3).

b. Preventive maintenance checks and services (para 3-5).

c. Operator's weekly checks (para 3-6).

d. Cleaning (para 3-7).

e. Troubleshooting (para 3-8).

f. Removal and replacement of panel lights (para 3-9).

3-2. Tools, Materials, and Equipment Required for Operator's Maintenance

No tools or equipment are required for operator's maintenance. The following cleaning materials are required:

a. Lint free cloths.

b. Dishwashing compound or detergent.

c. Cleaning compound.

d. Brush.

3-3. Routine Services

Routine services are a collection of checks and observations performed by the operator. Routine services are not listed in the preventive maintenance checks and services (table 3-1), in order to separate the nonoperational from the operational services.

a. Routines. The operator should perform the following routines as necessary:

(1) Cleaning.

(2) Dusting.

(3) Washing.

(4) Check for cut or frayed cables.

(5) Check for dented, bent, or broken components.

(6) Check to see that items not in use are properly stowed.

(7) Check carrying pouches and straps for holes or tears.

(8) Check for rusting.

(9) Check controls for smooth operation.

(10) Cover unused receptacles.

(11) Check for loose nuts, bolts, and connectors.

(12) Check to see that all nameplates are clean and legible.

(13) Check to see that cables are securely connected.

(14) Check for completeness of equipment.

b. Items Requiring Routine Services.

(1) Test Set Subassembly MX-8638A/APS-94D.

(2) Test Set Subassembly MX-8639A/APS-94D.

(3) Test set cases.

(4) Alignment Fixture, Electron Tube MX-9985/APS94D.

(5) Microscope, Optical SU-4/APS-94D.

(6) Test adapters.

(7) CRT Alignment mask.

(8) Cables.

(9) Oil filling components.

(10) Reference thermocouple assembly.

3-4. Preventive Maintenance Checks and Services Periods

Complete preventive maintenance is the performance of routine services (para 3-3) and preventive maintenance checks and services (PMSCO) (para 3-5), to ensure that the equipment is available and ready for operation. The equipment should be checked and serviced as required before operation, and as soon as possible after operation.

3-5. Operator's Preventive Maintenance Checks and Services (PMCS)

a. PMCS procedures, covering operational services of the test set, are given in table 3-1. The PMCS are normally performed by the operator/ crew.

b. Before starting PMCS, check to see that the equipment is complete (para 1-9) and that cables and accessories are in usable condition.

c. If a PMCS procedure does not meet the readiness/availability requirements, refer to the operator's troubleshooting chart (para 3-8).

NOTE

Within the designated interval, these checks are to be performed in the order listed. The designated intervals are as follows:

B-Before Operation D-During Operation W-Weekly

Table -1. Operator/Crew Preventive Maintenance Checks and Services

Item No.	Interval B	D	W	Item to be inspected	Procedures Check for and have repaired or adjusted as necessary	For readiness reporting, equipment is not ready/ available if:
1	X			Test set group.	Arrange units of test set on bench in following sequence, left to right: MX-8638A/APS-94D (upper) MX-8639A/APS-94D MX-8638A/APS-94D (lower)	
				WARNING When power is applied to test set group, potentials of + 640 vdc, + 100 vdc, and 115 vac exist in MX-8638A/APS-94D (lower), and potentials of + 640 vdc exist throughout test set group. Exercise extreme caution when power is applied to avoid contact with any exposed connector terminals. Contact with these voltages may result in injury or death.		
2	X			Test set group.	Set all switches, circuit breakers, and controls to off, down, or fully counterclockwise. Check to see that each switch, circuit breaker, and control operates smoothly.	Switch, circuit breaker, or control does not operate smoothly.
3	X			Test set group.	Connect test set group as shown in figure 2-5.	
4		X		MX-8639A/APS-94D and MX-8638A/APS-94D.	Set MX-8639A/APS-94D POWER switch to ON and check for following: a. MX-8639A/APS-94D POWER ON lamp lights. b. MX-8638A/APS-94D (upper) POWER ON lamp lights.	 a. MX-8639A/APS-94D POWER ON lamp does not light. b. MX-8638A/APS-94D (upper) POWER ON lamp does not light.
5		X		MX-8638A/APS-94D.	Momentarily set PANEL LIGHTS switch to TEST. Check that all lamps on panel light.	Panel lamps do not light.
6		X		MX-8639A/APS-94D.	Momentarily set PANEL LIGHTS switch to TEST. Check that all lamps on panel light.	Panel lamps do not light.
7		X		MX-8638A/APS-94D (lower).	Set HIGH VOLTAGE switch to ON. Check that HIGH VOLTAGE lamp lights.	HIGH VOLTAGE LAMP does not light.
8		X		MX-8638A/APS-94D (upper).	Set BITE switch to ON. Check to see that FAILURE lamp lights.	FAILURE lamp does not light.
9		X		MX-8638A/APS-94D (upper) and MX-8639A/APS-94D. UNBLANK switch-ON. FT GAIN control-fully clockwise. VIDEO AMPLITUDE control--fully clockwise.	a. Set controls as follows: MX-638A/APS-94D (upper):	

Table 3-1. Operator/Crew Preventive Maintenance Checks and Services-Continued

Item No.	Interval B	D	W	Item to be inspected	Procedures Check for and have repaired or adjusted as necessary	For readiness reporting, equipment is not ready/ available if:
					MX-8639A/APS-94D: DRIFT ANGLE switch-15	
					b. Check to see that FAILURE lamp goes off.	FAILURE lamp remains on.
10		X		MX-8639A/APS-94D.	a. Set controls as follows: NAVIGATION switch-AUTO. GS/DFT DRIVE switch-ON.	
11		X		MX-8638A/APS-94D (upper) and MX-8639/APS-94D.	a. Set MX-8638A/APS-94D (upper) NAV SIM control to 0 degree. Allow MX-8639A/ APS-94D GS/DFT indicator to stabilize at 0 degree.	a. GS/DFT indicator does not stabilize at 0 degree.
					b. Set NAV SIM control clockwise to 7 degrees. Check to see that MX-8639A/APS-94D SERVO FAULT lamp flashes on and off. Check to see the GCIDFT indicator increases clockwise and stabilizes at 7 degrees. SERVO FAULT lamp goes off when indication reaches 7 degrees.	b. SERVO FAULT lamp does not flash on and off; GS/DFT indicator does not stabilize at 7 degrees, or SERVO FAULT lamp remains on.
12		X		MX-8638A/APS-94D (upper) and MX-8639A/APS-94D.	a. Set MX-8638A/APS-94D (upper) NAV SIM control to 7 degrees. Allow MX-8639A/ APS-94D GS/DFT indicator to stabilize at 7 degrees.	a. GS/DFT indicator does not stabilize at 7 degrees.
					b. Check to see that MX-8639A/ APS-94D SERVO FAULT lamp flashes on and off. Check to see that GS/DFT indicator rotates counterclockwise and stabilizes at 7 degrees. SERVO FAULT lamp goes off when indicator reaches 7 degrees.	b. SERVO FAULT lamp does not flash on and off; GS/DFT indicator does not stabilize at 7 degrees, or SERVO FAULT lamp remains on.
13		X		MX-8639A/APS-94D.	Set SERVO LOOP switch to DFT and repeat steps.	
14			X	MX-8639A/APS-94D.	Loosen captive screws securing SERVO AMPLIFIER SWEEP GENERATOR access panel. Remove access panel, remove sweep generator module 2A4 and check for following:	
					a. SWEEP FAULT lamp flashes on and off.	a. SWEEP FAULT lamp does not flash on and off.
					b. Install sweep generator module 2A4 and check to see that SWEEP FAULT lamp goes off. Install access panel and secure with screws.	b. SWEEP FAULT lamp remains on.
15		X		Test set group.	Set MX-8639A/APS-94D POWER switch to OFF. Disconnect primary power input cables W9 and W10 from power sources.	

