TECHNICAL MANUAL

OPERATOR'S AND ORGANIZATIONAL MAINTENANCE MANUAL

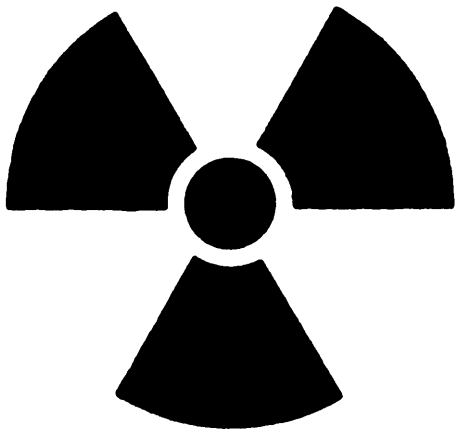
TEST SET, RADIO AN/ARM-63
(AIRCRAFT CORP MODEL BTK-35A)
(NSN 6625-00-868-8323)

This copy is a reprint which includes current pages from Changes 1 through 6. The title is changed by Change 6 as shown above.

HEADQUARTERS, DEPARTMENT OF THE ARMY
16 SEPTEMBER 1966

WARNING

EXTREMELY DANGEROUS VOLTAGES (600 VDC) EXIST IN TEST SET, RADIO T-1797/ARM-63 WHEN TESTING THE RADIO SETS. BE CAREFUL WHEN WORKING ON THIS UNIT.



Meter, Arbitrary Scale Ra226 0.17µCi 6625-555-4385
Radiation Hazard Information: The following radiation hazard information must be read and understood by all personnel before operating or repairing Radio Test Set AN/ARM-63. Hazardous radioactive materials are present in the above listed component of the AN/ARM-63.

The components are potentially hazardous when broken. See qualified medical personnel and the local Radiological Protection Officer (RPO) immediately if you are exposed to or cut by broken components. First aid instructions are contained in TB 43-0122, and AR 755-15.
NEVER place radioactive components in your pocket.
Use extreme care NOT to break radioactive components while handling them.
NEVER remove radioactive components from cartons until you are ready to use them.
If any of these components are broken, notify the local RPO immediately. The RPO will survey the immediate area for radiological contamination and will supervise the removal of broken components. The above listed radioactive components *will not* be repaired or disassembled.
Disposal of broken, unserviceable, or unwanted radioactive components will be accomplished in accordance with the instructions in AR 755-15.

TECHNICAL MANUAL
No. 11-6625-556-12

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON, DC, *16 September 1966*

OPERATOR AND ORGANIZATIONAL MAINTENANCE MANUAL

TEST SET, RADIO AN/ARM-63 (AIRCRAFT RADIO CORP. MODEL BTK-35A) (NSN 6625-00-868-8323)

CHAPTER 1
INTRODUCTION

Section I. GENERAL

1. Scope

a. This manual describes Test Set, Radio AN/ARM-63 (Aircraft Radio Corp Model BTK-35A) and covers its installation, operation, and operator's and organizational maintenance. It includes instructions for cleaning and inspection of the equipment, and replacement of parts available to operator and organizational maintenance personnel.

b. Official nomenclature followed by (*) is used to indicate all models of an equipment. Official nomenclatures represented throughout this manual in this manners are as follows:

(1) Receiving Set, Radio AN/ARN-30 (*) indicates Receiving Set, Radio AN/ARN-30, AN/ARN-30A, AN/ARN-30B, AN/ARN-30C, AN/ARN-30D, and/or AN/ARN-30E.

(2) Radio Set AN/ARC-60(*) indicates Radio Set AN/ARC-60 and/or AN/ARC-60A.

(3) Radio Set AN/ARC-27(*) indicates Radio Set AN/ARC-27 and/or AN/ARC-27A.

(4) Radio Set AN/ARC55(*) indicates Radio Set AN/ARC-55, AN/ARC-55A, and/or AN/ARC-55B.

(5) Radio Compass AN/ARN-6(*) indicates Radio Compass AN/ARN-6 and/or AN/ARN-6A.

(6) Antenna AS-580(*)/ARN-30 indicates Antenna AS-580/ARN-30 and/or AS-580A/ARN-30.

(7) Loop Assembly AS-313(*)/ARN-6 indicates Loop Assembly AS-313/ARN-6, AS-313A/ARN-6, and/or AS-313B/ARN-6.

(8) Antenna AT-269/ARN-6(*) indicates Antenna AT-269/ARN-6 and/or AT-269/ARN-6A.

(9) Control Box C-149(*)/ARN-6 indicates Control Box C-149/ARN-6, C-149A/ARN-6, and/or C-149B/ARN-6.

(10) Control Panel C-403(*)/A indicates Control Panel C-403/A, C-403A/A, and/or C-403-B/A.

(11) Radio Set Control C-628(*)/ARC-27 indicates Radio Set Control C-628/ARC-27 and/or C-628/ARC-27.

(12) Control, Radio Set C-3426(*)/ARN-30D indicates Control, Radio Set C-3436/ARN-30D and/or C-3436/ARN-30D.

(13) Converter, Signal Data CV-265(*)/ARN-30A indicates Converter, Signal Data CV-265/ARN-30A and/or CV-265A/ARN-30A.

(14) Frequency Converter-Transmitter CV-431(*)/AR indicates Frequency Converter-Transmitter CV-431/AR and/or CV-431A/AR.

(15) Indicator ID-90(*)/ARN-6 indicates Indicator ID-90/ARN-6, ID-90A/ARN-6, and/or ID-90B/ARN-6.

(16) Indicator ID-91(*)/ARN-6 indicates Indicator ID-91/ARN-6, ID-91A/ARN-6, and/or ID-91B/ARN-6.

(17) Indicator ID-92(*)/ARN-6 indicates Indicator ID-92/ARN-6, ID-92A/ARN-6, and/or ID-92B/ARN-6.

(18) Indicator ID-231(*)/ARN-6 indicates Indicator ID-231/ARN-6, ID-231A/ARN-6, ID-231B/ARN-6, ID-231C/ARN-6, ID-231D/ARN-6, and/or ID-231E/ARN-6.

(19) Radio Compass Unit R-101(*)/ARN-6 indicates Radio Compass Unit R-101/ARN-6, R-101A/ARN-6, R-101B/ARN-6, and/or R-101C/ARN-6.

(20) Radio Receiver R-122(*)/ARN-12 indicates Radio Receiver R-122/ARN-12 and/or R-122A/ARN-12.

(21) Receiver, Radio R-666(*)/ARN-32 indicates Receiver. Radio R-666/ARN-32, R-666A/ARN-32, R-666B/ARN-32, and/or R-666C/ARN-32.

(22) Receiver, Radio R-1041(*)/ARN indicates Receiver, Radio R-1041/ARN and/or R-1041A/ARN.

(23) Receiver-Transmitter, Radio RT-349(*)/ARC-55 indicates Receiver Transmitter, Radio RT-349/ARC-55, RT-349A/ARC-55, and/or RT-349B/ARC-55.

(24) R.F. Signal Generator Set AN/URM-25(*) indicates R.F. Signal Generator Set AN/URM-25, AN/URM-25A, AN/URM-25B, AN/URM-25C, AN/URM-25D, AN/URM-25E, and/or AN/URM-25F.

(25) Wattmeter AN/URM-43(*) indicates Radio Frequency Wattmeter AN/URM-43, AN/URM-43A, and/or AN/URM-43B; and/or Wattmeter AN/URM-43C.

(26) Generator, Signal AN/USM-44(*) indicates Generator, Signal AN/USM-44 and/or AN/USM-44A.

(27) Headset HS-33(*) indicates Headset HS-33 and/or HS-33-A.

(28) Microphone T-17(*) indicates Microphone T-17-B, T-17-E, and/or T-17-F.

(29) Multimeter TS-352(*)/U indicates Multimeter TS-352/U, TS-352A/U, TS-352B/U, and/or TS-352C/U.

(30) Audio Oscillator TS-382(*)/U indicates Audio Oscillator TS-382/U, TS-832A/U, TS-382B/U, TS-382C/U, TS-382-E/U, and/or TS-382F/U.

(31) oscilloscope OS-8(*)/U indicates oscilloscope OS-8/U, OS-8A/U, OS-8B/U, OS-8C/U, OS-8D/U, and/or OS-8E/U.

(32) Output Meter TS-585(*)/U indicates Output Meter TS-585/U, TS-585A/U, TS-585B/U, TS-585C/U, and/or Meter, Audio Level TS-585D/U.

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.

2.1. 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 Deficienties. 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 DSAR 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 4610.33A/AFR 75-18/MCO P4610.19B and DSAR 4500.15.

2.2. Destruction of Army Electronics Materiel

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

2.3. Administrative Storage

Administrative storage of equipment issued to and used by Army activities shall be in accordance with TM 740-90-1.

2.4. Reporting of Errors

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: DRSEL-MA-Q, Fort Monmouth, NJ 07703.

2.5. Reporting Equipment Improvement Recommendations (EIR)

EIR will be prepared using DA Form 2407, Maintenance Request. Instructions for preparing EIR's are provided in TM 38-750, The Army Maintenance Management System. EIR's should be mailed direct to the Commander, US Army Electronics Command, ATTN: DRSEL-MA-Q, Fort Monmouth, New Jersey 07703. A reply will be furnished direct to you.

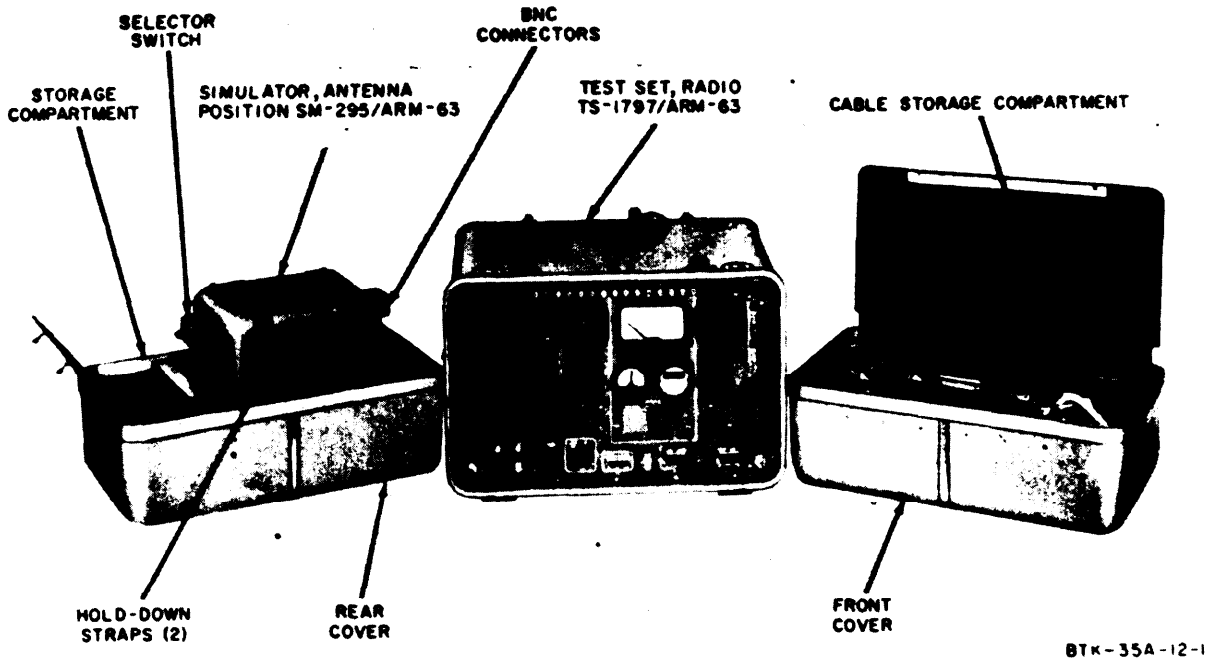


Figure 1. Test Set, Radio AN/ARM-63 (Aircraft Radio Corp Model BTK-35A).

Section II. DESCRIPTION AND DATA

3. Purpose and Use

a. Test Set, Radio ANA/RM-63 (radio test set), combines the functions of a group of electronic maintenance kits used at field and depot maintenance. Bench testing facilities for the following airborne navigation and communications radio sets are provided by the radio test set: (AN/ARN-6(*) and AN/ARN-54 cannot be tested by Test Set, Radio AN/ARM-63 procured on Contract DAAB05-67-C-1648).

(1) Receiving Set, Radio AN/ARN-30(*).

(2) Marker Beacon, Receiving Set AN/ARN-12

(3) Receiving Set, Radio AN/ARN-32

(4) Receiver, Radio R-1041(*)ARN.

(5) Radio Set AN/AR-60(*) or ARC Type 12.

(6) Receiver, Radio R-746/AR.

(7) Radio Set AN/ARC27(*).

(8) Radio Set AN/ARGSS(*).

(9) Radio Compass AN/ARN-6(*).

(10) Receiving Set, Radio AN/ARN-54.

(11) Direction Finder Set AN/ARN-59(V).

b. The radio test set interconnects the components of the equipment under test with the necessary test equipment and power supplied to permit third through fifth echelon repairmen of the airborne radio sets *(a* above) to operate any of these radio sets on a repair bench and monitor significant electrical characteristics of this radio set The radio test set is also used to test and troubleshoot individual components of the airborne radio sets listed in *a* above after they have been removed from an aircraft.

4. Technical Characteristics

Types of equipment tested	. . . Vhf/hf radio communication and navigation sets (para 3a)
Input voltage:	
AC	. . . . . 115 volts, 400 cps, single-phase, 3 wire.
Dc	. . . . . 28 volts at 20 amp max
Maximum power consumption.	25 watts.

Meters:
Multimeter . . . . . .±3% accuracy, 10 scales as follow:
0-600 volts dc.
0-150 volts dc.
0-30 volts dc.
0-5 amp dc.
0-30 amp dc.
0-30 ma dc.
0-150 volts ac, 400 cps.
0-30 volts ac, 115 cps.
0-50 mw audio.
0-500 mw audio.
Deviation . . . .±2% accuracy for the AN/ARM-63 procured on contract DAAB05-67-C-1648.
±3% accuracy, 200-0-200 ua (zero-centered).
Frequency . . . . . ±3% accuracy, 95 to 120 cps.
Tuning . . . . . Right-hand zeroed.
Number of switches:
Selector . . . .7.
Toggle . . . .13.

5. Components (Aircraft Radio Corp Model BTK-35A only)

The radio test set and its components are listed in the following chart. The chart also lists the dimensions and weight of the radio test set and its components.

Quantity	Item	Height	Depth	Width	Unit weight (lb)	Figure No.
1	Test Set, Radio AN/ARM 63	15 in.	30½ in.	22½ in.	93	1
1	Test Set, Radio TS-1797/ARM 63	15 in.	16 in.	22½ in.	45	1 and 2
1	Front Cover, containing:	15 in.	7¾ in.	22½ in.	12	1
1	Cable Assembly ARC 30077 (black)	6 ft lg			1.3	4
	Wiring Harness, Branched ARC 29425 (red/black tracer)	6 ft 6 in. lg			1.7	5
1	Cable Assembly ARC 29422 (blue)	2 ft 6 in. lg			1.0	5
1	Wiring Harness, Branched ARC 29421 (orange)	3 ft 5 in. lg			0.71	5
1	Wiring Harness, Branched ARC 29418 (yellow)	7 ft lg			4.25	5
1	Mechanical Linkage MC-215	4 ft lg			0.5	4
1	Cable Assembly, Radio Frequcney ARC 35311 (black).	27 ft 6 in. lg			1.75	4
1	Adapter Cable Assembly ARC 30075 (black).	2 ft lg			0.5	4
1	Adapter Cable Assembly ARC 30073 (black)	2 ft lg			0.1	4
1	Adapter Cable Assembly ARC 30076 (white)	20 ft 6 in. lg			0.4	4
1	Wiring Harness, Branched ARC 29423 (red)	5 ft lg			1.4	5
1	Wiring Harness, Branched ARC 29424 (red w/white tracer).	6 ft 4 in lg			1.95	5
1	Power Cable Assembly ARC 30070 (red and black).	6 ft 6 in. lg			0.65	4
1	Adapter Cable Assembly ARC 30071 (black).	2 ft lg			0.25	4
1	Adapter Cable Assembly ARC 30074 (black)	2 ft lg			0.45	4
1	Wiring Harness, Branched ARC 29420 (black w/white tracer).	5 ft lg			2.0	5
1	Wiring Harness, Branched ARC 29419 (black)	5 ft lg			1.75	5
1	Rear Cover, containing:	15 in.	7¾ in.	22½ in.	10.0	1
	Adapter Plage Assembly ARC 30136	5/8 in.	7¼ in.	9½ in.	0.5	3
1	Simulator, Antenna Position SM-295/ ARM-63.	11 3/8 in.	15¾ in.	11 in.	5.8	1 and 3

Quantity	Item	Height	Depth	Width	Unit weight (lb)	Figure No.
1	Interconnecting Box J-1107/ARN	2 3/8 in.	4 5/8 in.	2 in.	0.8	3
1	Dial, Control MX-2871/ARN	1 27/64 in. lg X 1¼ in. dia.				3
1	Telephone Plug PJ-055B					3
1	Alignment Tool, Electronic Equipment TL-659/U	2 27/64 in. lg				3
1	Adapter UG-273/U					3
1	Adapter UG-201A/U					3
1	Connector RF-0756 (ARC 30136)					3
1	Connector UG-690/U					3
2	Adapter, Connector, Mechanical Linkage ARC 30133					3

5.1. Items Comprising an Operable Test Set, Radio AN/ARM-43

QTY	Nomenclature, part No., and mfr code	Fig. No.
	NOTE The part number is followed by the applicable 5-digit Federal supply code for manufacturers (FSCM) identified in SB 708-42 and used to identify manufacturer, distributor, or Government agency, etc.	
	Test Set, Radio AN/ARM-63 (Aircraft Radio Corp Model BTR-35A) consisting of:	
1	Test Set TS-1797/ARM-63, 30069, 00781	
1	Case Assembly: (consists of center case with a front and rear cover which cannot be ordered separately) 35250 (M6AC36-0423) 00731	
	NOTE The following items and their quantities are located in the front cover for storage purposes.	
1	Cable Assembly, R.F.: 11369-0072 (M6AC36-0672) 00781	
1	Cable Assembly: 29422 (M6AC36-0561) 00781	
1	Cable Assembly, Power: 30070 (M6AC36-0439) 00781	
1	Cable Assembly: 30071 (M6AC36-0645) 00781	
1	Cable Assembly: 30073 (M6AC36-0652) 00781	
1	Cable Assembly: 30074 (M6AC36-0659) 00781	
1	Cable Assembly: 30075 (M6AC36-0666) 00781	
1	Cable Assembly: 30076 (M6AC36-0675) 00781	
1	Cable Assembly: 30077 (M6AC36-0687) 00781	
1	Cable Assembly: 35311 (M6AC36-0682) 00781	
1	Linkage, Mechanical MC-215: 16158-0048 (M6AC63-0434) 00781	
1	Wiring Harness: 29418 (M6AC36-0440) 00781	
1	Wiring Harness: 29419 (M6AC36-0493) 00781	
1	Wiring Harness: 29420 (M6AC36-0512) 00781	
1	Wiring Harness: 29421 (M6AC36-0542) 00781	
1	Wiring Harness: 29423 (M6AC36-0579) 00781	
1	Wiring Harness: 29424 (M6AC36-0599) 00781	
1	Wiring Harness: 29425 (M6AC36-0621) 00781	
	NOTE The following items and their quantities are located in the rear cover for storage purposes.	
1	Adapter, Connector: Automatic Metal Products Corp RF-N0756 (M6AC36-0710)	
1	Adapter, Cable UG-201/U 00781	
1	Adapter, Cable UG-273/U 00781	

QTY	Nomenclature, part No., and mfr code	Fig. No.
1	Adapter, Connector UG-690/U 00781	
2	Adapter, Connector: 30133 (M6AC36-0703) 00781	
1	Alignment Tool TL-659/U: 10307-0002 (M6AC36-0711) 00781	
1	Dial, Control, MX-2871/ARN: 18802 (M6AC36-0708) 00781	
1	Interconnecting Box J-1107/ARN: 22048 (M6AC36-0688) 00781	
1	Plate Assembly, Adapter: 30136 (M6AC36-0435) 00781	
1	Plug Assembly Tip PJ-055B: 30072 (M6AC36-0436) 00781	
1	Shaft Extension: 21330 (M6AC36-0712) 00781	
1	Simulator, Antenna Position SA-41A: 30137 (M6AC36-0371) 00781	

6. Common Names (Aircraft Radio Corp Model BTK-35A only)

A list of common names for the components of the radio test set is given in the following chart:

Common name	Nomenclature
Adapter assembly	Interconnecting Box J-1107/ARN.
Alignment tool	Alignment Tool, Electronic Equipment TL-659/U.
Antenna position simulator	Simulator, Antenna Position SA-41A.
ARC-27 test cable	Wiring Harness, Branched ARC 29419 (black).
ARC-55 dynamotor patch cord	Adapter Cable Assembly ARC 30075 (black).
ARC-55 patch cord No. 1	Adapter Cable Assembly ARC 30071 (black).
ARC-55 patch cord No. 2	Adapter Cable Assembly ARC 30073 (black).
ARC-55 patch cord No. 3	Adapter Cable Assembly ARC 30074 (black).
ARC-60 test cable	Wiring Harness, Branched ARC 29420 (black w/white tracer).
ARN-6 adapter	Adapter, Connector, Mechanical Linkage ARC 30133.
ARN-6 loop cable	Cable Assembly ARC 30077 (black).
ARN-6 test cable	Wiring Harness, Branched ARC 29424 (red w/white tracer).
ARN-30 test cable	Wiring Harness, Branched ARC 29418 (yellow).
ARN-54 loop cable	Cable Assembly, Radio Frequency ARC 35311 (black).
ARN-54 test cable	Wiring Harness, Branched ARC 29425 (red w/black tracer).
ARN-59 loop cable	Adapter Cable Assembly ARC 30076 (white).
ARN-59 test cable	Wiring Harness, Branched ARC 29423 (red).
Dc power cable	Power Cable Assembly ARC 30070 (red and black).
Dial	Dial, Control MX-2871/ARN.
Glide slope test cable	Cable Assembly ARC 29422 (blue).
Loop adapter	Adapter Plate Assembly ARC 30136.
Marker receivers test cable	Wiring Harness, Branched ARC 29421 (orange).
Mechanical linkage	Mechanical Linkage MC-215.
Plug	Telephone Plug PJ-055B.
Radio test set	Test Set, Radio AN/ARM-63 (Aircraft Radio Corp Model BTK-35A).
Test set	Test Set, Radio TS-1797/ARM-63.

7. Description of Radio Test Set

a. General (fig. 1). The radio test set consists of a carrying case *(d* below) which contains the test set *(b* below), antenna position simulator (c below), test cables (para 8), and minor components (para 9) (including test adapters and mechanical items). The antenna position simulator is mounted on the rear cover with two hold down straps and the minor components are in the rear cover storage compartment. The front cover contains a cable storage compartment for all the test cables.

b. Test Set (fig. 2.) The front panel of the test set contains the electronic switching and mechanical controls, input and output connectors, test multimeter, primary power controls and indicators, and standard indicators. The test set is held in the center section of the carrying case by 20 screws. Carrying handles on each side permit the complete test set to be moved about when installed in the carrying case; two front panel bails permit the test set to be withdrawn from the carrying case center section for servicing. The rear and front

cover hasps hold the center section of the carrying case to the rear and front covers at the top. The covers are hinged by separable hinges at the bottom. Alternating current (at) power connections are made through a power cord which extends from the rear of the test set. An air relief valve permits escape of excess pressure within the test set. The test set contains the following components of the equipment to be tested as standard controls and indicators (fig. 2):

(1) Control, Radio Set C-1827/ARC-55.
(2) Indicator, Course ID-453/ARN-30.
(3) Indicator, Course ID-250/ARN.
(4) Tuning control ARC 18639.

c. Antenna Position Simulutor (fig. 3). The antenna position simulator is a screen compartment Radio frequency (rf) field simulator made of sheet aluminum. The opening at the top of the compartment is used to mount Antenna AT-593A/ARN-42 or AT-780/ARN-59; the loop adapter is used to mount Loop Assembly AS-313(*)/ARN-6 or AT-269/ARN-6(*). Connections between the loop under test and the test set and the remaining components of the equipment under test are made through two BNC connectors on the antenna position simulator (fig. 1). A three-position selector switch is mounted on the side of the unit.

d. Carrying Case (fig. 1). The carrying case is a reinforced fiberglass, three-piece transit case. The center section of the carrying case holds the test set; the front and back covers contain the antenna position simulator, cable assemblies, and accessories.

8. Description of Cables

(figs. 4 and 5)

NOTE

For the AN/ARM-63 procured on Contract DAAB05-67-C-1648, the AN/ARM-63 includes 12 special cable assemblies; subparagraphs *b, g, h, i, j, k, l, n, p,* and *q* do not apply; subparagraphs *r,* s, *t, u, v,* and w apply only to the AN/ARM-63 procured on Contract DAAB05-67-C-1648.

a. General. The radio test set includes **16** special cable assemblies that provide the necessary connections for interconnecting the test set with the various components of the radio equipment to be tested or bench operated for troubleshooting and repair purposes. Each of the cable assemblies has a specific purpose and is color coded to match the color

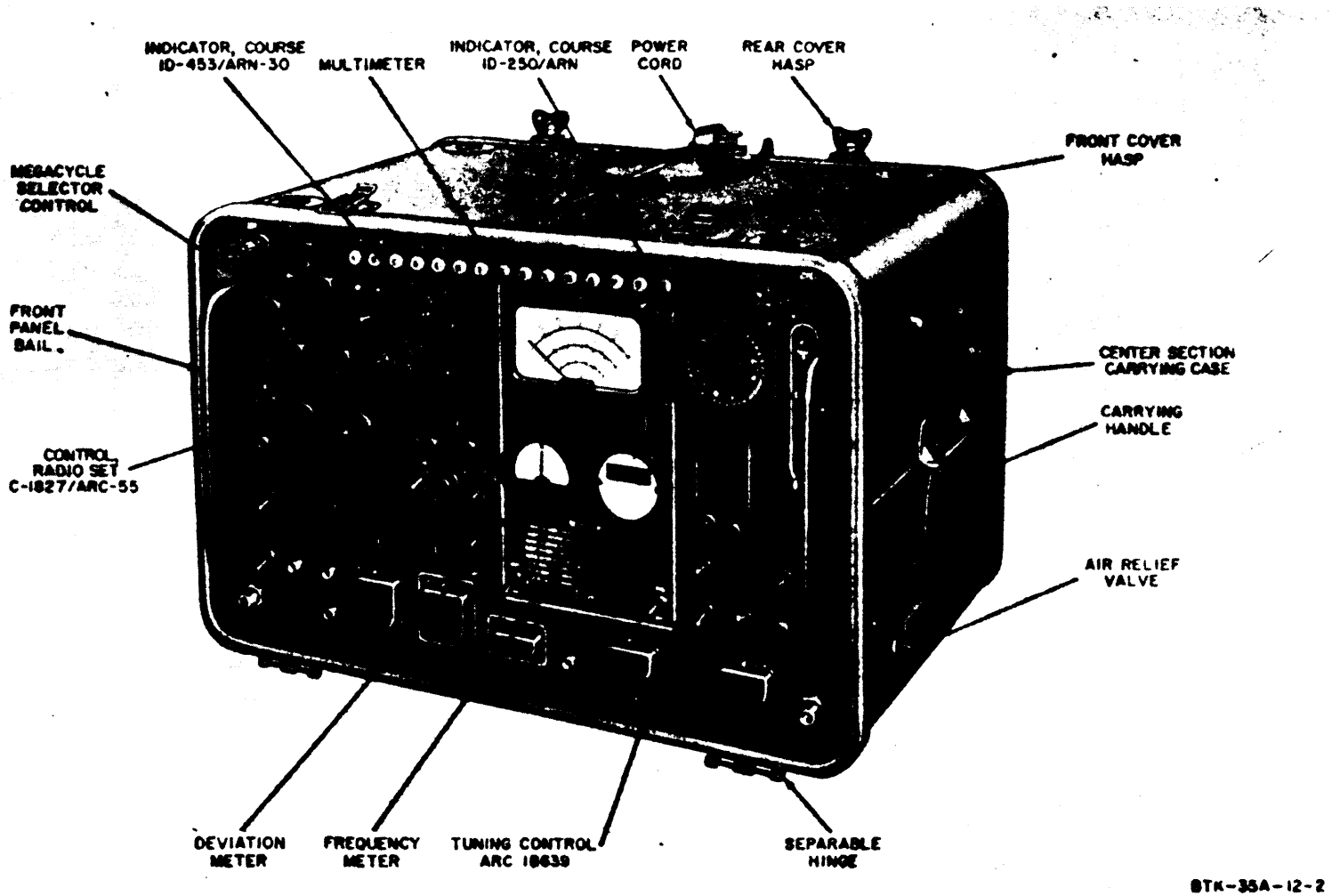


Figure 2. Test Set, Radio TS-1797/ARM-63 (Aircraft Radio Corp Model BTK-35A only).

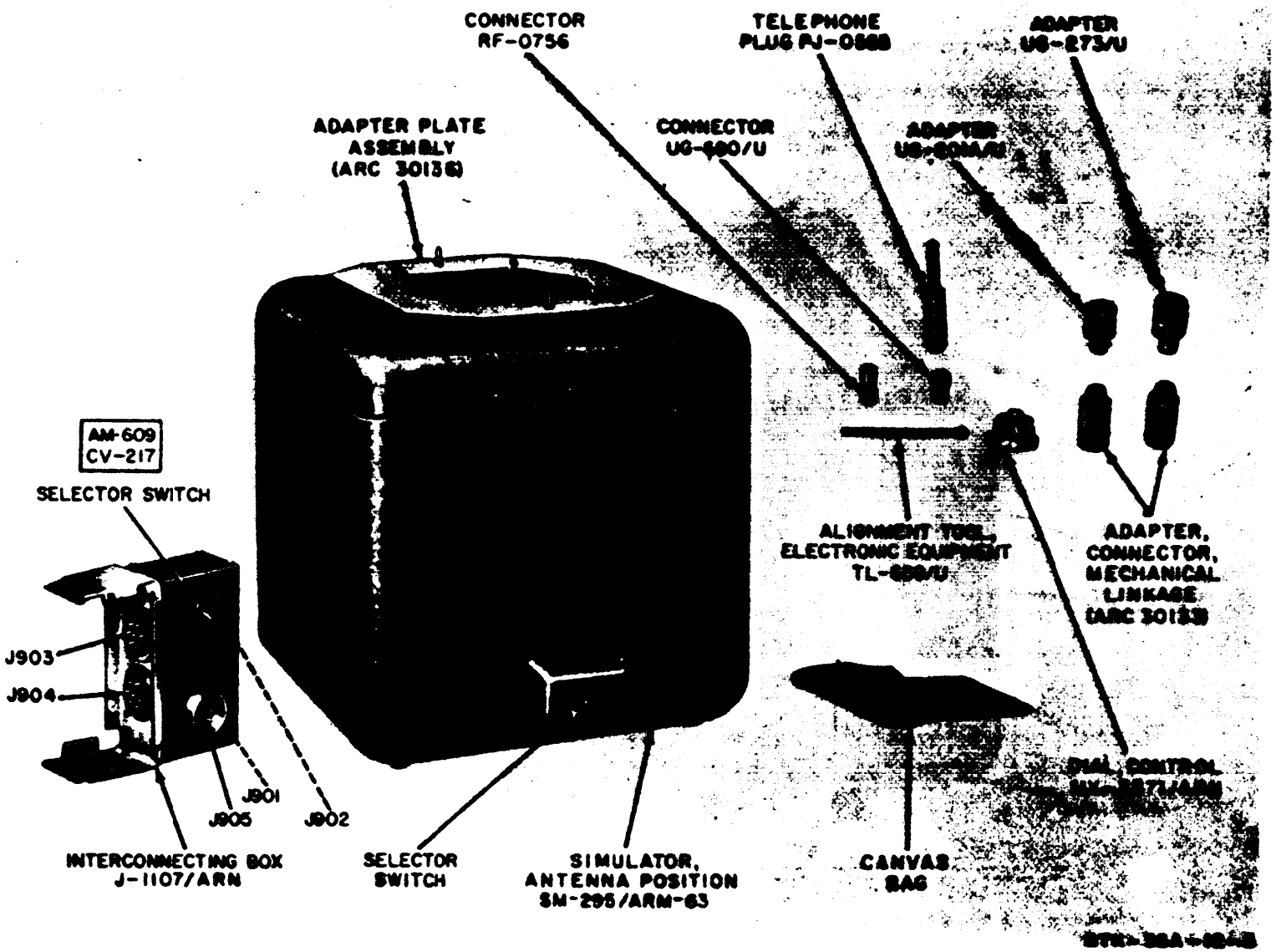


Figure 3. Components contained in rear cover (Aircraft Radio Corp Model BTK-35A only).

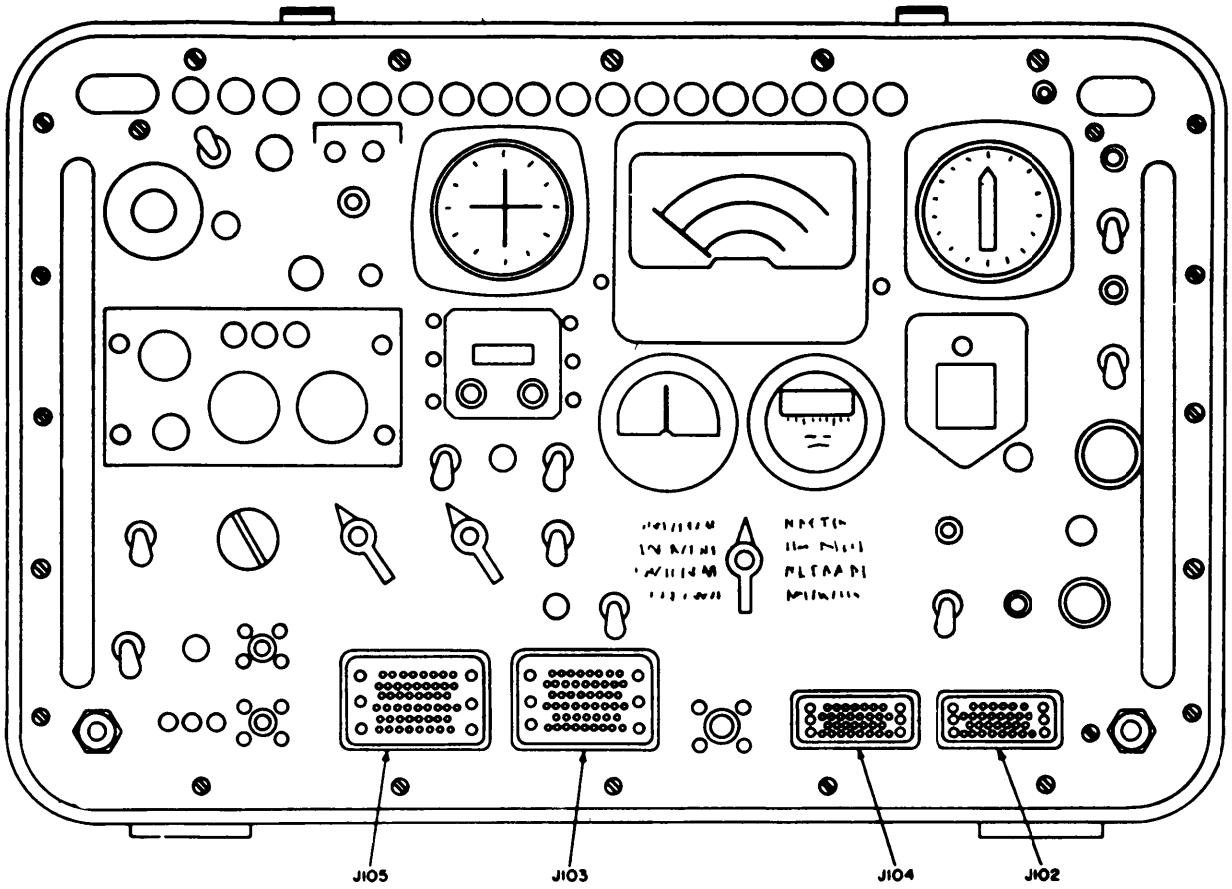


Figure 2.1. Test Set, Radio TS-1797/ARM-68 (procured on Contract DAAB05-67-C-1648).

