TM 11-6625-564-12

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

OPERATOR AND ORGANIZATIONAL MAINTENANCE MANUAL:

MAINTENANCE KIT, ELECTRONIC EQUIPMENT MK-731/ARC-51X

This copy is a reprint which includes current pages from Change 1, 2, 3

HEADQUARTERS, DEPARTMENT OF THE ARMY

13 OCTOBER 1964

WARNING

Be careful when working with the + 225-volt dc power converter circuit. SERIOUS INJURY or DEATH may result from contact with terminals where this voltage is present.

CHANGE
No. 3

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D. C., *14 May 1974*

Operator's and Organizational Maintenance Manual
MAINTENANCE KITS, ELECTRONIC EQUIPMENT MK-731/ARC-51X AND MK-731A/ARC-51X

TM 11-6625-564-12, 13 October 1964, is changed as follows:

1. A vertical bar appears opposite changed material.
2. Remove and insert pages as indicated in the page list below:

Remove	*Insert*
1 through 4	1 through 4.2
17 and 18	17 and 18
41 through 44	

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

By Order of the Secretary of the Army:

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To be distributed in accordance with DA Form 12-36, (qty rqr block no. 95) Direct and General Support maintenance requirements for AN/ARC-51.

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HEADQUARTERS
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Operator and Organizational Maintenance Manual
MAINTENANCE KITS, ELECTRONIC EQUIPMENT MK–731/ARC–51X
AND MK–731A/ARC–51X

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3 through 6	3 through 6
7 through 15	7 through 15
17 through 20	17 through 20
21 through 26	21 through 26
29 through 34	29 through 34

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TECHNICAL MANUAL
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DEPARTMENT OF THE ARMY
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Operator and Organizational Maintenance Manual
MAINTENANCE KITS ELECTRONIC EQUIPMENT
MK-731/ARC-51X AND MK-731A/ARG-51X

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CHAPTER 1
INTRODUCTION

Section I. GENERAL

1-1. Scope

Note: Maintenance Kit, Electronic Equipment MK-731A/ARC-51X is similar to Maintenance Kit MK-731/ARC-51X. Information in the manual applies to both maintenance kits unless otherwise specified.

This manual describes Maintenance Kit, Electronic Equipment MK-731/ARC-51X and MK-731A/ARC-51X (referred to as the maintenance kit) (fig. l-l) and covers its operation and organizational maintenance. The maintenance includes preventive maintenance checks and services, cleaning, preservation, and replacement of indicator lamps.

1-2. Indexes of Publications

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

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

1-3. Forms and Records

a. Reports of Maintenance and Unsatisfactory Equipment. Maintenance forms, records, and reports which are to be used by maintenance personnel at all maintenance levels are listed in and prescribed by TM 38-750.

b. Report of Packaging and Handling Deficiencies. Fill out and forward DD Form 6 (Report of Packaging and Handling Deficiencies) as prescribed in AR 700-58/NAVSUP PUB 378/AFR 71-4/MCO P4030.29, and DSAR 4145.8.

c. Discrepancy in Shipment Repont (DISREP) (SF 361). Fill out and forward Discrepancy in Shipment Report (DISREP) (SF 361) as prescribed in AR 55-38/NAVSUPINST 4610.33/AFM 75-18/MCO P4610.19A, and DSAR 4500.15.

1-3.1. Reporting of Equipments Publication Improvements

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

Section II. DESCRIPTION AND DATA

1-4. Purpose and Use

a. Purpose. Maintenance kit (fig. l-l) provides a means for troubleshooting and aligning of Radio Set AN/ARC-51X and Radio Set AN/ARC-51BX. The maintenance kit is composed of two major components, as follows:

(1) Test Set, Radio TS-1962/ARC-51X, which provides facilities for connecting, switching, changing frequency, and monitoring the input signals to, or the output signals from, Receiver-Transmitter, Radio RT-702/ARC-51X, Receiver-Transmitter, Radio RT-742/ARC-51BX, or Simulator-Test Set, Radio SM-348/ARC-51X and SM-348A/ARC-51X.

(2) Simulator-Test Set, Radio SM-348/ARC-51X or SM-348A/ARC-51X, which is substituted for the Receiver-Transmitter, Radio RT-702/ARC-51X or the Receiver-Transmitter. Radio RT-742/ARC-51BX in the aircraft to facilitate troubleshooting aircraft wiring and associated communication units.

b. Use. The maintenance kit is used by the repairman to perform in-aircraft troubleshooting of the aircraft wiring, bench troubleshooting, and alignment of the RT-702/ARC-51X, or RT-742/ARC-51BX.

1-5. Technical Characteristics

a. General.

Ambient temperature range:
Operating . . . .-40°C to +55ºC
Nonoperating . . . . . -62ºC to +85ºC.
Ambient humidity range, operating or nonoperating. 95% at + 50ºC for 48 hours.
Altitude limits:
Operating . . . . . 10,000 feet.
Nonoperating . . . . . 50,000 feet.
Frequency control range. 225.000 to 399.95 mc in 0.05-mc steps
Weight . . . . . 80 pounds.

b. Simulator-Test Set Radio, SM-348/ARC-51X and SM-348A/ARC-51X.

Dc voltage input . . . .27.5 volts.
Dc power consumption:
Transmit . . . .330 watts.
Receive . . . . . .137.5 watts.
Test meter:
Meter movement . . . . ..0 to 50 microampere.
Accuracy . . . .3% at full scale.
Audio amplifier 1A1:
Input . . . . . .l milliwatt, l50 ohms.
output . . . . 250 milliwatts, 9.5 ohms-
Power converter 1A3:
Input . . . . . .+27.5 volts dc.
Output . . . . . .+l75 volts dc, 80 milliamperes or 225 volts dc, 15 milli-amperes.
Transient blanker 1A4:
Input . . . . . .+27.5 volts dc.
Output . . . . . .+27.5 volts dc +20 volts dc, and + 19.2 volts dc with power consump-tion 34 watts.
Uhf test generator lA5, frequency . . . . . .300 mc.
Readout mechanism, input . . . . . +27.5 volts dc.

c. Test Set Radio, TS-1962/ARC-51X.

Input power required . . . . . +27.5 volts dc with from 55 watts minimum to 385 watts maximum.
Audio amplifier No. 3:
Input . . . . . .600 picowattts, 5 ohms.
output . . . . . .l milliwatt, l50 ohms.
Dummy Load. . . . . .20 watts, 50 ohms.

1-5.1 Items Comprising Operable Maintenance Kits, Electronic Equipment MK-731/ARC51X and MKL-731A/ARC-51X

FSN		Nomenclature, part No. and mfr code	Fig. No.
66250824057		Maintenance Kit, Electronic Equipment MK-731/ARC-51X consisting of NOTE The part number is followed by the applicable 5-digit Federal supply code for manufacturers (FSCM) identified in SB 708-42 and used to identify manufacturer, distri-butor, or Government agency, etc.	1-1
6625-738-5982	1	Extender, Module MS-4911/ARC-51X	1-4
6625738-5981	1	Extender, Module MK-4910/ARC-51X	1-4
6625-738-5980	1	Extender, Module MX-4909/ARC-51X	1-4
6625-738-5979	1	Extender, Module MX-4908/ARC-51X	1-4
6625-738-5978	1	Extender, Module MX-4907/ARC-51X	1-4
6625-738-5977	1	Extender, Module MX-4906/ARC-51X	1-4
6625-965-1483	1	Test Set, Radio TS-1962/ARC-51X (Maintenance Float Item)	1-2
5995-985-8081	1	Cable Assembly, Special Purpose, Electrical CX-10191/ARC-51X	1-7
6625-985-8088	1	Cable Assembly, Special Purpose, Electrical CX-10190/ARC-51X	1-7
6625-935-8641	1	Cable Assembly, Special Purpose, Electrical CX-10189/ARC-51X	1-7
6625-985-8086	1	Cable Assembly, Special Purpose, Electrical CX-10188/ARC-51X	1-7
6625-985-8085	1	Cable Assembly, Special Purpose, Electrical CX-10187/ARC-51X	1-7

FSN	QTY	Nomenclature, part No. and mfr code	Fig No
6625-738-5985	1	Cable Assembly, Special Purpose, Electrical CX-10186/ARC-51X	1-6
6625-985-8084	1	Cable Assembly, Special Purpose, Electrical CX-10185/ARC-51X	1 - 6
6625-985-8077	1	Cable Assembly, RF: CG-1889/U 5 ft 0 in.	1-6
6625-985-8083	1	Cable Assembly, Special Purpose, Electrical CX-9053/ARC-51X	1-6
6625-985-8082	1	Cable Assembly, Special Purpose, Electrical CX-9052/ARC-	1-6
5180-738-6019	1	Tool Kit, Radio Set TK-155/ARC-51X	1-10
		consisting of	
4320—906-6336	1	Pump, Inflating 6A49450, 53800	
5120-908-4754	1	Alignment Tool: 544-8357-002, 13499	
5120-910-8803	1	Alignment Tool: 024-0168-00, 13499	
5120-201-3711	1	Alignment Tool: 548-9286-002, 13499	
5140-906-6373	1	Container, Tool: 024-0628-010, 13499	
5120-906-6380	1	Anvil: 756-7571-001, 13499	
5120-906-6376	1	Pin, Drift: 553-970940", 13499	
5120-952-0108	1	Key, Socket Head Screw: GT1003, 70276	
5120-995-9045	1	Key, Socket Head Screw: 024443940, 13499	
5120-198-5401	1	Key, Socket Head Screw: 050,08664	
6625-908-7391	1	Lead, Electrical: 544-83 W, 13499	
5120-202-2779	1	Alignment Tool: 548-2214-002, 13499	
5120-908-4752	1	Key, Socket Head Screw: 544-8398-002, 13499	
6680-908-6709	1	Gauge, Pressure: 17875-7229	
5120-906-6379	1	Socket, Wrench: 756-7579-001, 13499	
5120-906-6377	1	Socket, Wrench: 7567580-001, 13499	
5120-618-4433	1	Wrench, Torque, F10-1, 58332	
	1	Tool, Extraction (M6AD2-0498B0), CETC6B, 71468	
	1	Container, Tool: 024-0628-020, 13499	
	1	Case, Torque Wrench: (M6AD2-0498DO), 761-5947-001, 13499	
	1	Cover, Torque Wrench: 761-5945-001 (M6AD2-0498EO), 13499	
	1	Bag, Cotton Duck: 024-0642-010, 13499	
	1	Cushion, Extraction: 761-59444)01, 13499	
	1	Bag, Cotton Duck: 024-0102-00, 13499	
6625-738-5973	1	Simulator-Test Set, Radio SM-348/ARC-51X	1-2
6625-738-5976	1	Mounting Tray, Simulator, Radio Set MT-3371/ARC-51X	1-10
6625-965-1484	1	Cover, Test Set, Radio CW-710/ARC-51X	
5985-726-2290	1	Antenna: AS-1484/ARC-51X (Maintenance Float Item)	
6625-738-5990	1	Alignment Fixture, Spectrum Generator MX-6732/ARC-51X	
6625-738-5989	1	Alignment Fixture, Power Amplifier MX-6733/ARC-51X	1-7
6625-738-5986	1	Alignment Fixture, Receiver-preamplifier: MX-6734/ARC-51X	
5935-762-9306	1	Adapter, Connector U-335/ARC-51X	
5935-762-9307	1	Adapter, Connector U-334/ARC-51X	1-4
6625-738-5975	1	Extender, Module MX-4913/ARC-51X	
6625-738-5983	1	Extender, Module MX-4912/ARC-51X	
6625-985-8080	1	Cable Assembly, Radio Frequency CG-3120/ARC-51X	
6625-985-8079	1	Cable Assembly, Radio Frequency CG-3119/ARC-51X	
6625-985-8078	1	Cable Assembly, Radio Frequency CG-3118/ARC-51X	
5935-762-9805	1	Adapter, Connector U-336/ARC-51X	
6625-738-5991	1	Dummy Load, Electrical DA-397/ARC-51X	1-8

1-6. Components of the Maintenance Kit

Quantity	Component	Figure No.	Height (in.)	Depth (in.)	Width (in.)	Weight (lb.)
1	Maintenance Kit, Electronic Equipment MK-731/ARC-51X or MK-731A/ARC-51X	1-1	15-1/2	21-3/8	16	78.0
1	Test Set, Radio TS-1962/ARC-51X	1-1	9-9/16	15-7/8	21-1/4	8.5
1	Simulator Test Set, Radio SM-348/ARC-51X or 348A/ARC-51X	1-1	6-9/16	8-3/4	9-1/2	15
1	Cover, Test Set Radio CX-710/ARC-51X	1-1	7-7/8	15-7/8	20-7/16	21.5
1	Dummy Load, Electrical DA-397/ARC-51X	1-1	1-3/8	2-47/64	7-15/32	1.5
1	Antenna AS-1484/ARC-51X	1-1				0.18
1	Mounting Tray, Simulator Radio Set MT-3371/ARC-51X	1-1	9/32	14-1/5	9-1/2	1.13
1	Gable, Assembly, Special Purpose, Electrical CX-9052/ARC-51X 5' lg (W1)	1-6				1.08
1	Cable Assembly, Special Purpose, Electrical CX-9053/ARC-15X 5' lg (W2)	1-6				0.94