3-6. Operator's Weekly Checks

Check for completeness of the test set group by referring to the items listed in table 1-1. Be sure that all the items listed are complete and accounted for.

3-7. Cleaning

The exterior surfaces of the test set group and accessories should be kept clean and free of dirt, grease, and fungus. When necessary, clean the equipment as follows:

a. Remove moisture and loose dirt with a clean soft cloth.

WARNING

Adequate ventilation should be provided while using TRICHLOROTRIFLUOROETHANE. Prolonged breathing of vapor should be avoided. The solvent should not be used near heat or open flame; the products of decomposition are toxic and irritating. Since TRICHLOROTRIFLUOROETHANE dissolves natural oils, prolonged contact with skin should be avoided. When necessary, use gloves which the solvent cannot penetrate. If the solvent is taken internally, consult a physician immediately.

b. Remove grease, fungus, and ground-in dirt from the equipment using a soft cloth dampened (not wet) with trichlorotrifluoroethane.

c. Remove dirt from connectors with a brush; remove moisture with a dry cloth.

d. Clean the MX-8639A/APS94D GS/DFT indicator (plastic) (fig. 2-4) with a soft clean cloth moistened with water. If dirt is difficult to remove, a mild soap may be used.

e. Clean switches and control knobs using a soft cloth dampened with water. Use dishwashing compound or mild soap if available.

f. Clean the dials of the alignment fixture using soft cloth dampened with water. Use a mild soap or detergent if available. Do not press on glass windows of dials.

3-8. Operator's Troubleshooting

Operator's troubleshooting is based on performing the preventive maintenance checks and services (para 3-5) until an abnormal condition or result is observed. Operator's troubleshooting is limited to replacement of indicator panel lamps. When an abnormal condition or result is observed, note the apparent trouble symptom, and turn to the corresponding trouble symptom in the troubleshooting chart (table 3-2). Perform the checks and corrective actions indicated in the troubleshooting chart. If the corrective measures indicated do not result in correction of the trouble, higher category of maintenance is required.

Table 3-2. Operator's Troubleshooting Chart

Item No.	Trouble symptom	Probable trouble	Checks and corrective actions
1	POWER ON pilot lamp (fig. 2-4) does not turn on when POWER switch is set to ON.	a. Defective pilot lamp. (para 3-9). b. Defective internal circuitry.	a. Replace defective pilot lamp b. Refer to higher category maintenance.
2	Not all lamps on each control panel turn on when respective PANEL LIGHTS TEST switch (fig. 2-2, 2-3 2-4) is set to TEST.	a. Lamp(s) that do not turn on are defective. b. Defective internal circuitry.	a. Replace defective lamp(s) (para 3-9). b. Refer to higher category maintenance.
3	HIGH VOLTAGE ON lamp (fig. 2-2) does not turn on when HIGH VOLTAGE switch (fig. 2-2), is set to ON.	a. Defective lamp.	a. Replace defective lamp (para 3-9).
4	SERVO FAULT lamp (fig. 2-4) does not flash when NAV-SIM control (fig. 2-3), is moved.	a. Defective lamp. b. Defective internal circuitry.	a. Replace defective lamp (para 3-9). b. Refer to higher category maintenance.
5	SWEEP FAULT lamp (fig. 2-4) does not flash when sweep generator module 2A4 is removed and POWER switch is set to ON.	a. Defective lamp. b. Defective internal circuitry.	a. Replace defective lamp (para 3-9). b. Refer to higher category maintenance.

3-9. Removal and Replacement of Panel Lights

a. Removal. To remove a panel light, unscrew the lens assembly. The light bulb will come out of the socket with the lens assembly. Pull the light bulb out of the lens assembly.

b. Replacement. To replace a panel light, insert the light bulb into the lens assembly and screw the lens assembly into the socket. Check the operation of the new light bulb by activating the PANEL LIGHTS-TEST switch (figs. 2-3 and 2-4) to ensure that the light bulb illuminates.

Section II. ORGANIZATIONAL MAINTENANCE

3-10. Scope of Organizational Maintenance

The maintenance duties assigned to organizational maintenance are listed below together with references to the paragraphs covering the specific maintenance functions. These duties supplement the maintenance duties for operator's maintenance (para 3-1).

a. Touchup painting (para 3-13).
b. Cleaning air intake filter (para 3-14).
c. Organizational troubleshooting (para 3-15).
d. Organizational repairs (para 3-16).

3-11. Tools, Test Equipment, and Materials Required for Organizational Maintenance

The following tools, test equipment, and materials are required for organizational maintenance.

a. Sandpaper (fine).
b. Electrical tape (black plastic).
c. Paint brush.
d. Primer, color Y per MILP 8585.
e. Enamel, light graph type III, class 2 per MILDE-15090.
f. Tool Kit, Electronic Equipment TK-101/G.
g. Multimeter AN/URM-105 (ohmmeter).

3-12. Organizational Preventive Maintenance Checks and Services

The organizational preventive maintenance checks and services (PMCS) are identical to those listed under operator's maintenance instructions. These include the routine services listed in paragraph 3-3 and the operator's preventive maintenance checks and services given in paragraphs 3-4 and 3-5. For equipment taken out of limited storage, the procedures given in table 3-1 shall be performed as a minimum. All deficiencies shall be recorded in accordance with the requirements of TM 38750.

3-13. Touchup Painting Instructions

Remove rust and corrosion from metal surfaces by lightly sanding them with fine sandpaper. Refer to the applicable cleaning and refinishing practices specified in TB 43-0118.

3-14. Removal, Cleaning and Replacement of Air Intake Filter

(fig. 3-1)

a. Removal.

(1) Remove the four screws, lockwashers, and washers securing the filter housing to the control panel.

(2) Remove the filter housing, filter element, 5 and rfi gasket.

b. Cleaning.

(1) Clean the filter element using dry, low pressure air to blow away entrapped dirt particles. Direct airflow against the inside surface of the filter element.

(2) Remove stubborn dirt particles or grease by soaking in warm water. A mild soap may be used to aid in dissolving grease.

(3) Dry filter element thoroughly using dry, low pressure air while tapping the sides of the filter element several times to ensure that no moisture remains.

c. Replacement.

(1) Position the rfi gasket squarely around the edges of the air intake cutout on the control panel.