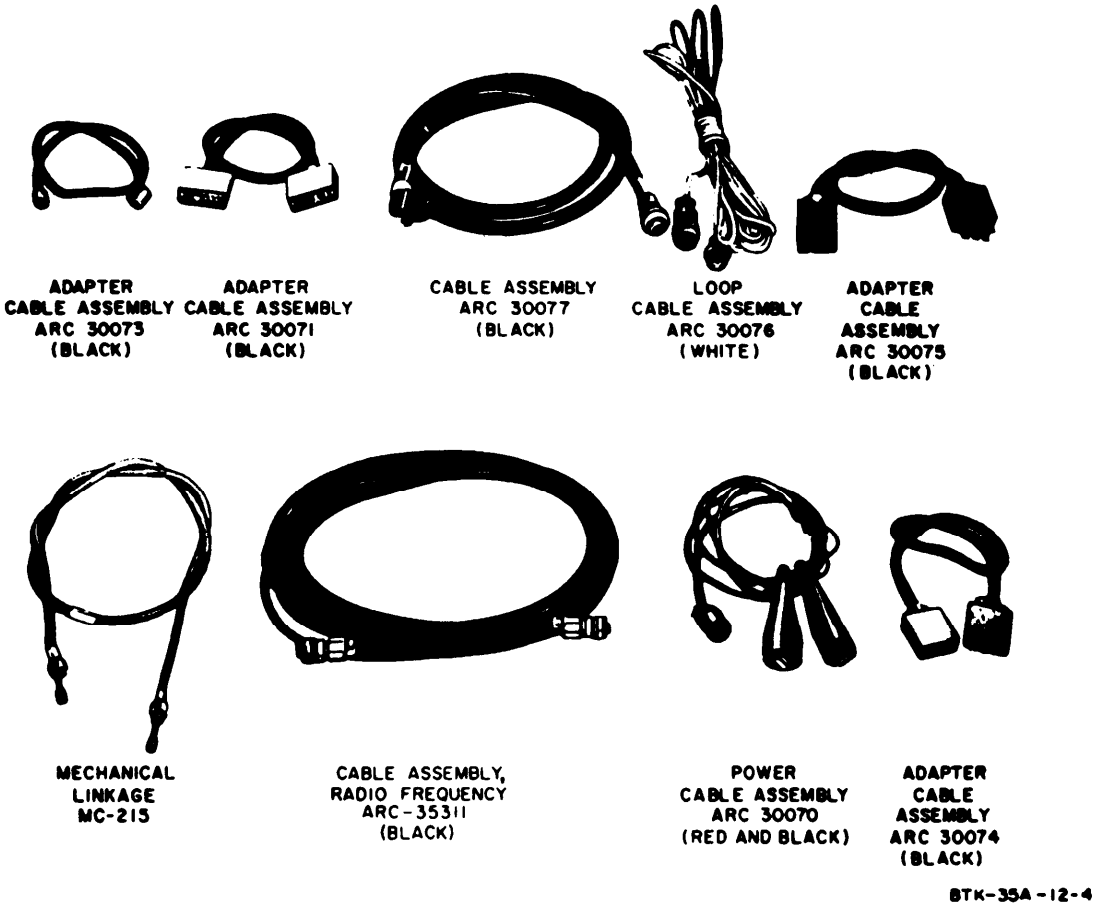


Figure 4. Radio test Set cables, less test cables.

on the test set front panel for easy identification. To further facilitate identification of the cable assemblies, each cable assembly is tagged with an identification number. The connectors on each of the cable assemblies are identified with reference designations.

b. ARC-27 Test Cable (fig. 5). The ARC-27 test cable (ARC 29419) is color coded black. This cable is 5 feet long and is branched into three 8 inch lengths on one end for connecting the components of Radio Set AN/ARC-27(*) or AN/ ARC-55(*) to the test set. These three 8 inch lenghts are terminated with two multipin connectors and one phone plug for connection to the two connectors and the meter phone jack on the front panel of the radio set under test. The other end of the cable in terminated with a single multipin connector that is color coded to, and mates with, teat cable connector J104 on the test set front panel.

c. ARC-55 Dynamotor Patch Cord (fig. 4). The ARC-55 dynamotor patch cord (ARC 30075) is an extension cord that provides interconnection between the main chassis of Receiver-Transmitter, Radio RT-178/ARC-27 or RT-349(*)/ARC-55 under test and its dynamotor when the dynamotor is removed from the main chassis. The ARC-55 dynamotor patch cord is two feet long and contains six single conductors. A six-contact plug on one end of the cord connects to the chassis of the radio set under test and a six-contact receptacle on the other end of the cord connects to the removed dynamotor.

d. ARC-55 Patch Cord No. 1 (fig. 4). The ARC-55 patch cord No. 1 (ARC 30071) is an extension

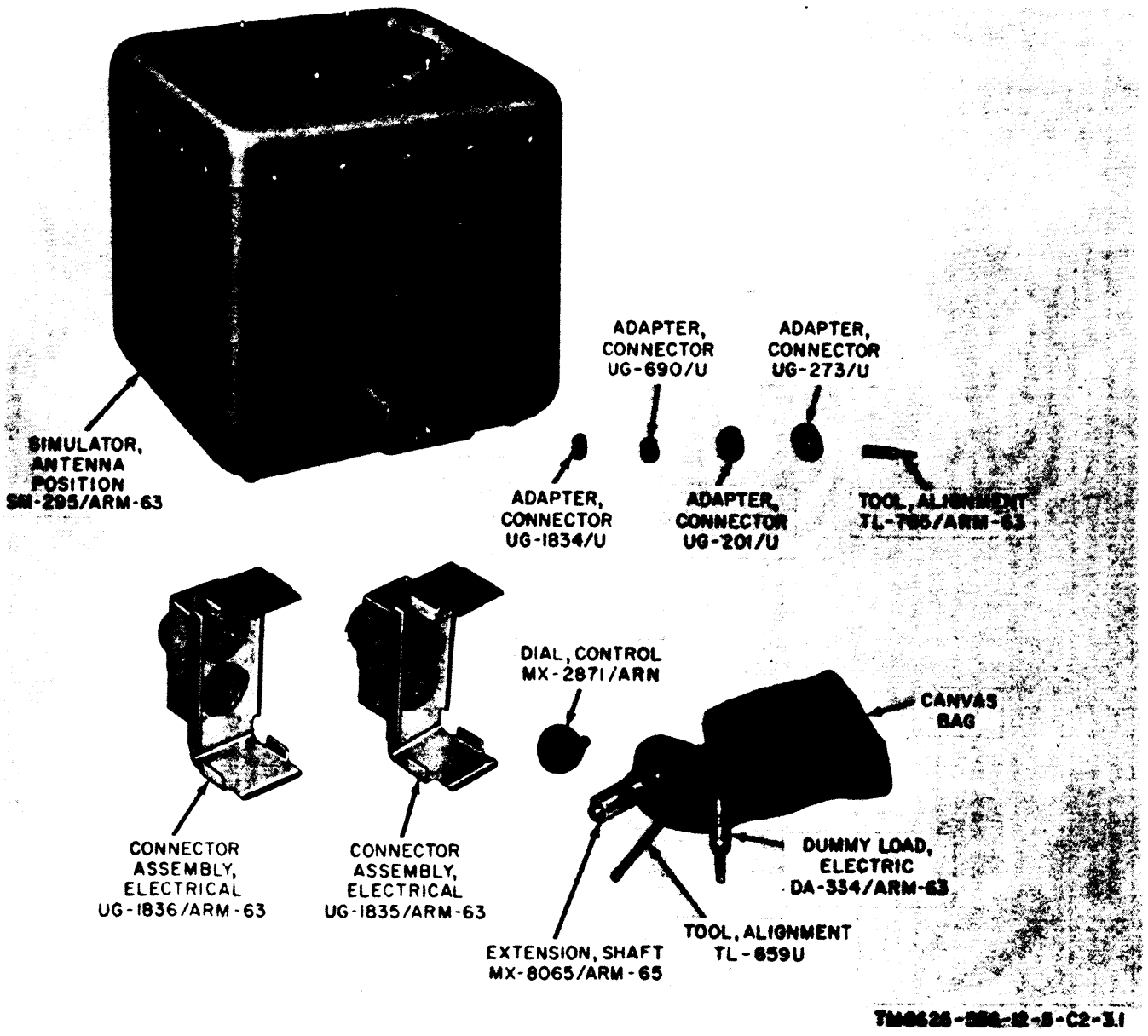


Figure 3–1 Components contained in rear cover (AN/ARM–63 procured on Contract DAAB05–67–C–1648).

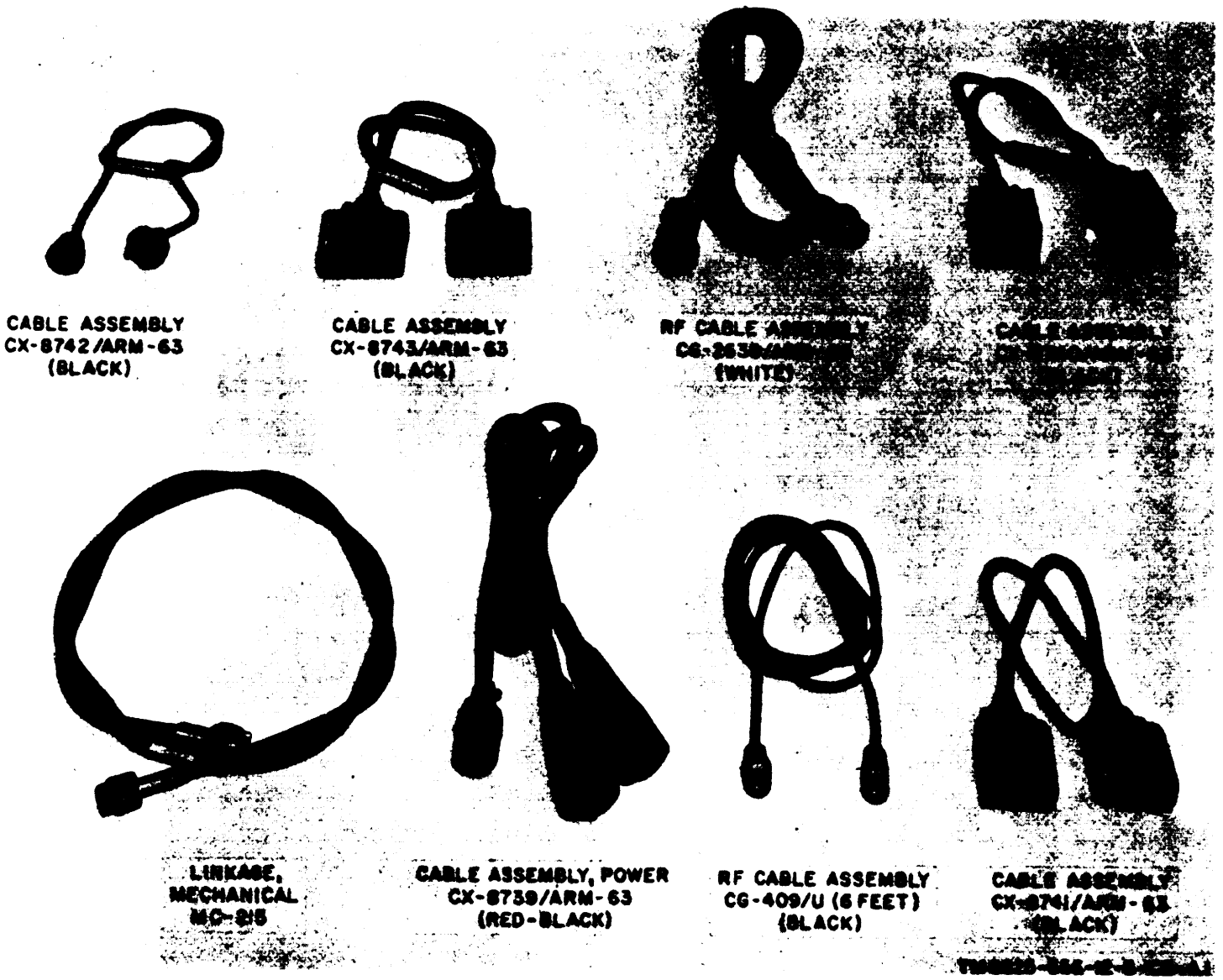


Figure 4.1 Radio test set cables, less test cables (AN/ARM–63 procured on Contract DAAB05–67–C–1648).

cord that provides interconnection between the main chassis of Receiver-Transmitter, Radio RT–178/ARC-27 or RT–349(*)/ARC-55 that is under test and four of the receiver-transmitter subassemblies when the subassemblies are removed for maintenance or troubleshooting. The four subassemblies of the receiver-transmitter that can be removed and connected to the main chassis with this patch cord are the modulator, intermediate-frequency (if.) and audio amplifier, bias relay, and mechanical drive. The ARC-55 patch cord No. 1 is two feet long and contains 15 single conductors. A 15 contact plug at one end of the cord connects to the chassis receptacle for the removed subassembly and a 15 contact receptacle on the other end of the cord connects to the removed subassembly.

e. ARC-55 Patch Cord No. 2 (fig. 4). The ARC-55 patch cord No. 2 (ARC 30073) is an extension cord that provides interconnection between the main chassis of Receiver-Transmitter, Radio RT–178/ARC-27 or RT–349(*)/ARC-55 and two of the receiver-transmitter subassemblies when the subassemblies are removed for troubleshooting and repair. The two subassemblies of the receiver-transmitter that can be removed l nd connected with this cord are the main receiver rf amplifier and the spectrum oscillator. The ARC-55 patch cord No. 2 is two feet long and contains seven single conductors. A seven-contact plug at one end of the cord connects to the chassis receptacle on the receiver-transmitter for the removed subassembly and a seven-contact receptacle at the other end connects to the removed subassembly.

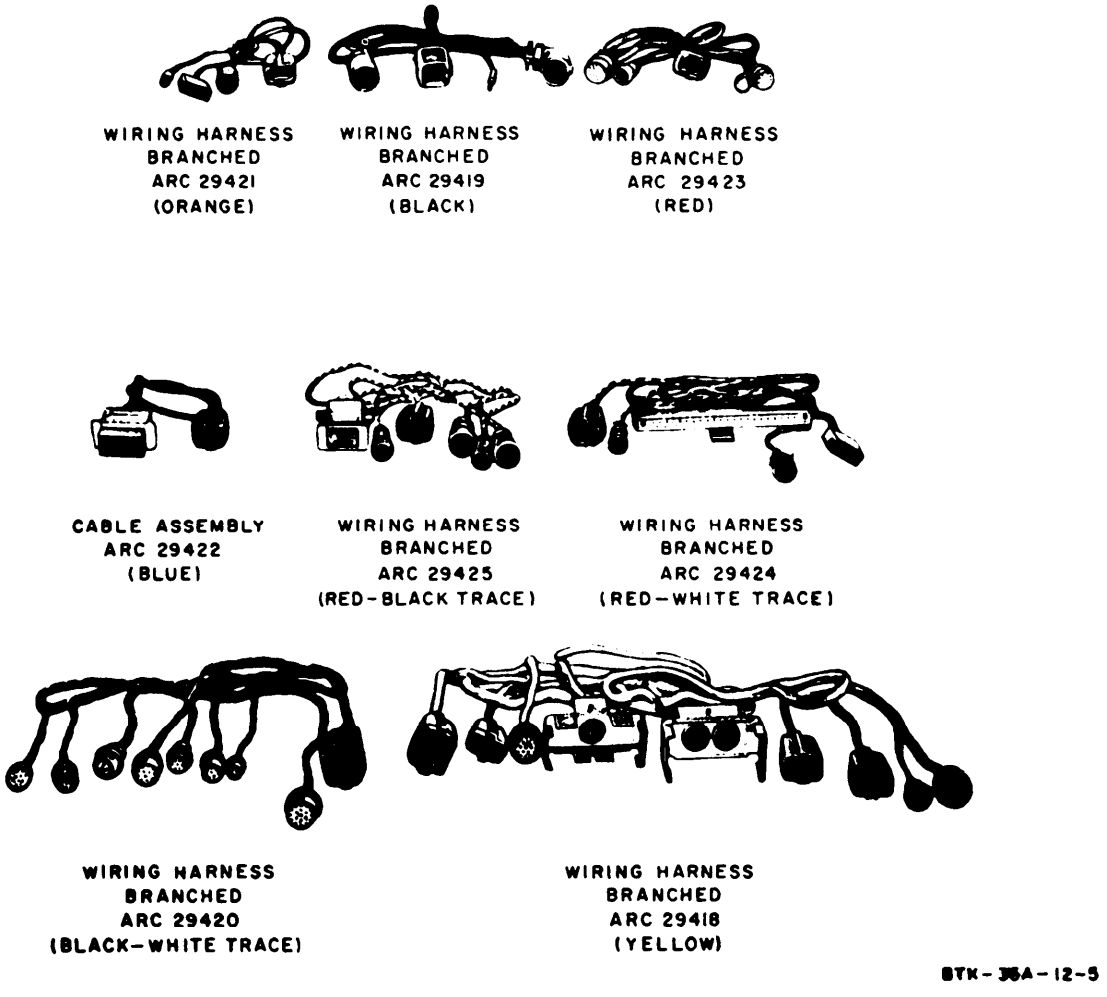


Figure 5. Radio test set test cables. (Aircraft Radio Corp Model BTK-35A only)

f. ARC-55 Patch Cord No. 3 (fig. 4). The ARC-55 patch cord No. 3 (ARC 30074) is an extension cord that provides interconnection between the main chassis of Receiver-Transmitter, Radio RT–178/ARG55 or RT–349(*)/ARC–55 that is under test and four of the receiver-transmitter subassemblies when these subassemblies are removed for maintenance and repair. The four subassemblies of the receiver-transmitter that can be removed and connected to the main chassis with this patch cord are the guard receiver, 20- to 30-megacycle (mc) if. amplifier, spectrum amplifier, and rf power amplifier. The ARC–55 patch cord No. 3 is two feet long and contains 20 single conductors. A 20 contact plug at one end of the cord connects to the chassis receptacle for the removed subassembly and a 20 contact receptacle at the other end of the cord connects to the removed subassembly.

g. ARC-60 Test Cable (fig. 5). The ARC-60 test cable (ARC 29420) is color coded black with *a* white tracer, This cable is used for bench test connecting components of Radio Set AN/ARC–60(*) or Radio Set ARC Type 12. The ARC-60 test cable is 5 feet long and one end is branched into eight 4-inch lengths, each terminated with a multipin connector. The terminating multipin connectors mate with appropriate connectors on the components of the radio set to be tested, The other end of this cable is terminated with a single multipin connector that is color coded to, and mates with, test cable connector J105 on the test set,

h. ARN-6 Loop Cable (fig. 4). The ARN-6 loop cable (ARC 30077) is color coded black, This cable is a twin-coaxial type that is used for connecting the loop antenna rf signals to the input of Radio Compass Unit R-101(*)/ARN-6. The ARN-6 loop cable is 6 feet long and terminated with a three-pin receptacle on each end that mates with the appropriate connectors on the loop antenna and R–101(*)/ARN–6.

i. ARN-6 Test Cable (fig. 5). The ARN–6 test cable (ARC 29424) is color coded red with a white tracer, This cable is 6 feet, 4 inches long and is branched into four lengths on one end, The four branched lengths are terminated with multipin connectors that provide connections to appropriate connectors of components of Radio Compass AN/ARN–6(*). The other end of the cable is terminated with a single multipin connector that mates with, and is color coded to, test cable connector J102 on the test set front panel.

j. ARN-30 Test Cable (fig. 5). The ARN-30 test cable (ARC 29418) is color coded yellow. This cable is 7 feet long and is branched into 9 lengths on one end. Each of the 9 lengths is terminated with a multipin connector that provides connection to appropriate connectors on components of Receiving Set, Radio AN/ARN-30(*). The other end of this cable is terminated with two multipin connectors that are color coded to, and mate with, test cable connectors J103 and J101 on the front panel of the test set.

k. ARN-64 Loop Cable (fig. 4). The ARN-54 loop cable (ARC 35311) is black. This cable is a twin-coaxial type that is 27 feet, 6 inches long and is used to connect the rf signals from the loop antenna to the receiver of Receiving Set, Radio AN/ARN-54. This cable is terminated with a three-receptacle connector on each end that mates with appropriate connectors on the AN/ARN-54 loop antenna and receiver.

l. ARN-54 Test Cable (fig. 5). The ARN-54 test cable (ARC 29425) is color coded red With a black tracer. This cable is 6 feet, 6 inches long. One end of this cable is branched into five lengths on one end that terminate with multipin connectors. The multipin connectors mate with appropriate connectors on the components of the AN/ARN-54. The other end of the cable is terminated with a multipin connector that is color coded to, and mates with, test cable connector J102 on the front panel of the test set.

m. ARN–59 Loop Cable (fig. 4). The ARN–59 loop cable (ARC 30076) is white. This cable is a twin-coaxial type that is 20 feet 6 inches long and is terminated on both ends with identical three-receptacle connectors that connect to the loop antenna and receiver of Direction Finder Set AN/ARN-59(V).

n. ARN–59 Test Cable (fig. 5). The ARN-59 test cable (ARC 29423) is color coded red. This cable is 5 feet long. The cable is branched into four lengths on one end with each length terminated with a multipin connector that connects to connectors on appropriate components of Direction Finder Set AN/ARN-59(V). The other end of the cable is terminated with a single multipin connector that is color coded to, and mates with, test cable connector J 102 on the front panel of the test set.

o. Dc Power Cable (fig. 4). The direct current (dc) power cable (ARC 30070) is color coded red and black. This cable is 6 feet 6 inches long and is

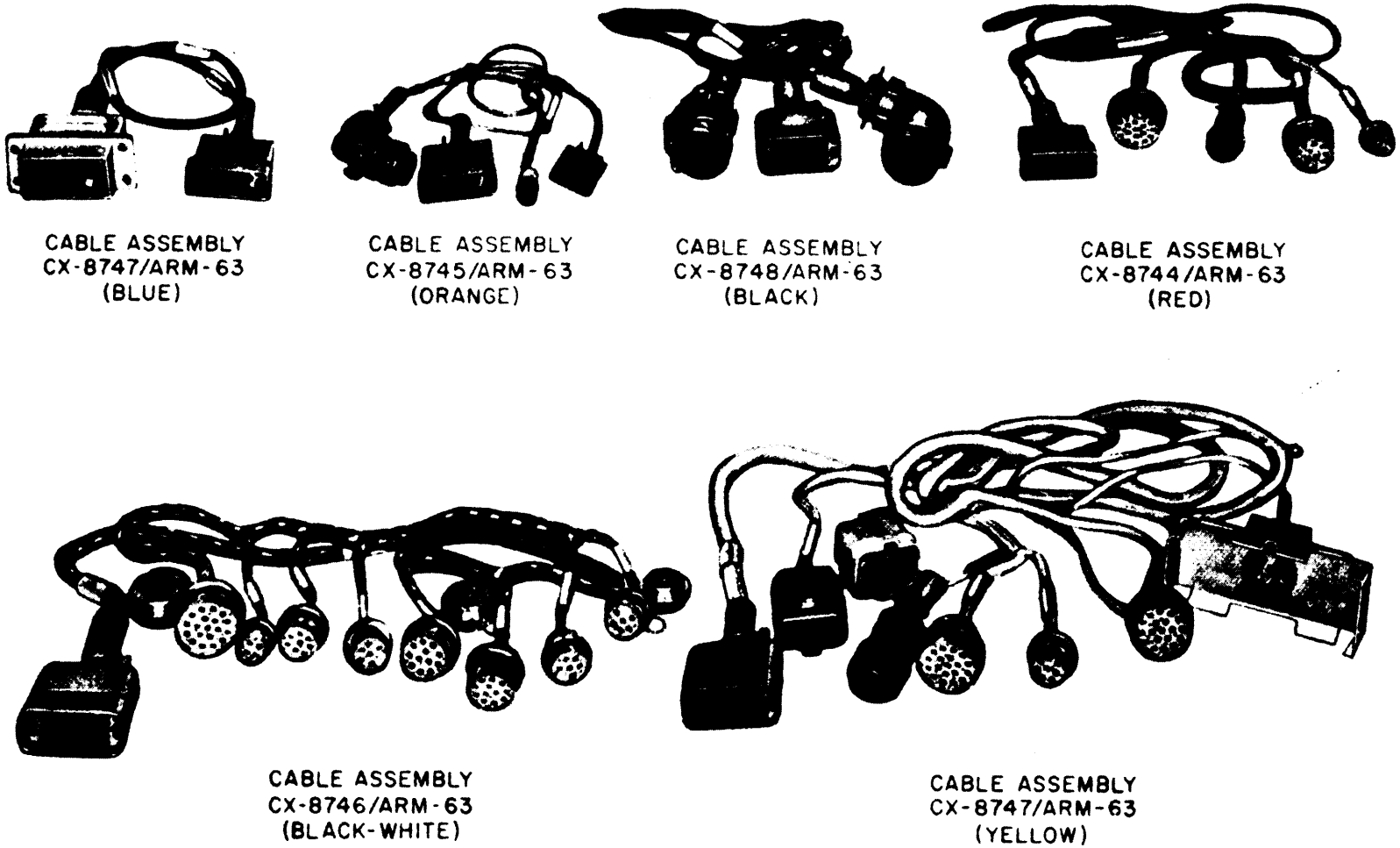


Figure 5.1 Radio test set cables (AN/ARM-63 procured on contract DAAB-5-67-C-1648).

terminated with a two-receptacle connector that mates with a power connector on the rear of the test set. The other end of the cable has two clips for connection to a battery or other source of 28-volt dc power. The clips have insulators that are color coded red and black. The red coded insulator is for connection to the positive terminal and the black coded insulator is for connection to the negative terminal of the dc power supply.

p. Glide Slope Test Cable (fig. 5). The glide slope test cable (ARC 29422) is color coded blue. This test cable is 2 feet 6 inches long and has a multipin connector on each end. The connector on one end connects to the glide slope receiver under test and the connector on the other end is color coded to, and mates with, test cable connector J104 on the test set front panel.

q. Marker Receivers Test Cable (fig. 5). The marker receivers test cable (ARC 29421) is color code d orange. This test cable is 3 feet 5 inches long and one end of the cable is branched into three 8 inch lengths. Each of the three lengths is terminated with multipin connectors which provide the proper connection for any of the marker beacon receivers that may be connected for test. The other end of the cable is terminated with a multipin connector that is color coded to, and mates with, test cable connector J104 on the test set front panel.

r. ARC–27 Test Cable. The ARC-27 test cable, CX-8748/ARM-63, is color coded black. The cable is 5 feet in length and branched into three 8-inch lengths on one end for connecting the components of Radio Set AN/ARC–27(*) to the AN/ARM-63. The three 8-inch lengths are terminated with two multipin connectors and one phone plug for connection to the two connectors and meter phone jack on the front panel of the radio set under test. The other end of the cable is terminated with a single color coded multipin connector for mating with connector J104 on the AN/ARM-63 front panel.

s. ARC-60 Test Cable. The ARC-60 test cable, CX-8746/ARM-63, is color coded black with a white tracer. The cable is used for bench test connection of components of the AN/ARC-60(*) or Radio Set ARC Type 12. The test cable is 5 feet long and one end is branched into eight 4-inch lengths. Each length is terminated with a multipin connector for mating with connectors on the components of the radio set to be tested. The other end of the cable is terminated with a single color coded multipin connector for mating with connector J105 on the AN/ARM-63 front panel.

t. ARN-30 Test Cable. The ARN-30 test cable, CX-8749/ARM-63, is color coded yellow. The cable is 7 feet in length and branched into seven (7) lengths on one end. Each length is terminated with a multipin connector that provides connection to connectors on components of the AN/ARN-30(*). The other end of the cable is terminated with a color coded multipin connector for mating with connector J103 on the AN/ARM-63 front panel.

u. ARN-59 Test Cable. The ARN-59 test cable, CX-8744/ARM-63, is color coded red. The cable is 5 feet long and one end is branched into four lengths. Each length is terminated with a multipin connector that connects to connectors on components of the AN/ARN-59(V). The other end of the cable is terminated with a single color coded multipin connector for mating with connector J102 on the AN/ARM–63 front panel.

v. Glide Slope Test Cable. The glide slope test cable, CX-8747/ARM-63, is color coded blue. The cable is 2 feet 6 in. long and terminated with a multipin connector on each end. One connector connects to the glide slope receiver under test and the other connector is color coded to mate with connector J104 on the AN/ARM-63 front panel.

w. Marker Receiver Test Cable. The marker receivers test cable, CX–8745/ARM-63, is color coded orange. The cable is 3 feet 5 in. long and one end of the cable is branched into three 8-inch lengths. The three lengths are terminated with multipin connectors which provide the proper connection for any of the marker beacon receivers that may be connected for test. The other end of the cable is terminated with a color coded multipin connector to mate with connector J104 on the AN/ARM-63 front panel.

9. Description of Minor Components

a. General. The minor components of the radio est set include the necessary adapters and mechanical items required for mechanical and electrical test connections of various components of the radio equipment to be bench tested. All the minor components, except for the mechanical linkage, are stored in the rear cover storage compartment. The mechanical linkage is stored in the front cover storage compartment with the cables (para 8).

b. Adapter Assembly (fig. 3). The adapter assembly (J-1107/ARN) consists of a rectangular aluminum box. This box contains five multipin connecters and a two-position double-throw selector switch. The adapter assembly provides the necessary test connections for connecting Converter, Signal Data CV-217/ARN-30 to the interconnecting cable connectors for Converter, Signal Data CV-265(*)/ARN-30 test cable (para 8j). When used, the unit mounts to the CV-217/ARN-30 with a U-shaped clip (does not apply for AN/ARM-63 on Contract DAAB 05-67-C-1648).

c. Alignment Tool (fig. 3). The alignment tool (TL-659/U) is a 2-27/32-inch-long brass wrench-type tool for rf alignment of very high-frequency (vhf) receivers. This tool has one working end and one special end which fits all the alignment adjustments in the rf portion of the receivers of Receiving Set, Radio AN/ARN-30(*).

d. ARN-6 Adapter (fig. 3). The ARN-6 adapters (two supplied) are special mechanical adapters that connect the mechanical linkage (g below) end fittings to the tuning drive fittings on the receiver and the control panel of Radio Compass AN/ARN–6(*) (does not apply for AN/ARM-63 on Contract DAAB05-67-C-1648).

e. Dial (fig. 3). The dial (MX*2871/ARN) is a drum-type dial and control that provides a mechanical direct tuning control and dial for flexible cable-tuned receivers. This dial has a scale graduated in 20 linear scale divisions. The unit mounts on the receiver by a captive nut. The direct tuning drive fits a 15-tooth tuning drive connection that has a pitch diameter of 0.208 inch. This dial is used for tuning Receiver, Radio R-445/ARN-30 or R-508/ARC (does not apply for AN/ARM-63 on Contract DAAB05-67-C-1648).

f. Loop Adapter (fig. 3). The loop adapter (ARC 30136) is a plate that fits on the antenna position simulator (para 7c) and provides the mounting for the loop antennas on the antenna position simulator.

g. Mechanical Linkage (fig. 4). The mechanical linkage (MC-215) is a flexible drive cable that connects to control panels and receivers of remote mechanically tuned radio equipment. This flexible cable transmits the mechanical tuning drive from the tuning control device to the receiver.

h. Plug (fig. 3). The plug (PJ-055B) is a standard-type telephone plug that contains an internal 150-ohm terminating resistor. This plug is used to terminate headset circuits when a headset is not used .

i. Adapter UG–273/U (fig. 3). Adapter UG–273/U is a coaxial cable adapter connector, This adapter connector consists of a male-type Ultra-

high-frequency (uhf) connector and a female-type BNC connector connected together. This adapter provides connection between BNC male and uhf-type female coaxial cable connectors.

j. Adapter UG-201A/U (fig 3). Adapter UG-201A/U is a coaxial cable adapter connector. This adapter connector consists of a male-type N-connector and a female-type BNC connector connected together. This adapter connector provides connection between female-type N and male-type BNC connectors.

k. Connector RF-0756 (fig. 3). Connector RF-0756 is a female-type BNC connector which mates with a male-type BSM connector. It is equipped with a coaxial center receptacle on both ends and has a knurled section for gripping.

l. Connector UG-690/U (fig. 3). Connector UG-690/U is a female-type BNC connector with a type BNC connector on one end and a type TSM connector on the other end. It mates with a type BNC and a type TSM male connector and has a knurled section for gripping.

10. Additional Equipment Required

The following chart lists the equipment required for use with the test set but not supplied with it:

Additional equipment	AN/ARN-6(*) AN/ARN-54 AN/ARN-59(V)	AN/ARN-30(*)	Used with tests for		R-746/AR	AN/ARC-27(*) AN/ARC-55(*)
			Marker receivers	AN/ARC-60(*) ARC Type 12		
R.F. Signal Generator Set AN/URM-25(*)	X	X				
Multimeter TS-352(*)/U	X					
Oscilloscope OS-8(*)/U	X					X
Headset HS-33(*)	X	X	X	X	X	X
Audio Oscillator TS-382(*)/U		X	X			
Signal Generator SG-66A/ ARM-5 (See Note)		X				
Test Set TS-11/AP		X		X		
Generator, Signal AN/USM-44(*)			X	X		X
Multimeter AN/URM-105		X		X		
Wattmeter AN/URM-43(*)				X		X
Microphone T-17-(*)				X		
Signal Generator AN/GRM-4					X	
Microphone (hand-held) NAF 213264-6						X
Variable bias supply, 0-4.5 volts dc. (See text for fabrication.)					X	
Test Probe ARC 16139		X				
Attenuator pad, 6-db, Boonton Radio 505-B		X			X	
Tuning wand, Teflon, one brass tip, one iron tip		X				
Output Meter TS-585(*)/U	X					
Loudspeaker, 3.2 ohms impedance	X					
Ammeter Weston model 301				X		
Rf coaxial cables (para 14b)	X (2)	X (2)	X (1)	X (4)	X (1)	X (2)

Note. Signal Generator ARC Type H-14A is interchangeable with and is recommended for use in place of Signal Generator SG-66A/ARM-5.

10.1. Differences in Models

Test Set, Radio AN/ARM-63 procured on Contract DAAB05-67-C-1648 differs from Test Set, Radio AN/ARM-63 (Aircraft Radio Corp Model BTK-35A) as indicated in *a* through *f* below.

a. The DEVIATION meter has a 250 degree total needle deflection and an accuracy tolerance of ±2 percent.

b. Four test cable connectors (J102, J103, J104, and J105; figure 2.1) are mounted on the AN/ARM-63 front panel. The shell of each connector is color coded to match its mating cable connector.

c. Six (6) special test cable assemblies (CX–8744/ARM-63, CX-8745/ARM-63, CX-8746/ARM-63, CX-8747/ARM-63, CX-8748/ARM-63, and CX-8749/ARM-63) are provided. No test or adapter cables are provided for testing the AN/ARN-6 or AN/ARN-54.

d. Electrical connector assemblies UG-1835/ARM-63 and UG-1836/ARM-63 and shaft extension MX–8065/ARM–63 are provided.

e. Electronic Equipment Alignment Tool. TL-765/ARM–63 is provided. The tool is used for adjustment of Z601, Z602, and Z603 in the AN/ARC-55(*).

f. Adapter plate ARC 30136, mechanical linkage connector adapters ARC 30133, and interconnecting box J–1107/ARN are not provided.