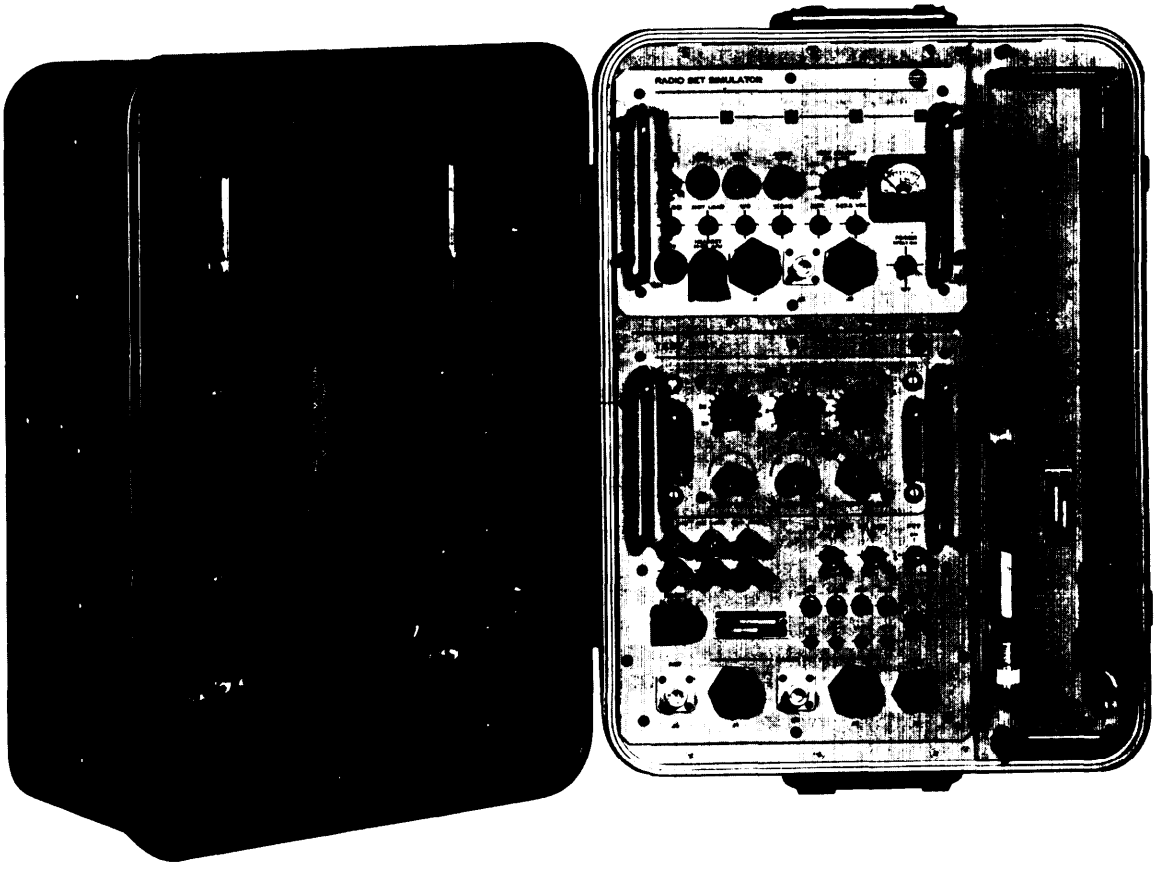
Quantity	Component	Figure No.	Height (in.)	Depth (in.)	Width (in.)	Weight (lb)
1	Cable Assembly, Radio Frequency CG-1889/U (5 ft 0 in.) (W3)	1-6				0.72
1	Cable Assembly, Special Purpose, Electrical CX-10185/ARC-51X 5' lg (W4)	1-6				1.31
1	Cable Assembly, Special Purpose, Electrical Branched CX-10186/ ARC-51X 6' lg (W5)	1-6				0.56
1	Cable Assembly, Special Purpose, Electrical CX-10187/ARC-51X 18" lg (W6)	1-7				0.19
1	Cable Assembly, Special Purpose, Electrical CX-10188/ARC-51X 18" lg (W7)	1-7				0.16
2	Cable Assembly, Special Purpose, Electrical CX-10189/ARC-51X (18" lg) (W8)	1-7				0.19
1	Cable Assembly, Special Purpose, Electrical CX-10190/ARC-51X (18" lg) (W9)	1-7				0.13
1	Cable Assembly, Special Purpose, Electrical CX-10191/ARC-51X (18" lg) (W10)	1-7				0.26
3	Cable Assembly, Radio Frequency CG-3118/ARC-51X (18" lg) (Wll)	1-7				0.05
3	Cable Assembly, Radio Frequency CG-3119/ARC-51X (18" lg) (W12)	1-7				0.06
3	Cable Assembly, Radio Frequency CG-3120/ARC-51X (18" lg) (W13)	1-7				0.06
1	Adapter, Connector U-336/ARC-51X	1-6	21 /32	21/32	1–3/4	0.11
1	Adapter, Connector U-334/ARC-51X	1-6	1-1/2	1-1/2	3-1/2	0.28
1	Adapter, Connector U-335/ARC-51X	1-6	1-1/2	1-1/2	3-1/2	0.28
1	Cable adapter storage bag	1-6				
1	Extender, Module MX-4906/ARC-51X	1-5	4-1/2	1-1/2	3-3/4	0.57
1	Extender, Module MX-4907/ARC-51X	1-5	4-1/2	3-1/2	3-3/4	1.04
1	Extender, Module MX-4908/ARC-51X	1–5	4-1/2	1	3-3/4	0.34
1	Extender, Module MX-4909/ARC-51X	1-5	4–1/2	3-1/2	3-3/4	0.77
1	Extender, Module MX-4910/ARC-51X	1-5	4-1/2	2-1/2	3-3/4	0.70
1	Extender, Module MX–4911/ARC–51X	1–5	4–1/2	4-1/2	3-3/4	1.13
1	Extender, Module MX-4912/ARC-51X	1-5	4-1/2	1–1/2	3-3/4	0.48
1	Extender, Module MX-4913/ARC-51X	1-5	4–1/2	2-1/2	3-3/4	0.60
1	Mounting tray, Module Extender MT-3372/ARC-51X	1-5	19-1/4	9-1132	4–25/64	3.25
1	A1ignment Fixture, Receiver-Pre. amplifier MX-6734/ARC-51X	1–8	1-9/16	1-7/8	4-7/16	0.78
1	Alignment Fixture, Power Amplifier MX-6733/ARC-51X	1–8	1-7/8	4–7/16	4-7/16	1.48
1	A1ignment Fixture, Spectrum Generator MX–6732/ARC–51X	1-8	1-7/8	2-7/16	4-7/16	1.06
1	Block, Locking MX-6731/ARC-51X	1-8	3/4	2-1/2	4-3/16	0.16
1	Tool Kit, Radio Set TK-155/ARC-51X composed of:	1-10				1.25
1	Tool bag	1-10				
1	Electrical extension lead	1-10				
1	Rotor alignment tool	1-10				
1	T-wrench, No. 8 hex.	1-10				
1	Hex. tip alignment tool	1-10				

Quantity	Component	Figure No.	Height (in.)	Depth (in.)	Width (in.)	Weight (lb)
1	Tuning wrench	1-10				
1	Ceramic screwdriver	1-10				
1	Ceramic screwdriver case	1-10				
1	Modified wrench	1-10				
1	Air pump	1-10				
1	Air gage	1-10				
1	Hex wrench	1-10				
1	Anvil	1-10				
1	Drift pin tool	1-10				
1	Special T-wrench	1-10				
1	Male coupling socket	1-10				
1	Female coupling socket	1-10				
1	Torque wrench	1-10				
1	Torque wrench case	1-10				
1	Torque wrench bag	1-10				
1	Coaxial extraction tool	1-10				
1	Coaxial extraction tool case	1-10				
1	Running spares	1-2				
1	8 spare panel lamps 1 spare 100-megacycle crystal Lubricating oil p/n 005-0116-000 (MK-731A/ARC-51X only)					

1.7 Common Names

Common Name	Nomenclature
Maintenance kit ------	Maintenance Kit, Electronic Equipment MK-731/ARC-51X or MK-731A/ARC-51X
Radio Set Simulator- - - -	Simulator-Test Set, Radio SM-348/ARC-51X or SM-348A/ARC-51X
Test unit ----------	Test Set, Radio TS-1962/ARC-51X
Transit case - - - - - - - - - -	Cover, Test Set, Radio CW-710/ARC-51X
Spectrum generator alignment fixture.	Alignment Fixture, Spectrum Generator MX-6732/ARC-51X

Common name	Nomenclature
Power amplifier alignment fixture.	Alignment Fixture, Power Amplifier MX-6733/ARC-51X
Receiver-preamplifier alignment fixture.	Alignment Fixture, Receiver-Preamplifier MX-6734/ARC-51X
Locking block	Block, Locking MX-6731/ARC-51X
Antenna	Antenna AS-1484/ARC-51X
Dummy Load	Dummy Load, Electrical DA-397/ARC-51X
Radio Set Simulator mounting tray.	Mounting Tray, Simulator, Radio Set MT-3371/ARC-51X
Rigid Module extender mounting tray.	Mounting Tray, Module Extender MT-3372/ARC-51X
Toolkit	Tool Kit, Radio Set TK-155/ARC-51X
Cable W1	Cable Assembly, Special Purpose, Electric al CX-9052/ARC-51X
Cable W2	Cable Assembly, Special Purpose, Electrical CX-9053/ARC-51X
Cable W3	Cable Assembly, Radio Frequency CG-1889/U (5 ft 0 in)
Cable W4	Cable Assembly, Special Purpose, Electrical CX-10185/ARC-51X



NOTE.
THE DA –397/ARC–51X IS MOUNTED ON THE RADIO SET SIMULATOR MOUNTING TRAY IN THE MK–731/ARC–51X.
THE DA–397/ARC–51X IS STORED IN THE TRANSIT CASE COVER IN THE MK–731A/ARC–51X.

TM6625–564–12–C2–

Figure 1-1. Maintenance Kits, Electronic Equipment MK-731/ARC-51X and MK-731A/ARC-51X.

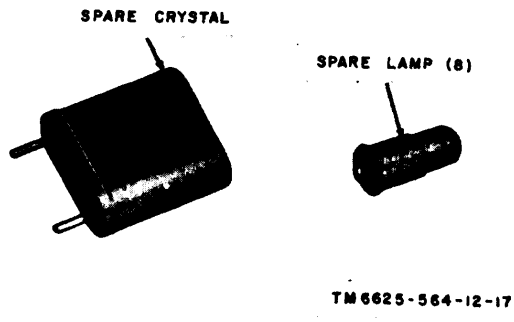


Figure 1-2. Running spares supplied with the MK-731/ARC-51X.

Common name	Nomenclature
Cable W5	Cable Assembly, Power, Electrical, B-ranched CX-10186/ARC-51X
Cable W6	Cable Assembly, Special Purpose, Electrical CX-10187/ARC-51X
Cable W7	Cable Assembly, Special Purpose, Electrical CX-10188/ARC–51X
Cable W8	Cable Assembly, Special Purpose, Electrical CX-10189/ARC-51X
Cable W9	Cable Assembly, Special Purpose, Electrical CX-10190/ARC-51X
Cable W10	Cable Assembly, Special Purpose, Electrical CX-10191/ARC-51X
Cable W11	Cable Assembly, Radio Frequency CG-3118/ARC-51X
Cable W12	Cable Assembly, Radio Frequency CG-3119/ARC-51X
Cable W13	Cable Assembly, Radio Frequency CG-3120/ARC-51X
Control cable adapter	Adapter, Connector U-334/ARC-51X
Frequency selector cable adapter.	Adapter, Connector U-335/ARC-51X
RF cable adapter	Adapter, Connector U-336/ARC-51X
Radio set	Radio set AN/ARC–51X or AN/ARC–51BX
Receiver-transmitter	Receiver-Transmitter, Radio RT-742/ARC-51X or RT–742/ARC–51BX
Radio set control	Control Radio Set C-4677/ARC-51X or C-6287/ARC-51BX
Receiver preamplifier module extender	Extender, Module MX–4906/ARC-51X
1st and 2d if. amplifier module extender	Extender, Module MX-4907/ARC-51X
3d if. amplifier module extender	Extender, Module MX-4908/ARC-51X
Modulator and audio module extender	Extender, Module MX-4909/ARC-51X
Specturm generator module extender	Extender, Module MX-4910/ARC-51X
Power amplifier module extender	Extender, Module MX–4911/ARC–51X
guard receiver module extender	Extender, Module MX-4912/ARC-51X
Power supply module extender	Extender, Module MX–4913/ARC-51X

1-8. Description of Maintenance Kit

The maintenance kit is composed of two major components: the test unit and the radio set simulator. Figure 1–3 shows the two major components of the maintenance kit.

1-9. Description of Radio Set Simulator

The radio set simulator is the smaller of the two major components shown in figure 1–3. It is removable from the transit case and is used in the aircraft in place of the receiver-transmitter during the in-aircraft troubleshooting procedure. All connectors, switches, lamps, operating controls, a monitoring meter, and two handles are located on the front panel. The frequency readout mechanism (fig. 2–3) is visible through the front panel.

1-10. Description of Test Unit

The test unit is the larger of the two major components shown in figure 1–3. It can be used either in or out of the transit case, whichever is more convenient. All connectors, switches, lamps, and operating controls are on the front panel. The section of the test unit above the indicator lamps is a radio set control simulator. This module containing two handles is removable and can be replaced by the radio set control when interconnected with cable W4.