(2) Carefully place the filter element squarely over the rfi gasket. Exercise care to avoid disturbing the position of the rfi gasket.

(3) Carefully install the filter housing and secure with the four washers, lockwashers, and screws.

3-15. Organizational Troubleshooting

a. Organizational troubleshooting supplements the operator's troubleshooting procedures given in paragraph 3-8. Organizational troubleshooting includes the performance of the operator's preventive maintenance checks and services (para 3-5) and the operator's troubleshooting procedures.

b. To troubleshoot the equipment, perform all the functions given in the operator's preventive maintenance checks and services (para 3-5). Proceed through the functions until an abnormal condition or result is observed. When an abnormal condition or result is observed, note the apparent

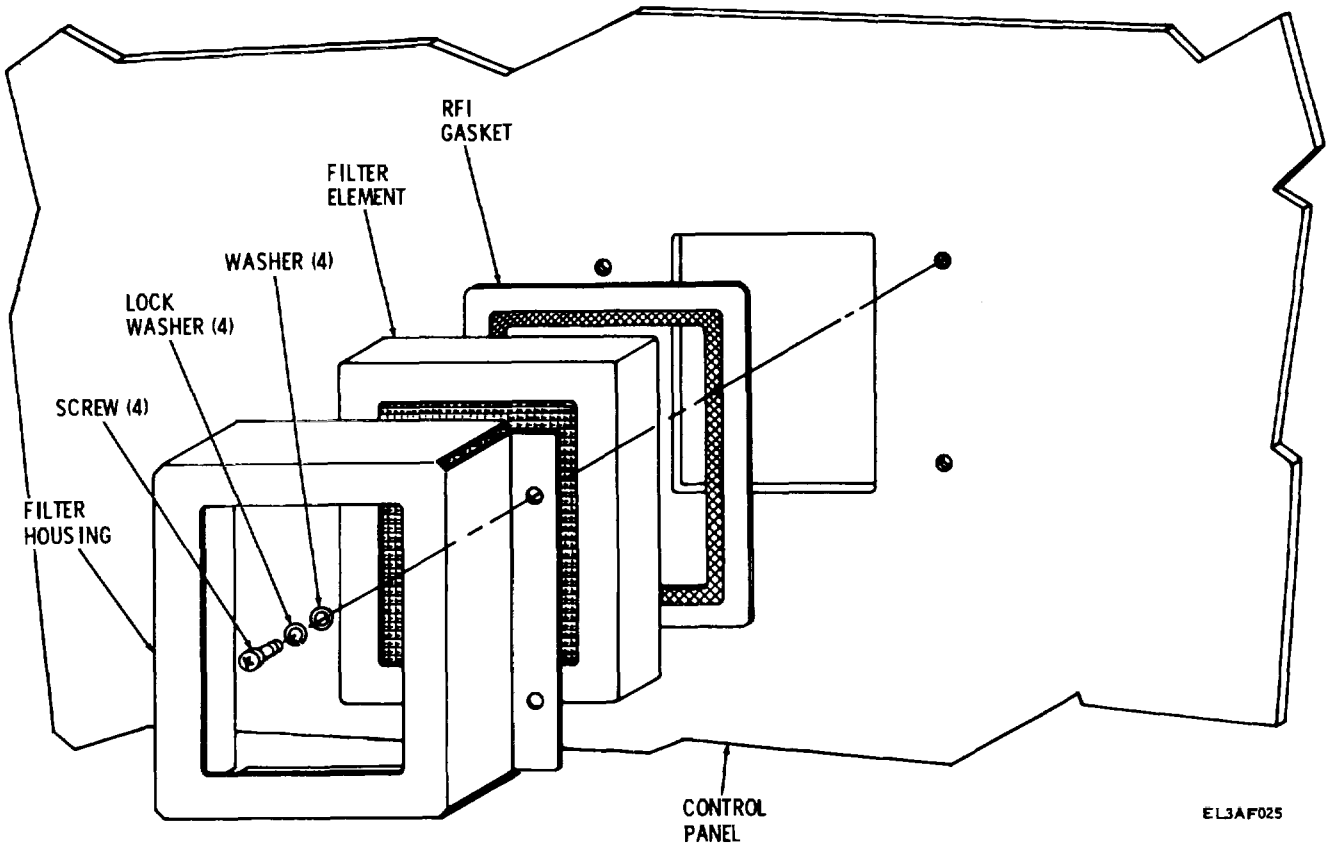


Figure 3-1. Air intake filter replacement .

trouble symptom, and refer to the corresponding trouble symptom in the operator's troubleshooting chart (table 3-2) and the organizational troubleshooting chart (table 3-3). Perform the checks and corrective actions indicated in the troubleshooting charts. If the corrective measures do not result in the correction of the trouble, a higher category of maintenance is required.

Table 3-3. Organizational Troubleshooting Chart

Item No.	Trouble symptom	Probable trouble	Checks and corrective actions
1	POWER ON pilot lamps (fig. 2-3 and 2-4) do not turn on when POWER switch is set to ON.	a. Dirty or bent pins or connectors of cable assemblies W1, W6, W8, or W10.	a. Clean or straighten connector pins.
	b. Defective cable assemblies W1, W6, W8, or W10.	b. Check cable continuity (para 3-16).	
2	Unable to correctly position rotary switch knob or adjust control knobs.	a. Loose knobs.	a. Position and tighten knobs as required.
		b. Defective switch or control.	b. Refer to higher category maintenance.

3-16. Cable Continuity Check and Repair

a. Cable Continuity Check. Use the ohmmeter and check the continuity of the cable from pin-to-pin. If any pin-to-pin measurement indicates an open (no continuity), refer to higher category maintenance.

b. Cable Repair. Repair cables that are cracked, cut, or badly chafed by wrapping with black, plastic electrical tape. Straighten bent connector pins with a small pair of needle-nose pliers, being careful not to break the pins. If the cable connector is corroded, clean with cleaning compound and a soft-bristled brush. If the cable cannot be repaired by any of the above methods, refer to higher category maintenance.

CHAPTER 4
SHIPMENT AND LIMITED STORAGE

4-1. Disassembly of Equipment

Prepare units of the test set for shipment and administrative storage as follows:

a. Disconnect all test set cabling, coil the cables as shown in figure 1-5, and tie with cotton twine.

b. Place cables W1 through W13, W15, W17 through W23, anode and focus splices and the cable adapter (fig. 1-5), the technical manual and all minor components inside the MX-8639A/APS 94D case inner cover (fig. 1-2). Place cables W34 through W40, mounting base, alignment fixture, extender card and card extractor in Test Set Subassembly MX-9984/APS-94D (fig. 1-3).

c. Use dry, soft neutral material to fill all voids and cushion any vibration.

d. Secure the inner cover by depressing the press-to-lock-unlock fasteners.

e. Close and secure the top of each case by fastening the six lock links.