10.2. Components (Test Set, Radio AN/ARM-63 procured on contract DAAB05-67-C-1648)

Test Set, Radio AN/ARM-63 and its components are listed in the following chart.

Quantity	Item	Height	Depth	Width	Unit weight (lb)	Figure No.
1	Test Set, Radio AN/ARM-63	15 in.	30½ in.	22½ in.	92	1
1	Test Set, Radio TS-1797/ARM-63	15 in.	16 in.	22½ in.	45	1, 2. 1
1	Front Cover, part of Case, Test Set CY-3913/ARM-63, containing:	15 in.	7¾ in.	22½ in.	12	1
1	Cable Assembly, Special Purpose, Electrical (blue) CX-8747/ARM-63.	2 ft 6 in. lg			1. 0	
1	Cable Assembly, Special Purpose, Electrical, Branched (orange) CX-8745/ARM-63.	3 ft 5 in. lg			0. 71	
1	Cable Assembly, Special Purpose, Electrical, Branched (yellow) CX-8749/ARM-63.	7 ft lg			4. 25	
1	Mechanical Linkage MC-215	4 ft lg			0. 5	4
1	Cable Assembly, Special Purpose, Electrical (black) CX-8740/ARM-63.	2 ft lg			0. 5	4
1	Cable Assembly, Special Purpose, Electrical (black) CX-8742/ARM-63.	2 ft lg			0. 1	4
1	Cable Assembly, Special Purpose, Electrical (white) CG-2638/ARM-63.	20 ft 6 in. lg			0. 4	4
1	Cable Assembly, Special Purpose, Electrical, Branched (red) CX-8744/ARM-63.	5 ft lg			1. 4	
1	Cable Assembly, Power Electrical (red and black) CX-8739/ARM-63.	6 ft 6 in. lg			0. 65	4
1	Cable Assembly, Special Purpose, Electrical (black) CX-8743/ARM-63.	2 ft lg			0. 25	4
1	Cable Assembly, Special Purpose, Electrical (black) CX-8741/ARM-63	2 ft lg			0. 45	4

Quantity	Item	Height	Depth	Width	Unit weight (lb)	Figure No.
1	Cable Assembly, Special Purpose, Electrical, Branched (black w/ white tracer) CX-8746/ARM-63.	5 ft lg			2.0	
1	Cable Assembly, Special Purpose, Electrical, Branched (black) CX-8748/ARM-63.	5 ft lg			1.75	
1	Rear Cover, part of Case, Test Set CY-3913/ARM-63, containing:	15 in.	7¾ in.	22½ in.	10	1
1	Simulator, Antenna Position SM-295/ARM-63.	11⅝ in.	15¾ in.	11 in.	5.8	1, 3
1	Connector Assembly, Electrical UG-1835/ARM-63.	4⅞ in.	4⅝ in.	2 1/16 in.	0.65	
1	Connector Assembly, Electrical UG-1836/ARM-63.	4⅞ in.	4⅝ in.	2 1/16 in.	0.65	
1	Dial, Control MX-2871/ARN	1 3/64 in. lg X 1¼ in. dia				3
1	Dummy Load, Electrical DA-334/ARM-63.					3
1	Alignment Tool, Electronic Equipment TL-659/U.	2 3/64 in. lg				3
1	Adapter, Connector UG-273/U					3
1	Adapter, Connector UG-201A/U					3
1	Adapter, Connector 1834/ARM-63					3
1	Adapter, Connector 690/U					3
1	Extension, Shaft MX-8065/ARM-63	2 3/32 in. lg				
1	Alignment Tool, Electronic Equipment TL-765/ARM-63.	1½ in. lg				

CHAPTER 2

INSTALLATION

11. Unpacking

a. Packaging Data. The components of Test Set, Radio BTK-35A are shipped in the carrying case and packed in a fiberboard carton. The dimensions and weight of the fiberboard carton are: height 20 inches, width 26 inches, depth 34 inches, and weight 100 pounds packed.

b. Removing Contents (fig. 6).

(1) Cut and remove the steel strapping from around the corrugated carton.

(2) Open the top of the corrugated carton and remove the corrugated pad, instruction manuals, and cardboard filler material.

(3). Lift out the radio test set.

> ***Caution:*** **The radio test set weighs 93 pounds; most of its weight is concentrated in the forward portion of the carrying case. Two men are required to lift it safely.**

12. Checking Unpacked Equipment

a. Separate the three sections of the carrying case and remove all components. To unlock the trunk latches:

(1) Lift up the catches and twist one-half turn counterclockwise to free hasps;

(2) Lift hasps to free sections of cover.

b. Inspect the equipment for damage incurred during shipment. Note especially the following:

(1) Check indicator and meter glass for cracks.

(2) Check connectors for bent or damaged pins.

(3) Check front panel for loose knobs, scratches, or other physical damage.

(4) Check antenna position simulator for evidence of damage.

(5) Check all accessories and cable assemblies for signs of damage.

(6) If the shipment has been damaged, refer to paragraph 2b.

c. Compare the equipment with the packing list. When no packing list accompanies the equipment, use the list of components (para 5) to make a general check.

13. Placement of Equipment

Place the test set in its carrying case on any convenient work surface that is close to both 115-volt, 400-cycle ac power and 28-volt dc power. When the antenna position simulator is to be used, place it in any convenient location adjacent to the test set. If the antenna position simulator is not to be used, store it in the rear cover of the carrying case (fig. 1). Store all extra cables and accessories in the front cover of the carrying case.

a. Connect the three-prong ac power connector to a 115-volt 400-cycle ac source.

b. Connect the alligator clips of the red and black dc power cable (ARC 30070 or CX-8739/ARM-63) to a 28-volt dc power source. Be sure to observe polarity; red-positive and black-negative.

c. Connections for testing each of the equipments to be tested are given in the section pertaining to that equipment.

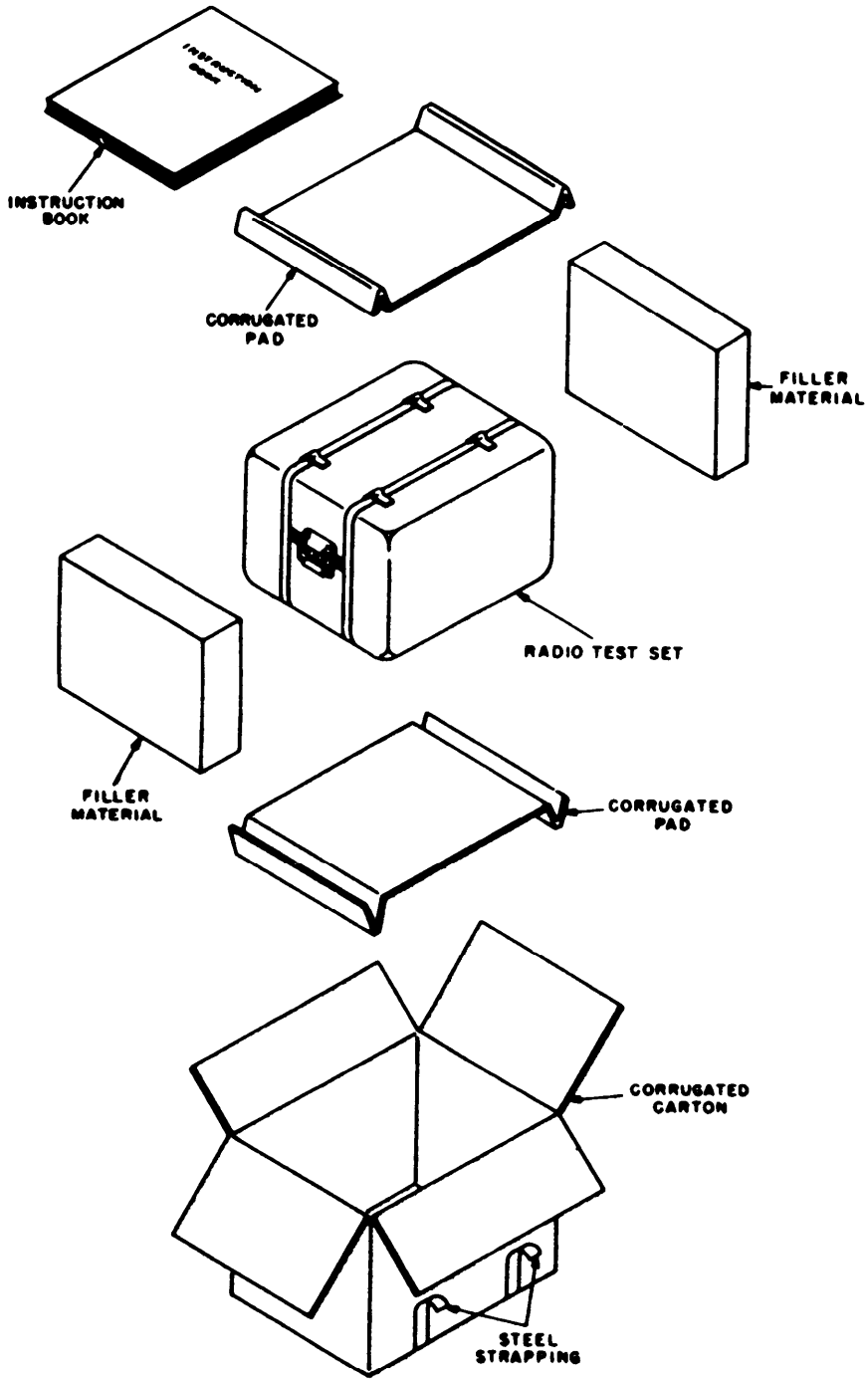


Figure 6. Packing diagram.

CHAPTER 3
OPERATING INSTRUCTIONS

Section I. GENERAL

Note. Test setup interconnecting cables, radio test set front panel connectors, and radio test set connections in text and on figures 9 through 13 and figures 15 through 17 apply only to Test Set, Radio AN/ARM-63 (Aircraft Radio Corp Model BTK-35A). For Test Set, Radio AN/ARM-63 procured on Contract DAAB05-67-C-1648, use the chart in paragraph 13.1 below to modify the text and test connections illustrated on figures 9 through 13 and figure 17; refer to figure 2.1 for physical location of connectors.

13.1. Test Cable Connections (AN/ARM-63 procured on contract DAAB05-67-C-1648)

Cable identification and color code	Connects from		Connects to	Figure No.
	AN/ARM-63 front panel connector No. and color code	Mating cable connector No. and color code		
CX-8745/ARM-63 (orange)	J104 (orange and blue)	P1 (orange)	Receiver, Radio R-666(*)/ARN-32 Receiver, Radio R-1041(*)/ARN. Receiver, Radio R-122(*)/ARN-12.	9
CX-8749/ARM-63 (yellow)	J103 (yellow)	P1 (yellow)	Receiver, Radio R-1021/ARN-30D Receiver, Radio R-445/ARN-30. Converter, Signal Data CV-265(*)/ARN-30A. Converter, Radio Magnetic Indicator CV-1275/ARN. Radio Set Control.	10
CX-8746/ARM-63 (black with white trace)	J105 (black)	P9 (black)	Frequency Converter-Transmitter CV-431/AR Receiver, Radio R-508/ARC. Transmitter, Radio T-366A/ARC. Oscillator-Relay O-423/AR.	11
CX-8747/ARM-63 (blue)	J104 (orange and blue)	P1 (blue)	Receiver, Radio R-746/AR	12
CX-8748/ARM-63 (black)	J105 (black)	P1 (black)	Receiver-Transmitter, Radio RT-128/ARC-27	13
CX-8744/ARM-63 (red)	J102 (red)	P1 (red)	Simulator, Antenna Position SM-295/ARM-63 Receiver, Radio R-836/ARN. Dynamotor DY-150/ARN. Indicator ID-637/ARN.	17

14. Test Setup Interconnecting Cables

a. Front Panel and Test Cable Color Codes. The front panel and test cables of the radio test set are color coded to simplify test setups and procedures. The color code is given below:

Color	Type of equipment under test	Cable No.	Front panel connectors	Equipment nomenclatures
White	Applies to more than one type of equipment			
Orange	Marker beacon receiving	ARC 29421 or CX-8745/ARM-63	J104	Marker Beacon Receiving Set AN/ARN-12. Receiving Set, Radio AN/ARN-32. Receiver, Radio R-1041(*)/ARN.
Yellow	Vhf omnidirectional radio range (vor) receiving.	ARC 29418 or CX-8749/ARM-63	J101 and J103	Receiving Set, Radio AN/ARN-30(*).
Black	Vhf and uhf radio communications.	ARC 29420 or CX-8746/ARM-63	J105 J105	Radio Set AN/ARC-60(*). Radio Set ARC type 12. Radio Set AN/ARC-27(*).
		ARC 29419 or CX-8748/ARM-63		Radio Set AN/ARC-55(*).
Blue	Glide slope receiving	ARC 29422 or CX-8747/ARM-63	J104 J104	Receiver Group AN/ARN-54. Receiver, Radio R-746/AR.
Red	Automatic direction finder receiving (adf).	ARC 29423 or CX-8744/ARM-63	J102 J102 J102	Radio Compass AN/ARN-6(*). Receiving Set, Radio AN/ARN-54. Direction Finder Set AN/ARN-59(V).

b. Fabrication of RF Coaxial Cable (fig. 7). A maximum of six RF coaxial cables are required to provide the necessary test connections for the test procedures. These RF coaxial cables are fabricated from Radio Frequency Cable RG-58/U and are terminated on both ends with BNC-type connectors.

(1) *Material required.* Fabrication of the RF coaxial cables requires 24 feet of type RG–58/U coaxial cable and 12 BNC connectors with plug body and male pin contacts.

(2) *Procedure.* Cut the RG-58/U coaxial cable into 1-foot lengths and install a BNC connector on each end of each cable. Follow the instructions on figure 7 for installing the BNC connectors on the RG-58/U coaxial cable lengths.

15. Arrangement of Instructions

The radio test set tests 14 different communication and navigation equipments (para 3a). The instructions in this manual are arranged in the order of the equipments listed. Before attempting to test *any* equipment, carefully study both the literature covering that equipment and the applicable portions of this manual.

16. Test Methods

The general method of testing is to interconnect all the components that make up a complete operable radio set (one known to be in good working order) as a *standard* radio set and then to substitute, in turn, each of the components of the radio set to be tested for the corresponding component of the *standard* radio set. Each component of the equipment under test is then checked and calibrated against the *standard.* If necessary, all the components of the equipment under test can

be interconnected through the radio test set and a complete system check made.

17. Start and Stop Procedures

To start the test set, place the ac and dc circuit breakers (fig. 8) in the ON (up) position. To stop the test set, place the circuit breakers to the OFF (down) position. To start the equipment being tested, except for the marker beacon receivers, operate the appropriate power switches on their control boxes as in normal operation. The section covering each of the equipments to be tested provides instructions for operation of appropriate switches in connection with the test procedures.

Section II. OPERATOR'S CONTROLS, INDICATORS, AND CONNECTORS

18. General

All operating controls and indicators are located on the front panel of the test set (fig. 8), the adapter assembly (fig. 3), and the antenna position simulator. Connections are made from the front panel of the test set and the antenna position simulator to the components to be tested. A special test cable is provided for each system. The test cable connectors on the front panel of the test set and all the test cables are color coded (para 14a). Paragraph 19 identifies the test set controls and their functions. Paragraph 20 identifies the test set indicators and connectors and their functions. Paragraph 21 identifies the controls, indicators, and connectors on the antenna position simulator and their functions. Paragraph 22 identifies the control and connectors on the adapter assembly and their functions.

19. Test Set Controls

The following chart lists the operator's controls on the front panel of the test set. The function of each control is also given.

Control	Function	
Dc circuit breaker	In ON (up) position, applies dc power to the test setup.	
Ac circuit breaker	In ON (up) position, applies 400-cycle ac power to the test setup.	
METER switch	Selects the circuit and appropriate meter range for measuring current, voltage, or power within the equipment under test on the multimeter.	
	Position	*Action*
	LV 0–5A	Multimeter measures current drawn by unit under test.
	LV 0–30A	Multimeter measures current drawn by unit under test.
	LV 0–30V	Multimeter measures dc supply voltage.
	AUDIO 0–6V	Multimeter measures audio output.
	AUDIO 0–30V	Multimeter measures audio output.
	AUDIO 0–50MW	Multimeter measures audio output.
	AUDIO 0–500MW	Multimeter measures audio output.
	HV 0–600V	Multimeter measures receiver B+ (240 vdc marked on scale as B+ SET).
	NAV MOD 0–6V	Multimeter measures receiver navigation modulating voltage for AN/ARN–30(*).
	CATHODE 0–30MA	Multimeter measures receiver rf amplifier cathode current.
	HV1 0–150V	Multimeter measures AN/ARN–54 B+ level.
	HV2 0–150V	Multimeter measures AN/ARN–59(V) B+ level.
	AN/ARC–27/55	Multimeter measures voltages and currents within the AN/ARC–27(*) or AN/ARC–55(*) receiver-transmitter as selected by the METER switch on the receiver-transmitter front panel.
	ADF 0–30V	Multimeter measures 100 cps adf signal at 0°.
	ADF 0–150V	Multimeter measures 100 cps adf signal at 90°.
	FLAG 0–1MA	Multimeter measures flag current.
	400N 0–150V	Multimeter measures ac supply level.

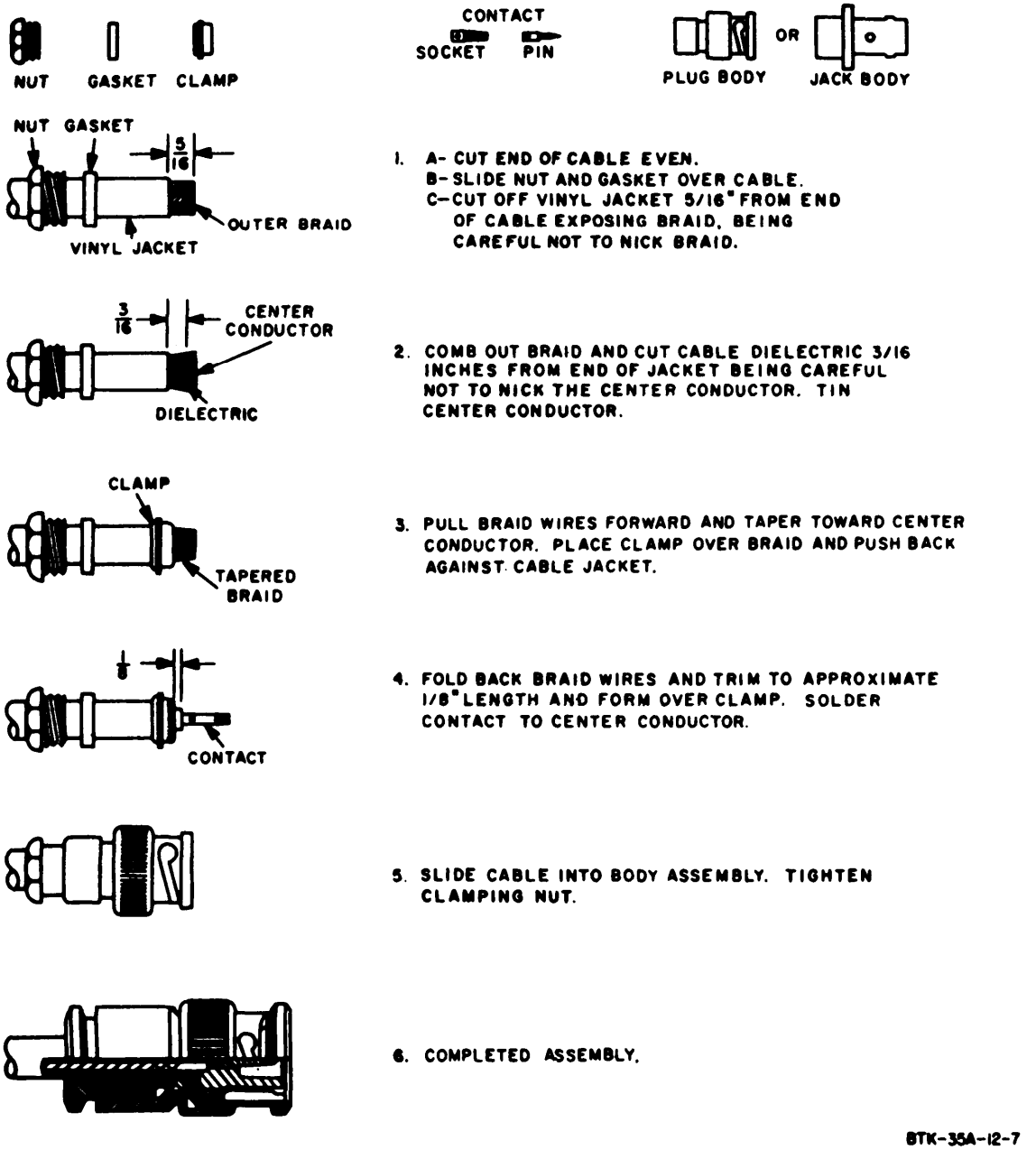


Figure 7. Installing BNC connectors on coaxial cable.

Control	Function
Tuning crank and PRESS TO WHISTLE control.	Tunes Receiver, Radio R–508/ARC or R–445/ARN–30 to desired frequency (mechanical linkage); when pressed toward panel, tuning crank permits whistle-through tuning of the R–508/ARC under test to any transmitter crystal frequency.
VHF-UHF crystal selector switch.	Selects one of 18 crystal channels; positions A through J are vhf; positions 1 through 8 are uhf; unlabeled positions are not used.
HI-LO band selector	Selects either high or low uhf band as shown by fiducial mark.
UHF control panel (Control, Radio Set C–1827/ARC–55).	Controls tuning, function selection, power rf sensitivity, and audio volume of AN/ARC–27(*) or AN/ARC–55(*).
Band switch and tuning crank (AN/ARN–59(V)).	Three-position selector switch for AN/ARN–59(V) frequency bands (0.19–0.40 mc, 0.40–0.84 mc, and 0.84–1.75 mc); tuning crank drives mechanical linkage for tuning AN/ARN–59(V) receiver only; dial indicates frequency in megacycles.
VERT CP HOR switch	Selects drive current applied to DEVIATION meter.
	Position — *Action* HOR — DEVIATION meter reads horizontal drive current to ID–453/ARN–30. VERT — DEVIATION meter reads vertical drive to ID–453/ARN–30.
Megacycle selector control (fig. 2).	Selects vhf receiver or glide slope channel; left knob dials megacycles; right knob dials fractional megacycles.
CP LOAD switch	Selects the indicator to display the AN/ARN–30(*) output.
	Position — *Action* VOR — AN/ARN–30(*) output is displayed on the ID–453/ARN–30 and the ID–250/ARN. RMI — AN/ARN–30(*) output is displayed on the ID–250/ARN only.
Control selector switch	Permits the megacycle selector control to control the frequency of the AN/ARC–60(*) uhf transmitter or the R–1021/ARN–30D, or allows control of the R–1021/ARN–30D frequency by an externally-connected C–3436(*)/ARN–30D.
	Position — *Action* UHF XMTR — Megacycle selector control controls the frequency of the transmitter of a CV–431/AR (AN/ARC–60(*) uhf transmitter). INT — Megacycle selector control selects the operating frequency of the R–1021/ARN–30D. EXT — The operating frequency of the R–1021/ARN–30D is selected by an externally connected C–3436(*)/ARN–30D.
VHF REC switch	Selects operating mode of AN/ARN–30(*) under test when the AN/ARN–30(*) includes Converter, Signal Data CV–265(*)/ARN–30A. Inoperative when Converter, Signal Data CV–217/ARN–30 and Filter-Amplifier AM–609/ARN–30 are used.
	Position — *Action* VOR — Activates the CV–265(*)/ARN–30A omnicircuits. LOC — Activates the CV–265(*)/ARN–30A visual-aural range and localizer circuits.
SQUELCH control and VOR-GS on-off switch.	Sets level for AN/ARN–30(*) receiver squelching (noise suppression). In VOR-GS (off) position, routes low-voltage dc to the AN/ARN–30(*) or glide slope receiver.
MAX-MIN SENS switch ..	Momentarily fixes rf gain level of AN/ARN–30(*) receiver.
NAV MOD switch	Selects signal fed to AN/ARN–30(*) converter.
	Position — *Action* RCVR — Applies receiver output to converter. EXT — Applies vhf signal generator output to converter.
Alignment function selector switch (AN/ARC–27(*) or AN/ARC–55(*) only).	RUN — Drives transmitter output capacitor plates. OFF — Stops capacitor plates in desired position. NORM — Permits recycling to preset frequency.
KEY-OFF-MOM switch	Keys transmitter.

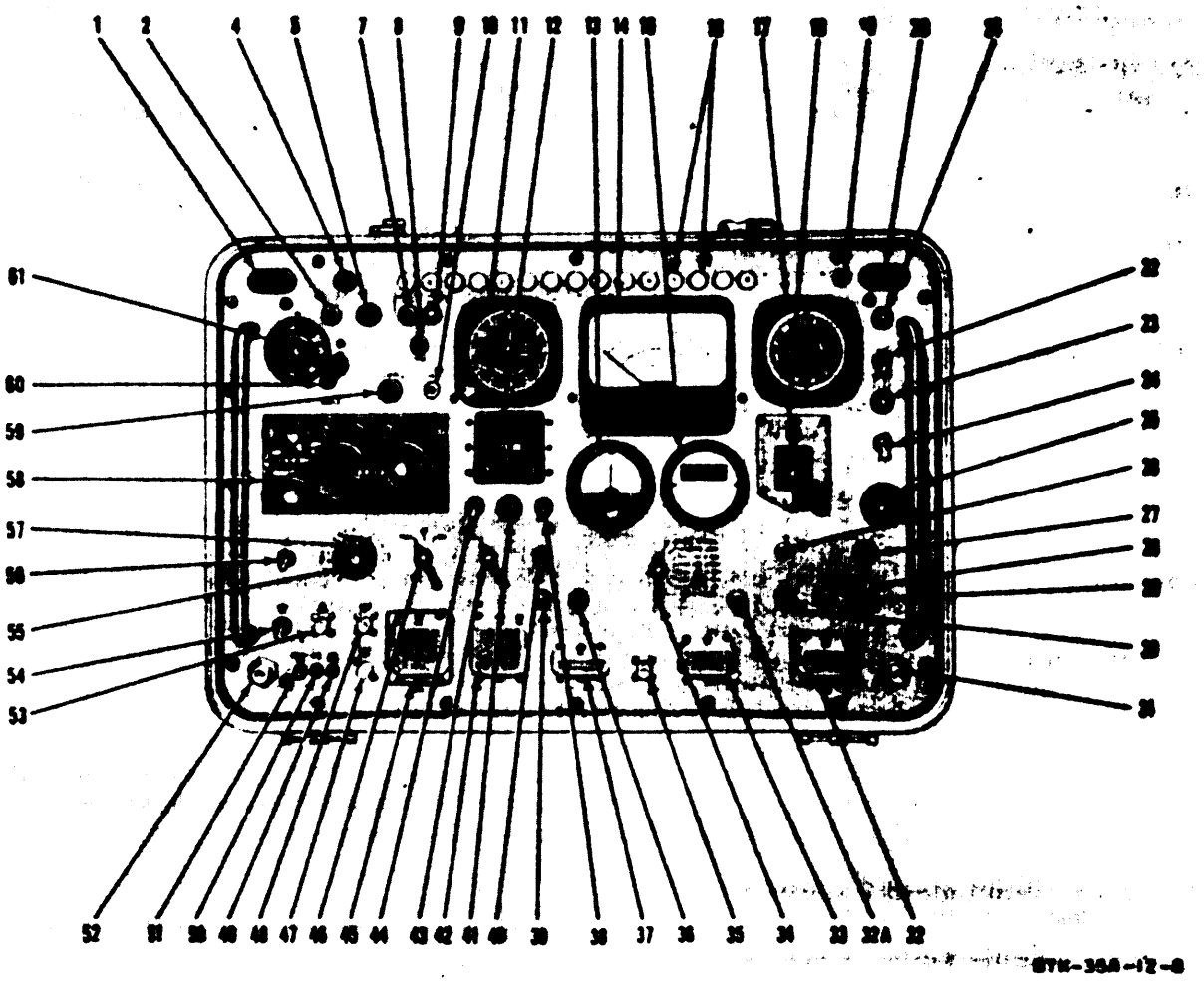
Control	Function
KEY-OFF-MOM switch .... (cont)	*Position* — *Action* KEY — Transmitter keyed. OFF — Transmitter off. MOM — Transmitter keyed momentarily; switch is spring-loaded to return to OFF.
MCW ON switch	In ON position, keys transmitter and modulates it by its internal oscillator (on sets equipped with modulated continuous-wave function).
SENS control	Adjusts rf sensitivity of receiver; clockwise rotation increases sensitivity.
MIC TONE switch	Selects audio for modulating transmitter under test. MIC — Selects microphone input (MIC jack). TONE — Selects tone input (1000 ~ IN jack).
ADF VOL control	Audio volume and on-off switch for the AN/ARN-59(V).
BFO switch	Controls (ON-OFF) beat-frequency oscillator of AN/ARN-59(V).
Function switch (AN/ARN-59(V)).	Selects AN/ARN-59(V) operating mode. *Position* — *Action* COMP — Sets up receiver circuits for adf operation. ANT — Sets up receiver circuits for communication operation. LOOP — Energizes loop relay.
LOOP switch	Rotates the AN/ARN-54 and AN/ARN-59(V) loop antennas away from null point to test rotational speed, bearing repeat accuracy, etc.
MOTOR switch	Stops AN/ARN-54 and AN/ARN-59(V) loop antennas in any desired position.
MKR VOL control	Applies power to the marker beacon receiver and controls audio volume level.
SENS HI-LO switch	Selects marker beacon receiver sensitivity range.
VERT FLAG HOR switch ..	Selects meter current applied to test set multimeter. *Position* — *Action* VERT — Multimeter reads vertical OFF flag current to ID-453/ARN-30. HOR — Multimeter reads horizonal OFF flag current to ID-453/ARN-30.

20. Test Set Indicators and Connectors

(fig. 8)

The following chart lists the indicators and connectors on the test set front panel that are used during operations.

Indicator or connector	Function
POWER DC indicator	Lights when dc power is applied to the test setup and the dc circuit breaker is in the ON position.
POWER 400 ~ indicator ...	Lights when ac power is applied to the test setup and the ac circuit breaker is in the ON position.
Multimeter	Operates with METER switch to measure voltage, current, or power levels within various circuits in equipment under test.
Frequency calibrated MC dial	Mechanically positioned by tuning crank and PRESS TO WHISTLE control to indicate frequency to which vhf or uhf receiver under test is tuned. When VHF-UHF crystal selector switch is set from A through J, dial indicates vhf receiver (R-508/ARC or R-445/ARN-30) frequency; when crystal selector switch is set from 1 through 8, dial indicates the AN/ARC-60 uhf converter (CV-431/AR) frequency.
DEVIATION meter	Measures drive current to ID-453/ARN-30 horizontal or vertical cross pointer as selected by VERT CP HOR switch.
Frequency meter	Measures frequency of reference voltage fed to fixed-phase winding of loop antenna.
Indicator lamps A through R.	Show status of AN/ARC-27(*) or AN/ARC-55(*) tuning circuit ground connections.
Indicator lamps H through R.	Show status of AN/ARN-30D and AN/ARN-30E tuning control ground circuits.
MIC jack	Connection for microphone input.



Note. Item 37 does not apply to the AN/ARM-63 on contract DAAB05-67-C-1648.

1 AUDIO INPUT jacks
2 SENS HI-LO switch
3 Not Used
4 400~ (blue) indicator
5 MKR VOL control
6 Not Used
7 XMTR lamp
8 KEY-OFF-MOM switch
9 STANDBY lamp
10 MIC jack
11 Indicator, Course ID-453/ARN-30
12 Megacycle selector control
13 DEVIATION meter
14 Multimeter
15 Frequency meter
16 Indicator lamps A through R
17 Indicator, Course ID-250/ARN
18 Band switch and tuning crank (AN/ARN-59(V))
19 PHONE jack
20 AUDIO OUTPUT jack
21 POWER DC indicator
22 Dc circuit breaker
23 POWER 400~ indicator
24 Ac circuit breaker
25 Tuning meter (AN/ARN-59(V))
26 LOOP switch
27 Function switch (AN/ARN-59 (V)).
28 BFO switch
29 ADF VOL control
30 MOTOR switch
31 Tuning shaft connection
32 Test cable connector J102
32A VERT FLAG HOR switch
33 Test cable connector J104
34 METER switch
35 EXT NAV MOD jack
36 VERT CP HOR switch
37 Test cable connector J101
38 VHF REC switch
39 MAX-MIN SENS switch
40 NAV MOD switch
41 SQUELCH control and VOR-GS on-off switch
42 Test cable connector J103
43 Control selector switch
44 CP LOAD switch
45 Text cable connector J105
46 Alignment function selector switch
47 WATT MTR jack
48 XMTR OUT jack
49 MOD TEST jack
50 GND jack
51 1000~ IN jack
52 Tuning shaft connection
53 SIG GEN jack
54 MICW-ON switch
55 VHF-UHF crystal selector switch
56 MIC-TONE switch
57 HI-LO band selector
58 UHF control panel (Control, Radio Set C-1827/ARC-55)
59 SENS control
60 Tuning crank and PRESS TO WHISTLE control
61 Frequency calibrated MC dial

Figure 8. Test set front panel, location of controls, indicators, and connectors.

Indicator or connector	Function
PHONE jack	Connection for Headset HS–33(*) or Telephone Plug PJ–055B.
AUDIO INPUT and OUTPUT jacks.	Connection for radio from receiver (AUDIO INPUT) and to headset or external monitor (AUDIO OUTPUT).
SIG GEN jack	Connection for external signal generator.
WATT MTR jack	Brings transmitter output to test set control panel for monitoring.
MOD TEST jack	Connection for monitoring modulation of transmitter output.
Tuning shaft connection	Connection for mechanical linkage.
Indicator, Course ID–250/ARN	Standard radio magnetic indicator course indicator needle No. 1 driven by vor circuits; bearing indicator No. 2 needle driven by adf circuits. (Card is locked in position.)
Indicator, Course ID–453/ARN–30.	Standard cross pointer indicator; vertical cross pointer and flag driven by AN/ARN–30(*); horizontal cross pointer and flag driven by glide slope receiver, as in normal position.
EXT NAV MOD jack	Connection for external AN/ARN–30(*) navigation modulating source.
STANDBY lamp	When on, transmitter is in standby status.
XMTR lamp	When on, transmitter is operating.
1000~ IN jack	Connection for audio oscillator tone input.
GND jack	Ground connection for tone input.
Tuning shaft connection	Connection for connecting mechanical linkage to AN/ARN–59(V).
Tuning meter (AN/ARN–59(V)).	Indicates relative rf sense antenna current to permit accurate tuning of AN/ARN–59(V).
400~ (blue) indicator	Lights when marker beacon receiver output is at prescribed level; used for *all* single-light marker receivers.
Test cable connectors	Test cable connections.

Connector (Aircraft Radio Corp Model BTK–35A only)	*Test Cable*	*Connector for AN/ARM–63 procured on Contract DAAB05–67–C–1648*
J101	ARN–30	
J102	ARN–6, ARN–54, ARN–59	J102 (ARN–59 only)
J103	ARN–30	J103
J104	Marker beacon receivers, glide slope	J104
J105	ARC–60, ARC–27	J105

21. Antenna position Simulator Controls, Indicators, and Connectors

The following chart lists the operating controls, indicators, and connectors on the antenna position simulator. The function of each control, indicator, and connector is also given.

Control, indicator, or connector	Function	
	Position	*Action*
DUMMY-FIELD switch	DUMMY	Connects signal generator output directly to adf receiver rf input circuits, bypassing antenna position simulator and loop antenna.
	FIELD	Connects signal generator output to antenna position simulator radiating rod, for testing loop antennas.
Selector switch	Swtiches appropriate load resistances into antenna position simulator radiating rod circuit for each adf receiver as labeled on the switch (AN/ARN–6(*), AN/ARN–54, or AN/ARN–59(V)).	
SIG GEN jack (BNC connector, fig. 1).	Connection for external signal generator.	
REC jack (BNC connector, fig. 1).	Connection for receiver sense antenna input.	