1-11. Description of Minor Components

a. Transit Case (fig. 1–4). Cover, Test Set, Radio CW–710/ARC-51X, the transit case, is made of molded, reinforced fiberglass with aluminum framework and hardware. It provides a dustproof, portable enclosure for the equipment, with an air relief valve (not shown) for airborne transportation. The transit case is composed of two parts: One half houses the radio set simulator and the test unit. Also in this half are eight module extenders, an antenna, and an air pump, all mounted on a removable mounting tray. The other half of the transit case contains a radio set simulator mounting tray and a metal antenna scale, used for adjusting the length of the antenna supplied with the maintenance kit. The dummy load is stored next to the air pump in the MK-731/ARC-51X and in the radio test set cover in the MK-731A/ARC-51X. The door on the radio test set cover

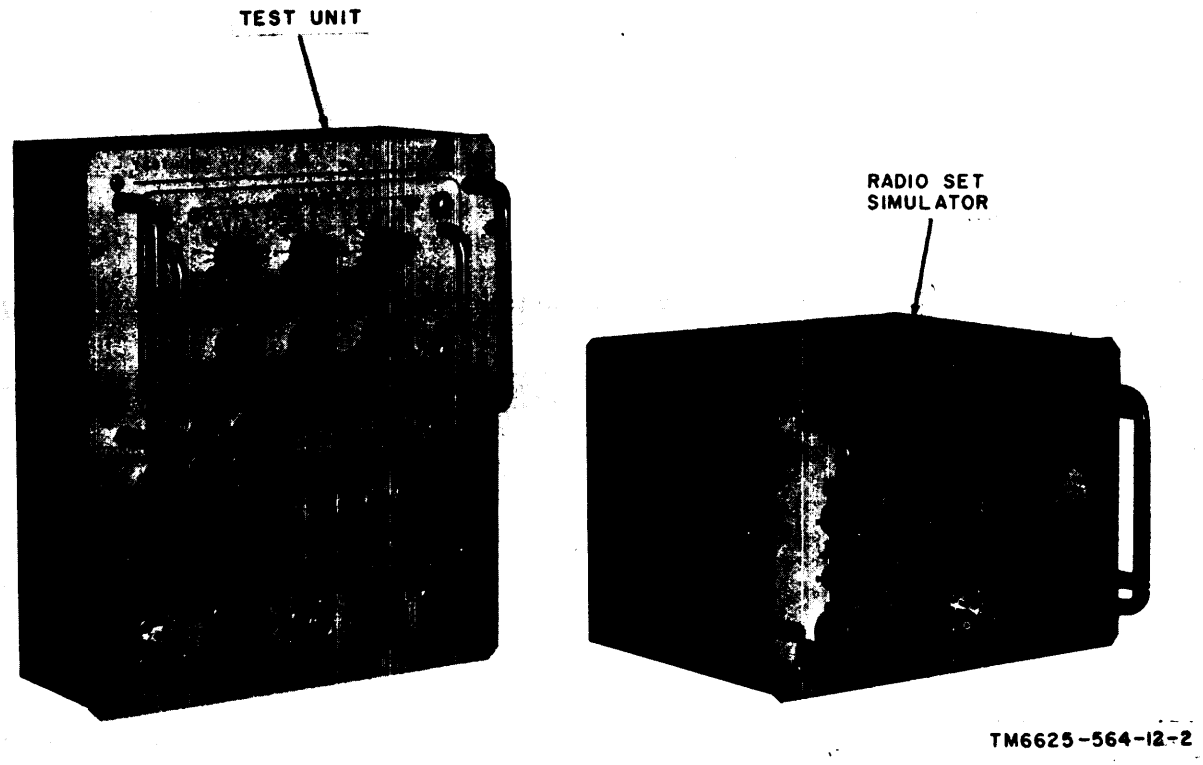


Figure 1-3. The major component of the maintenance kit.

provides access to a space containing test cables, tools, cable adapters; technical manuals, and a dummy load (MK-731A/ARC-51X only). The two halves are fastened together by four twist-lock clamps.

b. Rigid Module Extenders (fig. 1-5). The rigid module extenders are aluminum castings, in the shape of the modules they replace, that elevate the receiver-transmitter modules so modules can be worked on while still being electrically and mechanically connected to the receiver-transmitter. They also provide test points for monitoring all electrical leads except the coaxial type. The eight rigid module extenders, one for each module in the receiver-transmitter except mechanical tuner module A9, are stored in the rigid module extender mounting tray.

c. Main Cables and Cable Adapters (fig. 1–6). Five main cables and three adapters are provided with the maintenance kit. Each cable is identified by short nomenclature stamped on a band located on the cable. The following is a description of the main cables and adapters:

(1) *Cable W1.* Cable W1 is a 26-conductor rubber-covered cable, 5 feet long, with a 26-pin female connector on each end.

(2) *Cable W2.* Cable W2 is a 26-conductor rubber-covered cable, 5 feet long, with a 26-pin female connector on each end.

(3) *Cable W3.* Cable W3 is a coaxial cable, 5 feet long, with a male connector on each end.

(4) *Cable W4.* Cable W4 is a 32-conductor rubber-covered cable, 5 feet long, with a 32-pin female connector on each end.

(5) *Cable W5.* Cable W5 is a two-conductor rubber-covered cable, 6 feet long, with a three-pin male connector on one end and two alligator clips on the other end.

(6) *Cable adapters.* The control and frequency selector cable adapters have a 26-pin male connector at each end. The rf cable adapter has a female connectyor on each end. These

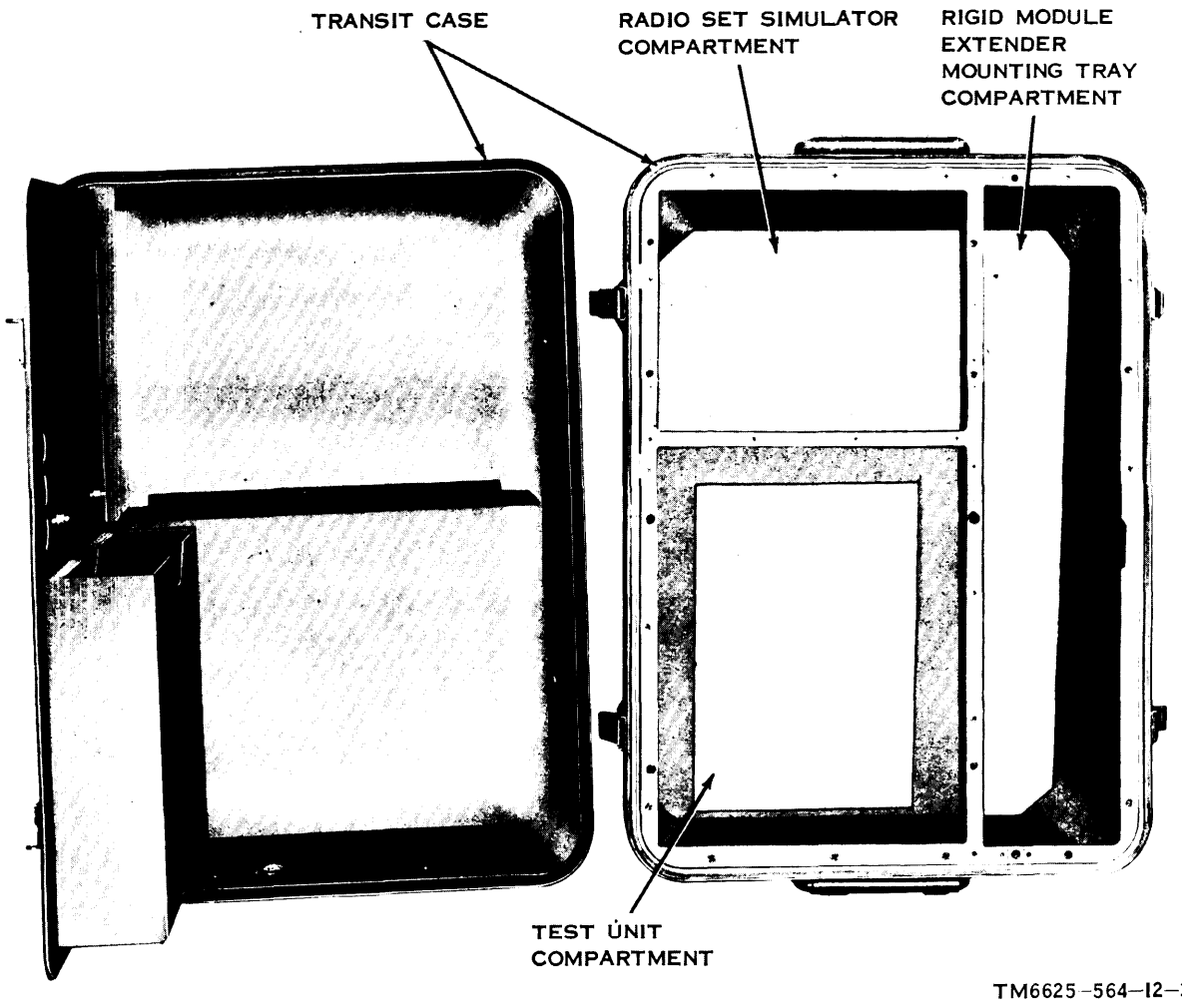


Figure 1-4. Cover, Test Set Radio CW-710/ARC-51X.

three cable adapters are stored in the cable adapter storage bag supplied.

d. Flexible Module Extenders (fig. 1–7). There are 8 flexible module extender cables (W6 through W13). With these cables all modules, except mechanical tuner module A9, can be electrically connected to the receiver-transmitter main chassis while the modules are mechanically disconnected for work on the bench.

(1) *Cable W6.* Cable W6 is a nine-conductor rubber-covered cable, 18 inches long, with a nine-pin male connector on one end and a nine-pin female connector on the other end.

(2) *Cable W7.* Cable W7 is a 10-conductor rubber-covered cable, 18 inches long, with a 10-pin male connector on one end and a 10-pin female connector on the other end.

(3) *Cable W8.* Cable W8 is a 15-conductor rubber-covered cable, 18 inches long, with a 15-pin male connector on one end and a 15-pin female connector on the other end.

(4) *Cable W9.* Cable W9 is a 10-condutor rubber-covered cable, 18 inches long, with a 10-pin male connector on one end and a 10-pin female connector ont he other end.

(5) *Cable W10.* Cable W10 is a 25-conductor rubber-covered cable, 18 inches long,

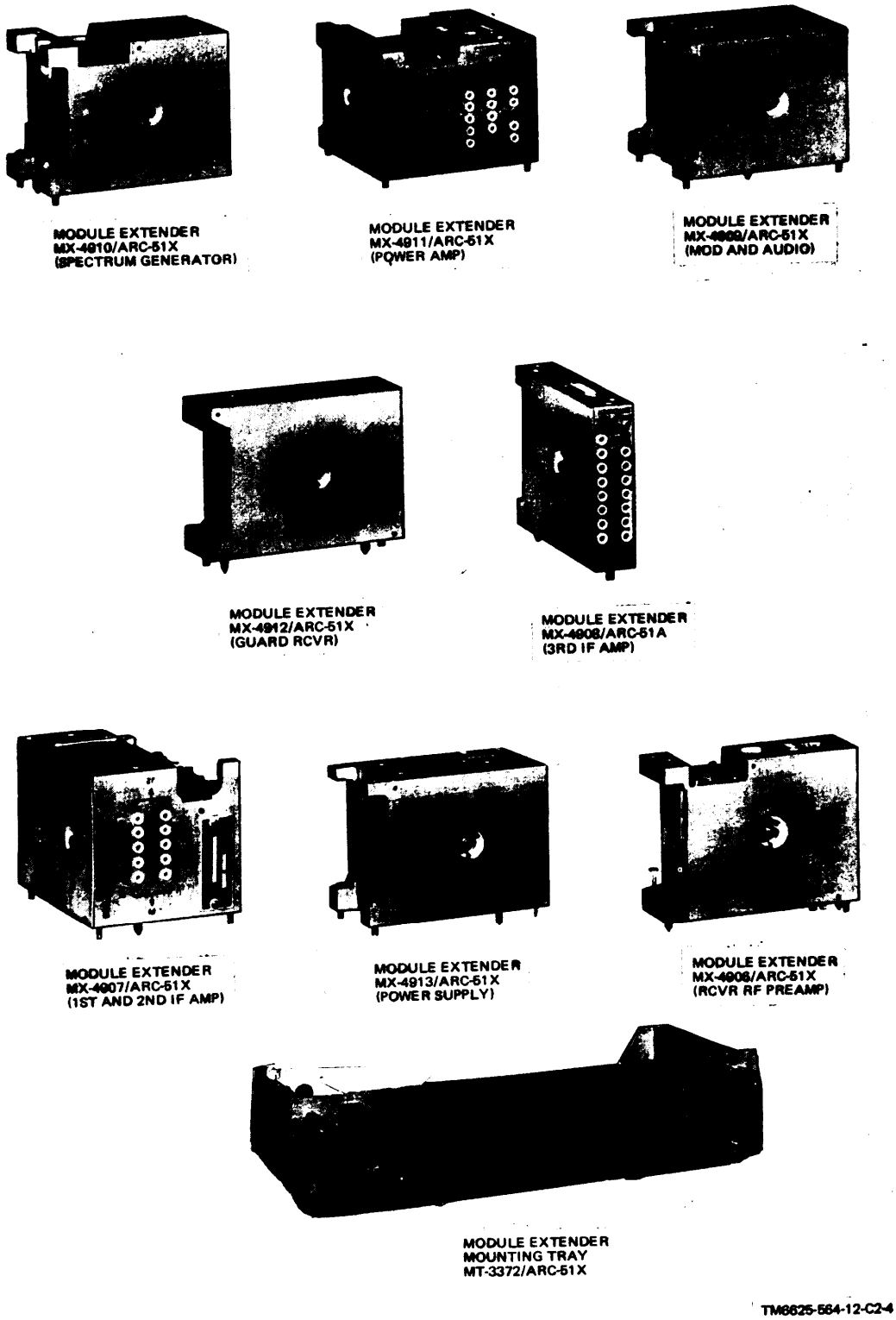


Figure 1-5. Rigid module exenders and, mountion tray.