4-2. Repacking for Shipment or Limited Storage

The exact procedure for repacking for limited storage depends on the material available and the condition under which the equipment is to be shipped or stored. Adapt the procedures outlined below whenever circumstances permit. The information concerning the original packaging (para 2 1) and reference to figure 2-1 will be helpful.

a. Material Requirements. The materials required for repackaging of the test set are listed in table 4-1. For stock numbers of materials, refer to SB 38-100.

b. Repackaging. Package the units of the test set as follows:

(1) Make sure the procedures listed in paragraph 4-1 have been completed.

(2) Use the original crates and packing materials if available. If not, fabricate a shipping crate and packing materials using the materials described in *a* above.

(3) Place the shipping crate on the floor and line it with the corner blocks and the fiberboard liners as shown in figure 2-1.

(4) Place the test set in the shipping crate and install the top corner blocks and fiberboard liners (fig. 2-1).

(5) Nail the shipping crate cover to the shipping crate.

Table 4-1. Materials for Fabrication of Shipping Box for Test Set Subassemblies MX86S8AIAPS-94D and MX-8659A/APS-94D

Quantity	Materials
2	Fiberboard liners (PPP-F-320, CF, DOM, SW,200), top and bottom, 17.75 by 32.25 inches.
8	Foam corner blocks (uncellular, polyethylene foam, MIL-C-46842), 9 by 9 by 2 inches thick.
As required	Steel strapping, flat (QQ7B1, Type 1, Class B, Grade 2) 0.75 inches wide by 0.023 inches thick.
As required	Cleated plywood box (PPP-B-601, Style A, Domestic Type) inside dimensions 35 by 27.5 by 24 inches.

Table 4-2. Materials for Fabrication of Shipping Box for Test Set Subassembly MX-99841/APS-94D

Quantity	Materials
2	Fiberboard liners (PPP-F-320, CF, DOM, SW, 200), top and bottom, 17.75 by 32.25 inches.
2	Fiberboard liners (PPP-F-320, CF, DOM, SW, 200), sides, 10.75 by 32.25 inches.
2	Fiberboard liners (PPP-F-320, CF, DOM, SW, 200), ends, 10.25 by 17.25 inches.
8	Foam corner blocks (uncellular, polyethylene foam, MIL-C-46842), 9 by 9 by 2 inches thick.
As required	Steel strapping, flat (QQ7B1, Type 1, Class B, Grade 2) 0.75 inches wide by 0.023 inches thick.
As required	Cleated plywood box (PPP-B-601, Style A, Domestic type) inside dimensions 37 by 22 by 15 inches).

APPENDIX A
REFERENCES

The following publications contain information applicable to the operation and maintenance of Test Set Group, Indicator, Radar OQ-3A/APS-94D.

DA PAM 310-4	Index of Technical Manuals, Technical Bulletins, Supply Manuals Types 7, 8, and 9), Supply Bulletins, and Lubrication Orders.
DA PAM 310-7	US Army Equipment Index of Modification Work Orders.
SB 11-73	Painting and Preservation Supplies Available for Field Use for Electronics Command Equipment.
SB 38-100	Preservation, Packaging, Packing and Marking Materials, Supplies and Equipment Used by the Army.
TB 43-0118	Field Instructions for Painting and Preserving Electronics Command Equipment Including Camouflage Pattern Painting of Electrical Equipment Shelters.
TM 11-5895967-12	Operator's and Organizational Maintenance Manual: Radar Surveillance Set AN/APS-94E (NSN 584141-01403873).
TM 11-89-967-34	Direct Support and General Support Maintenance Manual: Radar Surveillance Set AN/APS-94E (NSN 5841-01-4 3873).
TM 11 6626-203-12	Operator and Organizational Maintenance: Multimeter AAN/URM-105 and AN/URM-105C, Including Multimeter ME-77/U and ME-77C/U).
TM 38-750	The Army Maintenance Management System (TAMMS).
TM 750-244-2	Procedures for Destruction of Electronics Materiel to Prevent Enemy Use (Electronics Command).
TM 11-6625-1833-12-HR	Hand Receipt Manual Covering End Ite /Components of End Item (COEI), Basic Issue Items (BII), and Additional Authorization List (ML) for Test Set Group, Indicator, Radar OQ-63A/APS-94D,(NSN 6625-01-058-7874).

APPENDIX B

COMPONENTS OF END ITEM UST

Section I. INTRODUCTION

B-1. Scope

This appendix lists integral components of and basic issue items for the OQ63A/APS-94D to help you inventory items required for safe and efficient operation.

B-2. General

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

a. Section II. Integral Components of the End Item. These items, when assembled, comprise the OQ-63A/APS-94D and must accompany it whenever it is transferred or turned in. The illustrations will help you identify these items.

b. Section II. Basic Issue Items. These are the minimum essential items required to place the OQ-63A/APS-94D in operation, to operate it, and to perform emergency repairs. Although shipped separately packed they must accompany the OQ-63A/APS-94D during operation and whenever it is transferred between accountable officers. The illustrations will assist you with hard-to-identify items. This manual is your authority to requisition replacement BII, based on TOE/MTOE authorization of the end item.

B-3. Explanation of Columns

a. Illustration. This column is divided as follows:

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

(2) Item number. Not applicable.

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

c. Description. Indicates the Federal item name and, if required, a minimum description to identify the item. The part number indicates the primary number used by the manufacturer, which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements to identify an item or range of items. Following the part number, the Federal Supply Code for Manufacturers (FSCM) is shown in parentheses.

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

e. Usable on Code. Not applicable.

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

g. Quantity. This column is left blank for use during an inventory. Under the Rcvd column, list the quantity you actually receive on your major item. The Date columns are for your use when you inventory the major item. *Items without stock numbers should be requisitioned by Manufacturers and Part Number direct from: US Army Communications and Electronics Materiel Readiness Command, ATTN: DRSEL-MM, Fort Monmouth, NJ. 07703.

(Next printed page is B-3)

SECTION II INTEGRAL CONPONENTS OF END ITEM

(1) ILLUSTRATION (A) FIG.	(1) ILLUSTRATION (B) ITEM	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION PART NUMBER (FSCM)	(4) LOCATION	(5) USUABLE ON CODE	(6) QTY REQD	(7) QUANTITY RCVD	(7) QUANTITY DATE
			TEST SET GROUP, INDICATOR, RADAR CQ-63A/APS-94D CONSISTING OF:					
1-1		6625-01-058-7986	TEST SET SUBASSEMBLY MX-8638A/APS-94D			1		
1-2		6625-01-061-9005	TEST SET SUBASSEMBLY MX-8639A/APS-94D			1		
1-3		5841-01-070-5813	TEST SET SUBASSEMBLY MX-9984/APS-94D			1		