22. Adapter Assembly Control and Connectors (Aircraft Radio Corp Model BTK-35A only)

(fig. 3)

The following chart lists the control and connectors on the adapter assembly and their functions. The adapter assembly is used for testing the AN/ARN-30(*) when it includes a CV-217/ARN-30.

Indicator or connector	Function
AM-609 to CV-217 selector switch.	Selects localizer or vor operation of the AN/ARN-30(*) under test.
	Position — *Function* AM-609 — Operates Receiver, Radio R-445/ARN-30 as a localizer receiver. CV-217 — Operates Receiver, Radio R-445/ARN-30 as an omnirange receiver (vor operation).
Connectors J901 and J902	Connect to P4 and P5 of the ARN-30 test cable. Connectors P4 and P5 normally connect to the CV-265(*)/ARN-30A.
Connectors J903 and J904	Connect to the CV-217/ARN-30 under test.
Connector J905	Connects through interconnecting cable to the AM-609/ARN-30 under test.

Section III. TEST PROCEDURES, MARKER BEACON RECEIVERS

23. Introduction

a. General. The following chart lists the marker beacon receivers that can be tested with the test set. The chart also lists the associated radio set of which the receiver is a part and the applicable reference covering maintenance of the receiver.

Receiver	Associated radio set	References
R-666(*)/ARN-32.	AN/ARN-32	TM 11-5826-205-34 TM 11-5826-205-50
R-122(*)/ARN-12.	AN/ARN-12	TM 11-521
R-1041(*)/ARN		TM 11-5826-208-35

Note. The test technician must have a thorough working knowledge of the equipment under test before beginning the tests. In all cases, refer to the applicable technical manual for detailed test instructions.

b. Equipment Required. In addition to the test set, the following equipment is required for testing the marker receivers:

(1) Audio oscillator TS-382(*)/U.
(2) Generator, Signal AN/USM-44(*).
(3) Headset HS-33(*).
(4) Fabricated rf coaxial cables (para 14b).

24. Interconnection of Components

Only one receiver may be connected and tested at a time. Interconnect the receiver, the test set, and the other test equipment as shown in figure 9 or 9.1. Leave the remaining connectors, for other marker receivers, of the marker receiver test cable unconnected. For example, if Receiver, Radio R-666(*)/ARN-32 is to be tested, leave the connectors that connect to the R–1041(*)/ARN and the R-122(*)/ARN-12 disconnected.

Caution: Observe polarity when connecting power cable (ARC 30070 or CX-8739/ARM-63) to 28-volt dc source (para 13).

25. Preliminary Procedures

(fig. 8)

Start the test set and the receiver under test by placing the dc circuit breaker (22) and the MKR VOL control (5) of the test set at ON. Check the supply voltage level by setting the METER switch (34) to LV 0—30V position and noting that multimeter reading is at LV + SET position. Wait 3 minutes for the receiver to warm up.

26. Sensitivity Test

(fig. 8)

Perform the interconnection of components (para 24) and preliminary procedures (para 25); then proceed as follows:

a. Test Set Sensitivity Switch at High.

(1) Place the test set SENS HI-LO switch (2) in the HI position. Monitor the receiver audio output with Headset HS-33(*) and the blue indicator lamp (4) while slowly increasing the output of the AN/USM-44(*). Refer to paragraph 28, column 5, for modulation frequency. The indicator lamp should light and the tone should be audible in the headset with the light on. In the case of single-light markers (R-1041(*)/ARN, R-122(*)/ARN-12, and R-666(*)/ARN-32) the blue 400 ~ lamp (4) will light for all frequencies.

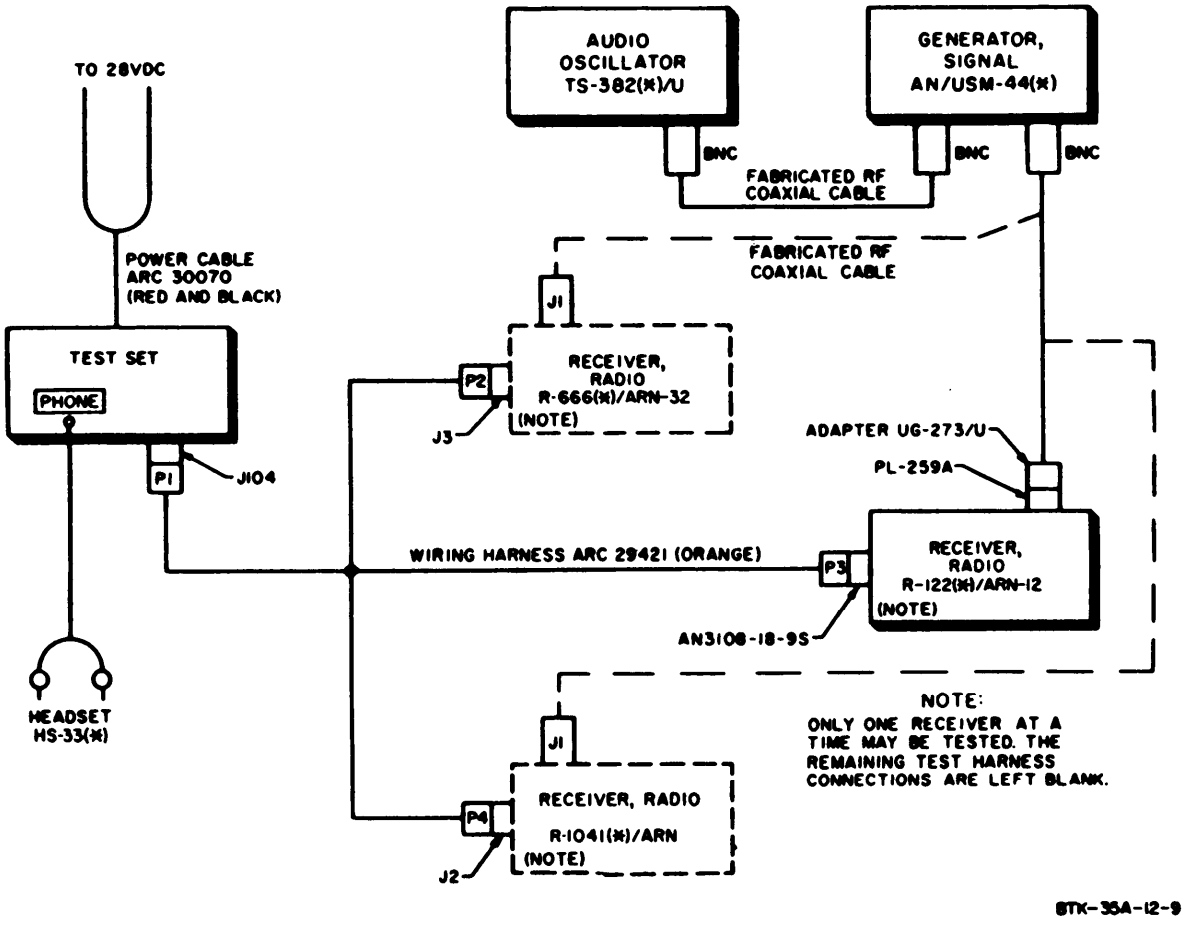


Figure 9. Marker receivers test connections (Aircraft Radio Corp. Model BTK-35A only)

(2) Check the output of the AN/USM-44(*) at the point at which the blue indicator lamp lights. The AN/USM-44(*) output should be as shown in paragraph 28, column 8.

(3) Decrease the output of the AN/USM-44(*) until the indicator lamp goes out. The audio tone should still be heard in the headset.

(4) Repeat the procedures in (l), (2), and (3) above for at least three readings to insure accuracy of the AN/USM–44(*).

b. Test Set Sensitivity Switch in Low. Place the test set SENS HI–LO switch (2) in LO position and repeat the procedure in *a* above. The indicator lamp should light when the output of the AN/USM-44(*) is set according to paragraph 28, column 6.

c. Test Results. If the results obtained do not agree with those in *a* and *b* above, refer to the alignment procedures in the technical manual that pertains to the receiver under test.

27. Output Measurements

(fig. 8)

To measure the output of the receiver under test, perform the interconnection of components (para 24) and the preliminary procedures (para 25). Insert Telephone Plug PJ-055B or Dummy Load DA-334/ARM-63 into PHONE jack (19) of the test set. Place the test set SENS HI-LO switch (2) in the HI position.

a. Adjust the AN/USM-44(*) MOD control until its PERCENT MODULATION meter indicates the value given in paragraph 28, column 4.

b. Adjust the AN/USM44(*) output to the level indicated in paragraph 28, column 8.

c. Set the test set METER switch (34) to AUDIO 0-500MW; if reading is less than 50 milliwatts (row), set the switch to AUDIO 0-50MW. The reading should be as shown in paragraph 28, column 7. If the output reading is incorrect, refer to the technical manual pertaining to the receiver under test.

d. Set the test set SENS HI-LO switch (2) to LO.

e. Adjust the AN/USM-44(*) output to the value given in paragraph 28, column 6.

f. Observe the test set multimeter (14) indication. The multimeter should indicate the values given in paragraph 28, column 7. If the output reading is incorrect, refer to the technical manual pertaining to the receiver under test.

28. Test Data

The test results obtained with the test procedures in paragraphs 26 and 27 are listed below:

1	2	3	4	5	6		7	8
Receiver	Supply voltage (dc)	Indicator lamp	Percent modulation	Mod. frequency (cps)	SENS switch position (signal generator output, uv)		Minimum audio output power (mw) with 150-ohm load	Max signal generator voltage (uv)
					HI	LO		
AN/ARN-12	26.5	Blue	30	400	500	1,500	1	100,000
AN/ARN-32	27.5	Blue	30	100	500	1,500	1	100,000
R-1041(*)/ARN	27.5	Blue	30	400	500	1,500	5	350,000

Section IV. TEST PROCEDURES, RECEIVING SETS, RADIO AN/ARN-30, AN/ARN-30A, AN/ARN-30B, AND AN/ARN-30C

29. Introduction

a. General. Tests for Receiving Sets, Radio AN/ARN-30 through AN/ARN-30C are identical for all four systems and individual major components may be interchanged among the four systems without the need for adjustment, alignment, or repeated testing. The tests given in this section cover the entire system and each of the major components, without reference to model designation. For detailed test information, alignment instructions, and repair procedures, refer to TM 11-520 or TM 11-5826-207-24.

b. Equipment Required. In addition to the test set, the following items *of* equipment are required for testing the AN/ARN-30 through AN/ARN-3OC:

(1) Generator, Signal SG-66A/ARM-5 or H-14A.
(2) Audio Oscillator TS-382(*)/U.
(3) R. F. Signal Generator Set AN/URM-25(*).
(4) Test Sets TS-11/AP.
(5) Multimeter AN/URM-105.
(6) Fabricated rf coaxial cables (para 14b).
(7) Headset HS-33(*).
(8) Test Probe ARC 16139.
(9) Attenuator pad, 6-db.

30. Interconnection of Components

Connect the major components of the AN/ARN-30, AN/ARN-30A, AN/ARN-30B, or AN/ARN-30C, the test set, and the other equipment as shown in figure 10 or figure 10.1. Connect a fabricated rf coaxial cable between the SG–66A/ARM–5 ATTEN jack and the ANT jack of Radio Receiver R-445/ARN-30. If only a single major component to is be tested, complete the test setup with all the other major components that comprise a complete system.

Caution: Observe polarity when connecting the power cable (ARC 30070 or CX-8739/ARM-63) to the dc power source (para 13).

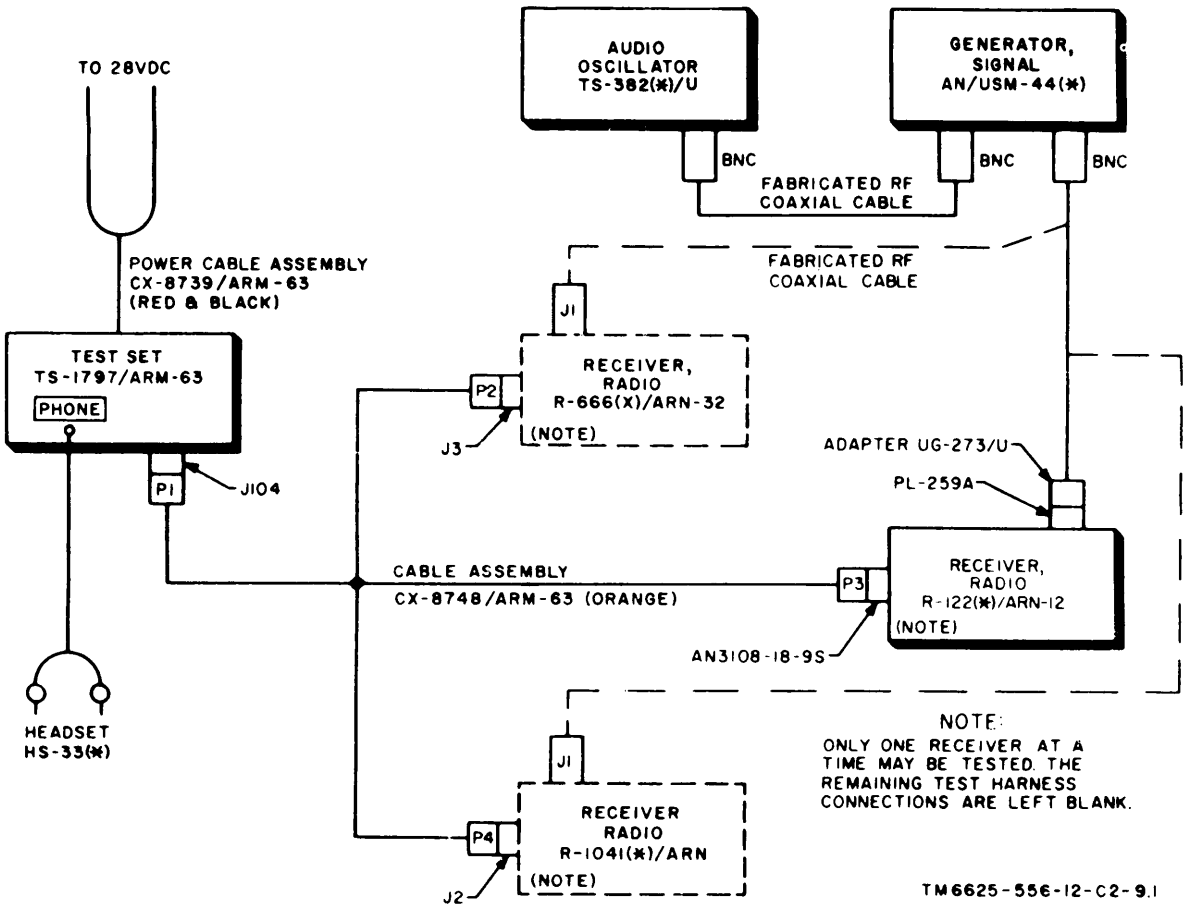


Figure 9. Marker receiver test connection (AN/ARM-63 procured on contract DAAB05-67-C-1648).

31. Preliminary Procedure

(fig. 8)

a. With the AN/URM–105, check the primary power voltage at the dynamotor input terminals. The voltage at these terminals should be 28 volts dc.

b. Set the test set METER switch (34) to AUDIO 0-6V. Set the SG-66A/ARM-5 so that its rf and if. test signals are 30-percent modulated with a 1000-cps signal. Adjust the output level of the SG-66A/ARM-5 so that the multimeter (14) indicates on the green set point (an audio output of 10 milliwatts into a 300-ohm resistive load, corresponding to a voltage of 1.73 volts). Turn the test set SQUELCH control and VOR-GS on-off switch (41) fully clockwise and the test set OMNI-VAR LOC switch to OMNI.

c. Place the test set dc circuit breaker (22) to the ON position. Allow at least 10 minutes for the equipment to warm up.

32. Receiver Voltage Checks

Perform the interconnection of components (para 24) and the preliminary procedures (para 25). Remove the SG–66A/ARM–5 signal input, place the test set MAX-MIN SENS switch (39) to MAX (maximum sensitivity), and check the following test set multimeter (14) readings for each of the indicated positions of the METER switch (34):

METER switch	Multimeter reading (volts)	Average reading (volts)
LV 0–30V	28	
HV 0–600V	235–270	250 (B+SET)

33. Receiver Calibration Check

(fig. 8)

Perform the interconnection of components (para 30) and the preliminary procedures (para 31). Adjust Audio Oscillator TS-382(*)/U for 400-cycle output and connect the TS-382(*)/U output to the SG-66A/ARM-5. Adjust the SG-66A/ARM-5 for an output of 131 mc. Check Receiver, Radio R-445/ARN-30 calibration as follows:

a. Turn the test set tuning crank and PRESS TO WHISTLE control (60) as far counterclockwise as it will go. Do not force beyond this point.

b. Disconnect the mechanical linkage from the front of the R-445/ARN-30.

c. Turn the test set tuning crank and PRESS TO WHISTLE control until the small dot at the right of the 135-mc line on the frequency calibrated MC dial (61) is directly under the triangular fiducial mark on the test set panel.

d. Reconnect the mechanical linkage. Do not change the relative positions of the shaft and the splined end.

Note. It may be necessary to rotate the tuning crank slightly to make the splined end engage. Turn the knob in the direction for minimum error.

e. Use the test set frequency calibrated MC dial (61) and tune the R445/ARN-30 for maximum signal. If a distinct point of maximum signal cannot be obtained, decrease the SG-66A/ARM-5 output. The test set frequency calibrated MC dial should read 131 mc, with not more than one line-width error. If a greater error exists, the R445/ARN-30 must be aligned.

f. Set the SG-66A/ARM-5 to 111 mc and tune the test set tuning crank and PRESS TO WHISTLE control (60) for maximum receiver output.

g. Observe the indication on the test set frequency calibrated MC dial (61). The frequency calibrated MC dial should indicate 111 mc with not more than two line-widths error. If a greater error exists, the R-445/ARN-30 must be aligned.

34. Receiver RF Sensitivity Check

(fig. 8)

Note. Rf sensitivity is the signal input in microvolt required to produce a lo-milliwatt receiver output.

To check the rf sensitivity, perform the interconnection of components (para 30) and the preliminary procedures (para 31).

a. Tune the SG-66A/ARM–5 to 131 mc and tune the test set tuning crank and PRESS TO WHISTLE control (60) to obtain maximum receiver output. Disconnect the HS–33(*) from the test set PHONE jack (19).

b. Place the test set METER switch (34) to AUDIO 0-6V.

c. Adjust the SG-66A/ARM–5 output until the test set multimeter (14) points to the green set point (1.73 volts or 10 milliwatts into 300 ohms).

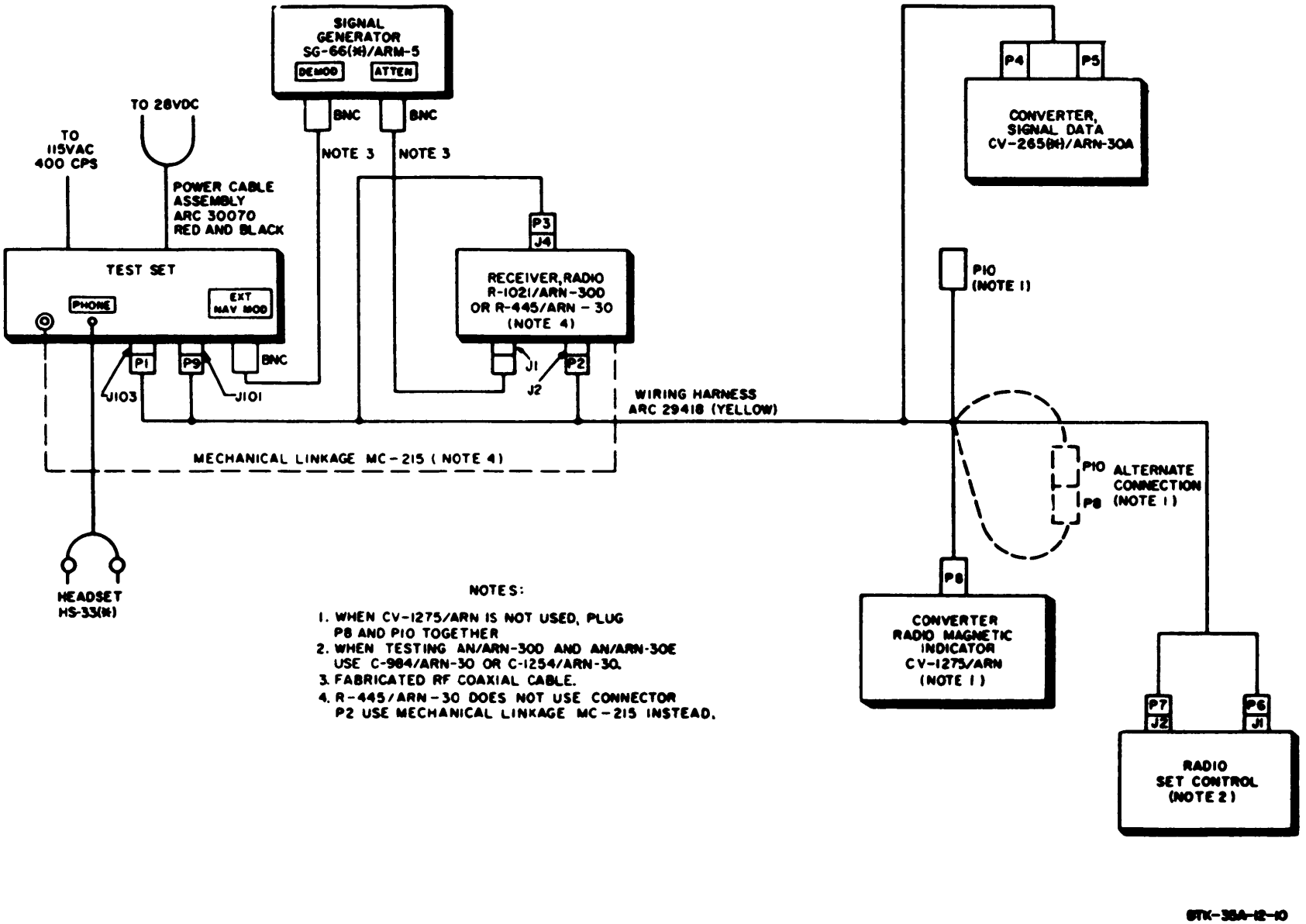


Figure 10. Receiving Set, Radio AN/ARN-30(*), test connections (Aircraft Radio Corp. Model BTK-35A only).

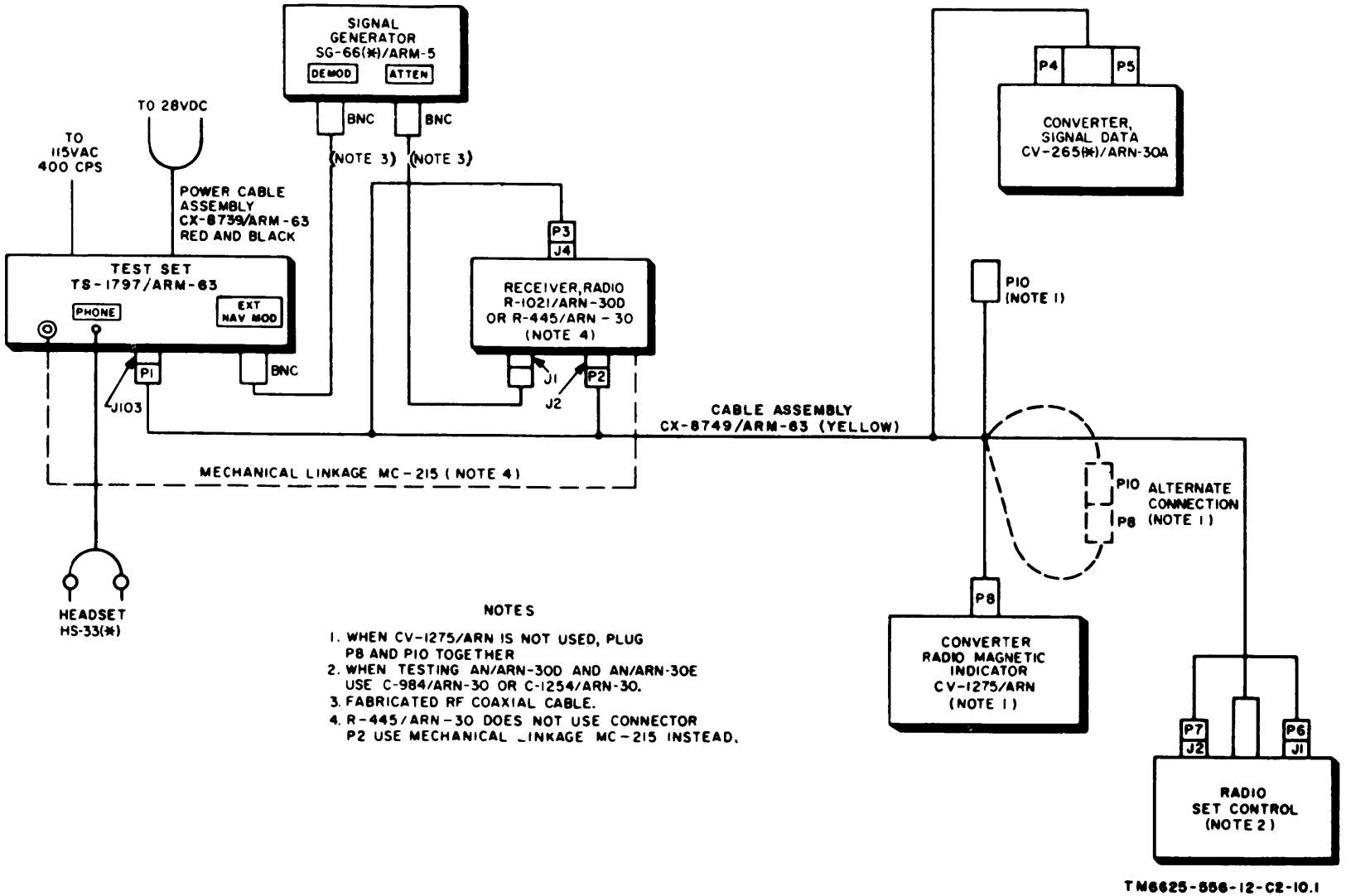


Figure 10.1 Receiving Set, Radio AN/ARM-30 (*) test connections (AN/ARM-63 procured on contract DAAB-5-67-C-1648).

d. Check the SG-66A/ARM-5 output; it should be less than 5 microvolt. If greater rf output is required, the R–445/ARN-30 must be aligned. (The average value is 1.34 microvolt for 10 milliwatts output.)

e. Set the SG-66A/ARM-5 attenuator for 10,000 microvolt output.

f. Reconnect the HS-33(*) to the test set PHONE jack (19). Hold the MAX-MIN SENS switch (39) on the test set in the MIN position. The audio signal is cut off when the switch is held in the MIN position.

g. Reduce the SG-66A/ARM–5 output to zero and disconnect the headset.

35. Receiver If. Sensitivity Check

Perform interconnection of components (para 30) and the preliminary . procedures (para 31). Disconnect the SG-66A/ARM-5 from the R-445/ARN/30 ANT jack. Use Test Probe ARC 16139 and connect R. F. Signal Generator Set AN/URM-25(*) to coaxial connector J102 on the R-445/ARN-30 chassis.

a. Tune the AN/URM–25(*) to 15 mc and adjust its modulation to 30 percent at 400 cycles.

Note. Operate R. F. Signal Generator Set AN/URM-25(*) at a level that does not activate the R-445/ARN-30 automatic volume control (avc) circuits.

b. Adjust the AN/URM-25(*) output to obtain a green set point reading (1.73 volts) on the test set multimeter (14) with the METER switch (34) at AUDIO 0-6V. The AN/URM-25(*) output should be between 100 and 400 microvolt. If a higher output is required, the R-445/ARN-30 if. circuits must be aligned. (The average value is 147 its output to 100 microvolt.

c. Disconnect the AN/URM-25 (*) from the R-445/ARN-30.

36. Receiver Avc Operation Check

Interconnect the components (para 30) and perform the preliminary procedures (para 31). Note the no-signal reading on the test set multimeter (14, fig. 8) and connect the SG-66A/ARM-5 to 'the R-445/ARN-30 ANT jack. Tune the R445/ARN-30 to the same frequency as the SG-66A/ARM-5. To check avc operation, increase the SG-66A/ARM-5 output to 100, then to 10.000 microvolt and check to see that the audio output is within the limits listed below. Set test set METER switch (34, fig. 8) to AUDIO 0-30V and read the test set multimeter(14).

Input level (uv)	Audio output (volts)	Average
100	6.8 to 10	8.4
10,000	8 to 12	10

37. Receiver Overload Check

Interconnect the components (para 30) and perform the preliminary procedures (para 31). Tune the R-445/ARN-30 and the SG-66A/ARM-5 to the same frequency. Increase the output of the SG-66A/ARM -5 to 1.0 volt. The multimeter reading should not be less than that obtained with the 10,000-microvolt input in paragraph 36. The average reading should be 10 volts.

38. Receiver Noise

(fig. 8)

Interconnect the components (para 30) and perform the preliminary procedures (para 31); then proceed as follows:

a. Place the test set METER switch (34) to AUDIO 0-6V.

b. Tune the R-445/ARN-30 and the SG66A/ARM-5 to the same frequency and adjust the output of the SG-66A/ARM-5 to the value required to produce an output of 1.73 volts, indicated on test set multi meter (14) green set point, with the METER switch (34) at AUDIO 0-6V.

c. Turn off the SG-66A/ARM–5 modulation and read audio output on multimeter. The reading should be less than 1.6 volts. (The average reading should be 1.05 volts.)

d. Depress test set MAX-MIN SENS switch (39) to MIN position and read the audio output on the multimeter. It should be less than 0.01 volt. (Average reading is 0.003 volt.)

39. Receiver Navigation Signal Audio Fidelity Check

(fig. 8)

Interconnect the components (para 30) and perform the preliminary procedures (para 31); then proceed as follows:

a. Adjust the SG-66A/ARM-5 for 111 mc and its output to 100 microvolts.

b. Set test set NAV MOD switch (40) to RCVR. Turn the tuning crank and PRESS TO WHISTLE control (60) to obtain maximum reading on the multimeter (14).

c. Set Audio Oscillator TS-382 (*) /U to the modulating frequencies listed below. Maintain 30-percent modulation and check to seethat the test set multimeter readings are within the limits listed.

40. Receiver Audio Fidelity Check

Interconnect the components (para 30) and perform the preliminary procedures (para 31). Tune the R-445/ARN-30 and the SG-66A/ARM-5 to the same frequency; then proceed as follows:

a. Set the output of the SG-66A/ARM–5 to 50 microvolt, modulated 30 percent at 4,000 cps.

b. Set the TS-382(*)/U for modulating frequencies of 200 and 5,000 cycles and check the test set multimeter (14, fig. 8) readings against test limits given below.

41. Receiver Oscillator Starting Check

Interconnect the components (para 30) and perform the preliminary procedures (para 31). Tune the R-445/ARN-30 and the SG-66A/ARM-5 to the same frequency. Adjust the SG-66A/ARM-5 output to 500 microvolt and check for oscillator starting voltage as follows:

a. Reduce the dc primary supply voltage until the audio signal abruptly disappears and wait 10 seconds.

b. Slowly increase the dc primary supply voltage until the signal abruptly reappears. The voltage at which the signal reappears is the oscillator starting voltage and should be less than 20.5 volts (average value is 19.1 volts).

c. Restore the dc primary supply voltage to 28 volts.

42. Receiver Phase Shift Check

(fig. 8)

Interconnect the components (para 30) and perform the preliminary procedures (para 31). Tune the R-445/ARN-30 and the SG-66A/ARM-5 to the same frequency. Adjust the SG-66A/ARM-5 output to 100 microvolts. Set the SG-66A/ARM-5 MODULATION switch at OMNI. Check the R-445/ARN-30 phase shift as follows:

a. Adjust test set Indicator, Course ID-453/ ARN-30 (11) for vertical pointer centering. The card position and TO-FROM flag position should correspond to the track angle being generated by the SG-66A/ARM-5.

b. Disconnect the SG-66A/ARM-5 output from the R-445/ARN-30.

c. Connect the SG-66A/ARM-5 DEMOD connector to EXT NAV MOD jack (35) on the test set and set the test set NAV MOD switch (40) to EXT.

Note. Check the SG-66A/ARM-5 to insure that the modulation level is 30 percent.

d. Adjust the test set Indicator, Course ID-453/ ARN-30 for vertical pointer centering. The ID-453/ARN-30 card should indicate 192° and the flag should show TO.

Note. If improper phase shift occurs, adjust R141 on the R-445/ARN-30 chassis (TM 11-5826-207-24).

43. Receiver Alignment Check

Interconnect the components (para 30) and perform the preliminary procedures (para 31). Place the test set METER switch (34, fig. 8) to AUDIO 0-6V position and perform the procedures in TM 11-5826-207-24. Keep the multimeter reading below 2 volts.

44. Converter, Signal Data CV-217/ARN-30 Tests

(fig. 8)

Converter, Signal Data CV-217/ARN-30 (signal data converter) may be tested independently of the R-445/ARN-30 by supplying navigational audio signals from the DEMOD connector on the SG-66A/ARM-5. However, it is necessary to have a

properly operating Receiver, Radio R-445/ARN-30 connected to the test set during signal data converter tests to supply high voltage. interconnect the components (para 30) and perform the preliminary procedures (para 31); then proceed as described below. Test instructions are given in paragraphs 45 through 48.

a. Allow the test setup to warm up for 10 minutes.

b. Set the test set METER switch (34) to NAV MOD 0-6V position.

c. Connect the DEMOD connector of the SG-66A/ARM-5 to the EXT NAV MOD jack (35) on the test set.

d. Set test set NAV MOD switch (40) to EXT.

e. With the SG-66A/ARM-5 MODULATION switch at 30- MOD, adjust the output to obtain a reading of 1.8 volts on the test set multimeter (14).

f. Check to see that the VHF REC switch (38) on the test set is set at VOR.

45. Maximum Course Error Check

Refer to paragraph 44 before performing the following check.

a. With the signal data converter fed directly from the SG-66A/ARM-5, on-course indications should be obtained when the test set Indicator, Course ID-453/ARN-30 (11, fig. 8) card reading is 102° greater than the SG-66A/ARM-5 OMNI TRACK switch setting as indicated in the following table.

OMNI TRACK switch setting (deg)	Course indicator reading (deg)
0	192 TO
15	207 TO
165	357 TO
180	12 TO

b. Set the SG46A/ARM-5 MODULATION switch to OMNI.

c. Check the course accuracy at each of the 24 OMNI TRACK switch settings. Maximum course error at any of the 24 angles should be less than ±0.7°. Average error is ±0.3°. If the error is greater, align the signal data converter.

46. Course Sensitivity

Follow the procedures in paragraph 44; then proteed as follows:

a. Set the SG-66A/ARM-5 OMNI TRACK switch to 0° and set Indicator, Course ID-453/ARN-30 for 182°. The test set Indicator, Course ID-453/ARN-30 (11, fig. 8) should show a five-dot deflection to the right (yellow) side.

b. If a five-dot deflection is not obtained, set the test set Indicator, Course ID-453/ARN-30 to obtain it. Note the test set Indicator, Course ID-453/ARN-30 reading and subtract it from 192°.

c. Set the test set Indicator, Course ID-453/ARN-30 for 202°. The test set Indicator, Course ID-453/ARN-30 should show a five-dot deflection to the left (blue) side.

d. If a five-dot deflection is not obtained, set the test set Indicator, Course ID-453/ARN-30 to obtain it. Note the test set Indicator, Course ID-453/ARN-30 reading and subtract 192° from it.

e. Add the values obtained in *b* and *d* above or, if either or both of these steps were not necessary, substitute the value of 10 for each step omitted. The sum obtained should be within the limits of 19° and 210 (average sum is 20). If a value outside these limits is obtained, the signal data converter must be aligned,

47. Flag Current

Follow the procedures in paragraph 44; then proceed as follows:

a. Set the test set Indicator, Course ID-453/ARN-30 for 192°. The OFF flag associated with the vertical pointer of Indicator, Course ID-453/ARN-30 (11, fig. 8) should not be visible.

b. Remove either the 30- or 9,960-cycle component from the SG–66A/ARM–5 omnisignal. The flag should appear when either component is removed.

c. Replace the omnisignal component *(b* above).