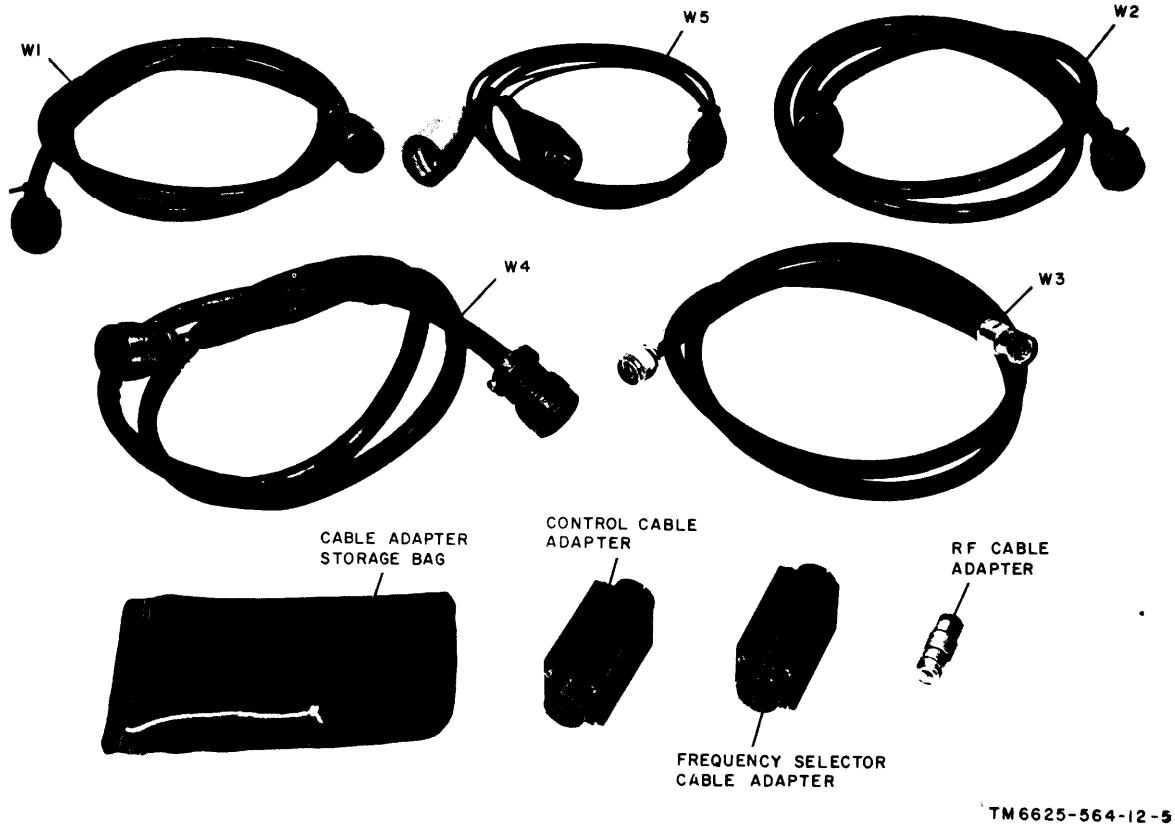


Figure 1-6. Main Cables, cable adapters, and cable adapter storage bag.

with a 25-pin male connector on one end, and a 25-pin female connector on the other end.

(6) *Cable W11.* Cable W1l is a coaixial vinyl-covered cable, 18 inches long, with a male microdot connector on one end and a female microdot connector on the other end.

(7) *Cablc W12.* Cable W12 is a coaxial vinyl-covered cable, 18 inches long, with a female microdot connector on one end and a female BNC connector on the other end.

(8) *Cable W13.* Cable W13 is a coaxial vinyl-covered cable, 18 inches long, with a male microdot connector on one end and a female BNC connector on the other end.

e. Alignment Fictures and Locking Block (fig. 1-8). The three alignment fixtures, spectrum generator alignment fixture, power amplifier alignment fixture, and receiver-preamplifier alignment fixture, are used to hold the coupler halves of power amplifier module A6, receiver radiofrequency (rf) preamplifier module Al, and spectrum generator module A5 during the alignment of their gear trains. The locking block attaches to the base of first and second intermediate frequency (if.) amplifier module A2, to hold the if. at 25 megacycles during alignment of the preamplifiers.

f. Dummy Load and Antenna. (fig. 1-9). The dummy load provides the transmitter with a load of 50 ohms for use during transmitter testing. The adjustable whip antenna is used during receiver-transmitter testing.

g. Toolist (fig. 1–10). The toolkit provides a11 the special tools necessary for the use of the maintenance kit by the technician. The running spares consisting of eight panel lamps and one 100-megacycle crystal (fig. 1–2) are stored in the toolkit bag.

h. Radio Set Simulator Mounting Tray (fig. 1-11). The radio set simulator mounting tray is an aluminum framework with two wingnut

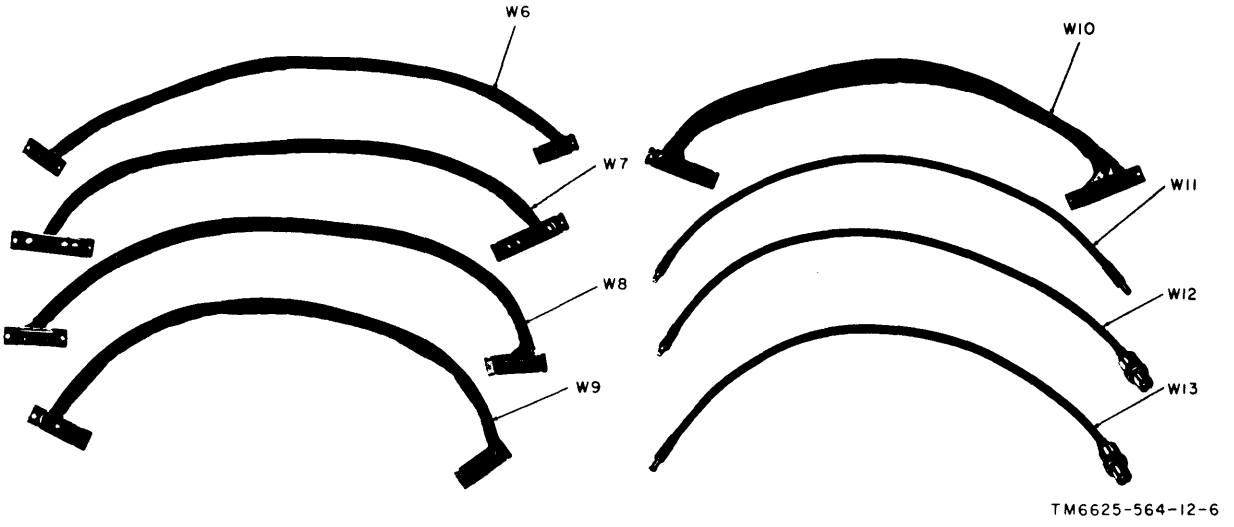


Figure 1-7. Flexible module extenders.

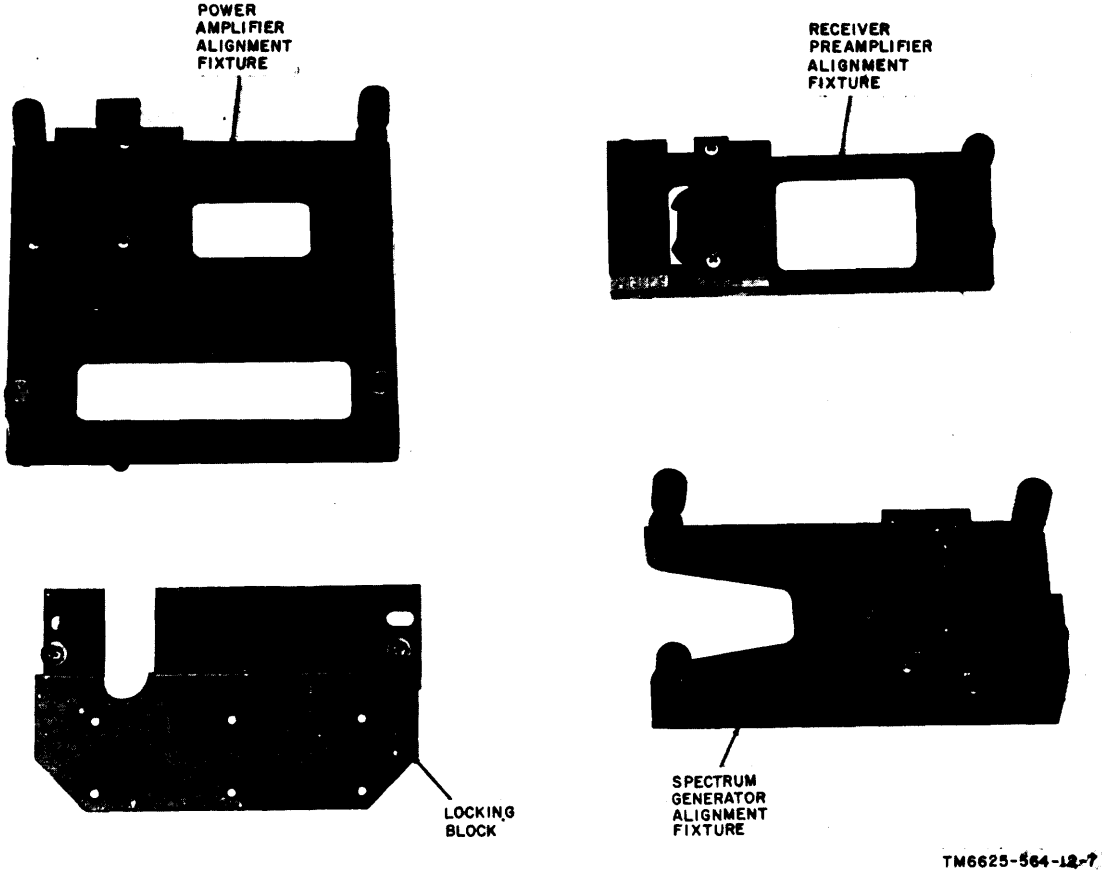
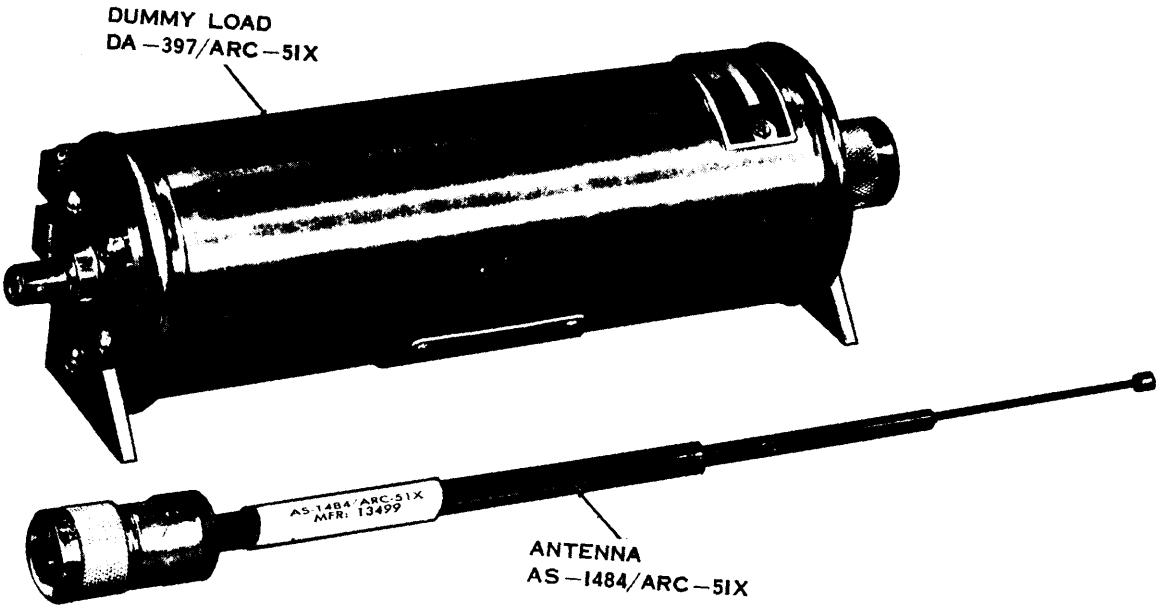


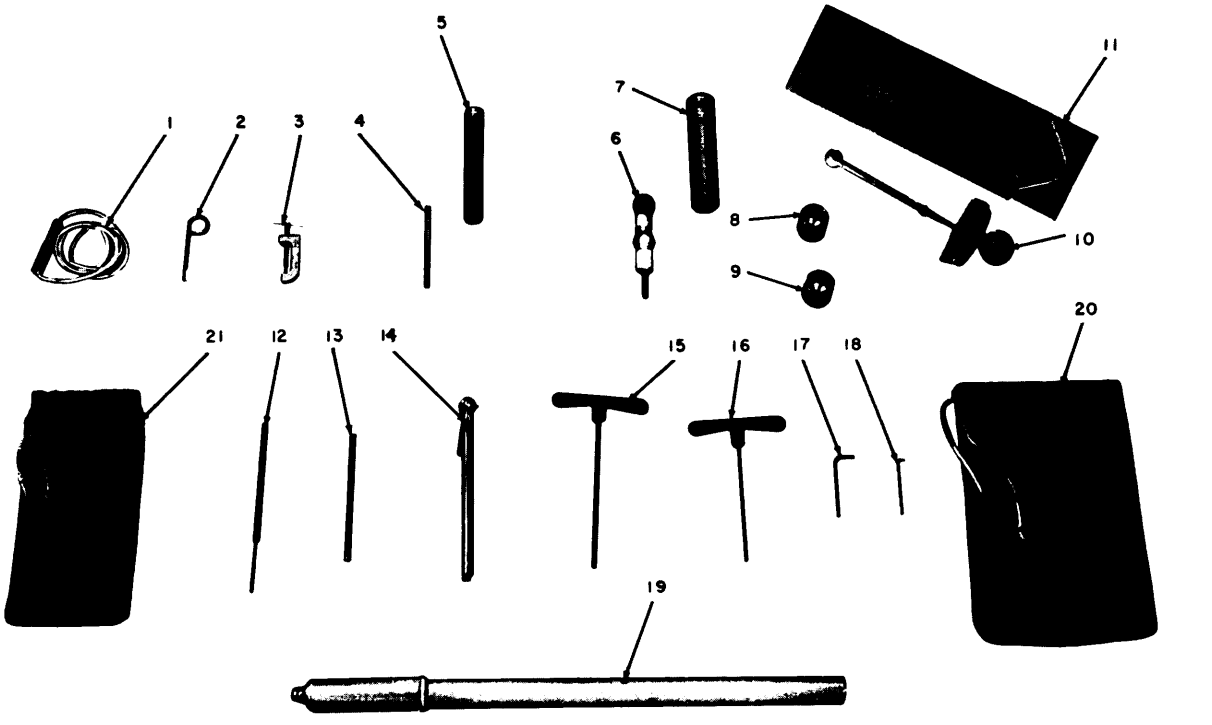
Figure 1-8. Alignment fixtures and locking block.