SECTION III BASIC ISSUE ITEMS

(1) ILLUSTRATION (A) FIG.	(B) ITEM	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION PART NUMBER (FSCM)	(4) LOCATION	(5) USUABLE ON CODE	(6) QTY REQD	(7) QUANTITY RCVD	DATE
			TEST SET SUBASSEMBLY MX-8639A/APS-94D Consisting of:					
1-5	W1	6625-403-1053	CABLE ASSEMBLY SPECIAL PURPOSE, ELECTRICAL CX-12296/U (80058)		1			
1-3	W2	6625-489-2655	CABLE ASSEMBLY SPECIAL PURPOSE, ELECTRICAL CX-12331/U (80058)		1			
1-5	W3	6625-489-2660	CABLE ASSEMBLY SPECIAL PURPOSE, ELECTRICAL CX-12323/U (80058)		1			
1-5	W4	6625-412-9242	CABLE ASSEMBLY SPECIAL PURPOSE, ELECTRICAL CX-12332/U (80058)		1			
1-5	W5	6625-403-1052	CABLE ASSEMBLY SPECIAL PURPOSE, ELECTRICAL CX-12324/U (80058)		1			
1-5	W6	6625-412-2025	CABLE ASSEMBLY SPECIAL PURPOSE, ELECTRICAL CX-12333/U (80058)		1			
1-5	W7	6625-477-9964	CABLE ASSEMBLY SPECIAL PURPOSE, ELECTRICAL CX-12334/U (80058)		1			
1-5	W8	6625-477-9965	CABLE ASSEMBLY SPECIAL PURPOSE, ELECTRICAL CX-12335/U (80058)		1			
1-5	W9	6625-494-6616	CABLE ASSEMBLY SPECIAL PURPOSE, ELECTRICAL CX-12210/U (80058)		1			
1-5	W10	6625-493-7478	CABLE ASSEMBLY SPECIAL PURPOSE, ELECTRICAL CX-12441/U (80058)		1			
1-3	W11	6625-412-2029	CABLE ASSEMBLY SPECIAL PURPOSE, ELECTRICAL CX-12325/U (80058)		1			
1-5	W12	6625-489-2652	CABLE ASSEMBLY SPECIAL PURPOSE, ELECTRICAL CX-12326/U (80058)		1			
1-5	W15	6625-189-2650	CABLE ASSEMBLY SPECIAL PURPOSE, ELECTRICAL CX-12328/U (80058)		1			
1-5	W17	6625-489-2661	CABLE ASSEMBLY SPECIAL PURPOSE, ELECTRICAL CX-12336/U (80058)		1			
1-5	W18	6625-189-2659	CABLE ASSEMBLY SPECIAL PURPOSE, ELECTRICAL CX-12337/U (80058)		1			
1-5	W19	6625-493-T777	CABLE ASSEMBLY, RADIO FREQUENCY CG-3618/U (80058)			4		
	W20 W21 W22							
1-5	W23	6625-193-3010	CABLE ASSEMBLY SPECIAL PURPOSE, ELECTRICAL CX-12338/U (80058)		1			
1-6		6625-194-2856	ADAPTER, TEST MX-8630/APS-91D (80058)			1		
1-6		6625-938-0228	ADAPTER TEST MX-8633/APS-94D (80058)			1		
1-6		6625-938-0227	ADAPTER, TEST MX-8634/AS-94D (80058)			1		
1-6		6625-762-4906	ADAPTER, TEST MX-8631/APS-94D (80058)			1		
1-6		6625-489-0427	ADAPTER, TEST MX-8632/APS-91D (80058)			1		
1-6		6625-762-4923	ADAPTER, TEST MX-874T2/APS-94D (80058)			1		
1-6		5841-01-069-7086	ADAPTER, TEST MX-8794/APS-94D (80058)			1		

SECTION III BASIC ISSUE ITEMS -- COTINUED

(1) ILLUSTRATION (A) FIG.	(B) ITEM	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION PART NUMBER (FSCM)	(4) LOCATION	(5) USUABLE ON CODE	(6) QTY REQD	(7) QUANTITY RCVD	DATE
			TEST SET SUBASSEMBLY MX-9984/APS-94D CONSISTING OF:					
1-3		5841-01-058-8023	CASE, TEST SET CY-7001/APS-94D (80058)			1		
1-4		5826-01-058-7718	1OUNTING BASE ELECTRICAL EQUIPMENT MT-4978/APS-94D (80058)				1	
1-7		5895-01-058-7875	ALIGNMENT FIXTURE, ELECTRON TUBE MX-9985/APS-94D (80058)			1		
1-6			EXTENDER CARD, ELECTRONIC TEST MX-9986/APS-94D (80058)			1		
1-4			EXTRACTOR, ELECTRICAL CARD 55PO9524A 001 (94990)			1		
			TOOL, ALIGNMENT FIXTURE 66PO6594F OO1 (94990)				1	
1-4			CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL (W34) 30P06623F 001 (94990)			1		
1-4			CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL (W35) 30PC6642F 001 (94990)			1		
1-4			CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL (W36) 30P6643F 001 (94990)			1		
1-4			CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL (W37) 30PO6639F 001 (94990)			1		
1-4			CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL (W38) 30P06644F 001			1		
1-4			CABLE ASSEMBLY, SPECIAL PURPOSE. ELECTRICAL (W39) 830614 (00779)			1		
1-4			CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL (W40) 830612 (00779)			1		
1-5	W41 W42	6625-493-7477	CABLE ASSEMBLY, RADIO FREQUENCY CO-3618/U (80058)			2		

APPENDIX D

MAINTENANCE ALLOCATION

Section I. INTRODUCTION

D-1. General

This appendix provides a summary of the maintenance operations for OQ-63A/APS94D. It authorizes categories of maintenance for specific maintenance functions on repairable items and components and the tools and equipment-required to perform each function. This appendix may be used as an aid in planning maintenance operations.

D-2. Maintenance Function

Maintenance functions will be limited to and defined as follows:

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

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

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

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

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

f. Calibrate. To determine and cause corrections to be made or to be adjusted on instruments or test measuring and diagnostic equipments used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

g. Install. The act of emplacing, seating, or fixing into position an item, part, module (compo nent 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.

D-3. Column Entries

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

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

c. Column 3, Maintenance Functions. Column 3 lists the functions to be performed on the item listed in column 2. When items are listed without

maintenance functions, it is solely for purpose of having the group numbers in the MAC and RPSTL coincide.

d. Column 4, Maintenance Category. Column 4 specifies, by the listing of a "work time" figure in the appropriate 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 "work time" figures will be shown for each category. The number of task-hours specified by the "work time" figure represents the average time required to restore an item (assembly, subassembly, component, module, end item or system) to a serviceable condition under typical field operating conditions. This time includes preparation time, troubleshooting time, and quality assurance/quality control time in addition to the time required to perform the specific tasks indicated 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 sup port equipment required to perform the designated function.