48. To-From Current Check

Follow the procedures in paragraph 44; then proceed as follows:

a. Set test set indicator, Course ID-453/ARN-30 for 192°. The TO-FROM meter should indicate TO.

b. Vary the test set Indicator, Course ID-453/ ARN-30 over a range of 20° either side of 192°. The TO-FROM meter should continue to indicate TO and the warning flag should remain out of sight.

c. Set the test set Indicator, Course ID-453/ ARN-30 to 12° or set the SG-66A/ARM-5 OMNI TRACK switch to 180°. The test set TO-FROM nector should indicate FROM.

49. Converter, Signal Data CV-217/ARN-30 Alignment

Follow the procedures in paragraph 44. Set R206 on the signal data converter fully counterclockwise and set R212 on the signal data converter to its midpoint. Align the CV-217/ARN-30 (para 50 and 51).

50. Variable Channel Alignment Procedure

Follow the procedures in paragraph 49; then proceed as follows:

a. Set the SG-66A/ARM-5 MODULATION switch at 30 ~ MOD.

b. Connect Multimeter AN/URM-105 between J204 and J205 of the signal data converter. It should read between 2.7 and 4.1 volts.

Note. An output outside these limits indicates trouble in the variable channel. Correct the trouble before proceeding with alignment.

c. Adjust R225 on the signal data converter for an *on-course* (vertical pointer centered) indication on Indicator, Course ID-453/ARN-30 (11, fig. 8) of the test set.

d. Set the SG-66A/ARM-5 OMNI TRACK switch to 0º and the test set Indicator, Course ID-453/ARN-30 at 192°.

e. Connect the AN/URM–105 between J203 and J204 of the signal data converter and adjust R206 on the signal data converter for an indication of 4.0 volts on the AN/URM-105.

f. Adjust R212 on the signal data converter for an on-course indication of the test set Indicator, Course ID-453/ARN-30.

g. Set the SG-66A/ARM-5 OMNI TRACK switch to 180°. The test set Indicator, Course ID-453/ARN-30 should indicate on-course. If it does not, readjust R225 on the signal data converter to reduce the error by one-half.

h. Repeat *j* and *g* above until on-course indications are obtained for both. Lock R225 on the signal data converter.

51. Reference Channel Alignment Procedure

Follow the procedures in paragraph 49; then proceed as follows:

a. Set the test set Indicator, Course ID-453/ ARN-30 at 182º. The ID-453/ARN-30 should show a five-dot deflection to the right (yellow) side. If not, adjust R206 on the signal data converter for a five-dot deflection.

b. Set the teat set Indicator, Course ID-453/ ARN-30 at 192°. Check the AN/URM-105 reading between J203 and J204 of the signal data converter; then connect it between J204 and J205. The readings obtained for the two connections (variable and reference channels) should be equal within the limits of -4.4 and + 1.0 volt, using the variable channel (J203 and J204) reading as the standard.

Note. If the reference channel reading is outside the limits given, change R236 on the signal data converter to a value that will produce the required balance of the channels. An increase of 10 percent in the value of R236 will increase the variable channel output by about 0.4 volt. Repeat *a* and *b* above if the value of R236 is changed. It may also be necessary to readjust R212 (para 50/) to obtain an on-course indication on the test set Indicator, Course ID-453/ARN-30.

c. Use AN/URM-105 and check the signal data converter voltages at the points listed in the following table. Voltages outside the limits given are an indication of trouble.

Pin of V201 (converter)	Voltage limits
7	0.7–1.3
1	11–20

d. Set the SG-66A/ARM-5 OMNI TRACK switch to 30° and adjust test set Indicator, Course ID-453/ARN-30 for an on-course indication. The ID-453/ARN-30 should read 222°.

Note. If the ID-453/ARN-30 does not indicate 222º, record the difference with the proper algebraic sign. Also record the differences obtained in the following step.

e. Repeat step d above at successive 30º angles (60°, 90°, 120°, etc.). The ID-453/ARN-30 readings should be the angle plus 192°.

f. If differences have been encountered in *d* and *e* above, proceed to *g*, *h*, and *i* below; otherwise, proceed to *j* below.

g. If the error is predominantly minus, decrease the value of R233 on the signal data converter to a value determined by taking the total spread of the error in degrees and multiplying it by 10,000.

h. If the error is predominantly plus, increase R233 value to a value determined by taking the total spread of the error in degrees and multiplying it by 10,000.

i. Repeat d, e, and *f* or *g* above until the error had been minimized; record the differences obtained.

j. Set the SG-66A/ARM-5 OMNI TRACK switch to 900 and adjust the test set Indicator, Course ID-453/ARN-30 for a reading of 282°

k. Adjust R212 on the signal data converter for an on-course indication of the test set Indicator, Course ID-453/ARN-30. Lock R206, R212, and R225.

l. Repeat *d* and *e* above, and the tests in paragraphs 47 and 48.

52. Filter-Amplifier AM-609/ARN-30, Tests and Alignment

a. General. Interconnect the test set as described in paragraph 30 and perform the preliminary procedures (para 31). Set the VHF REC switch (38, fig. 8) on the test set to LOC, and proceed as follows :

b. Procedure.

(1) Set the SG-66A/ARM-5 MODULATION switch to AMP LOC ⓘ (needle center). The vertical pointer of Indicator, Course ID-453/ARN-30 (11, fig. 8) on the test set should give an on-course indication. If not, adjust R408 to the AM-609/ARN-30 for on-course indication. With the test set VERT CP HOR switch (36, fig. 8) in the VERT position, the test set DEVIATION meter (13) should show ±2 microamperes; average reading is zero.

(2) Set the SG-66A/ARM-5 MODULATION switch to AMP LOC ⓓ (needle left). The vertical pointer of Indicator, Course ID-53/ARN-30 should rest at the outer edge of the left (blue) sector. Test set DEVIATION meter current should be 81 to 99 microampere with an average reading of 90 microampere. If not, adjust R403 in Filter-Amplifier AM-609/ARM-30 until these conditions are met.

(3) Set the SG-66A/ARM-5 MODULATION switch to AMP LOC ⓛ (needle right). The vertical pointer of the test set Indicator, Course ID453/ARN-30 should rest at the outer edge of the right (yellow) sector. The DEVIATION meter current should be 81 to 99 microampere, with an average of 90 microampere. If not, adjust R403 in Filter-Amplifier AM-609/ARN-30.

(4) Repeat (1), (2), and (3) above and check to see that Indicator, Course ID-453/ARN-30 warning flag is solidly down in each case.

(5) Lock R403 and R408 in the AM-609/ARN-30; then repeat steps (1), (2), and (3) above. If any residual error exists, it should be approximately equal for needle left and needle right settings.

Section V. TEST PROCEDURES, RECEIVING SETS, RADIO AN/ARN-30D AND AN/ARN-30E

53. Introduction

a. General. The radio test set is used to test components of the AN/ARN-30D or AN/ARN-30E after they have been removed from the aircraft. Controls, Radio Set C-3436/ARN-30D and C-3436A/ARN-30D can be used interchangeably in the tests. Either substitution may be made independently of the other. Converter, Radio-Magnetic CV-1275/ARN may be tested with the AN/ARN-30D or AN/ARN-30E or eliminated with no effect on other test results. It is necessary that the test technician have thorough working knowledge of the equipment under test before beginning the tests. In

all cases, refer to TM 1l-5826-215-35 for detailed testing and maintenance instructions.

b. Equipment Required. The equipment required for testing the AN/ARN-30D and AN/ARN-30E is the same as that used for the AN/ARN-30, AN/ARN-30A, AN/ARN-30B, and AN/ARN-30C (para 29b).

54. Interconnection of Components

Interconnect the components of the AN/ARN-30D or AN/ARN-30E and the test equipment as shown in figure 10 or figure 10.1, Refer to paragraph *30,* Perform the preliminary *procedures* in paragraph 31.

Caution: Observe polarity when connecting dc Power Cable Assembly ARC 30070 or CX-8739/ARM-63 to dc source. The leads have polarity identification tags attached to them.

55. Tests and Alignment

After Receiving Set, Radio AN/ARN-30D or AN/ARN-30E is connected to the test set for bench operation (para 54), perform the necessary tests or alignment. Complete testing and alignment procedures are contained in TM 11-5826-215-35. Use the following test set controls (fig. 8) as necessary throughout the tests or alignment procedures as outlined below.

a. Use the test set megacycle selector control (12) for all steps in TM 11-5826-215-35 that rerequire setting a receiver frequency on the radio set control.

b. Use the test set SQUELCH control and VOR-GS on-off switch (41) in place of the radio set control VOL-OFF knob.

c. Use the test set ac and dc circuit breakers (22 and 24) whenever the procedures require turning on or off primary power.

d. Use Alignment Tool, Electronic Equipment TL-659/U for rf alignment procedures requiring an alignment tool.

e. Use the test set NAV MOD switch (40) for switching the output of the SG-66A/ARM-5, connected to the EXT NAV MOD jack (35) to the input of the signal data converter.

Section VI. TEST PROCEDURES, RADIO SETS AN/ARC-60(*) AND ARC TYPE 12

56. Introduction

a. General. The radio test set is used to test components of Radio Set AN/ARC-60(*) and Radio Set ARC Type 12 after they have been removed from the aircraft. It is necessary that the maintenance repairman have a thorough working knowledge of the equipment under test *before* beginning the tests. In all cases, refer to the applicable technical manual for detailed test instructions.

Radio Set	Applicable TM
AN/ARC-60(*)	TM 11-5821-205-12 TM 11-5821-205-35
ARC Type 12	TM 11-525-25

b. Equipment Required. In addition to test set, the following items of equipment are required for testing the AN/ARC-60(*) or the ARC Type 12:

(1) Generator, Signal AN/USM-44(*).
(2) Fabricated rf coaxial cable (para 14b), four required.
(3) Attenuator pad, 6-db.
(4) Wattmeter AN/URM-43(*).
(5) Microphone T-17-(*).
(6) Headset HS-33(*).
(7) Ammeter, Weston model 301 (0-100 microampere).
(8) Test Set TS-ll/AP.
(9) Multimeter AN/URM-105.

57. Interconnection of Components

Corresponding components of either the AN/ARC-60(*) or the ARC Type 12 may be incorporated in a single test setup. Except for the mechanical linkage and Wattmeter AN/URM-43(*) connections, interconnect the component to be tested and test equipment as shown in figure 11 or figure 11.1. If only a single component is to be tested, complete the test setup with components of a radio set that

are known to be in good working order. Four fabricated rf coaxial cables (para 14b) are also required for the test setup. The 6-db attenuator pad must be connected to the input receptacle of the receiver and not to the output receptacle of Generator, Signal AN/USM-44(*).

Caution: Observe polarity when connecting the dc power cable to a dc source. The leads have polarity identification tags attached to them.

58. preliminary Procedure

(fig. 8)

a. Connect Mechanical Linkage MC-215 between the test set tuning shaft connection (52) and Receiver, Radio R–508/ARC; then rotate the test set tuning crank and PRESS TO WHISTLE control (60) fully counterclockwise. Be careful not to force the tuning crank past its mechanical stop.

b. Disconnect the mechanical linkage at the test set tuning shaft connection. Turn the test set tuning crank and PRESS TO WHISTLE control (60) until the reference dot just to the right of the high end of the frequency calibrated MC dial (61) is directly under the triangle-shaped fiducial mark.

c. Reconnect the mechanical linkage. Be careful not to disturb the setting of the test set frequency calibrated MC dial or the mechanical linkage.

d. Connect the headset to the PHONE jack (19) and microphone to the MIC jack (10) connections on the test set.

e. Place the test set dc circuit breaker (22) in the ON (up) position. Allow approximately 3 minutes for warmup.

f. Place the test set METER switch (34) to LV 0-30V, and adjust the low-voltage input to obtain a LV + SET point indication on the test set multimeter (14, fig. 8).

Note. The dynamotor mounted on the receiver supplies high voltage for all units under test. When testing or troubleshooting components other than the dynamotor, install a dynamotor that is known to be good.

59. Receiver Measurements and Tests

(fig. 8)

Interconnect the components (para 57) and perform the preliminary procedures (para 58); then proceed as follows:

a. Dynamotor Output Voltage. Turn the test set METER switch (34) to the HV + 600V position. The test set multimeter (14) must reach the B + SET point but not exceed 350 volts dc.

b. Receiver Alignment. Turn the test set METER switch to the AUDIO 0-30V position and observe the multimeter reading while adjusting the rf and if. trimmers. Detailed alignment procedures are given in TM 11-525-25 and TM 11–5821-205-35.

c. Receiver Cathode Current Avc Check. Rotate the test set SENS control (59) fully clockwise. Turn the METER switch (34) to the CATHODE 0-30MA position; the multimeter (14, fig. 8) reading should be 10 to 16 milliamperes.

d. Receiver Rf and If. 10-Milliwatt Sensitivity.

(1) Adjust Generator, Signal AN/USM-44(*) to 144 megacycles, 30-percent amplitude-modulated at 1,000 cps.

(2) Turn the test set METER switch (34) to the AUDIO 0-6V position and rotate the test set SENS control (59) fully clockwise.

(3) Rotate the receiver SQUELCH control fully clockwise. Tune the receiver to 144 megacycles by using the test set tuning crank and PRESS TO WHISTLE control.

(4) Adjust the AN/USM-44(*) output attenuator until the test set multimeter (14) is on the green set point (1.73 VOLTS).

(5) Read the rf 10-milliwatt sensitivity, in microvolt, on the AN/USM-44(*) output attenuator dial.

(6) To measure the receiver if. 10-milliwatt sensitivity, adjust the AN/USM-44(*) to 15 megacycles, 30-percent amplitude-modulated at 1,000 cps, and connect its output through the 6-db attenuator pad to the test set SIG GEN jack (53). Turn the test set METER switch (34) to AUDIO 0-6V position and adjust the AN/USM-44(*) output attenuator until the test set multimeter (14) is on the green set point, (1.73 VOLTS). Read the if. 10-milliwatt sensitivity, in microvolt, on the AN/USM-44(*) output attenuator.

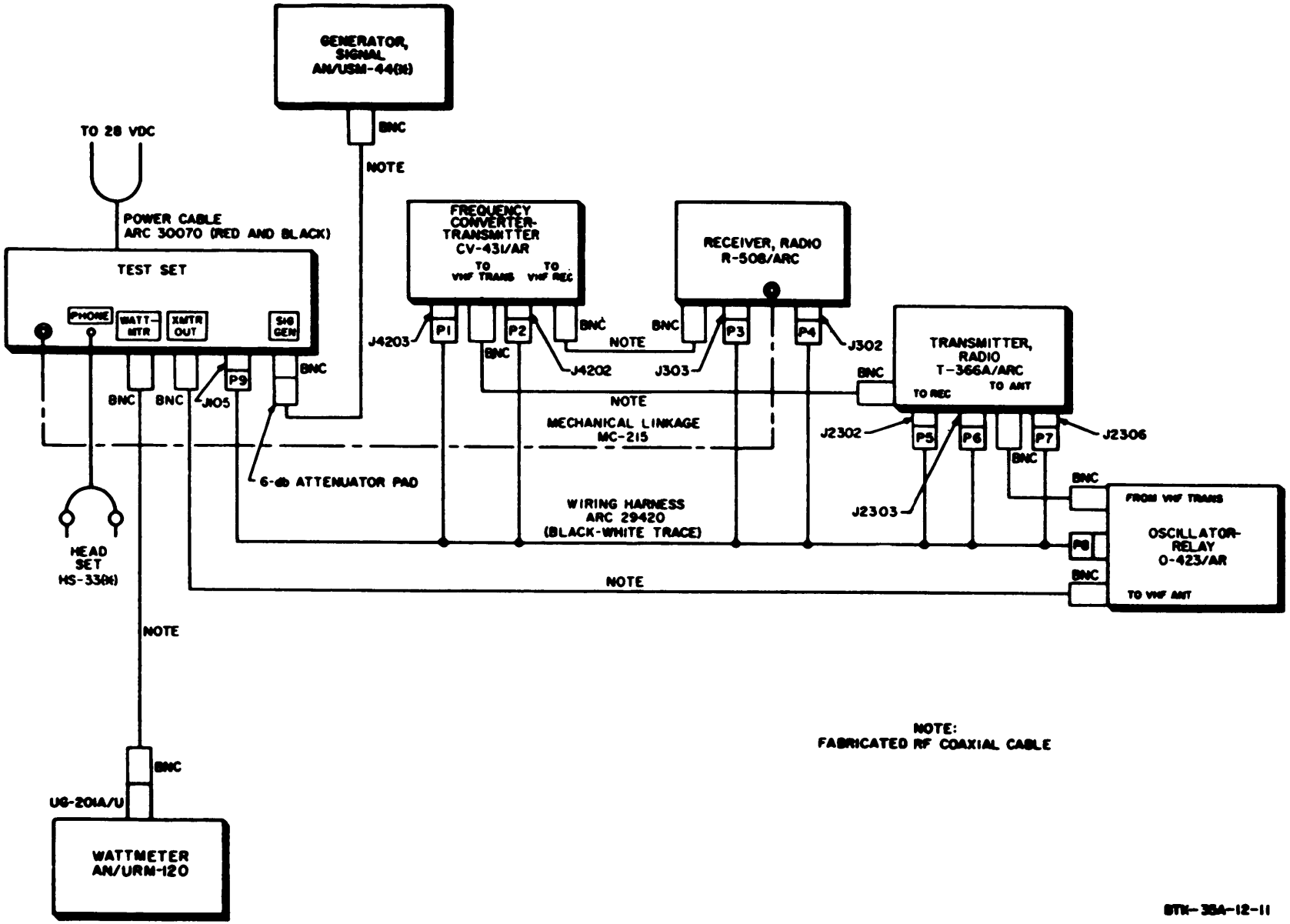


Figure 11. Radio Set AN/ARC-60(*) and ARC Type 18 communication set, test connections (Aircraft Radio Corp Model BTK-35A only).

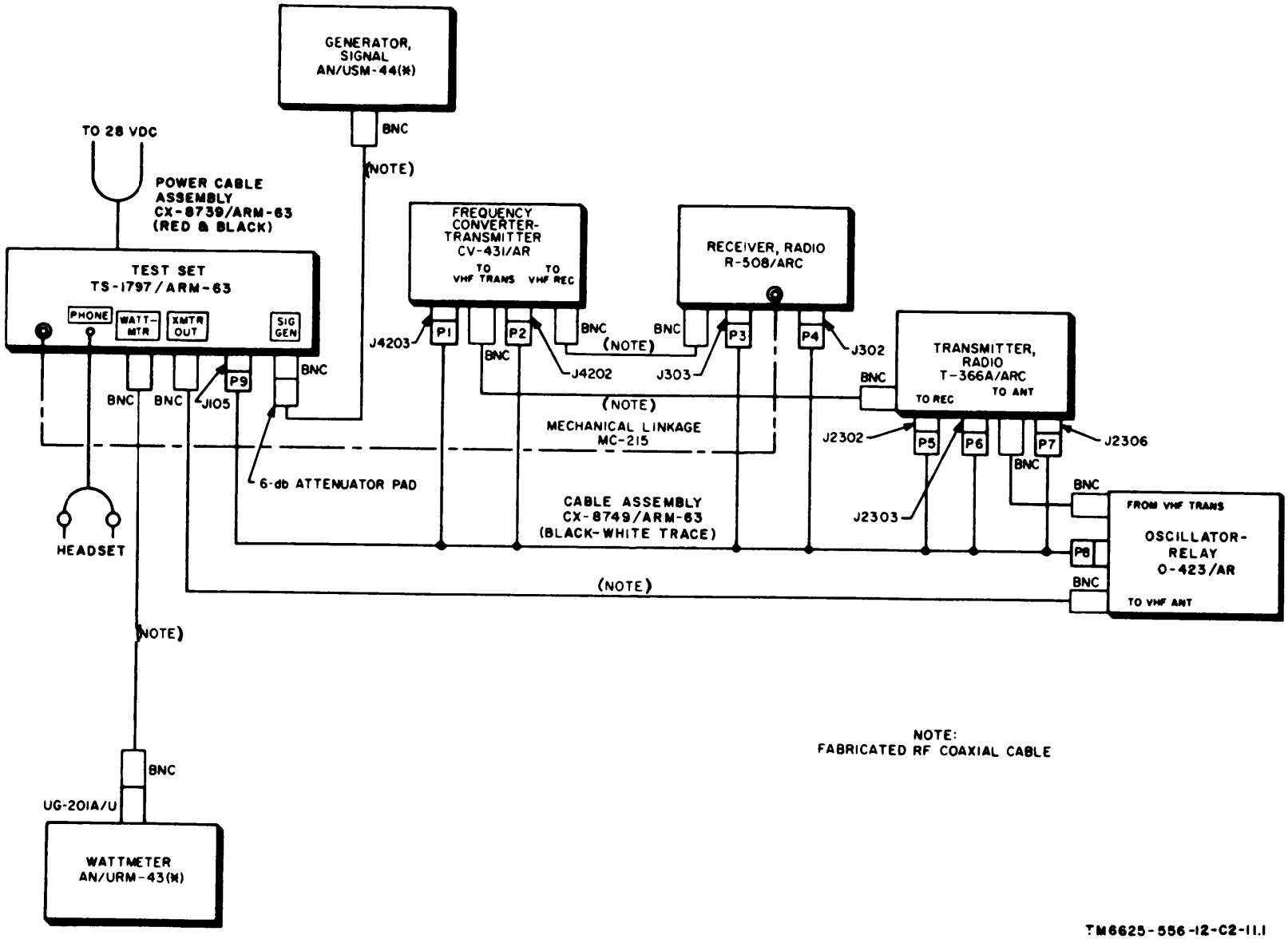


Figure 11.1 Radio Set AN/ARC-60(*) and ARC type 12 communications set, test connections (AN/ARM-63 procured on contract DAAB05-67-C-1648).

e. Receiver Tuning Calibration.

(1) Disconnect the mechanical linkage from the front of the receiver.

(2) Fit Dial, Control MX-2871/ARN (fig. 3) over the receiver tuning capacitor spline. Turn the dial of the MX-2871/ARN counterclockwise until it stops; do not force it beyond the stop point.

(3) Without disturbing the receiver spline gear setting, remove the MX-2871/ARN.

(4) Set the MX-2871/ARN so that the red zero line is in the 12 o'clock position. Without disturbing the receiver spline gear setting, reinstall the MX-2871/ARN and tighten the knurled nut.

(5) Rotate the collar on the MX-2871/ARN until the black fiducial line is aligned with the red zero line.

(6) Rotate the dial clockwise four and three-quarter turns to set the receiver to a frequency of 144 megacycles.

(7) Check the AN/USM-44(*) accuracy by using its internal crystal calibrator. Refer to applicable technical manual.

(8) Adjust the AN/USM-44(*) to 144 megacycles, 30-percent amplitude-modulated at 1,000 cps. Connect the AN/USM-44(*) output through a 6-db attenuator pad to the test set SIG GEN jack (53).

(9) Place the test set METER switch (34) to the AUDIO 0-30V position.

(10) Use the alignment tool (fig. 3) and adjust the receiver oscillator trimmer capacitor (TM 11-525-25 and TM 11-5821-205-35) to produce maximum audio output on the test set multimeter (14).

60. Vhf Transmitter Measurements and Tests (fig. 8)

Interconnect the components (para 57) and perform the preliminary procedures (para 58); then proceed as follows:

a. Vhf Transmitter (T-366A/ARC) Tuning.

(1) Turn the test set VHF-UHF crystal selector switch (55) to the VHF crystal position that corresponds to the frequency of the vhf transmitter.

(2) Connect the vhf transmitter antenna connector and the test set XMTR OUT jack (48) with a fabricated rf coaxial cable (para 14b). Connect Wattmeter AN/URM-120 to the test set WATT MTR jack (47) with a fabricated rf coaxial cable. Use Adapter UG–201A/U to adapt the BNC connector of the fabricated rf coaxial cable to the cable connector on the AN/URM-120.

(3) Connect Microphone T-17-(*) to test set MIC jack (10). Key the microphone.

(4) Adjust the vhf transmitter tuning slugs (TM 11-525-25) to produce maximum output as indicated on the AN/URM-120. Adjust the tuning slugs in the following order: oscillator-doubler (L-2302), amplifier-tripler (L-2303), and amplifier-doubler (L-2305). The power output rating should he approximately 1.8 watts.

b. Vhf Transmitter Rf Power (Comparison. To compare the rf power output of several vhf transmitters, tune each to the same frequency *(a* above) and record the AN/URM–120 readings. All meter readings should be approximatelj the same.

c. Vhf Transmitter Modulation Test. With the tuning crank and PRESS TO WHISTLE control, tune the receiver to the same frequency as the transmitter. Press the test set tuning crank and PRESS TO WHISTLE control (60) ; then key and speak into the microphone connected to the test set MIC jack (10). If the transmittcr Inoculation system is functioning properly, the voice signal will be heard in Headset HS-33(*) that is connectcd to the test set PHONE jack (19).

d. Vhf Transmitter Frequency Range. To check the transmitter frequency range, install low-limit, midrange, and high-limit crystals in the transmitter. Tune the transmitter for maximum power output at each of the three frequencies *(a* above). The tuning slugs will go through resonance at all three frequencies with normal power output if the frequency range coverage is correct.

61. Uhf Transmitter Measurements and Tests (fig. 8)

Interconnect the components (para 57) and perform the preliminary procedures (para 58); then proceed as follows:

a. Transmitter Section.

(1) Connect Frequency Converter-Transmitter CV-431(*)/AR UHF ANT connector and the test set XMTR OUT jack (48) with a fabricated rf coaxial cable (para 14b).

(2) Insert a 240-megacycle crystal in transmitter crystal position 1.

(3) Turn the test set VHF-UHF crystal selector switch (55) to UHF crystal position 1.

(4) Set the test set HI-LO band selector (57) fiducial line just to the left of UHF crystal position 1.

(5) Key the microphone that is plugged into the test set MIC jack (10) and adjust the high hand tuning slugs in the transmitter to produce maximum power output as indicated on the AN/URM-43(*). Adjust the tuning slugs in an ascending order starting with slug 1.

(6) Plug the 240-inegacycle crystal into each transmitter crystal socket in turn and set the test set VHF-UHF crystal selector switch to the corresponding UHF crystal position. Check to see that the power output shown on the AN/URM-43(*) is the same for all crystal sockets. Refer to TM 11-5821-205-35 for correct power output indications.

(7) Turn the test set VHF-UHF crystal selector switch to a vacant UHF crystal position; there should be no power output on the AN/URM-43(*).

(8) Insert 228-, 230-, 240-, 252-, and 258-megacycle crystals in transmitter crystal positions 1 through 5, respectively.

(9) Turn the test set VHF-UHF crystal selector switch (55) to UHF crystal position 1 and repeat (5) above.

(10) Turn the test set VHF-UHF crystal selector switch to UHF crystal position 5 and repeat (5) above.

(11) Set the test set HI-LO band selector (57) fiducial line between UHF crystal positions 4 and 5.

(12) Turn the test set VHF-UHF crystal selector switch (55) to UHF crystal position 4.

(13) Key the microphone plugged into the test set MIC jack (10) and tune the low band tuning slugs of the transmitter for maximum power output. Adjust the tuning slugs in an ascending order starting with slug 1.

(14) Turn the teat set VHF-UHF crystal selector switch (55) to UHF crystal position 3 and repeat (13) above.

(15) Turn the test set VHF-UHF crystal selector switch to UHF crystal position 2 and repeat (13) above.

(16) Tune the test set tuning crank and PRESS TO WHISTLE control (60) for *a* frequency indication of 230 megacycles on the frequency calibrated MC dial (61). Press tuning crank and PRESS TO WHISTLE control and speak into the microphone. If the modulation system is functioning properly, the voice signal will be heard in Headset HS-33(*).

b. 110-Mc Oscillator Section. Check to be sure the equipment to be tested and the test equipment are interconnected as shown in figure 11 or 11.1.

(1) Set the test set VHF-UHF crystal selector switch (55) to any UHF crystal position.

(2) Remove the fabricated rf coaxial cable that is connected to the CV-431(*)/AR VHF REC connector.

(3) Connect the ammeter (100-microampere scale, Weston model 301) between J4205 on the CV-431(*)/AR transmitter preselector and ground, (Because resistor R4232 in the transmitter shunts the meter movement, the meter will read full scale for 1 milliampere of crystal current.) The ammeter should read 0.4 milliampere or more. If the reading is less than 0.4 milliampere, refer to the test procedure in TM 11-5821-20545.

c. Crystal Mixer Section.

(1) Connect the ammeter (100-microampere scale) between J4205 on the CV-431(*)/ AR transmitter preselector and ground.

(2) Place test set dc circuit breaker (22) in the off (down) position.

(3) Adjust Generator, Signal AN/USM-44(*) to 250 megacycle continuous wave (cw).

Set the AN/USM-44(*) output attenuator to produce 200 millivolts. The ammeter should indicate at least 0.3 milliampere. If the reading is below this value, refer to TM 11-5821-205-35.

(4) Remove the ammeter.

d. Overall Sensitivity.

(1) Turn test set METER switch (34) to the AUDIO 0-6V position.

(2) Place the test set dc circuit breaker (22) to the ON (up) position.

(3) Adjust the AN/USM-44 (*) to 255 megacycles, 30-percent amplitude-modulated at 1,000 cps.

(4) Turning the test set tuning crank and PRESS TO WHISTLE control (60) until the frequency calibratcd MC dial indicates 225 megacycles.

(5) Set the AN/USM-44(*) output attenuator so that the test set multimeter (14) reads on the green set mark (1.73 VOLTS). The AN/USM-44(*) output attenuator reading should be 10 microvolt or less.

(6) Adjust the AN/USM-44(*) to 243 megacycles, 30-percent amplitude-modulated at 1,000 cps.

(7) Turn the test set tuning crank and PRESS TO WHISTLE control until the frequency calibrated MC dial indicatcs 243 megacycles.

(8) Adjust the AN/USM-44(*) output attenuator so that the test set multimeter reads on the green set mark. The AN/USM-44(*) output attenuator should read 9 microvolts or less.

(9) Adjust the AN/USM-44(*) to 230 megacycles, 30-percent amplitude-modulated at 1,000 cps.

(10) Turn the test set tuning crank and PRESS TO WHISTLE control until the frequency calibratcd MC dial indicates 230 megacycles. Adjust the AN/USM-44(*) output attenuator so that the test set multimeter (14) reads on the green set mark. The AN/USM-44(*) output attenuator reading should be 14 microvolt or less.

62. Oscillator-Relay Measurements and Tests

(fig. 8)

Interconnect the components (para 57) and perform the preliminary procedures (para 58); then proceed as follows:

a. Set the test set METER switch (34) to the AUDIO 0-30V position.

b. Turn the Oscillator-Relay 0-423/AR VHF WHISTLE LEVEL control fully clockwise.

c. Turn the test set VHF-UHF crystal selector switch (55) to the VHF crystal position corresponding to the center of the vhf transmitter frequency band.

d. Press the test set tuning crank and PRESS TO WHISTLE control (60) and tune the receiver to the transmitter. A 1,000-cps tone should be audible in the headset that is connected to the test set PHONE jack (19) and the multimeter (14) should read at least 7 volts when the receiver is accurately tuned to the transmitter.

63. Whistle-Through Level Adjustment

(fig. 8)

Interconnect the components (para 57) and perform the preliminary procedures (para 58); then proceed as follows:

a. Set test set METER switch (34) to the AUDIO 0-6V position.

b. Turn the 0-423/AR UHF and VHF WHISTLE LEVEL controls to their approximate midpositions,

c. Turn the test set VHF-UHF crystal selector switch (55) to the VHF crystal position corresponding to the center of the vhf transmitter frequency band.

d. Press the test set tuning crank and PRESS TO WHISTLE control (60) and tune the receiver to the transmitter. Adjust the 0423/AR VHF WHISTLE LEVEL control to produce 1 volt on the test set multimeter (14).

e. Turn the test set VHF-UHF crystal selector switch (55) to the UHF crystal position corresponding to the center of the uhf transmitter high band. Set the test set HI-LO band selector (57) fiducial line just to the left of this UHF crystal position.

f. Press the test set tuning crank and PRESS TO WHISTLE control (60) and tune the receiver to the transmitter. Adjust the 0-423/AR UHF WHISTLE LEVEL control to produce 1 volt on the test set multimeter (14).

Section VII. TEST PROCEDURES, RECEIVER RADIO R-746/AR

64. Introduction

a. General. The radio test set is used to test Receiver, Radio R–746/AR (Glide Slope receiver) after it is removed from the aircraft. It is necessary that the maintenance repairman have a thorough working knowledge of the receiver before beginning the tests. Refer to TM 11-5826-200-12 and TM 11-5826-200--35 for detailed test instructions,

b. Equipment Required. In addition to the test set, the following equipment is required for testing the R-746/AR:

(1) Generator, Signal AN/GRM-4 (or equivalent such as the AN/ARM-5 used together with the AN/ARM-69.
(2) Bias supply, 0 to 4.5 volts dc, fabricated (c below).
(3) Fabricated rf coaxial cable (para 14b).
(4) Attenuator pad, 6-db.
(5) Headset HS-33(*).

c. Bias Supply Fabrication. Fabricate a variable source of voltage, Use a suitable 4.5 volt battery (Battery BA-31, or equivalent) and a potentiometer (approximately 100 K). Connect the battery terminals to the two outer lugs of the potentiometer. Connect a ground lead to the battery positive terminal. Connect the negative voltage lead to the center lug of the potentiometer.

65. Interconnection of Components

Interconnect the R-746/AR, the test set, a 6-db attenuator pad, and the AN/GRM-4 as shown in figure 12. or 12.1.

Caution: Observe polarity when connecting Power Cable ARC 30070 or CX-8739/ARM-63 to the dc source. The leads have polarity identification tags attached to them.

66. Preliminary Procedure

Place the test set dc and ac circuit breakers (22 and 24, fig. 8) to the ON (up) position and rotate the SQUELCH control and VOR-GS on-off switch (41) to its on (fully clockwise) position. Allow 15 minutes for the equipment to warm up.

67. Receiver Control Alignment Check

Interconnect the components (para 65); perform the preliminary procedures (para 66) and proceed as follows:

a. Set Signal Generator AN/GRM–4 attenuator to 700 microvolt. Set AN/GRM-4 modulation level for 40 percent (for both 90- and 150-cycle signals).

b. Set test set megacycle selector control (12, fig. 8) to 109.3 mc. Set the AN/GRM-4 output for 332 mc. Set test set VERT CP HOR switch (36, *fig.* 8) to HOR and the VERT FLAG HOR switch (32A) to HOR.

c. Set the R-746/AR deflection sensitivity control, R164, fully clockwise.

d. Set the AN/GRM-4 DB RATIO control to 0-DB position and adjust R156 in the R-746/AR to obtain 0 microampere on the test set DEVIATION meter (13, fig. 8).

e. Set DB RATIO control to 2-DB position on 90-cycle side and adjust the R-746/AR audio gain control, R171, for an indication of 140 microampere on the test set DEVIATION meter.

f. Set the AN/GRM-4 DB RATIO control to 0-DB and readjust R156 on the R-746/AR for O microampere on the test set DEVIATION meter.

g. Set the AN/GRM-4 DB RATIO control to 2-DB position on 150-cycle side and adjust R164 on the R-746/AR to obtain 78 microampere on the test set DEVIATION meter.

h. Reset the AN/GRM-4 DB RATIO control to 0-DB and reset R156 on the R-746/AR for O microampere on the test set DEVIATION meter.

i. Increase the AN/GRM-4 attenuator setting to 100,000 microvolts and place the test set METER switch (34, fig. 8) on FLAG 0-1MA. Set the R-746/AR flag alarm control, R161, for an indication of 275 microampere on the test set multimeter (14, fig. 8).