TM 6625-564-12-C2-8

Figure 1-9. Dummy load and antenna.

holddown assemblies to hold the tray to the mounting in the aircraft. Holes are located in the tray to secure the radio set simulator to the tray with screws.



1 Electrical extension lead
2 Rotor alignment tool
3 Anvil and drift pin tool
4 Ceramic screwdriver
5 Ceramic screwdriver case
6 Coaxial extraction tool
7 Coaxial extraction tool case
8 Male coupling socket
9 Male coupling socket
10 Torque wrench
11 Torque wrench case
12 Hex tip alignment tool
13 Tuning wrench
14 Air gage
15 No. 8 hex T-wrench
16 Special T-wrench
17 Hex wrench
18 Modified wrench
19 Air pump
20 Toolkit bag
21 Torque wrench bag

Figure 1-10. Toolkit.

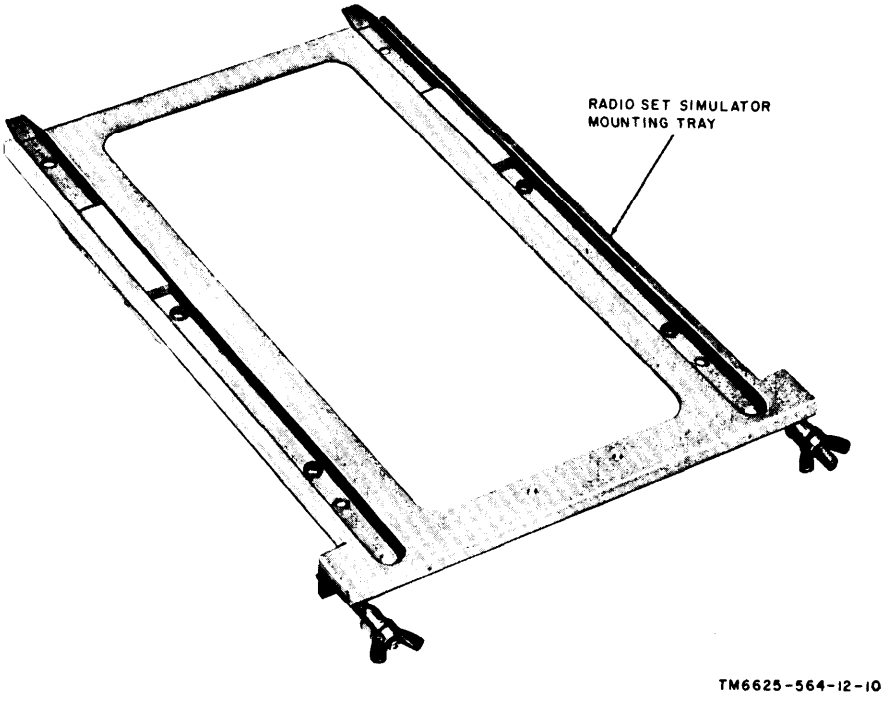


Figure 1-11. Radio set simulator mounting tray.

1-12. Difference in Models

Differences	*MK–731/ARC-51X*	*MK-731A/ARC-51X*
Uhf test generator 1A5	Contains vacuum tubes	Replaces vacuum tubes with transistors
Dummy load	Mounted on removable mounting tray	Stored in transit case cover

CHAPTER 2
OPERATION

Section I. SERVICE UPON RECEIPT OF EQUIPMENT

2-1. Unpacking

a. Packaging Data. All components of the maintenance kit are contained in the transit case. When packed for shipment, the air vent on the transit case is opened, and the maintenance kit is placed in a moisture-dust-proof barrier bag, 17 by 17 by 23 inches. After the free air is removed and the bag is sealed, the maintenance kit is placed on four polystyrene corner blocks that are in the four bottom corners of a tri-ply fiberboard box. Four more corner blocks are then placed on the top four corners of the maintenance kit. The box is then closed and taped shut. The box is 19 by 19 by 25 inches, the *corner* blocks are 6 by 6 by 6 inches with cutouts of 4 by 4 by 4 inches, the total weight is 81 pounds, and the volume is 5.2 cubic feet. A typical-shipping box and its contents are shown in figure 2-1.

b. Removing Contents.

(1) Use a knife to cut the tape on the box. Open the four flaps.

(2) Remove the four corner blocks from the top of the box. Remove the bag and its contents. Tear the bag away from the maintenance kit.

(3) Disengage the four twist-lock clamps and open the transit case.

(4) Remove the radio set simulator by loosening four retaining screws.

(5) Remove the test unit by removing four redheaded screws.

(6) Remove the rigid module extender mounting tray by loosening four retaining screws. Remove the antenna, dummy load, and air pump from their respective clips on the module extender mounting tray (MK-731/ARC-5lX). Remove the rigid module extender with a T-wrench from the toolkit. Remove the alignment fixtures and the locking block from the mounting tray by loosening four retaining screws on each.

(7) Remove the radio set simulator mounting tray from the access door by loosening four retaining screws.

(8) Unlock the access door by sliding the two slide-lock fasteners. Lift the door.

(9) Remove the technical manuals, cables, cable adapters, dummy load (MK-731A/ARC-51X), and toolkit from the storage spaces.

2-2. Checking Unpacked Equipment

a. Inspect the equipment for damage during shipment. If the equipment has been damaged, refer to paragraph 1-3.

b. Check the equipment against the packing list. If no packing list accompanies the equipment, refer to paragraphs 1-5.1 and 1-6, and report any overages or shortages on DD Form 6.

c. If the equipment has been used or reconditioned, see whether it has been changed by a modification work order (MWO). If modified, an MWO number will appear on the front panel near the nomenclature plate. Check to see whether the MWO number and appropriate notations concerning the modification have been annotated in this manual.

Note: Current MWO's applicable to the equipment are listed in DA Pamphlet 310-4.

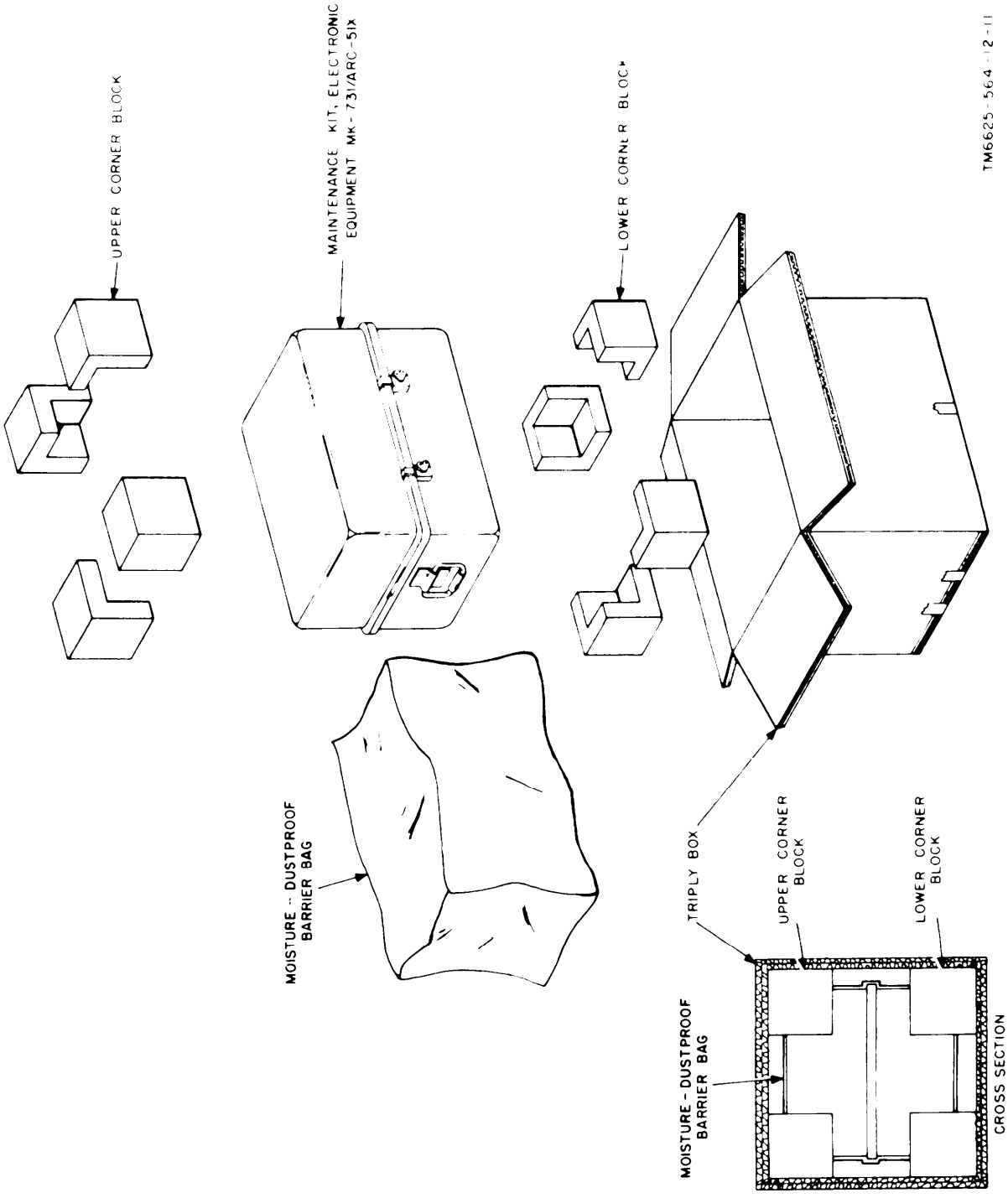


Figure 2-1. Typical packaging.

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Section II. OPERATING INSTRUCTIONS

2-3. Controls, Indicators, and Connectors

The charts in *a* through *d* below list the maintenance kit controls, indicators, and connectors and indicate their functions:

a. Test Unit Control and Indicator (fig. 2–2).

Control or indicator	Function
FUNCTION SELECT switch (four-position rotary)	Applies power to radio set and selects type of operation. Switch position — Action OFF — Removes operating power from receiver-transmitter, T/R — Applies power to the receiver-transmitter for transmission and reception; guard receiver is not operative. T/R+G — Same as T/R position except that guard receiver is operative. ADF — Same as T/R position except that the aircraft automatic direction finder system is in operation.
AUDIO GAIN potentiometer	Controls audio level applied to headset.
SENSITIVITY potentiometer and SQ DIS switch	Adjusts radio set main receiver sensitivity, When rotated fully clockwise, it disables the squelch.
FREQ SELECT switches:	
10-megacycle control (l8-position rotary switch)	Selects portion of receiver-transmitter operating frequency in 10-megacycle steps (first two digits).
l-megacycle control (l0-position rotary switch)	Selects portion of receiver-transmitter operating frequency in l-megacycle steps (third digit).
0.1–megacycle control (20-position rotary switch)	Selects portion of receiver-transmitter operating frequency in 0.05-megacycle steps (fourth and fifth digits).
POWER RESET switch circuit breaker (two-position)	Connects and disconnects power to test unit. Switch position — Action OFF — Removes +27.5 volts dc from test unit. RESET ON — Applies +27.5 volts dc to the test unit.
MIC SELECT switch	Connects the HDSET H–101A/U or the DUM MIC jacks to the modulator and audio module of the receiver-transmitter. Switch position — Action DUM MIC — Connects DUM MIC jacks to modulator and audio module of receiver-transmitter. Disconnects audio amplifier No. 3 output from this module. HD SET — Connects audio amplifier No. 3 output to modulator and audio module of receiver-transmitter. Disconnects the DUM MIC jacks from this module.
PIT switch (three-position)	Keys the receiver-transmitter. Switch position — Action ON — Grounds radio set keying relay, placing radio set in transmitting condition. XMIT lamp lights. OFF — Ungrounds keying relay. Puts receiver-transmitter in receive condition. MOM ON — Places the receiver-transmitter in transmitting condition and automatically switches to OFF when released. XMIT lamp lights.

Control or indicator	Function
RF DET switch (two-position)	Connects either main audio or detected signal from receiver-transmitter to HDSET H–101A/U and MAIN AUDIO jacks. OFF — Connects main audio signal to HD SET H-101A/U jack, though audio gain control. ON — Disconnects main audio signal from headset, Applies detected rf signal from receiver-transmitter to HDSET H-101A/U through AUDIO GAIN control.
	POWER switch set to RESET ON:
T/R lamp	Lights when FUNCTION SELECT switch is turned to T/R.
T/R+G lamp	Lights when FUNCTION SELECT switch is turned to T/R+G.
ADF lamp	Lights when FUNCTION SELECT switch is turned to ADF.
XMIT lamp	Lights when PTT switch is set to ON or MOM ON.
J6 connector (not shown; located on test unit at rear of radio set control simulator. Radio set control simulator must be removed to reach this connector.	Provides a connection between test unit and radio set control during testing procedures.

b. Test Unit Connectors. (fig. 2-2).