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

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

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

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

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

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

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

D-5. Remarks (Sec 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 D-3)

SECTION II MAINTENANCE ALLOCATION CHART
FOR
TEST SET GROUP, INDICATOR, RADAR OQ-63A/APS-94D

(1) GROUP NUMBER	(2) COMPONENT ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQUIPMENT	(6) REMARKS
00	Test Set Group, Indicator, Radar OQ-63A/APS-94D	Inspect	0.2					4	
		Test			4.0			1,2,6,7	A
		Test					1.0	1 thru 2H	
		Service	0.3					4,5	
		Calibration			0.8			1,2,6,7,9	
		Replace		0.1				4	
		Repair			0.8			5	
		Overhaul					40.0	1 thru 2E	
01	Test Set Subassembly MX-863SA/APS-94D	Inspect		0.1				4	
		Test			1.0			1,2,6,7,9	A
		Service		0.2				4,5	
		Replace		0.1				5	
		Repair			0.3			5	
		Repair					4.0	I thru 28	
0101	Electrical Test Panel 1A1	Inspect			0.2			4,5	
		Repair			0.4			4,5	
010101	Circuit Card Assembly 1A1A1 (ADAS Simulator)	Test					0.9	2,6,9,11, 12,14	
		Replace			0.3			5	
		Repair					1.0	2,5,6,9, 11,12,14	
010102	Circuit Card Assembly 1A1A2 (+28V Regulator)	Test					1.3	1,2,6,7, 9,11,15	
		Replace			0.3			5	
		Repair					0.8	1,2,5,6, 7,9,11, 15	
010103	Power Supply 1AIA3	Test					0.6	2,6,7,13, 16	B
		Replace			0.3			5	
		Repair					1.0	2,5,6,7, 13,16	
01010301	Circuit Card Assembly 1A1A3A1	Test					0.5	2,6,7, 13,16	C
		Replace					0.3	5	
		Repair					0.8	2,5,6,7, 13,16	
010104	Circuit Card Assembly 1A1A4	Test					0.4	2,6,7, 13,16	B
		Replace			0.3			5	
		Repair					0.5	2,5,6,7, 13,16	
01010401	Circuit Card Assembly 1A1A4A1	Test					0.5	2,6,7, 13,16	C
		Replace					0.3	5	
		Repair					0.8	2,5,6,7, 13,16	
01010402	Circuit Card Assembly 1A1A4A2	Test					0.5	2,6,7, 13,16	
		Replace					0.3	5	
		Repair					0.8	2,5,6,7, 13,16	
010105	Case, Test Set	Inspect		0.1				4,5	
		Replace		0.2				5	
		Repair			0.4			5	
0102	Electrical Test Panel 1A2	Inspect		0.2				4,5	
		Repair			0.4			5	
010201	5MHz Oscillator and Prf Counter Nodule IAAI	Test					1.0	2,6,8, 11,17	D
		Replace			0.3			5	
		Repair					1.0	2,5,6,8 11,17	

SECTION II MAINTENANCE ALLOCATION CHART
FOR
TEST SET GROUP, INDICATOR, RADAR OQ-63A/APS-94D - Continued

(1) GROUP NUMBER	(2) COMPONENT ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQUIPMENT	(6) REMARKS
010202	Antenna Counter Module 1A2A2	Test					0.8	2,6,8,11, 17	D
		Replace			0.3			5	
		Repair					1.0	2,5,6,8, 11,17	
010203	Low Voltage Power Supply and Regulator Module 1A2A3	Test					0.8	6,7,18	
		Replace			0.3			5	
		Repair					1.0	5,6,7,18	
010204	Bite Circuit Nodule 1A2A4	Test					0.8	2,6,9,11, 19	
		Replace			0.3			5	
		Repair					1.4	2,5,6,9, 11,19	
010205	Overvoltage Protector Module 1A2A5	Test					0.7	1,2,7,20	
		Replace			0.3			5	
		Repair					0.6	1,2,5,7, 20	
010206	Video Amplifier Nodule 1A2A6	Test					0.8	2,6,9,11, 21	
		Replace			0.3			5	
		Repair			0.5			4,5	
		Repair					1.0	2,5,6,9, 11,21	
01020601	Circuit Card Assembly 1A2A6A1	Test					0.5	2,6,9,11, 21	C
		Replace			0.3			5	
		Repair					0.6	2,5,6,9, 11,21	
01020602	Circuit Card Assembly 1A2A6A2	Test					0.5	2,6,9,11. 21	C
		Replace			0,3			5	
		Repair					0.6	2,5,6,9, 11,21	
010207	Electronic Components Assembly 1A2TB3	Test			0.5			1	
		Replace			0.3			4,5	
		Repair			0.9			5	
02	Test Set Subassembly MX-8639A/APS-94D	Inspect		0.2				4.5	A
		Test			0.5			1,2,6,7	
		Service		0.2				4,5	
		Replace		0.1				5	
		Repair			0.5			5	
		Repair					5.0	1 thru 28	
0201	Panel, Test Electrical	Inspect		0.2				4,5	
		Repair			0.4			4,5	
020101	Yoke Simulator Module 2A1	Test					0.7	2,6,9,11, 22,23	
		Replace			0.3			5	
		Repair					1.0	2,5,6,9, 11,22,23	
020102	Direct Current Amplifier Nodules 2A2 and 2A3	Test					0.5	2,6,9,11,	
		Replace			0.3			5	
		Repair					0.6	2,5,6,9, 11,24	
02010201	Circuit Card Assemblies 2A2A1 and 2A3A1	Test					0.5	2,6,9,11, 24	C
		Replace					0.3	5	
		Repair					0.6	2,5,6,9, 11,24	

SECTION II MAINTENANCE ALLOCATION CHART
FOR
TEST SET GROUP, INDICATOR, RADAR OQ-63A/APS-94D-Continued

(1) GROUP NUMBER	(2) COMPONENT ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQUIPMENT	(6) REMARKS
020103	Sweep Generator Module 2A4	Test					0.7	1,2,6,9, 11,25	
		Replace			0.3			5	
		Repair					1.0	1,2,5,6,9 11,25	
02010301	Circuit Card Assembly 2A4A1	Test					0.5	1,2,6,9, 11,25	C
		Replace					0.3	5	
		Repair					0.8	1,2,5,6, 9,11,25	
02010302	Circuit Card Assembly 2A4A2	Test					0.5	1,2,6,9, 11,25	C
		Replace					0.3	5	
		Repair					0.8	1,2,5,6, 9,11,25	
020104	Serve Amplifier Module 2A5	Test					0.6	2,6,11,26	
		Replace			0.3			5	
		Repair					0.3	2,5,6,11, 26	
02010401	Circuit Card Assembly 2A5A1	Test					0.5	2,6,11	C
		Replace					0.3	5	
		Repair					0.8	2,5,6,11, 26	
02010402	Circuit Card Assembly 2A5A2	Test					0.5	2,6,11,26	
		Replace					0.3	5	
		Repair					0.8	2,5,6,11, 26	
02010403	Circuit Card Assembly 2A5A3	Test					0.5	2,6,11,26	
		Replace					0.3	5	
		Repair					0.8	2,5,6,11, 26	
020105	Offset Amplifier Module 2A6	Test					0.6	2,6,10, 11,27	
		Replace			0.3			5	
		Repair			0.3			4,5	
		Repair					0.6	2,5,6,10, 11,27	
02010501	Circuit Card Assembly 2A6A1	Test					0.5	2,6,10, 11,27	C
		Replace			0.3			5	
		Repair					0.5	2,5,6,10, 11,27	
020106	Offset Control Module 2A7	Test					0.5	2,6,11, 23,28	
		Replace			0.3			5	
		Repair			0.3			4,5	
		Repair					0.8	2,5,6,11, 23,28	
02010601	Circuit Card Assembly 2A7A1	Test					0.5	2,6,11, 23,28	C
		Replace			0.3			5	
		Repair					0.6	2,5,6,11, 23,28	
02010602	Circuit Card Assembly 2A7A2	Test					0.5	2,6,11 23,28	C
		Replace					0.3	5	
		Repair					0.8	2,5,6,11, 23,28	