Note. If the controls of the R-746/AR cannot be set to obtain the designated current values for any *of* the above steps, the receiver should be repaired (TM 11-5826-35).

68. Audio Gain Control Range Check

Interconnect the components (para 65) and perform the preliminary procedures (para 66); then proceed as follows:

a. Set the R–746/AR deflection sensitivity control, R164, fully clockwise.

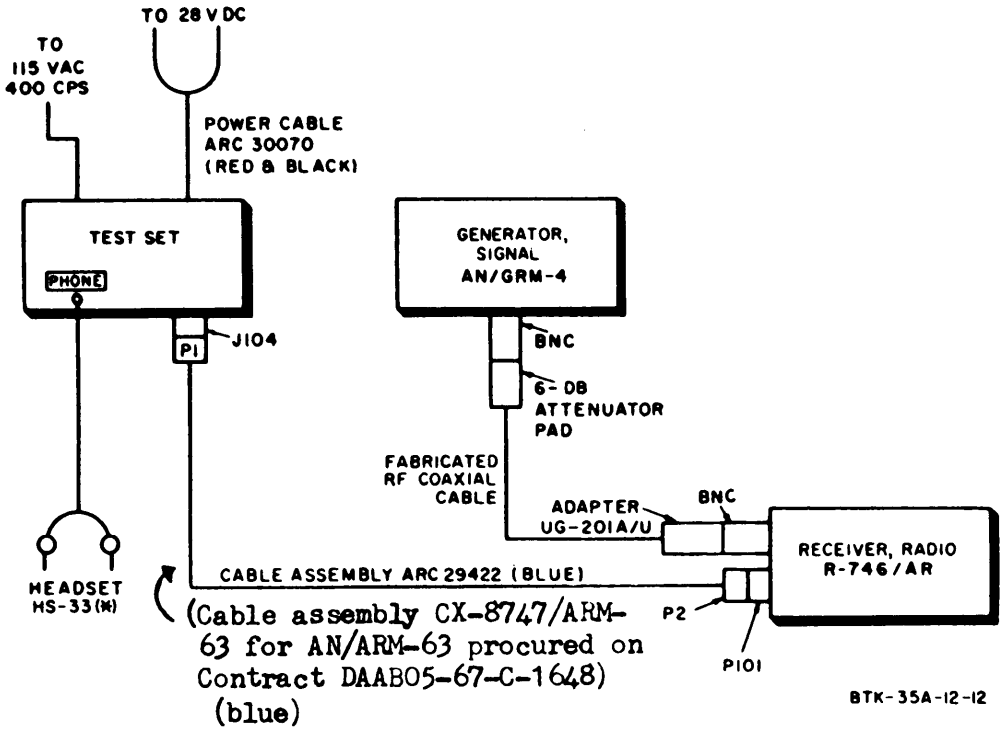


Figure 12. Receiver, Radio R–746/AR test connections.

b. Set the AN/GRM-4 attenuator to 700 microvolt, and set the test set megacycle selector control (12, fig. 8) to 109.3 mc.

c. Set the AN/GRM–4 for a 332-megacycle output and its DB RATIO control to 2-DB on the 90-cycle side.

d. Vary the R-746/AR audio gain control, R171, from its fully clockwise to fully counterclockwise position; note the current readings on the DEVIA.-TION meter (13, fig. *8)* of the test set for each limit position of the control. The peak current reading should be at least 100 microampere; minimum current should be less than *75* microampere.

e. Adjust the R–746/AR audio gain control, R171, to obtain 140-microampere reading on the test set DEVIATION meter.

f. Adjust the R-746/AR deflection sensitivity control, R 164, for a 78-microampere average reading for both 2-db ratios between the 90- and 150-*cycle* signals (para 67e and g).

69. Deflection Sensitivity Control Range Check

Interconnect the components (para 65) and perform the preliminary procedures (para 66). With the AN/GRM-4 and test set controls set as at the end of the audio gain control range check (para 68), proceed as follows:

a. Vary deflection sensitivity control R 164 of the R-746/AR from its fully clockwise to its fully counterclockwise position and note the readings of the test set DEVIATION meter (13, fig. 8) for both control limit positions. The minimum current reading should be less than 35 microampere. The maximum current reading should be more than 135 microampere.

b. Reset deflection sensitivity control R-164 of the R–746/AR for 78-microampere average readings on the test set DEVIATION meter for 2-db ratios between 90- and 150-cycle signals (para 67e and g).

70. Balance Control Range Check

Interconnect the components (para 65) and perform the preliminary procedures (para 66). Set the AN/GRM-4 attenuator to 700 microvolt and the DB RATIO control to 0-DB position. Proceed as follows for the balance control range check:

a. Vary the R–746/AR balance control, R 156, between its fully clockwise and counterclockwise

positions; note the current readings on the test set DEVIATION meter (13, fig. 8) for each control limit. Current readings should be at least 20 microampere on either side of the DEVIATION meter zero mark.

b. Adjust balance control R156 for zero current on the test set DEVIATION meter.

71. Flag Alarm Control Range Check

Interconnect the components (para 65) and perform the preliminary procedures (para 66); then proceed as follows:

a. Set the AN/GRM-4 attenuator to 100,000 microvolt. Set test set METER switch (34, fig. 8) to FLAG 0-1MA position.

b. Vary flag alarm control R161 of the R-746/AR to get maximum flag current reading on the teat set multimeter (14, fig. 8). The current reading should be at least 850 microamperes.

c. Reset flag alarm control R161 to get 275 microampere of flag current.

72. Age Characteristics (Course Softening) Check

Interconnect the components (para 65) and perform the preliminary procedures (para 66); then proceed as follows:

a. Set megacycle selector control (12, fig. 8) to 109.3 mc. Tune the AN/GRM-4 to feed a 332-megacycle signal into the receiver.

b. Set the AN/GRM-4 attenuator controls to the amplitude specified in the first column *of* the chart in *f* below.

c. Set the AN/GRM-4 DB RATIO control first to the 2-DB position on the W-cycle side, and then to the 2-DB position on the 150-cycle side. Note the readings of the test set DEVIATION meter (13, fig. 8) for both positions of the DB RATIO control.

d. Add the current values obtained from the DEVIATION meter *(c* above) to obtain a total deflection current for a 2db ratio between the 90- and 150-cycle signals in both directions. This total deflection current value should be within the limits shown in the second column of the chart in *f* below.

e. Return the AN/GRM–4 DB RATIO control to its 0-DB position, and note the current reading of the test set DEVIATION meter for this balanced condition. Current values for the balanced condition should be within the limits shown in the third column *of* the chart *(f* below).

f. Input signal levels and current limits are as follows:

Input signal level (microvolts)	Total deflection current (microamperes) limits (*d* above)	Balanced condition current (microamperes) limits (*e* above)
700	154–158	2. 0
30	138–220	± 5. 0
14, 000	112–138	± 5. 0
100, 000	88–128	± 5. 0

73. Interchannel Stability and Deflection Sensitivity Check

Interconnect the components (para 65) and perform the preliminary procedures (para 66); them proceed as follows:

a. Set the AN/GRM-4 attenuator for 700 microvolt at 332 megacycles.

b. Set the test set megacycle selector control (12, fig. 8) to 109.3 mc.

c. Set the AN/GRM-4 DB RATIO control first to its 2-DB position on the 90-cycle side, and then to its 2–DB position on the 150-cycle side. Note the current readings on the test set DEVIATION meter (13, fig. 8) for both positions of the DB RATIO control.

d. Add the current values noted in c above to obtain a total deflection current value. The total deflection current value for this channel should be 156 microampere.

e. Return the AN/GRM-4 DB RATIO control to its 0-DB position, and note the current reading on the test set DEVIATION meter for this balanced condition. The balanced condition current reading should be 0.0 microampere for this channel.

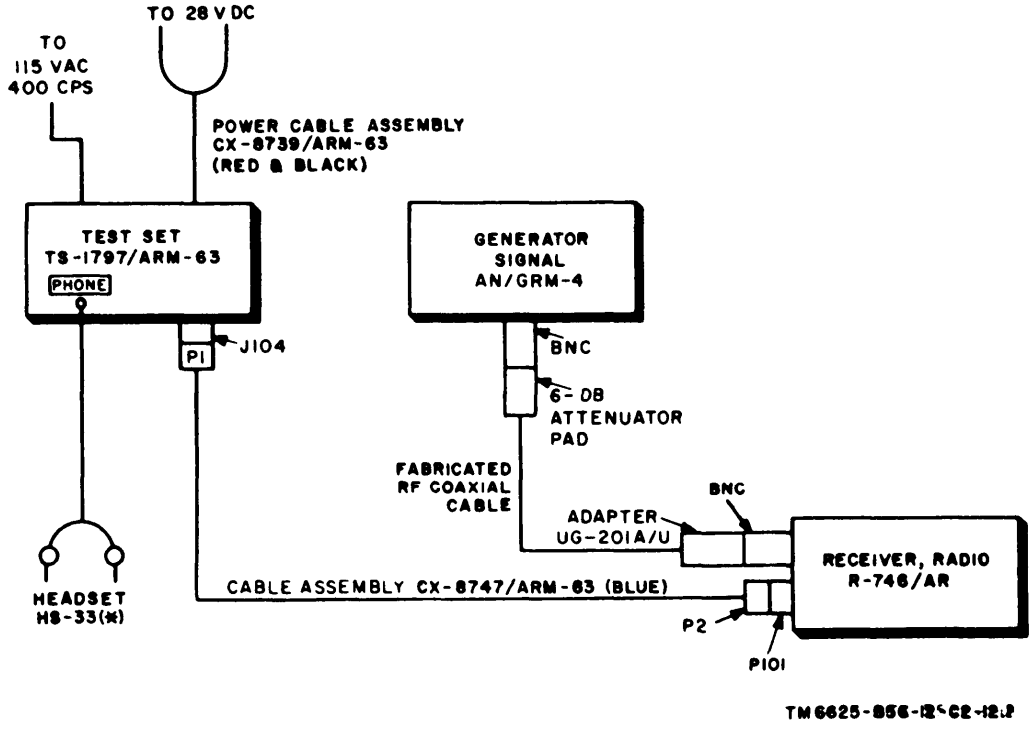


Figure 12.1 Receiver, Radio R-746/AR test connections (AN/ARM-63 procured on contract DAAB-5-67-C-1648).

f. Use the test set megacycle selector control (12, fig. 8) to select another channel of the glide slope receiver. Retune the AN/GRM-4 so that it feeds a signal at the correct frequency for the selected channel into the R–746/AR. The chart below indicates the channel allocations, the corresponding test set, and the AN/GRM-4 frequency settings.

Channel	Test set megacycle selector control setting	AN/GRM–4 frequency (megacycles)
1	110.1	334.4
2	108.1	334.7
3	110.3	335.0
4	108.9	329.3
5	110.5	329.6
6	108.5	329.9
7	110.7	330.2
8	108.7	330.5
9	110.9	330.8
10	108.3	334.1
11	109.1	331.4
12	111.1	331.7
13	109.3	332.0
14	111.3	332.3
15	109.5	332.6
16	111.5	332.9
17	109.7	333.2
18	111.7	333.5
19	109.9	333.8
20	111.9	331.1

g. Set the AN/GRM-4 DB RATIO control first to its 2-DB position on the 90-cycle side, then to its 2-DB position on the 150-cycle side. Note the current readings on the test set DEVIATION meter (13, fig. 8) for both positions of the DB RATIO control, and add these current values to obtain a total deflection current value. This value should be between 150 and 162 microampere.

h. Reset the AN/GRM-4 DB RATIO control to its 0-DB position, and note the current reading of test set DEVIATION meter. The current reading should be 0.0 microampere ±3.O.

i. Repeat *f* through *h* above for the remaining channels of the R-746/AR.

j. For each channel of the R-746/AR, tune the AN/GRM-4 to feed a signal of the correct frequency for that channel into the receiver, and adjust the AN/GRM-4 DB RATIO control to its 2-DB position on the 90-cycle side of the 0-DB position. Slowly adjust the amplitude of the input signal from a minimum value until the current reading of 70 microampere is obtained on the test set DEVIATION meter. Note the value of input signal necessary to achieve the 70-microampere reading, which should be 30 microvolt or less for any channel. The maximum variation between channels in minimum input signal necessary to obtain a 70-microampere deflection current should be less than 3 db.

74. Selectivity Check

To make a selectivity check, a variable bias voltage supply (para 64c), the AN/GRM-4, and the test set must be used. The bias supply provides a voltage between 4.5 and 0 volts, to a point in the automatic gain control (agc) circuit of the glide slope receiver. The selectivity check determines the bandwidth of a particular channel of the receiver, for attenuation values of 6, 60, and 75 db. To do this, a fixed-value input signal is fed into the receiver under test, and the variable bias supply is connected to feed 4.5 volts dc to agc point C132B in the receiver. The variable dc bias voltage is then adjusted toward 0.0 volt, until a flag current of 200 microampere is obtained on the test set multimeter (METER switch at FLAG 0-1MA). The input signal is then increased in amplitude by 6 db, and the AN/GRM-4 frequency is varied until the flag current again reads 200 microampere. This indicates that the signal is being attenuated by 6 db at the particular frequency being fed into the receiver at this time. The input signal is then varied in frequency in the opposite direction, until a second point is obtained at which the flag current reads 200 microampere. This is the second frequency, or the other end of the bandpass, at which input signals are attenuated by 6 db. Similar techniques are used to measure the bandwidth for 60 and 75 db attenuation. To check the R–746/AR sensitivity y, interconnect the components (para 65) and perform the preliminary procedures (para 66); then proceed as follows:

a. Set the AN/GRM–4 attenuator to 18 microvolt, at the correct frequency for the particular channel selected by test set megacycle selector control (para 73f).

b. Connect the variable bias supply (at 4.5 volts dc) to feed a negative voltage to agc point C132A in the receiver (TM 11-5826-200-35).

c. Set the test set METER switch (34, fig. 8) to FLAG 0-1MA.

d. Slowly reduce the amplitude of the negative hiss voltage until the flag current reading of 200 microampere is obtained on the test set multimeter (14, fig. 8).

e. Increase the AN/GRM-4 attenuator to 36 microvolt.

f. Increase the frequency of the AN/GRM-4 until the flag current on the test set multimeter again indicates 200 microampere. (If necessary, recalibrate AN/GRM-4 as its output frequency is varied, to insure that its output amplitude is exactly 36 microvolt.) Note the frequency of the AN/GRM-4 output.

g. Decrease the AN/GRM-4 frequency until the point is found at which the flag current is again 200 microampere. Note the frequency of the AN/GRM-4.

h. Determine the difference between the two frequencies noted in *f* and *g* above. The difference is the bandwidth of the channel at the 6-db attenuation points. The bandwidth at the 6-db attenuation points should be 135 kilocycles or more.

i. Increase the AN/GRM-4 attenuator setting to 18,000 microvolt, and increase the frequency until the flag current is again 200 microampere. Note the frequency of the AN/GRM-4.

j. Decrease the AN/GRM-4 frequency until l point is found at which the flag current is again 200 microampere. Note the frequency of the AN/GRM-4.

k. Determine the difference between the two frequencies noted in *i* and *j* above. The difference is the channel bandwidth at the 60db attenuation points. The bandwidth at 60-db attenuation points should be 500 kilocycles or less.

l. Increase the AN/GRM-4 attenuator to 100,-000 microvolt and increase the AN/GRM-4 output frequency until a point is located at which the flag current is 200 microampere. Note the frequency of the AN/GRM-4.

m. Decrease the AN/GRM-4 output frequency until a point is located at which the flag current is again 200 microampere. Note the AN/GRM-4 output frequency.

n. Determine the difference between the frequencies noted in *l* and *m* above. The difference is the bandwidth of the channel at the 75-db attenuation points. The bandwidth at 75-db attenuation points should be 600 kilocycles or less.

o. Repeat a through *n above* for each channel (para 73f) of the glide slope receiver.

Section VIII. TEST PROCEDURES, RADIO SETS AN/ARC-27(*) AND AN/ARC-55(*)

75. Introduction

a. General. The radio test set tests either Radio Set AN/ARC-27(*) or AN/ARC-55(*) after the equipment has been removed from the aircraft. The maintenance repairman must have a thorough working knowledge of all radio sets under test before beginning the tests. Refer to TM 11-5821-225-10, TM 11-5821-225-34, and TM 11-5821-225-50 for detailed test procedures. Throughout this section the common name radio set refers to the Receiver-Transmitter, Radio RT-178/ARC-27 or RT-349 (*)/ARC-55.

b. Equipment Required. In addition to the test set, the following items are required to test the radio sets.

(1) Wattmeter AN/URM-43(*).
(2) Oscilloscope OS-8(*)/U.
(3) Microphone (hand-held) NAF 213264-6.
(4) Audio Oscillator TS-382(*)/U.
(5) Multimeter AN/URM-105.
(6) Generator, Signal AN/USM-44(*).
(7) Fabricated rf coaxial cable (para 14b).

76. Interconnection of Components

Interconnect the radio set, the test set, and the wattmeter as shown in figure 13 or 13.1.

Caution: Observe the polarity when connecting power Cable ARC 30070 or CX-8739/ARM-63 to the dc source. The leads have polarity identification tags attached to them.

77. Preliminary Procedures

(fig. 8)

a. Set the test set MIC-TONE switch (56) to TONE, the alignment function selector switch (46) to NORM, and MCW ON switch (54) down (off).

b. Plug Microphone (hand-held) NAF 213264-6 into the MIC jack (10) of the test set and Headset HS-33(*) into the PHONE jack (19) of the test set.

c. Place the test set dc circuit breaker (22) in the ON position. The STANDBY lamp and POWER DC indicator (9 and 21) should light.

d. To key the radio set transmitter, press the push-to-talk switch on the microphone. If continuous keying is desired, place the test set KEY-OFF-MOM switch (8) in the KEY position. If continuous keying with internal modulation is desired, set the test set MCW ON switch (54) to ON. The XMTR lamp (7) should light and the STANDBY lamp (9) should extinguish whenever the transmitter is keyed.

e. For testing the radio set under reduced primary voltage conditions, reduce the input voltage. This voltage will be indicated on the test set multimeter (14) when the METER switch (34) is at LV 0-30V.

78. Modulation Checks

(fig. 8)

Modulation may be observed by connecting oscilloscope 0S-8(*)/U to the MOD TEST jack (49) of the test set or may be monitored aurally by Headset HS-33(*) plugged into the test set PHONE jack. In the latter case, side-tone should be heard when the transmitter is keyed and modulated. Interconnect the components (para 76) and perform the preliminary procedures (para 77); then proceed as follows:

a. Modulate the transmitter with a 1,000-cycle tone by connecting Audio Oscillator TS-382(*)/U to the test set 1000 ~ IN jack (51) and placing the MIC-TONE switch (56) in the TONE position.

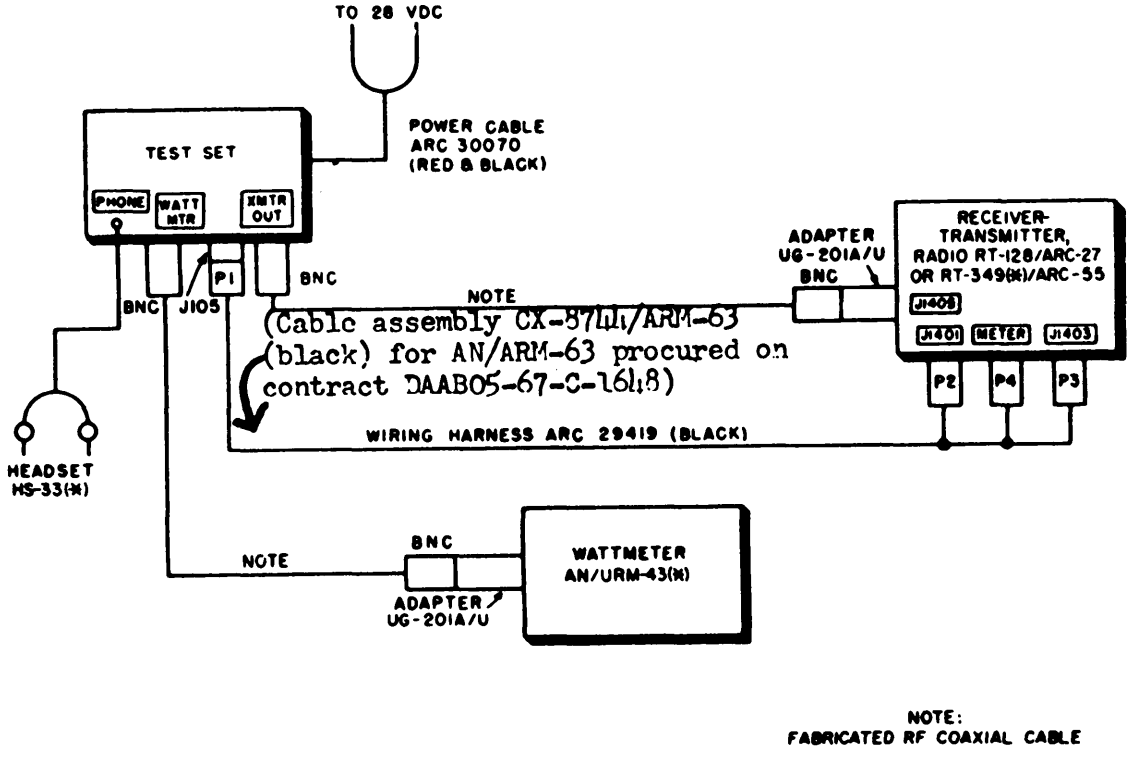


Figure 13. Radio Sets AN/ARC-27(*) and AN/ARC-55(*), test connections.

b. Measure the audio signal input level at the output of the TS-382(*)/U with Multimeter AN/URM-105.

c. Use the oscilloscope display to measure the dc level of the rectified carrier and the maximum and minimum voltage levels of the modulating signal (fig. 14).

(1) Positive peak modulation (%)

$$= \frac{E_{max} - E_o}{E_o} \times 100.$$

(2) Negative peak modulation (%)

$$= \frac{E_o - E_{min}}{E_o} \times 100.$$

79. Sensitivity Tests

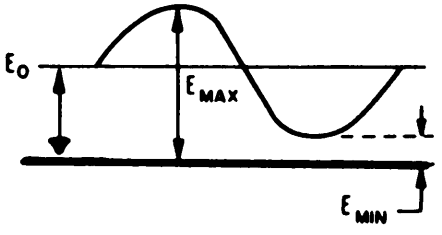
For sensitivity measurement, interconnect the components (para 76), perform the preliminary procedures (para 77), connect Generator, Signal AN/USM-44(*)/to the SIG GEN jack (53, fig. 8) on the test set, and monitor the receiver audio output on the test set multimeter (14, fig. 8). (Start with the METER switch at the AUDIO 0-30V Setting.) The audio output may also be measured by the AN/URM-105 at the test set AUDIO OUTPUT jack (20, fig. 8).

80. Alignment

When aligning the rf amplifier, spectrum amplifier, transmitter preamplifier, and transmitter amplifier, use the test set alignment function selector switch (46, fig. 8) to drive the capacitor plates to accessible positions. Set the receiver-transmitter frequency with the alignment function selector switch in the NORM position; then move the switch to the RUN position. The capacitor plates will rotate. When the plates are accessible, release the alignment function selector switch and it will return to OFF. Adjust the plates. Place the switch back in the NORM position after adjustment and the radio set will recycle to the preset frequency.

81. Typical Test Results

Typical test set multimeter readings are shown in the table below. All these readings are obtained with the test set METER switch (34, fig. 8) in the AN/ARC-27/55 position. The meter readings will



E_O = DC LEVEL OF RECTIFIED CARRIER SIGNAL

E_{MAX} = LEVEL OF MODULATION ENVELOPE POSITIVE PEAK

E_{MIN} = LEVEL OF MODULATION ENVELOPE NEGATIVE PEAK

BTK-35A-12-14

Figure 14. Rectified carrier with modulating signal.

Radio Set panel switch position	Full-scale meter reading	Receive mode test set multimeter reading	Value	Transmit mode test set multimeter reading	Value
E_{IN}	50 v	0.54–0.56	27.5 v (LV+ SET point)	0.54–0.56	27.5 v
I_B:					
Guard off	1000 ma	0.24–0.28	240–280 ma	0.4–0.54	400–540 ma
Guard on	1000 ma	0.30–0.34	300–340 ma		
MOD I_K:					
Unmodulated	200 ma	0	0	0.25–0.4	50–80 ma
Modulated	200 ma	0	0	0.5–0.7	100–140 ma
DRIVER I_G	50 ma	0	0	0.3–0.8	15–40 ma
FINAL I_G	50 ma (approx)	See note	See note	0.4–1.0	20–50 ma (approx)
I_{ANT}	25 watts (approx)	0	0	0.3–0.95	10–25 watts† (approx)

Note. A residual current will be read because of a voltage divider in the final power amplifier stage. This reading does not indicate grid current through the tube.

† Power out may be read on Wattmeter AN/URM-43(*) used as load.

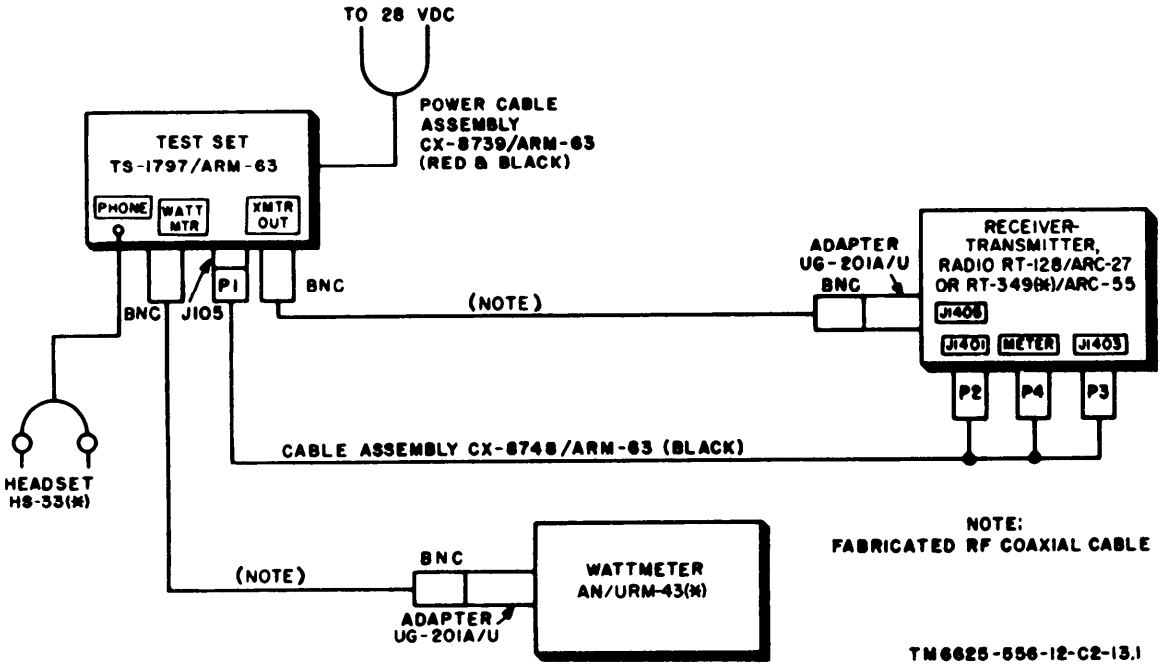


Figure 13.1 Radio Sets AN/ARC-27(*) and AN/ARC-55(*), test connections (AN/ARM-63 procured on contract DAAB05-67-C-1648).

correspond exactly to those in the table, because of the variable factors that affect them.

82. Frequency Selection Circuits Check

Interconnect the components (para 75) and perform the preliminary procedures (para 76). Check the frequency selection circuits by operating the UHF control panel (58, fig. 8) on the test set and noting the lamp combinations that are lighted. Set the control for each of the frequency settings given in the charts in *a*, *b*, and *c* below, and check to see that the correct lamp combinations (lefthand column of the tabled are lighted throughout. If incorrect combinations appear, check the circuits of the radio set.

a. 10-Mc Dial Settings.

Lighted test lamps	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
A	X			X					X	X	X	X		X	X		X		X	
B		X			X					X	X	X	X		X	X		X		X
C	X		X			X					X	X	X	X		X	X		X	
D		X		X			X					X	X	X	X		X	X		X
E	X		X		X			X					X	X	X	X		X	X	
H	X	X	X	X		X	X		X		X		X			X				

b. 1-Mc Dial Settings.

(1) Set the 0.1-mc dial to any position from 0 to 0.4.

(2) Set the 0.1-mc dial to any position from 0.5 to 0.9.

Lighted test lamps	0	1	2	3	4	5	6	7	8	9
I	X	X		X	X			X		X
J	X	X	X		X	X			X	
K		X	X	X		X	X			X
L	X		X	X	X		X	X		
N		X		X	X	X		X	X	

Lighted test lamps	0	1	2	3	4	5	6	7	8	9
I			X			X	X		X	
J				X			X	X		X
K	X				X			X	X	
L		X				X			X	X
N	X		X				X			X

c. 0.1-Mc Dial Settings.

Lighted test lamps	0	1	2	3	4	5	6	7	8	9
O	X		X				X		X	X
P	X	X		X				X		X
Q	X	X	X		X				X	
R		X	X	X		X				X

Section IX. TEST PROCEDURES, AUTOMATIC DIRECTION FINDERS

83. Introduction

a. General. The radio teat set tests components of any of three separate automatic direction finding radio sets after they have been removed from the aircraft. Refer to the technical manual listed below for detailed test instructions.

Direction finding set	Applicable TM
AN/ARN-6(*)	TM 11-5125
AN/ARN-54	TM 11-519
AN/ARN-59(V)	TM 11-5826-204-35

b. Equipment Required. In addition to the test set, the following equipments or components are required for testing the automatic direction finders:

(1) R. F. Signal Generator Set AN/URM-25(*).
(2) Multimeter TS-352(*)/U.
(3) Oscilloscope OS-8(*)/U.
(4) Headset HS-33(*).
(5) Output Meter TS-585(*)/U.
(6) Loudspeaker, 3.2 ohms impedance.
(7) Fabricated rf coaxial cables (para 14b).

84. Interconnection of Components

Only one direction finder set may be tested l t l time. Interconnect the set to be tested, the test set, and the appropriate test equipment as shown in the applicable bench test interconnection diagram (fig. 15, 16, 17, or 17.1) as indicated in the chart below.

Caution: Observe polarity when connecting Power Cable Assembly ARC 30070 or CX-8739/ARM-63 to dc source. The leads have polarity identification tags attached to them.

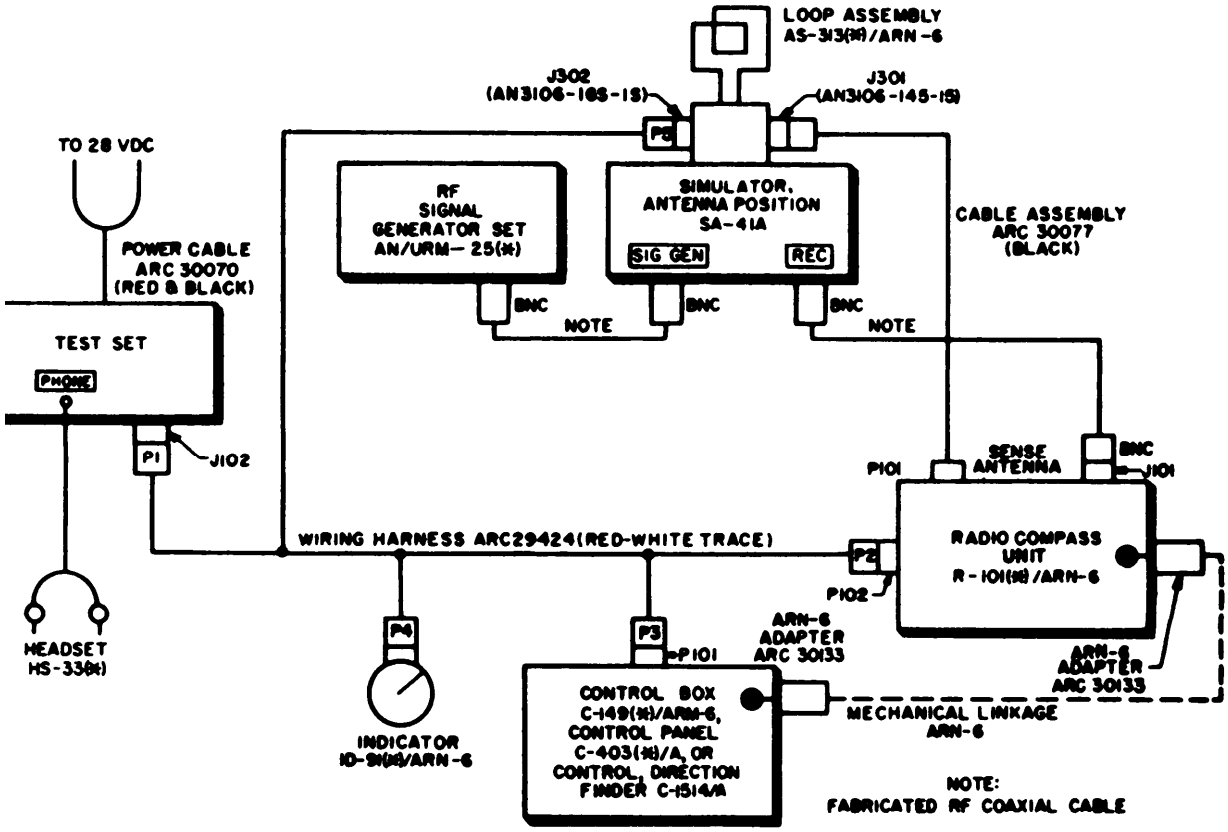


Figure 15. Radio Compass AN/ARN-6(*), test connections (Aircraft Radio Corp Model BTK-35A only).

Direction finding set	Interconnection diagram (fig. No.)
AN/ARN-6(*)	15
AN/ARN-54	16
AN/ARN-59(V)	17 or 17.1

85. Preliminary Procedure

Note. This procedure applies to all three adf sets, except as noted.

Place the test set dc circuit breaker (22, fig. 8) in the ON position. The POWER DC indicator (21) lights. Wait 30 seconds for warmup. Make the following checks:

a. Primary Power Test. This test indicates whether or not 27.5 volts dc is fed to the unit from the primary power supply. To measure the voltage, place the test set METER switch (34, fig. 8) in the LV 0-30V position. The test set multimeter (14) should point to the green LV + SET point.

b. Current Drain Test. This test indicates whether or not the receiving set is drawing the current required for proper operation. Set the test set METER switch (34, fig. 8) to LV 0-5A. The results given in the chart below must be indicated on the test set multimeter (14).