Connector	Function
J1	Provides electrical connections to test unit from receiver-transmitter under test.
J2	Provides electrical connections to test unit from receiver-transmitter under test.
J5	Provides electrical connections to test unit from +27.5-volt dc power source.
J3	Provides facilities for rf interconnection to receiver-transmitter.
J4	Provides a connection from test unit to either an antenna or dummy load.
MAIN AUDIO (two jacks)	Provides points for testing main audio signal. Lower jack is ground.
AUX AUDIO (two jacks)	Provides points for testing auxiliary audio signal. Lower jack is ground.
DUM MIC (two jacks)	Provides points at which an audio oscillator signal can be applied through the test unit to receiver-transmitter. Lower jack is ground.
AVC jack	Provides test point to check radio set ave.
CAR RELAY JACK	Provides a test point to check if squelch relay K1 is energized or not.
+225V jack	Provides a test point to check for ADF plate voltage and whether adf relay K8 is energized or not.
+27.5V jack	Provides test point to check input voltage to test unit.
HDSET H-101A/U jack	Provides jack to connect headset to test unit.

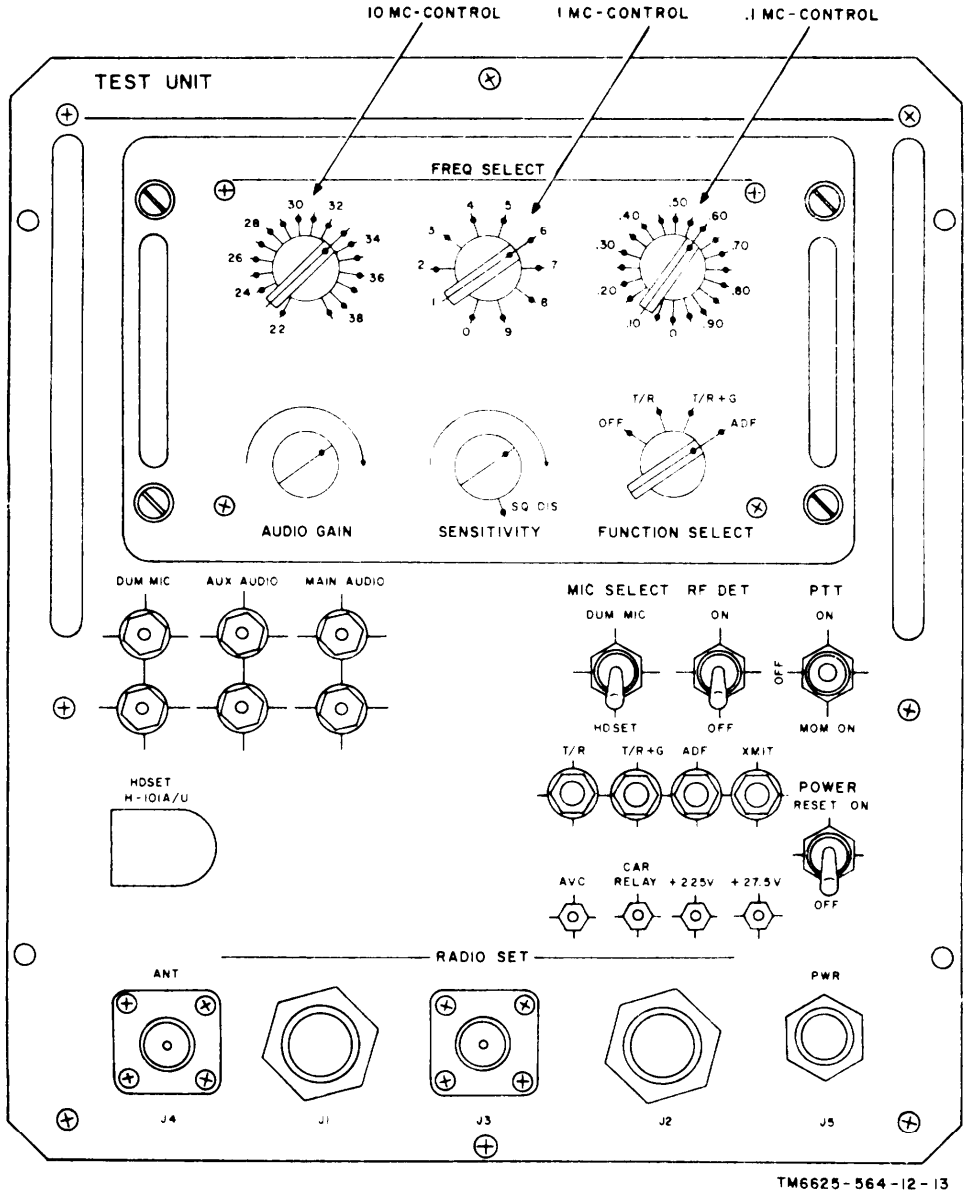

Figure 2-2. Test unit panel controls, indicators, and connectors.

c. Radio Set Simulator Controls and Indicators. (fig. 2-3).

Control or indicator	Function
Monitoring meter TEST SELECT SWITCH (nine-position rotary)	Selects circuit to be monitored by metering circuit. Switch position — Action OFF — Disconnects the meter from the metering circuits. ADF — Connects the meter to the ADF low voltage metering circuit.

Control or Indicator	Function
	+27.5V — Connects the meter to the aircraft power metering circuits.
	+22.5V — Connects the meter to the ADF +225-volt dc metering circuit.
	AUX AUDIO — Connects the meter to the AUX AUDIO metering circuit.
	REMOTE SENS — Connects the meter with SENS control circuit of the radio set control. Meter reading varies from 0 to 8 as SENS control is rotated.
	SHIELD GND — Connects the meter to the shield ground metering circuit.
	VSWR CAL — Connects the meter to the forward power metering circuit of the directional coupler for setting the VSWR CAL control and connects +175 Volts dc (MK-731/ARC-51X) or +27.5 volts dc (MK-731A/ARC-51X) to uhf generator 1A5.
	VSWR TEST — Connects the meter to the reflected power metering circuit of the directional coupler to check the vswr of the aircraft antenna and the rf feedline. Connects +175 volts dc (MK-731/ARC-51X) or +27.5 volts dc (MK-731A/ARC-5lX) to uhf generator 1A5.
POWER (two-position switch)	Connects or disconnects the 27.5 volts dc to the radio set simulator,
	Switch position: OFF — Action: +27.5-volt dc power is disconnected from the radio set simulator,
	Switch position: RESET ON — Action: Connects 27.5-volt dc power to the radio set simulator.
VSWR CAL. potentiometer	Adjusts the output of the uhf test generator.
AUDIO GAIN potentiometer	Controls the volume to the headset from audio amplifier No. 2.
XMIT LOAD (two-position switch)	Places load on the +27.5-volt dc power supply while simulating XMIT conditions,
	Switch position: ON — Action: Applies +27.5 volts dc to the XMIT load circuit. The XMIT and XMIT LOAD lamps should light.
	Switch position: OFF — Action: Disconcerts the power source from the XMIT LOAD circuit.
PTT (pushbutton switch)	Causes the radio set simulator to generate a mock transmitting condition in the aircraft.
	Switch position: Depressed — Action: Turns on transmit portion of radio set simulator, (if the TEST SELECT switch is in a VSWR position) and disconnects the ADF portion of radio set simulator, XMIT lamp lights.
	Switch position: Released — Action: Turns off transmit portion of test set, (if the TEST SELECT switch is in a VSWR position) and connects the ADF portion of radio set simulator.

Control or indicator	Function
CAR RELAY (pushbutton switch)	Applies ground to a terminal of squelch relay Kl. Used for automatic relaying of signals when aircraft is equipped with two radio sets for this purpose. Switch position — Action Depressed — Grounds pin S of jack J2. Released — Disconnects pin S from ground.
Control or indicator	
Meter	Monitors and provides indications for various settinxs of TEST SELECT switch S1.
Readout mechanism	Indicates receiver-transmitter operating frequency.
HEADSET H-101 A/U	Provides jack for operator to plug headset into system.
+27.5 VDC lamp	Lights when POWER switch is set to RESET ON.
XMIT lamp	Lights when PTT pushbutton switch is depressed.
T/R+G lamp	Lights when radio set control function select switch is set to T/R+G.
T/R lamp	Lights when radio set control function select switch is set to T/R.
XMIT LOAD lamp	Lights when XMIT LOAD switch is set to ON.
SQ. DIS lamp	Lights when the radio set control SENS knob is turned fully clockwise.

d. Radio Set Simulator Connectors. (fig. 2-3).

Connectors	Function
J1	Provides electrical connections to the radio set simulator from the aircraft radio set control.
J2	Provides electrical connections to the radio set simulator from the aircraft radio set control and ADF equipment.
J3	Provides electrical connections to the radio set simulator from the aircraft UHF antenna.

2-4. In-Aircraft and Bench Test Procedures

a. To perform in-aircraft troubleshooting of the radio set, perform the preliminary in-aircraft starting procedures (para 2–5) in this manual and refer to TM 11-5820-518–35 for operating and troubleshooting procedures.

b. To perform bench troubleshooting of the radio set, perform the preliminary starting procedures (para 2–7) in this manual and refer to TM 11-5820-518–35 for operating and trouble shooting procedures.

c. A complete list of all the cable connections used in troubleshooting procedures is indicated in the chart below.

Cable or cable adapter	Connection To	Connection From
Cable W1 [a]	J2 on test unit	J12 on receiver-transmitter or J2 on radio set simulator
Cable W2 [a]	J1 on test unit	Jll on receiver-transmitter or J1 on radio set simulator
Cable W3 [b]	J3 on test unit	J1 on receiver-transmitter or J3 on radio set simulator
Cable W4	J6 on test unit	J1 on radio set control
Cable W5	J5 on test unit	External +27.5-volt dc source
Cable W6	P1 on receiver-transmitter module A1	J1 on receiver-transmitter chassis

Cable or cable adapter	Connection To	Connection From
Cable W7	P1 on receiver-transmitter module A2	J2 on receiver-transmitter chassis
Cable W8	P1 on receiver-transmitter module A3	J3 on receiver-transmitter chassis
Cable W8	P1 on receiver-trasmitter module A4	J4 on receiver-transmitter chassis
Cable W8	P1 on receiver-transmitter module A6	J6 on receiver-transmitter chassis
Cable W8	P1 on receiver-transmitter module A8	J8 on receiver-transmitter chassis
Cable W9	P1 on receiver-transmitter module A5	J5 on receiver-transmitter chassis
Cable W9	P1 on receiver-transmitter module A7	J7 on receiver-transmitter chassis
Cable W10	P1 on receiver-transmitter module A9	J9 on receiver-transmitter chassis
Cable W11	Receiver-transmitter module coaxial connectors	Reciver-transmitter chassis coaxial connectors
Cable W12	Receiver-transmitter module coaxial connectors	Test equipment BNC connectors
Cable W13	Receiver-transmitter module coaxial connectors	Test equipment BNC connectors
Control cable adapter	Radio set control cable	Cable W1 [a]
Frequency selector cable adapter	Aircraft frequency cable	Cable W2 [a]
Rf cable adapter	Aircraft rf cable	Cable W3 [b]

a Cables W1 and W2 aare also used in the aircraft as an extension between the aircraft control cales and jacks J1 and J2 on the radio set simulator.

b Cables W3 is used in the aircraft as an extension between the aircraft antenna cable and jack J3 on the radio set simulator.

2-5. Preliminary In-Aircraft Starting Procedure for Radio Set Simulator

Perform the operations listed below before starting the equipment.

a. Secure radio set simulator to the receiver-transmitter mounting in the aircraft.

b. Set the radio set simulator controls to the positions listed in the following chart.

Control	Position
POWER	OFF
TEST SELECT	OFF
XMIT LOAD	OFF

c. Connect aircraft cable cnnectors P1 and P2 to jacks J1 and J2, respectively, on the radio set simulator.

d. Connect the radio set antenna cable to jack J3 on the radio set simulator,

e. Plug the headset into the radio set simulator HEADSET H-101 A U jack.

2-6. Stopping Procedure for Radio Set Simulator

Perform the following procedures to remove radio set simulator from operation:

a. Turn TEST SELECT switch to OFF.

b. Set POWER switch to OFF.

c. Set radio set control FUNCTION SELECT switch to OFF.

d. Disconnect cables from jacks Jl, J2, and J3.

e. Disconnect headset from HEADSET H-101 A U jack.