SECTION II MAINTENANCE ALLOCATION CHART
FOR
TEST SET GROUP, INDICATOR, RADAR OQ-63A/APS-94D-Continued

(1) GROUP NUMBER	(2) COMPONENT ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQUIPMENT	(6) REMARKS
0202	Group: Test Adapters								
020201	Adapter, Test, MX-8630/APS-94D	Inspect		0.1				Visual	
		Replace		0.1				None	
		Repair			0.5			1,4,5	
020202	Adapter, Test, MX-8631/APS-94D	Inspect		0.1				Visual	
		Replace		0.1				None	
		Repair			0.5			1,4,5	
020203	Adapter, Test, MS-8632/APS-94D	Inspect		0.1				Visual	
		Replace		0.1				None	
		Repair			0.5			1,4,5	
020204	Adapter, Test, MX-8633/APS-94D	Inspect		0.1				Visual	
		Replace		0.1				None	
		Repair			0.5			1,4,5	
020205	Adapter, Test, MX-8634/APS-94D	Inspect		0.1				Visual	
		Replace		0.1				None	
		Repair			0.5			1,4,5	
020206	Adapter, Test, MX-8742/APS-94D	Inspect		0.1				Visual	
		Replace		0.1				None	
		Repair			0.5			1,4,5	
020207	Adapter, Test, MX-8794/APS-94D	Inspect		0.1				Visual	
		Replace		0.1				None	
		Repair			0.5			1,4,5	
0203	Group: Cable Assemblies								
020301	Cable Assembly, Special Purpose Electrical, CX-12296/U, W1	Inspect		0.1				Visual	
		Replace		0.1				None	
		Repair			1.0			1,4,5	
020302	Cable Assembly, Special Purpose Electrical, CX-12331/U, W2	Inspect		0.1				Visual	
		Replace		0.1				None	
		Repair			1.0			1,4,5	
020303	Cable Assembly, Special Purpose Electrical, CX-12323/U, W3	Inspect		0.1				Visual	
		Replace		0.1				None	
		Repair			1.0			1,4,5	
020304	Cable Assembly, Special Purpose Electrical, CX-12332/U, W4	Inspect		0.1				Visual	
		Replace		0.1				None	
		Repair			1.0			1,4,5	
020305	Cable Assembly, Special Purpose Electrical, CX-12324/U, W5	Inspect		0.1				Visual	
		Replace		0.1				None	
		Repair			1.0			1,4,5	
020306	Cable Assembly, Special Purpose Electrical, CX-12333/U, W6	Inspect		0.1				Visual	
		Replace		0.1				None	
		Repair			1.0			1,4,5	
020307	Cable Assembly, Special Purpose Electrical, CX-12334/U, W7	Inspect		0.1				Visual	
		Replace		0.1				None	
		Repair			1.0			1,4,5	
020308	Cable Assembly, Special Purpose Electrical, CX-12335/U, W8	Inspect		0.1				Visual	
		Replace		0.1				None	
		Repair			1.0			1,4,5	
020309	Cable Assembly, Special Purpose Electrical, CX-12240/U, W9	Inspect		0.1				Visual	
		Replace		0.1				None	
		Repair			1.0			1,4,5	
020310	Cable Assembly, Special Purpose Electrical, CX-12241/U, W10	Inspect		0.1				Visual	
		Replace		0.1				None	
		Repair			1.0			1,4,5	

SECTION II MAINTENANCE ALLOCATION CHART
FOR
TEST SET GROUP, INDICATOR, RADAR OQ-63A/APS-94D-Continued

(1) GROUP NUMBER	(2) COMPONENT ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQUIPMENT	(6) REMARKS
20311	Cable Assembly, Special Purpose Electrical,	Inspect		0.1				Visual	
	CX-12325/U, W11	Replace		0.1				None	
		Repair			1.0			1,4,5	
020312	Cable Assembly, Special Purpose Electrical,	Inspect		0.1				Visual	
	CX-12326/U, W12	Replace		0.1				None	
		Repair			1.0			1,4,5	
020313	Cable Assembly, Special Purpose Electrical,	Inspect		0.1				Visual	
	CX-12328/U, W15	Replace		0.1				None	
		Repair			1.0			1,4,5	
020314	Cable Assembly, Special Purpose Electrical,	Inspect		0.1				Visual	
	CX-12336/U, W17	Replace		0.1				None	
		Repair			1.0			1,4,5	
020315	Cable Assembly, Special Purpose Electrical,	Inspect		0.1				Visual	
	CX-12337/U, W18	Replace		0.1				None	
		Repair			1.0			1.4,5	
020316	Cable Assembly, Radio Frequency CG-3618/U, W19,	Inspect		0.1				Visual	
	W20, W21, W22	Replace		0.1				None	
		Repair			1.0			1,4,5	
020317	Cable Assembly, Special Purpose Electrical,	Inspect		0.1				Visual	
	CX-12338/U, W23	Replace		0.1				None	
		Repair			1.0			1,4.5	
020318	Cable Assembly, Radio Frequency CG-3618/U (4 ft)	Inspect			0.1				Visual
	(coaxial) W41	Replace		0.1				None	
		Repair			1.0			1,4,5	
020319	Cable Assembly, Radio Frequency CG-3681/U (4 ft)	Inspect			0.1				Visual
	(coaxial) W42	Replace		0.1				None	
		Repair			1.0			1,4,5	
03	Test Set Subassembly MX-9984/APS-94D	Inspect		0.1				Visual	
		Replace		0.1				None	
		Repair			0.5			4,5	
0301	Alignment Fixture MX-9985/APS-94D	Inspect		0.1				Visual	
		Replace		0.1				None	
		Repair			0.5			4,5	
0302	Group: Cable Assemblies								
030201	Cable Assembly, Special Purpose Electrical, W34	Inspect		0.1				Visual	
		Replace		0.1				None	
		Repair			1.0			1.4,5	
030202	Cable Assembly, Special Purpose Electrical. W37	Inspect		0.1				Visual	
		Replace		0.1				None	
		Repair			1.0			1,4,5	
030203	Cable Assembly, Special Purpose Electrical, W35	Inspect		0.1				Visual	
		Replace		0.1				None	
		Repair			1.0			1,4,5	
030204	Cable Assembly, Special Purpose Electrical, W36	Inspect		0.1				Visual	
		Replace		0.1				None	
		Repair			1.0			1,4,5	
030205	Cable Assembly, Special Purpose Electrical, W38	Inspect		0.1				Visual	
		Replace		0.1				None	
		Repair			1.0			1,4,5	
030206	Cable Assembly, Special Purpose Electrical, W43	Inspect		0.1				Visual	
		Replace		0.1				None	
		Repair			1.0			1,4,5	
0303	Extender Card, Electronic Test	Inspect		0.1				Visual	
		Replace		0.1				None	
		Repair			0.5			1,4,5	
0304	Mounting Base, Electronic Equipment	Inspect		0.1				Visual	
		Repair			0.5			4,5	