Direction finding set	Volts input	Minimum current drawn (amperes)
AN/ARN-54	27.5	3.5
AN/ARN-59(V)	27.5	2.8
AN/ARN-6(*):		
Continuous operation on ANT 100 microvolts signal	24	3.28
	26.5	3.5
	30	3.8
Continuous operation on COMP or Adf (signal tuned in, loop nulled)	24	3.82
	26.5	4.1
	30	4.5

c. B+ Voltage Test (AN/ARN-54, AN/ARN-59(V) Only). This test indicates whether or not the receiving set produces the plate voltage required for proper operation. After the receiving set has warmed up, turn the test set METER switch (34, fig. 8) to HV1 0-150V position for AN/ARN-54 or HV1 0-150V and HV2 0-150V positions for AN/ARN-59(V). With the METER switch at HV1 0-150V, the test set multimeter should indicate +115 volts for the AN/ARN–54 or + 125 volts

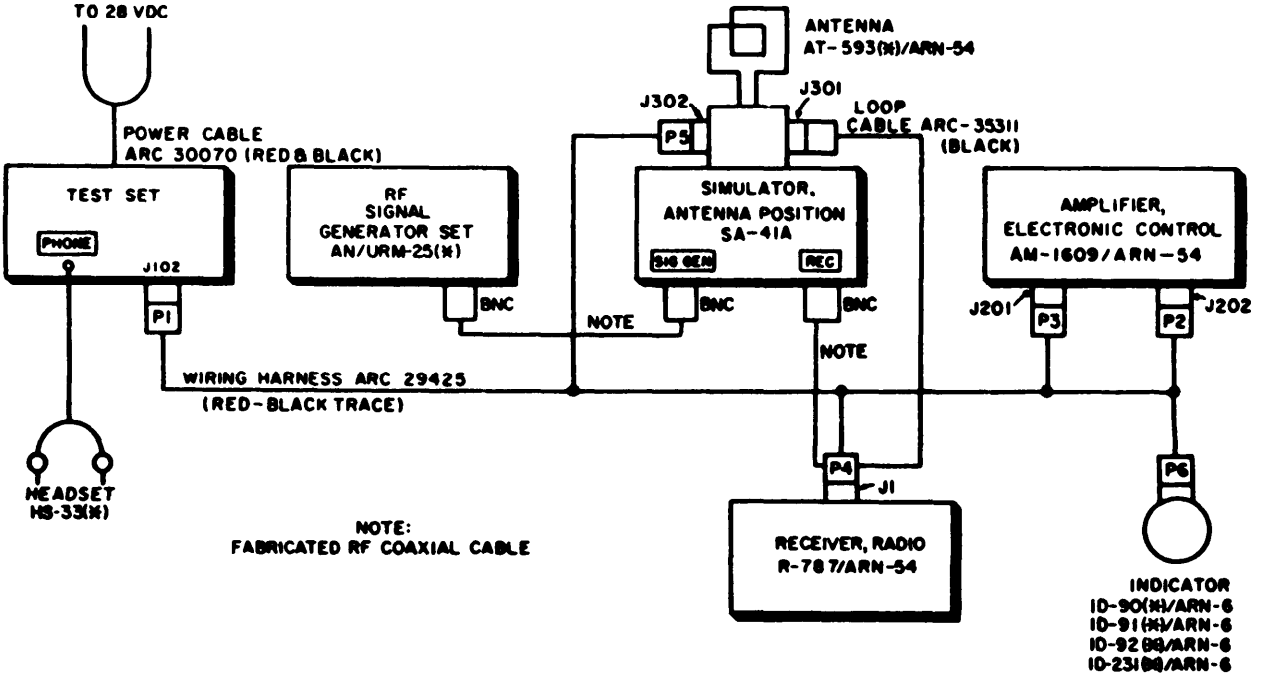


Figure 16. Receiving Set Radio AN/ARN-54, test connections (Aircraft Radio Corp Model BTK-35A only).

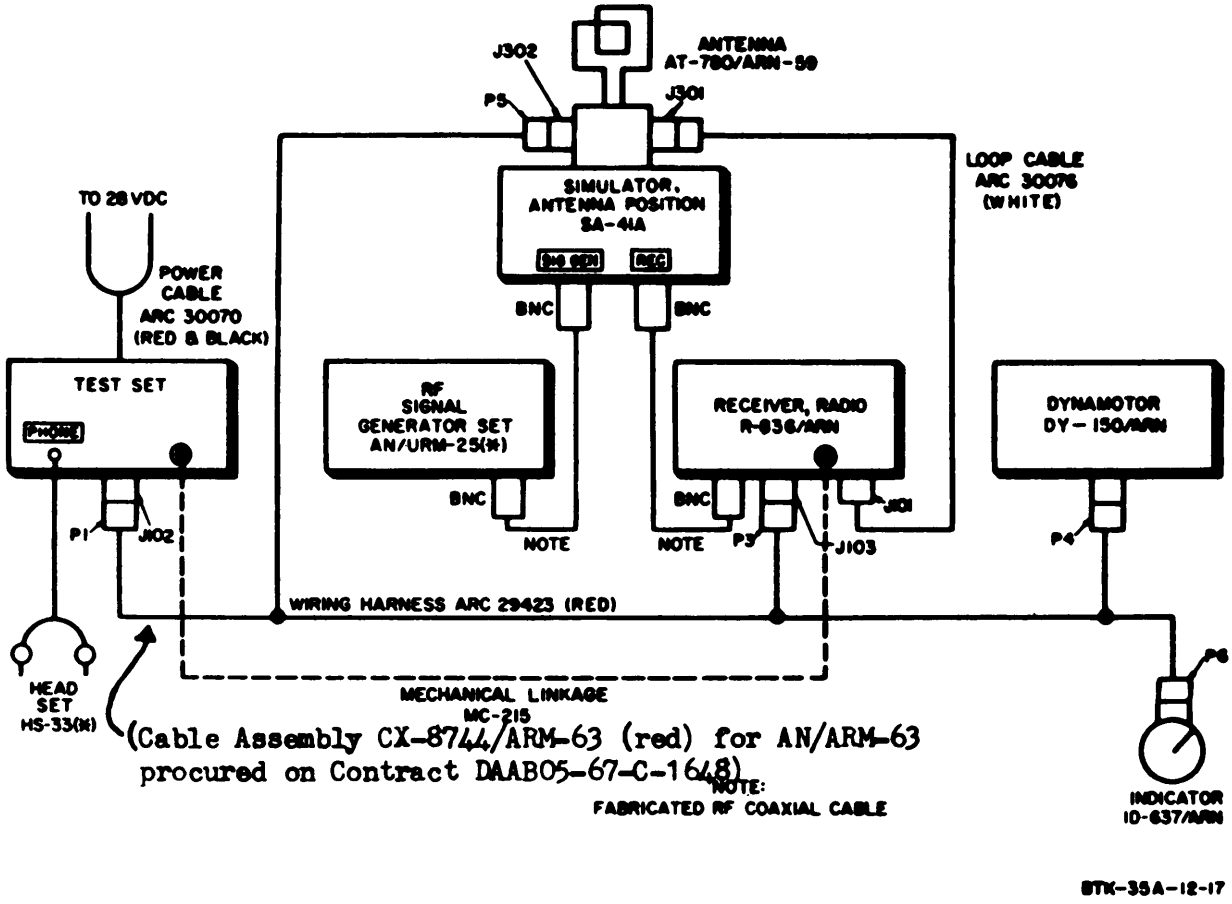


Figure 17. Direction Finder Set AN/ARN-59(V), test connections.

for the AN/ARN-59(V). With the METER switch at HV2 0-150V (AN/ARN-59(V)), the test set multimeter should indicate +135 volts. The AN/ ARN-6(*) uses the +27.5-volt dc as plate voltage; therefore, no B+ voltage checks are required for the AN/ARN-6(*). A low reading on the test set multimeter (14, fig. 8) usually indicates a short circuit in the B+ power supply or in the reference voltage circuit. A high reading on the test set multimeter usually indicates an open in the B+ or reference voltage circuits.

d. Ac Reference Voltage Tests. This teat indicates whether or not the ac portion of the receiving set power supply is functioning properly.

(1) *Ac voltage check.* Set the test set METER switch (34, fig. 8) to ADF 0-30V (AN/ARN-54 and AN/ARN-59(V) or to ADF 0-150V (AN/ARN-6(*)). Set function switch (27) to position indicated in the chart below. The test multimeter (14) will read the ac output of the power sup ply that operates the receiving set modulator stage. Compare the readings against the reference voltages shown in the chart. A reference voltage that is too low indicates that the power supply is overloaded (usually a short circuit). This effect is usually accompanied by a low B+ indication *(c* above). A reference voltage that is too high indicateas that the power sup ply is underloaded (usually an open circuit). Test standards are given below.

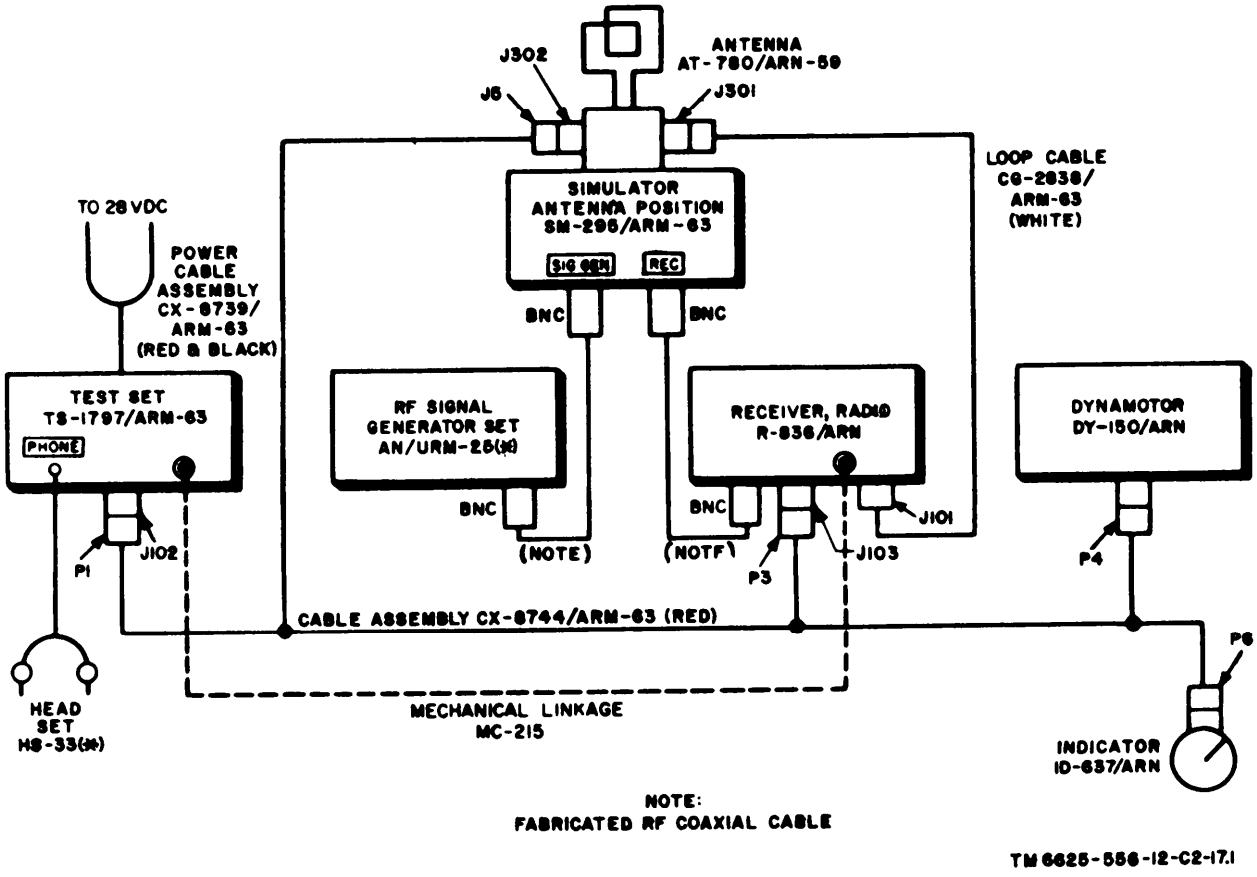


Figure 17.1 Direction Finder Set AN/ARN-59V, test connections (AN-ARM-63 procured on contract DAAB05-67-C2-1648).

Direction finding set	Control setting	Reference voltage (ac)†
AN/ARN-6(*)	ADF‡	24–25
AN/ARN-54	COMP‡	10–16
AN/ARN-59(V)	COMP††	12–20

† No signal input to antenna.
‡ On radio set control unit.
†† Function switch (AN/ARN-59(V)) on test set (37, fig. 8).

(2) *Ac frequency check.* The test set ac frequency meter (15, fig, 8) shows the frequency of the signal delivered from the power supply for operation of the receiving set modulator circuit and loop antenna drive motor. The frequency meter indicates the frequency by the vibration of a white dot actuated by a resonant reed. Vibration of two dots indicates that the frequency being measured is between the two frequencies marked on the meter face. (Vibration of the dots will sometimes be relatively small and the meter must be observed closely to determine the frequency being measured.) The rated ac frequency for each of the receiving sets is given in the chart below. The receiving set will usually operate properly if the ac frequency varies as much as ±5 cps from the rated frequency for the equipment. An ac frequency that is too high normally will be caused by an open B+ or reference voltage circuit in the AN/ARN-6(*) or AN/ARN-54. In the case of the AN/ARN-59(V), which utilizes a well-governed dynamotor, a high frequency output of this ac voltage will almost always be caused by a failure in the governor mechanism.

Direction finding set	Test set reference frequency (cps)
AN/ARN-6(*)	100 ±5
AN/ARN-54	115 ±5
AN/ARN-59(V)	100 ±5

86. Antenna Sensitivity, AN/ARN-6(*)

Note. Refer to paragraphs 84 and 85 before performing this test.

a. Preliminary.

(1) Set Simulator, Antenna Position SM-295/ARM-63 DUMMY-FIELD switch to DUMMY.

(2) Set the C-149(*)/ARN-6, C-403(*)/A, or Control, Direction Finder C-1514/A function switch to ANT.

(3) Set R. F. Signal Generator Set AN/URM-25 (*) for 30-percent modulation at 400 cps.

(4) To use a loudspeaker in place of the HS-33(*), connect a 3.2-ohm impedance loudspeaker to the test set AUDIO OUTPUT jack (20, fig. 8).

b. Procedure.

(1) Tune the AN/URM-25(") to each of the (test) frequencies listed in the chart in c below.

(2) Set the AN/URM-25(*) output (MICROVOLTS control) to the value listed in the chart in *c* below.

(3) Tune the adf receiver for the greatest audio volume (400-cps tone in the loudspeaker or HS-33(*)) at each frequency setting.

Note. To tune the AN/ARNA(*) receiver, use the tuning crank on the control panel (C149(*)/ARN-6, C-403(*)/A, or C-1514/A).

(4) Disconnect the HS-33(*) or loudspeaker from the test set.

(5) Set the test METER switch (34, fig. 8) to AUDIO 0-50MW.

(6) Adjust the AN/URM-25(*) output (MICROVOLTS control) until the rated receiver output (50 mw) is read on the test set multimeter (14, fig. 8). The AN/URM-25(*) output, as indicated by its RF VOLTS meter, must not exceed the value given in the chart (c below) for each frequency. If the AN/URM-25(*) output is higher than the level given in the chart, troubleshooting the radio receiver is required (TM 11-5125).

Note. To tune the next frequency, reconnect the loudspeaker or HS-33(*).

c. Tuning Chart.

AN/ARN-6(*) band	Test frequency (kilocycles)	AN/URM-25(*) output (microvolts)
100–200	105	5.4
	150	5.4
	195	5.3
200–410	205	5.4
	300	4.8
	400	4.5
410–850	420	4.3
	620	4.3
	840	4.5
850–1750	870	2.5
	1,300	3.0
	1,700	3.0

87. Antenna Sensitivity, AN/ARN-54

Interconnect the components (para 84) and perform the preliminary procedures (para 85); then proceed as follows:

a. Preliminary.

(1) Set Simulator, Antenna Position SM-295/ ARM-63 DUMMY-FIELD switch to DUMMY.

(2) Set the R-787/ARN-54 function switch to ANT.

(3) Set R. F. Signal Generator Set AN/URM-25(*) for 30-percent modulation at 400 cps.

(4) To use a loudspeaker in place of the HS-33 (*), connect a 3.2-ohm impedance loudspeaker to the test set AUDIO OUTPUT jack (20, fig. 8).

b. Procedure.

(1) Perform the procedures in paragraph 86b(1) through (4) ; use the frequencies listed in *c* below.

(2) Set the test set METER switch (34, fig. 8) to AUDIO 0-500MW.

(3) Adjust the AN/URM-25(*) output until the rated receiver output (500 mw) is read on the test set multimeter (14, fig. 8). The signal generator output, as indicated by its RF VOLTS meter, must not exceed the value given in the chart *(c* below) for each frequency. If the AN/URM-25 (*) output is higher than the level given in the chart, troubleshooting the receiver is required. Refer to TM 11-519 for detailed instructions.

Note. To tune the next frequency, reconnect the loudspeaker or HS-33(*).

c. Tuning Chart.

AN/ARN-24 band	Test frequency (kilocycles)	AN/URM-25(*) output (microvolts)
190–430	190	15
	210	15
480–1025	210	10
	430	10
1025–1750	480	15
	500	15
	500	10

88. Receiver Sensitivity, AN/ARN-59(V)

Interconnect the components (para 84); perform the preliminary procedures (para 85) and proceed as follows:

a. Preliminary.

(1) Set Simulator, Antenna Position SM-295/ ARM-63 DUMMY-FIELD switch to DUMMY.

(2) Set the test set function switch to ANT.

(3) Set R. F. Signal Generator Set AN/ URM-25(*) for 30-percent modulation at 400 cps.

(4) To use a loudspeaker in place of the HS-33(*), connect a 3.2-ohm impedance loudspeaker to the test set AUDIO OUTPUT jack (20, fig. 8).

b. Procedure.

(1) Perform the procedures in paragraph 86b (1) through (4); use the test frequencies listed in c below.

(2) Set the test set METER switch (34, fig. 8) to AUDIO O-500MW.

(3) Adjust the AN/URM-25(*) output until the rated receiver output (500 mw) is read on the test set multimeter (14, fig. 8). The AN/URM-25(*), as indicated by its RF VOLTS meter, must not exceed the value given in the chart *(c* below) for each frequency. If the required AN/URM-25(*) output is higher then the level given in the chart, troubleshooting is required. Refer to TM 11-5826-204-35 for detailed instructions.

Note. To tune the next frequency, reconnect the loudspeaker or HS-33(*).

c. Tuning Chart.

Test set band switch and tuning crank position (18, fig. 16)	Test frequency (kilocycles)	AN/URM-25(*) output (microvolts)†
0.19–0.40 mc	210	4.5
	380	3
0.40–0.84 mc	450	6
	800	4
	950	6.5
0.84–1.75 mc	1,650	5

† These are average values. The AN/URM-89(V) is rated at 4 to 10 microvolts sensitivity and any receiver may be accepted for installation which has 10 microvolts (or better) sensitivity at the listed frequencies.

89. Antenna Selectivity, AN/ARN-6(*)

a. Preliminary. Use the test setup and control settings as for the AN/ARN–6(*) sensitivity test (para 86a).

b. Procedure. Tune Radio Compass Unit R-101(*)/ARN-6 to each of the signal generator (test) frequencies listed in the chart in *d* below. First, tune the AN/URM-25(*); then set the AN/URM-25(*) output (MICRO-VOLTS control) to the value listed in the chart under *For tuning* and rotate the C-149(*)/ARN-6, C-403(*)/A, or C-1514/A tuning crank while listening for the 400-cps tone in the loudspeaker or HS-33(*); tune for greatest audio volume at each frequency setting. As soon as the receiver is tuned accurately to each frequency, disconnect the HS-33(*) or loudspeaker end set the test set METER switch (34, fig. 8) to AUDIO 0-50MW. At completion of bandwidth test at each frequency, reconnect the loudspeaker or HS-33(*).

c. 6-db Bandwidth. Use the AN/URM-25(*) MICROVOLTS control and increase the AN/URM-25(*) output level to the value given in the *At 6 db* column of the chart in *d below*. Vary the frequency setting of the AN/URM-25(*) by plus and minus the value given under At *6 db* in the *Bandwidth* column. Note the reading of the teat set multimeter (14, fig. 8) ; this value should not drop below the rated 50 mw. If the receiver output drops below 50 mw within this bandwidth, refer to TM 11-5125 for detailed repair instructions.

d. 20-db Bandwidth. Repeat *b* and *c* above; use the values in the *At 20 db* column in the chart below for AN/URM-25(*) output and bandwidth. The test set multimeter reading in this case *must fall below* the rated output of 40 mw at the bandwidth limits. If the limits are not met, refer to TM 11-5826-204--35.

AN/URM-25(*) band	Test frequency (kilocycles)	Bandwidth (kilocycles)		AN/URM-25(*) output (microvolts)		
		At 6 db	At 20 db	For tuning	At 6 db	At 20 db
C	195†	±1.1	±2.2	5.3	21.2	530
E	840‡	±1.7	±2.5	4.5	18	450

† IF is 455 kc.
‡ IF is 142.5 kc.

90. Antenna Selectivity, AN/ARN-54

a. Preliminary. Use the same test setup and control settings as for the AN/ARN–54 sensitivity test (para 87a).

b. Procedure. Tune the AN/ARN-54 receiver to each of the AN/URM-25(*) (test) frequencies listed in the chart in *d* below. First, tune the AN/URM-25(*) to the desired frequency; then set the AN/URM-25(*) MICROVOLTS control to the value listed in the chart under *For tuning* and tune the R-787/ARN-54 while listening for the 400-cps tone in the loudspeaker HS-33(*); tune for greatest audio volume at each frequency setting. As soon as the R–787/ARN-54 is tuned accurately to each frequency, disconnect the HS-33(*) or loudspeaker and set the test set METER switch (34, fig. 8) to AUDIO 0-500MW and note the reading on the multimeter (14, fig. 8). At completion of bandwidth test at each frequency, reconnect loudspeaker or HS-33(*).

c. 6-Db Bandwidth. Use the AN/URM-25(*) MICROVOLTS control and increase the AN/URM-25(*) output level to the value given in the *At 6 db* column of the chart in *d* below. Then vary

the frequency setting of the AN/URM-25(*) by plus and minus the value given under *At 6 db* in the *Bandwidth column.* Note the reading of the test set multimeter (14, fig. 8) ; this value should not drop below the rated 500 mw. If the receiver outlet drops below 500 mw within this bandwidth, refer to TM 11-519 for repair instructions.

d. 60-Db Bandwidth. Repeat *c* above; use the values given under *At 60 db* for AN/URM-25(*) outlet and bandwidth. Note that the test set multimeter reading in this case *must fall below* the rated output of 500 mw at the bandwidth limits. If these limits arc not met, refer to TM 11-519.

AN/URM-25(*) band	Test frequency (kilocycles)	Bandwidth (kilocycles)		AN/URM-25(*) output (microvolts)		
		At 6 db	At 20 db	For tuning	At 6 db	At 20 db†
D	300	±1.25	±9	10	40	1
E	750	±2.25	±11	10	40	1
E	1400	±2.75	±12	10	40	1

† Approximate value; R. F. Signal Generator Set AN/URM-25(*) is limited to 1 volt rf output maximum.

91. Receiver Selectivity, AN/ARN-59(V)

a. Preliminary. Use the test setup and control settings as for the AN/ARN–59(V) sensitivity test (para 88a).

b. Tuning Procedure. With the tuning control (fig. 2), tune the AN/ARN-59(V) receiver to each of the AN/URM-25(*) test frequencies listed in the chart in *d* below. First, tune the AN/URM-25(*) to the desired frequency; then set the AN/URM-25(*) output MICROVOLTS control to the value listed in the chart under *For tuning* and rotate the test set tuning crank and PRESS TO WHISTLE control (60, fig. 8) while listening for the 400-cps tone in the loudspeaker or HS-33(*); tune for greatest audio volume at each frequency setting. As soon as the receiver is tuned accurately to each frequency, disconnect the HS-33(*) or loudspeaker and set the test set METER switch (34, fig. 8) to AUDIO 0-500MW and note the reading on the test set multimeter (14, fig. 8). At completion of bandwidth test at each frequency, reconnect headspeaker or HS-33(*).

c. 6-Db Bandwidth. Use the AN/URM-25(*) MICROVOLTS control and increase the AN/URM-25(*) output level to the value given in the *At 6 db* column of the chart in *d* below. Vary the frequency setting of the AN/URM-25(*) by plus and minus the value given under At *6 db* in the *Bandwidth* column. Note the reading of the test set multimeter (14, fig. 8) *;* this value should not drop below the rated 500 mw. If the receiver output drops below 500 mw within this bandwidth, refer to TM 11-5826-204-35 for detailed repair instructions.

d. 60-Db Bandwidth. Repeat *c* above; use the values given under *At 60 db* for the AN/URM-25(*) output and bandwidth. Note that the test set multimeter (14, fig. 8) reading in this case *must fall below* the rated output of 500 mw at the bandwidth limits. If these limits are not met, refer to TM 11-5826-204-35.

Test set band and tuning crank switch position	Test frequency (kilocycles)	Bandwidth (kilocycles)		AN/URM-25(*) output		
		At 6 db	At 60 db	For tuning (microvolts)	At 6 db (microvolts)	At 60 db† (volts)
0.19–0.40 mc	210	0.8	2.1	4.5	18	1
0.40–0.84 mc	450	1.1	3.15	6	24	1
0.84–1.75 mc	950	1.4	4.25	6.25	26	1

† Approximate value; R. F. Signal Generator Set AN/URM-25(*) is limited to 1 volt rf output maximum.

92. Antenna Signal Plus Noise-to-Noise Ratio, AN/ARN-6(*)

a. Preliminary. Use the test setup and control settings as for the AN/ARN-6(*) sensitivity test (para 86a).

b. procedure. Tune Radio Compass Unit R-101(*)/ARN-6 (receiver) to each of the AN/URM-25(*) (test) frequencies listed in the chart below. To tune each frequency, first tune the AN/URM-25(*) to the desired frequency. Then set the AN/URM-25(*) MICROVOLTS control to the output value listed in the chart below and tune the receiver while listening for the 400-cps tone in the loudspeaker or HS-33(*); tune for greatest audio volume at each frequency setting. As soon as the receiver is tuned accurately to each frequency, disconnect the HS-33(*) or loudspeaker and set the test set METER switch (34, fig. 8) to AUDIO 0-50MW. Turn the AN/ARN-25(*) MODULATION switch to OFF and note the reading on the test set multimeter (14, fig. 8). The residual reading, which constitutes system noise, must be within the limits given in the chart at each frequency. If residual reading is not correct, refer to TM 11-5125. To tune the next frequency, reconnect the loudspeaker or headset and place the AN/URM-25(*) MODULATION switch in the ON position.

AN/ARN-6(*) band	Test frequency (kilocycles)	AN/URM-25(*) output (microvolts)	Noise level (milliwatts)	
			Max	Min
100–200	105	5.4	30	5
	150	5.4	30	5
	195	5.3	30	5
200–410	205	4.5	20	2
	300	4.8	25	3
	400	4.5	25	3
410–850	420	4.3	10	1
	620	4.3	15	2
	840	4.5	20	2
850–1750	870	2.5	20	2
	1,300	3.0	30	5
	1,700	3.0	30	5

93. Antenna Signal Plus Noise-to-Noise Ratio, AN/ARN-54

a. Preliminary. Use the test setup and control settings as for the AN/ARN-54 sensitivity test (para 87a).

b. Procedure. Tune the receiver to each of the AN/URM-25(*) test frequencies listed in the chart in paragraph 87c. To tune each frequency, first tune the AN/URM-25(*); then set the AN/URM-25(*) output (MICROVOLTS control) to the output value listed in the chart (para 87c) and rotate the test set tuning crank while listening for the 400-cps tone in the loudspeaker or HS-33(*); tune for greatest audio volume at each frequency setting. As soon as the receiver is tuned accurately to each frequency, disconnect the HS-33(*) or loudspeaker and set the test set METER switch (34, fig. 8) to AUDIO 0-500MW. Note the meter reading. Turn the AN/URM-26(*) MODULATION switch to OFF and note the residual reading on the test set multimeter (14, fig. 8) ; this constitutes system noise and must be at least 6 db down from (less than one-quarter) the initial reading (MODULATION switch at ON) at each *frequency*. If the residual reading is not correct, refer to TM 11-519. To tune the next frequency, reconnect the loudspeaker or HS-33(*) and place the AN/URM-25(*) MODULATION switch in the ON position.

94. Receiver Signal Plus Noise-to-Noise Ratio, AN/ARN-59(V)

a. Preliminary. Use the test setup and control settings as for the AN/ARN-59(V) Sensitivity test (para 88a).

b. Procedure. Tune the AN/ARN-59(V) receiver to each of the AN/URM-26(*) (test) frequencies listed in paragraph 88c. To tune each

frequency, first tune the AN/URM-25(*) to the desired frequency. Set the AN/URM-25(*) output MICROVOLTS control to the output value listed in the chart (para 88c) and rotate the test set tuning crank and PRESS TO WHISTLE control (60, fig. 8) while listening for the 400-cps tone in the loudspeaker or HS-33(*); tune for greatest audio volume at each frequency setting. As soon as the receiver is tuned accurately to each frequency, disconnect the headset or loudspeaker and set the test set METER switch (34, fig. 8) to AUDIO 0-500MW. Note the test set multimeter (14, fig. 8) reading. Turn the AN/URM-25(*) MODULATION switch to OFF and note the residual reading on the test set multimeter (14, fig. 8) ; this constitutes system noise and must be at least 6 db down from (less than one-quarter) the initial reading (MODULATION switch at ON) fit each frequency. If the residual reading is not correct, refer to TM 11-5826-204-35. To tune the next frequency, reconnect the loudspeaker or HS-33(*) and place the AN/URM-25(*) MODULATION switch in the ON position.

95. Loop Antenna Tests (AN/ARN-6(*) and AN/ARN-59(V) Only)

Two tests are used to evaluate the operation of the AN/ARN-6(*) and AN/ARN-59(V) when used as aural-null direction finders (loop antenna alone). The tests are loop sensitivity (in microvolt per meter) and loop signal plus noise-to-noise ratio. The procedures for testing the loop antenna sensitivity (a below) and noise ratio (c below) are identical for both the AN/ARN-6(*) and AN/ARN-59(V). The test results for the sensitivity *(b* below) and noise ratio *(d* below) tests are also identical.

a. Loop Sensitivity.

(1) *Preliminary.* Perform applicable procedures in paragraphs 84 and 85. Set Simulator, Antenna Position SA-41A DUMMY-FIELD switch in the FIELD position. For the AN/ARN-6, set the C-149(*)/ARN-6, C-403(*)/A, or C-1514/A function switch to ANT. For the AN/ARN-59(V), set function switch (27, fig. 8) to ANT. Set the AN/URM-25(*) for 30-percent modulation at 400-cps. To use a loudspeaker, connect a 3.2-ohm impedance loudspeaker to the test set AUDIO OUTPUT jack (20, fig. 8).

(2) *Procedure.*

(a) Tune the receiver under test to each of the AN/URM-25(*) frequencies listed in the chart in (3) *(a)* below for the AN/ARN-6 or (3) *(b)* below for the AN/ARN-59(V). To tune each frequency, first tune the AN/URM-25(*) to the desired frequency. Set the AN/URM-25(*) MICROVOLTS control to the minimum value given in the chart and tune the receiver while listening for the 400-cps tone. Tune for greatest audio volume at each frequency setting. When the receiver is tuned accurately to each frequency, disconnect the headset or loudspeaker, set the C-149(*)/ARN-6, C-403(*)/A, or C-1514/A function switch to LOOP (AN/ARN-6(*)) or the test set function switch (18, fig. 8) to LOOP (AN/ARN-59(V)), and set the test set METER switch (34, fig. 8) to AUDIO 0-50MW (AN/ARN-6) or AUDIO 0-500MW (AN/ARN-59(V)). Use the C-149(*)/ARN-6, C-403(*)/A, or C1514/A L-R control (AN/ARN-6) for the test set LOOP and MOTOR switches (26 and 30, fig. 8) (AN/ARN-59(V)) and rotate the loop antenna for a maximum reading on the test set multimeter (14, fig. 8) ; this should occur when the test set Indicator, Course ID-250/ARN (17, fig. 8) reads either 90° or 270°.

(b) Note the reading of the test set multimeter; the loop sensitivity should be within the limits given in the charts in *b* below. If loop sensitivity is low, increase the AN/URM-25(*) output level up to, but not exceeding, the maximum value given for that frequency. If loop sensitivity is still low, the receiver requires repair. Refer to TM 11-5125 (AN/ARN-6) or TM 11-5826-204-35 (AN/ARN-59(V)) for details.

(c) To tune the next frequency, reconnect the loudspeaker or HS-33(*) and return test set function switch (27, fig. 8) to ANT position.

(3) *Test results.*

(a) AN/ARN-6(*)

AN/ARN-6(*) band	Test frequency (kilocycles)	AU/URM-25(*) output (microvolts)		Loop sensitivity (microvolts/meter)	
		Min	Max	Min	Max
100–200	105	90	125	90	125
	150	75	100	75	100
	195	80	135	65	90
200–410	205	90	130	60	85
	300	55	90	40	65
	400	60	100	45	75
410–850	420	50	80	40	60
	620	50	65	35	50
	840	30	65	30	65
850–1750	870	25	50	25	50
	1300	30	60	25	45
	1700	30	50	20	35

(b) AN/ARN-39(V)

AN/ARN-59(V) band	Test frequency (kilocycles)	AN/URM-25(*) output (microvolts)	Loop sensitivity (microvolts/meter)
0.19–0.40 mc	211	Less than 1400	Less than 140
	295	Less than 700	Less than 70
	379	Less than 600	Less than 60
0.40–0.84 mc	445	Less than 600	Less than 60
	621	Less than 500	Less than 50
	798	Less than 500	Less than 50
0.84–1.75 mc	936	Less than 600	Less than 60
	1306	Less than 500	Less than 50
	1662	Less than 500	Less than 50

c. Loop Signal Plus Noise-to-Noise Ratio.

(1) *Preliminary.* Perform the preliminary procedures in *a* (1) above.

(2) *Procedure.*

(a) Tune the receiver (a(2) (a) above) to each of the AN/URM-25(*) frequencies listed in the chart in (3) (a) below for the AN/ARN-6(*) or (3) *(b)* below for the AN/ARN-59(V).

(b) Turn the AN/URM-25(*) MODULATION switch to OFF and note the reading on the test set multimeter (14, fig. 8). The residual reading, which constitutes system noise, must be, within the limits given in the charts in d(1) or (2) below at each frequency, If the equipment fails to provide the specified output, refer to TM 11-5125 (AN/ARN-6) or TM 11-5826-204-35 (AN/ARN-59(V)).

(c) To tune the next frequency, reconnect the loudspeaker or HS-33(*) and return the function switch to the ANT position. Turn the AN/URM-25(*) MODULATION switch to ON.

(3) *Test results.*

(a) AN/ARN-6(*)

AN/ARN-6(*) band	Test frequency (kilocycles)	AN/URM-25(*) output (microvolts)		Noise level (milliwatts)	
		Min	Max	Min	Max
100–200	105	90	125	3	30
	150	75	100	4	35
	195	80	135	4	35
200–410	205	90	130	5	35
	300	55	90	3	35
	400	60	100	4	35
410–850	420	50	80	3	35
	620	50	65	2	20
	840	30	65	1	10
850–1750	870	25	50	2	25
	1300	30	60	5	25
	1700	30	50	1	25

(b) AN/ARN-59(V)

AN/ARN-59(V) band	Test frequency (kilocycles)	AN/URM-25(*) output (microvolts)	Loop noise level (milliwatts)
0.19–0.40 mc	211	Less than 100	Less than 4
	295	Less than 100	Less than 4
	379	Less than 100	Less than 4
0.04–0.84 mc	445	Less than 100	Less than 4
	621	Less than 100	Less than 4

AN/ARN-59(V) band	Test frequency (kilocycles)	AN/URM-25(*) output (microvolts)	Loop noise level (milliwatts)
0.84-1.75 mc	798	Less than 100	Less than 4
	936	Less than 100	Less than 4
	1306	Less than 100	Less than 4
	1662	Less than 100	Less than 4

96. Adf Tests

a. General. Adf tests determine the condition of the radio set as an automatic direction finder or radio compass system. The tests consist of adf voltage tests, loop voltage tests, compass sensitivity and accuracy tests, and loop rotational speed tests. These tests are identical for all three radio sets; only the test results and the various control settings differ.

b. Preliminary. Interconnect the components (para 84) and perform the preliminary procedures (para 85). Set the antenna position simulator DUMMY-FIELD switch (fig. 3) to FIELD. Set the AM-1609/ARN-54 (AN/ARN-54) or the C-149(*)/ARN-6, C-403(*)/A, or C-1514/A (AN/ARN-6(*)) function switch to ANT, or set the test set function switch (27, fig. 8) to ANT (AN/ARN-59(V)). Set the AN/URM-25(*) for 30 percent modulation at 400 cps; adjust the AN/URM-25(*) signal amplitude (MICROVOLTS control) to the level given in the chart in *b* below. To use a loudspeaker in place of the HS-33(*), connect a 3.2-ohm impedance loudspeaker to the AUDIO OUTPUT jack (20, fig. 8) of the test set.

c. Procedure.

(1) Tune the receiver to one arbitrary frequency in each of its bands. To tune each selected frequency, first tune the AN/URM-25(*) to the selected frequency; then set the AN/URM-25(*) MICROVOLTS control to the value given in the chart below. Tune the receiver for maximum volume while listening for the 400-cps tone in the loudspeaker or HS-33(*). When the radio set is tuned to each frequency, disconnect HS-33(*) or loudspeaker and turn the AN/URM-25(*) MODULATION switch to OFF. To tune the next frequency, reconnect the loudspeaker or HS-33(*) and turn the AN/URM-25(*) MODULATION switch to ON.

(2) At each frequency setting, rotate the loop to the 180° position (shown by the test set Indicator, Course ID–250/ARN). To rotate the AN/ARN–6(*) loop, set the function switch on the C-149(*)/ARN-6, C-403(*)/A or C-1514/A (control panel) to LOOP and use the L-R switch on the control panel. To rotate the AN/ARN-54 and AN/ARN-59(V) loops, use the test set LOOP switch (26, fig. 8) with the test set MOTOR switch (30, fig. 8) ON.

(3) Set the test set METER switch (34, fig. 8) to ADF 0-150V (AN/ARN-6(*) and AN/ARN-59(V)) or to ADF 0-30V (AN/ARN-54). Set up the radio set for adf or compass operation. (See chart below for function switch positions.) Note that the loop slews to the null position (0° on the test set Indicator, Course ID–250/ARN). As the ID-250/ARN needle No. 1 passes the 90° or 270° position, note the reading on the test set multimeter (14, fig. 8). When the loop has stropped at the null position, set the METER switch to ADF 0-30V (for all radio sets) and note the test set multimeter reading. Adf voltages under these conditions must he as given in the chart below. If the radio set fails to provide the specified output, refer to the applicable technical manual.

Direction finding set	Switch position	AN/URM-25B output (microvolts)	Adf voltage (vac)	
			Loop rotating	Loop nulled
AN/ARN-6(*)	ADF or COMP†	300–400	35–50	10–20
AN/ARN-54	COMP†	1,000	11–21	10
AN/ARN-59(V)	COMP†	500–600	35–50	Less than 35

† On radio set control unit.
‡ On test set (27, fig. 8).

97. Loop Voltage Tests (AN/ARN-6(*) and AN/ARN-59(V) Only)

a. Preliminary. Use the test setup and control settings as for the adf voltage test (para 96b).

b. Procedure.

(1) Tune the receiver to one arbitrary frequency in each of its hands. To tune each selected frequency, first tune the AN/

URM-25(*) to the selected frequency; then set the AN/URM-25(*) (MICROVOLTS control) to the value given in the chart in (4) below. Tune the receiver (with the C-149(*)/ARN-6, C-403(*)/A, or C1514/A for AN/ARN-6(*) and test set tuning control (18, fig. 8) for AN/ARN-59(V)), while listening for the 400-cps tone in the loudspeaker or headset. Tune for greatest audio volume at each frequency setting. As soon as the receiver is tuned to each frequency, disconnect headset or loudspeaker and turn the AN/URM-25(*) MODULATION switch to OFF. To tune next frequency, reconnect loudspeaker or HS-33(*) and put the AN/URM-25(*) MODULATION switch to ON.

(2) At each frequency setting, prepare the radio set for loop operation. For AN/ARN-6(*), place the function switch on the C-149(*)/ARN-6, C-403(*)/A, or C-1514/A in the LOOP position; for AN/ARN-59(V), place the test set function switch (27, fig. 8) in the LOOP position.

(3) Slew the loop; use the LOOP and L-R switches on the C-149(*)/ARN-6, C-403(*)/A, or C-1514/A (AN/ARN-6(*)) or the test set LOOP and MOTOR switches (26 and 30, fig. 8) (AN/ARN-59).

(4) While loop is rotating at full speed, note reading on test set multimeter (14, fig. 8) (METER switch (34, fig. 8) at ADF 0-150V). Release switches and allow loop to stop; when loop is stationary, read test set multimeter (METER switch at ADF 0-30V). Voltages must be as given below. If the radio set fails to provide the specified output, refer to TM 11-5125 (AN/ARN4(*)) or TM 11-5820-204-35 (AN/ARN-59(V)).

Direction finding set	AN/URM-25(*) output (microvolts)	Loop voltage (vac)	
		Loop rotating	Loop stationary
AN/ARN-6(*)	300–400	35–45	0
AN/ARN-59(V)	500–600	40–60	0

98. Compass Sensitivity and Accuracy Tests

a. Preliminary. Use the test setup and control settings as for the adf voltage test (para 96b), except use the AN/URM-25(*) outputs given in the appropriate chart (c below).

b. Procedure.

(1) Tune the receiver (para 950(2) *(a)) to* each of the test frequencies listed in the appropriate chart in c below. To tune each frequency, first tune the AN/URM-25(*) to the selected frequency; then set the AN/URM-25(*) MICROVOLTS control to the value given in the chart for that frequency and tune the receiver while listening for the 400-cps tone in the loudspeaker or HS-33(*). Tune for greatest audio volume at each frequency setting. As soon as the radio set is tuned to each frequency, disconnect the HS-33(*) or loudspeaker and turn the AN/URM-25(*) MODULATION switch to OFF. To tune the next frequency, reconnect the loudspeaker or HS-33(*) and put the AN/URM-25(*) MODULATION switch to ON,

(2) At each frequency setting, slew the radio set loop to the 180° position as shown by teat set Indicator, Course ID-250/ARN (fig. 2). To rotate the AN/ARN-6(*) loop, set the function switch to LOOP and use the L-R switch (both located on the C-149(*)/ARN-6, C-403(*)/A, or C-1514/A); to rotate the AN/ARN-59(V) loop, use the test set LOOP and MOTOR switches (26 and 30, fig. 8).

(3) When function switch has been set for compass operation, the adf action of the receiver will rotate the loop of a properly operating radio set back to the 0° position at each frequency and with the AN/URM 25(*) output specified in the appropriate chart in *c* below.

(4) Repeat (2) and (3) above five times at each frequency setting, noting each time the accuracy with which the test set Indicator, Course ID-250/ARN nulls at 0°. If loop does not return to 0° with the required accuracy in each of five successive tests, refer to the applicable technical manual (para 83a) for repair instructions.

c. Test results.

(1) *AN/ARN-6(*).*

Note. Function switch on C-149(*)/ARN-6, C-403(*)/A, or C-1514/A must be set to COMP.

Band	Test frequency (kilocycles)	AN/URM-25B output (microvolts)	Compass sensitivity (microvolts/meter)	Accuracy (degrees)
100–200	105	25	25†	±1.0
	150	25		
	195	38		
200–410	205	38		
	300	35		
	400	33		
410–850	420	33		
	620	35		
	840	25		
850–1750	870	25		
	1300	33		
	1000	35		

† Bearing accuracy of ±1.0° must be obtained at any compass sensitivity (field strength) above 25 microvolts/meter.

(2) *AN/ARN–54.*

Note. Function switch on Receiver, Radio R–787/ARN–54 must bet set to COMP.

Test frequency (kilocycles)	AN/URM–25(*) output (microvolts)	Compass sensitivity (microvolts/meter)	Accuracy (degrees)
250	38	15	±2†
450	36		
1450	35		

† Bearing accuracy of ±2° must be obtained at any compass sensitivity (field strength) between 100 microvolts/meter.

(3) *AN/ARN–59(V).*

Note. Function switch (27, fig. 8) on the test set must be set at COMP.

Test frequency (kilocycles)	Signal generator output (microvolts)	Compass sensitivity (microvolts/meter)	Accuracy (degrees)
211	150	50	±2†
445	150		
936	150		
1662			

† Bearing accuracy of ±2° must be obtained at a field strength of 50 microvolts/meter.

99. Loop Rotational Speed Test

a. Preliminary. Use the test setup and control settings as for the adf voltage test (para 96b), except use the AN/URM-25(*) outputs given in the chart in *c* below.

b. Procedure.

(1) Tune the receiver to one arbitrary frequency in each of its bands. To tune each selected frequency, first tune the AN/URM-25(*); then set the AN/URM-25(*) output (MICROVOLTS control) to the value given in the chart in *c* below, and rotate the test set tuning crank (60) while listening for the 400-cps tone in the loudspeaker or HS-33(*). Tune for greatest audio volume at each frequency setting. As soon as the radio set is tuned to each frequency, disconnect HS-33(*) or loudspeaker and turn AN/URM-25(*) MODULATION switch to OFF. To tune next frequency, reconnect loudspeaker or HS-33(*) and put the AN/URM-25(*) MODULATION switch to ON.

(2) At each frequency setting, ohm the radio set loop to the 175° position, as shown by test set Indicator, Course ID-250/ARN. To rotate the AN/ARN-6(*) loop, set the function switch to LOOP and use the L-R switch (both located on the C-149(*)/ARN-6, C-403(*)/A, or C-1514/A); to rotate the AN/ARN-54 and AN/ARN-59(V), use the test set LOOP switch (26, fig. 8) with the MOTOR switch (30, fig. 8) ON.

(3) With the loop at the 175° position, switch the radio set over to compass operation; for the AN/ARN-6, set the function switch on the C-149(*)/ARN-64, C-403-(*)/A, or C-1514/A to COMP; for the AN/ARN-54, set the function switch on

Receiver, Radio R-787/ARN-54 to COMP; for the AN/ARN-59(V), set the test set function switch (27, fig. 8) to COMP. Time the rotation of the loop back to the 0º null position (shown by test set Indicator, time ID-250/ARN). Rotation time must be as specified in the chart in c below; if rotation time is incorrect, refer to applicable technical manual.

c. Test results.

Direction finding set	AN/URM-86(*) output (microvolts)	Equivalent field strength (microvolts/meter)	Time required for 178° rotation (seconds)
AN/ARN-6(*)	500	50	Less than 5
AN/ARN-54	500	50	Less than 5
AN/ARN-59(V)	500	50	8-20

CHAPTER 4
MAINTENANCE INSTRUCTIONS

100. General

This chapter lists the maintenance duties normally performed by the operator and organizational maintenance technician of Test Set, Radio AN/ARM-63. Operator and organizational maintenance for the test set consists of the following.

a. Preventive maintenance (para 102).
b. Visual inspection (para 103).
c. Equipment performance (para 104).
d. Replacement of defective parts (para 105).

NOTE

The operator should carefully record all equipment operating conditions at the time of any failure of the test set.

101. Tools, Materials, and Test Equipment Required

a. Tools.
(1) Tool Kit, Electronic Equipment TK-105/G.
(2) Tool Kit, Electronic Equipment TK-101/G.
b. Materials.
(1) Cleaning cloth.
(2) Sandpaper No. 000.
(3) Rubber tape.
(4) Friction tape.
c. Test Equipment.
(1) Jumper wires No. 22 AWG (two each), 6 inches long.
(2) Multimeter AN/URM-105.

102. Preventive Maintenance

Following is a preventive maintenance checklist to be used by the operator and organizational maintenance personnel.

a. Use a clean cloth to remove dust, dirt, moisture, and grease from all the major components. Be careful when cleaning the windows of the meters and indicators.

b. All control knobs should work smoothly and should not bind. Tighten all loose knobs and be sure that the knobs do not rub against the panel.

c. If either power circuit breaker (fig. 3) snaps to OFF repeatedly, an abnormal condition exists. Check all cable connections for shorts or frayed insulation.

d. Repair any cuts in the insulation of test harnesses or power cable assemblies by covering them with rubber tape and then with friction tape.

e. Remove rust and corrosion from metal surfaces by sanding with fine sandpaper. Brush two thin coats of paint on bare metal to protect it from further corrosion. Refer to applicable cleaning and refinishing practices specified in TB 43-0118.

103. Visual Inspection

a. When the equipment fails to perform properly, turn off the power and check for conditions listed in (1) through (6) below.

CAUTION

Do not perform any check with the power

(1) Wrong setting of switches and controls.
(2) Power cables disconnected or poorly connected.
(3) Cracks in window of indicators or meters.
(4) Test harness frayed or otherwise defective.
(5) Connectors defective or poorly connected.
(6) Mechanical linkage defective or not properly connected.

b. If the checks above do not locate the trouble, proceed to equipment performance checklist (para 104).

c. If a specific trouble is indicated, carefully record all applicable conditions: the equipment under test; the particular test; the test connections; the position of all switches, controls, and indicators; and all meter readings on the test set and on the equipment under test.

104. Equipment Performance Checklist

a. General. The equipment performance checklist provides a procedure for systematically checking equipment performance. All corrective measures that the operator and the organizational maintenance man can perform are given in the *Corrective maintenance column.* When using the checklist, start at the beginning and follow each step in order. If the corrective measures indicated do not correct the fault, troubleshooting by a higher echelon is required. Note on the repair tag how the equipment performed and the corrective measures that were taken.

b. Checklist.

Item No.	Action or condition	Normal indication	Corrective maintenance
1	Connect radio test set to power sources and place ac circuit breaker in the ON position.	Circuit breaker locks in ON position. POWER 400~lamp lights and remains lighted.	Improper ac connection, no power on ac line; check and take corrective action. Defective indicator; replace (para 105). Defective cable, short circuit, or defective power cable. Higher echelon required.
2	Set dc circuit breaker in ON position.	Dc circuit breaker locks in ON position. POWER DC lamp lights and remains lighted.	Defective indicator (para 105). Improper dc connection, no power on dc line; defective cable; higher echelon repair required.
3	Turn METER switch to the LV 0–30V position.	Test set multimeter reads dc line voltage; compare with external meter reading line voltage.	Defective meter, defective METER switch, defective power cable, defective internal wiring. Higher echelon repair required.
4	Turn METER switch to the 400~ 0–150V position.	Test set multimeter reads ac line voltage; compare with external meter reading line voltage.	Defective meter, defective METER switch, defective power cable, defective internal wiring. Higher echelon repair required.
5	Operate tuning knobs of Radio Set Control C–1827/ARC–55.	Digits in control window change with knob motion.	Defective C–1827/ARC–55. Higher echelon repair required.
6	Rotate the test set tuning crank and PRESS TO WHISTLE control.	MC dial rotates with crank motion.	Defective tuning mechanism. Higher echelon repair required.
		Tuning shaft connection rotates with knob.	Defective mechanical linkage in test set. Higher echelon repair required.
7	Operate both the fractional megacycle and the megacycle knobs of the megacycle selector control.	Fractional mc indication controlled by right-hand knob; mc indication controlled by left-hand knob.	Defective control. Higher echelon repair required.
8	Operate band switch of the band switch and tuning crank (AN/ARN–59(V)) (18, fig. 8).	Band indication of tuning control switches with each selection.	Defective tuning control, defective band switch. Higher echelon repair required.
9	Turn tuning crank of the band switch and tuning crank (AN/ARN–59–(V)) in each band position.	Frequency indication varies continuously with tuning crank position.	Defective tuning control. Higher echelon repair required.
		Tuning shaft connection rotates with knob.	Defective mechanical linkage in test set. Higher echelon repair required

105. Replacement of Defective Parts

Replacement of Indicator Lamps (fig. 8).

(1) Turn the jewel of the indicator lamp counterclockwise and remove it.

(2) Remove the indicator lamp from its socket and replace with a new one.

(3) Replace the jewel of the indicator lamp by screwing it clockwise into the front panel (fingertight) to secure it.

b. Replacement of Major Components.

(1) *Simulator, Antenna Position SM-295/ARM–63* (fig. *3).* Disconnect all wires and cables, and remove the antenna position simulator from the test bench. To replace the antenna simulator, place it on the test bench and connect the cables as shown in figures 15, 16, 17, and 17.1.

(2) *Test Set.* Turn air pressure relief valve counterclockwise (fig. 2). Remove the 20 front panel screws that hold test set in carrying case center section. Use front panel bails and pull test set from carrying case. Replace by sliding the test set in its carrying case, replacing the 20 screws on the front panel, and tightening the air relief valve.

106. Electrical Check of Indicators

To determine that Indicator, Course ID-453/ARN-30 and Indicator, Course ID-250/ARN (fig. 2) are operating properly, use the electrical checks given in paragraphs 107 and 108.

107. Indicator, Course ID-453/ARN-30 Check

Set up a dc power source (para 101c). Check vertical and horizontal cross pointers separately. Disconnect test set from ac and dc lines and from other equipment.

a. Vertical Cross Pointer. Place the VERT CP HOR switch in the VERT position. Connect the power supply leads to pins 44 (+) and 48 (–) of connector J103. Turn on power supply and slowly increase its output until the test set DEVIATION meter reads 120 microampere. Vertical cross pointer should deflect 20°.

b. Vertical Flag. With VERT FLAG HOR switch in VERT, connect the power supply (para 101c) to test set connector J103, pins 49 (+) and 52 (–). Set test set METER switch to FLAG 0–1MA. Turn on power supply and slowly increase its output until the vertical OFF flag disappears. Test set multimeter must read between 125 and 250 microamperes.

c. Horizontal Cross Pointer. Place the test set VERT CP HOR switch in the HOR position. Connect the power supply leads to J104, pins 6 (+) and 9 (-) (for the AN/ARM–63 procured on contract DAAB05-67-C-1648, connect the power supply leads to J104, pins H (+) and L (-)) of the test set. Turn on power supply and slowly increase output until test set DEVIATION meter reads 120 microampere. Horizontal cross pointer should deflect 20°.

d. Horizontal Flag. With VERT FLAG HOR switch in HOR, connect the power supply (para 101c to the test set connector J104, pins 8 (+) and 7 (–) (for the AN/ARM-63 procured on contract DAAB05-67-C-1648, connect the power supply leads to J104, pins K (+) and J (-)). Set test set METER switch to FLAG 0-1MA. Turn on power supply and slowly increase its output until horizontal OFF disappears. Test set multimeter should read between 125 and 250 microampere.

108. Indicator, Course ID-250/ARN Check

NOTE

For the AN/ARM–63 procured on contract DAAB05–67–C–1648, perform the procedures in *a, d, e,* and *f* below.

Connect the test set to a 400-cps, 115-volt, ac power source as for normal operation. Disconnect all other cables and equipment.

a. Place the ac circuit breaker in the ON position; the card of the ID–250/ARN must lock with its 0° index matched with the indicator lubberline (fiducial mark). Card must remain in this position throughout the following steps.

b. Use a No. *22* AWG wire jumper and connect test set J101, pin 8 to pin 12. Indicator needle No. 1 should swing to 30° on the card. Disconnect jumper from pin 12 and connect between J101, pins 8 and 13; indicator needle No. 1 should swing to 330° on the card. Disconnect jumper.

c. Use a No. 22 AWG wire jumper and connect test set J102, pin 1, to chassis ground.

Connect jumper between J102, pins 3, and J101, pin 8; indicator needle No. 2 should swing to 2100 on the card. Disconnect jumper from J102, pin 3, and reconnect between J102, pin 4, and J101, pin 8; needle No. 2 should swing to 1500 on card.

d. Use a No. 22 AWG wire jumper and connect test set J103, pin 41 to pin 24; indicator needle No. 1 should swing to 300 on the card. Disconnect jumper from pin 24 and reconnect between J103, pins 41 and 25. Indicator needle No. 1 should swing to 330° on the card. Disconnect the jumper.

e. Use a No. 22 AWG wire jumper and connect test set J102, pin FF, to chassis ground. Connect jumper between J102, pin E, and J103, pin 41; indicator needle No. 2 should swing to 2100 on the card. Disconnect jumper from J102, pin E and reconnect between J102, pin F, and J103, pin 41; indicator needle No. 2 should swing to 150° on the card.

f. Disconnect all jumpers; turn power off.

CHAPTER 5
SHIPMENT AND LIMITED STORAGE

109. Disassembly

a. Disconnect Simulator, Antenna Position SM-295/ARM-63 (fig. 3).

b. Disconnect all test cables and interunit cabling.

c. Replace all accessories in the storage areas (fig. 1).

d. Secure the front and rear sections.

110. Repackaging for Shipment or Limited Storage

a. The procedure for repackaging depends on the material available and the conditions under which the equipment is to be shipped or stored.

b. If the original carton is available, pack the equipment first in the carrying case (fig. 1) and then in the corrugated carton; use the corrugated fillers as shown in figure 6.

c. If a carton is not available, or only limited storage is desired, pack the equipment in the carrying case.

APPENDIX I

REFERENCES

Following is a list of references available to the operator and organizational maintenance personnel of Test Set, Radio AN/ARM–63 (Aircraft Radio Corp Model BTK–35A):

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	U.S. Army Equipment Index of Modification Work Orders.
SB 11-573	Painting and Preservation Supplies Available for Field Use for Electronic Command Equipment.
TB 746-10	Field Instructions for Painting and Preserving Electronics Command Equipment.
TM 11-518	Operator's Manual, Radio Test Set AN/ARM–5 and Converter, Frequency, Electronic AN/ARM-69.
TM 11-520	Operation and Maintenance, Radio Receiving Set AN/ARN-30.
TM 11-521	Marker Beacon Receiving Set AN/ARN-12.
TM 11-525-10	Operating Instructions, Radio Set ARC Type 12.
TM 11-525-25	Maintenance Instructions, Radio Set ARC Type 12.
TM 11-1214	Instruction Book for Oscilloscope OS-8A/U.
TM 11-5017	Output Meters TS-585A/U, TS-585B/U, TS-585C/U and TS-585D/U.
TM 11-5125	Radio Compass AN/ARN-6.
TM 11–5551A	RF Signal Generator Set AN/URM-25A.
TM 11-5551B	RF Signal Generator Set AN/URM-25B.
TM 11-5551C	Signal Generator Set AN/URM-25C.
TM 11-5551D	RF Signal Generator Set AN/URM-25D.
TM 11-5551E	RF Signal Generator Set AN/URM-25F.
TM 11-5821-205-12	Operator and Organizational Maintenance Manual; Radio Sets AN,/ ARC-60 and AN/ARC-60A.
TM 11-5821-205-35	DS, GS, and Depot Maintenance Manual; Radio Sets AN/ARC-60 and AN/ARC–60A.
TM 11-5821-225-10	Operator's Manual; Radio Sets AN/ARC-27, AN/ARC-27A, AN tARC-55, AN/ARC-55A, and AN,/ARC-55B.
TM 11-5821-225-24	Organizational and Field Maintenance Manual; Radio Sets AN/ARC-27, AN/ARC-27A, AN/ARC-55, AN/ARC-55A, and AN/ARC-55B.
TM 11-5821-225-50	Depot Maintenance Manual; Radio Sets AN/ARC-27, AN/ARC-27A, AN/ARC-55, AN/ARC-55A, and AN/ARC-55B.
TM 11-5826-200-12	Organizational Maintenance Manual Including Repair Parts and Special Tool Lists, Receiver Group AN/ARA-54.
TM 11-5826-200-35	Field and Depot Maintenance Manual, Receiver Group AN/ARA-54.
TM 11-5826-204-12	organizational Maintenance Manual, Direction Finder Set AN/ ARN-59(V).
TM 11-5826-204-35	Field and Depot Maintenance Manual. Direction Finder Set AN/ ARN-59(V).

TM 11-5826-205-34	Field Maintenance Manual, Radio Receiving Set AN/ARN-32.
TM 11-5826-205-50	Radio Receiving Set AN/ARN-32.
TM 11-5826-207-10	Operator's Manual, Radio Receiving Sets AN/ARN-30A, AN/ARN-30B, and AN/ARN-30C.
TM 11-5826-207-24	Organizational and Field Maintenance, Radio Receiving Sets AN/ARN-30A, AN/ARN-30B, and AN/ARN-30C.
TM 11-5826-207-50	Depot Maintenance; Radio Receiving Sets AN/ARN-30A, AN/ARN-30B, and AN/ARN-30C.
TM 11-5826-208-12	Operator's and Organizational Maintenance Manual, Receiving Set, Radio AN/ARN-68 and Receiver, Radio R-1041/ARN.
TM 11-5826-208-35	Field and Depot Maintenance Manual, Receiving Set, Radio AN/ARN-68.
TM 11-5826-210-12	Operator's and Organizational Maintenance Manual: Maintenance Kit, Electronic Equipment MK-252/ARN and Test Set Adapter.
TM 11-5826-215-12	Organizational Maintenance Manual: Receiving Set, Radio AN/ARN-30D and AN/ARN-30E Including Repair Parts and Special Tool Lists.
TM 11-5826-215-35	DS, GS, and Depot Maintenance Manual, Including Repair Parts and Special Tool Lists: Receiving Sets, Radio AN/ARN-30D and AN/ARN-30E.
TM 11-6625-203-12	Operator and Organizational Maintenance; Multimeter AN/URM-105, including Multimeter ME-77/U.
TM 11-6625-239-12	Operator's and Organizational Maintenance Manual; Electronic Multimeter TS-505A/U and TS-505B/U, and Multimeters TS-505C/U and TS-505D/U.
TM 11-6625261-12	Operator's and Organizational Maintenance Manual; Audio Oscillators TS-382A/U, and TS-382B/U, TS-382D/U, TS-382E/U and TS-382F/U.
TM 11-6625366-15	Organizational, DS, GS, and Depot Maintenance Manual: Multimeter TS-352B/U.
TM 38-750	The Army Maintenance Management System (TAMMS).
TM 740-90-1	Administrative Storage of Equipment.
TM 750-244-2	Procedures for Destruction of Electronic Materiel to Prevent Enemy Use (Electronic Command).

APPENDIX III
MAINTENANCE ALLOCATION

Section I. INTRODUCTION

A3-1. General

This appendix provides a summary of the maintenance operations for the Radio Test Set AN/ARM 63. It authorizes categories of maintenance for specific maintenance functions on repairable items and components and the tools and equip ment required to perform each function. This appendix may be used as an aid in planning maintenance operations.

A3-2. 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 examinations.

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 condition, i.e., to clean (decontaminate), to preserve, to drain, to paint, or to replenish fuel, lubricants, hydraulic fluids, or compressed air supplies.

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

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

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

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

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

i. Repair. The application of maintenance services (inspect, test, service, adjust, align, calibrate, replace) or other maintenance actions (welding, grinding, riveting, straightening, facing, remachining, or resurfacing) to restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system. This function does not include the trial and error replacement of running spare type items such as fuses, lamps, or electron tubes.

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.

A3-3. 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 func-

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

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

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

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

A3-4. 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.

A3-5. 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.

SECTION II MAINTENANCE ALLOCATION CHART
FOR

TEST SET, RADIO AN/ARM-63

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY					(5) TOOLS AND EQPT.	(6) REMARKS
			C	O	F	H	D		
00	TEST SET, RADIO AN/ARM-63 (ARC MODEL BTK-35A)	Inspect		0.2					
		Test		0.5				1,2,3	
		Service		0.5				2	
		Repair		0.2				1,2,3	A
		Repair				5.0		4,5,6	
01	TEST SET, RADIO TS-1797/ARM-63	Inspect		0.2					
		Test		1.0				1,2	
		Service		0.5				1,2	
		Install		0.2				1,2,3	
		Replace		0.2				1,2,3	
		Repair		0.2				1,2,3	B
		Repair				1.5		4,5,6	
0101	CONTROL UNIT, COURSE C-1827/ARC-55	Inspect		0.2					
		Test		0.5				1,3	
		Service		0.2				2	
		Install		0.4				1,2	
		Replace		0.4				1,2,3	
		Repair				1.0		4,5,6	
010101	SWITCH ASSEMBLY	Inspect				0.2			
		Test				0.2		4,5,6	
		Replace				0.2		4,5,6	
		Repair				0.2		4,5,6	
0102	CONTROL, RECEIVER	Inspect				0.4			
		Test				0.4		4,5,6	
		Service				0.2		4,5,6	
		Install				0.2		4,5,6	
		Replace				0.2		4,5,6	
		Repair				0.5		4,5,6	
0103	INDICATOR, COURSE ID-453/ARN-30	Inspect		0.2					
		Calibrate				0.5			C
		Replace		0.2				2,3	
		Repair					5.0	4,5,6,7, 8,9,10	D
0104	INDICATOR, COURSE ID-250A/ARN	Inspect		0.2					
		Calibrate				0.5			E
		Replace		0.2				2,3	
		Repair					5.0	4,5,6,7, 8,9,10	F
0105	CABLE ASSEMBLY, SPECIAL PURPOSE	Inspect		0.2					
		Test		0.2				1,2	
		Replace		0.2				3	
		Repair				0.2		4,5,6	
0106	CABLE ASSEMBLY	Inspect		0.2					
		Test		0.2				1,2	
		Replace		0.2				3	
		Repair				0.2		4,5,6	
0107	REAR PANEL ASSEMBLY	Inspect		0.2					
		Test		0.2				1,2	
		Replace		0.2				3	
		Repair				0.2		4,5,6	
0108	CABLE ASSEMBLY	Inspect		0.2					
		Test		0.2				1,2	
		Replace		0.2				3	
		Repair				0.2		4,5,6	
02	SIMULATOR, ANTENNA POSITION SM-295/ARM-63	Inspect		0.2					
		Test		0.2				1,2	
		Replace		0.2				3	
		Repair		0.2				1,2,3	G
		Repair				0.2		4,5,6	

SECTION II MAINTENANCE ALLOCATION CHART
FOR

TEST SET, RADIO AN/ARM-63

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY					(5) TOOLS AND EQPT.	(6) REMARKS
			C	O	F	H	D		
0201	BOX ASSEMBLY, COUPLING	Inspect		0.2					
		Test		0.2				1,2	
		Replace		0.2				3	
		Repair				0.2		4,5,6	
03	BOX, INTERCONNECTING J-1107/ARM	Inspect		0.2					
		Test		0.2				1,2	
		Replace		0.2				3	
		Repair				0.2		4,5,6	
04	CABLE ASSEMBLY, POWER CX-8739/ARM-63 W16	Inspect		0.2					
		Test		0.2				1,2	
		Replace		0.2				3	
		Repair				0.2		4,5,6	
05	WIRING HARNESS, BRANCHED CX-8749/ARM-63 W3	Inspect		0.2					
		Test		0.2				1,2	
		Replace		0.2				3	
		Repair				0.2		4,5,6	
06	WIRING HARNESS, BRANCHED (ARC 29419) W2	Inspect		0.2					
		Test		0.2				1,2	
		Replace		0.2				3	
		Repair				0.2		4,5,6	
07	WIRING HARNESS, BRANCHED (ARC 29418) W1	Inspect		0.2					
		Test		0.2				1,2	
		Replace		0.2				3	
		Repair				0.2		4,5,6	
08	WIRING HARNESS, BRANCHED (CX-8748) W4	Inspect		0.2					
		Test		0.2				1,2	
		Replace		0.2				3	
		Repair				0.2		4,5,6	
09	CABLE ASSEMBLY, BRANCHED (CX-8747) W5	Inspect		0.2					
		Test		0.2				1,2	
		Replace		0.2				3	
		Repair				0.2		4,5,6	
10	WIRING HARNESS, BRANCHED (CX-8746) W6	Inspect		0.2					
		Test		0.2				1,2	
		Replace		0.2				3	
		Repair				0.2		4,5,6	
11	TIP PLUG ASSEMBLY	Inspect		0.2					
		Test		0.2				1,2	
		Replace		0.2				3	
		Repair				0.2		4,5,6	
12	WIRING HARNESS, BRANCHED (CX-8745) W7	Inspect		0.2					
		Test		0.2				1,2	
		Replace		0.2				3	
		Repair				0.2		4,5,6	
13	WIRING HARNESS, BRANCHED (CX-8744) W8	Inspect		0.2					
		Test		0.2				1,2	
		Replace		0.2				3	
		Repair				0.2		4,5,6	
14	CABLE ASSEMBLY (CX-8743) W9	Inspect		0.2					
		Test		0.2				1,2	
		Replace		0.2				3	
		Repair				0.2		4,5,6	
15	CABLE ASSEMBLY (ARC 30073) W10	Inspect		0.2					
		Test		0.2				1,2	
		Replace		0.2				3	
		Repair				0.2		4,5,6	

SECTION II MAINTENANCE ALLOCATION CHART
FOR

TEST SET RADIO AN/ARM-63

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY					(5) TOOLS AND EQPT.	(6) REMARKS
			C	O	F	H	D		
16	CABLE ASSEMBLY (CX-8741) W11	Inspect		0.2					
		Test		0.2				1,2	
		Replace		0.2				3	
		Repair				0.2		4,5,6	
17	CABLE ASSEMBLY (ARC 30075) W12	Inspect		0.2					
		Test		0.2				1,2	
		Replace		0.2				3	
		Repair				0.2		4,5,6	
18	CABLE ASSEMBLY (ARC 30076) W13	Inspect		0.2					
		Test		0.2				1,2	
		Replace		0.2				3	
		Repair				0.2		4,5,6	
19	CABLE ASSEMBLY, RF (ARC 35311) W14	Inspect		0.2					
		Test		0.2				1,2	
		Replace		0.2				3	
		Repair				0.2		4,5,6	
20	CABLE ASSEMBLY, (ARC 30077) W15	Inspect		0.2					
		Test		0.2				1,2	
		Replace		0.2				3	
		Repair				0.2		4,5,6	

SECTION III TOOL AND TEST EQUIPMENT REQUIREMENTS
FOR

TEST SET, RADIO AN/ARM-63

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE CATEGORY	NOMENCLATURE	NATIONAL/NATO STOCK NUMBER	TOOL NUMBER
1	O	MULTIMETER AN/URM-105	6625-00-581-2036	
2	O	TOOL KIT, ELECTRONIC EQUIPMENT TK-105G/U	5180-00-610-8177	
3	O	TOOL KIT, ELECTRONIC EQUIPMENT TK-101/G	5180-00-064-5178	
4	H,D	TOOL KIT, ELECTRONIC EQUIPMENT TK-100/G	5180-00-605-0079	
5	H,D	MULTIMETER ME-26D/U	6625-00-913-9781	
6	H,D	MULTIMETER AN/USM-223	6625-00-999-7465	
7	D	MOTOR GENERATOR PU-545/A*	6125-00-958-6915	
8	D	POWER SUPPLY PP-1104C/G**	6130-00-542-6385	
9	D	VARIABLE POWER SUPPLY CN-16( )/U	5950-00-235-2086	
10	D	RESISTANCE BRIDGE ZM-4/U	6625-00-166-0398	
		* OR EQUIVALENT AC SOURCE		
		** OR EQUIVALENT DC SOURCE		

SECTION IV. REMARKS

REFERENCE CODE	REMARKS
A	Repair by replacement of Group 01, 0101, 0103 thru 0108, 02, 0201, 03 thru 20.
B	Replacement of knobs, lamps, fuses and cables.
C	Calibrate as per TB 11-6625-556-35.
D	Repair as per TM 11-5826-207-50.
E	Calibrate as per TB 11-6625-556-35.
F	Repair as per TM 11-5826-211-50.
G	Repair by replacement of Group 0201.

INDEX

By Order of the Secretary of the Army:

HAROLD K. JOHNSON,
General, United States Army,
Chief of Staff.

Official:

KENNETH G. WICKHAM,
Major General, United States Army,
The Adjutant General.

Distribution:

To be distributed in accordance with DA Form 12-36 Unclassified requirements for direct and general support maintenance literature to any account who has expressed a need for fixed wing and/or rotor wing aircraft.

U.S. GOVERNMENT PRINTING OFFICE: 1987 - 784-030/68191