2-7. Preliminary Starting Procedure for the Test Unit

Perform the operations listed below before starting the equipment.

a. Control Settings. Set the test unit controls to the positions listed in the following chart:

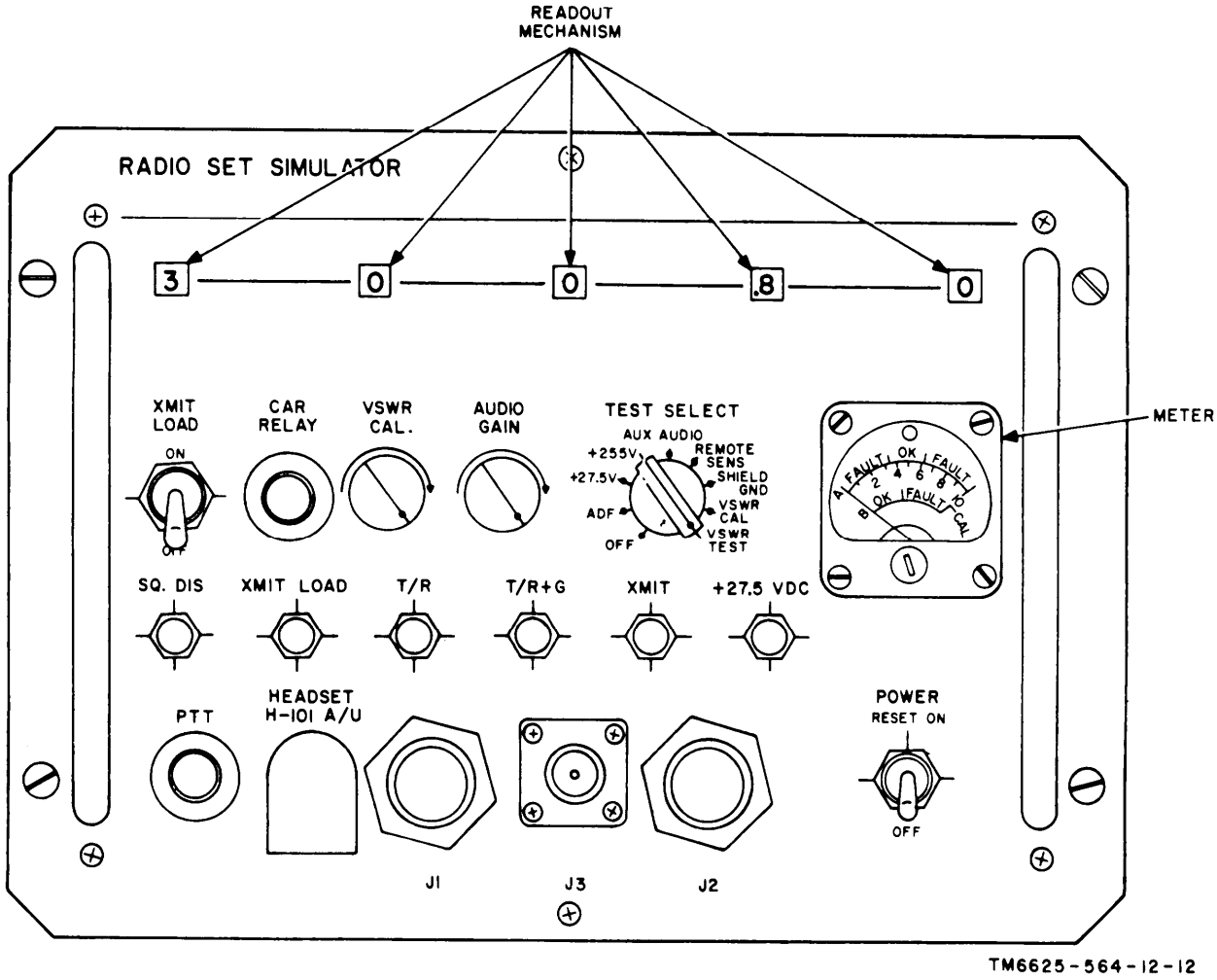

Figure 2–3. Radio Set Simulator panel controls, indicator, and connectors.

Control	Position
POWER RESET	OFF
FUNCTION SELECT	OFF
PTT	OFF

b. Bench Test Connections. Figure 2–4 shows typical bench test setup connections for testing the receiver-transmitter, Make the connections as indicated in the following chart:

Cable	Connects	
	From	To
W1	J2 of test unit	J12 of receiver-transmitter
W2	J1 of test unit	Jll of receiver-transmitter
W5	J5 of test unit	+27.5-volt dc power supply
W3	J3 of test unit	J13 of receiver-transmitter
None	J4 of test unit	Dummy load or antenna

2-8. Stopping Procedures for Test Unit

Perform the following steps to remove the test unit from operation:

a. Set the following switches to OFF;
(1) PTT switch.
(2) FUNCTION SELECT switch.
(3) POWER switch,

b. Disconnect all cables from the test unit.

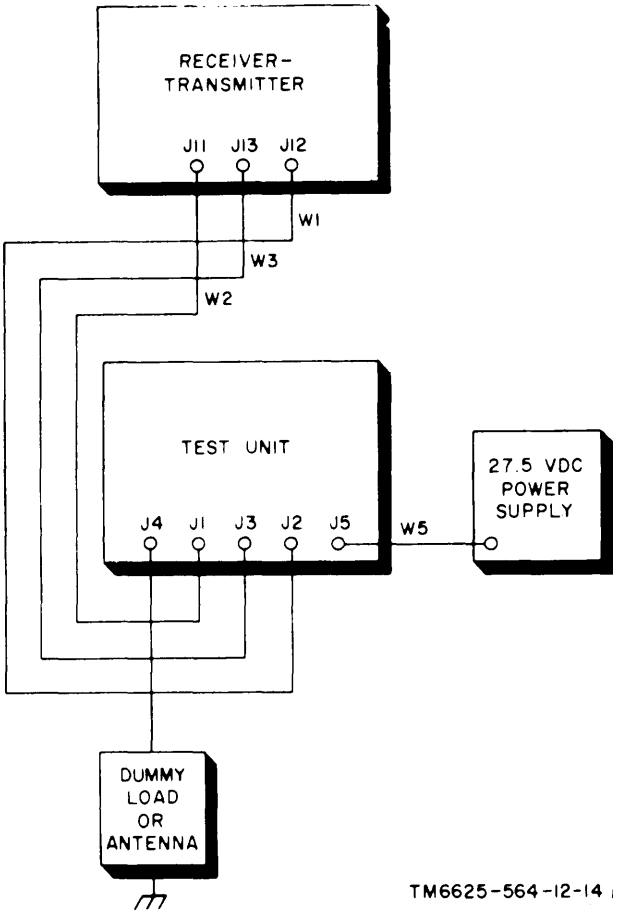

Figure 2-4. Typical bench test setup block diagram.

CHAPTER 3

MAINTENANCE INSTRUCTIONS

Note: The operator will perform and organizational maintenance.

3-1. Scope of Maintenance

The maintenance duties assigned to the operator are listed below, together with a reference to the paragraphs covering the specific maintenance functions. The paragraphs include instructions for performing preventive and corrective maintenance. No tools or materials other than those listed in the paragraph 3-2 are required.

a. Daily preventive maintenance checks and services (para 3–4).

b. Cleaning (para 3-6).

c. Monthly preventive maintenance checks and services (para 3–7).

d. Preservation (para 3-9).

e. Quarterly preventive maintenance checks and services (para 3–10).

f. Replacement of indicator lamps (para 3–12).

3–2 Tools and Materials Required for Maintenance

The tools and materials required for organizational maintenance are listed below:

a. Phillips screwdriver.

b. Lint-free cloth.

c. Blade screwdriver.

d. Sandpaper, extra fine #000.

e. Small soft-bristle brush.

f Rubber electrician's tape.

g. Materials for repainting, (Refer to TM 9-213.)

h. Hexagon wrench, #8.

3-3. Preventive Maintenance

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

a. Systematic Care. The procedures given in paragraphs 3–4 through 3–11 cover routine systematic care and cleaning essential to proper upkeep and operation of the equipment,

b. Preventive Maintenance Checks and Services. The preventive maintenance checks and services charts (para 3–5, 3–8, and 3–11) outline functions to be performed at specific intervals. These checks and services maintain Army electronic equipment in a serviceable condition, that is, in good general (physical) condition and in good operating condition. To assist operators in maintaining serviceability, the charts indicate what to check, how to check, and what the normal conditions are; the *References* column lists the illustrations, paragraphs, or manuals that contain supplementary information. *If the defect cannot be remedied by performing the corrective action indicated, higher level maintenance or repair is required.* Records and reports of these checks and services must be made in accordance with the requirements set forth in TM 38–750.

3-4. Daily Preventive Maintenance Checks and Services

Preventive maintenance checks and services of the maintenance kit are required daily. A daily period is defined as 8 hours of equipment operation. Parapraph 3-5 specifies checks and services that must be accomplished daily or under the special conditions listed below:

a. When the equipment is initially installed.

b. When the equipment is reinstalled after removal for any reason.

c. At least once each week if the equipment is maintained in a *standby* condition.

3-5. Daily Preventive Maintenance Checks and Services Chart

Sequence No.	Item	Procedure	References
1	Exterior surfaces.	Clean the maintenance kit panel and the meter. Check for broken meter glass.	Para 3-6
2	Knobs, switches and lamps.	a. During operation see that the knobs, switches, and lamps operate properly. b. Tighten any loose knobs with a No. 8 hex- wrench. c. Replace all burned-out lamps. d. If trouble remains, contact higher level maintenance for repair.	Para 3-12.
3	Operational test.	During operation, be alert for any unusual operating indications. If any unusual indications occur, remove all power and contact higher level maintenance for repair.	Paras 2-5 through 2-8.

3-6. Cleaning

Caution: **Do not use any cleaning solvent on the front panels or anywhere there is silk screening.**

Inspect the exterior of the test unit, radio set simulator, and the transit case. The exterior surface should be free of dirt, grease, and fungus.

Caution: **Do not press on the meter face when cleaning; the meter may become damaged.**

a. Remove all loose foreign material with a clean lint-free cloth.

b. Remove grease fungus, and ground-in dirt with a cloth dampened (not wet) with water and a mild soap.

c. Remove dust or dirt from the connectors with a soft-bristled brush.

3–7. Monthly Preventive Maintenance Checks and Services

Perform the maintenance functions indicated in the monthly preventive maintenance checks and services chart (para 3–8) once each month in addition to the daily preventive maintenance checks and services (para 3-5). A month is defined as approximately 30 calendar days of 8-hour-per-day operation. Adjustment of the maintenance interval must be made to compensate for any unusual operating conditions. Equipment maintained in a *standby (ready* for immediate operation) condition must have monthly preventive maintenance checks and services performed on it. Equipment in limited storage (requires service before operation) does not require monthly preventive maintenance.

3–8. Monthly Preventive Maintenance Checks and Services Chart

Sequence No.	Item	Procedure	References
1	Cables, flexible module extenders, and rigid module extenders.	*a.* Inspect the cables and flexible module extenders for deterioration and damage, such as cuts, cracks, or frayed insulation. Repair minor damage to insulation by covering the damaged area with rubber electrical's tape. Replace defective cables. *b.* Inspect the rigid module extenders for damage such as bent or missing connector pins. Refer to higher category for repair.	None
2	Connectors, handle grips, jacks, and screws.	*a.* Hand check these exterior items for looseness. Tighten all loose exterior items. *b.* See that there are no loose or missing screws. Replace missing screws and tighten all loose screws.	None.
3	Exterior surfaces.	Inspect all exposed metal surfaces for rust and corrosion. Touch up surfaces.	Para 3-9

3-9. Preservation

Remove rust and corrosion from metal surfaces by lightly sanding them with No. 000 sandpaper. Brush two thin coats of paint on the bare metal to protect it from further corrosion. Refer to the applicable cleaning and refinishing practices specified in TM 9–213.

3-10. Quarterly Preventive Maintenance Checks and Services

Perform the maintenance functions indicated in the quarterly preventive maintenance checks and services chart (para 3-11) once each 3 months (quarter1y interval) in addition to the daily (para 3–5) and monthly (para 3–8) preventive maintenance checks and services. A quarterly interval is defined as 90 calendar days of 8-hour-per-day operation. All deficiencies or shortcomings will be recorded, and those not corrected during the maintenance service and inspection will be immediately reported to higher level maintenance by the use of forms and procedures specified in TM 38-750. Equipment with a deficiency that cannot be corrected at the organizational level should be deadlined in accordance with TM 38-750.

3-11. Quarterly Preventive Maintenance Checks and Services Chart

Sequence No.	Item	Procedure			References
1	Completeness ----------	See that the maintenance kit is complete ----------			Para 1-6.
2	Publications ----------	Check to see that all pertinent publications are available. The technical manuals must be complete and in usable condition, without missing pages. All changes pertinent to the publications must be on hand.			DA Pam 310-4.
3	Modification Work Orders.	Check to see that all urgent MWO's have been applied to the equipment and that all routine MWO's have been scheduled.			DA Pam 310-4.
4	Operational check (self-test).	Connect the equipment as shown in the block diagram (fig. 3-1) for this test and proceed as shown in the chart.			
		Equipment control setting	Test procedure	Performance standard	
5	Radio set simulator ---- Radio set simulator ---- Radio set simulator ---- Test unit ----------	Set TEST SELECT switch to OFF. Set XMIT LOAD switch to OFF. Set POWER switch to RESET ON. Set POWER switch to RESET ON.	*a.* Turn FUN C-TION SELECT switch to T/R *b.* Turn FUNC-TION SELECT switch to T/R+G. *c.* Turn FUNC-TION SELECT switch to ADF	*a.* T/R lamps on test unit and radio set simulater light, The 27.5 VDC lamp on the radio set simulator lights. *b.* T/R+G lamps on both equipments light. *c.* The ADF lamp on the test unit lights.	
		Equipment control setting	Test procedure	Performance standard	
6	Test unit ----------	Turn FUNCTION SELECT switch to T/R.	*a.* Set test unit PTT switch to ON and then MOM ON.	*a.* XMIT lamps on both test unit and radio set simulator will light in both ON and MON ON positions.	

Sequence No.	Item	Procedure		References
		b. Set the radio set simulator PTT switch to ON.	*b.* XMIT lamps on the radio set simulator will light.	
7	Test unit ----------	Equipment control setting: Set MIC SELECT switches to H D SET. Set RF DET switch to OFF.	Test procedure / Performance standard: *a.* Plug headsets into both equipments. Speak into MIC of test unit headset. — *a.* Audio is heard in radio set simulator headset. *b.* On radio Set simulutor. turn AUDIO GAIN control clockwise. — *b.* Audio volume increases. *c.* Speak into MIC of radio set simulator headset. — *c.* Audio is heard in the test unit headset. *d.* Turn test unit AUDIO GAIN control clockwise. — *d.* Audio volume increases,	
8	Test unit ----------	Equipment control setting: same as in sequence No. 7.	Test procedure / Performance standard: *a.* Turn the test unit FREQ SELECT 10-megacycle control to all its positions. — *a.* Far left two numbers in the readout on the radio set simulator should read the same as on the control. *b.* Repeat a above for 1 megacycle. — *b.* Middle number on the readout should read the same as on the control. *c.* Repeat a above for 0.1 megacycle. — *c.* Far right two numbers on the readout should read the same as on the control.	
9	Radio set simulator.	Equipment control setting: See test procedure.	Test procedure / Performance standard: *a.* Turn TEST SELECT switch to ADF. — *a.* Meter indicates scale A, green.	
	Radio set simulator.	See test procedure.	*b.* Turn TEST SELECT switch to +27.5V. — *b.* Same as *a* above.	

Sequence No.	Item	Procedure			References
	Radio set simulator.	See test procedure.	*c.* Turn TEST SELECT switch to +225V.	*c.* Same as *a* above.	
	Radio set simulator.	See test procedure.	*d.* Turen TEST SELECT switch to AUX AUDIO.	*d.* Same as *a* above.	
	Radio set simulator.	See test procedure.	*e.* Turen TEST SELECT switch to REMOTE SENS. Rotate the test unit SENSITIVITY control from fully counter-clockwise to fully clockwise.	*e.* The meter varies from 0-8 (scale A). When the SENSITIVITY Control is fully clockwise, the SQ DIS lamp lights.	
	Radio set simulator.	See test procedure.	*f.* Turn TEST SELECT switch to SHIELD GND.	*f.* Same as *a* above.	

Sequence No.	Item	Equpment control setting	Test procedure	Performance standard	References
10	Radio set simulator.	Turn TEST SELECT switch to VSWR CAL.	Press PTT switch. Adjust VSWR CAL. control.	Meter indicates CAL, scale B.	
		Turn TEST SELECT switch to VSWR TEST.	Press PTT switch	Meter indicates green, scale B.	

Sequence No.	Item	Equipment control setting	Test procedure	Performance standard	References
12	Radio set simulator.	Turn TEST SELECT switch to +27.5V.	Set XMIT LOAD switch to ON momentarily. *Note:* If held to ON for more than 5 Seconds the transmit load will automatically shut off for 30 seconds and then come back on.	XMIT LOAD and XMIT lamp lights Meter indicates green, scale A.	

3-12. Replacement of Indicator Lamps

Replace the indicator lamps (fig 2-2 and 2-3) as follows:

a. Rotate the lamp assembly counterclockwise until it separates from the panel.

b. Extract the defective lamp; use a knife blade or screwdriver as a pry if bulb is difficult to remove.

C. Install a new lamp and rotate the lamp assembly back into place.

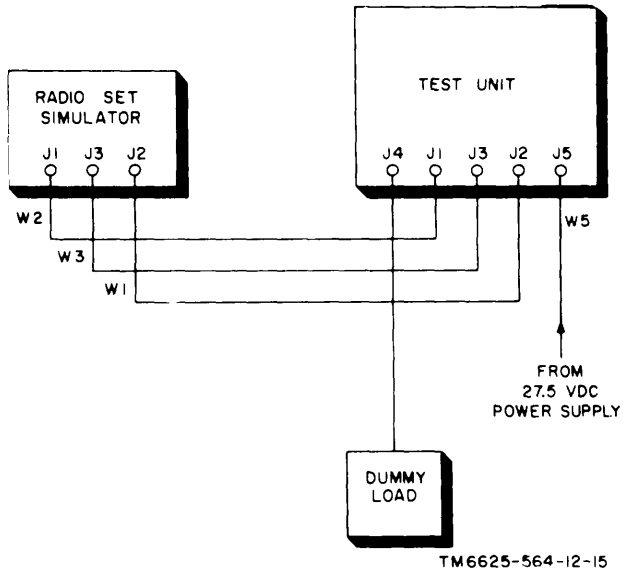

Figure 3-1. Self-test setup diagram.

GPO 821-148-3

CHAPTER 4

SHIPMENT, LIMITED STORAGE, AND DEMOLITION TO PREVENT ENEMY USE

Section I. SHIPMENT AND LIMITED STORAGE

4-1. Disassembly of Equipment

Prepare the maintenance kit for shipment and Storage as follows:

a. Disconnect the cables and flexible module extenders.

b. Roll up the cables and place them in the cable storage space provided inside the transit case.

c. Place the cable adapters in the bag provided and place toolkit tools in the bag provided.

d. Place both bags and the dummy load inside the transit case cover (MK-731A/ ARC-51X), and close the door. Place the dummy load (MK-73l/ARC-51X) in the radio set simulator mounting tray.

e. Install the simulator mounting tray in the space provided on the door.

f. Place the rigid module extenders, the alignmcnt fixtures, and the locking block in the rigidi module extender mounting tray. Install the module extender mounting tray in the tramsot case and fasten with the screws provided.

g. Clip the antenna and the air pump to the top of the module extender mounting tray.

h. Place the radio set simulator in the space provided in the transit case. Fasten the radio set simulator in place with screws provided on the radio set simulator.

i. Place the test unit in the space provided in the transit case. Fasten the test unit in place with the screws provided.

j. Place the cover on the transit case lower half.

k. Secure the four twist-lock clamps located on the sides of the transit case.

4-2. Repackaging for Shipment and Limited Storage

The exact procedure for repackaging depends on the material available and the conditions under which the equipment is to be shipped *(b* below) or stored *(c* below). Adapt the procedures outlined below whenever circumstances permit. The information concerning the original packaging (para 2–1) will also be helpful.

a. Material Requirements. The following materials are required for packaging the maintenance kit for shipment. For stock numbers of materials, consult SB 38–100.

Material	Quantity
Tri-ply fiberboard box	19 x 19 x 25 inches
Polystyrene blocks	6 x 6 inches, 8 each
Nylon tape	10 feet
Barrier, MIL-B-131	17 x 17 x 23–inch bag

b. Packaging for Shipment. See paragraph 2–1 for detailed packaging instructions.

***Caution: Be* sure the air vent on the end of the transit case is open prior to packaging for air shipment.**

c. Packaging for Limited Storage. The transit case provides adequate protection for the other components of the maintenance kit during limited Storage. The case is corrosive-resistant and is sealed by a rubber gasket which makes the case interior airtight and moistureproof, with the air vent closed.

Section II. DEMOLITION OF MATERIEL TO PREVENT ENEMY USE

4-3. Authority for Demolition

The demolition procedures given in paragraph 4-1 will be used to prevent the enemy from using or salvaging this equipment. Demolition of the equipment will be accomplished only upon the order of the commander.

4-4. Methods of Destruction

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

a. Smash. Use sledges, axes, hammers, crowbars, and any other heavy tools available to smash the interior units of the set.

(1) Use the heaviest tool on hand to smash the connectors, meter, knobs, dials, switchcs, lamps, antenna, dummy load, and modules.

Note: Heavy tools will affectively destroy the external parts mentioned in (1) above, but the remainder of the exposed surfaces of the equipment are constructed of steel plate; attempts to damage it by smashing will be useless.

(2) Remove the units from the transit case. With a heavy hammer or bar, smash as many of the exposed parts of the various chassis as possible.

b. Cut. Use axes, handaxes, machetes, and similar tools to cut cabling and wiring. Use a heavy axe or machete to cut the power cable. Cut all cords and cables in a number of places.

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

c. Burn. Burn the technical manuals first. Burn as much of the equipment as is flammable; use gasoline, oil, flamethrowers, and similar materials. Pour gasoline on the cut cables and internal wiring and ignite it. Use a flamethrower to burn spare parts or pour gasoline on the spares and ignite them. Use incendiary grenades to complete the destruction of the unit.

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

(1) Use a fragmentation grenade to destroy the interior of the maintenance kit. Remove the test unit far enough to provide room and drop the grenade into the interior.

(2) For quick destructio of the maintenance kit, explode an incendiary grenade on the front panels of the unit.

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

APPENDIX I

REFERENCES

Following is a list of applicable publications available to the organizational repairman of Maintenance Kit, Electronic Equipment MK-731/ARC-51X:

DA Pam 310-4	Index of Technical Manuals, Technical Bulletins, Supply Manuals (Types 7, 8, and 9), Supply Bulletins, Lubrication Orders, and Modification Work Orders
SB 38-100	Preservation, Packaging, and Packing Materials, Supplies, and Equipment Used by the Army
TM 9–213	Painting Instructions for Field Use
TM 11-5820-518-12	Operator and Organizational Maintenance Manual: Radio Sets AN/ARC-51X and AN/ARC-51BX
TM 11-5820-518-35	Field and Depot Maintenance Manual, Radio Sets AN/ARC-51X and AN/ARC-51BX
TM 38-750	Army Equipment Record Procedures
SB 11-573	Painting and Preservation Supplies Available for Field Use for Electronics Command Equipment.
TB SIG 364	Field Instructions for Painting and Preserving Electronics Command Equipment.

APPENDIX II

MAINTENANCE ALLOCATION

Section I. INTRODUCTION

A2-1. General

a. This appendix assigns maintenance functions to be performed on components, assemblies, and subassemblies by the lowest appropriate maintenance category.

b. Columns in the maintenance allocation chart are as follows:

(1) *Part or Component.* This column shows only the nomenclature or standard item name. Additional descriptive data are included only where clarification is necessary to identify the component, Components, assemblies, and subassemblies are listed in top-dowm order. That is, the assemblies which are part of a component are listed immediately below that component. and the subassemblies which are part of an assembly are listed immediately below that assembly. Each generation breakdown (components, assemblies, or subassemblies) is listed in disassembly order or alphabetical order.

(2) *Maintenance function.* This column indicates the various maintenance functions allocated to the categories :

(a) Service. To clean, to preserve, and to replenish lubricants.

(b) Adjust. To regulate periodically to prevent malfunction,

(c) *lnspect.* To verify serviceability and to detect incipient electrical or mechanical failure by scrutiny.

(d) To verify serviceability and to detect incipient electrical or. mechanical failure by use of special equipment such as gages, meters, etc.

(e) Replace. To substitute serviceable components, assemblies, or subassemblies, for unserviceable components, assemblies, or subassemblies.

(f) Repair. To restore an item to serviceable condition through correction of a specific failure or unserviceable condition. This function includes but is not limited to welding, grinding, riveting, straightening, and replacement of parts other than the trial and error replacement of running Spare type items such as fuses, lamps, or electron tubes.

(g) Align. To adjust two or more components of an electrical system. so that their functions are properly synchronized.

(h) Calibrate. To determine, check, or rectify the graduation of an instrument, weapon, or wreapons system, or components of a weapons system.

(i) Overhaul. To restore an item to *completely serviceable* condition as prescribed by serviceability standards developed and published by heads of technical services. This is accomplished through employment of the technique of “Inspect and Repair Only as Necessary” (IROAN). Maximum utilization of diagnostic and test equipment is combined with minimum disassembly of the item during the overhaul process.

(j) Rebuild. To restore an item to a standard as near as possible to original or new condition in appearance, performance, and life expectancy. This is accomplished

through the maintenance technique of complete disassembly of the item, inspection of all parts of components, repair or replacement of worn or unserviceable elements using original manufacturing tolerances and/or specifications and subsequent reassembly of the item.

(3) *Operator. organization, direct support, general support, and depot.* The symbol X indicates the categories responsible for performing that particular maintenance operation, but does not necessarily indicate that repair parts will be stocked at that level. Categories higher than those marked by "X are authorized to perform the indicated operation.

(4) *Tools required.* This column indicates codes assigned to each individual tool equipment, test equipment, and maintenance equipment referenced. The grouping of codes in this column of the maintenance allocation chart indicates the tool, test, and maintenance equipment required to perform the maintenance function.

(5) *Remarks.* Entries in this column will be utilized when necessary to clarify any of the data cited in the preceding columns.

c. Columns in the allocation of tools for maintenance functions are as follows:

(1) *Tools required for maintenance functions.* This column lists tools, test, and maintenance equipment required to perform the maintenance functions.

(2) *Operator, organization. direct support, general support, and depot.* The dagger (†) symbol in these columns indicates the categories normally allocated the facility.

(3) *Tool code.* This column lists the tool code assigned.

A2-2. Maintenance by Using Organizations

When this equipment is used by signal services organizations organic to theater headquarters or communication zones to provide theater communications, those maintenance functions allocated up to and including general support are authorized to the organization operating this equipment.

SECTION II. MAINTENANCE ALLOCATION CHART

PART OR COMPONENT	MAINTENANCE FUNCTION	ECHELON O/C	ECHELON O	ECHELON DS	ECHELON GS	ECHELON D	TOOLS REQUIRED	REMARKS
MAINTENANCE KIT, ELECTRONIC EQUIPMENT MK-731/ARC-51X	service		X					
	adjust				X			Audio level.
	inspect		X				7	Verify servicability Diagnostic
	test				X			
	repair				X		2	Replace Modules, piece parts.
	overhaul				X		1,2,3,4,5,6,7	IROAN

SECTION III. ALLOCATION OF TOOLS FOR MAINTENANCE FUNCTIONS

TOOLS REQUIRED FOR MAINTENANCE FUNCTIONS	ECHELON O/C	O	DS	GS	D	TOOL CODE	REMARKS
MK-731/ARC-51X (continued)							
FREQ METER AN/URM-81				†	†	1	
HEADSET H-101/U				†	†	2	
MULT ME-26/U				†	†	3	
MULT TS-352/U				†	†	4	
TEST SET, TRANSISTOR TS-1836/U				†	†	5	
TOOL KIT, ELECTRONIC EQUIPMENT TK-100/G				†	†	6	
TOOL AND TEST EQUIPMENT NORMALLY ALLOCATED TO THE REPAIRMAN USER BECAUSE OF HIS ASSIGNED MISSION		†				7	

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