SECTION II MAINTENANCE ALLOCATION CHART

FOR

TEST SET GROUP, INDICATOR, RADAR OQ-63A/APS-94D-Continued

(1) GROUP NUMBER	(2) COMPONENT ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQUIPMENT	(6) REMARKS
0305	Case, Test Set	Inspect		0.1				Visual	
		Replace		0.1				4,5	
		Repair			0.5			4,5	
0306	Microscope, Optical SU-54/APS-94D	Inspect		0.1				Visual	
		Replace		0.1				None	
0307	Alignment Mask, Crt	Inspect		0.1				Visual	
		Replace		0.1				None	
0308	Thermocouple, Reference, Assembly	Inspect		0.1				Visual	
		Replace		0.1				None	
		Repair			0.5			1,5	
0309	Extractor, 0Electrical Card	Inspect		0.1				Visual	
		Replace		0.1				None	
0310	Splice, Anode	Inspect		0.1				1	
		Replace		0.1				None	
0311	Splice, Focus	Inspect		0.1				1	
		Replace		0.1				None	

★U.S. GOVERNMENT PRINTING OFFICE: 1981-765-01/41

SECTION III TOOL AND TEST EQUIPMENT REQUIREMENTS
FOR
TEST SET GROUP, INDICATOR, RADAR OQ-63A/APS-94D

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE CATEGORY	NOMENCLATURE	NATIONAL/NATO STOCK NUMBER	TOOL NUMBER
1	O,F,D	Multimeter AN/USM-223	6625-00-999-7465	
2	F,D	Oscilloscope AN/USH-281C	6625-00-106-9622	
3	D	Repair Kit, Printed Wiring Board MK-772/U	5999-00-757-7042	
4	O,F,D	Tool Kit, Electronic Equipment TK-101/G	5180-00-064-5178	
5	O,F,D	Tool Kit, Electronic Equipment TK-105/G	5180-00-610-8177	
6	F,D	Voltmeter, Digital AN/GSM-64B including:	6625-00-137-8366	
		AC Plug-in module	6625-00-137-8366	
		AC Cover	6625-00-137-8348	
7	F,D	Transformer, Variable Power, General Radio Model H2G3	5950-00-557-6988	
8	F,D	Counter, Electronic, Digital Readout AN/USM-207	6625-00-911-6368	
9	F,D	Generator, Signal SG-1105/U	6625-01-010-3524	
10	D	Oscillator, Audio TS-421/U	6625-00-669-0228	
11	D	Power Supply PP-3940/G (6 required)	6130-00-985-8136	
12	D	Power Supply PP-3941/G (2 required)	6130-00-985-8143	
13	D	Test Adapter MX-8631/APS-94D	6625-00-762-4906	
14	D	Test Fixture, 1A1A1 Module	Fabricated	
15	D	Test Fixture, 1A1A2 Nodule	Fabricated	
16	D	Test Fixture, 1A1A3 and 1A1A4 Modules	Fabricated	
17	D	Test Fixture, 1A2A1 and 1A2A2 Modules	Fabricated	
18	D	Test Fixture, 1A2A3 Module	Fabricated	
19	D	Test Fixture, 1A2A4 Module	Fabricated	
20	D	Test Fixture, 1A2A5 Module	Fabricated	
21	D	Test Fixture, 1A2A6 Module	Fabricated	
22	D	Test Fixture, 2A1 Module, intermediate	Fabricated	
23	D	Test Fixture, 2A1 and 2A7 Modules	Fabricated	
24	D	Test Fixture, 2A2 and 2A3 Modules	Fabricated	
25	D	Test Fixture, 2A4 Module	Fabricated	
26	D	Test Fixture, 2A5 Module	Fabricated	
27	D	Test Fixture, 2A6 Module	Fabricated	
28	D	Resistor, 1000 ohms, 5%, 1/2 watt		

Section IV. REMARKS

Reference Code	Remarks
A	All units of test set group are tested together.
B	Subassemblies 1A1A3 and 1A1A4 must be tested together.
C	Must be tested with next higher assembly.
D	Subassemblies 1A2A1 and 1A2A2 must be tested together.

APPENDIX E

EXPENDABLE SUPPLIES AND MATERIALS LIST

Section I. INTRODUCTION

E-1. Scope

This appendix lists expendable supplies and materials you will need to operate and maintain the OQ-63A/APS-94D. These items are authorized to you by CTA 50-970, Expendable Items (Except Medical, Class V, Repair Parts, and Heraldic Items).

E-2. Explanation of Columns

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

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

C--Operator/Crew
O--Organizational Maintenance

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

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

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

(Next printed page is E-3)

★ U.S. GOVERNMENT PRINTING OFFICE: 1984 0-421-302 (11001)

SECTION II. EXPENDABLE SUPPLIES AND MATERIALS LIST

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION PART NO. AND FSCM	(5) UNIT OF MEAS.
1	0	5350-00-264-3485	Paper, Abrasive, Flint (Sandpaper, Fine) MIL PP-105	Fig
2	0	7510-00-933-7372	Tape Electrical (Black Plastic) ½ inch	Roll
3	C,0	8020-00-178-8305	Brush, Paint MIL-H-B-420 (81348)	Ea
4	0	5350-145-0147	Primer, Color Y Per MIL-P-8585 (81348)	Qt
5	0	8010-00-515-0800	Enamel, Light Gray (Class-2 - Metal)	Gal
6	C,0	**6850-00-105-3084**	**Trichlorotrifluoroethane, Freon type TF**	**16 Oz**
7	C,0	8305-00-205-3496	Cloth, Cotton, (Lint-Free) CCC-C-440-(81348)	Yd
8	C,0	7920-00-205-2401	Brush, Cleaning MIL-B-288 (81348)	Ea

Change 1 E-3/(E-4 blank)

By Order of the Secretary of the Army:

BERNARD W. ROGERS
General, United States Army
Chief of Staff

Official:

J.C. PENNINGTON
Brigadier General, United States Army
The Adjutant General

Distribution:
To be distributed in accordance with DA Form 12-36, Direct and General Support maintenance requirements for AN/APS-94.

TEAR ALONG PERFORATED LINE

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS

SOMETHING WRONG WITH THIS PUBLICATION?

FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)

DATE SENT

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE
TM 11-5825-270-10	23 Jul 81	Radio Frequency R-2176/FRN

BE EXACT. . .PIN-POINT WHERE IT IS

PAGE NO.	PARA-GRAPH	FIGURE NO	TABLE NO.

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

PRINTED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER

SIGN HERE:

DA FORM 1 JUL 79 2028-2

PREVIOUS EDITIONS ARE OBSOLETE.

P.S.—IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS.